Company catalogue 2009

Couplings
Hydraulic Components
Torque Limiters
Torque Measurement
Clamping Elements

Made for Motion KTR

www.ktr.com

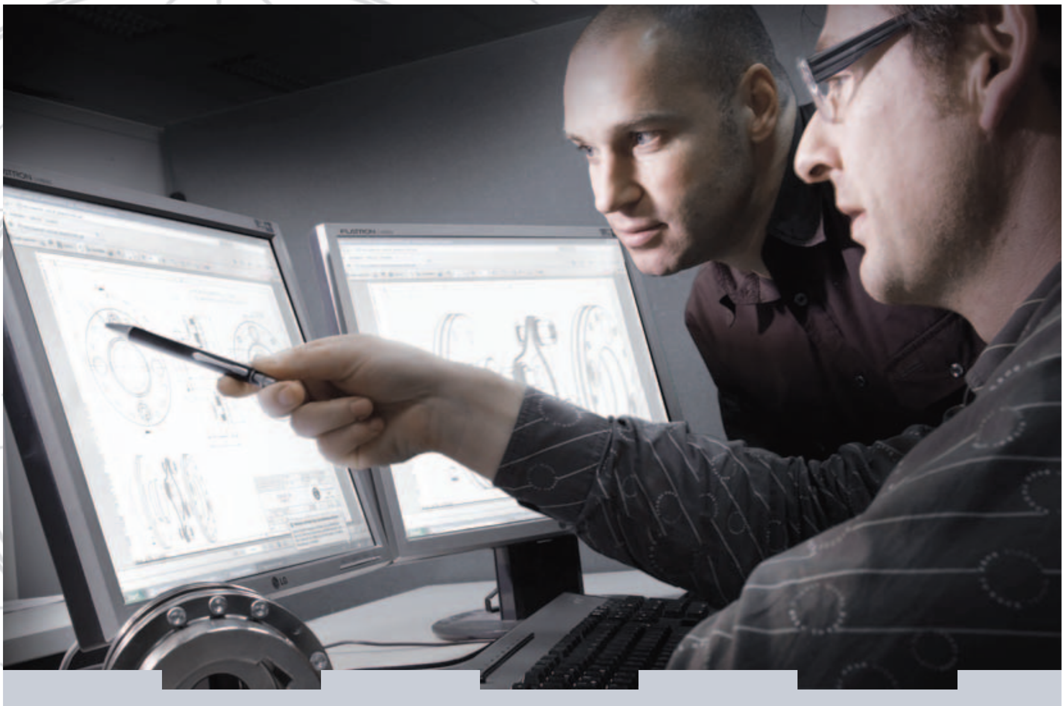
If you want to set things in motion: KTR

Competence meets creativity

As a leading manufacturer of high-quality drive components, KTR supplies mechanical couplings, clamping sets, torque limiters, torque measuring systems and hydraulic components all over the world. With more than 50 years experience in power transmission we are trendsetters in the development of coupling technology and offer customised solutions to all industries. The KTR trademark characterises quality and innovation, speed, reliability, flexibility and a close working relationship with customers.

Having started with the curved-tooth gear coupling® BoWex® and the torsionally flexible jaw coupling ROTEX®, KTR has built up an extensive product portfolio covering torques from 0,15 to over 750.000 Nm. The production by KTR's in-house, up-to-date machinery ensures that the couplings are made to the utmost accuracy. The couplings having a unit weight of up to 2 tons. Flexible automation ensures a quick and low-cost production even if the product has to be customised to meet customers individual specifications. KTR produce several million couplings a year.

Even though KTR's standard product portfolio is quite extensive, it only represents a fraction of the different options available. KTR is not only a subcontractor but also a solution provider. The knowledge gained from thousands of applications in the field allows us to find optimum, low-cost solutions for customised applications. We will consult you during the planning stage providing drawings and prototypes or arranging for local discussions if required. Every year KTR produces more than 10.000 new products ordered by customers. This trend increases year on year. This leads to many special products becoming standard items: We permanently give vital ideas to the Power Transmission technology – in cooperation with our customers.



Accuracy meets speed

KTR products are evidence of well-designed, quality components resulting in improved characteristics of the drive system and as a consequence, a longer service life. It is our aim to continually improve the quality of our products and services. We can analyse the stiffness of components by utilising FEM (Finite Element Method) system and we can also perform torsional vibration calculations for entire drive systems. In our in-house Research and Development Centre we test our products on accurate test benches in realistic operating conditions. Our main objective is to provide the uppermost satisfaction to our customers.

Our technical sales engineers and our well-trained sales staff will be pleased to give you advice. KTR provides you with extensive services online, too: At www.ktr.com you can request information, including our product catalogue, 3D-CAD-models and assembly instructions. Depending on your application you can select your drive component from of more than 3.500 standard products. Having selected which one is the right component for your application by using our online calculation program, you are now in a position to order the products by contacting your nearest KTR company. Alternatively our Euro shop is open 24 hours a day.

Our latest scheduling system SAP ERP ensures an optimum networking with our customers and allows for a quick and reliable delivery service. A selection of 3.500 couplings and hydraulic components are permanently available from stock. For orders placed by 2:00pm we guarantee the despatch of orders the same day! In the KTR Logistics Centre the overall flow of goods is supervised by radio-controlled barcode scanning. Leading distribution partners ensure delivery on time. Our tracking and tracing system allows you to follow the progress of your order at all times. KTR supplies to every location in the world.

For further details about us and our products:
www.ktr.com

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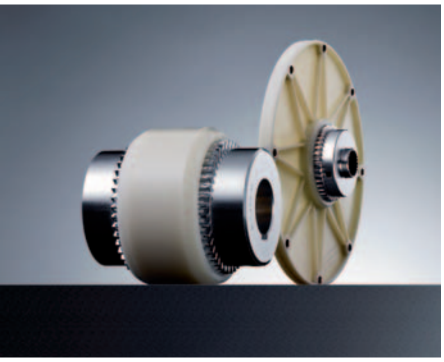

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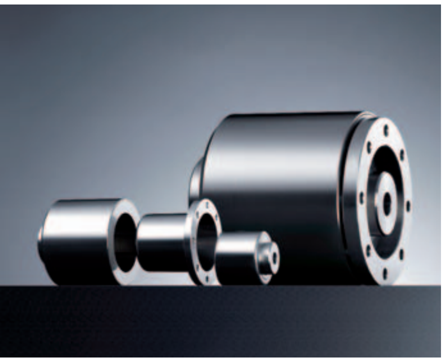

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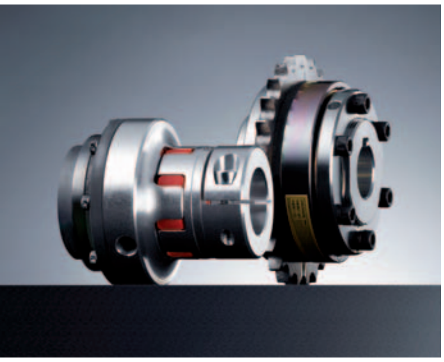

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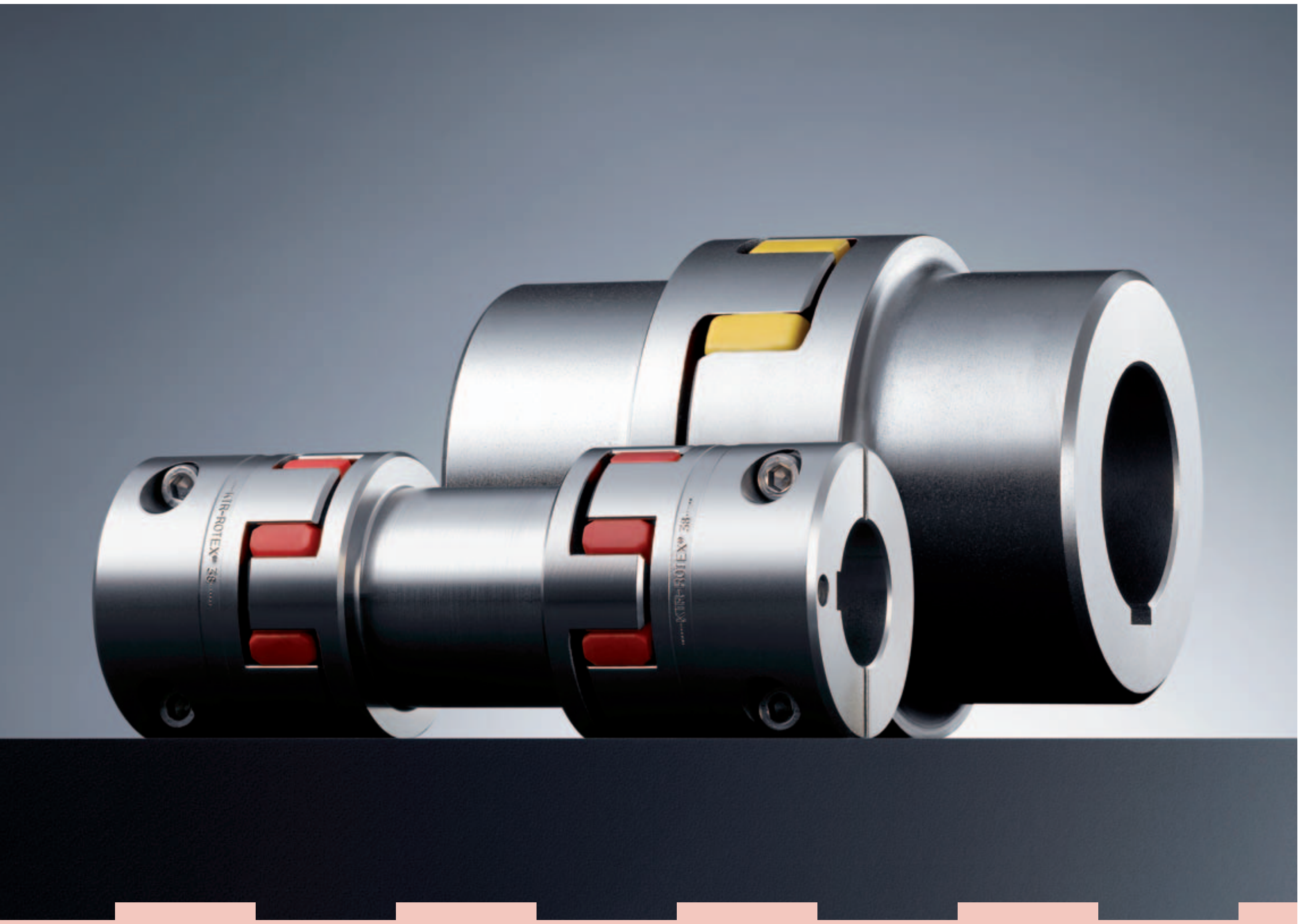

ROTEX®

Torsionally flexible coupling

Made for Motion KTR

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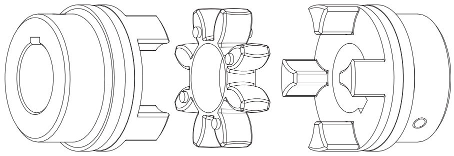
Description of coupling

ROTEX® - couplings are characterized by small dimensions, low weight and low mass moments of inertia yet transmit high torques. Running quality and service life of the coupling are improved by accurate all-over machining.

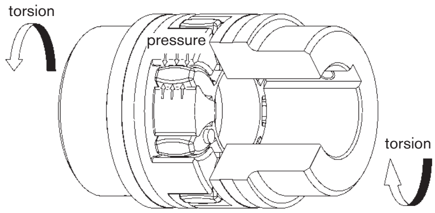
Their application is ideal for transmitting torque while damping torsional vibrations and absorbing shocks produced by the uneven operation of certain prime movers.



General description

ROTEX® - couplings are torsionally flexible and designed for positive torque transmission. They are fail-safe. Operational vibrations and shocks are efficiently dampened and reduced. The two congruent coupling halves with concave claws on the inside are periphally offset in relation to one another by half a pitch.
In addition, they are designed in such a way as to enable an involute spider to be located between them.
The teeth of the spider are crowned to avoid edge pressure if the shafts are misaligned.
ROTEX® couplings are capable of compensating for axial, radial and angular displacements of the shafts to be connected.

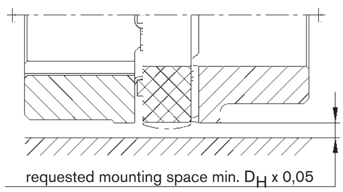
Load on spider



Performance

In contrast to other flexible couplings, the intermediate members of which are subject to bending stress and are therefore prone to earlier wear, the flexible teeth of ROTEX couplings are subject to pressure only. This gives the additional advantage of the individual teeth being able to accept considerably higher loads.The elastomer parts show deformation with load and excessive speeds. Sufficient space for expansion should be ensured (see drawing – deformation with load).
The maximum torsion angle with ROTEX couplings of any size amounts to 5°. They can be fitted both horizontally and vertically.

Deformation with load



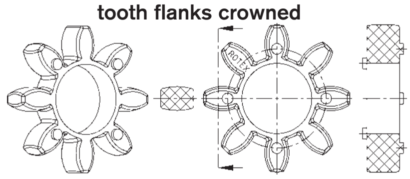
Explosion-proof use

ROTEX® couplings are suitable for power transmission in drives in hazardous areas. The couplings are certified and confirmed according to EC standard 94/9/EC (ATEX 95) as units of category 2G/2D and thus suitable for the use in hazardous areas of zone 1, 2, 21 and 22. Please read through our information included in the respective Type Examination Certificate and the operating and mounting instructions at www.ktr.com.

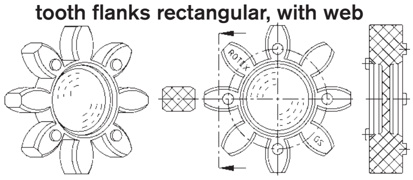
Spiders

An operating temperature range of - 40 °C to + 90 °C ensures perfect operation. Transient temperature peaks up to + 120 °C do not cause any damage on the coupling. Continuous improvement of materials has resulted in a standard spider of 92 Shore A which offers various advantages over usual polyurethane materials. For higher torques it is also possible to make use of a spider 95/98 Shore A or 64 Shore D-F.
The spiders are extremely resistant to wear, oil, ozone and ageing. In addition, they are resistant to hydrolysis (ideal for tropical climates).
The high internal damping protects the drive against dynamic overload.

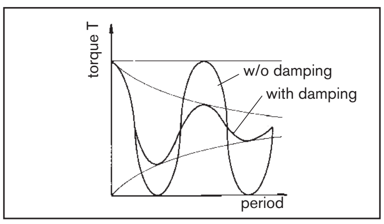
**Standard spider
tooth flanks crowned**



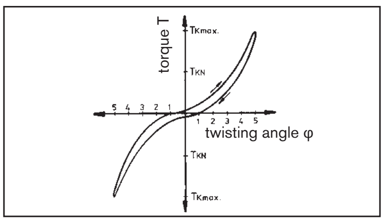
**GS spiders
tooth flanks rectangular, with web**



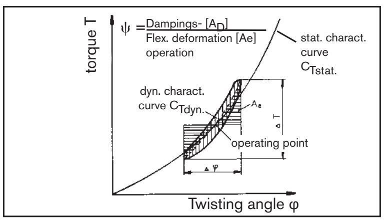
Comparison of loads



Twisting angle



Damping



Coupling selection

The ROTEX® coupling is selected in accordance with DIN 740 part 2. The coupling has to be dimensioned in a way that the permissible coupling load is not exceeded in any operating condition. For this purpose the actual loads have to be compared to the permissible parameters of the coupling.

1 **Drives without periodical torsional vibrations**
e. g. centrifugal pumps, fans, screw compressors, etc.
The coupling is selected taking into account the rated torques T_{KN} and maximum torque $T_{K\,max}$.

1.1 **Load produced by rated torque**

$$T_N\ [\mathrm{Nm}] = 9550 \cdot \frac{P\ [\mathrm{kW}]}{n\ [1/\mathrm{min}]}$$

$$T_{KN} \geq T_N \cdot S_t$$

Taking into consideration the ambient temperature, the permissible rated torque T_{KN} of the coupling has to correspond at least to the rated torque T_N of the machine.

1.2 **Load produced by torque shocks**

$$T_{K\,max} \geq T_S \cdot S_z \cdot S_t + T_N \cdot S_t$$

Drive-sided shock
$$T_S = T_{AS} \cdot M_A \cdot S_A$$

Load-sided shock
$$T_S = T_{LS} \cdot M_L \cdot S_L$$

$$M_A = \frac{J_L}{J_A + J_L} \qquad M_L = \frac{J_A}{J_A + J_L}$$

The permissible maximum torque of the coupling has to correspond at least to the total of peak torque T_S and the rated torque T_N of the machine, taking into account the shock frequency Z and the ambient temperature.

This applies in case if the rated torque T_N of the machine is at the same time subject to shocks.

Knowing the mass distribution, shock direction and shock mode, the peak torque T_S can be calculated.

For drives with A. C.-motors with high masses on the load side we would recommend to calculate the peak driving torque with the help of our simulation programme.

2. **Drives with periodical torsional vibrations.** For drives subject to high torsional vibrations, e. g. diesel engines, piston compressors, piston pumps, generators, etc., it is necessary to perform a torsional vibration calculation to ensure a safe operation. If requested, we perform the torsional vibration calculation and the coupling selection in our company. For necessary details please see KTR standard 20004.

2.1 **Load produced by rated torque**

$$T_{KN} \geq T_N \cdot S_t$$

Taking into account the ambient temperature, the permissible rated torque T_{KN} of the coupling has to correspond at least to the rated torque T_N of the machine.

2.2 **Passing through the resonance range**

$$T_{K\,max} \geq T_S \cdot S_t$$

Taking into account the temperature, the peak torque T_S arising when the resonance range is run through must not exceed the maximum torque T_{Kmax} of the coupling.

2.3 **Load produced by vibratory torque shocks**

$$T_{KW} \geq T_W \cdot S_t$$

Taking into account the ambient temperature, the permissible vibratory torque T_{KW} of the coupling must not be exceeded by the highest periodical vibratory torque T_W with operating speed.

$$P_{KW} \geq P_W$$

For higher operating frequencies f > 10, the heat produced by damping in the elastomer part is considered as damping power P_W.

The permissible damping power P_{KW} of the coupling depends on the ambient temperature and must not be exceeded by the damping power produced.

Description	Symbol	Definition or explanation
Rated torque of coupling	T_{KN}	Torque that can continuously be transmitted over the entire permissible speed range
Maximum torque of coupling	$T_{K\,max}$	Torque that can be transmitted as dynamic load ≥ 10^5 times or 5 x 10^4 as vibratory load, respectively, during the entire operating life of the coupling
Vibratory torque of coupling	T_{KW}	Torque amplitude of the permissible periodical torque fluctuation with a frequency of 10 Hz and a basic load of T_{KN} or dynamic load up to T_{KN}, respectively
Damping power of coupling	P_{KW}	Permissible damping power with an ambient temperature of + 30 °C.
Rated torque of machine	T_N	Stationary rated torque on the coupling
Rated torque of driving side	T_{AN}	Rated torque of machine, calculated from rated power and rated speed
Rated torque of load side	T_{LN}	Maximum figure of the load torque calculated from power and speed
Peak torque of machine	T_S	Peak torque on the coupling
Peak torque on the driving side	T_{AS}	Peak torque with torque shock on the driving side, e. g. breakdown torque of the electric motor

Description	Symbol	Definition or explanation
Peak torque of load side	T_{LS}	Peak torque with torque shock on load side, e. g. braking
Vibratory torque of machine	T_W	Amplitude of the vibratory torque effective on the coupling
Damping power of the machine	P_W	Damping power which is effective on the coupling due to the load produced by the vibratory torque
Moment of inertia of driving side	J_A	Total of moments of inertia existing on the driving or load side referring to the coupling speed
Moment of inertia of load side	J_L	
Rotational inertia coefficient of driving side	M_A	Factor taking into account the mass distribution with shocks and vibrations produced on the driving or load side
Rotational inertia coefficient of load side	M_L	$M_A = \frac{J_L}{(J_A + J_L)}$ $M_L = \frac{J_A}{(J_A + J_L)}$

Coupling selection

Service factor S_t for temperature

	-30 °C +30 °C	+40 °C	+60 °C	+80 °C
S_t	1,0	1,2	1,4	1,8

Service factor S_Z for starting frequency

starting frequency/h	100	200	400	800
S_Z	1,0	1,2	1,4	1,6

Service factor S_A / S_L for shocks

	S_A/S_L
gentle shocks	1,5
average shocks	1,8
heavy shocks	2,5

Permissible load on feather key of the coupling hub

The shaft-hub-connection has to be verified by the customer. Permissible surface pressure according to DIN 6892 (method C).

Cast iron EN-GJL-250 (GG 25)	225 N/mm²
material nodular iron EN-GJS-400-15 (GGG 40)	225 N/mm²
material steel S355J2G3 (St 52.3)	250 N/mm²
for other steel materials p_{zul} =	$0{,}9 \cdot R_e$ ($R_{p0.2}$)

Example of calculation of standard IEC motors shown on page 23:

Given: Details of driving side

A. C. motor	type 315 L ⇛ S_A = 1,8
Motor output	P = 160 kW
Speed	n = 1485 rpm
Moment of inertia driven side	J_A = 2,9 kgm²
Start-up frequency	z = 6 ¹/ₕ ⇛ S_Z = 1,0
Ambient temperature	= + 60 °C ⇛ S_t = 1,4

Given: Details of load side

Screw compressor	
Rated torque of load side	T_{LN} = 930 Nm
Moment of inertia of load side	J_L = 6,8 kgm²

Calculation

- Rated driving torque

$$\boxed{T_{AN}\ [\mathrm{Nm}] = 9550\ \frac{P_{AN}[\mathrm{kW}]}{n_{AN}\ [\mathrm{rpm}]}}$$

$$T_{AN} = 9550 \cdot \frac{160\ \mathrm{kW}}{1485\ \mathrm{rpm}} = \underline{1029\ \mathrm{Nm}}$$

Coupling selection:

- Load produced by rated torque:

$$\boxed{T_{KN} \geq T_{LN} \cdot S_t}$$

$$T_{KN} \geq 930\mathrm{Nm} \cdot 1{,}4 = \underline{1302\ \mathrm{Nm}}$$

Selected: ROTEX® Size 90 - spider 92 Shore A with:

T_{KN} = 2400 Nm

$T_{K\ max}$ = 4800 Nm

- Load produced by torque shocks:

$$\boxed{T_{K\ max} \geq T_S \cdot S_z \cdot S_t}$$

Drive-sided shock

$$\boxed{T_S = T_{AS} \cdot M_A \cdot S_A}$$

$$M_A = \frac{J_L}{(J_A + J_L)} = \frac{6{,}8\ \mathrm{kgm}^2}{(2{,}9\mathrm{kgm}^2 + 6{,}8\ \mathrm{kgm}^2)} = \underline{0{,}7}$$

- Driving torque

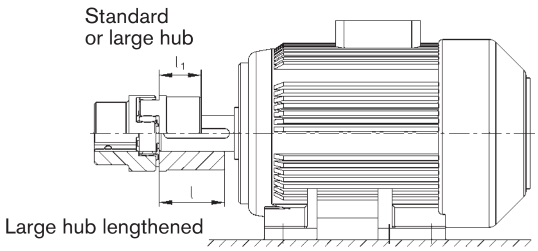
$$T_{AS} = 2{,}0 \cdot T_{AN} = 2{,}0 \cdot 1029\ \mathrm{Nm} = \underline{2058\ \mathrm{Nm}}$$

$$T_S = 2058\ \mathrm{Nm} \cdot 0{,}7 \cdot 1{,}8 = \underline{2593{,}1\ \mathrm{Nm}}$$

$$T_{K\ max} \geq 2593{,}1\ \mathrm{Nm} \cdot 1 \cdot 1{,}4 = \underline{3630{,}3\ \mathrm{Nm}}$$

$T_{K\ max}$ with 4800 Nm ≥ 3630,3 Nm ✓

Selection of standard IEC motors



ROTEX® couplings for standard IEC motors, protection IP 54/IP 55 (spider 92 Shore A)														
A. C. motor 50 Hz			Motor output n = 3000 1/min 2-pole		ROTEX® coupling size	Motor output n = 1500 1/min 4-pole		ROTEX® coupling size	Motor output n = 1000 1/min 6-pole		ROTEX® coupling size	Motor output n = 750 1/min 8-pole		ROTEX® coupling size
Size	Shaft end dxl [mm]													
	2-pole	4,6,8 pole	Output P [kW]	Torque T [Nm]		Output P [kW]	Torque T [Nm]		Output P [kW]	Torque T [Nm]		Output P [kW]	Torque T [Nm]	
56	9 x 20		0,09	0,32	**9** 1)	0,06	0,43	**9** 1)	0,037	0,43	**9** 1)			
			0,12	0,41		0,09	0,64		0,045	0,52				
63	11 x 23		0,18	0,62		0,12	0,88		0,06	0,7				
			0,25	0,86	**14**	0,18	1,3	**14**	0,09	1,1	**14**			
71	14 x 30		0,37	1,3		0,25	1,8		0,18	2		0,09	1,4	**14**
			0,55	1,9		0,37	2,5		0,25	2,8		0,12	1,8	
80	19 x 40		0,75	2,5		0,55	3,7		0,37	3,9		0,18	2,5	
			1,1	3,7	**19**	0,75	5,1	**19**	0,55	5,8	**19**	0,25	3,5	**19**
90S	24 x 50		1,5	5		1,1	7,5		0,75	8		0,37	5,3	
90L			2,2	7,4		1,5	10		1,1	12		0,55	7,9	
100L	28 x 60		3	9,8		2,2	15	**24**	1,5	15	**24**	0,75	11	**24**
					24	3	20					1,1	16	
112M			4	13		4	27		2,2	22		1,5	21	
132S	38 x 80		5,5	18		5,5	36		3	30		2,2	30	
			7,5	25	**28**			**28**			**28**			**28**
132M						7,5	49		4	40		3	40	
									5,5	55				
160M	42 x 110		11	36		11	72		7,5	75		4	54	
			15	49	**38**			**38**			**38**	5,5	74	**38**
160L			18,5	60		15	98		11	109		7,5	100	
180M	48 x 110		22	71		18,5	121							
180L						22	144	**42**	15	148	**42**	11	145	**42**
200L	55 x 110		30	97	**42**	30	196		18,5	181		15	198	
			37	120					22	215				
225S	55 x 110	60 x 140				37	240	**48**				18,5	244	**48**
225M			45	145		45	292	**55**	30	293	**55**	22	290	**55**
250M	60 x 140	65 x 140	55	177	**48**	55	356		37	361	**65** 2)	30	392	**65**
280S		75 x 140	75	241	**55**	75	484	**65** 2)	45	438		37	483	**65** 2)
280M			90	289		90	581		55	535		45	587	**75**
315S			110	353		110	707	**75**	75	727	**75**	55	712	
315M		80 x 170	132	423	**65**	132	849		90	873		75	971	
	65 x 140		160	513		160	1030		110	1070		90	1170	**90**
315L			200	641		200	1290	**90**	132	1280	**90**	110	1420	
					75				160	1550		132	1710	
315		85 x 170	250	802		250	1600		200	1930		160	2070	
			315	1010		315	2020		250	2410	**100**	200	2580	**100**
			355	1140		355	2280	**100**						
355	75 x 140	95 x 170	400	1280	**90**	400	2570		315	3040	**110**	250	3220	**110**
			500	1600		500	3210	**110**	400	3850	**125**	315	4060	**125**
			560	1790		560	3580	**125**	450	4330		355	4570	
400	80 x 170	110 x 210	630	2020		630	4030		500	4810		400	5150	**140**
			710	2270	**100**	710	4540		560	5390	**140**	450	5790	
			800	2560		800	5120	**140**	630	6060		500	6420	
450	90 x 170	120 x 210	900	2880	**110**	900	5760		710	6830	**160**	560	7190	**160**
			1000	3200		1000	6400	**160**	800	7690		630	8090	

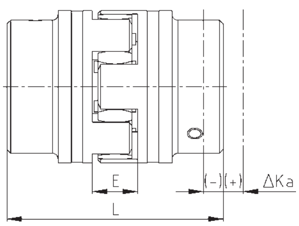
The arrangement of couplings is valid for an ambient temperature of up to + 30 °C. For the selection there is a minimum safety factor of 2 of the max. coupling torque ($T_{Kmax.}$).
A detailed arrangement is possible according to catalogue, page 20 and 21. Drives with periodical torque curves must be selected according to DIN 740 part 2. If requested, KTR will make the selection.
Torque T = nominal torque according to Siemens catalogue M 11 · 1994/95.

1) For dimensions see ROTEX® GS line
2) Motor hub from steel see page 29

Displacements and installation

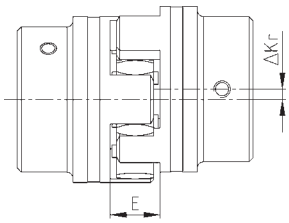
Displacements

Axial displacement ΔKa

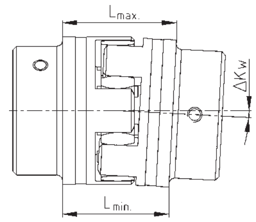


$L_{max.} = L + \Delta Ka$

Radial displacement ΔKr



Angular displacement ΔKw [degrees]



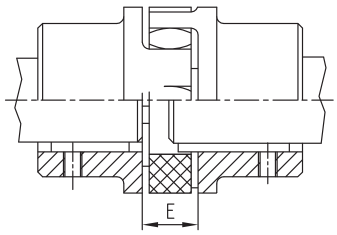
$\Delta Kw\ [mm] = L_{max} - L_{min}$

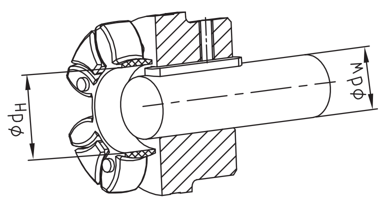
Displacements																	
ROTEX® Size	14	19	24	28	38	42	48	55	65	75	90	100	110	125	140	160	180
Max. axial displacement ΔKa [mm]	-0,5 +1,0	-0,5 +1,2	-0,5 +1,4	-0,7 +1,5	-0,7 +1,8	-1,0 +2,0	-1,0 +2,1	-1,0 +2,2	-1,0 +2,6	-1,5 +3,0	-1,5 3,4	-1,5 +3,8	-2,0 +4,2	-2,0 +4,6	-2,0 +5,0	-2,5 +5,7	-3,0 +6,4
Max. radial displacement with n=1500min⁻¹. ΔKr [mm]	0,17	0,20	0,22	0,25	0,28	0,32	0,36	0,38	0,42	0,48	0,50	0,52	0,55	0,60	0,62	0,64	0,68
Max. angular displacement with n= 1500min⁻¹. ΔKw [degree]	1,2	1,2	0,9	0,9	1,0	1,0	1,1	1,1	1,2	1,2	1,2	1,2	1,3	1,3	1,2	1,2	1,2
ΔKw [mm]	0,67	0,82	0,85	1,05	1,35	1,70	2,00	2,30	2,70	3,30	4,30	4,80	5,60	6,50	6,60	7,60	9,00

The above-mentioned figures of displacement of flexible ROTEX® couplings are standard values taking into account the load of the coupling up to the rated torque T_{KN} and an operating speed n = 1500 1/min along with an ambient temperature of + 30° C.
For different operating conditions please order our data sheet KTR-N 20240 regarding displacements for ROTEX®. The displacement figures may only be used one by one - if they appear simultaneously, they must be limited in proportion. Care should be taken to maintain the distance dimension E accurately in order to allow for axial clearance of the coupling while in operation. In case of an axial shifting the dimension "L" has to be considered as a minimum dimension in order to keep the spider free from pressure on its faces. Detailed mounting instructions are shown on our homepage (http://www.ktr.com).

Installation

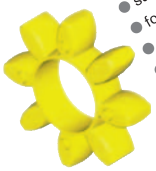
Shaft with keyway (acc. DIN 6885) protruding into the spider $Ød_W$



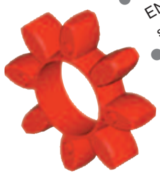


Mounting dimension																	
ROTEX® Size	14	19	24	28	38	42	48	55	65	75	90	100	110	125	140	160	180
Distance dimension E	13	16	18	20	24	26	28	30	35	40	45	50	55	60	65	75	85
Dimension d_H	10	18	27	30	38	46	51	60	68	80	100	113	127	147	165	190	220
Dimension d_W	7	12	20	22	28	36	40	48	55	65	80	95	100	120	135	160	185

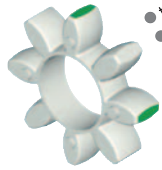
Spider types - Materials, physics, properties



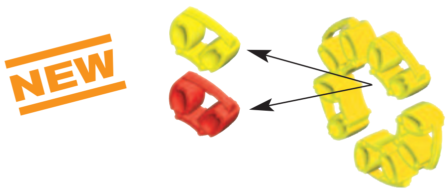
- standard spider 92 Sh A
- suitable for all hub materials
- for all applications in general engineering/hydraulics
- good dynamic properties
- temperature range from - 40 °C to + 90 °C
- standard from size 14 to 100



- spider 95/98 Sh A
- optimum combination with hub material EN-GJL-250 (GG 25); steel; EN-GJS-400-15 (GGG 40)
- transmitting high torques yet damping vibrations
- temperature range from - 30 °C to + 90 °C
- standard from size 14 to 100



- spider 64 Sh D-F
- optimum combination with hub material steel; EN-GJS-400-15 (GGG 40)
- transmitting twice the torque of spider 92 Sh A
- small twisting angle
- spider suitable for critical drives
- resistant to hydrolysis
- standard from size 14 to 100



elements DZ (double tooth elements)
- standard from size 110 to 180
- available as hardness 92 Sh A and 95 Sh A
- available from stock in the sizes 90 - 180

Standard spiders						
Spider type hardness (Shore)	Dentification colour	Material	Perm. temperature range (°C) Continuous temperature	Perm. temperature range (°C) Max. temperature short time	Available for coupling size	Typical applications
92 Sh A	yellow	polyurethane	- 40 to + 90	- 50 to + 120	size 14 – 180	– for all applications in general engineering and hydraulics – Standard applications with average elasticity
95/98 Sh A	red	polyurethane	- 30 to + 90	- 40 to + 120	size 14 – 180	– good torque transmission with good damping properties
64 Sh D-F	natural white with green tooth flanks	polyurethane	- 30 to + 110	- 30 to + 130	size 14 – 180	– high air moisture, resistant to hydrolysis – displacement of critical speeds

Spiders for special applications on request for:					
Typical applications	Spider type hardness (Shore)	Identification colour	Material	Perm. temperature range (°C) Continuous temperature	Perm. temperature range (°C) Max. temperature short time
For high dynamic load, high air moisture/resistant to hydrolysis	94 Sh A-T	blue with yellow tooth flanks	polyurethane	- 50 to + 110	- 60 to + 130
Drives with higher loads, small twisting angles - torsionally rigid, high ambient temperatures	64 Sh D-H	green	hytrel	- 50 to + 110	- 60 to + 150
Small twisting angles and high torsion spring stiffness, high ambient temperature, good resistance to chemicals [1]	polyamide	-	PA	- 20 to + 130 1)	- 30 to + 150 1)
Small twisting angles and high torsion spring stiffness, very high ambient temperature, good resistance to chemicals, resistant to hydrolysis	PEEK	light grey	PEEK	up to + 180 (ATEX release up to a max. +160)	to + 250

[1] Different properties depending on compound

Technical data

ROTEX® sizes for all designs and materials	Max. speed [1/min] with V = 30 m/s	Max. speed [1/min] with V = 40 m/s	Twisting angle with T_{KN} φ	Twisting angle with $T_{K\,max}$ φ	Torque [Nm] Rated T_{KN}	Torque [Nm] Max $T_{K\,max}$	Torque [Nm] Vibratory T_{KW}	Damping power [W] with +30 °C P_{KW}	Torsion spring stiffness C_{dyn} [Nm/rad] 1,00 T_{KN}	0,75 T_{KN}	0,50 T_{KN}	0,25 T_{KN}
Spider from polyurethane 92 Shore A; colour yellow												
14	19000	–	6,4°	10°	7,5	15	2,0	–	0,38x10^3	0,31x10^3	0,24x10^3	0,14x10^3
19	14000	19000			10	20	2,6	4,8	1,28x10^3	1,05x10^3	0,80x10^3	0,47x10^3
24	10600	14000			35	70	9,1	6,6	4,86x10^3	3,98x10^3	3,01x10^3	1,79x10^3
28	8500	11800			95	190	25	8,4	10,90x10^3	8,94x10^3	6,76x10^3	4,01x10^3
38	7100	9500			190	380	49	10,2	21,05x10^3	17,26x10^3	13,05x10^3	7,74x10^3
42	6000	8000			265	530	69	12,0	23,74x10^3	19,47x10^3	14,72x10^3	8,73x10^3
48	5600	7100			310	620	81	13,8	36,70x10^3	30,09x10^3	22,75x10^3	13,49x10^3
55	4750	6300			410	820	107	15,6	50,72x10^3	41,59x10^3	31,45x10^3	18,64x10^3
65	4250	5600	3,2°	5°	625	1250	163	18,0	97,13x10^3	79,65x10^3	60,22x10^3	35,70x10^3
75	3550	4750			1280	2560	333	21,6	113,32x10^3	92,92x10^3	70,26x10^3	41,65x10^3
90	2800	3750			2400	4800	624	30,0	190,09x10^3	155,87x10^3	117,86x10^3	69,86x10^3
100	2500	3350			3300	6600	858	36,0	253,08x10^3	207,53x10^3	156,91x10^3	93,01x10^3
110	2240	3000			4800	9600	1248	42,0	311,61x10^3	255,52x10^3	193,20x10^3	114,52x10^3
125	2000	2650			6650	13300	1729	48,0	474,86x10^3	389,39x10^3	294,41x10^3	174,51x10^3
140	1800	2360			8550	17100	2223	54,6	660,49x10^3	541,60x10^3	409,50x10^3	242,73x10^3
160	1500	2000			12800	25600	3328	75,0	890,36x10^3	730,10x10^3	552,03x10^3	327,21x10^3
180	1400	1800			18650	37300	4849	78,0	2568,56x10^3	2106,22x10^3	1592,51x10^3	943,95x10^3
Spider from polyurethane 98 Shore A; from size 65 95 Shore A; colour red												
14	19000	–	6,4°	10°	12,5	25	3,3	–	0,56x10^3	0,46x10^3	0,35x10^3	0,21x10^3
19	14000	19000			17	34	4,4	4,8	2,92x10^3	2,39x10^3	1,81x10^3	1,07x10^3
24	10600	14000			60	120	16	6,6	9,93x10^3	8,14x10^3	6,16x10^3	3,65x10^3
28	8500	11800			160	320	42	8,4	26,77x10^3	21,95x10^3	16,60x10^3	9,84x10^3
38	7100	9500			325	650	85	10,2	48,57x10^3	39,83x10^3	30,11x10^3	17,85x10^3
42	6000	8000			450	900	117	12,0	54,50x10^3	44,69x10^3	33,79x10^3	20,03x10^3
48	5600	7100			525	1050	137	13,8	65,29x10^3	53,54x10^3	40,48x10^3	24,00x10^3
55	4750	6300			685	1370	178	15,6	94,97x10^3	77,88x10^3	58,88x10^3	34,90x10^3
65	4250	5600	3,2°	5°	940	1880	244	18,0	129,51x10^3	106,20x10^3	80,30x10^3	47,60x10^3
75	3550	4750			1920	3840	499	21,6	197,50x10^3	161,95x10^3	122,45x10^3	72,58x10^3
90	2800	3750			3600	7200	936	30,0	312,20x10^3	256,00x10^3	193,56x10^3	114,73x10^3
100	2500	3350			4950	9900	1287	36,0	383,26x10^3	314,27x10^3	237,62x10^3	140,85x10^3
110	2240	3000			7200	14400	1872	42,0	690,06x10^3	565,85x10^3	427,84x10^3	253,60x10^3
125	2000	2650			10000	20000	2600	48,0	1343,64x10^3	1101,79x10^3	833,06x10^3	493,79x10^3
140	1800	2360			12800	25600	3328	54,6	1424,58x10^3	1168,16x10^3	883,24x10^3	523,54x10^3
160	1500	2000			19200	38400	4992	75,0	2482,23x10^3	2035,43x10^3	1538,98x10^3	912,22x10^3
180	1400	1800			28000	56000	7280	78,0	3561,45x10^3	2920,40x10^3	2208,10x10^3	1308,84x10^3
Spider from polyurethane 64 Shore D-F; colour natural white with green tooth marking [1)]												
14	19000	–	4,5°	7,0°	16	32	4,2	9,0	0,76x10^3	0,62x10^3	0,47x10^3	0,28x10^3
19	14000	19000			21	42	5,5	7,2	5,35x10^3	4,39x10^3	3,32x10^3	1,97x10^3
24	10600	14000			75	150	19,5	9,9	15,11x10^3	12,39x10^3	9,37x10^3	5,55x10^3
28	8500	11800			200	400	52	12,6	27,52x10^3	22,57x10^3	17,06x10^3	10,12x10^3
38	7100	9500			405	810	105	15,3	70,15x10^3	57,52x10^3	43,49x10^3	25,78x10^3
42	6000	8000			560	1120	146	18,0	79,86x10^3	65,49x10^3	49,52x10^3	29,35x10^3
48	5600	7100			655	1310	170	20,7	95,51x10^3	78,32x10^3	59,22x10^3	35,10x10^3
55	4750	6300			825	1650	215	23,4	107,92x10^3	88,50x10^3	66,91x10^3	39,66x10^3
65	4250	5600	2,5°	3,6°	1175	2350	306	27,0	151,09x10^3	123,90x10^3	93,68x10^3	55,53x10^3
75	3550	4750			2400	4800	624	32,4	248,22x10^3	203,54x10^3	153,90x10^3	91,22x10^3
90	2800	3750			4500	9000	1170	45,0	674,52x10^3	553,11x10^3	418,20x10^3	247,89x10^3
100	2500	3350			6185	12370	1608	54,0	861,17x10^3	706,16x10^3	533,93x10^3	316,48x10^3
110	2240	3000			9000	18000	2340	63,0	1138,59x10^3	933,64x10^3	705,92x10^3	418,43x10^3
125	2000	2650			12500	25000	3250	72,0	1435,38x10^3	1177,01x10^3	889,93x10^3	527,50x10^3
140	1800	2360			16000	32000	4160	81,9	1780,73x10^3	1460,20x10^3	1104,05x10^3	654,42x10^3
160	1500	2000			24000	48000	6240	112,5	3075,80x10^3	2522,16x10^3	1907,00x10^3	1130,36x10^3
180	1400	1800			35000	70000	9100	117,0	6011,30x10^3	4929,27x10^3	3727,01x10^3	2209,15x10^3

STANDARD
92 Sh A
gelb/yellow/jaune

98 Sh A
rot/red/rouge

64 Sh D-F
grün/green/vert

Unless explicitly specified in your order, we will supply spiders with Shore hardness 92 A.
For peripheral speeds exceeding V = 35 m/sec., we would recommend only steel or nodular iron, respectively. Dynamic balancing required.

1) Hub material: EN-GJS-400-15 (GGG 40); steel

Spider from polyurethane	92 Shore A	95/98 Shore A	64 Shore D-F
Relative Damping ψ [-]	0,80	0,80	0,75
Resonance factor V_R [-]	7,90	7,90	8,50

Cylindrical bores and spline bores

Stock programme cylindrical finish bore [mm] H7 keyway to DIN 6885 sheet 1 [JS9] with thread for setscrew

ROTEX® Size	material	unbored	6	8	9	10	11	12	14	15	16	17	18	19	20	22	24	25	28	30	32	35	38	40	42	45	48	50	55	60	65	70	75	80	85	90	100
14	Sint	●		●		●	●	●	●	●	●																										
14	Al-H	●	●	●	●	●	●	●	●	●	●																										
19	Sint	●							●		●			●	●	●	●																				
19	AL-D	●		●		●	●	●	●	●	●	●	●	●	●		●																				
19	St	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●																			
24	Al-D	●				●	●	●	●	●	●	●	●	●	●	●	●	●	●																		
24	St	●				●		●	●	●	●	●	●	●	●	●	●	●	●	●	●																
28	Al-D	●						●	●		●		●	●	●	●	●	●	●	●	●	●	●														
28	St	●							●	●	●		●	●	●	●	●	●	●	●	●	●		●													
38	GG	●									●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●										
38	St	●													●		●	●	●	●	●	●	●	●	●		●										
42	GG	●											●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●								
42	St	●																●		●	●	●	●	●	●	●	●	●	●								
48	GG	●															●	●	●	●	●	●	●	●	●	●	●	●	●	●							
48	St	●																●		●	●	●	●	●	●	●	●	●	●	●							
55	GG	●																●		●	●	●	●	●	●	●	●	●	●	●	●	●					
55	St	●																			●	●	●				●				●						
65	GG	●																			●	●	●	●	●	●	●	●	●	●	●						
65	St	●																						●			●	●	●	●	●	●	●	●			
75	GG	●																				●		●		●	●	●	●	●	●	●	●				
75	St	●																										●	●	●	●		●		●	●	
90	GG	●																								●		●	●	●	●	●	●	●	●	●	
90	St	●																												●	●	●	●	●		●	●

GG = EN-GJS-250

Basic programme SAE involute spline

Spline code	Size	Pitch circle	Pitch	No. of teeth	Angle	Spline code	Size	Pitch circle	Pitch	No. of teeth	Angle
PH-S	$^5/_8$"	14,28	16/32	9	30°	**PS-S**	1 $^1/_2$"	35,98	12/24	17	30°
PI-S	$^3/_4$"	17,46	16/32	11	30°	**PD-S**	1 $^1/_2$"	36,51	16/32	23	30°
PB-S	$^7/_8$"	20,63	16/32	13	30°	**PE-S**	1 $^3/_4$"	42,86	16/32	27	30°
PB-BS	1"	23,81	16/32	15	30°	**PK**	1 $^3/_4$"	41,275	8/16	13	30°
PJ	1 $^1/_8$"	26,98	16/32	17	30°	**PT-C**	2"	47,625	8/16	15	30°
PC-S	1 $^1/_4$"	29,63	12/24	14	30°	**PQ-C**	2 $^1/_4$"	53,975	8/16	17	30°
PA-S	1 $^3/_8$"	33,33	16/32	21	30°						30°

Basic programme spline bores to DIN 5482

Size	Pitch circle	Pitch	No. of teeth	Profile correctio	Size	Pitch circle	Pitch	No. of teeth	Profile correction
A 17 x 14	14,40	1,6	9	+0,600 [1]	**A 35 x 31**	31,50	1,75	18	+0,676
A 20 x 17	19,20	1,6	12	-0,2	**A 40 x 36**	38,00	1,9	20	+0,049
A 25 x 22	22,40	1,6	14	+0,550	**A 45 x 41**	44,00	2	22	+0,181
A 28 x 25	26,25	1,75	15	+0,302	**A 50 x 45**	48,00	2	24	+0,181
A 30 x 27	28,00	1,75	16	+0,327					

Basic programme spline bores to DIN 5480

Spline code	Pitch circle	Module	No. of teeth	Spline code	Pitch circle	Module	No. of teeth
20 x 1 x 18 x 7H	18,0	1	18	**40 x 2 x 18 x 7H**	36,0	2	18
20 x 1,25 x 14 x 7H	17,5	1,25	14	**45 x 2 x 21 x 7H**	41,0	2	21
25 x 1,25 x 18 x 7H	22,5	1,25	18	**48 x 2 x 22 x 9H**	44,0	2	22
28 x 1,25 x 21 x 7H	26,25	1,25	21	**50 x 2 x 24 x 7H**	48,0	2	24
30 x 2 x 13 x 7H	26,0	2	13	**60 x 2 x 28 x 8H**	56,0	2	28
30 x 2 x 14 x 8H	28,0	2	14	**75 x 3 x 24 x 7H**	72,0	3	24
35 x 2 x 16 x 8H	32,0	2	16	**80 x 3 x 25 x 8H**	75,0	3	25

Basic programme spline bores to DIN 9611

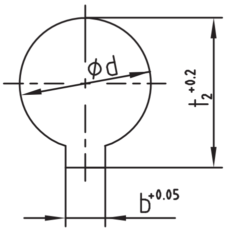
Size	Type	No. of teeth	Tip circle
1 $^3/_8$"	1	6	34,93

Spline clamping hubs are often adapted to the shafts of hydraulic pumps/hydraulic motors. Please ask us about the corresponding hub length of the spline code!
[1] spline correction different with DIN

Inch bores and taper bores

Stock programme inch bores

ROTEX® Size					19	24	28	38	42	48	55	65	75	90
Material					St	St	St	GG	GG	GG	GG	GG	GG	GG
Code	Ød	Ød Inch	$b^{+0,05}$	$t_2^{+0,2}$										
Tb	9,5$^{+0,03}$	3/8	3,17	11,1										
DNB	11,11^{M7}	7/16	2,4	12,5										
T	12,69^{H7}	1/2	4,75	14,6										
Ta	12,7$^{+0,03}$	1/2	3,17	14,3	●	●								
DNC	13,45^{H7}	17/32	3,17	14,9										
Do	14,29$^{+0,03}$	9/16	3,17	15,6										
E	15,87$^{+0,03}$	5/8	3,17	17,5										
Es	15,88$^{+0,03}$	5/8	4,00	17,7		●	●							
Ed	15,87$^{+0,03}$	5/8	4,75	18,1	●	●								
DNH	17,465^{H7}	11/16	4,75	19,6										
Ad	19,02$^{+0,03}$	3/4	3,17	20,7										
A	19,05$^{+0,03}$	3/4	4,78	21,3	●	●	●	●						
Gs	22,22$^{+0,03}$	7/8	4,78	24,4										
G	22,22$^{+0,03}$	7/8	4,75	24,7	●	●	●	●	●					
F	22,22$^{+0,03}$	7/8	6,38	25,2		●	●	●	●	●				
Gd	22,225^{M7}	7/8	4,76	24,7										
Gf	23,80$^{+0,03}$	15/16	6,35	26,8										
Bs	25,38$^{+0,03}$	1	6,37	28,3		●	●	●	●					
H	25,40$^{+0,03}$	1	4,78	27,8										
Hs	25,40$^{+0,03}$	1	6,35	28,7			●							
R	26,95$^{+0,03}$	1 1/16	4,78	29,3										
Sa	28,575^{M7}	1 1/8	6,35	31,7		●	●		●					
Sb	28,58$^{+0,03}$	1 1/8	6,35	31,5			●	●						
Sd	28,58$^{+0,03}$	1 1/8	7,93	32,1										
Js	31,75$^{+0,03}$	1 1/4	6,35	34,6				●						
K	31,75^{K7}	1 1/4	7,93	35,5			●	●	●	●	●	●		
Ma	34,925^{M7}	1 3/8	7,93	38,7			●	●						
RH1	34,93^{M7}	1 3/8	9,55	37,8										
Cb	36,50$^{+0,03}$	1 7/16	9,55	40,9										
Ca	38,07$^{+0,03}$	1 1/2	7,93	42,0										
C	38,07$^{+0,03}$	1 1/2	9,55	42,5			●	●	●	●	●	●	●	
Nb	41,275^{M7}	1 5/8	9,55	45,8				●	●					
Ls	44,42$^{+0,03}$	1 3/4	9,55	48,8										
L	44,45^{K7}	1 3/4	11,11	49,4						●				
Lu	47,625^{M7}	1 7/8	12,7	53,5					●					
Da	49,20$^{+0,03}$	1 15/16	12,7	55,0										
Ds	50,77$^{+0,03}$	2	12,7	56,4										●
D	50,80$^{+0,03}$	2	12,7	55,1										
Pa	53,975^{M7}	2 1/8	12,7	60,0					●					
U	57,10$^{+0,03}$	2 1/4	12,7	62,9										
Ub	60,325^{M7}	2 3/8	15,875	67,6										
Wd	85,725^{M7}	3 3/8	22,225	95,8										
Wf	92,075^{M7}	3 5/8	22,225	101,9										



Basic programme taper 1:8

Code	$d^{+0,05}$	(d_2)	b^{JS9}	$t_2^{+0,1}$	l_K
...N.../ 1	9,7	7,575	2,4	10,85	17,0
...N.../ 1c	11,6	9,5375	3	12,90	16,5
...N.../ 1e	13,0	10,375	2,4	13,80	21,0
...N.../ 1d	14,0	11,813	3	15,50	17,5
...N.../ 1b	14,3	11,8625	3,2	15,65	19,5
...N.../ 2	17,287	14,287	3,2	18,24	24,0
...N.../ 2a	17,287	14,287	4	18,94	24,0
...N.../ 2b	17,287	14,287	3	18,34	24,0
...N.../ 3	20,002	18,6895	4	23,40	28,0
...N.../ 4	25,463	20,963	4,78	27,83	36,0
...N.../ 4b	25,463	20,963	5	28,23	36,0
...N.../ 4a	27,0	22,9375	4,78	28,80	32,5
...N.../ 4g	28,45	23,6375	6	29,32	38,5
...N.../ 5	33,176	27,676	6,38	35,39	44,0
...N.../ 5a	33,176	27,676	7	35,39	44,0

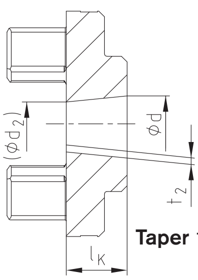
Basic programme taper 1:10

Code	$d^{+0,05}$	(d_2)	b^{JS9}	$t_2^{+0,1}$	l_K
CX	19,95	16,75	5	22,08	32
DX	24,95	20,45	6	26,68	45
EX	29,75	24,75	8	31,88	50

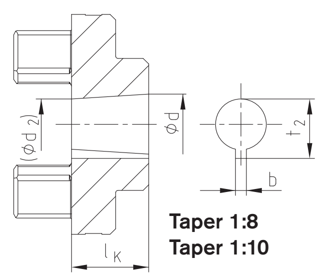
Basic programme taper 1:5

Code	$d^{+0,05}$	(d_2)	b^{JS9}	$t_2^{+0,1}$	l_K
A-10	9,85	7,55	2	1,0	11,5
B-17	16,85	13,15	3	1,8	18,5
C-20	19,85	15,55	4	2,2	21,5
Cs-22	21,95	17,65	3	1,8	21,5
D-25	24,85	19,821	5	2,9	26,5
E-30	29,85	23,55	6	2,6	31,5
F-35	34,85	27,55	6	2,6	36,5
G-40	39,85	32,85	6	2,6	35,0

With codes N.../6 and N.../6a parallel to taper the respective pump code should be started before ...N and the respective size of coupling before and behind ...N.../.



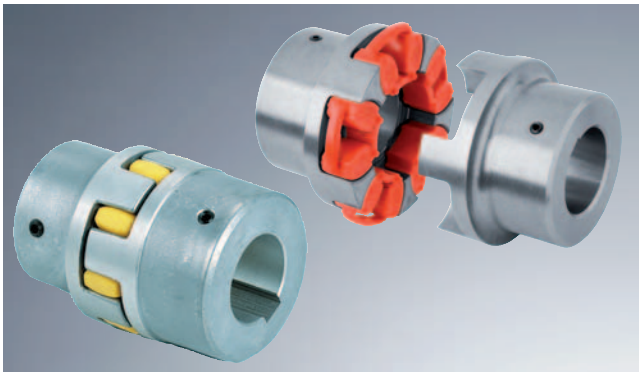
Taper 1:5



Taper 1:8
Taper 1:10

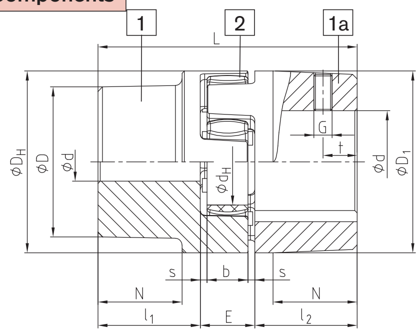
Made for Motion KTR

Shaft coupling design No. 001 - casted materials

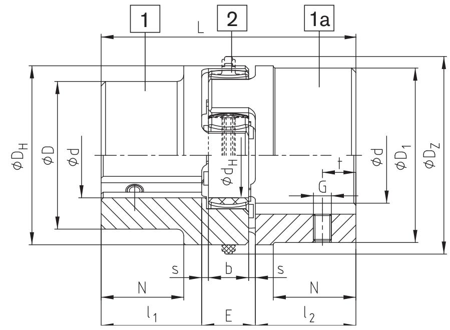


- Torsionally flexible, maintenance-free
- Damping vibrations
- Axial plug-in, fail-safe
- Allover machining – good dynamic properties
- Compact design/small flywheel effect
- Finish bore according to ISO fit H7, feather keyway according to DIN 6885 sheet 1 - JS9
- Stock programme/basic programme see pages 26 and 27
- Ex Approved according to EC Standard 94/9/EC (without aluminium AL-D)
- Mounting instructions under www.ktr.com

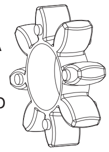
Components



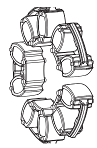
AL-D (thread opposite the keyway)



EN-GJL-250 / EN-GJS-400-15 (thread on the keyway)



Spider
as hardness 92 Sh-A and 95/98 Sh-A standard from size 14 - 100 and 64 Sh-D size 14 - 180



NEW

elements DZ (double tooth elements)
as hardness 92 Sh-A and 95 Sh-A standard from size 110 - 180

Size	Component	Spider (part 2) [1) Rated torque [Nm] 92 Sh A	98 Sh A	64 Sh D	Finish bore d (min-max)	L	$l_1; l_2$	E	b	s	D_H	D_Z	d_H	$D; D_1$	N	Thread for setscrews G	t	T_A [Nm]
ROTEX® Aluminium diecast (Al-D)																		
14 [2)	1a	7,5	12,5	-	6-16	35	11	13	10	1,5	30	-	10	30	-	M4	5	1,5
19	1	10	17	-	6-19	66	25	16	12	2	41	-	18	32	20	M5	10	2
	1a				19-24									41				
24	1	35	60	-	9-24	78	30	18	14	2	56	-	27	40	24	M5	10	2
	1a				22-28									56				
28	1	95	160	-	10-28	90	35	20	15	2,5	66	-	30	48	28	M8	15	10
	1a				28-38									66				
ROTEX® Cast iron EN-GJL-250 (GG 25)																		
	1				12-40	114	45							66	37			
38	1a	190	325	405	38-48			24	18	3	80	-	38	78		M8	15	10
◣	1b				12-48	164	70								62			
	1				14-45	126	50							75	40			
42	1a	265	450	560	42-55			26	20	3	95	-	46	94		M8	20	10
◣	1b				14-55	176	75								65			
	1				15-52	140	56							85	45			
48	1a	310	525	655	48-62			28	21	3,5	105	-	51	104		M8	20	10
◣	1b				15-62	188	80								69			
55	1	410	685	825	20-60	160	65	30	22	4	120	-	60	98	52	M10	20	17
◣	1a				55-74									118				
◣ 65	1	625	940	1175	22-70	185	75	35	26	4,5	135	-	68	115	61	M10	20	17
◣ 75	1	1280	1920	2400	30-80	210	85	40	30	5	160	-	80	135	69	M10	25	17
◣ 90	1	2400	3600	4500	40-97	245	100	45	34	5,5	200	218	100	160	81	M12	30	40
ROTEX® Nodular iron EN-GJS-400-15 (GGG 40)																		
◣ 100	1	3300	4950	6185	50-115	270	110	50	38	6	225	246	113	180	89	M12	30	40
◣ 110	1	4800	7200	9000	60-125	295	120	55	42	6,5	255	276	127	200	96	M16	35	80
◣ 125	1	6650	10000	12500	60-145	340	140	60	46	7	290	315	147	230	112	M16	40	80
◣ 140	1	8550	12800	16000	60-160	375	155	65	50	7,5	320	345	165	255	124	M20	45	140
◣ 160	1	12800	19200	24000	80-185	425	175	75	57	9	370	400	190	290	140	M20	50	140
◣ 180	1	18650	28000	35000	85-200	475	195	85	64	10,5	420	450	220	325	156	M20	50	140

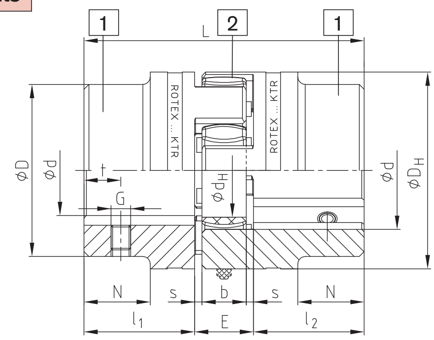
◣ = If no material is mentioned in the order, the calculation/order is based on the material marked with ◣

[1) Maximum torque of the coupling $T_{Kmax.}$ = rated torque of the coupling $T_{K\ Nenn.}$ x 2   [2) Material Al-H.

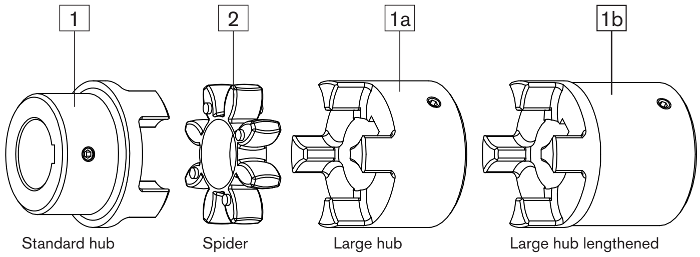
Shaft coupling design No. 001 - material steel

- Hubs from steel, specifically suitable for drive elements subject to high loads, e. g. steel mills, elevator drives, spline hubs, etc.)
- Torsionally flexible, maintenance-free, vibration-damping
- Axial plug-in, fail-safe
- Allover machining - good dynamic properties
- Compact design/small flywheel effect
- Finish bore according to ISO fit H7, feather keyway according to DIN 6885 sheet 1 - JS9
- Stock programme/basic programme see pages 26 and 27
- Ex Approved according to EC Standard 94/9/EC
- Mounting instructions under www.ktr.com

Components



Steel (thread on the keyway)



ROTEX® steel

Size	Compo-nent	Spider (part 2) [1) Rated torque [Nm] 92 Sh A	98Sh A	64 Sh D	Finish bore d (min-max)	L	l_1; l_2	E	b	s	D_H	d_H	D	N	G	t	T_A [Nm]
14	1a	7,5	12,5	-	0-16	35	11	13	10	1,5	30	10	30	-	M4	5	1,5
	1b					50	18,5										
19	1a	10	17	-	0-25	66	25	16	12	2	40	18	40	-	M5	10	2
	1b					90	37										
24	1a	35	60	-	0-35	78	30	18	14	2	55	27	55	-	M5	10	2
	1b					118	50										
28	1a	95	160	-	0-40	90	35	20	15	2,5	65	30	65	-	M8	15	10
	1b					140	60										
38	1	190	325	405	0-48	114	45	24	18	3	80	38	70	27	M8	15	10
	1b					164	70						80	-			
42	1	265	450	560	0-55	126	50	26	20	3	95	46	85	28	M8	20	10
	1b					176	75						95	-			
48	1	310	525	655	0-62	140	56	28	21	3,5	105	51	95	32	M8	20	10
	1b					188	80						105	-			
55	1	410	685	825	0-74	160	65	30	22	4	120	60	110	37	M10	20	17
	1b					210	90						120	-			
65	1	625	940	1175	0-80	185	75	35	26	4,5	135	68	115	47	M10	20	17
	1b					235	100						135	-			
75	1	1280	1920	2400	0-95	210	85	40	30	5	160	80	135	53	M10	25	17
	1b					260	110						160	-			
90	1	2400	3600	4500	0-110	245	100	45	34	5,5	200	100	160	62	M10	30	40
	1b					295	125						200	-			

(Dimensions [mm]: L to N = General; G, t, T_A = Thread for setscrews)

ROTEX® sintered steel

Size	Compo-nent	Spider (part 2) [1) Rated torque [Nm] 92 Sh-A	98 Sh-A	Finish bore d	L	l_1; l_2	E	b	s	D_H	d_H	D	N	G	t	T_A [Nm]
14	1a	7,5	12,5	unbored, 8, 10, 11, 12, 14, 15, 16	35	11	13	10	1,5	30	10	30	-	M4	5	1,5
19	1a	10	17	unbored, 14, 16, 19, 20, 22, 24	66	25	16	12	2	40	18	40	-	M5	10	2

(Dimensions [mm]: L to N = General; G, t, T_A = Thread for setscrews)

= If no material is mentioned in the order, the calculation/order is based on the material marked with

[1) Maximum torque of the coupling $T_{Kmax.}$ = rated torque of the coupling $T_{K\ Nenn.}$ x 2

ROTEX® 19 – 48 from stainless steel available from stock

- ROTEX® 19, 28 and 42 – hub material X10CrNiS 18-9 material number 1.4305 (V2A) DIN 17440
- ROTEX® 24, 38 and 48 – hub material X6CrNiMoTi17-12-2 material number 1.4571 (V4A) DIN 17440

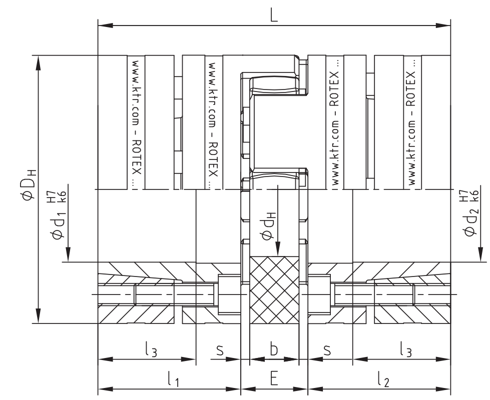
Order form:

ROTEX®-38	St	92	1 –	Ø 45	1 –	Ø 25
Coupling size	Material	Spider hardness Shore A]	Hub design	Finish bore	Hub design	Finish bore

Clamping ring hubs

- Torsionally flexible shaft coupling with integrated clamping system
- High smoothness of running, application up to a peripheral speed of 40 m/s
- For high friction torques (consider the selection in case of explosion protection use)
- Easy to assemble due to internal clamping screws
- Finish bore up to Ø 50 mm according to ISO fit H7, from Ø 55 mm according to ISO fit G7
- Ⓔx Approved according to EC Standard 94/9/EC

Tack thread M_1 between clamping screws



Size	Torques [Nm] 1) 92 Sh A		98 Sh A		Dimensions [mm]								Clamping screws				Weight per hub with max. bore [kg]	Mass moment of inertia per hub with max. bore [kgm²]
	T_{KN}	T_{Kmax}	T_{KN}	T_{Kmax}	D_H 3)	d_H	L	l_1; l_2	l_3	E	b	s	M	Anzahl z	T_A [Nm]	M_1		
Hub and clamping ring material – Steel (St-H)																		
19	10,0	20	17	34	40	18	66	25	18	16	12	2,0	M4	6	4,1	M4	0,179	0,44 x 10^{-4}
24	35,0	70	60	120	55	27	78	30	22	18	14	2,0	M5	4	8,5	M5	0,399	1,91 x 10^{-4}
28	95,0	190	160	320	65	30	90	35	27	20	15	2,5	M5	8	8,5	M5	0,592	4,18 x 10^{-4}
38	190,0	380	325	650	80	38	114	45	35	24	18	3,0	M6	8	14	M6	1,225	12,9 x 10^{-4}
42	265	530	450	900	95	46	126	50	35	26	20	3,0	M8	4	35	M8	2,30	31,7 x 10^{-4}
48	310	620	525	1050	105	51	140	56	41	28	21	3,5	M10	4	69	M10	3,08	52,0 x 10^{-4}
55	375	750	685	1370	120	60	160	65	45	30	22	4,0	M10	4	69	M10	4,67	103,0 x 10^{-4}
65	-	-	940 2)	1880 2)	135	68	185	75	55	35	26	4,5	M12	4	120	M12	6,70	191,0 x 10^{-4}
75	-	-	1920 2)	3840 2)	160	80	210	85	63	40	30	5,0	M12	5	120	M12	9,90	396,8 x 10^{-4}

1) Please note coupling selection on pages 129 and 130 2) Figures for 95 Sh A - GS 3) ØD_H + 2 mm with high speeds for expansion of spider

Bores d_1/d_2 and the corresponding transmittable friction torques T_R of clamping ring hub in [Nm] 1)

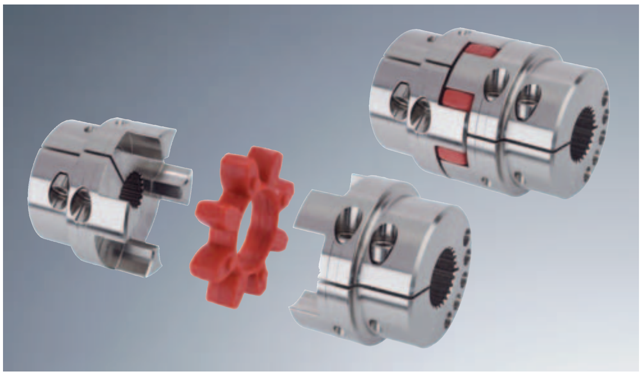
Größe	Ø10	Ø11	Ø14	Ø15	Ø16	Ø19	Ø20	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55	Ø60	Ø65	Ø70	Ø80
19	31	37	62	68	62	83	90																	
24			67	74	66	90	97	112	120	143														
28				142	154	189	170	237	250	280	307	310	353	389										
38							269	337	356	398	436	442	501	533	572	615	644							
42									399	445	506	470	566	581	647	630	728	836	858					
48											650	685	809	841	926	916	1042	1181	1125	1311				
55													918	954	1052	1040	1185	1220	1318	1359	1646	1662	1960	
65															1568	1569	1768	1833	1968	2049	2438	2495	2898	
75																	2246	2338	2500	2620	3082	3179	3657	4235

The transmittable torques of the clamping connection consider the max. clearance with shaft fit k6 / bore H7, from Ø55 G7/m6. With bigger clearance the torque is reduced.
For the stiffness calculation of the shaft/hollow shaft see KTR standard 45510 at our homepage www.ktr.com

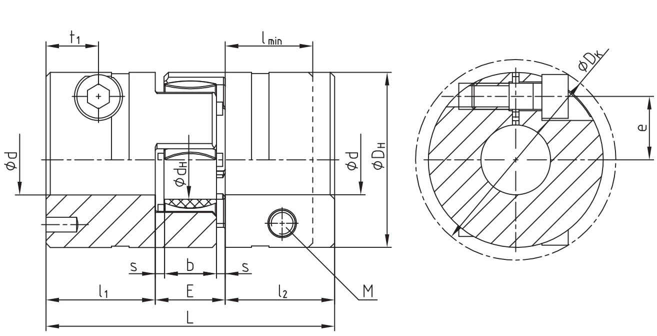
Order form:

ROTEX® GS 24	98 Sh A	6.0 – Ø 24	6.0 – Ø 20
Coupling size	Spider hardness	Hub design / Finish bore	Hub design / Finish boreg

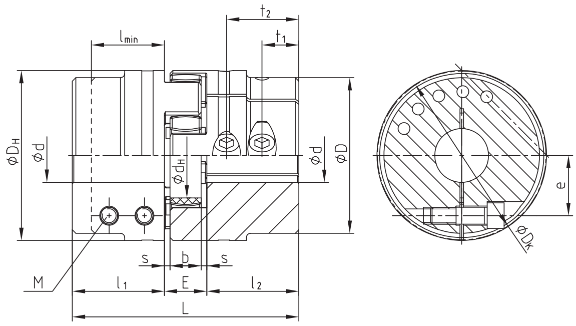
Clamping hubs



- Standard hub material steel
- Suitable in combination with spline hubs according to DIN 5480, DIN 5482, SAE J498 (see page 26) and in addition DIN 9611, DIN 5463 (ISO 14), DIN 5481 and DIN 5472
- Balanced on the basis of 3D-CAD data
- Axial plug-in, fail-safe
- Particularly suitable for applications with reversing operation
- Ex Protection assessed and confirmed in accordance with EU standard 94/9/EC (only for hub designs 2.1 and 2.3, hub design 2.0 only according to category 3)



ROTEX® 19 - 28

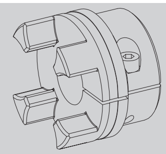


ROTEX® 38 - 90

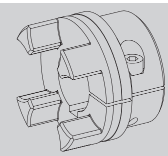
ROTEX® with clamping hubs																
Size	Dimensions [mm]															T_A [Nm]
	$d_{max.}$	L	l_1;l_2	$l_{min.}$	E	b	s	D_H	D	d_H	M	D_K	t_1	t_2	e	
19	20 1)	66	25	20	16	12	2	40	-	18	M6	46,0	12	-	14,5	14
24	28	78	30	25	18	14	2	55	-	27	M6	57,5	12	-	20,0	14
28	38	90	35	30	20	15	2,5	65	-	30	M8	73,0	14 2)	-	25,0	35
38	42	114	45	35	24	18	3	80	70	38	M8	77,5	19	-	26,5	35
42	50	126	50	42	26	20	3	95	85	46	M10	93,5	18 2)	-	32,0	69
48	55	140	56	46	28	21	3,5	105	95	51	M12	105,0	21 2)	-	36,0	120
55	68	160	65	50	30	22	4	120	110	60	M12	119,5	26	51 2)	42,5 3)	120
65	70	185	75	55	35	26	4,5	135	115	68	M12	132,5	33	61 2)	50,0 3)	120
75	80	210	85	65	40	30	5	160	135	80	M16	158,0	36	68 2)	57,0 3)	295
90	90	245	100	80	45	34	5,5	200	160	100	M20	197,0	40	80 2)	72,0 3)	580

Bore area and the corresponding transmittable friction torques [Nm] of ROTEX® clamping design 2.0																														
Size	Ø8	Ø10	Ø11	Ø14	Ø15	Ø16	Ø18	Ø19	Ø20	Ø22	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55	Ø60	Ø65	Ø70	Ø75	Ø80	Ø85	Ø90
19	44	46	47	51	52	53	55	57	58																					
24		59	60	64	65	66	68	70	71	73	76	77	80																	
28				139	141	144	148	150	152	157	161	163	170	174	178	185	191													
38					163	165	170	172	174	178	183	185	192	196	200	207	213	217	222											
42									291	297	304	308	318	325	332	342	353	360	367	377	387	394								
48									466	476	486	491	506	516	526	542	557	567	577	592	607	618	643							
55															1185	1215	1245	1266	1286	1316	1347	1367	1417	1468	1519					
65																1316	1347	1367	1387	1417	1448	1468	1519	1569	1620	1671				
75																			2869	2926	2983	3022	3117	3213	3309	3404	3500	3595		
90																			5220	5310	5400	5460	5610	5760	5910	6060	6210	6360	6510	6660

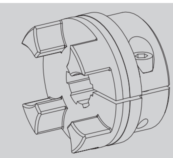
1) With design 2.1 dmax. Ø17 mm
2) With reduced hubs the dimension t_1 varies or the number of screws changes from 2-off to 1-off
3) t_1 and t_2 have a different e dimension



Design 2.0
clamping hub,
single slotted,
without keyway



Design 2.1
clamping hub,
single slotted,
with keyway



Design 2.3
clamping hub with
spline bore
(Please find a selection from our spline bore programme on page 26)

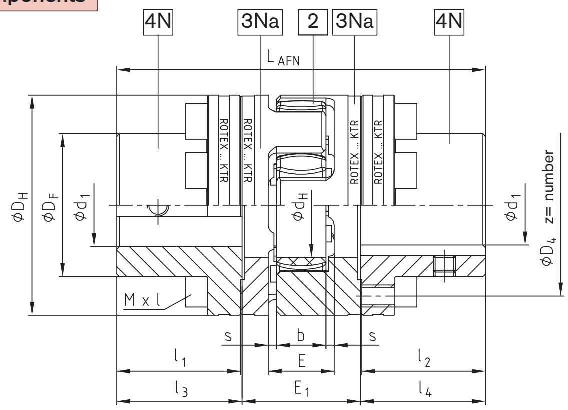
Order form:

ROTEX® 24	98 Sh-A	2.1	–	Ø 24	2.0	–	Ø 20
Coupling size	Spider hardness	Hub design		Finish bore	Hub design		Finish-bore

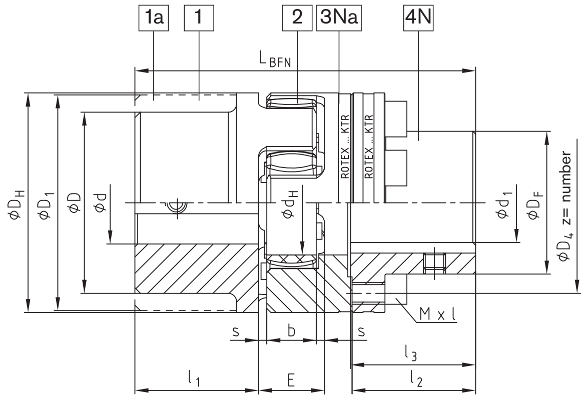
Flange programme types AFN and BFN

- Double flange design AFN and flange design BFN applicable to heavy machinery
- Radial assembly of driving or driven machine after disassembly of driving flanges
- For design AFN - spider interchangeable while coupling installed, without removal of driving or driven machine
- Power flow can be disconnected while coupling is installed
- Flange materials: comp. 4 N steel
  comp. 3 Na EN-GJS-400-15 (GGG 40)
- Finish bore according to ISO fit H7, feather keyway according to DIN 6885 sheet 1 - JS9
- Ex Approved according to EC Standard 94/9/EC

Components



Type AFN



Type BFN

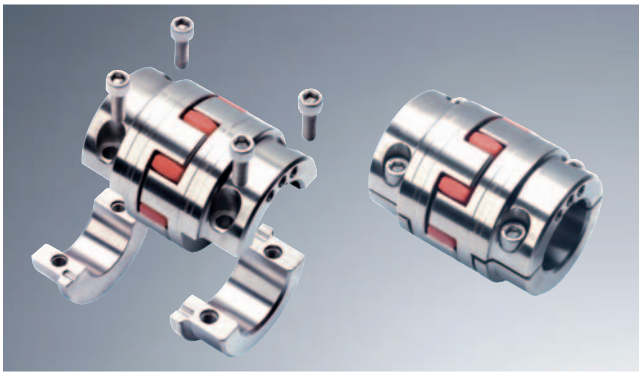
ROTEX® AFN (No. 002) and BFN (No. 004)																		
Size	Pilot bored Ød;ØD; ØD1	Component 4N max. finish bore Ød1	Dimensions [mm]												Cyl. screws 3) DIN EN ISO 4762 - 12.9			
			D_H	D_F	D_4	d_H	l_1; l_2	E	E_1	s	b	l_3; l_4	L_{AFN}	L_{BFN}	Mxl	z	Pitch 2)	1) T_A[Nm]
24		24	55	36	45	27	30	18	33	2,0	14	30,5	94	86	M5x16	8		10
28		28	65	42	54	30	35	20	39	2,5	15	35,5	110	100	M6x20	8	8x45°	17
38	see shaft coupling on pages 28 and 29 stock programme/basic programme see pages 26 and 27	38	80	52	66	38	45	24	43	3,0	18	45,5	134	124	M8x22	8		41
42		42	95	62	80	46	50	26	48	3,0	20	51,0	150	138	M8x25	12	16x22,5°	41
48		48	105	70	90	51	56	28	50	3,5	21	57,0	164	152	M8x25	12		41
55		55	120	80	102	60	65	30	60	4,0	22	66,0	192	176	M10x30	8	8x45°	83
65		65	135	94	116	68	75	35	65	4,5	26	76,0	217	201	M10x30	12	16x22,5°	83
75		75	160	108	136	80	85	40	75	5,0	30	86,5	248	229	M12x40	15		120
90		100	200	142	172	100	100	45	82	5,5	34	101,5	285	265	M16x40	15		295
100		110	225	158	195	113	110	50	97	6,0	38	111,5	320	295	M16x50	15		295
110		125	255	178	218	127	120	55	103	6,5	42	122,0	347	321	M20x50	15	20x18°	580
125		145	290	206	252	147	140	60	116	7,0	46	142,0	400	370	M20x60	15		580
140		165	320	235	282	165	155	65	128	7,5	50	157,5	443	409	M20x60	15		580
160		190	370	270	325	190	175	75	146	9,0	57	177,5	501	463	M24x70	15		1000
180		220	420	315	375	220	195	85	159	10,5	64	198,0	555	515	M24x80	18	24x15°	1000

1) Screw tightening torque T_A [Nm]. 2) Thread in driving flange between cams. 3) Coupling is delivered not assembled.

Order form

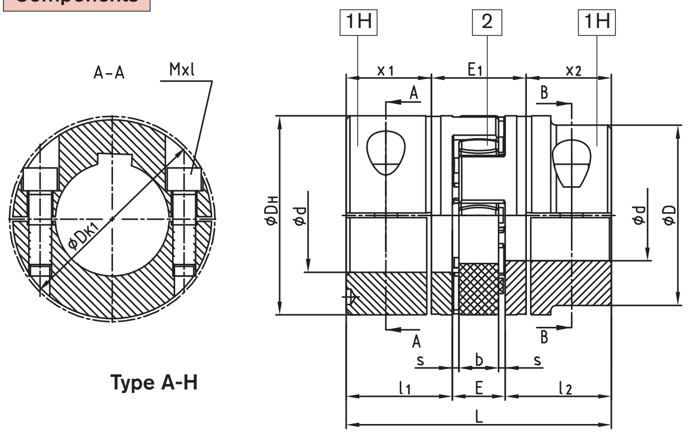
ROTEX® 38	AFN	92 Sh A	4N –	Ø 38	4N –	Ø 35
Coupling size	Type	Spider hardness	Component	Finish bore	Component	Finish bore

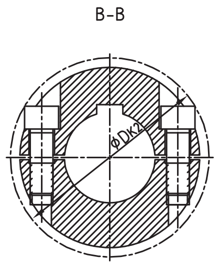
Drop-out center design coupling type A-H

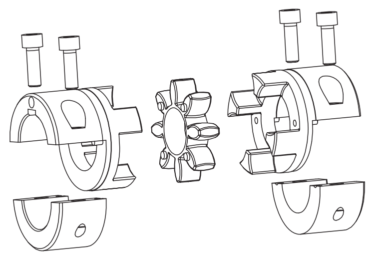


- Assembly/disassembly by means of 4 screws only
- Exchange of spider with no need to shift the driving and driven side (motor and pump)
- Positive-locking and frictionally engaged hub combinations to be assembled radially (dimension E_1 of design AFN = dimension E_1 of A-H)
- Finish bore according to ISO tolerance H7, feather key according to DIN 6885 sheet 1 - JS9
- Please order our separate dimension sheet (M425460)
- Ex Approved according to EC Standard 94/9/EC (type 7.8 shell clamping hub without feather key according to category 3)

Components







Please note:
With maximum bore the feather keys are offset to each other by approx. 5°!
Hub materials: up to size 90 S355J2G3; from size 100 EN-GJS-400-15

[1] From size 100: 4 clamping screws for each clamping hub.

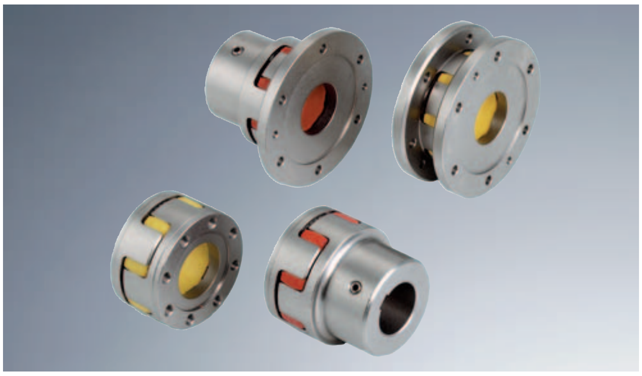
ROTEX® Type A-H

Size	Component	Finish bore $Ød_{max.}$ [mm]	Dimension [mm] L	l_1; l_2	E	b	s	D_H	D	D_{K1}	D_{K2}	x_1/x_2	E_1	Cyl. screw DIN EN ISO 4762 Mxl	T_A [Nm]
19	1H	20	66	25	16	12	2,0	40	-	46	-	17,5	31	M6x16	14
24	1H	28	78	30	18	14	2,0	55	-	57,5	-	22,5	33	M6x20	14
28	1H	38	90	35	20	15	2,5	65	-	73	-	25,5	39	M8x25	35
38	1H	45	114	45	24	18	3,0	80	-	83,5	-	35,5	43	M8x30	35
42	1H	50	126	50	26	20	3,0	95	85	-	93,5	39	48	M10x30	69
		55							-	97	-			M10x35	
48	1H	55	140	56	28	21	3,5	105	95	-	105	45	50	M12x35	120
		60							-	108,5	-			M12x40	
55	1H	65	160	65	30	22	4,0	120	110	-	119,5	50	60	M12x40	120
		70							-	122	-			M12x45	
65	1H	70	185	75	35	26	4,5	135	115	-	123,5	60	65	M12x40	120
		80							-	132,5	-			M12x45	
75	1H	80	210	85	40	30	5,0	160	135	-	147,5	67,5	75	M16x50	295
		90							-	158	-				
90	1H	90	245	100	45	34	5,5	200	160	-	176	81,5	82	M20x60	580
		110							-	197	-				
100 [1]	1H	110	270	110	50	38	6,0	225	180	-	185,5	84	102	M16x50	295
110 [1]	1H	120	295	120	55	42	6,5	255	200	-	208	90	119	M20x60	580
125 [1]	1H	140	340	140	60	46	7,0	290	230	-	242,5	105	130	M24x70	1000

Order form

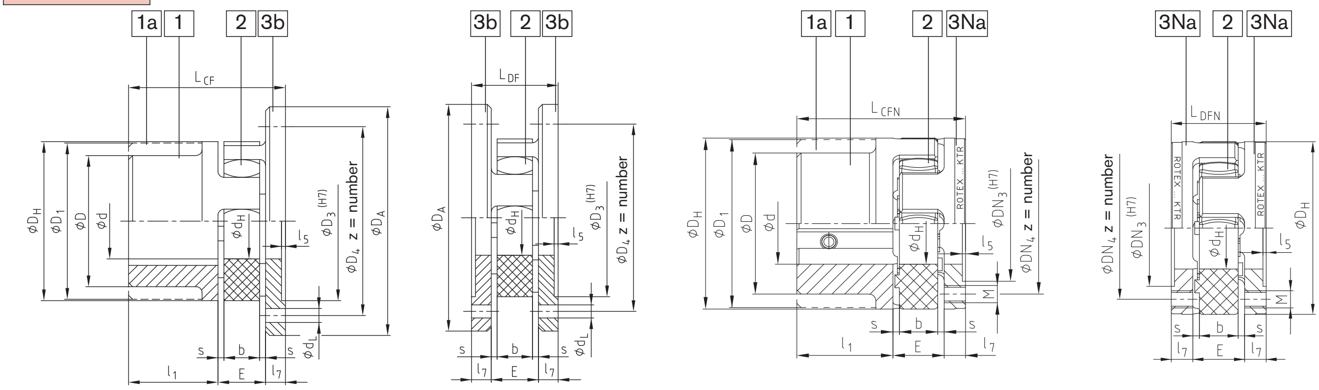
ROTEX® 38	A-H	98 Sh A	1H –	Ø 38	1H –	Ø 30
Coupling size	Type	Spider hardness	Component	Finish bore	Component	Finish bore

Flange programme types CF, CFN, DF and DFN



- Flange designs applicable to heavy machinery
- CF and CFN - connection flange to shaft
  DF and DFN - double flange design for the connection of driving and driven machine, radial assembly possible without removal of other components ⇛ quick replacement of spider
- CFN and DFN - particularly small outside diameters
- DF and DFN – compact design
- DFN - for customer-specific mounting flanges
- Flange material part 3b: EN-GJS-400-15 (GGG 40)
- Finish bore according to ISO fit H7, feather keyway according to DIN 6885 sheet 1 - JS9
- ⟨Ex⟩ Approved according to EC Standard 94/9/EC

Components



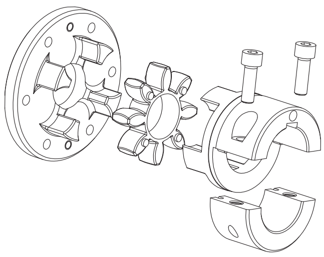
Type CF Type DF Type CFN Type DFN

ROTEX® CF; CFN (No. 005) and DF; DFN (No. 006)																						
Size	Ød ØD ØD1	General dimension								Dimensions CF and DF							Dimensions CFN and DFN						
		D_H	d_H	l_1	E	s	b	l_5	l_7	D_A	D_3	D_4	z	d_L	L_{CF}	L_{DF}	DN_3	DN_4	M	z	Pitch 2)	L_{CFN}	L_{DFN}
24	see shaft coupling on pages 28 and 29 stock programme/basic programme see pages 26 and 27	55	27	30	18	2,0	14	1,5	8	80	55	65	5	4,5	56	34	36	45	M5	8		56	34
28		65	30	35	20	2,5	15	1,5	10	100	65	80	6	6,6	65	40	44	54	M6	8	8x45°	65	40
38		80	38	45	24	3,0	18	1,5	10	115	80	95	6	6,6	79	44	54	66	M8	8		79	44
42		95	46	50	26	3,0	20	2,0	12	140	95	115	6	9,0	88	50	65	80	M8	12	16x22,5°	88	50
48		105	51	56	28	3,5	21	2,0	12	150	105	125	8	9,0	96	52	75	90	M8	12		96	52
55		120	60	65	30	4,0	22	2,0	16	175	120	145	8	11,0	111	62	84	102	M10	8	8x45°	111	62
65		135	68	75	35	4,5	26	2,0	16	190	135	160	10	11,0	126	67	96	116	M10	12	16x22,5°	126	67
75		160	80	85	40	5,0	30	2,5	19	215	160	185	10	13,5	144	78	112	136	M12	15		144	78
90		200	100	100	45	5,5	34	3,0	20	260	200	225	12	13,5	165	85	145	172	M16	15		165	85
100		225	113	110	50	6,0	38	4,0	25	285	225	250	12	13,5	185	100	165	195	M16	15		185	100
110		255	127	120	55	6,5	42	4,0	26	330	255	290	12	18,0	201	107	180	218	M20	15	20x18°	201	107
125		290	147	140	60	7,0	46	5,0	30	370	290	325	16	18,0	230	120	215	252	M20	15		230	120
140		320	165	155	65	7,5	50	5,0	34	410	320	360	16	22,0	254	133	245	282	M20	15		254	133
160		370	190	175	75	9,0	57	5,0	38	460	370	410	16	22,0	288	151	280	325	M24	15		288	151
180		420	220	195	85	10,5	64	5,5	40	520	420	465	16	26,0	320	165	330	375	M24	18	24x15°	320	165

Other flange dimensions see page 32

Further types: ROTEX® CF-H
Flange drop-put center design coupling

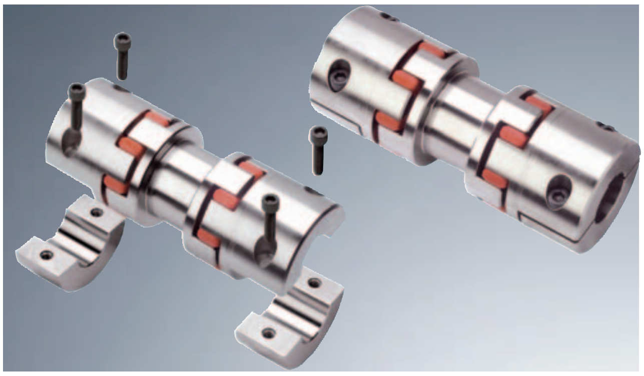
Please order our separate dimension sheet (M412069)



Order form:

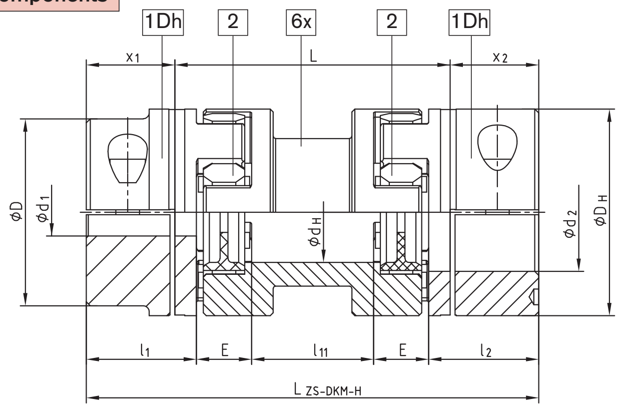
ROTEX® 38	CF	92 Sh A	1 — EN-GJL-250 — Ø 20
Coupling size	Type	Spider hardness	Component · material · Finish bore

Double cardanic type ZS-DKM-H

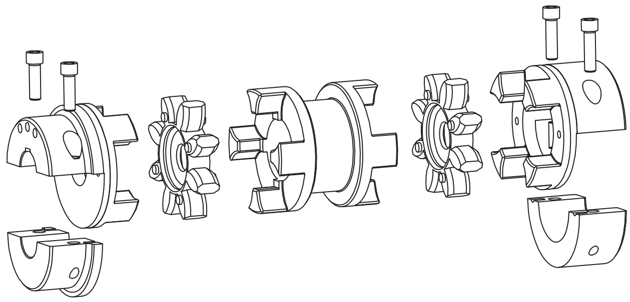


- Standard spacers up to 250 mm shaft distance dimension – ex stock
- Assembly/disassembly through 4 screws only
- Compensates for high shaft displacements due to double-cardanic design
- Remains torsionally symmetric in case of shaft displacements
- Reduced vibration and noise
- Low restoring forces ⇛ Increase of the total lifetime of all adjacent components (bearings, seals etc.)
- Ex Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95) (type 7.6 marked at stock, type 7.5 shell clamping hub without feather key according to category 3)

Components



Type ZS-DKM-H



ROTEX® ZS-DKM-H																		
Size	Dismountable lenght L [mm]	Finish bore max. $Ød_1/d_2$ [mm]	Spider (part 2) 1) T_{KN} [Nm]	Dimensions [mm]							Cap screw DIN EN ISO 4762 – 12.9		Max. displacements					Weight 2) [kg]
													Axial [mm]	at n = 1500 1/min		at n = 3000 1/min		
				D_H	d_H	l_1; l_2	x_1; x_2	l_{11}	E	$L_{ZS-DKM-H}$	M	T_A [Nm]		Radial [mm]	Angular [°]	Radial [mm]	Angular [°]	
24	100	28	35	55	27	30	22,5	49	18	145	M6	14	1,4	1,17		0,87		1,40
	140							89		185				1,87		1,40		1,60
28	100	38	95	65	30	35	25,5	41	20	151	M8	35	1,5	1,06		0,80		1,90
	140							81		191				1,76		1,32		2,20
38	100	45	190	80	38	45	35,5	33	24	171	M8	35	1,8	0,99		0,74		3,90
	140							73		211				1,69		1,27		4,10
42	100	55	265	95	46	50	39,0	26	26	178	M10	69	2,0	0,91		0,68		5,10
	140							66		218				1,60		1,20		5,70
48	100	60	310	105	51	56	45,0	22	28	190	M12	120	2,1	0,87		0,65		7,10
	140							62		230				1,57		1,18		7,90
55	100	70	410	120	60	65	50,0	10	30	200	M12	120	2,2	0,70	1,0	0,52	0,75	9,50
	140							50		240				1,40		1,05		11,20
	180							90		280				2,09		1,57		12,30
	200							110		300				2,44		1,83		12,80
65	140	80	625	135	68	75	60,0	40	35	260	M12	120	2,6	1,31		0,98		16,10
	180							80		300				2,00		1,50		16,80
75	140	90	1280	160	80	85	67,5	25	40	275	M16	295	3,0	1,13		0,85		23,60
	180							65		315				1,83		1,37		26,00
	200							85		335				2,19		1,64		27,00
	250							135		385				3,05		2,29		29,50
90	180	110	2400	200	100	100	81,5	53	45	343	M20	580	3,4	1,71		1,28		48,90
	250							123		413				2,93		2,19		52,60

1) Maximum torque of coupling $T_{K max.}$ = nominal torque of coupling T_{KN} x 2
Size 24 to 75 spider type 95/98 Sh A-GS; at size 90 spider type 95 Sh A with inner ring
ZS-DKM-H: transmittable torque according to 92 Sh A-GS

2) Refer to max. bore

Finish bore according to ISO fit H7, feather keyway according to DIN 6885 sheet 1 - JS9

ATTENTION: The standard line is only for the horizontal assembly. Vertical assembly on request.

Order form

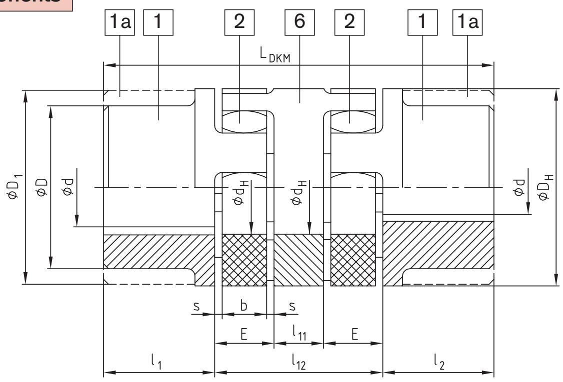
ROTEX® 38	ZS-DKM-H	140	98 Sh A	Ø38	Ø30
Coupling size	Type	Shaft distance dimension L	Spider hardness	Finish bore	Finish bore

Made for Motion KTR

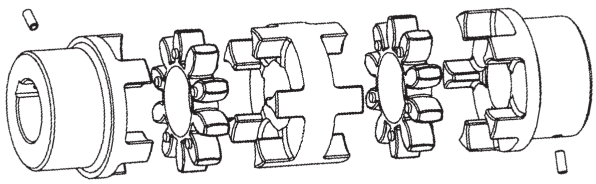
Double cardanic type DKM

- For high shaft displacements
- 3-part double-cardanic
- Reduced vibration and noise
- The restoring forces resulting from displacements are very low
- Increase of the total lifetime of all adjacent components (bearings, seals etc.)
- Ⓔx Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)
- Mounting instructions under www.ktr.com
- Double-cardanic design without the need for bearing support or external guarding

Components



Type DKM



ROTEX® DKM (No. 018)															
Size	Ød ØD ØD1	Spider (part 2) Nominal torque [Nm]		Dimensions [mm]									Max. displacements at n = 1500 $^1/_{min}$		
		92 Sh-A	98 Sh-A	D_H	d_H	$l_1; l_2$	l_{11}	l_{12}	E	s	b	L_{DKM}	Radial [mm]	Angular [°]	Axial [mm]
19	see shaft coupling page 28 and 29; stock programme/basic programme page 26 and 27	10	17	40	18	25	10	42	16	2,0	12	92	0,54	1,20	+1,2/-1,0
24		35	60	55	27	30	16	52	18	2,0	14	112	0,53	0,90	+1,4/-1,0
28		95	160	65	30	35	18	58	20	2,5	15	128	0,60	0,90	+1,5/-1,4
38		190	325	80	38	45	20	68	24	3,0	18	158	0,77	1,00	+1,8/-1,4
42		265	450	95	46	50	22	74	26	3,0	20	174	0,84	1,00	+2,0/-2,0
48		310	525	105	51	56	24	80	28	3,5	21	192	1,00	1,10	+2,1/-2,0
55		410	685	120	60	65	28	88	30	4,0	22	218	1,11	1,10	+2,2/-2,0
65		625	940	135	68	75	32	102	35	4,5	26	252	1,40	1,20	+2,6/-2,0
75		1280	1920	160	80	85	36	116	40	5,0	30	286	1,59	1,20	+3,0/-3,0
90		2400	3600	200	100	100	40	130	45	5,5	34	330	1,78	1,20	+3,4/-3,0

Finish bore according to ISO fit H7, feather keyway according to DIN 6885 sheet 1 - JS9

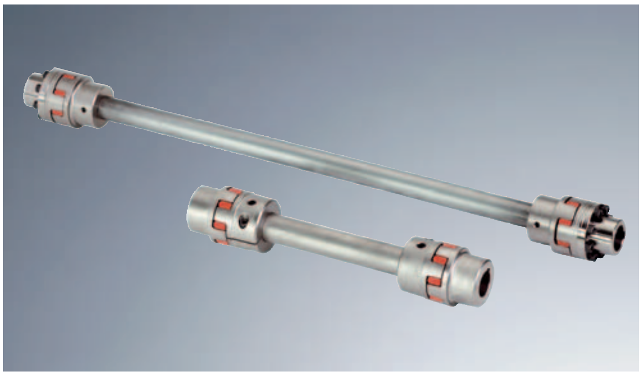
Further types: ZS-DKM1

For detailed information please ask for our total data sheet no. M 369832.

Order form:

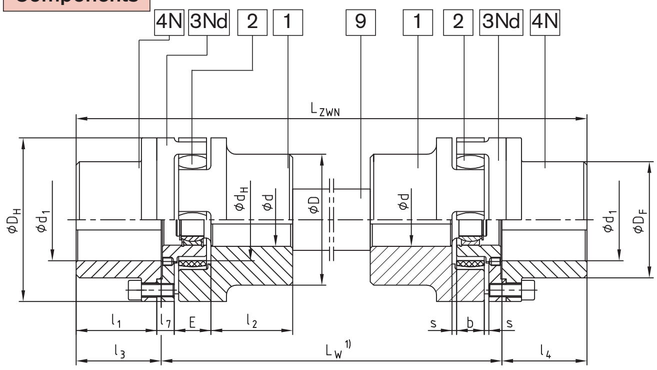
ROTEX® 38	DKM	EN-GJL-250	98 Sh A	1 —	Ø 38	1 —	Ø 30
Coupling size	Type	Material	Spider hardness	Component	Finish-bore	Component	Finish-bore

Intermediate shaft programme type ZWN and ZR

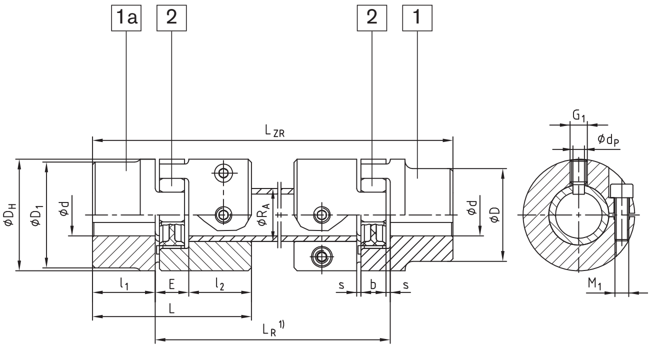


- To connect shaft ends with extended shaft separations
- Double cardanic - thus able to compensate for high radial misalignments
- Good damping properties by the arrangement of two spiders
- Radial assembly possible without displacement of the driving or driven machine
- Design ZWN - intermediate shaft centered via the spherical plain bearings
- Design ZR - flexible within the GS spider - intermediate pipe with bearings, to be disassembled radially
- Designs ZWN and ZR - modification for customers from the stock programme

Components



Type ZWN



Type ZR with GS spider

ROTEX® ZWN (Nr. 017) und ZR (Nr. 037)

Size	Pilot bore Ød ØD ØD1	Dimensions of ZWN and ZR: Component 4N [St] finish bore $Ød_{1max}$	Materials see page 45: D_H	D_F	d_H	l_1; l_2	E	s	b	l_3; l_4	l_7	L_{ZWN}	Dimensions for ZR: Intermediate pipe R_A	C[2] Nm²/rad	Clamping screw M_1	T_A [Nm]		L	Locking screw G_1	Locking pin d_p [mm]	Axial displa-cement [mm]	Angular dis-place- ment [degrees]
19[3]		—	40	—	18	25	16	2	12	—	—	—	20x3	954,9	M6	14		66	M6	4	1,2	0,9
24	see shaft coupling page 28 and 29; stock programme/basic programme page 26 and 27	24	55	36	27	30	18	2,0	14	30,5	8		30x4	4522	M6	14		78	M8	5,5	1,4	0,9
28		28	65	42	30	35	20	2,5	15	35,5	10		35x4	7611	M8	35	$L_{ZR} = L_R + 2 \cdot l_1$	90	M10	7,0	1,5	0,9
38		38	80	52	38	45	24	3,0	18	45,5	10		40x4	11870	M8	25		114	M12	8,5	1,8	1,0
42		41	95	62	46	50	26	3,0	20	51,0	12	$L_{ZWN} = L_W + 2 \cdot l_3$	45x4	17487	M10	49		126	M12	8,5	2,0	1,0
48		48	105	70	51	56	28	3,5	21	57,0	12		50x4	24648	M12	86		140	M16	12,0	2,1	1,1
55		55	120	80	60	65	30	4,0	22	66,0	16		55x4	39662	M12	120		160	M16	12,0	2,2	1,1
65		65	135	94	68	75	35	4,5	26	76,0	16		65x5	68329	M12	120		185	M16	12,0	2,6	1,2
75		75	160	108	80	85	40	5,0	30	86,5	19		75x5	108000	M16	295		210	M16	12,0	3,0	1,2
90		100	200	142	100	100	45	5,5	34	101,5	20		**Selection indication for design ZR:**									
100		110	225	158	113	110	50	6,0	38	111,5	25		▪ Friction torques of clamping hubs have to be observed.									
110		125	255	178	127	120	55	6,5	42	122,0	26		Please order dimension sheet no. 5020/000/017–757537.									
125		145	290	206	147	140	60	7,0	46	142,0	30		▪ Material on request.									

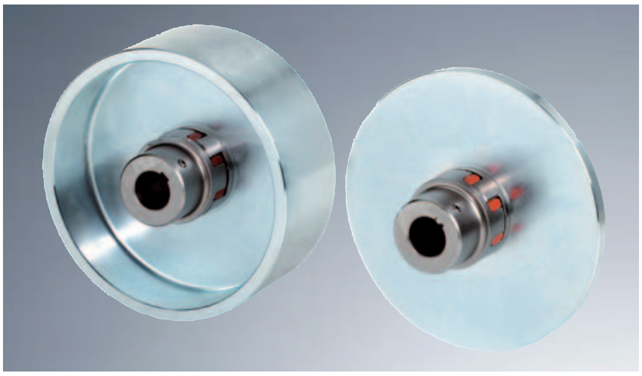
1) Please indicate the shaft distance dimension L_W or L_R in all inquiries and orders along with the maximum speed to review the critical whirling speed.
2) Torsion spring stiffness when the intermediate pipe is 1m
3) Type ZR
Finish bore according to ISO fit H7, feather keyway according to DIN 6885 sheet 1 - JS9

Design ZWNV - for vertical assembly with thrust bearing, see dimension sheet no. 5020/000/027-760390.

Order form:

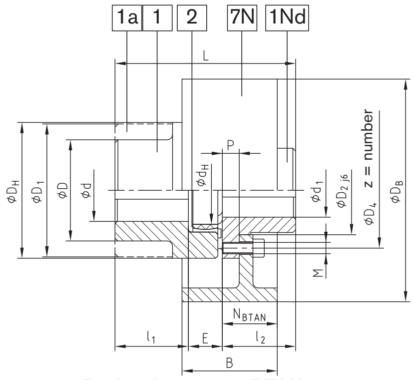
ROTEX® 38	ZWN	1200	St / EN-GJL-250	98 Sh A	4N —	Ø 38	4N —	Ø 30
Coupling size	Type	Shaft distance dim. L_W	Material	Spider hardness	Compo-nent	Finish bore	Compo-nent	Finish bore

Type BTAN with brake drum/type SBAN with disk brake

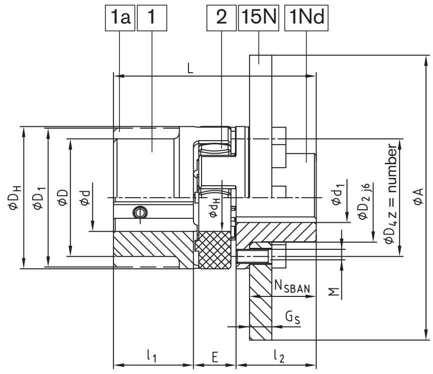


- Shaft coupling BTAN with brake drum to be mounted to external drum brakes with double shoes according to DIN 5431/15435
- Shaft coupling BTAN with disk for braking calipers
- Each coupling type to be combined with various sizes of brake drum disks (see dimension "N")
- The brake drum or disk brake has to be placed onto the shaft end with the biggest mass moment of inertia
- The maximum brake torque must not exceed the maximum torque of the coupling
- Designs BTAN and SBAN - modification for customer from the stock programme
- Mounting instructions under www.ktr.com

Components



Brake drum type BTAN



Disk brake type SBAN

ROTEX® type BTAN (No. 011) and SBAN (No. 013)																
Size	Pilot bore Ød; ØD ØD$_1$	Finish bore max.d$_1$		Dimensions [mm]												
		EN-GJS-400-15	Steel	D_H	D_2	D_4	d_H	z	pitch [1)]	M	T_A [Nm]	l_1; l_2	E	L	P	N_{SBAN}
38	see shaft coupling on pages 28 and 29; stock programme/basic programme see pages 26 and 27	—	34	80	50	66	38	8	8 x 45°	M8	41	45	24	114	7,5	37,5
42		—	42	95	60	80	46	12	16 x 22,5°	M8	41	50	26	126	9,5	40,5
48		—	48	105	68	90	51	12		M8	41	56	28	140	10,5	45,5
55		—	55	120	78	102	60	8	8 x 45°	M10	83	65	30	160	12,5	52,5
65		—	65	135	92	116	68	12	16 x 22,5°	M10	83	75	35	185	13,5	61,5
75		—	75	160	106	136	80	15		M12	120	85	40	210	15,5	69,5
90		—	100	200	140	172	100	15		M16	295	100	45	245	18,5	81,5
100		100	—	225	156	195	113	15	20 x 18°	M16	295	110	50	270	20,5	89,5
110		110	—	255	176	218	127	15		M20	580	120	55	295	23,5	96,5
125		130	—	290	204	252	147	15		M20	580	140	60	340	27,5	112,5

1) Thread in the hub between the cams

Type BTAN											
Brake drum	ROTEX® BTAN dimension „N_{BTAN}"										Speed rpm [V] (30 m/s)
	38	42	48	55	65	75	90	100	110	125	
160x60	31										3550
200x75	36	38	39	41							2800
250x95	44	46	47	49	50	52					2240
315x118		55	56	58	59	61	64				1800
400x150		68	69	71	72	74	77	79	82		1400
500x190					87	89	92	94	97	101	1120
630x236						107	110	112	115	119	900
710x265								123	126	130	800
800x300										144	710

Type SBAN											
Disk brake	ROTEX® SBAN coupling/disk brake dimension										Speed rpm [V] (30 m/s)
	38	42	48	55	65	75	90	100	110	125	
200x12,5	x										2800
250x12,5	x	x	x								2240
315x16		x	x	x	x	x					1800
400x16			x	x	x	x	x	x	x		1400
500x16				x	x	x	x	x	x	x	1120
630x20					x	x	x	x	x	x	900
710x20					x	x	x	x	x	x	800
800x25							x	x	x	x	710
900x25									x	x	630

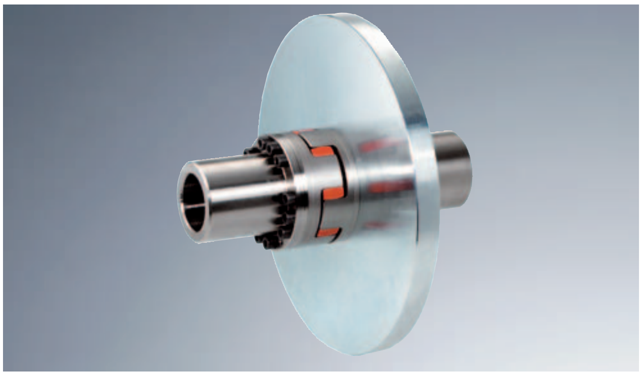
Other sizes on request according to dimension sheet no.: BTAN:M 380821
SBAN straight: M380822; cranked: M 370065
FNN hub: M 380823

Finish bore according to ISO fit H7, feather keyway according to DIN 6885 sheet 1 - JS9

Order form:

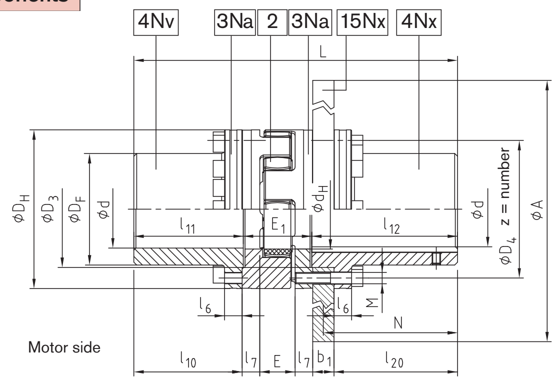
ROTEX® 38	BTAN	∅200x75	92 Sh A	1Nd —	Ø 38	1 —	Ø 30
Coupling size	Type	∅Brake drum x witdh of brake drum	Spider hardness	Compo-nent	Finish bore	Compo-nent	Finish bore

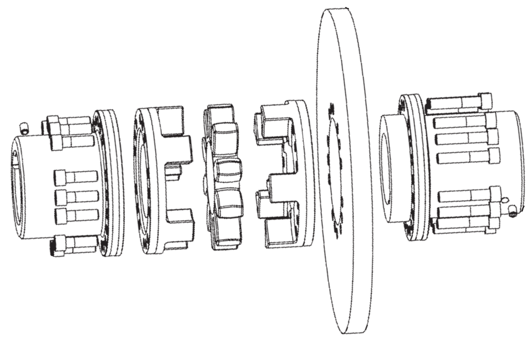
Type AFN-SB special with disk brake



- Shaft coupling AFN-SB special with disk brake for braking calipers
- The disk brake has to be placed onto the shaft end with the biggest mass moment of inertia
- The maximum braking torque must not exceed the maximum torque of the coupling
- For details about ROTEX AFN-SB spec. please see our dimension sheet no. M 351054
- Finish bore according to ISO fit H7, feather keyway according to DIN 6885 sheet 1 - JS9
- Mounting instructions under www.ktr.com

Components





Size	Finish bore d min.	Finish bore d max.	D_H	D_F	D_3 H7/h7	D_4	d_H	E	E_1	M	z	Pitch	T_A [Nm]
ROTEX® Type AFN-SB special													
65	22	65	135	94	96	116	68	35	65	M10	12	16x22,5°	83
75	30	75	160	108	112	136	80	40	75	M12	15		120
90	40	100	200	142	145	172	100	45	82	M16	15		295
100	46	110	225	158	165	195	113	50	97	M16	15		295
110	60	125	255	178	180	218	127	55	103	M20	15	20x18°	580
125	60	145	290	206	215	252	147	60	116	M20	15		580
140	60	165	320	235	245	282	165	65	128	M20	15		580
160	80	190	370	270	280	325	190	75	146	M24	15		1000

Size	Torque[1] mit 95Sh-A T_{KN}	Torque[1] mit 95Sh-A $T_{Kmax.}$	Max. speed [rpm]	Max.[1] brake torque [Nm]	l_6	l_7	l_{10}	l_{11}	l_{12}	l_{20}	N	L
ROTEX® Type AFN-SB special												
65	940	1880	3450	1880	15	16	112,5	113,5	166,0	135	150	344,5
75	1920	3840	3250	3840	20	19	131,5	133,0	166,5	135	150	374,5
90	3600	7200	3000	7200	20	20	164,0	165,5	206,5	175	190	454,0
100	4950	9900	2800	9900	25	25	153,5	155,0	206,5	175	190	458,5
110	7200	14400	2600	14400	25	26	201,5	203,5	212,0	180	195	518,5
125	10000	20000	2250	20000	30	30	198,5	200,5	212,0	180	195	528,5
140	12800	25600	1800	25600	30	34	244,5	247,0	252,5	220 210 [2]	235 230 [2]	627,5
160	19200	38400	1500	38400	34	38	226,5	229,0	252,5	220 210 [2]	235 230 [2]	627,5

Size	Brake disk ØA x b_1: 355x30	400x30	450x30	500x30	560x30	630x30	710x30	800x30	900x30	900x40	1000x40
Selection of ROTEX® coupling/disk brake											
65	x	x	x								
75		x	x	x							
90			x	x	x	x					
100				x	x	x					
110				x	x	x	x				
125						x	x	x			
140							x	x	x	x	x
160							x	x	x	x	x

[1] The max. braking torque must not exceed the maximum torque of the coupling.
[2] Dimensions for a brake disk width b_1 of 40 mm.

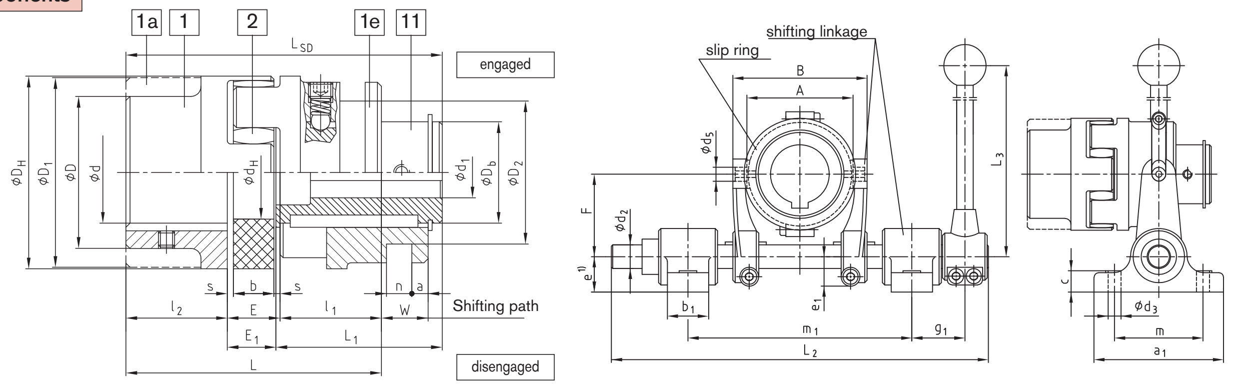
Order form:

ROTEX® 90	AFN-SB special	Ø450x30	95 Sh A	4Nv —	Ø 90	4Nx —	Ø 90
Couplings size	Type	ØDisk brake width of disk	Zahnkranzhärte	Component	Finish bore	Component	Finish bore

Type SD (shiftable at standstill)

- Shiftable shaft coupling for all applications in general engineering
- Easy to engage and disengage driving or driven machines with standstill of machine
- Existing shifting hub to be combined with slip ring and shiftable linkage
- With pilot bored shifting hubs the requested shifting force must be set after final machining
- Other sizes on request according to M 370266
- Complete shifting device consisting of:
  separated slip ring from red bronze, shift fork, shifting shaft, shifting lever, eye type bearing

Components



ROTEX® type SD (No. 015)																				
Size	Ød ØD $ØD_1$	Finish bore d_1		Dimensions [mm]														Shifting force set in [N]	Slip ring size	Shiftabe linkage size
			min.	max. $ØD_H$	D_2±0,1	D_b	d_H	l_1;l_2	E	s	b	E_1	L	L_1	W	a	n±0,1	L_{SD}		
24	see shaft coupling on pages 28 and 29; see stock programme/basic programme pages 26 and 27	8	18	55	41	30	27	30	18	2,0	14	16,5	78	51,5	16,0	6	6,0	98	110	—	—
28		10	22	65	58	36	30	35	20	2,5	15	18,0	90	60,0	17,5	8	8,0	113	130	—	—
38		12	28	80	70,5	45	38	45	24	3,0	18	22,0	114	73,0	21,0	8	12,5	140	150	1,1	1
42		14	32	95	70,5	50	46	50	26	3,0	20	24,0	126	82,0	23,0	8	12,5	156	180	1,1	1
48		15	40	105	89,5	60	51	56	28	3,5	21	25,5	140	90,5	24,5	6	17,5	172	200	2,2	2
55		18	48	120	112,5	70	60	65	30	4,0	22	27,0	160	103,0	26,0	6	18,0	195	250	3,3	3
65		20	55	135	112,5	80	68	75	35	4,5	26	32,0	185	120,0	30,5	7	18,0	227	280	3,3	3
75		25	65	160	130,5	95	80	85	40	5,0	30	37,0	210	135,0	35,0	6	20,5	257	350	4,4	3
90		28	75	200	164,5	110	100	100	45	5,5	34	41,0	245	152,0	39,5	8	25,5	293	350	5,5	4
100		30	80	225	164,5	115	113	110	50	6,0	38	46,0	270	169,0	44,0	14	25,5	325	380	5,5	4
110		35	85	255	164,5	125	127	120	55	6,5	42	51,5	295	184,0	48,5	18,5	25,5	355	450	5,5	4
125		40	100	290	210,5	145	147	140	60	7,0	46	55,5	340	208,5	53,0	18,5	30,5	404	500	6,6	5

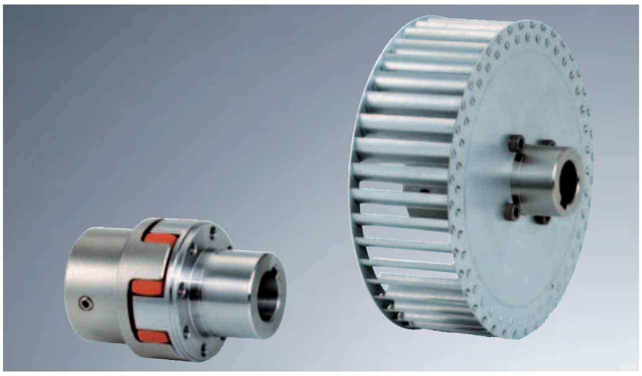
slip ring and shiftable linkage																			
Size	Shiftabe linkage size	Dimensions [mm]																	Max. speed n for slip ring [rpm]
		a_1	b_1	c	d_2	d_3	d_5	e[1)]	e_1	F	g_1	L_2	L_3	m	m_1 min.	m_1 max.	A	B	
38	1	110	35	18	20	11	12	30	25	70	55	320	400	75	180	190	90	114	3280
42	1																		
48	2	140	40	25	25	13,5	17	40	27	97,5	60	430	450	100	240	270	111	151	2550
55	3				30				32,5	120	70	490	600		280	310	140	180	2120
65	3																		
75	3																170	210	1710
90	4	160	45		35		21	50	37,5	147,5	70	565	750	120	321	365	200	244	1360
100	4																		
110	4																		
125	5				40		25		46	190	80	630	1068		365	410	250	300	855

[1)] In case of a through base plate the dimension "e" of the shiftable linkage size 5 has to be increased by at least 10 mm.
Finish bore according to ISO fit H7, feather keyway according to DIN 6885 sheet 1 - JS9

Order form:

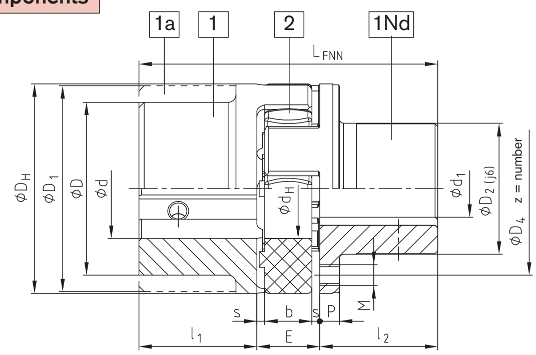
ROTEX® 38	SD	with 1,1 and 1	92 Sh A	1 —	Ø 38	11 —	Ø 28
Couplings size	Type	with slip ring 1,1 and shiftable linkage 1	Spider hardness	Component	Finish bore	Component	Finish bore

Type FNN and FNN with fan

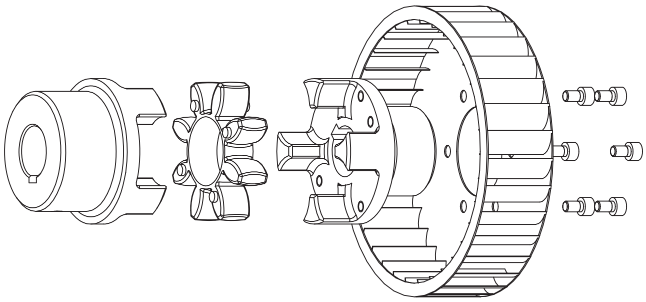


- Damping vibrations and reducing noise
- Ideal compensation for misalignment due to crowned teeth
- Coupling as plug-in design
- Easy checking of wear by sight control
- Coupling to be equipped with any fan
- Finish bore according to ISO fit H7,
  feather keyway according to DIN 6885 sheet 1 - JS9

Components



Type FNN



Type FNN with fan (typ 1)

ROTEX® type FNN (No. 021)															
Size	Ød ØD ØD1	max. finish bore Ød1	Dimensions [mm]												
			D_H	D_2	D_4	d_H	E	s	b	$l_1;l_2$	P	M	z		L_{FNN}
28	see shaft coupling on pages 28 and 29; stock programme/basic programme see pages 26 and 27	24	65	40	54	30	20	2,5	15	35	6,5	M6	8	8x45°	90
38		34	80	50	66	38	24	3,0	18	45	7,5	M8	8		114
42		42	95	60	80	46	26	3,0	20	50	9,5	M8	12	16x22,5°	126
48		48	105	68	90	51	28	3,5	21	56	10,5	M8	12		140
55		55	120	78	102	60	30	4,0	22	65	12,5	M10	8	8x45°	160
65		65	135	92	116	68	35	4,5	26	75	13,5	M10	12	16x22,5°	185
75		75	160	106	136	80	40	5,0	30	85	15,5	M12	15	20x18°	210
90		100	200	140	172	100	45	5,5	34	100	18,5	M16	15		245

Other sizes on request

Type 1: Fan screwed on
The ROTEX® coupling can be supplied with the fan screwed on. Specific connection dimensions of customers such as pitch circle of threads, size of threads and number of centering of fans should be mentioned in your inquiry.

Type 2: Fans injection-moulded
Low prices due to production volumes depending on quantity.

Type 3: Fans pressed or glued on
Special surface forming (knurling according to DIN 82) allows the fan to be pressed or glued onto the hub collar.

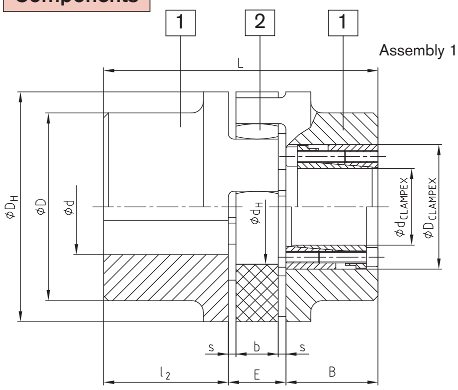
Order form:

ROTEX® 38	FNN	92 Sh A	1 —	Ø 38	1Nd —	Ø 30
Couplings size	Type	Spider hardness	Component	Finish bore	Component	Finish bore

Made for Motion KTR

Further types

Components



Assembly 1

Assembly 2

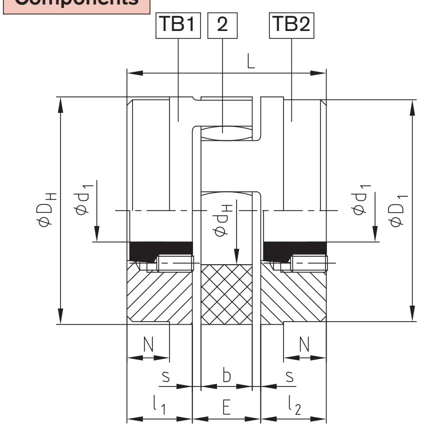
ROTEX® type No. 001 with clamping set CLAMPEX® KTR 200

Size	Ød ØD ØD1	Hub material	CLAMPEX® KTR 200 Largest poss KTR clamping set dxD	Transmittable torques and force T [Nm]	F_{AX} [KN]	B	Dimensions [mm] l_2	E	s	b	D_H	D	d_H	L
42	see shaft couplings on pages 26 and 27 basic programme see pages 24 and 25		30x55	769	51	48	50	26	3,0	20	95	—	46	length L = l_1 + E + B_1 (clamping set)
48			35x60	1197	68	48	56	28	3,5	21	105	—	51	
55		Steel part 1	45x75	2132	95	59	65	30	4,0	22	120	—	60	
65			45x75	2132	95	59	75	35	4,5	26	135	115	68	
75			50x80	3159	126	59	85	40	5,0	30	160	135	80	
90			65x95	4107	126	59	100	45	5,5	34	200	160	100	
100		EN-GJS-400-15 part 1	65x95	4107	126	59	110	50	6,0	38	225	180	113	
110			70x110	7023	201	70	120	55	6,5	42	255	200	127	
125			80x120	8026	201	70	140	60	7,0	46	290	230	147	
140			95x135	11373	239	70	155	65	7,5	50	320	255	165	
160			110x155	16068	292	80	175	75	9,0	57	370	290	190	
180			120x165	21910	365	80	195	85	10,5	64	420	325	220	

ROTEX® type No. 001 with clamping set CLAMPEX® KTR 200

KTR 200 Size	Length	Transmittable torque and axial force		Clamping screw DIN EN ISO 4762 – 12.9		KTR 200 Size	Length	Transmittable torque and axial force		Clamping screw DIN EN ISO 4762 – 12.9		KTR 200 Size	Length	Transmittable torque and axial force		Clamping screw DIN EN ISO 4762 – 12.9	
dxD	B	T [Nm]	F_{ax} [kN]	zxM	T_A [Nm]	dxD	B	T [Nm]	F_{ax} [kN]	zxM	T_A [Nm]	dxD	B	T [Nm]	F_{ax} [kN]	zxM	T_A [Nm]
20x47	48	513	51	6xM6	17	38x65	48	1299	68	8xM6	17	65x95	59	4107	126	8xM8	41
22x47	48	564	51	6xM6	17	40x65	48	1368	68	8xM6	17	70x110	70	7023	201	8xM10	83
24x50	48	616	51	6xM6	17	42x75	59	1990	95	6xM8	41	75x115	70	7524	201	8xM10	83
25x50	48	641	51	6xM6	17	45x75	59	2132	95	6xM8	41	80x120	70	8026	201	8xM10	83
28x50	48	718	51	6xM6	17	48x80	59	3033	126	8xM8	41	85x125	70	10659	251	10xM10	83
30x55	48	769	51	6xM6	17	50x80	59	3159	126	8xM8	41	90x130	70	11286	251	10xM10	83
32x60	48	1094	68	8xM6	17	55x85	59	3475	126	8xM8	41	95x135	66	11373	239	10xM10	83
35x60	48	1197	68	8xM6	17	60x90	59	3791	126	8xM8	41	for further details please see CLAMPEX® catalogue					

Components



ROTEX® type No. 001 with taper clamping bush

Size	Taper clamping bush	Dimensions [mm] l_1;l_2	E	s	b	L	N	D_H	D_1	d_H	Fixing screw for taper bush Size [Inch]	Length [mm]	Number	T_A [Nm]
28	1108	23	20	2,5	15	66	—	65	65	30	1/4"	13	2	5,7
38	1108	23	24	3,0	18	70	15	80	78	38	1/4"	13	2	5,7
42	1610	26	26	3,0	20	78	16	95	94	46	3/8"	16	2	20
48	1615	39	28	3,5	21	106	28	105	104	51	3/8"	16	2	20
55	2012	33	30	4,0	22	96	20	120	118	60	7/16"	22	2	31
75	2517	52	40	5,0	30	144	36	160	135	80	1/2"	25	2	49
	▪ 3020										5/8"	32		92

▪ Only available for design TB 2
* 1. BSW thread

Coupling type TB 1/1; TB 2/2; TB 1/2 possible

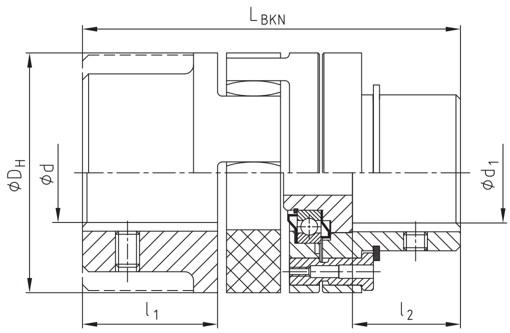
▪ Please order our separate dimension sheet (M 373054).

Taper clamping bush

Size	Bore dimensions d_1 available; H7 fit – keyways to DIN 6885 sheet 1																		
1108	10	11	12	14	16	18	19	20	22	24	25	28*							
1610	14	16	18	19	20	22	24	25	28	30	32	35	38	40	42*				
1615	14	16	18	19	20	22	24	25	28	30	32	35	38	40	42*				
2012	14	16	18	19	20	22	24	25	28	30	32	35	38	40	42	45	48	50	
2517	16	18	19	20	22	24	25	28	30	32	35	38	40	42	45	48	50	55	60
3020	25	28	30	35	38	40	42	45	48	50	55	60	65	70	75				

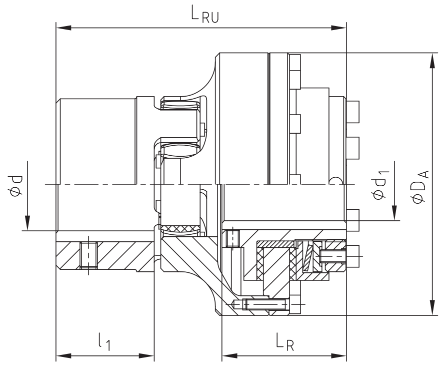
* Bores with keyway (flat design) to DIN 6885 sheet 3

Further types with torque limiter



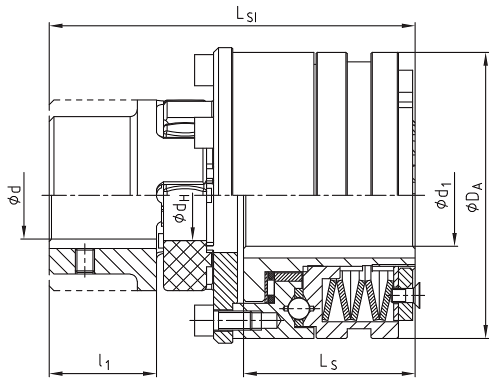
ROTEX® BKN - shear pin coupling, typw BKN No. 009							
Size	d	Max. d_1	l_1	l_2	L_{BKN}	D_H	Min. fracture torque [Nm]
28	see shaft coupling on pages 28 and 29 basic programme see pages 26 and 27	28	35	25	101	65	100
38		38	45	35	125	80	190
42		42	50	40	139	95	250
48		48	56	46	153	105	300
55		55	65	55	177	120	400
65		65	75	65	202	135	500
75		75	85	70	230	160	600
90		100	100	85	266	200	700

Modification for customer from the stock programme.
Please mention the fracture torques with your order!
For further details please see dim. sheet no. 5020/000/009-7603

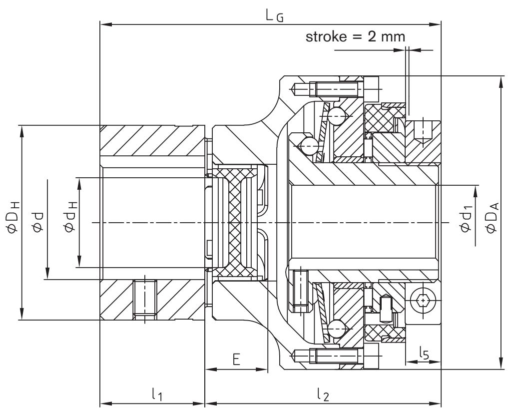


ROTEX® - RUFLEX® - coupling with torque limiter, type No. 070								
ROTEX® Size	RUFLEX® Size	Slipping torques [Nm]	d	d_1 max.	D_A	l_1	L_R	L_{RU}
14	00	0,5 — 5	see shaft coupling on pages 28 and 29 basic programme see pages 26 and 27	10	44	11	31	59
19	0	2 — 20		20 [1)]	63	25	33	78
24	01	5 — 70		22	80	30	45	98
28	1	20 — 200		25	98	35	52	113
38	2	25 — 400		35	120	45	57	133
48	3	50 — 800		45	162	56	68	166
75	4	90 — 1600		55	185	85	78	205

1) Finish bore exceeding ø 19, keyway according to 6885 sheet 3



ROTEX® - KTR-SI - coupling with torque limiter, type No. 070									
ROTEX® Size	KTR-SI design	KTR-SI Size	Ratchet torque [Nm]	d	max. d_1	D_A	l_1	L_S	L_{SI}
28	DK	2	12-200	see shaft coupling on pages 28 and 29 basic programme see pages 26 and 27	35	100	35	56	124
	SR/SGR	0	5-40		20	55		34,5	102
38	DK	3	25-450		45	120	45	73	155
	SR/SGR	1	12-100		25	82		48	129,5
48	DK	4	50-1000		55	146	56	93,5	194
	SR/SGR	2	25-200		35	100		56	155
55	DK	5	85-2000		65	176	65	107	222,5
	SR/SGR	3	50-450		45	120		73	186
75	DK	—	—		—	—	85	—	—
	SR/SGR	4	100-2000		55	146		93,5	241,5
90	DK	—	—		—	—	100	—	—
	SR/SGR	5	170-3400		65	176		107	275,5

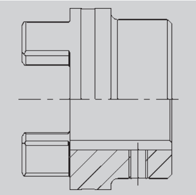


SYNTEX® - backlash-free, torsionally rigid overload coupling with ROTEX® GS																
ROTEX® Size	SYNTEX® Size	SYNTEX® torque range disk spring [Nm]				Max. bore										
		DK_1	DK_2	SK_1	SK_2	d	d_1	D_A	D_H	d_H	E	L	L_G	l_1	l_2	l_5
24	20	6-20	15-30	10-20	20-65	35	20	80	55	27	18	45	100	30	70	10
28	25	20-60	45-90	25-65	40-100	40	25	98	65	30	20	50	113	35	78	11
38	35	25-80	75-150	30-100	70-180	48	35	120	80	38	24	60	136	45	91	13
48	50	60-180	175-300	80-280	160-400	55	50	162	105	51	28	70	167	56	111	14

Hub designs

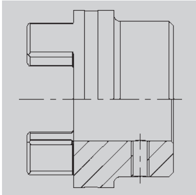
Due to the numerous applications of ROTEX® for many different mounting situations, this coupling system is available with various hub designs. These designs mainly differ in that they offer either positive or frictionally engaged connections, but mounting situations like, for example, gear shafts with integrated transmission cams or similar applications are covered, too.

Design 1.0 hub with keyway and fixing screw



Positive power transmission; permissible torque depends on the permissible surface pressure. Not suitable for backlash-free power transmission for heavily reversing operation.

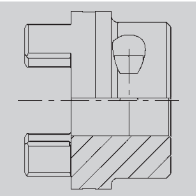
Design 1.1 hub without feather key, with setscrew



Positive torque transmission for connections pressed or glued in. (No ATEX release)

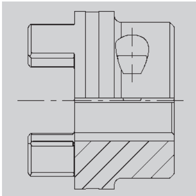
Design 1.3 hub with spline bore (page 26)

Design 2.0 clamping hub, single slotted, without keyway



Frictionally engaged, backlash-free shaft-hub-connection. Transmittable torques depend on the bore diameter. (Only for ATEX category 3)

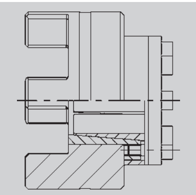
Design 2.1 clamping hub, single slotted, with keyway



Positive power transmission with additional frictional tightness. The frictional tightness avoids or reduces reversal backlash. Surface pressure of the keyway connection is reduced.

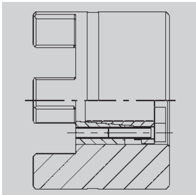
Design 2.3 clamping hub with spline bore (page 26/31)

Design 4.2 with CLAMPEX® clamping set KTR 250



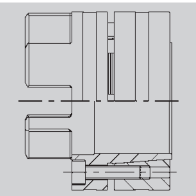
Frictionally engaged, backlash-free shaft-hub-connection for transmission of average torques.

Design 4.1 w. CLAMPEX® clamping set KTR 200/f. KTR 400 design 4.3



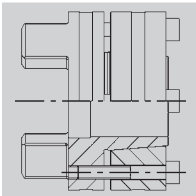
Frictionally engaged, backlash-free shaft-hub-connection for transmission of larger torques. Largest clamping set possible depends on the hub collar diameter. Clamping set screw fitting possible both internally and externally. For details of calculation please see CLAMPEX® catalogue.

Design 6.0 clamping ring hub (see ROTEX® GS series)



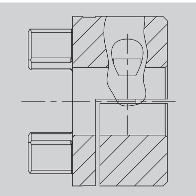
Integrated frictionally engaged shaft-hub-connection for transmission of higher torques. Screw fitting on elastomer side. For details about torques and dimensions see on page 30. Suitable for high speeds.

Design 6.5 clamping ring hub



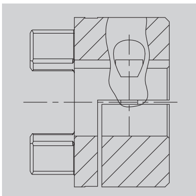
Design equal to 6.0, but clamping screws to be fitted externally. Suitable, for example, for disassembly of radial spacer tubes (special design).

Design 7.5 shell clamping hub without feather key for a double-cardanic connection



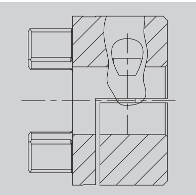
Frictionally engaged, backlash-free shaft-hub-connection for radial assembly of couplings. Transmittable torques depending on the bore diameter (only for ATEX category 3).

Design 7.6 shell clamping hub without feather key for a double-cardanic connection



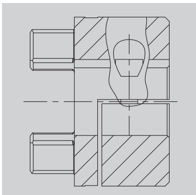
Positive power transmission with additional frictionally engaged operation for radial assembly of couplings. The frictionally engaged operation prevents or reduces reversing backlash, respectively. Surface pressure of the feather key connection is reduced.

Design 7.8 shell clamping hub without feather key



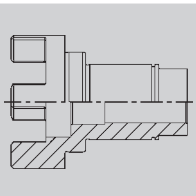
Frictionally engaged, backlash-free shaft-hub-connection for radial assembly of couplings. Transmittable torques depending on the bore diameter (only for ATEX category 3)

Design 7.9 shell clamping hub with feather key

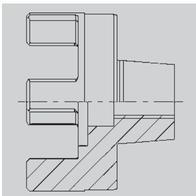


Positive power transmission with additional positive locking for radial assembly of couplings. Positive locking prevents or reduces reversing backlash, respectively. Surface pressure of the feather key connection is reduced.

Special hubs on request



Special lengthened hub/shaft with integrated cams.

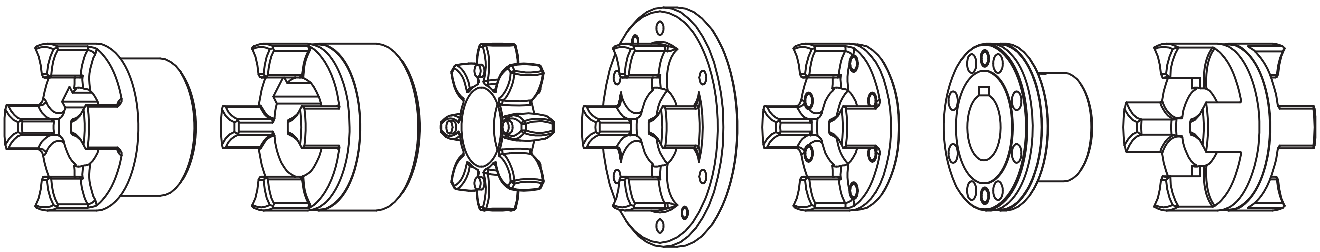


Special hub with external taper as a frictionally engaged connection.

Weights and mass moment of inertia

Components

1 | 1a | 2 | 3b | 3Na | 4N | 6



Size	Standard hub				Large hub			Spider	Driving flange			Coupling flange	DKM spacer
	Part 1				Part 1a			Part 2	Part 3b	Part 3Na		Part 4N	
	Alu [kg] [kgm²]	EN-GJL-250 [kg] [kgm²]	EN-GJS-400-15 [kg] [kgm²]	St [kg] [kgm²]	Alu [kg] [kgm²]	EN-GJL-250 [kg] [kgm²]	St [kg] [kgm²]	Polyurethan (Vulkollan) [kg] [kgm²]	EN-GJS-400-15 [kg] [kgm²]	St [kg] [kgm²]	EN-GJS-400-15 [kg] [kgm²]	St [kg] [kgm²]	Alu [kg] [kgm²]
14	–	–	–	–	0,020	–	–	0,0044	–	–	–	–	–
	–	–	–	–	0,000003	–	–	0,0000005	–	–	–	–	–
19	0,064	–	–	–	0,074	–	0,25	0,0056	–	–	–	–	–
	0,00001	–	–	–	0,00002	–	0,00006	0,000001	–	–	–	–	–
24	0,123	–	–	–	0,174	–	0,55	0,014	0,028	0,145	–	0,30	0,14
	0,00004	–	–	–	0,00008	–	0,00023	0,000006	0,00023	0,00007	–	0,00009	0,00006
28	0,200	–	–	–	0,264	–	0,89	0,024	0,54	0,232	–	0,49	0,22
	0,00010	–	–	–	0,00019	–	0,00053	0,000010	0,0007	0,00017	–	0,0002	0,00013
38	0,44	1,16	–	1,5	0,470	1,32	1,27	0,042	0,73	–	0,313	0,87	0,35
	0,00033	0,00086	–	0,00121	0,00046	0,00135	0,0014	0,00003	0,001	–	0,00038	0,0005	0,00035
42	0,69	1,75	–	2,52	0,772	2,05	1,84	0,065	1,26	–	0,608	1,4	0,47
	0,00067	0,00178	–	0,00283	0,00111	0,00291	0,0017	0,00007	0,0032	–	0,00089	0,0011	0,00068
48	0,80	2,44	–	3,34	1,01	2,78	2,74	0,086	1,45	–	0,755	1,92	0,62
	0,011	0,00308	–	0,00473	0,00174	0,00484	0,0052	0,00013	0,0043	–	0,001358	0,0018	0,0011
55	–	3,68	–	5,05	–	4,08	3,93	0,11	2,58	–	1,243	2,93	0,90
	–	0,00615	–	0,00948	–	0,00926	0,010	0,00023	0,0105	–	0,002920	0,0037	0,0021
65	–	5,67	–	6,79	–	6,04	5,85	0,17	3,10	–	1,635	4,36	1,31
	–	0,01240	–	0,01516	–	0,01789	0,019	0,00042	0,0149	–	0,004891	0,0069	0,0039
75	–	8,72	–	10,53	–	9,53	9,06	0,32	4,46	–	2,511	6,80	1,97
	–	0,02644	–	0,03273	–	0,03946	0,040	0,00116	0,0281	–	0,01050	0,0151	0,0082
90	–	14,8	–	18,7	–	18,2	17,0	0,57	6,94	–	4,151	12,84	3,45
	–	0,06730	–	0,08742	–	0,15086	0,117	0,00323	0,0651	–	0,02723	0,0448	0,0224
100	–	–	19,7	–	–	–	–	0,81	10,2	–	6,350	16,16	–
	–	–	0,11694	–	–	–	–	0,00588	0,1165	–	0,05273	0,0798	–
110	–	–	27,4	–	–	–	–	1,19	–	–	8,578	21,35	–
	–	–	0,20465	–	–	–	–	0,01097	–	–	0,09121	0,2824	–
125	–	–	42,3	–	–	–	–	1,63	–	–	12,598	34,33	–
	–	–	0,40727	–	–	–	–	0,01972	–	–	0,17469	0,3229	–
140	–	–	58,1	–	–	–	–	2,11	–	–	17,271	48,69	–
	–	–	0,67739	–	–	–	–	0,03129	–	–	0,29247	0,4917	–
160	–	–	84,2	–	–	–	–	3,21	–	–	26,305	71,08	–
	–	–	1,31729	–	–	–	–	0,63228	–	–	0,59436	0,9693	–
180	–	–	118,5	–	–	–	–	5,25	–	–	33,076	109,43	–
	–	–	2,30835	–	–	–	–	0,13789	–	–	0,97394	1,9650	–

Weight and mass moment of inertia each refer to the medial finish bore without keyway.

Weights and mass moment of inertia

ROTEX® complete couplings												
Size	AFN		BFN		CF		DF		ZWN [1]		SD	
	Weight [kg]	Mass moment of inertia J [kgm²]	Weight [kg]	Mass moment of inertia J [kgm²]	Weight [kg]	Mass moment of inertia J [kgm²]	Weight [kg]	Mass moment of inertia J [kgm²]	Weight [kg]	Mass moment of inertia J [kgm²]	Weight [kg]	Mass moment of inertia J [kgm²]
19	—	—	—	—	0,44	0,00016	0,38	0,00020	—	—	0,42	0,00008
24	0,98	0,00036	1,1	0,00041	0,84	0,00047	0,57	0,00047	2,2	0,00084	1,1	0,00046
28	1,6	0,00083	1,7	0,00095	1,5	0,00124	1,1	0,00141	3,6	0,00193	1,9	0,00106
38	2,8	0,00209	2,6	0,00193	1,9	0,00217	1,5	0,00259	5,5	0,00393	3,0	0,00435
42	4,5	0,00472	4,1	0,00419	3,1	0,00513	2,6	0,00662	8,6	0,00853	4,4	0,00804
48	5,9	0,00736	5,5	0,00684	3,9	0,00755	3,0	0,00881	11,3	0,0138	6,2	0,00223
55	8,9	0,01480	8,3	0,01369	6,4	0,01692	5,3	0,02131	17,7	0,0279	9,8	0,0166
65	12,9	0,0266	12,3	0,0259	8,9	0,02780	6,4	0,003037	26,3	0,0531	14,9	0,0326
75	20,6	0,0601	19,3	0,0572	13,5	0,0557	9,2	0,05741	41,6	0,1172	23,2	0,0706
90	37,8	0,1718	34,2	0,1551	22,3	0,1356	14,5	0,1333	73,2	0,3173	40,5	0,1891
100	49,6	0,3068	45,2	0,2737	30,9	0,2401	21,2	0,2394	98,7	0,5629	46,7	0,2467
110	67,5	0,5385	61,7	0,4793	42,9	0,4324	29,8	0,4446	135,1	0,986	61,5	0,4186
125	102,6	1,0485	94,4	0,9413	64,4	0,8187	42,2	0,8031	206,2	1,937	96,8	0,8497
140	141,2	1,743	129,7	1,564	90,4	1,4221	62,5	1,4580	283,3	3,222	127,8	1,368
160	210,3	3,517	190,9	3,107	127,6	2,589	83,6	2,4805	418,2	6,393	190,3	2,723
180	306,6	6,582	274,4	5,668	175,1	4,448	107,9	4,141	601,9	11,682	262,2	4,810

BTAN/SBAN without drum/disk		
Size	Weight [kg]	Mass moment of inertia J [kgm²]
28	0,90	0,0004
38	2,10	0,0014
42	3,24	0,0031
48	4,41	0,0053
55	6,60	0,0105
65	10,1	0,0209
75	15,4	0,0442
90	27,6	0,1224
100	36,9	0,2074
110	50,9	0,3665
125	79,1	0,7349
140	109,0	1,2292
160	161,9	2,4569
180	232,9	4,4967

Drum for BTAN [2]		
Brake disk $\varnothing D_B$ x B	Weight [kg]	Mass moment of inertia J [kgm²]
160 x 60	2,12	0,01
200 x 75	3,45	0,03
250 x 95	6,87	0,08
315 x 118	14,95	0,28
400 x 150	31,20	0,89
500 x 190	60,00	2,70
630 x 236	112,00	8,01
710 x 265	161,00	14,9
800 x 300	202,00	27,2

Disk for SBAN [2]		
Disk brake $\varnothing A$ x G_S	Weight [kg]	Mass moment of inertia J [kgm²]
200 x 12,5	2,928	0,015367
250 x 12,5	4,662	0,037584
315 x 16	8,618	0,111829
400 x 16	15,230	0,315206
500 x 16	23,964	0,769963
630 x 20	47,716	2,426359
710 x 20	60,934	3,915100
800 x 25	94,913	7,878998
900 x 25	118,954	12,609089
1000 x 25	148,240	19,234941

Weights and mass moments of inertia refer to standard hub with medial bore without keyway.

[1] Weights and mass moments of inertia without intermediate shaft.

[2] Selection of ROTEX® brake drum - disk brake please see page 38.

POLY-NORM®
Short torsionally flexible shaft coupling

REVOLEX® KX
Torsionally flexible pin & bush coupling

POLY
Torsionally flexible coupling, not failsafe

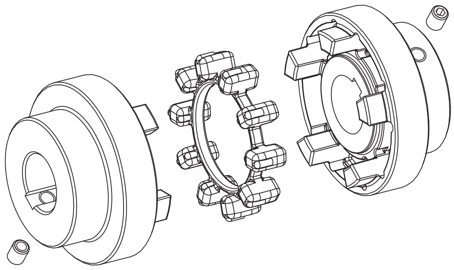
Made for Motion KTR

Table of contents

Coupling description

General description

The POLY-NORM® coupling is a torsionally flexible, shear type shaft coupling.
It has an axial plug-in design with a unique short over all length. The POLY-NORM® can be used in nearly all types of machinery and is ideal for the pump industry.
The POLY-NORM® coupling compensates for shaft misalignment of all kinds and safely transmits the torque.



Function/Design

The coupling consists of two hubs, with fingers separated by elastomeric elements. The hubs are assembled blindly plugging the hub fingers into each other axially and the elastomer ring is trapped in a groove between both coupling hubs. The compact POLY-NORM® coupling transmits torque with the elastomer in compression. Shaft misalignments, vibrations and shock loads are effectively absorbed by the POLY-NORM®.
The coupling is maintenance-free and used in general machinery, the pump industry and in compressors. Torques of up to 26,800 Nm are stocked in 17 different sizes and 7 designs. In addition to the standard coupling models, flange drop out center and spacer options are available in many variations.

Explosion-roof use

POLY-NORM® couplings are suitable for the use in drives in hazardous areas. The couplings are certified according to EC Standard 94/9/EC (ATEX 95) and belong to category 2G/2D, are confirmed and thus suitable for the use in hazardous areas of zone 1, 2, 21 and 22. Please read our information in the respective Type Examination Certificate and the operating and mounting instructions under www.ktr.com.

Variety of Options

The coupling can be adapted to many applications due to the many options that are possible with the building block arrangement. The POLY-NORM® components of a given model can be mixed and matched with each other to obtain different shaft distances using the same basic component.
On request, we can provide customized variations of the POLY-NORM® to fit your needs – for example, our POLY-NORM® overload coupling with RUFLEX® torque limiter. Just ask us!

Coupling selection

Selection of the POLY-NORM® coupling meets the DIN 740 part 2 specification. The coupling must be sized such that the coupling rated nominal torque is not exceeded in any operating condition. A comparison must be made between the application torque vs. the rating of the coupling. The selection process for torsionally flexible shaft couplings is described in detail in the ROTEX® catalogue which can be used for POLY-NORM® couplings as well.

Service factor S_t for temperature				
	-30 °C +30 °C	+40 °C	+60 °C	+80 °C
S_t	1,0	1,2	1,4	1,8

Service factor S_Z for starting frequency				
starting frequency/h	100	200	400	800
S_Z	1,0	1,2	1,4	1,6

Service factor S_A / S_L for shocks	
	S_A/S_L
gentle shocks	1,5
average shocks	1,8
heavy shocks	2,5

Example of calculation – Pump drive with three-phase motor

Given: Details of driving side

Power	P = 75 kW	
Speed	n = 1485 rpm	
Mass moment of inertia	J_A = 1,06 kgm²	⇛ S_A = 1,5
Starting frequency	z = 6 ¹/ₕ	⇛ S_z = 1,0
Ambient temperature	= + 60 °C	⇛ S_t = 1,4

Given: Details of load side

Pump		
Nominal torque	T_{LN} = 400 Nm	
Peak torque [1)]	T_{LS} = 300 Nm	[1)] Peak value with shock load
Mass moment of inertia	J_L = 2,3 kgm²	⇛ S_L = 1,5

Calculation

● Rated driving torque

$$\boxed{T_{AN}\ [\mathrm{Nm}] = 9550 \cdot \frac{P_{AN}[\mathrm{kW}]}{n_{AN}\ [\mathrm{rpm}]}}$$

$$T_{AN} = 9550 \cdot \frac{75\ \mathrm{kW}}{1485\ \mathrm{rpm}} = \underline{484\ \mathrm{Nm}}$$

Coupling selection

● Load produced by rated torque:

$$\boxed{T_{KN} \geq T_{AN} \cdot S_t}$$

$$T_{KN} \geq 484\mathrm{Nm} \cdot 1{,}4 = \underline{678\ \mathrm{Nm}}$$

Selected: POLY-NORM® AR Size 75:

T_{KN} = 850 Nm
$T_{K\,max}$ = 1700 Nm

● Load produced by torque shocks:

$$\boxed{T_{K\,max} \geq T_S \cdot S_z \cdot S_t}$$

Drive-sided shock
$T_S = T_{AS} \cdot M_A \cdot S_A$

● Driving torque:

$T_{AS} = 2 \cdot T_{AN}$
$= 2 \cdot 484$ Nm = 968 Nm

$$M_A = \frac{J_L}{(J_A + J_L)} = \frac{2{,}3\ \mathrm{kgm^2}}{(1{,}06\mathrm{kgm^2} + 2{,}3\ \mathrm{kgm^2})} = \underline{0{,}68}$$

T_S = 968 Nm · 0,68 · 1,5 = <u>987 Nm</u>
$T_{K\,max}$ ≥ 987 Nm · 1 · 1,4 = <u>1381Nm</u>
$T_{K\,max}$ with 1700 Nm ≥ 1381 Nm ✓

$$\boxed{T_{K\,max} \geq T_S \cdot S_z \cdot S_t}$$

Shock on driven side
$T_S = T_{LS} \cdot M_L \cdot S_L$

$$M_A = \frac{J_A}{(J_L + J_A)} = \frac{1{,}06\ \mathrm{kgm^2}}{(2{,}3\ \mathrm{kgm^2} + 1{,}06\ \mathrm{kgm^2})} = \underline{0{,}32}$$

T_S = 300 Nm · 0,32 · 1,5 = 144 Nm
$T_{K\,max}$ ≥ 144 Nm · 1,0 · 1,4 + 400 Nm · 1,4 = 762 Nm
$T_{K\,max}$ with 1700 Nm ≥ 762 Nm ✓

Technical data

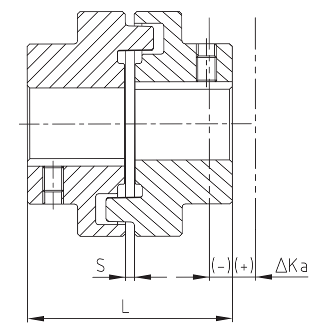
POLY-NORM® Technical data

Size	Torque [Nm] Nominal T_{KN}	Torque [Nm] Max. $T_{Kmax.}$	Torque [Nm] Alternating T_{KW}	Max. speed [rpm] at V = 30 m/s	Twisting angle with T_{KN}	Twisting angle with T_{Kmax}	Torsion spring stiffness C_{dyn} [Nm/rad] 1,0 T_{KN}	0,75 T_{KN}	0,5 T_{KN}	0,25 T_{KN}	Max. permissible misalignment [mm] [1)] Axial ΔKa	Radial ΔKr	Angular ΔKw
28	40	80	16	8300			5200	3318	1867	897	± 1,0	0,20	1,2
32	60	120	24	7300	4,5	6,0	7820	4989	2821	1349	± 1,0	0,25	1,4
38	90	180	36	6500			13540	8639	4885	2336	± 1,0	0,25	1,5
42	150	300	60	5900			26250	16748	9471	4528	± 1,0	0,25	1,7
48	220	440	88	5400			29896	19074	10786	5157	± 1,5	0,30	1,8
55	300	600	120	4800			38500	24563	13891	6641	± 1,5	0,30	2,0
60	410	820	164	4400	4,0	5,5	67600	43129	23200	11661	± 1,5	0,30	2,2
65	550	1100	220	4100			81800	52188	26994	14111	± 1,5	0,35	2,4
75	850	1700	340	3600			122900	78410	40557	21200	± 1,5	0,40	2,7
85	1350	2700	540	3150			243045	155063	74858	41925	± 1,5	0,40	3,0
90	2000	4000	800	2900			361571	230682	111364	62371	± 1,5	0,45	3,4
100	2900	5800	1160	2600			548200	349752	168846	94565	± 3,0	0,50	3,9
110	3900	7800	1560	2300			792300	505487	244028	136672	± 3,0	0,60	4,3
125	5500	11000	2200	2050	2,5	3,5	1023240	652827	315158	176509	± 3,0	0,60	4,8
NEW 140	7200	14400	2880	1825			1640430	1046594	508533	282974	± 3,0	0,60	5,5
NEW 160	10000	20000	4000	1625			2090930	1334013	648188	360685	± 3,0	0,65	6,1
NEW 180	13400	26800	5360	1425			2670700	1703907	827917	460696	± 3,0	0,65	6,0

[1)] Misalignment at n = 1500 rpm.
Angular and radial misalignment can occur at the same time. The sum of all misalignments must not exceed the figures set forth in the table. Couplings may be dynamically balanced on request.

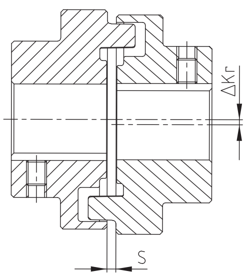
Misalignment

Axial misalignment ΔKa

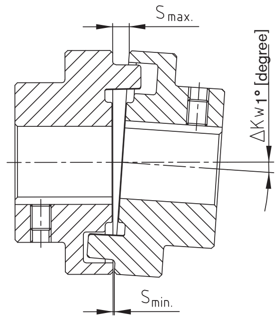


$L_{max./min} = L + \Delta Ka$ [mm]

Radial misalignment ΔKr



Angular misalignment ΔKw



$\Delta Kw = S_{max.} - S_{min.}$ [mm]

Assembly Guidelines

During assembly, the coupling halves must be mounted in a way that the coupling hub faces are flush to the end of the shafts. The alignment of the shafts must be adjusted that radial and the angular misalignments are minimal. The life of the coupling and bearings is extended by precise alignment. Steps must be taken to ensure that the alignment will not change during all operating conditions. Shaft misalignments which cannot be avoided must not exceed the figures indicated in the table. Angular and radial misalignments can occur at the same time but the sum of these misalignments must not exceed the figures set forth in the table above. See the KTR mounting instructions, KTR standard 49510 at our homepage www.ktr.com.

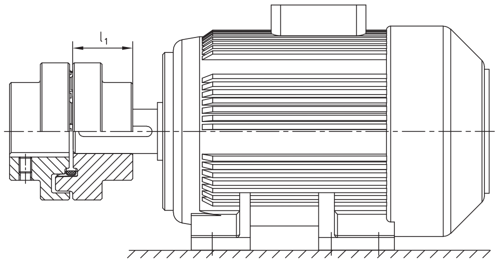
General information about the elastomer

Material/Hardness	Perbunan [NBR]/78 Shore A
Permanent temperature range [°C]	- 30 to + 80
Max. temperature (short time) [°C]	- 50 to + 120
Applications	General machine construction Pump industry ATEX applications Chemical industry Applications of average elasticity
Resistant to	Gasoline, diesel Acids, bases Tropics (Salt-) Water (hot/cold) Oils, greases Propane, butane Natural gas, city gas

Elastomer ring

Supplement to our programme: elastomeres for the high-temperature range

Selection of standard IEC motors



POLY-NORM® couplings for standard IEC motors, protection IP 54/IP 55 (elastomer ring 78 Shore A)														
A. C. motor 50 Hz			Motor output n = 3000 1/min 2-pole		POLY-NORM®-coupling size	Motor output n = 1500 1/min 4-pole		POLY-NORM® coupling size	Motor output n = 1000 1/min 6-pole		POLY-NORM® coupling size	Motor output n = 750 1/min 8-pole		POLY-NORM® coupling size
Size	Shaft end dxl [mm]		Output P [kW]	Torque T [Nm]		Output P [kW]	Torque T [Nm]		Output P [kW]	Torque T [Nm]		Output P [kW]	Torque T [Nm]	
	2-pole	4,6,8 pole												
56	9 x 20		0,09	0,32		0,06	0,43		0,037	0,43				
			0,12	0,41		0,09	0,64		0,045	0,52				
63	11 x 23		0,18	0,62		0,12	0,88		0,06	0,7				
			0,25	0,86		0,18	1,3		0,09	1,1				
71	14 x 30		0,37	1,3		0,25	1,8		0,18	2		0,09	1,4	
			0,55	1,9		0,37	2,5		0,25	2,8		0,12	1,8	
80	19 x 40		0,75	2,5	**28/32**	0,55	3,7	**28/32**	0,37	3,9	**28/32**	0,18	2,5	**28/32**
			1,1	3,7		0,75	5,1		0,55	5,8		0,25	3,5	
90S	24 x 50		1,5	5		1,1	7,5		0,75	8		0,37	5,3	
90L			2,2	7,4		1,5	10		1,1	12		0,55	7,9	
100L	28 x 60		3	9,8		2,2	15		1,5	15		0,75	11	
						3	20					1,1	16	
112M			4	13		4	27		2,2	22		1,5	21	
132S			5,5	18		5,5	36		3	30		2,2	30	
	38 x 80		7,5	25	**38**			**38**			**38**			**38**
132M						7,5	49		4	40		3	40	
									5,5	55				
160M			11	36		11	72		7,5	75	**42**	4	54	
	42 x 110		15	49	**42**			**42**				5,5	74	**42**
160L			18,5	60		15	98		11	109		7,5	100	
180M	48 x 110		22	71	**48**	18,5	121	**48**			**48**			**48**
180L						22	144		15	148		11	145	
200L	55 x 110		30	97		30	196	55	18,5	181	**55**	15	198	**55**
			37	120	**55**				22	215				
225S	55 x 110	60 x 140				37	240	**60**			**60**	18,5	244	**60**
225M			45	145		45	292		30	293		22	290	
250M	60 x 140	65 x 140	55	177	**60**	55	356	**65**	37	361	**65**	30	392	**65**
280S		75 x 140	75	241		75	484	**75**	45	438	**75**	37	483	**75**
280M			90	289	**65**	90	581		55	535		45	587	
315S			110	353		110	707	**85**	75	727	**85**	55	712	**85**
315M		80 x 170	132	423	**75**	132	849		90	873		75	971	
	65 x 140		160	513		160	1030		110	1070	**90**	90	1170	**90**
315L			200	641		200	1290	**90**	132	1280		110	1420	
					85				160	1550	**100**	132	1710	**100**
315		85 x 170	250	802		250	1600	**100**	200	1930		160	2070	
			315	1010		315	2020		250	2410	**110**	200	2580	**110**
			355	1140	**90**	355	2280		315	3040	**125**	250	3220	**125**
355	75 x 140	95 x 170	400	1280		400	2570	**110**	400	3850		315	4060	
			500	1600		500	3210				**140**			**140**
			560	1790	**100**	560	3580	**125**	450	4330		355	4570	
400	80 x 170	110 x 210	630	2020		630	4030		500	4810		400	5150	
			710	2270	**110**	710	4540	**140**	560	5390		450	5790	**160**
			800	2560		800	5120		630	6060	**160**	500	6420	
450	90 x 170	120 x 200	900	2880	**125**	900	5760	**160**	710	6830		560	7190	
			1000	3200		1000	6400		800	7690	**180**	630	8090	**180**

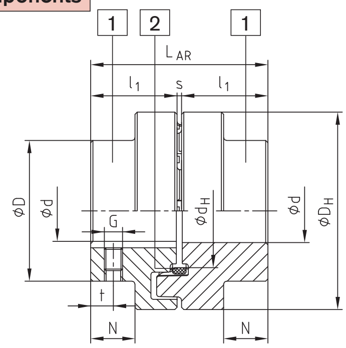
The arrangement of couplings is valid for an ambient temperature of up to + 30° C. For the selection there is a minimum safety factor of 2 of the max. coupling torque ($Tk_{max.}$).
A detailed arrangement is possible according to catalogue, page 51. Drives with periodical torque curves must be selected according to DIN 740 part 2. If requested, KTR will make the selection.

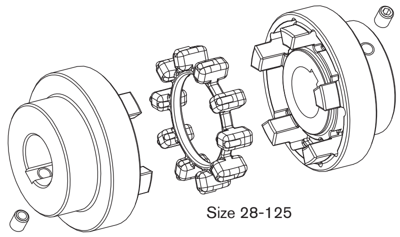
The coupling selection assumes normal operating conditions. Torque T = nominal torque according to Siemens catalogue M 11 · 1994/95.

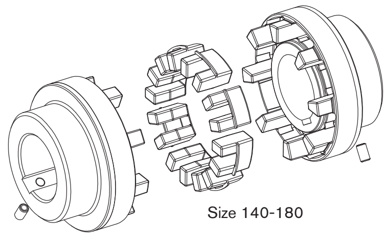
Type AR

- Torsionally flexible, reduces vibrations
- Failsafe
- Maintenance-free
- Very short design
- Axial plug-in
- According to DIN 740
- ⟨Ex⟩ Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)
- Detailed mounting instructions and further information available at www.ktr.com

Components




Size 28-125


Size 140-180

1 = Standard hub
2 = Elastomer ring

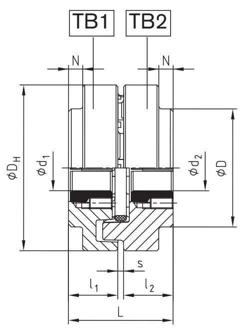
Componets:
Type AR
(EN-GJL-250)
(NBR 78 ShA)

POLY-NORM® Type AR

Size	Elastomer ring (part 2) [1] Torque [Nm]		Finish-bore	Dimensions [mm] General							Feststellgewinde [2]		Mass moment of inerrtia	AR [3] Weight
	T_{KN}	$T_{K\,max.}$	Ø d_{max} [2]	L_{AR}	l_1	s	D_H	D	d_H	N	G	t	[kgm²] [3]	[kg]
28	40	80	28	59	28	3	69	46	36,5	12	M5	7	0,0004	0,9
32	60	120	32	68	32	4	78	53	41,5	14	M8	7	0,0008	1,4
38	90	180	38	80	38	4	87	62	50	19,5	M8	10	0,0016	2,0
42	150	300	42	88	42	4	96	69	55,5	20	M8	10	0,0026	2,7
48	220	440	48	101	48	5	106	78	64	24	M8	15	0,0042	3,7
55	300	600	55	115	55	5	118	90	73	29	M8	14	0,0070	5,5
60	410	820	60	125	60	5	129	97	81	33	M8	15	0,0112	6,9
65	550	1100	65	135	65	5	140	105	86	36	M10	20	0,0174	8,8
75	850	1700	75	155	75	5	158	123	100	42,5	M10	20	0,028	13,5
85	1350	2700	85	175	85	5	182	139	116	48,5	M10	25	0,052	19,5
90	2000	4000	90	185	90	5	200	148	128	49	M12	25	0,090	23,2
100	2900	5800	100	206	100	6	224	165	143	55	M12	25	0,160	31,9
110	3900	7800	50-110	226	110	6	250	185	158	60	M16	30	0,317	38,0
125	5500	11000	55-125	256	125	6	280	210	178	70	M16	35	0,570	55,2
NEW 140	7200	14400	65-140	286	140	6	315	235	216	76,5	M20	35	1,030	92,6
NEW 160	10000	20000	75-160	326	160	6	350	265	246	94,5	M20	45	1,746	126,9
NEW 180	13400	26800	75-180	366	180	6	400	300	290	111,5	M20	50	3,239	181,8

[1] Standard material perbunane (NBR) 78 Shore A, size 140 - 180 double tooth elastomers
[2] Bore H7 with keyway DIN 6885 sheet 1 [JS9] and threads for setscrews on the feather keyway.
[3] Refer to medium bore

Components



POLY-NORM® with taper clamping sleeve

Size	Taper clamping sleeve	Dimensions [mm] max. $d_1; d_2$	$l_1; l_2$	Fixing screws [1] for taper sleeve Größe [Zoll]	Länge [mm]	SW [mm]	T_A [Nm]	Size	Taper clamping sleeve	Dimensions [mm] max. $d_1; d_2$	$l_1; l_2$	Fixing screws [1] for taper sleeve Größe [Zoll]	Länge [mm]	SW [mm]	T_A [Nm]
32	1108	25	25,5	1/4"	13	3	5,7	**85**	2517	60	46,5	1/2"	25	6	49
48	1610	40	30,0	3/8"	16	5	20	**90**	3020	75	52,0	5/8"	32	8	92
	1615	40	42,5	3/8"	16	5	20	**100**	3535	90	98,0	1/2"	38	10	115
60	2012	50	38,5	7/16"	22	6	31	**125**	4040	100	111,5	5/8"	45	12	172
75	2517	60	52,5	1/2"	25	6	49	[1] 2 fixing screws except for 3535/4040 3 fixing screws.							

Coupling design — TB 1 Cam-sided screwing — TB 2 Verschraubung bundseitig
Combination possible — Please ask for our seperate data sheet M407045

Order form:

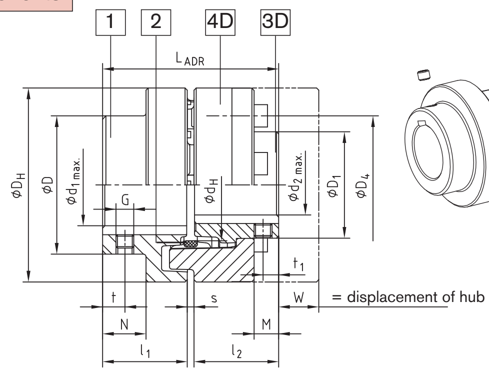
POLY-NORM® 65	AR	∅38	∅30
Coupling size	Type	Finish bore	Finish bore

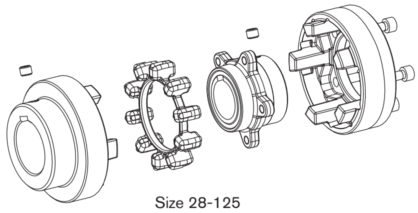
Made for Motion KTR

Type ADR (3-part design)

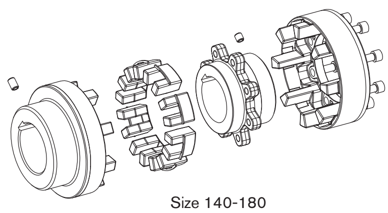
- Torsionally flexible, reduces vibrations
- Elastomer ring can be exchanged in assembled condition
- Failsafe
- Maintenance-free
- Short design
- Axial plug-in
- According to DIN 740
- Ex Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)
- Detailed mounting instructions and further information available at www.ktr.com

Components





Size 28-125



Size 140-180

Components:

Type ADR (3-part)

1	=	Standard hub	(EN-GJL-250)
2	=	Elastomer ring	(NBR 78 ShA)
3D	=	Flange hub	(EN-GJS-400-15)
4D	=	Cam ring	(EN-GJL-250)

	POLY-NORM® Type ADR																		
	Size	Elastomer ring torque [Nm] [1]		Dimensions [mm]															
				Finish bore [2]		General										Thread for setscrew			
		T_{KN}	$T_{Kmax.}$	d_1 max.	d_2 max.	L_{ADR}	l_1/l_2	s	D_H	D	D_1	d_H	N	M	W	G	t	t_1	T_A [Nm]
	38	90	180	38	32	80	38	4	87	62	48	50	19,5	11,0	12	M8	10	7	10
	42	150	300	42	35	88	42	4	96	69	54	55,5	20	12,0	16	M8	10	7	10
	48	220	440	48	42	101	48	5	106	78	62	64	24	13,7	16	M8	15	7	10
	55	300	600	55	48	115	55	5	118	90	72	73	29	18,7	15	M8	14	14	10
	60	410	820	60	55	125	60	5	129	97	80	81	33	22,2	14	M8	15	15	10
	65	550	1100	65	60	135	65	5	140	105	86	86	36	26,7	11	M10	20	20	17
	75	850	1700	75	65	155	75	5	158	123	98	100	42,5	27,8	16	M10	20	20	17
	85	1350	2700	85	75	175	85	5	182	139	112	116	48,5	33,7	18	M10	25	25	17
	90	2000	4000	90	85	185	90	5	200	148	122	128	49	31,5	26	M12	25	25	40
	100	2900	5800	100	90	206	100	6	224	165	136	143	55	37,5	28	M12	25	25	40
	110	3900	7800	110	100	226	110	6	250	185	150	158	60	39,5	30	M16	30	30	80
	125	5500	11000	125	110	256	125	6	280	210	168	178	70	48,0	35	M16	35	35	80
NEW	140	7200	14400	65-140	55-130	286	140	6	315	235	195	216	76,5	47,0	59	M20	35	35	140
NEW	160	10000	20000	75-160	65-150	326	160	6	350	265	225	246	94,5	65,0	43	M20	45	45	140
NEW	180	13400	26800	75-180	65-170	366	180	6	400	300	255	290	111,5	79,0	33	M20	50	50	140

[1] Standard material perbunane (NBR) 78 Shore A, size 140 - 180 double tooth elastomers

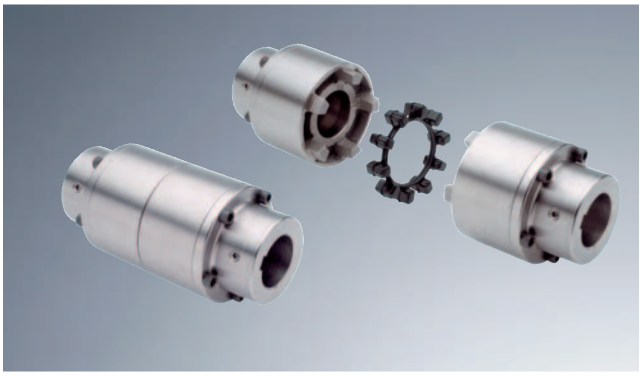
[2] Bore H7 with keyway to DIN 6885 sheet 1(JS9) with thread for set screws

Classification of cap crews DIN EN ISO 4762–12.9											
Size	M x l [mm]	Number z	Separation z x angle	D_4 [mm]	T_A [Nm] [3]	Size	M x l [mm]	Number z	Separation z x angle	D_4 [mm]	T_A [Nm] [3]
38	M6x16	5	5x72	62	10	**90**	M16x30	6	6x60	149	210
42	M8x16	5	5x72	69	25	**100**	M16x30	6	6x60	163	210
48	M8x20	6	6x60	78	25	**110**	M16x40	8	8x45	183	210
55	M8x20	6	6x60	88	25	**125**	M20x40	8	8x45	202	410
60	M8x20	6	6x60	98	25	**140**	M20x50	8	8x45	237	410
65	M10x20	6	6x60	104	49	**160**	M20x55	9	9x40	267	410
75	M10x25	6	6x60	120	49	**180**	M20x60	10	10x36	304	410
85	M12x25	6	6x60	138	86						

Order form:

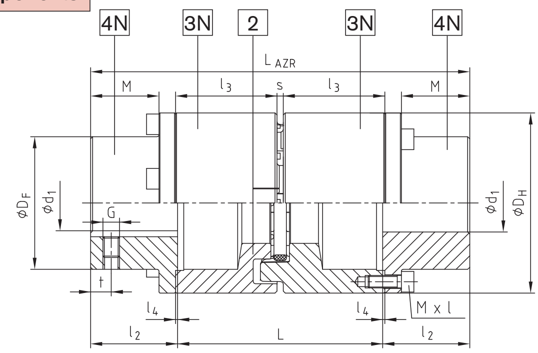
POLY-NORM® 65	ADR	$d_1 = \varnothing 55$	$d_2 = \varnothing 60$
Coupling size	Type	Finish bore part 1	Finish bore part 3D

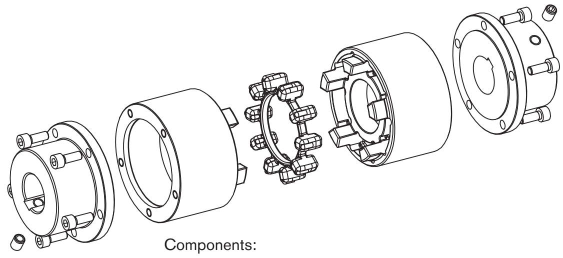
Type AZR



- Connection of long shaft gaps with spacers
- Enables a change of the elastomer without disassembly of the drive and the driven components.
- No movement of driver and driven components is necessary for disassembly of pump thrust bearing.
- Custom designs are available (AZVR)
- Ex Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)
- Detailed mounting instructions and further information available at www.ktr.com

Components





Components:
Type AZR

2	=	Elastomer ring	(NBR 78 ShA)
3N	=	Driving flange	(EN-GJS-400-15)
4N	=	Coupling flange	(S355J2G3)

POLY-NORM® Type AZR

Size	Drop out center length L [mm] *	Elastomer ring (p. 2) [1] torque [Nm]		Dimensions [mm]												Thread for setscrew [2]		Mass moment of inertia [3] [kgm²]	AZR Weight [3] [kg]
		T_{KN}	T_{Kmax}	Finish bore [2] Ø d_1 max	General														
					L_{AZR}	l_2	l_3	s	l_4	D_H	D_F	M	Mxl	T_A [Nm]	G	t			
28	100	40	80	30	170	35	49,5	3	1	69	46	26	M6x18	14	M5	7	0,0020	2,4
	140				210		69,5										0,0030	2,9
32	100	60	120	35	170	35	49	4	1	78	53	26	M6x18	14	M8	7	0,0042	3,2
	140				210		69										0,0062	3,9
38	100	90	180	40	184	42	49	4	1	87	62	33	M6x20	14	M8	10	0,0048	4,3
	140				224		69										0,0068	5,1
42	100	150	300	45	190	45	49	4	1	96	69	35	M6x20	14	M8	10	0,0094	5,1
	140				230		69										0,0128	6,0
48	100	220	440	50	204	52	49	5	1,5	106	78	41,5	M6x20	14	M8	15	0,0170	6,6
	140				244		69										0,0216	7,5
	100				210		49										0,0188	9,4
55	140	300	600	60	250	55	69	5	1,5	118	88	43,5	M8x25	35	M8	14	0,0240	10,8
	180				290		89										0,0232	12,2
	100				220		49										0,0326	11,2
60	140	410	820	65	260	60	69	5	1,5	129	97	47,5	M8x25	35	M18	15	0,0414	13,0
	180				300		89										0,0504	14,6
	100				230		49										0,0564	14,0
65	140	550	1100	70	270	65	69	5	1,5	140	105	51,5	M8x25	35	M10	20	0,0730	15,8
	180				310		89										0,0894	17,5
	140				290		69										0,0824	23,2
75	180	850	1700	80	330	75	89	5	1,5	158	123	60,5	M10x30	69	M10	20	0,1008	25,6
	250				400		124										0,1332	29,8
	140				310		69										0,1570	32,1
85	180	1350	2700	90	350	85	89	5	1,5	182	139	69,5	M10x30	69	M10	25	0,1658	35,2
	250				420		124										0,1812	40,7
	140				320		69										0,2466	38,2
90	180	2000	4000	100	360	90	89	5	1,5	200	148	73,5	M12x35	120	M12	25	0,2880	42,2
	250				430		124										0,3566	49,3
	140				340		69										0,3988	50,0
100	180	2900	5800	110	380	100	89	6	2	224	165	83	M12x35	120	M12	25	0,4450	54,8
	250				450		124										0,5465	63,2

[1] Standard material Perbunan (NBR) 78 Shore-A
[2] Bore H7 with keyway DIN 6885 sheet 1 [JS9] and threads for setscrews on the feather keyway.
[3] Refer to medium bore
*For other extendable lengthes (L=120/160/195/215) it is possible to combine two driving flanges 3N with various lengthes (as an example: driving flanges POLY-NORM® 85 for extendable length 140 and 250 result in an extendable length of 195 mm (140 mm + 250 mm = 390 mm 390 mm/2 = 195 mm).

Order form:

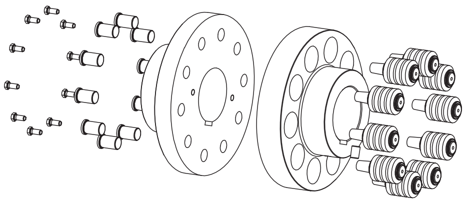
POLY-NORM® 42	AZR	140	Ø38	Ø42
Coupling size	Type	Drop out center lenght L	Finish bore	Finish bore

Made for Motion KTR

Coupling description

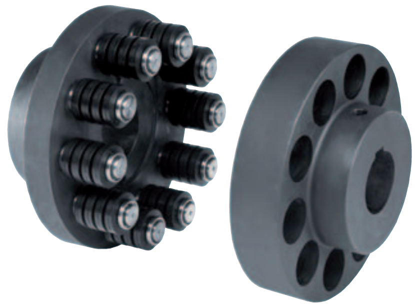
General description

REVOLEX® KX is a torsionally flexible, failsafe pin & bush coupling. It can be plugged in axially and is characterized by its short design. In addition,
REVOLEX® KX allows for an easy disassembly of the elastomer rings including the pins while being assembly. Taking into account the transmittable torque,
REVOLEX® KX is based on the POLY-NORM® coupling.
The REVOLEX® KX coupling compensates for every kind of shaft misalignment while transmitting the torque safely.



Operation/Arrangement

The coupling consists of two hubs; one pin hub with the corresponding pins and a bush hub. The torque is transmitted via the steel pins with their taper elastomer rings and the corresponding bores in the bush hub.
As a result all kinds of shaft misalignment, for example caused by inaccurate alignment of the driving or driven elements, is compensated for reliably and vibrations and shocks are compensated for excellently.
The coupling is maintenance-free and is used in general engineering and the pump industry, conveyor technology, etc. For an optimum adjustment to the different applications, 14-off sizes are available covering torques up to 377.800 Nm. Apart from the standard programme customized solutions are available.



General information about the elastomer ring

Material	Perbunan
Hardness	80 Shore A
Permanent temperature range [°C]	- 30 to + 80
Max. temperature (short-term) [°C]	- 50 to + 120
Applications	General engineering
	Heavy industry
	Pump industry
	Conveyor technology
	Standard applications of average elasticity
Resistant to	Gasoline, diesel
	Acids, bases
	Tropics
	(Salt-) Water (hot/cold)
	Oils, greases
	Propane, butane
	Natural gas, city gas
	...

Other elastomer materials on request.

Explosion-proof use

REVOLEX® KX couplings are suitable for the use in drives in hazardous areas. The couplings are certified according to EC Standard 94/9/EC (ATEX 95) and belong to category 2G/2D, are confirmed and thus suitable for the use in hazardous areas of zone 1, 2, 21 and 22.
Please read our information in the respective Type Examination Certificate and the operating and mounting instructions under www.ktr.com.

Technical data

REVOLEX® KX Technical data												
Size	Torque [Nm] NBR 80Sh-A			Max. speed [rpm] at V = 35 m/s	Max. bore [mm]	Dyn. Torsion spring stiffness				Max. permissible misalignment [mm] [1]		
	Nominal T_{KN}	Max. $T_{Kmax.}$	Alternating T_{KW}			$0{,}25xT_{KN}$ [Nm/rad]	$0{,}50xT_{KN}$ [Nm/rad]	$0{,}75xT_{KN}$ [Nm/rad]	$1{,}00xT_{KN}$ [Nm/rad]	Axiale ΔKa	Radiale ΔKr	Angular ΔKw
KX 105	6485	12970	2594	2000	110/125	1,053x10^{6}	1,545x10^{6}	2,225x10^{6}	3,060x10^{6}	±2,0	0,25	0,45
KX 120	10080	20160	4032	1800	125/145	1,242x10^{6}	1,675x10^{6}	2,350x10^{6}	3,167x10^{6}	±2,0	0,3	0,6
KX 135	14030	28060	5612	1600	140/150	1,728x10^{6}	2,331x10^{6}	3,270x10^{6}	4,407x10^{6}	±2,0	0,3	0,6
KX 150	17960	35920	7184	1450	160	2,213x10^{6}	2,985x10^{6}	4,187x10^{6}	5,643x10^{6}	±2,0	0,3	0,6
KX 170	26360	52720	10544	1250	180	3,250x10^{6}	4,480x10^{6}	7,500x10^{6}	9,970x10^{6}	±2,5	0,3	0,9
KX 190	36160	72320	14464	1100	205	4,458x10^{6}	6,145x10^{6}	1,029x10^{7}	1,367x10^{7}	±2,5	0,4	0,9
KX 215	48160	96320	19264	1000	230	5,938x10^{6}	8,185x10^{6}	1,370x10^{7}	1,822x10^{7}	±2,5	0,4	0,9
KX 240	65740	131480	26296	900	250	7,850x10^{6}	1,675x10^{7}	2,575x10^{7}	3,465x10^{7}	±2,5	0,5	1,2
KX 265	91480	182960	36592	800	285	1,092x10^{7}	2,331x10^{7}	3,583x10^{7}	4,822x10^{7}	±2,5	0,5	1,2
KX 280	123530	247060	49412	720	315	1,475x10^{7}	3,147x10^{7}	4,838x10^{7}	6,511x10^{7}	±2,5	0,5	1,2
KX 305	152840	305680	61136	675	330	1,830x10^{7}	3,904x10^{7}	6,002x10^{7}	8,076x10^{7}	±2,5	0,6	1,6
KX 330	188470	376940	75388	625	355	2,250x10^{7}	4,802x10^{7}	7,382x10^{7}	9,934x10^{7}	±4,0	0,75	2,2
KX 355	230110	460220	92044	575	380	2,748x10^{7}	5,863x10^{7}	9,013x10^{7}	1,213x10^{8}	±4,0	0,75	2,2
KX 370	302500	605000	121000	535	450	3,614x10^{7}	7,712x10^{7}	1,186x10^{8}	1,595x10^{8}	±4,0	0,75	2,2

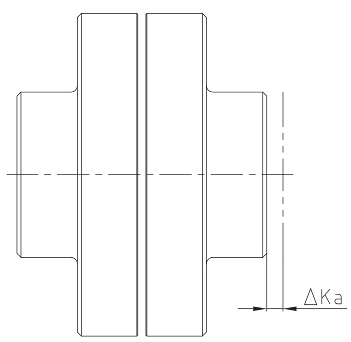
REVOLEX® KX-D Technical data												
Size	Torque [Nm] NBR 80Sh-A			Max. speed [rpm] at V = 35 m/s	Max. bore [mm]	Dyn. Torsion spring stiffness				Max. permissible misalignment [mm] [1]		
	Nominal T_{KN}	Max. $T_{Kmax.}$	Alternating T_{KW}			$0{,}25xT_{KN}$ [Nm/rad]	$0{,}50xT_{KN}$ [Nm/rad]	$0{,}75xT_{KN}$ [Nm/rad]	$1{,}00xT_{KN}$ [Nm/rad]	Axiale ΔKa	Radiale ΔKr	Angular ΔKw
KX-D 105	8650	17300	3460	2000	110	1,404x10^{6}	2,060x10^{6}	2,967x10^{6}	4,081x10^{6}	±2,0	0,25	0,45
KX-D 120	14110	28220	5640	1800	125	1,742x10^{6}	2,350x10^{6}	3,297x10^{6}	4,443x10^{6}	±2,0	0,3	0,6
KX-D 135	18690	37380	7476	1600	140	2,304x10^{6}	3,108x10^{6}	4,360x10^{6}	5,876x10^{6}	±2,0	0,3	0,6
KX-D 150	23100	46200	9240	1450	160	2,880x10^{6}	3,885x10^{6}	5,450x10^{6}	7,345x10^{6}	±2,0	0,3	0,6
KX-D 170	36900	73800	14760	1250	180	4,550x10^{6}	6,272x10^{6}	1,050x10^{7}	1,396x10^{7}	±2,5	0,3	0,9
KX-D 190	48210	96420	19284	1100	205	5,980x10^{6}	8,243x10^{6}	1,380x10^{7}	1,834x10^{7}	±2,5	0,4	0,9
KX-D 215	61900	123800	24760	1000	230	7,634x10^{6}	1,052x10^{7}	1,762x10^{7}	2,342x10^{7}	±2,5	0,4	0,9
KX-D 240	92030	184060	36812	900	250	1,101x10^{7}	2,350x10^{7}	3,613x10^{7}	4,861x10^{7}	±2,5	0,5	1,2
KX-D 265	121900	243800	48760	800	285	1,456x10^{7}	3,108x10^{7}	4,778x10^{7}	6,429x10^{7}	±2,5	0,5	1,2
KX-D 280	158800	317600	63520	720	315	1,896x10^{7}	4,047x10^{7}	6,221x10^{7}	8,371x10^{7}	±2,5	0,5	1,2
KX-D 305	191060	382120	76424	675	330	2,287x10^{7}	4,880x10^{7}	7,502x10^{7}	1,009x10^{8}	±2,5	0,6	1,6
KX-D 330	251200	502400	100480	625	355	3,001x10^{7}	6,403x10^{7}	9,843x10^{7}	1,324x10^{8}	±4,0	0,75	2,2
KX-D 355	299100	598200	119640	575	380	3,572x10^{7}	7,622x10^{7}	1,172x10^{8}	1,577x10^{8}	±4,0	0,75	2,2
KX-D 370	377800	755600	151120	535	450	4,518x10^{7}	9,640x10^{7}	1,482x10^{8}	1,994x10^{8}	±4,0	0,75	2,2

[1] Misalignment at n = 500 rpm.

Angular and radial misalignment can occur at the same time. The sum of all misalignments must not exceed the figures set forth in the table. Couplings may be dynamically balanced on request (semi-spline balancing G 6,3 with 500 rpm). For peripheral speeds exceeding V = 30 m/sec., we would recommend only steel or nodular iron, respectively. Dynamic balancing required. For circumferential speeds exceeding 35 m/s please consult with KTR's engineering department.

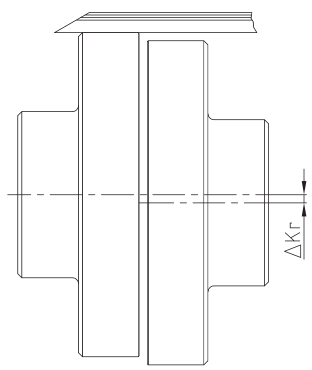
Misalignment

Axial misalignment ΔKa

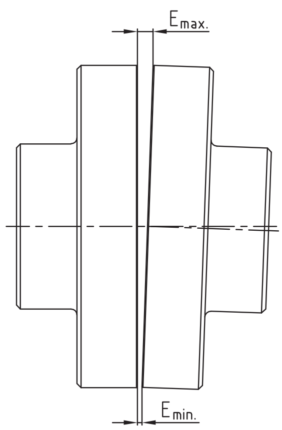


$L_{max./min} = L + \Delta Ka$ [mm]

Radial misalignment ΔKr



Angular misalignment ΔKw



$\Delta Kw = E_{max.} - E_{min.}$ [mm]

Assembly instructions

The permissible misalignment figures of the flexible REVOLEX® KX couplings mentioned are general standard values, taking into account the coupling load up to the rated torque T_{KN} of the coupling and an operating speed n = 500 1/min as well as an ambient temperature of + 30° C.

The displacement figures may only be used separately - if various kinds of displacement arise in parallel, the displacement figures may only be used proportionately. For the assembly of the coupling please make sure that the distance dimension E is adhered to accurately to make sure that the coupling remains flexible during operation. See KTR assembly instructions, KTR standard 49410 at our homepage www.ktr.com.

Coupling selection

The selection of the REVOLEX® KX coupling has to be dimensioned in a way that the permissible coupling load is not exceeded with any operating condition. For this purpose a comparison between the loads that arise and the permissible coupling parameters has to be performed.

1 **Drives without periodical torsional vibrations**
e. g. centrifugal pumps, fans, screw compressors, etc.
The coupling is selected taking into account the rated torques T_{KN} and maximum torque $T_{K\,max}$.

1.1 **Load by rated torque**

Determination of the actual rated torque T_N of the machine.

$$T_N\ [\text{Nm}] = 9550 \cdot \frac{P_{AN/LN}\ [\text{kW}]}{n\ [\text{rpm}]}$$

Taking into account the operating factor S_B and the temperature factor S_t, the permissible rated torque T_{KN} of the coupling has to be at least as high as the rated torque T_N of the machine.

$$T_{KN} \geq T_N \cdot S_B \cdot S_t$$

1.2 **Taking into account short-term shocks**

As an example: for the start-up or braking of drives two times the rated torque of the coupling is admitted for up to 10 times an hour.

$$T_{K\,max} \geq 2 \cdot T_{KN}$$

1.3 **Determination of the necessary operating factor S_B**

see table
It is necessary to consult with the engineering department of KTR if:

- the operating speed is close to the critical speed (page 57)
- the ambient temperature exceeds 80 °C
- more than 10 starts per hour are performed

2. **Drives with periodical torsional vibrations.**
For drives subject to high torsional vibrations, e. g. diesel engines, piston compressors, piston pumps, generators, etc., it is necessary to perform a torsional vibration calculation to ensure a safe operation. If requested, we perform the torsional vibration calculation and the coupling selection in our company. For necessary details please see KTR standard 20004.

Description	Symbol	Definition or explanation
Rated torque of coupling	T_{KN}	Torque that can continuously be transmitted over the entire permissible speed range
Maximum torque of coupling	$T_{K\,max}$	Torque that can be transmitted as dynamic load ≥ 10^5 times or 5 x 10^4 as vibratory load, respectively, during the entire operating life of the coupling
Vibratory torque of coupling	T_{KW}	Torque amplitude of the permissible periodical torque fluctuation with a frequency of 10 Hz and a basic load of T_{KN} or dynamic load up to T_{KN}, respectively
Rated torque of machine	T_N	Stationary rated torque on the coupling

Service factor S_t for temperature				
	-30 °C +30 °C	+40 °C	+60 °C	+80 °C
S_t	1,0	1,2	1,4	1,8

Permissible load on feather key of the coupling hub
The shaft-hub-connection has to be verified by the customer.
Permissible surface pressure according to DIN 6892 (method C).

Cast iron EN-GJL-250 (GG 25)	225 N/mm²
material nodular iron EN-GJS-400-15 (GGG 40)	225 N/mm²
material steel S355J2G3 (St 52.3)	250 N/mm²
for other steel materials p_{zul} =	$0{,}9 \cdot R_e\ (R_{p0.2})$

Example of calculation:

Kneading machine drive with rotary current motor

Details of machine on driving side:

Rotary current	motor size 560
Motor power	P = 1000 kW
Speed	n = 991 rpm

General details:

Ambient temperature = +40 °C

Coupling selection:
Load by rated torque:

$$T_N = 9550 \cdot \frac{1000\ \text{kW}}{991\ \text{rpm}} = 9636{,}7\ \text{Nm}$$

Operating factor S_B = 1,75 (see page 59)
Temperature factor S_t = 1,2 (see table)

Calculation of coupling torque:

$$T_{KN} \geq T_N \cdot 1{,}75 \cdot 1{,}2 = 20237\ \text{Nm}$$

➔ **Selected: REVOLEX® KX-170**

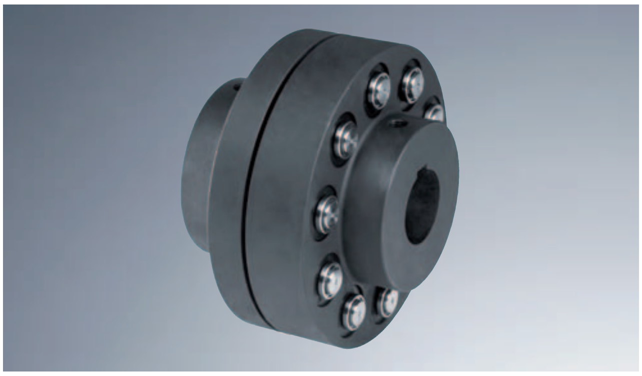
Coupling selection

The operating factors listed are based on experiences estimating the operating behaviour of driving and driven combinations. For a periodic impulse of the machine or driving or braking of big masses it is necessary to perform a selection in accordance with DIN 740.

Operating factor S_B	
Agitator	
Light liquid	1,00
Viscous liquid	1,25
Liquid with constant density	1,25
Liquid with variable density	1,50
Liquid mixed with solids	1,75
Compressors	
Rotary compressors	1,00
Rotary compressors	1,25
Construction machines	
Manoeuvre winches	1,25
Swing gears	1,25
Miscellaneous winches	1,50
Filters, cable winches	1,75
Multi-bucket excavators	1,75
Running gears (caterpillars)	1,75
Impellers	1,75
Cutter heads	1,75
Cutter drives	2,00
Construction lifts	1,25
Concrete mixers	1,25
Road machines	1,25
Conveyors	
Bucket elevators	1,50
Freight lifts	1,75
Hauling winches	1,25
Apron conveyors	1,25
Rubber belt conveyors (bulk)	1,25
Boom plate bucket conveyors	1,25
Rotary conveyors	1,25
Steel plate conveyors	1,25
Worm conveyors	1,25
Steel belt conveyors	1,25
Conveyors	1,75
Rubber belt conveyor (piece goods)	1,75
Inclined lifts	1,75
Shaking slides	2,00
Fans, ventilators and blowers	
Centrifugal fans	1,75
Industrial fans	1,75
Rotary blowers	1,75
Fans (axial / radial)	1,75
Fans for cooling towers	1,75
Induced draught ventilators	1,75
Filters	
Screening drums	1,50
Food-processing industry	
Sugarcane harvesters	1,25
Sugar-beet harvesters	1,25
Sugar-beet washing	1,25
Kneading machines	1,75
Sugarcane breakers	1,75
Sugarcane mills	1,75
Generators	
Frequency converters	1,75
Generators	1,75
Lifters/cranes	
Luffing gears	1,00
Swing and sliding gears	1,25
Running gears	1,75
Lifting gears	1,75
Machine tools	
Scissors	1,25
Dressing rollers	1,50
Bending machines	1,50
Hole punching machines	1,75

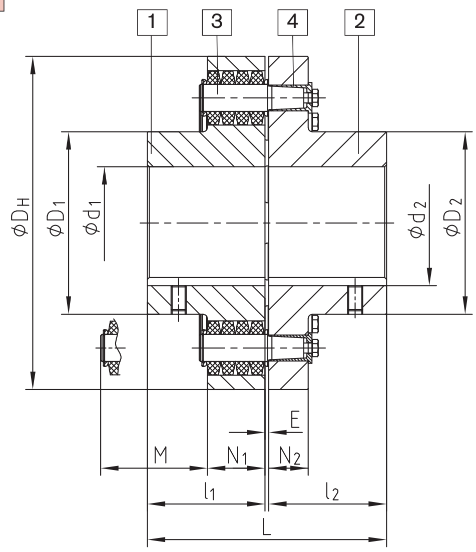
Operating factor S_B	
Machine tools	
Levelling machines	1,75
Hammers	1,75
Presses	1,75
Forging presses	1,75
Metal industry	
Plate tilters	1,25
Wire pulls	1,25
Winders	1,25
Crawlersr	1,25
Roller levellers	1,25
Winding drums	1,50
Wire drawing machines	1,75
Roller tables (light)	1,75
Plate shears	1,75
Block pushers	1,75
Blooming and slabbing	1,75
De-scalers	1,75
Cold rolling mills	1,75
Billet shears	1,75
Plugging machines	1,75
Continuous casting machines	1,75
Shifting devices	1,75
Roller tables (heavy)	2,00
Mills	
Centrifugal mills	1,75
Beater mills	1,75
Autogenous mills	1,75
Hammer and ball mills	2,00
Mixers	
Constant density	1,50
Variable density	1,75
Oil industry	
Filter presses for paraffin	1,50
Rotary furnaces	1,75
Paper machines	
Couch rolls	1,75
Calenders	1,75
Wet presses	1,75
Pumps	
Rotary pumps (light liquid)	1,00
Rotary pumps (viscous liquid)	1,25
Gear and vane pumps	1,25
Screw type pumps	1,50
Piston pumps, plunger pumps and press pumps	2,00
Rubber & nylon	
Rubber calenders and rolling mills	1,75
Mixers	1,75
Extruders	1,75
Kneading machines	1,75
Sewage plants	
Rakes	1,00
Spiral pumps	1,25
Concentrators	1,25
Mixers	1,25
Aerators	1,75
Textile industry	
Winders	1,25
Printing and dyeing machines	1,25
Tanning barrels	1,25
Shredders	1,50
Woodworking machinery	
Planing machines	1,25
Barking machines	1,75
Saw frames	1,75

Standard type KX

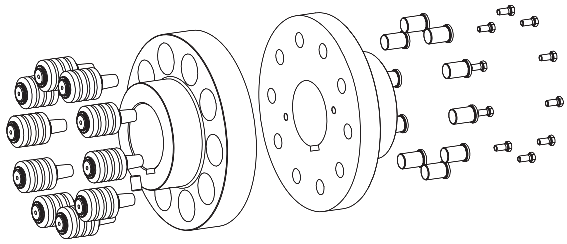


- Torsionally flexible, maintenance free
- Vibration-reducing
- Radial assembly/disassembly
- Axial plug-in, failsafe
- All-side machining ➜ good dynamical features
- Short design
- Protected surfacees
- Elastomers made of NBR
- Standard hub material EN-GJL-250, (EN-GJS-400-15 or steel on request)
- ⟨Ex⟩ Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)

Components



Components
Type KX
1 = Hub part 1 (Bush)
2 = Hub part 2 (Pin)
3 = Complete pin
4 = KX sleeve



REVOLEX® KX																
Size	Torques [1] [Nm]		max. speed [2] [rpm]	Finish bore [min. - max.]		Dimensions [mm]									Moment of inertia [3]	Approx. weight [3]
	T_{KN}	$T_{Kmax.}$		d_1	d_2	L	l_1; l_2	E	D_H	D_1	D_2	N_1	N_2	M*	[kgm²]	[kg]
KX 105	6485	12970	2000	34-110	34-125	237	117	3	330	180	202	56	30	15	0,771	61,5
KX 120	10080	20160	1800	50-125	50-145	270	132	6	370	206	232	76	46	40	1,611	96,3
KX 135	14030	28060	1600	70-140	70-150	300	147	6	419	230	240	76	46	30	2,685	123
KX 150	17960	35920	1450	82-160		336	165	6	457	256	260	76	46	10	3,887	162
KX 170	26360	52720	1250	95-180		382	188	6	533	292	292	92	63	35	9,165	273
KX 190	36160	72320	1100	110-205		428	211	6	597	330	330	92	63	10	14,765	360
KX 215	48160	96320	1000	125-230		480	237	6	660	368	368	92	63	0	22,771	465
KX 240	65740	131480	900	140-250		534	264	6	737	407	407	122	76	25	43,484	695
KX 265	91480	182960	800	160-285		590	292	6	826	457	457	122	76	0	70,143	910
KX 280	123530	247060	720	180-315		628	311	6	927	508	508	122	76	0	112,637	1183
KX 305	152840	305680	675	180-330		654	324	6	991	533	533	122	76	0	146,974	1369
KX 330	188470	376940	625	200-355		666	330	6	1067	572	572	122	76	0	198,005	1598
KX 355	230110	460220	575	225-380		718	356	6	1156	610	610	122	76	0	293,894	2069
KX 370	302500	605000	535	225-450		770	382	6	1250	720	720	122	76	4	433,554	2629

* Drop-out center dimension
[1] Standard material NBR 80 Shore A
[2] Higher speeds on request
[3] Relating to max. bore

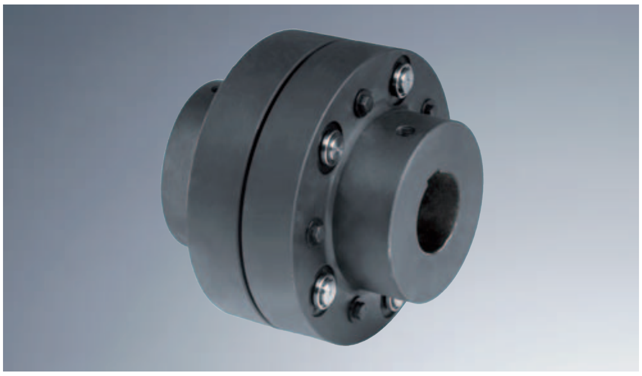
Finish bore according to ISO fit H7, feather keyway according to DIN 6885 sheet 1 - JS9.

◣ = with pilot bore available from stock

Order form:

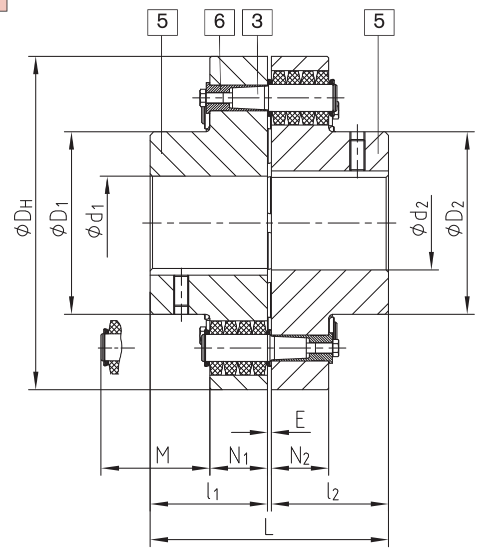
REVOLEX® KX 170	Teil 1 ∅120	Teil 2 ∅150
Coupling type/size	Finish bore Bush	Finish bore Pin

Type KX-D

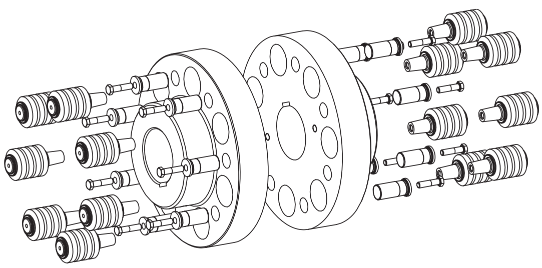


- Pins are arranged alternately
- Increase of transmittable torque by up to 40 % compared to REVOLEX® KX
- Symmetrical arrangement of pin and bush nut
- ⟨Ex⟩ Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)

Components



Components
Type KX-D
5 = Hub part 5
3 = Complete pin
6 = KX-D sleeve



REVOLEX® KX-D													
Size	Torque [1] [Nm]		Max. speed [2] [rpm]	Finish bore [min. - max.]	Dimensions [mm]							Moment of inertia [3]	Approx. weight [3]
	T_{KN}	$T_{Kmax.}$		d_1	L	l_1; l_2	E	D_H	D_1; D_2	N_1; N_2	M*	[kgm²]	[kg]
KX-D 105	8650	17300	2000	34-110	237	117	3	330	180	56	15	0,907	69,2
KX-D 120	14110	28220	1800	50-125	270	132	6	370	206	76	45	1,867	109
KX-D 135	18690	37380	1600	70-140	300	147	6	419	230	76	30	3,144	147
KX-D 150	23100	46200	1450	82-160	336	165	6	457	256	76	15	4,573	182
KX-D 170	36900	73800	1250	95-180	382	188	6	533	292	92	43	10,259	296
KX-D 190	48210	96420	1100	110-205	428	211	6	597	330	92	10	16,601	390
KX-D 215	61900	123800	1000	125-230	480	237	6	660	368	92	0	25,495	504
KX-D 240	92030	184060	900	140-250	534	264	6	737	407	122	20	50,147	768
KX-D 265	121900	243800	800	160-285	590	292	6	826	457	122	0	80,796	1006
KX-D 280	158800	317600	720	180-315	628	311	6	927	508	122	0	129,979	1311
KX-D 305	191060	382120	675	180-330	654	324	6	991	533	122	0	170,016	1521
KX-D 330	251200	502400	625	200-355	666	330	6	1067	572	122	0	227,451	1769
KX-D 355	299100	598200	575	225-380	718	356	6	1156	610	122	0	338,145	2291
KX-D 370	377800	755600	535	225-450	770	382	6	1250	720	122	0	492,353	2869

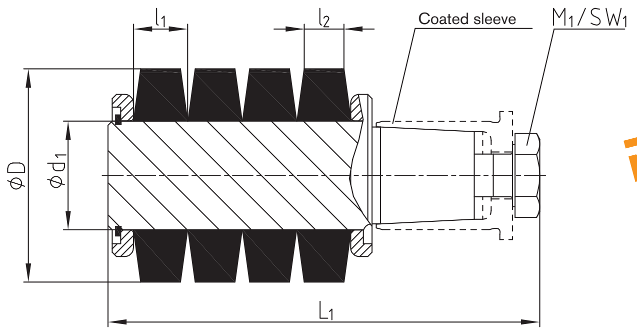
* Drop-out center dimension
[1] Standard material NBR 80 Shore A
[2] Higher speeds on request
[3] Relating to max. bore

Finish bore according to ISO fit H7, feather keyway according to DIN 6885 sheet 1 - JS9.

Order form:

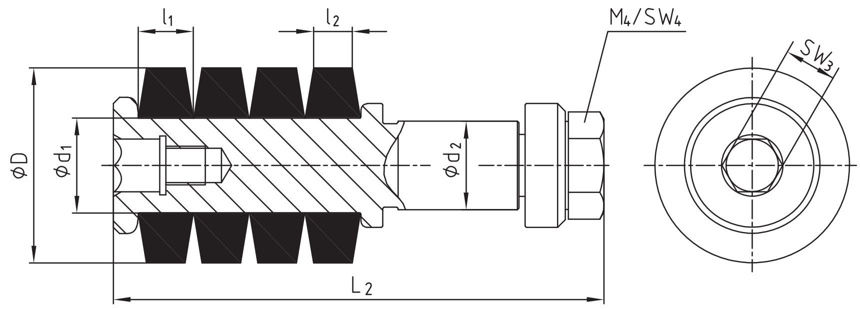
REVOLEX® KX-D 170	∅120	∅150
Coupling type/size	Finish bore	Finish bore

Technical data pin



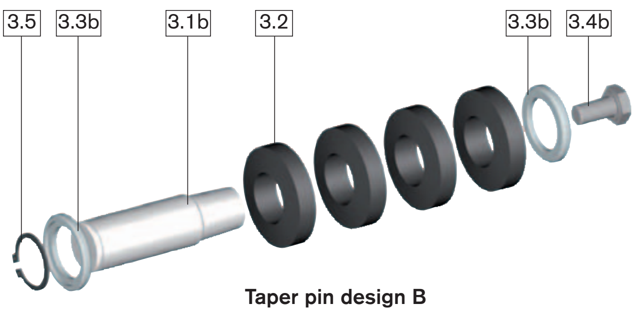
Taper pin design B

NEW

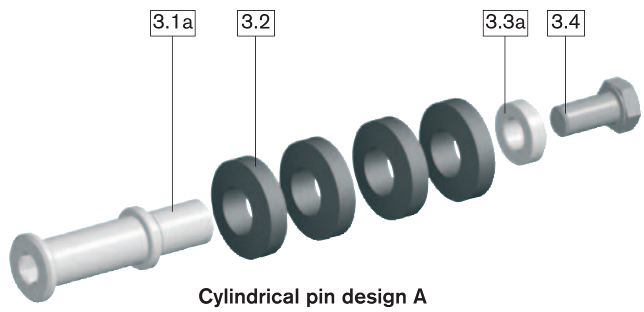


Cylindrical pin design A

Technical data														
Size	Pin			Component 3.2			Component 3.1a / 3.1b					Component 3.4/3.4b			
	Size	Number		Elastomer ring NBR 80 Shore A			Pin					Screw DIN EN ISO 4017			
		KX	KX-D	D	l_1	l_2	d_1	d_2	L_1	L_2	SW_3	M_1	SW_1	M4	SW_4
KX 105	3	12	16	50,0	12,7	9,0	25,40	25,40	101	116	17	M10	16	M16	24
KX 120	4	10	14												
KX 135	4	12	16	63,0	17,8	12,5	30,60	28,57	147,5	158,5	17	M12	18	M20	30
KX 150	4	14	18												
KX 170	5	10	14												
KX 190	5	12	16	85,5	22,9	15,2	43,20	41,30	190	205	17	M16	24	M24	36
KX 215	5	14	18												
KX 240	6	10	14												
KX 265	6	12	16												
KX 280	6	14	18												
KX 305	6	16	20	113,7	30,5	20,3	58,40	57,20	242	255	17	M24	36	M27	41
KX 330	6	18	24												
KX 355	6	20	26												
KX 370	6	24	30												



Taper pin design B

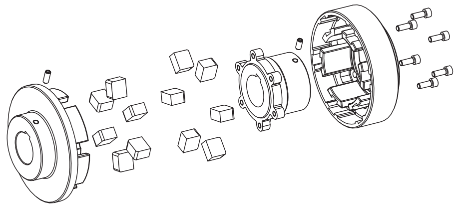


Cylindrical pin design A

Tightening torque				
REVOLEX® KX Size	3	4	5	6
Tightening torque T_A [Nm] 3.1a	290	560	970	1450
Tightening torque T_A [Nm] 3.4b	67	115	290	970

Coupling description

General description:
The POLY coupling is a torsionally flexible, shear shaft coupling for general machinery. It is assembled by axially pluging the hubs into each other and has excellent dampening characteristics. Its unique features are the flexible elastomeric elements that are located in both coupling halves.
The POLY advantage – A much greater number of flexible elements and thus a larger effective mass of the elastomer to accept vibration and to dissipate the heat caused by torsional vibrations when compared to similar competitive couplings with elements only in one half.

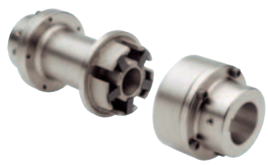


Coupling selection
The coupling selection must be done on the base POLY-NORM® or ROTEX®.

Function/Design
The coupling consists of 2 hubs with fingers that are separated by elastomeric elements which are assembled by axial blind plug-in to each other. Elastomer elements are placed into the slots of both coupling hubs. Torque is transmitted in a compact design. Shaft misalignments, vibrations and shock loads are effectively absorbed by the POLY coupling.
The coupling is maintenance-free and used in general machinery, the pump industry and in compressors. The Poly coupling handles torque ranges of up to 65,000 Nm and is stocked in 21 different sizes and 4 designs for immediate availability. In addition to our standard coupling models, a variety of flange, drop out center and spacer options are available.

Explosion-proof use
POLY couplings are suitable for the use in drives in hazardous areas. The couplings are certified according to EC Standard 94/9/EC (ATEX 95) and belong to category 2G/2D, are confirmed and thus suitable for the use in hazardous areas of zone 1, 2, 21 and 22. Please read our information in the respective Type Examination Certificate and the operating and mounting instructions under www.ktr.com.

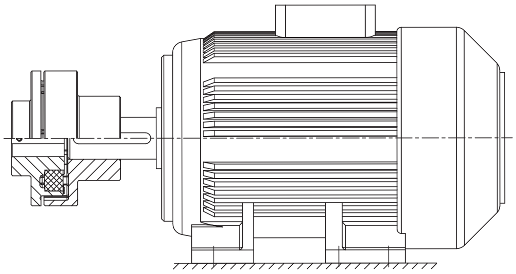
Variation of components
The coupling can be adapted to many applications due to the many options that are possible with the building block arrangement. The POLY components of a given model can be mixed and matched with each other to obtain different shaft distances using the same basic component.



General information about the elastomer packing

Standard Material/Hardness	Perbunan [NBR] / 92 Shore A
Permanent temperature range [°C]	- 30 to + 80
Max. temperature (short time) [°C]	- 50 to + 120
Applications	ATEX applications Chemical industry Mining General machine construction Applications of average elasticity
Resistant to	Gasoline, diesel Acids, bases Tropics (Salt-) Water (hot/cold) Oils, greases Propane, butane Natural gas, city gas

Selection of standard IEC motors



POLY couplings for standard IEC motors, protection IP 54 / IP 55

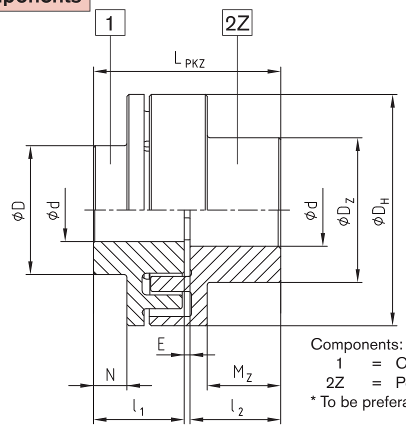
A. C. motor 50 Hz			Motor output n = 3000 1/min 2-pole		POLY coupling size	Motor output n = 1500 1/min 4-pole		POLY coupling size	Motor output n = 1000 1/min 6-pole		POLY coupling size	Motor output n = 750 1/min 8-pole		POLY coupling size
Size	Shaft end dxl [mm]		Output P [kW]	Torque T [Nm]		Output P [kW]	Torque T [Nm]		Output P [kW]	Torque T [Nm]		Output P [kW]	Torque T [Nm]	
	2-pole	4,6,8 pole												
56	9 x 20		0,09	0,32		0,06	0,43		0,037	0,43				
			0,12	0,41		0,09	0,64		0,045	0,52				
63	11 x 23		0,18	0,62		0,12	0,88		0,06	0,7				
			0,25	0,86	**8**	0,18	1,3	**8**	0,09	1,1	**8**			**8**
71	14 x 30		0,37	1,3		0,25	1,8		0,18	2		0,09	1,4	
			0,55	1,9		0,37	2,5		0,25	2,8		0,12	1,8	
80	19 x 40		0,75	2,5		0,55	3,7		0,37	3,9		0,18	2,5	
			1,1	3,7		0,75	5,1		0,55	5,8		0,25	3,5	
90S	24 x 50		1,5	5		1,1	7,5		0,75	8		0,37	5,3	
90L			2,2	7,4		1,5	10		1,1	12		0,55	7,9	
100L			3	9,8	**9**	2,2	15	**9**	1,5	15	**9**	0,75	11	**9**
	28 x 60					3	20					1,1	16	
112M			4	13		4	27		2,2	22		1,5	21	
132S			5,5	18		5,5	36		3	30		2,2	30	
	38 x 80		7,5	25	**10**			**10**			**10**			**10**
132M						7,5	49		4	40		3	40	
									5,5	55				
160M			11	36		11	72		7,5	75		4	54	
	42 x 110		15	49	**12**			**12**				5,5	74	
160L			18,5	60		15	98		11	109	**14**	7,5	100	**14**
180M	48 x 110		22	71		18,5	121	**14**						
180L						22	144		15	148		11	145	
200L	55 x 110		30	97		30	196	**15**	18,5	181	**15**	15	198	**15**
			37	120	**15**				22	215				
225S	55 x 110	60 x 140				37	240	**17**				18,5	244	**17**
225M			45	145		45	292	**19**	30	293	**19**	22	290	**19**
250M	60 x 140	65 x 140	55	177	**17**	55	356		37	361		30	392	
280S		75 x 140	75	241		75	484	**20**	45	438	**20**	37	483	**20**
280M			90	289	**19***	90	581		55	535		45	587	
315S			110	353		110	707	**22**	75	727	**22**	55	712	**22**
315M		80 x 170	132	423	**20***	132	849	**25**	90	873	**25**	75	971	**25**
	65 x 140		160	513		160	1030		110	1070		90	1170	
315L			200	641		200	1290		132	1280	**28**	110	1420	**28**
					22*			**28**	160	1550		132	1710	
315		85 x 170	250	802		250	1600		200	1930		160	2070	**30**
			315	1010		315	2020		250	2410	**30**	200	2580	
			355	1140		355	2280	**30**						**35**
355	75 x 140	95 x 170	400	1280		400	2570		315	3040		250	3220	
			500	1600		500	3210		400	3850	**35**	315	4060	
			560	1790		560	3580	**35**	450	4330		355	4570	
400	80 x 170	110 x 210	630	2020		630	4030		500	4810		400	5150	**40**
			710	2270		710	4540		560	5390	**40**	450	5790	
			800	2560		800	5120	**40**	630	6060		500	6420	
450	90 x 170	120 x 210	900	2880		900	5760		710	6830	**45**	560	7190	**45**
			1000	3200		1000	6400		800	7690		630	8090	

The coupling is selected for an ambient temperature of up to + 30 °C. The coupling was selected for the normal operation. The respective couplings have a minimum operating factor of f min. = 1,35. Drives with periodical torque courses must be selected according to DIN 740 part 2. On request the selection is made by KTR.
Torque T = nominal torque according to Siemens catalogue M 11 · 1994/95.
* dynamical balancing is necessary

Type PKD (2-part design) and PKD (3-part design)

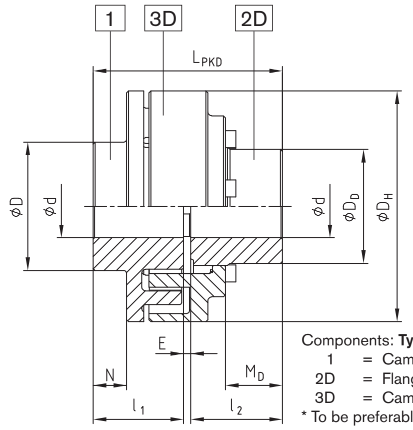
- Torsionally flexible / maintenance-free
- Reduced vibrations
- Shear type
- Axial plug-in assembly
- Short overall length / minimum distance between shafts
- In PKD the elastomer elements can be changed without moving driver or driven
- Ex Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)
- Detailed mounting instructions and further information available at www.ktr.com

Components



Components: **Type PKZ (Z)**
1 = Cam section (EN-GJL-250)
2Z = Pocket section * (EN-GJL-250)
* To be preferably used drive-sided

Type PKZ (Z) – (Size 8 to 30)



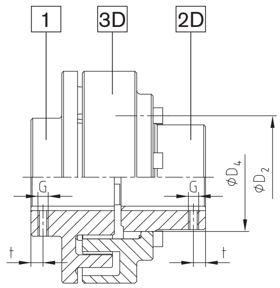
Components: **Type PKD (D)**
1 = Cam section * (EN-GJL-250)
2D = Flange hub (EN-GJS-400/steel)
3D = Cam ring (EN-GJL-250)
* To be preferably used drive-sided

Type PKD (D) – (Size 15 to 45)

POLY PKZ and PKD

Size	Nominal torque [1] T_{KN} [Nm]	Max. speed[2] n [rpm]	Max. Finish bore $Ød_{max.}$ [mm] part 1	part 2Z	part 2D	Dimensions [mm] D_H	D	D_Z	D_D	L_1; l_2	M_Z	M_D	N	E	D_2	D_4(H7/h7)	$L_{PKZ/PKD}$	Thread of setscrew G	t	T_A [Nm]	Weight [3] [kg]
8 (Z)	42	5000	20	28	—	86	43	50	—	35	25	—	3	3	—	—	73	M5	18	2	1,7
9 (Z)	72	5000	28	38	—	97	55	65	—	41	30	—	7	3	—	—	85	M8	23	10	2,7
10 (Z)	100	5000	32	42	—	107	60	70	—	45	35	—	10	4	—	—	94	M8	27	10	3,5
12 (Z)	170	5000	38	48	—	131	70	80	—	55	43	—	12	4	—	—	114	M8	30	10	5,4
14 (Z)	210	4800	45	55	—	142	80	93	—	60	46	—	17	4	—	—	124	M8	10	10	7,6
15 (Z;D)	320	4300	50	60	50	157	90	100	74,5	65	52	35	22	4	92	75	134	M8	15	10	8,6
17 (Z;D)	400	3800	60	65	60	176	100	110	87	70	56	40	25	4	106	90	144	M8	15	10	12
19 (Z;D)	660	3500	75	75	70	195	125	125	106	75	64	45	30	4	126	107	154	M8	15	10	18
20 (Z;D)	820	3300	65	75	70	205	115	127	98	80	65	45	23	4	123	105	164	M8	15	10	20
22 (Z)	1100	3000	85	85	90	224	140	140	129	90	75	59	39	4	150	130	184	M10	20	17	25
25 (Z;D)	1600	2700	90	90	95	257	150	150	138	100	84	60	44	5	162	140	205	M12	20	40	35
28 (Z;D)	2500	2350	100	100	100	288	165	165	154	110	90	65	45	5	178	160	225	M12	20	40	53
30 (Z;D)	3950	2200	110	110	110	308	180	180	165	130	108	75	58,5	5	202	170	265	M16	20	80	66
35 (D)	6100	1850	130	—	140	373	210	—	209	160	—	95	69	5	240	210	325	M16	25	80	125
40 (D)	9000	1600	145	—	160	423	240	—	238	180	—	115	85	5	275	240	365	M16	25	80	180
45 (D)	14300	1400	160	—	180	473	270	—	268	180	—	110	74	6	308	270	366	M16	30	80	220

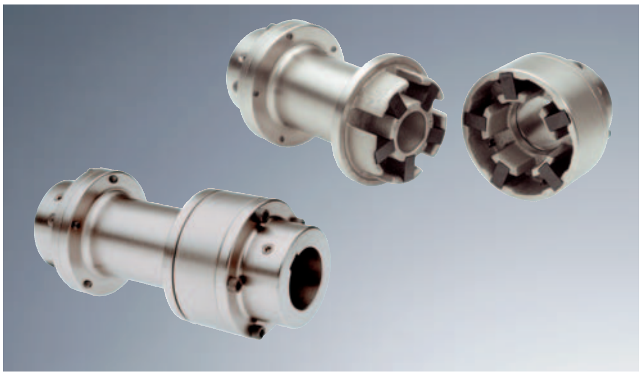
[1] Maximal torque $T_{K max} = T_{KN} \times 2$; Standard material Perbunan (NBR) 92 Shore-A; Standard hub material: EN-GJL-250
[2] For v = 30 m/sec. For peripheral speeds exceeding v = 30 m/sec. we recommend a dynamical balancing; hub material EN-GJS-400-15
[3] Refer to medium bore



Order form:

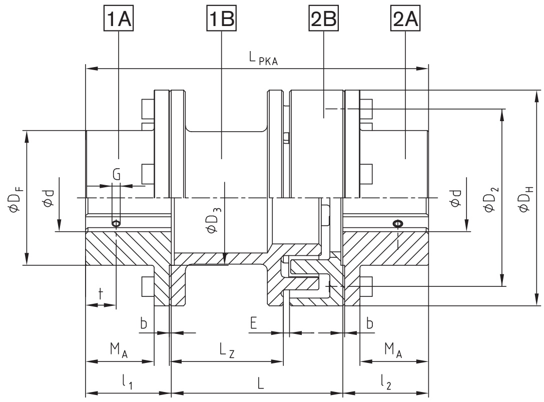
POLY	PKD	28	d_1 Ø90	d_2 Ø80
Coupling	Type	Size	Finish bore part 1	Finish bore part 2

Type PKA (dismountable coupling)



- Torsionally flexible, maintenance-free
- Vibration-reducing
- Not failsafe
- Axial plug-in
- Short design / low shaft distance dimension
- In the PKD the elastomer packages can be exchanged in exembled state
- ⟨Ex⟩ Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)
- Detailed mounting instructions and further information at www.ktr.com

Components



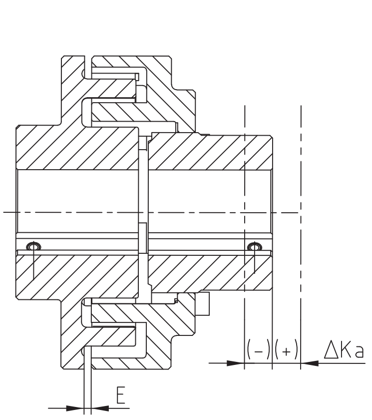
Components: **Type PKA**
1A/2A = Coupling flange (steel)
1B = Spacer (EN-GJL-250)
2B = Driving flange (EN-GJL-250)
1A and 1B to be preferably used drive-sided

POLY Type PKA																			
Size	Nominal-torque T_{KN} [Nm]	Max. speed n [rpm]	Finish bore $d_{max.}$ [mm] part 1A/2A	Dimensions [mm]												Thread of setscrew			Weight [kg]
				D_H	D_F	D_2	D_3	l_1, l_2	b	M_A	E	L	L_{PKA}	L_Z	G	t	T_A [Nm]	
8	42	5000	38	86	55	70	60	35	1,5	25,5	3	100	170	66	M5	15	2	3,04
9	72	5000	45	97	70	85	70	41	1,5	30,5	3	100	182	63	M8	15	10	4,26
												140	222	103				4,66
10	100	5000	50	107	78	93	80	46	1,5	35,5	4	100	192	61	M8	20	10	5,42
												140	232	101				5,88
12	170	5000	60	131	95	113	90	55	1,5	43,0	4	100	210	55	M8	20	10	9,49
												140	250	95				10,15
												180	290	135				10,86
14	210	4800	70	142	105	125	100	60	1,5	48,0	4	100	220	54	M8	25	10	11,46
												140	260	94				12,23
												180	300	134				13,01
15	320	4300	70	157	110	135	110	65	1,5	49,5	4	100	230	53	M8	25	10	14,77
												140	270	93				15,63
												180	310	133				16,50
												250	380	203				18,01
17	400	3800	80	176	125	150	110	70	1,5	54,5	4	100	240	53	M8	25	10	18,79
												140	280	93				19,60
												180	320	133				20,41
												250	390	203				21,83
19	660	3500	90	195	135	160	120	75	1,5	59,5	4	140	290	91	M8	30	10	24,62
												180	330	131				25,91
												250	400	201				28,15
20	820	3300	100	205	150	175	130	80	2,0	61,0	4	140	300	81	M8	30	10	30,96
												180	340	121				32,18
												250	410	191				34,79
22	1100	3000	105	224	160	190	140	90	2,0	71,0	4	180	360	127	M10	35	17	37,79
												250	430	197				39,94
25	1600	2700	125	257	195	225	150	100	2,0	81,0	5	140	340	81	M12	40	40	54,73
												180	380	121				56,50
												250	450	191				59,60
28	2500	2350	140	288	215	250	170	110	2,0	91,0	5	180	400	114	M12	45	40	77,84
												250	470	184				82,41

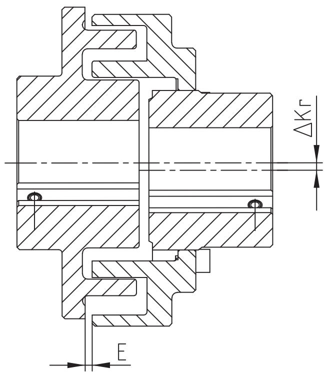
Order form:

POLY	PKA	28	140	∅38	∅40
Coupling	Type	Size	Dismountable L	Finish bore part 1A	Finish bore part 2A

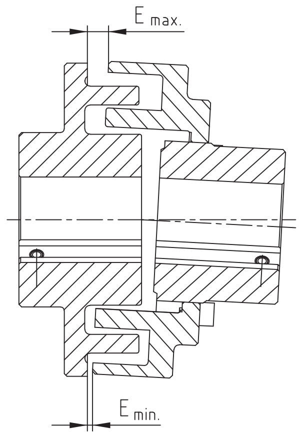
Displacements — Elastomer elements — Screws



Axial displacement



Radial displacement



Angular displacement

$\Delta K_w = E_{max.} - E_{min.}$ [mm]

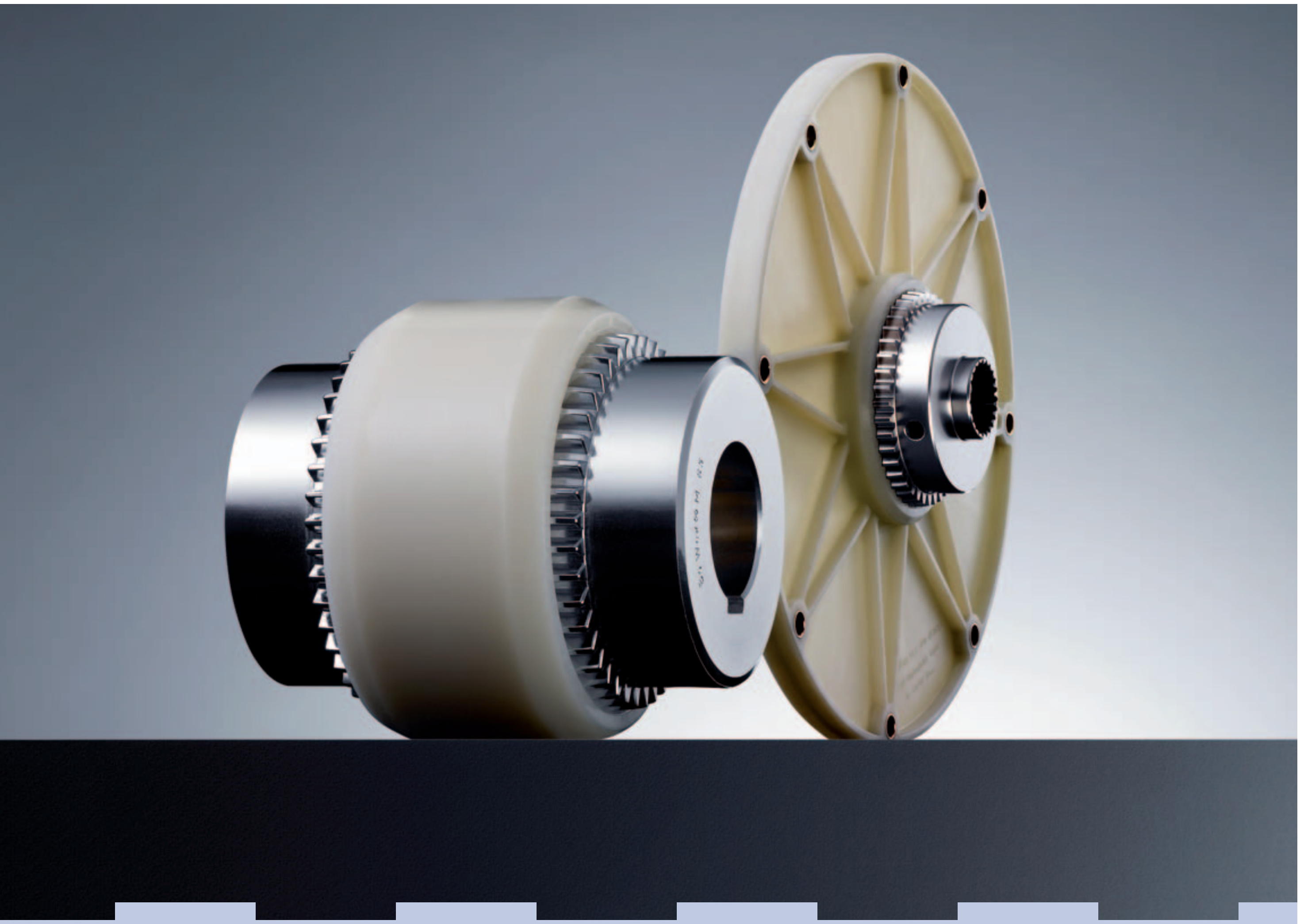
Radial and angular displacements can occur simultaneously.
The combined sum $V = \Delta K_r + (E_{max.} - E_{min.})$ must not exceed the values listed in table .

Displacements [mm]																	
Couplingsize		8	9	10	12	14	15	17	19	20	22	25	28	30	35	40	45
Max. axial displacement ΔK_a [mm]		±1	±1	±1	±2	±2	±2	±2	±2	±2	±2	±2	±2	±2	±3	±3	±3
Max. radial displacement ΔK_r or	n = 750 min^{-1}	0,8	0,8	0,8	0,8	0,8	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,2	1,2	1,2	1,2
max. angular displacement ΔK_w	n = 1000 min^{-1}	0,7	0,7	0,7	0,7	0,7	0,9	0,9	0,9	0,9	0,9	0,9	0,9	1,1	1,1	1,1	1,1
or sum V	n = 1500 min^{-1}	0,5	0,5	0,5	0,5	0,5	0,7	0,7	0,7	0,7	0,7	0,7	0,7	0,7	0,9	0,9	0,9

Elastomer elements NBR (cuboid)																	
Couplingsize		8	9	10	12	14	15	17	19	20	22	25	28	30	35	40	45
Element size			1		2		3		3a	4	3b	4	5	6Ü	7Ü	8	9
Number of elements		8	10	10	10	10	12	12	12	12	16	16	16	16	20	20	20
Dimensions of elastomer	b		18,4		24,9		27,2		27,7	34,9	26,9	34,9	40	43,3	45,7	52,1	58,1
elements	t		10		15,3		16,1		18,4	19,6	18,4	19,6	22,2	28,6	25,0	28,6	29,3
b x t x h [mm]	h		18,9		23,9		24,6		26,8	34,6	29,6	34,6	40,6	41,1	60,0	59,7	69

Type PKD — Dimension cyl. screw DIN EN ISO 4762																	
Couplingsize		8	9	10	12	14	15	17	19	20	22	25	28	30	35	40	45
Screw size	M	—	—	—	—	—	M8	M8	M8	M10	M8	M10	M10	M12	M12	M16	M16
	l	—	—	—	—	—	30	25	25	30	30	30	40	40	55	55	60
Number		—	—	—	—	—	6	6	6	6	8	8	8	8	10	10	10
Tigthening torque T_A [Nm]		—	—	—	—	—	25	25	25	25	25	49	49	86	86	295	210
Type PKA — Dimension cyl. screw DIN EN ISO 4762																	
Screw size	M	M6	M6	M6	M8	M8	M10	M10	M10	M10	M10	M10	M12	—	—	—	—
	l	16	18	18	20	20	25	25	25	30	30	30	30	—	—	—	—
Number		4	5	5	5	5	6	6	6	6	8	8	8	—	—	—	—
Tigthening torque T_A [Nm]		10	10	10	25	25	49	49	49	49	49	49	86	—	—	—	—

Standard bore H7 with keyway DIN 6885 sheet 1 [JS9] and threads for setscrews on the feather keyway.
Please see our detailed mounting instructions at our website www.ktr.com.



BoWex®
Curved-tooth gear couplings®, shaft couplings

BoWex® FLE-PA
U.S. Patent 5,586,938

Torsionally rigid flange couplings

BoWex - ELASTIC®
Highly flexible flange couplings

MONOLASTIC®
EP 0853203 U.S. Patent 6,117,017

Single parted, flexible flange couplings

Pump mounting flanges
according to SAE and special dimensions

Made for Motion KTR

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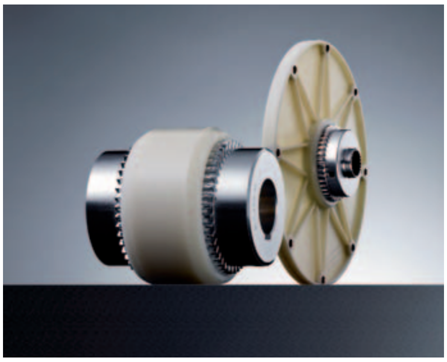
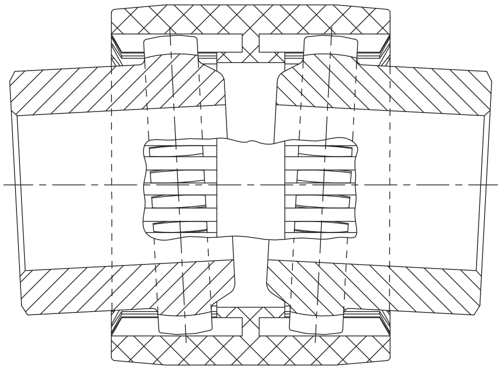
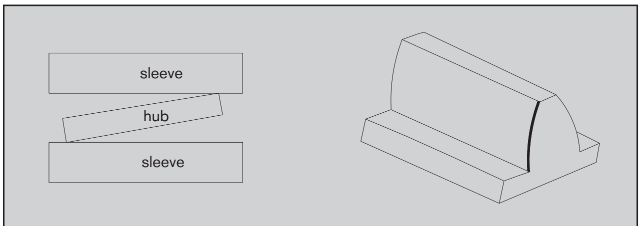


Operating description



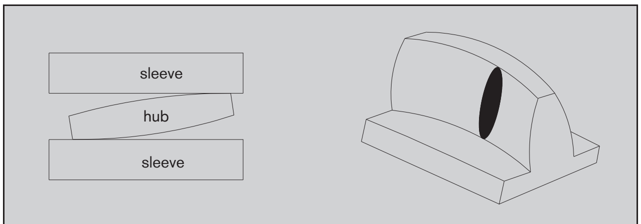
BoWex® Curved-tooth gear couplings® are flexible shaft connections for a positive torque transmission and specifically suitable to compensate for axial, radial and angular shaft misalignment.

According to the well-known effect of curved-tooth gear couplings any edge pressure in the spline in case of angular and radial displacements is avoided so that BoWex couplings are almost free from wear.



Hub with spur toothing

On couplings with spur toothing high edge pressure along with considerable wear arises at the contact surfaces in case of misalignment.



Hub with curved toothing (BoWex®)

The curved teeth avoid any edge pressure on the coupling in case of angular and radial misalignment.

The material combination of steel hubs and polyamide sleeves allows for maintenance-free continuous operation with very low friction on the teeth.

Due to the double cardanic operation of BoWex® couplings restoring forces may be neglected in case of angular and radial displacements and periodic fluctuations in angular velocity do not arise.

BoWex® couplings can be assembled both vertically or horizontally with no need for any special assembly tools.

The standard polyamide material is characterized by the following positive features:

- high mechanical consistency
- high stiffness
- high thermal stability (+ 100 °C)
- good viscosity even in case of low temperatures
- favourable slide-friction behaviour
- very good electrical insulating property
- good resistance to chemicals
- good dimensional accuracy

Behaviour of friction and wear of the BoWex® sleeve
The smooth and hard surface (crystalline structure) and the high thermal stability and resistance to lubricants, fuels, hydraulic fluids, dissolvents, etc. make polyamide an ideal material for components stressed by sliding, particularly for the coupling production. While any metallic materials tend to "corrode" in case of dry running, slide combinations with polyamide and steel are operative without any lubrication and maintenance.

Explosion protection use
BoWex® couplings type M until size 65 including an electrically conductive nylon sleeve (PA-CF) are suitable for power transmission in drives in hazardous areas. The couplings are certified and confirmed according to EC standard 94/9/EC (ATEX 95) as units of category 2G/2D and thus suitable for the use in hazardous areas of zone 1, 2, 21 and 22. Please read through our information included in the respective Type Examination Certificate and the operating and mounting insructions at www.ktr.com.

Technical data

Power, Torque and Speed							
Design and size		Power P [kW] / n [1/min]		Torque T_K [Nm]			Max. speed [1/min]
		Rated	Maximum	T_{KN}	$T_{K\ max.}$	T_{KW}	
Type	junior 14 / M-14	0,0005	0,010	5	10	2,5	6000
plug-in coupling /	junior 19 / M-19	0,0008	0,0017	8	16	4	6000
junior M	junior 24 / M-24	0,0013	0,0025	12	24	6	6000
Type	14	0,0010	0,003	10	30	5	14000
M	19	0,0017	0,005	16	48	8	11800
I	24	0,0021	0,006	20	60	10	10600
AS	28	0,0047	0,014	45	135	23	8500
Spez.-I	32	0,0063	0,019	60	180	30	7500
SG	38	0,0084	0,025	80	240	40	6700
SSR	42	0,010	0,031	100	300	50	6000
	45 / 48	0,015	0,044	140	420	70	5600
	65	0,040	0,119	380	1140	190	4000
	80	0,073	0,22	700	2100	350	3150
	100	0,13	0,38	1200	3600	600	3000
	125	0,26	0,78	2500	7500	1250	2120
Type	14	0,0015	0,0047	15	45	7,5	14000
M...C	19	0,0025	0,0075	24	72	12	11800
	24	0,003	0,009	30	90	15	10600
	28	0,007	0,022	70	210	35	8500
	32	0,009	0,028	90	270	45	7500
	38	0,013	0,038	120	360	60	6700
	48	0,021	0,063	200	600	100	5600
	65	0,058	0,18	560	1680	280	4000
Type	28	0,0078	0,014	75	185	37,5	6000
FLE-PA	32	0,014	0,028	135	335	67,5	6000
	48	0,025	0,050	240	600	120	5000
	T 48	0,030	0,078	300	750	150	5000
	T 55	0,047	0,012	450	1125	225	4500
	65	0,068	0,140	650	1600	325	3600
	T 65	0,084	0,210	800	2000	400	3600
	T 70	0,105	0,262	1000	2500	500	3400
	80	0,13	0,250	1200	3000	600	3000
	T 80	0,16	0,039	1500	3750	750	3000
	100	0,21	0,43	2050	5150	1025	2500
	T 100	0,26	0,65	2500	6250	1250	2500
	125	0,44	0,89	4250	10700	2125	2500
Type	40Sh	0,014	0,041	130	390	36	
ELASTIC	42 HE 50Sh	0,016	0,047	150	450	45	6200
HE	65Sh	0,019	0,057	180	540	54	
HEW	40Sh	0,021	0,063	200	600	60	
HEW-ZS	48 HE 50Sh	0,024	0,072	230	690	69	5600
HE-ZS	65Sh	0,029	0,088	280	840	84	
HEG	40Sh	0,037	0,110	350	1050	105	
	65 HE 50Sh	0,042	0,126	400	1200	120	4500
	65Sh	0,052	0,157	500	1500	150	
	40Sh	0,045	0,135	430	1290	129	
	G 65 HE 50Sh	0,052	0,157	500	1500	150	4300
	65Sh	0,065	0,195	620	1860	186	
	40Sh	0,089	0,267	750	2250	225	
	80 HE 50Sh	0,096	0,298	950	2850	285	3600
	65Sh	0,126	0,372	1200	3600	360	
	40Sh	0,130	0,39	1250	3750	375	
	G 80 HE 50Sh	0,16	0,50	1600	4800	480	3000
	65Sh	0,21	0,62	2000	6000	600	
	40Sh	0,21	0,62	2000	6000	600	
	100 HE 50Sh	0,26	0,78	2500	7500	750	2700
	65Sh	0,36	1,00	3200	9600	960	
	40Sh	0,31	0,942	3000	9000	900	
	125 HE 50Sh	0,41	1,256	4000	12000	1200	2300
	70Sh	0,52	1,570	5000	15000	1500	
	40Sh	0,42	1,26	4000	12000	1200	
	G 125 HE 50Sh	0,54	1,63	5200	16000	1600	2100
	70Sh	0,68	2,04	6500	20000	2000	
	40Sh	0,58	1,73	5500	16500	1650	
	150 HE 50Sh	0,73	2,20	7000	21000	2100	1800
	70Sh	0,94	2,83	9000	27000	2700	

Coupling selection

The BoWex® coupling is selected in accordance with DIN 740 part 2. The coupling has to be dimensioned in a way that the permissible coupling load is not exceeded in any operating condition. For this purpose the actual loads have to be compared to the permissible parameters of the coupling.

1 **Drives without periodical load**
The coupling has been selected by checking the rated torques T_{KN} and maximum torque $T_{K\,max}$.

2 **Load produced by rated torque**

$$T_{KN} \geq T_N \cdot S_t$$

$$T_N\,[\mathrm{Nm}] = 9550 \cdot \frac{P_{AN/LN}\,[\mathrm{kW}]}{n\,[1/\mathrm{min}]}$$

Taking into consideration the ambient temperature, the permissible rated torque T_{KN} of the coupling has to correspond at least to the rated torque T_N of the machine.

3 **Load produced by torque shocks**

$$T_{K\,max} \geq T_S \cdot S_Z \cdot S_t + T_N \cdot S_t$$

Drive-sided shock
$$T_S = T_{AS} \cdot M_A \cdot S_A$$
Load-sided shock
$$T_S = T_{LS} \cdot M_L \cdot S_L$$

$$M_A = \frac{J_L}{J_A + J_L} \qquad M_L = \frac{J_A}{J_A + J_L}$$

The permissible maximum torque of the coupling has to correspond at least to the total of peak torque T_S and the rated torque T_N of the machine, taking into account the shock frequency Z and the ambient temperature.

This applies in case if the rated torque T_N of the machine is at the same time subject to shocks.

Knowing the mass distribution, shock direction and shock mode, the peak torque T_S can be calculated.

For drives with A. C.-motors with high masses on the load side we would recommend to calculate the peak driving torque with the help of our simulation programme.

Service factor S_t for temperature

Material of sleeve	-40 °C +60 °C	+70 °C	+80 °C	+90 °C	+100 °C	+110 °C	+120 °C
PA 6.6	1,0	1,2	1,4	1,6	1,8	-	-
PA-CF	1,0	1,1	1,2	1,4	1,6	1,9	2,2

Service factor S_Z for starting frequency

starting frequency/h	100	200	400	800
S_Z	1,0	1,2	1,4	1,6

Service factor S_A / S_L for shocks

	S_A/S_L
gentle shocks	1,5
average shocks	1,8
heavy shocks	2,5

Permissible load on feather key of the coupling hub
The shaft-hub-connection has to be verified by the customer.
Permissible surface pressure according to DIN 6892 (method C).

Polyamide	30 N/mm² (up to + 40 °C)
Powder metal steel	180 N/mm²
Material steel S355J2G3 (St 52.3)	250 N/mm²
for other steel materials $p_{perm.}$ =	$0{,}9 \cdot R_e\ (R_{p0.2})$

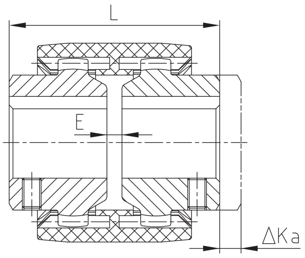
Description	Symbol	Definition or explanation
Rated torque of coupling	T_{KN}	Torque that can continuously be transmitted over the entire permissible speed range.
Maximum torque of coupling	$T_{K\,max.}$	Torque that can be transmitted as dynamic load ≥ 10^5 times or 5 x 10^4 as vibratory load, respectively, during the entire operating life of the coupling.
Vibratory torque of coupling	T_{KW}	Torque amplitude of the permissible periodical torque fluctuation with a frequency of 10 Hz and a basic load of T_{KN} or dynamic load up to T_{KN}, respectively.
Damping power of coupling	P_{KW}	Permissible damping power with an ambient temperature of + 30 °C.
Rated torque of machine	T_N	Stationary rated torque on the coupling
Peak torque of machine	T_S	Peak torque on the coupling
Peak torque on the driving side	T_{AS}	Peak torque with torque shock on the driving side, e. g. breakdown torque of the electric motor.

Description	Symbol	Definition or explanation
Peak torque of load side	T_{LS}	Peak torque with torque shock on load side, e. g. braking.
Vibratory torque of machine	T_W	Amplitude of the vibratory torque effective on the coupling.
Damping power of the machine	P_W	Damping power which is effective on the coupling due to the load produced by the vibratory torque.
Moment of inertia of driving side	J_A	Total of moments of inertia existing on the driving or load side referring to the coupling speed.
Moment of inertia of load side	J_L	
Rotational inertia coefficient of driving side	M_A	Factor taking into account the mass distribution with shocks and vibrations produced on the driving or load side.
Rotational inertia coefficient of load side	M_L	$M_A = \frac{J_L}{J_A + J_L}$ $\quad M_L = \frac{J_A}{J_A + J_L}$

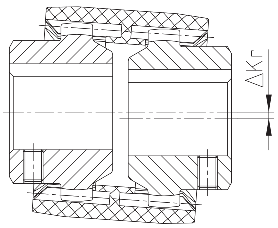
Displacements and threads for setscrews

Displacements

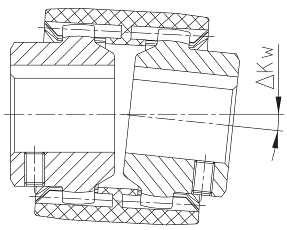
BoWex® couplings are double cardanic and in addition to transmitting the power compensate for axial, radial and angular shaft displacements in a way to prevent damages from the driving or driven machine, respectively.



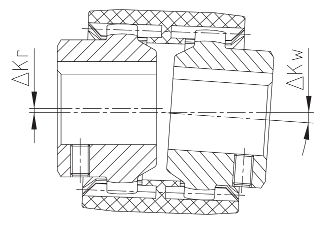
Parallel shafts



Shafts subject to radial displacement



Shafts subject to angular displacement

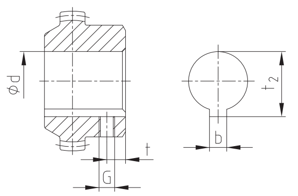


Shafts subject to radial and angular displacement

Displacements						
Type and size	Overall length L of the coupling assembled (standard design) 2) [mm]	Can the coupled power pack be disassembled vertically without axial displacement?	Shift distance dimension E 1) [mm]	Max. axial displacement ΔKa [mm]	Max. permissible displacements ΔKr radial [mm] or	ΔKw angular [°]
junior 14 (plug-in coupling)	48					
junior 19 (plug-in coupling)	52	no	2	± 1	± 0,1	
junior 24 (plug-in coupling)	54					
junior M-14; M-14	50					
junior M-19; M-19	54	no			± 0,3	
junior M-24; M-24; Special I-24	56					
24 AS; 24 SSR		yes				
24 SG	76					
M-28; Special I-28		no				
28 AS; 28 SG; 28 SSR		yes				
M-32; Special I-32	84	no	4		± 0,4	
32 AS; 32 SG; 32 SSR		yes				
M-38		no				
M-42		no		± 1		± 1° each hub
45 AS; 45 SG; 45 SSR	88	yes				
Special I-45		no				
M-48	104					
M-65; Special I-65	114	no			± 0,6	
65 AS; 65 SG; 65 SSR		yes				
80 AS; 80 SSR	186		6		± 0,7	
I-80; Special I-80; 80 SG		no				
100 AS; 100 SSR	228	yes	8		± 0,8	
I-100; Special I-100; 100 SG		no				
125 AS; 125 SSR	290	yes	10		± 1,1	
I-125; Special I-125; 125 SG		no				

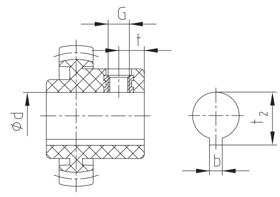
The assembled hubs must in every case be flush with the shaft ends. If it is difficult to determine the distance dimension E, reference may be made to the overall assembled length.
The shaft ends to be connected should be supported close to each coupling half.
1) The listed distance dimension E for the different couplings must be observed in every case, particularly for radial and angular misalignments.
2) If the coupling hubs have been shortened or lengthened on the outside, the overall length of the coupling assembled will be reduced by the corresponding figure.
3) The permissible displacement figures depend on speed and performance. We shall be glad to send you a displacement diagramme if required.
Prior to operation of the BoWex® coupling please make sure that the coupling sleeves are readily capable of axial movement.
The customer must provide guards in order to ensure that rotating parts cannot cause injury (Safety of Machines, DIN EN 292 part 2).

Threads for setscrews (Thread dimensions for setscrews. BoWex® coupling hubs with cylindrical bores.)



Position of the thread for setscrews BoWex® M-14 to M-24 opposite to the keyway

BoWex® M-28 to I-125 on the keyway



Position of the thread for BoWex®

junior plug-in coupling and junior M-coupling

BoWex® – coupling hubs							
Size Dimensions	14 19 24	28 32 38	42 45 48	65	80	100	125
Thread G	M5	M8		M10	M10	M12	M16
Distance t	6	10		15 1) 20	20	30	40
Tightening torque T_A [Nm]	2	10		17	17	40	80

1) Hub length 55 mm t = 15 mm, 70 mm t = 20 mm

BoWex® junior – coupling hubs			
Size Dimensions	14	19	24
Thread G	M5	M5	M5
Hub 1b - Distance t	6	6	6
Plug-in sleeve 2b - Distance t	8	10	10
Tightening torque T_A [Nm]	1,4	1,4	1,4

Cylindrical bores, taper/inch bores and selection of standard IEC motors

Stock programme cylindrical finish bores [mm] H7 keyway to DIN 6885 sheet 1 [JS9] with thread for setscrew

BoWex® size	un-/pilot bored	Ø8	Ø9	Ø10	Ø11	Ø12	Ø13	Ø14	Ø15	Ø16	Ø17	Ø18	Ø19	Ø20	Ø22	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55	Ø60	Ø65	Ø70	Ø75
14	●■	●	●	●	●	●	●	●■	●																							
19	●■			●	●	●		●	●	●	●	●	●■	●																		
24	●■			●	●	●		●■	●	●	●	●	●■	●	●	●■																
28	●■							●	●	●	●	●	●	●	●	●■	●	●■														
32	●■											●	●	●	●	●	●	●	●	●												
38	●■											●	●	●	●	●	●	●	●	●	●	●■										
42	●■													●	●	●	●	●	●	●	●	●	●	●								
48	●■																●	●	●	●	●	●	●	●■	●	●■						
65	●■																		●	●	●	●	●	●	●■	●■	●■	●■	●■	●■		
80	●																										●	●	●	●	●	●

● standard length ■ standard lengthened

Stock programme taper and inch bores

	Taper 1:5					Taper 1:8					Inch bores								
Code	A-10	B-17	C-20	D-25	E-30	N/1	N1d	N/2	N/2a	N/3	Ta	DNC	Ed	A	G	F	Bs	Hs	K
d +0,05	9,85	16,85	19,85	24,85	29,85	9,7	14	17,28	17,28	22	12,7	13,45	15,87	19,05	22,22	22,22	25,38	25,4	31,75
b JS9	2	3	4	5	6	2,4	3	3,2	4	3,99	3,17	3,17	4,75	4,78	4,75	6,38	6,37	6,35	7,93
t +0,2											14,3	14,9	18,1	21,3	24,7	25,2	28,3	28,3	35,4
14	●					●							●						
19		●				●							●						
24	●	●				●	●	●	●		●		●	●					
28	●	●	●			●	●	●	●					●			●		
32		●	●																
38		●	●					●	●	●				●		●	●		●
42		●	●	●				●	●	●				●	●	●	●		●
48															●				●
65										●									

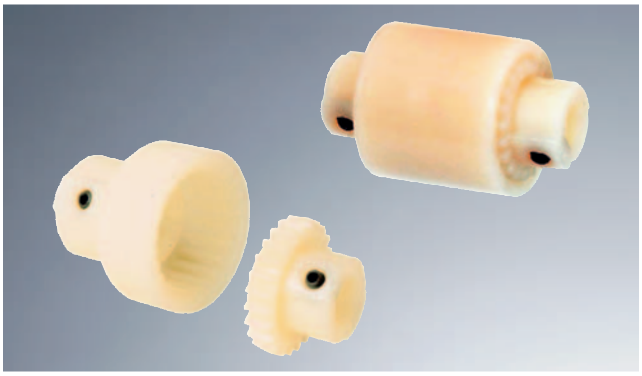
Further dimensions on request.

BoWex®-couplings for standard IEC-motors, protection type IP 54/IP 55

A. C. motor size	Motor output with 50 Hz n = 3000 [1/min] kW	T [Nm]	BoWex®-coupling	Motor output with 50 Hz n = 1500 [1/min] kW	T [Nm]	BoWex®-coupling	Motor output with 50 Hz n = 1000 [1/min] kW	T [Nm]	BoWex®-coupling	Cylindric shaft end d x l [mm] 3000	≤ 1500
56	0,09	0,32		0,06	0,43		0,037	0,43		9 x 20	
	0,12	0,41		0,09	0,64		0,045	0,52			
63	0,18	0,62	14	0,12	0,88	14	0,06	0,72	14	11 x 23	
	0,25	0,86		0,18	1,3		0,09	1,1			
71	0,37	1,3		0,25	1,8		0,18	2,0		14 x 30	
	0,55	1,9		0,37	2,5		0,25	2,7			
80	0,75	2,5	19	0,55	3,7	19	0,37	3,9	19	19 x 40	
	1,1	3,7		0,75	5,1		0,55	5,8			
90 S	1,5	5,0	24	1,1	7,5	24	0,75	8,0	24	24 x 50	
90 L	2,2	7,4		1,5	10		1,1	12			
100 L	3	9,8	28	2,2	15	28	1,5	15	28	28 x 60	
				3	20						
112 M	4	13		4	27		2,2	22			
132 S	5,5	18	38	5,5	36	38	3	30	38	38 x 80	
	7,5	25									
132 M				7,5	49		4	40			
							5,5	55			
160 M	11	36	42	11	72	42	7,5	75	42	42 x 110	
	15	49									
160 L	18,5	60		15	98		11	108			
180 M	22	71	48	18,5	121	48			48	48 x 110	
180 L				22	144		15	148			
200 L	30	97		30	196		18,5	181		55 x 110	
	37	120					22	215			
225 S				37	240	65			65	55 x 110	60 x 140
225 M	45	145	65	45	292		30	293			
250 M	55	177		55	356		37	361		60 x 140	65 x 140
280 S	75	241		75	484		45	438			75 x 140
280 M	90	289		90	581	80	55	535	80		
315 S	110	353		110	707		75	727			
315 M	132	423		132	849		90	873			80 x 170
315 L	160	513	80	160	1030	100	110	1070	100	65 x 140	
	200	641		200	1290		132	1280			
							160	1550			
315	250	801		250	1610		200	1930	125		85 x 170
	315	1010	100	315	2020	125	250	2420			
355	355	1140		355	2280		315	3040	-	75 x 140	95 x 170
	400	1280	125	400	2560						

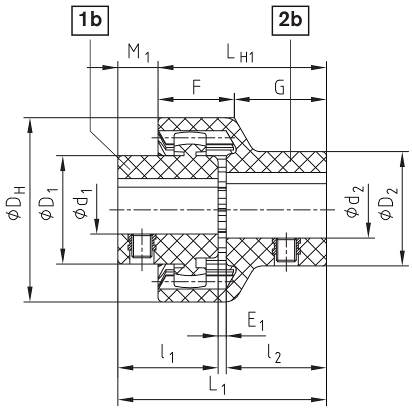
Torque T ≙ rated torque according to Siemens catalogue.

Type junior plug-in coupling and type junior M from nylon

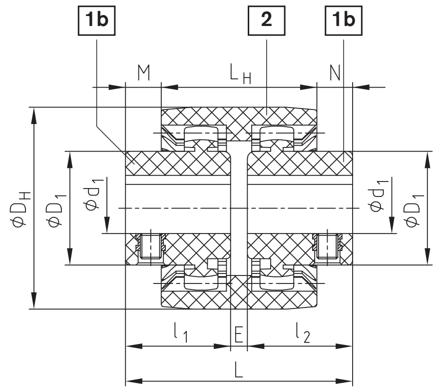


- Curved-tooth gear coupling plug-in type (2 parts) from nylon
- Double cardanic curved-tooth gear coupling type M (3 parts) from nylon
- Maintenance-free due to material combination nylon
- Compensating for axial, radial and angular shaft misalignment
- Low weight and small flywheel effect
- Axial plug-in – easy assembly
- Operating range - 25 °C to + 100 °C
- Available from stock with finish bore for standard shafts including keyway to DIN 6885 sheet 1 and thread for set-screws, bore tolerance + 0,05 - 0,1 keyway tolerance ± 0,08, H7 fit for steel hubs only

Components



Type junior plug-in coupling (2 parts)



Type junior M coupling (3 parts)

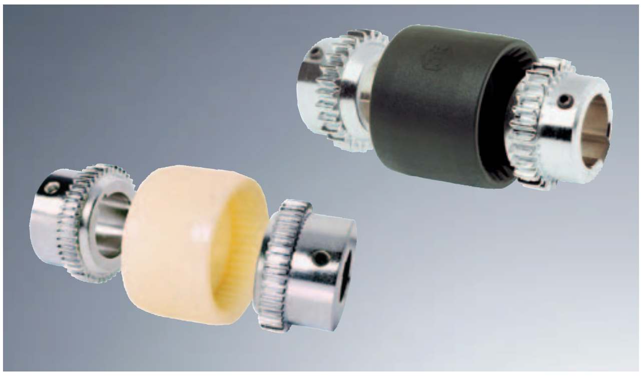
BoWex® junior plug-in coupling (2 parts) and BoWex® junior M (3 parts)

Size	Torque T_K [Nm] T_{KN}	Torque T_K [Nm] $T_{Kmax.}$	Finish bore: Hub part 1b d_1	Finish bore: D_1	Finish bore: Plug-in-sleeve part 2b d_2	Finish bore: D_2	D_H	l_1, l_2	E_1	L_1	L_{H1}	M_1	F	G	E	L	L_H	M, N	Max. speed [1/min]
14 M-14	5	10	Ø6, Ø7, Ø8, Ø9	22	Ø8	22	40	23	2	48	40	8	18,5	21,5	4	50	37	6,5	6000
			Ø10, Ø11	25	Ø10, Ø11	25													
			Ø12, Ø14	26	Ø12, Ø14	26													
19 M-19	8	16	Ø12, Ø14	27	Ø14, Ø15	29	47	25	2	52	42	10	19,0	23,0	4	54	37	8,5	6000
			Ø16	30															
			Ø19	32	Ø19	35													
24 M-24	12	24	Ø10, Ø11, Ø12	26	Ø14, Ø16	32	53	26	2	54	45	9	21,5	23,5	4	56	41	7,5	6000
			Ø14, Ø15, Ø16	32															
			Ø18, Ø19, Ø20	36	Ø19, Ø20	36													
			Ø24	38	Ø24	40													

Order form:

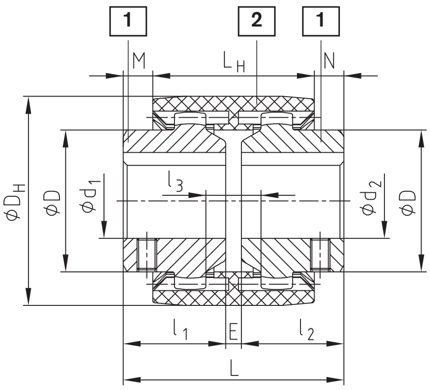
BoWex® junior 19	d_1 Ø 19	d_2 Ø 14
Coupling size 2-parted type or BoWex® junior M-19 3-parted type	Finish bore	Finish bore

Type M, type I and type M...C ⟨Ex⟩

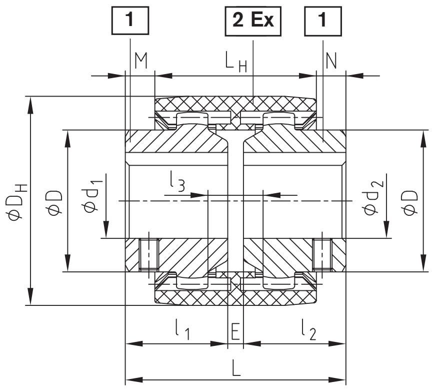


- For all applications in the range of general engineering and hydraulics
- Maintenance-free due to the material combination nylon/steel
- Compensating for axial, radial and angular shaft misalignment
- Axial plug-in - easy assembly
- Available with finish bore to ISO fit H7, keyway to DIN 6885 sheet 1 - JS9 as well as taper and inch bores
- ⟨Ex⟩ Type M...C with carbon fiber reinforced PA, low backlash, higher torques and approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)
- Finish bores see stock programme on page 75
- For performance data see page 72

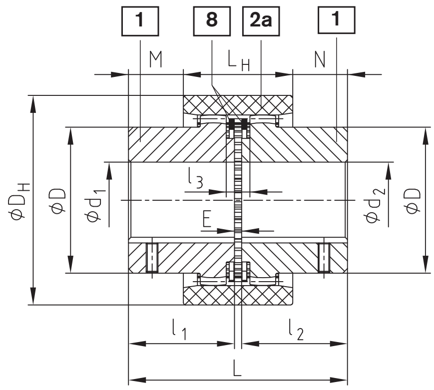
Components



Type M



Type M...C ⟨Ex⟩



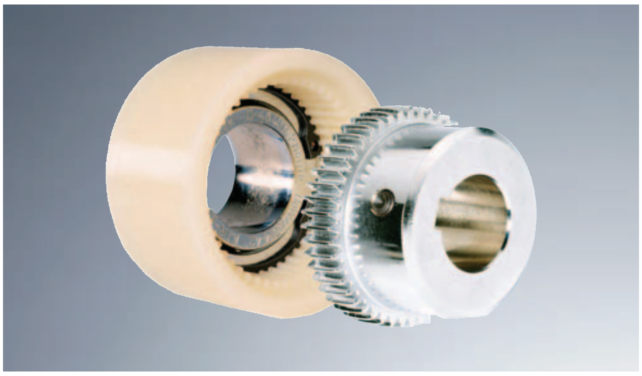
Type I

BoWex® type M, type I and type M...C ⟨Ex⟩																					
Size		Finish bore d_1, d_2			Dimensions [mm]											Weight with max. bore-Ø			Massmoment of inertia J with max. bore-Ø		
	⟨Ex⟩	Pilot bored		max.	l_1, l_2	E	L	L_H	M, N	l_3	D	D_H	Tip circle $ØD_Z$ of hub	Lengthened l_1, l_2 max.	Sleeve [kg]	Hub [kg]	Total [kg]	Sleeve [kgcm²]	Hub [kgcm²]	Total [kgcm²]
M-14	M-14C	-		15	23	4	50	37	6,5	10	25	40	33	40	0,03	0,07	0,10	0,08	0,09	0,26
M-19	M-19C	-	Finish bores see stock programme	20	25	4	54	37	8,5	10	32	47	39	40	0,03	0,10	0,23	0,15	0,16	0,47
M-24	M-24C	-		24	26	4	56	41	7,5	14	36	53	45	50	0,04	0,14	0,32	0,21	0,36	0,93
M-28	M-28C	-		28	40	4	84	46	19	13	44	65	54	55	0,08	0,33	0,74	0,65	1,22	3,09
M-32	M-32C	-		32	40	4	84	48	18	13	50	75	63	55	0,09	0,43	0,95	1,14	2,17	5,48
M-38	M-38C	-		38	40	4	84	48	18	13	58	83	69	60	0,13	0,55	1,23	1,58	3,55	8,68
M-42		-		42	42	4	88	50	19	13	65	92	78	60	0,14	0,68	1,50	2,32	5,98	14,28
M-48	M-48C	-		48	50	4	104	50	27	13	68	95	78	60	0,23	0,79	1,81	3,90	7,22	18,34
M-65	M-65C	26 70 lg.		65	55	4	114	68	23	16	96	132	110	70	0,55	1,90	4,35	21,2	31,8	84,8
I-80		31		80	90	6	186	93	46,5	20	124	175	145	-	1,13	5,20	11,53	68,9	150,8	370,5
I-100		35		100	110	8	228	102	63	22	152	210	176	-	1,78	9,37	20,52	158,6	401,3	961,2
I-125		45		125	140	10	290	134	78	30	192	270	225	-	3,88	19,44	42,76	562,9	1362,3	3287,5

Order form:

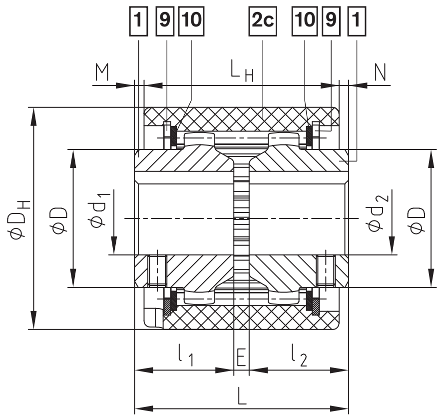
BoWex® M-28	d_1 Ø 20	d_2 Ø 28
Size and type of coupling	Finish bore H7 keyway to DIN 6885 sheet 1 (JS9)	Finish bore H7 keyway to DIN 6885 sheet 1 (JS9)

Type AS and type Spec.-I

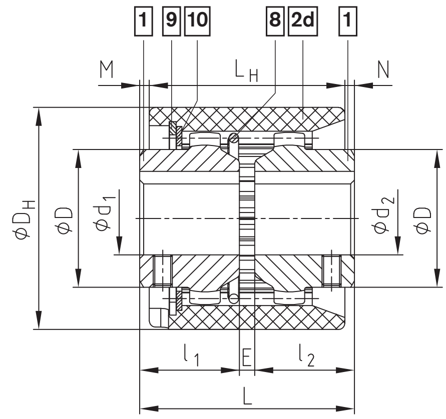


- Double cardanic curved-tooth gear coupling
- Maintenance-free due to the material combination nylon/steel
- Compensating for axial, radial and angular shaft misalignment
- Type AS – separable coupling design - axially movable sleeve when assembled
- Type Spec.-I – axial plug-in for blind assembly
- Application range from - 25 °C to + 100 °C
- Available with finish bore acc. to ISO fit H7, keyway to DIN 6885, sheet 1 - JS9 and thread for setscrews (page 74)
- Finish bores see stock programme on page 75
- For performance data see page 72

Components



Type AS



Type Spez. - I

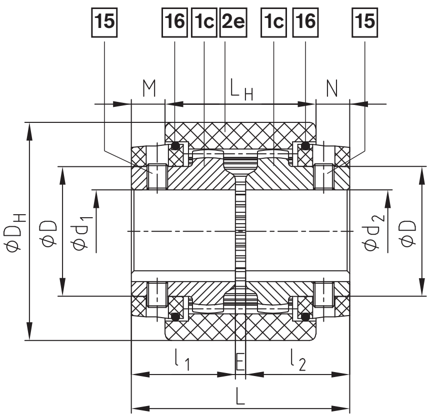
BoWex® type AS and type Spez.-I																		
Size	Pilot bore		Finish bore d_1, d_2		Dimensions [mm]								Weight with max. bore-Ø			Massmoment of inertia J with max. bore-Ø		
	Unbored	Pilot bored		max.	l_1, l_2	E	L	L_H	M, N	D	D_H	Lengthened l_1, l_2 max.	Sleeve [kg]	Hub [kg]	Total [kg]	Sleeve [kgcm²]	Hub [kgcm²]	Total [kgcm²]
24	x	-	Finish bores see stock programme	24	26	4	56	51	2,5	36	58	50	0,11	0,14	0,39	0,38	0,36	1,10
28	x	-		28	40	4	84	56	14	44	70	55	0,16	0,33	0,82	1,54	1,22	3,98
32	x	-		32	40	4	84	58	13	50	84	55	0,21	0,43	1,07	2,75	2,17	7,09
45	x	-		45	42	4	88	60	14	65	100	60	0,27	0,63	1,53	5,49	5,66	16,81
65	x	26 70 lg.		65	55	4	114	84	15	96	140	70	0,84	2,10	5,00	29,83	43,96	117,8
80	-	31		80	90	6	186	93	46,5	124	175	-	1,30	5,20	11,70	83,20	150,8	384,8
100	-	35		100	110	8	228	102	63	152	210	-	2,05	9,40	20,80	184,4	401,3	987,0
125	-	45		125	140	10	290	134	78	192	270	-	4,32	19,44	43,10	620,0	1362,3	3344,6

Order form:

BoWex® 32 AS	d_1 Ø 32	d_2 Ø 32
Size and type of coupling AS or Spec.-I	Finish bore H7 keyway to DIN 6885 sheet 1 (JS9)	Finish bore H7 keyway to DIN 6885 sheet 1 (JS9)

Type SG, type SSR and type Spec.-I/CD

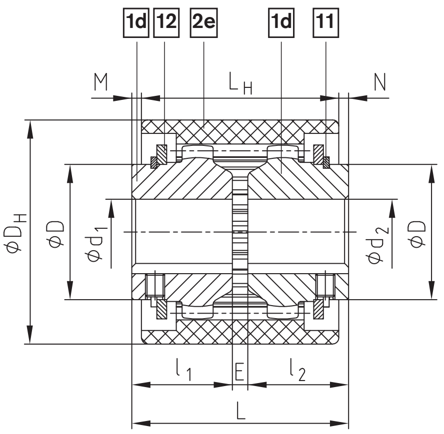
Type SG with dust protection circlips



BoWex® type SG												
Size	Pilot bore		Finish bore		Dimensions [mm]							
	Un-bored	Pilot bored	min.	max.	l_1, l_2	E	L	L_H	M, N	D	D_H	Leng-thened l_1, l_2 max.
24 SG	x	-	10	24	36	4	76	51	12,5	36	58	50
28 SG	x	-	10	28	40	4	84	56	14	44	70	55
32 SG	x	-	12	32	40	4	84	58	13	50	84	55
45 SG	x	-	20	45	42	4	88	60	14	65	100	60
65 SG	-	26	30	65	70	4	144	84	30	96	140	-
80 SG	-	31	35	80	90	6	186	93	46,5	122	175	-
100 SG	-	35	40	100	110	8	228	102	63	150	210	-
125 SG	-	45	50	125	140	10	290	134	78	190	270	-

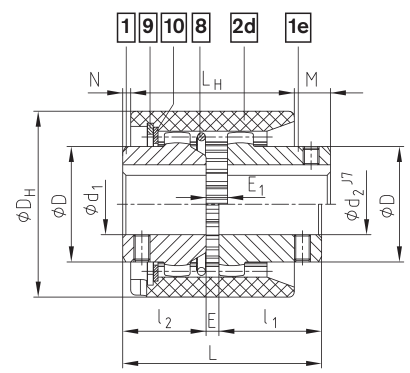
Thread for setscrews only for finish bored hubs.

Type SSR with supporting circlips



BoWex® type SSR												
Size	Pilot bore		Finish bore		Dimensions [mm]							
	Un-bored	Pilot bored	min.	max.	l_1, l_2	E	L	L_H	M, N	D	D_H	Leng-thened l_1, l_2 max.
24 SSR	x	-	10	22	26	4	56	51	2,5	35	58	50
28 SSR	x	-	10	26	40	4	84	56	14	42	70	55
32 SSR	x	-	12	30	40	4	84	58	13	48	84	55
45 SSR	x	-	20	42	42	4	88	60	14	63	100	60
65 SSR	x	26 70 lg.	30	65	55	4	114	84	15	95	140	70
80 SSR	-	31	35	80	90	6	186	93	46,5	120	175	-
100 SSR	-	35	40	100	110	8	228	102	63	150	210	-
125 SSR	-	45	50	125	140	10	290	134	78	190	270	-

Type Spec.-I/CD



driven side driving side

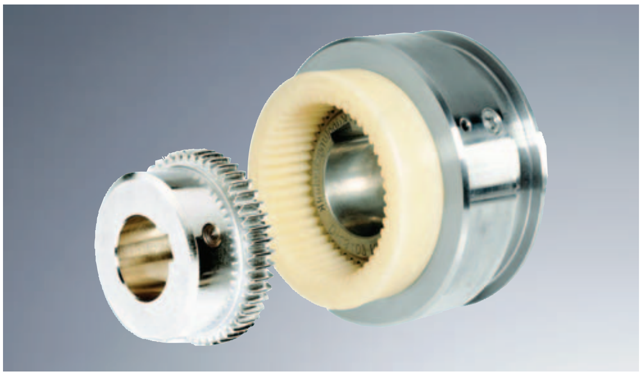
BoWex® type Spec.-I/CD															
Size	Pilot bore		Finish bore		Dimensions [mm]										
	Un-bored	Pilot bored	min.	max.	L	L_1	L_H	E	E_1	l_2	l_1	D_H	D	M	N
24 CD	x	-	10	24	70	73,5	51	4	7,5	26	40	58	36	20	2,5
28 CD	x	-	10	28	94,5	98	56	4	8,5	40	50,5	70	44	28	14
32 CD	x	-	12	32	94,5	-	58	4	8,5	40	50,5	84	50	27	13
45 CD	x	-	20	45	101,5	-	60	4	8,5	42	55,5	100	65	32	14
65 CD	-	26	30	65	123	-	84	4	10	55	64	140	96	28,5	15
80 CD	-	31	35	80	179	-	93	6	13	90	83	175	124	44	46,5

Please order dimension sheet of type Spec.-I/CDB with shear pins.

Order form:

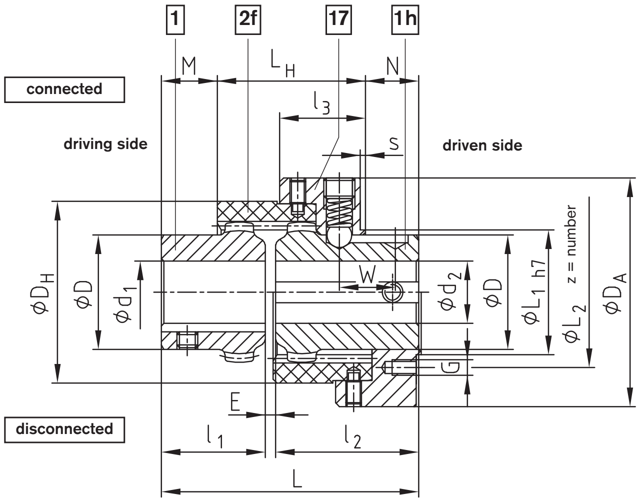
BoWex® 45 SG	d_1 Ø 22	d_2 Ø 40
Size and type of coupling SG, SSR or Spec.-I/CD	Finish bore H7 keyway to DIN 6885 sheet 1 (JS9)	Finish bore H7 keyway to DIN 6885 sheet 1 (JS9)

Type SD



- For all applications in the range of general engineering to quickly connect or disconnect power packs at standstill
- Maintenance-free due to the material combination nylon/steel
- Application range from - 25 °C to + 100 °C
- Available with finish bore according to ISO fit H7, keyway to DIN 6885 sheet 1 - JS9, thread for setscrews see on page 74
- For performance data please see page 72, compare to design M/I
- max. circumferential speed v = 20 m/s, referring to $ØD_A$

Components



BoWex® type SD																						
Size	Pilot bore		Finish bore d_1, d_2			Dimensions [mm]												Weight with max. bore-Ø		Massmoment of inertia J with max. bore-Ø		Shifting force [N]
	Unbored	Pilot bored	d_1	d_1 max.	d_2 max.	E	l_1	l_2	L	L_H	l_3	M	W	N	D	D_H	D_A	Shifting hub with sleeve [kg]	Driving hub [kg]	Shifting hub with sleeve [kgcm²]	Driving hub [kgcm²]	
24 SD	x	-	Finish bores see stock programme on page 75	24	24	4	26	50	80	52	31	10	19	18	36	58	78	1,08	0,14	8,23	0,36	140
28 SD	x	-		28	28	4	40	55	99	57	33	21,5	21,5	20,5	44	70	88	1,50	0,33	15,62	1,22	180
32 SD	x	-		32	32	4	40	55	99	58	33	20,5	21,5	20,5	50	84	100	1,85	0,43	22,87	2,17	180
45 SD	x	-		45 48	45	4	42 50	60	106 114	63	37	21,5 29,5	22,5	21,5	65	100	125	2,56	0,68 0,79	46,07	5,66	250
65 SD	x	26 70 lg.		65	65	4	55	70	129	77	37	28	25	24	95	140	156	5,07	2,30	158,99	43,96	350
80 SD	-	31		80	80	6	90	90	186	96	47	56	35	34	124	175	195	10,60	5,20	523,7	150,8	350
100 SD	-	35		100	100	8	110	110	228	113	55	72	43	43	152	210	235	18,87	9,37	1350	401,3	400
125 SD	-	45		125	125	10	140	140	290	149	70	89	52	52	192	270	298	40,40	9,44	4919	1362,3	450

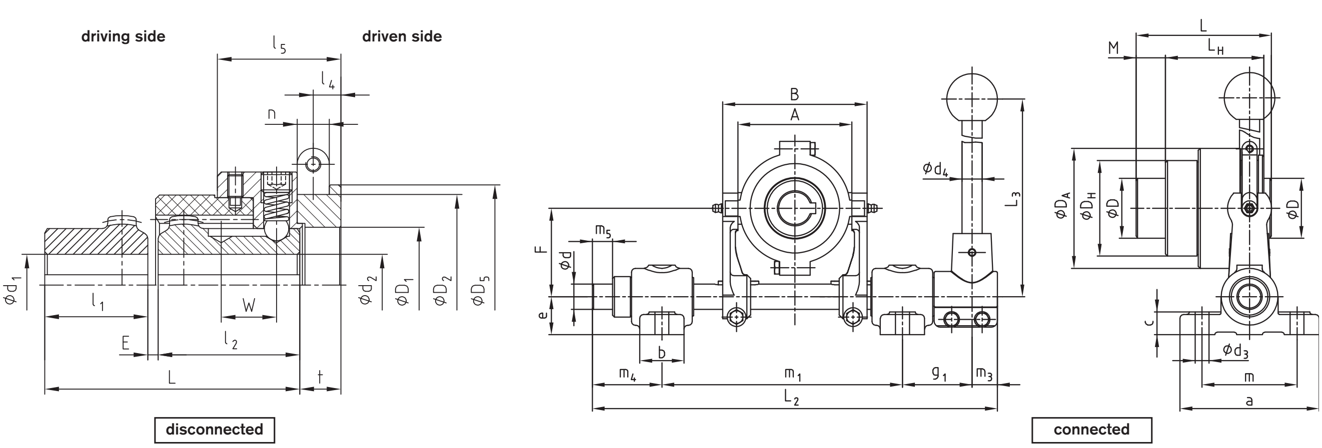
Connection dimensions of BoWex® SD shifting ring (part 17) for mounting of: slip ring SD1 (s. catalogue page 81), shifting disk etc.				
Size	Dimensions [mm]			
	L_1	L_2	z x G	s
24 SD	48	58	4 x M6	2
28 SD	48	58	4 x M6	2
32 SD	64	75	4 x M6	2
45 SD	75	90	4 x M8	2
65 SD	100	114	4 x M8	2
80 SD	130	145	4 x M8	3
100 SD	180	196	6 x M10	4
125 SD	220	236	6 x M10	4

Order form:

BoWex® 32 SD	d_1 Ø 32	d_2 Ø 32
Size and type of coupling	Finish bore H7 keyway to DIN 6885 sheet 1 (JS9)	Finish bore H7 keyway to DIN 6885 sheet 1 (JS9)

Type SD

- For all applications in the range of general engineering to quickly connect or disconnect power packs at standstill
- Maintenance-free due to the material combination nylon/steel
- Application range from - 25 °C to + 100 °C
- Available with finish bore according to ISO fit H7, keyway to DIN 6885 sheet 1 - JS9, thread for setscrews see on page 74
- Available with slip ring and shiftable linkage for manual operation
- For performance data please see page 72, compare to design M/I
- max. circumferential speed v = 20 m/s, referring to $ØD_A$



BoWex® type SD1 and slip ring

Size	Finish bore			Dimensions [mm]																	Shifting force
	d_1	d_1 max.	d_2 max.	E	l_1	l_2	L	L_G	l_4	l_5	M	W	t	D	D_H	D_A	D_1	$D_2^{\pm0,1}$ (keyway)	D_5	$n^{\pm0,1}$ (keyway)	[N]
24 SD1	Finish bores see stock programme on page 75	24	24	4	26	50	80	67	11	46	10	19	16	36	58	78	45	70,5	78	12,5	140
28 SD1		28	28	4	40	55	99	72	11	48	21,5	21,5	16	44	70	88	45	70,5	78	12,5	180
32 SD1		32	32	4	40	55	99	78	13,5	53	20,5	21,5	21	50	84	100	60	89,5	100	17,5	180
45 SD1		45	45	4	42	60	106	84	14	58	21,5	22,5	22	65	100	125	70	112,5	125	18	250
		48			50		114				29,5										
65 SD1		65	65	4	55	70	129	103	16	61	26	25	25	96	140	156	96	130,5	145	20,5	350
80 SD1		80	80	6	90	90	1186	124	18,5	75	56	35	29	124	175	195	125	164,5	182	25,5	350
100 SD1		100	100	8	110	110	228	152	28	94	72	43	39	152	210	235	174	210,5	230	30,5	400
125 SD1		125	125	10	140	140	290	193	30,5	114	89	52	44	192	270	298	214	250,5	275	35,5	450

BoWex® Bauart SD1 – shiftable linkage

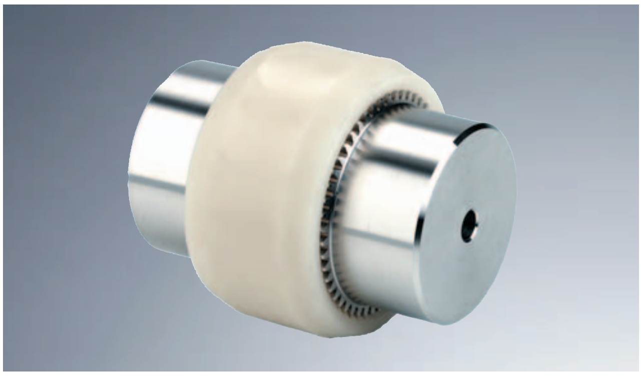
Size	Shiftable linkage size	Slip ring size	Dimensions [mm]																Dimensions with m_1 max.		
			a	b	c	d	d_3	d_4	e	F	g_1	L_2	L_3	m	m_1 min.	m_1 max.	A	B	m_3	m_4	m_5
24 SD1	1	1,1	110	35	18	20	11	16	30	70	55	320	400	75	180	190	90	114		55	16
28 SD1	1	1,1																			
32 SD1	2	2,2				25				97,5	60	430	450		240	270	111	151	20	80	34
45 SD1	3	3,3	140	40		30		20	40	120		490	600	100	280	310	140	180		90	44
65 SD1	3	4,4			25		13,5				70						170	210			
80 SD1	4	5,5				35			50	147,5		565	750		321	365	200	244		100	54
100 SD1	5	6,6	160	45		40		30	50 1)	190	80	630	1068	120	365	410	250	300	30	110	62
125 SD1	5	7,7													-		300	350			

1) = For a continuous base plate the dimension "e" has to be increased by at least 10 mm.
The brackets have to be adapted to the driving and driven sides accordingly.

Order form:

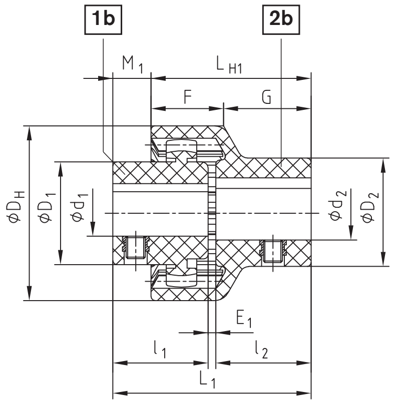
BoWex® 65 SD1	d_1 Ø 32	d_2 Ø 32	4,4	3
Size and type of coupling	Finish bore H7 keyway to DIN 6885 sheet 1 (JS9)		Slip ring size	Shiftable linkage size

made from corrosion-proof material

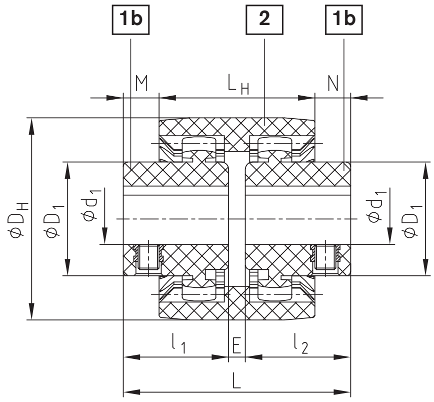


- BoWex® shaft couplings made from polyamid or stainless steel (material-no. 1.4571 and V4A respectively)
- BoWex® junior plug-in coupling (2 parts)
- BoWex® junior M (3 parts) from polyamide
- BoWex® M with sleeve made from polyamide and hubs from stainless steel (1.4571), available with finish bore acc. to ISO fit H7, keyway to DIN 6885, sheet 1 - JS9 and thread for setscrews (page 74)
- For performance data please see page 72

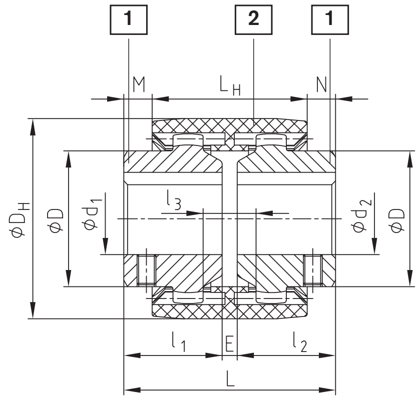
Components



Type junior plug-in coupling (2 parts)



Type junior M coupling (3 parts)



Type M

BoWex® junior plug-in coupling (2 parts) and BoWex® junior M (3 parts)

Size	Finish bore				Dimensions [mm]									
	Hub part 1b d_1	D_1	Plug-in-sleeve part 2b d_2	D_1	D_H	l_1, l_2	E_1	E	L_{H1}	L_H	L_1	L	M_1	M, N
14 M-14	Ø6, Ø7, Ø8, Ø9	22	Ø8	22	40	23	2	4	40	37	48	50	8	6,5
	Ø10, Ø11	25	Ø10, Ø11	25										
	Ø12, Ø14	26	Ø12, Ø14	26										
19 M-19	Ø12, Ø14	27	Ø14, Ø15	29	48	25	2	4	42	37	52	54	10	8,5
	Ø16	30												
	Ø19	32	Ø19	35										
24 M-24	Ø10, Ø11, Ø12	26	Ø14, Ø16	32	53	26	2	4	45	41	54	56	9	7,5
	Ø14, Ø15, Ø16	32												
	Ø18, Ø19, Ø20	36	Ø19, Ø20	36										
	Ø24	38	Ø24	40										

BoWex® type M

Size	Finish bore $d_{1max.}, d_{2max.}$	Dimensions [mm]						
		D_H	D	l_1, l_2	E	L_H	L	M, N
M-24	24	53	36	26	4	41	56	7,5
M-38	38	83	58	40	4	48	84	18
M-48	48	95	68	50	4	50	84	18

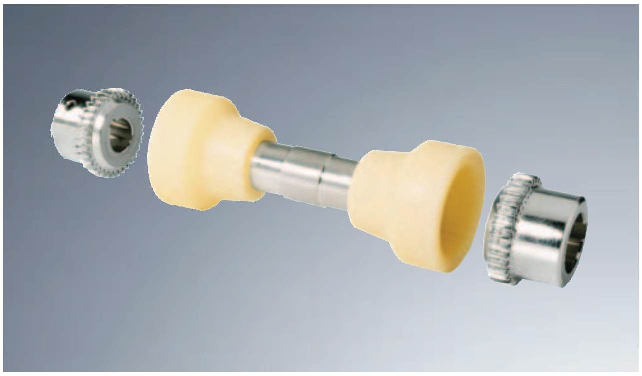
Further sizes on request.

Application areas:
Food processing industry, print and paper, textile industry, sewage technology, wash-mobiles, chemical and pharmaceutic industry, offshore units ...
For applications in aggressive atmospheres (air, water, chemicals etc.).

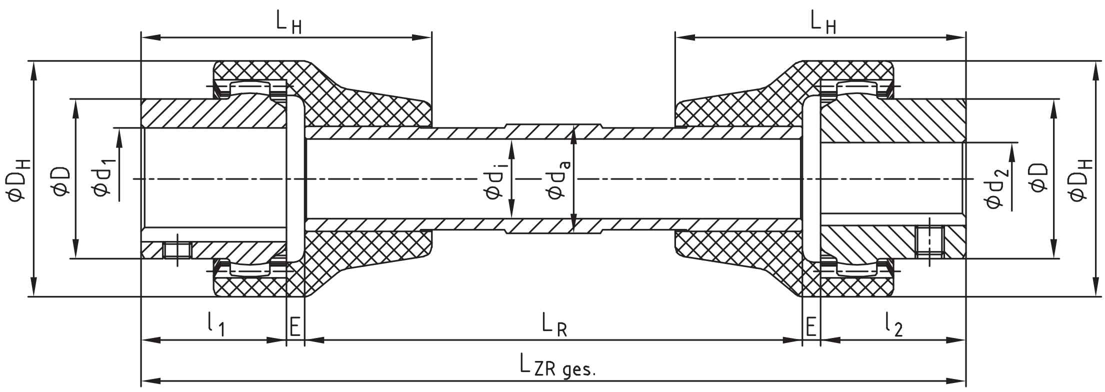
Order form:

BoWex® M-24 V4A	d_1 Ø 20	d_2 Ø 24
Size and type of coupling	Finish bore H7 keyway to DIN 6885 sheet 1 (JS9)	Finish bore H7 keyway to DIN 6885 sheet 1 (JS9)

Type ZR and type Spec.-I for connection of larger shaft distances

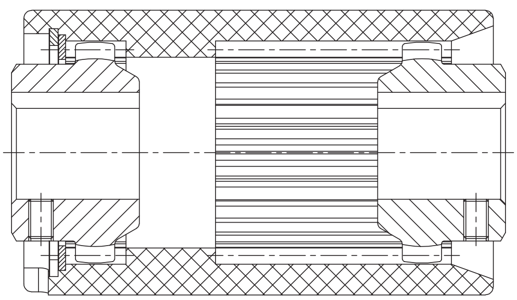


- Double cardanic curved-tooth gear coupling
- For all applications to connect larger shaft distances
- Low-cost for serial production
- Compensating for larger shaft displacements
- Axial plug-in
- Intermediate tubes variable in length (max. 2000 mm; on consultation with KTR)
- Hubs available with finish bores acc. to ISO fit H7 as well as taper and inch bores
- Application range from - 25 °C to + 100 °C



Type ZR

BoWex® type ZR																	
Size	Pilot bore	Finish bore	Dimensions [mm]												Torque T_K [Nm]		
		$d_{1max.}$, $d_{2max.}$	l_1, l_2	Lengthened l_1, l_2 max.	L_H	E	$L_{ZR\ ges.}$	L_R	D	D_H	d_i	d_a	T_{KN}	$T_{K\ max.}$	T_{KW}
14	-	14	23	40	40	3			25	40	21	25	10	20	5
28	-	28	40	55	60	3	as indicated by		44	66	30	26	45	90	23
42	-	42	42	60	85	3	the customer		65	95	40	50	100	200	50
48	-	48	50	60	85	3			68	95	40	50	140	280	70



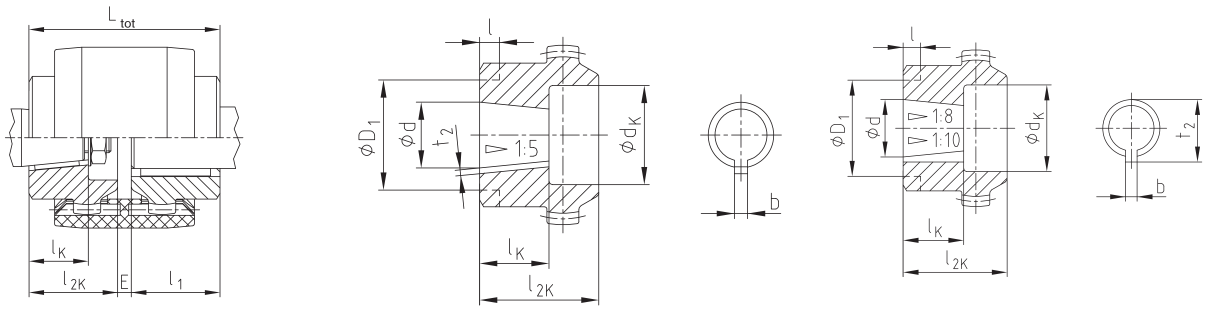
Type Spec.-I with a long PA-sleeve

- Lengthened special sleeves available on request
- Connecting larger shaft distances
- Axial shifting of driving and driven shaft at standstill
- Maintenance-free
- Compensating for larger displacements
- Axial plug-in
- Application range from - 25 °C to + 100 °C

- BoWex® ZR couplings are available up to a length of 2000 mm only for serial applications (n_{max} = 1000 1/min)
- BoWex® Spec.-I with lengthened sleeve on request

Taper bores

BoWex® with taper bores



$L_{tot} = l_1 + E + l_{2K}$

For stock parts please see page 75

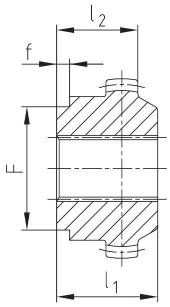
Taper bores 1:5																						
Dimensions [mm]					Counterbore d_K and hub length l_{2K} [mm] Recess on hub collar D_1 x l [mm]																	
Code	Details of bores				14		19		24		28		32		38		42		48		65	
	$d^{+0,05}$	b^{JS9}	$t_2^{+0,1}$	l_K	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}
A-10	9,85	2	1,0	11,5	18	23	18	25	25	26	25	26	25	26	25	26						
					-		30 x 7		30 x 7		30 x 5		-		30 x 5							
B-17	16,85	3	1,8	18,5			25	30	28	30	36	40	36	40	36	40	45	42	45	42	45	50
C-20	19,85	4	2,2	21,5					28	36	36	40	36	40	36	40	45	42	45	42	45	50
Cs-22	21,95	3	1,8	21,5					28	36	36	40	36	40	36	40	45	42	45	42		
D-25	24,85	5	2,9	26,5							36	40	36	40	36	40	45	42	45	42	45	50
E-30	29,85	6	2,6	31,5											45	55	45	55	45	55	45	55
F-35	34,85	6	2,6	36,5															52	60	55	60
G-40	39,85	6	2,6	41,5															52	60	65	70

Taper bores 1:8																						
Dimensions [mm]					Counterbore d_K and hub length l_{2K} [mm] Recess on hub collar D_1 x l [mm]																	
Code	Details of bores				14		19		24		28		32		38		42		48		65	
	$d^{+0,05}$	b^{JS9}	$t_2^{+0,1}$	l_K	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}
N/1	9,7 ±0,015	2,4	10,85	17	18	26	18	25	25	26	25	30	25	30	25	30						
					23 x 8		23 x 8		23 x 8		23 x 8		-		23 x 8							
N/1c	11,6	3^{JS9}	12,90	16,5	18	23			25	26	25	30										
N/1e	13	2,4	13,80	21					25	30	25	30			25	30						
N/1d	14	3^{JS9}	15,50	17,5	20	23	25	30	28	30	28	30	28	40								
					-		-		-		28 x 10		-									
N/2	17,287	3,2	18,24	24					28	35	36	40	36	40	36	40	45	42	45	42	45	50
									-		35 x 12		-		-		-		-		-	
N/2a	17,287	4^{JS9}	18,94	24					28	35	36	40	36	40	36	40	45	42	45	42	45	50
									-		35 x 12		-		-		-		-		-	
N/2b	17,287	3^{JS9}	18,34	24					28	35					36	40	45	42	45	42		
									-						-		-		-			
N/3	22,002	4^{JS9}	23,40	28							36	40	36	40	36	40	45	42	45	42	45	50
											-		-		-		-		-		48 x 14	
N/4	25,463	4,78	27,83	36							36	50	36	50	36	50	45	50	45	50	45	62
											-		-		-		58 x 10		58 x 10		-	
N/4b	25,463	5^{JS9}	28,23	36							36	50					45	50	45	50	45	62
N/4a	27	4,78	28,80	32,5											36	50						
N/4g	28,45	6^{JS9}	29,32	38,5											36	60	45	60	45	60		
N/5	33,176	6,38	35,39	44											45	60	45	60	45	60	45	62
N/5a	33,176	7^{JS9}	35,39	44													45	60	45	60	45	62

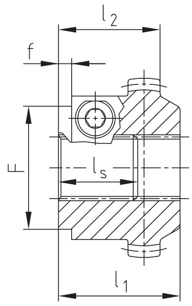
Taper bores 1:10																						
Dimensions [mm]					Counterbore d_K and hub length l_{2K} [mm]																	
Code	Details of bores				14		19		24		28		32		38		42		48		65	
	$d^{+0,05}$	b^{JS9}	$t_2^{+0,1}$	l_K	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}
CX-20	19,85	5	22,08	32							36	50			36	50	45	50	45	50		
DX-25	24,95	6	26,68	45									36	50			45	60	45	60	45	60
EX-30	29,75	8	31,88	50													45	60	45	60	45	70

Spline hubs and inch bores

Basic programme of BoWex® spline hubs



Spline hub (N)



Clamping hub (K)

If it is not possible to secure the hubs of pump shafts with involute spline by means of an end plate and a screw, we recommend our spline clamping hub.
The radial clamping ensures a backlash-free tight fit on the pump shaft.

Spline and clamping hubs to DIN 5480

Size	Dimensions [mm]							Order designation Indicate coupling size
	Type	Spline size	l_1	l_2	l_S	F	f	
42	N	25x1,25x18	42	-	-	-	-	P000205
	K	25x1,25x18	42	-	-	-	-	P500202
	K	30x2x14	42	-	-	60	6	P500203
48	N	30x2x14	50	-	-	60	6	P000206
	K	30x2x14	50	-	-	60	6	P500203
65	N	35x2x16	55	-	-	60	6	P000303
	K	35x2x16	60	-	-	60	6	P500301
	N	40x2x18	55	-	-	78	6	P000304
	K	40x2x18	60	-	-	78	6	P500302
	K	45x2x21	55	-	-	78	6	P500401

Spline and clamping hubs to SAE J498

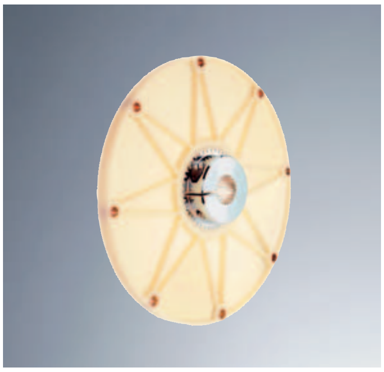
Size	Dimensions [mm]							Order designation Indicate coupling size
	Type	Spline size	l_1	l_2	l_S	F	f	
42	K	PH-S ⅝" 16/32DP, z=9	42	-	-	-	-	P558101
	K	PI-S ¾" 16/32DP, z=11	-	35	-	-	-	P559101
	K	PB-S ⅞" 16/32DP, z=13	42	-	-	60	3	P567101
	K	PB-BS 1" 16/32DP, z=15	42	-	27	50	6	P660201
48	K	PA-S ⅜" 16/32DP, z=21	50	-	45	52	7	P663301
65	K	PA-S ⅜" 16/32DP, z=21	55	-	48	52	5	P663301
	K	PC-S 1¼" 16/32DP, z=14	55	-	44	52	5	P656201

Inch bores – For the stock parts please see the stock programme on page 75

Code	Dimensions [mm]				Code	Dimensions [mm]				Code	Dimensions [mm]			
	Ød	Ød [inch]	$b^{+0,05}$	$t_2^{+0,2}$		Ød	Ød [inch]	$b^{+0,05}$	$t_2^{+0,2}$		Ød	Ød [inch]	$b^{+0,05}$	$t_2^{+0,2}$
Tb	9,5$^{+0,03}$	3/8	3,17	11,1	F	22,22$^{+0,03}$	7/8	6,38	25,2	M	34,92$^{+0,03}$	1 3/8	7,93	38,6
DNB	11,11^{M7}	7/16	2,4	12,5	Gd	22,225^{M7}	7/8	4,76	24,7	RH1	34,93^{M7}	1 3/8	9,55	37,8
T	12,69^{H7}	1/2	4,75	14,6	Gf	23,80$^{+0,03}$	15/16	6,35	26,8	Cb	36,50$^{+0,03}$	1 7/16	9,55	40,9
Ta	12,7$^{+0,03}$	1/2	3,17	14,3	B	25,37$^{+0,03}$	1	4,78	27,8	Ca	38,07$^{+0,03}$	1 1/2	7,93	42,0
DNC	13,45^{M7}	17/32	3,17	14,9	Ba	25,37$^{+0,03}$	1	6,35	27,6	C	38,07$^{+0,03}$	1 1/2	9,55	42,5
E	15,87$^{+0,03}$	5/8	3,17	17,5	Bs	25,38$^{+0,03}$	1	6,37	28,3	N	41,25$^{+0,03}$	1 5/8	9,55	45,6
S	15,87$^{+0,03}$	5/8	3,97	17,9	H	25,40$^{+0,03}$	1	4,78	27,8	Nb	41,275^{M7}	1 5/8	9,55	45,8
Es	15,88$^{+0,03}$	5/8	4,0	17,7	DNF	25,38^{H7}	1	6,35	28,4	Ls	44,42$^{+0,03}$	1 3/4	9,55	48,8
DND	15,852^{H7}	5/8	4,75	18,1	Hs	25,40$^{+0,03}$	1	6,35	28,7	L	44,45^{K7}	1 3/4	11,11	49,4
Ed	15,87$^{+0,03}$	5/8	4,75	18,1	Sa	28,575^{M7}	1 1/8	6,35	31,7	Lu	47,625^{M7}	1 7/8	12,7	53,5
DNH	17,465^{H7}	11/16	4,75	19,6	Sb	28,58$^{+0,03}$	1 1/8	6,35	31,5	Da	49,20$^{+0,03}$	1 15/16	12,7	55,0
Ad	19,02$^{+0,03}$	3/4	3,17	20,7	Sd	28,58$^{+0,03}$	1 1/8	7,93	32,1	Ds	50,77$^{+0,03}$	2	12,7	56,4
As	19,02$^{+0,03}$	3/4	4,78	21,3	Ja	31,70^{H7}	1 1/4	7,93	34,4	D	50,80$^{+0,03}$	2	12,7	55,1
A	19,05$^{+0,03}$	3/4	4,78	21,3	Jc	31,71$^{+0,03}$	1 1/4	7,93	35,3	P	53,95$^{+0,03}$	2 1/8	12,7	59,6
Fa	22,20$^{+0,03}$	7/8	6,35	25,2	Js	31,75$^{+0,03}$	1 1/4	6,35	34,6	Pa	53,975^{M7}	2 1/8	12,7	60,0
Ga	22,21^{H7}	7/8	4,75	24,8	J	31,75$^{+0,03}$	1 1/4	7,93	34,4	Ub	60,325^{M7}	2 3/8	15,875	67,6
DNI	22,228^{H7}	7/8	6,35	25,0	K	31,75^{K7}	1 1/4	7,93	35,5	Wa	73,025^{M7}	2 7/8	19,05	81,7
Gs	22,22$^{+0,03}$	7/8	4,78	24,4	DNK	31,755^{H7}	1 1/4	7,93	35,3	Wd	85,725^{M7}	3 3/8	22,225	95,8
G	22,22$^{+0,03}$	7/8	4,75	24,7	Ma	34,925^{M7}	1 3/8	7,93	38,7	Wf	92,075^{M7}	3 5/8	22,225	101,9

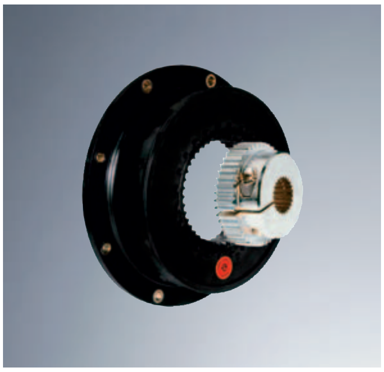
Operating description

BoWex® FLE-PA



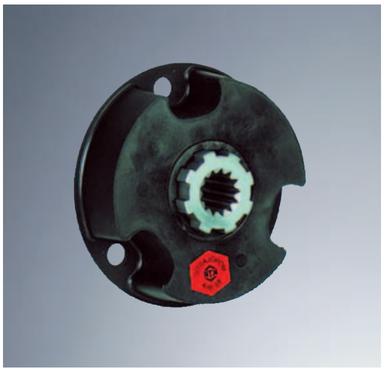
BoWex® FLE-PA couplings are torsionally rigid curved-tooth flange couplings, made from a combination of nylon and steel, for diesel engine drives in combination with hydraulic pumps.
The FLE-PA mounting flange is made from glass fiber reinforced polyamide with high mechanical stability and thermal strength.
The coupling hub with external curved teeth is made from steel.
The BoWex® FLE-PA allows an extremely short installation space. Apart from that it is easy to assemble without any additional tools for alignment.

BoWex-ELASTIC®



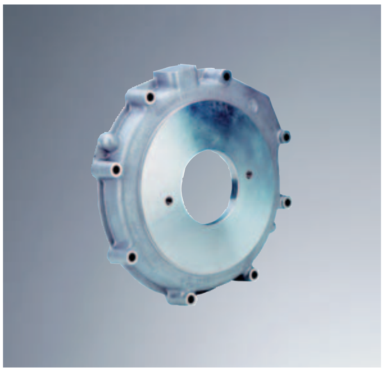
BoWex-ELASTIC® is highly flexible, combining the benefits of the well-approved BoWex® system with the suppleness of a highly flexible coupling in compact design. Torsional vibrations and shock loads that may occur are dampened and reduced.
The BoWex-ELASTIC® consists of a highly flexible, annular rubber element from temperature-resistant natural caoutchouc, stressed for torque-to-bore ratio, and a BoWex® coupling hub to be plugged-in axially.

MONOLASTIC®



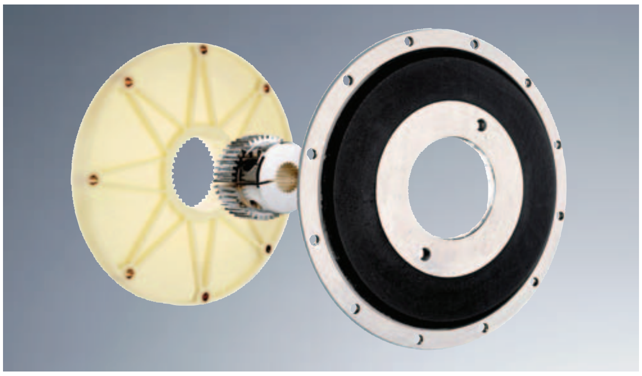
MONOLASTIC® is a single-piece, flexible coupling with torque-to-bore volume ratio from natural rubber. The hub from steel with a hardened internal spline already assembled by the manufacturer allows an axial plug-in connection of the hydraulic pump. These couplings are available with all usual involute splines to SAE or DIN.

Pump mounting flanges

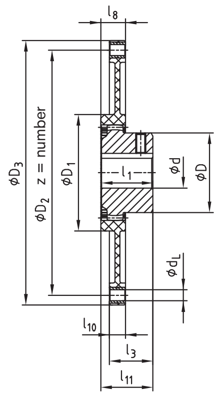


For connecting hydraulic pumps to the diesel engine KTR supplies mounting flanges sizes SAE 6 to SAE 1 in accordance with the SAE mounting dimensions. The flanges are made from steel for hydraulic pumps with flange connections to SAE-A, B, C, D and E both in a 2-hole or 4-hole design.
Pump connection housings from EN-GJL-250 (GG 25) to be mounted directly to the back plate of the engine.

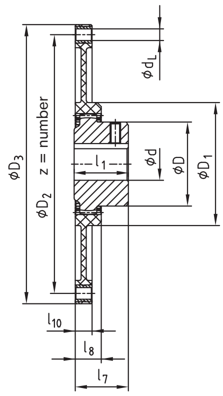
Type FLE-PA



- Flange coupling for connection to I. C.-engines and hydraulic pumps
- Applicable to all hydrostatic drives of construction machines, harvesting machines, etc.
- High torsional stiffness – operation free from resonance
- Maintenance-free due to the material combination nylon/steel
- Nylon flange with high mechanical resistance and thermal strength (+ 130 °C)
- Extremely short assembly
- Easy assembly by axial mounting
- Special mounting flanges available



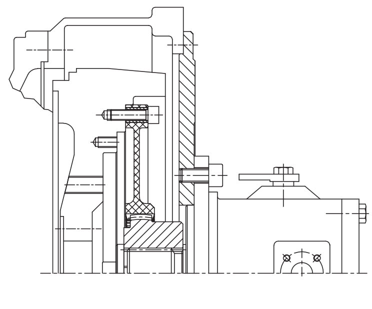
mounting short



mounting long

Flange dimensions according to SAE J 620 [mm]				
Size	D_3	D_2	z	d_L
6 ½"	215,9	200,02	6	9
7 ½"	241,3	222,25	8	9
8"	263,52	244,47	6	11
10"	314,32	295,27	8	11
11 ½"	352,42	333,37	8	11
14"	466,72	438,15	8	14

Example of installation



BoWex® FLE-PA
for diesel engines with SAE connection; fixing of hub by means of end plate and screw.

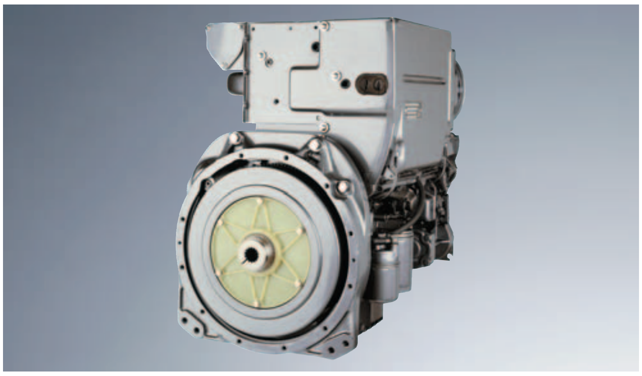
BoWex®-FLE-PA – Dimensions/Dimension to SAE

Size	Pilot bore	Finish bore d		Dimensions [mm]								Special length	Dimension to SAE (D_3)						Max. axial displacement
		min.	max.	D	D_1	l_1	l_3	l_7	l_8	l_{10}	l_{11}	l_1 max.	6 ½"	7 ½"	8"	10"	11 ½"	14"	[mm]
48	-	20	48	68	100	50	41	50	20	13	48	up to 60	●	●	●	●			± 2
T 48	13	20	48	68	100	50	38	45	20	13	46	-	●	●	●	●			± 1
T 55	17	20	55	85	115	50	37	48	24	13	48	-	●	●	●	●			± 2
65 / T 65	26	30	65	96	132	55	45	54	27	21	51	up to 70			●	●	●		± 2
T 70	26	30	70	100	153	60	48	56	30	21	57	-				●			± 2
80 / T 80	31	35	80	124	170	90	78	87	30	21	87	-					●		± 2
100 / T 100	35	40	100	152	265	110	78	108	35	21	110	-					●	●	± 2
125	45	50	125	192	250	140	37	133	50	28	97	-					●	●	± 2

Technical data of BoWex® FLE-PA – Torques/Weight/Mass moments of inertia/Torsion spring stiffness

Size	Torque T_K [Nm]			Weight / Mass moment of inertia J	Hub with max. bore Ø	FLE-PA flanges according to SAE						Dynamic torsion spring stiffness with + 60 °C / ψ = 0,4 [Nm/rad]			
	T_{KN}	$T_{K\,max.}$	T_{KW}			6 ½"	7 ½"	8"	10"	11 ½"	14"	0,30 T_{KN}	0,50 T_{KN}	0,75 T_{KN}	1,00 T_{KN}
48	240	600	120	[kg]	0,79	0,32	0,43	0,51	0,64	–	–	35 x 10^3	75 x 10^3	105 x 10^3	125 x 10^3
				[kgm²]	0,0007	0,0021	0,0035	0,0049	0,0085						
T 48	300	750	150	[kg]	0,79	0,32	0,43	0,51	0,64	–	–	40 x 10^3	86 x 10^3	120 x 10^3	143 x 10^3
				[kgm²]	0,0007	0,0021	0,0035	0,0049	0,0085						
T 55	450	1125	225	[kg]	1,12	0,34	0,62	0,45	0,646	–	–	90 x 10^3	140 x 10^3	170 x 10^3	195 x 10^3
				[kgm²]	0,0016	0,0022	0,0053	0,0044	0,0086						
65	650	1600	325	[kg]	2,30	–	–	0,63	0,64	0,89	–	110 x 10^3	160 x 10^3	200 x 10^3	230 x 10^3
				[kgm²]	0,0044			0,0064	0,0065	0,012					
T 65	800	2000	400	[kg]	2,40	–	–	0,63	0,64	0,89	–	130 x 10^3	190 x 10^3	240 x 10^3	280 x 10^3
				[kgm²]	0,0044			0,0064	0,0065	0,012					
T 70	1000	2500	500	[kg]	2,60	–	–	–	0,941	–	–	230 x 10^3	345 x 10^3	440 x 10^3	517 x 10^3
				[kgm²]	0,0059				0,0132						
80	1200	3000	600	[kg]	5,20	–	–	–	–	1,12	–	200 x 10^3	410 x 10^3	580 x 10^3	700 x 10^3
				[kgm²]	0,0151					0,022					
T 80	1500	3750	750	[kg]	5,20	–	–	–	–	1,12	–	240 x 10^3	450 x 10^3	638 x 10^3	770 x 10^3
				[kgm²]	0,0151					0,022					
100	2050	5150	1025	[kg]	9,37	–	–	–	–	1,16	8,45	500 x 10^3	700 x 10^3	856 x 10^3	950 x 10^3
				[kgm²]	0,0401					0,021	0,234				
T 100	2500	6250	1250	[kg]	9,37	–	–	–	–	1,16	8,45	600 x 10^3	830 x 10^3	960 x 10^3	1070 x 10^3
				[kgm²]	0,0401					0,021	0,234				
125	4250	10700	2125	[kg]	19,73	–	–	–	–	2,09	9,85	4200 x 10^3	5000 x 10^3	5600 x 10^3	6200 x 10^3
				[kgm²]	0,1359					0,043	0,306				

Selection according to SAE standard

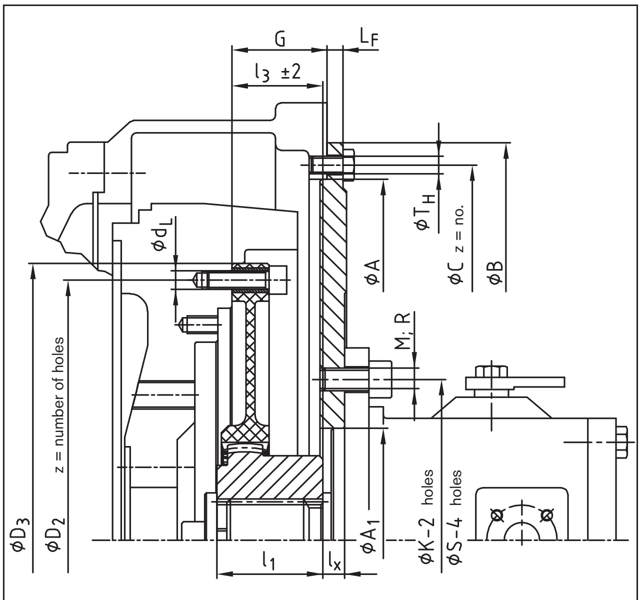


Selection of the coupling

Determination of coupling size	Table 1
Connection dimension of coupling	Table 2
Hub design/Mounting length	Table 3

SAE - pump mounting flange

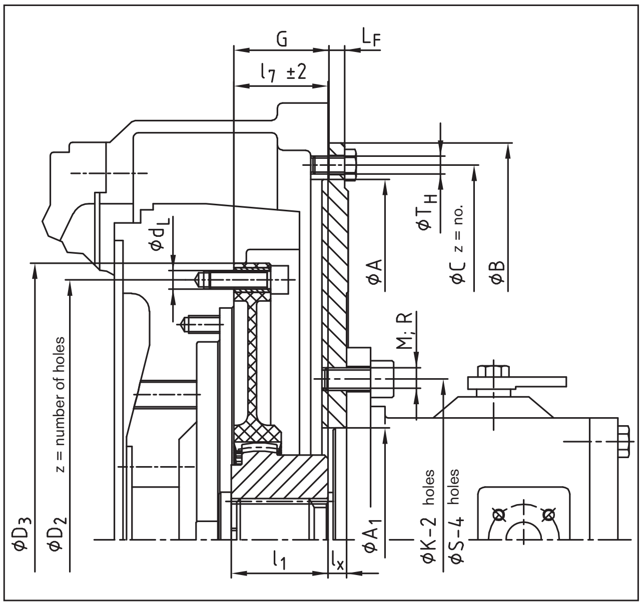
Flange size according to SAE 617	Table 4
Mounting flange of hydraulic pump	Table 5



Coupling-mounting short (l_3)

Marking on PA flange

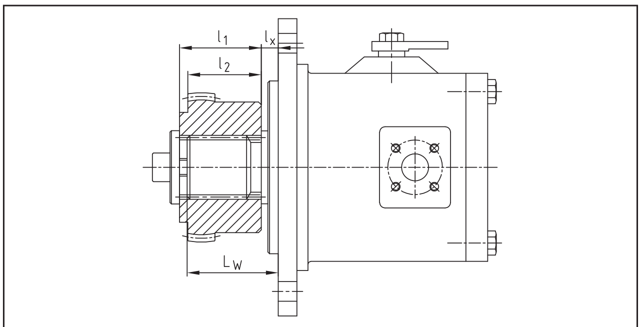
1 mounted short side



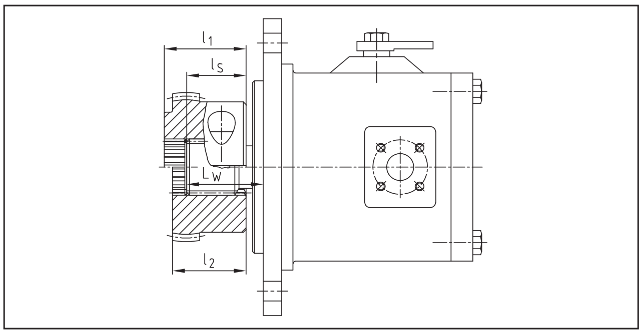
Coupling-mounting long (l_7)

Marking on PA flange

2 mounted long side



Spline hub



Clamping hub

Determination of mounting length l_3 oder l_7	
SAE shaft	$l_3 / l_7 = G + L_F - L_W + l_S$
DIN shaft	$l_3 / l_7 = G + L_F - l_X$

If axial fixing of the hub by means of an end plate and a screw is not possible for a pump shaft with involute spline, we would recommend to use our clamping hub.

Mounting instructions:
The flange can be fastened to the engine flywheel by means of socket head cap screws according to DIN EN ISO 4762 quality 8.8 or by hexagon head screw quality 8.8. We recommend screws are loctited in position.

Screw tightening torque of FLE-PA flange to flywheel	
M8	25 Nm
M10	49 Nm
M12	86 Nm

Screw tightening torque of spline clamping hubs DIN EN ISO 4762		
42/48	M10	49 Nm
65	M12	86 Nm
80/100	M16	210 Nm

Mounting dimensions according to SAE standard

1. Selection of coupling for diesel engine

ⓧ	Diesel engine power kW	Diesel engine power HP	Coupling size	Flywheel to SAE	G	G	Pump mounting flange	LF	LF	Driving shaft of pump
				6 1/2"	30,15	1,19"	Dimensions to SAE see tables 3 and 4			See table 3 Hub design SAE J 498 / DIN 5480
	up to 30 kW	up to 40 PS	48 FLE-PA	7 1/2"	30,15	1,19"				
				8"	62	2,44"		9,5	0,375"	
				10"	54	2,12"				
	up to 90 kW	up to 120 PS	65 FLE-PA	8"	62	2,44"				
				10"	54	2,12"		9,5	0,375"	
				11 1/2"	39,6	1,56"		12,7	0,5"	
	up to 180 kW	up to 240 PS	80 FLE-PA	11 1/2"	39,6	1,56"		12,7	0,5"	

2. Dimensions of coupling flange acc. to SAE J 620 [mm]

ⓧ	Size	D_3	D_2	z=number	d_L
	6 1/2"	215,90	200,02	6	9
	7 1/2"	241,30	225,25	8	9
	8"	263,52	244,47	6	11
	10"	314,32	295,27	8	11
	11 1/2"	352,42	333,37	8	11

4. Housing dimensions according to SAE 617 [mm]

ⓧ	SAE size	A	B	C	Z	TH	
	SAE-1	511,18	552	530,2	12	M10	3/8"
	SAE-2	447,68	489	466,7	12	M10	3/8"
	SAE-3	409,58	451	428,6	12	M10	3/8"
	SAE-4	361,95	403	381,0	12	M10	3/8"
	SAE-5	314,33	356	333,4	8	M10	3/8"

5. Mounting flange for hydraulic pump to SAE [mm]

ⓧ	SAE size	SAE – 2-hole-flange A_1	K-2	M		Z	SAE – 4-hole-flange A_1	S-4	R		Z
	A	82,55	106,4	M10		2	82,55	104,6	M10	3/8"	4
	B	101,6	146,0	M12	1/2"	2	101,6	127,0	M12	1/2"	4
	C	127,0	181,0	M16		2	127,0	162,0	M12	1/2"	4
	D	152,4	228,6	M16	5/8"	2	152,4	228,6	M16	5/8"	4
	E	-	-	-	-	-	165,1	317,5	M20	3/4"	4

3. Selection of coupling hub - Determination of mounting lenght l_3 or l_7

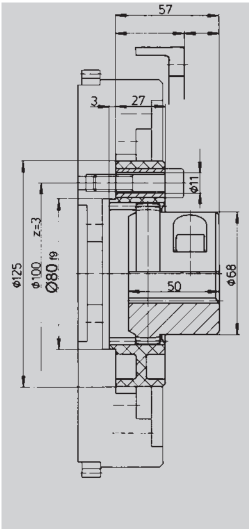
Please mention type ⓧ	BoWex® coupling size	Pump shaft to SAE J 498 and DIN 5480	Spline hub	Clamping hub	Dimensions of coupling size [mm] l_1	l_2	l_S	Flange size 6 1/2" and 7 1/2" K l_3	L l_7	Flange size 8" K l_3	L l_7	Flange size 10" K l_3	L l_7	Flange size 11 1/2" K l_3	L l_7	Code to order coupling hub (Please mention coupling size)
	42	SAE-16/32 DP		x	42	-	33	33	42							P559101
		PI-S 3/4"														
		z=11														
	42	SAE-16/32 DP		x	42	-	-	33	42							P567101
		PB-S 7/8"														
		z=13														
	42	SAE-16/32 DP		x	42	-	27	33	42							P660201
		PB-BS 1"														
		z=15														
	48	SAE-16/32 DP		x	50	-	45	41	50		50	41	50			P660301
	65	PA-S 1 3/8"		x	50	-	48				54	45	54	41		P660301
		z=21														
	65	SAE-12/24 DP		x	55	-	44				54	45	54	41		P656201
		PC-S 1 1/4"														
		z=14														
	65	SAE-16/32 DP		x	-	49	45						53	41		P664301
		PD-S 1 1/2"														
		z=23														
	80	SAE-16/32 DP		x	55	-	-							44	33	P565402
		PE-S 1 3/4"														
		z=27														
	42	25 x 1,25 x 18	x		42	-	-	33	42							P000205
	42	DIN 5480		x	42	-	-	33	42							P500202
	42	30 x 2 x 14		x	42	-	-	33	42							P500203
	48	DIN 5480	x		50	-	-	41	50							P000206
	48			x	50	-	-	41	50		50		50			P500203
	48	35 x 2 x 16	x		46	-	-	37	46							P000303
	65	DIN 5480	x		55	-	-						54	39		P000303
	65			x	60	-	-			50	59	50	59	39		P500301
	65	40 x 2 x 18	x		55	-	-						54	39		P000304
	65	DIN 5480		x	55	-	-				54	45	54	39		P500302
	65	45 x 2 x 21	x		-	64	-			60	69	60	69	39		P000403
	65	DIN 5480		x	55	-	-				54	45	54	39		P500401
	80	50 x 2 x 24		x	55	-	-							42	37	P500405
		DIN 5480														

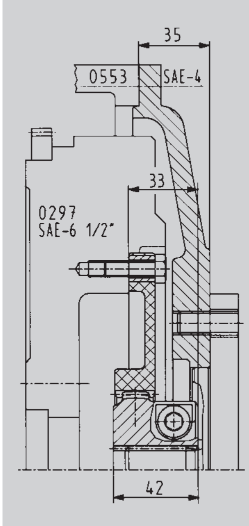
Please photocopy dimension sheet and highlight all details required for design.

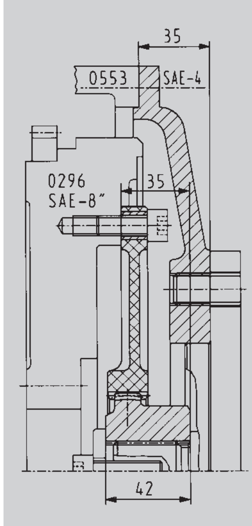
Order form: FLE-PA coupling			SAE pump mounting flange	
BoWex® 48 FLE-PA	7 1/2"	P663301	SAE-4	B-2L
Coupling size	SAE connection of coupling	Code of coupling hub	Pump mounting flange for engine housing	Pump mounting to SAE 2 holes/4 holes standard - metric fastening thread
Table 1	Table 2	Table 3	Table 4	Table 5

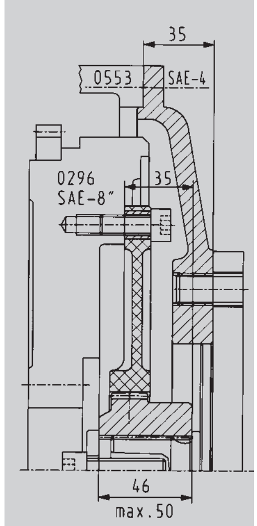
Special flange programme, deviations from the SAE standard

Fitting to Deutz 2011 diesel engines



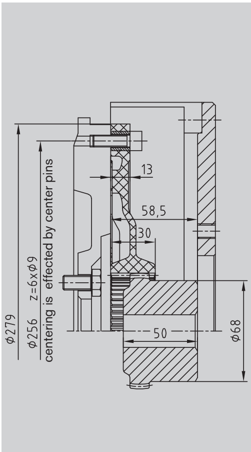


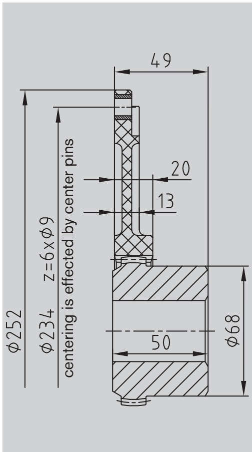


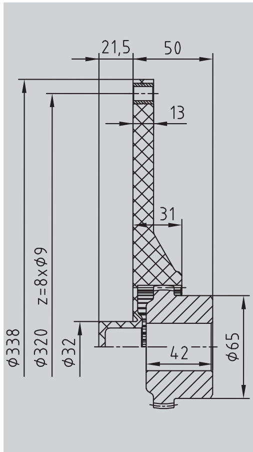


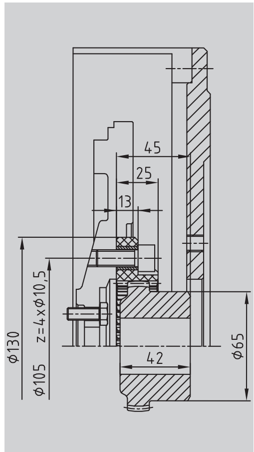
Coupling size	BoWex® 48 FLE-PA, Ø 125	BoWex® 48 FLE-PA, Ø 215,9	BoWex® 48 FLE-PA, Ø 263,52	BoWex® T 48 FLE-PA, Ø 263,52
Engine type	F2L511 – kit 1338	F2-4L 2011	F2-4L 2011	BF 4L 2011

Fitting to VW Mitsubishi diesel engines



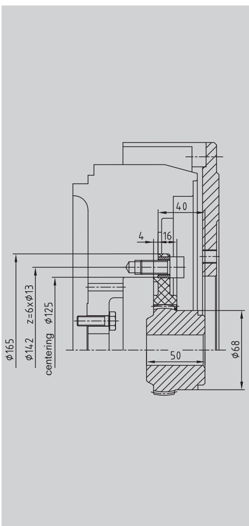


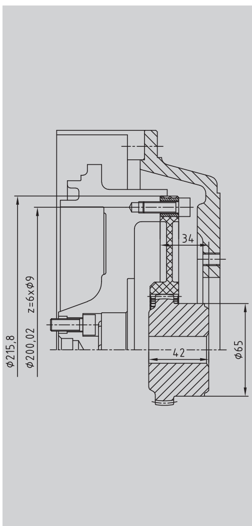


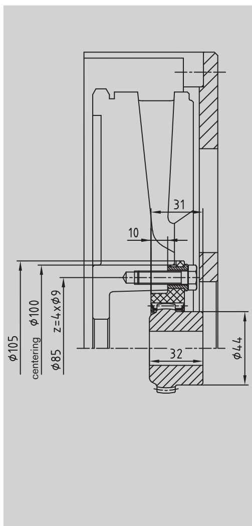


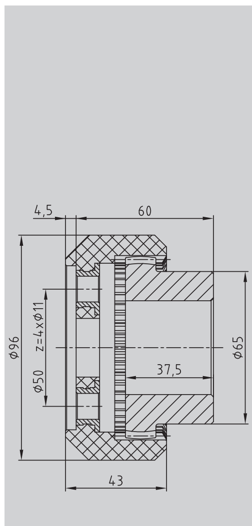
Coupling size	BoWex® 48 FLE-PA, Ø 279 VW	BoWex® 48 FLE-PA, Ø 252 VW	BoWex® 48 FLE-PA Mitsubishi	BoWex® 48 FLE-PA, Ø 130 Mitsubishi
Engine type	028.B / M344	062.2 / 068.5 / 6 / A / D	Ø 338-32	L-series / K-series

Fitting to Hatz diesel engines





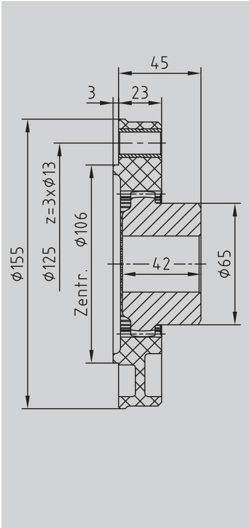


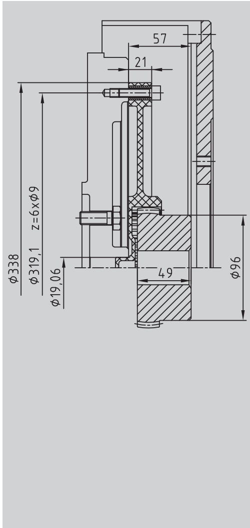


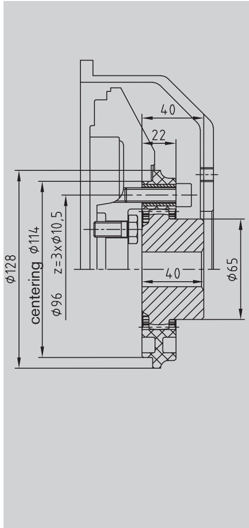
Coupling size	BoWex® 48 FLE-PA, Ø 165 Hatz	BoWex® 48 FLE-PA, 6.5 Hatz	BoWex® 28 FLE-PA, Ø 105 Hatz	BoWex® 48 FLE-PA, Ø 96 Hatz
Engine type	2L/3L/4L41C 2M/3M/4M41	W35	1D81 / 1D90	Z788 / Z789 / Z790

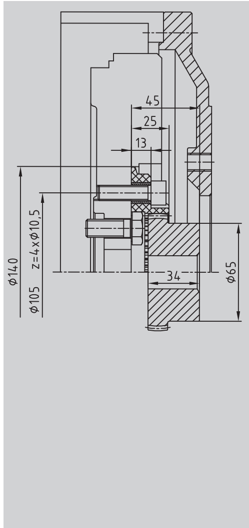
Special flange programme, deviations from the SAE standard

Fitting to Perkins Lombardini diesel engines



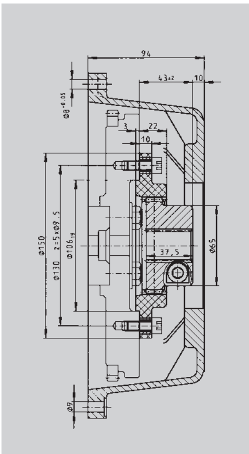


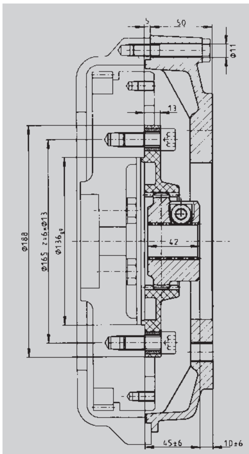


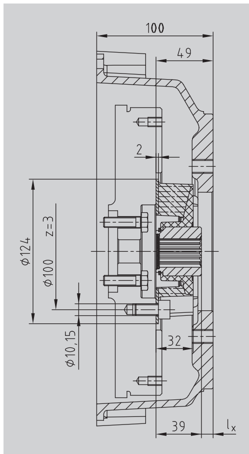


Coupling size	BoWex® 48 FLE-PA, Ø 152/1	BoWex® 65 FLE-PA, Ø 338	BoWex® 48 FLE-PA, Ø 128	BoWex® 48 FLE-PA, Ø 140
Engine type	Perkins 4.108	Perkins 1104C-44T Flywheel-No. D0014	Lombardini FOCS-Serie	Lombardini LDW 1303/1503/2004

Fitting to Kubota diesel engines

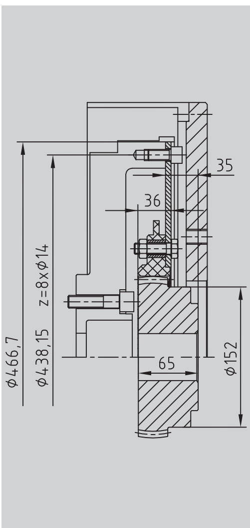


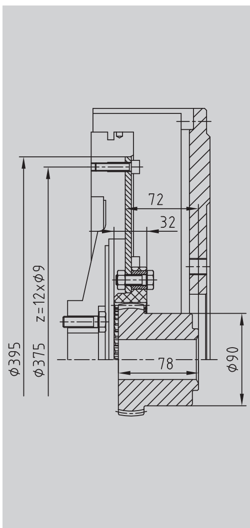


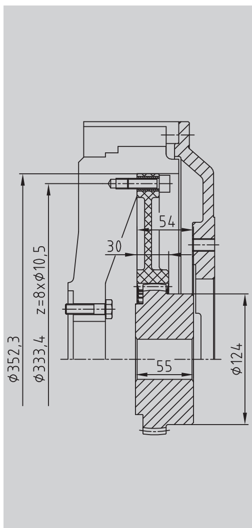


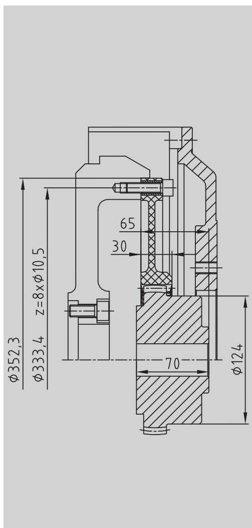
Coupling size	BoWex® 48 FLE-PA, Ø 150	BoWex® 48 FLE-PA, Ø 188	MONOLASTIC® 28, Ø 124
Engine type	Super mini Serie	Super 3 Serie	Super 5 Serie

Fitting to Caterpillar Daimler-Chrysler Cummins John-Deere diesel engine



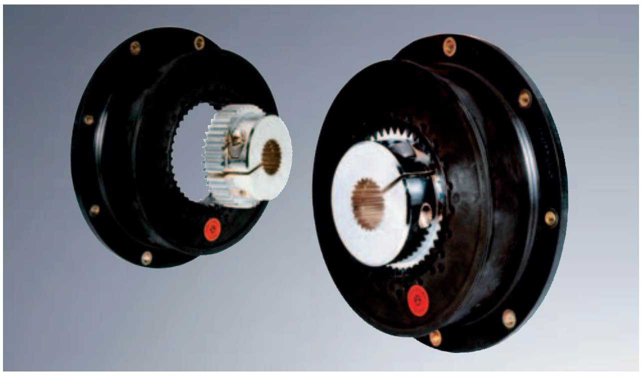






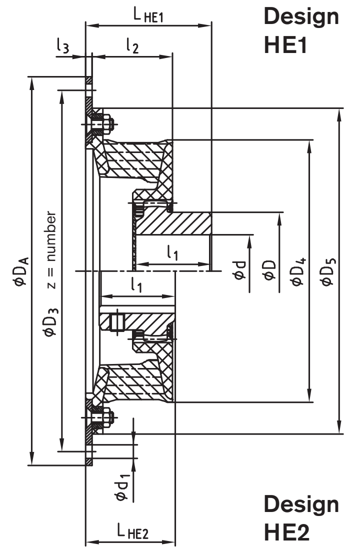
Coupling size	BoWex® T100 FLE-PA, 14"	BoWex® T65 FLE-PA, Ø 395	BoWex® 80 FLE-PA, 11 $^1/_2$"	BoWex® 80 FLE-PA 11 $^1/_2$"
Engine type	Caterpillar C 10 / C 12	Daimler-Chrysler OM904	Cummins 6BTA5.9	John Deere 1010D / 1110D / 1400D

Type HE



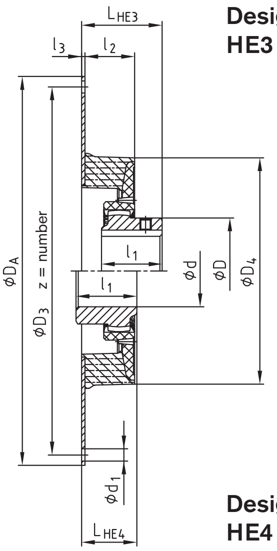
- Flange coupling with flanges according to SAE and special dimensions for mounting to I. C.-engines
- Easy assembly by axial plug-in
- Compensation of misalignment on driving and driven side
- Use of coupling hubs from the BoWex standard programme
- Finish bore according to ISO fit H7, keyway to DIN 6885, sheet 1 (JS9) - inch bores, taper bores, spline clamping hub
- Available in the hardness 40, 50 and 65 Shore A
- Ⓔx Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95) until size 80 including

Design HE1



Design HE2

Design HE3



Design HE4

Flange dimensions according to SAE J 620 [mm]				
Size	D_A	D_3	z	d_1
6 ½"	215,90	200,02	6	9
7 ½"	241,30	222,25	8	9
8"	263,52	244,47	6	11
10"	314,32	295,27	8	11
11 ½"	352,42	333,37	8	11
14"	466,72	438,15	8	14
16"	517,50	489,00	8	14
18"	571,50	542,90	6	18

BoWex-ELASTIC® Type HE

Size	Design		Bore d [mm]		Flange connection according to SAE - J 620								Dimensions [mm]								Weight with pilot bored coupling	Mass moment of inertia with pilot bored coupling	
	HE1 HE2	HE3 HE4	Pilot bored	max.	6 ½"	7 ½"	8"	10"	11 ½"	14"	16"	18"	l_3	l_2	D_4	D_5	D	l_1	L_{HE1} L_{HE3}	L_{HE2} L_{HE4}	[kg]	J_A [kgm²]	J_L [kgm²]
42 HE	●		-	42	●	●							4	45	146	180	65	42	70	50	2,7	0,0061	0,0014
	●						●														2,9	0,0083	0,0014
	●				●	●															2,9	0,0106	0,0019
48 HE	●		-	48			●						4	45	164	198	68	50	78	50	3,1	0,0148	0,0019
	●							●													3,9	0,0298	0,0019
65 HE	●		-	65				●					5	55	205	244	96	55	85	62	6,4	0,0377	0,0064
	●								●												7,2	0,0594	0,0064
G 65 HE		●	-	65				●					3	45	205	-	96	55	73	50	5,3	0,0242	0,0076
		●							●												5,7	0,0372	0,0076
80 HE	●		31	80				●					-	70	266	-	124	90	126	74	10,9	0,0211	0,0283
	●								●				6			316			132	80	13,0	0,0726	0,0283
G 80 HE	●		31	80					●				-	80	302	-	124	90	136	84	12,5	0,0402	0,0428
	●									●			6			356			142	90	17,3	0,2251	0,0428
100 HE		●	35	100						●			4	80	350	-	152	110	150	82	24,1	0,1951	0,1019
125 HE		●	45	125						●			-	98	416	-	192	140	186	103	45,8	0,3013	0,2861
		●									●		6						192	109	47,7	0,4123	0,2861
G 125 HE		●	45	125							●		6	89	440	-	192	140	179	91	48,4	0,4781	0,2916
		●										●				-					50,5	0,6380	0,2916
150 HE		●	50	150								●	6	134	470	-	225	150	205	157	66,7	0,6918	0,5192

Order form:

BoWex-ELASTIC® 42	HE 1	40	8	70	U
Coupling size	Design	Elastomer hardness	Flange diameter D_A acc. to SAE or special	Mounting length L_{HE}	Unbored or with finish bore

Technical data

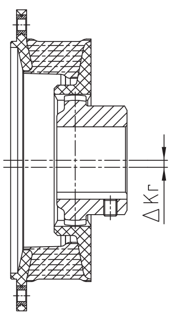
Technical Data																						
Coupling sizes		42 HE			48 HE			65 HE G 65 HE			80 HE G 80 HE			100 HE			125 HE G 125 HE			150 HE		
Elastomer hardness [Shore A]	Shore A	40 Sh	50 Sh	65 Sh	40 Sh	50 Sh	65 Sh	40 Sh	50 Sh	65 Sh	40 Sh	50 Sh	65 Sh	40 Sh	50 Sh	65 Sh	40 Sh	50 Sh	70 Sh	40 Sh	50 Sh	70 Sh
Rated torque	T_{KN} [Nm]	130	150	180	200	230	280	350 430	400 500	500 620	750 1250	950 1600	1200 2000	2000	2500	3200	3000 4000	4000 5200	5000 6500	5500	7000	9000
Maximum torque	$T_{K\ max.}$ [Nm]	390	450	540	600	690	840	1050 1290	1200 1500	1500 1860	2250 3750	2850 4800	3600 6000	6000	7500	9600	9000 12000	12000 16000	15000 20000	16500	21000	27000
Vibratory torque with 10 Hz	T_{KW} [Nm]	36	45	54	60	69	84	105 129	120 150	150 186	225 375	285 480	360 600	600	7505	960	900 1200	1200 1600	1500 2000	1650	2100	2700
Permissible damping power 60 °C	P_{KW} [W]	20			27			45 51			90 135			160			180 200			225		
Permissible damping power 80 °C	P_{KW} [W]	6,5			9			15 17			30 45			53			60 67			75		
Max. perm. operating speed	$n_{max.}$ [min⁻¹]	6200			5600			4500 4300			3600 3000			2700			2300 2100			1800		
Twisting angle with rated torque	φ_{TKN} [°]	16	13	8	16	13	8	16 12	13 10	8 6	14 12	13 10	6 6	12	10	6	12 11	10 9	6 5	10	8	5
Dynamic torsion spring stiffness	C_{dyn} [Nm/rad]	550	850	2700	850	1300	3500	1600 2350	2200 3000	6000 8500	4500 7500	6500 12000	18000 32000	12000	19000	48000	19000 30000	30000 44000	75000 110000	42000	67000	166000
Relative damping	ψ	0,6	0,8	1,2	0,6	0,8	1,2	0,6	0,8	1,2	0,6	0,8	1,2	0,6	0,8	1,2	0,6	0,8	1,2	0,6	0,8	1,2
Resonance-factor $V_R \approx \frac{2 \cdot \pi}{\psi}$	V_R	10,5	7,9	5,2	10,5	7,9	5,2	10,5	7,9	5,2	10,5	7,9	5,2	10,5	7,9	5,2	10,5	7,9	5,2	10,5	7,9	5,2
Radial spring stiffness	C_r [N/mm]	142	219	697	176	269	724	209 259	288 346	784 975	351 476	507 762	1404 2031	366	570	1200	617 560	974 920	2434 1915	714	1200	2500
Perm. rad. coupling misalignment with n = 1500 min⁻¹	ΔKr [mm]	1,1	1,0	0,5	1,2	1,1	0,5	1,6	1,5	0,7	1,8	1,7	0,8	2,2	2,0	1,0	2,5	2,3	1,1	2,8	2,5	1,3
Max. perm. rad. coupl. misalignment for short-term start	$\Delta Kr_{max.}$ [mm]	3,6	3,3	1,5	3,8	3,5	1,7	5,1	4,7	2,2	5,7	5,3	2,4	6,5	6,0	3,0	7,5	6,9	3,3	8,0	7,5	4,0
Perm. angular coupl. misalignment with n = 1500 min⁻¹	ΔKw [°]	1,0	0,75	0,5	1,0	0,75	0,5	1,0	0,75	0,5	1,0	0,75	0,5	1,0	0,75	0,5	1,0	0,75	0,5	1,0	0,75	0,5
Perm. angular coupl. misalignment with n = 3000 min⁻¹	ΔKw [°]	0,5	0,4	0,25	0,5	0,4	0,25	0,5	0,4	0,25	0,5	0,4	0,25	0,5	0,4	0,25	0,5	0,4	0,25	0,5	0,4	0,25
Max. perm. angular coupl. misalignment for short-term start	$\Delta Kw_{max.}$ [mm]	1,5			1,5			1,5			1,5			1,5			1,5			1,5		
Perm. axial coupling misalignment	ΔKa [mm]	± 2			± 2			± 2			± 2 ± 3			± 3			± 3			± 5		

The technical data mentioned apply for an ambient temperature of T = 60 °C.

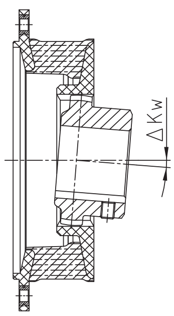
Displacements

For other operating speeds or higher operating temperatures the permissible radial displacement is calculated as follows:

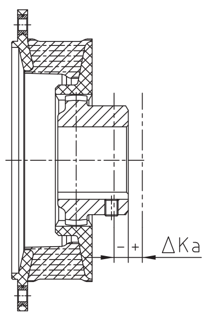
$$\Delta Kr_{perm.} = \Delta Kr \cdot S_t \cdot \sqrt{\frac{1500}{n_x}}$$



Radial displacement ΔKr



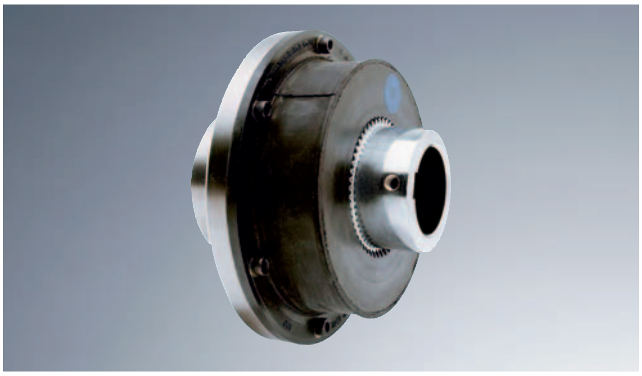
Angular displacement ΔKw



Axial displacement ΔKa

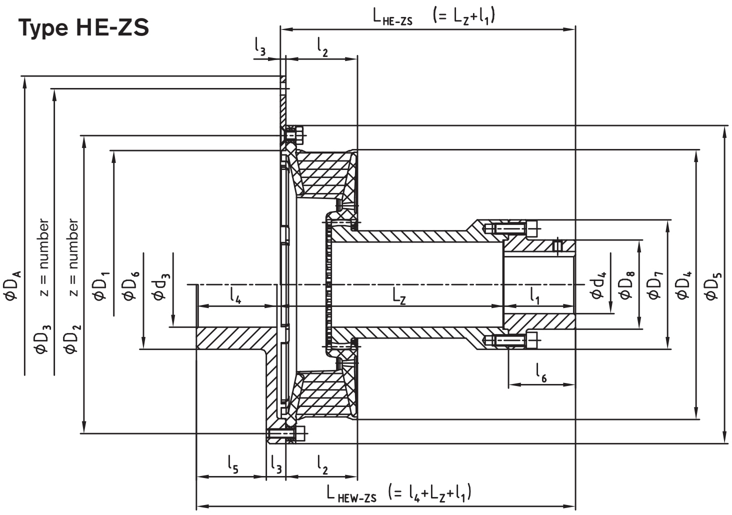
Process of assembly, screw type with quality, tightening torques according to KTR assembly instructions (see www.ktr.com).

Type HE-ZS, Type HEW-ZS and Type HEW



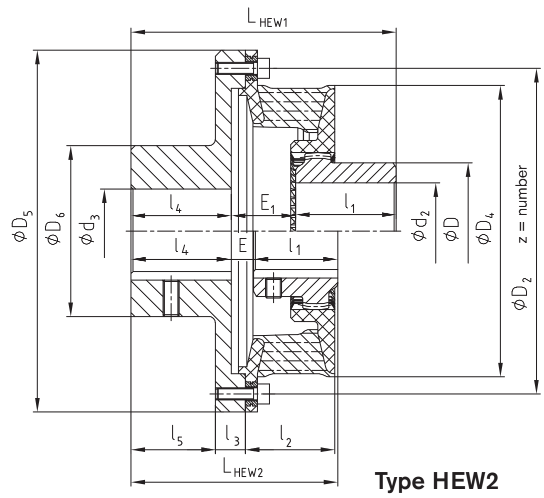
- Highly flexible coupling to be mounted to combustion engines and electric motors
- Elastomer parts available as hardness 40, 50 and 65 Shore A
- High degree of compensation of errors in alignment
- Type HE-ZS with flange connection according to SAE-J 620 and removable part for pump drives
- Type HEW-ZS for shaft connections with removable part
- Type HEW1/HEW2 highly flexible shaft coupling
- Finish bore according to ISO fit H7, feather key according to DIN 6885 sheet 1 - JS9
- Ⓔx Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)

Type HE-ZS



Type HEW-ZS

Type HEW1



Type HEW2

BoWex-ELASTIC® Type HE-ZS

Size	max. finish bore	Flange connection to SAE-J 620 D_A for HE-ZS						Dimensions [mm]									Removable part HE-ZS L_Z [mm]					Weight with max. bore [kg]	Mass moment of inertia [kgm²]	
	d_4	6 ½"	7 ½"	8"	10"	11 ½"	14"	D_1	D_4	D_5	D_7	D_8	l_1	l_2	l_3	l_6	100	120	140	180	250		J_A	J_L
48	28	●						160	164	200	78	45	40	48	10	45	●	●				2,9	0,0028	0,0050
			●											37	4		●	●				3,6	0,0106	0,0050
				●													●	●				3,9	0,0148	0,0050
					●												●	●				4,6	0,0298	0,0050
G 65	45				●			198	205	245	110	72	60	45	3	56		●	●			7,7	0,0242	0,0223
						●												●	●			8,2	0,0372	0,0223
80	65				●			265	266	318	145	100	80	70	11	75			●	●		13,7	0,0211	0,0701
						●									6				●	●		15,9	0,0726	0,0701
G 80	65					●		300	302	358	145	100	80	80	11	75				●	●	17,4	0,0402	0,1412
							●								6					●	●	22,3	0,2251	0,1412

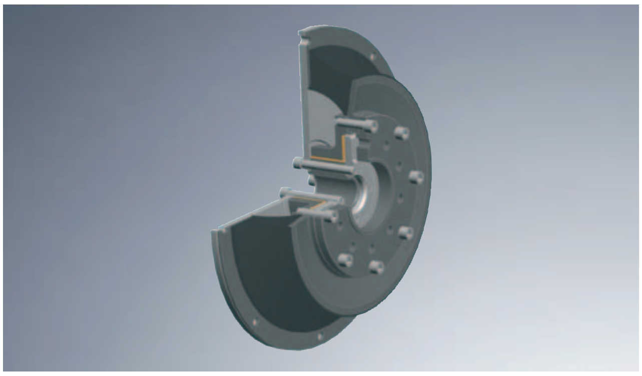
BoWex-ELASTIC® Type HEW-ZS

Size	max. finish bore		Dimensions [mm]												Removable part HEW-ZS L_Z [mm]					Weight with max. bore [kg]	Mass moment of inertia [kgm²]	
	d_3	d_4	D_2	z_1 x M		D_4	D_5	D_6	l_1	l_2	l_3	l_4	l_5	100	120	140	180	250			J_A	J_L
48	55	28	180	8	M6	164	200	92	50	45	17	55	45	●	●				6,9		0,0203	0,0050
65	75	45	224	8	M8	205	245	125	55	55	28	75	63		●	●			16,0		0,0747	0,0160
80	80	65	295,3	8	M10	266	318	130	90	70	17	80	70			●	●		25,5		0,1447	0,0699
G 80	95	65	333,4	8	M10	302	358	145	90	80	22	90	78				●	●	34,2		0,2752	0,1412

BoWex-ELASTIC® Type HEW

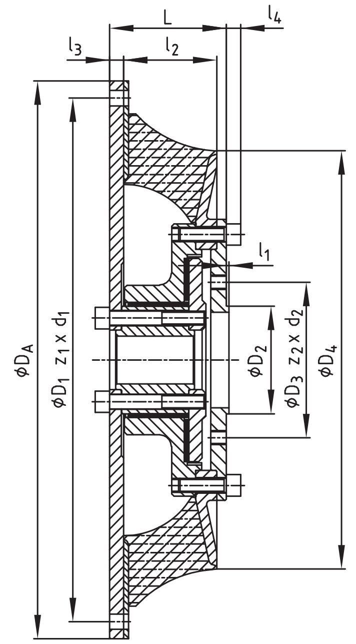
Size	max. finish bore		Dimensions [mm]																	Weight with max. bore [kg]	Mass moment of inertia [kgm²]	
	d_2	d_3	D	D_2	z x M		D_4	D_5	D_6	l_1	l_2	l_3	l_4	l_5	E	E_1	L_{HEW1}	L_{HEW2}			J_A	J_L
42	48	50	68	162	6	M6	146	180	85	50	45	15	50	42	4	32	132	104	4,3		0,0121	0,0015
48	48	55	68	180	8	M6	164	200	92	50	45	17	55	45	4	32	137	109	5,5		0,0204	0,0019
65	65	75	96	224	8	M8	205	245	125	70	55	28	75	63	5	42	187	150	13,2		0,0752	0,0071
80	80	80	124	295,27	8	M10	266	318	130	90	70	17	80	70	5	45	215	160	19,7		0,1449	0,0285
G 80	85	95	124	333,4	8	M10	302	358	145	90	80	22	90	78	5	55	235	185	25,9		0,2748	0,0422

Type HEG for cardan shaft connections

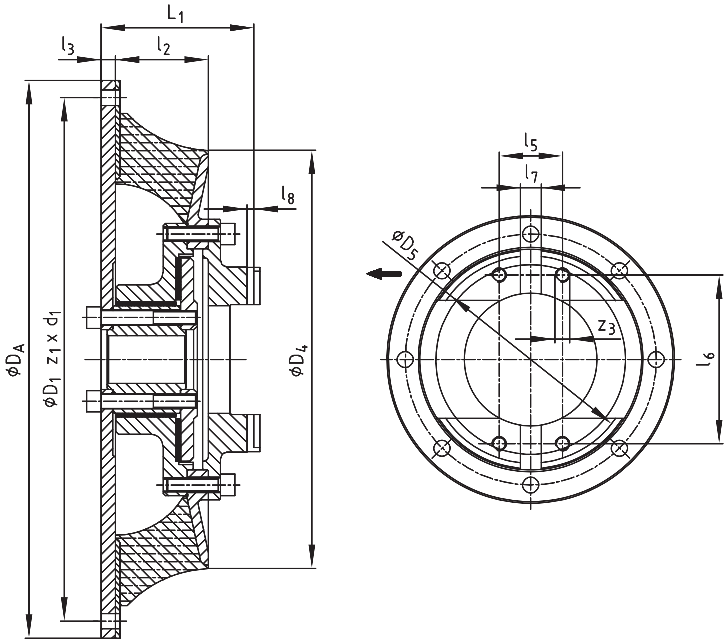


- Highly-flexible cardan shaft auxiliary coupling for I. C. engines
- Available in different elastomer hardness's
- High torsional flexibility
- Excellent damping properties due to additional friction damping
- Reduction of torque peaks in the elastomer part
- Radial plain bearing in maintenance-free design
- Cardan shaft connection for usual designs

Type HEG1



Type HEG2



BoWex-ELASTIC® Type HEG1 and Type HEG2

Size	Flywheel connection to SAE-J 620					Metric cardan shaft connection HEG1 dimensions [mm]										MECHANICS cardan shaft connection HEG2 dimensions [mm]								Dimensions [mm]			Weight	Mass moment of inertia	
	8"	10"	11 ½"	14"	16"	58	65	75	90	100	120	150	180	l_4	L	2 C	4 C	5 C	6 C	7 C	8,5 C	8 C	L_1	D_4	l_2	l_3	[kg]	J_A [kgm²]	J_L [kgm²]
48	●					●	●	●						8	58,5									163	43,5	8	7	0,03	0,006
		●				●	●	●																			8	0,06	0,006
G 65		●						●	●	●				8	66	●	●	●					71	205	48,0	10	12	0,07	0,02
			●					●	●	●						●	●	●									14	0,10	0,02
80		●						●	●	●	●			10	88,5		●	●	●				104	265	68,5	23	21	0,11	0,06
			●					●	●	●	●						●	●	●							12	23	0,17	0,06
G 80			●						●	●	●	●		10	96			●	●	●			110	302	74,0	23	26	0,18	0,09
				●					●	●	●	●						●	●	●						12	33	0,48	0,09
100				●						●	●	●	●	12	98					●	●		128	350	78,0	16	41	0,63	0,19
125				●						●	●	●	●	12	111						●	●	135	416	96,0	18	56	0,74	0,42
					●					●	●	●	●								●	●				12	59	0,97	0,42

Flywheel connection to SAE-J 620 [mm]

Size	D_A	D_1	z_1	d_1
8"	263,52	244,47	6	11
10"	314,32	295,27	8	11
11 ½"	352,42	333,37	8	11
14"	466,72	438,15	8	14
16"	517,50	489,00	8	14

Metric cardan shaft connection HEG1 [mm]

Size	D_2	l_1	D_3	z_2	d_2
58	30	1,0	47,0	4	M5
65	35	1,0	52,0	4	M6
75	42	1,5	62,0	6	M6
90	47	2,0	74,5	4	M8
100	57	2,0	84,0	6	M8
120	75	2,0	101,5	8	M10
150	90	2,5	130,0	8	M12
180	110	2,5	155,5	8	M14

MECHANICS cardan shaft connection HEG2 [mm]

Size	D_5	l_5	l_6	l_7	l_8	z_3
2 C	79,35	33,3	59,5	9,50	3,8	M8
4 C	107,92	36,5	87,3	9,50	3,8	M8
5 C	115,06	42,9	88,9	14,26	5,1	M10
6 C	140,46	42,9	114,3	14,26	5,1	M10
7 C	148,39	49,2	117,5	15,85	6,0	M12
8,5 C	165,08	71,4	123,8	15,85	6,0	M12
8 C	206,32	49,2	174,6	15,85	6,0	M12

Coupling selection

1. BoWex-ELASTIC® couplings should be selected in accordance with DIN 740 part 2. The coupling must be sufficiently sized to ensure that the maximum permissible coupling load is not exceeded in any operating condition. It is therefore necessary to compare the actual loads with the permissible rated parameters of the coupling according to tables 1.1 - 1.4 listed below.

   For drives subject to dangerous torsional vibrations it is necessary for a safe operation to review the drive by means of a torsional vibration calculation.

1.1 **Load by rated torque**

$T_{KN} \geq T_N \cdot S_t$

$T_N\,[Nm] = 9550 \cdot \frac{P_{AN/LN}\,[kW]}{n\,[1/min]}$

The permissible rated torque T_{KN} of the coupling must, at all operating temperatures, be at least as high as the rated torque T_N of the machine.

1.2 **Load by torque shocks**

$T_{K\,max} \geq T_S \cdot S_Z \cdot S_t$

Shock on driving side
$T_S = T_{AS} \cdot M_A \cdot S_A$

Shock on driven side
$T_S = T_{LS} \cdot M_L \cdot S_L$

$M_A = \frac{J_L}{J_A + J_L} \qquad M_L = \frac{J_A}{J_A + J_L}$

The maximum permissible torque of the coupling must, at all operating temperatures, be as high as the operational peak torque T_S, taking into account the shock factor S_Z.

With knowledge of mass distribution, direction and type of shock it is possible to calculate the peak torque T_S. If the moments of inertia are unknown, M_A or $M_L = 1$.

1.3 **Passing through resonance range**

$T_{K\,max} \geq T_S \cdot S_Z \cdot S_t$

The peak torque T_S arising when the resonance range is passed through must not exceed the maximum torque T_{Kmax} of the coupling, taking into account the temperature.

1.4 **Load by vibratory torque shocks**

$T_{KW} \geq T_W \cdot S_t$

$P_{KW} \geq P_W$

The permissible vibratory torque T_{KW} of the coupling, at the operating speed and ambient temperature, must not be exceeded by the biggest periodical vibratory torque T_W.

With operating frequencies f > 10 Hz the heat produced by damping in the elastomer is considered as damping power P_W.

The permissible damping power P_{KW} of the coupling depends on the ambient temperature and must not be exceeded by the actual damping power produced.

Temperature factor S_t

	- 40 °C + 60 °C	+ 70 °C	+ 80 °C
S_t	1,0	1,2	1,6

Table No. 1

Starting factor S_Z

Starting frequency/h	< 10	> 10 < 60	> 60 < 120	> 120
S_Z	1,0	1,5	2,0	on request

Table No. 2

Shock factor S_A/S_L

Moderate shocks		1,5
Average shocks	S_A/S_L	1,8
Heavy shocks		2,5

Table No. 3

Technical data for coupling selection / Torsional vibration calculation

Driving side

diesel ☐ gas ☐ engine-type ____

straight-type engine ☐ V-engine/angle ____ stroke ____ mm

2-cycles ☐ 4-cycles ☐ piston Ø mm ____ no. of cylinders ____

nominal torque T_{AN} ____ Nm speed range n: idle speed ____ 1/min.

peak torque T_{AS} ____ Nm $n_{min.}$ operational ____ $n_{max.}$ operational ____ 1/min.

mass moment of inertia J_A or flywheel effect $GD^2{}_A$ for

flywheel J_A ____ kgm² or $GD^2{}_A$ ____ kgm²

driving gear J_A ____ kgm² or $GD^2{}_A$ ____ kgm²

Driven side

hydraulic pump ☐ splitterbox ☐ generator ☐ screw compressor ☐

piston compressor ☐ no. of cylinders ☐ order of cylinder ☐ tangential force diagram

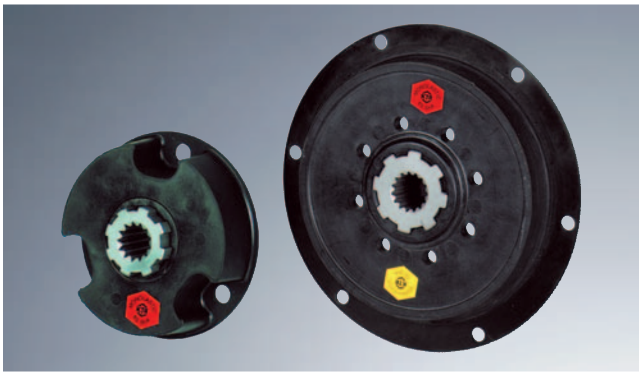
manufacturer/type ____

nominal torque T_{LN} ____ Nm peak torque ____ Nm

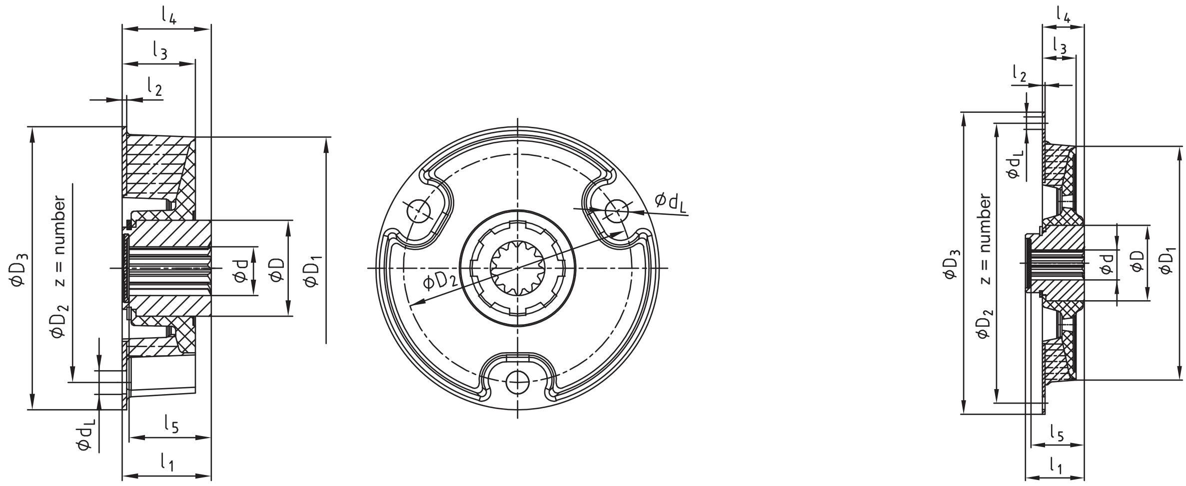
mass moment of inertia J_L ____ kgm² or flywheel effect $GD^2{}_L$ ____ kpm²

Made for Motion KTR

for I. C.-engines (EP 0853203/U.S. Patent 6,117,017)



- MONOLASTIC® – for the drive of diesel engine/hydraulic pump up to 100 kW
- Single-part design with flange fastening by three bolts (sizes 22, 28, 32, 50-140, 50-165, 50-170)
- Flange connection according to SAE 6 ½" to 11 ½" (size 30, 50, 65)
- Easy assembly of coupling
- Axial plug-in in combination with the pump shaft
- Compensation for high radial and angular displacements
- Available for pump shafts according to SAE and DIN



Size 22, 28, 32, 50-140, 50-165, 50-170

Size 30, 50, 65

MONOLASTIC®																
Size	Elastomer hardness [Shore A]	Torque [Nm]			Dimension [mm]											
		T_{KN}	$T_{K\ max.}$	T_{KW}	d	D	D_1	D_2	z	d_L	D_3	l_1	l_2	l_3	l_4	l_5
22	65	40	100	20	20	34	93	80	3	8,10	100	33	1,5	32	34	30
28	65	70	175	35	25	42	115	100	3	10,10	124	40	2	32	40	38
	70	100	300	50												
32	65	160	400	80	32	50	140	125	3	12,10	150	42	2	42	43	38
	70	225	675	112												
50-140	70	260	650	130	32	50	167	140	3	14,10	175	46	3	35	46	43
50-165	70	300	750	150	32	50	175	165	3	16,15	200	46	3	35	46	43
50-170	70	300	750	150	32	50	175	170	3	16,15	200	46	3	35	46	43
30	65	160	400	80	25	42	120	SAE-connection 6 ½", 7 ½"				39	2	21	30	36
50	65	300	750	150	32	50	167	SAE-connection 6 ½", 7 ½", 8", 10"				42	2	24	30	38
65	65	600	1600	180	48	68	200	SAE-connection 10", 11 ½"				45	3	32	45	42

Technical data										
Size	Elastomer hardness [Shore A]	$C_{dyn.}$ 60°C [Nm/rad]	Perm. damping power with 60°C P_{KW} [W]	Permissible radial displacement with 2200 min⁻¹ ΔK_r [mm]	Permissible angular displacement with 2200 min⁻¹ ΔK_w [°]	Radial spring stiffness C_r [N/mm]	Mass moment of inertia [kgm²]			Max. permissible operating speed n_{max} [min⁻¹]
							J_A		J_L	
22	65	600	10	0,6		200	0,00017		0,00010	6000
28	65	900	15	0,6		300	0,00054		0,00033	6000
	70	1300		0,5		400				
32	65	1800	25	0,6		400	0,00120		0,00081	6000
	70	2400		0,5		500				
50-140	70	4200	35	0,5		1365	0,00210		0,00130	6000
50-165	70	5600	40	0,5	1	1550	0,00250		0,00130	6000
50-170	70	5600	40	0,5		1550			0,00130	6000
30	65	3750	25	0,6		1150	6,5"	0,0038	0,00030	6000
							7,5"	0,0057		
50	65	9000	35	0,6		1300	8"	0,0078	0,00120	6000
							10"	0,0153		
65	65	14000	45	0,6		1900	10"	0,0238	0,00380	6000
							11,5"	0,0368		

Applications - BoWex® FLE-PA, BoWex-ELASTIC® and MONOLASTIC®

Applications for BoWex® FLE-PA couplings and MONOLASIC®

wheel loaders	K 1,6
compact loaders	K 1,6
hydraulic excavators	K 1,4
mobile cranes	K 1,6
graders	K 1,5
vibration rollers	K 1,4
fork lift trucks	K 1,6
concrete mixer trucks	K 1,3
concrete pumps	K 1,4
asphalt finishers	K 1,4
concrete cutters	K 1,4
road mortisers	K 1,4

For a selection according to the engine driving torque T_{AN} a service factor K = 1,3 – 1,6 should be considered, depending on the load.

$$T_{KN} \geq T_{AN} \cdot K$$

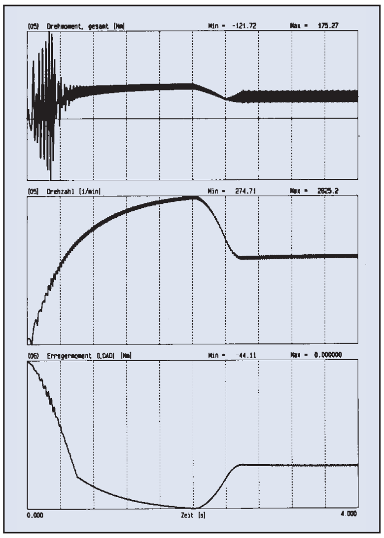
Applications for BoWex-ELASTIC® couplings

- screw compressors
- generators
- piston compressors
- splitterboxes
- suction pumps
- high-pressure pumps
- reversing gears
- sifting gears
- hydrodynamic converters

Coupling selection by means of torsional vibration calculation.

Additional Information

Use of PC with special software for coupling s-election



Application:
3-cylinder diesel engine - screw compressor

Use:
BoWex-ELASTIC®
42 HE - 50 Shore A

Calculation:
Acceleration
from 300 min^{-1}
to 2700 min^{-1}

KTR makes use of special simulation calculation programs for the coupling selection and the torsional vibration determination of the drive system.

This ensures a resonance-free operation of the machine, along with a safe, long-lasting operation of the drive components.
This is part of the usual KTR standard service.

GEAREX

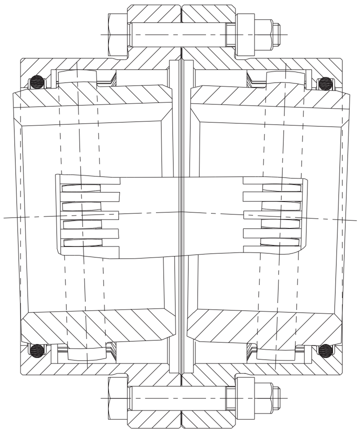
All-steel gear couplings

NEW

Made for Motion KTR

Table of contents

Operating description

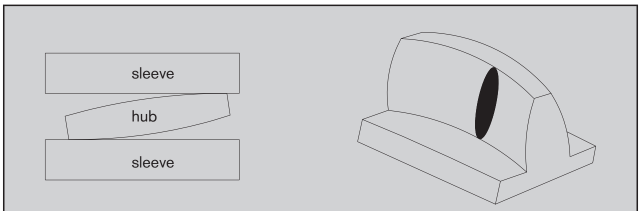


GEAREX couplings made from steel with grease lubrication and toroidal sealing ring correspond to the international standard. Being flexible shaft connections they are suitable for a positive torque transmission. In addition, they ensure to compensate for axial, radial and angular shaft displacements.

GEAREX couplings are used in every range of general engineering requesting for high operating safety and a long service life resulting from the reliable grease lubrication of the crowned spline. The couplings are suitable for horizontal assembly. As special solutions they are suitable for vertical assembly, too.

Numerous coupling sizes for a torque transmission from 930 Nm to 135.000 Nm with shaft dimensions up to a maximum of Ø 276 mm are available. The coupling torques may be increased by using special materials.

GEAREX couplings are in correspondence with the AGMA standard (**A**merican **G**ear **M**anufacturer **A**ssociation). Small dimensions and a low weight along with a small mass moment of inertia result in a wide range of applications of GEAREX couplings.



Hub with crowned spline (GEAREX)

According to the operating principle of the well-known crowned gear edge pressure in the spline is avoided in case of angular and radial displacements. Moreover, permanent grease lubrication produces a better friction ratio of the spline with an operation almost free from wear along with a long service life of the coupling.

In order to ensure a regular and verified lubrication in assembled condition, two connections for hydraulics are arranged opposite to each other radially on each coupling sleeve. As a result a complete GEAREX coupling has four connections being offset to each other by 90°.
The interior of the coupling is sealed by means of toroidal sealing rings (NBR 70 ShA).
The feather keys have to be sealed against escape of lubricants during the assembly.

Explosion-proof use
GEAREX couplings are suitable for power transmission in drives in hazardous areas. The couplings are certified and confirmed according to EC standard 94/9/EC (ATEX 95) as units of category 2G/2D and thus suitable for the use in hazardous areas of zone 1, 2, 21 and 22. Please read through our information included in the respective Type Examination Certificate and the operating and mounting instructions at www.ktr.com.

Coupling selection

The coupling has to be dimensioned in a way that the permissible coupling load is not exceeded during any operating condition. For that purpose the loads that are produced have to be compared to the permissible characteristic figures of the coupling.

1 **Coupling selection**
The coupling is selected according to the rated torque (T_{KN}). For that purpose the corresponding operating factors of the driving machine have to be taken into account, see starting factor S_Z and operating factor S_B.

2 **Load of the coupling**

$$T_{KN} \geq T_{NS}$$

$$T_{NS} = T_N \cdot S_Z \cdot S_B$$

$$T_N\,[\text{Nm}] = 9550 \cdot \frac{P_{AN/LN}\,[\text{kW}]}{n\,[1/\text{min}]}$$

T_{KN} = rated torque of the coupling
T_N = driving torque
TNS = driving torque including operating factors
S_Z = starting factor
S_B = operating factor

3 **Starting torque**
The permissible starting torque of the machine should not exceed two times the rated torque of the coupling.

4 **Permissible load on the feather key of the coupling**
The shaft-hub-connection should be verified by the customer. Permissible surface pressure according to DIN 6892 (method C).

5 **Permissible temperature range**
The coupling can be used in a temperature range from -20 °C to +80 °C.

6 **Example of selection**

Electric motor: 30 kW
Application: textile machine
Shaft-Ø: 70/65 mm
Speed: 250 1/min
Starts: < 10/h
Starting torque: $2{,}5 \cdot T_{KN}$

Result:

$$T_N = 9550 \cdot \frac{30\text{ kW}}{250\text{ 1/min}}$$

T_N = 1146 Nm
T_{NS} = 1146 Nm · 1 · 1,25
T_{NS} = 1432,5 Nm

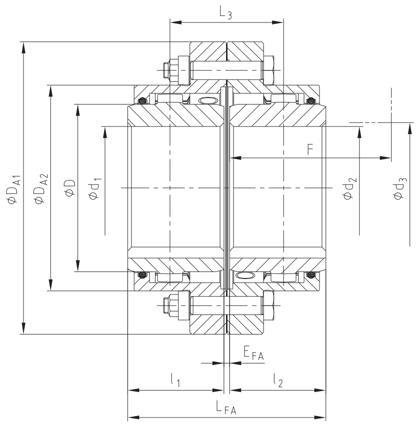
Coupling selected:
GEAREX 15 (T_{KN} = 2000 Nm)
The starting torque of the machine is 2,5 times the starting torque (3581 Nm).
(permissible $2 \cdot T_{KN}$ = 4000 Nm)

Service factor S_Z for starting frequency			
starting frequency/h	10	25	50
S_Z	1,0	1,2	1,4

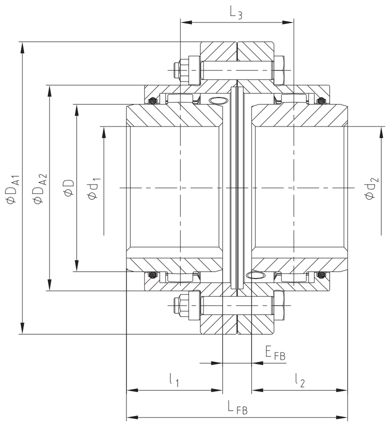
Operating factor S_B			
Kind of load	Operating features	Machines	Operating factor
Smooth/ smoothly	Permanent operation without overload or shock load. Low connecting frequency.	• Electric generators • Radial pumps • Light-weight fans	1,00
Light-weight	Permanent operation with small overload and short-term and rare shock load.	• Multistage radial compressors • Piston pumps • Large fans (heavy load operation) • Mixers for liquids • Mixers for solid matters • Textile machines • Machine tools • Belt conveyor • Elevators	1,25
Average	Interrupted operation with low shock load and short-term average overload.	• Piston compressor, cranes (running or drawing operation) • Winding engine, calenders for rubber and nylon • Calenders • Rolling mill drives • Non-reversing cold rolling mills	1,50
Heavy	Operation with heavy and frequent shock load. Frequent load reversion. High degree of safety.	• Bridge cranes for steel industry • Mixers for rubber and nylon • Cranes (heavy load operation) • Wood grinders, marine drives • Equipment for transport of persons • Mine fans • Roller tables • Non-reversing cold rolling mills • Reversing cold rolling mills • Hot-rolling mill	2,00
Very heavy	Extreme and overload with frequent and sudden load revolution.	• Reversing rolling mill drives • Heavy load operation in steel industry • Slitting machines • Grinding machines • Scissors and cutters • Crushers	2,50

Type FA, type FB and type FAB

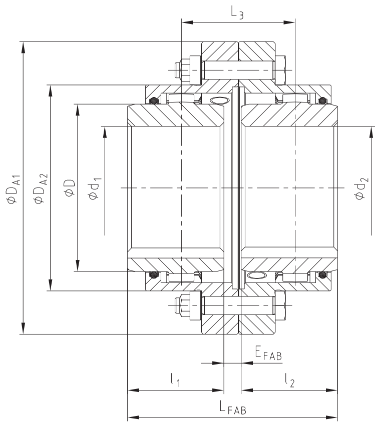
- Double-cardanic crowned gear coupling
- To be used on all applications in general engineering
- Compensating for shaft misalignment axial – radial – angular
- Available with finish bore to ISO, feather key according to DIN 6885 sheet 1, taper and inch bores
- For horizontal assembly
- Higher torques to be realized by special materials
- Ex Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)



Type FA



Type FB



Type FAB

Dimensions

Size	Max. finish bore	Dimensions [mm]													Grease [2] feeding
	d_1; d_2	l_1, l_2	E_{FA}	E_{FB}	E_{FAB}	L_{FA}	L_{FB}	L_{FAB}	L_3	D	D_{A1}	D_{A2}	F [1]	d_3 [1]	[dm³]
10	50	43	3	21	12	89	107	98	55	67	111	84	74	52	0,02
15	64	50	3	15	9	103	115	109	59	87	152	107	84	68	0,04
20	80	62	3	31	17	127	155	141	79	108	178	129,5	104	85	0,08
25	98	76	5	29	17	157	181	169	93	130	213	156	123	110	0,12
30	112	90	5	33	19	185	213	199	109	153	240	181	148	130	0,18
35	133	105	6	40	21,5	216	250	233	128	180	280	211	172	150	0,22
40	158	120	6	42	24	246	282	264	144	214	318	249,5	192	175	0,35
45	172	135	8	50	29	278	320	299	164	233	347	274	216	190	0,45
50	192	150	8	56	32	308	356	332	182	260	390	307	241	220	0,70
55	210	175	8	70	39	358	420	389	214	283	425,5	332,5	275	250	0,90
60	232	190	8	84	46	388	464	426	236	312	457	364	316	265	1,15
70	276	220	10	76	43	450	516	483	263	371	527	423,5	360	300	1,50

1) Required space to align the coupling or replace the sealing ring, respectively.
2) Grease feeding for each coupling half

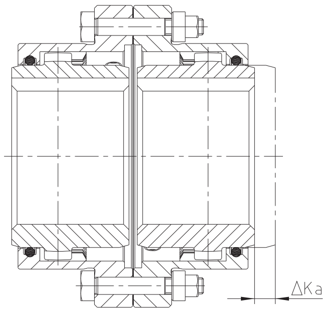
Technical Data

Size	Torque [Nm]		Max. speed [1/min]	Weight with max. bore-Ø [kg]			Massmoment of inertia J with max. bore-Ø [kgm²]	Dowel screws (10.9)		
	T_{KN}	$T_{Kmax.}$		Sleeve	Hub	Total		z	M	T_A [Nm]
10	930	1860	8500	0,748	0,553	2,73	0,00436	6	M6	15
15	2000	4000	7700	1,878	1,119	6,38	0,01894	8	M8	36
20	3500	7000	6900	2,602	2,089	9,94	0,04000	6	M10	72
25	6500	13000	6200	4,432	3,564	16,83	0,09749	6	M12	125
30	10000	20000	5800	5,829	6,184	25,21	0,18080	8	M12	125
35	17000	34000	5100	9,705	9,868	41,25	0,41419	8	M14	200
40	28500	57000	4500	11,883	16,065	58,14	0,75535	8	M14	200
45	37000	74000	4000	15,724	21,419	77,08	1,17590	10	M14	200
50	51000	102000	3750	25,661	29,594	114,40	2,24991	8	M18	430
55	65000	130000	3550	31,522	40,304	150,41	3,45102	14	M18	430
60	85000	170000	3400	32,822	52,960	177,44	4,16734	14	M18	430
70	135000	270000	3200	43,521	85,768	268,20	9,32429	16	M20	610

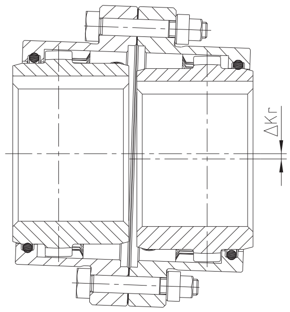
Order form:

GEAREX FA 10	d_1 Ø 50	d_2 Ø 50
Size and type of coupling	Finish bore keyway DIN 6885 sheet 1	Finish bore keyway DIN 6885 sheet 1

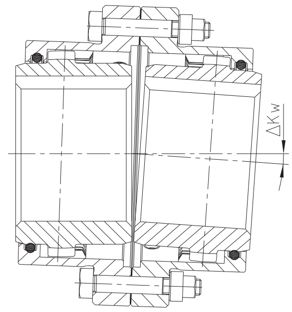
Displacements



Axial displacement



Radial displacement



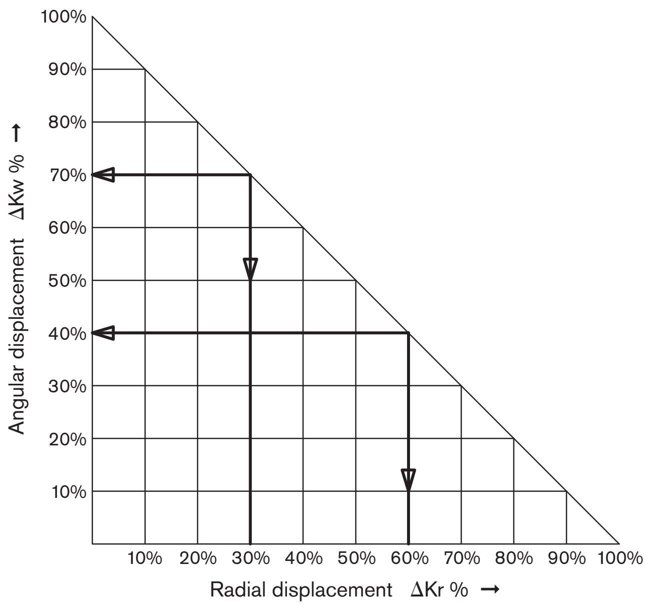
Angular displacement

Displacements			
Size	Max. axial displacement ΔKa [mm]	Max. permissible displacements 1)	
		ΔKr [mm]	ΔKw [°]
10		0,4	
15		0,5	
20		0,6	
25	± 1,0	0,8	
30		1,0	
35		1,0	0,5° each hub
40		1,2	
45		1,4	
50		1,6	
55	± 1,5	1,8	
60		2,0	
70		2,2	

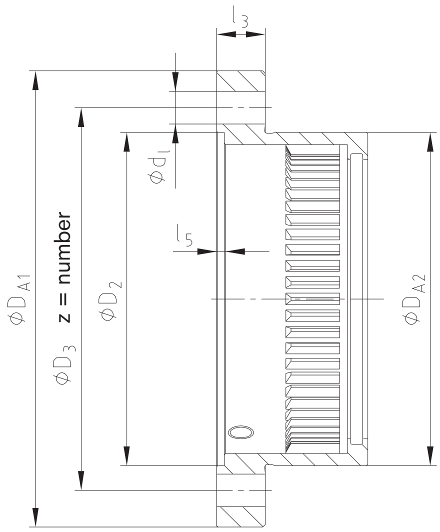
1) The displacement figures are maximum figures which must not arise at the same tine. If both radial and angular displacement arise at the same time, these figures have to be reduced (see examples of calculation and diagramme).

Example 1:
ΔKr = 30%
ΔKw = 70%

Example 2:
ΔKr = 60%
ΔKw = 40%

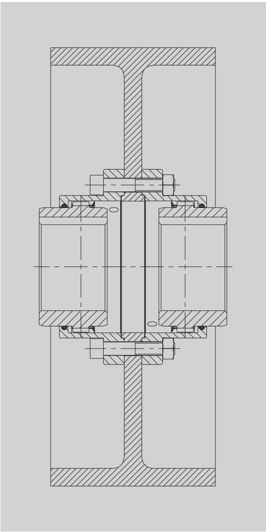


Flange dimensions

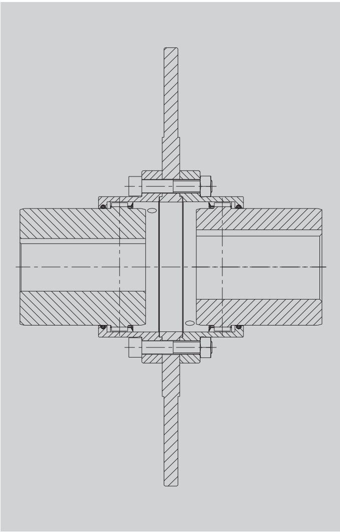


Flange dimensions								
Size	Dimensions [mm]							
	D_{A1}	D_{A2}	D_2	D_3	d_l	number z	l_3	l_5
10	111	84	82	95,25	6,35	6	14	3
15	152	107	105	122,24	9,52	8	19	3
20	178	130	130	149,23	12,70	6	19	3
25	213	158	153	180,97	15,87	6	22	4
30	240	182	178	206,38	15,87	8	22	4
35	280	214	205	241,30	19,05	8	28,5	5
40	318	250	243	279,40	19,05	8	28,5	4
45	347	274	265	304,80	19,05	10	28,5	5,5
50	390	309	302	342,90	22,22	8	38	6
55	424,5	334	320	368,30	22,22	14	38	6
60	457	365,5	353	400,05	22,22	14	26	6
70	527	425	412	463,55	25,40	16	28,5	8

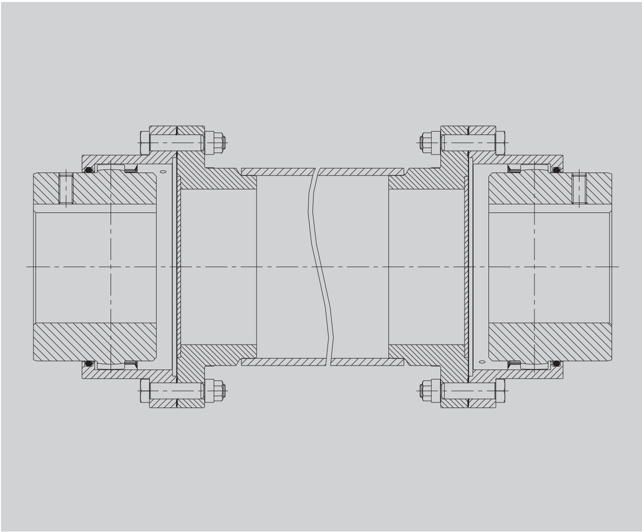
Other types



Type with brake drum



Type with brake disc



Type FH with intermediate pipe

RADEX®-N
Steel laminae coupling

RIGIFLEX®-N
Steel laminae coupling

Made for Motion KTR

Table of contents

Coupling selection steel laminae coupling

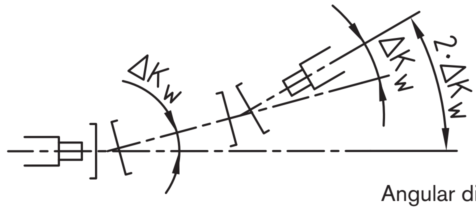
Description	Code	Explanation
Rated torque of coupling	T_{KN}	Torque which can be transmitted continuously over the entire speed range of the coupling.
Vibratory torque of coupling	T_{KW}	Torque amplitude of the permissible periodic torque fluctuation with a frequency of 10 Hz and a basic load of T_{KN} or dynamic load up to T_{KN}.
Maximum torque of coupling	T_{Kmax}	Torque which can be trans-mitted during the entire life of the coupling ≥ 10^5 times as spike load or 5 x 10^4 times as alternating load.

Guidelines for operating factor S_B	
Application	S_B
Construction machinery	2,0
Agitators	1,0 - 2,0
Centrifuges	1,5
Conveyors	2,0
Elevators	2,0
Fans/Blowers	1,5
Generators	1,0
Calanders	2,0
Crushers	2,5
Textile machinery	2,0
Rolling mills	2,5
Woodworking machinery	1,5
Mixers and extruders	2,0
Stamps, presses	2,5
Machine tools	2,0
Grinders	2,5
Packaging machines	1,0
Roller drives	2,5
Piston pumps	2,5
Centrifugal pumps	1,5
Piston compressors	2,5
Turbo compressors	2,0

1. **Permissible displacements:**

ΔK_a: Permissible axial displacement
ΔK_w: Permissible angular displacement
ΔK_r: Permissible radial displacement

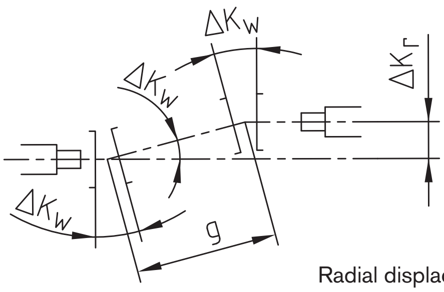
The steel laminae couplings are selected in a way that the maximum permissible angular excursion ΔK_w may be compensated by every laminae set. Consequently the maximum permissible angular excursion of two shafts combined with each other is
$2 \cdot \Delta K_w$. The maximum angular excursion for each laminae set is shown in the table "Technical capacity utilization".



Angular displacement

The permissible radial displacement ΔK_r with distance g of the coupling elements is

$$\Delta K_r = g \cdot \tan(\Delta K_w)$$



Radial displacement

In the table "Technical data" (RADEX®-N page 113 and RIGIFLEX®-N page 122) you can see the max. permissible radial displacements ΔK_r for every size and type based on the given standard lengths of the flange hollow shaft as well as the permissible angular displacement ΔK_w of the coupling elements.
The max. permissible axial displacements ΔK_a for every size and type are also mentioned in the table "Technical data".
The figures of the permissible displacements indicated are dependent on each other!
With an increasing axial displacement ΔK_a the permissible angular displacement ΔK_w decreases and thus the radial displacement ΔK_r.
(See our mounting instructions www.ktr.com).

Coupling selection steel laminae coupling

Selection of the coupling size

2. **Drives without periodic torsional vibrations**
For example centrifugal pumps, fans, screw compressors, etc. The coupling selection requires that the rated torque T_{KN} and the maximum torque $T_{K\,max}$ are reviewed.

2.1 **Loading by rated torque**
Taking into account the operating factor S_B, directional factor S_R and temperature factor S_t, the permissible rated speed must be at least as large as the rated torque T_N of the machine.

The nominal torque T_{KN} of the coupling is:

$$\boxed{T_{KN} \geq T_N \cdot S_B \cdot S_t \cdot S_R}$$

T_N = Torque of the machine
S_B = Operating factor (see table page 109)
S_R = Factor of direction
= 1,00 same torque direction
= 1,70 changing torque direction
S_t = Operating temperature
Temperature factor

°C	- 30	0	+ 150	+ 200	+ 230	+ 270
Factor	1,00	1,00	1,00	1,10	1,25	1,43

2.2 **Loading by torque shocks**
The permissible maximum torque T_{Kmax} of the coupling must be at least as high as the sum of the peak torque T_S and rated torque T_N of the machine taking into account the operating factor S_B, temperature factor S_t and directional factor S_R. This is valid in case that the rated torque of the machine is super-imposed by a shock (e. g. starting of the engine). For drives with A. C.
motors and large masses on the load side we would recommend calculations by our simulation programme (please consult with our Engineering
Department).

$$\boxed{T_{K\,max} \geq (T_N + T_S) \cdot S_t \cdot S_R}$$

T_S = Peak torque

Selection of the coupling size

3. **Drives with periodic torsional vibrations**
For drives subject to dangerous torsional vibrations (e. g. diesel engines, piston compressors, piston pumps, generators, etc.) it is necessary to perform a torsional vibration calculation (please consult with our Engineering Department).

3.1 **Loading by rated torque**
Taking into account the operating factor S_B, directional factor S_R and temperature factor S_t, the permissible rated speed must be at least as large as the rated torque T_N of the machine.

The nominal torque T_{KN} of the coupling is:

$$\boxed{T_{KN} \geq T_N \cdot S_B \cdot S_t \cdot S_R}$$

T_N = Torque of the machine
S_B = Operating factor (see table page 109)
S_R = Factor of direction
= 1,00 same torque direction
= 1,70 changing torque direction
S_t = Operating temperature
Temperature factor

°C	- 30	0	+ 150	+ 200	+ 230	+ 270
Factor	1,00	1,00	1,00	1,10	1,25	1,43

3.2 **Passing through resonance**
The peak torque T_{SR} arising while passing through resonance must not exceed the permissible maximum torque of the coupling $T_{K\,max}$.

$$\boxed{T_{K\,max} \geq T_{SR}}$$

3.3 **Loading by vibratory torque**
The permissible vibratory torque of the coupling T_{KW} must not be exceeded by the maximum
periodic vibratory torque of the machine T_W.

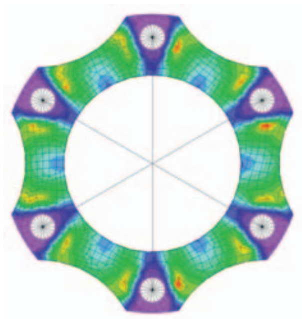
$$\boxed{T_{KW} \geq T_W}$$

Description of coupling

The RADEX®-N is a backlash-free, torsionally rigid and maintenance-free all-steel coupling. The laminae that are extremely rigid in sense of rotation are made from high-strength, stainless spring steel and enable a compensation for high displacements with low restoring forces. By reason of the all-steel design the RADEX®-N can be used in drives with temperatures of up to 280 °C.

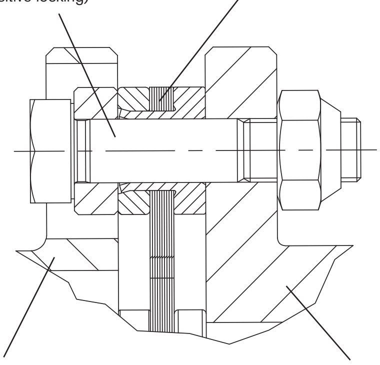
FEM-optimized laminae form

The steel laminae packings from stainless spring steel were developed on the basis of FEM calculations. Under consideration of the necessary possibilities of displacements of the coupling the optimal form regarding torque transmission and torsional rigidity was aimed for. The fitted form of the steel laminae at the outside diameter is the result of this optimization calculation.



Laminae packings with sdowel screws

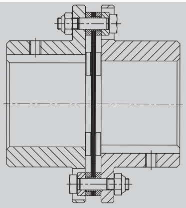
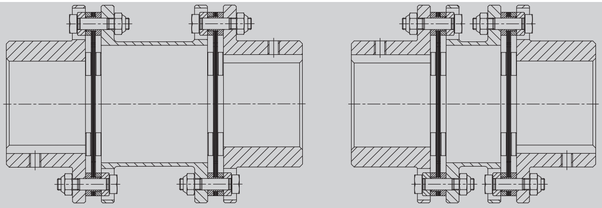
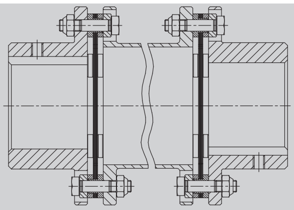
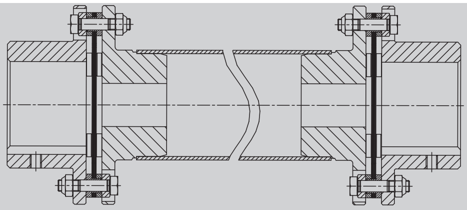
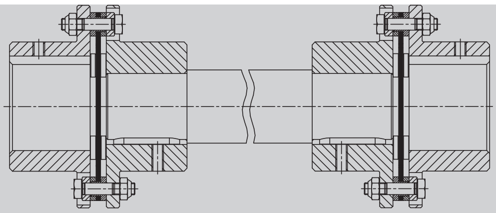
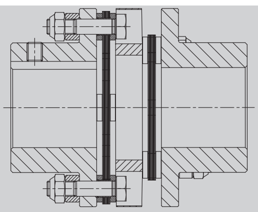
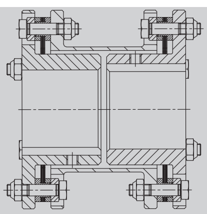
The „heart" of the steel laminae coupling are the laminae packings and their connection to the hubs or spacers. High-strength, special dowel screw that are alternately screwed with hubs and spacer enable a combination of frictional engagement and positive locking. Thus a high power density with simultaneous easy displacement and low restoring forces is guaranteed. Due to the special constructive design of the RADEX®-N components the laminae packings are „artificially" prestressed. Hereby the torsional rigidity of approx. 30 % is enabled and at the same time the known problem regarding the axial vibrations of the spacer is avoided.



Explosion protection use

RADEX®-N couplings are suitable for power transmission in drives in hazardous areas. The couplings are certified and confirmed according to EC standard 94/9/EC (ATEX 95) as units of category 2G/2D and thus suitable for the use in hazardous areas of zone 1, 2, 21 and 22. Please read through our information included in the respective Type Clamping ring hubs (clamping hub without dowel screw only for category 3) used in hazardous areas must be selected in a way that there is a safety of s = 2 from the peak torque of the unit including all operating parameters to the torque of frictional engagement and to the nominal torque of the coupling.
Examination Certificate and the operating and mounting instructions at www.ktr.com.

Types and applications

Types	Characteristics	Applications
 **Type NN** (see page 116)	● single cardanic design ● only angular and axial displacement permissible ● high torsional rigidity ● compact dimensions	● mixers ● agitating machines ● immersion pumps ● fans ● applications with high radial load
 **Type NANA 1 / NANA 2** (see page 116)	● double cardanic design ● compensation of high misalignment with low restoring forces ● standard spacers available from stock	● paper machines ● printing and processing machines ● conveyors ● steel mills ● generators ● grinding machines
 **Type NANA 3** (see page 117)	● double cardanic design ● spacers adapted to standard dimensions of pumps ● radial assembly, no movement of the machine required ● **available according to API 610**	● process pumps ● water pumps ● pumps according to API standard ● turbines ● compressors
 **Type NANA 4** (see page 118)	● spacers can be determined by the customer ● maximum shaft distance dimension up to approx. 6 m ● welded intermediate pipes for high torsional rigidity	● foil and paper machines ● pallet and conveyor systems ● portal robots ● test benches ● cooling towers/blowers
 **Type NNW** (see page 118)	● spacers can be determined by the customer ● coupling consisting of 2 x type NN with intermediate shaft ● for drives with relatively low speeds	● low speed drives with big shaft distance dimensions ● agitating machines ● crushers ● presses ● packaging machines
 **Type NNZ** (see page 118)	● compact double cardanic design ● cannot be radially assembled ● with intermediate disk ● ideal for replacement of curved-tooth gear couplings from steel ● standard type up to size 70	● robotics ● paper machines and inserters ● machine tools ● packaging machines ● test benches
 **Type NENE 1** (see page 116)	● with reduced hubs ● compact double cardanic design ● spacers cannot be assembled radially ● variable spacer length	● applications with short shaft distance dimensions ● replacement for curved-tooth gear couplings from steel

Technical data

Torques, misalignments

Size	Torques [Nm]			Permissible misalignments				
	T_{KN}	$T_{K\ max}$	T_{KW}	Angular [°] each laminae	Axial [mm] NN	Axial [mm] NANA 1/ NANA2/NNZ	Radial [mm] NANA 1	Radial [mm] NANA 2/NNZ
20	15	30	5	1,0	0,6	1,2	0,5	0,1
25	30	60	10	1,0	0,8	1,6	0,5	0,2
35	60	120	20	1,0	1,0	2,0	0,5	0,2
38	120	240	40	1,0	1,2	2,4	0,6	0,3
42	180	360	60	1,0	1,4	2,8	0,6	0,3
50	330	660	110	1,0	1,6	3,2	0,8	0,4
60	690	1380	230	1,3	1,0	2,0	1,7	1,0
70	1100	2200	370	1,3	1,1	2,2	2,1	1,2
80	1500	3000	500	1,3	1,3	2,6	2,5	1,5
85	2400	4800	800	1,3	1,3	2,3	2,5	1,5
90	4500	9000	1500	1,0	1,0	2,0	2,0	1,4
105	5100	10200	1700	1,0	1,2	2,4	2,5	1,6
115	9000	18000	3000	1,0	1,4	2,8	2,0	1,3
135	12000	24000	4000	1,0	1,75	3,5	4,0	–
138	23000	46000	11500	0,5	1,3	2,6	$\Delta Kr = \tan 0{,}5° \times (E_7 - E_1)$	–
158	33000	66000	16500	0,5	1,3	2,6		–
168	45000	90000	22500	0,5	1,45	2,9		–
208	70000	140000	35000	0,5	1,75	3,5		–
248	120000	240000	60000	0,5	2,1	4,2		–
288	200000	400000	100000	0,5	2,4	4,8		–
338	280000	560000	140000	0,5	2,5	5,0		–

Permissible speeds, torsional stiffness

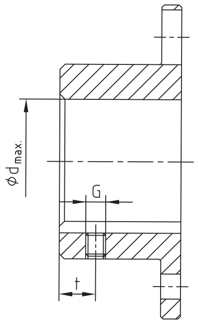
Size	Max. speed [rpm] (higher speeds on request)	Torsion spring rigidity x 10^6 [Nm/rad] per laminae set	Size	Max. speed [rpm] (higher speeds on request)	Torsion spring rigidity x 10^6 [Nm/rad] per laminae set
20	20000	0,017	105	4000	2,540
25	16000	0,028	115	3400	3,480
35	13000	0,092	135	3000	6,850
38	12000	0,198	138	3800	13,200
42	10000	0,282	158	3500	18,300
50	8000	0,501	168	3300	26,200
60	6700	0,560	208	2800	52,000
70	5900	0,900	248	2300	71,000
80	5100	1,140	288	2000	108,000
85	4750	1,520	338	1800	156,000
90	4300	1,940			

Weights and mass moments of inertia

Size	Hub 1) [kg] / [kgm²]	Laminae set [kg] / [kgm²]	NN 1) complete [kg] / [kgm²]	NANA 1 1) complete [kg] / [kgm²]	NANA 2 1) complete [kg] / [kgm²]	NNZ 1) complete [kg] / [kgm²]
20	0,129 / 0,000043	0,044 / 0,00001	0,304 / 0,00010	0,551 / 0,00011	–	0,436 / 0,00010
25	0,24 / 0,000116	0,077 / 0,00003	0,558 / 0,00026	0,935 / 0,00029	–	0,768 / 0,00025
35	0,571 / 0,00042	0,098 / 0,00006	1,242 / 0,0008	1,891 / 0,0095	–	1,597 / 0,0085
38	0,781 / 0,00073	0,2 / 0,00015	1,764 / 0,0016	2,839 / 0,0018	–	2,362 / 0,015
42	1,076 / 0,00123	0,248 / 0,0002	2,407 / 0,0027	3,638 / 0,0029	–	3,157 / 0,0024
50	1,752 / 0,00291	0,462 / 0,0003	3,973 / 0,0061	6,182 / 0,010	–	5,111 / 0,008
60	1,878 / 0,00378	0,395 / 0,0006	4,158 / 0,0082	6,005 / 0,013	5,816 / 0,012	5,287 / 0,01
70	2,778 / 0,00714	0,432 / 0,0009	0,6239 / 0,0152	9,101 / 0,024	8,659 / 0,022	8,028 / 0,02
80	4,12 / 0,0134	0,719 / 0,002	8,973 / 0,029	12,594 / 0,044	12,009 / 0,042	–
85	5,115 / 0,0195	1,011 / 0,003	11,256 / 0,042	16,161 / 0,067	15,522 / 0,064	–
90	6,196 / 0,0282	2,309 / 0,008	14,728 / 0,064	21,987 / 0,106	21,288 / 0,103	–
105	7,601 / 0,0414	2,194 / 0,01	17,423 / 0,093	25,771 / 0,148	24,654 / 0,143	–
115	11,951 / 0,0899	3,931 / 0,02	27,862 / 0,199	42,765 / 0,344	41,225 / 0,333	–
135	18,9 / 0,1866	7,265 / 0,11	45,144 / 0,483	71,397 / 0,851	–	–
138	16,263 / 0,1457	9,895 / 0,143	42,455 / 0,435	Mounting dimension E as indicated by the customer	–	–
158	19,611 / 0,2064	14,238 / 0,242	53,494 / 0,655		–	–
168	29,483 / 0,3609	15,090 / 0,315	174,161 / 1,038		–	–
208	54,171 / 0,9738	22,375 / 0,679	130,854 / 2,629		–	–
248	84,221 / 2,1508	38,161 / 1,605	206,759 / 5,909		–	–
288	142,962 / 4,8456	53,823 / 3,056	340,051 / 12,755		–	–
338	221,02 / 10,2386	77,499 / 5,778	520,540 / 26,313		–	–

1) Hubs with maximum bore

Cylindrical bores



Standard hub 1.0 according to DIN 6885 sheet 1 (with keyway)									
Size	$d_{max.}$	G	t	T_A [Nm]	Size	$d_{max.}$	G	t	T_A [Nm]
20	20	M5	6	2,0	105	105	M12	30	40,0
25	25	M5	8	2,0	115	115	M12	30	40,0
35	35	M6	15	4,8	135	135	on request of customer		
38	38	M6	15	4,8	138	135			
42	42	M8	20	10,0	158	150			
50	50	M8	20	10,0	168	165			
60	60	M8	20	10,0	208	200			
70	70	M10	20	17,0	248	240			
80	80	M10	20	17,0	288	280			
85	85	M10	25	17,0	338	330			
90	90	M12	25	40,0					

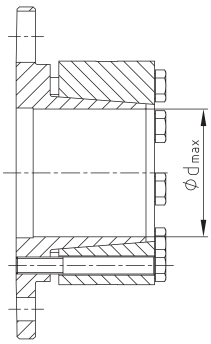
Stock programme cylindrical finish bore [mm] H7, keyway to DIN 6885 sheet 1 (JS9) with thread for setscrew of standrad hub 1.0

Size	unbored	10	12	14	15	18	19	20	22	24	25	28	30	32	35	38	40	42	45	48	50	55	60	65	70	75	80	85	90	95	100	110
20	●	●		●	●		●	●																								
25	●		●	●		●	●	●	●	●	●																					
35	●			●			●	●		●	●	●	●	●	●																	
38	●									●	●	●	●		●	●																
42	●									●	●		●		●	●	●	●														
50	●												●	●	●	●	●	●	●	●	●											
60	●										●		●	●	●	●	●	●	●	●	●	●	●									
70	●																●		●	●	●		●	●	●							
80	●																●		●	●	●	●	●	●	●	●						
85	●																						●	●			●					
90	●																						●	●	●	●	●		●			
105	●																								●		●		●			
115	●																										●		●		●	●
135	●																															
138	pilot bore																															
158	pilot bore																															
168	pilot bore																															
208	pilot bore																															
248	pilot bore																															
288	pilot bore																															
338	pilot bore																															

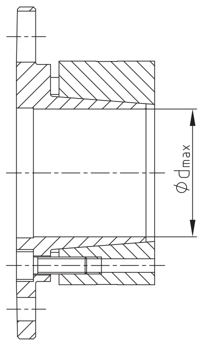
Backlash-free shaft-hub connections without feather key

Selection: In case of use in hazardous areas the clamping ring hubs must be selected in a way that there is a minimum safety factor of s = 2 between the peak torque (including all operating parameters) and the nominal torque and frictional torque of engagement of the coupling.

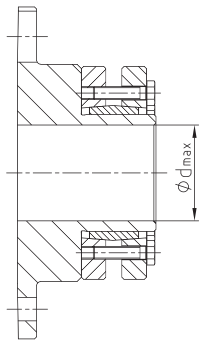
Clamping ring hub type 6.5
(clamping screws from the outside)



Clamping ring hub type 6.0
(clamping screws from the inside)



Design with CLAMPEX®
element type 603

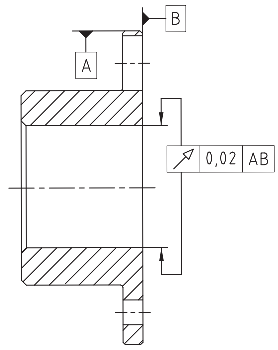


Size	Type 6.5 and 6.0 $d_{max.}$	CLAMPEX® 603/620 $d_{max.}$	Size	Type 6.5 and 6.0 $d_{max.}$	CLAMPEX® 603/620 $d_{max.}$
35	28	36	115	100	115
38	32	36	135	110	125
42	38	42	138	on request	
50	42	60	158		
60	50	70	168		
70	60	75	208		
80	70	80	248		
85	70	90	288		
90	80	95	338		
105	90	105			

General information

Delivery condition

RADEX®-N are delivered as individual parts (can be delivered assembled on request). The hubs can be supplied unbored or with finish bore and keyway or with a frictionally engaged shaft-hub-connection.



Assembly and operating advice

(Please see our mounting instructions KTR standard 47110 see www.ktr.com.)
For the assembly it is important to make sure that the laminae sets are assembled free from distortion in axial direction.

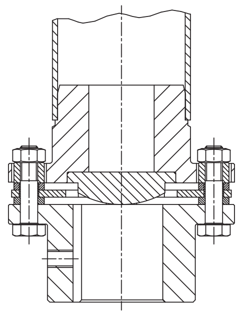
If the finish bore is machined by the customer, the concentric and axial running tolerances have to be observed (see sketch below).

Balancing:

On request of the customer the RADEX®-N couplings can be balanced. For most applications this is not necessary due to the accurate machining of the coupling. Please consult with KTR for any further questions.

Safety regulations:

The coupling must be selected in a way that the permissible coupling load is not exceeded in any operating condition. For that purpose a comparison between the actual loads with the permissible coupling characteristics has to be performed.
The customer must protect rotating parts against unintended touch (Safety of Machines DIN EN 292 part 2).
Please take precautions that there is a sufficient coupling protection in case of a fracture of the coupling caused by overload.

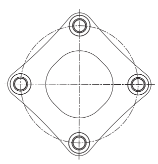


Installation:

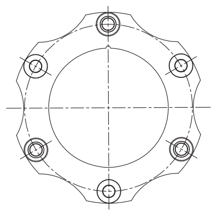
RADEX®-N couplings are designed for horizontal installation. For vertical installation the spacer has to be supported (see sketch below). Please contact.

The following laminae types are distinguished for RADEX®-N

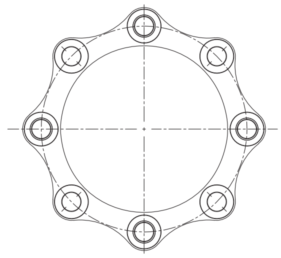
Size 20 – 50
(4 hole laminae)



Size 60 – 135
(6 hole laminae)



Size 138 – 338
(8 hole laminae)

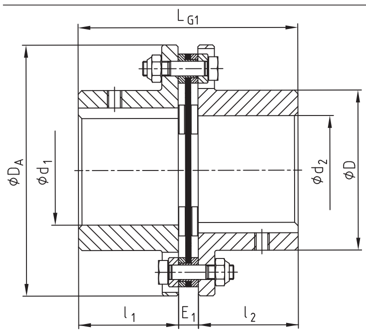


Screw tightening torques of laminae:

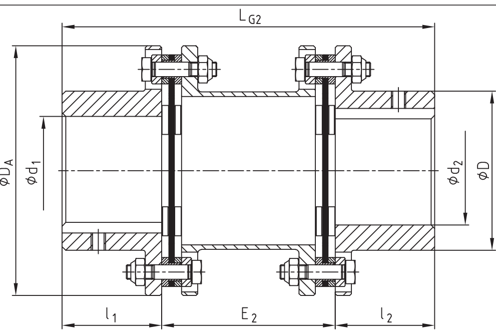
Size	Screw	T_A [Nm]	Size	Screw	T_A [Nm]
20	4 x M5	8,5	105	6 x M16	280
25	4 x M6	14	115	6 x M20	550
35	4 x M6	14	135	6 x M24	900
38	4 x M8	35	138	8 x M24	8 x 30
42	4 x M8	35	158	8 x M27	9 x 30
50	4 x M10	69	168	8 x M27	9 x 30
60	6 x M8	33	208	8 x M30	8 x 60
70	6 x M10	65	248	8 x M36	8 x 90
80	6 x M10	65	288	8 x M42	10 x 90
85	6 x M12	115	338	8 x M48	11 x 90
90	6 x M16	280			

Standard types

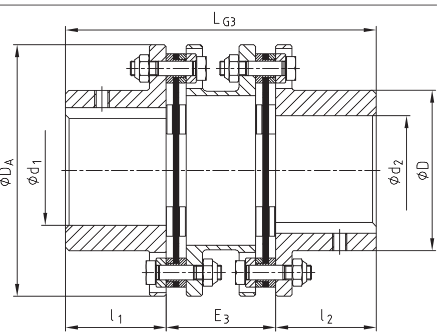
- Standard types available from stock
- Single and double cardanic designs
- Furthermore available with frictionally engaged shaft-hub-connection
- Finish bore according to ISO fit H7, feather keyway according to DIN 6885 sheet 1 - JS9
- Ⓔx Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)



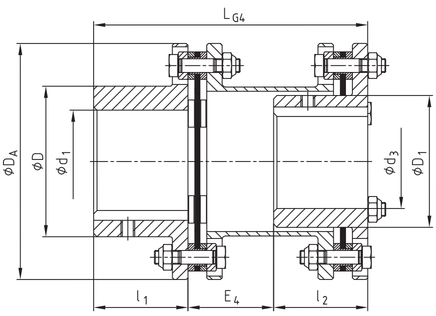
Type NN



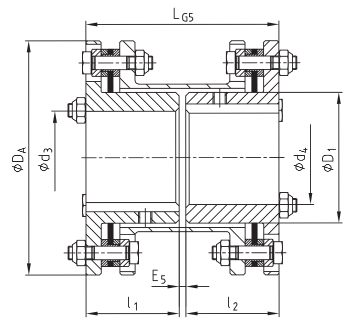
Type NANA 1



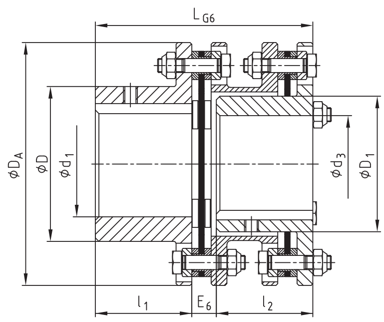
Type NANA 2



Type NENA 1



Type NENE 1



Type NENA 2

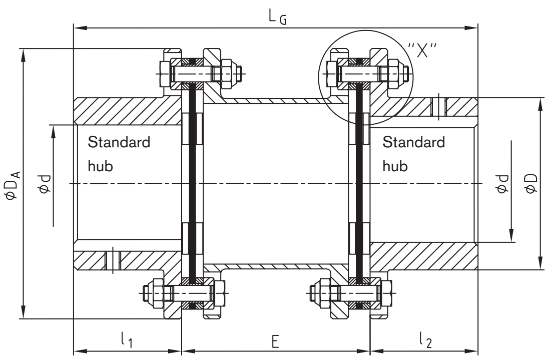
RADEX®-N types NN, NANA 1, NANA 2, NENA 1, NENE 1, NENA 2																		
Size	Finish bore		Dimensions [mm]															
	d_1/d_2	d_3/d_4	D	D_1	D_A	l_1/l_2	L_{G1}	E_1	L_{G2}	E_2	L_{G3}	E_3	L_{G4}	E_4	L_{G5}	E_5	L_{G6}	E_6
20	20	-	32	-	56	20	45	5	100	60	-	-	-	-	-	-	-	-
25	25	-	40	-	68	25	56	6	110	60	-	-	-	-	-	-	-	-
35	35	-	54	-	82	40	86	6	150	70	-	-	-	-	-	-	-	-
38	38	-	58	-	94	45	98	8	170	80	-	-	-	-	-	-	-	-
42	42	-	68	-	104	45	100	10	170	80	-	-	-	-	-	-	-	-
50	50	-	78	-	126	55	121	11	206	96	-	-	-	-	-	-	-	-
60	60	55	88	77	138	55	121	11	206	96	170	60	160	50	114	4	124	14
70	70	65	102	90	156	65	141	11	246	116	200	70	190	60	134	4	144	14
80	80	75	117	104	179	75	164	14	286	136	233	83	220	70	154	4	167	17
85	85	80	123	112	191	80	175	15	300	140	246	86	232	72	164	4	178	18
90	90	85	132	119	210	80	175	15	300	140	251	91	233	73	166	6	184	24
105	105	90	147	128	225	90	200	20	340	160	281	101	263	83	186	6	204	24
115	115	100	163	145	265	100	223	23	370	170	309	109	288	88	206	6	227	27
135	135	115	184	160	305	135	297	27	520	250	-	-	-	-	-	-	-	-

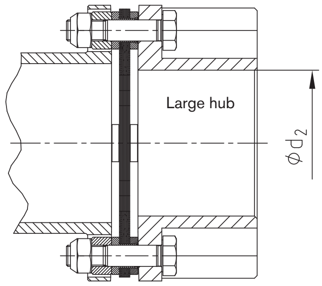
Order form

RADEX® - N 60	NANA 1	Ø 50	Ø 60
Coupling size	Type	Bore d_1	Bore d_2

Standard line NANA 3 for pump drives according to API 610

- Line NANA 3 for pump drives
- Coupling according to API 610
- High balancing quality due to precise manufacture (AGMA class 9)
- Device to secure the spacer if the laminae breaks (see detail "X")
- Also available with large hub for larger bore diameters
- Finish bore according to ISO fit H7, feather keyway according to DIN 6885 sheet 1 - JS9
- Ex Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)

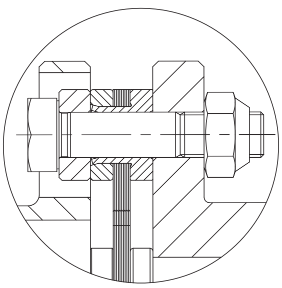




RADEX®-N type NANA 3									
Size	Dimensions [mm]							Perm. displacements	
				D	D_A	$E_{Standard}$ 1)	l_1/l_2	Angle each laminae [°]	Axial [mm]
42	42	58	68	104	100	45	1,0	2,8
50	50	65	78	126	140/180	55	1,0	3,2
60	60	80	88	138	100/140/180/250	55	1,3	2,0
70	70	90	102	156	100/140/180	65	1,3	2,2
80	80	105	117	179	100/140/180/250	75	1,3	2,6
85	85	115	123	191	100/140/180/250	80	1,3	2,3
90	90	120	132	210	140/180/250	80	1,0	2,0
105	105	130	147	225	250	90	1,0	2,4
115	115	150	163	265	250	100	1,0	2,8
135	135	-	184	305	250	135	1,0	3,5

1) Other E-dimensions available on request.

Detail "X"



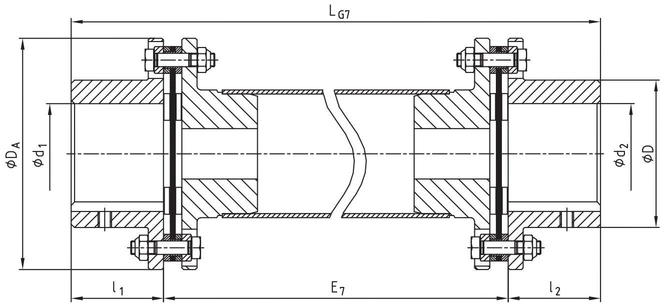
Securing device of the spacer:
The laminae packings have a sleeve in order to secure the spacer if the laminae breaks.

Order form:

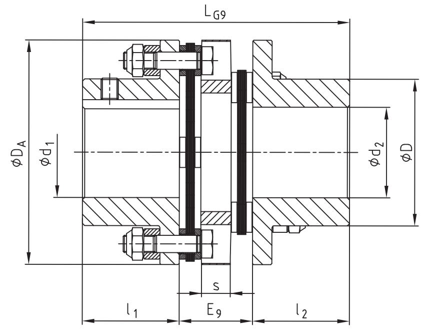
RADEX®-N 60	NANA 3	Ø 50	Ø 60	140
Coupling size	Type	Bore d_1	Bore d_2	Shaft distance dimension

Special types on request of customers

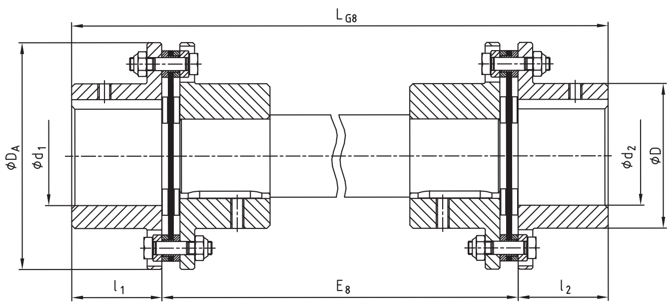
- Types as per customer requirements
- Type NANA 4 for shaft distance dimensions up to 6 m
- Type NNW with full shaft (please note the critical whirling speed)
- Type NNZ (double-cardanic) for very short shaft distance dimensions
- Finish bore according to ISO fit H7, feather keyway according to DIN 6885 sheet 1 - JS9
- Ex Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)



Type NANA 4



Type NNZ



Type NNW

RADEX®-N types NANA 4, NNZ and NNW

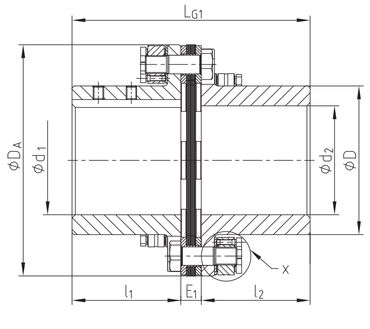
Size	max. finish bore	Dimensions [mm]									
	d_1/d_2	D	D_A	l_1/l_2	L_{G7}	E_7	L_{G8}	E_8	L_{G9}	E_9	s
20	20	32	56	20	$L_{G7} = E_7 + l_1 + l_2$	Intermediate shaft dimension according to customer specification	$L_{G8} = E_8 + l_1 + l_2$	Intermediate shaft dimension according to customer specification	58	18	8
25	25	40	68	25					70	20	8
35	35	54	82	40					102	22	10
38	38	58	94	45					118	28	12
42	42	68	104	45					124	34	14
50	50	78	126	55					144	34	12
60	60	88	138	55					144	34	12
70	70	102	156	65					166	36	14
80	80	117	179	75					-	-	-
85	85	123	191	80					-	-	-
90	90	132	210	80					-	-	-
105	105	147	225	90					-	-	-
115	115	163	265	100					-	-	-
135	135	184	305	135					-	-	-

Order form:

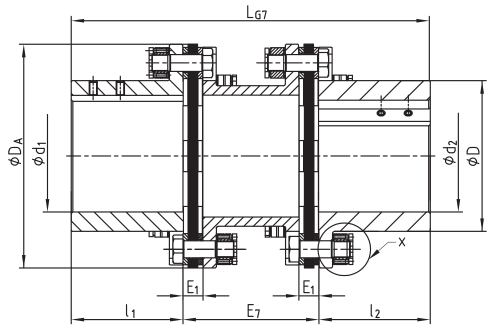
RADEX®-N 60	NANA 4	Ø 50	Ø 60	2500
Coupling size	Type	Bore d_1	Bore d_2	Shaft distance dimension

Standard types with laminae with 8 holes

- New design with a higher power density
- Laminae set in a design with 8 pins
- Closed ring laminae
- Easier assembly by means of KTR clamping nuts (see below)
- Finish bore according to ISO fit H7, feather keyway according to DIN 6885 sheet 1 - JS9
- Furthermore available with frictionally engaged shaft-hub-connection
- Ⓔx Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)



Type NN

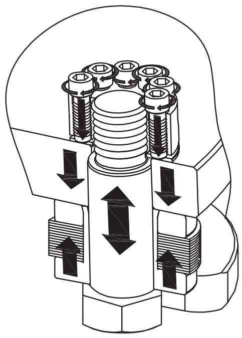


Type NANA 1

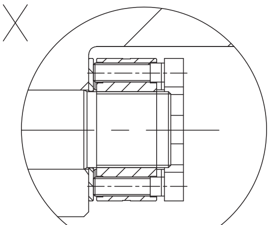
RADEX®-N types NN and NANA 1

Size	Torque [Nm]			max. Finishbore	Dimensions [mm]						
	T_{KN}	$T_{K\ max.}$	T_{KW}	d_1/d_2	D	D_A	l_1/l_2	E_1	L_{G1}	E_7	L_{G7}
138	23000	46000	11500	135	180	300	135	23	293	Indicated by the customer	Indicated by the customer
158	33000	66000	16500	150	195	325	150	27	327		
168	45000	90000	22500	165	225	350	165	31	361		
208	70000	140000	35000	200	275	420	200	37	437		
248	120000	240000	60000	240	320	500	240	44	524		
288	200000	400000	100000	280	383	567	280	52	612		
338	280000	560000	140000	330	445	660	330	58	718		

- Use of usual dynamometric screwdrivers (up to approx. 100 Nm) even with large screwings like, for example, M42 threads
- Savings of expenses (easy and quick assembly or disassembly, no special tools necessary)
- Optimum load of screws, since they are subject to tensile stress only (no torsional loads like with usual screw connections)
- Ideal for narrow mounting spaces (e. g. gearbox housings), since big tools do not have to be used
- For screw quality classes 8.8 and 10.9
- For further details please see page 284



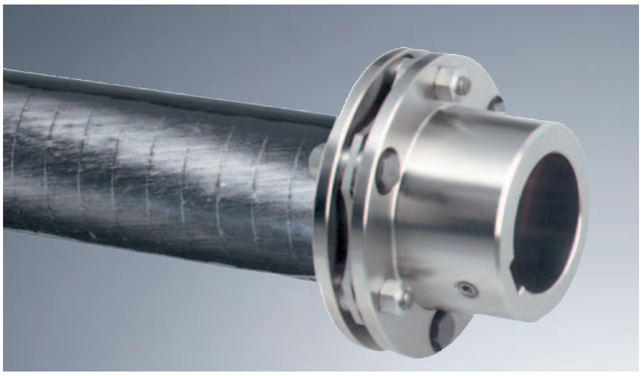
X



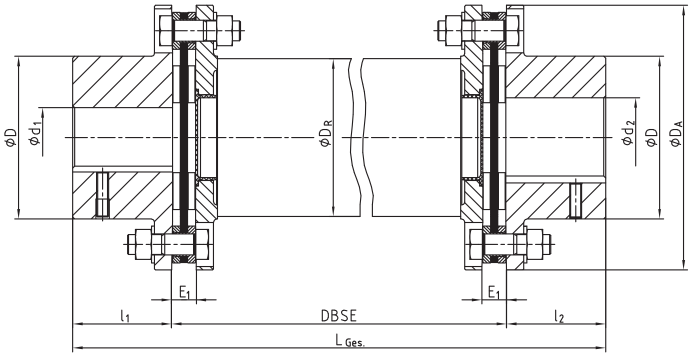
Order form

RADEX®-N 208	NANA 1	d_1 Ø 200 mm	d_2 Ø 180 mm	500
Coupling size	Type	Bore d_1	Bore d_2	Shaft distance dimension E

Corrosion-resistant type for large shaft distance dimension



- All steel parts made of stainless material
- Composite tubes are conglutinated with the flanges and radially bolted in addition
- Spacer sealed against environmental influences (e. g. penetration of moisture into the glued joint)
- On request also available with brake disc made of stainless material
- ATEX release possible



RADEX®-N type NANA 4 CFK											
Size	Torque [Nm]		Dimensions [mm]								
	T_{KN}	$T_{K\ max.}$	D_A	max. d_1/d_2	D	l_1/l_2	E_1	DBSE	$L_{Ges.}$	Composite Pipe D_R	max. DBSE[1)] at 1500 rpm
70	800	1600	149	70	102	65	11	customer's specifications	$l_1 + l_2 +$ DBSE	95	3500
85	1800	3600	184	85	123	80	15			117	3900
90	2500	5000	200	90	135	80	15			128	4100
115	4500	9000	253	115	163	100	23			160	4600

[1)] In case of higher speeds or longer DBSE dimensions please contact the KTR engineering department (+49 5971 798-484).
Due to composite tubes optimized by applications the aforementioned technical details (e. g. max. DBSE) may be varied, if required.

Particularly the steel laminae couplings are wellsuited for applications with especially large distance dimensions between the drive and the driven side (e. g. cooling towers, ventilators etc.) due to their design.
In order to be able to realize high speeds with large distance dimensions, RADEX®-N couplings with intermediate shafts made from glass fiber or carbon fiber reinforced nylon (GRP or CFRP) are used, if necessary.

Order form:

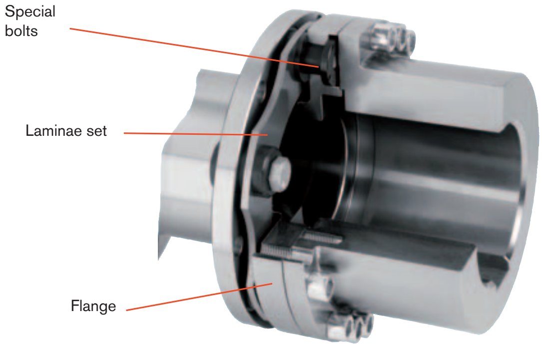
RADEX® - N 85	NANA 4 CFK	Ø 60	Ø 70	3000
Coupling size	Type	Bore d_1	Bore d_2	Shaft distance dimension

Description of coupling

RIGIFLEX®-N couplings are used on such applications which require a reliable and maintenance-free torque transmission with shaft displacement at the same time.
RIGIFLEX®-N was developped for pump drives in particular. This coupling system corresponds to the regulations of API 610 and may be supplied in accordance with API 671 optionally.
(API = American Petroleum Institute)
Torques from 240 Nm to 280.000 Nm are available in 15 sizes for an optimum adjustment to the different applications.

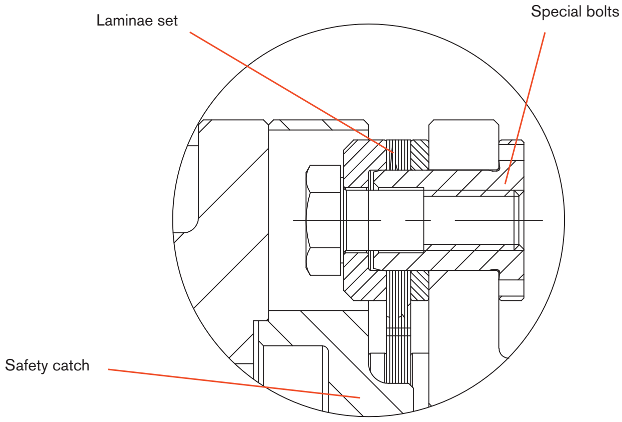
RIGIFLEX® N laminae

RIGILFEX®-N laminae are waisted laminae sets arranged in layers. They are connected to the hubs or flanges, respectively, in an absolutely backlash-free fit by means of positive-locking set screws. The number of the layers of individual laminae allows to vary torques, displacement figures and stiffness for special designs.



Securing the spacer

Since our main idea with the development of RIGIFLEX®-N was to comply with the standards of API 610 and API 671, the spacer is secured by a safety catch, too.
In case that the laminae break the spacer remains within the coupling.
In general the removable part is supplied along with a laminae set preassembled by the manufacturer.



Explosion protection use

RIGIFLEX®-N couplings are suitable for the use in drives in hazardous areas. The couplings are certified according to EC Standard 94/9/EC (ATEX 95) and belong to category 2G/2D, are confirmed and thus suitable for the use in hazardous areas of zone 1, 2, 21 and 22.
Further information about this topic under www.ktr.com.

Technical data

Torques, misalignments

Size	Torque [Nm]			Permissible misalignments						
	T_{KN}	$T_{K\ max}$	T_{KW}	Angular $\pm K_W$ [1] [°]	Axial $\pm K_A$ [mm]	Radial $\pm K_R$ [mm] E=100	E=140	E=180	E=200	E=250
NEW 50	240	480	120	0,7	1,4	0,79	0,128	-	-	-
65	450	900	225	0,7	1,5	0,75	1,23	1,72	-	-
75	940	1880	470	0,7	1,8	0,73	1,22	1,71	-	-
85	1700	3400	850	0,7	2,1	-	1,14	1,62	1,87	2,48
110	2700	5400	1350	0,7	2,4	-	1,05	1,54	1,78	2,39
120	4500	9000	2250	0,7	2,6	-	1,00	1,49	1,73	2,35
140	9000	18000	4500	0,7	3,3	-	-	-	1,55	2,16
160	13000	26000	6500	0,7	3,8	-	-	-	-	1,99
168	23000	46000	11500	0,5	2,6					
198	30000	60000	15000	0,5	2,6					
218	42500	85000	21500	0,5	2,9					
258	70000	140000	35000	0,5	3,5	Mounting dimension E as indicated by the customer				
308	115000	230000	57500	0,5	4,2					
348	180000	360000	90000	0,5	4,8					
408	280000	560000	140000	0,5	5,0					

1) Angular mIsalignment each laminae

If axial, angular and radial shaft misalignment arises in parallel please note the following table:

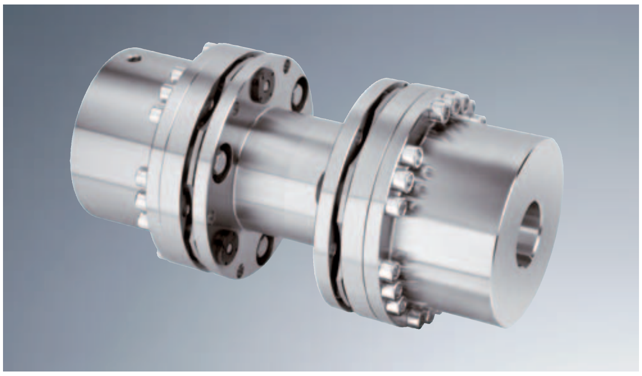
Size	Permissible angular displacement 0	0,1	0,2	0,3	0,4	0,5	0,6	0,7
	Permissible axial displacement							
NEW 50	1,40	1,20	1,00	0,80	0,60	0,40	0,20	0,00
65	1,50	1,29	1,07	0,86	0,64	0,43	0,22	0,00
75	1,80	1,54	1,29	1,03	0,77	0,52	0,26	0,00
85	2,10	1,80	1,50	1,20	0,90	0,60	0,30	0,00
110	2,40	2,06	1,71	1,37	1,03	0,69	0,34	0,00
120	2,60	2,23	1,86	1,48	1,11	0,74	0,37	0,00
140	3,30	2,83	2,36	1,88	1,41	0,94	0,47	0,00
160	3,80	3,26	2,71	2,17	1,63	1,09	0,54	0,00
168	2,6	2,08	1,56	1,04	0,52	0,0	-	-
198	2,8	2,24	1,68	1,12	0,56	0,0	-	-
218	3,0	2,40	1,80	1,20	0,60	0,0	-	-
258	3,5	2,80	2,10	1,40	0,70	0,0	-	-
308	4,0	3,20	2,40	1,60	0,80	0,0	-	-
348	4,5	3,60	2,70	1,80	0,90	0,0	-	-
408	5,0	4,00	3,00	2,00	1,00	0,0	-	-

Permissible speeds, stiffness

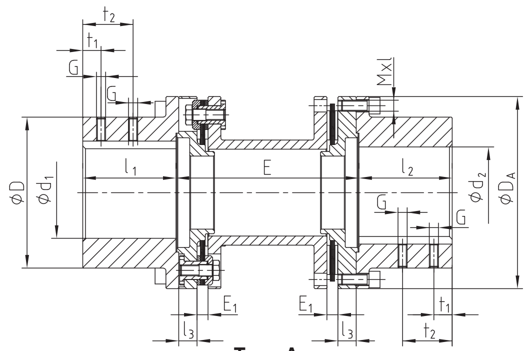
Size	Max. speed [rpm]	Complete coupling ca [N/mm]	Laminae cw [Nm/rad]	Laminae ct [Nm/rad]	ct [Nm/rad] for complete coupling with mounting length E: E=100	E=140	E=180	E=200	E=250
NEW 50	18000	75	470	198000	73953	63990	-	-	-
65	13600	136	860	360000	146022	129938	117046	-	-
75	12400	340	1500	720000	306145	278381	255234	-	-
85	11000	385	2300	1062000	-	406641	369429	353265	318433
110	9000	390	2800	1460000	-	664284	637587	625028	595693
120	8000	600	4100	4500000	-	1798018	1637553	1567602	1416348
140	6400	580	6400	5600000	-	-	-	2363340	2226630
160	5600	620	9800	6850000	-	-	-	-	2654894
168	5600	1230	34000	13200000					
198	5200	1800	58000	18300000					
218	4600	2300	110000	26200000					
258	3900	2950	160000	52000000	Mounting dimension E as indicated by the customer				
308	3300	3400	220000	71000000					
348	2900	3700	290000	108000000					
408	2500	3800	550000	156000000					

ca = axial stiffness   cw = angular stiffness   ct = torsion spring stiffness

Type A



- Series for pump drives
- Coupling in accordance with API 610, API 671 optionally.
- Available with large hub for bigger bore diameters
- Spacers are supplied assembled by the manufacturer
- Finish bore according to ISO fit H7, feather key according to DIN 6885 sheet 1 - JS9
- High balancing quality due to accurate machining (AGMA Class 9)
- Ⓔx Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)



Type A

RIGIFLEX®-N type A

	Size	Torque [Nm]			Max. finish bore	Dimensions [mm]													Screws DIN EN ISO 4762	
		T_{KN}	$T_{Kmax.}$	T_{KW}	d_1/d_2	D	D_A	l_1/l_2	l_3	G	t_1	t_2	E_1	E [1]					Mxl	T_A
NEW	50	240	480	120	50	70	95	50	12	M6	10	-	9	100	140	-	-	-	M6x22	14
	65	450	900	225	65	100	126	63	12	M8	20	-	10	100	140	180	-	-	M6x20	14
	75	940	1880	470	75	105	138	62,5	12	M8	20	-	10	100	140	180	-	-	M8x20	35
	85	1700	3400	850	85	120	156	72,5	15	M10	20	-	12	-	140	180	200	250	M8x25	35
	110	2700	5400	1350	110	152	191	87	18	M10	25	-	12	-	140	180	200	250	M10x30	69
	120	4500	9000	2250	120	165	213	102	20	M12	25	-	12	-	-	180	200	250	M12x30	120
	140	9000	18000	4500	140	200	265	126	25	M12	30	-	15	-	-	-	200	250	M16x40	295
	160	13000	26000	6500	160	230	305	145	31	M20	50	-	15	-	-	-	-	250	M16x50	295
	168	23000	46000	11500	165	230	305	155	31	M16	30	70	17						M20x50	490
	198	30000	60000	15000	190	260	330	185	32	M16	40	90	24						M20x50	490
	218	42500	85000	21500	210	285	370	205	32	M20	50	110	26						M20x50	490
	258	70000	140000	35000	250	350	440	245	38	M20	70	130	31	acc. to customer's request					M24x60	840
	308	115000	230000	57500	300	400	515	294	43	M24	70	130	36						M27x70	1250
	348	180000	360000	90000	340	460	590	333	55	M24	95	175	45						M30x120	1700
	408	280000	560000	140000	400	530	675	392,5	58,5	M24	95	175	50						M36x100	2800

1) Other shaft distances available on request

For selection of coupling see pages 109/110. Mounting instructions no. 47410 under www.ktr.com.

Weights [kg] / Mass moments of inertia x 10^{-3} [kgm²]

	Size	Hub (max. bore)		Spacer complete [kg]					Spacer complete [kgm²]				
		[kg]	[kgm²]	E=100	E=140	E=180	E=200	E=250	E=100	E=140	E=180	E=200	E=250
NEW	50	0,924	0,001019	2,262	2,442	-	-	-	0,00256	0,00263	-	-	-
	65	2,673	0,00541	3,922	4,183	4,445	-	-	0,00810	0,00830	0,00828	-	-
	75	2,424	0,00566	4,482	4,842	5,202	-	-	0,01143	0,01191	0,01239	-	-
	85	3,742	0,01135	-	7,154	7,548	7,746	8,239	-	0,02364	0,02427	0,02459	0,02538
	110	6,711	0,03222	-	12,492	13,478	13,972	15,205	-	0,06291	0,06540	0,06665	0,06976
	120	9,181	0,05238	-	-	17,324	17,842	19,137	-	-	0,10314	0,10458	0,10818
	140	18,211	0,15175	-	-	-	32,530	34,325	-	-	-	0,31901	0,32845
	160	29,868	0,33890	-	-	-	-	52,458	-	-	-	-	0,68640
	168	29,9	0,328										
	198	39,9	0,557										
	218	52,0	0,880										
	258	98,8	2,431	Mounting dimension E as indicated by the customer									
	308	141,7	4,780										
	348	221,5	9,833										
	408	325,1	19,220										

Order form:

RIGIFLEX®-N 120	A	Ø 100	Ø 120	200
Coupling size	Type	Bore d_1	Bore d_2	Shaft distance dimension E

ROTEX® GS
backlash-free flexible shaft coupling

TOOLFLEX®
backlash-free torsionally stiff bellow-type coupling

RADEX®-NC
backlash-free torsionally stiff servo laminae coupling

Made for Motion KTR

Table of contents

Application recommendation

If a shaft coupling is needed for a servo drive, three different backlash-free coupling types are available: ROTEX® GS, TOOLFLEX® and RADEX®-NC . Dependent on the required torsional stiffness of the complete system you choose the best coupling for your individual application.

ROTEX® GS Backlash-free, flexible jaw-type coupling

- axial plug-in ability
- high power density
- adjustment of damping through different elastomer hardness of the spiders

Shaft encoders, miniature drives	compact design, easy assembly/disassembly, electric insulation
Ball screws, synchronous belt drives	high power density, adapted torsional stiffness, damping vibrations, for thread drives with incline < 40 (otherwise an inspection by KTR is necessary)
Low backlash/backlash-free gears	high power density, easy blind assembly/disassembly, fail-safe, suitable for average to high gear ratios i≥ 7, temperature range 80 °C at the maximum
Main spindle drives	high power density, good concentric running properties of the clamping ring hubs, damping vibrations with interrupted cutting, higher accuracy of the ROTEX® GS-P design for HSC machining

TOOLFLEX® Backlash-free, torsionally stiff metal bellow-type coupling

- non-positive bellow-hub connection
- frictionally engaged clamping hubs

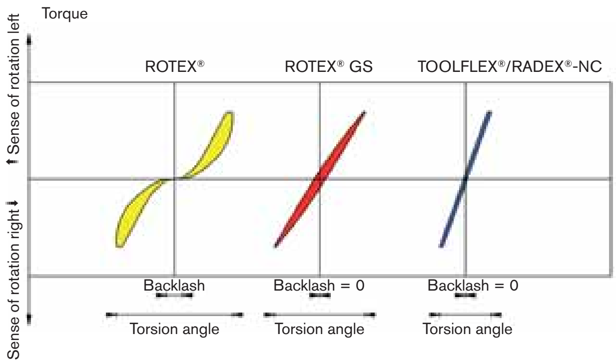
Shaft encoders, miniature drives	compact flexible coupling with low radial restoring forces
Ball screws, synchronous belt drives	suitable if higher torsional stiffness is required, e. g. high incline with threaded spindle drives s ≥ 40, constant torsional stiffness with high temperatures
Low backlash/backlash-free gears	suitable if higher torsional stiffness is required, e. g. gear ratios i < 7, constant torsional stiffness with high temperatures
Main spindle drives	high torsional stiffness, for main spindle drives subject to critical resonances

RADEX®-NC Backlash-free, torsionally rigid steel lamina coupling

- compact design
- higher torsional stiffness
- frictionally engaged clamping hubs

Shaft encoders, miniature drives	double-cardanic design to compensate for bigger displacements
Ball screws, synchronous belt drives	suitable if higher torsional stiffness is required, e. g. high incline with threaded spindle drives s ≥ 40, constant torsional stiffness with high temperatures
Low backlash/backlash-free gears	suitable if higher torsional stiffness is required, e. g. gear ratios i < 7 , constant torsional stiffness with high temperatures
Main spindle drives	high torsional stiffness, for main spindle drives subject to critical resonances, for high torques type RADEX®-N is available: T_{KN} up to 280.000 Nm

The diagram alongside this text clarifies the influence of the ROTEX®, ROTEX® GS, RADEX®-NC and the TOOLFLEX® couplings regarding backlash and torsion angle.
Due to the high stiffness of the RADEX®-NC and the TOOLFLEX® the torsion angle is very low under torque.
However, contrary to the flexible ROTEX® and the backlash-free ROTEX® GS a damping of torsional vibrations is not possible.

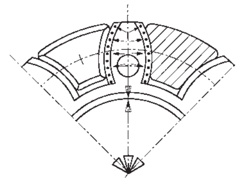


Technical description

ROTEX® GS is a 3-part, axial plug-in coupling backlash-free under pre-stress. It is convincing even with critical applications by its backlash-free power transmission, its stiffness which is each adapted to the application and its optimum damping of vibrations. This principle of installation offers significant assembly possibilities which optimize the assembly times in production.

ROTEX® GS straight tooth, backlash-free)
The straight toothing of the spider mounted under prestress results in a smaller surface pressure and consequently higher stiffness of the coupling system. The flexible teeth compensate for misalignment but are supported radially in the inside diameter by a central web. This avoids too high internal or external deformation by high acceleration or high speeds. This is vital for a smooth operation and long service life of the coupling.

Limitation by concave cams in case of too high speeds/centrifugal forces and prestress of elastomer parts

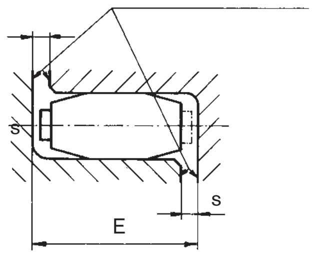


Support to the axis of rotation

The hub claws and the nylon teeth are chamfered to allow for a "blind assembly". The pegs arranged reciprocally on the spider prevent the spider from touching the hub over the entire surface. Observing the distance dimension E ensures the ability of the coupling to compensate for displacements. The plug-in force varies depending on the Shore hardness and prestress of the spider (see comments in the mounting instructions KTR-N 45510).

By observing the gap dimension "s" the electrical isolation is ensured, as well as a high service life of the coupling. This fact is gaining more and more importance, due to the increasing precision of shaft encoders and the existing demand for electro-magnetic compatibility.

Electric isolation due to gap dimension "s"



The elastic spiders of the GS line are available in three different kinds of Shore hardness, identified by colour, the material being soft to hard. Due to these four spiders with different kinds of Shore hardness it is easily possible to adjust the **ROTEX® GS** regarding the torsional stiffness and the vibration behaviour to the individual conditions of an application.

Explosion protection use
ROTEX® GS couplings are suitable for power transmission in drives in hazardous areas. The couplings are certified and confirmed according to EC standard 94/9/EC (ATEX 95) as units of category 2G/2D and thus suitable for the use in hazardous areas of zone 1, 2, 21 and 22. Please read through our information included in the respective Type Examination Certificate and the operating and mounting instructions at www.ktr.com.
Selection: In case of use in hazardous areas the clamping ring hubs (clamping hubs without feather keyway only for use in category 3) must be selected so that there is a minimum safety factor of s = 2 between the peak torque (including all operating parameters) and the nominal torque and frictional torque of engagement of the coupling.

Spider						
Description of spider hardness [Shore]	Identification Colour	Material	Permissible temperature range [° C] Permanent temperature	Max. temperature short-term	Available for coupling size	Typical applications
80 Sh A-GS	blue	Polyurethane	– 50 to + 80	– 60 to + 120	size 5 to 24	– drives of electric measuring systems
92 Sh A-GS	yellow	Polyurethane	– 40 to + 90	– 50 to + 120	size 5 to 55	– drives of electric measuring and control systems
95/98 Sh A-GS	red	Polyurethane	– 30 to + 90	– 40 to + 120	size 5 to 75	– positioning drives, main spindle drives – high load
64 Sh D-H-GS	green	Hytrel	– 50 to + 120	– 60 to + 150	size 7 to 38	– planetary gears / backlash-free gears – heighten torsional stiffnes
64 Sh D-GS	green	Polyurethane	– 20 to + 110	– 30 to + 120	size 42 to 75	– high load – high ambient temperat. / resistant to hydrolysis

Technical data

Size	Spider Shore-GS	Shore range	max. speed [rpm] for hub design 2.0 / 2.1 2.5 / 2.6	1.0 1.1	6.0 [2)]	6.0 P [2)]	Torque [Nm] T_{KN}	$T_{K\,max}$	Static torsion spring stiffness [1)] [Nm/rad]	Dynamic torsion spring stiffness [1)] [Nm/rad]	Radial stiffness C_r [N/mm]	Weight [kg] each hub	spider	Mass moment of inertia J [kgm²] each hub	spider
5	70	A	3800	47700			0,2	0,3	1,78	5	43	1 x 10^{-3}	0,2 x 10^{-3}	0,016 x 10^{-6}	0,002 x 10^{-6}
	80	A					0,3	0,6	3,15	10	82				
	92	A					0,5	1,0	5,16	16	154				
	98	A					0,9	1,7	8,3	25	296				
7	80	A	2700	34100			0,7	1,4	8,6	26	114	3 x 10^{-3}	0,7 x 10^{-3}	0,085 x 10^{-6}	0,014 x 10^{-6}
	92	A					1,2	2,4	14,3	43	219				
	98	A					2,0	4,0	22,9	69	421				
	64	D					2,4	4,8	34,3	103	630				
9	80	A	1900	23800			1,8	3,6	17,2	52	125	9 x 10^{-3}	1,8 x 10^{-3}	0,49 x 10^{-6}	0,079 x 10^{-6}
	92	A					3,0	6,0	31,5	95	262				
	98	A					5,0	10,0	51,6	155	518				
	64	D					6,0	12,0	74,6	224	739				
12	80	A	15200	19100			3,0	6,0	84,3	252	274	14 x 10^{-3}	2,3 x 10^{-3}	1,3 x 10^{-6}	0,139 x 10^{-6}
	92	A					5,0	10,0	160,4	482	470				
	98	A					9,0	18,0	240,7	718	846				
	64	D					12,0	24,0	327,9	982	1198				
14	80	A	12700	15900	25400	47700	4,0	8,0	60,2	180	153	20 x 10^{-3}	4,6 x 10^{-3}	2,8 x 10^{-6}	0,457 x 10^{-6}
	92	A					7,5	15,0	114,6	344	336				
	98	A					12,5	25,0	171,9	513	654				
	64	D					16,0	32,0	234,2	702	856				
19	80	A	9550	11900	19000	35800	4,9	9,8	618	1065	582	66 x 10^{-3}	7 x 10^{-3}	20,4 x 10^{-6}	1,49 x 10^{-6}
	92	A					10,0	20,0	1090	1815	1120				
	98	A					17,0	34,0	1512	2540	2010				
	64	D					21,0	42,0	2560	3810	2930				
24	92	A	6950	8650	13800	2600	35	70	2280	4010	1480	132 x 10^{-3}	18 x 10^{-3}	50,8 x 10^{-6}	7,5 x 10^{-6}
	98	A					60	120	3640	5980	2560				
	64	D					75	150	5030	10895	3696				
28	92	A	5850	7350	11700	22000	95	190	4080	6745	1780	253 x 10^{-3}	29 x 10^{-3}	200,3 x 10^{-6}	16,5 x 10^{-6}
	98	A					160	320	6410	9920	3200				
	64	D					200	400	10260	20177	4348				
38	92	A	4750	5950	9550	17900	190	380	6525	11050	2350	455 x 10^{-3}	49 x 10^{-3}	400,6 x 10^{-6}	44,6 x 10^{-6}
	98	A					325	650	11800	17160	4400				
	64	D					405	810	26300	42515	6474				
42	92	A	4000	5000	8050	15000	265	530	10870	15680	2430	1850 x 10^{-3}	79 x 10^{-3}	2246 x 10^{-6}	100 x 10^{-6}
	98	A					450	900	21594	37692	5570				
	64	D					560	1120	36860	62600	7270				
48	92	A	3600	4550	7200	13600	310	620	12968	18400	2580	2520 x 10^{-3}	98 x 10^{-3}	3786 x 10^{-6}	200 x 10^{-6}
	98	A					525	1050	25759	45620	5930				
	64	D					655	1310	57630	99750	8274				
55	92	A	3150	3950	6350	11900	410	820	15482	21375	2980	3800 x 10^{-3}	115 x 10^{-3}	7496 x 10^{-6}	300 x 10^{-6}
	98	A					685	1370	42117	61550	6686				
	64	D					825	1650	105730	130200	9248				
65	95	A	2800	3500	5650	11000	940	1880	48520	71660	6418	4500 x 10^{-3}	210 x 10^{-3}	12000 x 10^{-6}	500 x 10^{-6}
	64	D					1175	2350	118510	189189	8870				
75	95	A	2350	2950	4750	8950	1920	3840	79150	150450	8650	7180 x 10^{-3}	340 x 10^{-3}	26000 x 10^{-6}	2000 x 10^{-6}
	64	D					2400	4800	182320	316377	11923				

[1)] Static and dynamic torsional stiffness with 0,5 x T_{KN} [2)] Higher speeds on request

The size of the coupling has to be such that the permissible coupling load is not exceeded in any operating condition (see coupling selection on page 130).

1. Definitions and factors for coupling selection

Prestress: The flexible prestress varies depending on the coupling size, the spiders/spider material and the production tolerances. As a result there is the axial plug-in force varying from low as sliding seat or with a torsionally soft spider to heavy with a high amount of prestress or torsionally rigid spider.

T_{KN} Rated torque of coupling [Nm]
Torque which can be transmitted continuously over the entire permissible speed range, taking into account the operating factors (S_t, S_d).

T_{Kmax} Maximum torque of coupling [Nm]
Torque which can be transmitted during the full service life of the coupling as dynamic load ≥ 10^5 or as alternating load $5 \cdot 10^4$, taking into account the operating factors (S_t, S_d, S_A).

T_R Friction torque [Nm]
Torque which can be transmitted by the frictionally engaged shaft-hub-connection.

T_{AN} Constantly occurring driving torque as per the data indicated by the engine manufacturer

T_{AS} Maximum driving torque [Nm] as per the data indicated by the engine manufacturer
Peak torque in case of shock by the driving A. C. motor, for example during acceleration or breakdown torque of the A. C. motor.

T_S Peak torque [Nm]
Peak torque on the coupling, calculated from max. driving torque T_{AS}, rotational inertia coefficient m_A or m_L and opertaing factor S_A.

S_t Temperature factor
Factor considering the lower loading capacity or larger deformation of an elastomer part under load particularly in case of increased temperatures. In case of temperatures exceeding 80 °C we would recommend to use the RADEX®-NC (see page 152).

S_d Torsional stiffness factor
Factor considering the different demands on the torsional stiffness and fatigue strength of the coupling dependent on the application. In case of using the spider 64 Sh D-GS and reversing drive S_d has to selected in case of couplings made of aluminium. For positioning drives with increased demand on torsional stiffness (e. g. gearbox with low transmission) we would recommend the use of the TOOLFLEX® or RADEX®-NC (see page 144 and 152).

S_A Operating factor
Factor considering the occurring shocks or starts each minute, depending on the use

$m_{A(L)}$ Rotational inertia coefficient of driving side (load side)
Factor taking into account the distribution of masses in case of drive and load side shocks and vibration excitation.

Coupling selection

2. Factors

Temperature factor S_t				
	-30 °C +30 °C	+40 °C	+60 °C	+80 °C
S_t	1,0	1,2	1,4	1,8

Siehe Hinweis auf Seite 129.

Torsional stiffness factorr S_d		
Main spindle drive of machine tool	Positioning drive (x - y axis)	Shaft encoders Angle encoders
2 — 5*	3 — 8*	10 →

See note on page 129.
*When using the 64 Sh D-GS spider at least factor 4

Operating factor S_A		
main spindle drive	positioning drive*	S_A
light shock loads	≤ 60	1,0
average shock loads	≥60 ≤300	1,4
heavy shock loads	≤300	1,8

*Starts/minute

3. Calculation formula

The size of the coupling must be selected so that the following conditions are met.

$T_{KN} \geq T_N \cdot S_t \cdot S_d$ and $T_{KN} \geq T_S \cdot S_t \cdot S_d$

For the factors please see the tables at the top.

Peak torque

Shock on driving side
$T_S = T_{AS} \times m_A \times S_A$

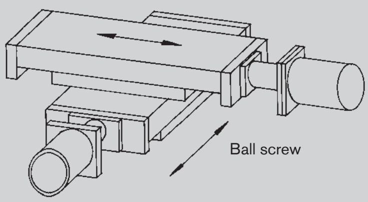
Shock on load side
$T_S = T_{LS} \times m_L \times S_L$

$$m_A = \frac{J_L}{J_A + J_L} \qquad m_L = \frac{J_A}{J_A + J_L}$$

J_A = Moment of inertia of driving side
J_L = Moment of inertia of load side

4. Example of calculation (positioning drive)

Given: Details of driving side
Servo motor
Rated torque T_{AN} = 43 Nm
Max. drive torque T_{AS} = 144 Nm
Moment of inertia J_{Mot} = $108 \cdot 10^{-4}$ kgm²
Driving shaft d = 32 k6 ohne Passfedernut



Details of driven side
Ball spindle J_{SP} = $38 \cdot 10^{-4}$ kgm²
Screw pitch s = 10 mm
Driven shaft d = 30 k6 ohne Nut
Mass of slide and work piece m_{Schl} = 1030 kg

Ambient temperature t = 40 °C ⇛ $S_t = 1{,}4$
60 starts/minute required ⇛ $S_A = 1{,}0$

Gefordert:
high torsional stiffness ⇛ Sd = 4

Preliminary consideration:
ROTEX® GS clamping ring hub - axial plug-in jaw coupling backlash-free under prestress with frictionally engaged shaft-hub-connection.

- Moment of inertia of slide and work piece reduced to driving axis.

$$J_{Schl} = m_{Schl} \left(\frac{s}{2 \cdot \pi}\right)^2 [\text{kgm}^2] \qquad J_{Schl} = 1030 \text{ kg} \left(\frac{0{,}01 \text{ m}}{2 \cdot \pi}\right)^2 = 26 \cdot 10^{-4} \text{ kgm}^2$$

Coupling selection

- Selection according to rated torque (pre-selection)

$$T_{KN} \geq T_{AN} \cdot S_t \cdot S_d \qquad T_{KN} \geq 43 \text{ Nm} \cdot 1{,}2 \cdot 4 \qquad T_{KN} \geq 206{,}4 \text{ Nm}$$

- Coupling selection: ROTEX® GS 38 - 98 Sh A-GS - clamping hub design T_{KN} 325 Nm

- Review of max. deiving torque

$$T_{KN} \geq T_S \cdot S_t \cdot S_d$$

$$\rightarrow T_S = T_{AS} \cdot m_A \cdot S_A$$

$$\rightarrow m_A = \frac{J_L}{J_A + J_L} = \frac{73{,}8 \cdot 10^{-4}}{(117{,}6 + 73{,}8) \cdot 10^{-4}} = 0{,}385$$

$J_L = (J_{Sp} + J_{Schl} + \tfrac{1}{2} J_K) = (38 + 26 + 9{,}6) \cdot 10^{-4}$ kgm² $= 73{,}8 \cdot 10^{-4}$ kgm²
$J_A = J_{Mot} + \tfrac{1}{2} J_K = (108 + 9{,}6) \cdot 10^{-4}$ kgm² $= 117{,}6 \cdot 10^{-4}$ kgm²

T_S = 144 Nm · 0,385 · 1,0 = 55,44 Nm
$T_{KN} \geq$ 55,44 Nm · 1,2 · 4

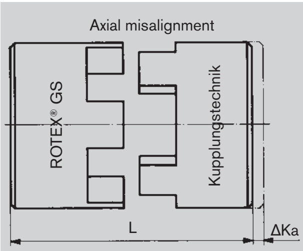
ROTEX® GS 38 98 Sh A-GS T_{KN} = 325 Nm
$T_{KN} \geq$ 266,11 Nm

- Check of torque transmission of clamping ring hub for shaft diameter Ø 30

$T_R > T_{AS}$ Figures for T_R see table on catalogue page 137.
Transmittable torque T_R Ø 30 H7/k6 = 436 Nm > 144 Nm ✓

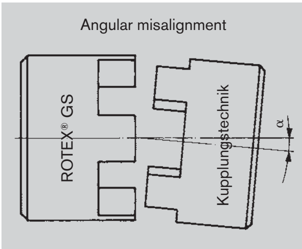
Displacements

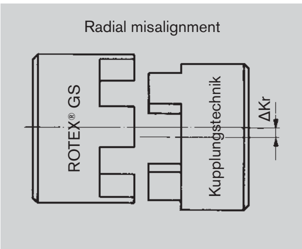
Due to its design the ROTEX® GS is able to absorb axial, angular and radial misalignment, without causing any wear or premature failure of the coupling. As the spider is only stressed under pressure it is ensured that the coupling will remain backlash-free even after a longer operation period.



As an example, axial misalignment may be produced by different tolerances of the connecting elements during the assembly or by alteration of the shaft length if fluctuation of temperature occurs. As the shaft bearings usually cannot be axially stressed to a big extent, it is the task of the coupling to compensate for this axial misalignment and to keep the reaction forces low.

In case of pure angular misalignment the imagined bisecting lines of the shafts intersect in the middle of the coupling. Up to a certain permissible extent this displacement can be absorbed by the coupling without any danger of extensive restoring forces.





Radial misalignment results from parallel displacement of the shafts towards each other, caused by different tolerances at the centerings or by mounting of the power packs on different levels. Due to the kind of misalignment the largest restoring forces are produced here, consequently causing the highest stresses for the adjacent components.

In case of larger displacements (especially radial displacements) the ROTEX® GS DKM double cardanic design should be applied in order to avoid excessive restoring forces.

Displacements

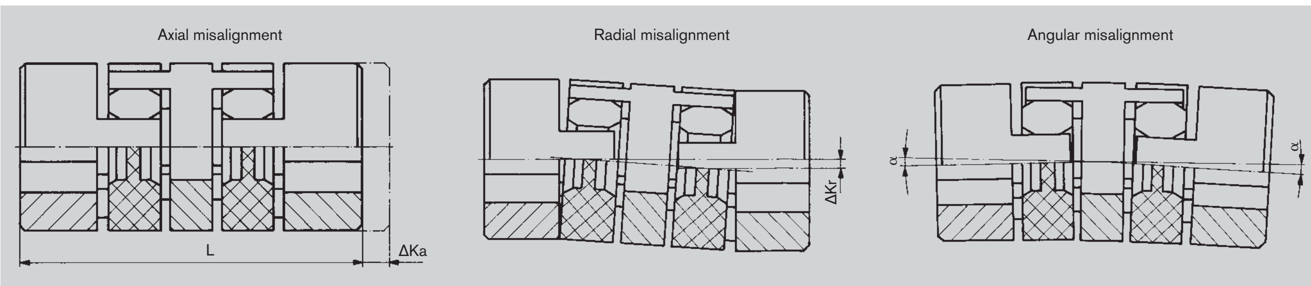
Size	Spider GS	Displacements standard [mm] Axial ΔKa[2]	[mm] Radial ΔKr	[degree] Angular α	Displacements DKM [mm] Axial ΔKa[2]	[mm] Radial ΔKr	[degree] Angular α
5	70		0,14	1,2°		0,17	1,2°
	80	+0,4	0,12	1,1°	+0,4	0,15	1,1°
	92	-0,2	0,06	1,0°	-0,4	0,14	1,0°
	98		0,04	0,9°		0,13	0,9°
7	80		0,15	1,1°		0,23	1,1°
	92	+0,6	0,10	1,0°	+0,6	0,21	1,0°
	98	-0,3	0,06	0,9°	-0,6	0,19	0,9°
	64		0,04	0,8°		0,17	0,8°
9	80		0,19	1,1°		0,29	1,1°
	92	+0,8	0,13	1,0°	+0,8	0,26	1,0°
	98	-0,4	0,08	0,9°	-0,8	0,24	0,9°
	64		0,05	0,8°		0,21	0,8°
12	80		0,20	1,0°		0,35	1,1°
	92	+0,9	0,14	1,0°	+0,9	0,32	1,0°
	98	-0,4	0,08	0,9°	-0,9	0,29	0,9°
	64		0,05	0,8°		0,25	0,8°
14	80		0,21	1,1°		0,40	1,1°
	92	+1,0	0,15	1,0°	+1,0	0,37	1,0°
	98	-0,5	0,09	0,9°	-1,0	0,33	0,9°
	64		0,06	0,8°		0,29	0,8°
19	80		0,15	1,1°		0,49	1,1°
	92	+1,2	0,10	1,0°	+1,2	0,45	1,0°
	98	-0,5	0,06	0,9°	-1,0	0,41	0,9°
	64		0,04	0,8°		0,36	0,8°
24	92	+1,4	0,14	1,0°	+1,4	0,59	1,0°
	98	-0,5	0,10	0,9°	-1,0	0,53	0,9°
	64		0,07	0,8°		0,47	0,8°
28	92	+1,5	0,15	1,0°	+1,5	0,66	1,0°
	98	-0,7	0,11	0,9°	-1,4	0,60	0,9°
	64		0,08	0,8°		0,53	0,8°
38	92	+1,8	0,017	1,0°	+1,8	0,77	1,0°
	98	-0,7	0,12	0,9°	-1,4	0,69	0,9°
	64		0,09	0,8°		0,61	0,8°
42	92	+2,0	0,19	1,0°	+2,0	0,84	1,0°
	98	-1,0	0,14	0,9°	-2,0	0,75	0,9°
	64		0,10	0,8°		0,67	0,8°
48	92	+2,1	0,23	1,0°	+2,1	0,91	1,0°
	98	-1,0	0,16	0,9°	-2,0	0,82	0,9°
	64		0,11	0,8°		0,73	0,8°
55	92	+2,2	0,24	1,0°	+2,2	1,01	1,0°
	98	-1,0	0,17	0,9°	-2,0	0,91	0,9°
	64		0,12	0,8°		0,81	0,8°
65	95	+2,6	0,18	0,9°	–	–	–
	64	-1,0	0,13	0,8°			
75	95	+3,0	0,21	0,9°	–	–	–
	64	-1,5	0,15	0,8°			

[2] The Ka figures mentioned above have to be added to the length of the corresponding coupling type.

Shaft misalignment ROTEX® GS type DKM

This design reduces the restoring forces arising with radial misalignment to a minimum, due to the double-jointed operation, additionally the coupling is able to compensate for higher axial and angular misalignment.

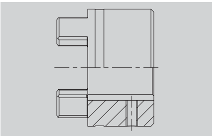
The above-mentioned permissible displacement figures of the flexible ROTEX® GS couplings are standard values, taking into account the coupling load up to the rated torque T_{KN} of the coupling and an operating speed n = 1500 min^{-1} along with an ambient temperature of + 30 °C. The displacement figures may, in each case, merely be used individually - if they occur simultaneously they may only be used proportionately. The ROTEX® GS-couplings are in a position to compensate for radial and angular displacements. Careful and accurate alignment of the shafts increases the service life of the coupling.



Hub designs

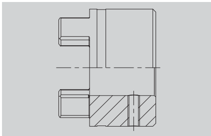
Due to the numerous applications of ROTEX® GS for many different mounting situations, this coupling system is available with various hub designs. These designs mainly differ in that they offer either positive or frictionally engaged (backlash-free) connections, but mounting situations like, for example, hollow shaft tacho, shaft encoder installation or similar applications are covered, too.

Design 1.0 with keyway and fixing screw



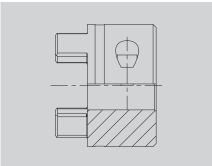
Positive power transmission; permissible torque depends on the permissible surface pressure. Not suitable for backlash-free power transmission for heavily reversing operation.

Design 1.1 without keyway, with setscrew



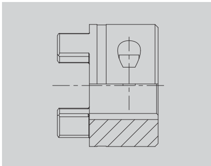
Non-positive torque transmission, suitable for backlash-free transmission of very small torques.
(No ATEX release)

Design 2.0 clamping hub, single slotted, without keyway



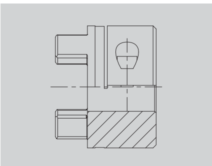
Frictionally engaged, backlash-free shaft-hub-connection. Transmittable torques depend on the bore diameter. Design 2.0 up to size 14 as standard.
(Only for ATEX category 3)

Design 2.1 clamping hub, single slotted, with keyway



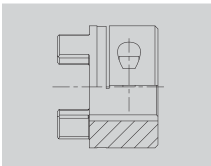
Positive power transmission with additional frictional tightness. The frictional tightness avoids or reduces reversal backlash. Surface pressure of the keyway connection is reduced. Design 2.1 up to size 14 as standard.

Design 2.5 clamping hub, double slotted, without keyway



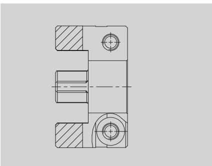
Frictionally engaged, backlash-free shaft-hub-connection. Transmittable torques depend on the bore diameter. Design 2.5 from size 19 as standard.
(Only for ATEX category 3)

Design 2.6 clamping hub, double slotted, with keyway



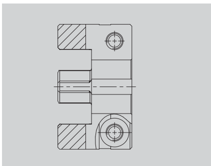
Positive power transmission with additional frictional tightness.
The frictional tightness prevents or reduces reversal backlash.
Surface pressure of the keyway connection is reduced.
Design 2.6 from size 19 as standard.

Type 2.8 short clamping hub with axial slots without feather key



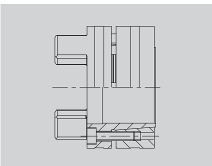
Frictionally engaged, backlash-free shaft-hub-connection, good properties of concentric running due to symmetrical arrangement and cams without slots.
Design 2.8 up to size 24 as standard.
(Only for ATEX category 3)

Type 2.9 short clamping hub with axial slots with feather key



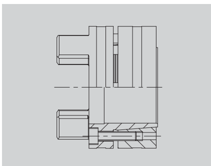
Positive-locking power transmission in addition frictionally engaged. Smooth power transmission due to cams without slots.
The surface pressure of the feather key combination is reduced. Type 2.9 from size 24 as standard.

Design 6.0 clamping ring hub



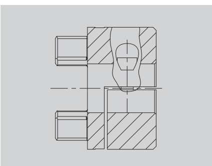
Integrated frictionally engaged shaft-hub-connection for transmission of higher torques. Screw fitting on elastomer side. For details about torques and dimensions see page 137.
Suitable for high speeds.

Design 6.0 P precision clamping ring hub



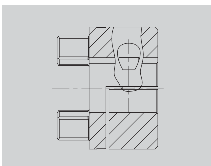
Design equal to 6.0, but highly accurate machining with slight modifications of design, see page 138.

Design 7.5 split claming hub without feather keyway for double-cardanic connections



Frictionally engaged, backlash-free shaft-hub connection for the radial assembly of the coupling. Transmittable torques dependent on bore diameter. Torque indicated on page 141.

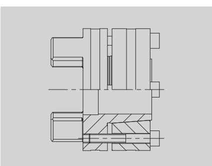
Design 7.6 split clamping hub with feather keyway for double-cardanic connections



Positive shaft-hub connection with additional frictional engagement for the radial assembly of the coupling. The frictional engagement avoids or reduces the reverse backlash. The surface pressure of the feather key connection is reduced.

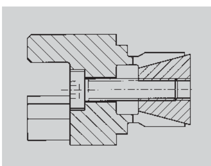
Special designs on request of customers

Design 6.5 clamping ring hub

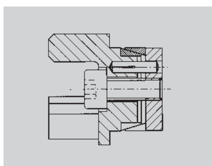


Design equal to 6.0, but clamping screws on the outside. For example for radial disassembly of the intermediate tube (special design).

Special hub designs for hollow shaft drives



Expansion hub



ROTEX® GS hub with CLAMPEX® KTR 150

Stock programme

Finish bore [mm] according to ISO fit H7 / feather keyway with thread according to DIN 6885 sheet 1 - JS9																															
Size	Hub design	un-/pilot bored	Ø2	Ø3	Ø4	Ø5	Ø6	Ø6,35	Ø7	Ø8	Ø9	Ø9,5	Ø10	Ø11	Ø12	Ø14	Ø15	Ø16	Ø18	Ø19	Ø20	Ø22	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42
7	1.1	●			●	●	●		●																						
	2.0	●		●	●	●	●	●	●																						
9	1.0	●					●		●	●	●		●																		
	1.1	●			●	●	●		●	●			●																		
	2.0	●		●	●	●	●	●	●	●	●	●	●	●																	
	2.1	●					●			●	●		●																		
12	1.0	●													●																
	1.1	●																													
	2.0	●			●	●	●	●		●	●		●	●	●																
	2.1	●											●		●																
14	1.0	●					●			●	●		●	●	●	●	●	●													
	1.1	●					●			●			●	●	●	●															
	2.0	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●													
	2.1	●								●	●		●	●	●	●	●	●													
	6.0									●			●	●	●	●															
	6.0 P															●															
19	1.0	●											●	●	●	●	●	●	●	●	●	●	●								
	2.5	●				■				●		●	●	●	●	●	●	●	●	●	●	●	●								
	2.6	●								●			●	●	●	●	●	●	●	●	●		●								
	6.0 light												●		●	●	●	●	●	●	●										
	6.0												●		●	●	●	●	●	●	●										
	P37.5																	●													
	6.0 P																			●											
24	1.0	●													●	●	●	●	●	●	●	●	●	●	●						
	2.5	●								■					●	●	●	●	●	●	●	●	●	●	●						
	2.6	●													●	●		●	●	●	●	●	●	●	●						
	6.0 light															●	●	●	●	●	●	●	●	●	●						
	6.0															●	●	●	●	●	●	●	●	●	●						
	P 50																					●									
	6.0 P																							●							
28	1.0	●																		●	●	●	●	●	●	●	●	●			
	2.5	●											■						●	●	●	●	●	●	●	●	●	●	●		
	2.6	●																●			●	●	●	●	●	●	●	●	●		
	6.0 light																		●	●	●	●	●	●	●	●	●	●	●		
	6.0																		●	●	●	●	●	●	●	●	●	●	●		
	6.0 P																										●	●	●		
38	1.0	●																			●			●	●	●	●	●	●	●	●
	2.5	●												■										●			●	●	●	●	
	6.0 light																				●	●	●	●	●	●	●	●	●	●	
	6.0																				●	●	●	●	●	●	●	●	●	●	
	6.0 P																										●		●	●	

Taper bores for Fanuc motors: GS 19 1:10 Ø 11; GS 24 1:10 Ø 16

Finish bores [mm]													
Size	Hub design	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55	Ø60
42	6.0 light	●	●	●	●	●	●	●	●	●	●		
	6.0	●	●	●	●	●	●	●	●	●	●		
48	6.0 light			●	●	●	●	●	●	●			
	6.0			●	●	●	●	●	●	●			
55	6.0						●	●	●	●	●	●	●
65	6.0											●	
75	6.0												

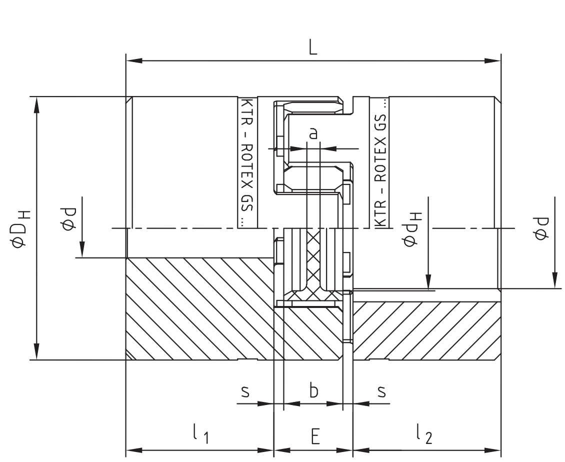
■ = Pilot bored clamping hubs ● = Standard bore

Unbored hubs up to size 65 available from stock.

Further dimensions on request

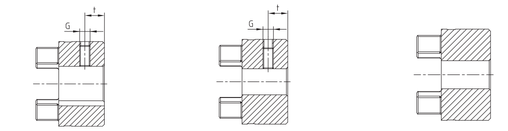
Miniature couplings

- Backlash-free shaft connections for measurement drive swith small torques
- Small dimensions - low flywheel mass
- Maintenance-free, easy to check visually
- Different elastomer hardness of spiders
- Finish bore acc. to ISO fit H7 (apart from clamping hub), keyway, from Ø 6 mm acc. to DIN 6885 sheet 1 - JS9
- Ⓔx Approved according to EC Standard 94/9/EC (only for hub design 1.0 and 2.1)



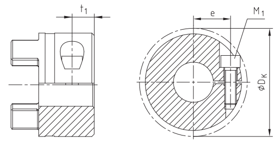
Hub designs: (see page 132)

Design 1.0 | Design 1.1 | Design 1.2



with keyway and setscrew | without keyway with setscrew | without keyway without setscrew

Setscrew to DIN EN ISO 4029



Clamping hub with capscrew DIN EN ISO 4762 (ROTEX® 5 DIN 84)

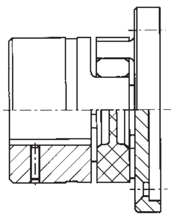
Design 2.0 Clamping hub without keyway, (only category 3), torques depending on bore diameter
Design 2.1 Clamping hub with keyway

Size	Finish bore				Dimensions [mm]								Setscrew		Clamping screw				
		Hub design 1.0	Hub design 1.1, 1.2	Hub design 2.0, 2.1															
	d_{min}	d_{max}	d_{max}	d_{max}	D_H	d_H	L	l_1; l_2	E	b	s	a	G	t	M_1	t_1	e	$ØD_K$	T_A [Nm]
ROTEX® GS Aluminium (Al-H)																			
5	2	—	6	5	10	—	15	5	5	4	0,5	4,0	M2	2,5	M1,2	2,5	3,5	11,4	—
7	3	7	7	7	14	—	22	7	8	6	1,0	6,0	M3	3,5	M2	3,5	5,0	16,5	0,37
9	4	10	11	11	20	7,2	30	10	10	8	1,0	1,5	M4	5,0	M2,5	5,0	7,5	23,4	0,76
12	4	12	12	12	25	8,5	34	11	12	10	1,0	3,5	M4	5,0	M3	5,0	9,0	27,5	1,34
14	5	15	16	16	30	10,5	35	11	13	10	1,5	2,0	M4	5,0	M3	5,0	11,5	32,2	1,34

Bores and the corresponding transmittable torques of the clamping hub design 2.0 [Nm]														
Size	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	Ø10	Ø11	Ø12	Ø14	Ø15	Ø16
5	*	*	*	*										
7		0,8	0,9	0,95	1,0	1,1								
9			2,1	2,2	2,3	2,4	2,5	2,6	2,7	2,8				
12			3,6	3,8	4,0	4,1	4,3	4,5	4,7	4,8	5,0			
14				4,7	4,8	5,0	5,1	5,3	5,5	5,6	5,6	6,1	6,3	6,5

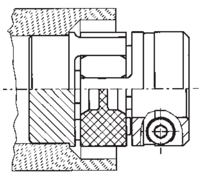
* Use of DIN 84 screw, tightening torque T_A not defined (slotted screw)

Other designs

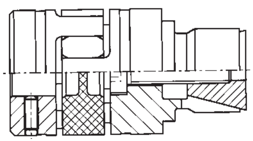


ROTEX® GS-CF

ROTEX® GS for hollow shaft connections



ROTEX® GS with interference fit hub



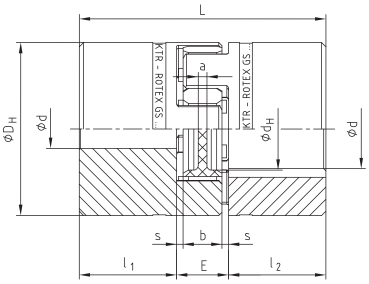
ROTEX® GS with expansion hub

Order form:

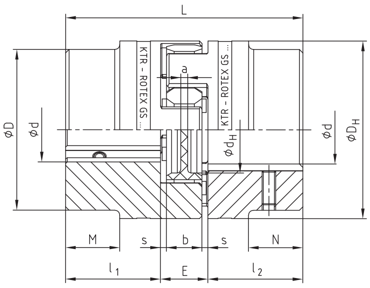
ROTEX® GS 14	80 Sh A-GS	1.0 –	Ø 12	2.0 –	Ø 10
Coupling size	Spider hardness	Hub design	Finish bore	Hub design	Finish bore

Standard types

- Backlash-free shaft connection under prestress for spindle drives, elevating platforms, machine tool drives, etc.
- Small dimensions - low flywheel mass
- Maintenance-free, easy to check visually
- Finish bore acc. to ISO fit H7 (apart from clamping hub), keyway, from Ø 6 mm acc. to DIN 6885 sheet 1 - JS9
- Ⓔx Approved according to EC Standard 94/9/EC (only for hub design 1.0 and 2.1/2.6)

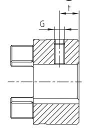


ROTEX® GS 5 - 38

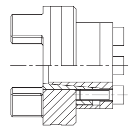


ROTEX® GS 42 - 75

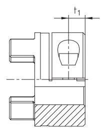
Hub designs: (see page 132)



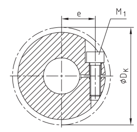
Design
1.0 with keyway and thread
1.1 without keyway, with thread



Design 4.2 with CLAMPEX® KTR 250



Design from size 19 as standard
2.5 double slot, without keyway (only for category 3)
2.6 double slot with keyway



Design 2.5 Torque depending on bore diameter

Size	un-bored	Finish bores				Dimensions [mm]										Setscrew		Clamping screw				
		$d_{min.}$	1.0, 1.1 $d_{max.}$	2.5 $d_{max.}$	2.6 [1] $d_{max.}$	D	D_H	d_H	L	l_1, l_2	M, N	E	b	s	a	G	t	M_1	t_1	e	$ØD_K$	T_A [Nm]
ROTEX® GS Aluminium (Al-H)																						
19	●	6	24	24	24	–	40	18	66	25	–	16	12	2,0	3,0	M5	10	M6	11,0	14,5	46	10,5
24	●	8	28	28	28	–	55	27	78	30	–	18	14	2,0	3,0	M5	10	M6	10,5	20,0	57,5	10,5
28	●	10	38	38	38	–	65	30	90	35	–	20	15	2,5	4,0	M8	15	M8	11,5	25,0	73	25
38	●	12	45	45	45	–	80	38	114	45	–	24	18	3,0	4,0	M8	15	M8	15,5	30,0	83,5	25
ROTEX® GS Steel																						
42	●	14	55	50	45	85	95	46	126	50	28	26	20	3,0	4,0	M8	20	M10	18	32,0	93,5	69
48	●	15	62	55	55	95	105	51	140	56	32	28	21	3,5	4,0	M8	20	M12	21	36,0	105	120
55	●	20	74	68	68	110	120	60	160	65	37	30	22	4,0	4,5	M10	20	M12	26	42,5	119,5	120
65	●	22	80	70	70	115	135	68	185	75	47	35	26	4,5	4,5	M10	20	M12	33	45,0	124	120
75	●	30	95	80	80	135	160	80	210	85	53	40	30	5,0	5,0	M10	25	M16	36	51,0	147,5	295

Bores and the corresponding transmittable torques of the clamping hub design 2.5 [Nm]

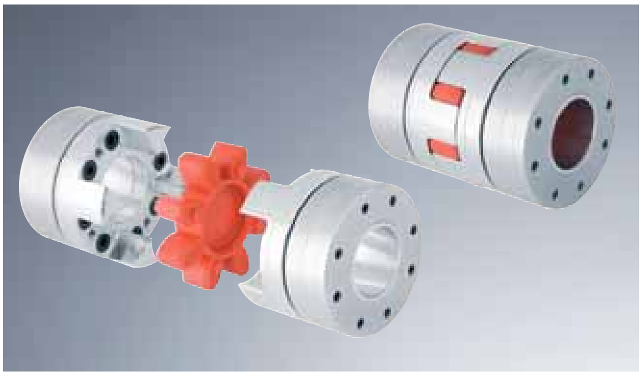
Size	Ø8	Ø10	Ø11	Ø14	Ø15	Ø16	Ø18	Ø19	Ø20	Ø22	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55	Ø60	Ø65	Ø70	Ø75	Ø80
19	25	27	27	29	30	31	32	32	34	30 [2]	32 [2]																	
24		34	35	36	38	38	39	40	41	42	43	45	46															
28				80	81	81	84	85	87	89	91	92	97	99	102	105	109											
38					92	94	97	98	99	102	104	105	109	112	113	118	122	123	126	130								
42									232	238	244	246	255	260	266	274	283	288	294	301	309	315						
48												393	405	413	421	434	445	454	462	473	486	494	514					
55															473	486	498	507	514	526	539	547	567	587	608			
65																507	518	526	535	547	559	567	587	608	627	648		
75																			1102	1124	1148	1163	1201	1239	1278	1316	1354	1393

[1] from Ø65 keyway opposite to the clamping screw [2] clamping hub single slotted 2 x clamping screw M4 and dimension e=15

Order form:

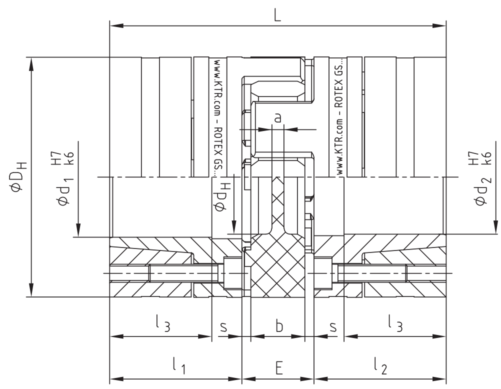
ROTEX® GS 24	98 Sh A-GS	2.5 –	Ø 24	1.0 –	Ø 20
Coupling size	Spider hardness	Hub design	Finish bore	Hub-design	Finish bore

Clamping ring hubs light



- Backlash-free shaft coupling with integrated clamping system
- Low weight and low mass moment of inertia due to a design fully made from aluminium
- Easy assembly due to internal clamping screws and block assembly
- High friction torques
- High smoothness of running, application up to a peripheral speed of 40 m/s

Tack thread M_1 between clamping screws



	Size	Torque [Nm] [1) 92 Sh A T_{KN}	92 Sh A T_{Kmax}	98 Sh A T_{KN}	98 Sh A T_{Kmax}	Dimensions [mm] D_H [2)]	d_H	L	$l_1; l_2$	l_3	E	b	s	a	Clamping screws M	number z	T_A [Nm]	M_1	Weight per hub with max. bore [kg]	Mass moment of inertia per hub with max. bore [kgm²]
	[3)] Hub material – Aluminium (Al-H)										Clamping ring material – Aluminium (Al-H)									
NEW	14	7,5	15	12,5	25	30	10,5	50	18,5	13,5	13	10	1,5	2,0	M3	4	1,34	;3	0,032	$0{,}04 \times 10^{-4}$
NEW	19	10	20	17	34	40	18	66	25	18	16	12	2,0	3,0	M4	6	3	M4	0,077	$0{,}19 \times 10^{-4}$
	24	35	70	60	120	55	27	78	30	22	18	14	2,0	3,0	M5	4	6	M5	0,162	$0{,}78 \times 10^{-4}$
	28	95	190	160	320	65	30	90	35	27	20	15	2,5	4,0	M5	8	6	M5	0,240	$1{,}70 \times 10^{-4}$
	38	190	380	325	650	80	38	114	45	35	24	18	3,0	4,0	M6	8	10	M6	0,490	$5{,}17 \times 10^{-4}$
	42	265	530	450	900	95	46	126	50	35	26	20	3,0	4,0	M8	4	25	M8	0,772	$11{,}17 \times 10^{-4}$
	48	310	620	525	1050	105	51	140	56	41	28	21	3,5	4,0	M10	4	49	M10	1,066	$18{,}81 \times 10^{-4}$

[1)] Please note coupling selection on pages 129 - 131 · [2)] $ØD_H$ + 2 mm with high speeds for expansion of spider
[3)] In case of using the spider 64 Sh D-GS resp. short dimensioning we recommend the application of clamping ring hubs made of steel.

Bore d_1/d_2 and the corresponding transmittable friction torques T_R of clamping ring hub in [Nm] [1)]

	Size	Ø6	Ø10	Ø11	Ø14	Ø15	Ø16	Ø19	Ø20	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55
NEW	14	5,4	7,5	11,3	24,7																	
NEW	19		17	20	41	49	36	56	64													
	24				47	57	67	98	110	127	139	175										
	28							121	133	201	219	248	285	253	307	329						
	38								203	304	331	394	452	453	543	550	609	669	634			
	42											444	508	535	638	692	763	754	858	964	976	
	48												572	638	762	842	929	943	1074	1208	1136	1336

The transmittable torques of the clamping connection consider the max. clearance with shaft fit k6 / bore H7. With bigger clearance the torque is reduced.
As shaft material – steel or spheroïdal iron with a yield point of approx. 250 N/mm² or more can be used.
For the stiffness calculation of the shaft/hollow shaft see KTR standard 45510 at our homepage www.ktr.com.

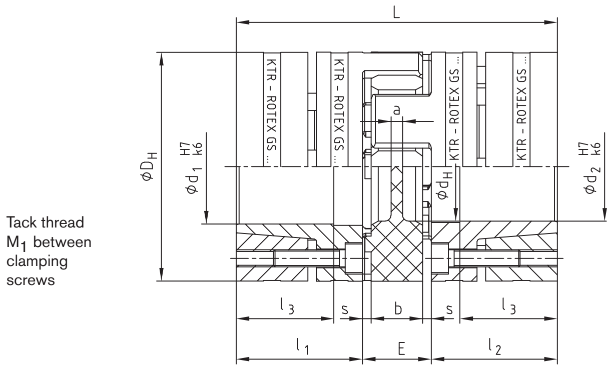
Order form:

ROTEX® GS 24	98 Sh A-GS	6.0 light – Ø 24		6.0 light – Ø 20	
Coupling size	Spider hardness	Hub design	Finish bore	Hub design	Finish boreg

Made for Motion KTR

Clamping ring hubs

- Backlash-free shaft coupling with integrated clamping system
- Applicable to, for example, forward feed main spindle drives of machine tools, press rollers, etc.
- High smoothness of running, application up to a peripheral speed of 40 m/s
- For high friction torques (consider the selection in case of explosion protection use)
- Easy to assemble due to internal clamping screws
- Finish bore up to Ø 50 mm according to ISO fit H7, from Ø 55 mm according to ISO fit G7
- Ex Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)



Size	Torques [Nm] 1)				Dimensions [mm]									Clamping screws				Weight per hub with max. bore [kg]	Mass moment of inertia per hub with max. bore [kgm²]
	92 Sh A		98 Sh A																
	T_{KN}	T_{Kmax}	T_{KN}	T_{Kmax}	D_H 3)	d_H	L	l_1; l_2	l_3	E	b	s	a	M	number z	T_A[Nm]	M_1		
4) Hub material – Aluminium (Al-H)										Clamping ring material – Steel									
14	7,5	15	12,5	25	30	10,5	50	18,5	13,5	13	10	1,5	2,0	M3	4	1,34	M3	0,049	0,07 x 10⁻⁴
19	10,0	20	17	34	40	18	66	25	18	16	12	2,0	3,0	M4	6	3	M4	0,120	0,31 x 10⁻⁴
24	35,0	70	60	120	55	27	78	30	22	18	14	2,0	3,0	M5	4	6	M5	0,280	1,35 x 10⁻⁴
28	95,0	190	160	320	65	30	90	35	27	20	15	2,5	4,0	M5	8	6	M5	0,450	3,13 x 10⁻⁴
38	190,0	380	325	650	80	38	114	45	35	24	18	3,0	4,0	M6	8	10	M6	0,950	9,60 x 10⁻⁴
Hub and clamping ring material – Steel (St-H)																			
19	10,0	20	17	34	40	18	66	25	18	16	12	2,0	3,0	M4	6	4,1	M4	0,179	0,44 x 10⁻⁴
24	35,0	70	60	120	55	27	78	30	22	18	14	2,0	3,0	M5	4	8,5	M5	0,399	1,91 x 10⁻⁴
28	95,0	190	160	320	65	30	90	35	27	20	15	2,5	4,0	M5	8	8,5	M5	0,592	4,18 x 10⁻⁴
38	190,0	380	325	650	80	38	114	45	35	24	18	3,0	4,0	M6	8	14	M6	1,225	12,9 x 10⁻⁴
42	265	530	450	900	95	46	126	50	35	26	20	3,0	4,0	M8	4	35	M8	2,30	31,7 x 10⁻⁴
48	310	620	525	1050	105	51	140	56	41	28	21	3,5	4,0	M10	4	69	M10	3,08	52,0 x 10⁻⁴
55	375	750	685	1370	120	60	160	65	45	30	22	4,0	4,5	M10	4	69	M10	4,67	103,0 x 10⁻⁴
65	-	-	940 2)	1880 2)	135	68	185	75	55	35	26	4,5	4,5	M12	4	120	M12	6,70	191,0 x 10⁻⁴
75	-	-	1920 2)	3840 2)	160	80	210	85	63	40	30	5,0	5,0	M12	5	120	M12	9,90	396,8 x 10⁻⁴

1) Please note coupling selection on pages 129 - 131 2) Figures for 95 Sh A - GS 3) $\varnothing D_H$ + 2 mm with high speeds for expansion of spider
4) In case of using the spider 64 Sh D-GS resp. short dimensioning we recommend the application of clamping ring hubs made of steel.

Bores d_1/d_2 and the corresponding transmittable friction torques T_R of clamping ring hub in [Nm] 1)

Größe	Ø6	Ø10	Ø11	Ø14	Ø15	Ø16	Ø19	Ø20	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55	Ø60	Ø65	Ø70	Ø80
14	8,6	13,8	14,7	22,7																					
19		31	37	62	68	62	83	90																	
24				67	74	66	90	97	112	120	143														
28					142	154	189	170	237	250	280	307	310	353	389										
38								269	337	356	398	436	442	501	533	572	615	644							
42										399	445	506	470	566	581	647	630	728	836	858					
48												650	685	809	841	926	916	1042	1181	1125	1311				
55														918	954	1052	1040	1185	1220	1318	1359	1646	1662	1960	
65																1568	1569	1768	1833	1968	2049	2438	2495	2898	
75																		2246	2338	2500	2620	3082	3179	3657	4235

The transmittable torques of the clamping connection consider the max. clearance with shaft fit k6 / bore H7, from Ø55 G7/m6. With bigger clearance the torque is reduced.
For the stiffness calculation of the shaft/hollow shaft see KTR standard 45510 at our homepage www.ktr.com.

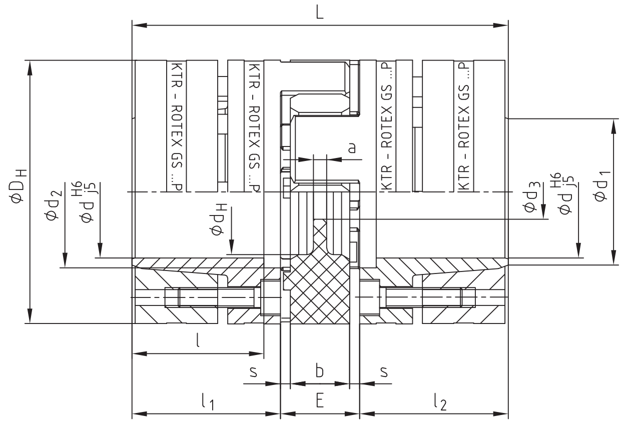
Order form:

ROTEX® GS 24	98 Sh A-GS	6.0 – Ø 24		6.0 – Ø 20	
Coupling size	Spider hardness	Hub design	Finish bore	Hub design	Finish bore

Type P according to DIN 69002

- Backlash-free, highly accurate shaft coupling with integrated clamping system
- Developed specifically for stub spindles on multiple spindle heads according to DIN 69002
- Application on main spindle drives with high speeds, peripheral speeds of 50 m/s and more (please consult with KTR Engineering Department)
- For high friction torques (consider the selection in case of explosion protection use)
- Easy to assemble to due internal clamping screws
- Ⓔx Approved according to EC Standard 94/9/EC Certificate ATEX 95)

Tack thread M_1 between clamping screws



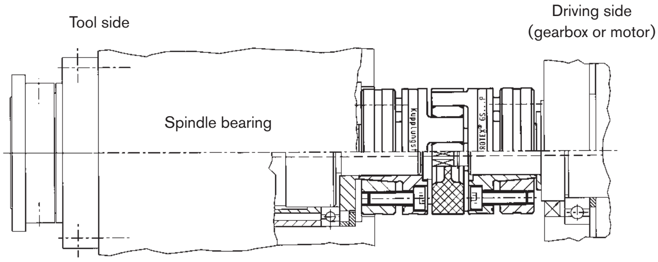
Size	Torque [Nm] 2)				Dimensions [mm]													Transmittable torque of clamping ring hub Ø d [Nm] 1)	Tightening torque of clamping screws T_A [Nm]	Weight per hub with bore Ø d norm [kg]	Mass moment of inertia with bore Ø d norm [kgm²]
	98 Sh A-GS		64 Sh A-GS																		
	T_{KN}	T_{Kmax}	T_{KN}	T_{Kmax}	d 1)	D_H 3)	d_H	L	$l_1;l_2$	l	E	b	s	a	d_1	d_2	d_3				
14 P	12,5	25	16	32	14*	32	10,5	50	18,5	15,5	13	10	1,5	2	17	17	8,5	25	1,89	0,08	$0,011\times10^{-3}$
19 P 37,5	14	28	17	34	16*	37,5	18	66	25	21	16	12	2	3	20	19	9,5	60	3,05	0,16	$0,037\times10^{-3}$
19 P	17	34	21	42	19*	40	18	66	25	21	16	12	2	3	23	22	9,5	71	3,05	0,19	$0,046\times10^{-3}$
24 P 50	43	86	54	108	24*	50	27	78	30	25	18	14	2	3	28	29	12,5	108	4,9	0,331	$0,136\times10^{-3}$
24 P	60	120	75	150	25*	55	27	78	30	25	18	14	2	3	30	30	12,5	170	8,5	0,44	$0,201\times10^{-3}$
28 P	160	320	200	400	35*	65	30	90	35	30	20	15	2,5	4	40	40	14,5	506	8,5	0,64	$0,438\times10^{-3}$
38 P	325	650	405	810	40	80	38	114	45	40	24	18	3	4	46	46	16,5	821	14	1,32	$1,325\times10^{-3}$
42 P	450	900	560	1120	42	95	46	126	50	45	26	20	3	4	52	55	18,5	709	35	2,23	$3,003\times10^{-3}$
48 P	525	1050	655	1310	45	105	51	140	56	50	28	21	3,5	4	52	60	20,5	1340	69	3,09	$5,043\times10^{-3}$
55 P	685	1370	825	1650	50	120	60	160	65	58	30	22	4	4,5	55	72	22,5	1510	69	4,74	$10,02\times10^{-3}$

Hub material – Steel   Clamping ring material – Steel

1) * Standard spindle shaft diameter · 2) Please note coupling selection on pages 129 - 131 · 3) Ø D_H + 2 mm with higher speed for expansion of spider
For the stiffness calculation of the shaft/hollow shaft see KTR standard 45510 at our homepage www.ktr.com).

Selection for stub spindles

Spindle drive	ROTEX® GS P Size	Dimensions				
		d	D_H	l_1; l_2	L	E
25 x 20	14 P	14	32	18,5	50	13
32k x 25	19 P37.5	16	37,5	25	66	16
32g x 30	19 P	19	40	25	66	16
40 x 35	24 P50	24	50	30	78	18
50 x 45	24 P	25	55	30	78	18
63 x 55	28 P	35	65	35	90	20



ROTEX® GS type P with central coolant supply for stub spindles and multiple spindle heads

Order form:

ROTEX® GS 24	P	98 Sh A-GS	6.0	-	∅25	6.0	-	∅25
Coupling size	Type	Spieder hardness	Hub-design		Finish bore	Hub-design		Finish bore

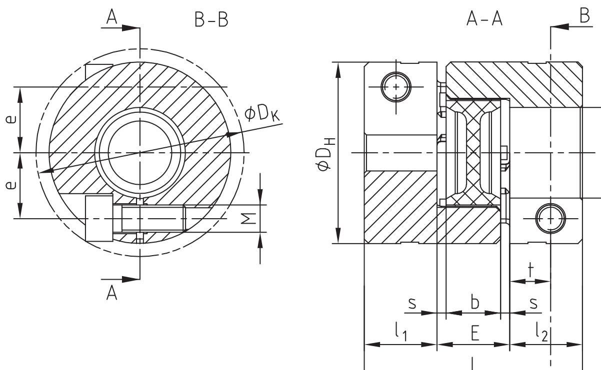
Compact

- Up to 1/3 shorter
- High performance

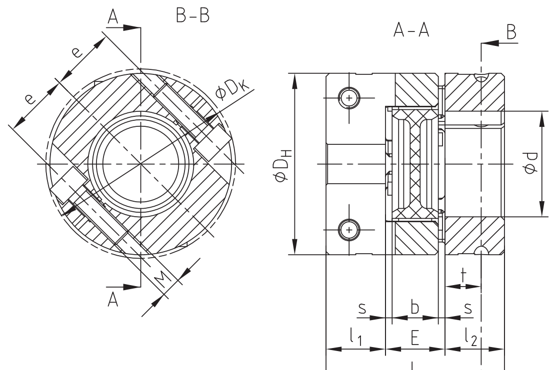
Design with axial slot, patent pending

- Good concentric running properties
- Uniform power transmission due to cams without slots
- Improved balancing quality

- Finish bore from Ø 6 mm also available with feather key acc. To DIN 6885 sheet 1 – JS9



ROTEX® GS 7 - 19 compact single slotted [1] design 2.0



ROTEX® GS 24 - 38 compact axially slotted design 2.8

ROTEX® GS Compact

Size	Torque [Nm]			Dimensions [mm]												T_A [Nm]
	92Sh A	98Sh A	64Sh D	$d_{max.}$	D_H	D_K	L	l_1, l_2	E	b	s	t	e	M	
7	1,2	2,0	2,4	7	14	16,6	18	5	8	6	1	2,5	5,0	M2	0,37
9	3,0	5,0	6	9	20	21,3	24	7	10	8	1	3,5	6,7	M2,5	0,76
12	5,0	9,0	12	12	25	26,2	26	7	12	10	1	3,5	8,3	M3	1,34
14	7,5	12,5	16	16 [2]	30	30,5	32	9,5	13	10	1,5	4,5	9,6	M4	2,9
19	10	17	21	24 [2]	40	45,0	50	17	16	12	2	9	14,0	M6	10
24	35	60	75	32	55	57,5	54	18	18	14	2	11	20,0	M6	10
28	95	160	200	35	65	69,0	62	21	20	15	2,5	12	23,8	M8	25
38	190	325	405	45	80	86,0	76	26	24	18	3	16	30,5	M10	49

Bores and the corresponding transmittable torques of clamping hub design 2.0/2.8

Size	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	Ø10	Ø11	Ø12	Ø14	Ø15	Ø16	Ø18	Ø19	Ø20	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45
7	0,8	0,9	1,0	1,0	1,1																					
9		1,9	2,0	2,1	2,2	2,3	2,4																			
12		3,4	3,6	3,7	3,9	4,1	4,2	4,4	4,6	4,7																
14			7,1	7,4	7,7	8,0	8,2	8,5	8,8	9,1	5,8 [2]	5,9 [2]	6,1 [2]													
19						24,3	25,0	25,7	26,3	27,0	28,4	29,0	29,7	31,1	31,7	32,4	25,0 [2]									
24								21	23	25	30	32	34	38	40	42	51	53	59	63	68					
28											54	58	62	70	74	78	93	97	109	116	124	136				
38												92	99	111	117	123	148	154	173	185	197	216	234	247	259	278

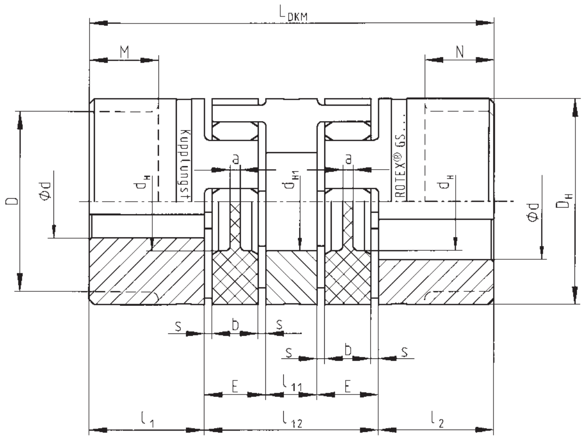
[1] ROTEX® GS compact size 7 to 19 axially slotted on request
[2] Size 14 with screw M3 and dimesnion e=10.4, size 19 with screw M5 and dimension e=15.5

Order form:

ROTEX® GS 38	Compact	98 Sh A-GS	2.8	-	Ø28	2.8	-	Ø45
Coupling size	Design	Spider Hardness	Hub-design		Finish bore	Hub-design		Finish bore

Typ DKM (double cardanic)

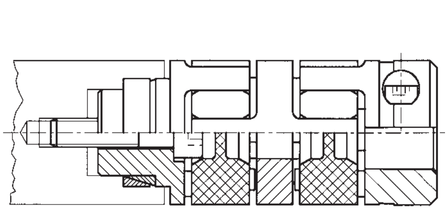
- Backlash-free, double cardanic shaft connection
- Double cardanic design allowing for absorption of larger radial displacements
- Axial plug-in ability - easy blind assembly
- Maintenance-free
- Simple to check visually
- Finish bore according to ISO fit H7 (apart from clamping hub), keyway, from Ø 6 mm according to DIN 6885 sheet 1 - JS9
- ⟨Ex⟩ Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)



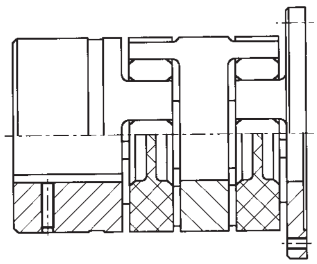
Size	Hub material – Aluminium (Al-H)							Spacer material – Aluminium (Al-H)						
	Dimenssions [mm]													
	$d_{max.}$ [1)]	D	D_H	d_H	d_{H1}	l_1; l_2	M; N	l_{11}	l_{12}	L_{DKM}	E	b	s	a
5	5	—	10	—	—	5	—	3	13	23	5	4	0,5	4,0
7	7	—	14	—	—	7	—	4	20	34	8	6	1,0	6,0
9	11	—	20	7,2	—	10	—	5	25	45	10	8	1,0	1,5
12	12	—	25	8,5	—	11	—	6	30	52	12	10	1,0	3,5
14	16	—	30	10,5	—	11	—	8	34	56	13	10	1,5	2,0
19	24	—	40	18,0	18	25	—	10	42	92	16	12	2,0	3,0
24	28	—	55	27,0	27	30	—	16	52	112	18	14	2,0	3,0
28	38	—	65	30,0	30	35	—	18	58	128	20	15	2,5	4,0
38	45	—	80	38,0	38	45	—	20	68	158	24	18	3,0	4,0
	Hub material – Steel							Spacer material – Aluminium (Al-H)						
42	55	85	95	46	46	50	28	22	74	174	26	20	3,0	4,0
48	62	95	105	51	51	56	32	24	80	192	28	21	3,5	4,0
55	74	110	120	60	60	65	37	28	88	218	30	22	4,0	4,5

[1)] depend on hub design

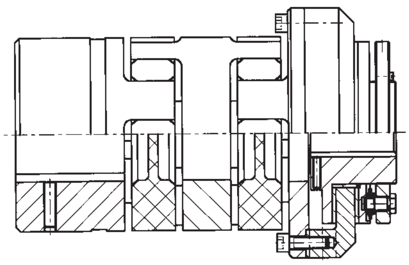
Other designs:



ROTEX® GS - DKM as hollow shaft design



ROTEX® GS - CF - DKM



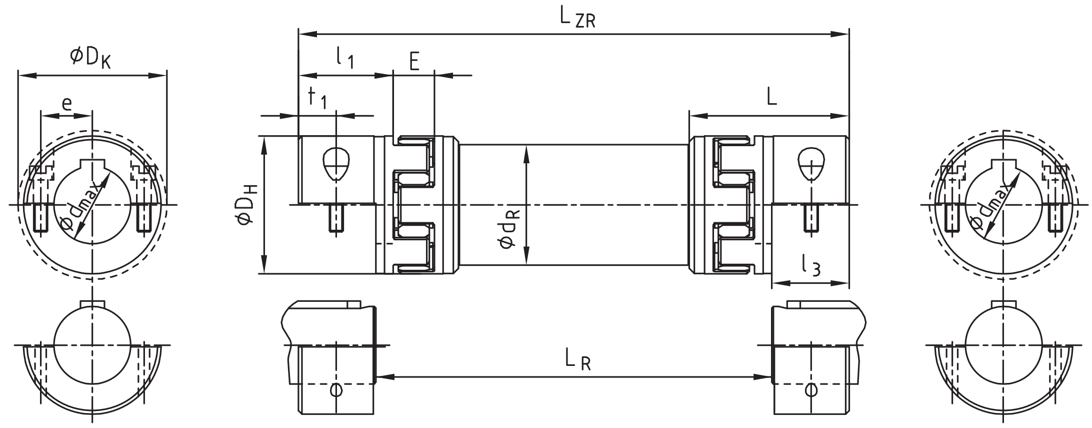
ROTEX® GS - DKM in combination with torque limiter KTR-RU

Order form:

ROTEX® GS 24	DKM	92 Sh A-GS	1.0	- Ø38	2.5	- Ø32
Coupling size	Type	Spieder hardness	Hub-design	Finish bore	Hub-design	Finish bore

Intermediate shaft coupling

- Use with lifting machines, in handling units, robotic palletisers etc.
- Easy, radial coupling assembly because of split coupling hub
- Exchange of spiders without displacing the drive and driven side
- Lengths are possible up to 4 m without intermediate bearing dependent on speed and size
- Positive and frictionally engaged torque transmission
- Low mass moment of inertia due to use of aluminium
- Can be combined with other hub forms (clamping or clamping ring hubs)
- Finish bore according to ISO fit H7,keyway according to DIN 6885 sheet 1 - JS9



ROTEX® GS typeZR3																
Size	Dimensions [mm]														Capscrew DIN EN ISO 4762	
	Finish bore		General													
			D_H	l_1	L	l_3	E	L_R		L_{ZR}		d_R	D_K	t_1	e	
	$d_{min.}$	$d_{max.}$						min.	max.	min.	max.					8.8	T_A [Nm]
19	8	20	40	25	49,0	17,5	16	98	2965	133	3000	40	46	8,0	14,5	M6	10
24	10	28	55	30	59,0	22,0	18	113	3456	157	3500	50	57,5	10,5	20	M6	10
28	14	38	65	35	67,0	25,0	20	131	3950	181	4000	60	73	11,5	25	M8	25
38	18	45	80	45	83,5	33,0	24	163	3934	229	4000	70	83,5	15,5	30	M8	25
42	22	50	95	50	93,0	36,5	26	180	3927	253	4000	80	93,5	18,0	32	M10	49
48	22	55	105	56	100,0	39,5	28	202	3921	281	4000	100	105	18,5	36	M12	86

Technical data of type ZR3 with a spider 98 Sh-A-GS														
Size	Coupling torques [Nm]		Mass moment of inertia [10^{-3} kgm²]			stat. torsion spring stiffness [Nm²/rad]	Size	Coupling torques [Nm]		Mass moment of inertia [10^{-3} kgm²]			stat. torsion spring stiffness [Nm²/rad]
	T_{KN}	$T_{K\,max.}$	Hub [1]	ZR-hub	Pipe/meter	ZW C_2 [2]		T_{KN}	$T_{K\,max.}$	Nabe [1]	ZR-Nabe	Rohr/Meter	ZW C_2 [2]
19	17	34	0,02002	0,01304	0,329	3243,6	38	325	650	0,50385	0,2572	2,972	29290,4
24	60	120	0,07625	0,04481	0,673	6631,8	42	450	900	1,12166	0,5523	4,560	44929,7
28	160	320	0,17629	0,10950	1,199	11814,1	48	525	1050	1,87044	1,1834	9,251	91158,2

Bores and the corresponding transmittable friction torques of split hub without keyway [mm]																								
Größe	Ø8	Ø10	Ø11	Ø14	Ø15	Ø16	Ø18	Ø19	Ø20	Ø22	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø46	Ø48	Ø50	Ø55
19	17	21	23	30	32	34	38	40	42															
24		21	23	30	32	34	38	40	42	47	51	53	59											
28				54	58	62	70	74	78	86	93	97	109	117	124	136	148							
38							70	74	78	86	93	97	109	117	124	136	148	156	163	175				
42										136	149	155	174	186	198	217	235	248	260	279	285	297	310	
48										199	217	226	253	271	290	317	344	362	380	407	416	434	452	498

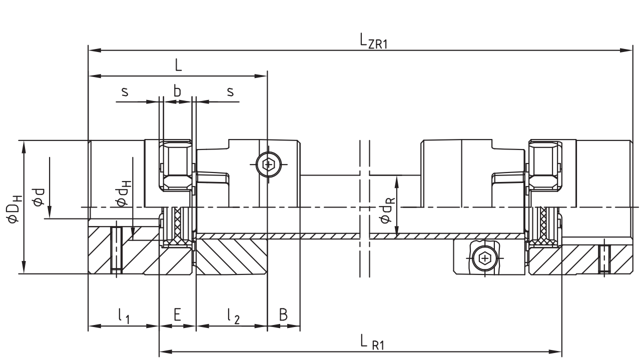
[1] At $d_{max.}$ [2] Torsional spring stiffness with an intermediate pipe of a length of 1 m, L_{Pipe} being = $L_{ZR} - 2 \cdot L$
For enquiries and orders please mention the shaft distance dimension L_R along with the maximum speed to review the critical speed.

Order form:

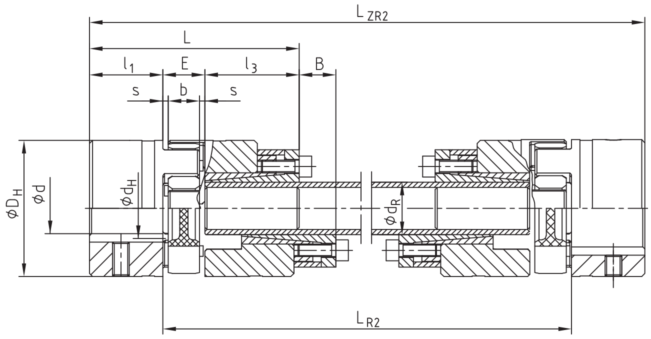
ROTEX® GS 24	ZR3	1200 mm	98 Sh A-GS	7.5	-	Ø24	7.5	-	Ø24
Coupling size	Type	Shaft distance dimension (L_R)	Spider hardness	Hub design		Finish bore	Hub design		Finish bore

Intermediate shaft coupling

- Backlash-free intermediate shaft coupling
- Application, for example, on lifting spindle elements, parallel linear systems, overhead gantry robots, handling machines
- For connection of larger shaft distances and a maximum speed of 1500 1/min
- Spacer part to be disassembled radially
- Design ZR1 for torques up to the maximum friction torque of clamping hub, design ZR2 for higher torques
- Finish bore according to ISO fit H7 (apart from clamping hub), keyway, from Ø 6 mm according to DIN 6885 sheet 1 - JS9



Type ZR1



Type ZR2

ROTEX® GS Type ZR1

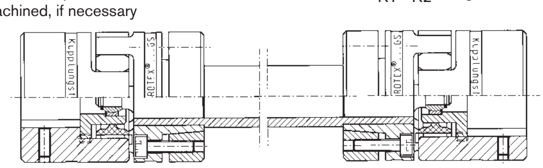
Size	Finish bore	Dimensions [mm]											Cap screw DIN EN ISO 4762 – 8.8	Tightening torque	Friction torque
	$d_{max.}$ [1]	D_H	l_1; l_2	L	E	b	s	B	L_{R1}	L_{R1} min.	L_{ZR1}	d_R [2]	Mxl		
14 ZR1	16	30	11	35	13	10	1,5	11,5	please mention for inquiries and orders	71	L_{R1}+22	14x2,5	M3x12	1,34	6,1
19 ZR1	24	40	25	66	16	12	2,0	14,0		110	L_{R1}+50	20x3,0	M6x16	10,5	34
24 ZR1	28	55	30	78	18	14	2,0	16,0		128	L_{R1}+60	25x2,5	M6x20	10,5	45
28 ZR1	38	65	35	90	20	15	2,5	17,5		145	L_{R1}+70	35x4,0	M8x25	25	105
38 ZR1	45	80	45	114	24	18	3,0	21,0		180	L_{R1}+90	40x4,0	M8x30	25	123

ROTEX® GS Type ZR2

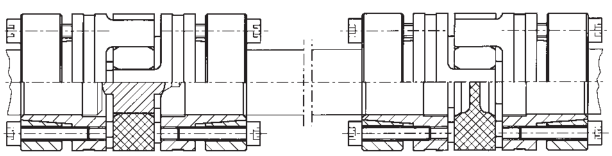
Size	Finish bore	Dimensions [mm]											Precision tube [mm]	Precision tube Nm²/rad	Clamping set size	Clamping screws DIN EN ISO 4762–12.9 µtot. = 0,14	Tightening torque T_A [Nm]
	max. d	D_H	l_1; l_2	l_3	L	E	b	s	B	L_{R2}	L_{R2}	L_{ZR2}	d_R	C_2		Mxl	
14 ZR2	16	30	11	26	50	13	10	1,5	11,5	please mention for inquiries and orders	109	L_{R2}+22	10x2,0	68,36	10x16	M4x10	5,2
19 ZR2	24	40	25	26	67	16	12	2,0	14,0		120	L_{R2}+50	12x2,0	130	12x18	M4x10	5,2
24 ZR2	28	55	30	38	86	18	14	2,0	16,0		156	L_{R2}+60	20x3,0	954,9	20x28	M6x18	17,0
28 ZR2	38	65	35	45	100	20	15	2,5	17,5		177	L_{R2}+70	25x2,5	1811	25x34	M6x18	17,0
38 ZR2	45	80	45	45	114	24	18	3,0	21,0		192	L_{R2}+90	32x3,5	5167	32x43	M6x18	17,0
42 ZR2	55	95	50	52	128	26	20	3,0	23,0		214	L_{R2}+100	40x4,0	11870	40x53	M6x18	17,0
48 ZR2	62	105	56	70	154	28	21	3,5	24,5		261	L_{R2}+112	45x4,0	17486	45x59	M8x22	41,0
55 ZR2	74	120	65	80	175	30	22	4,0	26,0		288	L_{R2}+130	55x4,0	33543	55x71	M8x22	41,0
65 ZR2	80	135	75	80	185	35	26	4,5	30,5		387	L_{R2}+150	60x4,0	44362	60x77	M8x22	41,0

[1] For inquiries and orders please mention the shaft distance dimension L_{R1}/L_{R2} along with the maximum speed to review the critical whirling speed.
[2] Has to be remachined, if necessary

Other designs:



ROTEX® ZRG with bearing for higher speeds



ROTEX® GS ZR for vertical assembly

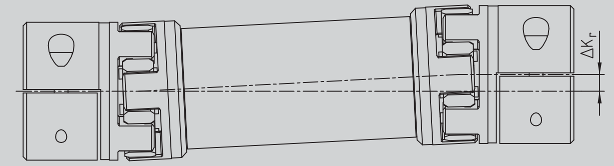
Order form:

ROTEX® GS 24	ZR1	1000 mm	98 Sh A-GS	1.0	-	Ø24	2.5	-	Ø24
Coupling size	Type	Shaft distance dimension (L_R)	Spider hardness	Hub design		Finish bore	Hub design		Finish bore

Displacements and technical data

Axial displacements

Radial displacements



$$\Delta K_r = (L_{ZR} - 2 \cdot l_1 - E) \cdot \tan \alpha$$

Angular displacements

Displacements Type ZR1 and ZR2			
ROTEX® GS Size with 98Sh A-GS	Axial ΔK_a [mm]	Radial ΔK_r [1)] [mm]	Angular α [degree]
14	+1,0 / -1,0	15,16	0,9°
19	+1,2 / -1,0	14,67	0,9°
24	+1,4 / -1,0	14,48	0,9°
28	+1,5 / -1,4	14,30	0,9°
38	+1,8 / -1,4	13,92	0,9°
42	+2,0 / -2,0	13,73	0,9°
48	+2,1 / -2,0	13,51	0,9°
55	+2,2 / -2,0	13,19	0,9°
65	+2,6 / -2,0	12,80	0,9°

1) Radial displacements based on coupling length L_{ZR} = 1000 mm

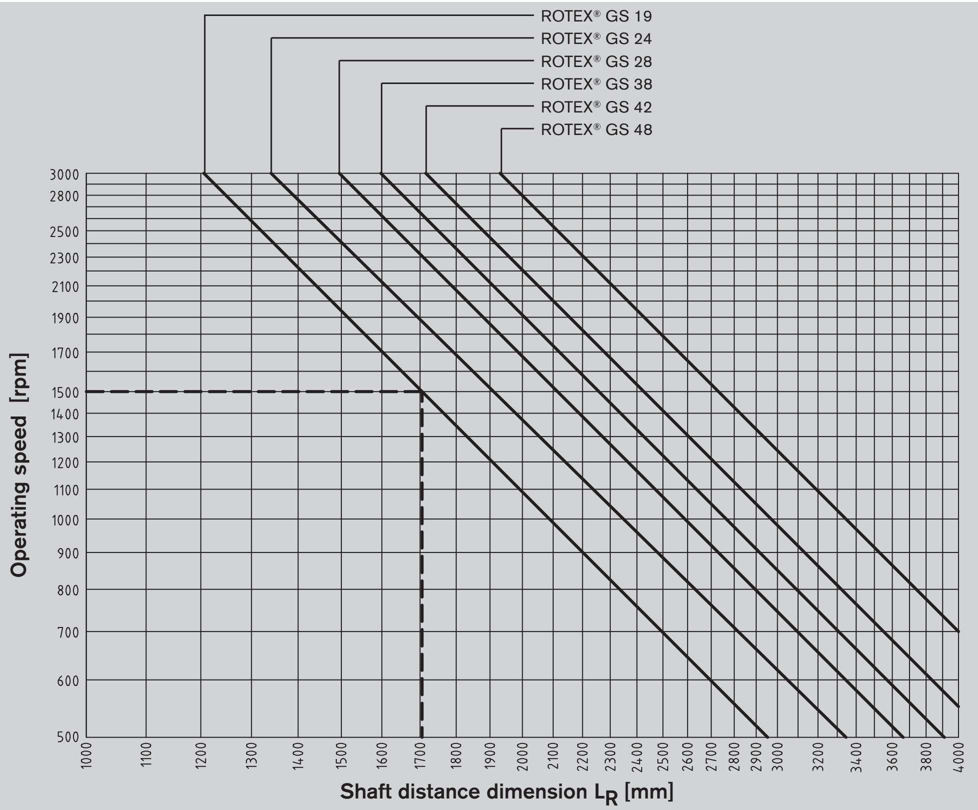
Calculation of total torsion spring stiffness:

$$C_{total} = \frac{1}{2 \cdot \frac{1}{C_1} + \frac{L_{pipe}}{C_2}} \quad [\text{Nm/rad}]$$

$$\text{with } L_{pipe} = \frac{L_{ZR} - 2 \cdot L}{1000} \quad [\text{m}]$$

C_1 = torsion spring stiffness for spider page 129
C_2 = from table page 141/142

Chart of critical speeds for design ZR3

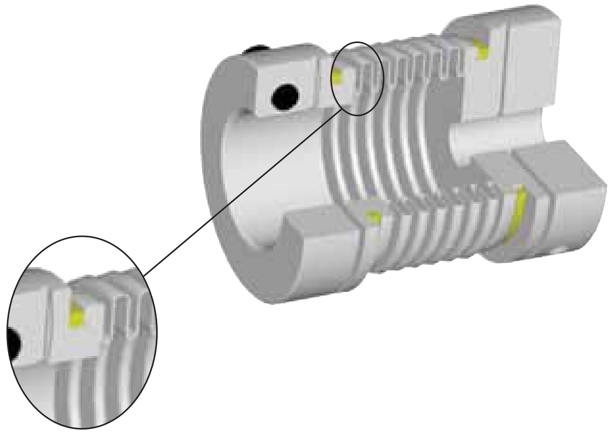


Example:

ROTEX® GS 19
Operating speed: 1500 rpm
Max. permissible shaft distance dimension: 1700 mm
Operating speed = $n_{krit}/1,4$

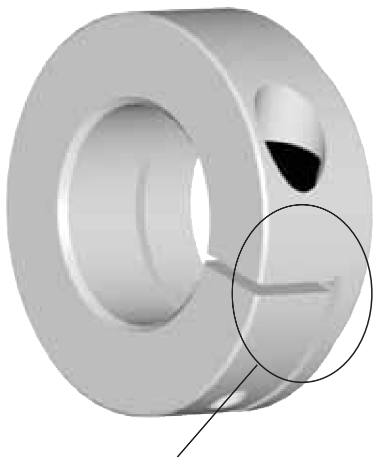
Coupling description

TOOLFLEX® is a metal bellow-type coupling, a coupling system which has proven its worth in the field in many cases. The metal bellow compensates perfectly for axial, radial and angular displacements. At the same time its geometric shape allows for high torsional stiffness and a low mass moment of inertia.
TOOLFLEX® is produced in eleven sizes for maximum torques up to 340 Nm.
Its main application ranges are both positioning drives, e. g. ball spindles with a high incline, and indexing tables or planetary and worm gears with small gear ratios.



Subject to its well-approved joint procedure a non-positive connection of the aluminium hubs with the multilayer bellows made from stainless steel is produced.
The flanged insert connection sizes 20 to 45 ensures a torque transmission of every single bellow layer.
Since Toolflex is a metal coupling, it remains fatigue-endurable in the high temperature range up to a maximum of 200 °C. Moreover, it is resistant to influences of media or critical operating conditions, respectively

The well-known shaft-hub-connection by means of clamping hubs ensures an easy assembly by a radial clamping screw.
Subject to two slots in the hub there is no deformation of the bellow when tightening the clamping screw. For higher friction torques type KN with taper hubs can be used.



clamping hub with two slots

Types

Type M and S

Type KN

Type PI

Coupling selection

Normally the TOOLFLEX® is selected according to the nominal torque (T_{KN}) shown in the list of technical data, like all other coupling systems. In all cases the torque (T_{KN}) must exceed the maximum torque to be transmitted (accelerating or peak torque). This should mainly be considered in connection with servo motors because their accelerating torques both positive and negative can exceed the nominal torque of the coupling by a significant amount. In case of values exceeding T_{KN} (collision, trouble) only limited alternating load figures are possible. In this torque range there can be permanent deformation of the bellow and fatigue fractures can occur.

Description	Symbol	Definition or explanation
Rated torque of coupling	T_{KN}	Torque that can continuously be transmitted over the entire permissible speed range
Peak torque of machine	T_S	Peak torque on the coupling
Peak torque on the driving side	T_{AS}	Peak torque with torque shock on the driving side, e. g. breakdown torque of the electric motor
Peak torque of load side	T_{LS}	Peak torque with torque shock on load side, e. g. braking
Moment of inertia	$J_{A/L}$	Total of moments of inertia existing on the driving or load side referring to the coupling speed
Rotational inertia coefficient of driving side	m_A	Factor taking into account the mass distribution with shocks and vibrations produced on the driving side
Rotational inertia coefficient of load side	m_L	Factor taking into account the mass distribution with shocks and vibrations produced on the load side

Description	Symbol	Definition or explanation
max. engine performance	$P_{max.}$	max. power in kW which the engine may produce
engine speed	n	Rated speed in rpm of the engine
Torsional angle	φ	Transmission error of the metal bellow due to torsional strain
Torsional stiffness	C_T	Torsional stiffness of the coupling in Nm/rad. For data see tables shown on the following pages.
Frequency of the 2-mass-system	f_e	in s^{-1}
Eexciting frequency of the drive	f_r	in s^{-1}
Operating factor	k	k = 1.5 with uniform movement k = 2,0 with ununiform movement k = 2.5 - 4 with shocking movement For drives in machine tools (servo motors) k values of 1.5 - 2 must be used.

Judgement calculation

The size of the coupling must be selected so that the following conditions are met.

$$T_{KN} \geq T_{AS/LS} \cdot k$$

$$T_{KN}\ [\text{Nm}] = 9550 \cdot \frac{P_{max}\ [\text{kW}]}{n\ [\text{rpm}]}$$

When selecting servo motors the calculations are made with the torque values of the engine suppliers and not with P_{max}. When dimensioning the coupling please use the respective data of the manufacturer considering the servo controller to be used.

Accelerating torque (drive side / load side)

$$T_{KN} > T_S$$

$$T_S = T_{AS} \cdot m_A \cdot k \qquad m_A = \frac{J_L}{J_A + J_L}$$

$$T_S = T_{LS} \cdot m_L \cdot k \qquad m_L = \frac{J_A}{J_A + J_L}$$

Inspection of torsional stiffness

$$\varphi = \frac{180 \cdot T_{AS}}{\pi \cdot C_T}$$

Inspection of resonance frequency

The natural frequency of the coupling must be above or below the frequency of the unit. Valid for the mechanical spare model of the 2-mass-system:

$$f_e = \frac{1}{2 \cdot \pi} \sqrt{C_T \cdot \frac{J_L + J_A}{J_L \cdot J_A}}\ [\text{Hz}]$$

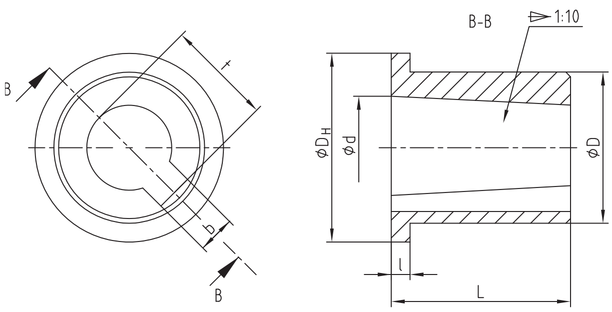
Valid in practice: $f_e \geq 2 \cdot f_r$

ROTEX® GS
TOOLFLEX®
RADEX®-NC

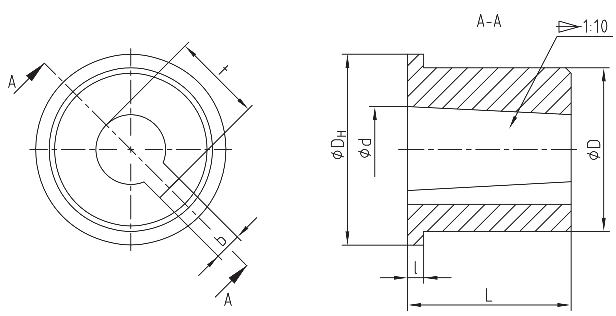
Basic programme

Basic programme TOOLFLEX® miniature (Finish bore [mm] according to ISO fit F7)																
Size	Hub design	Ø2	Ø3	Ø4	Ø5	Ø6	Ø6,35	Ø7	Ø8	Ø9	Ø9,5	Ø10	Ø11	Ø12	Ø14	Ø16
5	1.1	●	●	●	●											
7	1.1		●	●	●	●		●	●							
	2.5		●	●	●	●	●	●								
9	1.1			●	●	●		●	●	●		●				
	2.5		●	●	●	●	●	●	●	●						
12	1.1				●	●		●	●			●				
	2.5				●	●	●		●	●		●	●	●		

Basic programme TOOLFLEX® type M and S (Finish bore [mm] according to ISO fit F7)																														
Size		Ø5	Ø6	Ø6,35	Ø7	Ø8	Ø9	Ø10	Ø11	Ø12	Ø14	Ø15	Ø16	Ø18	Ø19	Ø20	Ø22	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55
16	■	●	●	●	●	●	●	●	●	●	●		●																	
20	■							●	●	●	●	●	●	●	●	●														
30	■										●	●	●	●	●	●	●	●	●	●										
38	■														●	●	●	●	●	●	●	●	●	●						
42	■														●	●	●	●	●	●	●	●	●	●	●	●				
45	■																		●	●	●	●	●	●	●	●	●			
55	■																					●	●	●	●	●	●	●	●	●



Size 1



Size 2

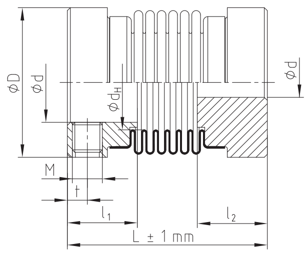
Type M and S sleeve dimensions [mm] for FANUC engines									
Sleeve size	L	l	D_H	D	$d^{+0,05}$	b^{JS9}	$t^{+0,1}$	Taper	Notice
1	16	2	20	16	10,9	4	12,2	1:10	For TOOLFLEX size 16-20
2	30	3	35	30	15,8	5	17,9	1:10	For TOOLFLEX size 30-45

Basic programme TOOLFLEX® type KN (Finish bore [mm] according to ISO fit F7)																			
		Ø14	Ø15	Ø16	Ø18	Ø19	Ø20	Ø22	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48
30	■	●	●	●	●	●	●	●											
38	■	●	●	●	●	●	●	●	●	●	●								
42	■																		
45	■				●	●	●	●	●	●	●	●	●	●	●				
55	■										●	●	●	●	●	●	●	●	●

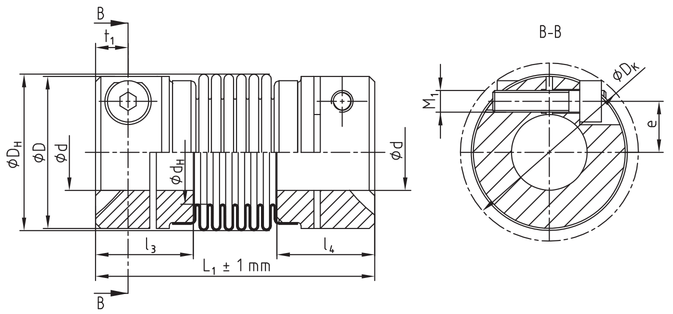
■ Pilot bore
Further dimensions on request

Miniature couplings

- Backlash-free, torsionally stiff
- Maintenance-free
- Low mass moment of inertia
- Easy assembly due to tolerance F7
- Temperature range - 30 °C to + 100 °C
- Finish bore from Ø 6 mm also available with feather key acc. To DIN 6885 sheet 1 – JS9



TOOLFLEX®Type 1.1



TOOLFLEX® Type 2.5

Technical data of type with fixing screw (type 1.1)

Size	Design[1/2]	Torque T_{KN} [Nm]	Dimensions [mm] Finish bore $d_{min.}$	$d_{max.}$	General D_H	d_H	L	$l_1; l_2$	Fixing screw M	t	number[3] z	Perm. displacements Axial [mm]	Radial [mm]	Angular [degrees]	Torsional stiffness C_T [Nm/rad]	Weight [4] [kg]
5	S	0,1	2	5	10	6	15 [1]	6	M2	1,8	1	0,30	0,10	0,7	97	0,0027
	M						17 [2]					0,40	0,15	1,0	75	0,003
7	S	1,0	3	8	15	9	18 [1]	7	M3	2,0	1	0,30	0,10	0,7	390	0,005
	M						20 [2]					0,40	0,15	1,0	300	0,006
9	S	1,5	4	10	20	12	21 [1]	8	M3	2,5	2	0,35	0,15	1,0	750	0,010
	M						24 [2]					0,50	0,20	1,5	580	0,011
12	S	2,0	5	14	25	16	27,5 [1]	11	M4	2,8	2	0,40	0,15	1,0	1270	0,017
	M						31 [2]					0,60	0,20	1,5	980	0,019
NEW 16	S	5,0	5	18	32	20	37	13	M5	4	2	0,3	0,15	1,0	4500	0,046
	M						41					0,5	0,20	1,5	3050	0,049
NEW 20	S	15	6	25	40	27	42	15	M5	5	2	0,4	0,15	1,0	9600	0,076
	S						49					0,6	0,20	1,5	6600	0,082

Circumferential speed v_{max}= 25 m/s

Technical data of type with clamping screw (type. 2.5)

Size	Design[1/2]	Torque T_{KN} [Nm]	Dimensions [mm] Finish bore $d_{min.}$	$d_{max.}$	General D_H	d_H	L_1	$l_3; l_4$	Clamping screw M_1	t_1	e	D_K	T_A [Nm]	Perm. displacements Axial [mm]	Radial [mm]	Angular [degrees]	Torsional stiffness C_T [Nm/rad]	Weight [4] [kg]
7	S	1,0	3	7	15	9	24 [1]	9	M2	3,2	5,0	16,5	0,37	0,3	0,1	0,7	390	0,007
	M						26 [2]							0,4	0,15	1,0	300	0,008
9	S	1,5	3	9	20	12	30 [1]	11	M2,5	3,5	7,1	21,5	0,76	0,35	0,15	1,0	750	0,014
	M						33 [2]							0,5	0,2	1,5	580	0,015
12	S	2,0	4	12	25	16	34,5 [1]	13	M3	4,0	8,5	26,5	1,34	0,4	0,15	1,0	1270	0,025
	M						38 [2]							0,6	0,2	1,5	980	0,027

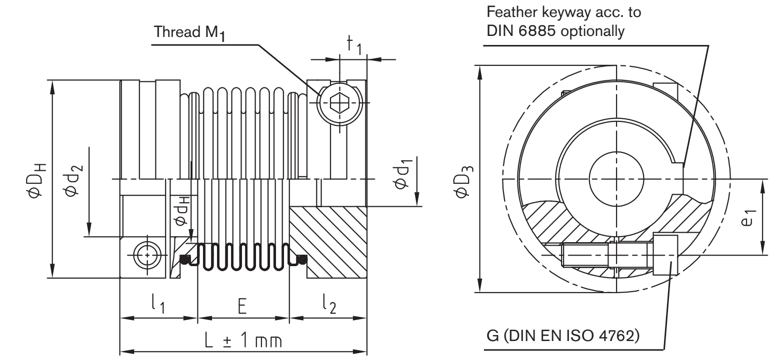
[1] Design S = 4 shafts [2] Design M = 6 shafts [3] Quantity each hub, from size 9: 2x120° offset
[4] Figures refer to the complete coupling with max. bores
Circumferential speed v_{max}= 20 m/s

Order form:

TOOLFLEX® 7 M	2.5	-	Ø4	2.5	-	Ø6
Coupling size	Hub design		Finish bore	Hub design		Finish bore

Type M

- Backlash-free, torsionally stiff
- Non-positive bellow-hub connection
- Frictionally engaged clamping hubs
- Maintenance-free
- Suitable for high temperatures due to flanged insert connection (max. 200 °C)
- Well-resistant to corrosion due to bellow made from stainless steel and aluminium clamping hubs
- Finish bore from Ø 6 mm also available with feather key acc. To DIN 6885 sheet 1 – JS9



TOOLFLEX Type M

Size	Dimensions [mm]											
	Finish bore		General					Clamping screws				
	$d_{min.}$	$d_{max.}$	L	l_1; l_2	E	D_H	d_H	M_1	D_3	t_1	e_1	T_A [Nm]
16	5	16	49	17,0	15	32	20	M4	35,0	5	12,0	2,9
20	8	20	62	21,5	19	40	27	M5	43,5	6	14,5	6
30	10	30	72	23,0	26	55	33	M6	58,0	7	19	10
38	14	38	81	25,5	30	65	42	M8	72,6	9	25	25
NEW 42	14	42	95	30,0	35	70	46	M8	76,1	9	27	25
45	14	45	103	32,0	39	83	58	M10	89,0	11	30	49
55 3)	20	55	125	40,0	45	100	73	M12	106,0	14	37	120

Technical data

Size	Torque T_{KN} [Nm]	Speed n 1) [rpm]	Moment of inertia 2) [x10⁻⁶kgm²]	Torsional stiffness C_T [Nm/rad]	Axial spring stiffness [N/mm]	Radial spring stiffness [N/mm]	Perm. displacements Axial [mm]	Radial [mm]	Angular [degrees]	Mass 2) [x10⁻³kg]
16	5	14900	10	3050	29	92	±0,5	0,20	1,5	61
20	15	11950	32	6600	42	126	±0,6	0,20	1,5	144
30	35	8700	123	14800	65	155	±0,8	0,25	2,0	306
38	65	7350	262	24900	72	212	±0,8	0,25	2,0	448
NEW 42	95	6820	427	36500	80	333	±0,8	0,25	2,0	520
45	150	5750	1020	64000	88	492	±1,0	0,30	2,0	1125
55 3)	340	4800	5118	96100	107	598	±1,0	0,30	2,0	3300

Bore range and respective torques of frictional engagement of the clamping hub [Nm]

Size	Ø5	Ø6	Ø7	Ø8	Ø9	Ø10	Ø11	Ø12	Ø14	Ø15	Ø16	Ø18	Ø19	Ø20	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø50	Ø55
16	8,5	8,8	9,1	9,4	9,7	9,9	10,2	10,5	11,1	11,4	11,7															
20				17,6	18,1	18,6	19,0	19,5	20,5	21,0	21,4	22,4	22,9	23,3												
30							33	34	35	36	36,4	38	38,5	39	42	42,5	44,5	46								
38												84	85	87	92	93	97	99	101	105	109					
NEW 42									84	85	87	89	90	92	96	98	101	104	106	110	114	116	119			
45														157	165	167	173	177	181	187	193	197	200	206		
55 3)															397	401	413	421	429	441	453	462	470	482	502	522

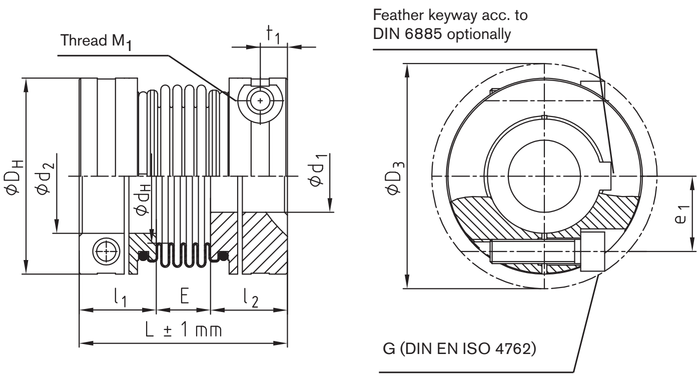
1) With v= 25 m/s 2) Figures refer to the complete coupling with max. bores 3) Hubs from steel welded with bellow

Order form:

TOOLFLEX® 30 M	Ø25	Ø30
Coupling size	Finish bore	Finish bore

Type S

- Short design
- Higher stiffness of torsion spring
- Lower mass moment of inertia
- Finish bore from Ø 6 mm also available with feather key acc. To DIN 6885 sheet 1 – JS9



TOOLFLEX Type S

Size	Dimensions [mm]											
	Finish bore		General					Clamping screws				
	$d_{min.}$	$d_{max.}$	L	l_1; l_2	E	D_H	d_H	M_1	D_3	t_1	e_1	T_A [Nm]
16	5	16	45	17,0	11	32	20	M4	35,0	5	12,0	2,9
20	8	20	55	21,5	12	40	27	M5	43,5	6	14,5	6
30	10	30	63	23,0	17	55	33	M6	58,0	7	19	10
38	14	38	69	25,5	18	65	42	M8	72,6	9	25	25
NEW 42	14	42	84	30,0	24	70	46	M8	76,1	9	27	25
45	14	45	86,5	32,0	22,5	83	58	M10	89,0	11	30	49
55 [3]	20	55	111	40,0	31	100	73	M12	106,0	14	37	120

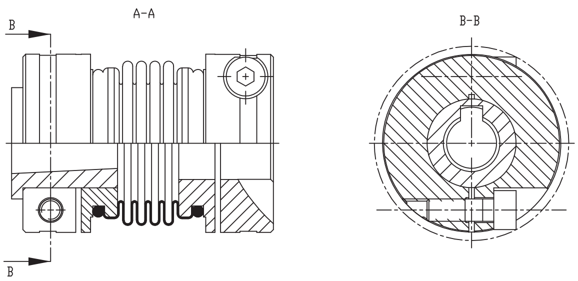
Technical data

Size	Torque T_{KN} [Nm]	Speed n [1] [rpm]	Moment of inertia [2] [x10⁻⁶kgm²]	Torsional stiffness C_T [Nm/rad]	Axial spring stiffness [N/mm]	Radial spring stiffness [N/mm]	Perm. displacements Axial [mm]	Perm. displacements Radial [mm]	Perm. displacements Angular [degrees]	Mass [2] [x10⁻³kg]
16	5	14900	9	4500	43	138	±0,3	0,15	1,0	61
20	15	11950	30	9600	63	189	±0,4	0,15	1,0	121
30	35	8700	114	17800	97	233	±0,5	0,20	1,5	243
38	65	7350	245	37400	108	318	±0,6	0,20	1,5	351
NEW 42	95	6820	396	54700	120	499	±0,6	0,20	1,5	485
45	150	5750	931	95800	132	738	±0,9	0,25	1,5	824
55 [3]	340	4800	4996	144100	160	894	±1,0	0,25	1,5	3213

[1] With v= 25 m/s
[2] Figures refer to the complete coupling with max. bores
[3] Hubs from steel welded with bellow

Info:
Torques of frictional engagement of the clamping hub shown under Type M (page 148)

Other designs: Type for FANUC-Motors

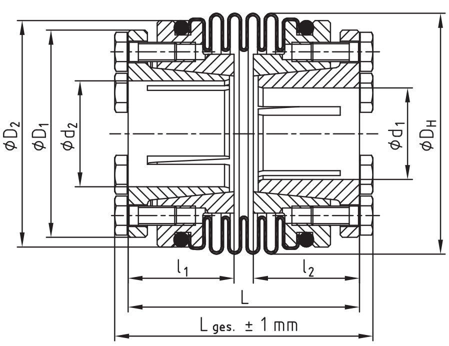


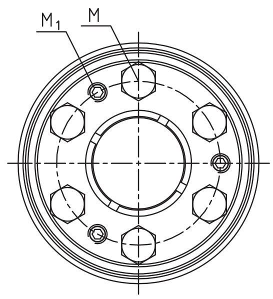
Order form:

TOOLFLEX® 30 S	∅25	∅30
Coupling size	Finish bore	Finish bore

Type KN

- Backlash-free, torsionally stiff
- Non-positive bellow-hub connection
- High friction torques
- Maintenance-free
- Good properties of concentric running with high speeds
- Maximum speed up to 40 m/s circumferential speed





TOOLFLEX® S-KN

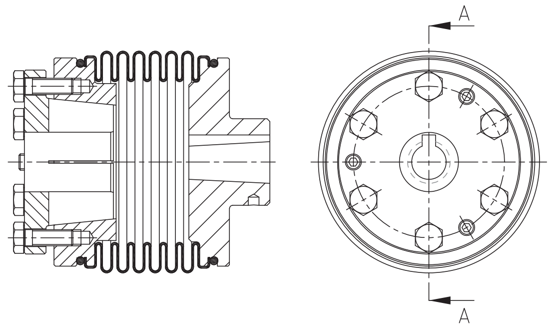
TOOLFLEX® Type KN																	
Size	Torque T_{KN} [Nm]	Dimensions [mm]															
		Finish bore		L		$L_{ges.}$						Clamping screw			Pull-off threads		
		$d_{min.}$	$d_{max.}$	4 shafts 1)	6 shafts 2)	4 shafts 1)	6 shafts 2)	l_1; l_2	D_H	D_1	D_2	M	T_A [Nm]	Number z	M_1	Number z	T_{A1} 4) [Nm]
30	35	12	22	48	57	54	63	22	50	43	47	M4	2,9	12	M4	6	1,2
38	65	12	28	56	68	63	75	26	60,5	52	56	M5	6	12	M5	6	1,4
NEW 42	95	14	35	64	75	71	82	29	66	60	63	M5	6	12	M5	6	1,4
45	150	15	40	74,5	91	82,5	99	34	82	68	77	M6	14	12	M6	6	3
55 3)	340	15	56	95,5	109	106	120	40	97	95	95	M8	35	12	M8	6	6

Bore range d and the corresponding transmittable torques T_R of frictional engagement of the clamping hub [Nm]

Size	∅14	∅15	∅16	∅19	∅20	∅24	∅25	∅28	∅30	∅32	∅35	∅38	∅40	∅42	∅45	∅48	∅50	∅55
30	50	58	66	71	79													
38		81	92	130	103	149	161	202										
NEW 42				105	117	168	131	164	189	215	257							
45					230	332	230	288	331	376	451	531	589					
55 3)							483	606	696	792	585	690	764	843	967	1101	1194	1445

1) Design S = 4 shafts
2) Design M = 6 shafts
3) Hubs from steel welded with bellow
4) After assembly of the clamping screws (M) tighten the pull-off thread (M_1) to the torque T_{A1} indicated.

Other designs: TOOLFLEX® KN for FANUC engines



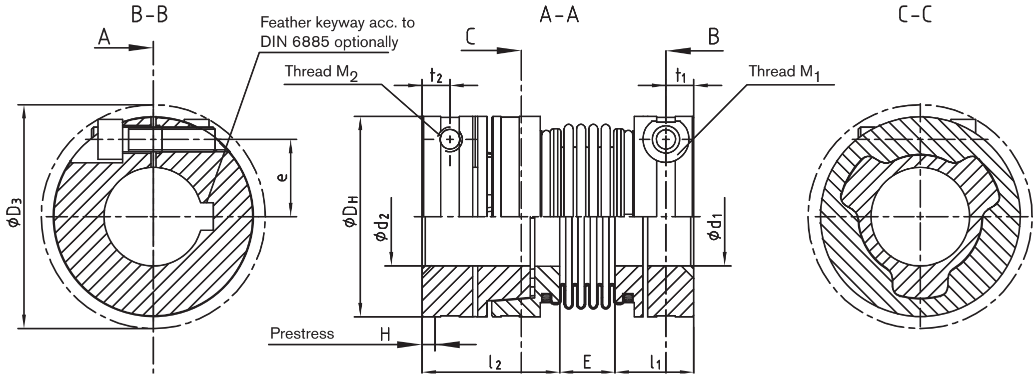
Order form:

TOOLFLEX® 38 S-KN	∅15	∅22
Coupling size	Finish bore	Finish bore

Type PI

- Axial plug-in
- Backlash-free, torsionally stiff
- Maintenance-free
- Suitable for high temperatures due to flanged insert connection
- Well-resistant to corrosion due to bellow made from stainless steel and aluminium clamping hubs
- Optionally type M (6 shafts)
  - higher perm. displacements

  or Type S (4 shafts, short design)
  - higher stiffness of torsion spring
  - lower mass moment of inertia



Plug in metal bellow-type coupling type PI															
Size	Design	Dimensions [mm]													
		General									Clamping screws				
		$d_1;d_2$ min.	d_1 max.	d_2 max.	L [1]	l_1	l_2	E	D_H	H	$M_1;M_2$	D_3	e	$t_1;t_2$	T_A [Nm]
20	S	8	20	20	67,0	21,5	33,5	12,0	40	0,5 - 1	M5	43,5	14,5	6	6
	M				74,0			19,0							
30	S	10	30	28	73,5	23,0	33,5	17,0	55	0,5 - 1	M6	58,0	19,0	7	10
	M				82,5			26,0							
38	S	14	38	32	87,5	25,5	44,0	18,0	65	0,5 - 1,5	M8	72,6	25,0	9	25
	M				99,5			30,0							
NEW 42	S	14	45	42	93,0	30	39,0	24,0	70		M8	76,1	25,0	9	25
	M				104,0			35,0							
45	S	14	45	42	96,0	32,0	41,5	22,5	83	0,5 - 1,5	M10	89,0	30,0	11	49
	M				112,5			39,0							

Technical data											
Size	Design	Torque T_{KN} [Nm]	Speed n [3] [min⁻¹]	Moment of inertia [2] [x10⁻⁶kgm²]	Torsional stiffness C_T [Nm/rad]	Axial spring stiffness [N/mm]	Radial spring stiffness [N/mm]	Perm. displacements		Mass [2] [x10⁻³kg]
								Radial [mm]	Angular [degrees]	
20	S	15	11950	37	9600	63	189	0,15	1,0	149
	M			38	6600	42	126	0,20	1,5	155
30	S	35	8700	140	17800	97	233	0,20	1,5	294
	M			145	14800	65	155	0,25	2,0	313
38	S	65	7350	329	37400	108	318	0,20	1,5	496
	M			346	24900	72	212	0,25	2,0	520
NEW 42	S	95	6820	396	54700	120	499	0,20	1,5	485
	M			427	36500	80	333	0,25	2,0	520
45	S	150	5750	1031	95800	132	738	0,25	1,5	930
	M			1127	64000	88	492	0,30	2,0	1000

Transmittable friction torque of clamping hubs $\varnothing d_1/\varnothing d_2$																				
Size	Ø8	Ø9	Ø10	Ø11	Ø12	Ø14	Ø15	Ø16	Ø18	Ø19	Ø20	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42
20	17,6	18,1	18,6	19,0	19,5	20,5	21,0	21,4	22,4	22,9	23,3									
30				33,0	34,0	35,0	36,0	36,4	38,0	38,5	39,0	42,0	42,5	44,5	46					
38									84,0	85,0	87,0	92,0	93,0	97,0	99,0	101,0				
NEW 42																				
45											157,0	165,0	167,0	173,0	177,0	181,0	187,0	193,0	197,0	200,0

[1] When being plugged in [2] Figures refer to the complete coupling with max. bores [3] With v= 25 m/s

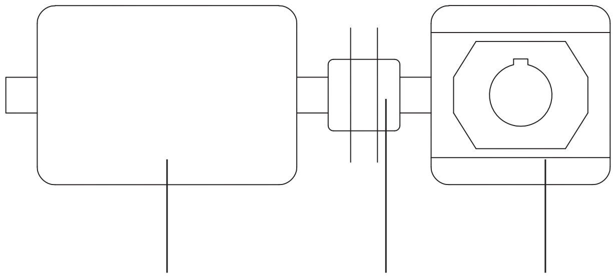
Order form:

TOOLFLEX® 30 PI-S	d_1 - Ø22	d_2 - Ø18
Coupling size	Finish bore Component 1	Finish bore Component 2

Coupling description

The RADEX®-NC is a line particularly developed for the servo technology. In this coupling a package of torsionally rigid steel laminae that are soft in bending ensures a reliable compensation for axial, angular and radial shaft displacements. As all-metal coupling - the laminae are made from stainless steel - the RADEX®-NC can even be used with high temperatures (up to 200 °C) and under aggressive ambient conditions. The RADEX®-NC is manufactured in 6 sizes from size 5 to 35 for max. torques of up to 200 Nm. The hubs are frictionally engaged clamping hubs made from aluminium (size 42 made from steel) and are thus backlash-free even in a reversing drive.

A typical application of the RADEX®-NC are backlash-free worm gear pairs with low transmissions. The rigidity of the coupling must be converted by reason of the transmission of the gearbox from the drive side to the driven side.
Here the transmission itself has a decisive influence because it is squarely included in the calculation. This converted rigidity is added in line to the gearbox stiffness in order to get the total rigidity. In case of transmissions that are lower than i = 8 we recommend to use the RADEX®-NC due to the loss of rigidity of the total system if flexible couplings are used.



Explosion protection use

RADEX®-NC couplings are suitable for power transmission in drives in hazardous areas. The couplings are certified and confirmed according to EC standard 94/9/EC (ATEX 95) as units of category 2G/2D and thus suitable for the use in hazardous areas of zone 1, 2, 21 and 22. Please read through our information included in the respective Type Examination Certificate and the operating and mounting instructions at www.ktr.com.

Selection: In case of use in hazardous areas the clamping hubs without feather key, only for use in category 3 (with feather key for category 2), must be selected in a way that there is a minimum safety factor of s = 2 between the peak torque (inclu ding all operating parameters) and the nominal torque andfrictional torque of engagement of the coupling.

Coupling selection

Normally the RADEX®-NC is selected according to the nominal torque (T_{KN}) shown in the list of technical data, like all other coupling systems. In all cases the torque (T_{KN}) must exceed the maximum torque to be transmitted (accelerating or peak torque). This should mainly be considered in connection with servo motors because their accelerating torques both positive and negative can exceed the nominal torque of the coupling by a significant amount. In case of values exceeding T_{KN} (collision, trouble) only limited alternating load figures are possible. In this torque range there can be permanent deformation of the bellow and fatigue fractures can occur.

Description	Symbol	Definition or explanation
Rated torque of coupling	T_{KN}	Torque that can continuously be transmitted over the entire permissible speed range
Peak torque of machine	T_S	Peak torque on the coupling
Peak torque on the driving side	T_{AS}	Peak torque with torque shock on the driving side, e. g. breakdown torque of the electric motor
Peak torque of load side	T_{LS}	Peak torque with torque shock on load side, e. g. braking
Moment of inertia	$J_{A/L}$	Total of moments of inertia existing on the driving or load side referring to the coupling speed
Rotational inertia coefficient of driving side	m_A	Factor taking into account the mass distribution with shocks and vibrations produced on the driving side
Rotational inertia coefficient of load side	m_L	Factor taking into account the mass distribution with shocks and vibrations produced on the load side

Description	Symbol	Definition or explanation
max. engine performance	$P_{max.}$	max. power in kW which the engine may produce
engine speed	n	Rated speed in rpm of the engine
Torsional angle	φ	Transmission error of the metal bellow due to torsional strain
Torsional stiffness	C_T	Torsional stiffness of the coupling in Nm/rad. For data see tables shown on the following pages
Frequency of the 2-mass-system	f_e	in s^{-1}
Eexciting frequency of the drive	f_r	in s^{-1}
Operating factor	k	k = 1.5 with uniform movement k = 2,0 with ununiform movement k = 2.5 - 4 with shocking movement For drives in machine tools (servo motors) k values of 1.5 - 2 must be used.

Judgement calculation

The size of the coupling must be selected so that the following conditions are met.

$$T_{KN} \geq T_{AS/LS} \times k$$

$$T_{KN}\ [\text{Nm}] = 9550 \times \frac{P_{max}\ [\text{kW}]}{n\ [\text{rpm}]}$$

When selecting servo motors the calculations are made with the torque values of the engine suppliers and not with P_{max}. When dimensioning the coupling please use the respective data of the manufacturer considering the servo controller to be used.

Accelerating torque (drive side / load side)

$$T_{KN} > T_S$$

$$T_S = T_{AS} \times m_A \times k \qquad T_S = T_{LS} \times m_L \times k$$

$$m_A = \frac{J_L}{J_A + J_L} \qquad m_L = \frac{J_A}{J_A + J_L}$$

Inspection of torsional stiffness

$$\varphi = \frac{180 \times T_{AS}}{\pi \times C_T}$$

Inspection of resonance frequency

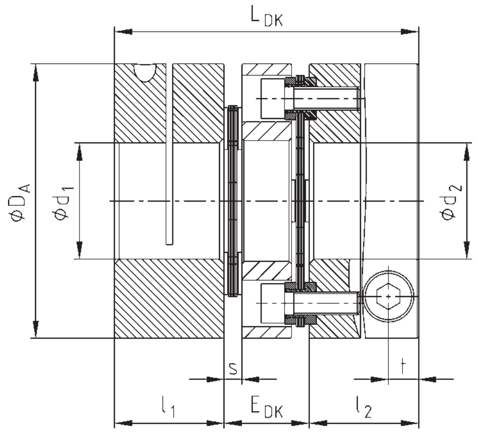
The natural frequency of the coupling must be above or below the frequency of the unit. Valid for the mechanical spare model of the 2-mass-system:

$$f_e = \frac{1}{2 \times \pi} \sqrt{C_T \cdot \frac{J_L + J_A}{J_L \times J_A}}\ [\text{Hz}]$$

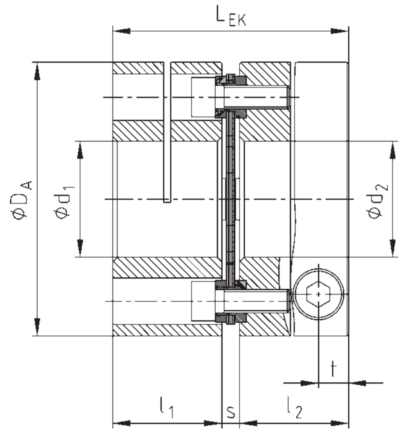
Valid in practice: $f_e \geq 2 \cdot f_r$

Standard types

- Backlash-free torque transmission
- Higher torsional rigidity
- Backlash-free shaft-hub-connection
- Low mass moment of inertia
- High speeds
- Operating temperature up to 200 °C
- Compact type
- Finish bore from Ø 6 mm also available with feather key acc. To DIN 6885 sheet 1 – JS9
- Ex Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95) (without feather key only for category 3)



Type DK



Type EK

RADEX®-NC types DK and EK												
Size	Dimensions [mm]								Clamping screw		Mass moment of inertia	
	max. d_1/d_2	D_A	l_1;l_2	L_{DK}	E_{DK}	L_{EK}	s	t	M	T_A [Nm]	DK [kgm²]	EK [kgm²]
5	10	26	12	34	10	26,5	2,5	3,5	M2,5	0,8	0,000004	0,000003
10	15	35	16	44	12	35	3	5,0	M4	3	0,000016	0,000012
15	20	47	21	55	13	45	3	6,8	M6	10	0,000065	0,000053
20	25	59	24	67	19	52	4	6,5	M6	10	0,000199	0,000154
25	35	70	32	88	24	69	5	9,0	M8	25	0,000508	0,000393
35	40	84	35	98	28	77	7	10,5	M10	49	0,001153	0,000911
42	55	104	40	116	36	91	11	10,5	M10	69	0,007458	0,006153

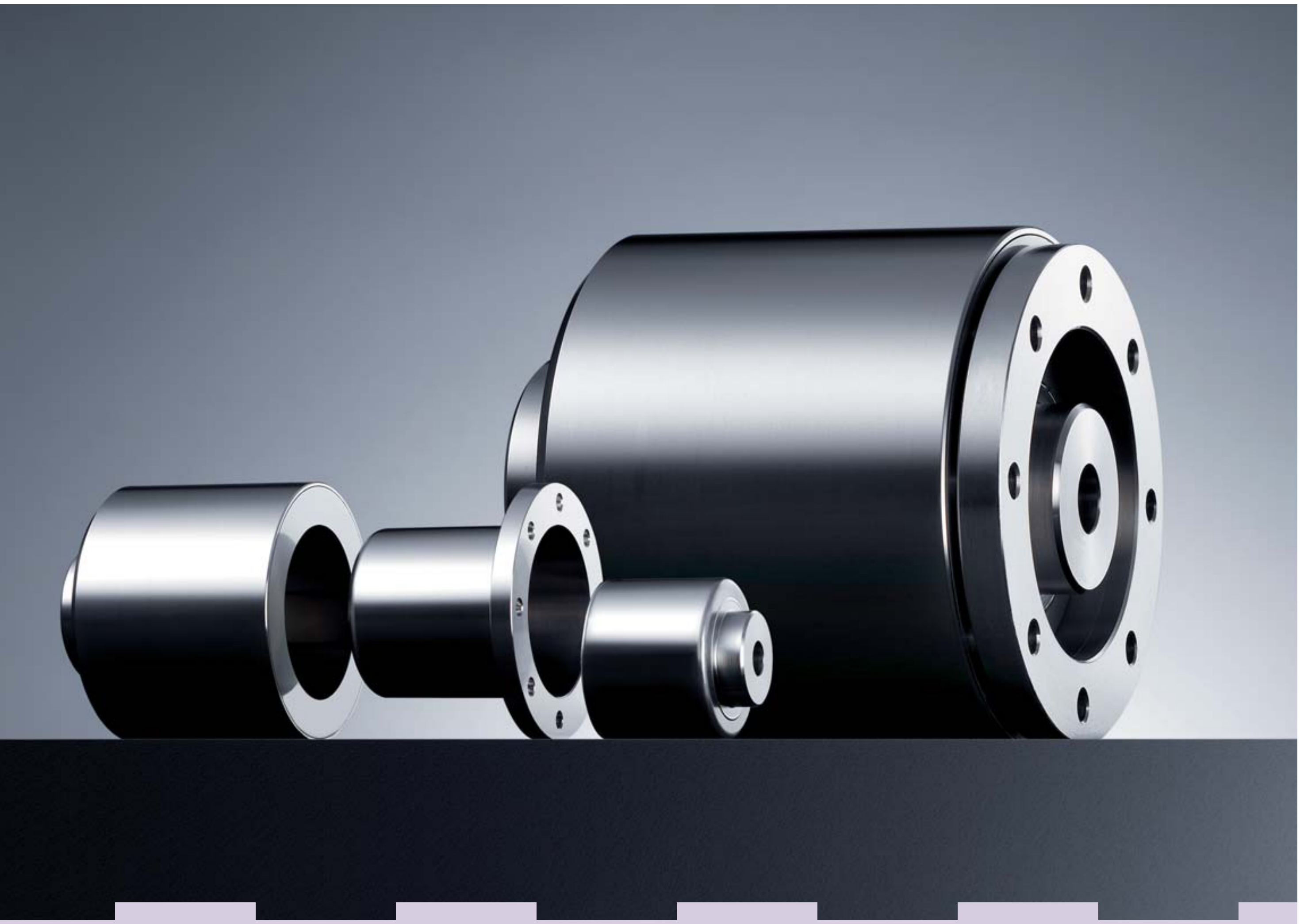
Technical data											
Size	T_{KN} [Nm]	$T_{K\ max.}$ [Nm]	max. speed [rpm]	Torsional rigidity [Nm/rad]		Displacement type DK			Displacement type EK		
				Type EK	Type DK	Radial [mm]	Axial [mm]	Angular [°] 1)	Radial [mm]	Axial [mm]	Angular [°] 1)
5	2,5	5	25000	2400	1200	0,10	0,4	1	—	0,2	1
10	7,5	15	20000	5600	2800	0,14	0,8	1	—	0,4	1
15	20	40	16000	12000	6000	0,16	1,0	1	—	0,5	1
20	30	60	12000	30000	15000	0,25	1,2	1	—	0,6	1
25	60	120	10000	60000	30000	0,30	1,6	1	—	0,8	1
35	100	200	9000	72000	36000	0,40	2,0	1	—	1,0	1
42	180	360	7000	120000	60000	0,50	2,8	1	—	1,4	1

Transmittable torque of the RADEX®-NC clamping hub [Nm] for standard bores																						
Size	Pilot bore	Ø3	Ø5	Ø8	Ø10	Ø12	Ø14	Ø15	Ø16	Ø19	Ø20	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø45	Ø50	Ø55
5	2,5	2,2	2,3	2,4	2,5																	
10	4,5		8	9	10	10	11	11														
15	5,5				28	30	31	32	32	34	35											
20	7,5					36	37	38	39	40	41	44	45									
25	9,5							82	83	87	88	93	94	98	100	103	106					
35	11,5									155	157	165	167	173	177	181	187	193	197			
42	15,0											285	287	296	301	307	315	323	329	343	357	370

1) for each laminae

Order form:

RADEX®-NC 20	DK	Ø20	Ø25
Coupling size	Type	Finish bore	Finish bore



MINEX®-S

Permanent magnetic couplings

Made for Motion KTR

Table of contents

Coupling description

General description

The MINEX®-S is a permanent-magnetic synchronous coupling that transmits torque through magnetic forces between the internal and the external rotor.

It ensures a hermetic separation of the drive and the driven side in its main function as sealing element in pumps and agitators.
For critical media like aggressive acids etc. it serves as a reliable seal and prevents serious leakages occuring.

On request KTR can manufacture special customer-specific types of the MINEX®-S in connection with KTR hydraulic components. Thus existing pumps with a conventional shaft seal can be easily retrofitted with the MINEX®-S.

Function/Design

Torque transmission

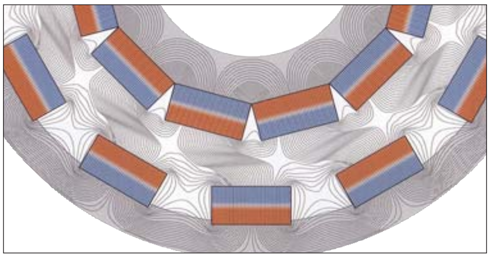
The coupling consists of an external and an internal rotor. The external rotor has high-quality, permanent magnets of changing polarity on the inner side and the internal rotor has them on the outside. The external rotor is normally fixed on the drive side and the magnets are glued in the keyways. The magnets of the driven-sided internal rotor are cylindrically ground to ensure a minimal air gap and encapsulated through a magnetic cover that is impervious to fluids.

In their non-operative states the north and south poles of the rotors are opposite to each other and the magnetic field is completely symmetric. It is only when the rotors are twisted that the magnetic field lines are moved, hence the torque is transmitted through the air gap. Then there is a synchronous operation under a constant torsion angle.

If the maximum coupling torque and the maximum torsion angle are exceeded, the power transmission is interrupted. Thus the MINEX®-S offers an overload protection function of the drive train. After removing the cause of the overload (e. g. damage to the bearing, blocking of the internal rotor) both rotors can be synchronised again and operation is resumed.

Internal rotor

External rotor



Run of flux lines

Sealing function

The main component of the MINEX®-S is the containment shroud that is fixed to the driven-sided power unit and separates internal and external rotor from each other. It ensures a low-vibration torque transmission working without mechanical connection and guarantees a completely leak-proof separation of product and atmosphere. The sealing is achieved with a flat seal or an o-ring, thus eliminating the need to dynamically load the sealing elements.

The containment shroud and internal rotor are generally made from stainless steel 1.4571 or Hastelloy.
The magnets of the internal rotor are encapsulated to make them impervious to fluids and thus protected against external influences.

Containment shroud

Since the containment shroud is a stationary component with a rotating magnetic field, it causes losses of eddy current. In order to keep these low, the containment shroud is also available in Hastelloy from size 75 upwards ensuring a higher electrical resistance than stainless steel. If eddy current losses can definitely be excluded, alternative materials like PEEK or ceramics may be chose.

Technical description

Explosion-protection use

MINEX®-S couplings are suitable for the power transmission in drives that are used in hazardous areas. As a component of the device class II the couplings are assessed and confirmed for the use in explosive areas of category 2G according to the EU standards 94/9/EC (ATEX 95).

Please see our website www.ktr.com for advice, copies of certification and operating/mounting instructions.

Technical Data

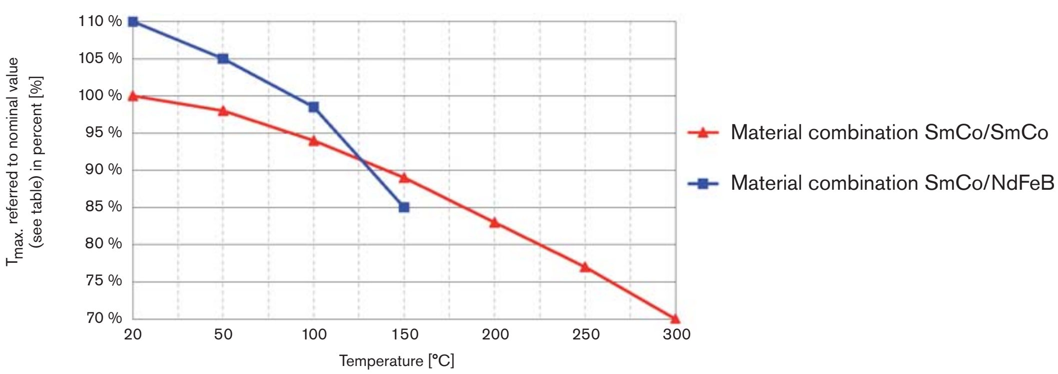
Size	Stat. tear torque $T_{Kmax.}$ with 20 °C [Nm]	External rotor					Internal rotor					Containment shroud			
		Standard material: Hub	Standard material: Magnets	Max. operating-temperature $t_{max.}$ [°C]	Weight unbored [kg]	Mass moment of inertia with min. bore Ø [kgm²]	Standard material: Hub	Standard material: Magnets	Max. operating-temperature $t_{max.}$ [°C]	Weight pilot bored [kg]	Mass moment of inertia with min. bore Ø [kgm²]	Standard material [2]: Flange	Standard material [2]: Can	Max. pressure resistance $p_N/p_{max.}$ [1] [bar]	Max. operational speed [min⁻¹]
SA 22/4	0,15	Structural steel S355J2G3	NdFeB	150	0,129	30,01 x 10⁻⁶	1.4462	NdFeB	150	0,039	1,912 x 10⁻⁶	Stainless steel 1.4571	Stainless steel 1.4571	60/90	3600 min⁻¹ using metal stationary cans as per KTR standard
SA 34/10	1				0,256	117,4 x 10⁻⁶				0,093	12,1 x 10⁻⁶			16/24	
SA 46/6	3		Samarium-cobalt (Sm_2Co_{17}) or neodymium-iron-boron (NdFeB)	300 °C (Sm_2Co_{17}) or 150 °C (NdFeB)	0,619	458,6 x 10⁻⁶	Stainless steel 1.4571	Samarium-cobalt (Sm_2Co_{17})	300	0,317	125 x 10⁻⁶				
SA 60/8	7				1,751	2279 x 10⁻⁶				0,563	221 x 10⁻⁶			40/60	
SB 60/8	14				2,682	3759 x 10⁻⁶				0,932	380 x 10⁻⁶				
SA 75/10	10				1,362	3159 x 10⁻⁶				0,940	539 x 10⁻⁶		Stainless steel 1.4571 or Hastelloy	16/24 bar with 1.4571, 25/37.5 bar with Hastelloy	
SB 75/10	24				2,095	4829 x 10⁻⁶				1,494	889 x 10⁻⁶				
SC 75/10	40				2,889	6654 x 10⁻⁶				1,893	1232 x 10⁻⁶				
SA 110/16	25				1,841	7356 x 10⁻⁶				2,550	3264 x 10⁻⁶				
SB 110/16	60				2,822	12111 x 10⁻⁶				3,732	5229 x 10⁻⁶		Hastelloy	25/37.5	
SC 110/16	95				3,788	16238 x 10⁻⁶				4,845	7137 x 10⁻⁶				
SB 135/20	100				3,747	22878 x 10⁻⁶				5,668	12333 x 10⁻⁶				
SC 135/20	145				4,904	29874 x 10⁻⁶				7,362	16768 x 10⁻⁶				
SD 135/20	200				6,061	36870 x 10⁻⁶				9,497	22387 x 10⁻⁶				
SC 165/24	210		Samarium-cobalt (Sm_2Co_{17})	300	5,305	45480 x 10⁻⁶				11,400	37917 x 10⁻⁶				
SD 165/24	280				6,559	56170 x 10⁻⁶				14,674	50633 x 10⁻⁶				
SE 165/24	370				7,813	66860 x 10⁻⁶				17,303	60855 x 10⁻⁶				
SD 200/30	430				9,887	117296 x 10⁻⁶				26,057	125915 x 10⁻⁶				
SE 200/30	550				10,364	122342 x 10⁻⁶				26,114	126405 x 10⁻⁶				
SD 250/38	670				10,930	202540 x 10⁻⁶				37,920	282795 x 10⁻⁶			16/24	
SE 250/38	820				13,030	241273 x 10⁻⁶				45,220	340420 x 10⁻⁶				
SF 250/38	1000				15,130	280000 x 10⁻⁶				52,500	397915 x 10⁻⁶				

1) Resistances to higher pressures can be realized on request of the customer.
2) Alternative materials of stationary cans like oxide ceramics (see page 162) or PEEK are available on request.

Description	Reference	Definition or explanation
Static tear torque of coupling	$T_{K\ max.}$	Max. transmittable torque, from which onwards the magnetic forces tear during the static test.

Description	Reference	Definition or explanation
Maximum operating temperature	$t_{max.}$	Max. permissible temperature causing a temporary attenuation of the magntic field. Exceeding irretrievable losses of magnetization.

Torque reduction with temperature increase

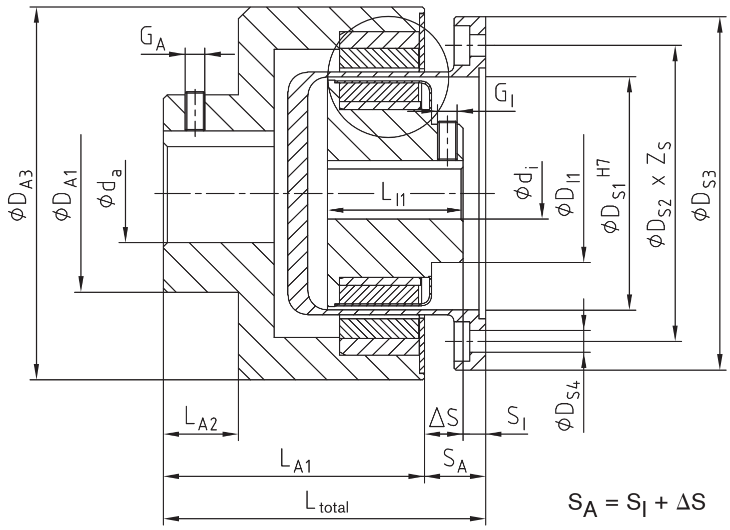


Temporary torque reduction with increased temperature for alternative material combinations [%]

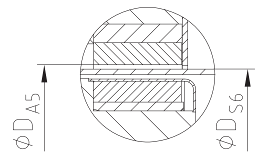
Please note:
To reduce expenses KTR would recommend to use NdFeB magnets for the external rotor if the operating temperature falls below 150 °C.

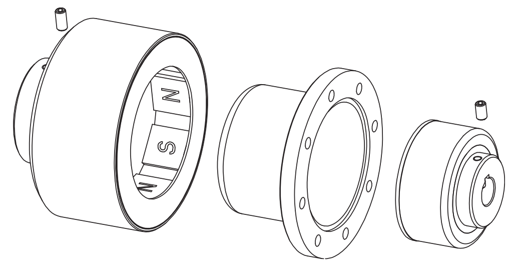
Sizes SA 22/4 to SB 60/8

- Contactless torque transmission
- Hermetic separation of drive and driven side
- Available from stock with pilot bored internal rotor and unbored external rotor
- Finish bore possible to ISO H7, feather keyway to DIN 6885 sheet 1 - JS9
- Standard containment shroud made from stainless steel 1.4571
- Ex Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)
- Mounting instructions available at www.ktr.com



$S_A = S_I + \Delta S$





External rotor | Containment shroud | Internal rotor

Technical Data – Internal rotor and containment shroud

Size	$T_{Kmax.}$ [Nm] in case of ~ 20 °C	Dimensions [mm]											
		Internal rotor							Containment shroud				
		Finish bore [1)] d_i		D_{I1}	L_{I1}	S_I		G_I	D_{S1}	D_{S2}	D_{S3}	D_{S4}	Z_S
		min.	max.			min.	max.						
SA 22/4	0,15	5	9	20	20	2,0	2,0	M3	21,5	38	46	4,5	8
SA 34/10	1	5	12	20	22	2,0	5,5	M3	34	46	55	4,5	4
SA 46/6	3	8	16	28	33	6,5	7,0	M4	46	–	78	–	–
SA 60/8	7	12	22	35	36	2,2	3,5	M5	59	75	89,5	5,5	8
SB 60/8	14				56	0,0	3,5						

Technical Data – External rotor and general

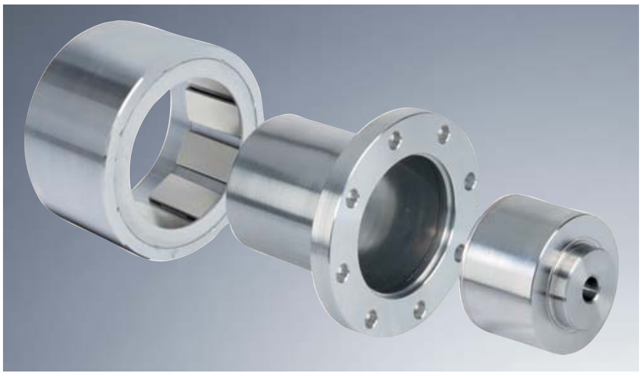
Size	Dimensions [mm]											
	External rotor								General			
	Finish bore [1)] d_a		D_{A1}	D_{A3}	L_{A1}	L_{A2}	ΔS	G_A	D_{S6}	D_{A5}	L_{total}	
	min.	max.									min.	max.
SA 22/4	5	11	18	38	35	8,5	5,0	M4	23,5	24,8	42	42
SA 34/10	5	14	22	53	38,5	10,5	5,5	M4	36,0	37,3	46	49,5
SA 46/6	5	19	30	69,5	53	16	9,0	M5	48,5	49,4	68,5	69,5
SA 60/8	9	28	50	94,5	66	19	12,0	M6	61,0	63,2	80	81,3
SB 60/8	9	38			93	15		M8	61,5	63,2	105	108

1) Bore H7 with feather keyway DIN 6885 sheet 1 [JS9]

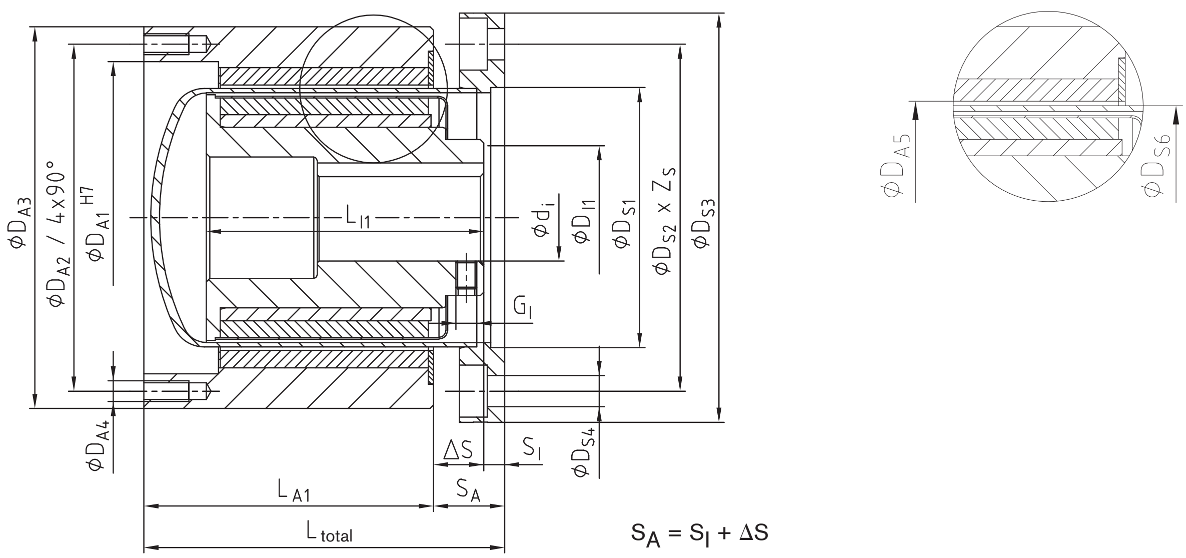
Order form:

MINEX® SA 60/8	Design	d_i Ø 20 mm	d_a Ø 24 mm
Coupling size	NdFeB – $t_{max.}$ = 150 °C Sm_2Co_{17} – $t_{max.}$ = 300 °C	Finish bore (H7) feather keyway DIN 6885 sheet 1 (JS9)	

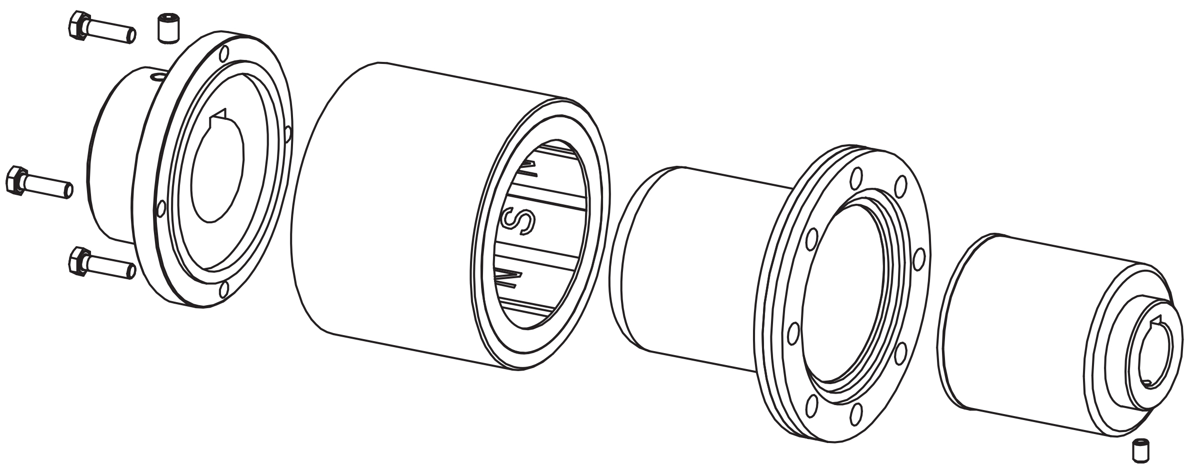
Sizes SA 75/10 to SF 250/38



- Contactless torque transmission
- Hermetic separation of drive and driven side
- Two-part external rotor with flange hub that must be separately screwed, customer-specific variations are possible
- Available from stock with pilot bored internal rotor
- Finish bore possible to ISO H7, feather keyway to DIN 6885 sheet 1 - JS9
- Containment shroud also available from stainless steel or Hastelloy
- Ⓔx Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)



$S_A = S_I + \Delta S$



Optional flange hub | External rotor | Containment shroud | Internal rotor

Order form:

MINEX® SB 75/10	Design	d_i Ø 20 mm	d_a Ø 24 mm	Containment shroud type
Coupling size	NdFeB – $t_{max.}$ = 150 °C Sm_2Co_{17} – $t_{max.}$ = 300 °C	Finish bore (H7), feather keyway DIN 6885 sheet 1 (JS9)		Stainless steel 1.4571 or Hastelloy

Technical Data – Sizes SA 75/10 to SF 250/38

Technical Data – Internal rotor and containment shroud

Size	$T_{Kmax.}$ [Nm] in case of ~ 20 °C	Dimensions [mm]											
		Internal rotor							Containment shroud				
		Finish bore 1) d_i		D_{I1}	L_{I1}	S_I		G_I	D_{S1}	D_{S2}	D_{S3}	D_{S4}	Z_S
		min.	max.			min.	max.						
SA 75/10	10				39,5		46,5						
SB 75/10	24	12	28	45	58	4	26,5	M6	75	100	118	9	8
SC 75/10	40				80		6,0						
SA 110/16	25				45		51,0						
SB 110/16	60	14	55	72	65	4	31,0	M8	110	133	153	9	12
SC 110/16	95				85		11,0						
SB 135/20	100				65		46,5						
SC 135/20	145	20	70	90	85	4	26,5	M10	135	158	178	9	16
SD 135/20	200				110		7,0						
SC 165/24	210				85		66,5						
SD 165/24	280	24	90	110	110	6	41,0	M12	163,5	192	218	11	12
SE 165/24	370				130		22,0						
SD 200/30	430	38	90	130	135	6	18,0	M16	200	252	278	11	12
SE 200/30	550												
SD 250/38	670				115		7,0						
SE 250/38	820	38	90	165	135	–	26,0	M16	255	285	315	13,5	12
SF 250/38	1000				155		46,0						

Technical Data – External rotor and general

Size	Dimensions [mm]								
	External rotor						General		
	D_{A1}	D_{A2}	D_{A3}	D_{A4}	L_{A1}	ΔS	D_{S6}	D_{A5}	L_{total}
SA 75/10					41	12,5			
SB 75/10	90	100	110	M6	61		74,6	76,2	102
SC 75/10					83,5	14,5			
SA 110/16					41				
SB 110/16	126	135	145	M6	61	19,0	111,5	112,8	115
SC 110/16					81				
SB 135/20					70	18,5			
SC 135/20	150	160	170	M6	90		136,5	138,2	139
SD 135/20					110	22,0			
SC 165/24					90	18,5			
SD 165/24	180	188	198	M6	110	21,0	167,0	168,5	170
SE 165/24					130				
SD 200/30	212	222	232	M6	130	26,0	198,0	199,5	180
SE 200/30									
SD 250/38					110				
SE 250/38	267	277	287	M6	130	26,0	253,0	255,0	183
SF 250/38					150				

1) Bore H7 with feather keyway DIN 6885 sheet 1 [JS9]

Futher sizes on request.

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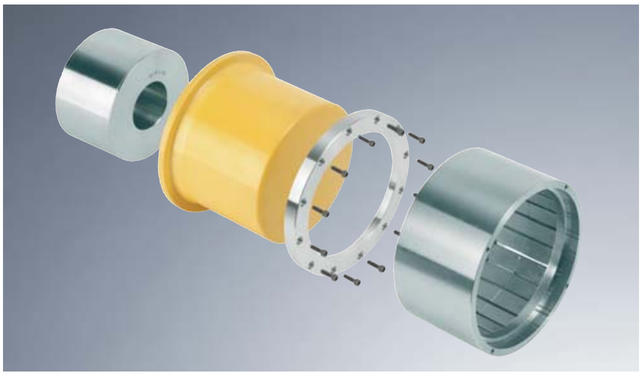
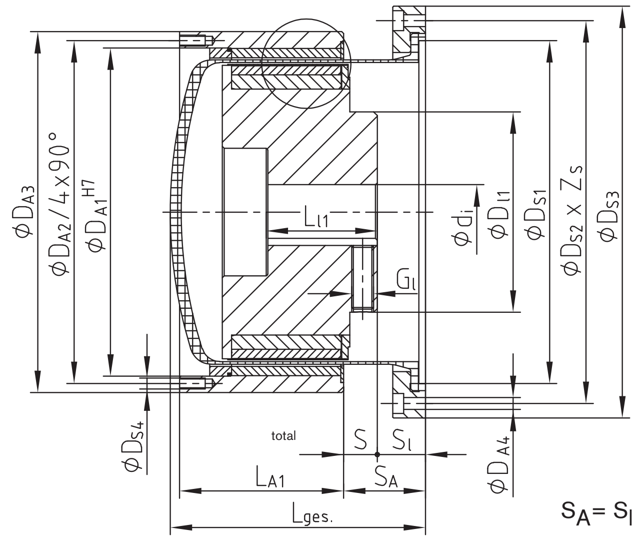
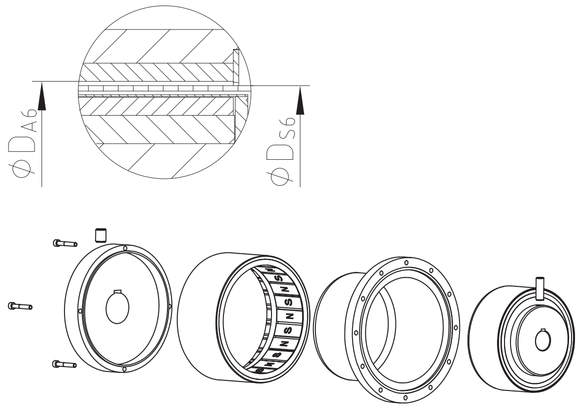
Sizes SB 135/20 to SE 200/30 with stationary can from ceramics



- No eddy current losses due to stationary can from ceramics
- No heat accumulation in the coupling caused by the stationary can
- Usually internal cooling measures are not necessary
- Suitable for dry running drives like compressors, vacuum pumps, etc.
- The selection torque may be reduced by 10 - 15 %
- Internal and external rotor in accordance with KTR standard
- Sizes SB 135/20 to SE 200/30 available from stock, other sizes on request
- Ⓔx Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)



$S_A = S_I + \Delta S$



Optional flange hub | External rotor | Containment shroud with clamping ring | Internal rotor

Technical Data – Internal rotor and containment shroud													
Size	$T_{Kmax.}$ [Nm] in case of ~ 20 °C	Dimensions [mm]											
		Internal rotor							Containment shroud				
		Finish bore [1)] d_i min.	Finish bore [1)] d_i max.	D_{I1}	L_{I1}	S_I min.	S_I max.	G_I	D_{S1}	D_{S2}	D_{S3}	D_{S4}	Z_S
SB 135/20	100				65		46,5						
SC 135/20	145	20	70	90	85	4,0	26,5	M10	145	173	187	5,5	12
SD 135/20	200				110		7,0						
SC 165/24	210				85	3,5	28,0						
SD 165/24	280	24	90	110	110	–	4,0	M12	188	210	226	6,6	12
SE 165/24	370				130	6,0	14,0						
SD 200/30	430	38	90	130	135	6,0	14,0	M16	242	272	294	9,0	12
SE 200/30	550												

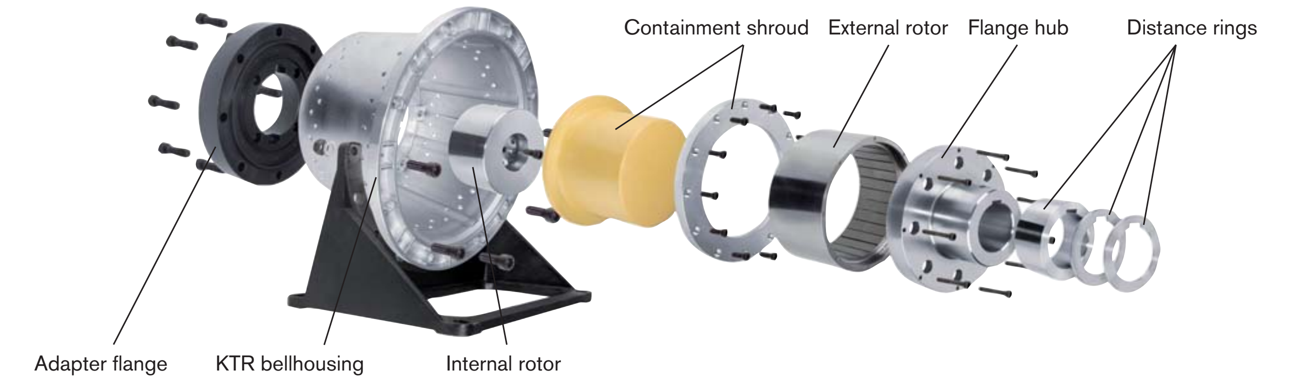
Technical Data – External rotor and general									
Size	Dimensions [mm]								
	External rotor						General		
	D_{A1}	D_{A2}	D_{A3}	D_{A4}	L_{A1}	ΔS	D_{S6}	D_{A5}	L_{total}
SB 135/20					70	18,5			
SC 135/20	150	160	170	M6	90		136,5	138,2	139
SD 135/20					110	22,0			
SC 165/24					90	18,5			
SD 165/24	180	188	198	M6	110	21,0	167,0	168,5	170
SE 165/24					130				
SD 200/30	212	222	232	M6	130	26,0	198,0	199,5	180
SE 200/30									

1) Bore H7 with feather keyway DIN 6885 sheet 1 [JS9]
Futher sizes on request.

Order form:

MINEX® SB 135/20	Design	d_i Ø 20 mm	Containment shroud type
Coupling size	NdFeB – $t_{max.}$ = 150 °C Sm_2Co_{17} – $t_{max.}$ = 300 °C	Finish bore (H7), feather keyway DIN 6885 sheet 1 (JS9)	Oxide ceramics ZrO_2MgO

Mounting sets and customized assemblies



On request KTR can offer special customer-specific solutions in combination with hydraulic components from KTR, whereby existing systems can be easily retrofitted with the MINEX®-S.

Redesigning sets for PUR foaming processes

Conveying and proportioning the media polyol and isocyanate in the processing plants for PUR, ambient air has to be prevented from penetrating into the process, since otherwise unwanted reactions may be produced.

For a reliable sealing of such drives KTR offers standard sets for retrofitting, among others for axial piston pumps types **REXROTH A2VK** and **ROTARY POWER C series** offering the following benefits:

- Maintenance-free operation
- Standstill periods are considerably reduced
- No more problems with sealing
- Better efficiency and process safety

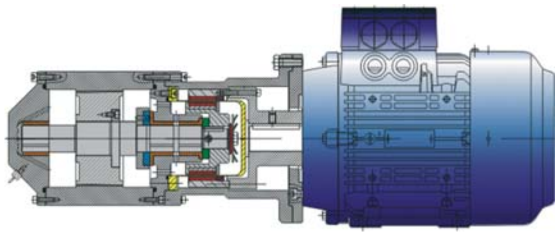
The assemblies are available for all motor-pump-combinations and in various materials.

Axial piston pump REXROTH type A2VK

Maintenance-free sealing of dosing pump for polyde and isocyanate in high-pressure reaction casting machines

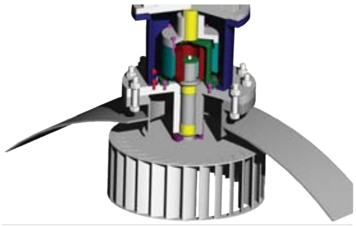
Examples of application

Use of the MINEX®-S in a small centrifugal pumps



MINEX®-S for sealing homogenizers for heavy oil processing in marine operation

Re-equipment of a gear pump with MINEX® SA 75/10, bellhousing PK 200/30, base flange and damping rod



MINEX®-S for the separation of autoclaves (T.B.M./STERICHEM) in laboratories and clinics

Technical data for coupling selection/selection of components

Motor type	____________	Pump type	____________
Power	____________ kW	Speedl	____________ min^{-1}
Pressure	____________ bar	Temperature	____________ °C
Viscosity of medium	____________ mm^2/s	Max. perm. dimensions	____________ $ØDxL_{total}$

Hydraulic components:

- Bellhousings and accessories
- Damping elements
- Tanks Alu and steel
- Tanks accessories
- Coolers, heaters and control

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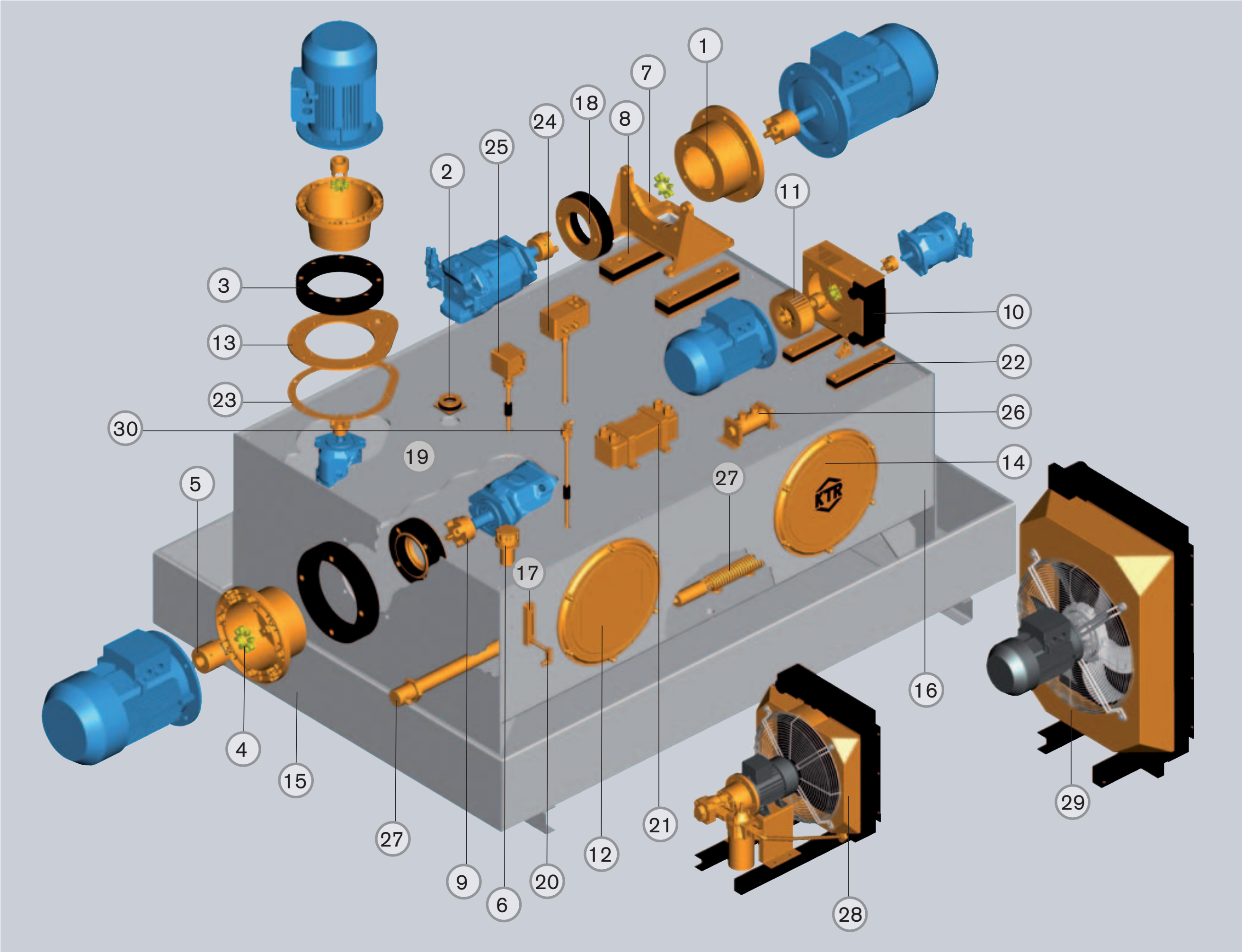
Made for Motion KTR

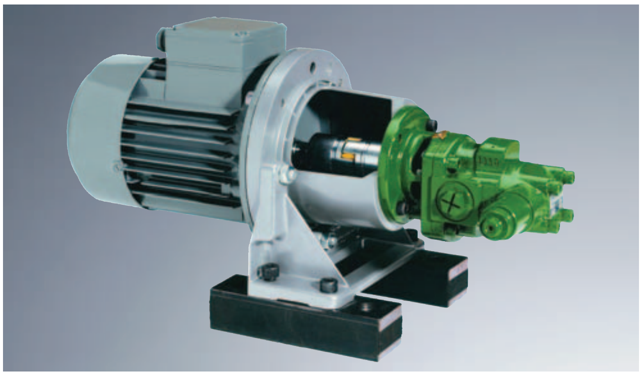
Overview



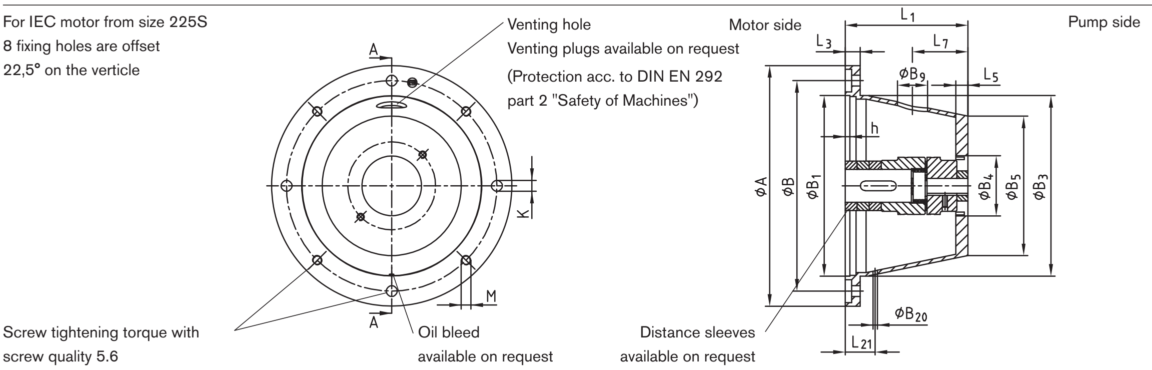
1	Bellhousing type PK/PL	16	Steel tanks type BSK/BNK/BEK
2	Elastic flange	17	Oil-level indicator type KO
3	Damping ring design DT	18	Damping ring type D
4	ROTEX® spider	19	Machining of tank according to customer specification
5	ROTEX® coupling hub, motor side	20	Temperature switch type TS
6	Filler breather (with ventilation filter)	21	PHE-Plate heat exchanger
7	Foot flange type PTFS (VDMA 24 561 part 1)	22	Damping rod design DSK for PIK
8	Damping rod design DSFS for foot flange type PTFS	23	Gasket type DZ for additional flange type ZO
9	ROTEX® coupling hub, pump side	24	Industrial controller IR
10	Bellhousing PIK with integrated oil cooler	25	IRDN Digital industrial control with level switch
11	Fan for PIK	26	Horizontally mounted cooler TAK
12	Standard cleaning cover	27	Tank heaters
13	Additional flange type ZO	28	OPC Cooling-pump-unit with hydraulic pump filter
14	Cleaning cover with logo according to customer specification	29	OAC-Oil/air coller
15	Oil sump pan	30	Level-temperatur-switch NVT

The customer has to protect rotating parts from unintended touch (Safety of Machines DIN EN 292 part 2).
The fastening screws should be secured against release by the customer (e. g. by anaerobic bonding agents like Loctite®).

Bellhousings



- Links between IEC motor and hydraulic pump
- For almost every hydraulic pump either available from stock or in short term
- Both flange sides are finish machined
- Motor and pump shaft centered
- KTR bellhousings are made from aluminium (steel on request)
- In many cases KTR bellhousings can be piled up
- Designed for high loads
- For the bellhousing selection you require please either see our selection programme at www.ktr.com or order the selection stored on CD-ROM
- Notice our mounting instructions



Bellhousings according to VDMA 24561 design A																				
IEC - motor size (shaft end) $d_1 \times l_3$	kW with n = 1500 rpm	Bell-housing Size	Gasket DP Size	Foot flange PTFL/ PTFS *)	Dimensions [mm] A	B	B_1	B_3	h	K	M	L_1	L_3	L_5[1)]	B_5	Min. B_4	Venting hole B_9	Venting hole L_7	Oil bleed B_{20}	Oil bleed L_{21}
71	0,25	PK 160/5/..	160	160	160	130	110	110	4	9	M8	80	13	8	105	27	25	33	7,5	28
(14 x 30)	0,37	PL 160/5/..										90			102	29		38		
80	0,55	PK 200/3/..										100			124	40		43		
(19 x 40)	0,75	PL 200/3/..										110				37		47		
		PL 200/8/..	200	200	200	165	130	145	4	11	M10	124	16	12	133	57	36	60	7,5	36
90S / 90L	1,1	PL 200/4/..													144	40		54		
(24 x 60)	1,5	PFL 200/6/..										140			180	47		62		
		PK 250/6/..										120	19		177	49		54		
	2,2	PL 250/3/..										124			124	42		52		
100L / 112M	3	PL 250/6/..	250	250	250	215	180	190	5	14	M12	135	18	12	180		40	57	7,5	43
(28 x 60)	4	PL 250/4/..										148			166	56		64		
		PFL 250/18/..										175			250			77		
		PK 300/5/..										144			205	57		63		
	5,5	PL 300/15/..										150			231	77		66		
132S / 132M		PK 300/4/..	300	300	300	265	230	234	5	14	M12	155	20	15	205	56	50	68	7,5	45
(38 x 80)	7,5	PL 300/4/..										168			220	57		74		
		PL 300/7/..										196						84		
160M / 160L	11	PK 350/4/..										188			225	59		82		
(42 x 110)	15	PK 350/6/..	350	350	350	300	250	260	6	17	M16	204	26	15		56	50	87	7,5	51
180M x 180L	18,5	PK 350/10/..										228			248	97		102		
(48 x 110)	22	PL 350/7/..										256			255	88		115		
200L		PK 400/4/..										204	26		230	75		92		
(55 x 110)	30	PK 400/5/..	400	400	400	350	300	300	6	17	M16	228		20	279	95	50	104	7,5	51
		PL 400/5/..										256	25		290	97		118		
225S / 225M		PK 450/2/..										234	25		260			107		
(60 x 140)	37	PK 450/3/..	450	450	450	400	350	350	6	17	M16	262	26	20	315	97	50	121	7,5	51
	45	PL 450/3/..										285	25		325			133		
250M	55	PL 550/8/..										248			340	97		116		
(65 x 140)		PL 550/1/..										265			360	120		125		
280S / 280M	75	PK 550/3/..	550	550	550	500	450	450[2)]	6	17	M16	275	26	25	340	97	50	130	7,5	51
(75 x 140)	90	PL 550/3/..										295			360	123		140		
		PL 550/2/..										315			400	150		135		
	110	PK 660/2/..										310			410	120		147		
315S / 315M	132	PL 660/5/..	660	660	660	600	550	550[2)]	8	22	M20	330	32	30	400		50	157	7,5	60
(80 x 170)	160	PL 660/2/..										343			490	174		163		
	200	PL 660/4/..										395			500	197		190		
355L / 400M	355	PL 880/1/..	800	800	800	740	680	680[2)]	8	22	M20	370	40	36	500	148	50	135	7,5	70
(100 x 210)	710	PK 800/3/..										395			487			160		

Bellhousings

Other bellhousings

IEC - motor size (shaft end) $d_1 \times l_3$	kW with n = 1500 rpm	Bell-housing Size	Gasket DP Size	Foot flange PTFL/ PTFS *)	Dimensions [mm] A	B	B_1	B_3	h	K	M	L_1	L_3	L_5	B_5	Min. B_4	Venting hole B_9	L_7	Oil bleed B_{20}	L_{21}
71	0,25	PFK160/6/..	160	160	160	130	110	110	4	9	M8	79	13	13	140	30	25	35	7,5	28
(14 x 30	0,37	PFL 160/6/..										101				60		46		
80	0,55	PK 200/4/..										109		12		57	36	46		36
(19 x 40)	0,75	PK 200/11/..										45		10	144	97	10	15		30
		PL 200/11/..	200	200	200	165	130	145	4	11	M10	55	16					18	7,5	
90S / 90L	1,1	PK 200/13/..										152		12		30	36	71		
(24 x 50)	1,5	PK 200/30/..										79			142	37	25	30		36
		PL 200/30/..										90			127			37		
		PK 250/13/..										159			186	77	40	69		
100L / 112M	2,2	PK 250/15/..	250	250	250	215	180	190	5	14	M12	61	18	12	187	97	10	20	7,5	43
(28 x 60)	3	PL 250/15/::										79					20	29		
	4	PK 250/17/..										100			186	74	40	39		
		PK 300/8/..										110			225	95	40	45		
132S / 132M	5,5	PK 300/9/..										85				97	30	32		
(38 x 80)		PL 300/9/..	300	300	300	265	230	234	5	14	M12	99	20	15	231		40	37	7,5	45
	7,5	PL 300/13/..										210				57	50	95		
		PK 300/15/.										138			228	56		57		
160 / 160L	11	PK 350/8/..										204	25	15	259	53		90		
(42 x 110)	15	PK 350/11/..										130				97		52		
180M / 180L	18,5	PL 350/11/..	350	350	350	300	250	260	6	17	M16	146	26	18	252	92	50	60	7,5	51
(48 x 110)	22	PK 350/18/..										159	25	15		77		67		
		PL 350/18/..										184						80		
200L		PL 400/3/..										165			290	97		73		
(55 x 110)	30	PK 400/12/..	400	400	400	350	300	300	6	17	M16	170	25	20	260	95	50	75	7,5	51
		PL 400/12/..										184						82		
		PK 450/5/..										165	25		260	120		73		
	37	PL 450/5/..										185			325			83		
225S / 225M	45	PK 450/6/..	450	450	450	400	350	350	6	17	M16	176	26	20	259	98	50	80	7,5	51
(60 x 140)		PFL 450/9/..										253			370	137		116		
		PK 450/12/..										204	25		260	97		90		
		PL 450/12/..										222						101		
250M	55	PK 550/4/..										190/192		26	355	129		88		
(65 x 140)		PL 550/4/..	550	550	550	500	450	450[2]	6	17	M16	207	26		330	124	50	96	7,5	51
280S / 280M	75	PK 550/8/..										217		25	340	97		100		
(75 x 140)	90																			
315S / 315M	110-	PK 660/3/..	660	660	660	600	550	550[2]	8	22	M20	247	32	30	500	80	50	115	7,5	60
(80 x 170)	160	PL 660/3/..										260			340	156		122		
355L / 400M	355	PK 800/1/..	800	900	800	740	680	680[2]	8	22	M20	335	40	36	520	149	50	140	7,5	70
(100 x 210)	710	P 800/3/..										443	37	38	500	305		206		

Please indicate in the order if the bellhousing is needed in oilproof design! (Extra charge)

[1] Bottom of pot does not consist of sold material ➔ ribbed

[2] Passing from dimension B3 to flange radius R = 5.

*) For vertical assembly or lateral assembly on the tank gaskets are available (type DP, see page 175).

For the detailed order designation please see our PC/Internet selection programme or mention the IEC motor size and detailed pump type for selection.
If venting holes or oil bleeds are requred, please mention in your order.

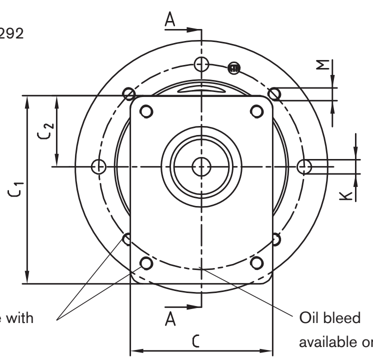
Order form

PL	PK	P	450	3	8
Bellhousing type, **L**ong	Bellhousing type, short, "**K**"	Former bellhousing type	Flange diameter of IEC Motor	Model code	Internal-code

Bellhousings

- Links between IEC motor and hydraulic pump
- Both flange sides are finish machined
- Motor and pump shaft centered
- KTR bellhousings are made from aluminium
- Designed for high loads
- For almost every hydraulic pump available from stock or in short term
- For the bellhousing selection you require please either see our selection programme at www.ktr.com or order the selection stored on CD-ROM
- Notice our mounting instructions

Venting hole and venting plugs available on request (Protection acc. to DIN EN 292 part 2 "Safety of Machines")

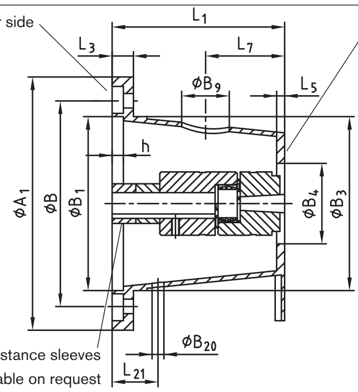


Screw tightening torque with screw quality 5.6

Oil bleed available on request

Motor side

Pump side



Distance sleeves available on request

Bellhousings with rectangular flange																						
IEC - motor size (shaft end)	kW with n = 1500 rpm	Bell-housing Size	Gasket DP Size	Foot flange PTFL/ PTFS *)	Dimensions [mm]													Min.	Venting hole		Oil bleed	
					A_1	B	B_1	B_3	h	K	M	L_1	L_3	L_5	C	C_1	C_2	B_4	B_9	L_7	B_{20}	L_{21}
		PL 160/1..										70		8	70	91	35	20	16	27		
71 (14x30)	0,25 0,37	PL 160/4..	160	160	160	130	110	110	4	9	M8	110	13	12	90	120	45	22	25	50	7,5	28
		PK 160/4..										95								43		
80	0,55	PL 200/1..										90			70	91	35	22		37		
(19x40)	0,75	PL 200/2..	200	200	200	165	130	145	4	11	M10	100	16	12					25	42	7,5	36
90S/90L	1,1														90	90	120	22				
(24x50)	1,5																					
	2,2	PL 250/1..										110			90	120	45	22		45		
100L/112M (28x60)	3	PL 250/2..	250	250	250	215	180	190	5	14	M12	115	18	12	120	150	53	47	36	47	7,5	43
	4	PL 250/7..										125			145	180	64	46		52		
132S/132M	5,5	PL 300/1..	300	300	300	265	230	234	5	14	M12	132	20	15	120	150	53	33	50	56	7,5	45
(38x80)	7,5	PK 300/2..										137			145	180	64	33		59		
160M/160L	11	PL 350/1..										171			120	156	59	33		73		
(42x110)	15	PL 350/2..										181			145	180	64	31		78		
180M/180L	18,5		350	350	350	300	250	260	6	18	M16		25	15					50		7,5	51
(48x110)	22																					

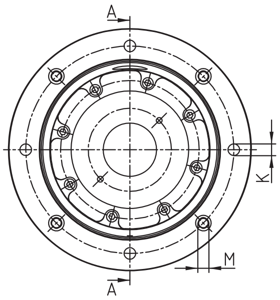
If venting holes or oil bleeds are requred, please mention in your order.

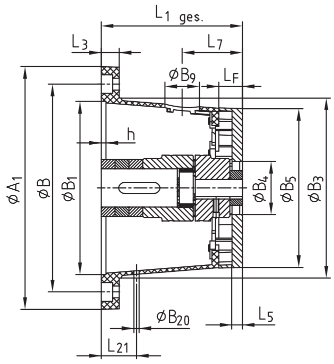
Order form

PL	PK	P	450	3	8
Bellhousing type, Long	Bellhousing type, short, "K"	Former bellhousing type	Flange diameter of IEC Motor	Model code	Internal-code

Made for Motion KTR

Bellhousings

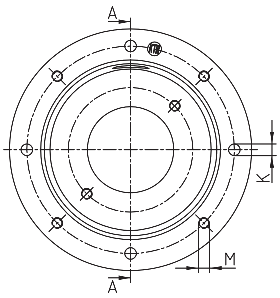


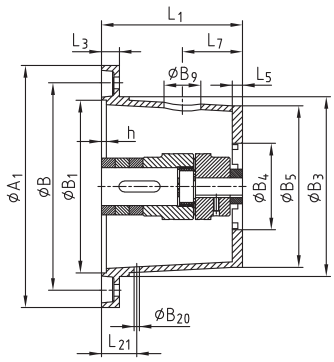


- Bellhousing from special nylon material
  - Accurate to size with higher temperatures and moisture
  - Stiffness similar to aluminium bellhousings
  - Very good damping properties
- Low-cost alternative to bellhousings with damping ring
- Both mounting sides are finish machined
- Flange side for pump mounting from aluminium
- Motor and pump shaft centered
- For almost every hydraulic pump available within short term
- Notice our mounting instructions
- Operating temperature: -10 °C to +60 °C

Bellhousings from nylon

IEC - motor size (shaft end)	kW with n = 1500 rpm	Bell-housing Size	Gasket DP Size	Foot flange PTFL/ PTFS *)	Dimensions [mm]												Min.	Venting hole		Oil bleed	
					A_1	B	B_1	B_3	h	K	M	L_1	L_F	L_3	L_5	B_5	B_4	B_9	L_7	B_{20}	L_{21}
100L/112M	2,2	KPT 250/2/..										120	12				35		54		
(28X60)	3	KPT 250/3/..	250	250	250	215	180	190	7	14	M12	124	16	19	12	166	42	40	52	7,5	43
	4	KPT 250/4/..										135	27				58		57		
		KPT 300/2/..										144	15				57		63		
132S/132M	5,5	KPT 300/3/..										155	26				56		68		
(38x80)	7,5	KPT 300/4/..	300	300	300	265	230	234	7	14	M12	168	39	20	15	208	57	50	74	7,5	45
		KPT 300/5/..										196	67						84		
160M/160L	11	KPT 350/2/..										188	18				56		82		
(42x110)	15	KPT 350/3/..	350	350	350	300	250	260	7	17	M16	204	34	26	15	230	77	50	87	7,5	51
180M/180L	18,5	KPT 350/4/..										228	58				97		102		
(48x110)	22																				





- Bellhousing from cast iron EN-GJL-250
- Bellhousing suitable for high loads
- To be used in mining and offshore applications
- Resistant to almost every hydraulic oil and salt water
- Both mounting sides are finish machined
- The bellhousings are primed, machined surfaces are preserved.
- Good damping properties due to the relatively big mass
- For almost every hydraulic pump available from stock or within short term
- Notice our mounting instructions

Bellhousings from cast iron

IEC - motor size (shaft end)	kW with n = 1500 rpm	Bell-housing Size	Gasket DP Size	Foot flange PTFL/ PTFS *)	Dimensions [mm]											Min.	Venting hole		Oil bleed	
					A_1	B	B_1	B_3	h	K	M	L_1	L_3	L_5	B_5	B_4	B_9	L_7	B_{20}	L_{21}
132S/132M	5,5	PG 300/5/..	300	300	300	265	230	234	5	14	M12	144	20	15	215	30	50	63	7,5	45
(38x80)	7,5																			
160M/160L	11	PG 350/4/..										188			242			82		
(42x110)	-	PG 350/6/..	350	350	350	300	250	260	7	17	M16	204	26	15	235	76	50	87	7,5	51
180M/180L	22																			
(48x110)																				
200L	30	PG 400/4/..	400	400	400	350	300	300	7	17	M16	204	26	20	260	97	50	92	7,5	51
(55x110)		PG 400/5/..										228			280			104		
225S/225M	37	PG 450/2/..	450	450	450	400	350	350	7	17	M16	234	26	24	289	97	50	107	7,5	51
(60x140)	45	PG 450/3/..										262		20	315	91		121		
250M	55	PG 550/1/..										265			360			125		
(65x140)	75	PG 550/8/..	550	550	550	500	450	450	7	17	M16	248	26	25	349	97	50	116	7,5	51
280S/280M	90																			
(75x140																				
315S/315M	110 -	PG 660/5/..	660	660	660	600	550	550	8	22	M20	330	32	30	425	119	50	157	7,5	60
(80x170)	160																			

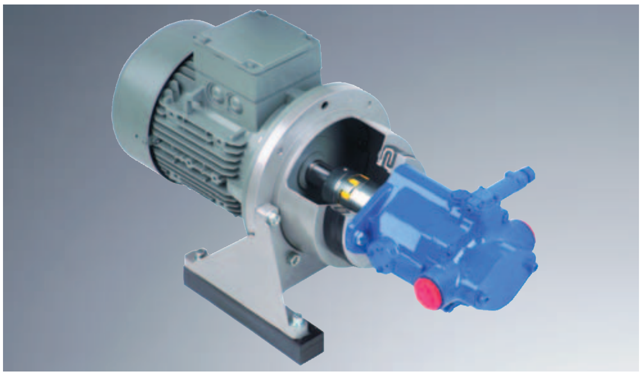
If venting holes or oil bleeds are requred, please mention in your order.

Order form

PG	KPT	250	1	4
Bellhousing design from nylon	Bellhousing design from cast iron	Flange diameter of IEC Motor	Model code	Internal-code

Hydraulic Components Steel Tanks

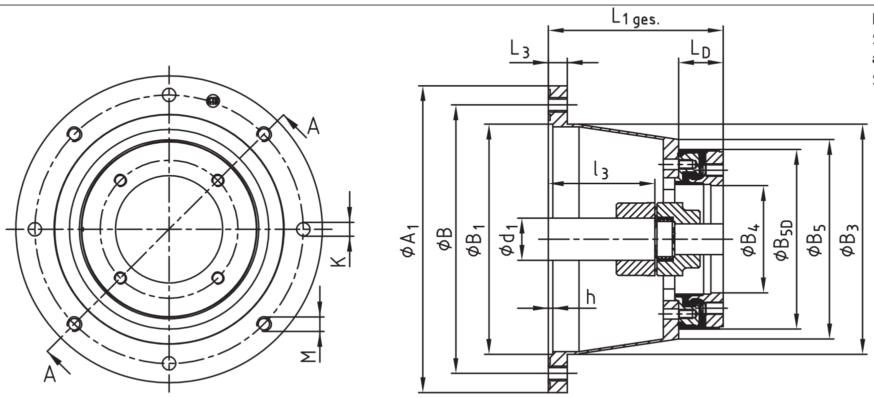
Damping rings D in combination with bellhousings



- The damping ring forms a centering unit with the bellhousing
- Combination also available for multiple pumps
- For the mounting of the damping ring special bellhousings are available to build a short design
- For the bellhousing selection you require please either see our selection programme at www.ktr.com or order the selection stored on CD-ROM
- Notice our mounting instructions

For IEC-motor from size 225 S / 225 M 8 fixing holes and through holes are offset 22,5° to the verticle.

Please mention in your order if venting holes or oil bleeds, respectively, are requested.
For dimensions see page 168/169.



Damping rings type D in combination with bellhousings [1)]

IEC - Motor size (shaft end) $d_1 x l_3$	kW with n = 1500 rpm	Bellhousing Size	Damping-ring Size	Foot flange Size	A_1	B	B_1	$L_{1\,ges.}$	L_3	K	M	h	L_D	B_3	B_4 min.	B_4 max.	B_5	B_{5D}
90S/90L	1,1	PK 200/11/..						90										
(24x50)	1,5	PL 200/11/..	D 150/..	PTFL 200	200	165	130	100	16	11	M10	4	45	145	18	83	145	148
		PK 200/30/..						124										
		PK 250/15/..						106										
		PL 250/15/..	D 150/..					124							18	83		148
100L/112M	2,2	PK 250/17/..		PTFL 250	250	215	180	145	18	14	M12	5	45	190			187	
(28x60)	3	PK 250/15/..						106										
		PL 250/15/..	D 190/..					124							30	121		190
		PK 250/17/..						145										
		PK 300/8/..						155									225	
		PK 300/9/..						130										
		PL 300/9/..	D 150/..					144					45		18	83	231	148
		PK 300/15/..						179										
		PL 300/15/..						195										
		PK 300/8/..						155									225	
132S/132M	5,5	PK 300/9/..						130										
(38x80)	7,5	PL 300/9/..	D 190/..	PTFL 300	300	265	230	144	20	14	M12	5	45	234	30	121	231	190
		PK 300/15/..						183										
		PL 300/15/..						195										
		PK 300/8/..						168									225	
		PK 300/9/..						143										
		PL 300/9/..	D 230/..					157					58		97	143	231	234
		PK 300/15/..						196										
		PL 300/15/..						208										
		PK 350/11/..						175	25									
		PL 350/11/..	D 150/..					190	26						18	83		148
		PK 350/18/..						204										
		PL 350/18/..						229	25									
160M/160L	11	PK 350/18/..						175					45					
(42x110)	15	PL 350/11/..						188										
		PK 350/18/..	D 190/..	PTFL 350	350	300	250	204	26	17	M16	6		260	30	121	252	190
180M/180L	18,5	PL 350/18/..						229										
(48x110)	22	PK 350/11/..						188	25									
		PI 350/11/..						204										
		PK 350/18/..	D 230/..					217	26				58		97	143		234
		PL 350/18/..						242	25									

Continued on page 173

Damping rings D in combination with bellhousings

Damping rings type D in combination with bellhousings [1]																		
IEC - Motor size (shaft end) d_1xl_3	kW with n = 1500 rpm	Bellhousing Size	Damping-ring Size	Foot flange Size	Dimensions[mm] A_1	B	B_1	$L_{1\ ges}$	L_3	K	M	h	L_D	B_3	B_4 min.	B_4 max.	B_5	B_{5D}
160M/160L	11	PK 350/11/..						188	25									
(42x110)	15	PL 350/11/..						204	26									
		PK 350/18/..	D 260/..	PTFL 350	350	300	250	217		17	M16	6	58	260	97	143	252	264
180M/180L	18,5	PL 350/18/..						242	25									
(48x110)	22	PL 350/48/98						247										
		PL 400/3/..						210									290	
		PK 400/12/..	D 190/..					215					45		30	121		190
		PL 400/12/..						229										
200L	30	PK 400/12/..	D 230/..	PTFL 400	400	350	300	228	20	17	M16	6		300		143		
(55x110)		PL 400/12/..						242									260	
		PK 400/12/..						228					58		97			264
		PL 400/12/..	D 260/..					242								164		
		PL 400/12/98						247										
		PL 450/5/94						230									325	
		PK 450/12/94	D 190/..					249					45		30	121	260	190
		PL 450/12/94						267										
		PL 450/5/96						243									325	
		PK 450/6/96	D 230/..					234								143		234
225S/225M	37	PK 450/12/96		PTFL 450	450	400	350	262	25	17	M16	6					260	
(60x140)	45	PL 450/12/96						280					58		97			
		PK 450/5/98						243									325	
		PK 450/6/98	D 260/..					234								164		265
		PK 450/12/98						262									260	
		PL 450/12/98						280										
		PL 450/5/..	D 330/..					268					83		120	208	325	330
		PK 550/4/94						237									355	
		PL 550/4/94	D 190/..					252					45		30	121	330	190
		PK 550/8/94						262									340	
		PK 550/4/96						248									355	
250M	55	PL 550/4/96	D 230/..					265								143	330	234
(65x140)		PK 550/8/96		PTFL 550	550	500	450	275	26	17	M16	6	58	450	97		340	
280S/280M	75	PK 550/4/98						248									355	
(75x140)	90	PL 550/4/98	D 260/..					265								164	330	264
		PK 550/8/98						275									340	
		PK 550/4/..						275									355	
		PL 550/4/..	D 330/..					290					83		120	208	330	330
		PK 550/8/..						300									340	
315S/315M	110	PK 660/3/98	D 260/..					310					58		97	164	500	264
(80x170)	132	PL 660/3/98						318									340	
315L	160	PK 660/3/..	D 330/..	PTFL 660	660	600	550	330	32	22	M20	8	83	550	120	208	500	330
(80x170)	200	PL 660/3/..						343									340	
(85x170)		PK 660/3/..	D 125/../..					372					125		260	320	500	484

1) Preferred combinations with short bellhousings, other combinations on request (see pages 168 and 169), phone +49 5971 798-0.

* Passing from dimension B3 to the flange with radius R = 5

- For your power pack please pay attention to a separation of the piping, e. g. by tubes or elastic flanges (see page 177).
- For further measures of noise damping we recommend to use damping rods (see page 180/181) or DT/DTV rings (see page 179).

For the detailed order designation please see our PC/Internet selection programme or mention the IEC motor size and detailed pump type for selection.

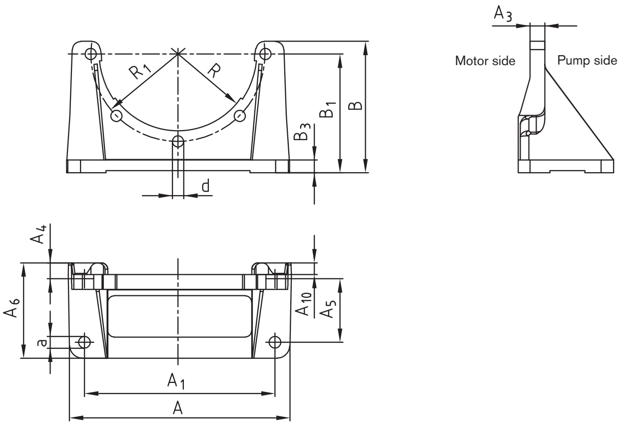
Order form

PL	PK	250	15	92	D	150	23
Bellhousing type, **L**ong	Bellhousing type, short, "**K**"	Flange diameter of IEC Motor	Model code	Internal code	Damping ring	Size	Internal code

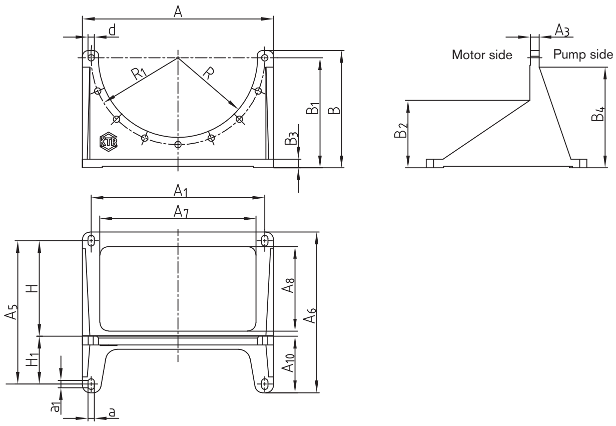
Made for Motion

Foot flange

- Material: PTFL; PTFS = aluminium
  from PTFS 550 = EN-GJS-400-15
- The designing of PTFL by means of the finite element method permits very high loading capacity with minimum weight (DBGM)
- PTFL as a compact, space-saving design in combination with KTR bellhousing and damping ring
- Storage of only one electric motor type both for horizontal and vertical construction
- PTFS preferably for mobile applications
- All types available from stock - other sizes on request
- Notice our mounting instructions



Foot flange PTFL*



Foot flange PTFS*

*according to VDMA guideline 24561 part 1

Foot flange design PTFL (DBGM)															
Foot flange size	for bellhousing size	Dimensions [mm]													
		A	A_1	A_3	A_6	A_4	A_5	A_{10}	B	B_1	B_3	R	R_1	d	a
PTFL 160	160	160	140	12	80	15	50	8	110	100	10	55	65	9	9
PTFL 200	200	210	180	14	90	15	60	11	124	112	12	72,5	82,5	11	11
PTFL 250	250	250	220	16	97	21	60	–	145	132	15	95	107,5	13	13
PTFL 300	300	290	260	18	116	20	80	–	175	160	18	117	132,5	13	13
PTFL 350	350	340	300	20	150	20	110	–	195	180	22	130	150	18	16

Foot flange design PTFS																				
Foot flange size	for bellhousing size	Dimensions [mm]																		
		A	A_1	A_3	A_5	A_6	A_7	A_8	A_{10}	B	B_1	B_2	B_3	B_4	R	R_1	a	a_1	d	H	H_1
PTFS 250	250	250	215	18	185	230	190	–	82	165	155	120	15	150	95	107,5	14	10	14	125	60
PTFS 300	300	300	265	20	225	270	240	–	92	200	185	148	18	183	117	132,5	14	10	14	150	75
PTFS 350	350	350	300	25	265	305	260	160	110	252	235	188	18	28	130	150	18	12	18	175	90
PTFS 400	400	400	350	20	300	350	300	185	125	277	260	193	20	241	150	175	18	12	18	200	100
PTFS 450	450	450	400	25	335	385	350	207	138	312	295	232	20	290	175	200	18	12	18	225	110
PTFS 550	550	550	500	25	415	465	440	240	165	370	350	233	25	318	225	250	18	12	18	275	140
PTFS 660	660	660	600	30	495	555	540	292	195	405	380	233	30	348	275	300	22	15	22	330	165

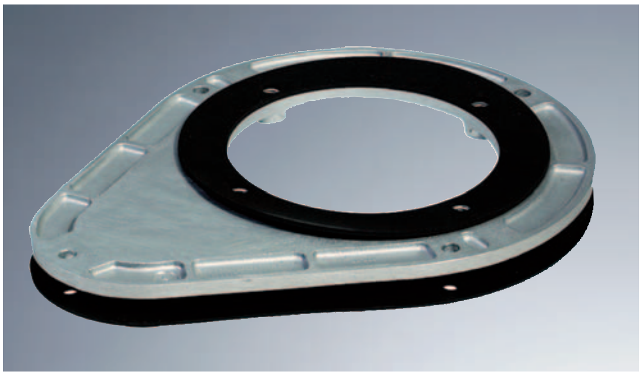
PTFS 800 from steel on request

In order to obtain the full loading capacity of the foot flanges all existing fastening bores have to be screwed up with the bellhousing!

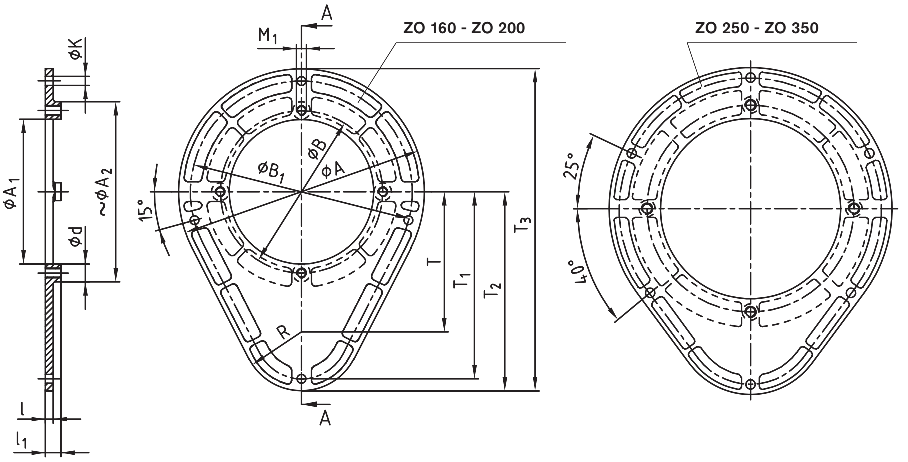
Order form

PTFL	250
Foot flange design	Size

Accessories for bellhousings

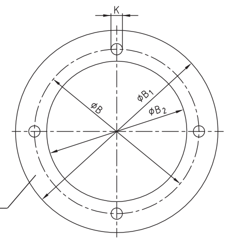


- Assembly and disassembly of the fully mounted drive unit outside the tank is possible
- Facilitates cleaning and maintenance
- Penstock connections via mounting flange
- Material aluminium
- Suitable for bellhousings up to size P 350
- Gaskets type DP and DZ made from perbunane (NBR)
- Gaskets type DP are used between bellhousing and tank cover and furthermore between bellhousing and ZO mounting flange
- Gaskets type DZ are used between ZO mounting flange and tank cover



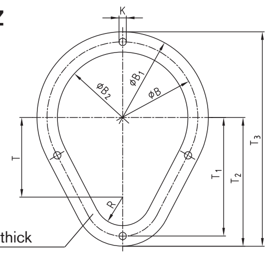
Gasket DP

Material:
perbunane



2,5 mm thick

Gasket DZ



2,5 mm thick

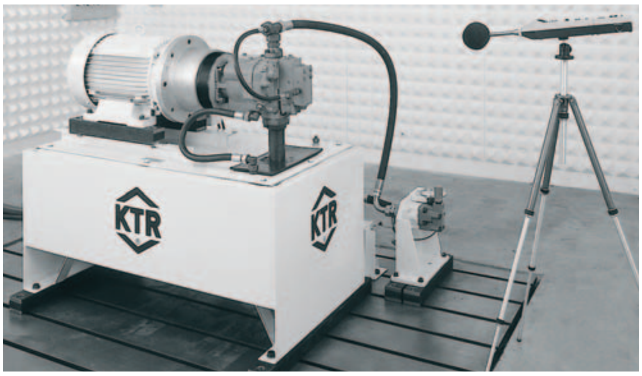
Mounting flange ZO																
Size	Dimensions [mm]														Gasket DZ size	Gasket DP size
	A	A_1	$\sim A_2$	B	B_1	K	M_1	R	T	T_1	T_2	T_3	d	l	l_1		
ZO 160	210	112	150	130	185	9	M8	60	97,5	145	157,5	262,5	18	7	15	DZ 160	DP 160
ZO 200	250	147	187	165	225	9	M10	60	142,5	190	202,5	327,5	18	8	16	DZ 200	DP 200
ZO 250	300	192	239	215	275	9	M12	60	142,5	190	202,5	352,5	20	8	16	DZ 250	DP 250
ZO 300	360	236	289	265	330	14	M12	60	150	225	240	420	20	10	18	DZ 300	DP 300
ZO 350	410	262	332	300	380	14	M16	110	160	225	270	475	24	12	20	DZ 350	DP 350

Gaskets for bellhousings and mounting flanges									
Size	Dimensions [mm]								
	B	B_1	B_2	T	T_1	T_2	T_3	K	R
DP 160	130	160	111	–	–	–	–	4 x 9	–
DP 200	165	200	146	–	–	–	–	4 x 11	–
DP 250	215	250	191	–	–	–	–	4 x 13	–
DP 300	265	300	235	–	–	–	–	4 x 13	–
DP 350	300	350	261	–	–	–	–	4 x 17	–
DP 400	350	400	301	–	–	–	–	4 x 17	–
DP 450	400	450	351	–	–	–	–	4 x 17	–
DP 550	500	550	451	–	–	–	–	4 x 17	–
DZ 160	185	210	160	97,5	145	157,5	262,5	4 x 9	35
DZ 200	225	250	200	142,5	190	202,5	327,5	4 x 9	35
DZ 250	275	300	250	142,5	190	202,5	352,5	6 x 9	35
DZ 300	330	360	300	150	225	240	420	6 x 14	60
DZ 350	380	410	350	160	255	270	475	6 x 14	80

Order form

ZO 300	DP 300
Mounting flange size	Gasket design and size

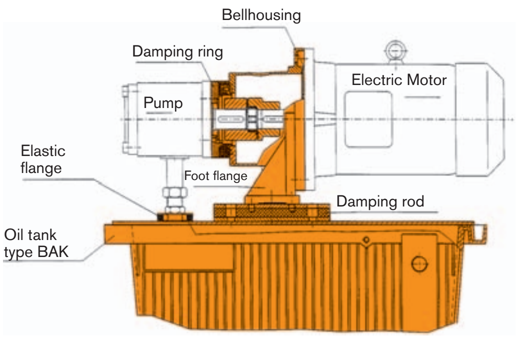
Damping elements

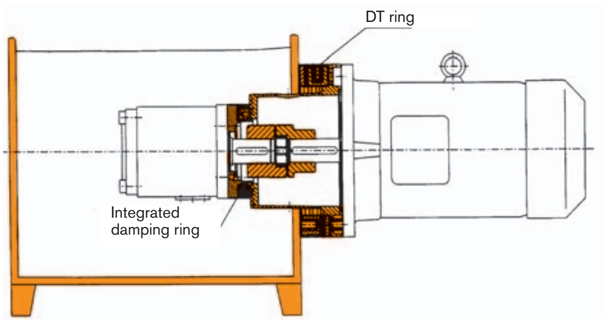


- Noise measurement in the R & D test center
- Noise measurement locally at the customer
- Airborne noise measurement on individual hydraulic components and complete units
- Structure-borne noise measurement to prove the efficiency of KTR damping elements
- Optimization of noise levels of systems or hydraulic units

In its research and development test center, KTR has provided for a sound measurement room allowing for low reflective test conditions. Comparative measurements are performed on an actual hydraulic power pack in order to test and optimize the efficiency of KTR damping elements. Apart from the stationary measurement in the laboratory, the efficiency of the KTR damping measurements taken can be proven locally.

Examples of application





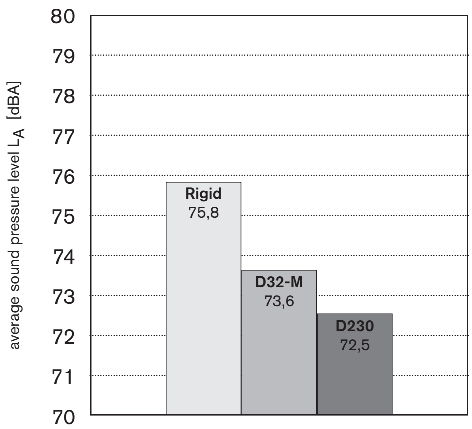
Possible noise reductions compared to the rigid arrangement:

a) Damping ring only	3 – 6 dBA
b) Damping rod only	3 – 4 dBA
c) Damping ring and damping rod	6 – 8 dBA
d) Damping ring, damping rod and elastic flange	7 – 10 dBA
e) DT/DTV damping ring	3 – 6 dBA
f) DT/DTV damping ring and damping ring	6 – 8 dBA

Effect:
The effect of the KTR damping elements reflects the structure-borne noise vibration by means of the vulcanized, non-prestressed rubber layer in the acoustic frequency range from about 200 Hz. The reduction of structure-borne noise vibrations causes a reduced radiation of the airborne noise produced by the power pack.

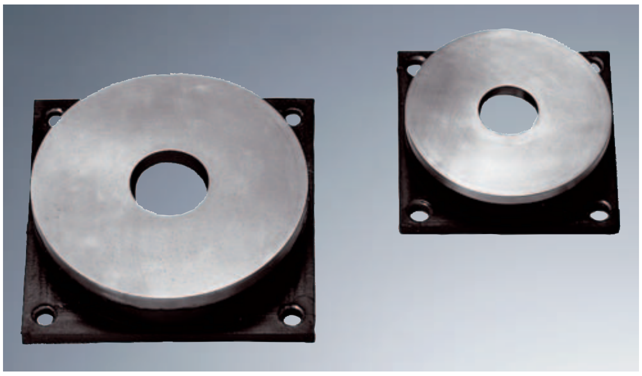
Result of a noise measurement

Test data:	
Electric motor:	rotary current asynchronous 180M 18,5 kW, n = 1450 rpm type B 3 / B 5
Pump:	axial piston pump
Coupling:	ROTEX® 42 - 92 Shore A

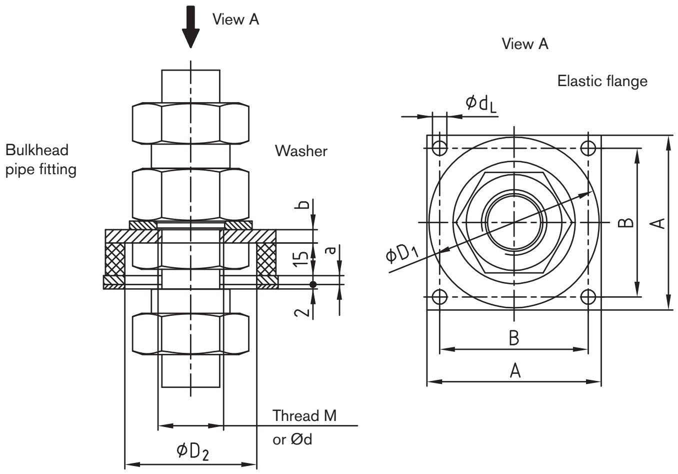


Made for Motion KTR

Damping elements



- For structure-borne noise separation on the pressure and suction lines to the tank
- Suitable for bulkhead pipe fitting SV6 - SV42
- Sealing surface is moulded on
- Made from oil-resistant perbunane
- Larger types on request



Elastic flange												
Elastic flange								Bulkhead pipe fitting *)				Comment
Size	A	B	a	b	D_1	D_2	d_L	Type L light	Type S heavy	Thread M	Pilot bore for ∅d	
◣ 80-2.11								SV 28-L	SV 25-S	M36 x 2	∅34	
80-2.10								SV 22-L	SV 20-S	M30 x 2	∅28	
80-2.9								SV 18-L	–	M26 x 1,5	∅24,5	
80-2.8								–	SV 16-S	M24 x 1,5	∅22,5	
80-2.7								SV 15-L	–	M22 x 1,5	∅20,5	
80-2.6	80	68	4	6	78	60	6,6	–	SV 12-S	M20 x 1,5	∅18,5	
80-2.5								SV 12-L	SV 10-S	M18 x 1,5	∅16,5	
80-2.4								SV 10-L	SV 8-S	M16 x 1,5	∅14,5	
80-2.3								SV 8-L	SV 6-S	M14 x 1,5	∅12,5	
80-2.2								SV 6-L	–	M12 x 1,5	∅10,5	
◣ 80-2.1								–	–	–	∅10	Standard design
100-2.5								SV 42-L	SV 38-S	M52 x 2	∅50	
100-2.4								–	SV 30-S	M42 x 2	∅40	
◣ 100-2.3	100	82	5	8	95	65	9	SV 28-L	SV 25-S	M36 x 2	∅34	
◣ 100-2.2								SV 22-L	SV 20-S	M30 x 2	∅28	
◣ 100-2.1								–	–	–	∅25	Standard design
◣ 130-2.4								SV 42-L	SV 38-S	M52 x 2	∅50	
◣ 130-2.3	130	110	6	10	125	95	9	SV 35-L	–	M45 x 2	∅43	
130-2.2								–	SV 30-S	M42 x 2	∅40	
◣ 130-2.1								–	–	–	∅35	Standard design

◣ Available from stock

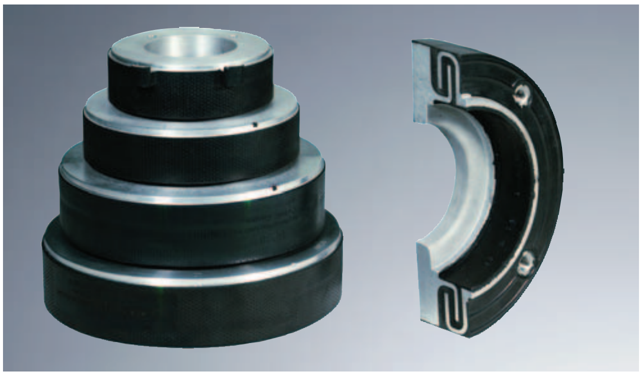
*) Bulkhead pipe fitting and washer do not form part of our supply.

Order form

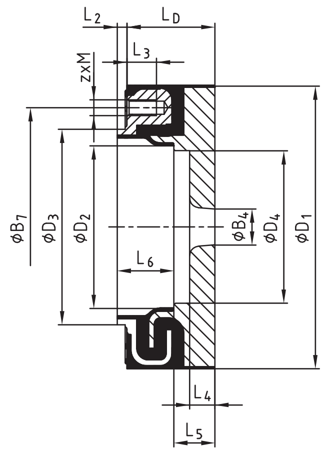
ERD	100 – 2.3	
	Size 100	Finish bore with thread M36 x 2

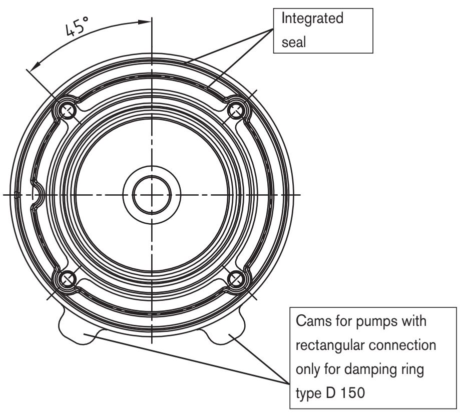
Hydraulic Components Steel Tanks

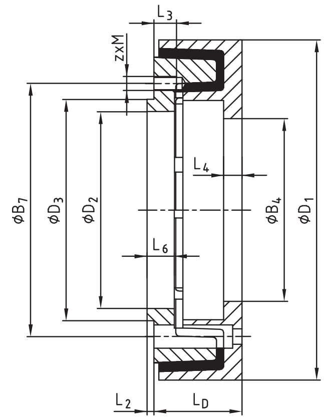
Damping elements



- Vulcanized and failsafe (up to D 330, DBGM)
- High weight load permissible (e. g. multiple pumps)
- Excellent damping properties
- Excellent resistance to hydraulic oil
- Sealing lips are moulded on (up to size 330) – no additional sealing required
- For the bellhousing selection you require please either see our selection programme at www.ktr.com or order the selection stored on CD-ROM







D 84 / D 125 / D 145

Damping ring D														
Size	Dimensions [mm]													
	B_4		B_7	D_1	D_2	D_3	D_4	L_D	L_2	L_3	L_4	L_5	L_6	z x M 2)
	min.	max.												
D 150/..	18	83	122	148	83	100	78	45	5	15	13	16	30	4 x M8
D 190/..	30	121	150	190	116	130	100	45	5	15	14	18	33	4 x M10
D 230/..	97	143	195	234	143	160	136	58	5	18	17	23	47	4 x M12
D 260/..	97	164	210	264	164	180	156	58	4	20	18	23	46	4 x M16
D 330/..	120	208	264	330	208	220	201	83	6	35	23	28	64	4 x M20
D 84/../A D 84/../C	147	224	280	360	210	224	–	83	5	35	25	25	18	4 x M20
D 125/../A	260	320	360	484	285	315	–	125	10	33	25	25	40	M20 3)
D 145/../A	390	400	1)	590	370	400	–	145	12	45	35	35	47	M24 3)

1) Pitch circle diameter on request. 2) Tightening torque of screw quality 5.6. 3) Number of fixing holes on request.

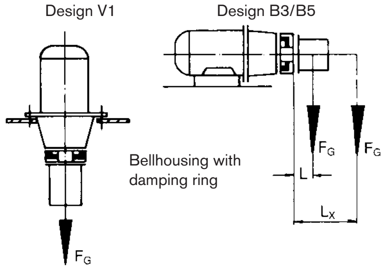
Permissible radial and axial weight load of damping rings based on an ambient temperature of + 60 °C								
	D 150	D 190	D 230	D 260	D 330	D 84	D 125	D 145
Distance of center of gravity for radial load L [mm]	100	100	100	200	200	200	250	250
Perm. weight load $F_{max.}$ [N]	650	1800	3000	2300	4100	4000	6000	10000

With a different distance of center of gravity L_X the permissible weight load is converted. If $L_X < L$, $F_{max.} = F_{perm.}$

$$F_{zul.} = \frac{F_{max.} \cdot L}{L_X} \quad [N]$$

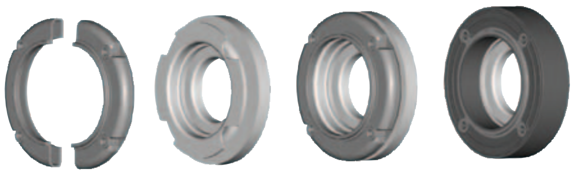
The permissible weight load $F_{perm.}$ must not be exceeded by the existing weight load F_G (radial or axial).

Design V1 Design B3/B5



Arrangement of damping ring D up to D 330

1 2 3

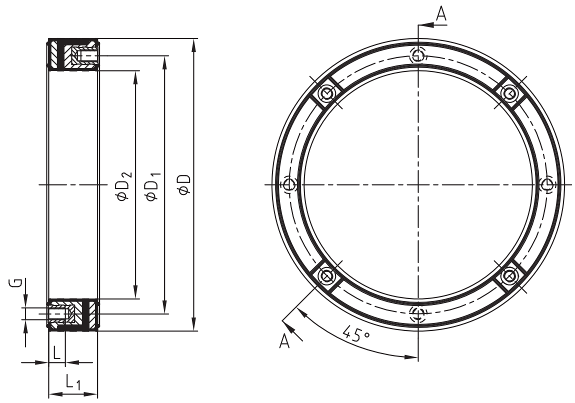


Order form

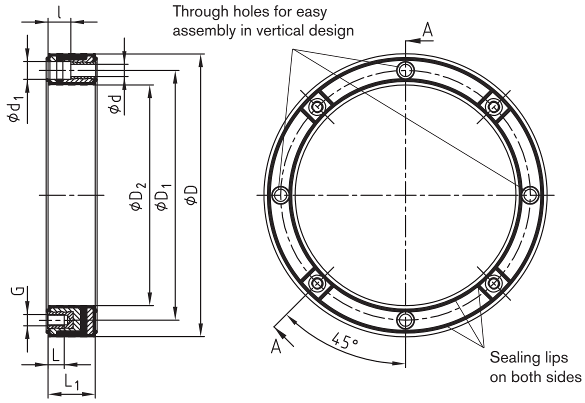
D	230	14
Damping ring	Size	Internal code

Damping elements

- **DTV for vertical assembly only!**
- To reduce noise between drive unit and tank by means of rubber flexible separation
- Type DT for horizontal and vertical assembly
- Type DT is protected against separation (failsafe) by means of a special design (registered design of theinterconnected parts)
- Pressure-loaded elastomer due to the interconnected parts
- High permissible radial, angular and axial load
- Sealing lips are moulded on - no additional sealings required



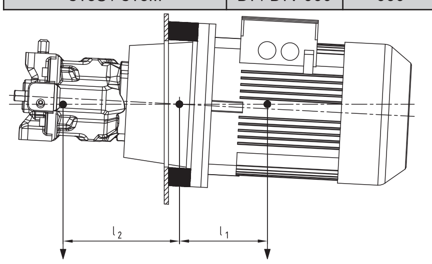
Damping ring type DT



Damping ring type DT.../2

Damping ring DT (DBGM) and DTV

IEC-motor Size	Damping ring Size	Dimensions [mm]									Screw tightening torque [Nm]
		D	D_1	D_2	z x G	L	L_1	z x d	z x d_1	l	
71	DTV 160	160	130	111	4 x M8	16,5	35	4 x 9	4 x 14,5	18	12
80, 90S / 90L	DT 200	200	165	145,2	4 x M10	20	40	4 x 11	4 x 17,5	20	23
100L / 112M	DT 250	250	215	191	4 x M12	17,5	45	4 x 13	4 x 19,5	22	40
132S / 132M	DT 300	300	265	235	4 x M12	17,5	50	4 x 13	4 x 19	24	40
160M / 160L, 180M / 180L	DT 350	350	300	261	4 x M16	31	60	4 x 17	4 x 25	26	100
200L	DT 400	400	350	301	4 x M16	31	70	4 x 17	4 x 25	31	100
225S / 225M	DT 450	450	400	351	8 x M16	31	80	8 x 17	8 x 25	41	100
250M, 280S / 280M	DT / DTV 550	550	500	451	8 x M16	30	68	8 x 17	8 x 25	23	210
315S / 315M	DT / DTV 660	660	600	551	8 x M20	30	68	8 x 22	8 x 33	23	410



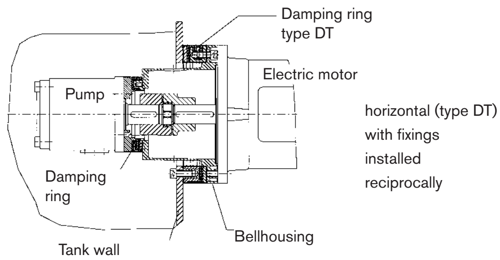
Permissible radial weight and bending load of DT damping rings with an operating temperature of + 60 °C

DT size	200	250	300	350	400	450	550	660
$F_{perm.}$ [N]	370	720	1450	3600	4800	6600	13000	24000
$M_{b\,perm.}$ [Nm]	30	65	175	740	1100	1600	4400	9000

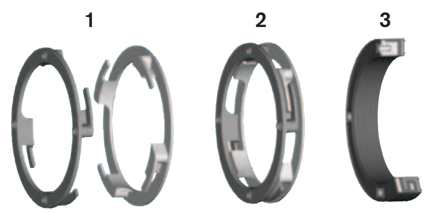
$$F_{perm.} \geq F_P + F_M$$

$$M_{b\,perm.} \geq F_M \cdot l_1 - F_P \cdot l_2$$

Example of assembly



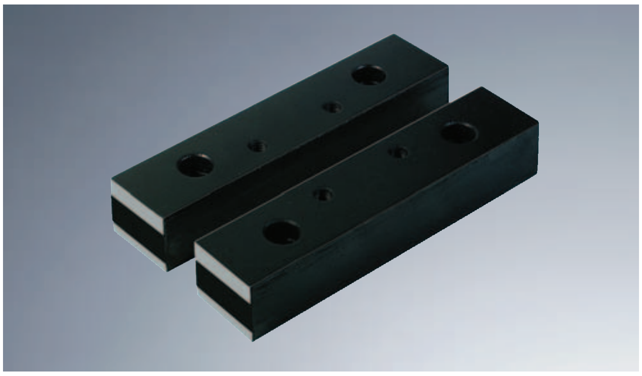
Arrangement of DT ring



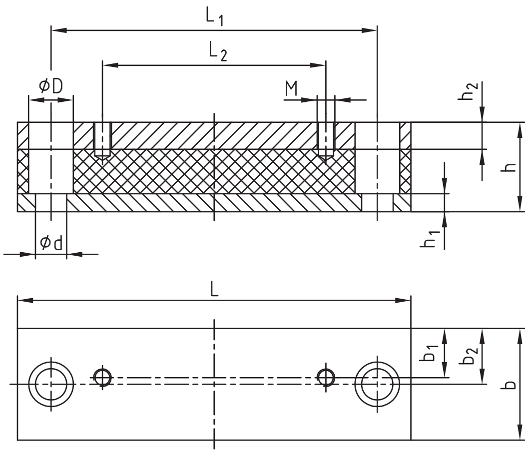
Order form

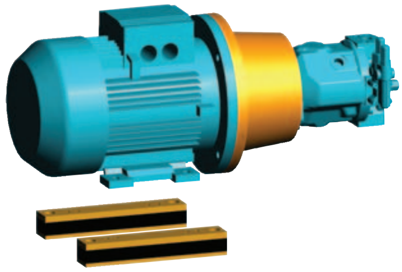
DT	250
Damping ring	Size

Damping elements



- Damping rods reduce the noise level and dampen vibrations
- Finish machined for motors IMB 35 (DSM), PTFL foot flanges (DSFL) or PTFS foot flanges (DSFS) and PIK oil coolers (DSK)
- Available from stock
- Special lengthes or special designs on request
- Also suitable for Nema motors
- Damping rods are made from natural rubber (NR)
- All damping rods are adapted to the weight load that is produced





Type DSM

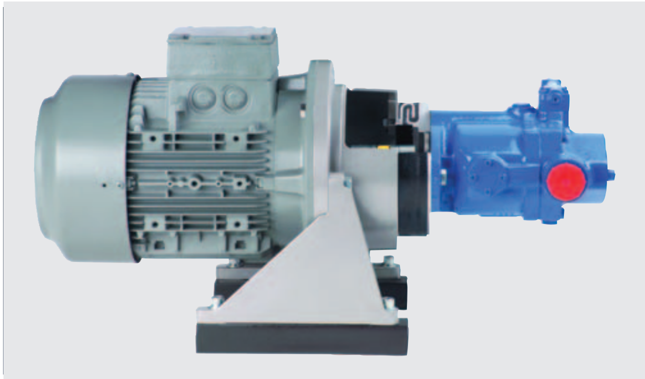
Damping rods design DSM for electric motors type IMB 35, protection IP 54													
Damping rod Size	For motor Size	Dimensions [mm]											
		L	L_1	L_2	h	h_1	h_2	b	b_1	b_2	d	D	D
DSM 71	71	196	156	90	40	8	12	50	21	25	14	20	M6
DSM 80	80	176	146	100	40	8	12	50	22	25	14	20	M8
DSM 90 S	90 S	196	156	100	40	8	12	50	24,5	25	14	20	M8
DSM 90 L	90 L	240	205	125	40	8	12	50	24	25	14	20	M8
DSM 100 L	100 L	240	205	140	40	8	12	50	22	25	14	20	M10
DSM 112 M	112 M	240	205	140	40	8	12	50	22	25	14	20	M10
DSM 132 S	132 S	280	245	140	45	8	12	50	20	25	14	20	M10
DSM 132 M	132 M	280	245	178	45	8	12	50	20	25	14	20	M10
DSM 160 M	160 M	340	300	210	60	15	15	70	28	35	18	26	M12
DSM 160 L	160 L	416	370	254	60	15	15	70	28	35	18	26	M12
DSM 180 M	180 M	416	370	241	60	15	15	70	35	35	18	26	M12
DSM 180 L	180 L	446	400	279	60	15	15	70	35	35	18	26	M12
DSM 200 L	200 L	492	430	305	60	15	15	70	35	35	22	33	M16
DSM 225 S	225 S	492	430	286	60	15	15	70	35	35	22	33	M16
DSM 225 M	225 M	492	445	311	60	15	15	70	35	35	22	33	M16
DSM 250 M	250 M	492	570	349	60	15	15	100	50	50	22	33	M20
DSM 280 S	280 S	614	570	368	60	15	15	100	50	50	22	33	M20
DSM 280 M	280 M	614	570	419	60	15	15	100	50	50	22	33	M20
DSM 315 S	315 S	614	570	406	60	15	15	120	60	60	22	33	M24
DSM 315 M	315 M	614	570	457	60	15	15	120	60	60	22	33	M24
DSM 315 L	315 L	704	660	508	60	15	15	120	60	60	22	33	M24

Other sizes on request.

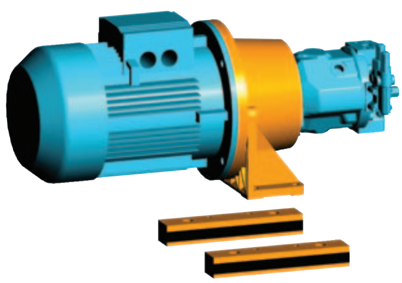
Order form

DSM	112 M
Damping rod	Size

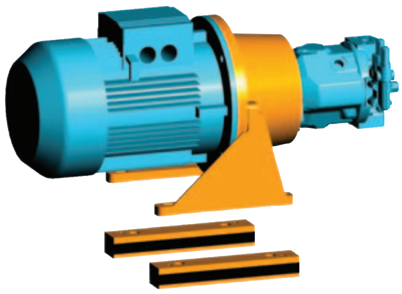
Damping elements



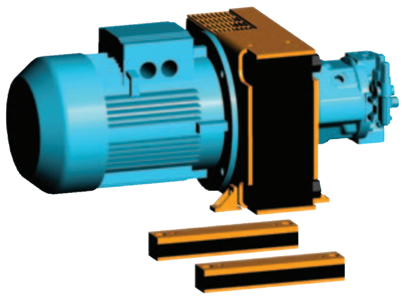
- Damping rods reduce the noise level and dampen vibrations
- Finish machined for motors IMB 35 (DSM), PTFL foot flanges (DSFL) or PTFS foot flanges (DSFS) and PIK oil coolers (DSK)
- Available from stock
- Special lengthes or special designs on request
- Also suitable for Nema motors
- Damping rods are made from natural rubber (NR)
- All damping rods are adapted to the weight load that is produced



Type DSFL



Type DSFS



Type DSK

Damping rods design DSFL for foot flange PTFL

Damping rod Size	For motor Size	Dimensions [mm]											
		L	L_1	L_2	h	h_1	h_2	b	b_1	b_2	d	D	M
DSFL 160	PTFL 160	176	130	50	40	8	12	50	10	25	14	20	M8
DSFL 200	PTFL 200	176	130	60	40	8	12	50	15	25	14	20	M10
DSFL 250	PTFL 250	230	140	60	40	8	12	50	15	25	14	20	M12
DSFL 300	PTFL 300	270	170	80	40	8	12	50	15	25	14	20	M12
DSFL 350	PTFL 350	305	200	110	60	15	15	70	25	35	18	26	M16

Damping rods design DSFS for foot flange PTFS

Damping rod Size	For motor Size	Dimensions [mm]											
		L	L_1	L_2	h	h_1	h_2	b	b_1	b_2	d	D	M
DSFS 250	PTFS 250	240	140	185	40	8	12	50	17,5	25	13	20	M12
DSFS 300	PTFS 300	280	180	225	40	8	12	50	17,5	25	13	20	M12
DSFS 350	PTFS 350	325	200	265	60	15	15	70	25	35	17	26	M16
DSFS 400	PTFS 400	350	234	300	60	15	15	70	25	35	17	26	M16
DSFS 450	PTFS 450	385	270	335	60	15	15	70	25	35	17	26	M16
DSFS 550	PTFS 550	490	350	415	60	15	15	100	25	50	18	26	M16
DSFS 660	PTFS 660	635	415	495	60	15	15	100	30	50	22	33	M20

Damping rods design DSK for PIK bellhousings with integrated oil cooler with feet

Damping rod Size	For cooler Size	Dimensions [mm]											
		L	L_1	L_2	h	h_1	h_2	b	b_1	b_2	d	D	M
DSK 200	PIK 200	240	210	154,5	40	8	12	50	25	25	14	20	M12
DSK 250	PIK 250	270	240	175,5	40	8	12	50	25	25	14	20	M12
DSK 300	PIK 300	280	250	199,5	45	8	12	50	25	25	14	20	M12
DSK 350	PIK 350	325	295	243,5	60	15	15	70	35	35	14	20	M12

Order form

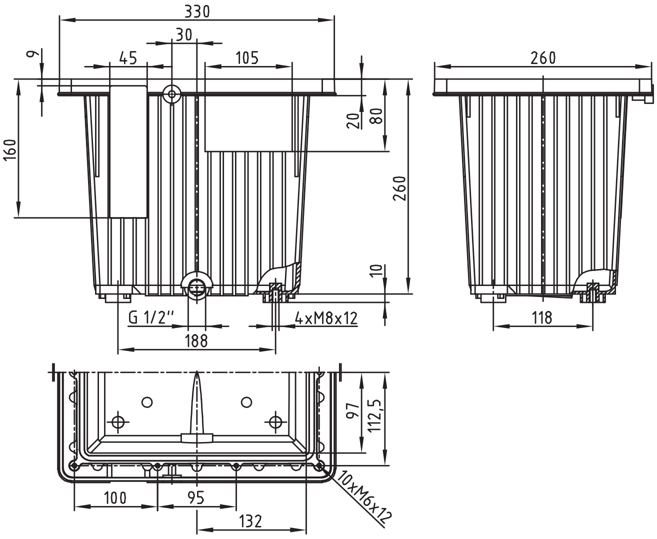
DSFS	300
Damping rod	Size

Aluminium tanks

- Made from aluminium for depressurized operation (0,5 bar at maximum)
- With oil collecting groove moulded on periphery for collection of leakage oil (Water Resources Act)
- O-ring seal for all tank sizes, ready to use
- No painting or priming of the tank required
- Good heat loss capacity due to high caloric conductibility and large heat dissipating surfaces
- All tanks are 100 % tight and may be stacked without jamming
- All sizes available from stock
- All tanks **including drain plug similar to DIN 908**
- Temperature resistant up to + 100 °C

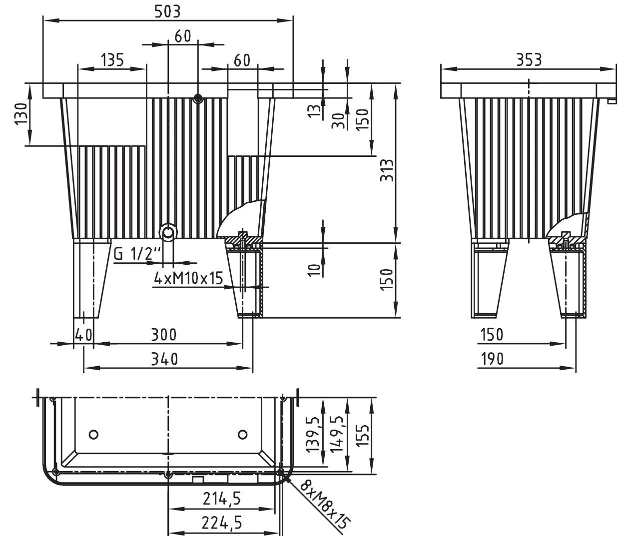
Tanks with oil collecting groove BAK 13, BAK 30, BAK 44 and BAK 70

BAK 13



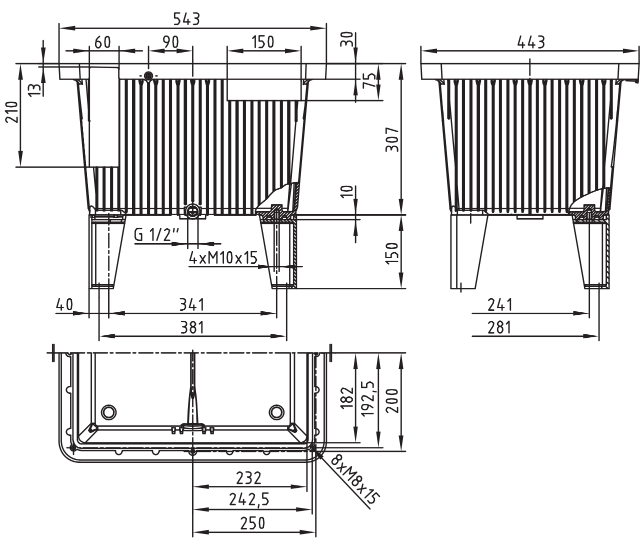
Available volume [Litres]	Seal
11,5	O-ring seal RS 13 NBR

BAK 30



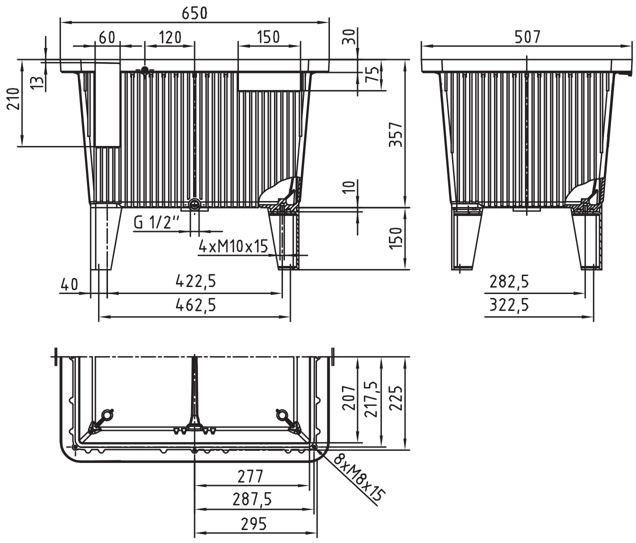
Available volume [Litres]	Seal
27,0	O-ring seal RS 30 NBR

BAK 44



Available volume [Litres]	Seal
40,0	O-ring seal RS 40/44 NBR

BAK 70



Available volume [Litres]	Seal
63,0	O-ring seal RS 63/70 NBR

Order form

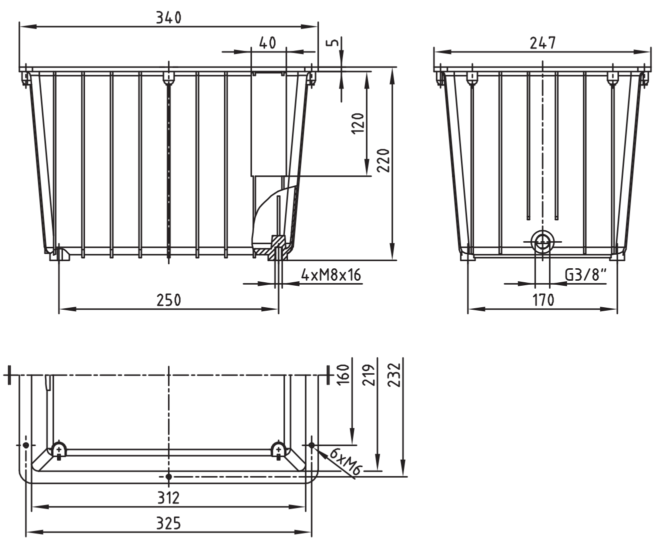
BAK	30
Aluminium tank	Size

Aluminium tanks

- Made from aluminium for depressurized operation (0,5 bar at maximum)
- Without oil connecting groove
- O-ring seal or flat seal for all tank sizes, ready to use
- No painting or priming of the tank required
- Good heat loss capacity due to high caloric conductibility and large heat dissipating surfaces
- All tanks are 100 % tight and may be stacked without jamming
- All sizes available from stock
- All tanks **including drain plug similar to DIN 908**
- Temperature resistant up to + 100 °C

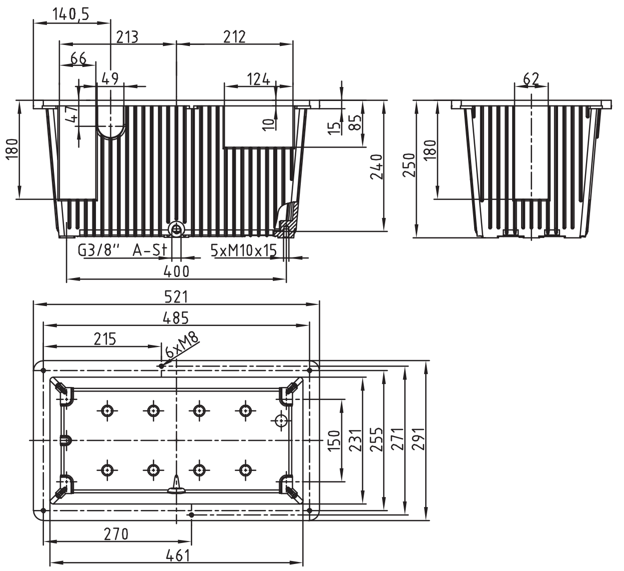
Tanks without oil collecting groove BAK 10, BAK 20, BAK 40, BAK 63 and BAK 100

BAK 10



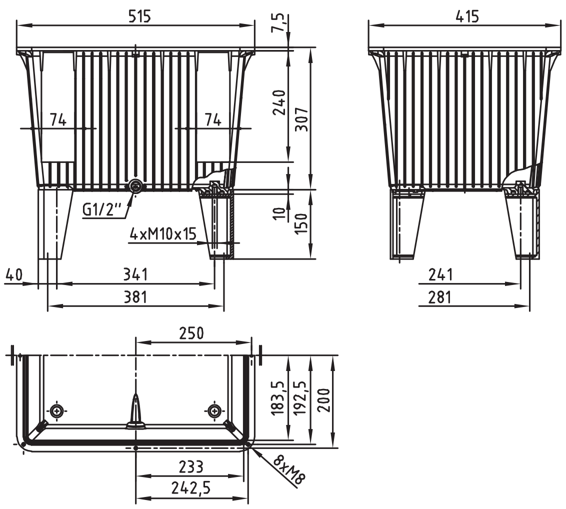
Available volume [Litres]	Seal
9,5	Flat seal FD 10

BAK 20



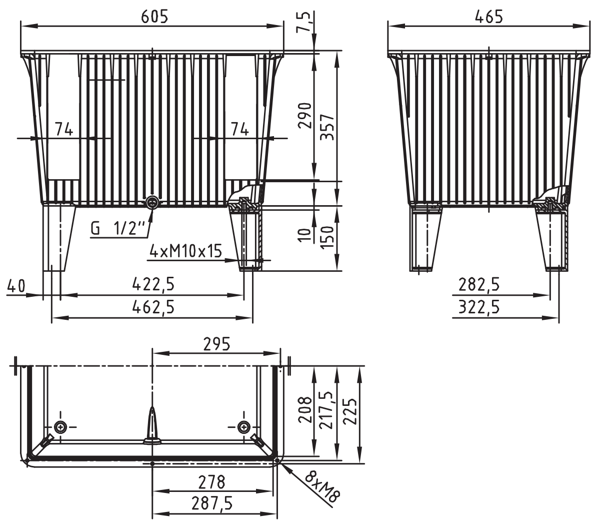
Available volume [Litres]	Seal
18,0	Flat seal FD 20

BAK 40



Available volume [Litres]	Seal
40,0	O-ring seal RS 40/44 NBR

BAK 63



Available volume [Litres]	Seal
63,0	O-ring seal RS 63/70 NBR

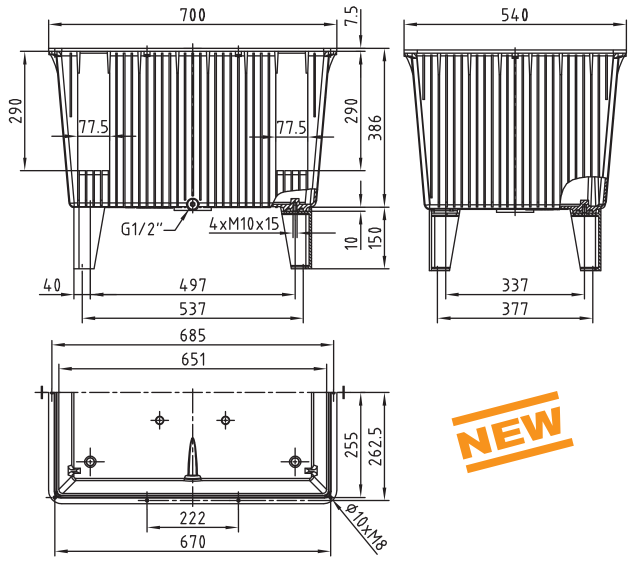
Order form

BAK	30
Aluminium tank	Size

Made for Motion KTR

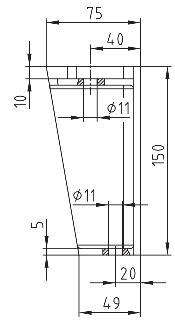
Aluminium tanks and accessories

BAK 100

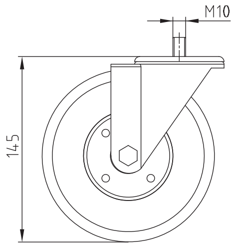


Available volume [Litres]	Seal
95	O-ring seal RS 100 NBR

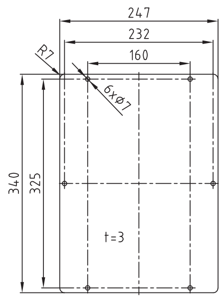
Tank feet BF 150 made from cast aluminium



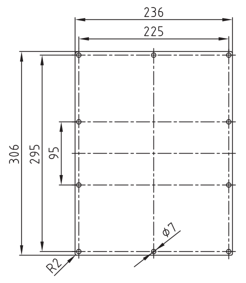
Wheels LR 150 with or without lock



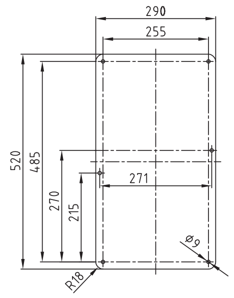
Tank cover made of steel and aluminium, accessories for aluminium tank													
Cover		For tank	Dimensions [mm]							Cover thickness		Weight [kg]	
Steel	Al		A	A_1	A_2	B	B_1	B_2	R	St	Al	St	Al
ST 30	AL 30	BAK 30	475	460	449	325	310	299	25	5	5	6	2,1
ST 44	AL 44	BAK 40/BAK 44	515	500	485	415	400	385	32	5	8	8,5	4,6
ST 70	AL 70	BAK 63/BAK 70	605	590	575	465	450	435	32	5	8	10,5	6,1



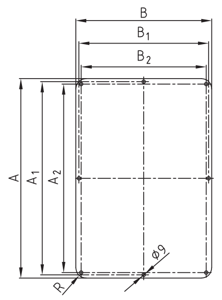
BAK 10 - ST 10
St: 3 mm thick; 1,9 kg



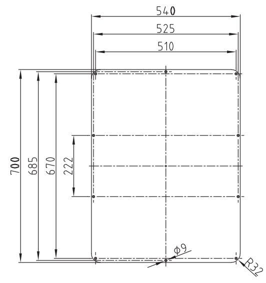
BAK 13 - ST 13 / AL 13
St: 4 mm thick; 2,2 kg
Al: 5 mm thick; 1,0 kg



BAK 20 - ST 20 / AL 20
St: 5 mm thick; 5,8 kg
Al: 5 mm thick; 2,0 kg



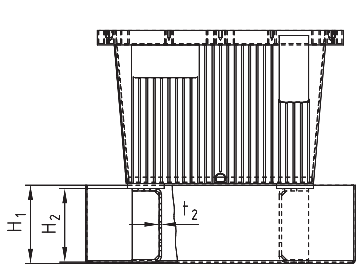
BAK 30-70
ST 30-70
AL 30-70

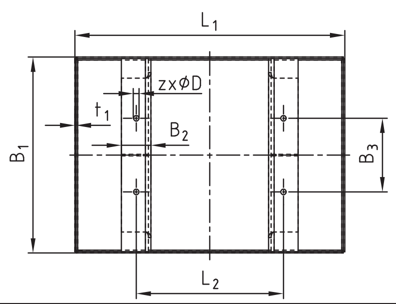


BAK 100 - ST 100 / AL 100
St: 6mm thick; 17,8 kg
Al: 8 mm thick; 8,2 kg

Order form:

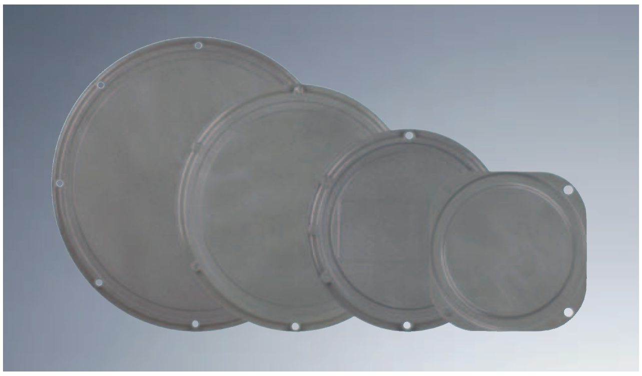
ST 44	BF 150	Plug DIN 908 with seal G 1/2 A
Tank cover for BAK 44 from steel	Feet for tank	Plug for BAK 44





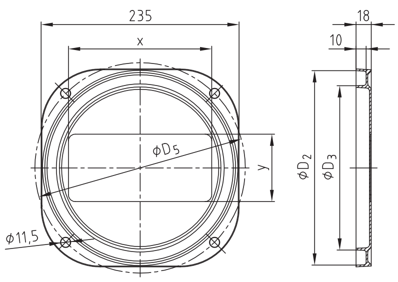
Oil sumps BAKW for KTR aluminium tanks BAK													
Oil sump	For tank	Volume of oil sump	Dimensions [mm]										
			L_1	L_2	B_1	B_2	B_3	H_1	H_2	t_1	t_2	z	D
BAKW 13	BAK 13	11,8 l	380	188	310	60	118	110	100	3	3	4	9
BAKW 20	BAK 20	20 l	570	400	350	60	150	110	100	3	3	4	12
BAKW 30	BAK 30	33 l	550	300	400	60	150	160	150	3	5	4	12
BAKW 44	BAK40/BAK 44	45 l	600	341	500	60	241	160	150	3	5	4	12
BAKW 70	BAK 63/BAK 70	63,5 l	730	422,5	580	60	282,5	160	150	3	5	4	12
BAKW 100	BAK 100	104 l	920	497	770	60	357	160	150	3	5	4	12

Accessories for oil tanks

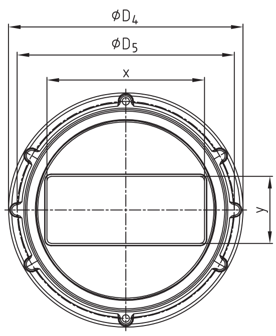


- Cleaning covers V324 and V449 according to DIN 24339
- Made from aluminium
- Screw tightening torque for all cleaning cover sizes 10 Nm at the maximum
- Cleaning cover V324-6/HFC and V449-6/HFC are resistant to HFC fluids
- Gaskets type PRD made from perbunane (NBR), made from Viton on request
- On request available with logo
- Max. permissible pressure = 0,5 bar

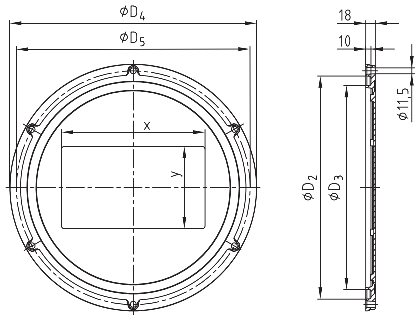
Cleaning cover design V250-4 PRD



Cleaning cover DIN 24339

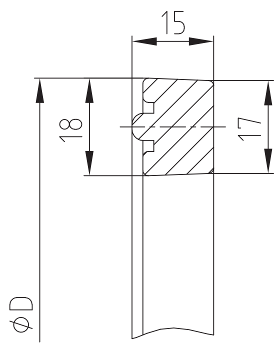


Cleaning cover



Cleaning covers								
Size	Dimensions[mm]							
	D_1	D_2	D_3	D_4	D_5	Number of bores	x	y
V250-4 PRD	11,5	229	193	-	250	4	170	80
V324-6 / V324-6/HFC *	11,5	304	268	350	324	6	235	100
V324-6 Mould *	11,5	304	268	350	324	6	276	158
V449-6 / V449-6/HFC	11,5	429	393	475	449	6	276	158
V530-12	11,5	505	471	560	530	12	276	158
V580-8	11,5	560	523	620	580	8	370	210

* Cover with 4-hole fixing on request.

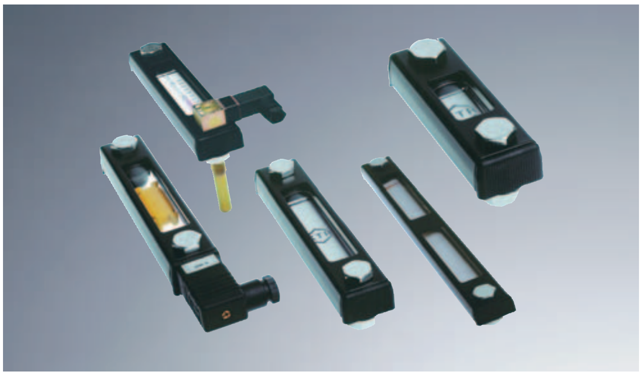


Gasket for cleaning covers			
Size		for cleaning cover	D [mm]
PRD 193 NBR	PRD 193 Viton	V250- PRD	229
PRD 268 NBR	PRD 268 Viton	V324	304
PRD 393 NBR	PRD 393 Viton	V449	429
PRD 471 NBR	-	V530	507
PRD 525 NBR	-	V580	561

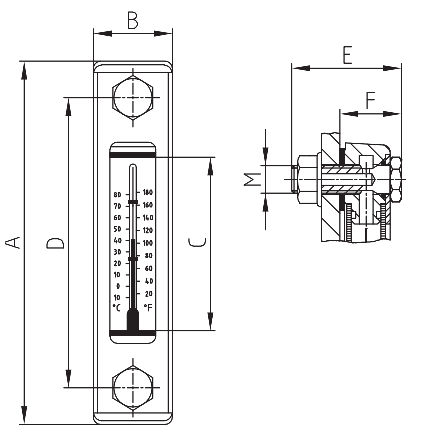
Order form

V449-6	PRD 393 NBR
Cleaning cover	Gasket

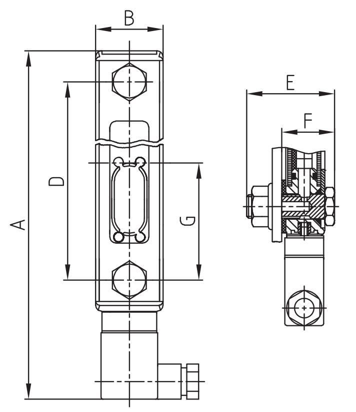
Accessories for oil tanks



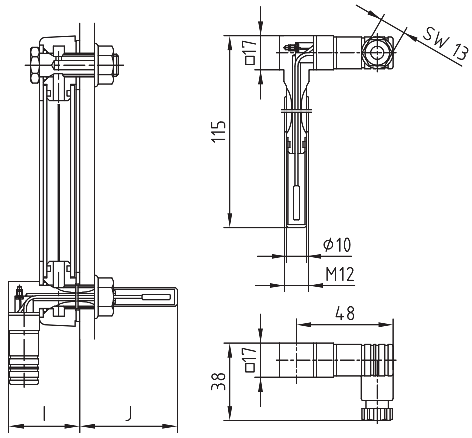
- Oil level indicator with and without temperature indication
- Oil level indicator with liquid level control indication
- Oil level indicator to be combined either with temperature switch TS60, TS70 or TS 80
- Suitable fot hydraulic oil HL, HLP, gas to max. 80 °C and diesel gas up to max. 60 °C
- Good UV resistance



Temperature indication with (KOT) and without (KO)



With visual/electrical control of the liquid level in the tank KOO/KOS

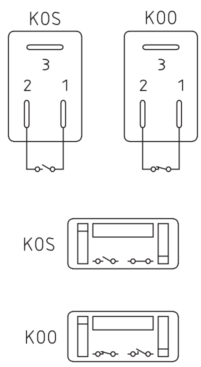


Combined with temperature switch TS 60, TS 70 or TS 80

Oil level indicator										
Designation	Dimensions [mm]								with TS	
	A	B	C	D	E	F	M	G	I	J
KO 01 / KOT 01	108	34	37	76	45	26	M12	—	39	76
KO 02 / KOT 02	159		76	127				—		
KOO 02 / KOS 02	205			127				50	47	68
KO 03	286		203	254				—	39	76

KOT 01: Indication range + 20 °C to + 80 °C
KOT 02: Indication range - 10 °C to + 80 °C
KOO: Electr. switch as opener
KOS: Electr. switch as closer
Operating range: - 10 °C to + 80 °C
Recommended screw tightening torque: 8 Nm
Prestress pressure of tank max. 1 bar

Elecrical connections and functions:



Contact load:
KOS max. 10 W
KOO max. 3 W
Voltage:
50 V AC/DC
Switching current:
KOS max. 0,50 A
KOO max. 0,25 A

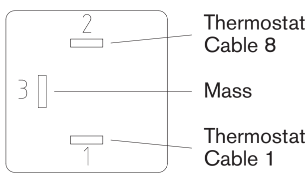
Line box with PG9
Protection IP 65
Connection 3 not used

Technical data (opener) of the temperature switch:

Shifting temperature: TS 60: Shifting temperture 60 °C / 140 °F
TS 70: Shifting temperture 70 °C / 158 °F
TS 80: Shifting temperture 80 °C / 176 °F
Hysteresis: 20 °C
Tolerance of the shifting temp.: ± 5 °C.

Alternating current
- max. voltage 250 V
- max. current with 10.000 circuits
  2,5 A with cos φ = 1,0
  1,6 A with cos φ = 0,6
- max. current with 10.000 circuits
  0,5 A with cos φ = 1,0
  ~0,25 A with cos φ = 0,6
- min. switching current 50 mA

Direct current
- max. voltage 42 V
- max. current with 10.000 circuits 1 A

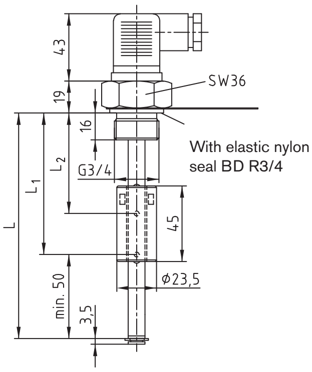


Order form

KO	02	+ TS 80
Typ [KO, KOT KOO or KOS]	Size [01, 02 or 03]	with Temperature switch [TS 60, TS 70 or TS 80]

Accessories for oil tanks

- Electrical level and temperature control
- Suitable for mineral oils
- Available with 1 or 2 level contacts and with 1 temperature probe
- Electrical switch: decreasing level „opener“ increasing temperature „opener“
- Further lengths on request



Level temperature switch

Size	Dimensions [mm]		
	L	L_1	L_2
NVT22	220	170	40
NVT37	370	320	40
NVT45	450	400	40

Switching tube

Operating pressure	max. 1 bar
Operating temperature	max. 80 °C
Density of fluid	min. 0,8 kg/dm³
Swimmer SK 161	NBR
Switching tube	MS
Flange	MS

Level contacts

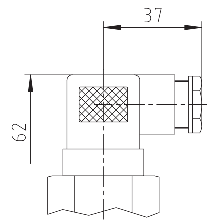
Function	NC (opener)
Max. voltage operating	230 V
Max. current	0,5 A
Contact load	10 VA

Temperature contacts

Max. voltage operating	250 V
Max. current switching	2 A
Max. contact load	100 VA
Switch-back difference	15 K ± 5 K

Plug-in connection D03

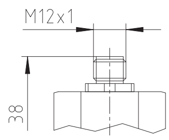
Three-pole + PE DIN 43650



IP65 protection
Cable screwing PG11
Max. voltage 230 V AC/DC

Plug-in connection DM12

3pol.



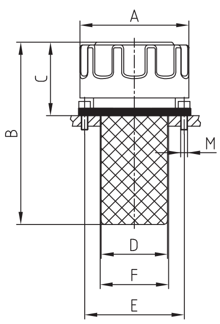
IP67** protection
Cable screwing PG7**
Max. voltage 24 V DC

** with respective upper part of plug

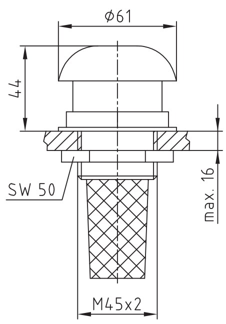
Order form

NVT	22	2	60	D3
Type	Size 22 = 220 mm cantact tube 37 = 370 mm cantact tube 45 = 450 mm cantact tube	Type * 1 = 2 switch contact area H a. L 2 = 1 switch contact area L and 1 temperature switch	Shifting temperature O = without temperature switch 60 = 60 °C 70 = 70 °C 80 = 80 °C	Voltage D3 = max. 230 Volt (Standard) DM12 = max. 24 Volt

* Type with level switch on request



KE 01 and KE 02
filter grade 10 µm



KE 03
filter grade 45 µm

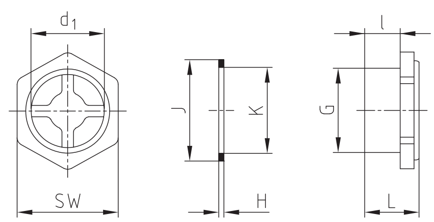
Filler breather with aeration filter

Size	Dimensions [mm]						
	A	B	C	D	E	F	M
KE 01	44,5	110	48,5	28	41,3	30	3xM5
KE 02	79,9	134	54	48,7	73	53	6xM5

Air flow: KE 01 = 0,40 m³/min KE 02 = 0,45 m³/min

Order form

Filler breather	KE 01
Type	Size



Oil level sight glass

Size	Dimensions [mm]							
	L	l	d_1	G	H	J	K	SW
G1/2A	17,7	9,2	27,5	G1/2	2	27	21	27
G3/4A	18	9,2	23,8	G3/4	2	32	27	32
G1A	23,5	14	29	G1	2	40	34	40

Order form

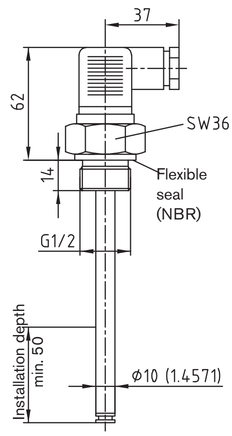
Oil level sight glass	G3/4A
Type	Size

Temperature control and monitoring

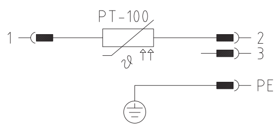
- Control of the operating temperature of the medium
- Value of resistance proportionally changeable to the temperature
- Continuous signal change
- Flexible seal at the screwed thread head
- Optionally available with transmitter

Temperature probe TE-PT-100											
Basic values of precision resistance PT-100											
°C	0	10	20	30	40	50	60	70	80	90	100
Ohm	100,00	103,90	107,79	111,67	115,54	119,40	123,24	127,07	130,89	134,70	138,50

Screwing and dipping sleeve:	1.4571 (stainless steel) – brass on request
Available lengths:	100, 200 and 300 mm from stock (special lengths up to 1000 mm)
Operating pressure:	10 bar (dipping sleeve of stainless steel)
Operating temperature/ measuring range:	- 40 °C to + 100 °C
Resistance feeler element:	PT-100 Class B DIN/IEC 751
Max. S-wire current PT-100:	1 mA
Plug:	according to DIN 43650 – 3 pl. + PE, Protection class IP65, cable screwing PG11



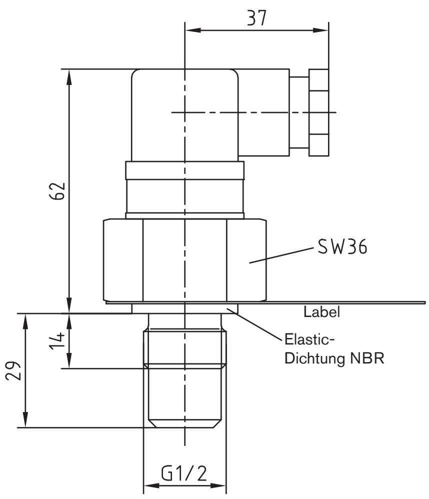
Connection diagram:



Order form

TE	PT-100	300
Temperature probe - electronic	Resistance feeler element	Lenght of dipping sleeve

Temperature switch



- Simple, solid design
- Electric insert easy to disassemble
- For plug according to DIN 43650 direction of cable outlet can be set in steps of 90°
- Elastic seal
- Protective system IP 65

Technical data	
Control element	DI metal
Switching function	NO = make contact
Switching temperature	+ 25 °C up to + 80 °C
Material of probe	aluminium anodisedt
Operating pressure max.	15 bar
Operating temperature	- 40 °C to + 80 °C

Temperature contacts

Operating voltage max	230 V AC
Switching current max.	2 A
Contact load max.	100 VA
Tolerance	± 5 K
Difference of shift back	15 K ± 3 K

Shift point:		
	40 °C	TSC 40
	50 °C	TSC 50
	60 °C	TSC 60
	70 °C	TSC 70
	80 °C	TSC 80

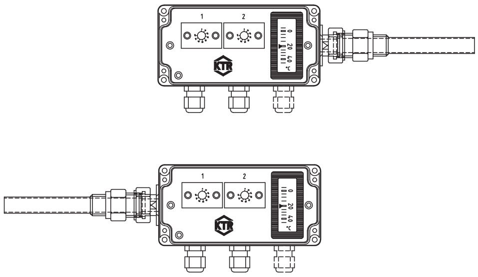
Order form

TSC	50
Temperature switch	Shift point 50 °C

Temperature control and monitoring

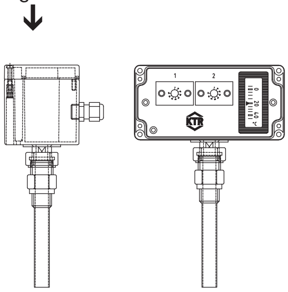
- Temperature control, indication and control of cooling and heating circles
- Excess temperature safety device of units
- Level control (IRDN)
- Used in hydraulic, lubrication and tempering units
- Up to 7 functions in one housing
- Dipping sleeve made from stainless steel
- Stable housing made from hardly inflammable and self-extinguishing Makrolon
- Operating range from - 30 °C to + 160 °C (IR)
- **IRDN:** Large LED display
  Level monitoring by means of 2-off firmly set Read contacts

Industrial control system: Type/position of the dipping sleeve

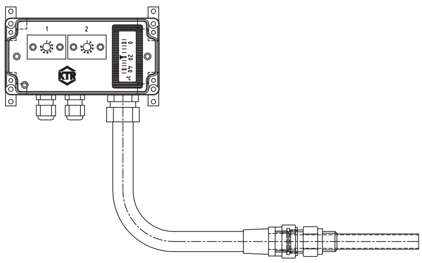


Type R and L

Viewing direction



Type H and U



Type S_1

R: Dipping sleeve on the right
L: Dipping sleeve on the left

H: Dipping sleeve in the back on the right
U: Dipping sleeve at the bottom

S_1: with 1 hose
S_3: with 2 hoses

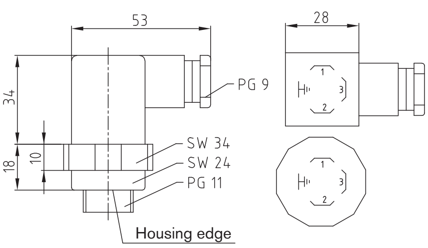
Hose lengths: S_1 = 1500 mm and S_3 = 2* 1500 mm

Electrical connections (IR)

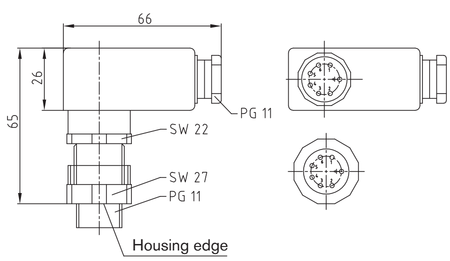
A01 standard: Flat plug 6,3 x 0,8; enclosed flat plug-in sleeves DIN 46247/3

A04 special design: Europe terminal strip completely cabled

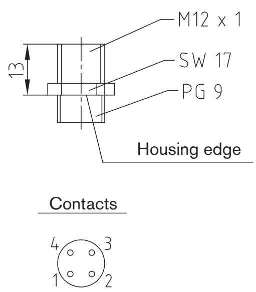
Connectors A02, A03 and A05 see pictures.



Plug A02
DIN 43650

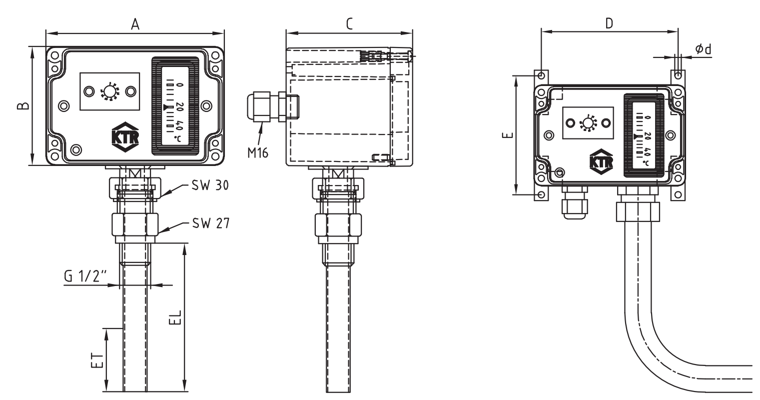


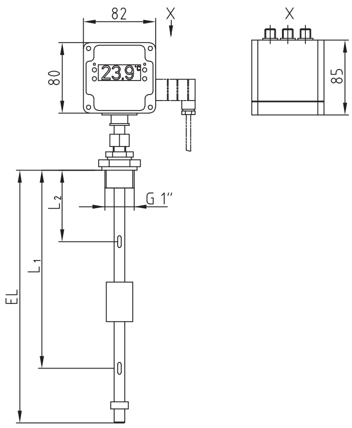
Plug A03
DIN 43651



Plug A05
M12 - 4pol.

Temperature control and monitoring





Type IR						
Dimensions of the housing [mm]						
Number of functions	A	B	C	D	Type S_1 - S_3 E	d
1	82	80	85	70	94	5,2
2	120	80	85	108	94	5,2
3	160	80	85	148	94	5,2
4 / 5 / 6 / 7	240	120	100	228	134	5,2

Type IRDN			
Type	EL	L_1	L_2
IRDN 220	220	160	65
IRDN 370	370	310	65
IRDN 450	450	390	65

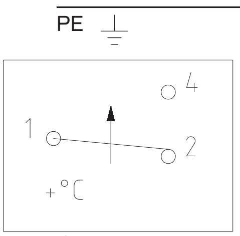
Dimensions of the dipping sleeve IR						
Typ/EL -installation length	100	200	300	400	500	900
ET - mm min. minimum depth of immersion referring to the number of installed functions						
1 - 3 functions	90					
4 - 6 functions		180				
7 functions			270			

Controllers and temperature indication (IR)				
Type	Function	Range	Max. probe temperature limiting temperature	Shifting difference Kelvin
00	Adjustable controller	-30 °C bis +40 °C	80	~5
02	Adjustable controller	0 °C bis +80 °C	120	~5
03	Adjustable controller	+10 °C bis +120 °C	160	~5
04	Adjustable controller	+10 °C bis +120 °C	160	~10
05	Adjustable controller	+60 °C bis +160 °C	200	~5
07	Adjustable limiter *	0 °C bis +150 °C	200	~5
T1	Thermometer	0 °C bis +120 °C	140	
T2	Thermometer	-40 °C bis +80 °C	100	

* Manual adjustment

Pin connection each controller IR

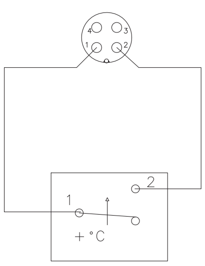
PE - connection (customer)



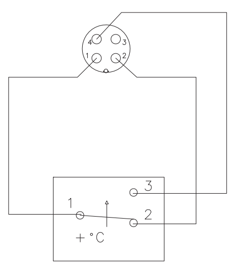
Controller 1 ... X
Connection 6,3 AMP
Insulated plug

Technical data	
16 A (2,5)/250 VAC	0,5 K/min.
10 A (1,5)/400 VAC	
	T max. dependent on the type

Pin connection IRDN



Controller



Level switch

Temperature control and monitoring

Type IR

Technical data

Contact selection	Unipolar changer
Contact material	Hard silver Ag
Setting gange	~ 30 °C to 160 °C
Shifting accuracy	~ 4 °C
Ambient temperature	~ 35 °C to 80 °C
Test Certificates	VDE 0631, NF, SEMKO, Demko, ÖVE, KEMA
Isulation	According to VDE
Protection class	IP 65
Cable screwing	M16 with strain relief
Max. operating pressure of the dipping sleeve	16 bar
Indication of thermometer	~ 30 °C to 160 °C
Accuracy of indication	Class 3 according to DIN 16203
Housing material	Polycarbonate (makrolon)
Dipping sleeve	1.4301
Cable screwing	Polyamide
Probe + capillary tube	Cu
Shifting power	16 A (2,5)/250 VAC 10 A (1,5)/400 VAC 0,5 A/24 VDC further data on request
Failsafety	2000 VAC between unified contacts and mass 1150 VAC between open contacts

LED 12 -24 V	Index
green	2
red	3
red + green	4

LED 240 V	Index
green	5
red	6

Order form

IR	200	H	A01	03 - 02 - 02 - T1
Typ	Length of the dipping sleeve	Position of dipping sleeve	Connection	Requested controller or thermometer (max. 7). Arrangement according to requested assembly. If LED is requested, the figure 0 in the controller name is replaced by the respective index number (e. g. controller 02 and LED red = 32).

Type IRDN

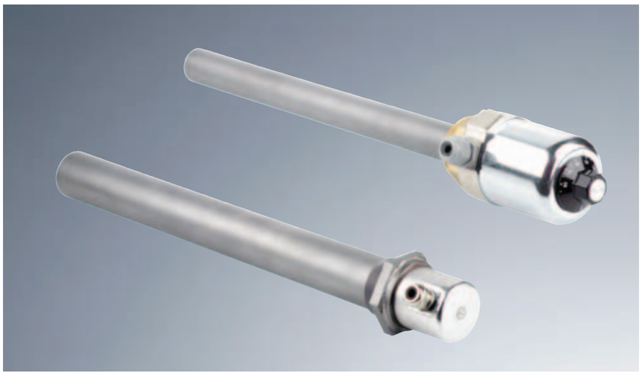
Technical data

Operating temperature:	min. 0 °C - max. 100 °C
Measuring input:	
Description	PT100 DIN EN 60751
Measuring range	-200... +300 °C
Accuracy	0,10 %
Overflow/underflow	is not recognized
Environmental influences:	
Ambient temperature range	0 ... +55 °C
Storage temperature range	-40 ... +70 °C
Temperature drift	<= 100 ppm/K from the measuring range
Climate resistance	<= 75 % % relative moisture without dew
Output:	
Relay	150.000 switchings with 250 VAC/10 A Ohmic load 800.000 switchings with 250 VAC/3 A Ohmic load Upper/lower figure adjustable - each as “OPENER”
Control temperature range:	min. 0 °C - max. 100 °C
Power supply:	230VAC +10 / -15 % 12 ... 24 VDC +15 / -15 %
Power consumption	< 3 VA
Material:	
Dipping pipe	Stainless steel (1.4301)
Swimmer	Hostaform C
Housing	Polycarbonate (Makrolon)
Plug:	
Power supply	230 VAC DIN EN 175301-803 form B
Power supply	12 ... 24 VDC M12 - 4 poles
Outputs	M14 - 4 poles

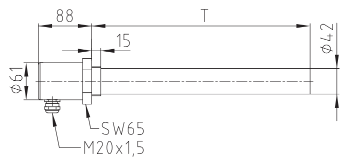
Order form

IRDN	220	01
Typ	Immersion depth of dipping sleeve [EL]	Power supply 01 = 230VAC +10/-15 %, 48 ... 63 Hz 02 = 12 ... 24 VDC +15/-15 %

Tank heaters

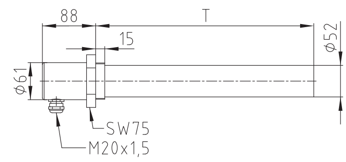


- Inserted heating cartridges to preheat hydraulic oil
- Temperature control by internal or external setting single-pole control 0 - 85 °C, 16 A
- Replaceable ceramic heating cartridges (assembly without oil drain)
- Steel cap from bright zinc coating
- Suitable for horizontal assembly below oil level
- Material: steel (other material on request)
- Surface load 1.5 W/cm² for hydraulic oils
- Protection class IP 65 (excluding design EHP (TA) IP 54)
- Further designs available on request
- The connector pin assignment is enclosed to the unit



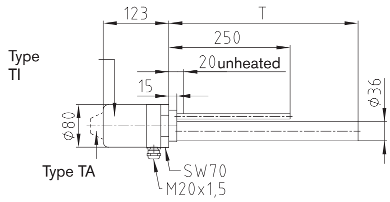
Without temperature control

Type EHP – G 1 1/2"



Without temperature control

Type EHP – G 2"



With temperature control switching accuracy ± 3 °C

Type EHP (TA/TI) – G 2"

Inserted heating cartridges EHP

Type	Heating capacity [Watt]	Immersion depth T [mm]	Voltage [V]	Type	Heating capacity [Watt]	Immersion depth T [mm]	Voltage [V]	Type	Heating capacity [Watt]	Immersion depth T [mm]	Voltage [V]
Type EHP G 1 1/2"	400	200	230	Type EHP G 2"	500	200	230	Type EHP (TA/TI) G 2" with temperature control	450	300	230
	600	300	230		750	300	230		600	400	230
	800	400	230		1000	400	230		750	500	230
	1000	500	230		1250	500	230		900	600	230
	1200	600	230		1450	600	230		1050	700	230
	1400	700	230		1700	700	230		1200	800	230
	1600	800	230		1950	800	230		1350	900	230
	1800	900	230		2200	900	230		1500	1000	230
	2000	1000	230		2450	1000	230		1650	1100	230
	2200	1100	230		2700	1100	230		1800	1200	230
	2400	1200	230		2950	1200	230		1950	1300	230
	2800	1400	230		3450	1400	3 x 400		2100	1400	230
	3200	1600	230		3900	1600	3 x 400		2250	1500	230
	3600	1800	3 x 400		4400	1800	3 x 400		2400	1600	230
	4000	2000	3 x 400		4900	2000	3 x 400				

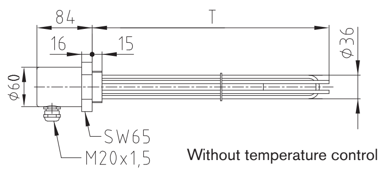
As an alternative: Control of tank heater possible in combination with KTR industrial controls with more than one temperature switch point (see page 189 to 191). In this case the temperature control on the tank heater can be done without.

Order form

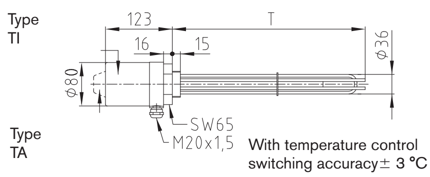
EHP	1950	1300	G 2"	TI	1 x 230 V
Type	Capacity [W]	Immersion depth T [mm]	Size of screwing thread	TA = temperature control with external setting TI = temperature control with internal setting O = without temperature control	Please make sure to mention the voltage [V] in your order, e. g. 1 x 230 V; 2 x 400 V; 3 x 400 V (from 1000 W)

Tank heaters

- Inserted tubular heating element to preheat hydraulic oil
- Suitable for horizontal assembly below oil level
- With or without temperature control for internal or external setting with single-pole control 0 - 85 °C, 16 Ampere
- Surface load 1.5 W/cm² for hydraulic oil
- Steel cap from bright zinc coating/cover from stainless steel
- Material: stainless steel (1.4541)/brassy nipple (other material on request)
- Protection class IP 65 (excluding design EH (TA) IP 54)
- Further designs available on request
- The connector pin assignment is enclosed to the unit
- Notice our mounting instructions (www.ktr.com)



Type EH – G 1 1/2”



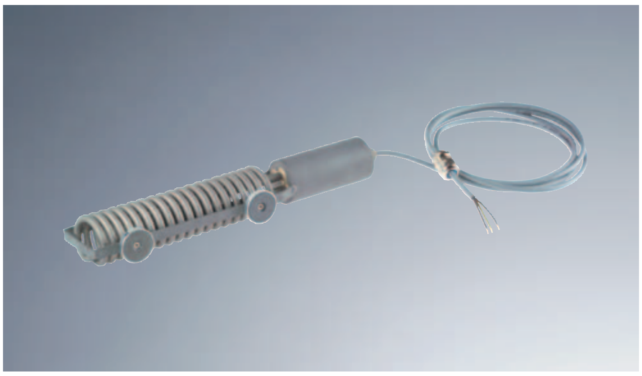
Type EH (TA/TI) – G 1 1/2”

Inserted tubular heatings type EH			
	Heating capacity [Watt]	Immersion depth T [mm]	Voltage [V]
Type EH G 1 1/2” without ot with temperature control	380	200	230
	500	250	230
	750	350	230
	990	450	230
	1460	650	230
	1825	800	230
	2300	1000	230

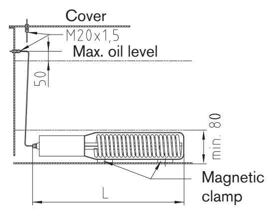
Order form

EH	990	450	G 1 $^{1}/_{2}$”	TI	1 x 230 V
Type	Capacity [W]	Immersion depth T [mm]	Size of screwing thread	TA = temperature control with external setting TI = temperature control with internal setting O = without temperature control	Please make sure to mention the voltage [V] in your order, e. g. 1 x 230 V; 2 x 400 V; 3 x 400 V (from 1000 W)

Inserted tank heater with magnetic clamp type TEHM



- To preheat hydraulic oil
- Inserted tank heater either horizontally to the tank ground or vertically to the tank wall by means of magnetic clamps
- Ideal solution to retrofit existing machines and plants
- Assembly without oil drain
- Internal control with preset cut-in or cut-off temperature (standard 20 °C, switching precision 3 °C)
- Shifting temperatures may be amended by KTR on customer’s request
- Other media/operating fluids available on request
- The connector pin assignment is enclosed to the unit
- Notice our mounting instructions (www.ktr.com)



Type	Heating capacity [Watt]	Overall length L [mm]	Voltage [V]
TEHM	250	265	230
	500	290	230
	1000	400	230

Order form:

TEHM	1950	00
Type	Capacity [W]	Cut-off temp. set by the company to 20 °C = 00 Without temperature control = 01. Requested cut-off temperature e. g. 35 °C = 35.

Technical data:

Shifting accuracy:	± 3°	Surface load:	1,2 W/cm² (0,6 W/cm² on request)
Voltage:	230 V (other on request)	Connection cable:	Three-pole, 2,5 m long including screwed cable gland M20x1,5

As an alternative: Control of tank heater possible in combination with KTR industrial controls with more than one temperature switch point (see page 189 to 191). In this case the temperature control on the tank heater can be done without.

NEW

Made for Motion KTR

Oil/air cooler

- High-performance cooler net for a maximum static operating pressure of 26 bar in aluminium (Al)
- Suitable for hydraulic oil, gear lubricant oil, lubricating oil, motor oil and water-glycine
- Fan drive in 12 V, 24 V, 230 V/400 V and hydraulic drive
- Easy maintenance and good options for cleaning
- Low sound pressure level
- CE certification
- Short delivery period

A compact and high-performance cooler series comprising eight sizes was developed for high-power cooling of hydraulic and lubricating oils.

Accessories
- Thermal switch
- Thermal bypass valves

Applications
- Construction machines
- Agricultural machines
- Rail technology
- Machine tools
- Hydraulic power packs
- Wind power
- Hydraulic presses
- Iron and steel industry etc.

Arrangement
- Cooler net (plate and bar) made of aluminium with industrial lamina in black (RAL 9005)
- Fan cover made of steel in black (RAL 9005)
- Fan made of nylon PAG
- Protective grid made of steel in black (RAL 9005)
- Fan12 V/24 V IP68, 230 V/400 V IP55
- Fan with hydraulic drive

Order form

OAC	400	-01
Typ	Size	Variant

NEW

Made for Motion KTR

Oil/air cooler

Selection system

To select the suitable cooler you need to know the following details:

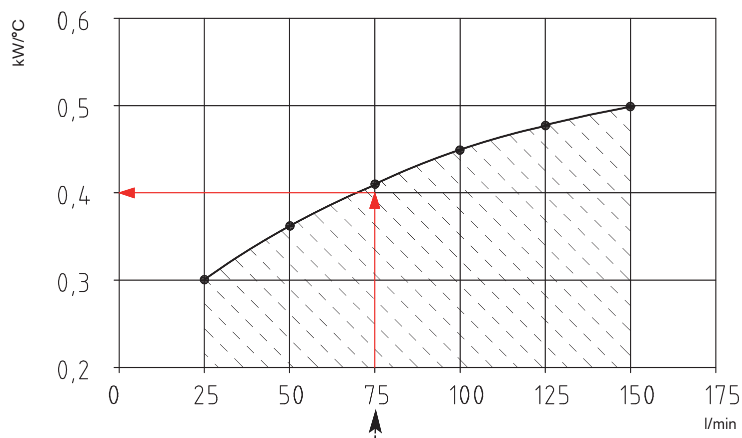
Q [kW] Heat to be dissipated
V [l/min] Oil flow
T_{Oil} [°C] Inlet temperature of oil into cooler
T_L [°C] Inlet temperature of ambient air into cooler

Example of calculation

Details given:

Q = 14 kW
V = 75 l/min
T_{Oil} = 65 °C
T_L = 30 °C

Power diagramme OAC 400



Calculation of the specific cooling effect

Inlet temperature difference ETD [°C] $= T_{Oil} - T_L$
required specific cooling effect $P_{erf.}$ = Q/ETD
The required specific cooling effect must be lower than the power curve! ➔ 14 kW/(65°C - 30°C)= 0,4 kW/°C
The following was selected: OAC 400
The actual cooling effect of the cooler is 0,41 kW/°C x 35°C = 14,35 kW

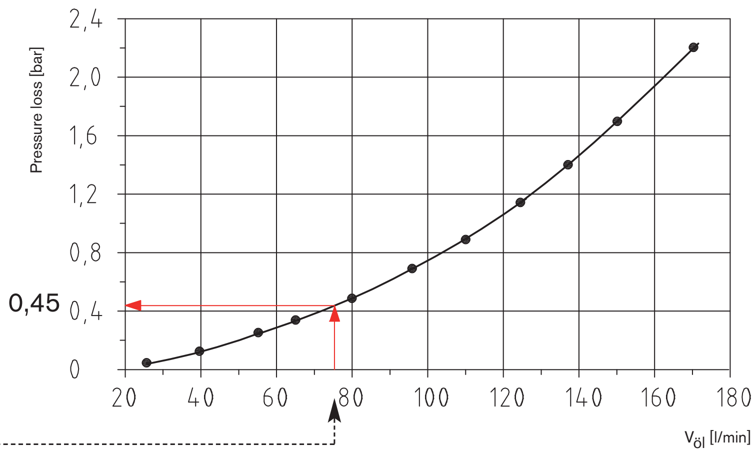
Calculation of the pressure lost

The pressure loss in the curves of the different data sheets is based on a viscosity of 30 cSt
The effective pressure loss is calculated as follows:
Pressure loss (from curve) x factor = effective pressure loss

Example
$V_{öl}$: 75 l/min
Viscosityt: 20 cSt

➔ 0,45 bar x 0,75 = 0,3375 bar

Pressure loss 30 cSt



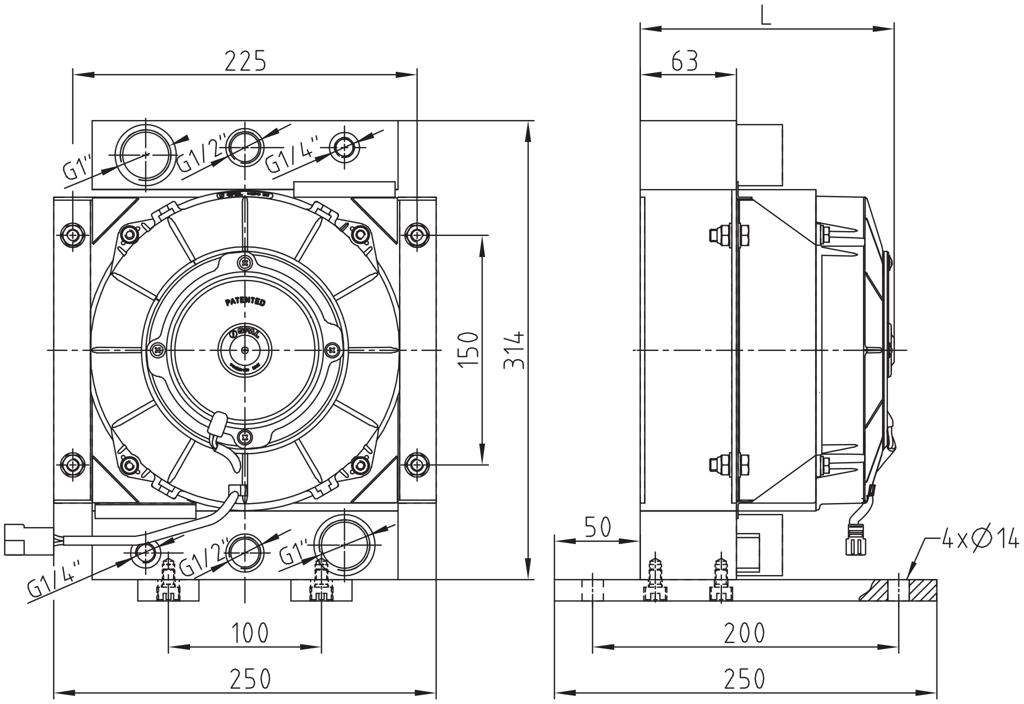
Conversion factor pressure loss

cSt	10	15	20	30	40	50	60	80	100
Factor	0,5	0,65	0,75	1	1,2	1,4	1,6	2,1	2,8

NEW

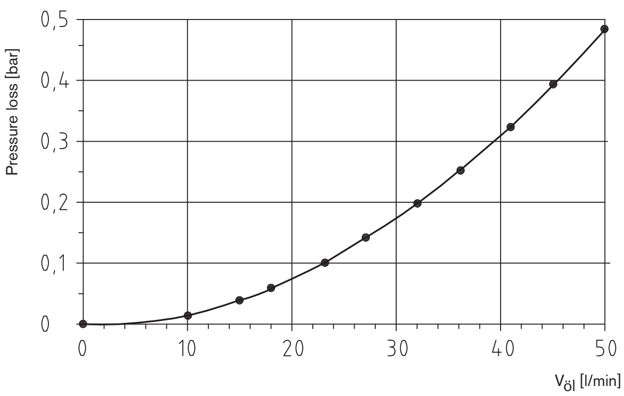
Made for Motion KTR

Oil/air cooler

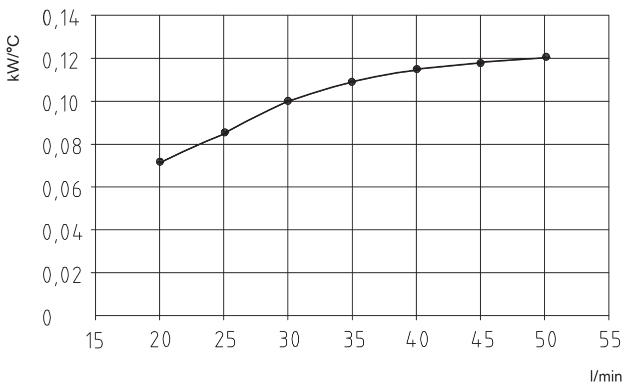


OAC 100								
Cooler type	Drive	kW	A	IP	Fan-Ø [mm]	db [A]	L	Weight [kg]
OAC100-01	12 V DC	0,060	8,5	68	190	70	167	6,9
OAC100-02	24 V DC	0,068	2,8	68	190	70	167	6,9

Pressure loss 30 cSt



Power diagramme OAC 100

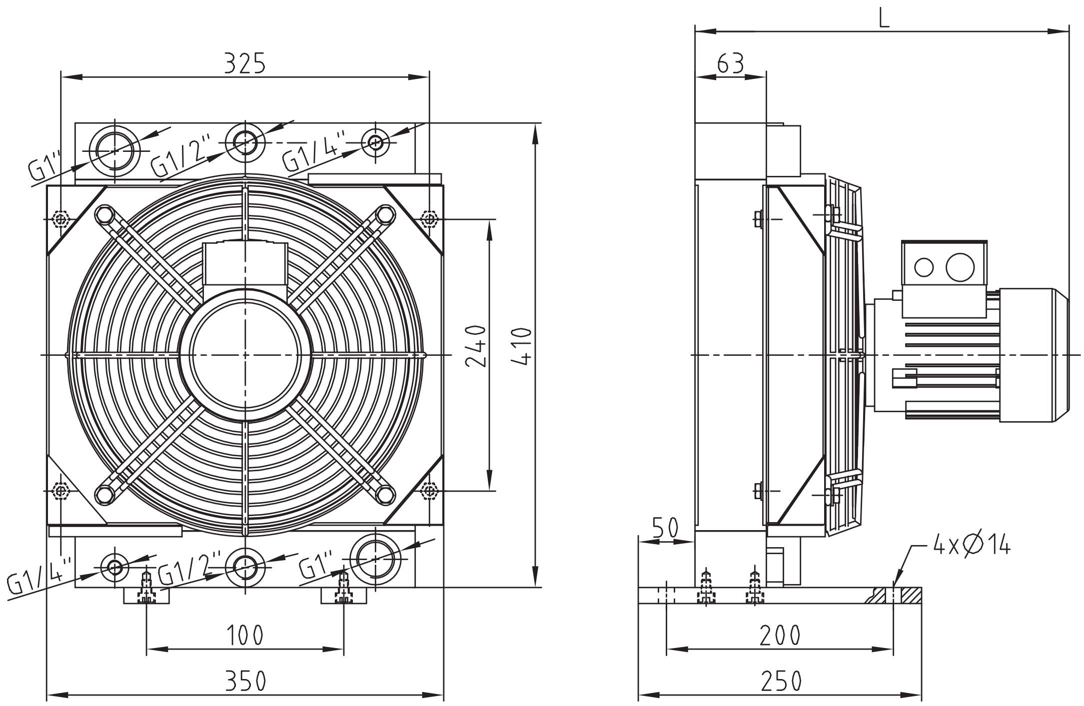


Conversion factor pressure loss									
cSt	10	15	20	30	40	50	60	80	100
Factor	0,5	0,65	0,75	1	1,2	1,4	1,6	2,1	2,8

NEW

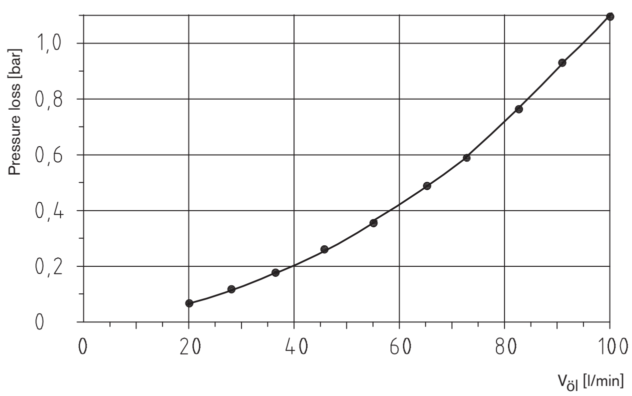
Made for Motion KTR

Oil/air cooler

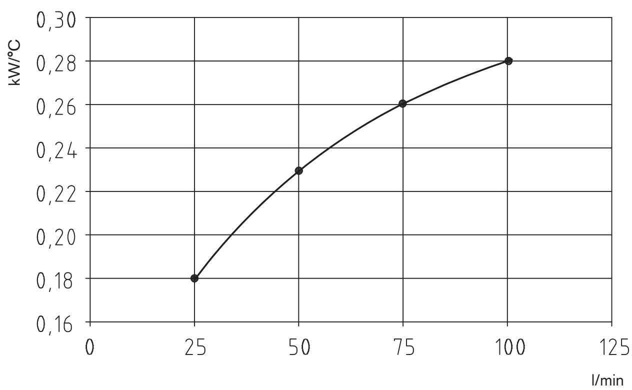


OAC 200								
Cooler type	Drive	kW	A	IP	Fan-Ø [mm]	db [A]	L	Weight [kg]
OAC200-01	12 V DC	0,084	4,7	68	280	73	167	14
OAC200-02	24 V DC	0,192	9,8	68	280	73	167	14
OAC200-03	230 V/400V	0,18	0,56	55	280	77	329	16
OAC200-04	Hydraulic				280	77	277	16

Pressure loss 30 cSt



Power diagramme OAC 100



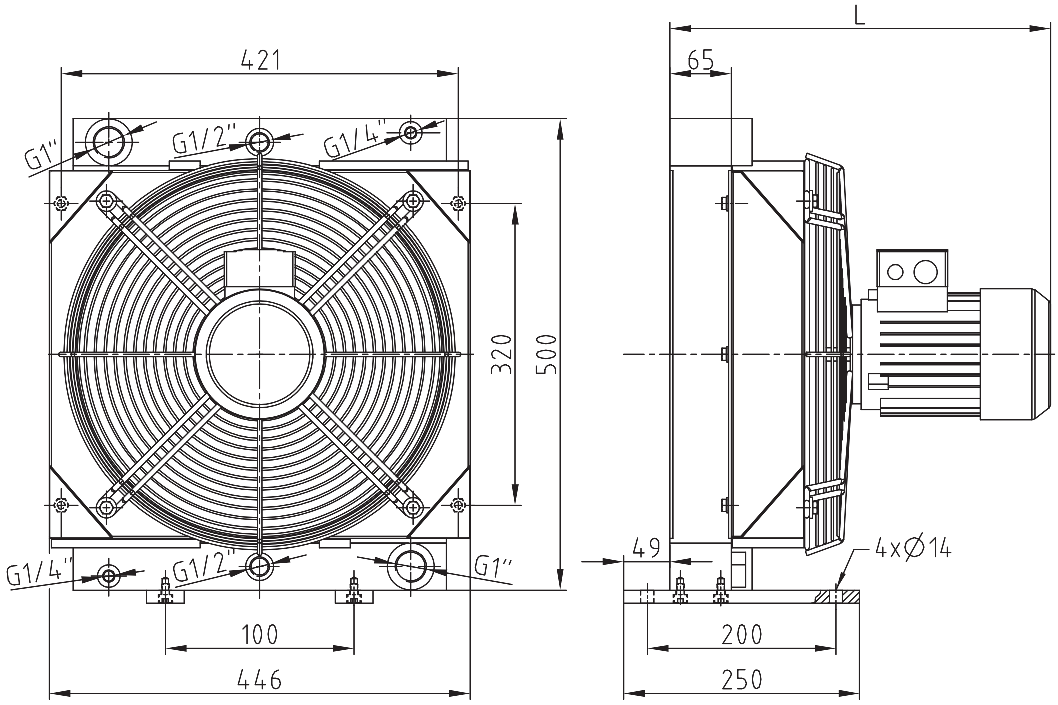
Conversion factor pressure loss

cSt	10	15	20	30	40	50	60	80	100
Factor	0,5	0,65	0,75	1	1,2	1,4	1,6	2,1	2,8

NEW

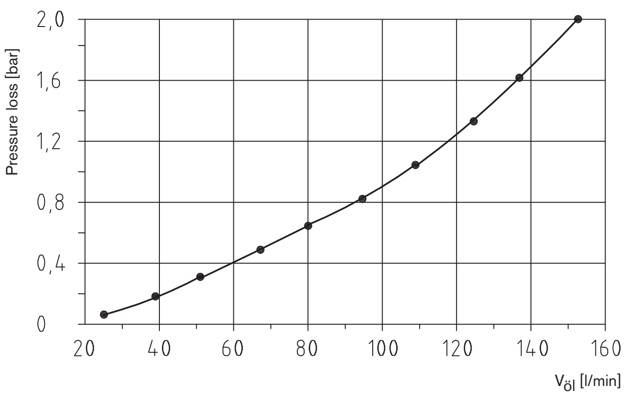
Made for Motion KTR

Oil/air cooler

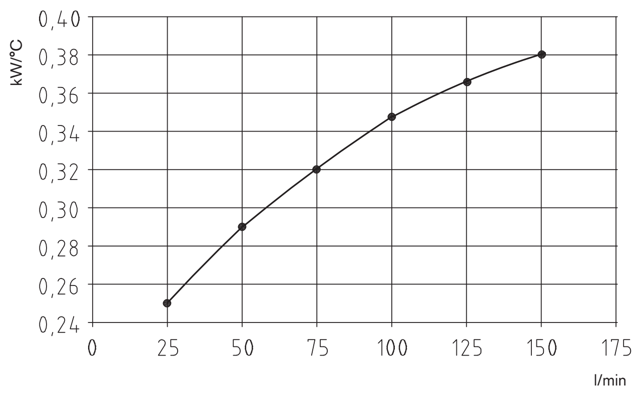


OAC 300								
Cooler type	Drive	kW	A	IP	Fan-Ø [mm]	db [A]	L	Weight [kg]
OAC300-01	12 V DC	0,252	21	68	385	76	230	22
OAC300-02	24 V DC	0,192	9,8	68	385	75	230	22
OAC300-03	230 V/400V	0,37		55	380	77	369	22
OAC300-04	Hydraulic				380	77	314	22

Pressure loss 30 cSt



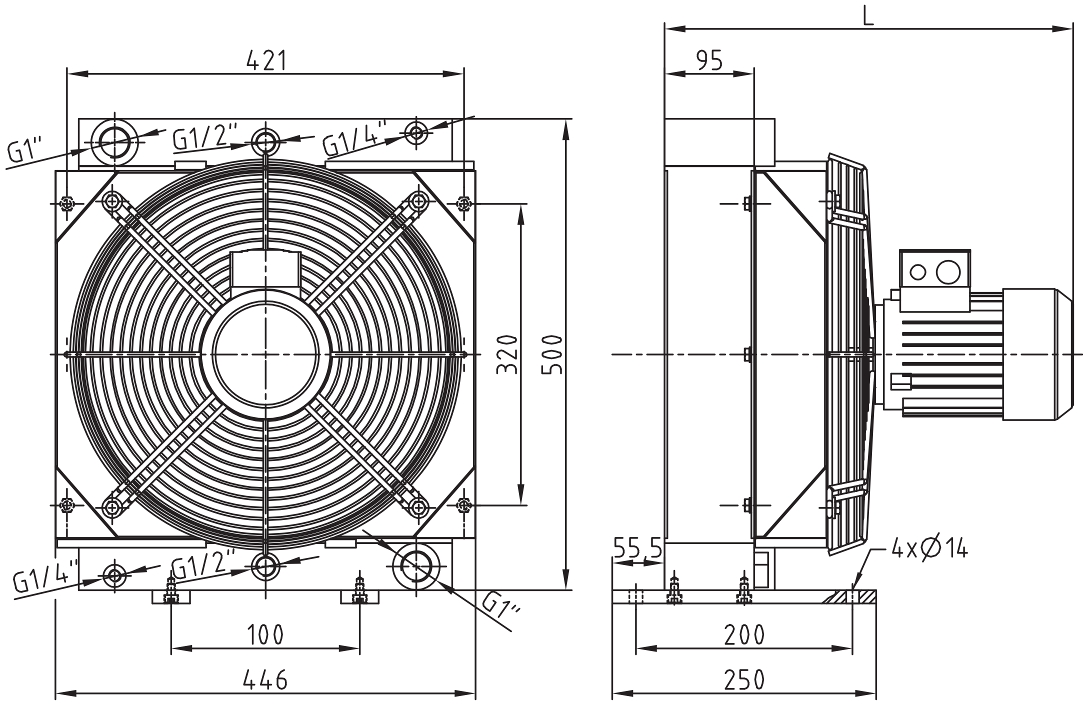
Power diagramme OAC 300



Conversion factor pressure loss									
cSt	10	15	20	30	40	50	60	80	100
Factor	0,5	0,65	0,75	1	1,2	1,4	1,6	2,1	2,8

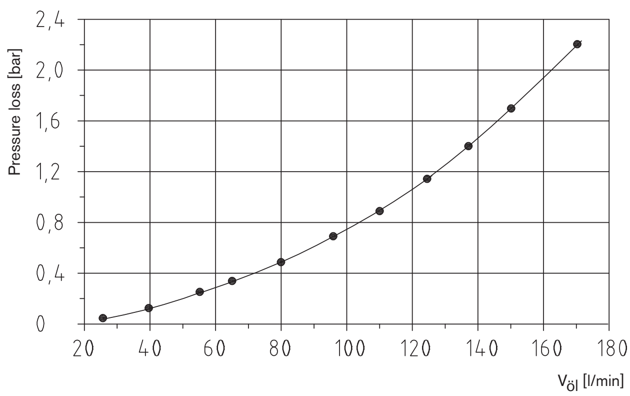
NEW

Oil/air cooler

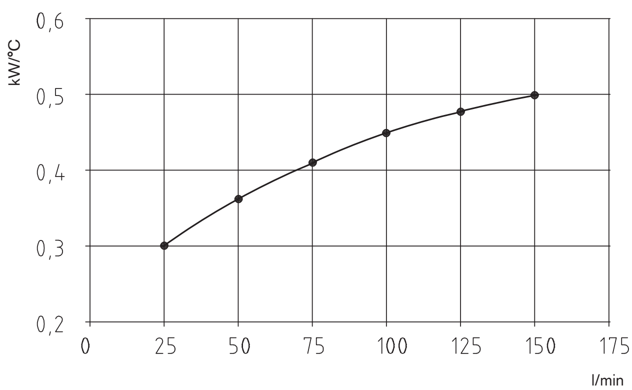


OAC 400								
Cooler type	Drive	kW	A	IP	Fan-Ø [mm]	db [A]	L	Weight [kg]
OAC400-01	12 V DC	0,252	21	68	385	76	260	27
OAC400-02	24 V DC	0,192	9,8	68	385	75	260	27
OAC400-03	230 V/400V	0,37		55	380	77	426	27
OAC400-04	Hydraulic				380	77	344	27

Pressure loss 30 cSt



Power diagramme OAC 400

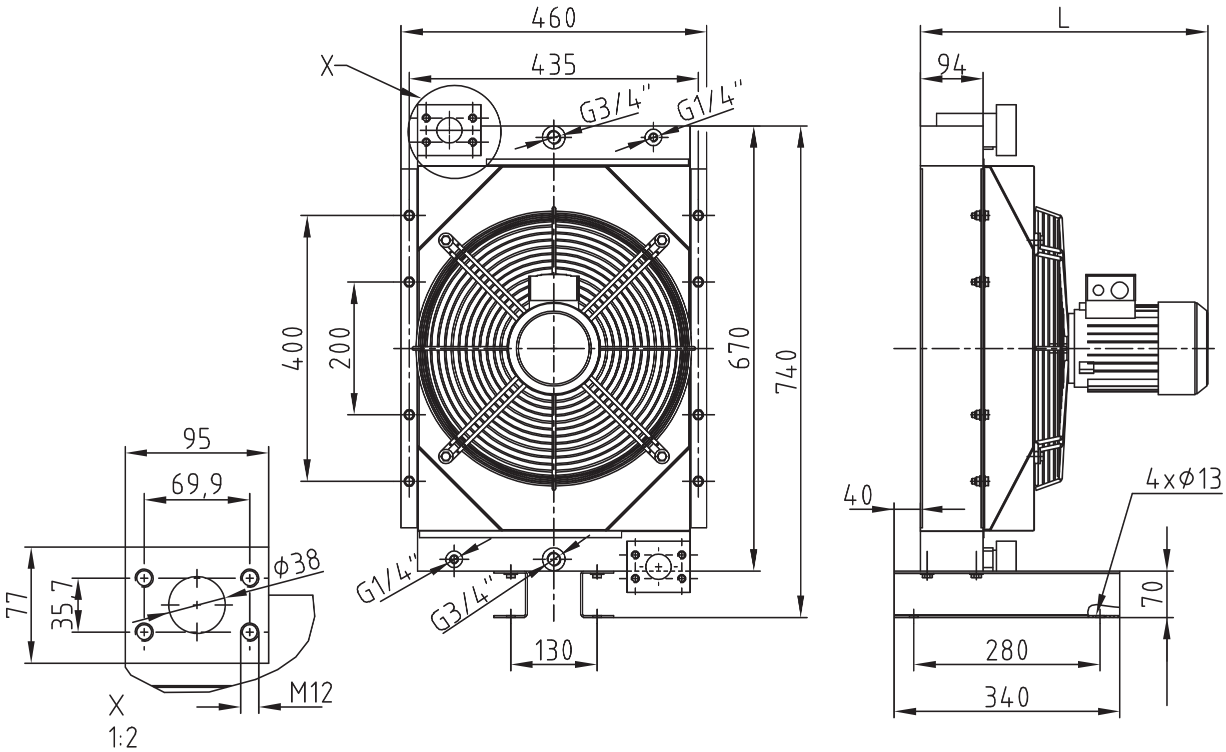


Conversion factor pressure loss									
cSt	10	15	20	30	40	50	60	80	100
Factor	0,5	0,65	0,75	1	1,2	1,4	1,6	2,1	2,8

NEW

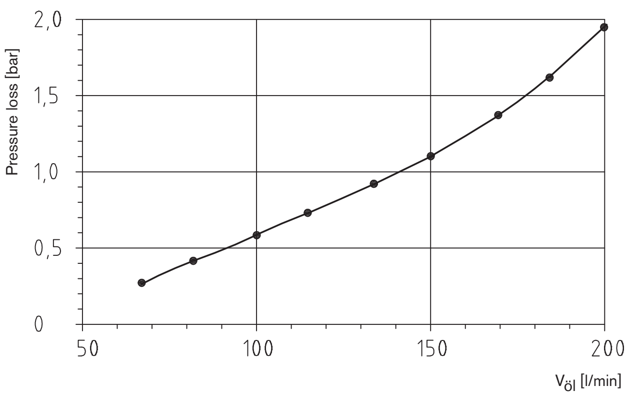
Made for Motion KTR

Oil/air cooler

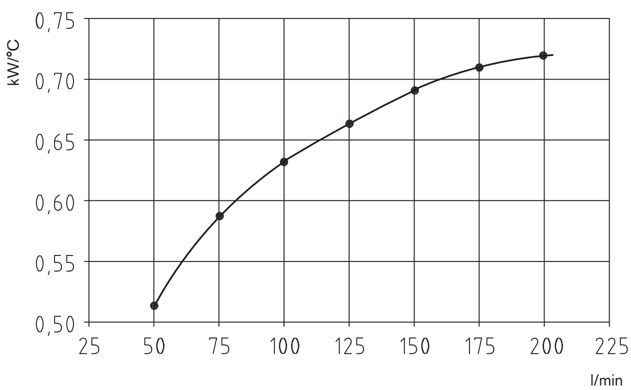


OAC 500								
Cooler type	Drive	kW	A	IP	Fan-Ø [mm]	db [A]	L	Weight [kg]
OAC500-01	12 V DC	0,096	20,8	68	385	78	167	36
OAC500-02	24 V DC	0,072	10,3	68	385	78	167	36
OAC500-03	230 V/400V	0,37	1,03	55	380	77	430	38
OAC500-04	Hydraulic				380	77	353	37

Pressure loss 30 cSt



Power diagramme OAC 100

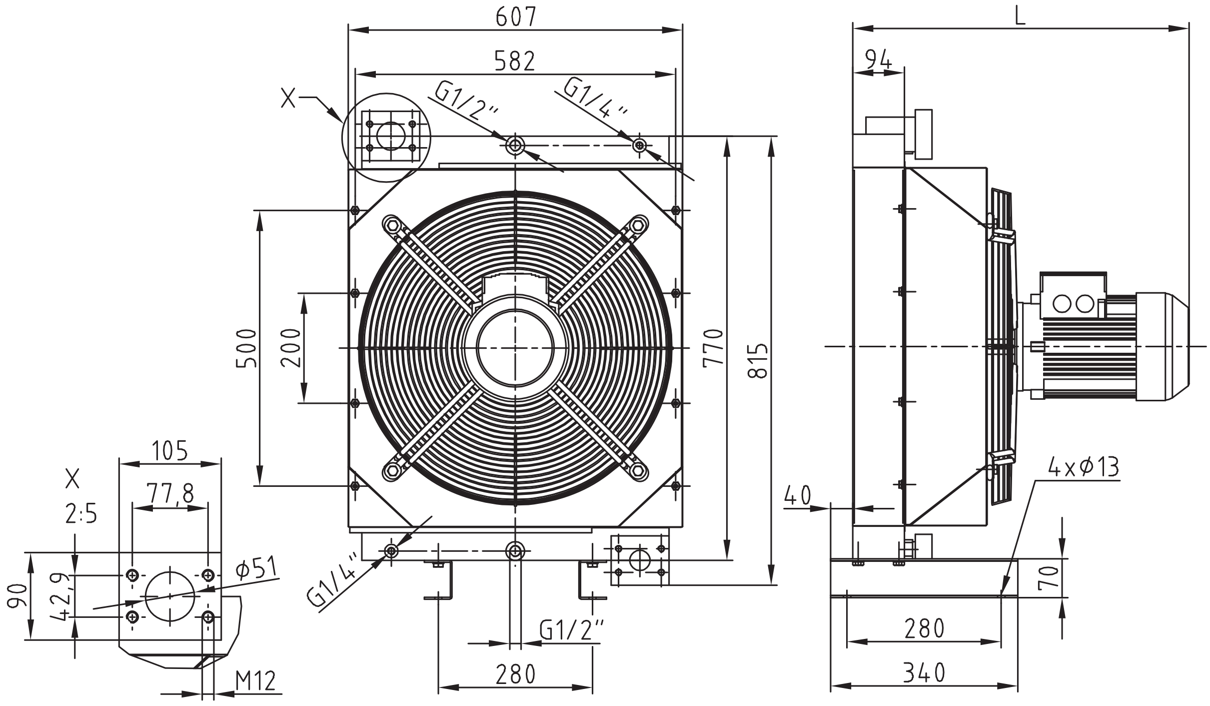


Conversion factor pressure loss									
cSt	10	15	20	30	40	50	60	80	100
Factor	0,5	0,65	0,75	1	1,2	1,4	1,6	2,1	2,8

NEW

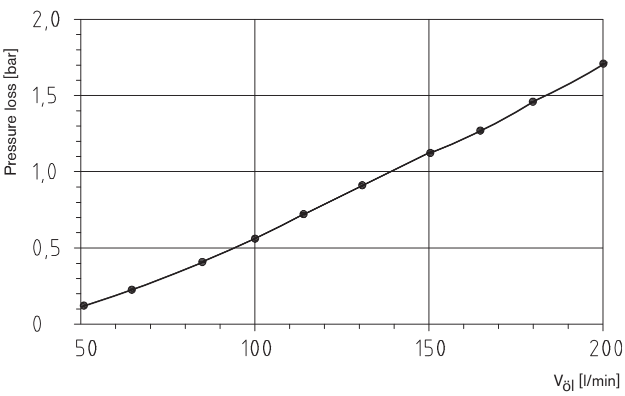
Made for Motion KTR

Oil/air cooler

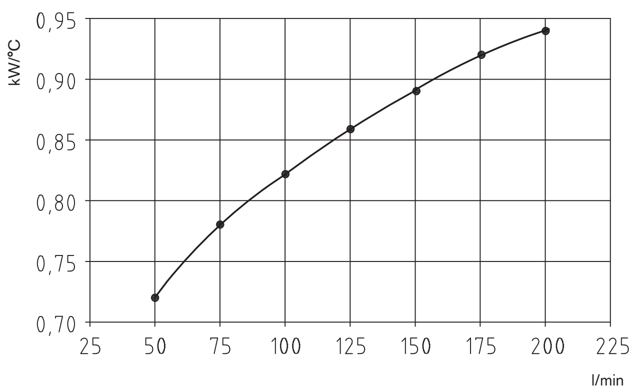


OAC 600								
Cooler type	Drive	kW	A	IP	Fan-Ø [mm]	db [A]	L	Weight [kg]
OAC600-01	2x12 V DC	2x0,11	4,7	68	2x280	79	296	46
OAC600-02	2x24 V DC	2x0,09	9,8	68	2x280	79	269	46
OAC600-03	230 V/400V	0,75	0,56	55	520	79	530	49
OAC600-04	Hydraulic				520	79	430	48

Pressure loss 30 cSt



Power diagramme OAC 600



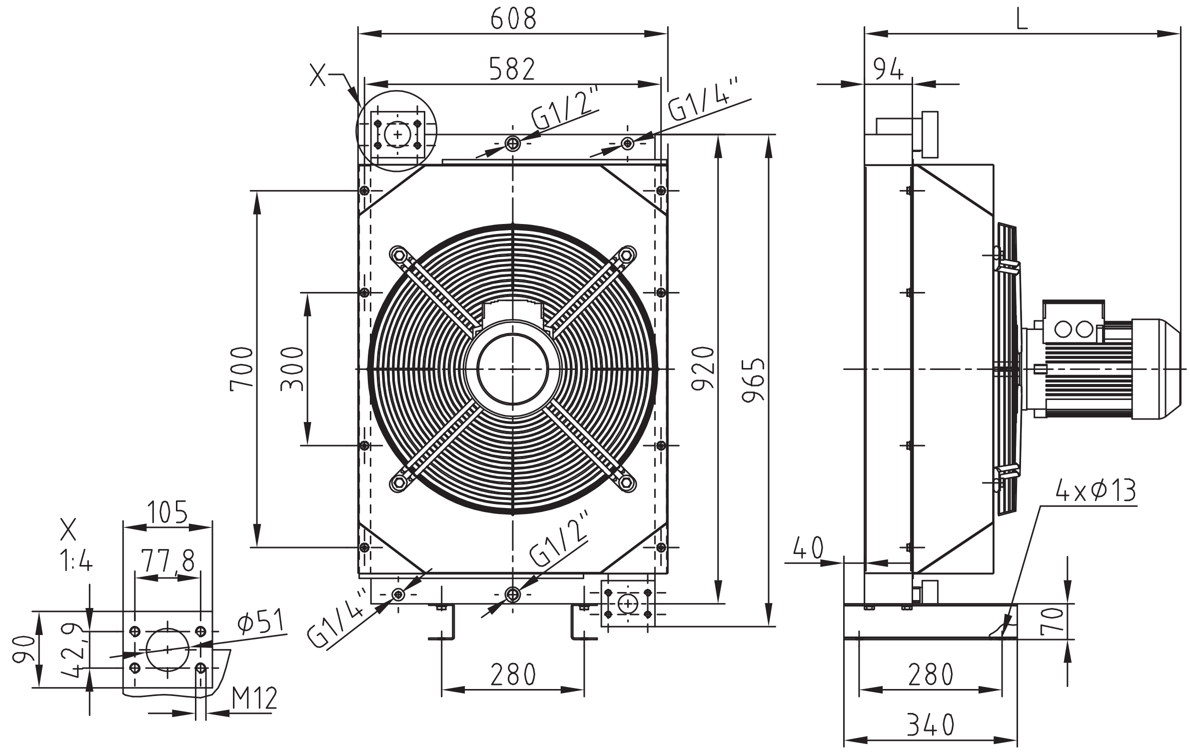
Conversion factor pressure loss									
cSt	10	15	20	30	40	50	60	80	100
Factor	0,5	0,65	0,75	1	1,2	1,4	1,6	2,1	2,8

Hydraulic Components Steel Tanks

NEW

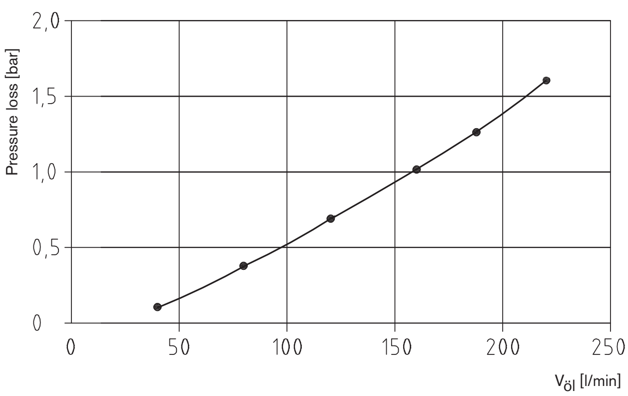
Made for Motion KTR

Oil/air cooler

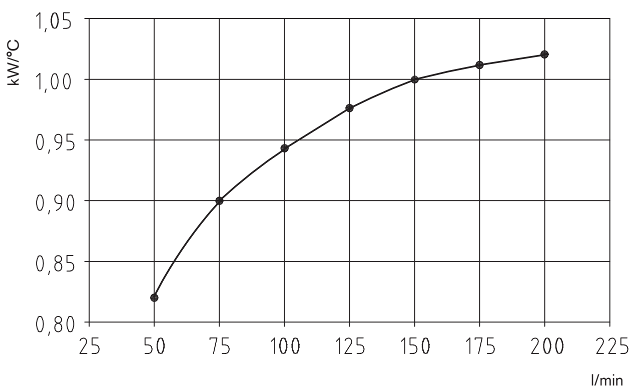


OAC 700								
Cooler type	Drive	kW	A	IP	Fan-Ø [mm]	db [A]	L	Weight [kg]
OAC700-03	230 V/240 V	0,75	1,86	55	510	78	441	56
OAC700-04	Hydraulic				510	78	353	56

Pressure loss 30 cSt



Power diagramme OAC 100

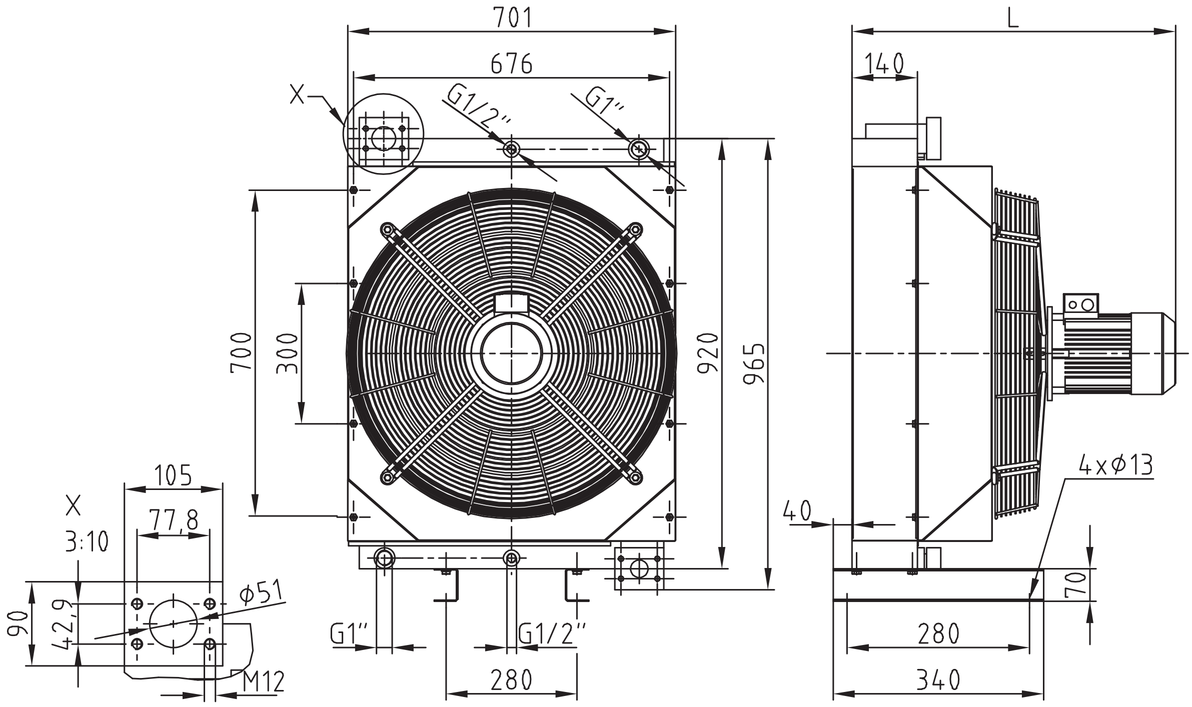


Conversion factor pressure loss									
cSt	10	15	20	30	40	50	60	80	100
Factor	0,5	0,65	0,75	1	1,2	1,4	1,6	2,1	2,8

NEW

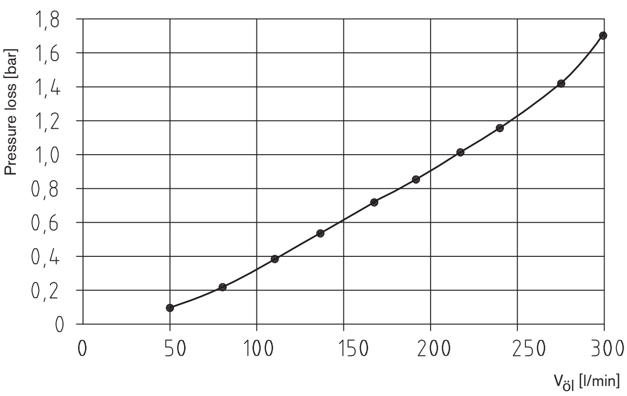
Made for Motion KTR

Oil/air cooler



OAC 800								
Cooler type	Drive	kW	A	IP	Fan-Ø [mm]	db [A]	L	Weight [kg]
OAC800-03	230 V/400 V	1,5	3,4	55	670	78	690	88
OAC800-04	Hydraulic				670	78	542	87

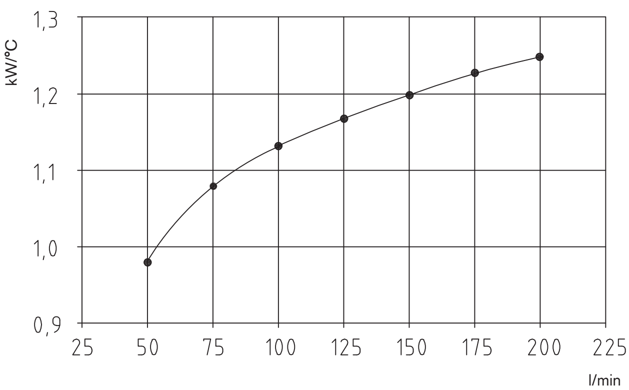
Pressure loss 30 cSt



Conversion factor pressure loss

cSt	10	15	20	30	40	50	60	80	100
Factor	0,5	0,65	0,75	1	1,2	1,4	1,6	2,1	2,8

Power diagramme OAC 600



NEW

Made for Motion KTR

OPC Cooling-pump-unit with hydraulic pump and filter

- High-performance cooler for a maximum static operating pressure of 26 bar
- Driving motor 230 V/400 V IP55
- Suitable for hydraulic oil, gear lubricant oil and lubricating oil
- Easy maintenance and good options for cleaning
- Available with filter
- Low sound pressure level
- CE certification
- Short delivery period

The OPC oil cooler unit is a system specifically developed for cooling in the bypass flow as an independent unit. The unit consists of a cooler, fan, electric motor, pump and may be supplemented by a filter on request of the customer.

Accessories
- Thermal switch
- Thermostat

Applications
- Machine tools
- Elevators
- Test benches
- Add-on coolers
- Bypass flow cooling

Arrangement
- Cooler net (plate and bar) made of aluminium with industrial lamina in black (RAL 9005)
- Fan cover made of steel in black (RAL 9005)
- Fan made of nylon PAG
- Protective grid made of steel in black (RAL 9005)
- Electric motor 230 V/400 V
- Bellhousing and coupling
- Gearwheel feed pump
- Filter with visual maintenance indication on request of the customer

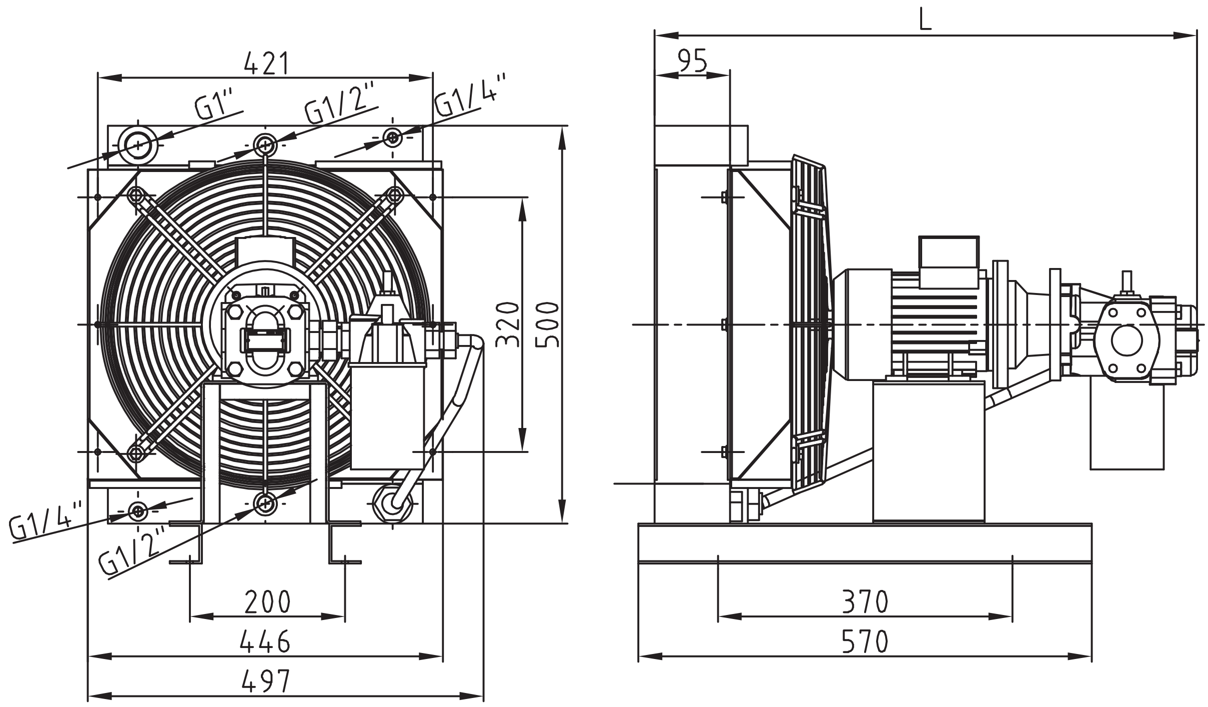
Order form

OPC	400	16	00
Typ	Size	Pump flow rate	Filter (00 = without; with filter please advise quality, e. g. 10 = 10)

NEW

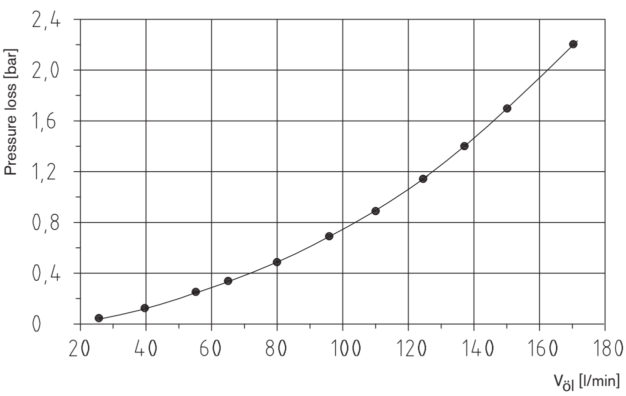
Made for Motion KTR

OPC Cooling-pump-unit with hydraulic pump and filter



OPC 400							
Cooler type	Drive	kW	IP	Fan-Ø [mm]	db [A]	L	Weight [kg]
OPC400-16	230 V/400 V	0,6	55	385	77	662	39
OPC400-32	230 V/400 V	0,6	55	385	78	704	39

Pressure loss 30 cSt



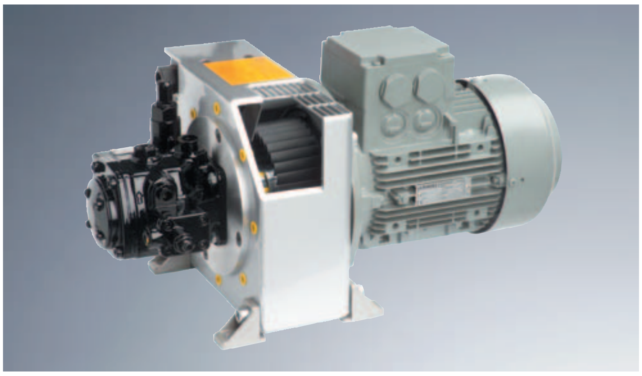
Conversion factor pressure loss									
cSt	10	15	20	30	40	50	60	80	100
Factor	0,5	0,65	0,75	1	1,2	1,4	1,6	2,1	2,8

Cooling effect		
Cooler type	Flow rate pump [l/min]	Cooling effect [kW/°C]
OPC400-16	22	0,30
OPC400-32	44	0,35

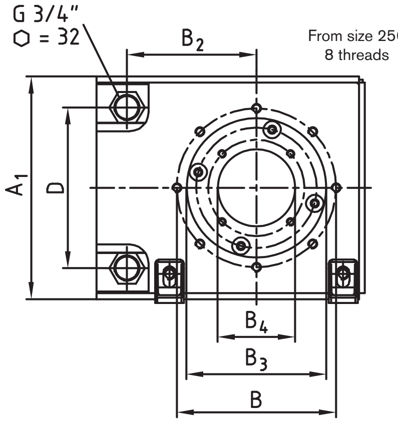
Available with filter

- Visual maintenance indication
- Bypass 3,5 bar
- Filter cartridge 5m x 10

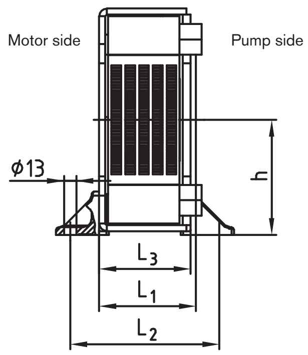
Oil/air cooler

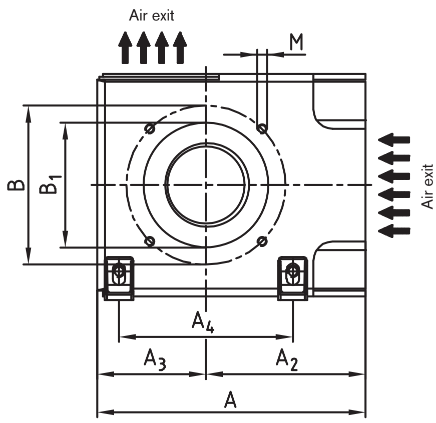


- Suitable to cool the entire oil volume (return pass)
- Constant air flow rate of the heat exchanger due to a low pressure principle (DBGM)
- Optimum utilization of the high-performance heat exchanger
- Optimum accommodation of housing and fan wheel
- Direct suction of cold ambient air by the heat exchanger
- Heat exchanger can easily be cleaned externally (without any disassembly)
- For the bellhousing selection you require please either see our selection programme at www.ktr.com or order the selection stored on CD-ROM



View pump side





View motor side

Bellhousings with integrated oil cooler PIK (DBGM)

IEC-motor Size (Shaft)	IEC-motor kW with 1500 rpm	PIK oil cooler type	L_1	L_2	L_3	A	A_1	A_2	A_3	A_4	B	B_1	B_2	B_3	min. B_4	D	M	h
			Dimensions [mm] *															
80 (19 x 40)	0,55 0,75	PIK 200/1/...	100	154,5	94,5	275	225	163	112,5	180	165	130	130	145	20	167	M10	116,5
90S / 90L	1,1	PIK 200/2/...	110	154,5	94,5	275	225	163	112,5	180	165	130	130	145	20	167	M10	116,5
(24 x 50)	1,5	PIK 200/4/...	124	154,5	94,5	275	225	163	112,5	180	165	130	130	145	20	167	M10	116,5
100L / 100M	2,2	PIK 250/2/...**	124	175,5	115,5	308	250	180	125	220	215	180	150	190	20	192	M12	129
(28 x 60)	3, 4	PIK 200/4/...**	135	175,5	115,5	305	250	180	125	220	215	180	150	190	20	192	M12	129
		PIK 300/1/...	144	199,5	139,5	359	300	205	154	260	265	230	175	234	30	242	M12	154
132S / 132M (38x80)	5,5 7,5	PIK 300/3/...	155	199,5	139,5	359	300	205	154	260	265	230	175	234	30	242	M12	154
		PIK 300/4/...	168	199,5	139,5	359	300	205	154	260	265	230	175	234	30	242	M12	154
160M / 160L	11	PIK 350/1/...	188	243,5	183,5	405	360	230	175	310	300	250	200	260	50	292	M16	184
(42 x 110)	15	PIK 350/2/...	204	243,5	183,5	405	360	230	175	310	300	250	200	260	50	292	M16	184
180M / 180L (48 x 110)	18,5 22																	

* Dimensions following the VDMA guideline 24561.

** In case of an engine speed of ≥1900 min^{-1} a steel fan must be used.

Assembly

For assembly and disassembly of the oil connection pipes please hold up with a hexagon key (max. tightening torque 40 Nm).

No reduction of the cross section behind the cooler. Return filter to be installed in front of the cooler (dynamic pressure, danger of bursting)

Tensions inside the connection pipes have to be avoided!

Vibration of the piping is to be avoided (should possibly be intercepted in front of the connection).

Supply and discharge to be chosen alternatively.

Please note that several hydraulic systems produce pressure peaks of more than 16 bar in the reverse motion (danger of bursting)!

Please consider our mounting instructions under www.ktr.com.

For PIK sizes 200 and 350 please mention the IEC-motor sizes in your order.

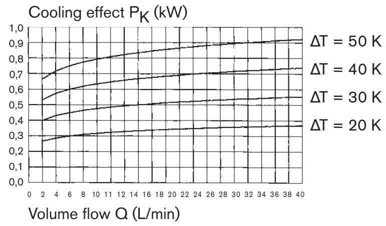
Order form

PIK	300	3	5	15
Bellhousing with integrated oil cooler	Flange diameter of IEC-motor	Model code (code referring to length)	Internal code	Standard design 11 – with feet 15 – V1 design

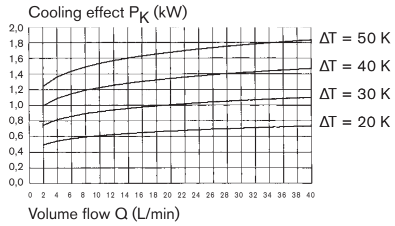
Oil/air cooler

1. Cooling effect for a speed of 1500 1/min depend-ing on the temperature difference between oil intake and air intake and oil volume

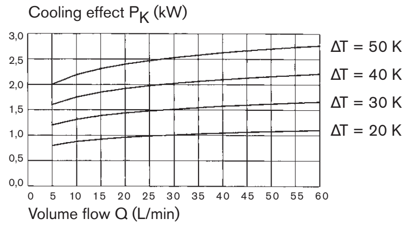
PIK 200



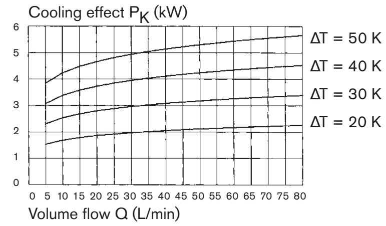
PIK 250



PIK 300



PIK 350

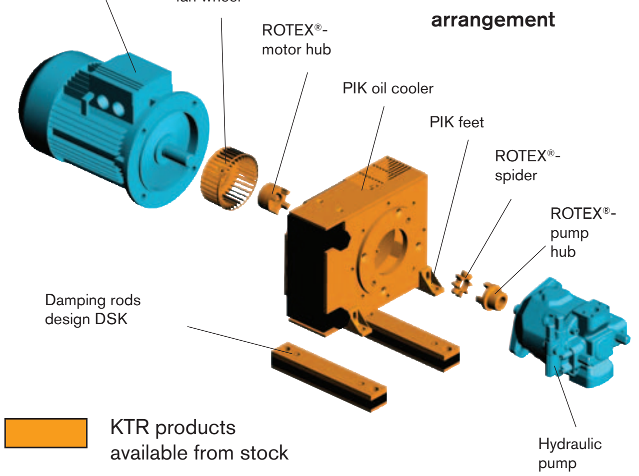


The diagrammes shown are based on actual measurements of the PIK oil cooler performed in the KTR R & D test center. With 3000 1/min the cooling effect is increased by 50 %.

2. Working pressure

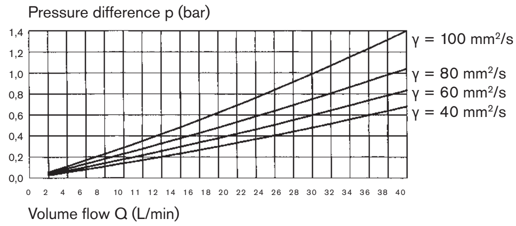
The maximum permissible working pressure for the oil cooler is 16 bar. Max. operating pressure in case of static load 30 bar. (All values apply for the medium pressure cooler.)

System arrangement

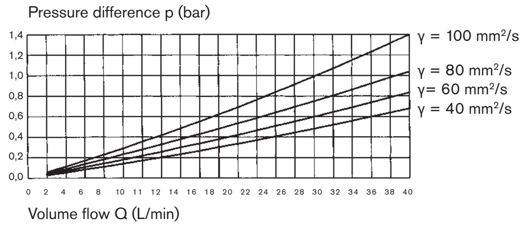


3. Pressure difference depending on oil flow and oil viscosity

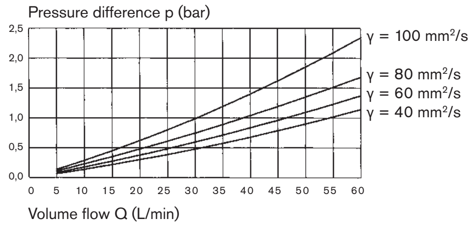
PIK 200



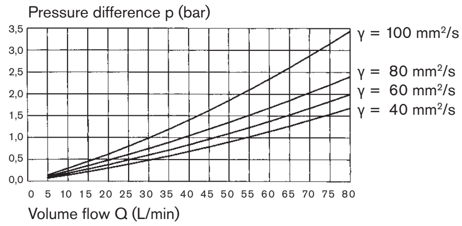
PIK 250



PIK 300



PIK 350



Viscosity measured up to 100 mm²/s.
Higher viscosity on request.

4. Fan wheel

Torsional direction looking onto the pump – **right** – standard design.

Performance of the fan with 1500 1/min

PIK 200 = 25 W
PIK 250 = 40 W
PIK 300 = 125 W
PIK 350 = 230 W

Air pressure rate in m³/h at 1500 1/min

PIK 200 = abt. 90 m³/h
PIK 250 = abt. 200 m³/h
PIK 300 = abt. 400 m³/h
PIK 350 = abt. 860 m³/h

5. Cooler connection

R 3/4" internal thread

6. Oil flow

For a higher oil flow than indicated in the above diagramme, please consult with our Engineering Department, phone +49 59 71 798-0.

Oil-water coolers

- Oil-water coolers as tube-bank heat exchanger
- Designs: **TAK** (built-on cooler)
- Wide fields of applications in industry
- Large cooling surface with low dimension
- High effectivity - heat exchange performance up to 230 kW due to aluminium laminas pushed over bank of tubes (cooling surface = 0,43 m² up to 18,41 m²)
- Minimum flow resistance due to large oil connections
- Maximum pressure: oil = 35 bar; water = 16 bar
- Optionally available in saltwater-proof design
- Easy to clean due to removable end caps

TAK

Materials		
Components	Standard coolers	Seawater coolers
mounting bracket shell baffle	steel	steel
end plates	TAK = steel	copper nickel alloy
cooling fins type designation plate	aluminium	aluminium
tubes	TAK = copper/nickel	TAK = copper/nickel
end caps	grey cast iron	grey cast iron (with copper/nickel layer)
gaskets	nitrile rubber cellulose fibres	nitrile rubber cellulose fibres
additional installation		zinc anode

Technical data

ATTENTION: Incorrect assembly can lead to a damage to the cooler!

1) Maximum flows

Series TAK	Oil Shell	TAK Water		
		1-pass	2-pass	4-pass
5..	75	45	22	-
7..	225	90	46	23
10..	330	210	106	53

All flows l/min.

2) Operating temperature
The max. operating temperature is:
TAK = 120 °C

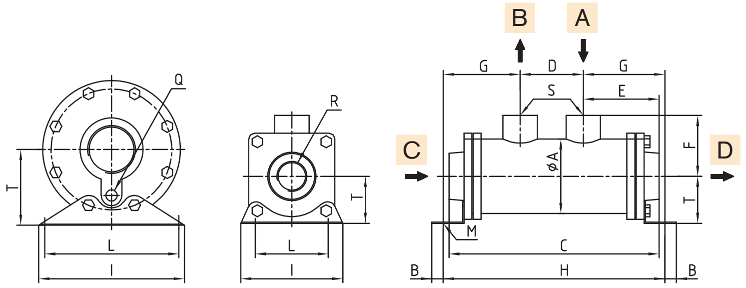
3) Operating pressure
The max. operating pressure of TAK is:
Shell = 35 bar; Tubes = 16 bar

To define the cooling performance or the cooler please contact **KTR** (phone: +49-59 71/7 98-4 24).

Order form

TAK	1014	M	2W	O	FW	2	1
Typ built-on cooler	Size	Oil connection type M=BSPF FM= SAE flange (optional)	Cooling water connection system 1W=1 pass 2W= 2 pass 4W= 4 pass	Bypass valve O=without	FW= fresh water SW= seawater	Tubes 2=copper/ nickel (standard)	Tube sheet 1=Stahl (standard) 3=saltwater-proof

Oil-water coolers



A - medium to be cooled

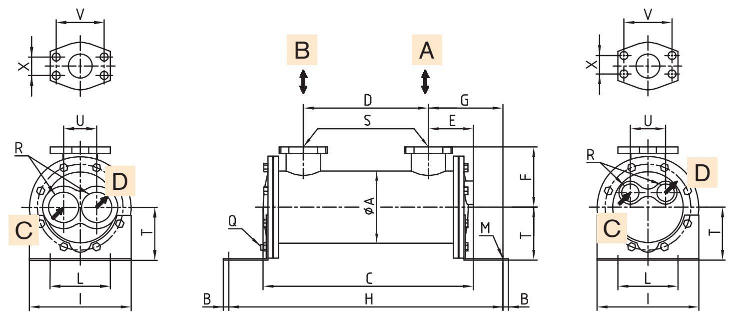
B - cooled medium

C - cooling water „on“

D - cooling water „off“

TAK - Type „1-pass“									
Type	Dimensions [mm]								
	A	B	E	G	I	L	M	Q	R	T
TAK-5..	65	12	82*	83	89	63,5	∅9x16	—	G 3/4"	41
TAK-7..	90	15	103	103	127	76	∅11x19	G 1/4"	G 1 1/4"	66
TAK-10..	128	20	116	116	165	102	∅11x25	G 1/4"	G 1 1/2"	102

* outsider TAK - 505 = 66 mm



Typ „2-pass“ Typ „4-pass“

A - medium to be cooled

B - cooled medium

C - cooling water „on“

D - cooling water „off“

TAK - Typ „2-pass/4-pass“											
Type	Dimensions [mm]										
	TAK - Typ "2-pass"										
	A	B	E	G	I	L	M	Q	R	T	U
TAK-5..	65	12	83	85	89	63,5	∅9x16	—	G 3/8"	41	28
TAK7..	90	15	91	95	127	76	∅11x19	—	G 1"	66	41
TAK10..	128	20	113	110	165	102	∅11x25	G 1/4"	G 1 1/4"	102	60
	TAK - Typ "4-pass"										
TAK-7..	90	15	107	95	127	75	∅11x19	G 1/4"	G 1/2"	66	44
TAK-10..	128	20	112	110	165	101	∅11x25	G 1/4"	G 3/4"	102	64

Unit dimensions												
Type	C			D	F	H	W_T [1)] [m²]	Weight [kg]	Oil connection			
									Standard S	Optional		
	1-pass	2-pass	4-pass							SAE-flange	X	V
TAK-505	187	187	—	55	53	189	0,43	3,15	G 3/4"	—	—	—
TAK-508	263	265	—	97	57	265	0,73	3,60	G 3/4"	—	—	—
TAK-510	314	314	—	148	57	316	0,94	3,45	G 3/4"	—	—	—
TAK-512	365	365	—	199	57	367	1,13	4,05	G 3/4"	—	—	—
TAK-514	416	416	—	250	57	418	1,43	4,5	G 3/4"	—	—	—
TAK-518	517	517	—	351	57	519	1,74	5,1	G 3/4"	—	—	—
TAK-524	670	672	—	504	57	672	2,35	6,0	G 3/4"	—	—	—
TAK-536	975	976	—	809	57	976	3,57	7,8	G 3/4"	—	—	—
TAK-708	283	258	262	76	73	272	1,38	7,3	G 1 1/2"	SAE 1 1/2"	35,8	69,9
TAK-712	385	360	364	177	73	373	2,18	8,4	G 1 1/2"	SAE 1 1/2"	35,8	69,9
TAK-714	435	411	415	228	73	424	2,53	8,8	G 1 1/2"	SAE 1 1/2"	35,8	69,9
TAK-718	537	513	516	330	73	526	3,29	10,2	G 1 1/2"	SAE 1 1/2"	35,8	69,9
TAK-724	689	665	669	482	73	678	4,44	11,6	G 1 1/2"	SAE 1 1/2"	35,8	69,9
TAK-736	994	995	974	787	73	983	6,73	15,5	G 1 1/2"	SAE 1 1/2"	35,8	69,9
TAK-1012	389	369	363	157	92	392	4,38	15,4	G 1 1/2"	SAE 2"	42,9	77,7
TAK-1014	440	420	413	207	92	443	5,17	16,9	G 1 1/2"	SAE 2"	42,9	77,7
TAK-1018	541	522	515	309	92	544	6,73	19,8	G 1 1/2"	SAE 2"	42,9	77,7
TAK-1024	694	674	667	461	92	697	9,06	21,8	G 1 1/2"	SAE 2"	42,9	77,7
TAK-1036	999	979	972	766	92	1002	13,74	30,5	G 1 1/2"	SAE 2"	42,9	77,7
TAK-1048	1303	1284	1277	1071	92	1306	18,41	39,8	G 1 1/2"	SAE 2"	42,9	77,7

Flange TAK 700 = 1 1/2"; flange TAK 1000 = 2"

[1)] W_T = Heat exchange surface [m²]

Cooling systems

- Plate heat exchanger to cool hydraulic oil and other media
- Applied in industry and mobile technology
- Compact design with high cooling performance
- High corrosion resistance subject to plates from stainless steel 1.4401 (AISI316) and the use of copper filler metal
- Maximum operating pressure 30 bar / Maximum operating temperature: 200 °C

Technical data

Plate heat exchanger from stainless steel 1.4401 soldered to copper (solder metal based on nickel on request).
The stamped plates produce a high power density in a tight space.
Compared to a bundle of pipes heat exchanger the plate heat exchanger only requires approx. 25 % - 30 % of space with less weight.
Applications are, as an example, machine tools, test benches, moulding machines, pump power packs, waste heat utilization, etc.
It is possible to use other media like, for example, oil, water glycole, water, refrigerating agents, air, etc.
Operating temperature: -10 °C to +200 °C.
Please observe boiling point and freezing point!
Maximum permissible operating pressure: 30 bar.

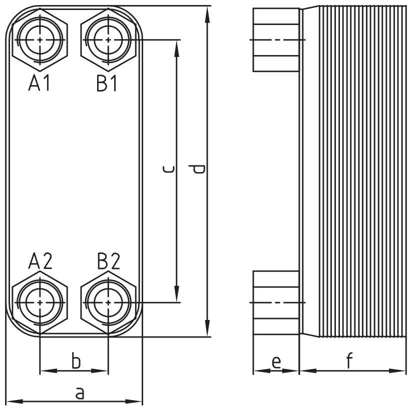
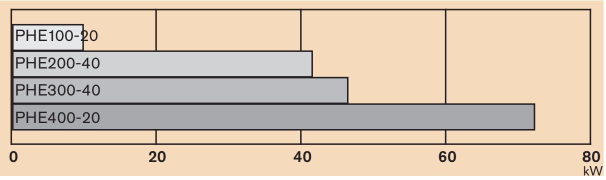


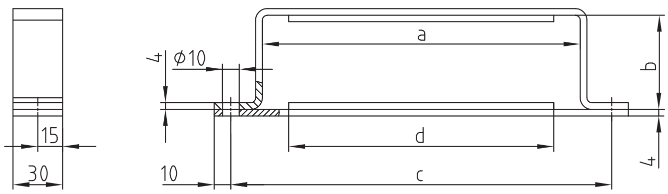
Plate heat exchanger

Series	Type	Thread	Plates	a	b	c	d	e	f
PHE	100	4 x 3/4"	20	80	40	154	194	27	55
PHE	200	4 x 1"	40	106	50	250	302	27	106
PHE	300	4 x 1"	40	106	50	466	522	27	106
PHE	400	4 x 1 1/2"	20	246	174	456	528	27	59,5

Cooling power



Typ	Oil temperatur switched on [°C]	Water temperature switched on [°C]	Oil V [l/min]	Water V [l/min]
PHE100-20	60	20	60	30
PHE200-40	60	20	160	80
PHE300-40	60	20	120	60
PHE400-20	60	20	180	90



Fasting device

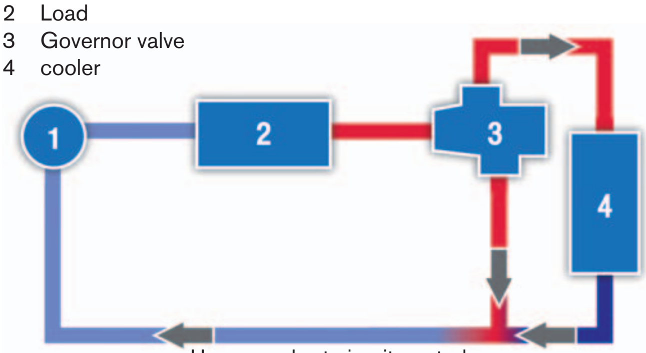
	a	b	c	d
BH100-20	84	53	114	70
BH200-40 / BH300-40	110	104	140	100
BH400-20	250	57	280	240

Order form

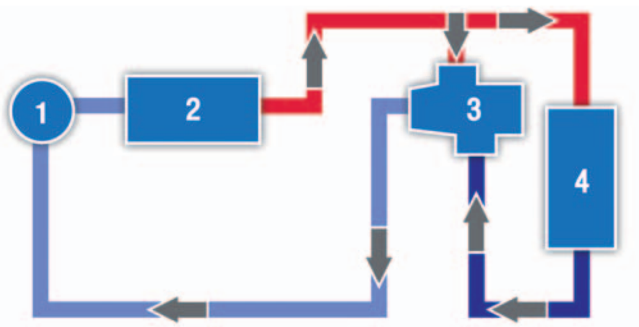
PHE	100	20	1
PHE=Plate heat exchanger	Size	Number of plates	Clamp (0= with, 1= without)

Oil thermostat valve

1 Pump
2 Load
3 Governor valve
4 cooler



Use as a short circuit control:
Constant temperature on load outlet



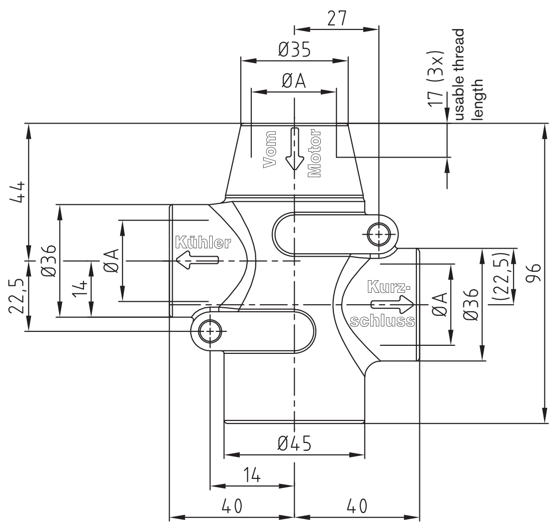
Use as a mixing valve:
Constant temperature on load inlet

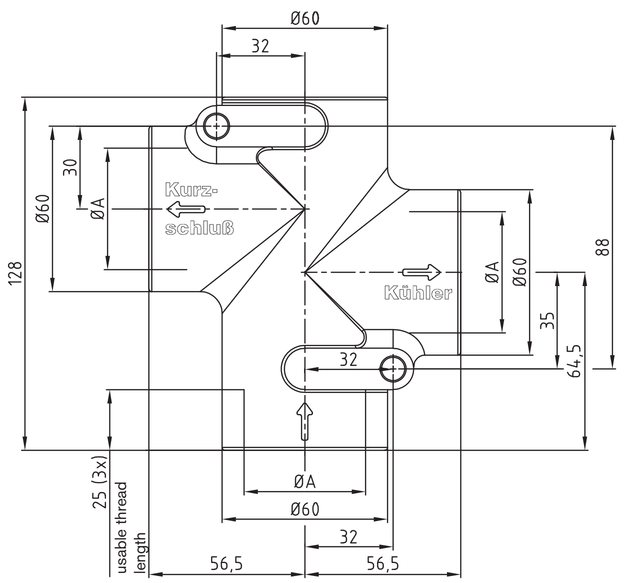
Main applications of oil thermostat valves

- Agricultural machines
- Construction machines
- Compressors
- Coolers
- Special applications,
  e. g. wind power stations, gearboxes, hydraulics, general engineering

Particular characteristics

- Temperature figures set
- High control accuracy
- Control operation independent of static and dynamic oil pressure
- Low pressure loss
- Solid design
- Insensitive to vibrations
- Insensitive to shocks
- operation independent of the mounting situation
- Maintenance-free
- Long service life





OTV Oil thermostat valve				
Description	max. volume flow [m³/h]	Connection therad	Inlet temperature [°C]	Max. inflow to the cooler obtained with °C
OTV1-45	4	G 3/4"	45	60
OTV1-55	4	G 3/4"	55	70
OTV1-70	4	G 3/4"	70	85
OTV2-45	10	G 1 1/2"	45	60
OTV2-55	10	G 1 1/2"	55	70
OTV2-70	10	G 1 1/2"	70	85

max. Betriebsdruck 16 bar

Order form

OTV	1	55
Oil temperature valve	Size	Inlet temperature

Resistance

KTR-product		Medium							
Component	Material	HFA	HFB	HFC	HFD, HFD-R HFD-S, HFD-T	Hydraulic fluid with mineral oil base	Biological hydraulic oils		
							HETG	HEES	HEPG
Bellhousing P, PK, PL	ALU	●	●	6	●	●	●	●	●
Bellhousing PG	GG	●	●	6	6	●	6	6	6
Bellhousing PS	steel	●	●	6	6	●	6	6	6
Bellhousing KPT	synthetic/ALU	●	●	6	●	●	●	●	●
Damping ring D, DT, DTV	ALU/NBR	●	●	6	1	●	●	●	●
Bellhousing with integrated oil cooler PIK	steel/ALU	●	●	6	1	●	●	●	●
Oil-water coolers TAK, TEK	-	●	●	6	6	●	6	6	6
Foot flange PTFL, PTFS	ALU	●	●	6	●	●	●	●	●
Foot flange PTFS, PTFS	steel/GGG	●	●	6	6	●	6	6	6
ZO flange	ALU	●	●	6	●	●	●	●	●
Pump bracket K	ALU	●	●	6	●	●	●	●	●
	steel	●	●	6	6	●	6	6	6
Alu tank BAK with feet	ALU	●	●	6	●	●	●	●	●
Oil sump pan BAKW	steel	●	●	6	6	●	6	6	6
Steel tanks	steel	●	●	6	6	●	6	6	6
Tank covers from steel	steel	3	●	6	6	3	●	●	●
Tank covers from aluminium	ALU	●	●	6	●	●	●	●	●
Oil level indicators	-	●	●	●	5	●	6	6	6
Oil level sight glass	-	●	●	●	5	●	6	6	6
Filler breather	-	●	●	●	5	●	6	6	6
Cleaning cober	ALU	●	●	6	●	●	●	●	●
O-sealing ring	NBR	●	●	●	1/2	●	●	●	●
Spline seal	NBR	●	●	●	1/2	●	●	●	●
Gaskets type DP, DZ	NBR	●	●	●	1/2	●	●	●	●
Damping rod	steel/NR	1	1	1	5	1	6	6	6
Elastic flanges	steel/NBR	●	●	●	1	●	●	●	●
Elastic cover support EDL	steel/NBR/ALU	●	●	7	1	●	●	●	●
Industrial control system IR, IRD	stainless steel	●	●	●	●	●	●	●	●
Level temperature switch NVT	brass/NBR	5	5	5	5	●	5	5	5
Temperature probe TE-PT-100	stainless steel/NBR	●	●	●	●	●	●	●	●
Temperature switch TS	steel (anodized)	●	●	●	●	●	●	●	●
Tank heaters EH	brass/stainless steel	●	●	●	●	●	●	●	●
Tank heaters EHP	steel/Fiber NBR	●	●	6	●	●	●	●	●
Tank heaters TEHM	stainless steel/copper	5	5	5	5	●	5	5	5
Plate heat exchanger	-	●	●	6	6	●	6	6	6
BoWex® sleeve	PA	●	●	●	●	●	●	●	●
BoWex® hub	steel	3	●	4	4	3	●	●	●
ROTEX® spider ➔ standard from polyurethane	PUR	1	1	1	5	●	6	6	6
ROTEX® hub	steel	3	●	4	4	3	●	●	●
ROTEX® hub	ALU	●	●	6	●	●	●	●	●

Composition of hydraulic fluids

HFA = Oil in water emulsion ➔ water content > 80%
HFB = Water in oil emulsion ➔ water content > 40%
HFC = Aqueous polymer solution (water glycols) water content > 45%
HFD = Synthetical liquids (anhydrous)
HFD-R = Phosphoric ester
HFD-S = Chlorinated hydrocarbons
HFD-T = Compound of HFD-R + HFD-S

Explanation of column notes

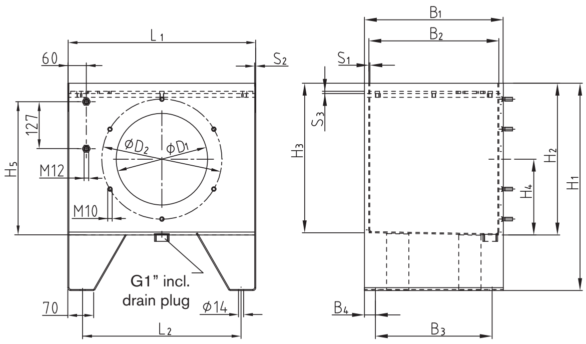
● = Resistant
1 = Oil splash resistant
Not resistant when continuously flushed with oil!
2 = With continuous oil flushing use EPDM gasket!
3 = Priming coat required
4 = An additional layer with epoxy resin / DD lacquers is necessary.
5 = Not resistant
6 = Consultation is necessary, phone +49 5971 798-0

Please note:
The figures indicated may only be considered as a general standard. In case of doubt we would absolutely recommend to perform a test. The aforementioned details do not entitle for any legal claim, we definitely do neither take over any warranty nor liability. Purely the chemical and mechanical resistance is not sufficient to assess whether a certain product is suitable or not. The standards have to be considered in particular, as an example, with flammable liquids (explosion protection).

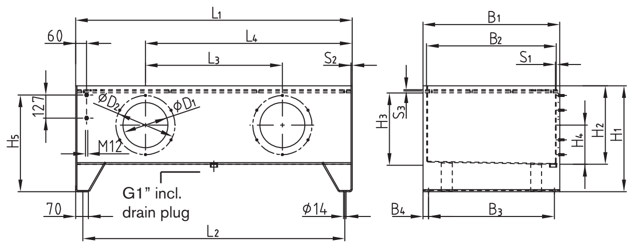
Series BSK

- Tanks made of high-grade steel
- Tank sand-blasted, with high-quality internal and external coating resistant to hydraulic oils on a mineral oil basis
- Priming is compatible with other varnish paints
- All tanks are subject to 100 % tightness test
- Subsequent assembly of KTR standard separation sheet metals possible for all tank sizes (assembly of separation sheet metals across cleaning hole)
- Cover machining as per customer's request
- Transport eyes on request of customer

up to NG 200



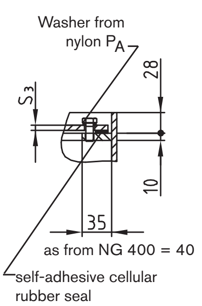
as from NG 250



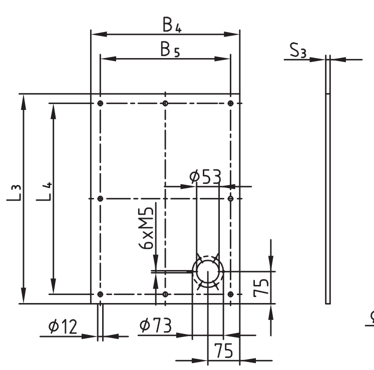
Series BSK, NG 40-400																									
Order description	Avail. vol.	Weight	Tank dimensions [mm]																		Cleaning cover		Tank completely available from stock Tank cover E	
NG	Litres	kg	L_1	L_2	L_3	L_4	B_1	B_2	B_3	B_4	H_1	H_2	H_3	H_4	H_5	D_1	D_2	S_1	S_2	S_3	No.	Type	Standard $t = S_3$	Reinforced $t = 10$
BSK 40	38	34	508	428	—	—	375	365	315	30	430	280	273	140	230	195	250	3	3	6	1	V 250-4	●	
BSK 63	59	38	508	428	—	—	375	365	315	30	560	410	403	205	360	248	324	3	3	6	1	V 324-6	●	
BSK 100	92	70	633	553	—	—	474	460	414	30	560	407	399	205	357	248	324	4	4	6	1	V 324-6	●	
BSK 160	152	86	810	730	—	—	604	590	544	30	560	410	400	205	360	248	324	4	4	6	1	V 324-6	●	on request
BSK 200	184	101	900	820	—	—	654	640	594	30	560	410	399	205	360	248	324	4	4	6	1	V 324-6	●	
BSK 250	235	138	1010	930	410	710	704	690	644	30	580	430	418	215	380	248	324	4	4	7	2	V 324-6	●	
BSK 300	272	144	1208	1128	410	809	714	700	654	30	580	412	400	206	362	248	324	4	4	7	2	V 324-6	●	
BSK 400	375	201	1514	1434	750	1132	749	735	689	30	580	430	417	215	380	248	324	4	7	7	2	V 324-6	●	

Tank cover

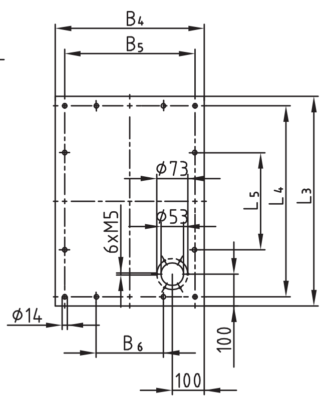
Cover type E



for NG 40-300



for NG 400



Cover type „E“								
	Dimensions [mm]							Number of holes
	L_3	L_4	L_5	B_4	B_5	B_6	S_3	
40	492	448	—	349	305	—	6	8x
63	492	448	—	349	305	—	6	8x
100	615	571	—	442	398	—	6	8x
160	792	748	—	572	528	—	6	8x
200	882	838	—	622	578	—	6	8x
250	992	948	—	672	628	—	7	8x
300	1190	1146	—	682	638	—	7	8x
400	1490	1440	480	717	667	222	7	12x

● = Standard programme available from stock and in short term

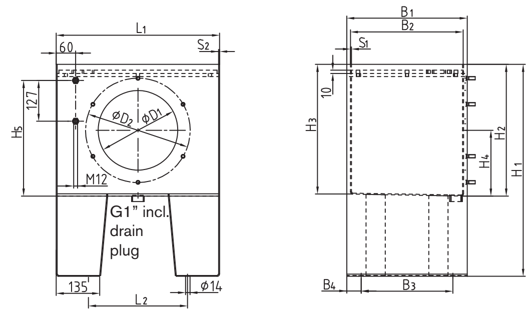
Order form

BSK	250	E
KTR standard tank	Tank size	Cover type "E"

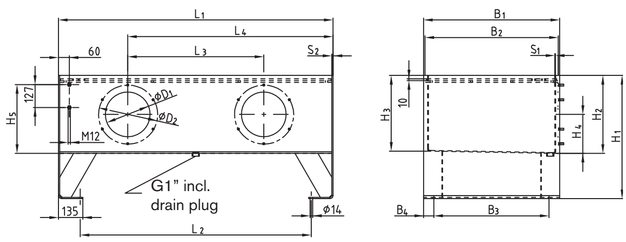
Serie BNK design A

- DIN tanks made of high-grade steel
- Tank sand-blasted, with high-quality internal and external coating resistant to hydraulic oils on a mineral oil basis.
- Priming is compatible with other varnish paints
- All tanks are subject to 100 % tightness test
- Subsequent assembly of KTR standard separation sheet metals possible for all tank sizes (assembly of separation sheet metals across cleaning hole)
- Cover machining as per customer's request
- Transport eyes on request of customer

up to NG 160



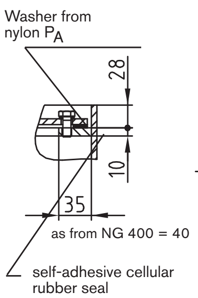
as from NG 250



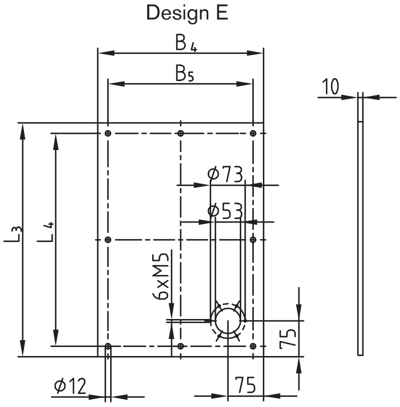
Serie BNK Form A, NG63-1250																							
Order description	Avail. vol.	Weight	Tank dimensions [mm]																	Cleaning cover		Tank completely available from stock	
NG	Litres	kg	L_1	L_2	L_3	L_4	B_1	B_2	B_3	B_4	H_1	H_2	H_3	H_4	H_5	D_1	D_2	S_1	S_2	No..	Type	Cover design E	Cover design C
BNK 63	59	47	508	308	—	—	375	365	285	45	660	410	403	205	360	248	324	3	3	1	V 324-6	●	
BNK 100	92	77	633	393	—	—	474	460	360	57	660	407	399	205	357	248	324	4	4	1	V 324-6	●	
BNK 160	152	112	810	570	—	—	604	590	490	57	660	410	400	205	360	248	324	4	4	1	V 324-6	●	
BSK 250	235	148	1010	770	410	710	704	690	590	57	680	430	418	215	380	248	324	4	4	2	V 324-6	●	
BNK 400	375	245	1514	1274	750	1132	749	735	635	57	680	430	417	215	380	248	324	4	7	2	V 324-6	●	on requuest
BNK 630	595	366	1514	1274	750	1132	959	945	845	57	770	520	504	265	470	383	449	4	7	2	V 449-6	●	
BNK 800	752	400	2014	1774	1000	1507	914	900	800	57	770	520	504	265	470	383	449	5	7	2	V 449-6	●	
BNK 1000	945	452	2014	1774	1000	1507	1079	1065	965	57	800	550	531	285	500	383	449	5	7	2	V 449-6		
BNK 1250	1180	600	2014	1774	1000	1507	1349	1335	1235	57	800	550	527	285	500	383	449	5	7	2	V 449-6		

Tank cover

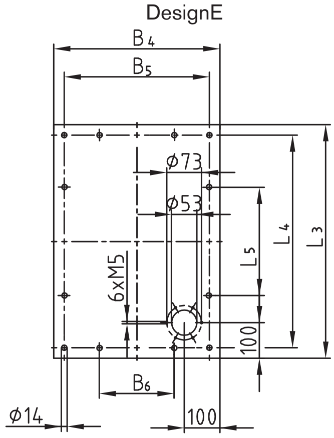
Cover design E
Design E



for NG 63-250
Design E



for NG 400-1250
DesignE



Cover design „E“							
NG	Design [mm]						Number of holes
	L_3	L_4	L_5	B_4	B_5	B_6	
63	492	448	—	349	305	—	8x
100	615	571	—	442	398	—	8x
160	792	748	—	572	528	—	8x
250	992	948	—	672	628	—	8x
400	1490	1440	480	717	667	222	12x
630	1490	1440	480	927	877	292	12x
800	1990	1940	647	880	830	277	12x
1000	1990	1940	647	1045	995	332	12x
1250	1990	1940	647	1315	1265	422	12x

● = Standard programme available from stock and in short term.

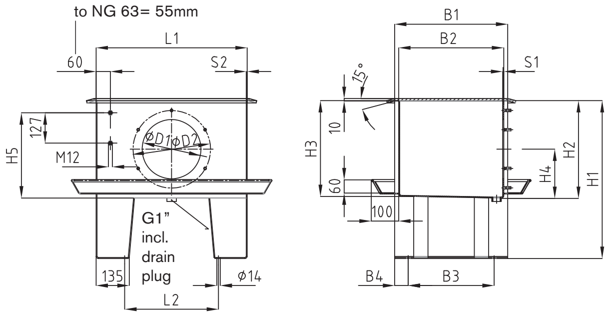
Order form

BNK	250	A	E
KTR tank standard	Tank size	Tank design "A"	Cover design "E"

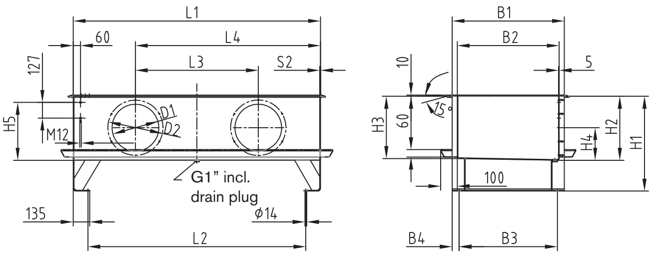
Serie BNK design B

- DIN tanks made of high-grade steel
- Tank sand-blasted, with high-quality internal and external coating resistant to hydraulic oils on a mineral oil basis.
- Priming is compatible with other varnish paints
- All tanks are subject to 100 % tightness test
- Cover machining as per customer's request
- Transport eyes on request of customer

up to NG 160

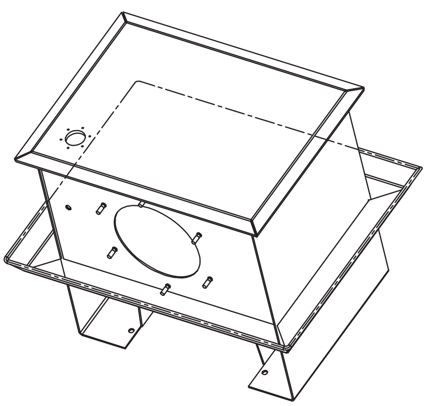


as from NG 250

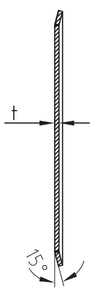


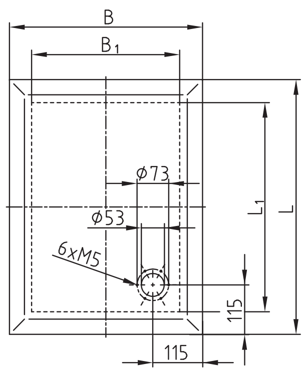
Serie BNK Form B, NG63-1250																						
Order description	Avail. vol.	Weight	Tank dimensions [mm]																	Tank completely available from stock		
NG	Litres	kg	L_1	L_2	L_3	L_4	B_1	B_2	B_3	B_4	H_1	H_2	H_3	H_4	H_5	D_1	D_2	S_1	S_2	No..	Type	
BNK 63	59	56	508	308	—	—	375	365	285	45	660	410	403	205	360	248	324	3	3	1	V 324-6	on reuquest
BNK 100	95	88	633	393	—	—	474	460	360	57	660	407	399	205	360	248	324	4	4	1	V 324-6	
BNK 160	152	130	810	570	—	—	604	590	490	57	660	410	400	205	360	248	324	4	4	1	V 324-6	
BSK 250	235	170	1010	770	410	710	704	690	590	57	680	430	418	215	380	248	324	4	4	1	V 324-6	
BNK 400	375	270	1514	1274	750	1132	749	735	635	57	680	430	417	215	380	248	324	4	7	1	V 324-6	
BNK 630	595	375	1514	1274	750	1132	959	945	845	57	770	520	504	265	470	383	449	4	7	2	V 449-6	
BNK 800	752	420	2014	1774	1000	1507	914	900	800	57	770	520	504	265	470	383	449	5	7	2	V 449-6	
BNK 1000	945	490	2014	1774	1000	1507	1079	1065	965	57	800	550	531	285	500	383	449	5	7	2	V 449-6	
BNK 1250	1180	636	2014	1774	1000	1507	1349	1335	1235	57	800	550	527	285	500	383	449	5	7	2	V 449-6	

Tank cover



Cover design A



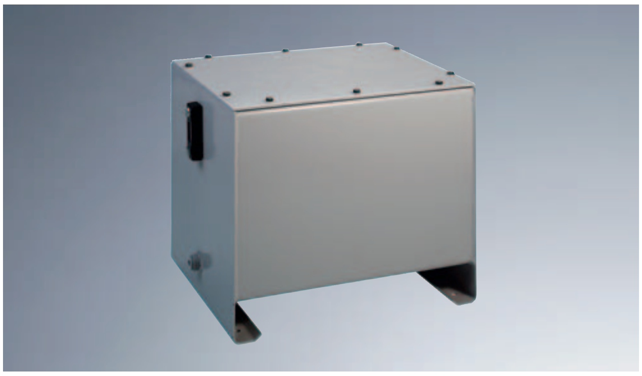


Cover design „E“			
NG	Design [mm]		
	L	B	t
63	588	445	10
100	713	540	10
160	890	670	10
250	1090	770	10
400	1594	815	10
630	1594	1025	10
800	2094	980	10
1000	2094	1145	10
1250	2094	1415	10

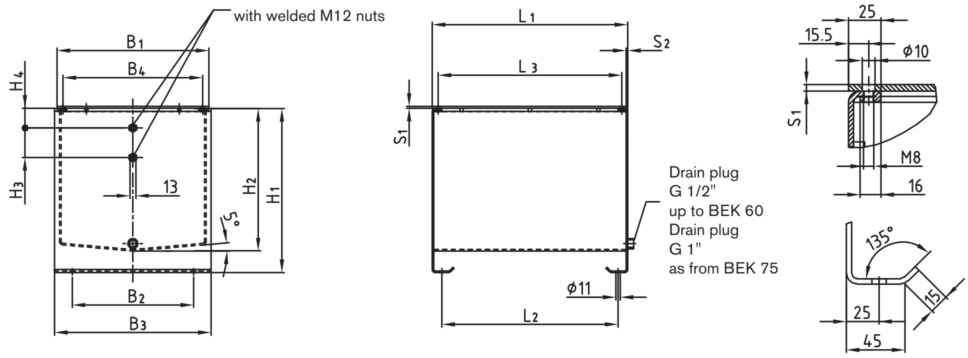
Order form

BNK	250	B	E
KTR tank standard	Tank size	Tank design "B"	Cover design "E"

Serie BEK



- Tanks made of high-grade steel
- Tank sand-blasted, with high-quality internal and external coating resistant to hydraulic oils on a mineral oil basis.
- Priming is compatible with other varnish paints
- All tanks are subject to 100 % tightness test
- Cover machining as per customer's request

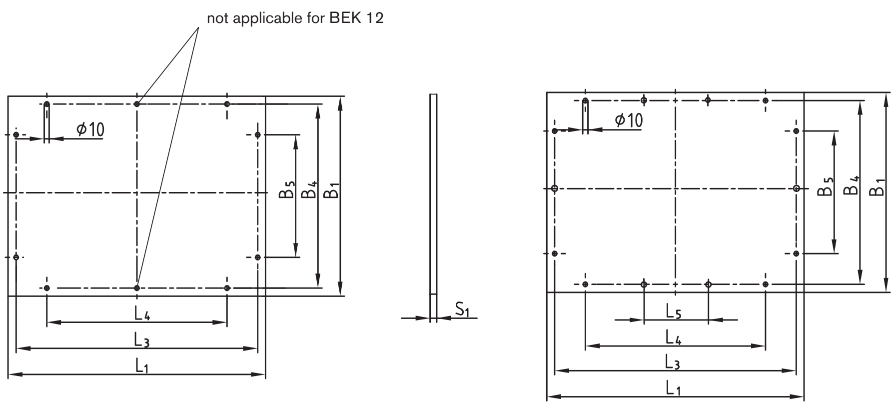


Serie BEK, NG 12-300													
Order description	Available volume	Weight	Tank dimensions [mm]										Tank completely available from stock
NG	Litres	kg	L_1	L_2	B_1	B_2	B_3	H_1	H_2	H_3	H_4	S_2	Cover type E
BEK 12	16	17	310	260	298	220	310	275	220	76	50	4	●
BEK 20	26	23	400	350	298	220	310	325	270	76	50	4	●
BEK 35	40	30	470	420	298	220	310	400	345	76	50	4	●
BEK 50	58	40	500	450	388	310	400	420	365	76	50	4	●
BEK 60	69	43	550	500	388	310	400	445	390	76	50	4	●
BEK 75	85	46	550	500	388	310	400	530	475	127	50	4	●
BEK 100	109	54	700	650	388	310	400	530	475	127	50	4	●
BEK 150	175	79	750	700	488	410	500	620	565	127	80	4	●
BEK 225	267	115	900	588	588	510	600	650	595	127	80	4	●
BEK 300	339	127	900	688	688	610	700	700	645	127	80	4	●

Tank cover

Cover design E

up to NG 75 **as from NG 100**



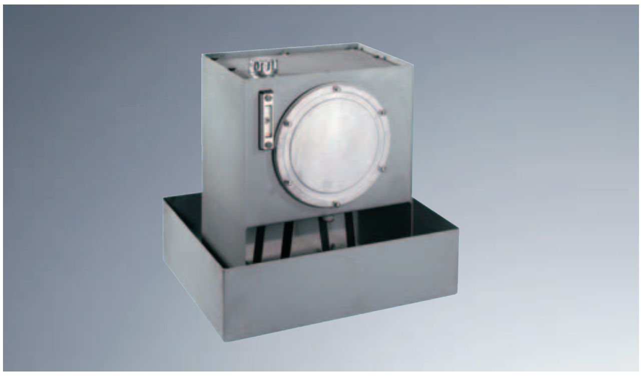
Cover design „E"								
NG	dimensions [mm]							
	S_1	L_1	B_1	L_3	B_4	L_4	B_5	L_5
12	4	310	298	279	267	160	148	—
20	4	400	298	369	267	250	148	—
35	5	470	298	439	267	320	148	—
50	5	500	388	469	357	350	238	—
60	5	550	388	519	357	400	238	—
75	5	550	388	519	357	400	238	—
100	6	700	388	669	357	550	238	184
150	6	750	488	719	457	600	338	200
225	8	900	588	869	557	750	438	250
300	8	900	688	869	657	750	538	250

● = **Standard programme available from stock and in short term.**

Order form

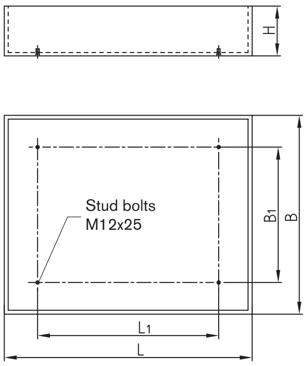
BEK	100	E
KTR Euro tank	Tank size	Cover design "E"

Oil Sumps



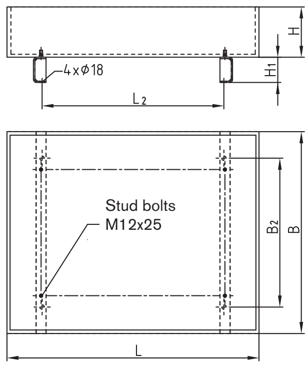
- Oil sumps made of high-grade steel
- Collection volume corresponds to the full load volume of the tank
- Tank sand-blasted, with high-quality internal and external coating resistant to hydraulic oils on a mineral oil basis.
- Priming is compatible with other varnish paints
- All oil sumps are subject to 100 % tightness test
- **Oil sumps meet with the standards of WHG**

Oil sump without feet



Distance dimensions for stud bolts see table L_1 and B_1

Oil sump with feet



Oil Sumps for BSK and BNK

Order description	Volume	Weight in kg		Tank dimensions [mm]										Available from stock without feet
NG	litres	without feet	with feet	L	L_1 BSK	L_1 BNK	L_2	B	B_1 BSK	B_1 BNK	B_2	H	H_1	
63	74	22	30	700	428	308	420	600	315	285	365	200	100	●
100	105	29	38	850	553	393	545	700	414	360	460	200	100	●
160	160	36	47	1000	730	570	722	800	544	490	590	200	100	●
200	200	42	54	1100	820	—	812	850	594	—	640	220	100	●
250	250	50	64	1250	930	770	922	1000	644	590	690	200	100	●
300	300	57	69	1400	1128	—	1120	900	654	—	700	250	100	●
400	400	72	87	1720	1434	1274	1426	980	689	635	735	250	100	●
630	630	93	112	1810	—	1274	1426	1190	—	845	945	300	100	●
800	800	110	138	2410	—	1774	1926	1190	—	800	900	300	100	
1000	1000	123	155	2420	—	1774	1926	1380	—	965	1065	300	100	
1250	1250	156	184	2380	—	1774	1926	1770	—	1235	1335	300	100	

● =Standard programme available from stock and in short term.

**Type plate and certificates according to regulations §19 WHG available against extra charge.
Please indicate in the order.**

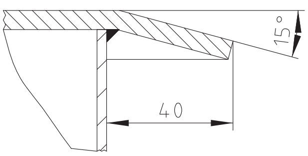
Order form

Ö	63	BSK	F
Oil sump	Tank size	Tank design	F = with feet

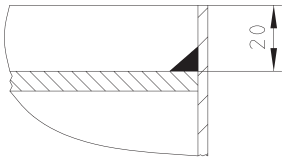
Cover design, separation sheet metals, transport eyes and creasings

Cover designs for DIN tanks of the BKN series:

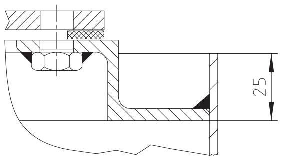
Design A



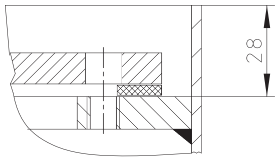
Design C



Design D

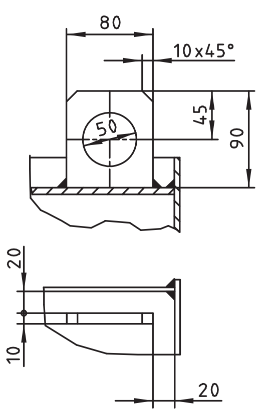


Design E

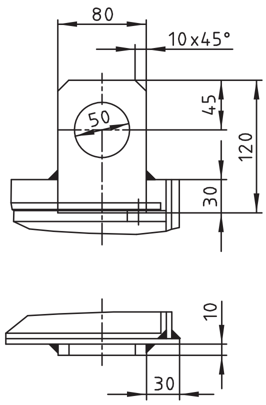


Transport eyes:

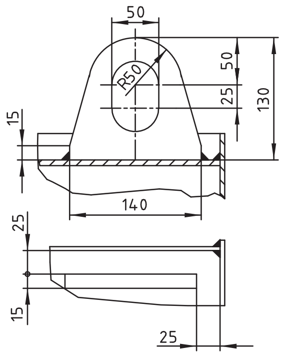
Design 1
(for NG 40-300)



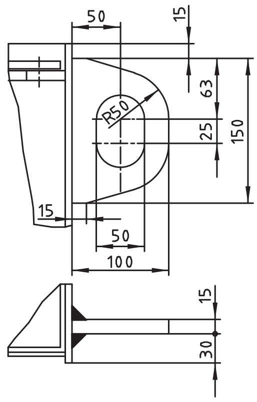
Design 2
(for NG 40-300)



Design 3
(for NG 40-2000)

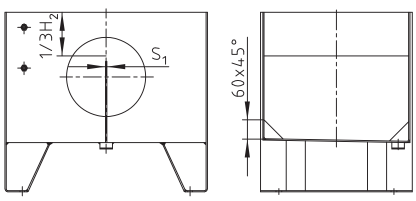


Design 4
(for NG 40-2000)

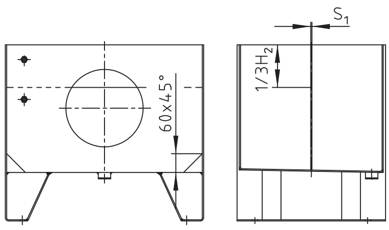


Separation sheet metals:

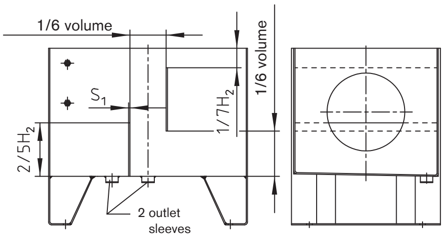
Design 1



Design 2

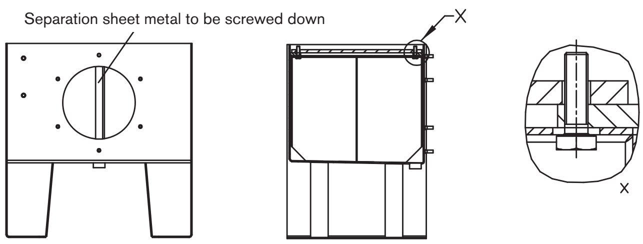


Design 3

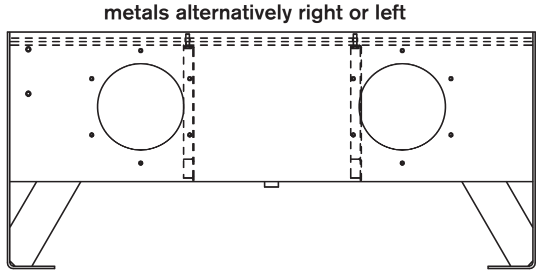


Separation sheet metals to be screwed down:

Separation sheet metal up to BSK/BNK 300

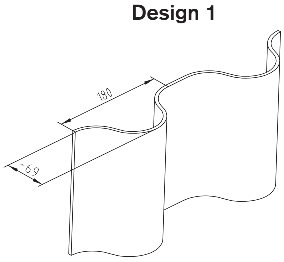


From BSK/BNK 400 separation sheet metals alternatively right or left

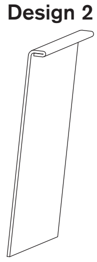


Creasings:

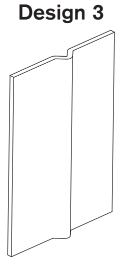
Design 1



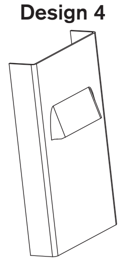
Design 2



Design 3



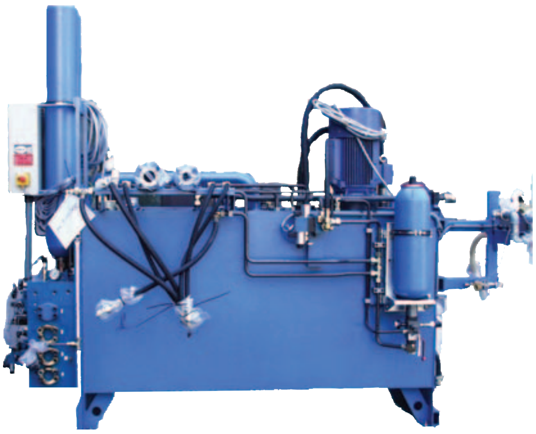
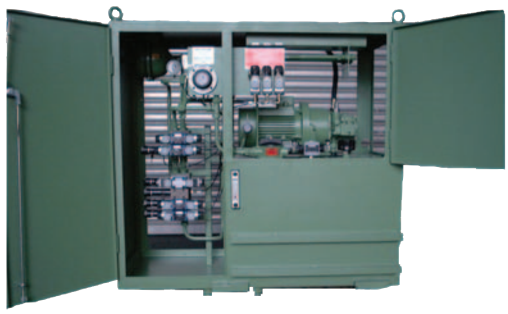
Design 4



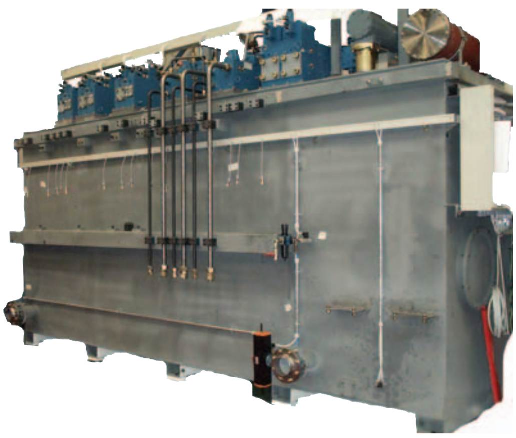
Made for Motion KTR

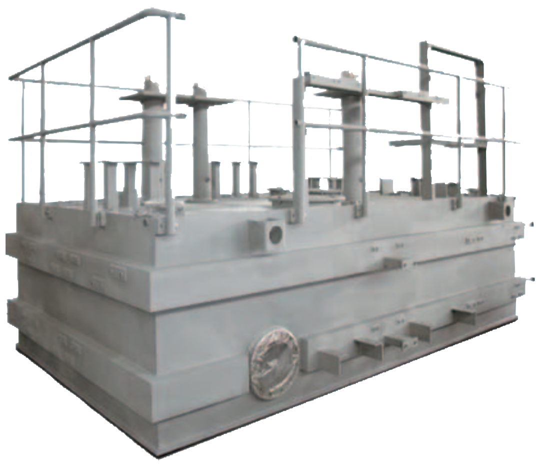
Special tanks on request

Combi-tank Hydraulic diesel with battery box	Mobile hydraulics
	

Hydraulic tank	Tank with housing
	

Large tanks for presses and units





Certificates

Welding approval for rail rehicles and vehicle parts acc. to DIN 6700-2


Schweißtechnische
Lehr- und Versuchsanstalt
Berlin-Brandenburg
Niederlassung der GSI mbH

Bescheinigung
zum Schweißen von Schienenfahrzeugen und -fahrzeugteilen
nach DIN 6700-2

The manufacturing plant of KTR is certified according to ISO 9001: 2000


Zertifikat

Konstrukcje Stalowe KTR Group Sp. z o.o.

ISO 9001:2008


Schweißtechnische
Lehr- und Versuchsanstalt
Berlin-Brandenburg
Niederlassung der GSI mbH

Zertifikat

DIN EN ISO 3834-2

Complete qualification proof for steel components and tanks according to DIN18800-7


Schweißtechnische
Lehr- und Versuchsanstalt
Berlin-Brandenburg
Niederlassung der GSI mbH

Bescheinigung

Klasse E

Recognized expert plant acc. to the water resources law §19 I WHG


URKUNDE

über die Anerkennung als Fachbetrieb
gemäß § 19 l WHG

FGMA

RUFLEX®
Torque limiter

SYNTEX®
Backlash-free Overload System

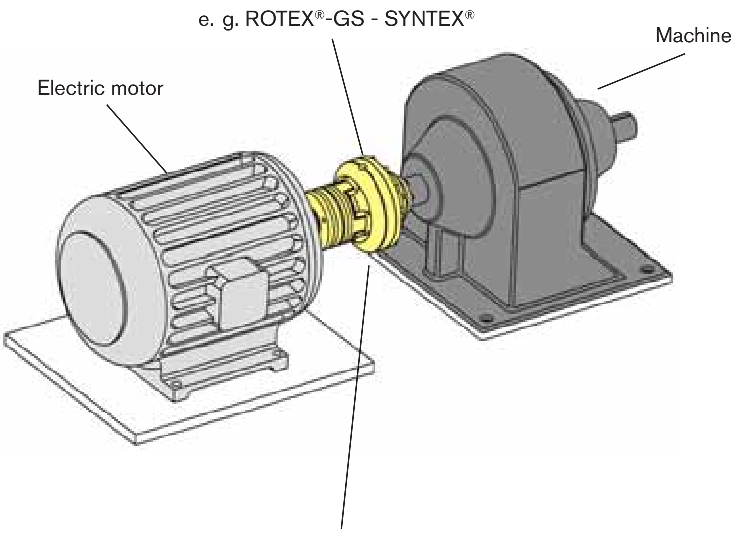
KTR-SI
Safety system

Made for Motion KTR

Table of contents

Overload protection for direct and indirect drives

Direct drives



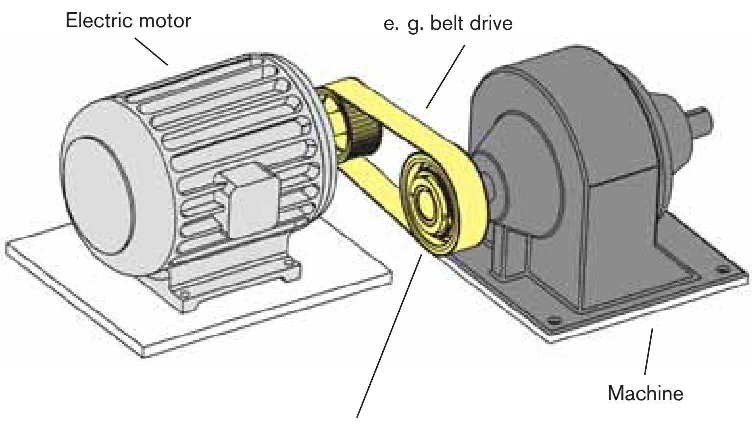
Torque limiter as shaft-to-shaft connection, for example:
- **ball spindles**
- **axle drives**
- **between motor and gearbox**

RUFLEX® - Torque limiter with ROTEX®

SYNTEX® - Safety coupling with ROTEX® GS

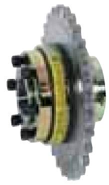
KTR-SI - Safety coupling with ROTEX®

Indirect drives



Shaft-to-flange connection, for example:
- **sprockets**
- **belt drives**
- **crank gears**

RUFLEX® - Torque limiter with sprocket



SYNTEX® - Safety coupling with sprocket

KTR-SI - Safety coupling with mounting flange

Typs and applications

Type	Characteristics	Applications
 RUFLEX® standard	● Torque limiter with high capacity due to high-quality materials ● Overload protection up to 6800 Nm ● High capacity of wear for a long service life ● Surfaces zinc-coated and yellow passivated ● See page 229	● Conveyors ● Packaging machines ● Textile machines ● Gear motors
 RUFLEX® with sprocket	● Torque limiter with sprocket ● Design ready for assembly ● Customer's torque is set ● Available from stock with standard sprockets ● Other sprockets available according to customer's requests ● See page 230	● Conveyors ● Automatisation systems ● Actuators
 RUFLEX® max.	● Torque limiter in a lengthened design for assemblies with wide driving elements (e.g. double or triple sprockets) ● Detailed adjustment to customer's mounting dimensions possible ● Also available as a sprocket ● See page 231	● Multiple sprocket drives ● Multiple groove V-belt pulleys ● Conveyors ● Packaging machines
 RUFLEX® with ROTEX®	● Torque limiter for shaft-to-shaft connection ● Torsionally flexible torque limiter able to compensate for misalignment ● Axial plug-in ● Various elastomers available each adjusted to the application ● See page 232	● Gear motors ● Axle drives ● High-quality pumps ● Printing machines
 RUFLEX® with BoWex®	● Torque limiter as a torsionally rigid, double-cardanic shaft-to-shaft connection ● Low-cost shaft-to-shaft connection ● Axial plug-in ● Compensation for high misalignment due to double-cardanic design ● See page 233	● Simple applications ● Low speeds ● High misalignment

Typs and applications

Type | **Characteristics** | **Applications**

SYNTEX® standard

Characteristics:
- Safety clutch up to 400 Nm
- Backlash-free, torsionally rigid
- Available as a synchronous or ratchet design
- For mounting of customer's components
- See page 236

Applications:
- Packaging machines
- Machine tools
- X-Y-Z – axle drives
- Linear drives

SYNTEX® with sprocket

Characteristics:
- Safety clutch with integrated sprocket
- Customer's torque is set
- Reduction of components and costs
- Standard sprockets available from stock
- Alternatively available with belt pulley instead of sprocket
- See pages 237 and 238

Applications:
- Conveyors for packaging machines
- Textile machines
- With belt pulley for linear drives

SYNTEX® with ROTEX® GS

Characteristics:
- Safety clutch as a shaft-to-shaft connection
- Combination with the backlash-free ROTEX® GS
- Torsionally flexible, able to compensate for misalignment
- Axial plug-in
- Various elastomers available
- See page 239

Applications:
- Axle drives on machine tools
- Gear motors
- Woodworking machinery
- Linear drives

KTR-SI standard

Characteristics:
- Safety clutch up to 8200 Nm
- Available as a ratchet, synchronous and failsafe design
- **New: Furthermore available as a free switching design (no residual torque)**
- See page 244 and 245

Applications:
- For rugged drives e.g. crushers
- In combination with coupling or belt pulleys, sprockets, etc.

KTR-SI with ROTEX®

Characteristics:
- Safety clutch as a shaft-to-shaft connection
- Torsionally flexible, able to compensate for misalignment
- Axial plug-in
- Various elastomers available
- See page 246

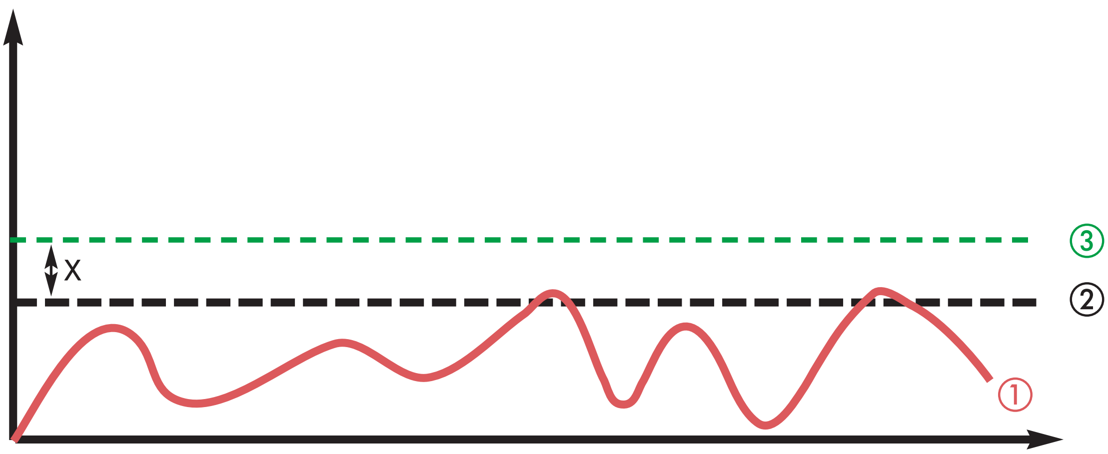
Applications:
- Axle drives as a shaft-to-shaft connection
- Combinations for motor and gearbox
- Bottle filling machines
- Extruders (as a free switching coupling)

Information for selection torque limiters

- For exact dimensioning torque limiters latest simulation and calculation programmes are available. Therefore let us know many data of your drive. The more precise these data are, the more precise are the results of calculation. Make use of this possibility and discuss with us the application in advance.
- Please notice: High masses at the drive or driven end can mean long slow-down times also in case of torque limiters entered in function. This can cause increased wear at the coupling. Therefore in case of high speeds we recommend to use a free-rotating (load-separating) safety clutch (KTR-SI idle rotation coupling). If required, please contact KTR's engineering department.
- Besides it is important fo the failure-free operation to define the engaging torque definitely above the max. operating torque of the unit. Therefore we recommend to set the coupling at least 30% above the max. operating torque (also refer ti diagram below)
- For all torque limiters an electrical disconnection of the drive should be provided. Long slipping or locking times can destroy the coupling. We kindly assist you when selecting sensors, end switches or speed controls.

Important factors for the selection of torque limiters:

A smooth operation is only guaranteed if the overload torque set exceeds the maximum operating torque of the machine (see diagram below).



① Torque curve of the machine
② Maximum operating torque of the machine
③ Torque of the coupling set
X Safety margin between ② and ③ (should be at least 30% of the maximum operating torque of the machine).

Assembly and operation

RUFLEX® standard	RUFLEX® with sprocket	RUFLEX® with ROTEX®
		

- Overload protection up to 6800 Nm (standard)
- Available with sprocket assembled
- Asbestos-free and rust-resistant friction lining for dry running
  Ⓔx (ATEX possible on request)
- High wear capacity, long service life
- High-quality slide bush with dry-film lubricant
- Torque setting while in place

- Securing of the nut by locking in 12 different positions
- Easy assembly and torque setting
- Coupling components from steel, high safety reserves
- Corrosion protection by zinc-coated and passivated surfaces
- Rust-resistant and acid-proof design on request
- High capacity due to high-quality disk springs and friction linings

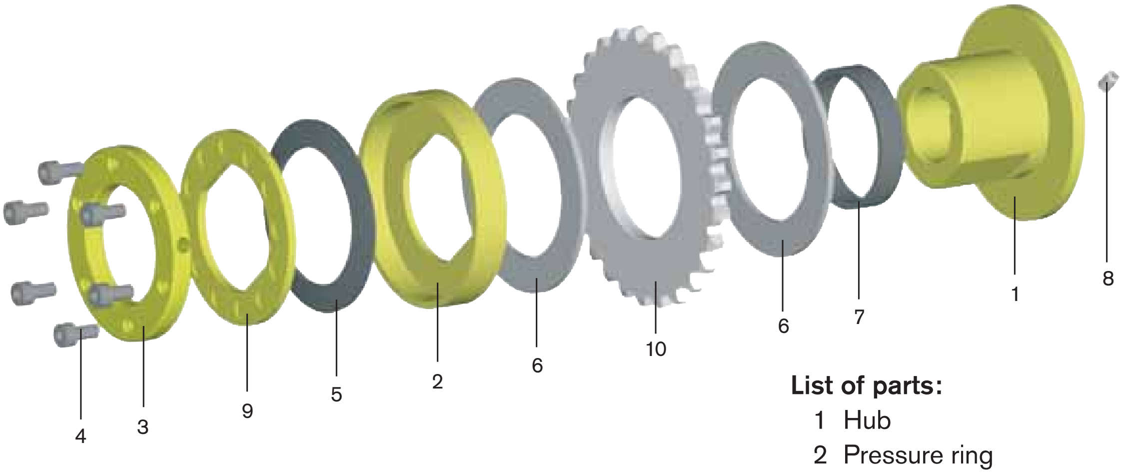
The RUFLEX® modular system is able to offer a solution for your drive, too.

The combination with the well-approved KTR couplings and the integration of customer-specific drive elements (e. g. sprockets) provides for an overload protection adapted to every application in an optimum way.

Various layers of disk springs and high-quality friction linings ensure a high capacity even for only a small mounting space.

Assembly and operation

RUFLEX® consists of the following components:



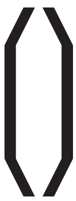
List of parts:

1 Hub
2 Pressure ring
3 Setting nut
4 Torque setting screws
5 Disk spring
6 Friction lining
7 Slide bush
8 Setscrew
9 Locking washer
10 Drive component (e. g. sprocket)

Layers of disk springs:

1 TF

- Small specific load on the friction linings
- For small to average torques
- High service life of the friction linings

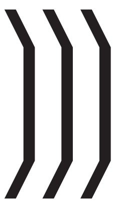


1 TFD

- Small specific load on the friction linings
- Torques as with design 1TF
- Only small decrease of the torque even during a longer period of friction
- Precision torque adjustment due to a double spring excursion

2 TF

- Average specific load on the friction linings
- Average wear and decrease of torque with longer slipping periods
- Double torque due to double layer of the disk springs

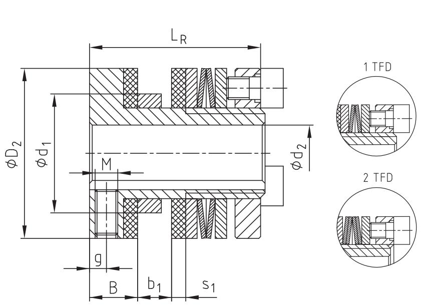


3 TF

- High specific load on the friction linings
- High wear and decrease of torque with longer slipping periods
- Suitable only in special cases for designs with only limited dimensions

Standard RUFLEX®

- Torque limiter for a torque range up to 6800 Nm
- Standard RUFLEX® zinc-coated and yellow passivated
- Torque setting possible while in place
- Asbestos-free and rust-resistant friction linings
- Finish bore according to ISO fit H7,
  feather keyway according to DIN 6885 sheet 1 - JS9
- Securing of the setting nut by locking in 12 different positions
- All components are made from high-quality steel



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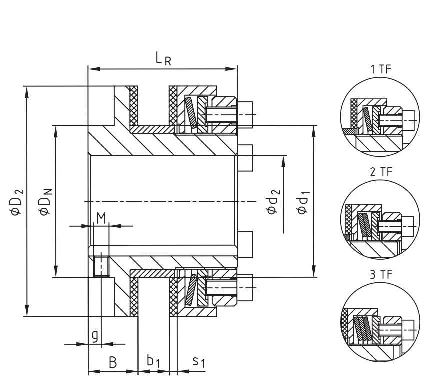

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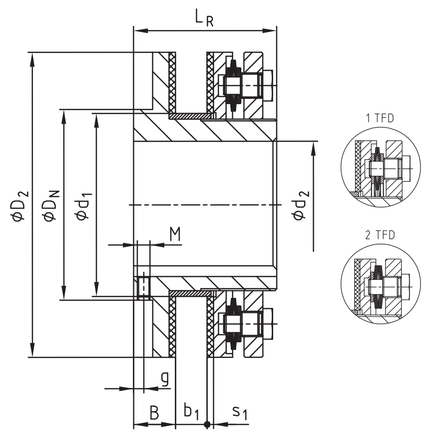
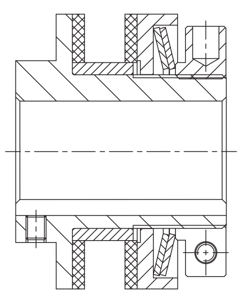


Size 6 - 8

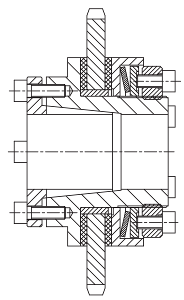
Technical Data

Size	Max. speed [min⁻¹]	Torques [Nm]			Dimension [mm]												
		1TF	2TF	3TF 3)	Bore d_2		D_2	D_N	d_1 2)	B	Driving component b_1		S_1	L_R	Setscrew	
					Pilot bore	max.					min.	max.			g	M
00	10000	0,5-3	1-5	–	–	10	30	30	21	8,5	2	6	2,5	31	3	M4
0	8500	2-10	4-20	–	–	20 1)	45	45	35	8,5	2	6	2,5	33	3	M4
01	6600	5-35	10-70	–	–	22	58	40	40	16	3	8	3	45	4	M5
1	5600	20-75	40-150	130-200	–	25	68	45	44	17	3	10	3	52	5	M5
2	4300	25-140	50-280	250-400	–	35	88	58	58	19	4	12	3	57	5	M6
3	3300	50-300	100-600	550-800	–	45	115	75	72	21	5	15	4	68	5	M6
4	2700	90-600	180-1200	1100-1600	–	55	140	90	85	23	6	18	4	78	5	M8
5	2200	400-800	800-1600	1400-2100	–	65	170	102	98	29	8	20	5	92	8	M8
6	1900	300-1200	600-2400	–	38	80	200	120	116	31	8	23	5	102	8	M8
7	1600	600-2200	1200-4400	–	45	100	240	150	144	33	8	25	5	113	8	M10
8	1300	900-3400	1800-6800	–	58	120	285	180	170	35	8	25	5	115	8	M10

1) Finish bore larger than Ø 19, keyway to DIN 6885 sheet 3
2) Dimension d_1 for bores F8
3) To use only for designs with limited dimensions



- with clamping setting nut
- for radial torque setting



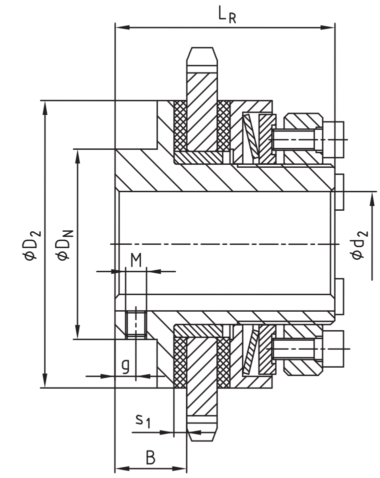
- with taper bush (hub design 4.5)
- frictionally engaged shaft-hub-connection

Order form:

RUFLEX®	1	2TF	10	Ø 20
Coupling type	Size	Disk spring layer	Width of driving components	Bore

RUFLEX® with sprocket

- RUFLEX® torque limiter with sprocket mounted
- Available from stock with standard sprocket (see table below)
- Other sprockets on request
- Complete unit with torque pre-set
- On request also available from stainless material
- Finish bore according to ISO fit H7,
  feather keyway according to DIN 6885 sheet 1 - JS9

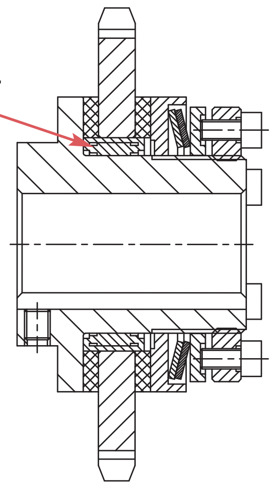


Technical Data

Size	Max. speed $[min^{-1}]$	Torques [Nm]			Dimensions [mm]									
		1TF	2TF	3TF 1)	Bore d_2		D_2	D_N	B	s_1	L_R	Setscrew		Standard sprocket
					Pilot bore	max.						g	M	
01	6600	5-35	10-70	–	–	22	58	40	16	3	45	4	M5	$^3/_8$ x $^7/_{32}$, z = 23
1	5600	20-75	40-150	130-200	–	25	68	45	17	3	52	6	M5	$^1/_2$ x $^5/_{16}$, z = 22
2	4300	25-140	50-280	250-400	–	35	88	58	19	3	57	6	M6	$^1/_2$ x $^5/_{16}$, z = 27
3	3300	50-300	100-600	550-800	–	45	115	75	21	4	68	6	M6	$^3/_4$ x $^7/_{16}$, z = 22

1) To use only for designs with limited dimensions

On request available with needle bearing instead of slide bush.



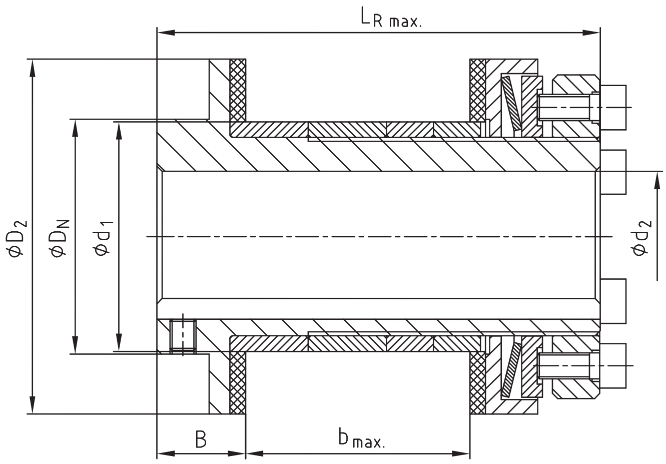
- available with needle bearing
- for high radial load on the sprocket
- for high torques or long slipping periods

Order form:

RUFLEX®	1	2TF	08 B1, z=24	Ø 20	100 Nm
Coupling type	Size	Disk spring layer	Sprocket	Bore	Torque set

RUFLEX® max.

- RUFLEX® for assemblies with wide driving components
- E. g. double and triple sprockets
- Detailed adjustment to the customer's dimensions possible
- Also available as a complete unit with sprocket
- Other sizes of RUFLEX® max. on request
- Please mention the width of driving component "b" in your order
- Finish bore according to ISO fit H7, feather keyway according to DIN 6885 sheet 1 - JS9

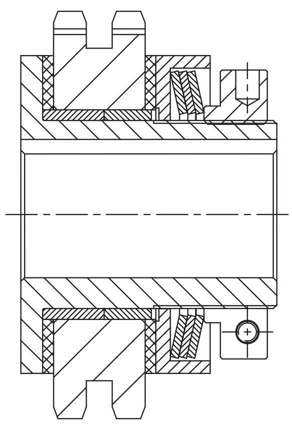


Technical Data

Size	Max. speed [min⁻¹]	Torques [Nm]			Dimensions [mm]							
		1TF	2TF	3TF 2)	Bore d_2		D_2	D_N	B	$b_{max.}$	d_1 1)	$L_{R\ max.}$
					Pilot bore	max.						
01	6600	5-35	10-70	–	–	22	58	40	16	33	40	70
1	5600	20-75	40-150	130-200	–	25	68	45	17	43	44	85
2	4300	25-140	50-280	250-400	–	35	88	58	19	54	58	100
3	3300	50-300	100-600	550-800	–	45	115	75	21	62	72	115

1) Dimension d_1 for bores F8

2) To use only for designs with limited dimensions



– RUFLEX® max. with sprocket mounted

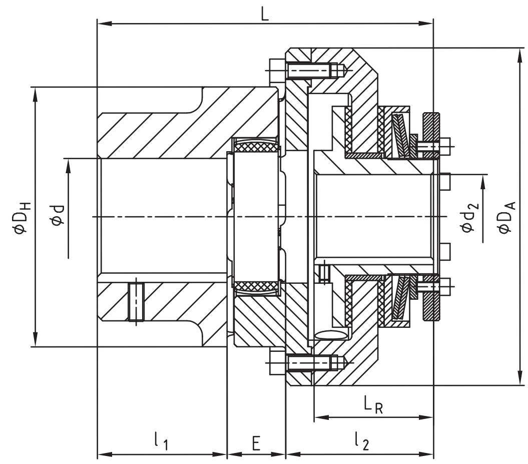
– available as a complete unit with torque pre-set

Order form:

RUFLEX® max.	1	2TF	35	Ø 20
Coupling type	Size	Disk spring layer	Width of driving components "b"	Bore

RUFLEX® with torsionally flexible ROTEX®

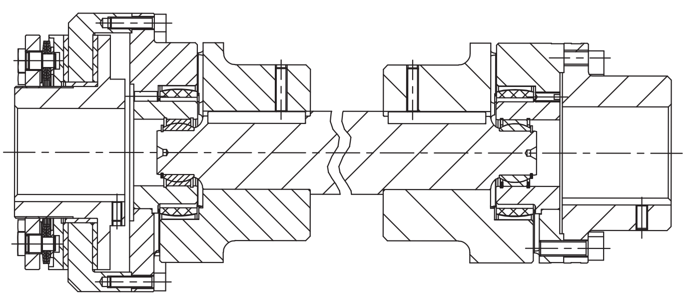
- RUFLEX® with ROTEX® as shaft-to-shaft-connection
- Torsionally flexible safety clutch
- Axial plug-in
- Able to compensate for misalignment
- Various kinds of elastomer hardness available
- Torque can be set while in place
- Easy assembly
- Finish bore according to ISO fit H7, feather keyway according to DIN 6885 sheet 1 - JS9



Technical Data																
RUFLEX® size	ROTEX® size	RUFLEX® torques [Nm]			ROTEX® torques [Nm]		Dimension [mm]									
		1TF	2TF	3TF 2)	95/98 Shore A		Bore d_2		Bore $d_{max.}$	L	D_A	L_R	E	l_1	l_2	D_H
					T_{KN}	$T_{K\ max.}$	Pilot bore	max.								
00	14	0,5-3	1-5	–	12,5	25	–	10	16	59	44	31	13	11	35	30
0	19	2-10	4-20	–	17	34	–	20 1)	25	78	63	33	16	25	37	40
01	24	5-35	10-70	–	60	120	–	22	35	98	80	45	18	30	50	55
1	28	20-75	40-150	130-200	160	320	–	25	40	113	98	52	20	35	58	65
2	38	25-140	50-280	250-400	325	650	–	35	48	133	120	57	24	45	64	80
3	48	50-300	100-600	550-800	525	1050	–	45	62	166	162	68	28	56	82	105
4	75	90-600	180-1200	1100-1600	1465	2930	–	55	95	205	185	78	40	85	80	160
5	90	400-800	800-1600	1400-2100	3600	7200	–	65	110	259	260	92	45	100	114	200
6	100	300-1200	600-2400	–	4950	9900	38	80	115	290	285	102	50	110	130	225
7	110	600-2200	1200-4400	–	6000	12000	45	100	125	317	330	113	55	120	142	255
8	140	900-3400	1800-6800	–	11000	22000	58	120	160	372	410	115	65	155	152	320

1) Finish bore larger than Ø 19, keyway to DIN 6885 sheet 3

2) To use only for designs with limited dimensions

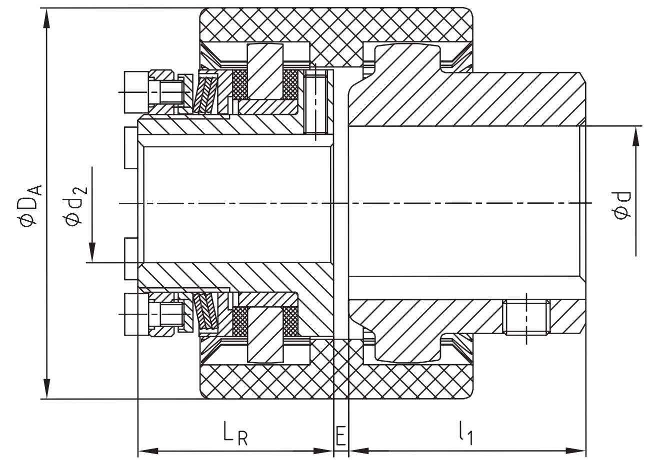


- RUFLEX® as intermediate shaft coupling
- for large shaft distance dimensions
- available in combination with ROTEX® or RADEX-N® steel laminae couplings

Order form:	RUFLEX®	1	2TF	Ø 20	ROTEX®	28	98 Sh A	Ø 25	100 Nm
	Coupling type	Size	Disk spring layer	RUFLEX® bore	Coupling type	Size	Spider	ROTEX® bore	Torque set

RUFLEX® with torsionally rigid BoWex®

- RUFLEX® with BoWex® as shaft-to-shaft-connection
- Torsionally rigid safety clutch
- Axial plug-in
- Double-cardanic, able to compensate for misalignment
- For simple drives (low speeds, etc.)
- Easy assembly
- Finish bore according to ISO fit H7, feather keyway according to DIN 6885 sheet 1 - JS9

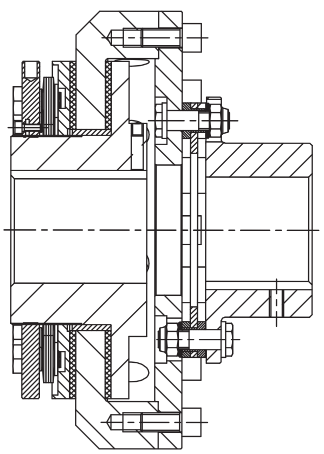


Technical Data

RUFLEX® size	BoWex® size	RUFLEX® torques [Nm] 1TF	2TF	3TF 2)	BoWex® torques [Nm] T_{KN}	$T_{K\,max.}$	Dimensions [mm] Bore d_2 Pilot bore	max.	Bore $d_{max.}$	D_A	L_R	E	l_1
00	19	0,5-3	1-5	–	16	32	–	10	19	48	31	2,5	25,0
0	28	2-10	4-20	–	45	90	–	20 1)	28	66	33	2,5	40,0
01	38	5-35	10-70	–	80	160	–	22	38	83	45	1,0	35,5
1	48	20-75	40-150	130-200	140	280	–	25	48	95	52	1,0	45,5
2	65	25-140	50-280	250-400	380	760	–	35	65	132	57	1,0	64,0

1) Finish bores larger than Ø 19 mm, keyway to DIN 6885 sheet 3

2) To use only for designs with limited dimensions



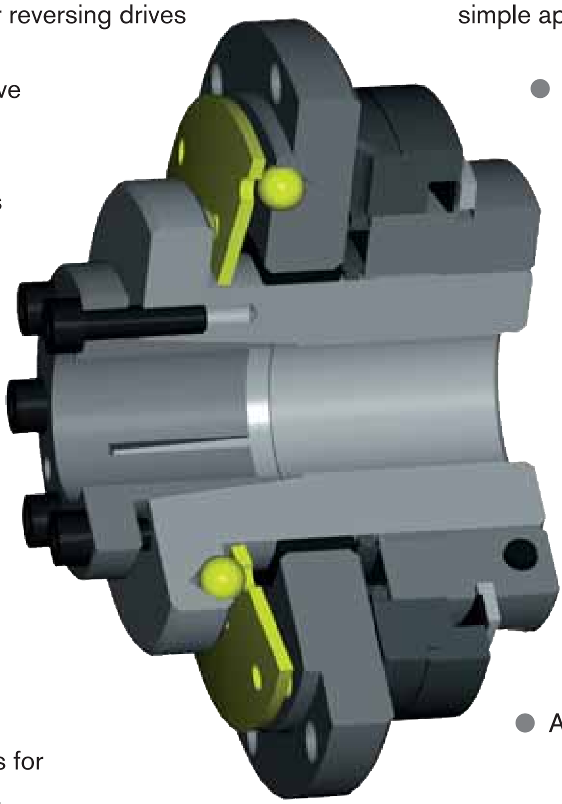
- RUFLEX® with torsionally rigid, backlash-free RADEX®-N steel laminae coupling
- suitable for high operating temperatures (up to 280 °C)
- with variable spacers for different shaft distance dimensions

Order form:

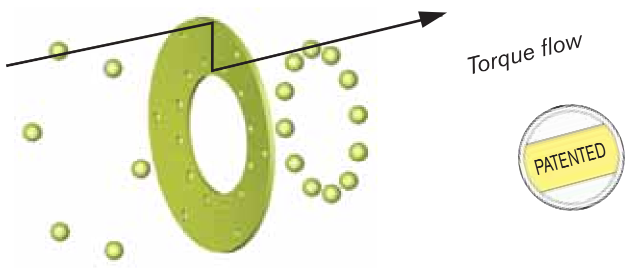
RUFLEX®	1	1TF	BoWex®	38	Ø 20	Ø 25	50 Nm
Coupling type	Size	Disk spring layer	Coupling type	Size	RUFLEX® bore	BoWex® bore	Torque set

A good idea - The punched disk spring

SYNTEX® - Safety clutch with mounting flange	SYNTEX® - Safety clutch with sprocket	SYNTEX® - Safety clutch with ROTEX® GS
		



- Backlash-free, torsionally stiff overload protection, suitable for reversing drives
- Disconnection of the drive in case of overload
- Reduction of torque peaks
- High repeating accuracy even after a long operation period
- Easy integration of customer components
- Compact design, low mass moment of inertia
- Variable due to modular system
- Special disk springs for special applications
- Low-cost protection even for simple applications
- Easy assembly and torque setting
- Maintenance-free
- Insensitive to oil and grease
- Long service life due to low internal loads
- Backlash-free shaft-hub-connections
- Any or synchronous re-engagement
- Automatically operative

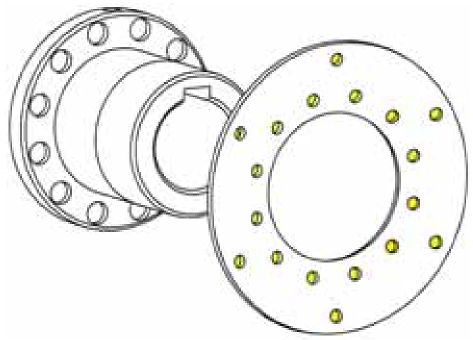


SYNTEX® is an overload system with positive operation.

The punched disk spring serves as the component for torque transmission (registered patent).

Operating principle

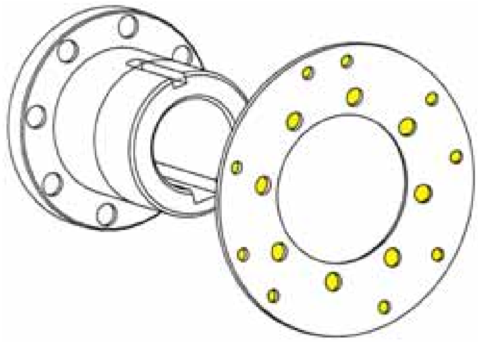
Ratchet design DK



If the torque set is exceeded, there is a relative movement between the driving and driven side. The transmittable torque is decreased to a minimum.

The balls leave the indentations of the disk springs.
After eliminating the overload, the balls engage automatically with the next following ball indentation of the disk springs.

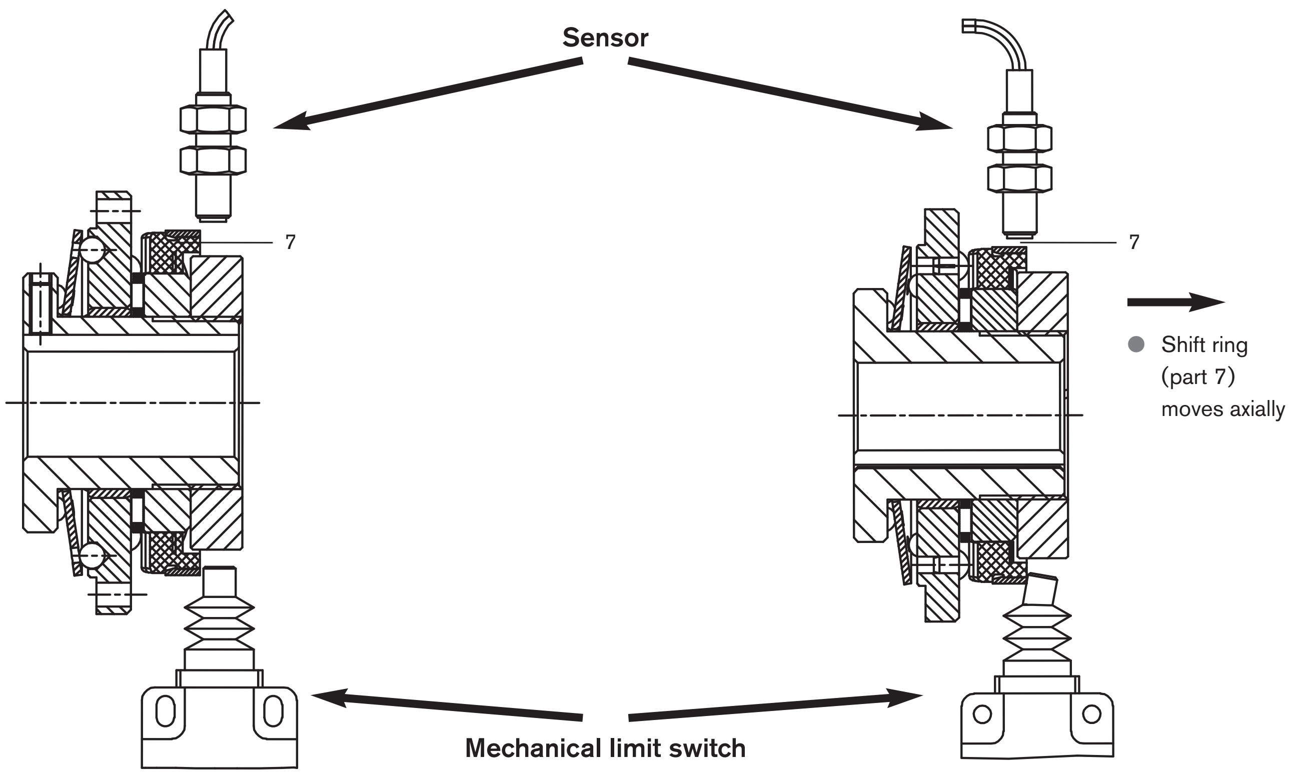
Synchronous design SK



If the torque set is exceeded, there is a relative movement between the driving and driven side. The transmittable torque is decreased to a minimum.

The balls leave the indentations of the disk springs. After eliminating the overload, the balls re-engage automatically with the disk springs after a rotation of 360°. Driving and driven side are always placed in the same position to each other (other degrees of re-engagement, for example 180°, are also possible).

Signal by limit switch or sensor in case of overload



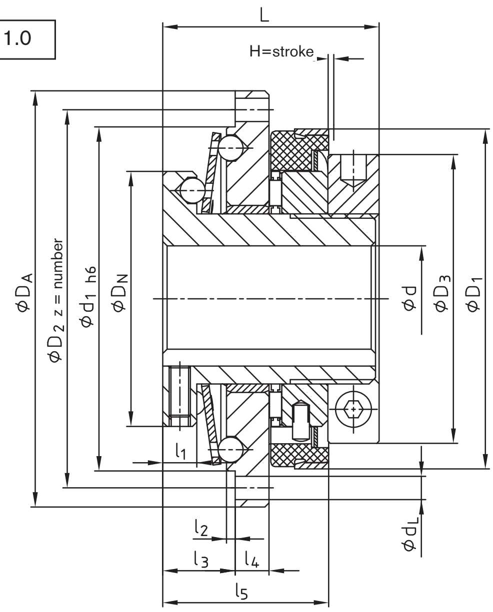
Normal operation:
No signal by sensor or mechanical limit switch

In case of overload:
The axial movement of the shift ring activates the sensor or mechanical limit switch, respectively. The resulting signal may be used for control operation (e. g. motor stop).

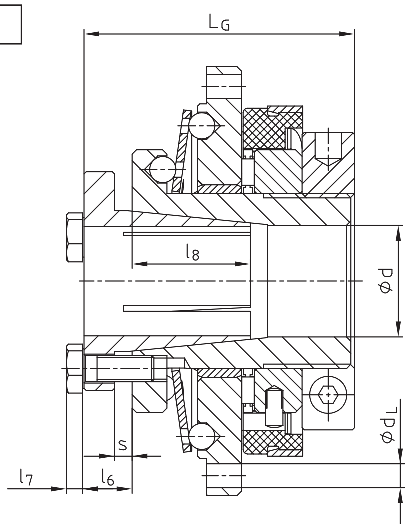
SYNTEX® standard flange coupling

- SYNTEX® standard safety clutch applicable up to 400 Nm
- Flange design
- Easy mounting of customers' components
- Available both as a ratchet and synchronous design
- Torque setting possible while in place
- Finish bore according to ISO fit H7,
  feather keyway according to DIN 6885 sheet 1 - JS9
- Also available with a frictionally engaged shaft-hub-connection (hub design 4.5)

Hub design 1.0



Hub design 4.5



Technical Data

Size	Torques [Nm] Ratchet design DK: DK1	DK2	Synchronous design SK: SK1	SK2	Max. speed [min⁻¹]	Bore d: Pilot bore	max.	D_A	D_2	d_1	D_N	D_3	D_1	d_L	L	l_1	l_2	l_3	l_4	l_5	z	H=stroke
20	6-20	15-30	10-20	20-65	1500	–	20	80	71	65	48	54	61,5	4,5	45	8	2	16	6	35	8	2
25	20-60	45-90	25-65	40-100	1500	–	25	98	89	81	60	68	80	5,5	50	8	2	17	8	39	8	2
35	25-80	75-150	30-100	70-180	1000	–	35	120	110	102	75	78	91	5,5	60	10	2	21	10	42	12	2
50	60-180	175-300	80-280	160-400	1000	–	50	162	152	142	105	108	121	6,6	70	12	2	25	13	56	12	2

Dimensions [mm]: D_A to H=stroke.

Technical Data – Hub design 4.5

Size	Dimensions [mm]: $d_{max.}$	l_6	l_7	l_8	L_G	s	Clamping screw	Tightening torque T_A [Nm]
20	20	9	3,5	23	54	3	4 x M5	8,5
25	25	11	4,0	28	61	4	4 x M6	14
35	35	10	4,0	31	70	4	4 x M6	14
50	50	12	4,0	37	82	6	4 x M6	14

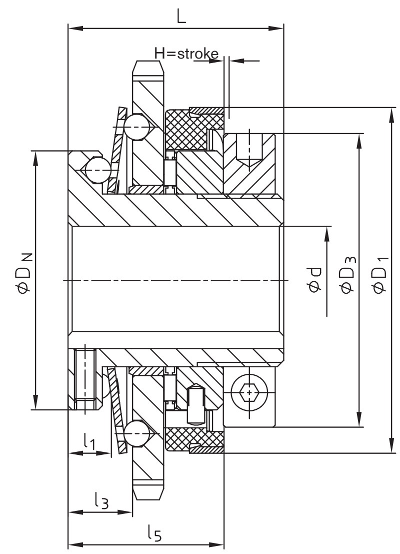
Order form:

SYNTEX®	25	DK1	Ø 20	1.0	45 Nm
Coupling type	Size	Design	Bore	Hub design	Torque set

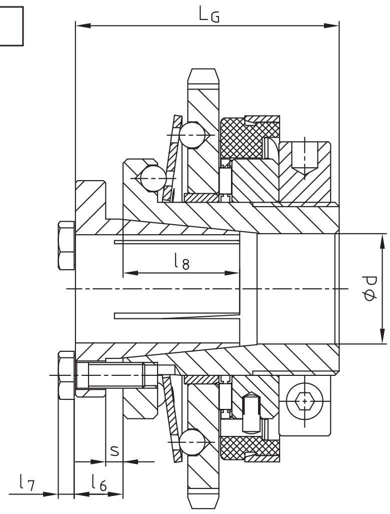
Standard SYNTEX® with integrated sprocket

- Standard SYNTEX® with integrated sprocket
- Available ready to be installed with the torque set
- Reduction of components by integration of parts
- Available both as a ratchet and synchronous design
- Torque setting possible while in place
- Finish bore according to ISO fit H7, feather keyway according to DIN 6885 sheet 1 - JS9
- Also available with a frictionally engaged shaft-hub-connection (hub design 4.5)

Hub design 1.0



Hub design 4.5



Technical Data

Size	Torques [Nm] Ratchet design DK: DK1	DK2	Synchronous design SK: SK1	SK2	Max. speed [min⁻¹]	Dimensions [mm] Bore d: Pilot bore	max.	Standard sprocket	D_N	D_3	D_1	L	l_1	l_3	l_5	H=stroke
20	6-20	15-30	10-20	20-65	1500	–	20	$^3/_8$ x $^7/_{32}$, z = 25	48	54	61,5	45	8	14	35	2
25	20-60	45-90	25-65	40-100	1500	–	25	$^1/_2$ x $^5/_{16}$, z = 24	60	68	80	50	8	15	39	2
35	25-80	75-150	30-100	70-180	1000	–	35	$^1/_2$ x $^5/_{16}$, z = 29	75	78	91	60	10	19	42	2
50	60-180	175-300	80-280	160-400	1000	–	50	$^3/_4$ x $^7/_{16}$, z = 27	105	108	121	70	12	23	56	2

Technical Data – Hub design 4.5

Size	Dimensions [mm]: $d_{max.}$	l_6	l_7	l_8	L_G	s	Clamping screws	Tightening torque T_A [Nm]
20	20	9	3,5	23	54	3	4 x M5	8,5
25	25	11	4,0	28	61	4	4 x M6	14
35	35	10	4,0	31	70	4	4 x M6	14
50	50	12	4,0	37	82	6	4 x M6	14

Order form:

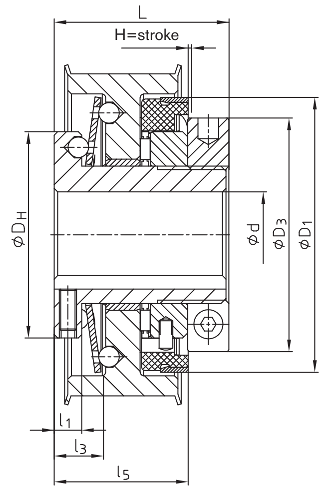
SYNTEX®	25	DK1	Ø 20	1.0	$^1/_2$ x $^5/_{16}$, z = 29	45 Nm
Coupling type	Size	Design	Bore	Hub design	Sprocket	Torque set

Made for Motion KTR

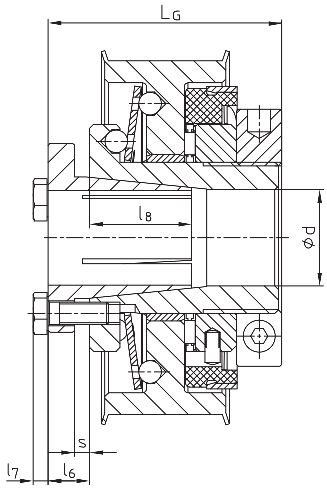
Standard SYNTEX® with belt drive

- Standard SYNTEX® with integrated belt drive
- Available ready to be installed with the torque set
- Reduction of components by integration of parts
- Available both as a ratchet and synchronous design
- Torque setting possible while in place
- Finish bore according to ISO fit H7, feather keyway according to DIN 6885 sheet 1 - JS9
- Also available with a frictionally engaged shaft-hub-connection

Hub design 1.0



Hub design 4.5



Technical Data

Size	Torques [Nm]				Max. speed [min⁻¹]	Dimensions [mm]												
	Ratchet design DK		Synchronous design SK			Bore d		Belt drive		D_N	D_3	D_1	L	l_1	l_3	l_5	H=stroke
	DK1	DK2	SK1	SK2		Pilot bore	max.	T10 [1]	AT10 [1]								
20	6-20	15-30	10-20	20-65	1500	–	20	T10, z=24	AT10, z=24	48	54	61,5	45	8	14	35	2
25	20-60	45-90	25-65	40-100	1500	–	25	T10, z=30	AT10, z=30	60	68	80	50	8	15	39	2
35	25-80	75-150	30-100	70-180	1000	–	35	T10, z=36	AT10, z=36	75	78	91	60	10	19	42	2
50	60-180	175-300	80-280	160-400	1000	–	50	T10, z=48	AT10, z=48	105	108	121	70	12	23	56	2

1) z = min. erforderliche Zähnezahl

Technical Data – Hub design 4.5

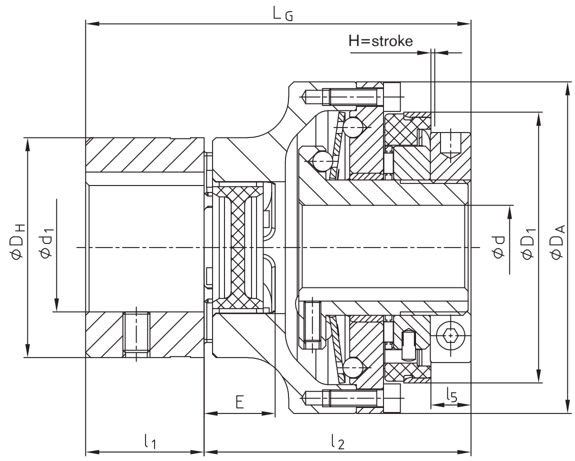
Size	Dimensions [mm]							Tightening torque
	$d_{max.}$	l_6	l_7	l_8	L_G	s	Clamping screw	T_A [Nm]
20	20	9	3,5	23	54	3	4 x M5	8,5
25	25	11	4,0	28	61	4	4 x M6	14
35	35	10	4,0	31	70	4	4 x M6	14
50	50	12	4,0	37	82	6	4 x M6	14

Order form:

SYNTEX®	25	DK1	Ø 20	1.0	AT10, z=24	30	45 Nm
Coupling type	Size	Design	Bore	Hub design	Belt drive	Width of synchronous belt	Torque set

SYNTEX® with shaft coupling ROTEX® GS

- Backlash-free, axially rigid safety clutch
- Axial plug-in
- Low mass moments of inertia by using aluminium components
- Available both as a ratchet or synchronous design
- Torque setting possible while in place
- Also available with a frictionally engaged shaft-hub-connection
- Finish bore according to ISO fit H7, feather keyway according to DIN 6885 sheet 1 - JS9



Technical Data

SYNTEX® size	ROTEX® GS size	Torques [Nm] Ratchet design DK: DK1	DK2	Synchronous design SK: SK1	SK2	ROTEX® GS 98 Sh A-GS: T_{KN}	$T_{Kmax.}$	Max. speed [min⁻¹]	Dimensions [mm] Max. bore: d	d_1	D_A	D_H	l_1	E	l_2	l_5	L	L_G	D_1	H=stroke
20	24	6-20	15-30	10-20	20-65	60	120	1500	20	28	80	55	30	18	70	10	45	100	61,5	2
25	28	20-60	45-90	25-65	40-100	160	320	1500	25	38	98	65	35	20	78	11	50	113	80	2
35	38	25-80	75-150	30-100	70-180	325	650	1000	35	45	120	80	45	24	91	13	60	136	91	2
50	48	60-180	175-300	80-280	160-400	525	1050	1000	50	62	162	105	56	28	111	14	70	167	121	2

Order form:

SYNTEX®	25	DK1	1.0	Ø 20	ROTEX® GS	28	98 Sh A-GS	1.0	Ø 25	50 Nm
Coupling type	Size	Design	Hub design	SYNTEX® bore	Coupling type	Size	Spider	Hub design	ROTEX® GS bore	Torque set

Made for Motion KTR

Assembly / Limit switch / Proximity initiator

Please order our separate mounting instructions KTR-N 46210!
The **SYNTEX**® overload system is pre-set in our company. Unless there are any further details mentioned by the customer, **the torque is set to about 70 % of the maximum torque**.
The operating principle of the **SYNTEX**® overload system enables backlash-free torque transmission by positive locking.
The torque is transmitted by **balls** and **disk springs**. By the prestressed force of the disk spring, the balls engage in the respective ball position of the disk spring.
By using a clamping **setting nut**, the ratchet torque can be set according to the partition of the plastic shift ring.

- Fix the hub against twisting.
- Unscrew the setscrew in the setting nut.
- Pay attention to the reference position (coloured marking on the hub).
- Turn the setting nut clockwise with a sickle spanner in order to increase the ratchet torque; turn the setting nut anticlockwise in order to reduce the ratchet torque.
- If the requested ratchet torque is set, fix the setting nut again by screwing down the setscrew on the thread of the hub.

Limit switch

Operation

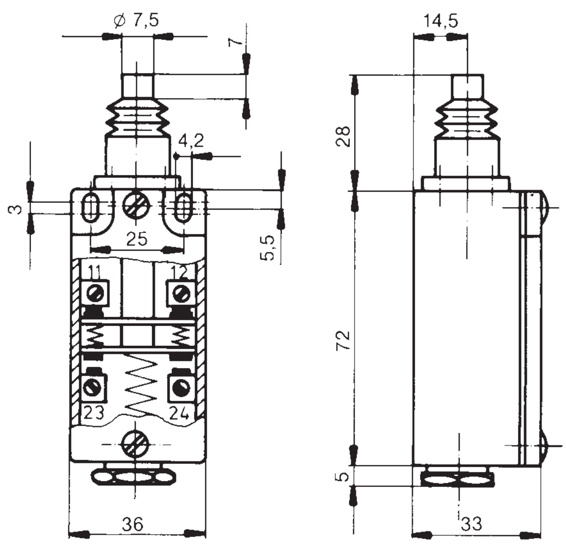
A mechanical limit switch or an inductive sensor is actuated by the axial stroke of the shift ring arising in case of overload. In this way a control signal is produced disconnecting the drive.

Assembly

The sensor has to be mounted in a solid device in order to ensure a smooth operation. The sensor should be protected against dirt and potential mechanical troubles.

Adjustment

On engagement of the overload coupling, the shift ring realizes an axial stroke movement of about 2 mm. The sensor or the limit switch must be assembled in this shifting range. In order to adapt the mechanical limit switch and the shifting way to the unit, the limit switch has to be adjusted accordingly. For that purpose the shifting way can be changed at the tappet after opening the cover plate.
Please make absolutely sure to check the operativeness of the limit switch before delivery of the unit.



Shifting

■ On □ Off

Degrees	0–3	3–8	8–12	12–16	16–20
11–12 Break contact	■				
23–24 Make contact					

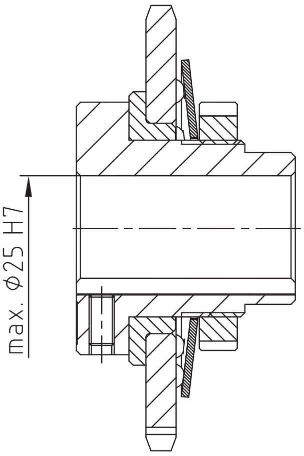
Technical data:

Maximum voltage	: 500 V AC
Maximum constant current	: 10 A
Kind of protection	: IP 65 acc. to DIN 40050
Switching frequency	: 6.000/h
Operating temperature	: - 30 °C to + 80 °C
Kind of contact	: 1 break contact, 1 make contact
Mechanical service life	: 10^7 switches
Housing	: Aluminium diecast
Cover	: Aluminium sheet steel
Switching direction	: Possible from all directions

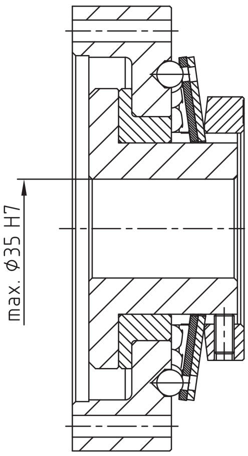
After opening the cover plate a change of the shifting way is possible!

Cost-optimised version

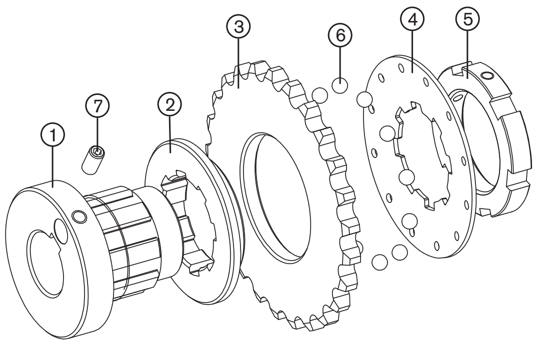
- Low-cost version with high power density
- Ideal for higher quantities e. g. for conveyor belt drives
- Use of optimised manufacturing processes, e. g. sintering
- Please ask for our detailed documentations



- Spec. SYNTEX® 25 with integrated sprocket
- Performance range with 1 disk spring up to 80 Nm, in case of 2 disk springs up to 160 Nm
- Use of different sprockets possible
- Ideal for „simple“ drives like e. g. in the conveyor technology



- Spec. SYNTEX® 35 with integrated flange
- Performance range with 1 disk spring up to 200 Nm, in case of 2 disk springs up to 400 Nm
- Adjustment of the flange to ambient construction possible

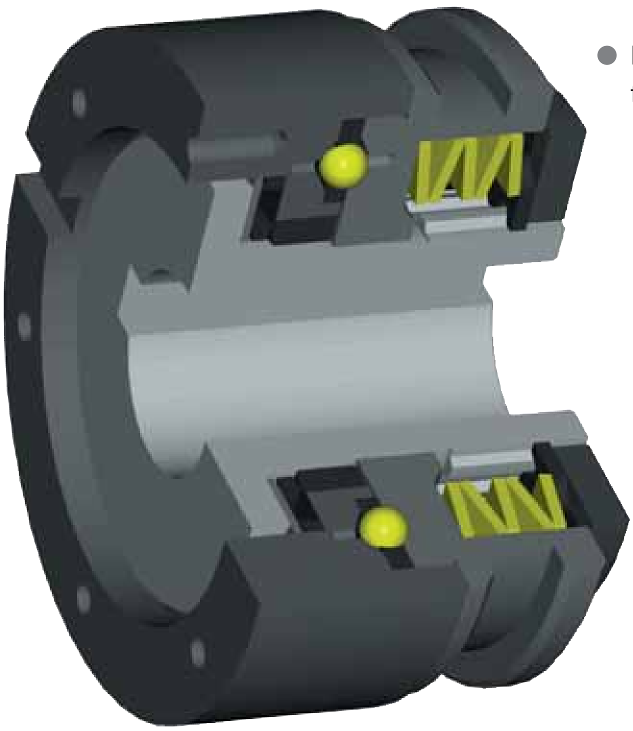


Components:

① Hub with external spline to support the disk spring (torque transmission)
② Plain bearing sleeve to support the axial and radial forces
③ Sprocket with cylinder bores to support the balls
④ Disk spring with internal spline and bores for balls (torque transmission and axial prestress, **KTR Patent**)
⑤ Keyway nut for torque setting
⑥ Ratchet balls for torque transmisson
⑦ Set screw for axial fixing onto the shaft

We provide safety

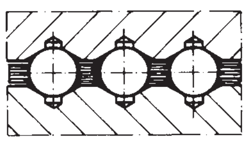
- Overload protection up to 8200 Nm
- Available with same dimensions as a ratchet, synchronous and fail-safe design
- Reduction of torque peaks
- High repeating accuracy, even after a long operating period
- Disconnection of the drive in case of overload
- Automatically operative



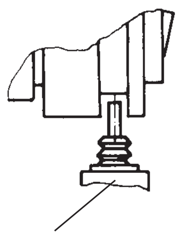
- Different designs also suitable for your application
- Easy assembly and torque setting
- Maintenance-free
- Insensitive to oil and grease
- High service life due to high-quality materials
- Backlash-free shaft-hub-connections

In case of overload the ratchet parts (balls or rollers) leave their indentations, and a relative motion between the driving and driven side is produced. In this way damages due to overload are avoided. The shift ring (3) makes an axial motion to the shifting way "S" and activates the limit switch or proximity initiator. The signal can be used for control functions or for disconnection of the drive. For the restart we would recommend to electrically bypass the limit switch or proximity initiator for a short time.

No signal in case of normal operation

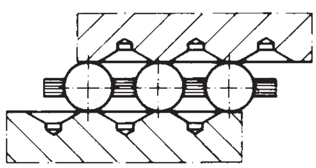


Engaged

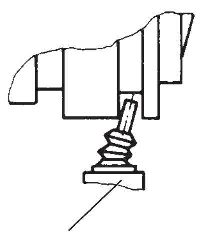


Limit switch

Signal in case of overload

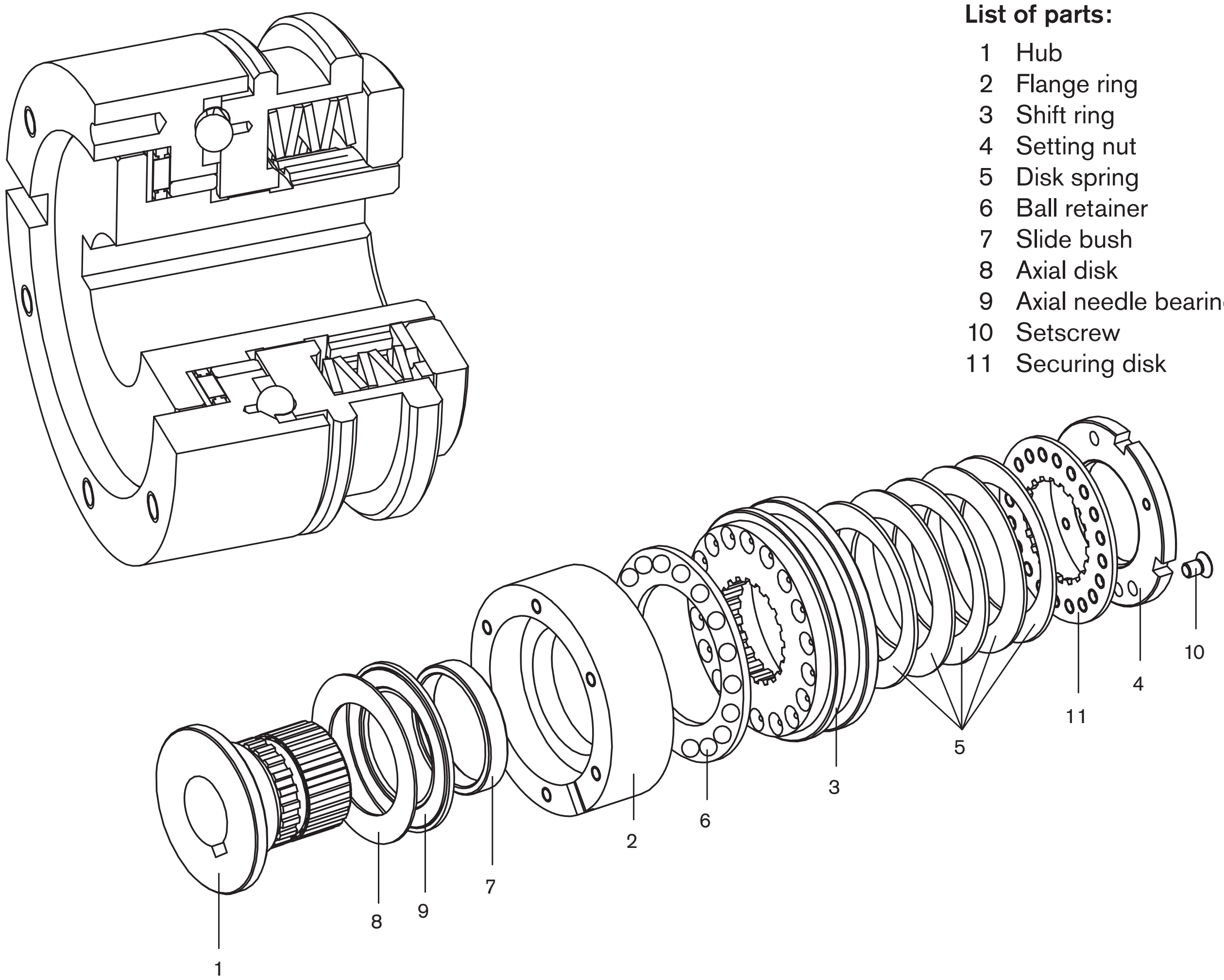


Disengaged



Limit switch

Variable applications by modular system

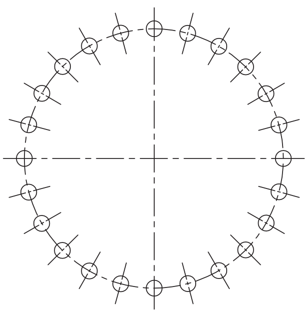


List of parts:

1 Hub
2 Flange ring
3 Shift ring
4 Setting nut
5 Disk spring
6 Ball retainer
7 Slide bush
8 Axial disk
9 Axial needle bearing
10 Setscrew
11 Securing disk

Three operating principles with the same mounting space

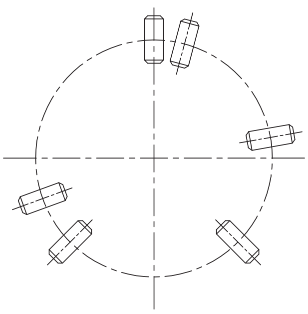
Ratchet design DK



Any engagement after an overload.

After eliminating the overload, the balls automatically engage in the next indentation.

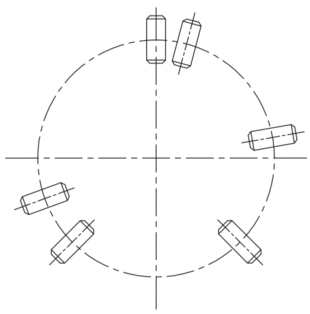
Synchronous design SR



Synchronous engagement after an overload.

After eliminating the overload the rollers automatically engage after a rotation of 360°. Driving and driven side are always placed in the same position to each other. Other degrees of engagement, e. g. 180°, are also possible.

Fail-safe design SGR

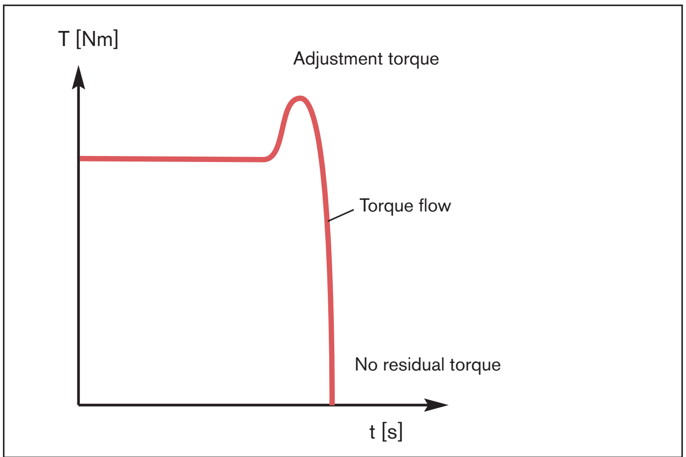


The fail-safe design is a pure torque measurement without any ratchet operation.

In case of overload a signal is given by the limit switch, producing a mechanical separation of driving and driven side = disengagement is not possible.

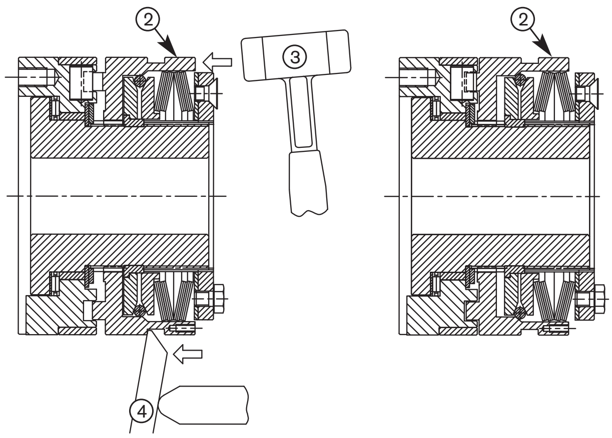
Idle rotation coupling (load-separating)

- Free-rotating safety clutch up to 1800 Nm torque
- Max. speed up to 5000 RPM (see table)
- Drive end and driven end are permanently separated
- Manual re-engagement
- Optional overload recognition by limit switch or sensor
- Combination with ROTEX® coupling as shaft-to-shaft connection
- Easy assembly and torque adjustment



Operating principle of the KTR-SI idle-rotation couplings:

- When achieving the torque setting, the coupling rotates.
- Subject to the idle rotation mechanism driving and driven side remain separated.
  The resulting flywheel mass may run out in idle state.
- After having removed the overload, the coupling re-engages.
- The re-engagement happens automatically.



Re-engagement Instructions:

Re-engagement of the free-rotating coupling is effected by axial pressure on the shifting ring (2). Dependent on the existing media, accessability etc., the re-engagement can be effected in different ways:

- by several shocks with a plastic hammer (3) axially on the shifting ring (see on the left)
- with mounting levers (4)
- with a pneumatic or hydraulic engagement device (automated process of engagement)

Torques

Size	Torque [Nm]		
	Spring layer		
	T1	T2	T3
1	12-25	25-50	50-100
2	25-50	50-100	100-200
3	50-100	100-200	200-450
4	100-200	200-400	400-800
5	170-450	350-900	600-1800

Max. speeds

Max. speed [min⁻¹]	
Size	$n_{max.}$
1	5000
2	4000
3	3500
4	3000
5	2300

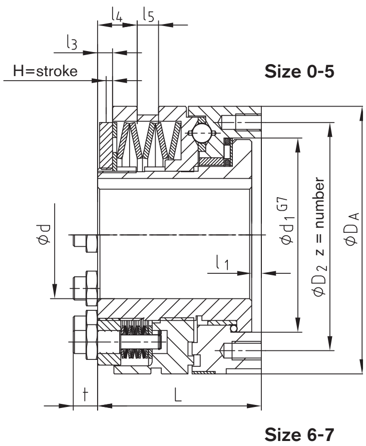
Dimensions like KTR-SI design DK, SR and SGR
(see following pages)

Order form:

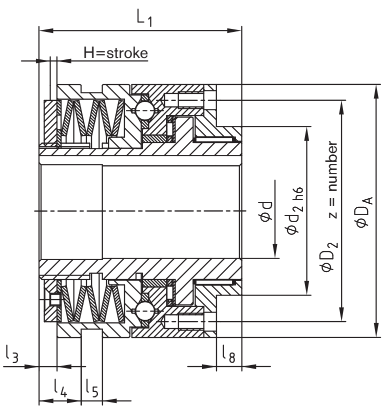
KTR-SI	2	FR	FT	T2	Ø 20	40 Nm
Coupling type	Size	Design	Design	Disk springs	Bore	Torque set

Type FT, KT and LT

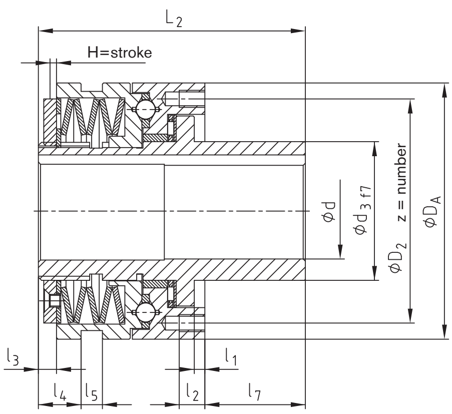
- Standard KTR-SI safety clutch suitable up to 8200 Nm
- Available ready for assembly with the torque set
- For direct mounting of customers' components
- Available as a ratchet, synchronous and fail-safe design
- Torque setting possible while in place
- Finish bore according to ISO fit H7,
  feather keyway according to DIN 6885 sheet 1 - JS9
- Surface protection by phosphating



Type FT



Type KT



Type LT

Technical Data – Torques, Weights

Size	Torques [Nm]								Weight with max. bore
	Disk spring layers design DK				Disk spring layers design SR and SGR				
	T1	T2	T3	T4	T1	T2	T3	T4	[kg]
0	2,5-5	5-20	–	20-40	5-10	10-40	–	–	0,41
1	6-12	12-25	25-55	55-100	12-25	25-50	50-100	–	1,30
2	12-25	25-50	50-120	120-200	25-50	50-100	100-200	–	2,27
3	25-50	50-100	100-250	200-450	50-100	100-200	200-450	–	3,88
4	50-100	100-200	200-500	500-1000	100-200	200-400	400-800	800-2000	8,34
5	85-250	230-600	300-1000	600-2000	170-450	350-900	600-1800	1200-3400	13,51
6	180-480	360-960	720-1950	1600-3300	300-750	600-1500	1200-3000	2900-5800	21
7	250-520	500-1050	1000-2100	2000-3600	550-1100	1100-2200	2200-4400	3000-8200	37

Technical Data – Dimensions

Size	Dimensions [mm]																					
	Bore d		d_1	D_2	D_A	d_2	d_3	l_1	l_2	l_3	l_4	l_5	l_7	l_8	L	L_1	L_2	z	H=stroke			
	Pilot bore	max.																	DK	SR	SGR	FR
0	7	20	41,0	48	55	38	28	4,0	6,5	3,0	7,5	9	27,5	8	38,5	51,0	66,0	6xM5	1,4	1,2	0,6	1,6
1	10	25	60,0	70	82	50	38	4,0	8,0	6,0	11,5	9	33,0	10	52,0	70,0	85,0	6xM5	2,3	1,8	0,8	2,3
2	14	35	78,0	89	100	60	52	5,0	10,0	5,0	12,0	9	39,0	12	61,0	78,0	100,0	6xM6	2,4	2,0	1,1	3,0
3	18	45	90,5	105	120	80	65	5,0	12,0	8,5	21,0	10	47,0	12	78,0	96,0	125,0	6xM8	2,7	2,2	1,2	3,5
4	24	55	105,0	125	146	100	78	6,5	15,0	11,0	27,0	9	52,5	16	100,0	124,5	152,5	6xM10 1)	3,7	2,5	1,2	3,8
5	30	65	120,5	155	176	120	90	6,5	17,0	12,0	33,0	9	57,5	18	113,5	140,0	171,0	6xM12 1)	4,6	3,0	1,6	4,5
6 2)	40	80	136,0	160	200	130	108	7,0	20,0	14,0	39,0	9	64,0	20	119,0	150,0	183,0	6xM12 1)	5,0	3,5	2,5	–
7 2)	50	100	168,0	200	240	160	135	8,0	25,0	15,0	46,0	9	72,0	25	141,0	175,0	213,0	6xM16 1)	5,5	4,0	2,7	–

1) Type T4 SR and SRG: tightening torques according to 12.9
2) Size 6: dimension t= 15 mm, Size 7: dimension t= 21 mm

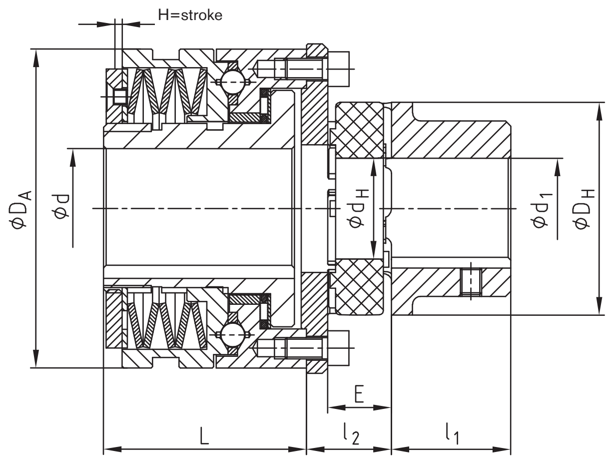
Order form:

KTR-SI	2	DK	FT	T2	Ø 20	40 Nm
Coupling type	Size	Design	Design	Disk springs	Bore	Torque set

Made for Motion KTR

With torsionally flexible ROTEX®

- KTR-SI safety clutch as a shaft-to-shaft connection
- Axial plug-in
- Able to compensate for misalignment
- Available as a ratchet, synchronous and fail-safe design
- Torque setting possible while in place
- Various kinds of elastomer hardness available
- Finish bore according to ISO fit H7, feather keyway according to DIN 6885 sheet 1 - JS9



Technical Data – Torques

Design DK						Design SR and SGR					
KTR-SI Size	ROTEX® Size	Torques [Nm] KTR-SI disk spring layer				KTR-SI Size	ROTEX® Size	Torques [Nm] KTR-SI disk spring layer			
		T1	T2	T3	T4			T1	T2	T3	T4
0	19	2,5-5	5-20	–	20-40	0	28	5-10	10-40	–	–
1	24	6-12	12-25	25-55	55-100	1	38	12-25	25-50	50-100	–
2	28	12-25	25-50	50-120	120-200	2	48	25-50	50-100	100-200	–
3	38	25-50	50-100	100-250	200-450	3	55	50-100	100-200	200-450	–
4	48	50-100	100-200	200-500	500-1000	4	75	100-200	200-400	400-800	800-2000
5	55	85-250	230-600	300-1000	600-2000	5	90	170-450	350-900	600-1800	1200-3400
6	100	180-480	360-960	720-1950	1600-3300	6	100	300-750	600-1500	1200-3000	2900-5800
7	110	250-520	500-1050	1000-2100	2000-3600	7	110	550-1100	1100-2200	2200-4400	3000-8200

Technical Data – Dimensions

KTR-SI Size	ROTEX® Size	Dimensions [mm]									H=stroke [mm] Design	
		Max. Bore		D_A	D_H	d_H	E	l_1	l_2	L		
		d	d_1								DK	SR
0	19	20	24	55	40	18	16	25	22	38,5	1,4	1,2
	28		38		65	30	20	35	28,5			
1	24	25	28	82	55	27	18	30	24	52	2,3	1,8
	38		45		80	38	24	45	32,5			
2	28	35	38	100	65	30	20	35	28	61	2,4	2,0
	48		60		105	51	28	56	38			
3	38	45	45	120	80	38	24	45	32	78	2,7	2,2
	55		70		120	60	30	65	43			
4	48	55	60	146	105	51	28	56	38	100	3,7	2,5
	75		95		160	80	40	85	56,5			
5	55	65	70	176	120	60	30	65	44	113,5	4,6	3,0
	90		110		200	100	45	100	62			
6	100	80	115	200	225	113	50	110	72	119	5,0	3,5
7	110	100	125	240	255	127	55	120	78	141	5,5	4,0

Order form:

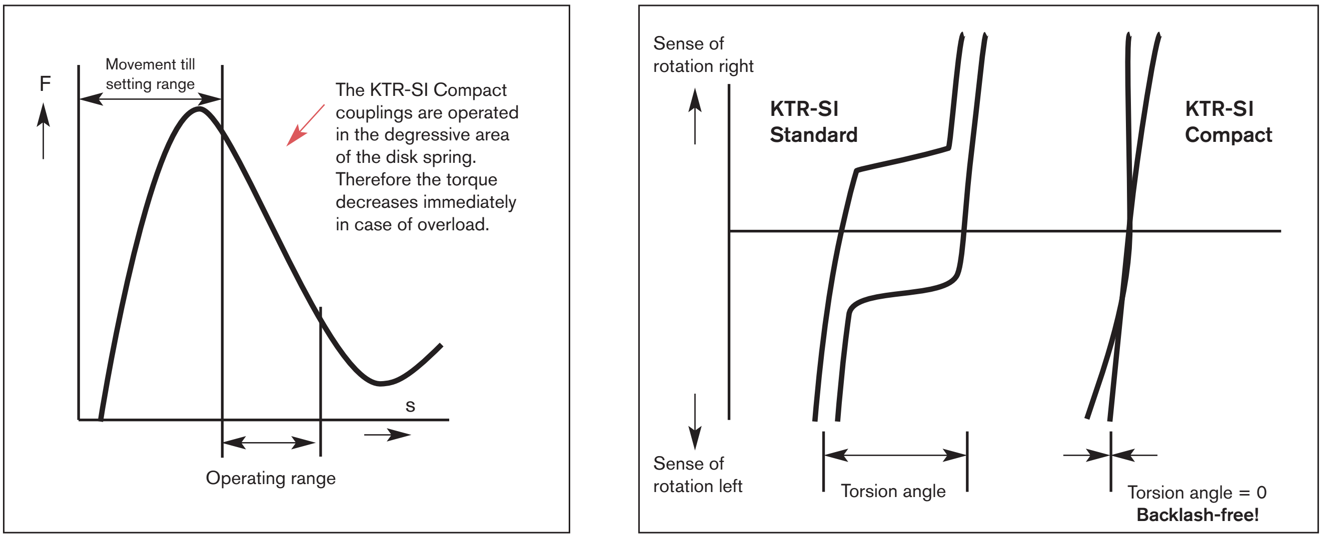
KTR-SI 2	28	DK	T2	Ø 25	Ø 20	40 Nm
Coupling type	ROTEX® Size	Design	Disk springs	ROTEX® Bore	KTR-SI Bore	Torque set

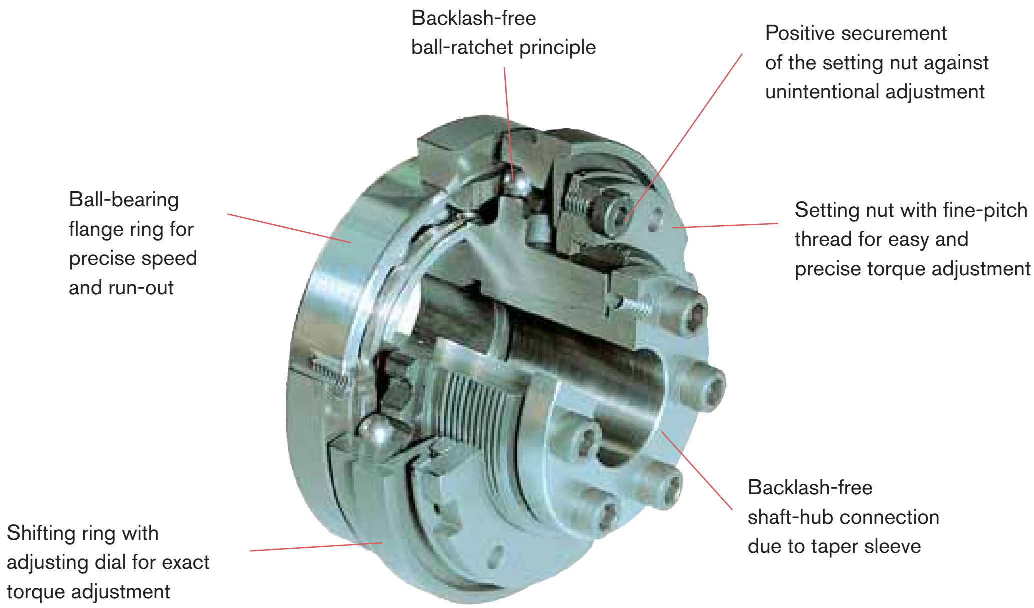
Backlash-free, torsionally stiff safety clutch

- Backlash-free safety clutch with patented curve spring design
- Precise switch-off with high repeating accuracy
- Exact, backlash-free torque transmission, even in case of wear
- Easy torque setting
- Ball-bearing connection flange
- Hardened ratchet surfaces for long lifespan
- Backlash-free shaft-hub connection due to taper sleeve
- Can be used with proven ROTEX® GS as shaft-to-shaft connection

Characteristic special curve

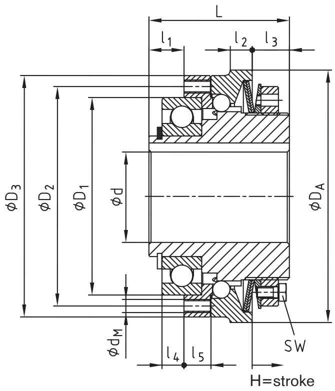
What is backlash-free?



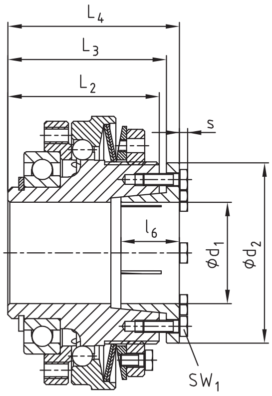


Type FT, FT-4.5 and FT with ROTEX® GS

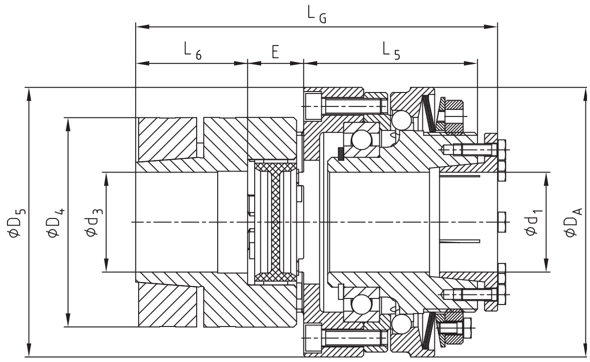
- Torque up to 740 Nm
- Maximum shaft diameter up to 60 mm
- Backlash-free and vibration-reducing in combination with ROTEX® GS
- Drive and driven-sided with backlash-free, frictionally engaged shaft-hub connection
- Synchronous and ratchet design
- Also available in combination with torsionally stiff RADEX®-N or RADEX®-NC
- Finish bore according to ISO fit H7, feather keyway according to DIN 6885 sheet 1 - JS9



Type FT



Type FT-4.5 with clamping connection



Type FT with ROTEX® GS as shaft-to-shaft connection

Technical Data

Size	Speed [min⁻¹]	Torques [Nm]			Dimensions [mm]													
		T1	T2	T3	$d_{max.}$	D_1^{h5}	D_2	D_3	D_A	d_M	L	l_1	l_2	l_3	l_4	l_5	SW	H-stroke
01	4000	3-14	6-28	13-56	20	47	56	65	70	8xM4	40	8	7	12	5	7,5	7	1,2
0	3000	9-35	18-70	40-140	30 [1]	62	71	80	85	8xM5	48	11	8	14	7	8,0	7	1,5
1	2500	19-65	38-130	78-260	35 [1]	75	85	95	100	8xM6	59	14	9	16	9	10,5	8	1,8
2	2000	35-110	80-220	160-440	45 [1]	90	100	110	115	8xM6	64	16	10	17	10	12	10	2,0
3	1200	80-185	160-370	320-740	50	100	116	130	135	8xM8	75	18	12	21	10	12	10	2,2

1) max. finish bore, keyway to DIN 6885 sheet 3

Dimensions with taper sleeve type 4.5 [mm]

Size	Dimensions [mm]							
	$d_{1max.}$	L_2	L_3	L_4	l_6	d_2	s	SW_1
01	10-20	40	42	47	26	40,5	2,8	7
	19-25					42,0		
0	30	46	49	56	31	57	4,0	10
1	19-30	57	60	67	40	57	4,0	10
	32-40				31	64	3,5	8
2	50	63	68,5	73	29	73,5	4,0	10
3	32-50	75	78,5	85	29	73,5	4,0	10
	55-60		78,0	86	45,5	89		

Dimensions type FT with ROTEX® GS [mm]

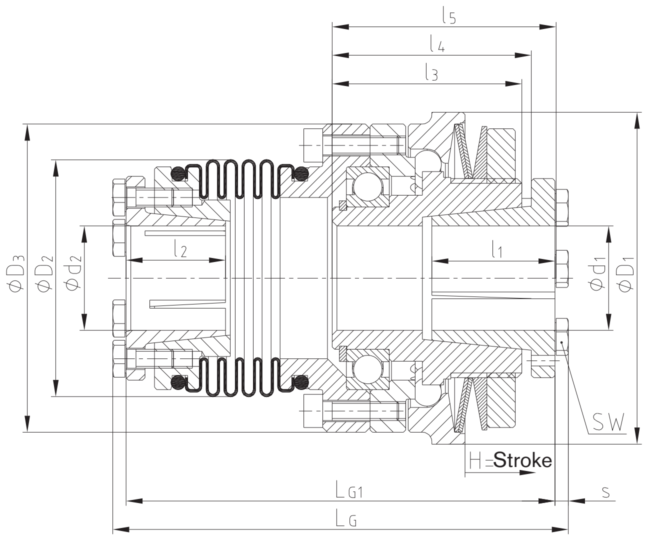
Size	ROTEX® GS Size	Dimensions [mm]								
		$d_{1max.}$	$d_{3max.}$	D_4	D_5	L_G	L_5	L_6	D_A	E
01	24	25	28	55	70	102	47	30	70	18
0	28	30	38	65	85	119,5	54,5	35	85	20
1	38	40	45	80	100	146	67	45	100	24
2	42	50	55	95	115	159	73	50	115	26
3	48	60	62	105	135	182	87	56	135	28

Order form:

KTR-SI Compact	2	DK	T2	Ø 40	4.5	150 Nm
Coupling type	Size	Design	Disk springs	Bore	Hub design	Torque set

with a torsionally stiff TOOLFLEX® S-KN

- Max. shaft diameter up to 56 mm
- Non-positive bellow-hub connection
- Maintenance-free
- Good properties of concentric running with high speeds
- Optionally available as design M (6 shafts) or design S (4 shafts, short version)



KTR-SI Compact with TOOLFLEX® S-KN

Technical Data – Speeds, torques, dimensions

KTR-SI Compact Size	TOOLFLEX® S-KN [1)] Size	Max. speed [min⁻¹]	TOOLFLEX® S-KN Torques [Nm]	KTR-SI Compact Torques [Nm] T1	T2	Dimensions [mm] d_1 max.	d_2 max.	D_1	L_G [2)]	L_{G1} [2)]
01	30	4000	35	3-14	6-28	25	22	70	96	90,5
0	38	3000	65	9-35	18-70	30	28	85	109	102,0
1	45	2500	150	19-65	38-130	40	40	100	145	137,5
2	55	2000	340	35-110	80-220	50	56	115	170	159,5

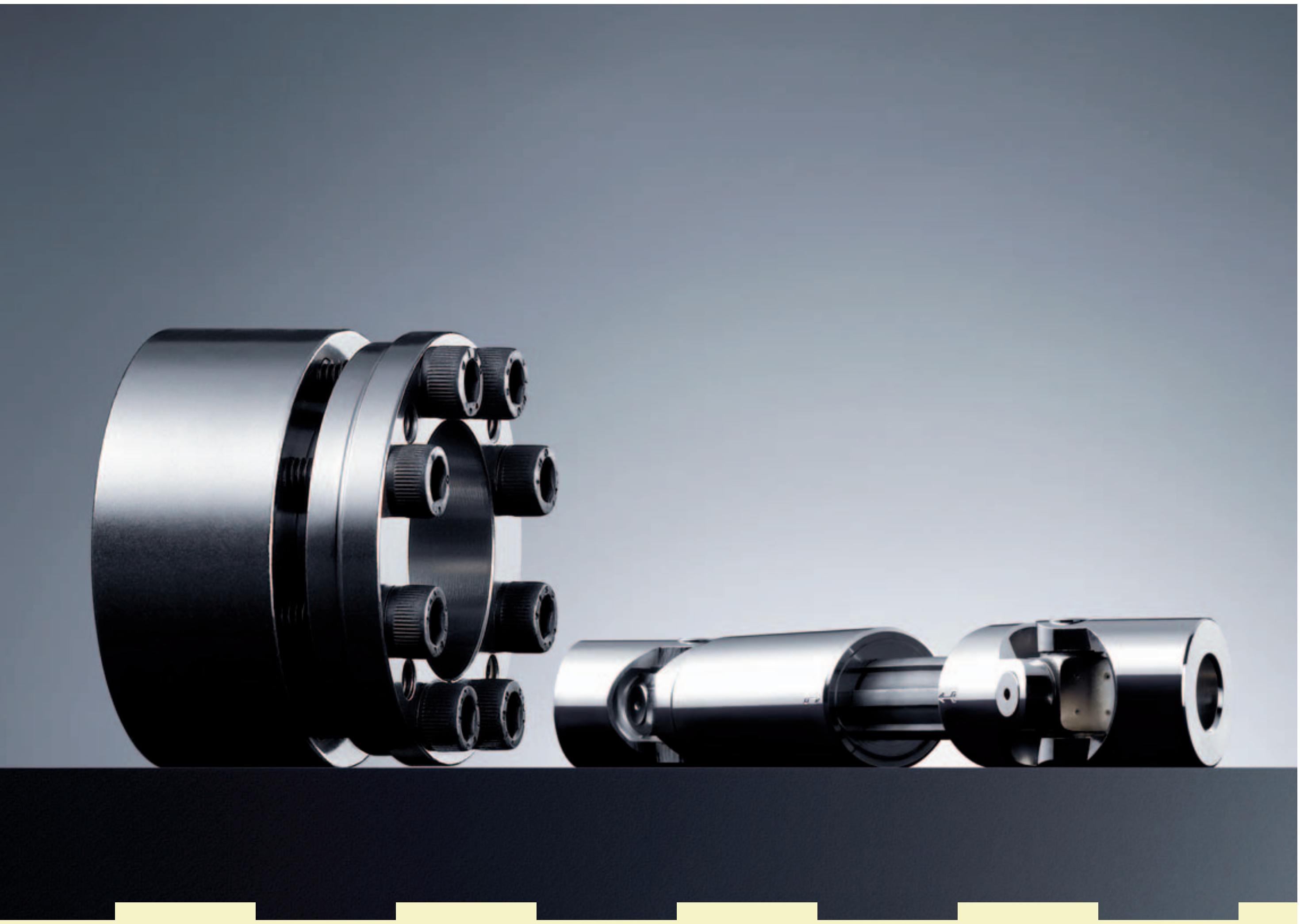
Technical Data – Dimensions

KTR-SI Compact Size	TOOLFLEX® S-KN [1)] Size	Dimensions [mm] D_2	D_3	l_1	l_2	l_3	l_4	l_5	s	SW_1	H
01	30	50,0	65	26	22	40	42,0	47	2,8	7	1,2
0	38	60,5	80	31	26	46	49,0	56	4,0	7	1,5
1	45	82,0	95	40	34	57	60,0	67	4,0	8	1,8
2	55	97,0	110	29	40	63	68,5	73	3,5	10	2,0

1) Optionally available with clamping hub
2) Depending on the type of TOOLFLEX®, M (6 shafts) or S (4 shafts)

Order form:

KTR-SI Compact	1	45	DK	T2	d_1 Ø 40	d_2 Ø 40	100 Nm
Coupling type	KTR-SI Compact Size	TOOLFLEX® S-KN Size	Design	Disk springs	Bore KTR-SI Compact	Bore TOOLFLEX® S-KN	Torque set



CLAMPEX®
Shaft-hub-connection

KTR-Präzisions-Wellengelenke
acc. DIN 808

Made for Motion

Table of contents

Factors, hints

Reduction of costs!

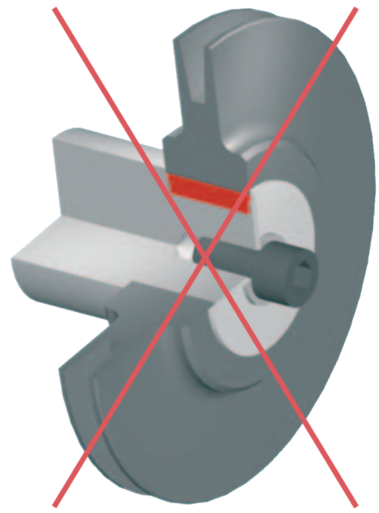
Reduction of components!

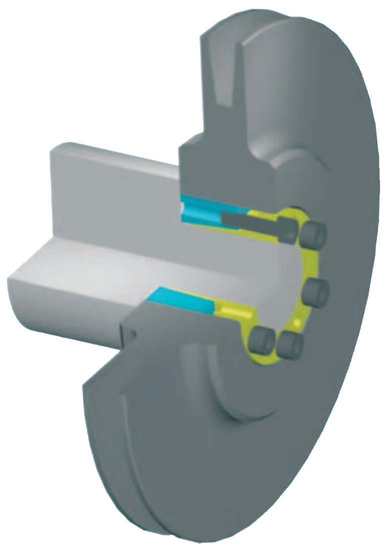
Reduction of dimensions!

Factors like cost reduction, material saving, simplified production processes, shorter delivery times of material are already determined by designing and development. Anyway, the growing demands can no longer be satisfied by keyway connections.

In this case the use of **CLAMPEX® clamping elements** offers new possibilities as a shaft-hub-connection:

- Material saving by smaller shaft and hub dimensions
- Simplified production processes
- Suitable for modern drive systems
- Easy assembly and disassembly with standard tools
- Ideal for drives with high vibratory loads, e. g. acceleration and braking
- Produce connections that are permanently free from destruction, i. e. no shearing off of keyways, dowel pins, pins, etc.
- Specifically suitable for high-speed drives
- Insensitive to dirt
- Reusable repeatedly
- Overload protection of the machine components by slipping (repeated slipping should be avoided)
- Low stress concentration on the shaft (stress concentration factor on request)
- Corrosion- and acid-resistant surface coating for food-processing industry, marine industry and chemical industry on request
- Simple calculation of the clamping connection

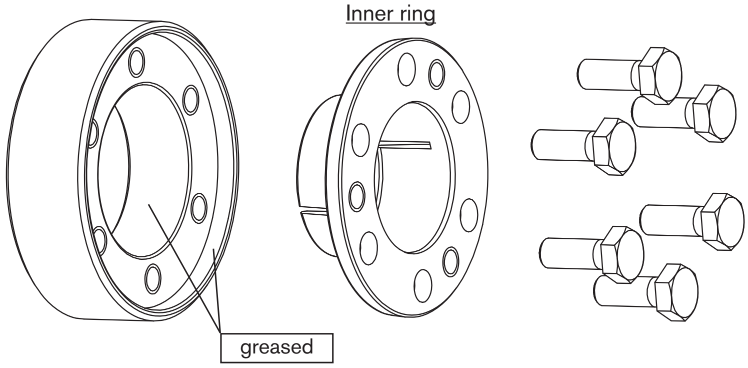




Advice for selection:
The transmission data mentioned in the catalogue are parameters found out by calculations.
Subject to tests and the physical coefficient of friction slight deviations from the transmission values may arise.

KTR 620

- Applications on hollow shafts, slip-on gears, couplings, mechanical shrink connections
- Suitable for high torque loads
- Easy assembly by optical mounting groove
- Corrosion-resistant outer ring (phosphatized)
- Good centering and concentricity characteristics
- Mounting instructions under www.ktr.com



Assembly

Clean and degrease the contact surfaces of shaft and hub (internal hollow shaft). Slightly unscrew the clamping screws and put the clamping set externally onto the hub/hollow shaft. Before tightening the clamping screws please assemble the shaft. Evenly tighten the diametrically opposite clamping screws until the front surfaces of the outer and inner rings are flush. The max. screw tightening torque indicated must not be exceeded. The values for T and F_{ax} indicated in the table relate to an assembly with greased external clamping set. The external clamping sets are delivered in greased condition. When assembling grease-free external clamping sets the values shown in the table and the values calculated are different. In case of questions, please feel free to contact us.

Note: Contact surfaces of shaft and hub bore (internal hollow shaft) must not be greased or oiled.

Disassembly

All clamping screws must be unscrewed evenly and successively. Do not completely unscrew the clamping screws off the thread. Loosen the external taper ring in the inner ring with the forcing thread.

Tolerances, surfaces

One accurate turning process is sufficient:

$R_Z \leq 16\mu m$

Maximum permissible tolerances:

d = f7 for the hub (external hollow shaft)

d_W = h6/H7

d_W > Ø 160 - g6/H7

Axial movement

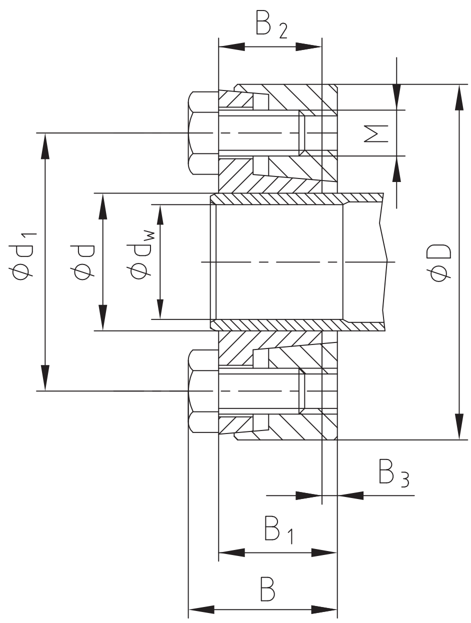
KTR 620: During the tightening of the screws there is no axial movement of the hub towards the shaft.

Order form:

KTR 620	20	x	47
Type	Size of inside diameter		Size of outside diameter

KTR 620 – Technical Data

Frictionally engaged connection of a DATAFLEX® torque measuring shaft with KTR 620



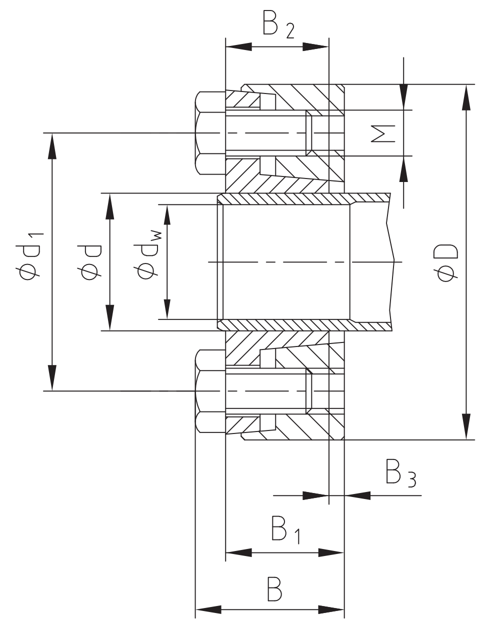
CLAMPEX® – KTR 620															
d x D [mm]	Shaft diameter d_w [mm]	Transmittable torque or axial force		Dimensions [mm]					Clamping screws DIN EN ISO 4017 - 10.9 $\mu_{ges.}$=0,10			Forcing thread		Surface pressure clamping set/ hollow shaft	Weight [~kg]
		T [Nm]	F_{ax} [kN]	B	B_1	B_2	B_3	d_1	M	z Number	T_A [Nm]	M_1	z_1	P_H [N/mm²]	
16 x 41	13	85	13	19,0	15	13	2	28	M6	3	12	M6	2	281	0,15
	14	105	15												
20 x 47	17	155	18	19,0	15	13	2	32	M6	4	12	M6	2	288	0,17
	18	175	19												
24 x 50	20	235	24	22,0	18	16	2	36	M6	5	12	M6	2	266	0,25
	22	305	28												
30 x 60	24	390	33	24,0	20	18	2	44	M6	6	12	M6	3	256	0,30
	25	430	34												
	26	480	37												
36 x 72	27	510	38	27,5	22	20	2	54	M8	5	30	M8	2	256	0,49
38 x 72	30	690	46											253	
	33	820	50												
40 x 80	34	910	54	29,5	24	22	2	61	M8	6	30	M8	2	254	0,61
44 x 80	35	850	49											231	
	37	980	53												
50 x 90	38	1180	62	31,5	26	23,5	2,5	68	M8	8	30	M8	2	249	0,84
	40	1320	66												
	42	1470	70												
55 x 100	42	1400	67	34,5	29	26	3	72	M8	8	30	M8	2	223	1,20
	45	1650	73												
	48	1900	79												
60 x 110	48	1700	71	34,5	29	26	3	80	M8	9	30	M8	3	223	1,50
62 x 110	50	2050	82											216	
	52	2200	85												
68 x 115	50	1900	76	34,5	29	26	3	86	M8	9	30	M8	3	222	1,60
	55	2450	89												
	60	3000	100												
75 x 138	55	2650	96	38,0	31	27	4	100	M10	10	59	M10	2	227	2,60
	60	3250	108												
	65	3850	118												
80 x 141	60	3350	112	38,0	31	27	4	104	M10	10	59	M10	2	224	2,80
	65	3980	122												
	70	4620	132												

All clamping sets available from stock.

Other sizes on request.
Inner ring slotted up to size 40 x 80, all sizes of outer ring phosphated.

KTR 620 – Technical Data

Frictionally engaged connection of a
DATAFLEX® torque measuring shaft with KTR 620



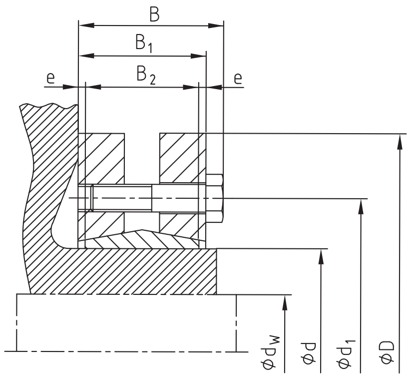
CLAMPEX® – KTR 620															
d x D [mm]	Shaft diameter d_W [mm]	Transmittable torque or axial force		Dimensions [mm]					Clamping screws DIN EN ISO 4017 - 10.9 $\mu_{ges.}$=0,10			Forcing thread		Surface pressure clamping set/ hollow shaft	Weight [~kg]
		T [Nm]	F_{ax} [kN]	B	B_1	B_2	B_3	d_1	M	z Number	T_A [Nm]	M_1	z_1	P_H [N/mm²]	
	65	5200	160												
90 x 155	70	6000	171	45	38	34	4	114	M10	11	59	M10	2	219	3,40
	75	6900	184												
	70	6600	189												
100 x 170	75	7600	203	50	43	39	4	124	M10	14	59	M10	3	206	4,60
	80	8600	215												
	80	10600	265												
110 x 185	85	11900	280	57	49	44	5	136	M12	12	100	M12	4	212	6,20
	90	13300	296												
	85	12700	299												
120 x 197	90	14200	316	61	53	48	5	147	M12	14	100	M12	4	205	7,40
	95	15700	331												
	90	14600	324												
125 x 215	95	16000	337	61	53	48	5	158	M12	14	100	M12	4	215	9,30
	100	17500	350												
	95	18600	392												
130 x 230	100	20300	406	67	58	52	6	165	M14	9	160	M14	4	225	11,90
	110	23600	429												
	100	20100	402												
140 x 230	105	21700	413	67	58	52	6	172	M14	9	160	M14	4	205	11,00
	115	25150	437												
	110	27400	498												
155 x 263	115	29600	515	71	62	56	6	195	M14	10	160	M14	4	212	16,00
	125	32000	533												
	120	41500	692												
165 x 290	125	44300	709	78	68	61	7	204	M16	12	250	M16	4	223	22,30
	135	47200	726												
	130	47600	732												
175 x 300	135	50500	748	78	68	61	7	214	M16	12	250	M16	4	216	23,30
	140	53500	764												
	140	66000	943												
185 x 320	145	69900	964	95	85	77	8	224	M16	14	250	M16	4	201	33,40
	150	73500	980												

All clamping sets available from stock.

Other sizes on request.
Inner ring slotted up to size 40 x 80, all sizes of outer ring phosphated.

KTR 603

- „Typical external clamping set“
- For middle and high loads
- Typical applications: hollow shafts, slip-on gears
- KTR 603 GT external clamping set separated (Please order dimension sheet M483039.)
- Mounting instructions under www.ktr.com



Assembly

Clean and degrease the contact surfaces of shaft and hub (hollow shaft inside). Assemble the external clamping set onto the hub (hollow shaft outside). In the area of the external clamping set the external surface of the hub (hollow shaft outside) may be lubricated. Before tightening the clamping screws, assemble the shaft or push on the hub (hollow shaft). Tighten the clamping screws by degrees and evenly one after the other until the screw tightening torque T_A mentioned in the table is achieved. Several tightening processes are necessary to achieve the requested T_A figure. The figures T and F_{ax} mentioned in the table were calculated for an assembly with oiled/greased external clamping set. The external clamping sets are delivered with oil/grease. For the assembly of external clamping sets without oil/grease the figures mentioned in the table will deviate. Please contact us for any questions you may have.

Note: Do not use any oil with molybdenum sulphide between the contact surfaces of shaft and hub bore (hollow shaft inside).

Disassembly

All clamping screws must be unscrewed evenly and successively. Do not completely unscrew the clamping screws off the thread. Usually the clamping elements release automatically.

Tolerances, surfaces

One accurate turning process is sufficient:

$R_Z \leq 16 \mu m$

Maximum permissible tolerances:

d = h8 for the shaft

Tolerances for dw

For **dw** from 18 to 30 mm **H6 / j6**
For **dw** from 31 to 50 mm **H6 / h6**
For **dw** from 51 to 80 mm **H6 / g6**
For **dw** from 81 to 500 mm **H7 / g6**

* In general bigger tolerances are possible. Please contact us!

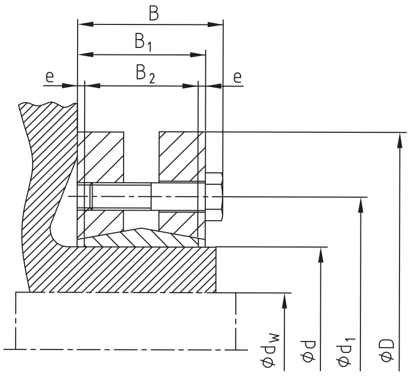
Axial movement

KTR 603: During the tightening of the screws there is no axial movement of the hub towards the shaft.

Order form:

KTR 603	44	x	80
Type	Size of inside diameter		Size of outside diameter

KTR 603 – Technical Data



CLAMPEX® – KTR 603														
d x D [mm]	Shaft diameter d_W [mm]	Transmittable torque or axial force		Dimensions [mm]					Clamping screws DIN EN ISO 4014 - 10.9 $\mu_{ges.}$=0,10			Surface pressure clamping set/ hollow shaft	Weight [~kg]	Stock-programme
		T [Nm]	F_{ax} [kN]	B	B_1	B_2	e	d_1	M	z Number	T_A [Nm]	P_H [N/mm²]		
	10	28	5											
14 x 38	11	38	7	14,5	11	9	1,0	23	M5 1)	4	3,5	388	0,15	
	12	50	9											
	12	50	9											
16 x 41	13	70	10	18,5	15	11	2,0	26	M5 1)	5	4	310	0,20	
	14	90	13											
	19	210	22											
24 x 50	20	260	26	22,5	19	14	2,5	36	M5 1)	6	5	286	0,20	●
	21	310	29											
	24	310	25											
30 x 60	25	340	27	24,5	21	16	2,5	44	M5 1)	6	6	233	0,30	●
	26	380	29											
	28	460	33											
36 x 72	30	590	39	27	23	18	2,5	52	M6	5	12	307	0,45	●
	31	630	40											
	32	630	40											
44 x 80	35	780	44	29	25	20	2,5	61	M6	7	12	317	0,60	●
	36	860	48											
	38	940	49											
50 x 90	40	1100	55	31	27	22	2,5	70	M6	8	12	289	0,80	●
	42	1300	62											
	42	1200	57											
55 x 100	45	1500	66	34	30	23	3,5	75	M6	8	12	252	1,10	●
	48	1900	79											
	48	1800	75											
62 x 110	50	2200	88	34	30	23	3,5	86	M6	10	12	279	1,30	●
	52	2400	92											
	50	2000	80											
68 x 115	55	2500	91	34	30	23	3,5	86	M6	10	12	255	1,40	●
	60	3100	103											
	55	2500	92											
75 x 138	60	3200	107	37,5	32	25	3,5	100	M8	7	30	273	1,70	●
	65	3900	121											
	60	3200	107											
80 x 145	65	3900	120	37,5	32	25	3,5	100	M8	7	30	256	2,20	●
	70	4600	131											
	65	4800	148											
85 x 155	70	6100	175	43,5	38	30	4,0	114	M8	10	30	285	3,40	
	75	7400	201											
	65	4700	145											
90 x 155	70	6000	172	44,5	39	30	4,5	114	M8	10	30	271	3,30	●
	75	7200	194											

● Clamping sets available from stock.

1) The clamping screws are designed as per DIN EN ISO 4014 – 8.8 with $\mu_{ges.}$=0,12.

Other sizes on request.

KTR 603 – Technical Data

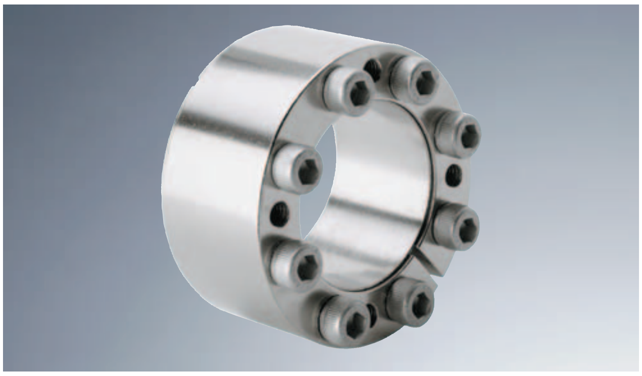
CLAMPEX® – KTR 603														
d x D [mm]	Shaft diameter d_w [mm]	Transmittable torque or axial force		Dimensions [mm]					Clamping screws DIN EN ISO 4014 - 10.9 $\mu_{ges.}$=0,10			Surface pressure clamping set/ hollow shaft	Weight [~kg]	Stock-programme
		T [Nm]	F_{ax} [kN]	B	B_1	B_2	e	d_1	M	z Number	T_A [Nm]	P_H [N/mm²]		
	70	6900	199											
100 x 170	75	7500	199	49,5	44	34	5,0	124	M8	12	30	258	4,60	●
	80	9000	225											
	75	7200	194											
110 x 185	80	9000	227	56,5	50	39	5,5	136	M10	9	59	244	5,90	●
	85	11000	259											
	80	8500	213											
115 x 188	85	10000	237	56,5	50	39	5,5	141	M10	9	59	234	6,30	
	90	12000	267											
	80	10600	267											
120 x 215	85	13300	312	58,5	52	42	5,0	160	M10	12	59	277	8,00	
	90	14500	324											
	85	11000	261											
125 x 215	90	13000	290	58,5	52	42	5,0	160	M10	12	59	266	8,60	●
	95	15000	318											
	90	13700	306											
130 x 215	95	15800	334	58,5	52	42	5,0	160	M10	12	59	285	8,20	
	100	18200	365											
	95	15000	350											
140 x 230	100	17000	342	67,5	60	46	7,0	175	M12	10	100	264	10,00	●
	105	20000	382											
	105	20000	381											
155 x 263	110	23000	415	71,5	64	50	7,0	192	M12	12	100	263	15,00	●
	115	26000	453											
	115	36000	626											
165 x 290	120	39000	648	78,5	71	56	7,5	210	M16	8	250	277	22,00	●
	125	44000	702											
	125	40000	642											
175 x 300	130	44000	677	81	71	56	7,5	220	M16	8	250	261	23,00	●
	135	49000	726											
	135	55000	816											
185 x 330	140	60000	855	96	86	71	7,5	236	M16	10	250	244	36,00	
	145	65000	902											
	140	66000	943											
195 x 350	150	76000	1013	96	86	71	7,5	246	M16	12	250	277	40,00	
	155	82000	1057											
	150	74000	982											
200 x 350	155	80000	1035	96	86	71	7,5	246	M16	12	250	270	48,00	
	160	86000	1081											
	160	95000	1194											
220 x 370	165	102000	1244	114	104	88	8,0	270	M16	15	250	248	54,00	
	170	110000	1293											
	170	120000	1408											
240 x 405	180	140000	1558	121,5	109	92	8,5	295	M20	12	490	272	67,00	
	190	160000	1690											
	190	165000	1476											
260 x 430	200	185000	1851	131,5	119	103	8,0	321	M20	14	490	262	82,00	
	210	205000	1950											
	210	217000	2067											
280 x 460	220	244000	2222	146,5	134	114	10,0	346	M20	16	490	251	102,0	
	230	270000	2352											
	230	275000	2395											
300 x 485	240	295000	2464	154,5	142	122	10,0	364	M20	18	490	246	118,0	
	245	315000	2574											

● Clamping sets available from stock.

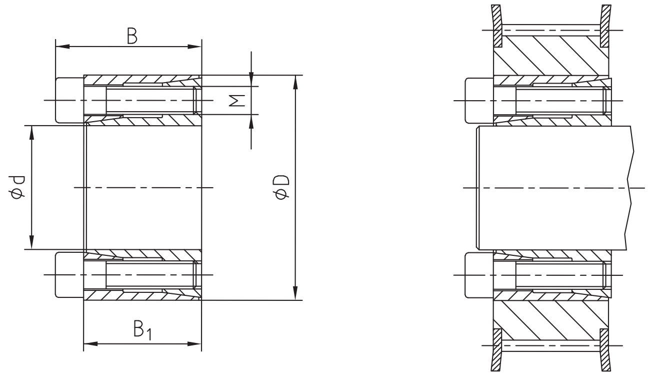
1) The clamping screws are designed as per DIN EN ISO 4014 – 8.8 with $\mu_{ges.}$=0,12.

Other sizes on request.

KTR 105 (self-centering)



- Compact design
- Short assembly times
- Suitable for small servo motors/pulleys
- QPQ surface protection on request
- Mounting instructions under www.ktr.com



Assembly

Clean and lightly oil contact surfaces of shaft and hub. Insert the clamping element into hub fit and push it onto the shaft. Tighten the clamping screws crosswise, evenly and by degrees to the tightening torque T_A mentioned by means of the torque wrench. Check the tightening torque of all clamping screws in the order of arrangement. The figures T and F_{ax} mentioned in the table were calculated for an assembly with oil.

Note: Do not use any oil with molybdenum disulphide or high-pressure additions or grease reducing the coefficient of friction considerably. The clamping sets are delivered with oil. For assembly without oil, the figures mentioned in the table deviate.

Disassembly

Unscrew the clamping screws. Screw the screws into the pull-off thread, tighten them crosswise by degrees and evenly until the rear taper ring is released. For repeated application oil the screws and threads.

Tolerances, surfaces

One accurate turning process is sufficient:

$R_Z \leq 16\mu m$

Maximum permissible tolerances:

h9 for the shaft - H9 for the hub

Axial movement

KTR 105: During the assembly a slight axial movement of the hub towards the shaft may arise.

Centering

The clamping element KTR 105 is **self-centering**. Between shaft and hub the concentricity of the clamping elements is between **0,02** mm and **0,04** mm.

Order form:

KTR 105	8	x	18
Type	Size of inside diameter		Size of outside diameter

KTR 105 (self-centering) – Technical Data

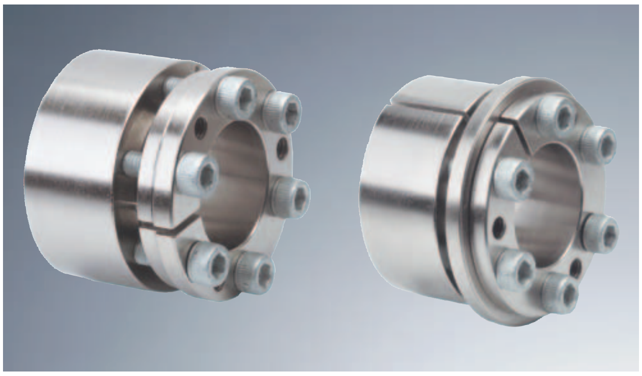
CLAMPEX® – KTR 105											
d x D [mm]	Dimensions [mm]		Clamping screws DIN EN ISO 4762 - 12.9 μ_{total}=0,14			Transmittable torque or axial force		Surface pressure between clamping set		Weight [~kg]	Stock-programme
	B	B_1	M	z Number	T_A [1] [Nm]	T [Nm]	F_{ax} [kN]	Shaft P_W [N/mm²]	Hub P_N [N/mm²]		
5 x 16	13,5	11	M2,5	3	1,2	6	3	196	61	0,010	
6 x 16	13,5	11	M2,5	3	1,2	8	3	163	61	0,012	●
6,35 x 16	13,5	11	M2,5	3	1,2	8	3	154	61	0,012	
7 x 17	13,5	11	M2,5	3	1,2	9	3	140	58	0,013	
8 x 18	13,5	11	M2,5	3	1,2	10	3	123	54	0,015	●
9 x 20	15,5	13	M2,5	4	1,2	16	3	121	54	0,020	●
9,53 x 20	15,5	13	M2,5	4	1,2	16	3	115	54	0,020	
10 x 20	15,5	13	M2,5	4	1,2	17	3	109	54	0,019	●
11 x 22	15,5	13	M2,5	4	1,2	19	3	99	50	0,024	●
12 x 22	15,5	13	M2,5	4	1,2	21	3	91	50	0,022	●
14 x 26	20	17	M3	4	2,2	40	6	97	52	0,039	●
15 x 28	20	17	M3	4	2,2	43	6	90	48	0,044	●
16 x 32	21	17	M4	4	4,9	80	10	149	74	0,067	●
17 x 35	25	21	M4	4	4,9	85	10	112	54	0,090	●
18 x 35	25	21	M4	4	4,9	90	10	106	54	0,087	●
19 x 35	25	21	M4	4	4,9	95	10	100	54	0,083	●
20 x 38	26	21	M5	4	10	164	16	155	82	0,100	●
22 x 40	26	21	M5	4	10	180	16	141	78	0,110	●
24 x 47	32	26	M6	4	17	278	23	146	75	0,200	●
25 x 47	32	26	M6	4	17	289	23	140	75	0,190	●
28 x 50	32	26	M6	6	17	486	35	188	105	0,220	●
30 x 55	32	26	M6	6	17	520	35	175	96	0,270	●
32 x 55	32	26	M6	6	17	555	35	164	96	0,250	●
35 x 60	37	31	M6	8	17	810	46	173	101	0,360	●
38 x 65	37	31	M6	8	17	879	46	159	93	0,430	●
40 x 65	37	31	M6	6	17	925	46	151	93	0,400	●
42 x 75	44	36	M8	6	41	1346	64	170	95	0,670	
45 x 75	44	36	M8	6	41	1442	64	159	95	0,630	
48 x 80	44	36	M8	8	41	2052	85	198	119	0,740	●
50 x 80	44	36	M8	8	41	2137	85	191	119	0,700	●

● Clamping sets available from stock.

1) These are the maximum screw tightening torques. They can be reduced to max. 40% of the aforementioned figures with T, F_{ax}, P_W and P_N being reduced proportionally.

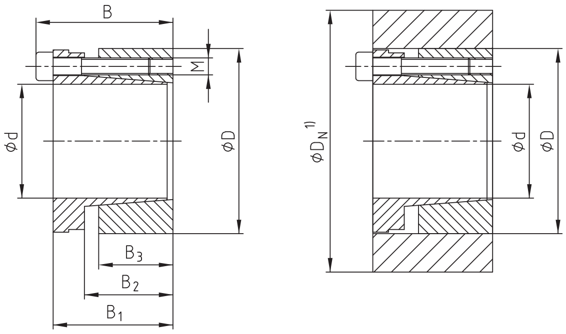
Made for Motion KTR

KTR 200 and KTR 201 (self-centering)



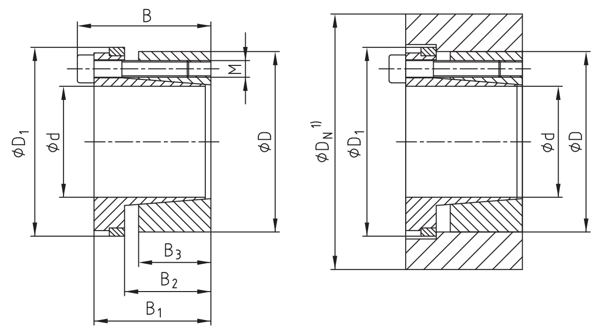
- Clamping element for universal use
- Wide range of applications
- Low-cost solution with average to high torques
- Mounting instructions under www.ktr.com

KTR 200



Considerably higher transmittable torque than KTR 201, slight axial movement of the hub

KTR 201



No axial movement of the hub, but lower transmittable torque than KTR 200

1) Dimension D_N: For calculation see page 282/283.

Assembly

Clean and lightly oil the contact surfaces of shaft and hub. Insert the clamping element into the hub fit and push it onto the shaft. Tighten the clamping screws crosswise, evenly and by degrees to the tightening torque T_A mentioned by means of the torque wrench. Check the tightening torque of all clamping screws in the order of arrangement. The figures T and F_{ax} mentioned in the table were calculated for an assembly with oil.

Note: Do not use any oil with molybdenum sulphide or high-pressure additions or grease reducing the coefficient of friction considerably. The clamping sets are delivered with oil. For assembly without oil the figures mentioned in the table deviate.

Disassembly

Unscrew the clamping screws. Screw the screws into the pull-off thread, tighten them crosswise by degrees and evenly until the rear taper ring is released. For repeated application oil the screws and threads.

Tolerances, surfaces

One accurate turning process is sufficient:

$R_Z \leq 16 \mu m$

Maximum permissible tolerances:

h8 for the shaft - H8 for the hub

Centering

The clamping elements KTR 200 and KTR 201 are **self-centering**. Between shaft and hub the concentricity of the clamping set is between **0,02** and **0,04** mm.

Order form:

KTR 200	40	x	65
Type	Size of inside diameter		Size of outside diameter

KTR 200 and KTR 201 (self-centering) – Technical Data

CLAMPEX® – KTR 200 and KTR 201

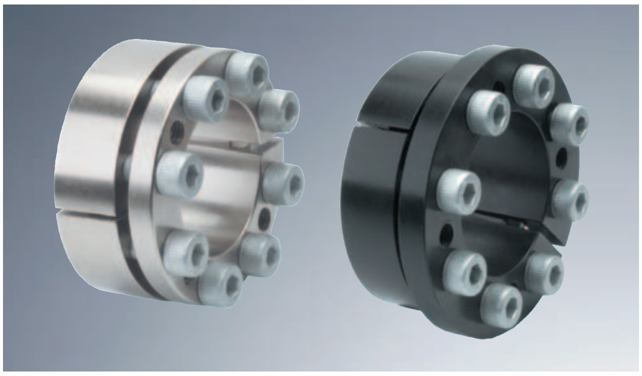
d x D [mm]	Dimensions [mm]					Clamping screws DIN EN ISO 4762 - 12.9 μ_{total}=0,14				KTR 200 Transmittable torque or axial force		KTR 200 Surface pressure between clamping set		KTR 200 Weight [~kg]	KTR 200 Stock-programme	KTR 201 Transmittable torque or axial force		KTR 201 Surface pressure between clamping set		KTR 201 Weight [~kg]	KTR 201 Stock-programme
	B	B_1	B_2	B_3	D_1	M	z Number	T_A 1) [Nm] KTR 200	T_A 1) [Nm] KTR 201	T [Nm]	F_{ax} [kN]	Shaft P_W [N/mm²]	Hub P_N [N/mm²]			T [Nm]	F_{ax} [kN]	Shaft P_W [N/mm²]	Hub P_N [N/mm²]		
20 x 47	48	42	31	26	53	M6	6	17	17	513	51	291	124	0,41	●	332	33	178	76	0,42	●
22 x 47	48	42	31	26	53	M6	6	17	17	564	51	264	124	0,38	●	366	33	162	76	0,39	●
24 x 50	48	42	31	26	56	M6	6	17	17	616	51	242	116	0,42	●	399	33	149	71	0,43	●
25 x 50	48	42	31	26	56	M6	6	17	17	641	51	233	116	0,41	●	415	33	143	71	0,42	●
28 x 55	48	42	31	26	61	M6	6	17	17	718	51	208	106	0,50	●	465	33	127	65	0,51	●
30 x 55	48	42	31	26	61	M6	6	17	17	769	51	194	106	0,47	●	499	33	119	65	0,48	●
32 x 60	48	42	31	26	66	M6	8	17	17	1094	68	242	129	0,56	●	709	44	149	79	0,57	●
35 x 60	48	42	31	26	66	M6	8	17	17	1197	68	222	129	0,53	●	776	44	136	79	0,54	●
38 x 65	48	42	31	26	71	M6	8	17	17	1299	68	204	119	0,62	●	842	44	125	73	0,63	●
40 x 65	48	42	31	26	71	M6	8	17	17	1368	68	194	119	0,57	●	886	44	119	73	0,58	●
42 x 75	59	51	35	30	81	M8	6	41	41	1990	95	222	124	1,01	●	1290	61	136	76	1,02	●
45 x 75	59	51	35	30	81	M8	6	41	41	2132	95	207	124	0,98	●	1382	61	127	76	0,99	●
48 x 80	59	51	35	30	86	M8	8	41	41	3033	126	259	155	1,09	●	1965	82	159	95	1,10	●
50 x 80	59	51	35	30	86	M8	8	41	41	3159	126	248	155	1,07	●	2047	82	152	95	1,08	●
55 x 85	59	51	35	30	91	M8	8	41	41	3475	126	226	146	1,15	●	2252	82	139	90	1,16	●
60 x 90	59	51	35	30	96	M8	8	41	41	3791	126	207	138	1,23	●	2456	82	127	85	1,24	●
65 x 95	59	51	35	30	101	M8	8	41	41	4107	126	191	131	1,32	●	2661	82	117	80	1,33	●
70 x 110	70	60	45	40	119	M10	8	83	83	7023	201	211	134	2,18	●	4550	130	130	83	2,29	●
75 x 115	70	60	45	40	124	M10	8	83	83	7524	201	197	129	2,30	●	4875	130	121	79	2,41	●
80 x 120	70	60	45	40	129	M10	8	83	83	8026	201	185	123	2,44	●	5200	130	113	76	2,56	●
85 x 125	70	60	45	40	134	M10	10	83	83	10659	251	217	148	2,55	●	6907	163	133	91	2,67	●
90 x 130	70	60	45	40	139	M10	10	83	83	11286	251	205	142	2,67	●	7313	163	126	87	2,80	●
95 x 135	66	60	45	40	144	M10	10	83	83	11373	239	186	131	2,80	●	7501	158	116	82	2,93	●
100 x 145	80	68	52	45	155	M12	8	145	145	14607	292	191	132	3,90	●	9465	189	117	81	4,10	●
110 x 155	80	68	52	45	165	M12	8	145	145	16068	292	174	123	4,20	●	10411	189	107	76	4,40	●
120 x 165	80	68	52	45	175	M12	10	145	145	21910	365	199	145	4,50	●	14197	237	122	89	4,72	●
130 x 180	80	68	52	45	188	M12	12	145	145	28483	438	221	159	5,50		18456	284	136	98	5,74	
140 x 190	90	76	58	50	199	M14	10	210	230	32023	457	193	142	6,60		22726	325	130	95	6,92	
150 x 200	90	76	58	50	209	M14	12	210	230	41173	549	216	162	6,90	●	29219	390	145	109	7,24	
160 x 210	90	76	58	50	219	M14	12	210	230	43918	549	202	154	7,40		31167	390	136	104	7,76	
170 x 225	90	76	58	50	234	M14	14	210	230	54440	640	222	168	8,60		38634	455	149	113	8,98	
180 x 235	90	76	58	50	244	M14	14	210	230	57642	640	210	161	9,10		40907	455	141	108	9,50	

● Clamping sets available from stock.

1) These are the maximum screw tightening torques. They can be reduced to max. 40% of the aforementioned figures with T, F_{ax}, P_W and P_N being reduced proportionally.

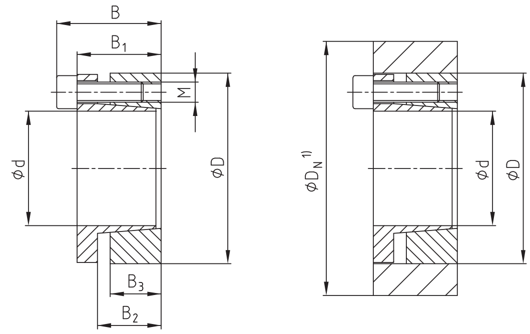
Made for Motion KTR

KTR 203 and KTR 206 (self-centering)



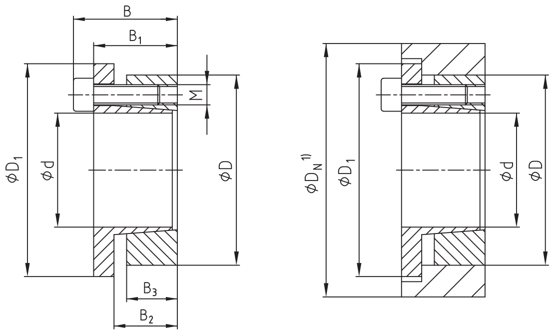
- Clamping set for universal applications
- Short dimensions
- Operation as with KTR 200/201
- Mounting instructions under www.ktr.com

KTR 203



Higher transmittable torque than KTR 206,
slight axial movement of the hub

KTR 206



No axial movement of the hub,
but lower transmittable torque than KTR 203

1) Dimension D_N: For calculation see page 282/283.

Assembly

Clean and lightly oil the contact surfaces of shaft and hub. Insert the clamping element into the hub fit and push it onto the shaft. Tighten the clamping screws crosswise, evenly and by degrees to the tightening torque T_A mentioned by means of the torque wrench. Check the tightening torque of all clamping screws in the order of arrangement. The figures T and F_{ax} mentioned in the table were calculated for an assembly with oil.

Note: Do not use any oil with molybdenum sulphide or high-pressure additions or grease reducing the coefficient of friction considerably. The clamping sets are delivered with oil. For assembly without oil the figures mentioned in the table deviate.

Disassembly

Unscrew the clamping screws. Screw the screws into the pull-off thread, tighten them crosswise by degrees and evenly until the rear taper ring is released. For repeated application oil the screws and threads.

Tolerances, surfaces

One accurate turning process is sufficient:

$R_Z \leq 16 \mu m$

Maximum permissible tolerances:

h8 for the shaft - H8 for the hub

Centering

The clamping elements KTR 203 and KTR 206 are **self-centering**. Between shaft and hub the concentricity of the clamping set is between **0,02** and **0,04** mm.

Order form:

KTR 203	40	x	65
Type	Size of inside diameter		Size of outside diameter

KTR 203 and KTR 206 (self-centering) – Technical Data

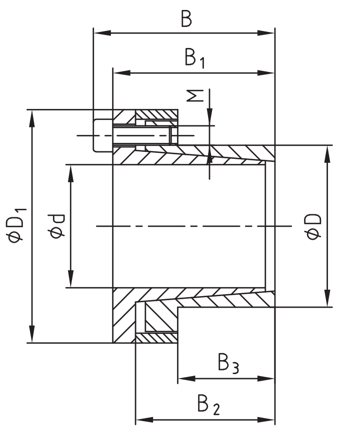
CLAMPEX® – KTR 203 and KTR 206																					
										KTR 203						KTR 206					
d x D [mm]	Dimensions [mm]					Clamping screws DIN EN ISO 4762 - 12.9 μ_{total}=0,14				Transmittable torque or axial force		Surface pressure between clamping set		Weight [~kg]	Stock-programme	Transmittable torque or axial force		Surface pressure between clamping set		Weight [~kg]	Stock-programme
	B	B_1	B_2	B_3	D_1	M	z Number	T_A [1] [Nm] KTR 203	T_A [1] [Nm] KTR 206	T [Nm]	F_{ax} [kN]	Shaft P_W [N/mm²]	Hub P_N [N/mm²]			T [Nm]	F_{ax} [kN]	Shaft P_W [N/mm²]	Hub P_N [N/mm²]		
20 x 47	34	28	22	17	53	M6	6	14	17	428	43	334	142	0,25	●	332	33	259	110	0,26	●
22 x 47	34	28	22	17	53	M6	6	14	17	471	43	304	142	0,23	●	366	33	236	110	0,24	●
24 x 50	34	28	22	17	56	M6	6	14	17	514	43	278	134	0,26	●	399	33	216	104	0,27	●
25 x 50	34	28	22	17	56	M6	6	14	17	535	43	267	134	0,25	●	415	33	207	104	0,26	●
28 x 55	34	28	22	17	61,5	M6	6	14	17	599	43	239	121	0,31	●	465	33	185	94	0,32	●
30 x 55	34	28	22	17	61,5	M6	6	14	17	642	43	223	121	0,29	●	499	33	173	94	0,30	●
32 x 60	34	28	22	17	67	M6	8	14	17	913	57	278	148	0,34	●	709	44	216	115	0,35	●
35 x 60	34	28	22	17	67	M6	8	14	17	999	57	254	148	0,33	●	776	44	198	115	0,34	●
38 x 65	34	28	22	17	72	M6	8	14	17	1084	57	234	137	0,38	●	842	44	182	106	0,39	●
40 x 65	34	28	22	17	72	M6	8	14	17	1141	57	223	137	0,34	●	886	44	173	106	0,35	●
42 x 75	41	33	25	20	84	M8	8	35	41	2207	105	332	186	0,59	●	1719	82	259	145	0,60	●
45 x 75	41	33	25	20	84	M8	8	35	41	2364	105	310	186	0,58	●	1842	82	241	145	0,59	●
48 x 80	41	33,5	24	20	89	M8	8	35	41	2522	105	290	174	0,64		1965	82	226	136	0,65	●
50 x 80	41	33,5	24	20	89	M8	8	35	41	2627	105	279	174	0,63	●	2047	82	217	136	0,64	●
55 x 85	41	33,5	24	20	91	M8	8	35	41	2890	105	253	164	0,69	●	2252	82	197	128	0,70	●
60 x 90	41	33,5	24	20	99	M8	8	35	41	3152	105	232	155	0,73	●	2456	82	181	121	0,74	●
65 x 95	41	33,5	24	20	104	M8	8	35	41	3415	105	214	147	0,79	●	2661	82	167	114	0,80	●
70 x 110	50	40	29	24	119	M10	8	70	83	5934	170	268	170	1,47	●	4550	130	205	131	1,58	●
75 x 115	50	40	29	24	124	M10	8	70	83	6358	170	250	163	1,55	●	4875	130	192	125	1,66	●
80 x 120	50	40	29	24	129	M10	8	70	83	6782	170	234	156	1,65	●	5200	130	180	120	1,77	●
85 x 125	50	40	29	24	134	M10	10	70	83	9007	212	276	187	1,72	●	6907	163	211	144	1,84	●
90 x 130	50	40	29	24	139	M10	10	70	83	9537	212	260	180	1,81	●	7313	163	200	138	1,94	●
95 x 135	50	40	29	24	144	M10	10	70	83	9611	202	235	166	1,90		7501	158	184	129	2,03	●
100 x 145	56	44	31	26	154	M12	8	115	145	11719	234	239	165	2,48	●	9465	189	193	133	2,68	●
110 x 155	56	44	31	26	164	M12	8	115	145	12891	234	217	154	2,66		10411	189	176	125	2,86	●
120 x 165	56	44	31	26	174	M12	9	115	145	15821	264	224	163	2,84		12777	213	181	132	3,06	●
130 x 180	64	52	39	34	189	M12	12	115	145	22853	352	211	152	4,45		18456	284	170	123	4,69	●
140 x 190	68	54	39	34	199	M14	9	185	230	25699	367	205	151	4,62		20453	292	163	120	4,94	
150 x 200	68	54	39	34	209	M14	10	185	230	30595	408	212	159	4,80		24349	325	169	127	5,14	
160 x 210	68	54	39	34	219	M14	12	185	230	39161	490	239	182	5,18		31167	390	190	145	5,54	
170 x 225	78	64	49	44	234	M14	12	185	230	41609	490	225	170	7,33		33115	390	179	135	7,71	
180 x 235	78	64	49	44	244	M14	12	185	230	44056	490	212	163	7,77		35063	390	169	129	8,17	

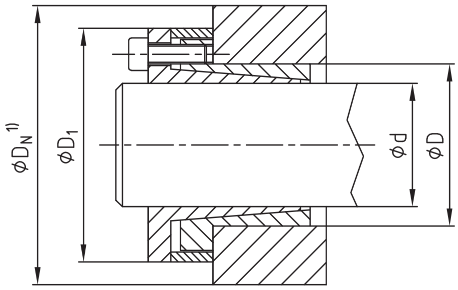
● Clamping sets available from stock.

1) These are the maximum screw tightening torques. They can be reduced to max. 40% of the aforementioned figures with T, F_{ax}, P_W and P_N being reduced proportionally.

KTR 250 (self-centering)

- Clamping set specifically suitable for hubs with a small wall thickness
- Reduction of costs by saving material
- Short assembly times
- Small radial mounting dimensions
- Clamping sets "stainless steel" on request (Please order dimension sheet M367697.)
- Mounting instructions under www.ktr.com





No axial displacement of the hub during the assembly

1) Dimension D_N: For calculation see page 282/283.

Assembly
Clean and lightly oil the contact surfaces of shaft and hub. Insert the clamping element into the hub fit and push it onto the shaft. Tighten the clamping screws crosswise, evenly and by degrees to the tightening torque T_A mentioned by means of the torque wrench. Check the tightening torque of all clamping screws in the order of arrangement. The figures T and F_{ax} mentioned in the table were calculated for an assembly with oil.

Note: Do not use any oil with molybdenum sulphide or high-pressure additions or grease reducing the coefficient of friction considerably. The clamping sets are delivered with oil. For assembly without oil the figures mentioned in the table deviate.

Disassembly
Unscrew the clamping screws. Screw the screws into the pull-off thread, tighten them crosswise by degrees and evenly until the rear taper ring is released. For repeated application oil the screws and threads.

Tolerances, surfaces
One accurate turning process is sufficient:
$R_Z \leq 16\mu m$

Maximum permissible tolerances:
h8 for the shaft - H8 for the hub

Centering
The clamping element KTR 250 is **self-centering**. Between shaft and hub the concentricity of the clamping set is between **0,02** and **0,04** mm.

Order form:	KTR 250	50	x	65
	Type	Size of inside diameter		Size of outside diameter

KTR 250 (self-centering) – Technical Data

CLAMPEX® – KTR 250														
d x D [mm]	Dimensions 2) [mm]					Clamping screws DIN EN ISO 4762 - 12.9 μ_{total}=0,14			Transmittable torque or axial force		Surface pressure between clamping set		Weight [~kg]	Stock-pro-gramme
	B	B_1	B_2	B_3	D_1	M	z Number	T_A 1) [Nm]	T [Nm]	F_{ax} [kN]	Shaft P_W [N/mm²]	Hub P_N [N/mm²]		
6 x 14	24	21	18,5	10	25	M3	4	2	14	5	252	108	0,10	●
8 x 15	29	25	22	11,5	27	M4	3	5	27	7	210	112	0,12	●
9 x 16	30	26	23	14	28	M4	4	5	40	9	207	116	0,15	●
10 x 16	30	26	22,5	14	29	M4	4	5	46	9	192	120	0,15	●
11 x 18	30	26	23	13,5	32	M4	4	5	49	9	169	103	0,18	●
12 x 18	30	26	22,5	13,5	32	M4	4	5	55	9	160	106	0,18	●
14 x 23	30	26	22,5	14	38	M4	6	5	64	9	137	83	0,20	●
15 x 24	42	36	28,5	16	44	M6	4	15	139	19	227	142	0,31	●
16 x 24	42	36	28,5	16	44	M6	4	15	148	19	213	142	0,30	●
18 x 26	44	38	31	18	47	M6	4	17	199	22	191	132	0,32	●
19 x 27	44	38	31	18	48	M6	4	17	210	22	181	127	0,35	●
20 x 28	44	38	31	18	49	M6	4	17	222	22	172	123	0,36	●
22 x 32	51	45	38	25	54	M6	4	17	244	22	112	77	0,45	●
24 x 34	51	45	38	25	56	M6	4	17	266	22	103	73	0,48	●
25 x 34	51	45	38	25	56	M6	4	17	277	22	99	73	0,50	●
28 x 39	51	45	38	25	61	M6	6	17	465	33	133	95	0,52	●
30 x 41	51	45	38	25	62	M6	6	17	499	33	124	91	0,53	●
32 x 43	51	45	38	25	65	M6	8	17	689	43	150	112	0,58	●
35 x 47	56	50	43	30	69	M6	8	17	776	44	118	88	0,69	●
38 x 50	56	50	43	30	72	M6	8	17	842	44	109	82	0,73	●
40 x 53	56	50	43	30	75	M6	8	17	886	44	103	78	0,80	●
42 x 55	65	57	49	32	78	M8	8	41	1665	80	170	130	0,83	●
45 x 59	73	65	57	40	85	M8	8	41	1842	82	127	97	1,40	●
48 x 62	78	70	62	45	87	M8	8	41	1909	80	103	80	1,42	●
50 x 65	78	70	62	45	92	M8	10	41	2559	102	127	98	1,60	●
55 x 71	83	75	67	50	98	M8	10	41	2815	102	104	81	1,90	●
60 x 77	83	75	67	50	104	M8	10	41	3070	102	95	74	2,05	●
65 x 84	83	75	67	50	111	M8	10	41	3326	102	88	68	2,15	●
70 x 90	101	91	80	60	119	M10	10	83	5688	163	108	84	3,35	●
75 x 95	101	91	80	60	126	M10	10	83	6094	163	101	80	3,60	●
80 x 100	106	96	85	65	131	M10	12	83	7801	195	105	84	3,75	●
85 x 106	106	96	85	65	137	M10	12	83	8288	195	99	79	4,05	●
90 x 112	106	96	85	65	143	M10	15	83	10970	244	116	93	4,32	●
95 x 120	106	96	85	65	153	M10	15	83	11579	244	110	87	4,50	●
100 x 125	114	102	85	65	162	M12	12	145	14197	284	122	98	4,80	●
110 x 140	140	128	114	90	180	M12	12	145	15174	276	78	61	6,15	●
120 x 155	140	128	115	90	198	M12	12	145	16554	276	71	55	10,14	
130 x 165	140	128	115	90	203	M12	16	145	23911	368	88	69	11,89	

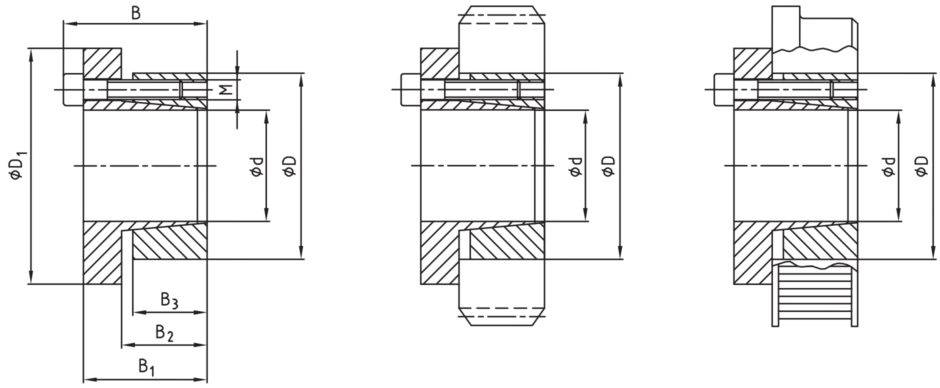
● Clamping sets available from stock.

1) These are the maximum screw tightening torques. They can be reduced to max. 40% of the aforementioned figures with T, F_{ax}, P_W and P_N being reduced proportionally.

2) For different dimensions for clamping sets “stainless steel“ please see dimension sheet M367697.

KTR 225 for disk and flange shape drive components (self-centering)

- For the same diameter of the external ring various bore diameters are available
- Only one bore for each size necessary for the hub
- Reduction of components and costs
- Short assembly times
- Mounting instructions under www.ktr.com



Assembly

Clean and lightly oil the contact surfaces of shaft and hub. Insert the clamping element into the hub fit and push it onto the shaft. Tighten the clamping screws crosswise, evenly and by degrees to the tightening torque T_A mentioned by means of the torque wrench. Check the tightening torque of all clamping screws in the order of arrangement. The figures T and Fax mentioned in the table were calculated for an assembly with oil.

Note: Do not use any oil with molybdenum sulphide or high-pressure additions or grease reducing the coefficient of friction considerably. The clamping sets are delivered with oil. For assembly without oil the figures mentioned in the table deviate.

Disassembly

Unscrew the clamping screws. Screw the screws into the pull-off thread, tighten them crosswise by degrees and evenly until the rear taper ring is released. For repeated application oil the screws and threads.

Tolerances, surfaces

One accurate turning process is sufficient:

$R_Z \leq 16\mu m$

Maximum permissible tolerances:

h8 for the shaft - H8 for the hub

Axial movement

KTR 225: During the tightening of the screws there is no axial movement of the hub towards the shaft.

Centering

The clamping element KTR 225 is **self-centering**. Between shaft and hub the concentricity of the clamping set is between **0,02** and **0,04** mm.

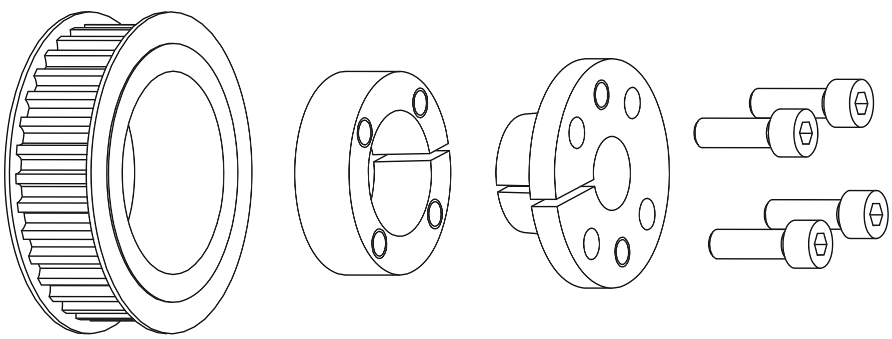
Order form:

KTR 225	28	x	65
Type	Size of inside diameter		Size of outside diameter

KTR 225 (self-centering) – Technical Data

CLAMPEX® – KTR 225														
d x D [mm]	Dimensions [mm]					Clamping screws DIN EN ISO 4762 - 12.9 μ_{total}=0,14			Transmittable torque or axial force		Surface pressure between clamping set		Weight [~kg]	Stock-programme
	B	B_1	B_2	B_3	D_1	M	z Number	T_A 1) [Nm]	T [Nm]	F_{ax} [kN]	Shaft P_W [N/mm²]	Hub P_N [N/mm²]		
14 x 55	38	30	22	17	62	M8	4	41	139	20	263	122	0,50	●
16 x 55									195	24	244		0,49	●
18 x 55									250	28	228		0,48	●
19 x 55	38	30	22	17	62	M8	4	41	278	29	221	122	0,47	●
20 x 55									306	31	214		0,46	●
22 x 55									362	33	203		0,45	●
24 x 55	38	30	22	17	62	M8	4	41	418	35	193	122	0,43	●
25 x 55									446	36	188		0,42	●
28 x 55	38	30	22	17	62	M8	4	41	529	38	177	122	0,39	●
30 x 55									585	39	170		0,37	●
24 x 65									467	39	211		0,66	●
25 x 65	38	30	22	17	72	M8	5	41	500	40	206	129	0,65	●
28 x 65									599	43	193		0,62	●
30 x 65									665	44	186		0,60	●
32 x 65	38	30	22	17	72	M8	5	41	731	46	179	129	0,58	●
35 x 65									830	47	171		0,54	●
38 x 65	38	30	22	17	72	M8	5	41	929	49	164	129	0,50	●
40 x 65									995	50	161		0,47	●
30 x 80									898	60	210		1,08	
32 x 80	41	33	25	20	88	M8	7	41	985	62	202	125	1,05	
35 x 80									1114	64	191		1,01	
38 x 80									1244	65	182		0,97	
40 x 80	41	33	25	20	88	M8	7	41	1331	67	177	125	0,94	●
42 x 80									1417	67	172		0,91	
45 x 80									1547	69	166		0,85	
48 x 80	41	33	25	20	88	M8	7	41	1677	70	161	125	0,79	
50 x 80									1764	71	159		0,75	●

Assembly with belt drive

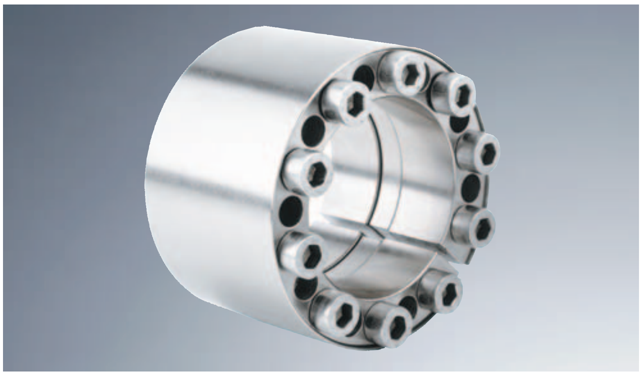


For different shaft diameters only one cylindrical bore dimension is necessary in the pulley in case of KTR 225.

● Clamping sets available from stock.

1) These are the maximum screw tightening torques. They can be reduced to max. 40% of the aforementioned figures with T, F_{ax}, P_W and P_N being reduced proportionally.

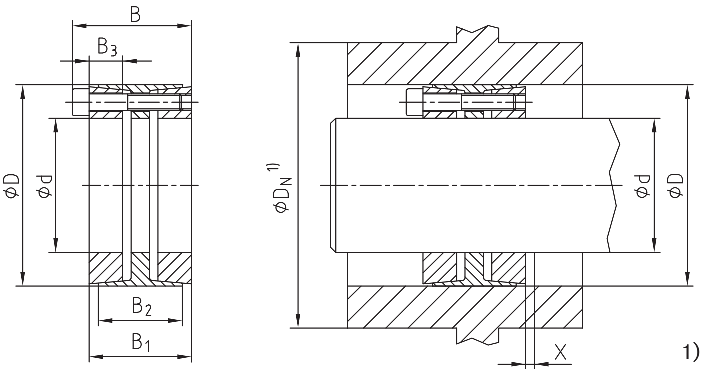
KTR 400 (self-centering)



- Clamping set suitable for high loads
- Specifically suitable for vibratory torques
- Typical applications: flywheels, belt drums
- Torque factor

1 off	1 x T
2 off	1,9 x T
3 off	2,7 x T
4 off	3,6 x T

- KTR 402 for shaft Ø 320 mm to Ø 560 mm and high torques, please order dimension sheet M483041.
- Mounting instructions under www.ktr.com



Formula to calculate space x left for disassembly:

$$x = \frac{(B1 - B2)}{2}$$

1) Dimension D_N: For calculation see page 282/283.

Assembly

Clean and lightly oil the contact surfaces of shaft and hub. Insert the clamping element into the hub fit and push it onto the shaft. Tighten the clamping screws evenly and crosswise. Here please increase the tightening torque step by step. This must be repeated until reaching the indicated tightening torque with all clamping screws.

Note: Do not use any oil with molybdenum sulphide or high-pressure additions or grease reducing the coefficient of friction considerably. The clamping sets are delivered with oil. For assembly without oil the figures mentioned in the table deviate.

Disassembly

Unscrew all clamping screws and screw them into the pull-off threads of the front taper ring. Tighten the screws crosswise by degrees and evenly to half the tightening torque T_A. Afterwards repeat this process to the full tightening torque. As soon as the front taper ring is released, screw the clamping screws into the pull-off threads of the spacer ring in order to release the rear taper ring.

Note: If the clamping element KTR 400 is reused, please make sure that the pull-off thread of the front taper ring and the spacer ring are situated in the original position. Here the slots of the front and of the back pressure ring and those of the external ring must be flush.

Tolerances, surfaces

One accurate turning process is sufficient:

$R_Z \leq$ 16µm

Maximum permissible tolerances:
h8 for the shaft - H8 for the hub

Axial movement

During the assembly a slight axial movement of the hub towards the shaft may arise.

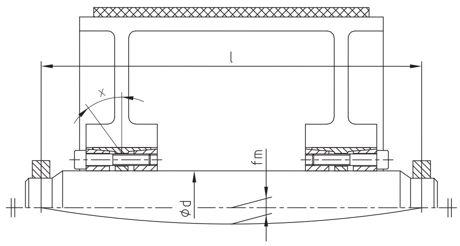
Centering

The clamping element KTR 400 is **self-centering**. Between shaft and hub the concentricity of the clamping set is between **0,02** and **0,04** mm.

Example of assembly

Drive of conveyor belt drum

The following conditions should be adhered to as limiting values for CLAMPEX® clamping sets with load by bending: Direction angles x on the contact position shaft-clamping set ≤ 6' or maximum shaft bending fm in the bearing area:
fm ≤ l ($^1/_{2000}$ - $^1/_{3000}$).



Order form:

KTR 400	100	x	145
Type	Size of inside diameter		Size of outside diameter

KTR 400 (self-centering) – Technical Data

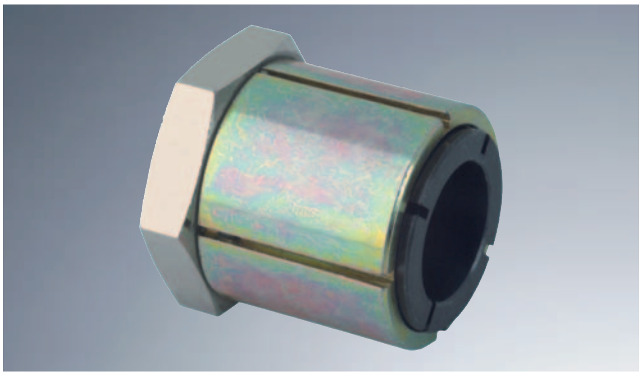
CLAMPEX® – KTR 400																					
					Standard industrial applications							Applications with components subject to bending and torsion									
d x D [mm]	Dimensions [mm]				Clamping screws DIN EN ISO 4762 - 12.9 μ_{total}=0,14			Transmittable torque or axial force		Surface pressure between clamping set		Clamping screws DIN EN ISO 4762 - 12.9 μ_{total}=0,14			Transmittable torque or axial force		Trans-mittable bending moment	Surface pressure between clamping set		Weight [~kg]	Stock-programme
	B	B_1	B_2	B_3	M	z Number	T_A 1) [Nm]	T [Nm]	F_{ax} [kN]	Shaft P_W [N/mm²]	Hub P_N [N/mm²]	M	z Number	T_A 1) [Nm]	T [Nm]	F_{ax} [kN]	$Mb_{perm.}$ [Nm]	Shaft P_W [N/mm²]	Hub P_N [N/mm²]		
24 x 50	51	45	41	16	M6	6	17	712	59	205	85	M6	6	14	537	45	315	232	87	0,54	
25 x 50	51	45	41	16	M6	6	17	742	59	197	85	M6	6	14	555	44	328	224	87	0,53	
28 x 55	51	45	41	16	M6	8	17	831	59	176	78	M6	8	14	608	43	367	203	81	0,50	
30 x 55	51	45	41	16	M6	8	17	1187	79	219	103	M6	8	14	880	58	459	250	106	0,47	●
32 x 60	51	45	41	16	M6	8	17	1266	79	205	95	M6	8	14	926	57	490	237	99	0,77	
35 x 60	51	45	41	16	M6	8	17	1385	79	187	95	M6	8	14	993	56	536	219	100	0,71	●
38 x 65	51	45	41	16	M6	10	17	1880	99	216	109	M6	10	14	1311	69	748	257	118	1,25	
40 x 65	51	45	41	16	M6	10	17	1979	99	205	109	M6	10	14	1361	68	787	247	118	1,21	●
42 x 75	53	45	41	16	M8	8	41	3071	146	289	140	M8	8	35	2278	107	827	328	143	1,16	
45 x 75	53	45	41	16	M8	8	41	3290	146	269	140	M8	8	35	2408	107	886	309	145	1,08	●
48 x 80	70	62	58	23	M8	8	41	3518	147	196	93	M8	8	35	2467	103	1494	207	99	1,45	●
50 x 80	70	62	58	23	M8	8	41	3664	147	188	93	M8	8	35	2267	91	1779	196	97	1,38	●
55 x 85	70	62	58	23	M8	8	41	4031	147	171	88	M8	8	35	2408	88	1957	182	93	1,49	●
60 x 90	70	62	58	23	M8	10	41	5497	183	196	103	M8	10	35	3447	115	2134	203	107	1,60	●
65 x 95	70	62	58	23	M8	10	41	5955	183	181	98	M8	10	35	3633	112	2312	190	103	1,70	●
70 x 110	86	76	70	28	M10	10	83	10182	291	219	111	M10	10	69	6619	189	3659	222	113	3,12	●
75 x 115	86	76	70	28	M10	10	83	10910	291	204	107	M10	10	69	6950	185	3920	210	110	3,29	●
80 x 120	86	76	70	28	M10	12	83	13964	349	230	122	M10	12	69	9200	230	4181	231	123	3,46	●
85 x 125	86	76	70	28	M10	12	83	14837	349	216	118	M10	12	69	9613	226	4443	220	120	3,64	●
90 x 130	86	76	70	28	M10	12	83	15710	349	204	113	M10	12	69	10008	222	4704	210	116	3,81	●
95 x 135	86	76	70	28	M10	12	83	16583	349	193	109	M10	12	69	10383	219	4965	201	113	3,98	●
100 x 145	110	98	92	35	M12	12	145	25415	508	214	112	M12	12	120	16527	331	8687	219	115	6,12	●
110 x 155	110	98	92	35	M12	12	145	27956	508	195	105	M12	12	120	17658	321	9445	203	110	6,62	●
120 x 165	110	98	92	35	M12	14	145	35581	593	208	115	M12	14	120	22948	382	10304	214	119	7,12	●
130 x 180	128	114	108	41	M14	12	230	45333	697	193	106	M14	12	190	28502	438	15350	201	110	9,98	●
140 x 190	128	114	108	41	M14	14	230	56957	814	209	117	M14	14	190	36719	525	16531	215	120	10,62	●
150 x 200	128	114	108	41	M14	16	230	69743	930	223	127	M14	16	190	45796	611	17712	226	129	11,26	●
160 x 210	128	114	108	41	M14	16	230	74392	930	209	121	M14	16	190	47958	599	18893	215	124	11,91	●
170 x 225	162	146	136	52	M16	14	355	96123	1131	189	109	M16	14	295	59316	698	32060	196	113	17,660	●
180 x 235	162	146	136	52	M16	16	355	116317	1292	203	119	M16	16	295	73592	818	33946	209	122	18,49	●
190 x 250	162	146	136	52	M16	16	355	122779	1292	193	112	M16	16	295	76340	804	35831	200	116	21,39	●
200 x 260	162	146	136	52	M16	16	355	129241	1292	183	108	M16	16	295	78946	789	37717	192	113	22,36	●
220 x 285	162	146	136	52	M16	20	355	177706	1616	208	123	M16	20	295	113209	1029	41489	213	125	26,59	●
240 x 305	162	146	136	52	M16	22	355	213248	1777	210	126	M16	22	295	136190	1135	45261	214	129	28,70	●
260 x 325	162	146	136	55	M16	22	355	233398	1795	185	122	M16	22	295	143090	1101	51099	193	127	31,23	
280 x 355	197	177	165	66	M20	18	690	336303	2402	192	121	M20	18	580	210027	1500	81312	200	126	46,77	
300 x 375	197	177	165	66	M20	20	690	400360	2669	199	127	M20	20	580	253018	1687	87120	206	132	49,72	
320 x 405	197	177	165	66	M20	21	690	448404	2803	196	124	M20	21	580	218947	1762	92928	203	128	60,52	
340 x 425	197	177	165	66	M20	22	690	499116	2936	193	123	M20	22	580	312383	1838	98736	201	128	63,86	
360 x 455	224	202	190	76	M22	21	930	627940	3489	188	119	M22	21	780	389170	2162	138624	196	124	86,78	
380 x 475	224	202	190	76	M22	22	930	694389	3655	186	119	M22	22	780	429232	2259	146325	195	125	91,04	
400 x 495	224	202	190	76	M22	24	930	797384	3987	193	125	M22	24	780	498899	2494	154027	201	130	95,30	

● Clamping sets available from stock.

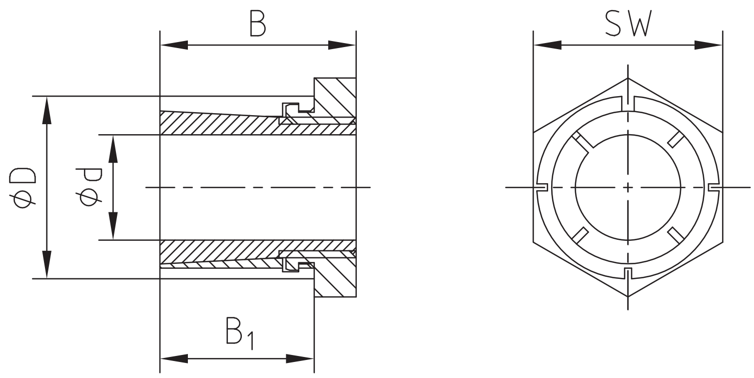
1) These are the maximum screw tightening torques. They can be reduced to max. 40% of the aforementioned figures with T, F_{ax}, P_W and P_N being reduced proportionally.

Other sizes on request.

KTR 130 (self-centering)



- Corrosion-protected surface
- Assembly and disassembly by using central clamping nut
- Self-centering
- Shaft diameters from 5 mm to 50 mm
- Tolerance h9/H9 for shaft and hub
- Mounting instructions under www.ktr.com



Assembly

Clean and lightly oil the contact surfaces of shaft and hub. Unscrew the hexagon nut. Insert the clamping set into the hub fit and push onto the shaft. Lightly tighten the hexagon nut and align the clamping set with the hub element. Afterwards tighten the hexagon nut to the tightening torque T_A mentioned by means of a dynamometric screwdriver. The figures T and Fax mentioned in the table were calculated for an assembly with oil.

Note: Do not use any oil with molybdenum sulphide or high-pressure additions or grease reducing the coefficient of friction considerably. The clamping sets are delivered with oil. For assembly without oil the figures mentioned in the table deviate.

Disassembly

Unscrew the hexagon nut. Turn the hexagon nut left until the clamping set can be moved on the shaft. Afterwards remove the unscrewed clamping set between shaft and hub. In case of repeated use, please lubricate the hexagon nut and thread.

Tolerances, surfaces

One accurate turning process is sufficient:

$R_Z \leq 16 \mu m$

Maximum permissible tolerances:

h9 for the shaft - H9 for the hub

Axial movement

KTR 130: During the process of tightening the hexagon nut the hub opposite to the shaft is displaced axially.

Centering

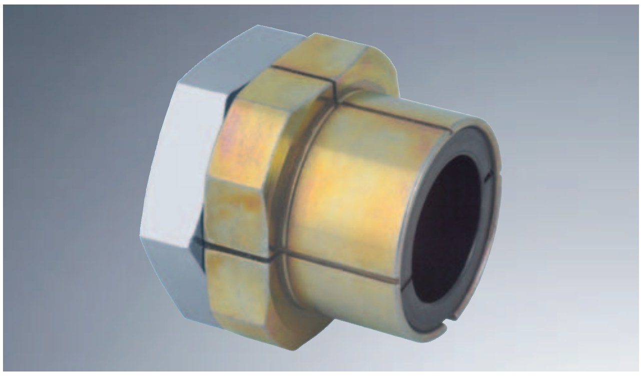
The clamping element KTR 130 is **self-centering**. Between shaft and hub the concentricity of the clamping set is between **0,02** and **0,04** mm.

Order form:	KTR 130	18	x	35
	Type	Size of inside diameter		Size of outside diameter

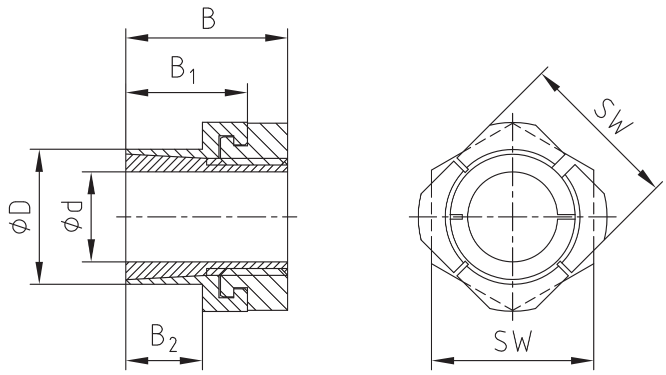
KTR 130 (self-centering) – Technical Data

CLAMPEX® – KTR 130									
d x D [mm]	Dimensions [mm]		Hexagon nut		Transmittable torque or axial force		Surface pressure between clamping sets		Weight [~kg]
	B	B_1	Width across flats SW	T_A [Nm]	T [Nm]	F_{ax} [kN]	Shaft P_W [N/mm²]	Hub P_N [N/mm²]	
5 x 14	19	15	14	10	10,1	4,0	264	96	0,018
6 x 14	19	15	14	10	12,1	4,0	220	96	0,017
8 x 16	22	17	17	17	23,4	5,8	179	91	0,024
9 x 20	24	19	22	35	43,2	9,7	248	112	0,042
10 x 20	24	19	22	35	48,6	9,7	223	112	0,045
12 x 22	24	19	22	44	65,3	10,9	206	117	0,048
14 x 26	28	22	27	65	93,0	13,3	178	99	0,081
15 x 26	28	22	27	65	99,0	13,3	166	99	0,076
16 x 26	28	22	27	65	106	13,3	156	99	0,071
18 x 35	36	27	36	161	223	24,8	224	125	0,197
19 x 35	36	27	36	161	235	24,8	212	125	0,191
20 x 35	36	27	36	161	248	24,8	201	125	0,181
22 x 42	41	30	46	250	349	31,8	197	110	0,342
24 x 42	41	30	46	250	381	31,8	180	110	0,321
25 x 42	41	30	46	250	397	31,8	173	110	0,309
30 x 47	44	33	50	355	605	40,4	162	110	0,372
32 x 55	51	38	55	490	764	47,8	166	102	0,627
35 x 55	51	38	55	490	836	47,8	151	102	0,566
40 x 62	58	43	65	800	1329	66,5	152	98	0,835
45 x 65	63	48	65	900	1605	71,0	142	98	0,855
48 x 75	73	58	75	1290	2227	92,0	121	77	1,470
50 x 75	73	58	75	1290	2320	92,0	116	77	1,380

KTR 131 (self-centering)



- Corrosion-protected surface
- Assembly and disassembly by using central clamping nut
- Hexagon locking nuts for clamping on slightly torsionable shafts
- Self-centering
- Shaft diameters from 5 mm to 35 mm
- Tolerance h9/H9 for shaft and hub
- Mounting instructions under www.ktr.com



Assembly

Clean and lightly oil the contact surfaces of shaft and hub. Unscrew the hexagon nut. Insert the clamping set into the hub fit and push onto the shaft. Lightly tighten the hexagon nut and align the clamping set with the hub element. Afterwards tighten the hexagon nut along with the counter nut to the tightening torque T_A mentioned by means of a dynamometric screwdriver. The figures T and Fax mentioned in the table were calculated for an assembly with oil.

Note: Do not use any oil with molybdenum sulphide or high-pressure additions or grease reducing the coefficient of friction considerably. The clamping sets are delivered with oil. For assembly without oil the figures mentioned in the table deviate.

Disassembly

Unscrew the hexagon nut. Turn the hexagon nut left until the clamping set can be moved on the shaft. Afterwards remove the unscrewed clamping set between shaft and hub. In case of repeated use, please lubricate the hexagon nut and thread.

Tolerances, surfaces

One accurate turning process is sufficient:

$R_Z \leq 16\mu m$

Maximum permissible tolerances:

h9 for the shaft - H9 for the hub

Axial movement

KTR 131: During the process of tightening the hexagon nut the hub opposite to the shaft is displaced axially.

Centering

The clamping element KTR 131 is **self-centering**. Between shaft and hub the concentricity of the clamping set is between **0,02** and **0,04** mm.

Order form:

KTR 131	16	x	24
Type	Size of inside diameter		Size of outside diameter

KTR 131 (self-centering) – Technical Data

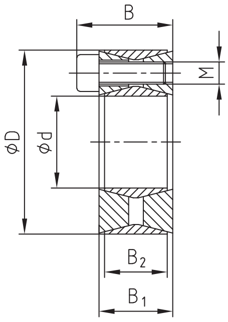
CLAMPEX® – KTR 131										
d x D [mm]	Dimensions [mm]			Hexagon nut/ counter nut		Transmittable torque or axial force		Surface pressure between clamping sets		Weight [~kg]
	B	B_1	B_2	Width across flats SW	T_A [Nm]	T [Nm]	F_{ax} [kN]	Shaft P_W [N/mm²]	Hub P_N [N/mm²]	
5 x 12	19	15	9	14	10	10,1	4,0	264	119	0,016
6 x 12	19	15	9	14	10	12,1	4,0	220	119	0,015
8 x 14	22	17	11	17	17	23,4	5,8	179	121	0,021
10 x 18	24	19	12	22	35	48,6	9,7	221	127	0,044
12 x 20	24	19	12	22	44	65,3	10,9	206	128	0,044
14 x 24	28	22	15	27	65	93,0	13,3	178	107	0,077
15 x 24	28	22	15	27	65	99,0	13,3	166	107	0,072
16 x 24	28	22	15	27	65	106	13,3	156	107	0,068
18 x 30	36	27	17	36	161	223	24,8	224	145	0,176
19 x 30	36	27	17	36	161	235	24,8	212	145	0,175
20 x 30	36	27	17	36	161	248	24,8	201	145	0,162
22 x 38	41	30	20	46	250	349	31,8	197	122	0,337
24 x 38	41	30	20	46	250	381	31,8	180	122	0,313
25 x 38	41	30	20	46	250	397	31,8	173	122	0,303
30 x 42	44	33	23	50	355	605	40,4	162	123	0,342
32 x 50	51	38	28	55	490	764	47,8	166	112	0,549
35 x 50	51	38	28	55	490	836	47,8	151	112	0,494

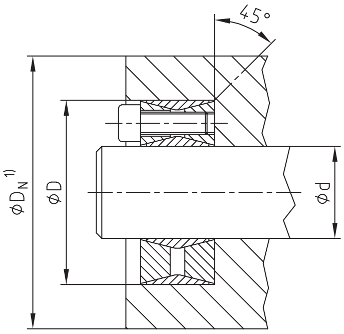
KTR 100 (not self-centering)

- „Typical clamping set“
- Axial fastening of the hub
- Torque factor

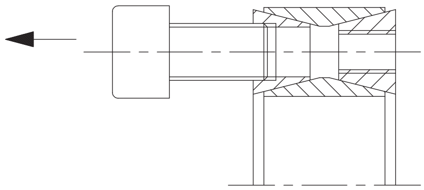
1 off	1 x T
2 off	1,9 x T
3 off	2,7 x T
4 off	3,6 x T

- Mounting instructions under www.ktr.com





Assembly with centering of hub



Accessory thread for disassembly

1) Dimension D_N: For calculation see page 282/283.

Assembly

Clean and lightly oil the contact surfaces of shaft and hub. Insert the clamping element into the hub fit and push it onto the shaft. Tighten the chromated screws until the internal ring is in contact with the shaft and the external ring is in contact with the hub. Afterwards tighten the clamping screws crosswise by degrees and evenly until the tightening torque T_A mentioned in the table is achieved. The figures T and F_{ax} mentioned in the table were calculated for an assembly with oil.

Note: Do not use any oil with molybdenum sulphide or high-pressure additions or grease reducing the coefficient of friction considerably. The clamping sets are delivered with oil. For assembly without oil the figures mentioned in the table deviate.

Disassembly

Unscrew all clamping screws. In normal cases the clamping element releases automatically. Otherwise lightly strike with a hammer onto the detached screws in order to push back the rear taper ring. By using the accessory threads the detached clamping set can be pulled-off.

Note: The accessory threads for the disassembly have approx. 3-5 supporting turns and are not cut. These are no threads for forcing screws.

Tolerances, surfaces

One accurate turning process is sufficient:

$R_Z \leq 16\mu m$

Maximum permissible tolerances:

h11 for the shaft - H11 for the hub

Axial movement

KTR 100: During the tightening of the screws there is no axial movement of the hub towards the shaft.

Centering

The clamping element KTR 100 is **not self-centering**. The concentricity of the hub towards the shaft merely depends on the fit and length of the pilot.

Order form:

KTR 100	50	x	80
Type	Size of inside diameter		Size of outside diameter

KTR 100 (not self-centering) – Technical Data

CLAMPEX® – KTR 100												
d x D [mm]	Dimensions [mm]			Clamping screws DIN EN ISO 4762 - 12.9 μ_{total}=0,14			Transmittable torque or axial force		Surface pressure between clamping set		Weight [~kg]	Stock-programme
	B	B_1	B_2	M	z Number	T_A 1) [Nm]	T [Nm]	F_{ax} [kN]	Shaft P_W [N/mm²]	Hub P_N [N/mm²]		
18 x 47	26	20	17	M6	8	15	240	27	289	111	0,24	
19 x 47	26	20	17	M6	8	15	254	27	274	111	0,24	●
20 x 47	26	20	17	M6	8	15	267	27	260	111	0,23	●
22 x 47	26	20	17	M6	8	15	294	27	237	111	0,23	●
24 x 50	26	20	17	M6	8	15	320	27	217	104	0,26	●
25 x 50	26	20	17	M6	8	15	334	27	208	104	0,25	●
28 x 55	26	20	17	M6	12	15	560	40	279	142	0,30	●
30 x55	26	20	17	M6	12	15	600	40	260	142	0,29	●
32 x 60	26	20	17	M6	12	15	641	40	244	130	0,34	●
35 x 60	26	20	17	M6	12	15	701	40	223	130	0,32	●
38 x 65	26	20	17	M6	15	15	951	50	257	150	0,36	●
40 x 65	26	20	17	M6	15	15	1001	50	244	150	0,34	●
42 x 75	32	24	20	M8	12	37	1506	72	283	159	0,60	●
45 x 75	32	24	20	M8	12	37	1614	72	264	159	0,57	●
48 x 80	32	24	20	M8	12	37	1721	72	248	149	0,60	●
50 x 80	32	24	20	M8	12	37	1793	72	238	149	0,60	●
55 x 85	32	24	20	M8	15	37	2465	90	270	175	0,63	●
60 x 90	32	24	20	M8	15	37	2690	90	248	165	0,69	●
65 x 95	32	24	20	M8	15	37	2914	90	229	156	0,73	●
70 x 110	38	28	24	M10	15	70	4992	143	282	179	1,26	●
75 x 115	38	28	24	M10	15	70	5349	143	263	171	1,33	●
80 x 120	38	28	24	M10	15	70	5705	143	246	164	1,40	●
85 x 125	38	28	24	M10	15	70	6092	143	232	158	1,49	●
90 x 130	38	28	24	M10	15	70	6418	143	219	152	1,53	●
95 x 135	38	28	24	M10	18	70	8130	171	249	175	1,62	●
100 x 145	44	32	26	M12	15	127	10881	218	278	191	2,01	●
110 x 155	44	32	26	M12	15	127	11969	218	252	179	2,15	●
120 x 165	44	32	26	M12	16	127	13927	232	247	179	2,35	●
130 x 180	50	38	34	M12	20	127	18860	290	218	157	3,51	●
140 x 190	50	38	34	M12	22	127	22341	319	222	164	3,85	●
150 x 200	50	38	34	M12	24	127	26113	348	226	170	4,07	●
160 x 210	50	38	34	M12	26	127	30175	377	230	175	4,30	●
170 x 225	58	44	38	M14	22	195	35710	420	216	163	5,78	●
180 x 235	58	44	38	M14	24	195	41248	458	222	170	6,05	●
190 x 250	66	52	46	M14	28	195	50796	535	203	154	8,25	●
200 x 260	66	52	46	M14	30	195	57289	573	206	159	8,65	●
220 x 285	72	56	50	M16	26	300	74838	680	205	158	11,22	●
240 x 305	72	56	50	M16	30	300	94202	785	217	171	12,20	●
260 x 325	72	56	50	M16	34	300	115659	890	227	182	13,20	
280 x 355	87	66	60	M18	32	410	139261	995	196	155	19,20	
300 x 375	87	66	60	M18	36	410	167860	1119	206	165	20,50	
320 x 405	101	78	72	M20	36	590	240190	1501	216	171	29,60	
340 x 425	101	78	72	M20	36	590	255201	1501	203	163	31,10	
360 x 455	116	90	84	M22	36	790	328186	1823	200	158	42,20	
380 x 475	116	90	84	M22	36	790	346419	1823	189	152	44,00	
400 x 495	116	90	84	M22	36	790	364651	1823	180	145	46,00	
420 x 515	116	90	84	M22	40	790	371953	1771	196	160	50,00	
440 x 545	130	102	96	M24	40	1000	453797	2063	188	152	64,60	
460 x 565	130	102	96	M24	40	1000	467548	2033	180	146	67,40	
480 x 585	130	102	96	M24	42	1000	512270	2134	181	148	71,00	
500 x 605	130	102	96	M24	44	1000	559025	2236	182	150	72,60	
520 x 630	130	102	96	M24	45	1000	603344	2321	179	148	80,00	
540 x 650	130	102	96	M24	45	1000	626549	2321	172	143	82,00	
560 x 670	130	102	96	M24	48	1000	683027	2439	177	148	85,00	
580 x 690	130	102	96	M24	50	1000	736897	2541	178	150	88,00	
600 x 710	130	102	96	M24	50	1000	773517	2578	172	145	91,00	

● Clamping sets available from stock.

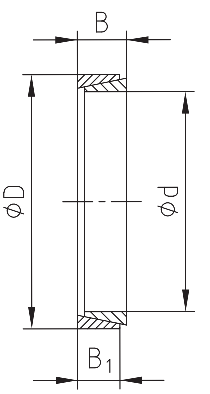
1) The screw tightening torques can be increased by max. 1,1 times or reduced to 0,6 times of the aforementioned figures with T, F_{ax} and P_W, P_N being reduced proportionally.

Other sizes on request.

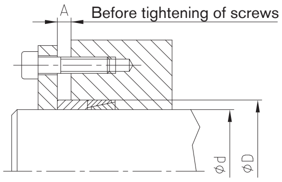
KTR 150 (not self-centering)

- Clamping set for small radial mounting dimensions
- Increase of torque by using several clamping sets in a series
- Mounting instructions under www.ktr.com)

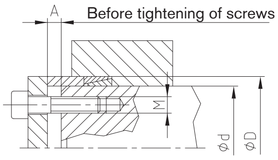
Before tightening of screws



Assembly 1
Clamping on hub side



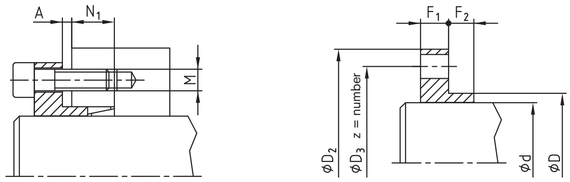
Assembly 2
Clamping on shaft side



Up to 4 clamping sets can be used in a series.
The torques are increased as follows:

1 clamping element	torque = $torque_{catalogue}$ x 1
2 clamping elements	torque = $torque_{catalogue}$ x 1,55
3 clamping elements	torque = $torque_{catalogue}$ x 1,85
4 clamping elements	torque = $torque_{catalogue}$ x 2,02

Recommended pressure flanges*
(dimensions see table below)



Assembly

Clean and lightly oil the contact surfaces of shaft and hub. Insert the clamping element, distance ring and clamping flange, tighten the clamping screws crosswise by degrees and evenly until the screw tightening torque defined for the corresponding screw size is achieved. The figures T and F_{ax} mentioned in the table were calculated for an assembly with oil.

Note: Do not use any oil with molybdenum sulphide or high-pressure additions or grease reducing the coefficient of friction considerably. The clamping sets are delivered with oil. For assembly without oil the figures mentioned in the table deviate.

Disassembly

Unscrew all clamping screws. In normal cases the clamping element releases automatically. Otherwise lightly strike with a hammer onto the hub or shaft.

Tolerances, surfaces

One accurate turning process is sufficient:

R_Z ≤ 6µm

Maximum permissible tolerances:
Shaft h6 - hub H7 (≤ Ø 38 mm)
Shaft h8 - hub H8 (> Ø 38 mm)

Recommended dimensions of pressure flange* for 1 to 4 clamping elements KTR 150

d^{H8} x D_{g7}	9,1 x 12	10,1 x 13	12,1 x 15	13,1 x 16	14,1 x 18	15,1 x 19	16,2 x 20	17,2 x 21	18,2 x 22	19,2 x 24	20,2 x 25	22,2 x 26	24,2 x 28	25,2 x 30	28,2 x 32	30,2 x 35	32,2 x 36
D_2	36	37	39	40	44	45	46	47	48	52	53	54	56	58	60	63	64
D_3	28	29	31	32	35	36	37	38	39	42	43	44	45	48	50	53	54
M	M4	M4	M4	M4	M5	M5	M5	M5	M5	M6	M6	M6	M6	M6	M6	M6	M6
z	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5
Tightening torque [Nm]	2,9	2,9	2,9	2,9	6	6	6	6	6	10	10	10	10	10	10	10	10
F_1	5,5	5,5	5,5	5,5	7	7	7	7	7	8	8	8	8	8	8	8	8
F_2	7	7	7	7	8,5	8,5	8,5	8,5	8,5	8,5	8,5	8,5	8,5	8,5	8,5	8,5	8,5

d^{H8} x D_{g7}	35,2 x 40	36,2 x 42	38,2 x 44	40,2 x 45	42,2 x 48	45,2 x 52	48,2 x 55	50,2 x 57	55,2 x 62	56,2 x 64	60,2 x 68	63,2 x 71	65,2 x 73	70,2 x 79	71,2 x 80	75,2 x 84
D_2	68	70	72	78	81	85	88	90	95	102	106	109	111	117	118	122
D_3	58	60	62	65	68	72	75	77	82	86	90	93	95	101	102	106
M	M6	M6	M6	M8	M8	M8	M8	M8	M8	M10	M10	M10	M10	M10	M10	M10
z	6	6	6	4	4	6	8	8	8	6	6	6	6	8	8	8
Tightening torque [Nm]	10	10	10	25	25	25	25	25	25	49	49	49	49	49	49	49
F_1	8	8	8	10,5	10,5	10,5	10,5	10,5	10,5	13	13	13	13	13	13	13
F_2	8,5	8,5	9,5	9,5	9,5	9,5	9,5	9,5	9,5	10,5	10,5	10,5	10,5	10,5	10,5	10,5

N_1	The hollow depth results from the number of clamping elements (max. 4-off) and the dimensions = F_2 - A.

* not part of the components delivered by KTR

Order form:

KTR 150	60	x	68
Type	Size of inside diameter		Size of outside diameter

KTR 150 (not self-centering) – Technical Data

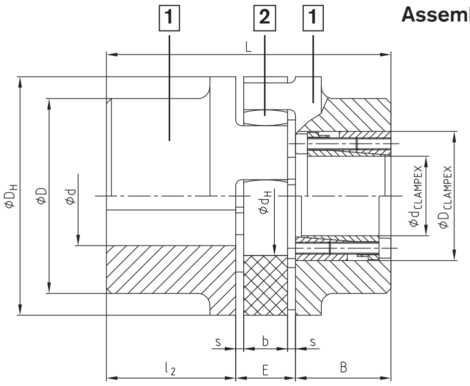
CLAMPEX® – KTR 150															
d x D [mm]	Dimensions [mm]		Distance dimension A [mm]				Necessary clamping force for clamping screws μ_{total} = 0,14			Transmittable torque or axial force		Surface pressure between clamping set		Weight [~kg]	Stock-programme
	B	B_1	Clamping element 1	2	3	4	P_O [N]	P_S [N]	$P_A = P_O + P_S$ [N]	T [Nm]	F_{ax} [kN]	Shaft P_W [N/mm²]	Hub P_N [N/mm²]		
6 x 9	4,5	3,7	2,5	2,5	3,0	4,0	**	3000	3000	2	0,67	80	53	0,0012	●
7 x 10	4,5	3,7	2,5	2,5	3,0	4,0	**	5300	5300	4	1,19	121	85	0,0014	●
8 x 11	4,5	3,7	2,5	2,5	3,0	4,0	**	5600	5600	5	1,25	112	82	0,0015	●
9 x 12	4,5	3,7	2,5	2,5	3,0	4,0	7947	6653	14600	7	1,50	119	89	0,0017	●
10 x 13	4,5	3,7	2,5	2,5	3,0	4,0	7063	8937	16000	10	2,00	143	110	0,0018	●
12 x 15	4,5	3,7	2,5	2,5	3,0	4,0	7808	8192	16000	11	1,80	110	88	0,0021	●
13 x 16	4,5	3,7	2,5	2,5	3,0	4,0	7007	9693	16700	14	2,20	120	97	0,0023	●
14 x 18	6,3	5,3	3,5	3,5	4,5	5,5	11957	14043	26000	22	3,10	112	87	0,0049	●
15 x 19	6,3	5,3	3,5	3,5	4,5	5,5	12106	14894	27000	25	3,30	111	88	0,0053	●
16 x 20	6,3	5,3	3,5	3,5	4,5	5,5	12478	14522	27000	26	3,20	102	91	0,0055	●
17 x 21	6,3	5,3	3,5	3,5	4,5	5,5	11678	16822	28500	32	4,10	120	90	0,0058	●
18 x 22	6,3	5,3	3,5	3,5	4,5	5,5	14630	18370	33000	37	3,70	102	94	0,0061	●
19 x 24	6,3	5,3	3,5	3,5	4,5	5,5	14186	18814	33000	40	4,20	111	88	0,0078	●
20 x 25	6,3	5,3	3,5	3,5	4,5	5,5	13339	19661	33000	44	4,40	110	88	0,0082	●
22 x 26	6,3	5,3	3,5	3,5	4,5	5,5	13689	20311	34000	50	4,50	103	87	0,0072	●
24 x 28	6,3	5,3	3,5	3,5	4,5	5,5	8676	25324	34000	68	5,70	118	101	0,0080	●
25 x 30	6,3	5,3	3,5	3,5	4,5	5,5	10190	26810	37000	75	6,00	120	100	0,0100	●
28 x 32	6,3	5,3	3,5	3,5	4,5	5,5	11275	28725	40000	90	6,40	115	101	0,009	●
30 x 35	6,3	5,3	3,5	3,5	4,5	5,5	10211	29789	40000	100	6,70	111	95	0,012	●
32 x 36	6,3	5,3	3,5	3,5	4,5	5,5	6487	33513	40000	120	7,50	117	104	0,010	●
35 x 40	7	6,0	3,5	3,5	4,5	5,5	9147	40853	50000	160	9,10	115	101	0,017	●
36 x 42	7	6,0	3,5	3,5	4,5	5,5	12910	43690	56600	176	9,80	120	103	0,020	●
38 x 44	7	6,0	3,5	3,5	4,5	5,5	15317	44683	60000	190	10,00	116	100	0,021	●
40 x 45	8	6,6	3,5	4,5	5,5	6,5	18614	51386	70000	230	11,50	116	103	0,023	●
42 x 48	8	6,6	3,5	4,5	5,5	6,5	14678	55322	70000	260	12,40	118	104	0,028	●
45 x 52	10	8,6	3,5	4,5	5,5	6,5	32549	77451	110000	390	17,30	119	103	0,042	●
48 x 55	10	8,6	3,5	4,5	5,5	6,5	29942	80058	110000	430	17,90	115	100	0,045	●
50 x 57	10	8,6	3,5	4,5	5,5	6,5	25995	84005	110000	470	18,80	116	102	0,047	●
55 x 62	10	8,6	3,5	4,5	5,5	6,5	25759	94241	120000	580	21,10	118	105	0,050	●
56 x 64	12	10,4	3,5	4,5	5,5	7,0	33227	117773	151000	738	26,40	120	105	0,067	●
60 x 68	12	10,4	3,5	4,5	5,5	7,0	34887	125113	160000	840	28,00	119	105	0,072	●
63 x 71	12	10,4	3,5	4,5	5,5	7,0	30510	132490	163000	934	29,70	120	107	0,077	●
65 x 73	12	10,4	3,5	4,5	5,5	7,0	22513	137487	160000	1000	30,80	121	108	0,079	●
70 x 79	14	12,2	3,5	5,0	6,5	7,5	34033	165967	200000	1300	37,10	115	102	0,110	●
71 x 80	14	12,2	3,5	5,0	6,5	7,5	36043	174957	211000	1390	39,20	120	106	0,120	●
75 x 84	14	12,2	3,5	5,0	6,5	7,5	41267	178733	220000	1500	40,00	116	104	0,130	●
80 x 91	17	15,0	4,0	6,0	6,5	8,0	65412	234588	300000	2100	52,50	116	102	0,190	●
85 x 96	17	15,0	4,0	6,0	6,5	8,0	54414	257586	312000	2450	57,60	120	106	0,200	●
90 x 101	17	15,0	4,0	6,0	6,5	8,0	51900	268100	320000	2700	60,00	118	105	0,220	●
95 x 106	17	15,0	4,0	6,0	6,5	8,0	52145	287855	340000	3060	64,40	120	107	0,230	●
100 x 114	21	18,7	5,0	6,0	7,0	9,0	64660	375340	440000	4200	84,00	119	105	0,380	●
110 x 124	21	18,7	5,0	6,0	7,0	9,0	100658	349342	450000	4300	78,20	101	89	0,410	●
120 x 134	21	18,7	5,0	6,0	7,0	9,0	80192	379808	460000	5100	85,00	100	90	0,450	●
130 x 148	28	25,3	5,0	7,0	9,0	11,0	93177	556823	650000	8100	124,60	101	88	0,850	●
140 x 158	28	25,3	6,0	7,0	9,0	11,0	89967	600033	690000	9400	134,30	101	89	0,910	●
150 x 168	28	25,3	6,0	7,0	9,0	11,0	64644	655356	720000	11000	146,70	103	92	0,970	
160 x 178	28	25,3	6,0	7,0	9,0	11,0	80303	774697	855000	13870	173,40	114	102	1,020	
170 x 191	33	30,0	7,0	9,0	10,0	12,0	128166	973834	1102000	18525	217,90	113	101	1,500	
180 x 201	33	30,0	7,0	9,0	10,0	12,0	142494	1057506	1200000	21300	236,70	116	104	1,580	
190 x 211	33	30,0	7,0	9,0	10,0	12,0	111751	1138249	1250000	24200	254,70	119	107	1,680	
200 x 224	38	34,8	7,0	9,0	11,0	13,0	182475	1407525	1590000	31500	315,00	120	107	2,320	
210 x 234	38	34,8	7,0	9,0	11,0	13,0	100300	1489700	1590000	34761	331,10	121	109	2,450	
220 x 244	38	34,8	7,0	9,0	11,0	13,0	117900	1552100	1670000	37941	344,90	120	109	2,490	
230 x 257	43	39,5	7,0	10,0	12,0	14,0	168900	1851100	2020000	47307	411,90	121	108	3,380	
240 x 267	43	39,5	7,0	10,0	12,0	14,0	160700	1929300	2090000	51449	428,70	121	109	3,520	
250 x 280	48	44,0	7,0	10,0	12,0	16,0	191000	2239000	2430000	52245	418,00	121	108	4,680	
260 x 290	48	44,0	7,0	10,0	13,0	16,0	182500	2328500	2511000	56506	434,70	121	108	4,820	
270 x 300	48	44,0	7,0	10,0	13,0	16,0	178000	2422000	2600000	61036	452,10	121	109	4,940	
280 x 313	53	49,0	7,0	11,0	14,0	17,0	207800	2792200	3000000	72971	521,20	121	108	6,270	
290 x 323	53	49,0	7,0	11,0	14,0	17,0	220700	2889300	3110000	77740	536,10	121	108	6,500	
300 x 333	53	49,0	7,0	11,0	14,0	17,0	215000	2990000	3205000	83224	554,80	121	109	6,700	
320 x 360	65	59,0	10,0	15,0	20,0	25,0	292000	3848000	4140000	114246	714,00	121	108	10,90	
340 x 380	65	59,0	10,0	15,0	20,0	25,0	275000	4085000	4360000	128863	758,00	121	108	11,50	
360 x 400	65	59,0	10,0	15,0	20,0	25,0	260000	4320000	4580000	141292	801,60	121	109	12,20	
380 x 420	65	59,0	10,0	15,0	20,0	25,0	270000	4570000	4840000	161122	848,00	121	109	12,80	
400 x 440	65	59,0	10,0	15,0	20,0	25,0	260000	4800000	5060000	178138	890,70	121	110	13,50	

● Clamping sets available from stock or in short term. ** Design with slot

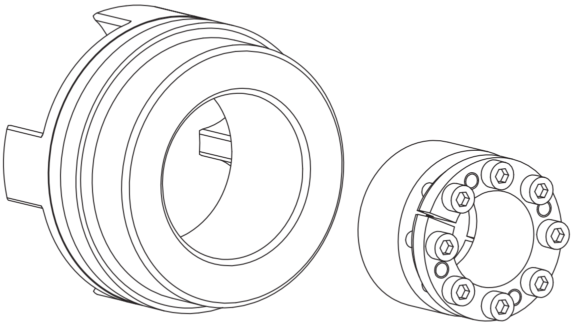
Other sizes on request.

Made for Motion KTR

KTR 200 with torsionally flexible ROTEX® coupling



Assembly 1



Assembly 2

KTR 200 with torsionally flexible ROTEX® coupling

ROTEX® size	Pilot bore Ød [mm]	Hub material	Dimensions of CLAMPEX® KTR 200 [mm]: Maximum KTR clamping d x D	Transmittable torques and axial force T [Nm]	F_{ax} [kN]	B	Dimensions of ROTEX® coupling [mm]: l_1	E	s	b	D_H	D	D_1	d_H	L
42	x	Steel part 1	30 x 55	769	51	48	50	26	3,0	20	95	-	95	46	Length L > l_1 + E + B (clamping set)
48	x		35 x 60	1197	68	48	56	28	3,5	21	105	-	105	51	
55	x		45 x 75	2132	95	59	65	30	4,0	22	120	-	120	60	
65	x		45 x 75	2132	95	59	75	35	4,5	26	135	115	-	68	
75	x		50 x 80	3159	126	59	85	40	5,0	30	160	135	-	80	
90	x		65 x 95	4107	126	59	100	45	5,5	34	200	160	-	100	
100	45	GGG40 part 1	65 x 95	4107	126	59	110	50	6,0	38	225	180	-	113	
110	58		70 x 110	7023	201	70	120	55	6,5	42	255	200	-	127	
125	58		80 x 120	8026	201	70	140	60	7,0	46	290	230	-	147	
140	56		95 x 135	11373	239	66	155	65	7,5	50	320	255	-	165	
160	78		110 x 155	16068	292	80	175	75	9,0	57	370	290	-	190	
180	80		120 x 135	21910	365	80	195	85	10,5	64	420	325	-	220	

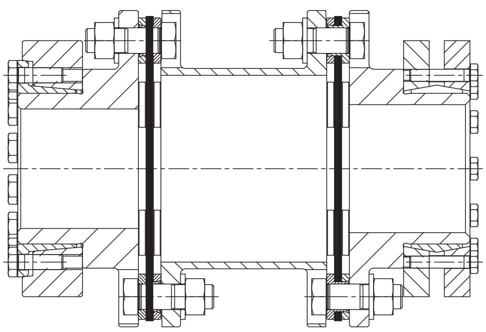
CLAMPEX® – KTR 200

d x D [mm]	B [mm]	Transmittable torques and axial force T [Nm]	F_{ax} [kN]	Clamping screws DIN EN ISO 4762 12.9 [mm] z x M	T_A [Nm]	d x D [mm]	B [mm]	Transmittable torques and axial force T [Nm]	F_{ax} [kN]	Clamping screws DIN EN ISO 4762 12.9 [mm] z x M	T_A [Nm]	d x D [mm]	B [mm]	Transmittable torques and axial force T [Nm]	F_{ax} [kN]	Clamping screws DIN EN ISO 4762 12.9 [mm] z x M	T_A [Nm]
20 x 47	48	513	51	6 x M6	17	38 x 65	48	1299	68	8 x M6	17	65 x 95	59	4107	126	8 x M8	41
22 x 47	48	564	51	6 x M6	17	40 x 65	48	1368	68	8 x M6	17	70 x 110	70	7023	201	8 x M10	83
24 x 50	48	616	51	6 x M6	17	42 x 75	59	1990	95	6 x M8	41	75 x 115	70	7524	201	8 x M10	83
25 x 50	48	641	51	6 x M6	17	45 x 75	59	2132	95	6 x M8	41	80 x 120	70	8026	201	8 x M10	83
28 x 55	48	718	51	6 x M6	17	48 x 80	59	3033	126	8 x M8	41	85 x 125	70	10659	251	10 x M10	83
30 x 55	48	769	51	6 x M6	17	50 x 80	59	3159	126	8 x M8	41	90 x 130	70	11286	251	10 x M10	83
32 x 60	48	1094	68	8 x M6	17	55 x 85	59	3475	126	8 x M8	41	95 x 135	66	11373	239	10 x M10	83
35 x 60	48	1197	68	8 x M6	17	60 x 90	59	3791	126	8 x M8	41	Further details see page 263.					

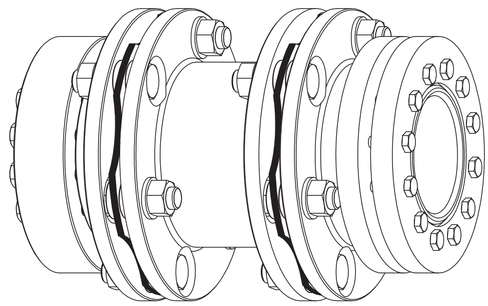
Other coupling combination

RADEX®-N NANA 1 with external clamping set KTR 620 and KTR 603

KTR 620



KTR 603

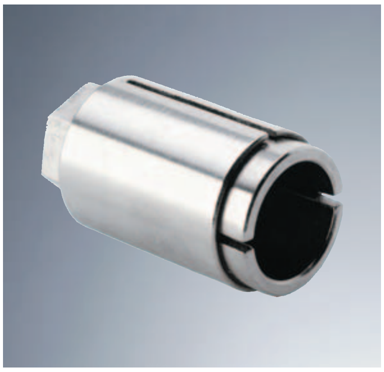


Further details about the external clamping set KTR 620 and KTR 603 are shown on page 254-259.

Series on request

SPH Clamping sleeve

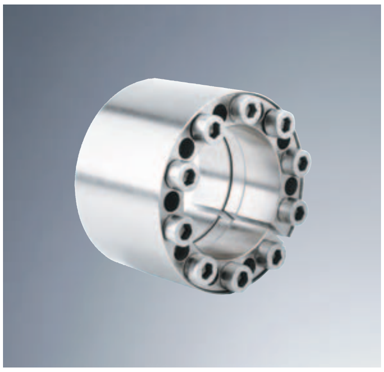
Self-centering



- Fast assembly and disassembly with one screw only
- Suitable for hub dimensions
- Applications: sprockets, pulleys that are assembled to the shaft end

KTR 401

Self-centering, short design



- Clamping set for high load
- Specifically suitable for vibratory torques
- Typical applications: flywheels, belt drums
- Smaller dimensions than with KTR 400
- Please order our dimension sheet No. **M 367699**

KTR 125 and KTR 125.1

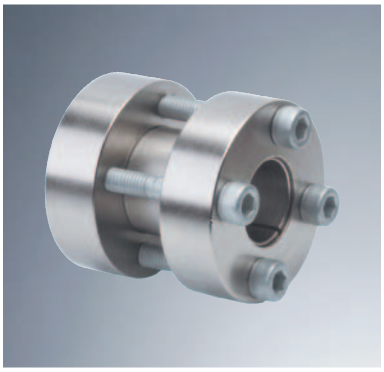
KTR 125
Not self-centering,
Short design

KTR 125.1
Self-centering,
Long design

- Clamping set for applications with low demands
- Very easy assembly
- Please order our dimension sheet No. **M 367700**

KTR 700

Rigid coupling



- Rigid, backlash-free torque transmission
- Well-aligned, bending and torsionally stiff shaft connection
- Shaft misalignment cannot be compensated
- Please order our **dimension sheet No. M 380931**

Calculation

For a properly working CLAMPEX® shaft-hub-connection the following technical details should be taken into account.
Please contact us in case you have tolerances different from the table below.

CLAMPEX® – Toleranzen, Rautiefe und Rundlaufgenauigkeit						
Type	d [mm]	d_W [mm]	Shaft diameter tolerance	Diameter of hub bore tolerance	Surface roughness [μm]	Concentricity (applies for the clamping set only)
KTR 250	-	-	h8	H8	Rz ≤ 16	0,02 - 0,04
KTR 200	-	-	h8	H8	Rz ≤ 16	0,02 - 0,04
KTR 201	-	-	h8	H8	Rz ≤ 16	0,02 - 0,04
KTR 203	-	-	h8	H8	Rz ≤ 16	0,02 - 0,04
KTR 206	-	-	h8	H8	Rz ≤ 16	0,02 - 0,04
KTR 225	-	-	h8	H8	Rz ≤ 16	0,02 - 0,04
KTR 100	-	-	h11	H11	Rz ≤ 16	1)
KTR 105	-	-	h9	H9	Rz ≤ 16	0,02 - 0,04
KTR 150	up to 38	-	h6	H7	Rz ≤ 6	1)
KTR 150	bigger than 38	-	h8	H8	Rz ≤ 6	1)
KTR 400	-	-	h8	H8	Rz ≤ 16	0,02 - 0,04
KTR 620	-	13-150 > 160	H7/h6 > H7/g6	H7/f7	Rz ≤ 16	0,02 - 0,04
KTR 603	-	18 - 30	j6	H6	Rz ≤ 16	0,02 - 0,04
KTR 603	-	31 - 50	h6	H6	Rz ≤ 16	0,02 - 0,04
KTR 603	-	51 - 80	g6	H6	Rz ≤ 16	0,02 - 0,04
KTR 603	-	81 - 500	g6	H7	Rz ≤ 16	0,02 - 0,04

1) Depending on the centering of the hub or shafts or the drive component and accuracy of assembly, respectively.

Fatigue strenght and shape stability of components loaded under torsion and bending

The stress calculation figures β_k, for the clamping elements, are worked out similar to those of hydraulic fittings. Please contact us for calculations. The stress concentration is dependet upon the load, the material and the clamping set type. Stress concentration factor on request.

Resulting torque T_R

The transmittable torque $T \approx T_R$ always has to exceed the highest torque peak T_B which may arise in the connection positions. The torque peaks arising during the acceleration of electric motors have to be considered.

$$T \approx TR \geq \sqrt{T_B^2 + \left[\frac{Fa \cdot d}{2}\right]^2} \quad [\text{Nm}]$$

Transmittable axial force F_{ax}

The maximum transmittable axial force F_{ax} which is mentioned in the tables has to be reduced accordingly in case of additional torque transmission.

$$F_{ax} = \frac{2 \cdot T}{d} \quad [\text{kN}]$$

Calculation of the outside diameter of the hub D_N

The required outside diameter of the hub D_N depends on the cross section of the hub, the shape of the hub and the apparent yield point of the hub material. In order to facilitate the calculation the table on page 283 shows some figures by the help of which D_N can be determined.

Example:
Shaft diameter d = 50 mm
Hub material: GGG 40
Apparent yield point of material
$\sigma_{0,2}$ = 250 N/mm

Selected: CLAMPEX® clamping set KTR 100
with d x D = 50 mm x 80 mm and P_N = 149 N/mm² page 277
➔ approximate value from table on page 283: P_N = 150 N/mm²
selected design see page 283. C = 0,8 (value C of hub shape)
➔ figure as per table 1,69
➔ D_N = D x 1,69 = 80 mm x 1,69 = 135,20 mm

Outside diameters of hubs which cannot be calculated based on the table are calculated with the following formula:

$$D_N \geq D \cdot \sqrt{\frac{\sigma_{N0,2} + P_N \cdot C}{\sigma_{N0,2} - P_N \cdot C}} \quad [\text{mm}]$$

Tangential tension on the inside diameter of hub

$$\sigma_{tiN} \approx P_N \frac{(1 + C_N^2)}{(1 - C_N^2)} \cdot C \quad [\text{N/mm}^2]$$

For clamping connections with hollow shafts the required inside diameter of the hollow shaft d_{iW} is calculated with the following formula:

$$d_{iw} \leq d \cdot \sqrt{\frac{\sigma_{W0,2} - 2 \cdot P_W \cdot 0{,}8}{\sigma_{W0,2}}} \quad [\text{mm}]$$

Tangential tension on the inside diameter of shaft

$$\sigma_{tiW} \approx \frac{2 \cdot P_W}{(C_W^2 - 1)} \quad [\text{N/mm}^2]$$

$\sigma_{N0,2}$ = Apparent yield point of the hub material [N/mm²]
C = Value C of hub shape (see picture on page 283)
P_N = Perm. surface pressure of clamping set/hub [N/mm²]
D = Outside diameter of the clamping set [mm]
T = Transmittable torque [Nm]
T_R = Resulting transmittable torque [Nm]
T_B = Operating torque to be transmitted [Nm]
L/L_1 = Hub length [mm]

$\sigma_{W0,2}$ = Apparent yield point of the shaft material [N/mm²]
P_W = Perm. surface pressure of clamping set/shaft [N/mm²]
d = Inside diameter of the clamping set [mm]
C_W = d_{iW} / d
C_N = D / D_N
F_a = Axial force arising during operation [N]
F_{ax} = Maximum transmittable axial force [kN]
F_V = Prestressed force [N]

Calculation of hubs

Table of screws

Dimension M	Prestressed force F_V and tightening torque T_A with μ_{total} = 0,14					
	Prestressed force F_V [N]			Tightening torque T_A [Nm]		
	8.8	10.9	12.9	8.8	10.9	12.9
M3	2210	3110	3730	1,34	1,89	2,25
M4	3900	5450	6550	2,9	4,1	4,9
M5	6350	8950	10700	6	8,5	10
M6	9000	12600	15100	10	14	17
M8	16500	23200	27900	25	35	41
M10	26200	36900	44300	49	69	83
M12	38300	54000	64500	86	120	145
M14	52500	74000	88500	135	190	230
M16	73000	102000	123000	210	295	355
M18	88000	124000	148000	290	405	485
M20	114000	160000	192000	410	580	690
M22	141000	199000	239000	550	780	930
M24	164000	230000	276000	710	1000	1200
M27	215000	302000	363000	1050	1500	1800
M30	262000	368000	442000	1450	2000	2400

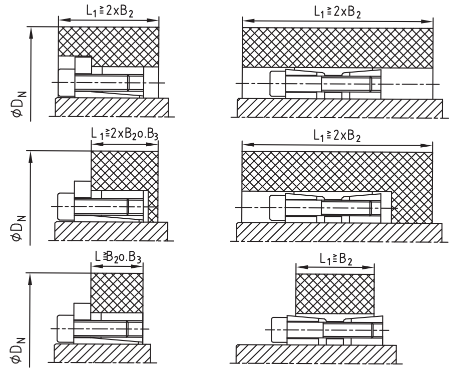
Mounting conditions of clamping set

Value C of hub shape

C = 0,6

C = 0,8

C = 1



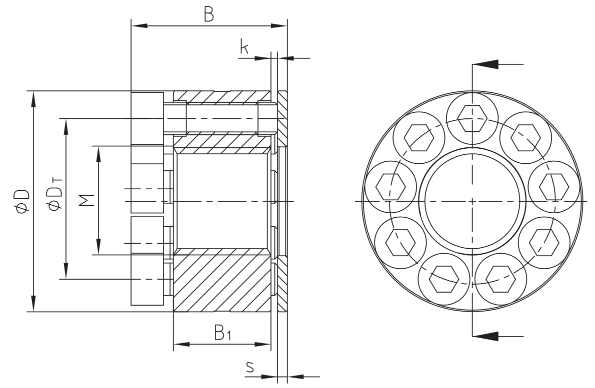
L/L_1 ≙ Hub length
B_2/B_3 ≙ Clamping set length

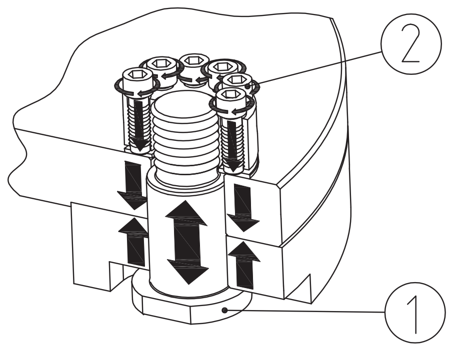
Selection table for the calculation of the required outside diameter of hub D_N

Surface pressure between clamping set and hub		Average apparent yield point of material σ 0,2 in N/mm² (more accurate stiffness data, depending on the diameter, as per details mentioned by the manufacturer)										
		150	180	200	220	250	270	300	350	400	450	600
		Hub materials										
PN [N/mm²]	Hub form C-value	GG 20	GG 25 GS 38	GG 30 GTS 35	GS 45 ST 37-2	GGG 40 GS 52 AlCuMgPb	ST 50-2 C 35	GGG 50 GS 60 ST 52-3	GGG 60 GS 62 C 45	GGG 70 GS 70 C 60	Tempering steel	Tempering steel
60	C = 0,6	1,28	1,25	1,20	1,18	1,15	1,14	1,12	1,10	1,09	1,08	1,06
	C = 0,8	1,39	1,30	1,24	1,23	1,22	1,20	1,18	1,15	1,12	1,11	1,08
	C = 1	1,52	1,42	1,36	1,32	1,28	1,25	1,22	1,18	1,16	1,14	1,10
65	C = 0,6	1,30	1,25	1,22	1,20	1,18	1,15	1,13	1,11	1,10	1,09	1,07
	C = 0,8	1,44	1,35	1,30	1,28	1,24	1,22	1,20	1,16	1,14	1,12	1,09
	C = 1	1,60	1,45	1,40	1,35	1,30	1,28	1,24	1,20	1,18	1,16	1,12
70	C = 0,6	1,34	1,26	1,24	1,22	1,18	1,16	1,15	1,12	1,11	1,10	1,07
	C = 0,8	1,48	1,38	1,34	1,30	1,25	1,23	1,20	1,18	1,15	1,13	1,10
	C = 1	1,65	1,50	1,45	1,40	1,34	1,30	1,26	1,22	1,20	1,17	1,13
75	C = 0,6	1,30	1,28	1,25	1,23	1,20	1,18	1,16	1,14	1,12	1,11	1,08
	C = 0,8	1,52	1,42	1,36	1,32	1,28	1,25	1,22	1,18	1,16	1,14	1,11
	C = 1	1,74	1,55	1,48	1,42	1,36	1,33	1,30	1,25	1,20	1,18	1,13
80	C = 0,6	1,39	1,31	1,28	1,25	1,21	1,20	1,18	1,15	1,13	1,11	1,08
	C = 0,8	1,58	1,45	1,39	1,35	1,30	1,27	1,24	1,20	1,18	1,15	1,11
	C = 1	1,81	1,61	1,53	1,46	1,39	1,36	1,31	1,26	1,22	1,20	1,14
85	C = 0,6	1,42	1,34	1,30	1,27	1,23	1,21	1,19	1,16	1,14	1,12	1,09
	C = 0,8	1,63	1,49	1,42	1,38	1,32	1,29	1,26	1,22	1,19	1,16	1,12
	C = 1	1,90	1,67	1,57	1,50	1,42	1,39	1,34	1,28	1,24	1,21	1,15
90	C = 0,6	1,46	1,36	1,32	1,28	1,25	1,22	1,20	1,17	1,15	1,13	1,09
	C = 0,8	1,69	1,53	1,46	1,40	1,34	1,31	1,28	1,23	1,20	1,18	1,13
	C = 1	2,00	1,73	1,62	1,54	1,46	1,41	1,36	1,30	1,26	1,22	1,16
95	C = 0,6	1,49	1,39	1,34	1,30	1,26	1,24	1,21	1,18	1,15	1,14	1,10
	C = 0,8	1,75	1,57	1,49	1,43	1,37	1,34	1,30	1,25	1,21	1,19	1,14
	C = 1	2,11	1,80	1,68	1,59	1,49	1,44	1,39	1,32	1,27	1,24	1,17
100	C = 0,6	1,53	1,41	1,36	1,32	1,28	1,25	1,22	1,19	1,16	1,14	1,11
	C = 0,8	1,81	1,61	1,53	1,46	1,39	1,36	1,31	1,26	1,22	1,20	1,14
	C = 1	2,24	1,87	1,73	1,63	1,53	1,48	1,41	1,34	1,29	1,25	1,18
105	C = 0,6	1,56	1,44	1,39	1,34	1,29	1,27	1,24	1,20	1,17	1,15	1,11
	C = 0,8	1,88	1,66	1,56	1,50	1,42	1,38	1,33	1,28	1,24	1,21	1,15
	C = 1	2,38	1,95	1,79	1,68	1,56	1,51	1,44	1,36	1,31	1,27	1,19
110	C = 0,6	1,60	1,47	1,41	1,36	1,31	1,28	1,25	1,21	1,18	1,16	1,12
	C = 0,8	1,96	1,71	1,60	1,53	1,44	1,40	1,35	1,29	1,25	1,22	1,16
	C = 1	2,55	2,04	1,86	1,73	1,60	1,54	1,47	1,38	1,33	1,28	1,20
115	C = 0,6	1,64	1,50	1,43	1,36	1,33	1,30	1,26	1,22	1,19	1,17	1,12
	C = 0,8	2,04	1,76	1,64	1,56	1,47	1,43	1,37	1,31	1,26	1,23	1,17
	C = 1	2,75	2,13	1,93	1,79	1,64	1,58	1,50	1,41	1,34	1,30	1,21
120	C = 0,6	1,69	1,53	1,46	1,40	1,34	1,31	1,28	1,23	1,20	1,18	1,13
	C = 0,8	2,13	1,81	1,69	1,60	1,50	1,45	1,39	1,33	1,28	1,24	1,18
	C = 1	3,00	2,24	2,00	1,84	1,69	1,61	1,53	1,43	1,36	1,31	1,22
125	C = 0,6	1,73	1,56	1,48	1,43	1,36	1,33	1,29	1,24	1,21	1,18	1,13
	C = 0,8	2,24	1,87	1,73	1,63	1,53	1,48	1,41	1,34	1,29	1,25	1,18
	C = 1	3,32	2,35	2,08	1,91	1,73	1,65	1,56	1,45	1,38	1,33	1,24
130	C = 0,6	1,78	1,59	1,51	1,45	1,38	1,35	1,30	1,25	1,22	1,19	1,14
	C = 0,8	2,35	1,93	1,78	1,67	1,56	1,50	1,44	1,36	1,30	1,27	1,19
	C = 1	3,74	2,49	2,17	1,97	1,78	1,69	1,59	1,48	1,40	1,35	1,25
135	C = 0,6	1,83	1,62	1,54	1,47	1,40	1,36	1,32	1,27	1,23	1,20	1,15
	C = 0,8	2,48	2,00	1,83	1,71	1,59	1,53	1,46	1,38	1,32	1,28	1,20
	C = 1	4,36	2,65	2,27	2,04	1,83	1,73	1,62	1,50	1,42	1,36	1,26
140	C = 0,6	1,88	1,66	1,56	1,50	1,42	1,38	1,33	1,28	1,24	1,21	1,15
	C = 0,8	2,63	2,07	1,88	1,75	1,62	1,55	1,48	1,39	1,33	1,29	1,21
	C = 1	5,39	2,83	2,38	2,12	1,88	1,78	1,66	1,53	1,44	1,38	1,27
145	C = 0,6	1,94	1,69	1,59	1,52	1,44	1,40	1,35	1,29	1,25	1,22	1,16
	C = 0,8	2,80	2,15	1,94	1,80	1,65	1,58	1,50	1,41	1,35	1,30	1,22
	C = 1	7,68	3,05	2,50	2,21	1,94	1,82	1,69	1,55	1,46	1,40	1,28
150	C = 0,6	2,00	1,73	1,62	1,54	1,46	1,41	1,36	1,30	1,26	1,23	1,16
	C = 0,8	3,00	2,24	2,00	1,84	1,69	1,61	1,53	1,43	1,36	1,31	1,23
	C = 1	–	3,32	2,65	2,30	2,00	1,87	1,73	1,58	1,48	1,41	1,29
155	C = 0,6	2,06	1,77	1,65	1,57	1,48	1,43	1,38	1,31	1,27	1,24	1,17
	C = 0,8	3,25	2,33	2,06	1,89	1,72	1,65	1,55	1,45	1,38	1,33	1,23
	C = 1	–	3,66	2,80	2,40	2,06	1,92	1,77	1,61	1,51	1,43	1,30
160	C = 0,6	2,13	1,81	1,69	1,60	1,50	1,45	1,39	1,33	1,28	1,24	1,18
	C = 0,8	3,55	2,43	2,13	1,94	1,76	1,67	1,58	1,47	1,39	1,34	1,24
	C = 1	–	4,12	3,00	2,52	2,13	1,98	1,81	1,64	1,53	1,45	1,31
165	C = 0,6	2,21	1,86	1,72	1,62	1,52	1,47	1,41	1,34	1,29	1,25	1,18
	C = 0,8	3,96	2,55	2,21	2,00	1,80	1,71	1,60	1,49	1,41	1,35	1,25
	C = 1	–	4,80	3,23	2,65	2,21	2,04	1,86	1,67	1,55	1,47	1,33

Large screw connections to be assembled easily and quickly

- Use of common dynamometric screwdrivers (up to approx. 100 Nm) even with big screws, e. g. M42 thread.
- Benefits with costs (easy and quick assembly or disassembly, respectively, no need for special tools).
- Optimum load of screws, because they are only loaded with extension (no torsional load like with usual screw connections).
- Ideal for narrow assemblies (e. g. gearbox housings), since it is not necessary to use large tools.
- For screw property classes 8.8 and 10.9.



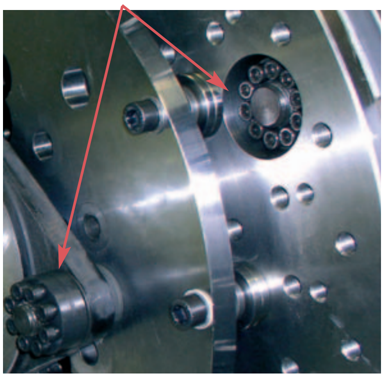


Clamping nut

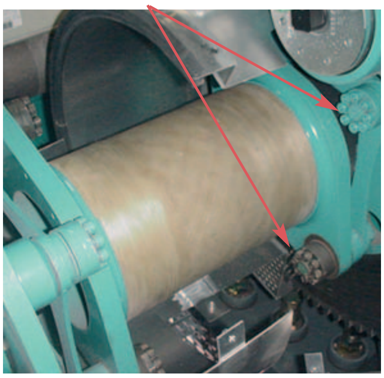
KTR clamping nuts													
Size	Dimensions [mm]						Pressure screw part 2		Property class 8.8 screw part 1		Property class 10.9 screw part 1		Stock programme
	D	D_T	B	B_1	s	k	DIN EN ISO 4762	Number	Tightening torque * [Nm]	Prestress [N]	Tightening torque * [Nm]	Prestress [N]	
M24 x 3,0	52	39	36	20	3	2	M8	8	21	174000	30	249000	
M27 x 3,0	57	42	41	25	3	2	M8	9	24	224000	30	280000	
M30 x 3,5	65	48	43	25	3	2	M10	8	41	274000	60	401000	●
M33 x 3,5	68	51	48	30	3	2	M10	9	45	338000	60	451000	●
M36 x 4,0	80	58	50	30	3	2	M12	8	71	396000	105	586000	●
M42 x 4,5	86	64	55	35	3	2	M12	10	78	544000	105	732000	●
M48 x 5,0	90	72	60	40	3	2	M12	11	94	721000	105	806000	

* each screw part 2

Use on a 100 kNm test bench bottle



Use of couplings for wind power stations

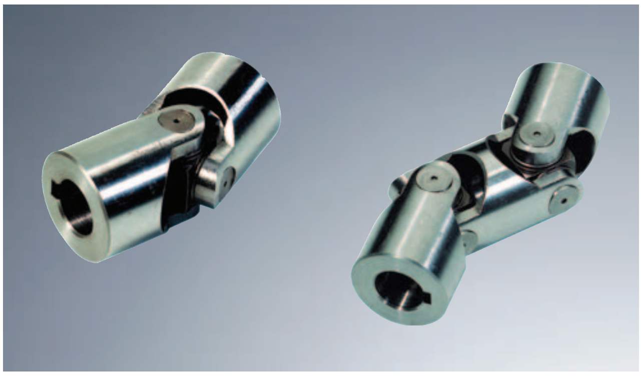


Also available as a complete unit including set screw

Order form:

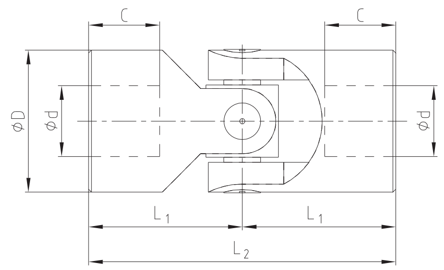
KTR clamping nut	M33 x 3,5
Type	Size

Type G and GD according to DIN 808 with plain bearing

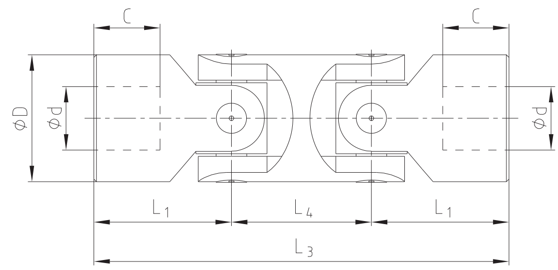


- Suitable for every application in the range of general engineering up to a maximum speed of 1000 min^{-1}
- Type G precision single joint
- Type GD precision double joint
- Maximum articulation angle 45° for each joint
- Bearings designed as plain bearings
- Available with finish bore H7 – on request with keyway, hexagon bore or square bore

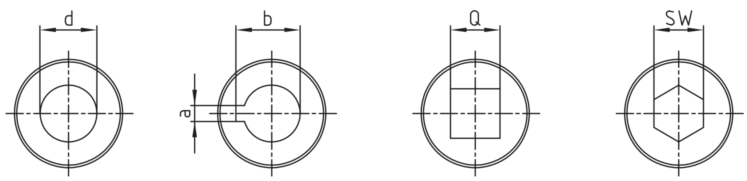
Precision single joint G



Precision double joint GD



Finish bores:



Type G and GD															
Types and size				Dimensions [mm]										Weight	
Size G	DIN description G	Size GD	DIN description GD	d [H7]	D	L_2	L_1	C	L_4	L_3	a [JS9]	b	Q [H8]	SW [H8]	G [kg]	GD [kg]
01 G	E6 x 16-G	01 GD	D6 x 16-G	6	16	34	17	8	22	56	2	7,0	6	6	0,05	0,08
02 G	E8 x 16-G	02 GD	D8 x 16-G	8	16	40	20	11	22	62	2	9,0	8	8	0,05	0,08
03 G	E10 x 22-G	03 GD	D10 x 22-G	10	22	48	24	12	26	74	3	11,4	10	10	0,10	0,15
04 G	E12 x 25-G	04 GD	D12 x 25-G	12	25	56	28	13	30	86	4	13,8	12	12	0,16	0,25
05 G	E14 x 28-G	05 GD	D14 x 28-G	14	28	60	30	13	36	96	5	16,3	14	14	0,20	0,40
1 G	E16 x 32-G	1 GD	D16 x 32-G	16	32	68	34	16	36	104	5	18,3	16	16	0,30	0,45
2 G	E18 x 36-G	2 GD	D18 x 36-G	18	36	74	37	17	40	114	6	20,8	18	18	0,45	0,70
3 G	E20 x 42-G	3 GD	D20 x 42-G	20	42	82	41	18	46	128	6	22,8	20	20	0,60	1,00
4 G	E22 x 45-G	4 GD	D22 x 45-G	22	45	95	47,5	22	50	145	6	24,8	22	22	0,95	1,55
5 G	E25 x 50-G	5 GD	D25 x 50-G	25	50	108	54	26	55	163	8	28,3	25	25	1,20	2,00
6 G	E30 x 58-G	6 GD	D30 x 58-G	30	58	122	61	29	68	190	8	33,3	30	30	1,85	2,90
6 G1	E32 x 58-G	6 GD1	D32 x 58-G	32	58	130	65	33	68	198	10	35,3	30	30	2,00	3,00
7 G	E35 x 70-G	7 GD	D35 x 70-G	35	70	140	70	35	72	212	10	38,3	-	-	3,15	4,75
8 G	E40 x 80-G	8 GD	D40 x 80-G	40	80	160	80	40	85	245	12	43,3	-	-	4,60	7,20
9 G	E50 x 95-G	9 GD	D50 x 95-G	50	95	190	95	50	100	290	14	53,8	-	-	7,60	12,0

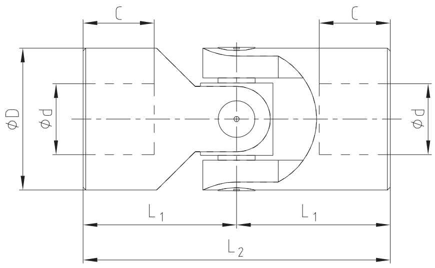
Order form:

04 G	Ø 12	Ø 12 keyway DIN
Size/type of joint	Finish bore (H7)	Finish bore (H7) keyway to DIN 6885 sheet 1 (JS9)

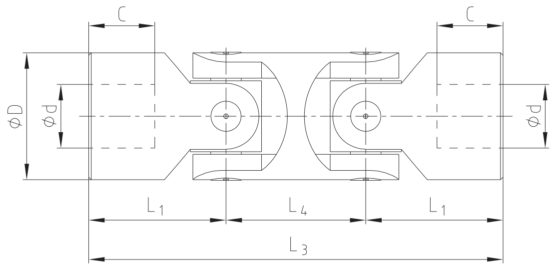
Type H and HD according to DIN 808 with needle bearing

- Suitable for every application in the range of general engineering up to a maximum speed of 4000 min^{-1}
- Type H precision single joint
- Type HD precision double joint
- Maximum articulation angle 45°
- High dynamic load - small bearing clearance
- Maintenance-free due to needle bearing
- Available with finish bore H7 – on request with keyway, hexagon bore or square bore

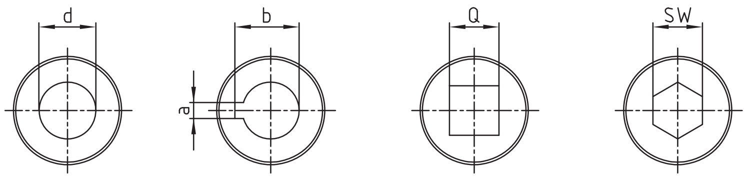
Precision single joint H



Precision double joint HD



Finish bores:

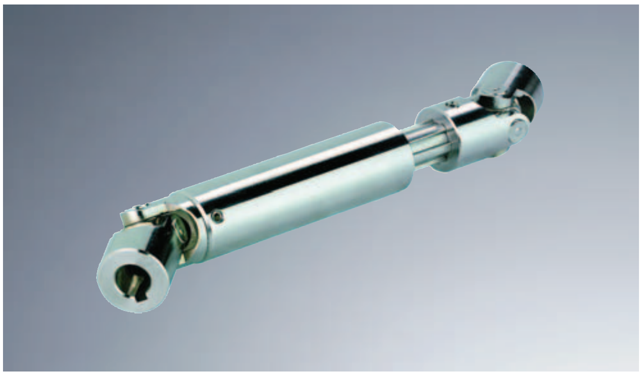


Type H and HD															
Types and size				Dimensions [mm]										Weight	
Size H	DIN description H	Size HD	DIN description HD	d [H7]	D	L_2	L_1	C	L_4	L_3	a [JS9]	b	Q [H8]	SW [H8]	H [kg]	HD [kg]
03 H	E10 x 22-W	03 HD	D10 x 22-W	10	22	48	24	12	26	74	3	11,4	10	10	0,10	0,15
04 H	E12 x 25-W	04 HD	D12 x 25-W	12	25	56	28	13	30	86	4	13,8	12	12	0,16	0,25
05 H	E14 x 28-W	05 HD	D14 x 28-W	14	28	60	30	13	36	96	5	16,3	14	14	0,20	0,40
1 H	E16 x 32-W	1 HD	D16 x 32-W	16	32	68	34	16	36	104	5	18,3	16	16	0,30	0,45
2 H	E18 x 36-W	2 HD	D18 x 36-W	18	36	74	37	17	40	114	6	20,8	18	18	0,45	0,70
3 H	E20 x 42-W	3 HD	D20 x 42-W	20	42	82	41	18	46	128	6	22,8	20	20	0,60	1,00
4 H	E22 x 45-W	4 HD	D22 x 45-W	22	45	95	47,5	22	50	145	6	24,8	22	22	0,95	1,55
5 H	E25 x 50-W	5 HD	D25 x 50-W	25	50	108	54	26	55	163	8	28,3	25	25	1,20	2,00
6 H	E30 x 58-W	6 HD	D30 x 58-W	30	58	122	61	29	68	190	8	33,3	30	30	1,85	2,90
6 H1	E32 x 58-W	6 HD1	D32 x 58-W	32	58	130	65	33	68	198	10	35,3	30	30	2,00	3,00
7 H	E35 x 70-W	7 HD	D35 x 70-W	35	70	140	70	35	72	212	10	38,3	-	-	3,15	4,75
8 H	E40 x 80-W	8 HD	D40 x 80-W	40	80	160	80	40	85	245	12	43,3	-	-	4,60	7,20
9 H	E50 x 95-W	9 HD	D50 x 95-W	50	95	190	95	50	100	290	14	53,8	-	-	7,60	12,0

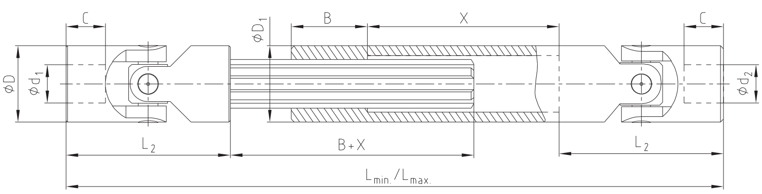
Order form:

1 H	Ø 16	Ø 16 keyway DIN
Size/type of joint	Finish bore (H7)	Finish bore (H7) keyway to DIN 6885 sheet 1 (JS9)

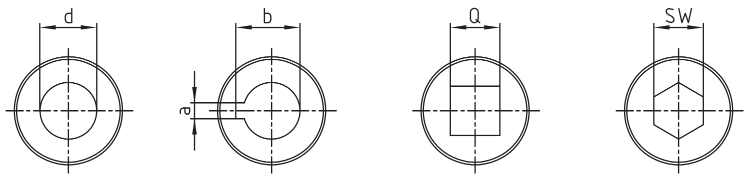
Type GA and HA acc. to DIN 808 with plain and needle bearing (extendable)



- Precision double joint - extendable, maximum articulation angle 45° for each joint
- Bridging of bigger shaft distances
- Type GA (plain bearing) $n_{max.}$ = 1000 min^{-1}
- Type HA (needle bearing) $n_{max.}$ = 4000 min^{-1}
- Available with quick locking GR; HR
- Available with finish bore H7 – on request available with keyway, thread for setscrews, square or hexagon bore



Finish bores:



Preferred lengthes									
Size	Dimensions [mm] $L_{min.}$ / $L_{max.}$								
03	140	160	180	230					
	170	200	240	330					
04	160	180	200	220	250	280	300		
	190	225	270	300	355	420	450		
05	170	180	200	220	250	280	300	350	400
	200	220	260	300	350	420	450	550	650
1	190	210	240	250	275	300	380	400	
	210	250	320	350	390	430	590	630	
2	230	250	270	290	300	400	500		
	280	320	370	400	415	620	820		
3	250	270	290	320	380	420	500		
	300	340	380	440	560	640	800		
4	250	270	290	330	350	470			
	280	320	350	430	470	710			
5	295	310	350	380	420	460	500		
	345	375	450	500	590	660	745		
6	330	350	370	400	450	500	540		
	380	420	455	510	620	720	795		

Type GA with plain bearing $n_{max.}$ = 1000 min^{-1} and type HA with needle bearing $n_{max.}$ = 4000 min^{-1}

Size		Dimensions [mm]											Spline shaft	D_1
GA	HA	d_1, d_2 [H7]	D	L_2	C	$L_{min.}$ / $L_{max.}$ / X	B	a [JS9]	b	Q [H8]	SW [H8]			
01 GA	-	6	16	34	8	← →	25	2	7,0	6	6		SW8	16
02 GA	-	8	16	40	11	← →	25	2	9,0	8	8		SW8	16
03 GA	03 HA	10	22	48	12	← →	30	3	11,4	10	10		11 x 14 Z6	22
04 GA	04 HA	12	25	56	13	← →	40	4	13,8	12	12		13 x 16 Z6	26
05 GA	05 HA	14	28	60	13	← →	40	5	16,3	14	14		13 x 16 Z6	29
1 GA	1 HA	16	32	68	16	← as per →	40	5	18,3	16	16		16 x 20 Z6	32
2 GA	2 HA	18	36	74	17	← customers' →	40	6	20,8	18	18		18 x 22 Z6	37
3 GA	3 HA	20	42	82	18	← request →	45	6	22,8	20	20		21 x 25 Z6	42
4 GA	4 HA	22	45	95	22	← L_{min} / L_{max} →	50	6	24,8	22	22		23 x 28 Z6	47
5 GA	5 HA	25	50	108	26	← →	50	8	28,3	25	25		26 x 32 Z6	52
6 GA	6 HA	30	58	122	29	← →	60	8	33,3	30	30		32 x 38 Z8	58
7 GA	7 HA	35	70	140	35	← →	70	10	38,3	-	-		36 x 42 Z8	70
8 GA	8 HA	40	80	160	40	← →	80	12	43,3	-	-		42 x 48 Z8	80
9 GA	9 HA	50	95	190	50	← →	90	14	53,8	-	-		46 x 54 Z8	95

Calculation of mounting lengthes L and X (Stroke)

Stroke $X \leq \frac{L_{max.} - 2 \cdot L_2 - B}{2}$

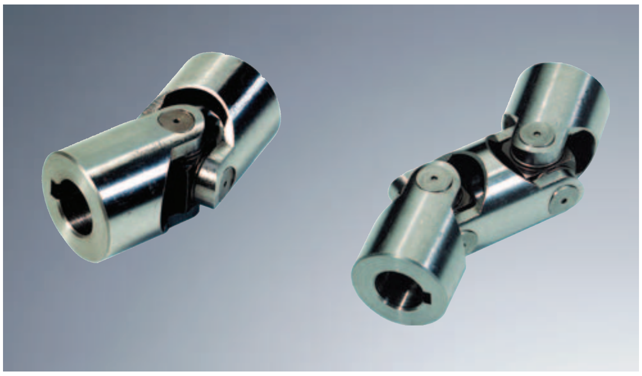
$L_{min.} \geq \frac{L_{max.} + 2 \cdot L_2 + B}{2}$

Minimum dimension $L_{min.}$
$L_{min.} = L_2 + B + X + L_2$

Order form:

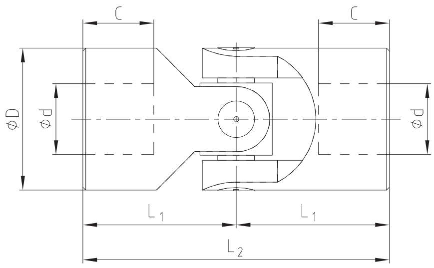
3 GA	d_1 = Ø 20	d_2 = Ø 20 keyway DIN	550/650
Size/type of joint	Finish bore (H7)	Finish bore (H7), keyway to DIN 6885 sheet 1 (JS9)	Mounting length $L_{min.}$/$L_{max.}$

Type X and XD acc. to DIN 808 with plain bearing (stainless steel 1.4301)

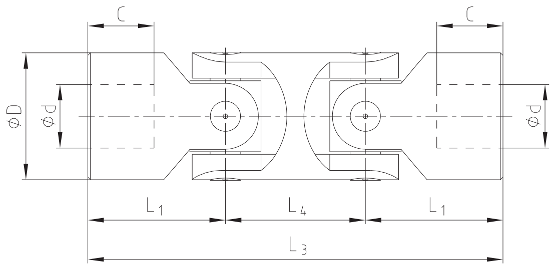


- Suitable for every application in the range of general engineering up to a maximum speed of 300 min^{-1}
- Type X precision single joint
- Type XD precision double joint
- Maximum articulation angle 45° for each joint
- Available with finish bore H7 – on request with keyway, hexagon bore or square bore

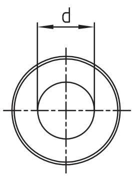
Precision single joint X

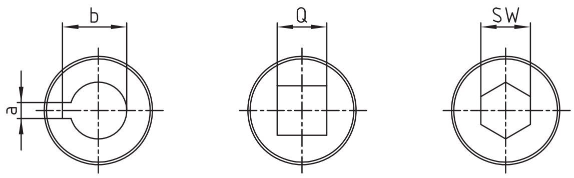


Precision double joint XD



Finish bores:



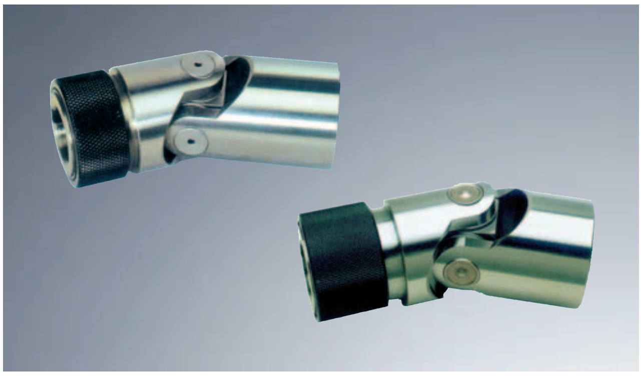


Type X and XD															
Types and size				Dimensions [mm]										Weight	
Size X	DIN description X	Size XD	DIN description XD	d [H7]	D	L_2	L_1	C	L_4	L_3	a [JS9]	b	Q [H8]	SW [H8]	X [kg]	XD [kg]
01 X	E6 x 16-G	01 XD	D6 x 16-G	6	16	34	17	8	22	56	2	7,0	6	6	0,05	0,08
02 X	E8 x 16-G	02 XD	D8 x 16-G	8	16	40	20	11	22	62	2	9,0	8	8	0,05	0,08
03 X	E10 x 22-G	03 XD	D10 x 22-G	10	22	48	24	12	26	74	3	11,4	10	10	0,10	0,15
04 X	E12 x 25-G	04 XD	D12 x 25-G	12	25	56	28	13	30	86	4	13,8	12	12	0,16	0,25
1 X	E16 x 32-G	1 XD	D16 x 32-G	16	32	68	34	16	36	104	5	18,3	16	16	0,30	0,45
3 X	E20 x 42-G	3 XD	D20 x 42-G	20	42	82	41	18	46	128	6	22,8	20	20	0,60	1,00
5 X	E25 x 50-G	5 XD	D25 x 50-G	25	50	108	54	26	55	163	8	28,3	25	25	1,20	2,00
6 X	E30 x 58-G	6 XD	D30 x 58-G	30	58	122	61	29	68	190	8	33,3	30	30	1,85	2,90

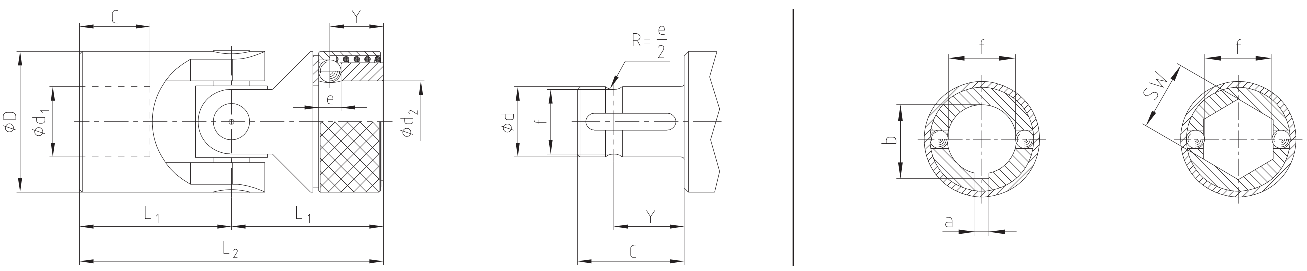
Order form:

04 X	Ø 12	Ø 12 keyway DIN
Size/type of joint	Finish bore (H7)	Finish bore (H7) keyway to DIN 6885 sheet 1 (JS9)

Type GR and HR with quick locking

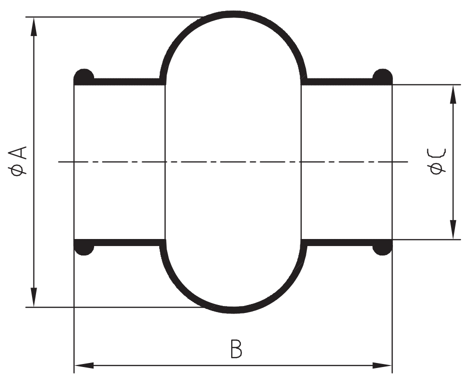


- Precision single joint with quick locking (separable)
- Type GR with plain bearing $n_{max.}$ = 1000 min^{-1}
- Type HR with needle bearing $n_{max.}$ = 4000 min^{-1}
- Maximum articulation angle 45°
- Quick locking (d_2) available with H7 bore and keyway to DIN 6885 sheet 1 – JS9 or hexagon bore



Type GR with plain bearing $n_{max.}$ = 1000 min^{-1} and type HR with needle bearing $n_{max.}$ = 4000 min^{-1}												
Size		Dimensions [mm]										
GR	HR	d_1, d_2 [H7]	D	L_2	L_1	C	Y	e	f	a [JS9]	b	SW [H8]
02 GR	-	8	16	52	26	14	9,5	3,5	7,0	2	9,0	8
03 GR	03 HR	10	22	62	31	17	11,5	4,0	8,7	3	11,0	10
04 GR	04 HR	12	25	74	37	21	13,5	4,0	11,0	4	13,3	12
05 GR	05 HR	14	25	74	37	21	13,5	4,0	13,0	5	15,3	14
1 GR	1 HR	16	32	86	43	24	14,0	6,35	14,8	5	17,3	16
2 GR	2 HR	18	36	96	48	28	19,0	8,0	16,0	6	19,8	18
3 GR	3 HR	20	42	108	54	31	19,0	8,0	18,0	6	22,3	20
4 GR	4 HR	22	45	120	60	34	20,5	10,0	20,0	6	24,8	22
5 GR	5 HR	25	50	132	66	38	20,5	10,0	23,0	8	28,3	25
6 GR	6 HR	30	58	166	83	49	25,0	10,0	28,0	8	33,3	30

Protection muffs for joints type G, H, GA, HA and X



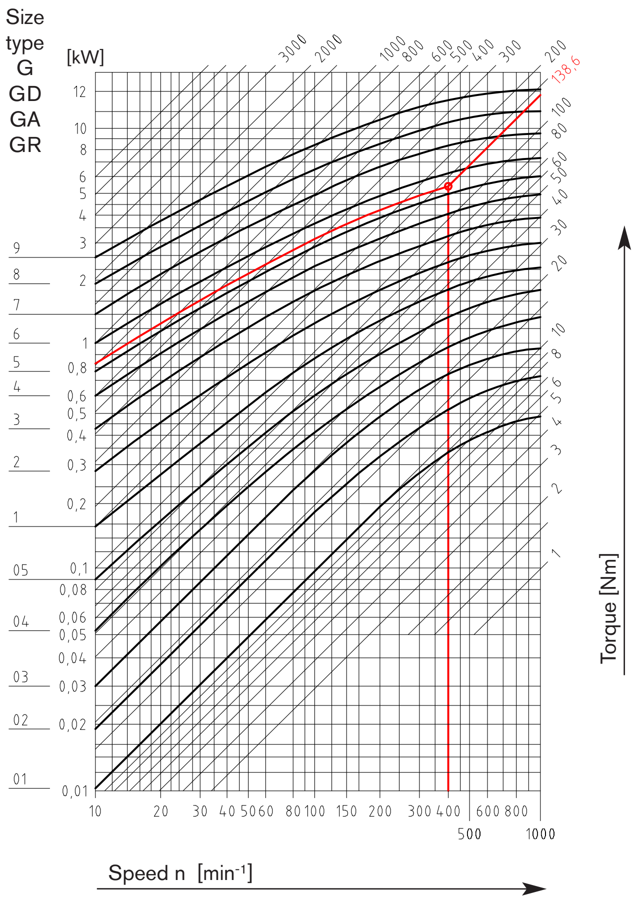
Protection muffs				
Size	Joints	A	B	C
M 01	01 G, 01 X	28	34	15
M 02	02 G, 02 X	32	40	16,5
M 03	03 G, 03 H, 03 GA, 03 HA, 03 X	40	45	20,5
M 04	04 G, 04 H, 04 GA, 04 HA, 04 X	48	50	24,5
M 05	05 G, 05 H, 05 GA, 05 HA	52	56	27,5
M 1	1 G, 1 H, 1 GA, 1 HA, 1 X	56	65	30,5
M 2	2 G, 2 H, 2 GA, 2 HA	66	72	35,5
M 3	3 G, 3 H, 3 GA, 3 HA, 3 X	75	82	40,0
M 4	4 G, 4 H, 4 GA, 4 HA	84	95	45,0
M 5	5 G, 5 H, 5 GA, 5 HA, 5 X	92	108	50,0
M 6	6 G, 6 G1, 6 H, 6 H1, 6 GA, 6 HA, 6 X	100	122	56,0

Order form:

03 HR	d_1 = Ø 10	d_2 = Ø 10 keyway DIN
Size/type of joint	Finish bore (H7)	Finish bore (H7) keyway to DIN 6885 sheet 1 (JS9)

Selection and determination of size acc. to DIN 808 with plain/needle bearing

For plain bearing $n_{max.}$ = 1000 min⁻¹



Articulation angle [α]	Correction value
45°	4,0
40°	3,3
35°	2,6
30°	2,2
25°	1,8
20°	1,5
15°	1,25
10°	1,00
5°	0,8

Selection of precision joints type G, GD, GA, GR (max. 1000 min^{-1})

The selection of the precision joints with plain bearing is based on the driving torque, taking into account a correction value which depends on the articulation angle α and the operating speed.
For the extendable joints in addition the overall length and the speed have to be considered to determine the size (please consult with KTR engineering department).

Torque ▪ correction value = selected torque

Example of selection

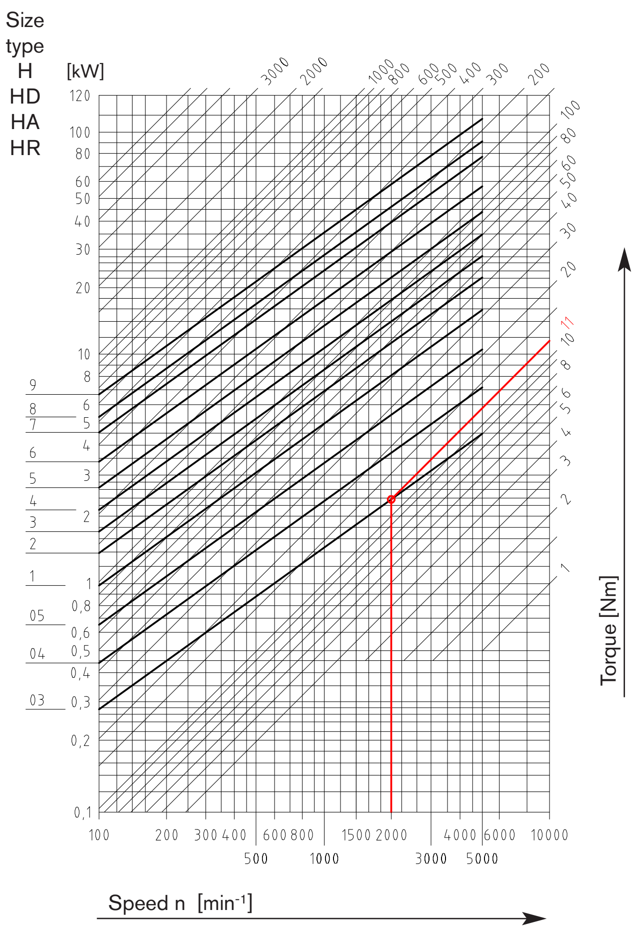
Driving torque	Correction value for articulation angle [α]	Selected torque Selection of size acc. to table
63 Nm	30°	
63 Nm	2,2	63 Nm ▪ 2,2 = 138,6 Nm
Operating speed = 400 min^{-1}		

The selection of the size according to the table is based on the driving torque (63 Nm) x correction value (30° = 2,2) = 138,6 Nm and the operating speed of 400 min^{-1}.

Selected: Joint size 6

$$\text{Torque [Nm]} = 9550 \cdot \frac{\text{Power [kW]}}{\text{Speed [min}^{-1}\text{]}}$$

For needle bearing $n_{max.}$ = 4000 min⁻¹



Articulation angle [α]	Correction value
45°	4,0
40°	3,3
35°	2,5
30°	2,0
25°	1,4
20°	1,25
15°	1,1
10°	1,00
5°	0,8

Selection of precision joints type H, HD, HA, HR (max. 4000 min^{-1})

The selection of the precision joints with needle bearing is based on the driving torque, taking into account a correction value which depends on the articulation angle α and the operating speed.
For the extendable joints in addition the overall length and the speed have to be considered to determine the size (please consult with KTR engineering department).

Torque ▪ correction value = selected torque

Example of selection

Driving torque	Correction value for articulation angle [α]	Selected torque Selection of size acc. to table
8,8 Nm	20°	
8,8 Nm	1,25	8,8 Nm ▪ 1,25 = 11 Nm
Operating speed = 2000 min^{-1}		

The selection of the size according to the table is based on the driving torque (8,8 Nm) x correction value (20° = 1,25) = 11 Nm and the operating speed of 2000 min^{-1}.

Selected: Joint size 03

$$\text{Torque [Nm]} = 9550 \cdot \frac{\text{Power [kW]}}{\text{Speed [min}^{-1}\text{]}}$$

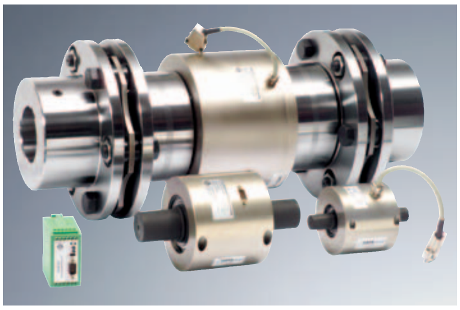
DATAFLEX®
Torque measuring shaft

Made for Motion KTR

Table of contents

The principle: Torque measurement at low cost

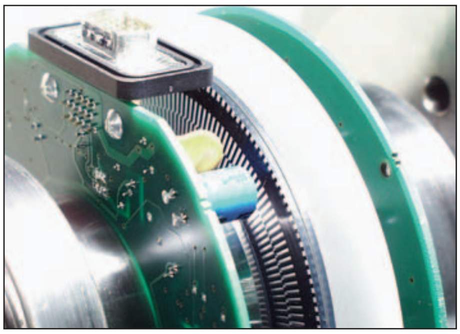
DATAFLEX® measures torques without contact or radio frequency, is maintenance-free and has a high frequency of response – all at low cost. Its secret is an innovative, patented measuring method. The new optical – electronic light method senses the twisting of the torsion shaft and does not use wire strain gauges. The light is passed through 2 slotted disks and the transmission ratio of light changes proportionally to the torque as the disks rotate relative to one another.



All electronics are located in a stationary housing, so that neither data nor energy is transmitted from the rotating shaft.

The advantages? Accurate torque measurement with a band width of more than 15 kHz without maintenance wearing pickups.

Advantages



Measured values for every torque
DATAFLEX® measures torques with a band width of more than 15 kHz and is therefore able to sense high frequency torque variations – such as the starting of an engine – precisely and continuously.

Easy analysis with standard appliances
The analog output values are available both as voltage (0 ... 10 V) and current (4 ... 20 mA). They can be easily read with a multimeter or oscilloscope or easily analyzed by computer.

Maintenance-free – the whole life long
DATAFLEX® does not require maintenance. The complete electronics are located in a stationary housing. Since neither data nor energy need to be transmitted from the rotating shaft, there is no maintenance of slip rings or expensive telemetry.

Two in One – control of torque and speed
In addition to torque measurement, DATAFLEX® also shows the speed. This feature is not an optional extra, but a standard part of the low cost package.

On site calibration
DATAFLEX® can be easily calibrated on site and includes fully automatic offset-balancing. Disassembly is not necessary. All connections are accessible via a standard multipole plug-in contact. An installed microprocessor controls the electronics.

Plug & Play: problem-free assembly
Options to DATAFLEX® include KTR's RADEX®-N steel disk coupling and the servo disk RADEX®-NC coupling. The result? A compact, complete solution which can be quickly integrated into your product – and saves space!

Lucid interval – a ray of hope for designers
DATAFLEX® measuring shafts supply precise results at low cost. Many machine control options are now practical such as process control in agitator drives, extruders and worm drives, the control of coiling / lapping machines, shredders or boring mills, or in quality control.

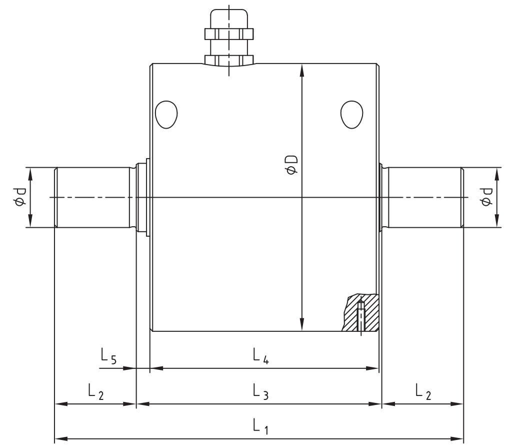
DATAFLEX® torque measuring shafts are available for production use now!

Made for Motion KTR

Type 22/20, 22/50, 22/100

- DATAFLEX® 22 for low torques
- Contactless measurement
- Integrated speed signal
- Very high measuring frequency
- Reliable values measured in the
  - machine control
  - process control
  - test stand dynamometers

DATAFLEX® – Dimensions							
Type	Dimensions [mm]						
	d	D	L_1	L_2	L_3	L_4	L_5
DATAFLEX® 22/20							
DATAFLEX® 22/50	22	98	150	30	90	84	5
DATAFLEX® 22/100							

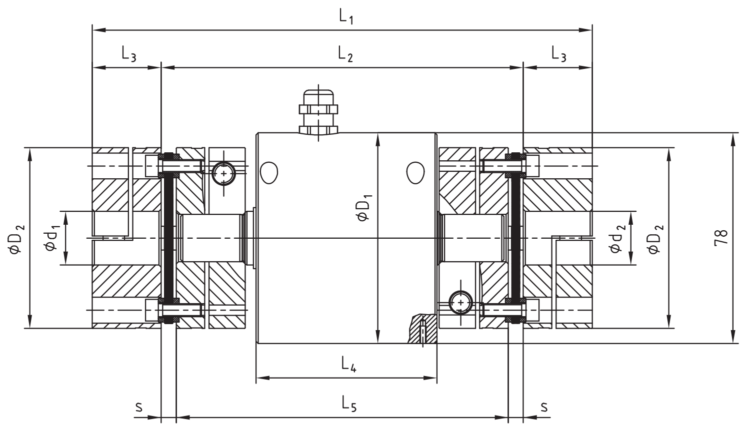


Technical Data			
DATAFLEX® Type	22/20	22/50	22/100
Electrical Data			
Rated torque T_{KN} [Nm]	-20 ... 20	-50 ... 50	-100 ... 100
Torque signal with limit frequency [kHz]	16		
Inaccuracy in measuring [%] 1)	± 0,5		
Influence of temperature [%/K] 1)	0,05		
Nominal temperature range [°C]	0 ... 55		
Distribution voltage [V]	24 ± 4		
Max. current consumption [mA]	100		
Connection 2)	Sub-D-15 pol. high density		
Output of torque			
Output of voltage [V]	0 ... 10		
Output of current [mA]	4 ... 20		
Output of speed			
Number of pulses / revolutions	60		
Output signal [V]	24		
Mechanical data			
Static load limit $T_{K\ max}$ [%] 1)	150		
Breaking load $T_{K\ break}$ [%] 1)	300		
Max. bending moment [Nm]	5	10	18
Max. radial force [N]	42	84	150
Max. axial force [kN]	3	5	7,5
Weight [kg]	1,5		
Torsion spring stiffness C_T [Nm/rad]	2865	7163	14325
Twisting angle with T_{KN} [degree]	0,4		
Mass moment of inertia [kgm^2]	0,000131	0,000132	0,000134
Max. speed [1/min]	8000		

1) Referring to T_{KN}
2) See accessory: Connection box DF 01

Type 22/20, 22/50, 22/100 – Accessories: RADEX®-NC Servo laminae coupling

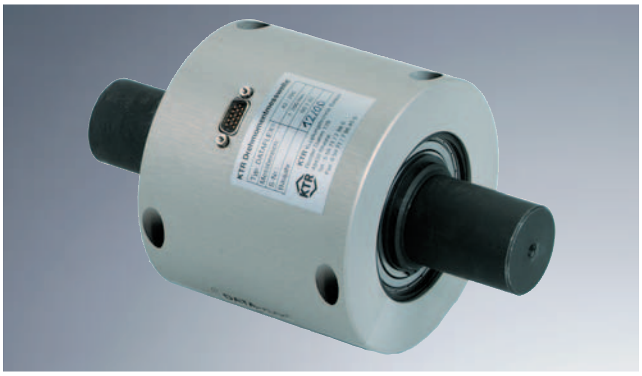
- Ideal solution to compensate for:
  - axial displacement
  - radial displacement
  - angular displacement
- Compact design
- Backlash-free, torsionally rigid
- Easy assembly
- Can be used with other couplings



Technical Data			
DATAFLEX® Type	22/20	22/50	22/100
Coupling size RADEX®-NC	25	35	
Dimensions			
Dimension $d_1/d_{2\ max.}$	35	40	
Dimension D_1	98	98	
Dimension D_2	70	84	
Dimension L_1	228	244	
Dimension L_2	164	174	
Dimension L_3	32	35	
Dimension L_4	84	84	
Dimension L_5	154	160	
Dimension s	5	7	
Thread for setscrews			
Dimension G	M8	M10	
Tightening torque T_A [Nm]	25	49	
Torque of coupling			
T_{KN} [Nm]	60	100	
$T_{K\ max.}$ [Nm]	120	200	
Mechanical data of the entire system			
Mass moment of inertia [kgm²]	0,00094	0,002	
Torsion spring stiffness C_T [Nm/rad]	2521	6383	11448
Weight [kg]	2,56	3,15	3,16
Max. speed [1/min] [1)]	8000	8000	8000

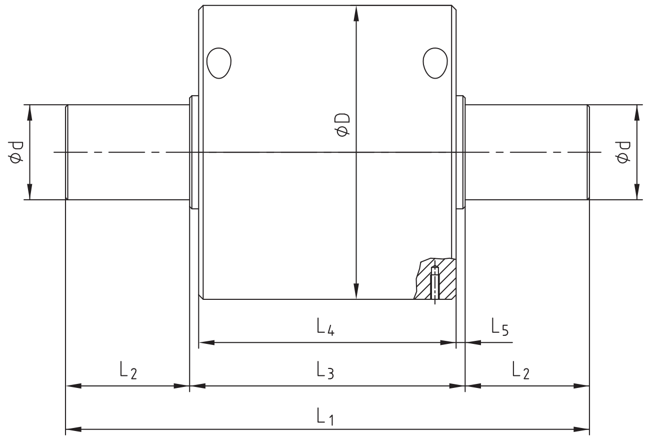
1) Higher speeds on request

Type 42/200, 42/500, 42/1000



- DATAFLEX® 42 for middle torques
- Contactless measurement
- Integrated speed signal
- Very high measuring frequency
- Reliable values measured in the
  - machine control
  - process control
  - test stand dynamometers

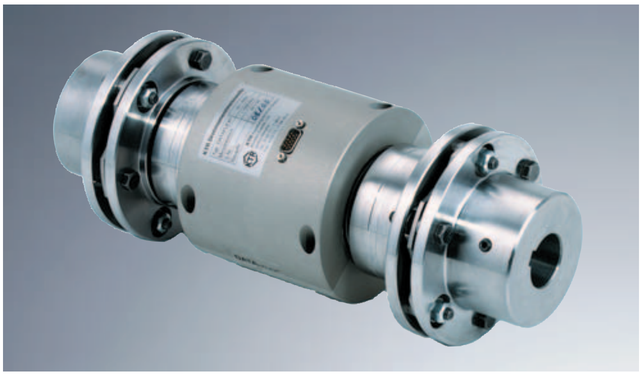
DATAFLEX® – Dimensions							
Type	Dimensions [mm]						
	d	D	L_1	L_2	L_3	L_4	L_5
DATAFLEX® 42/200							
DATAFLEX® 42/500	42	130	232	55	122	114	6,5
DATAFLEX® 42/1000							



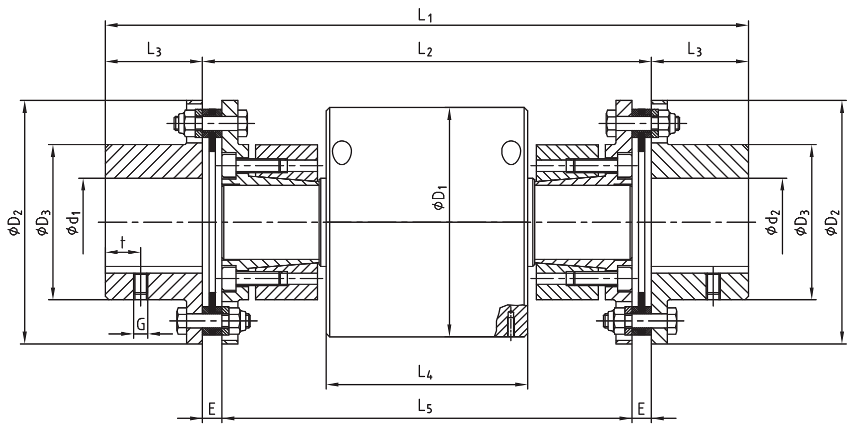
Technical Data			
DATAFLEX® Type	42/200	42/500	42/1000
Electrical Data			
Rated torque T_{KN} [Nm]	-200 ... 200	-500 ... 500	-1000 ... 1000
Torque signal with limit frequency [kHz]	16		
Inaccuracy in measuring [%] 1)	± 0,5		
Influence of temperature [%/K] 1)	0,05		
Nominal temperature range [°C]	0 ... 55		
Distribution voltage [V]	24 ± 4		
Max. current consumption [mA]	100		
Connection 2)	Sub-D-15 pol. high density		
Output of torque			
Output of voltage [V]	0 ... 10		
Output of current [mA]	4 ... 20		
Output of speed			
Number of pulses / revolutions	60		
Output signal [V]	24		
Mechanical data			
Static load limit $T_{K\ max}$ [%] 1)	150		
Breaking load $T_{K\ break}$ [%] 1)	300		
Max. bending moment [Nm]	50	135	270
Max. radial force [N]	280	750	1500
Max. axial force [kN]	12	20	30
Weight [kg]	4,71	4,84	5,01
Torsion spring stiffness C_T [Nm/rad]	40929	102321	204643
Twisting angle with T_{KN} [degree]	0,28		
Mass moment of inertia [kgm²]	0,0007343	0,0007603	0,0008048
Max. speed [1/min]	6000		

1) Referring to T_{KN}
2) See accessory: Connection box DF 01

Type 42/200, 42/500, 42/1000 – Accessories: RADEX®-N Steel laminae coupling



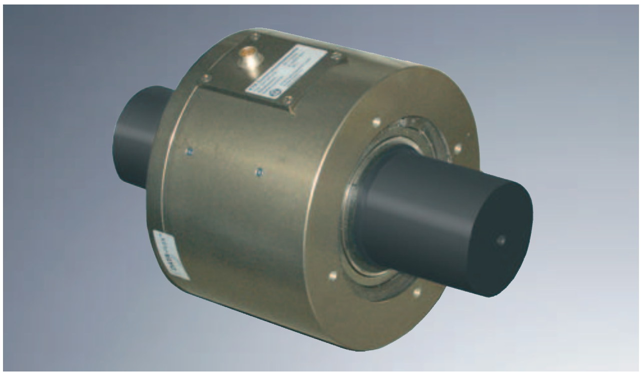
- Ideal solution to compensate for:
  - axial displacement
  - radial displacement
  - angular displacement
- Compact design
- Backlash-free, torsionally rigid
- Easy assembly
- Can be used with other couplings



Technical Data			
DATAFLEX® Type	42/200	42/500	42/1000
Coupling size RADEX®-N	60		80
Dimensions			
Dimension $d_1/d_{2\ max.}$	60		80
Dimension D_1	130		130
Dimension D_2	138		179
Dimension D_3	88		117
Dimension L_1	364		420
Dimension L_2	254		270
Dimension L_3	55		75
Dimension L_4	114		114
Dimension L_5	232		242
Dimension E	11		14
Thread for setscrews			
Dimension G	M8		M10
Dimension t	20		20
Tightening torque T_A [Nm]	10		17
Torque of coupling			
T_{KN} [Nm]	690		1500
$T_{K\ max.}$ [Nm]	1380		3000
T_{KW} [Nm]	± 230		± 500
Mechanical data of the entire system			
Mass moment of inertia [kgm²]	0,0173	0,0174	0,0569
Torsion spring stiffness C_T [Nm/rad]	29605	52304	86888
Weight [kg]	13,90	14,03	24,39
Max. speed [1/min] 1)	6000	6000	5100

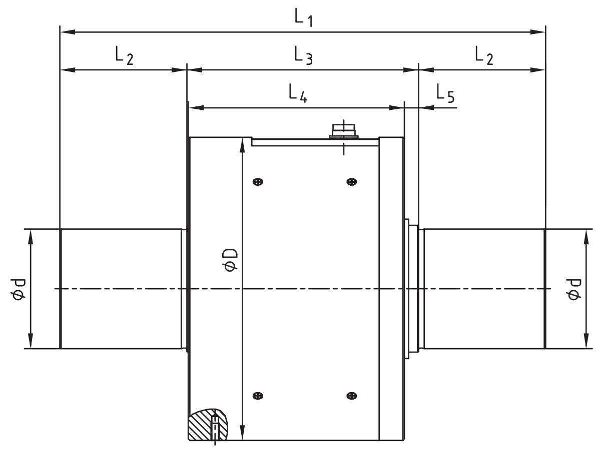
1) Higher speeds on request

Type 85/2000, 85/5000, 85/10000



- DATAFLEX® 85 for high torques
- Contactless measurement
- Integrated speed signal
- Shortest peak torques can be measured
- Reliable values measured in the
  - machine control
  - process control
  - test stand dynamometers

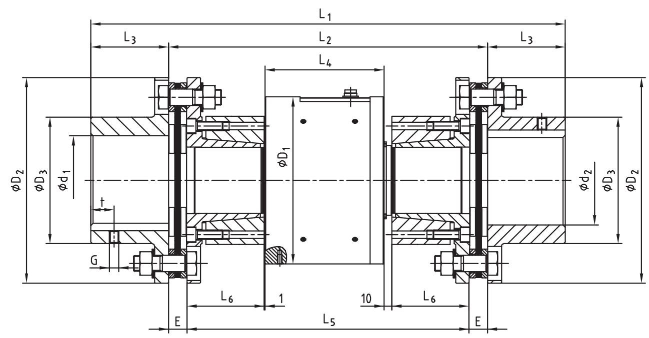
DATAFLEX® – Dimensions							
Type	Dimensions [mm]						
	d	D	L_1	L_2	L_3	L_4	L_5
DATAFLEX® 85/2000							
DATAFLEX® 85/5000	85	215	344	90	164	153	10
DATAFLEX® 85/10000							



Technical Data			
DATAFLEX® Type	85/2000	85/5000	85/10000
Electrical Data			
Rated torque T_{KN} [Nm]	-2000 ... 2000	-5000 ... 5000	-10000 ... 10000
Torque signal with limit frequency [kHz]	16		
Inaccuracy in measuring [%] 1)	± 0,5		
Influence of temperature [%/K] 1)	0,05		
Nominal temperature range [°C]	0 ... 55		
Distribution voltage [V]	24 ± 4		
Max. current consumption [mA]	100		
Connection 2)	Binder serial 423		
Output of torque			
Output of voltage [V]	0 ... 10		
Output of current [mA]	4 ... 20		
Output of speed			
Number of pulses / revolutions	60		
Output signal [V]	24		
Mechanical data			
Static load limit $T_{K\ max}$ [%] 1)	150		
Breaking load $T_{K\ break}$ [%] 1)	300		
Max. bending moment [Nm]	380	760	1270
Max. radial force [N]	1500	3000	5000
Max. axial force [kN]	50	80	110
Weight [kg]	22,61	23,23	23,85
Torsion spring stiffness C_T [Nm/rad]	382000	818570	1273330
Twisting angle with T_{KN} [degree]	0,30	0,35	0,45
Mass moment of inertia [kgm²]	0,01636	0,01679	0,01742
Max. speed [1/min]	2500		

1) Referring to T_{KN}
2) See accessory: Connection box DF 01

Type 85/2000, 85/5000, 85/10000 – Accessories: RADEX®-N Steel laminae coupling

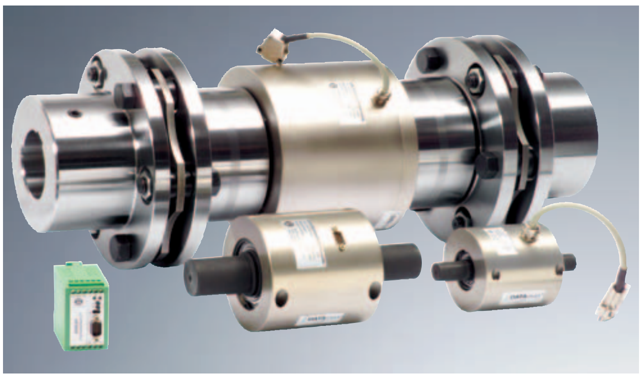


Technical Data			
DATAFLEX® Type	85/2000	85/5000	85/10000
Coupling size RADEX®-N	105	115	135
Dimensions			
Dimension d_1/d_2 max.	105	115	135
Dimension D_1	215	215	215
Dimension D_2	225	265	305
Dimension D_3	147	163	184
Dimension L_1	564	610	758
Dimension L_2	384	410	488
Dimension L_3	90	100	135
Dimension L_4	153	153	153
Dimension L_5	344	364	434
Dimension L_6	90	100	135
Dimension E	20	23	27
Thread for setscrews			
Dimension G	M12	M12	M20
Dimension t	30	30	40
Tightening torque T_A [Nm]	40	40	140
Torque of coupling			
T_{KN} [Nm]	5100	9000	12000
$T_{K\ max.}$ [Nm]	10200	18000	24000
T_{KW} [Nm]	1700	3000	4000
Mechanical data of the entire system			
Mass moment of inertia [kgm^2]	0,2250	0,4735	1,0067
Torsion spring stiffness C_T [Nm/rad]	293000	556000	928000
Weight [kg]	61,48	85,62	130,16
Max. speed [1/min] [1)]	2500	2500	2500

1) Higher speeds on request

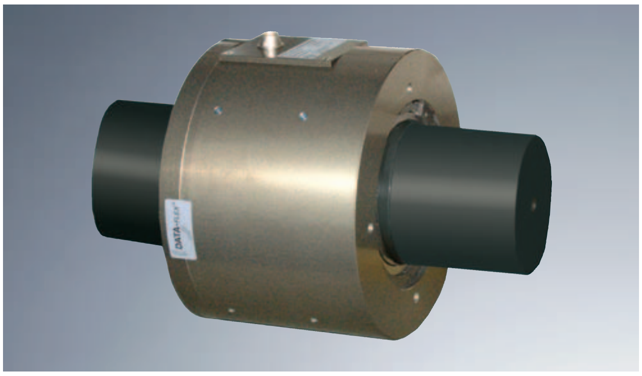
DATAFLEX® Connecting accessories

Connecting housing DF 01 and connecting cable



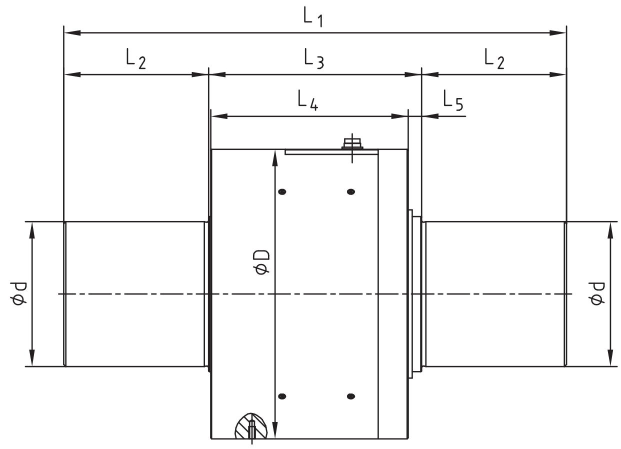
- Standard plug for all DATAFLEX® types
- DIN standard rail mounting
- Screw connectors
- Adjustable low pass integrated filter
- Integrated calibration system for fast calibration
- Cable lengths of 2 m, 5 m and 10 m available

Type 140/20000, 140/50000



- DATAFLEX® 140 for high torques
- Contactless measurement
- Integrated speed signal
- Shortest peak torques can be measured
- Reliable values measured in the
  - machine control
  - process control
  - test stand dynamometers

DATAFLEX® – Dimensions							
Type	Dimensions [mm]						
	d	D	L_1	L_2	L_3	L_4	L_5
DATAFLEX® 140/20000	140	280	486	140	206	191	13
DATAFLEX® 140/50000							



Technical Data		
DATAFLEX® Type	140/20000	140/50000
Electrical Data		
Rated torque T_{KN} [Nm]	-20000 ... 20000	-50000 ... 50000
Torque signal with limit frequency [kHz]	16	
Inaccuracy in measuring [%] 1)	± 0,5	
Influence of temperature [%/K] 1)	0,05	
Nominal temperature range [°C]	0 ... 55	
Distribution voltage [V]	24 ± 4	
Max. current consumption [mA]	100	
Connection 2)	Binder serial 423	
Output of torque		
Output of voltage [V]	0 ... 10	
Output of current [mA]	4 ... 20	
Output of speed		
Number of pulses / revolutions	60	
Output signal [V]	24	
Mechanical data		
Static load limit $T_{K\ max}$ [%] 1)	150	
Breaking load $T_{K\ break}$ [%] 1)	300	
Max. bending moment [Nm]	2750	5500
Max. radial force [N]	8000	16000
Max. axial force [kN]	100	160
Weight [kg]	73	75
Torsion spring stiffness C_T [Nm/rad]	3935000	6750000
Twisting angle with T_{KN} [degree]	0,30	0,42
Mass moment of inertia [kgm^2]	0,17	0,175
Max. speed [1/min]	2000	

1) Referring to T_{KN}
2) See accessory: Connection box DF 01

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