

Product range

Precision measuring instruments

02/2011



KT 55 - 250



Through bores
6-11, 18, 22-24



Deep bores
7, 10, 22-25



Bores with a short breakthrough
6, 9, 12, 13, 18, 22-24



Blind bores
9, 12, 13, 18, 22-24



Internal multi-splines
11



Internal gears
11



Bores in easily deformable materials
16, 17



Recessed grooves or bores
12, 13



Internal grooves
12, 13



Internal grooves / special
12, 13



Undercuts
12, 13



Outside diameter of a recessed section in a bore
25



Inside diameter bore, having a centre obstruction
15, 25



Bores with a central hub
15, 25



Bores with an axial obstruction (cross holes)
18, 22-24



Interrupted bores
18, 22-24



Spherical bores (socket)
6, 8, 12, 13, 18, 19



Thread distance / groove width
15



Thickness
15



Internal key seating
22-24



Shaft grooves
22-24



Parallel distances
11, 18, 22-24



Bore depth
15



Internal taper length
15



Inside chamfer
15



Outside chamfer
on inquiry



Roundness
6-11, 18, 22-24



Cylindricity
6, 8-10, 22-24



Straightness of a bore
on inquiry



Concentricity
22-24, 28



Coaxiality
28



True position of a bore to the X-Y coordinations
on inquiry



Centre distance on inquiry
on inquiry



Run-out
on inquiry



Internal taper
22-24



Shallow bores
18, 22-24



Center connection
25



Circumference
16, 17



Minor diameter of internal threads
17, 22-24



Major internal diameter of a ball screw
on inquiry



Wall indentations in a bore
22-24



Penetrating bores
6, 8, 22-24

Over 80 years experience in the field of metrology

Bore gauges from 1 mm
to over 1000 mm

Circumference measuring
from 20 mm to over 20.000 mm

Precision in the μm range

Fast delivery of all
standard instruments

Solutions for almost every
bore measuring problem

Spare parts delivery ex stock for all
serial measuring instruments

Repair service for all
SCHWENK measuring instruments

Planning / manufacturing / initiation
of measuring devices

Production of high-stressed
technical springs

Calibration service for all SCHWENK
measuring instruments

Experience

Solutions Precision

SUBITO® is a registered trademark
of Hahn + Kolb Werkzeuge GmbH.
Reg.-Nr.: 508 662

SCHWENK is connected with...



Series	Description	Model	Page
100 - 118	SUBITO® standard design	SU,SK	6
200 - 214	SUBITO® angled design	SW	6
120	Plug-in measuring depth extensions for SUBITO	MTV	7
122 - 124	SUBITO® Vario/SUBITO® Vario System	SV/SVS	8
404 - 416	RABITO for internal diameters	RA	8
121	Vario-plug gauges	SCA	9
140 - 146	SUBITO® for blind bores	SS	9
230 - 243	SUBITO® special measuring depth	SMT	10
130 - 133	SUBITO® for deep bores	SE	10
160 - 164	SUBITO® for internal gear teeth P.C.D.s	KT	11
215 - 221	SUBITO® for plane-parallel distances	SP	11
165 - 167	SUBITO® for grooves and recesses	SN	12
170 - 176	SUBITO® for grooves and recesses / pillow blocks	ST	12
190	Gauges for internal grooves and recesses	ON/ONM	12 - 13
125	Setting device for 2-point internal measuring instruments	ESU	14
198 - 199	Distance measuring instruments	OT	15
150 - 154	Bore gauges for bores with boring bar	SL	15
620 - 621	Measuring tapes for outside circumference and diameter	CJU, C, CENTI	16
622	Measuring tapes for plane-parallel distances	CJL	17
623	Measuring tapes for inside circumference	IUB	17
624	Novometer	NO	17
625 - 628	OSIMESS bore gauges	OS, OSH, OSS, OSF	18
	OSIMESS spare parts		19 - 20
629	OSIMESS measuring stand	OSM	21
129	Master setting rings		21
300 - 326	Plug gauges for bores	OD	22 - 24
155	Bore gauges for bores with a hub	SBO/SBU	25
610 - 611	Precision indicators in accordance with DIN 879	my	26
194	Internal chamfer gauge	IFM	26
600	Dial gauges		27
613	Digital dial gauges		27
614	Ball bearing traveller		27
999	Coax – mandrels	KF	28
	Plug gauges for positional deviations	KS	28
	High precision bore gauges with runners	KM	28
650	Measuring instrument test device	MPV	29
999	Reference unit	RV	29
680	Tungsten carbide precision balls		30
	Ruby, ceramic precision balls		31
	Special measuring inserts		31
620	Precision steel rulers		31
699	Inspection certificates		32 - 33





The company.

1921

since 1921

SCHWENK



Today, Schwenk is one of the oldest long-established manufacturers of precision measuring instruments with production experience dating back over 80 years. The company's founder, Oskar Schwenk, developed and made the first SUBITO® as long ago as 1921. Since then, this product has become the embodiment and the standard for a high-precision two-point-contact comparator bore gauge throughout the world.

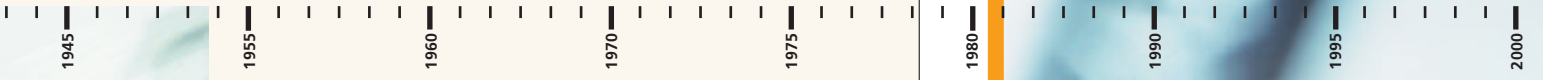
In the decades that followed, Schwenk's employees developed and series-produced more and more types of internal precision instruments, so that further world-renowned brand names such as the OSIMESS split-ball probe measuring instrument, the mytast precision indicator and the OD plug gauge were added to the range.

Also in 1921 Oskar Schwenk began to produce a quite different product, the technical springs. In this field, Schwenk has specialized in high-quality springs for static to highly dynamic stresses and process wires from 0,4 to 7,0 mm diameter in medium to large quantities; mainly for the automotive industry.

Worker at a machine



A trainee



The internationally outstanding quality of Schwenk products is assured by the employees' long experience and the use of modern production methods supplemented by an established internal quality assurance system. This is based on every single employee's responsibility for quality. They ensure that every individual component, whether for series or special measuring instruments, meets the strict Schwenk standards which in some cases are more demanding than international standards.

Schwenk also offers a **repair service** and a **calibration service**, issuing inspection certificates in accordance with our demanding internal standards. Our test equipment is regularly checked on the basis of normative regulations and can be traced back to national quality standards. In the field of standard measuring instruments it is our aim, to carry a sufficient stock of current instruments at all times, as well as the accompanying spare parts, so as to ensure speedy delivery.

Nowadays, Schwenk is the partner of choice when it comes to solving customer-specific measurement problems in bores, grooves and the like. Our designers and production engineers would be pleased to see how we can solve your measuring problems. In the past, we have had many opportunities of demonstrating our skills in the field of complete measuring device production.



Machine hall.



Workers washing their hands.



SUBITO® - Precision Bore Measuring Instrument

SU/SK/SW

for measuring internal diameters, application range 4,5 - 800 mm



SERIES 100-118

STANDARD VERSION SERIES SU w. inspection certificate

Delivery: Holder, fixed measuring pins, washers, in wooden box, w/o dial gauge. Movable contact pin as standard tungsten carbide.

Ruby Version: Measuring pins and contact pin ruby.

Version centring plate coated wear-resisting: standard with measuring pins tungsten carbide.

SHORT VERSION SERIES SK w. inspection certificate

Delivery: as Series SU, but with a short holder.

ANGLED VERSION SERIES SW

Delivery: as Series SU, but holder with a fixed angle piece.



SUBITO® SU 50 - 100

SUBITO® SU / SK / SW

Application range [mm]	Measuring pins steel Art.-No.			Measuring pins tungsten carbide Art.-No.			Centring plate coated Art.-No.		
	SU	SK	SW	SU	SK	SW	SU	SK	SW
4,5 - 6	-	-	-	100 00000	100 00001	200 00000	-	-	-
6 - 8	-	-	-	101 00000	101 00001	201 00000	101 00004	101 00005	201 00002
8 - 12	-	-	-	102 00000	102 00001	202 00000	102 00004	102 00005	202 00002
12 - 20	-	-	-	103 00000	103 00001	203 00000	103 00004	103 00005	203 00002
18 - 35	104 00000	104 00001	204 00000	104 00002	104 00003	204 00001	104 00006	104 00007	204 00003
35 - 60	105 00000	105 00001	205 00000	105 00002	105 00003	205 00001	105 00006	105 00007	205 00003
50 - 100	106 00000	106 00001	206 00000	106 00002	106 00003	206 00001	106 00006	106 00007	206 00003
50 - 150	107 00000	107 00001	207 00000	107 00002	107 00003	207 00001	107 00006	107 00007	207 00003
100 - 160	108 00000	108 00001	208 00000	108 00002	108 00003	208 00001	108 00006	108 00007	208 00003
100 - 230	109 00000	109 00001	209 00000	109 00002	109 00003	209 00001	109 00006	109 00007	209 00003
160 - 290	110 00000	110 00001	210 00000	110 00002	110 00003	210 00001	110 00006	110 00007	210 00003
160 - 360	111 00000	111 00001	211 00000	111 00002	111 00003	211 00001	111 00006	111 00007	211 00003
280 - 410	112 00000	112 00001	212 00000	112 00002	112 00003	212 00001	112 00006	112 00007	212 00003
280 - 510	113 00000	113 00001	213 00000	113 00002	113 00003	213 00001	113 00006	113 00007	213 00003
400 - 800	114 00000	114 00001	214 00000	114 00002	114 00003	214 00001	114 00076	114 00077	214 00003

SUBITO® with extended measuring range and for spherical diameters on inquiry

COMBINATION OF SEVERAL COMPLETE SETS

w. inspection certificate

to cover large measuring ranges, consisting of 2 and 3 complete measuring instruments in one wooden box, w/o dial gauge.

SUBITO® SU

Application range [mm]	Meas. pins steel Art.-No.	Meas. pins carbide Art.-No.	Centr. plate coated Art.-No.	Meas. pins ruby Art.-No.
18 - 100	115 00000	115 00002	115 00006	115 00004
18 - 150	116 00000	116 00002	116 00006	116 00004
50 - 160	117 00000	117 00002	117 00006	117 00004
50 - 230	118 00000	118 00002	118 00006	118 00004



SUBITO® several complete sets



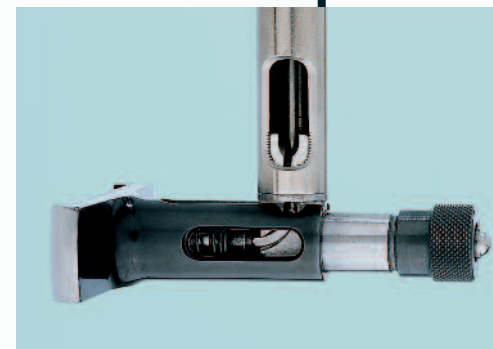
SUBITO® SW



SUBITO® Holder



SUBITO® SU 4,5 - 6 and SU 35 - 60



SUBITO® Segment

Measuring depth extension

for SUBITO® bore gauges,
plug-in extension, clamping shank
Ø 8 mm

MTV

Suitable from diameter 35 mm.

MEAS. DEPTH EXTENSION MTV

tube-Ø [mm]	length [mm]	Art.-No.	tube-Ø [mm]	length [mm]	Art.-No.
12	250	120 00000	18	1000	120 00004
12	500	120 00001	18	1500	120 00005
12	750	120 00002	18	2000	120 00006
12	1000	120 00003	<i>special length</i>		<i>on inquiry</i>



SERIES 120



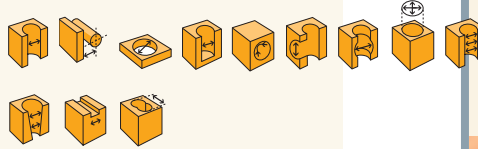
Measuring depth extension MTV

Inspection Certificates
for SCHWENK measuring
instruments see p.32

SUBITO®-Vario Precision Bore Measuring Instrument

SV/SVS

for measuring internal diameters, application range 6 - 800 mm



SERIES 122-124

Delivery SV: SUBITO® Vario SV modular system consisting of one upper part and different measuring heads in Vario design; with fixed measuring pins, washers, in wooden box, w/o dial gauge.

SUBITO® VARIO SV

Type SV	Application range [mm]	Meas. pins steel Art.-No.	Meas. pins carbide Art.-No.
	Meas. heads SUBITO Vario		
6 - 18	6 - 10	-	122 00000
	10 - 18		
6 - 10	6 - 10	-	122 00001
	10 - 18		
18 - 160	18 - 50	123 00000	123 00008
	50 - 160		
18 - 50	18 - 50	123 00001	123 00009
	50 - 160		
50 - 160	50 - 160	123 00002	123 00010
	160 - 800		
160 - 800	160 - 430	124 00000	124 00004
	430 - 800		
160 - 430	160 - 430	124 00001	124 00005
	400 - 800		
400 - 800	400 - 800	124 00002	124 00006

Accessories for Vario SV/SVS, e.g. measuring depth extensions, angle piece - on inquiry

SUBITO® VARIO SVS

Type SVS	Application range [mm]		Meas. pins steel Art.-No.	Meas. pins carbide Art.-No.
	Meas. heads			
18 - 160	SUBITO® Vario 18 - 50		123 00005	123 00013
	50 - 160			
	blind bores 20 - 50			
	50 - 140			



SUBITO® Vario SV



SUBITO® Vario System SVS

RABITO-Precision Bore Measuring Instrument

RA

for measuring internal diameters, application range 18 - 300 mm



SERIES 404-416

Delivery: Holder, fixed measuring pins in steel, washers, in wooden box, w/o dial gauge.

RABITO RA

Application range [mm]	Art.-No.
18 - 35	404 00001
35 - 60	405 00001
50 - 150	407 00001
18 - 150*	416 00001
150 - 300	410 00001

* consists of 2 complete sets in wooden box



Rabito 50-150

Vario Plug Gauge

for measuring internal diameters, application range 20 - 170 mm

Measuring w/o tipping of the instrument, similar to Series OD due to special self-centring and self-aligning centring plate; adaptable to changing diameters with different measuring pins.

Delivery: short holder with special centring plate, fixed measuring pins and contact pin tungsten carbide tipped, washers, in wooden box, w/o dial gauge. (Use of measuring depth extensions is not recommended).



SERIES 121

VARIO PLUG GAUGE SCA

Application range [mm]	Art.-No.
20 - 35	121 00000
35 - 55	121 00001
50 - 80	121 00002
80 - 120	121 00003
120 - 170	121 00004



Precision bore gauge SCA

SUBITO® Precision Bore Measuring Instrument

for measuring of blind bore diameters

Delivery: Holder, measuring tipped and contact pin tungsten carbide as standard, in wooden box, w/o dial gauge.

Version with h = 1 mm: for measuring very close to the bottom of the bore.

SS/SSV



SERIES 140-146

SUBITO® SS

Application range [mm]	front distance „h“ [mm]	meas. slides carbide Art.-No.	meas. slides ruby Art.-No.	holder SS Art.-No.
20 - 50	1,5	140 00000	140 00001	140 00024
20 - 60	1,5	141 00000	141 00001	140 00024
50 - 110	1,5	142 00000	142 00001	142 00027
50 - 140	1,5	143 00000	143 00001	142 00027
110 - 300	2,0	144 00000	144 00001	144 00032
110 - 400	2,0	145 00000	145 00001	144 00032
300 - 600	2,0	145 00100	145 00101	145 00105

20 - 50	1,0	140 00002		
20 - 60	1,0	141 00002		
50 - 110	1,0	142 00002		
50 - 140	1,0	143 00002		
110 - 300	1,0	144 00002		
110 - 400	1,0	145 00002		
300 - 600	1,0	145 00102		

Delivery: 1 short upper part, 2 blind bores measuring heads, measuring slides, in wooden box, w/o dial gauge.

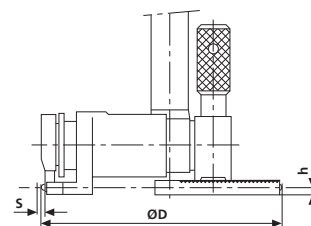
SUBITO® BLIND BORES VARIO SSV

Application range [mm]	front distance h [mm]	meas. slides carbide Art.-Nr.	meas. slides ruby Art.-Nr.
20 - 140	1,5	146 00000	146 00001
20 - 140	1,0	146 00002	



SUBITO® SS for blind bores

s: travel
D: diameter to be measured
h: front distance



front distance h for SUBITO® SS

SUBITO® Precision Bore Measuring Instrument

for measuring internal diameters in large depth

SMT



SERIES 230-244

Delivery: as Series SU, but holder in special length; fixed measuring pins and movable contact pin tungsten carbide tipped as standard, coated centering plate, in wooden box or transportation box, w/o dial gauge. Larger and intermediate depth on inquiry.

SUBITO® SMT

Application range [mm]	Measuring depth [mm]			
	250 Art.-No.	500 Art.-No.	750 Art.-No.	1000 Art.-No.
4,5 - 6	230 00000	-	-	-
6 - 8	231 00000	231 00001	231 00002	231 00003
8 - 12	232 00000	232 00001	232 00002	232 00003
12 - 20	233 00000	233 00001	233 00002	233 00003
18 - 35	234 00000	234 00001	234 00002	234 00003
35 - 60	235 00000	235 00001	235 00002	235 00003
50 - 100	236 00000	236 00001	236 00002	236 00003
50 - 150	237 00000	237 00001	237 00002	237 00003
100 - 160	-	238 00001	238 00002	238 00003
100 - 230	-	239 00001	239 00002	239 00003
160 - 290	-	240 00001	240 00002	240 00003
160 - 360	-	241 00001	241 00002	241 00003
280 - 410	-	242 00001	242 00002	242 00003
280 - 510	-	243 00001	243 00002	243 00003

Application range [mm]	Meas. depth [mm]				
	1250 Art.-No.	1500 Art.-No.	2000 Art.-No.	2500 Art.-No.	3000 Art.-No.
18 - 35	234 00004	-	-	-	-
35 - 60	235 00004	235 00005	235 00006	235 00007	235 00008
50 - 100	236 00004	236 00005	236 00006	236 00007	236 00008
50 - 150	237 00004	237 00005	237 00006	237 00007	237 00008
100 - 160	238 00004	238 00005	238 00006	238 00007	238 00008
100 - 230	239 00004	239 00005	239 00006	239 00007	239 00008
160 - 290	240 00004	240 00005	240 00006	240 00007	240 00008
160 - 360	241 00004	241 00005	241 00006	241 00007	241 00008
280 - 410	242 00004	242 00005	242 00006	242 00007	242 00008
280 - 510	243 00004	243 00005	243 00006	243 00007	243 00008



SUBITO® 50 - 100 in:
Special measuring depth SMT
1000 mm
Standard meas. depth SU
short version SK

SUBITO® Precision Bore Measuring Instruments

for measuring deep bores

SE



SERIES 130-133

For the use with an electronic length measuring probe and indicating unit; measuring depths up to 12 m are possible.

A complete instrument consists of: meas. head, connecting tube (1000 mm) w. cardan joint, length measuring probe, extensions if necessary. Delivery in transportation box, w/o length measuring probe, w/o indicating unit.

SUBITO® SE

Application range [mm]	Art.-No.
35 - 60	130 00000
50 - 90/(120)*	131 00000/01
100 - 230	132 00000
> 200	on request

* meas. range extension up to Ø 120 mm/160 mm on request

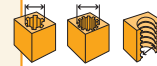


SUBITO® SE for deep bores
up to 12 m depth

SUBITO® Precision Bore Gauge

KT

for measuring reference diameters of internal gears



SERIES 160-164

Delivery: Holder with contact pin and exchangeable measuring inserts; contact pin and measuring inserts with inside thread to screw in ball inserts; in wooden box, ball inserts to be ordered separately. Measuring instruments for internal gears from diameter 8 mm based on OSIMESS on inquiry.

SUBITO® KT

	Application range M [mm]	Art.-No.
KT 12	8 - 12	160 00000
KT 22	12 - 22	161 00000
KT 55	22 - 55	162 00000
KT 250	55 - 250	163 00000
KT 510	100 - 510	164 00000

ACCESSORIES KT

	Application range M [mm]	Thread	Art.-No.
KT 12	1 Set ball inserts w. tungsten carbide balls of your choice*; ball - Ø d over 0,8 mm up to 2 mm (1 x meas. pin, 1 x ball insert)	M 1,6	160 00001
KT 22	1 Set ball inserts w. tungsten carbide balls of your choice*; ball - Ø d over 0,8 mm up to 4 mm	M 1,6	161 00001
KT 55	1 Set ball inserts w. tungsten carbide balls of your choice*; up to ball - Ø d 7 mm	M 2,5	162 00001
	1 Set ball inserts w. tungsten carbide balls of your choice*; ball - Ø d over 7 mm up to 10 mm		162 00003
	Reducing socket for the use of ball inserts KT 22 in KT 55	M1,6/M2,5	162 00032
KT 250 and KT 510	1 Set ball inserts w. tungsten carbide balls of your choice*; up to ball - Ø d 7 mm	M 4	163 00001
	1 Set ball inserts w. tungsten carbide balls of your choice*; ball - Ø d over 7 mm up to 10 mm		163 00003
	Reducing socket for the use of ball inserts KT 55 in KT 250/510	M4/M 2,5	162 00004

* Ball inserts with standard ball diameter < 10 mm according to our tungsten carbide ball list on page 30. Deviating intermediate dimensions + 25% extra charge.
Ball inserts with tungsten carbide ball-Ø ≤ 0,8 mm and ≥ 10 mm on inquiry.

SUBITO® Precision Bore Gauge

for measuring plane-parallel distances

SP

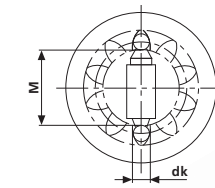
Delivery: Holder with special centring plate, fixed measuring pins, washers, in wooden box, w/o dial gauge. Movable contact pin tungsten carbide-tipped as standard.

SUBITO® SP

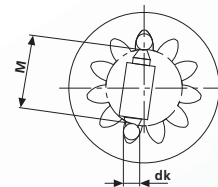
Application range [mm]	Meas. pins steel Art.-No.	Meas. pins carbide Art.-No.	Centring plate only Art.-No.
6 - 8	-	215 00000	215 00001
8 - 20	-	216 00000	216 00001
18 - 50	217 00000	217 00001	217 00002
50 - 100	218 00000	218 00001	218 00002
50 - 200	219 00000	219 00001	219 00002
100 - 160	220 00000	220 00001	220 00002
100 - 300	221 00000	221 00001	221 00002



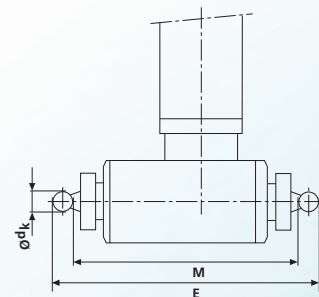
SUBITO® KT with measuring inserts and ball inserts



even no. of teeth



odd no. of teeth



SUBITO® KT dimensions



SERIES 215-221

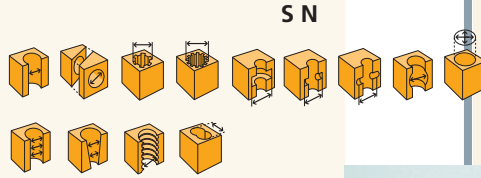


SUBITO® SP for plane-parallel distances (right)

Inspection Certificates for SCHWENK measuring instruments see p.32

SUBITO® Precision Bore Gauge

for measuring grooves
and recesses



SN

SERIES 165-167

Holder with retraction for measuring
recesses with groove width from 3 mm;
in wooden box, w/o dial gauge. Delivery
with one measuring pin for the required
diameter within the application range.

SUBITO® SN

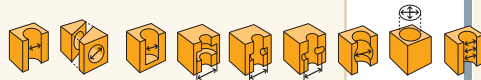
Application range [mm]	Retraction [mm]	Art.-No.
60 - 120	8,5	165 00000
120 - 180	23	166 00000
180 - 300	30	167 00000



SUBITO® SN for grooves
and recesses

SUBITO® Precision Bore Gauge

for measuring pillow
block housings, internal
grooves and recesses



ST

SERIES 170-176

with 180° rotatable fixed measuring pin; in
wooden box, w/o dial gauge.

SUBITO® ST

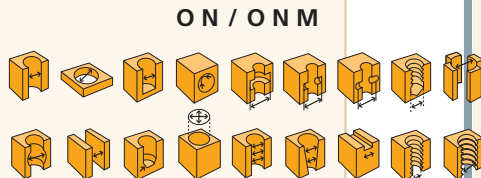
Application range [mm]		Standard Meas. depth	Meas. depth 200 mm	Meas. depth 400 mm	Meas. depth 750 mm
30 - 52	ST 52	170 00000	170 00001	170 00002	170 00003
50 - 70	ST 70	171 00000	171 00001	171 00002	171 00003
60 - 100	ST 100	172 00000	172 00001	172 00002	172 00003
80 - 150	ST 150	173 00000	173 00001	173 00002	173 00003
120 - 220	ST 220	174 00000	-	174 00002	174 00003
180 - 360	ST 360	175 00000	-	175 00002	175 00003
290 - 530	ST 530	176 00000	-	176 00002	176 00003



SUBITO® ST with fixed measuring
pin turned in

Precision Bore Gauge

for measuring
grooves and recesses



ON / ONM

SERIES 190

Complete set: basic unit and expanding
probe ON, ONM (additionally with meas.-
slides); Retraction travel up to 10 mm (stan-
dard); up to 20 mm from Ø 40 mm possible;
Delivery in wooden box, w/o dial gauge.
Expanding probe ON: Probe with deter-
mined range of application.
Expanding probe ONM: Probe with flexible
range of application through movable slides,
which have to be ordered separately.

BASIC UNIT ON / ONM

	Art.-No.
<i>Holder for expand. probe ON and ONM</i> 10 mm travel or 20 mm travel	190 00000



Basic unit ON / ONM with
expanding probe ON, ONM and
meas. slides

Precision Bore Gauge

ON / ONM

for measuring
grooves and recesses

SERIES 190

EXPANDING PROBE ON

Application range [mm]	Art.-No.
6 - 8	190 00001
8 - 12	190 00002
10 - 14	190 00003
12 - 18	190 00004
16 - 22	190 00005
<i>special ranges</i>	190 00035

EXPANDING PROBE ONM

Application range [mm]	Travel [mm]	Art.-No.
20 - 55	10	190 00006
40 - 200	10	190 00013
40 - 200	20	190 00041

MEASURING SLIDES FOR ONM

for ONM 20-55 Application range [mm]	Art.-No.	for ONM 20-55 Application range [mm]	Art.-No.
20 - 30	190 00007	40 - 50	190 00011
25 - 35	190 00008	45 - 55	190 00012
30 - 40	190 00009	<i>Special ranges</i>	190 00036
35 - 45	190 00010		

for ONM 40-200 Application range [mm]	Art.-No.	for ONM 40-200 Application range [mm]	Art.-No.
40 - 50	190 00014	70 - 80	190 00020
45 - 55	190 00015	75 - 85	190 00021
50 - 60	190 00016	80 - 90	190 00022
55 - 65	190 00017	85 - 95	190 00023
60 - 70	190 00018	90 - 100	190 00024
65 - 75	190 00019	95 - 105	190 00025

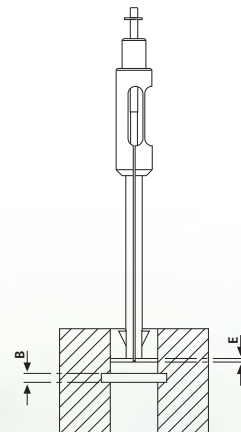
> 100 up to maximum 200 mm in 5 mm steps	190 00037
<i>Special ranges from 40 to 100 mm</i>	190 00038
<i>Special ranges from 100 to 200 mm</i>	190 00039
<i>Blind bore design</i>	<i>on inquiry</i>

ACCESSORIES / OPTIONS

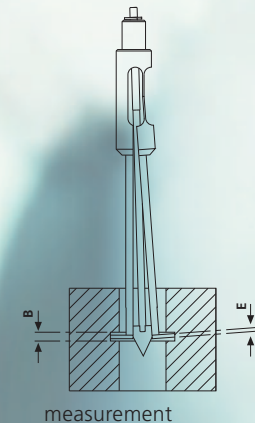
	Art.-No.
Measuring depth extension 100 mm from Ø 20	190 00032
Measuring depth extension 250 mm from Ø 20	190 00033
Depth stop	190 00034
Expanding probe - hard chrome plated	190 00901
Measuring slide - hard chrome plated	190 00902
Adapting expanding probes / measuring slides to reduced groove width B	190 00900



Accessories measuring
depth extension, depth stop



insertion



measurement

SUBITO® Setting Device

ESU

for setting two-point comparator measuring instruments with the help of gauge blocks

Delivery: frame with setting jaws holder, pair of setting jaws, tungsten carbide measuring anvils in gauge block quality, clamping unit, stand, in wooden box; w/o gauge blocks

FOR SUBITO® SU / SK / SW / SMT / SP / SV

Setting range [mm]	Art.-No.
4,5 - 35	125 00000
4,5 - 160	125 00001
4,5 - 290	125 00029
18 - 160	125 00028
18 - 290	125 00002
160 - 510	125 00003
160 - 800	125 00030

greater lengths / models for bore gauges of other brands on inquiry

for Series	Setting range [mm]	Art.-No.
SS	20 - 300	125 00005
SS	20 - 600	125 00038
ST	30 - 220	125 00006
ST	180 - 530	125 00007
OD-K/OD-KK	130 - 300	125 00034
OD-K/OD-KK	130 - 500	125 00035

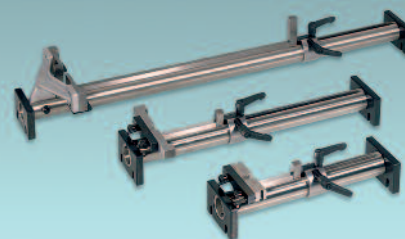
SPARE PARTS

Setting range [mm]	Art.-No.
Setting jaws holder with straddling lever (suitable for all setting jaws pairs, except for SP)	125 00008
Pair of setting jaws with stay bolt and nut	
4,5 - 35	125 00009
18 - 290	125 00011
20 - 300	for SS 125 00012
30 - 220	for ST 125 00013
6 - 160	w. setting jaws holder for SP 125 00014
Prism pair for OD cross sleeves / cross sleeves with runners	125 00033
Pair of tung. carbide meas. anvils for ESU 4,5 - 300	125 00015
Pair of tung. carbide meas. anvils for ESU 160 - 510	125 00036
Frame with clamping unit	
for setting range up to 160 mm	125 00016
for setting range up to 300 mm	125 00017
for setting range up to 600 mm	125 00031
for setting range up to 800 mm	125 00032
Special lengths on inquiry	
Stand for setting range up to 300 mm	125 00018
Wooden box	
4,5 - 160	125 00019
4,5 - 290	125 00020
18 - 290	125 00021
20 - 300	125 00022
160 - 510	on inquiry

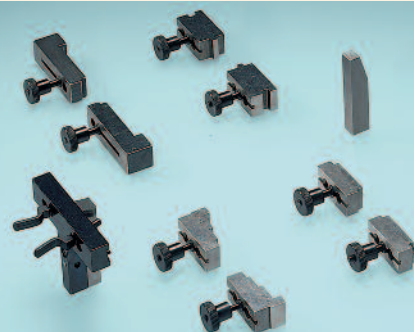
SERIES 125



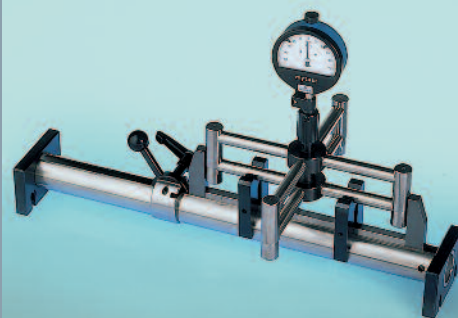
Setting device ESU with vertical measuring axis



Setting device ESU with horizontal measuring axis



Accessories setting jaws / measuring anvils



Setting device for OD cross sleeves / cross sleeves with runners

Distance measuring instruments

OT

for measuring bore depths, shoulders, widths / distances of grooves and recesses



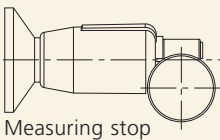
SERIES 198-199

SERIES OT

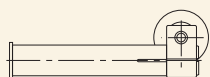
	Meas. depth [mm]	Art.-No.
OT - Standard with 6 mm ball insert M 2,5 and meas. bridge 80 mm, in wooden box	175/325	198 00000 / 198 00002
OT 4 - complete set with handle, meas. sleeve and probe finger, in wooden box	175/300	199 00000 / 199 00001

ACCESSORIES/SPARE PARTS

	dimens. [mm]	Art.-No.
Measuring bridge	80	198 00004
Measuring bridge	120	198 00005
Measuring depth extension	50	198 00007
Rotable probe finger	1	198 00009
Probe finger	10	198 00010
Measuring sleeve	50	198 00013
Measuring stop	28	198 00018



Measuring stop



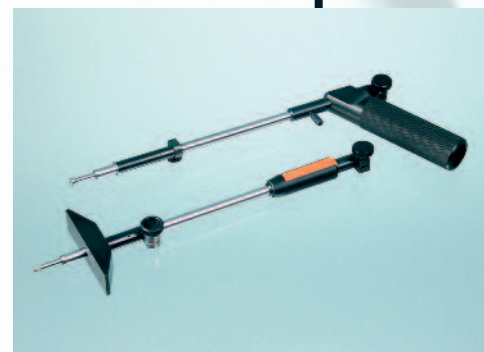
Measuring sleeve



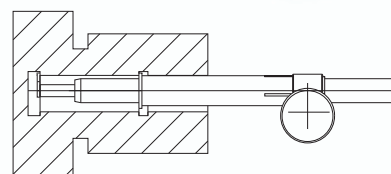
Rotable probe finger



Probe finger



Depth meas. instruments OT - Standard (bottom) and OT 4 (top)

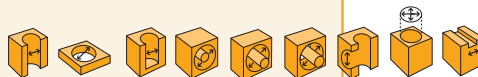


Principle OT

SUBITO® Precision Bore Gauge

SL

for measuring bores w. boring bar left in the workpiece



SERIES 150-154

Self-centring bore gauge for determining bore diameters, for instance with boring bar left in the workpiece.

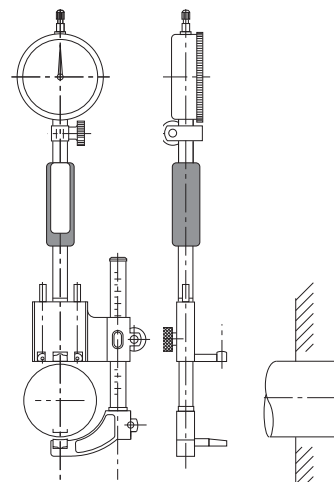
Design: meas. instrument w. column (mm- or inch-graduation) for pre-setting of the diameter, in wooden box, w/o dial gauge.

SUBITO® SL

Application range [mm]	max. Ø of boring bar [mm]	Meas. depth [mm]	Art.-No.
25 - 70	45	12	150 00000
35 - 105	70	17,5	151 00000
100 - 210	130	30	152 00000
100 - 280	130	30	153 00000
200 - 500	220	30	154 00000
[inch]	[inch]	[inch]	
1.00 - 2.75	1.77	0.47	150 00001
1.38 - 4.33	2.76	0.69	151 00001
3.94 - 8.27	5.12	1.18	152 00001
3.94 - 11.02	5.12	1.18	153 00001
7.87 - 19.68	8.66	1.18	154 00001



SUBITO® SL



Inspection Certificates for SCHWENK measuring instruments see p.32

Measuring Tapes

CJU/C/CJU-CENTI

for measuring outside circumference and diameter of cylindrical parts



SERIES 620-621

CIRCOMETER CJU

Circumference tape for measuring the outside circumference and diameter; graduation distance 1 mm, scaling according to DIN 866; with vernier 0,1 mm, laserscaled. Tape width: 16 mm.

CIRCOMETER CJU

Circumference range [mm]	Diameter range [mm]	Type	Art.-No. steel	Art.-No. stainless steel	Art.-No. black
60 - 950	20 - 300	CJU 950	620 00001	620 00027	620 00200
940 - 2200	300 - 700	CJU 2200	620 00002	620 00028	620 00201
2190 - 3460	700 - 1100	CJU 3460	620 00003	620 00029	620 00202
3450 - 4720	1100 - 1500	CJU 4720	620 00004	620 00030	620 00203
4710 - 5980	1500 - 1900	CJU 5980	620 00005	620 00031	620 00204
5970 - 7230	1900 - 2300	CJU 7230	620 00006	620 00032	620 00205
7220 - 8500	2300 - 2700	CJU 8500	620 00007	620 00033	620 00206
8490 - 9760	2700 - 3100	CJU 9760	620 00008	620 00034	620 00207
9730 - 11010	3100 - 3500	CJU11010	620 00009	620 00035	620 00208
- 23550	- 7500	<i>on inquiry</i>			



Measuring tape Circometer CJU

Circumference range [inch]	Diameter range [inch]	Type	Art.-No. steel	Art.-No. stainless steel
2 - 38	0,8 - 12,0	CJU 38	620 00010	620 00036
37 - 87	11,8 - 27,7	CJU 87	620 00011	620 00037

*On inquiry: CJU with tape width 6/35/60 mm and more inch ranges
CJU with vernier 0,05 mm (for diameter reading only)*

C-TAPE

C-measuring tape for determining the outside diameter; graduation distance 1 mm, with vernier 0,05 mm, laserscaled. Tape width: 12 mm.

Standard design: out of stainless steel
Black coated design: for maximum reading contrast.

C-MEASURING TAPE

Meas. range Ø [mm]	Type	Art.-No. black	Art.-No. stainless steel
15 - 115	C 115	621 00110	621 00063
100 - 230	C 230	621 00111	621 00064
200 - 330	C 330	621 00112	621 00065
300 - 620	C 620	621 00116	621 00073



C-tape with vernier 0,05 mm top: black C-measuring tape

CJU-CENTI

Measuring device for outside circumference CJU-Centi

Tape measuring device for the precise determination of outside circumferences, consisting of basic unit, interchangeable bevel tape and 1/100 dial gauge. Tape width: 10 mm.

CJU-CENTI

Application range [mm]	Art.-No.
<i>Basic unit with bevel tape (0,1 x 10) for application range 50 - 1000 mm</i>	620 00062
<i>Bevel tape from Ø 10 mm</i>	<i>on inquiry</i>



Measuring device CJU-Centi

Measuring Tapes

CJL/IUB/NO

for measuring plane-parallel distances and for inside circumference and diameter of cylindrical parts



SERIES 622-624

MEASURING TAPE CJL

Length measuring tape CJL for measuring plane-parallel distances

graduation dist. 1 mm; w. vernier 0,1 mm; laserscaled, stainless steel. Tape width: 16 mm.

BANDMAB CJL

Type	Meas. range Distance [mm]	Art.-No.
CJL 950	60 - 950	622 00076
CJL 2200	900 - 2200	622 00077
CJL 3460	2200 - 3460	622 00078
CJL 4720	3400 - 4720	622 00079
CJL 6000	4700 - 6000	622 00080

Larger measuring ranges on inquiry



Length measuring tape CJL

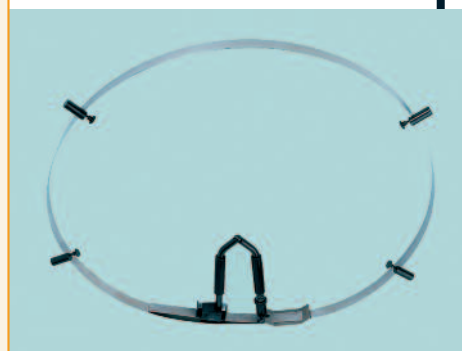
INSIDE CIRCUMFERENCE TAPE IUB

Measuring tape for determining the inside circumference and average diameter of round, oval or constant polygonal bores. Graduation distance 1 mm with vernier 0,1 mm, laserscaled, stainless steel; The tape is put against the inside bore wall with the help of clamping nippers. Tape width: 20 mm.

CIRCUMFERENCE TAPE IUB

Circumference range [mm]	Diameter range [mm]	Type	Art.-No.
<i>Clamping nippers for IUB (needed only once); for all tape ranges</i>			623 00016
720 - 1550	230 - 490	IUB 1550	623 00012
940 - 2200	300 - 700	IUB 2200	623 00013
2190 - 3620	700 - 1100	IUB 3620	623 00014
3450 - 4720	1100 - 1500	IUB 4720	623 00015
4710 - 5980	1500 - 1900	IUB 5980	623 00071
5970 - 7230	1900 - 2300	IUB 7230	623 00086
7220 - 8500	2300 - 2700	IUB 8500	623 00087

Larger measuring ranges on inquiry



Inside circumference tape IUB with clamping nippers

NOVOMETER

Contour measuring instrument for determining the average inside diameter of round, oval or constant polygonal bores, with scaled ring and vernier. Tape width: 20 mm.

Digital Novometer: with resolution 0,01 mm; recording of measuring values through interface RS 232 or RS 485 also for SPC-Systems; Digital display for Ø or circumference. Individual meas. range.

CONTOUR GAUGE NOVOMETER

Diameter range [mm]	Reading [mm]	Art.-No.
14 - 24	0,1	624 00017
22 - 40	0,1	624 00018
35 - 60	0,1	624 00019
55 - 100	0,1	624 00020
95 - 180	0,1	624 00021
170 - 255	0,1	624 00022
245 - 330	0,1	624 00070
<i>Spare tape for Novometer</i>	0,1	624 00085

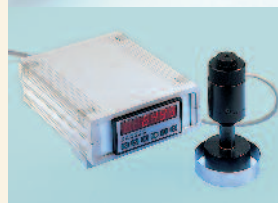
Option: Sliding clutch for reproducible measuring force with elastic work pieces

Digital Novometer on inquiry

on inquiry



Contour Gauge Novometer



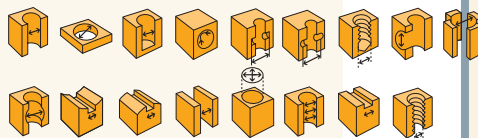
Digital Novometer

Inspection Certificates for SCHWENK measuring tapes see page 33

OSIMESS Precision Bore Gauge

OS/OSH/OSS

for small diameters
from 1,0 - 20 mm



SERIES 625-628

STANDARD DESIGN OS COMPLETE SETS

Delivery: hardchromed design, wedge-shaped meas. needle generally tungsten carbide; holder of your choice, in wooden box, w/o setting rings, w/o dial gauge. Separate probes see pages 19 and 20

OSIMESS OS

Application range [mm]		no. of probes	Holder w/o retraction	Holder with retraction
nominal range	effective range			
1,0 - 1,4	0,95 - 1,55	5	627 00400	627 00401
1,75 - 4,0	1,5 - 4,2	10	627 00402	627 00403
1,0 - 4,0	0,95 - 4,2	15	627 00404	627 00405
4,5 - 7,5	4,15 - 7,8	7	627 00200	627 00201
8,0 - 12,0	7,7 - 12,5	6	627 00300	627 00301
4,5 - 12,0	4,15 - 12,5	13	627 00000	627 00001
13,0 - 20,0	12,2 - 20,6	8	628 00000	628 00001



OSIMESS - probes overall view

DESIGN OSH COMPLETE SETS

As described for OS, but with tungsten carbide tipped probes

OSIMESS OSH

Application range [mm]		no. of probes	Holder w/o retraction	Holder with retraction
nominal range	effective range			
1,0 - 1,4	0,95 - 1,55	5	626 00200	626 00201
1,75 - 4,0	1,5 - 4,2	10	626 00202	626 00203
1,0 - 4,0	0,95 - 4,2	15	626 00000	626 00001
4,5 - 7,5	4,15 - 7,8	7	627 00202	627 00203
8,0 - 12,0	7,7 - 12,5	6	627 00302	627 00303
4,5 - 12,0	4,15 - 12,5	13	627 00004	627 00005
13,0 - 20,0	12,2 - 20,6	8	628 00004	628 00005



OSIMESS probe
blind bore design OSS (top)
OSIMESS probe
standard design OS (bottom)

DESIGN OSS COMPLETE SETS

As described for OS, but with probes for blind bores from \varnothing 1,75 mm.

OSIMESS OSS

Application range [mm]		no. of probes	Holder with retraction
nominal range	effective range		
1,75 - 4,0	1,5 - 4,2	10	626 00003
4,5 - 7,5	4,15 - 7,8	7	627 00204
8,0 - 12,0	7,7 - 12,5	6	627 00304
4,5 - 12,0	4,15 - 12,5	13	627 00003
13,0 - 20,0	12,2 - 20,6	8	628 00003



OSIMESS in wooden box

OSIMESS Precision Bore Gauge

OS

SERIES 625-628

OSIMESS-HOLDER

Holder with retraction especially recommended for probes up to 4 mm, for blind bores probes and for the max. protection of the probes.

OSIMESS-HOLDER

Design	Art.-No.
Holder w/o retraction for 1,0 - 20,0 mm	625 00009
Holder with retraction for 1,0 - 20,0 mm	626 00010

SETTING RINGS

Set	Quantity	Art.-No.
1,0 - 1,4	5	626 00204
1,75 - 4,0	10	626 00205
1,0 - 4,0	15	626 00004
4,5 - 7,5	7	627 00205
8,0 - 12,0	6	627 00305
4,5 - 12,0	13	627 00006
13,0 - 20,0	8	628 00006

ACCESSORIES

	Meas. range [mm]	Art.-No.
Clamp with depth stop	1,0 - 4,0	626 00005
	4,5 - 9,0	627 00007
	10,0 - 20,0	628 00007
Angle piece 90°	1,0 - 20,0	625 00008
Measuring depth extension from Ø 10 mm	50 mm long	625 00101
	100 mm long	626 00102
	250 mm long	627 00103

OS-probe with special length for Ø < 10 mm on inquiry

OSIMESS-Spare parts

PROBES 1,0 - 4,0 MM

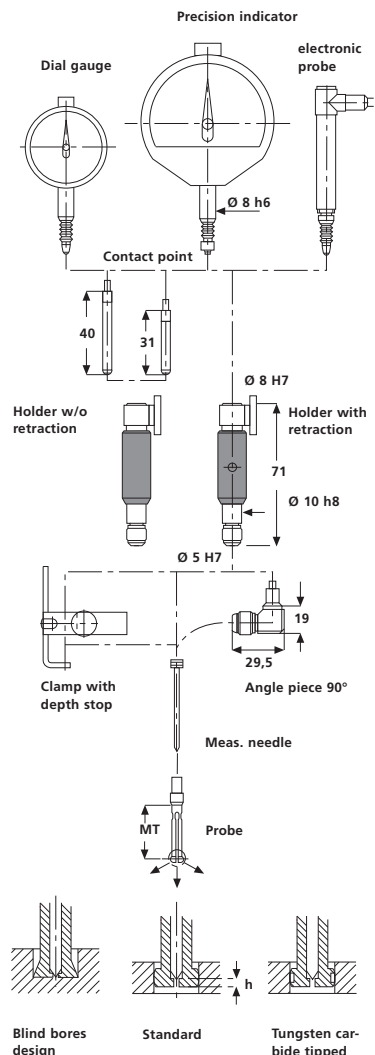
Nom.dim. [mm]	Meas. range [mm]	Probe OS Art.-No.	Probe OSH Art.-No.	Probe OSS Art.-No.	Setting ring Art.-No.
1,0	0,95 - 1,15	626 00078	626 00012	-	626 00052
1,1	1,07 - 1,25	626 00079	626 00013	-	626 00053
1,2	1,17 - 1,35	626 00080	626 00014	-	626 00054
1,3	1,27 - 1,45	626 00081	626 00015	-	626 00055
1,4	1,37 - 1,55	626 00082	626 00016	-	626 00056
1,75	1,50 - 1,90	626 00083	626 00017	626 00042	626 00057
2,0	1,80 - 2,20	626 00084	626 00018	626 00043	626 00058
2,25	2,05 - 2,45	626 00085	626 00019	626 00044	626 00059
2,5	2,30 - 2,70	626 00086	626 00020	626 00045	626 00060
2,75	2,55 - 2,95	626 00087	626 00021	626 00046	626 00061
3,0	2,80 - 3,20	626 00088	626 00022	626 00047	626 00062
3,25	3,05 - 3,45	626 00089	626 00023	626 00048	626 00063
3,5	3,30 - 3,70	626 00090	626 00024	626 00049	626 00064
3,75	3,55 - 3,95	626 00091	626 00025	626 00050	626 00065
4,0	3,80 - 4,20	626 00092	626 00026	626 00051	626 00066

MEASURING NEEDLES

Measuring needles OS/OSH/OSS from Ø 1,75 mm	Art.-No.
1,0 - 1,4	626 00067
1,75 - 2,25	626 00068
2,5 - 4,0	626 00069
Wooden box for OS + OSH and OSS 1,0 - 4,0	626 00072



Angle piece 90° with OSIMESS-holder



Assembly OSIMESS system

Inspection Certificates for SCHWENK measuring instruments see p.32

OSIMESS Precision Bore Gauge

OS

SERIES 625-628

PROBES 4,5-9,0 MM

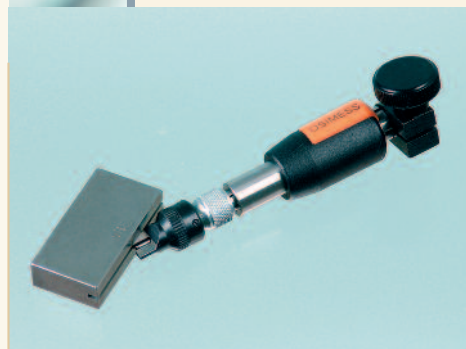
Nom. dim. [mm]	Meas. range [mm]	Probe OS Art.-No.	Probe OSH Art.-No.	Probe OSS Art.-No.	Setting ring Art.-No.
4,5	4,15 - 4,80	627 00015	627 00063	627 00047	627 00079
5,0	4,70 - 5,30	627 00016	627 00064	627 00048	627 00080
5,5	5,20 - 5,80	627 00017	627 00065	627 00049	627 00081
6,0	5,70 - 6,30	627 00018	627 00066	627 00050	627 00082
6,5	6,20 - 6,80	627 00019	627 00067	627 00051	627 00083
7,0	6,70 - 7,30	627 00020	627 00068	627 00052	627 00084
7,5	7,20 - 7,80	627 00021	627 00069	627 00053	627 00085
8,0	7,70 - 8,30	627 00022	627 00070	627 00054	627 00086
8,5	8,20 - 8,80	627 00023	627 00071	627 00055	627 00087
9,0	8,70 - 9,30	627 00024	627 00072	627 00056	627 00088



Standard OSIMESS probe OS

MEASURING NEEDLES

	Art.-No.
4,5 - 9 mm OS - OSH	627 00095
4,5 - 9 mm OSS	627 00096
Wooden box OS - OSH - OSS 4,5 - 12,0	627 00097



Special probe OSF for keyway

PROBES 10,0-20,0 MM

Nom. dim. [mm]	Meas. range [mm]	Probe OS Art.-No.	Probe OSH Art.-No.	Probe OSS Art.-No.	Setting ring Art.-No.
10	9,2 - 10,5	627 00106	627 00112	627 00109	627 00090
11	10,2 - 11,5	627 00107	627 00113	627 00110	627 00092
12	11,2 - 12,5	627 00108	627 00114	627 00111	627 00094
13	12,2 - 13,5	628 00015	628 00039	628 00031	628 00047
14	13,4 - 14,7	628 00016	628 00040	628 00032	628 00048
15	14,4 - 15,7	628 00017	628 00041	628 00033	628 00049
16	15,4 - 16,7	628 00018	628 00042	628 00034	628 00050
17	16,4 - 17,7	628 00019	628 00043	628 00035	628 00051
18	17,4 - 18,7	628 00020	628 00044	628 00036	628 00052
19	18,4 - 19,7	628 00021	628 00045	628 00037	628 00053
20	19,4 - 20,7	628 00022	628 00046	628 00038	628 00054
> 20 - 40	Standard and for blind bores on inquiry				

MEASURING NEEDLES

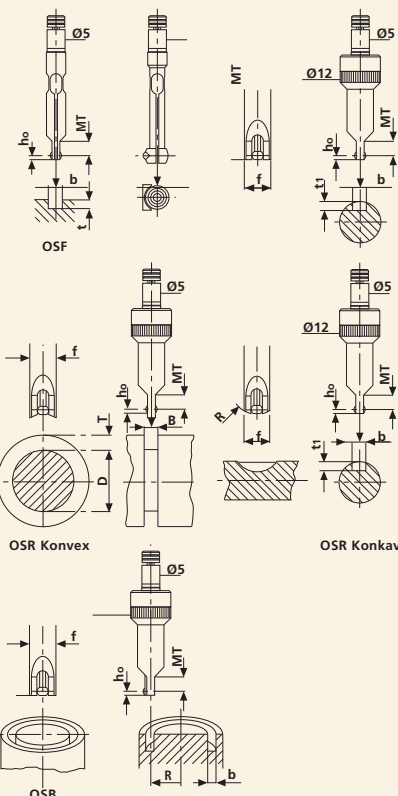
	Art.-No.
10 - 20 OS - OSH	628 00055
10 - 20 OSS	628 00056
Wooden box OS - OSH - OSS 13,0 - 20,0	628 00057

SPECIAL PROBES OSF FOR MEASURING GROOVES AND RECESSES

- Examples:
- OSF for plane-parallel distances, e.g. keyways
 - OSR convex for radial grooves, OSR concave for wood ruff keys
 - OSB for axial or special grooves

Please let us know the exact nominal dimension w. tolerance with your order. For OSR/ OSB please indicate additionally the radius.

Example:
 Special probe OSF No. 626 00035 3,0 H7
 Probe OSF No. 626 00035 3 +0,15 / -0,01mm



Special probes OSIMESS OSF

OSIMESS OSF

Special probe OSF with nominal dimension [mm] between	Probe Art.-No.	Meas. needle Art.-No.
1,0 - 1,4	626 00027	626 00067
1,75 - 2,25	626 00032	626 00068
2,5 - 4,0	626 00035	626 00069
4,5 - 9,0	627 00031	627 00105
10,0 - 20,0	627 00042	628 00064

Measuring Stand OSM

OSM 5

for the series control of
small workpieces

MEASURING STAND OSM 5 MEASURING STAND OSM 6

Height continuously adjustable up to 250 mm, max. working stroke 90 mm. With depth meas. device and clamping device for second indicating unit. Can also be used in combination with SUBITO® or plug gauges OD or similar bore gauges as well as for depth and thickness measurements (as an option). Delivery w/o dial gauge.

Height continuously adjustable up to 130 mm. Working stroke of the table max. 40 mm, suitable for workpieces up to 144 mm.

MEASURING STAND

Model	Art.-No.
OSM 5	629 00015
OSM 6	629 00016

ACCESSORIES OSM 5

Designation	Art.-No.
<i>Floating workpiece support for self-alignment of small workpieces</i>	629 00001
<i>Floating gauge block holder to ease the exact setting with gauge blocks from 1 - 20 mm</i>	629 00002
<i>Floating holder with clamping shaft, for integrating the OSIMESS holder or OD holder or for the use in fixtures</i>	629 00003
<i>Measuring travel limitation for OSIMESS holder w. retraction</i>	629 00011

Master setting rings

according to DIN 2250

Ideal for setting of OD plug gauges and of SUBITO meas. instruments. Setting rings made of hardened 62 HRC steel, according to DIN 2250. Tolerance of diameter is JS3. The rings are marked with their actual size (up to 1 µm).

MASTER SETTING RINGS

Setting rings Ø 1-20 mm see Series 625-628 OSIMESS	
Setting rings type C Ø 1 - 300 mm	
Setting rings type B - for pneumatic plug gauges	
Setting rings for tapers	on inquiry
Setting rings for toothings	
Setting rings more accurate than JS3	
Separate price list for master setting rings on inquiry.	

SERIES 629



Measuring stand OSM 5 with OSIMESS probe

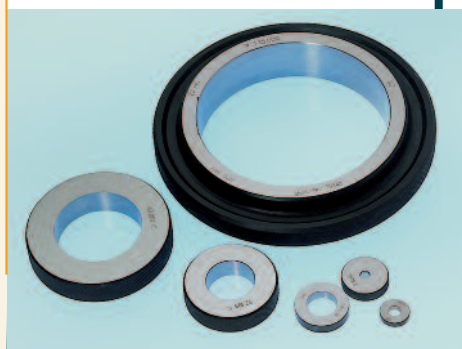


Measuring stand OSM 6



Floating holder

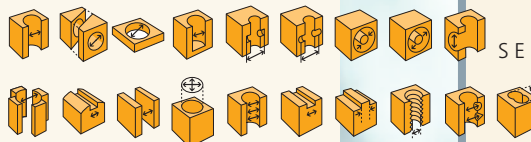
SERIES 129



Setting rings according to DIN 2250

Indicating Plug Gauge OD

for measuring internal diameters, application range 2,0 - 800 mm



SERIES 300-326

Assembly complete set: 1 measuring sleeve with two radially movable contact pins, offset by 180° + OD holder (see page 23) + indicating unit of choice.

Standard meas. range: 0,2 mm for $\varnothing \geq 6$ mm

Standard design of the meas. sleeve: tool steel w. tungsten carbide meas. contacts

OD MEASURING SLEEVES, STANDARD

Nominal- \varnothing [mm]	h [mm]	standard Art.-No.	h [mm]	for through bores Art.-No.	h [mm]	for blind bores Art.-No.
2,0 - 3,0	1,0	300 00015	-	-	0,7	300 00016
3,1 - 6	1,5	300 00000	6	300 00002	1	300 00001
6,1 - 12	2,5	301 00000	6/10*	301 00002	1	301 00001
12,1 - 20	2,5	302 00000	10	302 00002	1	302 00001
20,1 - 30	3,5	303 00000	10	303 00002	1,2	303 00001
30,1 - 40	3,5	304 00000	10	304 00002	1,2	304 00001
40,1 - 60	3,5	305 00000	10	305 00002	1,2	305 00001
60,1 - 80	4,0	306 00000	10	306 00002	1,2	306 00001
80,1 - 100	4,0	307 00000	10	307 00002	1,2	307 00001
100,1 - 110	4,0	308 00000	10	308 00002	1,2	308 00001
110,1 - 120	4,0	309 00010	10	309 00012	1,2	309 00011
120,1 - 130	4,0	310 00010	10	310 00012	1,2	310 00011
> 130		on inquiry				

*nom. - \varnothing 6,1-9 mm, h=6 mm; nom. - \varnothing 9,1-12 mm, h=10 mm

Please let us know the exact bore tolerance with your order:

Example: Meas. sleeve OD No. 304 00000 35 H7

Meas. sleeve OD No. 304 00000 35 + 0,15 /-0,01

Meas. sleeve OD No. 304 00000 34,990/35,005

OD MEASURING SLEEVES, HARDCHROMED

Nominal- \varnothing [mm]	h [mm]	Standard Art.-No.	h [mm]	for through bores Art.-No.	h [mm]	for blind bores Art.-No.
2,0 - 3,0	1,0	300 00019	-	-	0,7	300 00020
3,1 - 6	1,5	300 00004	6	300 00009	1	300 00008
6,1 - 12	2,5	301 00004	6/10*	301 00009	1	301 00008
12,1 - 20	2,5	302 00004	10	302 00009	1	302 00008
20,1 - 30	3,5	303 00004	10	303 00009	1,2	303 00008
30,1 - 40	3,5	304 00004	10	304 00009	1,2	304 00008
40,1 - 60	3,5	305 00004	10	305 00010	1,2	305 00009
60,1 - 80	4,0	306 00004	10	306 00015	1,2	306 00009
80,1 - 100	4,0	307 00004	10	307 00011	1,2	307 00010
100,1 - 110	4,0	308 00004	10	308 00016	1,2	308 00005
110,1 - 120	4,0	309 00004	10	309 00006	1,2	309 00005
120,1 - 130	4,0	310 00004	10	310 00006	1,2	310 00005
> 130		on inquiry				

*nom. - \varnothing 6,1-9 mm, h=6 mm; nom. - \varnothing 9,1-12 mm, h=10 mm

OD CROSS SLEEVES [WITH RUNNERS]

Sleeve- \varnothing [mm]	h [mm]	cross sleeve w. runners Art.-No.	h [mm]	cross sleeve w. runners Art.-No.	h [mm]	cross sleeve Art.-No.
130,1 - 140	7	311 00001	18	311 00000	6	311 00002
140,1 - 150	7	312 00001	18	312 00000	6	312 00002
150,1 - 160	7	313 00001	18	313 00000	6	313 00002
160,1 - 170	7	314 00001	18	314 00000	6	314 00002
170,1 - 180	7	315 00001	18	315 00000	6	315 00002
180,1 - 190	7	316 00001	18	316 00000	6	316 00002
190,1 - 200	7	317 00001	18	317 00000	6	317 00002
200,1 - 300	7	318 00001	18	318 00000	6	318 00002

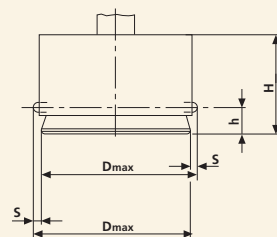
ESU Setting master therefore see Series 125



Plug gauges OD for various bore diameters and in open design

Floating contacting principle:

- H: Sleeve length
- h: Front distance; distance of meas. axis to bottom of the bore
- D_{max} : maximum \varnothing to be measured
- s: Measuring range = 0,2 mm



OD Dimensions



Cross sleeve from \varnothing 130 mm for centring shoulders or measuring with depth stop



Cross sleeve with runners from \varnothing 130 mm for through and deep bores

Indicating Plug Gauge OD

Measuring sleeves in open design for high surface roughness.
Measuring contacts with enlarged radii, to ensure filter effects with unpolished surfaces; tungsten carbide tipped, easy cleaning.

OD MEASURING SLEEVES WITH LARGE CONTACT RADIUS

Nominal-Ø [mm]	h Standard [mm]	Art.-No.	h blind bores [mm]	Art.-No.
3 - 6	6	300 00007	-	-
6,1 - 12	6/10*	301 00011	2	301 00012
12,1 - 20	10	302 00010	1,5	302 00011
20,1 - 30	10	303 00010	1,5	303 00011
30,1 - 40	10	304 00016	4	304 00019
40,1 - 60	10	305 00008	4	305 00011
60,1 - 80	10	306 00013	4	306 00016
80,1 - 100	10	307 00009	4	307 00012
> 100	10	on inquiry	4	on inquiry

*nom. - Ø 6,1-9 mm, h=6 mm; nom. - Ø 9,1-12 mm, h=10 mm

SPECIAL DESIGNS ON INQUIRY:

- with integrated inductive meas. probes, from Ø 25 mm
- Contact pins and/or sleeve out of Delrin for scratch sensible, polished workpieces
- Front distance „h“ non-standard
- Meas. sleeves for automatic measuring
- Three-point design
- Contact pins ruby, ceramic, diamond or hardchromed
- Two or more measuring axes
- Special sleeves for plane parallel distances
- Special profiles for extruders or for housings of toothed wheel pumps
- Blind bores design with $h \leq 1$ mm
- Extended meas. range > 0,2 mm
- Taper measurement - see illustration

Technical details regarding the Series OD can be found in our technical documentation 300 T

OD HOLDER

with thread connection M11 x 0,75 for direct connection to all OD meas. sleeves

OD HOLDER

Length [mm]	Art.-No.
50	320 00000
105	320 00001
235	320 00002
<i>greater length on inquiry</i>	
<i>Holder F, especially for electronic length meas. probes, w. fine adjustment, 110 mm long</i>	
	320 00004
<i>Strengthened holder w. tube Ø 18 mm, recommended for sleeve-Ø > 60 mm</i>	
145	320 00038
235	320 00039
<i>Holder with retraction, 70 mm long, recommended for blind bore sleeves</i>	
	320 00042

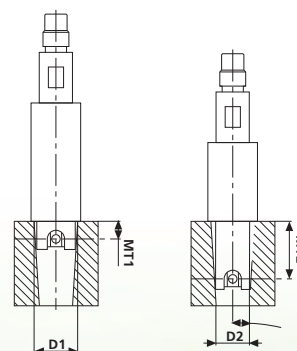
SERIES 300-326



OD measuring sleeve
Ø 60 mm



OD measuring sleeves in special design



Taper measurement



OD Holders

Accessories for Plug Gauge OD

SERIES 300-326

MEASURING DEPTH EXTENSION

for measuring also in large depth,
interchangeable, therefore very flexible
for different measuring depth

MEAS. DEPTH EXTENSION

Length [mm]	Ø 3,9 mm for OD Ø 4,0-6,5 mm	Ø 6,5 mm for OD Ø 6,5-12 mm	Ø 12 mm for OD from Ø 12 mm	Ø 18 mm for OD from Ø 60 mm
50	323 00100	323 00110	-	-
100	323 00101	323 00111	323 00000	323 00004
250	323 00103	323 00113	323 00001	323 00005
500	-	-	323 00002	323 00006
1000	-	-	-	323 00007

Please let us have the Ø of the corresp. OD sleeve with your order.

Extensions for measuring sleeves <4 mm: on inquiry.

DEPTH STOP

for measuring in reproducible measuring
depths and for eliminating the tilting error.

Please indicate with your order:

minimum/maximum measuring depth

SET COLLAR [CLAMPED ON SLEEVE]

Diameter meas. sleeve [mm]	Art.-No.
3,0 - 40	322 00000
40,1 - 60	322 00001

(due to the weight only reasonable up to max. Ø 60 mm)

3-POINT DEPTH STOP [CLAMPED ON SHAFT]

30 - 50	322 00019
50,1 - 80	322 00020
80,1 - 100	322 00021
100,1 - 150	322 00022

BRIDGE DEPTH STOP FOR DEEP BORES# [CLAMPED ON SHAFT]

3 - 50	322 00007
50,1 - 80	322 00008
80,1 - 100	322 00009
> 100	on inquiry

FLOATING HOLDER

for the use in measuring devices with
automatic meas. instrument feeding

FLOATING HOLDER

for OD holder 105	Art.-No.
	629 00003



Depth stops for OD plug gauge



OD plug gauge with two measuring axes

Accessories for Plug Gauge OD

ANGLE PIECE

	Art.-No.
90° with thread M11 x 0,75	324 00000

STAND

	Art.-No.
with clamping-Ø 12 mm OD holder 105	325 00000
with clamping-Ø 18 mm for strengthened OD holder 145	325 00004

Wooden box

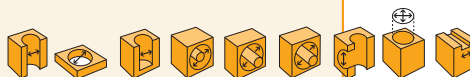
for secure storage of one standard OD holder, one dial gauge and one measuring sleeve

WOODEN BOX

Sleeve-Ø [mm]	Art.-No.
3 - 50	326 00000
50,1 - 100	326 00001
100,1 - 150	326 00002
150,1 - 200	326 00003

Precision bore gauges

for measuring internal and external diameters, for bores around a hub / with boring bar left in the workpiece, for centring shoulders, flanges etc.



SBO/SBU

SERIES 155

Manufactured individually to measure a definite bore diameter around a hub (SBO) or around a boring bar (SBU) or similar; the alignment of the instrument requires the support on the bottom of the bore or on a plane surface. High measuring accuracy, high measuring certainty. Delivery w/o dial gauge.

ORDER DATA SBO / SBU

- Bore diameter with tolerance D
- Diameter and height of the hubboring bar d
- Measuring depth MT
- Distance of the meas. axis to the bore bottom - front distance h
- Drawing of workpiece and / or workpiece

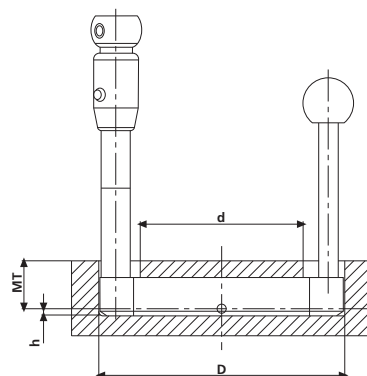
SERIES 300-326



Stand for OD with angle piece, plug gauge OD, depth stop (set collar), holder and precision indicator



Precision bore gauge SBO



Inspection Certificates for SCHWENK measuring instruments see p.32

Internal Chamfer Gauge IFM

for direct measuring the major diameter of internal chamfers and tapers

Delivery: Holder with integrated 90° or 127° taper and special ratio dial gauge with reading 0,01 mm for indication of measuring result. The gauge is preset.

INTERNAL CHAMFER GAUGE IFM

Type	Meas. range [mm]	Art.-No.
<i>IFM 20/90°</i>	0,5 - 20	194 00000
<i>IFM 40/90°</i>	20 - 40	194 00001
<i>IFM 20/127°</i>	0,5 - 20	194 00011
<i>IFM 40/127°</i>	20 - 40	194 00012

taper 60° on inquiry

SPARE PARTS

Type	Art.-No. IFM 20	Art.-No. IFM 40
<i>spec. dial gauge</i>	194 10006	194 10016
<i>holder w. 90° taper</i>	194 00003	194 00004
<i>spec. dial gauge 127°</i>	194 00017	194 00017
<i>holder w. 127° taper</i>	194 00005	194 00005

taper 60° on inquiry

Precision Indicator mytast

for internal measuring instruments of all series

Precision indicator according to DIN 879, ball bearing guided tracer rod, shockproof, 7 jewel movement, measuring force 1 N, adjustable tolerance markings, clamping shaft Ø 8 h6, with contact point 16 mm. Delivery in plastic box.

MYTAST/CENTITAST

Type	Reading [mm]	Range [mm]	Art.-No.	Model
<i>Mytast</i>	0,001	0,1	610 00000	<i>Standard</i>
<i>Mytast</i>	0,001	0,1	610 00012	<i>Splash-proof (IP54)</i>
<i>Mytast</i>	0,0001"	0,004"	610 00013	<i>Inch design</i>
<i>Centitast</i>	0,01	0,5	611 00000	<i>Standard</i>
<i>Centitast</i>	0,01	0,5	611 00011	<i>Splash-proof (IP54)</i>

Deviating measuring force and contact points on inquiry

ACCESSORIES

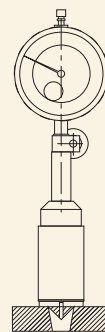
Designation	Art.-No.
<i>Angle piece 90° range s= 1,5 mm</i>	610 00011
<i>Shaft extension 90 mm*</i>	610 00014
<i>Release cable</i>	610 00052

* only available together with a precision indicator

SERIES 194



Internal Chamfer Gauges IFM



SERIES 610-611



Mytast



Centitast

Mechanical Dial Gauges

for internal measuring
instruments of all series

Design according to DIN 878, clamping
shaft \varnothing 8 h6, delivery in plastic box.

DIAL GAUGE

Reading [mm]	Housing \varnothing [mm]	Range [mm]	Art.-No.
0,01	58	10,0	600 00000
0,01	40	3,0	600 00001
0,001	58	1,0	600 00002
0,001	40	1,0	600 00003

Digital Dial Gauges

for internal measuring
instruments of all series

DIGITAL DIAL GAUGE

Series	Range [mm]	Resolution [mm]	Art.-No.
209	12,5	0,01	613 00010
209	12,5	0,001	613 00011
213	12,5	0,001	613 00012

Data transfer cable and larger measuring ranges on inquiry

Features:

- clamping shaft \varnothing 8 h6
- LCD digital display, height of digits 8,5 mm
- Data output: RS232 with optic coupling
- Housing aluminium, Display turnable 270°
- Power supply on lithium battery CR 2032; Battery life up to 4000 h

Series 213 additionally:

- Min/Max/Delta storage
- Selection and display of tolerance limits
- Preset value recall
- Change of measuring direction
- Selection of resolution
- Half duplex transmission

Functions:

- Zeroing
- Selection mm/inch
- Hold function
- Data transfer
- REF I / REF II
- Preset, Preset value

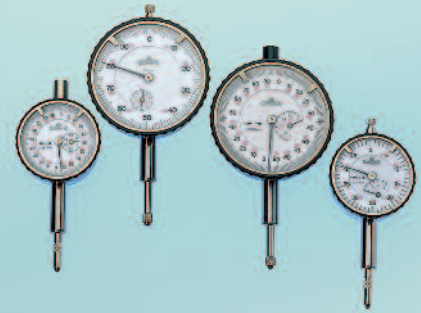
Linear stroke ball bearing

for easy backlash-free
linear movements

LINEAR STROKE BALL BEARING

Designation	Art.-No.
Ball bearing traveller with clamping shaft \varnothing 8 h6, with contact point 6 mm and 16 mm, with bellows, travel $h = 3$ mm	614 00000

SERIES 600



Dial gauges, housing-
 \varnothing 58 mm and 40 mm

SERIES 613



Digital dial gauge

SERIES 614



Ball bearing traveller

Coax-mandrels

for measuring
alignment errors between
two related bores

COAX-MANDREL

Fixed design for a determined bore
matching;
Enquiry/order data: drawing or/and
workpiece.

Plug gauges

for measuring positional
deviation of a bore in relation
to the reference

PLUG GAUGE FOR POSITIONAL DEVIATION

- For determining the centre deviation of a bore (for instance in a motor block or a gear housing) compared to a reference bore in a control wall
- Centring is obtained by the guide shank with a h3-fit
- Probe heads with wedge or segment bypass
- Vertical or horizontal arrangement of the dial gauge; delivery w. dial gauge

Precision measuring instruments

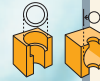
for measuring diameters,
roundness and course

Internal precision measuring instrument, with highest precision ($< 1 \mu\text{m}$), since the electronic probe is directly integrated in the measuring axis; for determining diameters from 90 mm and checking roundness and course; runners ensure self-alignment and centring. Delivery w/o. electronic probes. Prices on inquiry.

SERIES KM

Type	Application range [mm]	Meas. range [mm]
<i>KM 140</i>	90 - 140	I
<i>KM 200</i>	140 - 200	I
<i>KM 320</i>	200 - 320	I

K F



SERIES 999



Coax measuring instrument with workpiece

K S

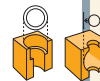


SERIES 999



Plug gauge for positional deviation

K M



SERIES 999



Measuring instrument with runners KM

Measuring instrument test device

MPV

for checking one-axial
length measuring instruments

TEST DEVICE

	Art.-No.
Measuring instrument test device MPV, for checking:	
- internal 2-point-contact comparison gauges (for instance SUBITO, OD, OSIMESS, etc...)	
- dial gauges	650 00000
- precision indicators for deviation, repeatability, hysteresis	

DELIVERY

- main stand	
- 2 setting units with a built-in micrometer screw	
- angle piece with clamping lug	
- adjustable anvil	
- adapter for various measuring sleeves connection threads	
Recording of the measured values for different distance sensors	
Software Tastkal for recording of the measured values according to DIN 878/879 or with free arrangeable runs with graphic diagram and record	on request
Complete system for fully automatic checking	

Reference unit

RV

Reference unit for setting
of one-axial length
measuring instruments

- Setting of 2-point-contact comparison gauges
- Setting of any intermediate dimensions, by which the linearity errors of the measuring instrument can be minimised
- Setting of wide length - setting rings or master blocks with long delivery time, high purchase costs and regular checking costs are not needed any more
- Use in the quality control, in the standards room and by the processing machine
- Linearity and hysteresis checking of 2-point-contact internal gauges
- Possibility of compensation in the indicating unit
- Integrated Heidenhain incremental measuring system

REFERENCE UNIT RV

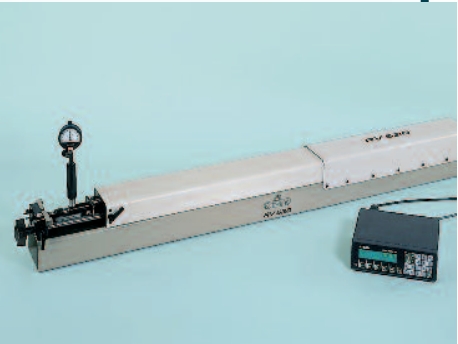
Type	Setting range [mm]	Accuracy with compensation	Art.-No.
RV 270	0 - 270	< 1µm to 100 mm < 2µm to 270 mm	125 00500
RV 520	0 - 520	< 1µm to 100 mm < 2µm to 270 mm < 3µm to 520 mm	125 00501
RV 1020	0 - 1020	< 1µm to 100 mm < 2µm to 270 mm < 3µm to 520 mm < 5µm to 1020 mm	125 00502

SERIES 650



MPV complete system

SERIES 999



Reference unit RV

Tungsten carbide precision balls

Extremely wear-resisting
and non-corroding

Applications: Measuring instruments, gauges, calibration tools, high-pressure valves, colour squirt devices, ball point pens, aerospace.

Material: sintered metal
(94% WC and 6% Co)
Hardness: HV 1550 ± 50
Precision: Grade 25

TUNGSTEN CARBIDE BALLS

Diameter		Art.-No.	Diameter		Art.-No.
[mm]	[Inch]		[mm]	[Inch]	
0,7937	1/32	680 00008	10,50		680 00047
1,00		680 00011	11,00		680 00048
1,190625	3/64	680 00012	11,50		680 00050
1,50		680 00015	12,00		680 00052
1,58750	1/16	680 00016	12,69988	1/2	680 00054
2,00		680 00018	13,00		680 00055
2,381250	3/32	680 00019	13,493750	17/32	680 00056
2,50		680 00020	14,00		680 00058
2,778125	7/64	680 00021	14,2875	9/16	680 00059
3,00		680 00022	14,50		680 00060
3,1750	1/8	680 00023	15,081250	19/32	680 00062
3,50		680 00024	15,8750	5/8	680 00064
3,968750	5/32	680 00025	16,00		680 00065
4,00		680 00026	16,668750	21/32	680 00066
4,50		680 00027	17,00		680 00067
4,76250	3/16	680 00028	17,46250	11/16	680 00068
5,00		680 00029	18,00		680 00069
5,50		680 00030	19,00		680 00071
5,556250	7/32	680 00031	19,050	3/4	680 00072
6,00		680 00032	19,843750	25/32	680 00073
6,350	1/4	680 00033	20,00		680 00074
6,50		680 00034	20,6375	13/16	680 00075
7,00		680 00035	21,00		680 00076
7,143750	9/32	680 00036	21,431250	27/32	680 00077
7,50		680 00037	22,00		680 00078
7,93750	5/16	680 00038	22,2250	7/8	680 00079
8,00		680 00039	23,00		680 00080
8,50		680 00040	23,81250	15/16	680 00081
8,731250	11/32	680 00041	24,00		680 00082
9,00		680 00042	24,606250	31/32	680 00083
9,50		680 00043	25,00		680 00084
9,5250	3/8	680 00044	25,40	1	680 00085
10,00		680 00045	26,00		680 00086

Further dimensions on inquiry.

Ruby precision balls

resistant to high temperatures,
with very low weight, acid-resisting
and good sliding quality

Applications: measuring instruments, contact balls for dial gauges, aerospace, chemical and nuclear industry

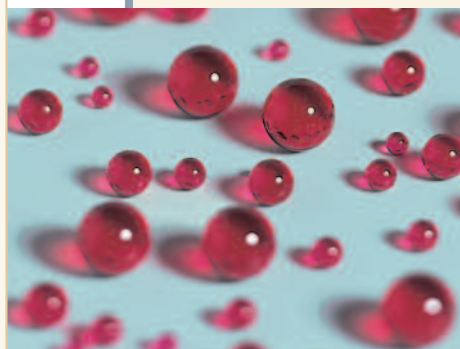
Material: aluminium-oxide
Hardness: Knoop 2000
Precision: Grade 25

SERIES 680



Tungsten carbide precision balls

SERIES 680



Ruby precision balls

Ceramic precision balls

resistant to high temperatures,
insensitive to abrasion and
aggressive media

Applications: measuring instruments,
valves, flowmeters, chemical and nuclear
industry

Material: aluminium-oxide
Hardness: Knoop 2000
Precision: Grade 25

Special measuring inserts

according to customer
configuration

for:

- dial gauges, precision indicators
- electronic probes
- measuring machines
- measuring devices
- manufactured according to specifications

Precision steel rulers

for fast and accurate length-measuring

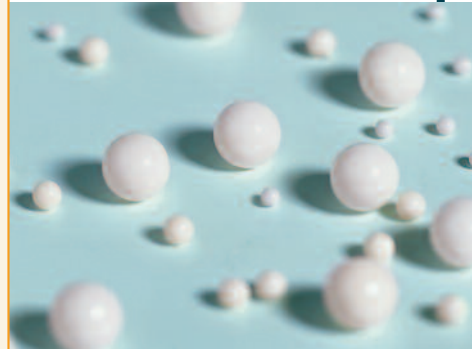
Steel rulers made of stainless steel.
Broad design with double laser marked scaling, in mm.
Mat surface for better reading.
High precision. Width 30 mm.

PRECISION STEEL RULERS

Meas. range [mm]	Deviation [mm]	Art.-No.
150	$\pm 0,1$	620 00849
300	$\pm 0,1$	620 00842
500	$\pm 0,1$	620 00843
1000	$\pm 0,15$	620 00844
2000	$\pm 0,2$	620 00845

Different measuring ranges and scalings, e.g. in Inch, on inquiry

SERIES 680



Ceramic precision balls

SERIES 680



Special measuring inserts

SERIES 620



Precision steel rulers

Inspection certificates

for SCHWENK
measuring instruments

SERIES 699

MANUFACTURER INSPECTION CERTIFICATES ACCORDING TO DIN 55350-18-4.2

Checking for repeatability, hysteresis and deviation (for comparator measuring instruments w/o dial gauge clamped in) at several measuring points, as well as visual and functional checking.

FOR MEASURING INSTRUMENTS

Description	Art.-No.
<i>SUBITO precision bore measuring instruments Series SU, SK, SV, SS, SP, KT and SCA up to SU 50 – 150 included</i>	699 00176
<i>SUBITO precision bore measuring instruments Series SU, SK, SV, SS, SP, KT and SCA, from SU 100 - 160 as well as SMT, SW, SE, SN, ST, SL</i>	699 00193
<i>OSIMESS split-ball probe OS, OSH, OSS up to probe 4,0 included</i>	699 00194
<i>OSIMESS split-ball probe OS, OSH, OSS from probe 4,5</i>	699 00178
<i>Precision indicator mytast / centitast according to DIN 879 part 1</i>	699 00179
<i>Dial gauge with 10 mm travel according to DIN 878</i>	699 00185
<i>Plug gauges OD up to Ø 200 mm</i>	699 00180
<i>Groove measuring instruments ON</i>	699 00181

INSPECTION CERTIFICATES ACCORDING TO DIN 55350-18-4.3

FOR SETTING RINGS

Description	Art.-No.
<i>Setting rings according to DIN 2250 and OSIMESS setting rings according to works standard, checking in 1 level; for Ø 0,5 – 1,4 mm</i>	699 00195
<i>Setting rings according to DIN 2250 and OSIMESS setting rings according to works standard, checking in 3 levels; from Ø 1,75 mm</i>	699 00209

INSPECTION CERTIFICATE FOR MEAS. ANVILS ESU

MEAS. ANVILS ESU

Description	Art.-No.
<i>Pair of meas. anvils for setting device ESU, Checking for evenness deviation and the mean surface roughness</i>	699 00187

Inspection certificates

for SCHWENK
measuring instruments

SERIES 699

QUALITY INSPECTION CERTIFICATES FOR MEAS. TAPES ACCORDING TO DIN 55350-18-4.1.2

FOR MEASURING TAPES

Description		Art.-No.
<i>Outside circumference measuring tape C-tape CJU 950 and CJU 2200 and CJL up to 2200</i>	<i>Checking of 1 scale (Ø or circumference) at several measuring points</i>	699 00188
<i>Outside circumference measuring tape CJU 950 and CJU 2200</i>	<i>Checking of both scales at several measuring points</i>	699 00189
<i>Inside and outside circumference measuring tape CJU 3460 and IUB and CJL from 3500</i>	<i>Checking of 1 scale (Ø or circumference) at several measuring points</i>	699 00183
<i>Inside and outside circumference measuring tape CJU 3460 and IUB</i>	<i>Checking of both scales at several measuring points</i>	699 00184
<i>Contour measuring instrument Novometer</i>	<i>Checking of the diameter at several measuring points</i>	699 00186

QUALITY INSPECTION CERTIFICATES FOR SCALES ACCORDING TO DIN 865 OR 866

SCALES

Description	Art.-No.
<i>Checking scales, work scales, like e.g. rulers, steel scales, tape measures For lengths up to 1.200 mm</i>	699 00196
<i>Checking scales, work scales, like e.g. rulers, steel scales, tape measures For lengths from 1.200 mm</i>	699 00197

For all calibration tasks, the traceability to the national standards is ensured. This is shown in each certificate.

A. General

- (1) Our terms and conditions of sale shall apply exclusively; contradictory terms and conditions of Customer or ones deviating from our terms and conditions of sale shall only be acknowledged if we expressly approve their validity in writing. Our terms and conditions of sale shall apply even if we supply to Customer without reservations despite knowledge of Customer's contradictors or deviating terms and conditions.
- (2) All agreements made between ourselves and Customer for the purpose of performance of the present contract have been recorded in writing in the present contract.
- (3) Our terms and conditions of sale shall only apply towards enterprises within the meaning of § 310, sub-section 1, German Civil Code.

B. Quotation, acceptance, contents of contract

- (1) To the extent that our quotations have not been limited, they shall always be subject to change without notice or without obligation for us. The foundation of the contract and the decisive thing for the scope of the delivery shall be our written order confirmations. This shall also apply if Customer has demanded provision of a specific quotation.
- (2) In the event of quotations with a time limitation and a set acceptance period, the quotation shall be decisive if no order confirmation is provided in good time. Side-agreements and amendments must be confirmed by us in writing.
- (3) Constructional changes as well as other changes of technical data and performance features shall be reserved to the extent that they contain technical improvements and can be reasonably expected.
- (4) The documents enclosed with the requests for a quotation or the order such as diagrams, samples and similar provided to Oskar Schwenk GmbH & Co. KG shall remain Customer's property. These shall be the binding foundation of the quotation by Oskar Schwenk GmbH & Co. KG. Customer shall make written reference to all subsequent amendments compared with the first request and the quotation from Oskar Schwenk GmbH & Co. KG when placing an order. To the extent that Oskar Schwenk GmbH & Co. KG encloses similar documents of the aforementioned nature with the quotations, these shall be and remain property of Oskar Schwenk GmbH & Co. KG. Customer engages not to use, reproduce these documents for purposes outside the contract or to make them accessible to third parties. Obvious errors, printing, counting, spelling and calculation errors shall not be binding for Oskar Schwenk GmbH & Co. KG and shall not give Customer any claim to damages.

C. Prices, payment

- (1) The prices shall be understood ex works in Euro, exclusive of packaging plus the value added tax valid on the day of delivery. The prices valid on the day of ordering in accordance with our price list shall be charged.
- (2) Small amount surcharge: the value of small orders is disproportionate to the administrative costs. Further details can be seen from our current price list.
- (3) To the extent not agreed to the contrary, our payment terms shall be:
 - 2% discount within 10 days from the invoice date
 - net within 30 days from the invoice date.
 This shall also apply to part deliveries. Repairs shall be paid net, i.e. without deduction of discount, as a matter of principle. Payment shall only be deemed made when the amount has been credited to our account. In the event of the use of cheques, payments shall only be deemed made when the cheques have been honoured.
- (4) Retention of payments or offset on account of all and any counterclaims shall only be admissible with undisputed, acknowledged or legally effective counter-claims of Customer.

D. Delivery time, impossibility, arrears

- (1) The delivery period shall commence on the date of the order confirmation. However, this shall only apply if all technical and commercial details have been clarified at said time.
- (2) Compliance with our duty to deliver shall further presuppose punctual and proper performance of Customer's obligation. The defence of unperformed contract shall remain reserved. The delivery time shall result from the contracting parties' agreements. Compliance by Oskar Schwenk GmbH & Co. KG shall presuppose that all commercial and technical questions have been clarified between the contracting parties and Customer has fulfilled all the obligations incumbent on it, such as obtaining the necessary official certifications or approvals or provision of a down-payment. If this is not the case, the delivery period shall be extended suitably. This shall not apply to the extent that Oskar Schwenk GmbH & Co. KG is answerable for the delay.
- (3) Compliance with the delivery period shall be subject to correct and punctual delivery to Oskar Schwenk GmbH & Co. KG. Foreseeable delays shall be notified by Oskar Schwenk GmbH & Co. KG without delay.
- (4) The delivery period shall be deemed complied with if the object of delivery has left the Oskar Schwenk GmbH & Co. KG works in Fellbach or readiness for dispatch has been notified by its expiry. To the extent that acceptance is necessary, the acceptance date shall be decisive, alternatively the report of readiness for dispatch - except in cases of justified rejection of acceptance.
- (5) If dispatch or acceptance of the object of delivery are delayed for reasons for which Customer is answerable, the costs caused as a result of the delay shall be charged to it, starting one month after the notification of readiness for dispatch or acceptance, as the case may be.
- (6) If failure to comply with the delivery period is to be put down to force majeure, industrial disputes or other incidents outside the sphere of influence of Oskar Schwenk GmbH & Co. KG, the delivery period shall be extended accordingly. Oskar Schwenk GmbH & Co. KG shall notify Customer of the start and end of such circumstances as soon as possible.
- (7) Customer can withdraw from the contract without setting a period if overall performance becomes impossible for Oskar Schwenk GmbH & Co. KG before the passage of risk. Over and above this, Customer can withdraw from the contract if performance of a part of the delivery becomes impossible for an order and it has a justified interest in rejection of the part delivery. If this is not the case, Customer shall pay the contractual price due for the part delivery. The same shall apply in the event of inability of Oskar Schwenk GmbH & Co. KG. H, M and N shall apply apart from this.
- (8) If Customer falls into arrears in acceptance and culpably breaches other cooperation duties, we shall be entitled to demand indemnification of the damage suffered by us to this extent, including all and any additional expenditure. Further-reaching claims or rights shall be reserved.
- (9) To the extent that the prerequisites of sub-section (4) have been fulfilled, the risk of chance destruction or chance deterioration of the object of purchase shall pass to Customer at the time at which the latter has fallen into arrears in acceptance or payment.

E. Passage of risk

- (1) Risk shall pass to Customer when the object of delivery has left the works in Fellbach, even if part deliveries are made or Oskar Schwenk GmbH & Co. KG has taken on further services, e.g. the costs of dispatch or delivery and erection. To the extent that acceptance is necessary, it shall be decisive for the passage of risk. It must take place without delay on the acceptance date, alternatively following the report of readiness for acceptance by Oskar Schwenk GmbH & Co. KG. Customer may not reject acceptance if an inconsiderable defect exists.
- (2) If dispatch or acceptance is delayed or does not take place as a result of circumstances not to be ascribed to Oskar Schwenk GmbH & Co. KG, risk shall pass to Customer from the day of the report of readiness for dispatch or acceptance, as the case may be. Oskar Schwenk GmbH & Co. KG

engages to conclude the insurances requested by Customer at the latter's expense.

- (3) Part deliveries shall be admissible to the extent that the deliveries are divisible and part deliveries can reasonably be expected of Customer.
- (4) To the extent requested by Customer, we shall cover the delivery by transport insurance; the costs incurred to this extent shall be borne by Customer.

F. Packing

Packing shall be charged by us at cost. In the case of free delivery to us, take-back on request.

G. Retention of title

- (1) The commodities supplied shall remain our property until complete payment of all present and future claims from the business relationship with Customer, regardless of the reason.
In the event of breach of contract by Customer, in particular in arrears in payment, we shall be entitled to take the supplied object back. A petition for opening of insolvency proceedings shall entitle Oskar Schwenk GmbH & Co. KG to withdraw from the contract and to demand immediate return of the object of purchase. Taking back the object of purchase by Oskar Schwenk GmbH & Co. KG shall represent withdrawal from the contract. Following a return of the object of purchase, Oskar Schwenk GmbH & Co. KG shall be entitled to exploit it, the yield from the exploitation being offset against Customer's liabilities following deduction of suitable costs of exploitation.
- (2) In the event of seizures or other interventions by third parties, Customer shall notify us in writing without delay, so that we can initiate proceedings pursuant to § 771, Code of Civil Proceedings. To the extent that the third party is not in a position to reimburse us for the judicial and extrajudicial costs of proceedings pursuant to § 771, Code of Civil Proceedings, Customer shall be liable for the damage suffered by us.
- (3) Customer shall revocably be entitled to resale of the object supplied within the framework of ordinary business operations. Customer here and now assigns all claims accruing to it against its customers or third parties from the resale to us to the amount of the final invoice value (incl. VAT) of our claim. The assigned claims shall serve to secure all claims pursuant to sub-section 1. Customer shall be obliged to notify the assignment to third parties for the purpose of payment to us and to give us the information and provide us with the documents necessary for us to claim our rights.

H. Claims from defects

- (1) Customer's claims from defects shall presuppose that it has properly complied with the duties to examination and notification incumbent on it pursuant to § 377, German Commercial Code.
- (2) To the extent that a defect in the object of purchase exists, the statutory regulations shall apply.

I. Return of goods

In principle, goods which have definitely been sold and delivered in the proper manner will not be taken back. Exceptions can only be made in special cases, following prior discussion. Returns shall be sent free of charge. The products must be individually and well packed. Reworking which is required because of defective packing or for other reasons shall be charged at cost.

J. Sample consignments / returns

Samples shall be charged for. Goods may only be taken back after agreement. We make an administrative charge of 10 % of the value of the goods, but Euro 10.00 minimum, for returns for which we are not responsible (e.g. incorrect order).

K. Costs of tools

To the extent not agreed to the contrary, tools produced for the performance of the order shall remain our property in all cases, even if a share of the tool costs is charged separately to Customer.

L. Special productions

Special productions shall require binding information in a written form on finish, quantity etc. when ordered. Amendments or deletions shall be possible one week after confirmation date at the latest. Thereafter, alterations or deletions shall only be possible if the costs incurred are charged. Taking back of special productions has been ruled out.

M. Liability

- (1) To the extent that Customer makes claims to damages based on malice aforethought or gross negligence, including malice aforethought or gross negligence of our representatives or vicarious agents, we shall be liable according to the statutory directives. To the extent that no deliberate breach of contract can be ascribed to us, the liability for damages shall be limited to the foreseeable damage typically occurring.
- (2) If the object of delivery cannot be used contractually by Customer through the culpability of Oskar Schwenk GmbH & Co. KG, the regulations according to M, N shall be applied, ruling out further claims by Customer.
- (3) Apart from this, we shall assume no liability for damage occurring for the following reasons: unsuitable and improper use or storage, defective assembly by Customer or third parties, high-handed attempts at repairs and amendments, natural wear and tear, defective or negligent treatment etc., on which we have no influence, and also in cases of improper use and failure to comply with our operating instructions.
- (4) To the extent not regulated to the contrary above, liability has been ruled out. Cogent law shall remain unaffected.
- (5) The period of barring for claims from defects shall be based on the statutory periods, starting from the passage of risk.
- (6) In the event of recourse for delivery, the period of barring shall be based on the statutory directives.

N. Joint and several liability

- (1) A further-reaching liability for damages than provided for in M has been ruled out without regard for the legal nature of the claims being made.
- (2) To the extent that liability for damages towards us has been ruled out or limited, this shall also apply with a view to the personal liability for damages of our employees, workers, fellow-workers, representatives and vicarious agents.

O. Data protection

We inform our business partners that we process their personal data with the help of electronic data processing for business purposes in accordance with the directives of the Federal Data Protection Act.

P. Place of jurisdiction

- (1) Insofar as Customer is a merchant, our registered office, 70736 Fellbach, Esslinger Strasse 84, shall be the place of jurisdiction; however, we shall be entitled to sue Customer at its registered office as well.
- (2) The law of the Federal Republic of Germany shall apply; validity of UN purchase law has been ruled out.
- (3) To the extent that nothing to the contrary results from the order confirmation, our registered office shall be the place of jurisdiction.

Are you also interested in our Technical Springs?

Precision compression springs for static up to highly dynamic stresses (approx. wire-Ø 0,4 - 7,00 mm)

1. Made of oil tempered (valve-) spring wire in accordance with EN 270-2,

- alloyed and unalloyed alternatively
- surface defect testing on a random basis
- surface defect testing at 100%
- with shaved surface and with 100% surface defect testing

for springs with medium up to high dynamic stresses like e.g. valve springs, damper springs or clutch springs.

2. Made of unalloyed spring steel wire in accordance with EN 270-1,

- for springs with low up to high static as well as medium dynamic stresses e.g. for tools, machine constructions and for the constructions of jigs and fixtures,

3. Made of stainless spring steel wire in accordance with EN 270-3,

for special springs which are used in a corrosive environment

Special treatments:
Shoot-peening:
Surface hardening to increase the fatigue strength for dynamic stresses

Cold-/Hot-Setting:
To improve the relaxation characteristics

Chamfering of the spring ends:
E.g. to reduce the wear or to ensure an easy assembly

Marking:
E.g. for identification or to avoid confusions.