



F6

COMBIVERT F6-K

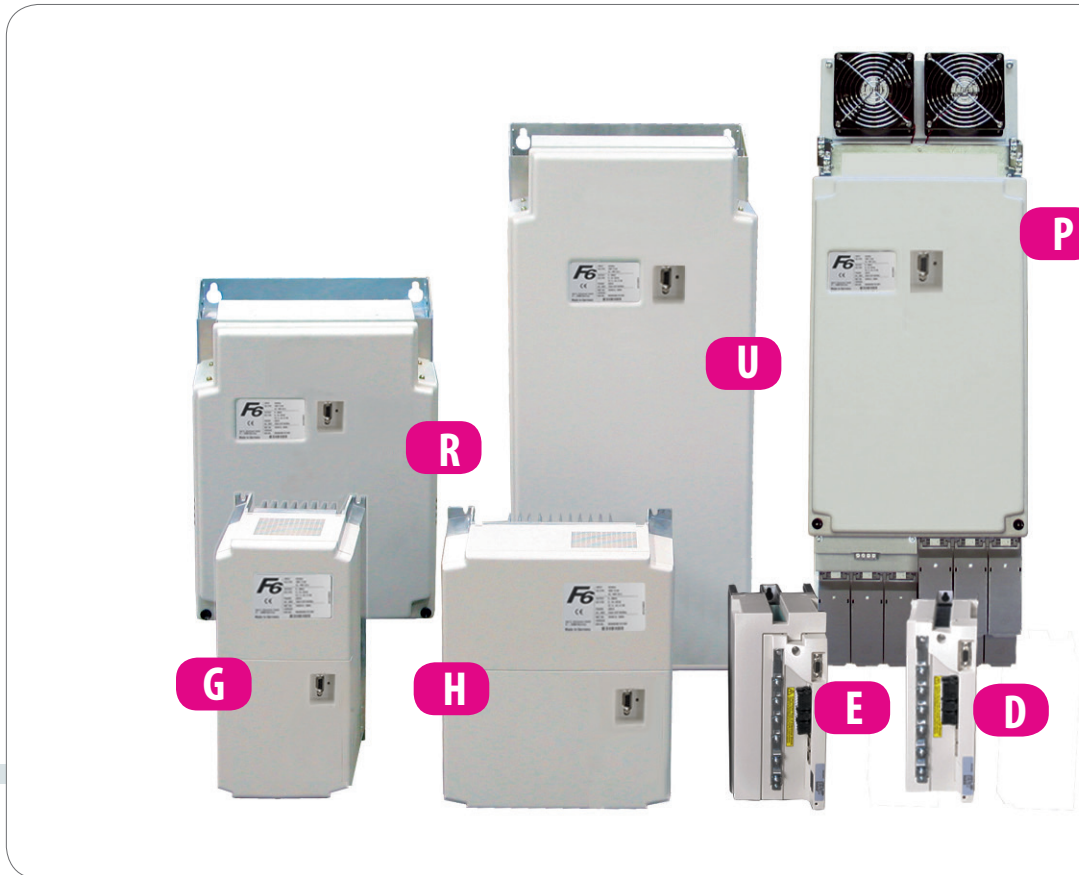


Single axis drives
1 ... 900 Hp



KEB COMBIVERT F6-K - Single Axis Drives

The **KEB COMBIVERT F6-K** drive platform features a next-generation control card with integrated real-time communication and SIL3 rated Safe-torque-off (STO) functionality. It is available in seven housing sizes up to 900 Hp. The F6 drive platform can run a wide variety of different motor types and comes equipped with dual encoder interfaces with universal connections.



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The F6-K drive family has a compact form factor and has been optimized for the use of individual machine axes and equipment. The **KEB COMBIVERT F6-K** covers the power ranges 1 to 900 Hp



	Power Range	Input Phases	Input Voltage
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230 V

1	... 3 Hp	- 1 & 3	200 ... 240 V AC
1	... 100 Hp	- 3	200 ... 240 V AC

480 V

1	... 900 Hp	- 3	380 ... 500 V AC
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KEB COMBIVERT F6-K frequency inverters follow the basic principle

ONE FOR ALL

It is capable of functioning as a closed-loop drive without encoder/resolver feedback in the following operating modes

- ASCL - Sensorless control of asynchronous motors (induction/squirrel cage)
(**A**synchronous **S**ensorless **C**losed **L**oop)
- SCL - Sensorless control of synchronous motors (permanent magnet)
(**S**ensorless **C**losed **L**oop)

Or, utilizing the universal feedback card, the **KEB COMBIVERT F6-K** adds:

- FOR - Field-oriented control of asynchronous motors with encoder feedback,
- closed loop servo motors with encoder feedback and
- open loop operation (V/Hz and Sensorless Motor Management™)

All operating modes are software selectable and use a common hardware platform.



The **KEB COMBIVERT F6-K** is the right drive for whatever motor type you are operating:

- Three-phase asynchronous
- Three-phase synchronous
- IPM (Interior-Permanent-Magnet)
- Spindle drives
- Torque motors, direct drives
- Synchronous reluctance motors
- Linear motors
- High-frequency motors

With the design principle

EVERYTHING ON BOARD

the **KEB COMBIVERT F6-K** drives have traditional analog and digital I/O on the control card:

- 3 x analog IN
- 8 x digital IN
- 4 x digital OUT

Communication with higher level controls can be achieved with:

- EtherCAT (2 x RJ 45)
 - the KEB standard bus for real-time applications based on Ethernet hardware
 - or optionally the protocol standard
- VARAN
- CAN interface (pluggable terminals)
- CiA 402 profile (IEC 61800-7-201)
 - Cyclic synchronous modes (position, velocity and torque), Profile position mode, Velocity mode, Homing Mode



Everything related to **start-up, service, diagnostics or PC operation**, as well as an external display connection is supported by the

- RS 232/485 interface (D-Sub 9-connector)

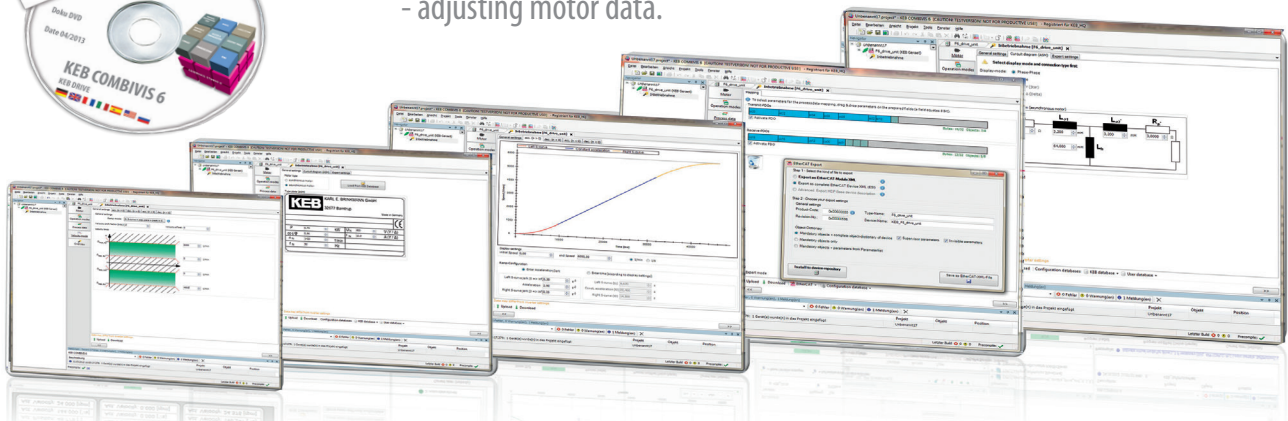


The **KEB COMBIVIS 6** software package is the high-performance tool for PC supported commissioning.

Settings and functional adjustments are simplified with user-friendly

WIZARD functions, examples include:

- adding process data or
- adjusting motor data.



Control units

A new generation of high-performance 32-bit microcontroller provides universal internal and external control functions such as:

- speed control
- torque control
- internal positioning module
- position mode
- external supply 24 V DC
- motor learn with standstill position detection
- switching frequencies up to 16 kHz
- current control loop = 125 μ s
- speed control loop = 250 μ s
- bus cycle < 1 ms
- digital input scan: 250 μ s
- analog input scan: 250 μ s
- analog input modes: 0 ... +/-10 V
0 ... +/- 20 mA, 4 ... +/- 20 mA

The 2-channel STO safety function and all analog and digital I/Os, including the CAN interface, use removeable connectors to simplify wiring and maintenance.

Power unit

State-of-the-art IGBT semiconductor technology forms the basis for low-loss motor control and the implementation of highly dynamic motion profiles.

KEB COMBIVERT F6-K contains

- integrated brake transistor (GTR 7)
- motor temperature monitoring PTC, frame size D and E
- motor temperature monitoring KTY / PTC, frame size D thru P
- output phase monitoring
- DC-bus connection
- protection against phase loss
- electronic motor protection
- ground fault and short-circuit monitoring

and features a robust design for ambient temperatures of up to 45° C or 55° C with de-rating

Depending on the power component,

- output frequencies up to 1600 Hz
- operation with sinusoidal filter is supported.

Universal feedback interface

The **KEB COMBIVERT F6-K** provides excellent flexibility for a variety of different motors. The control card contains two input channels that support the following feedback types:

- Resolver
- Incremental encoder (TTL)
- BiSS
- SSI
- SinCos
- Endat 2.1 and 2.2
- Hiperface

Preassembled cables, suitable for stationary or flexible applications, make installation easy and minimize wiring errors.



Technical data 230 VAC

power [Hp]	frame size	I_N [A]	I_{max} [A]	$f_{sn/max}$ [kHz]	KEB part-no.	
2	D	6.8	12.6	16	09F6K1D-2BMA	200 ... 240 VAC - 1/3 Phase
3	D	9.6	18	16	10F6K1D-2BMA	
5	D	15.2	29.7	8/16	12F6K1D-1AMA	200 ... 240 VAC - 3 Phase + / - 10 %
7.5	E	22	36	8/16	13F6K1E-16MA	
10	E	28	49.5	4/16	14F6K1E-15MA	
15	G	42	86	8/16	15F6K1G-19MA	
20	H	57	118	16	16F6K1H-1BMA	
25	H	84	151	8/16	17F6K1H-19MA	
30	R ★	100	150	8/16	18F6K1R-76MA	
40	R ★	115	172	8/16	19F6K1R-76MA	
50	R ★	130	217	8/16	20F6K1R-76MA	
60	R ★	154	270	8/16	21F6K1R-76MA	
100	U ★	224	362	4/8	23F6K1U-76MA	

230 V

★ operation with mains line choke xxZ1B03-1002 required (see page 11)

Technical data 480 V AC

power [Hp]	frame size	I _n (UL) [A]	I _{max} [A]	f _{sn/max} [kHz]	KEB part-no.
2	D	3.4	7.4	8/16	09F5K1D-3AMA
3	D	4.8	10.4	16	10F6K1D-3BMA
5	D	7.6	17	8/16	12F6K1D-3AMA
7.5	D	11	21.6	4/16	13F6K1D-39MA
10	D	14	29.7	2/16	14F6K1D-38MA
15	E	21	36	4/16	15F6K1E-35MA
20	E	27	49.5	2/16	16F6K1E-34MA
25	G	34	63	4/16	17F6K1G-35MA
30	G	40	75	2/16	18F6K1G-34MA
40	H	52	90	4/16	19F6K1H-35MA
50	H	65	112	2/4	20F6K1H-34MA
60 ★	R	77	135	4/16	21F6K1R-95MA
75 ★	R	96	172	4/16	22F6K1R-95MA
100 ★	R	136	225	2/12	23F6K1R-94MA
125 ★	R	172	270	2/8	24F6K1R-94MA
150 ★	U	198	263	4/8	25F6K1U-91MA
175 ★	U	231	313	4/8	26F6K1U-91MA
200 ★	U	264	375	2/8	27F6K1U-90MA
250 ★	P	320	462	2/4	28F6K1P-90MD
300 ★	P	398	575	2/4	29F6K1P-90MD
500 ★	2 x P	615	887	2/4	32F6K1P-90MD
600 ★	2 x P	692	1000	2/4	33F6K1P-90MD
650 ★	2 x P	770	1112	2/4	34F6K1P-90MD
750 ★	2 x P	867	1250	2/4	35F6K1P-90MD
800 ★	3 x P	996	1438	2/4	36F6K1P-90MD
900 ★	3 x P	1151	1663	2/4	37F6K1P-90MD

400 ... 480 V AC
+ / - 10 %

480 V

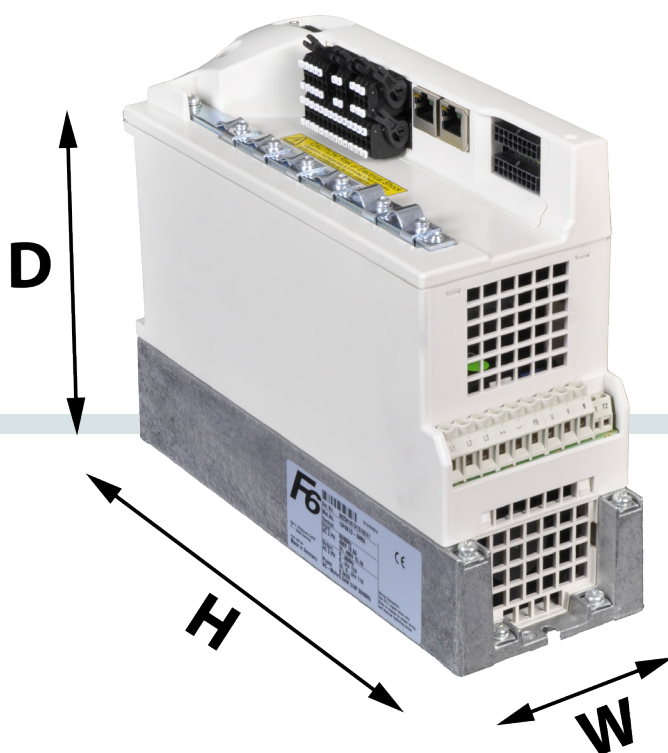
★ operation with mains line choke xxZ1B05-1002 required (see page 11)

The following applies to all panel mount units: 230 V, 480 V

■ protection type IP 20 / VBG 4 ■ operation temperature -10 ... 45° C / 55° C ■ storage temperature -25 ... 70° C

Mechanical data for panel mount units

frame size	D	E	G	H	R	U	P
width (mm)	90	130	170	300	342	342	340
height	250	290	340	340	520	800	960
depth	181	208	255	255	355	355	454
with backmount EMI filter							
width	90	132	181	300	340	-	-
height	285	352	415	445	520	-	-
depth	221	258	311	321	355	-	-



Mechanical options

cooling	D	E	G	H	R	U	P
through-mount version Air	-	•	•	•	•	•	•
flat Rear	•	•	•	•	-	-	-
water cooling panel mount version	-	-	•	•	•	•	•
water cooling through-mount version	-	-	-	-	•	•	•

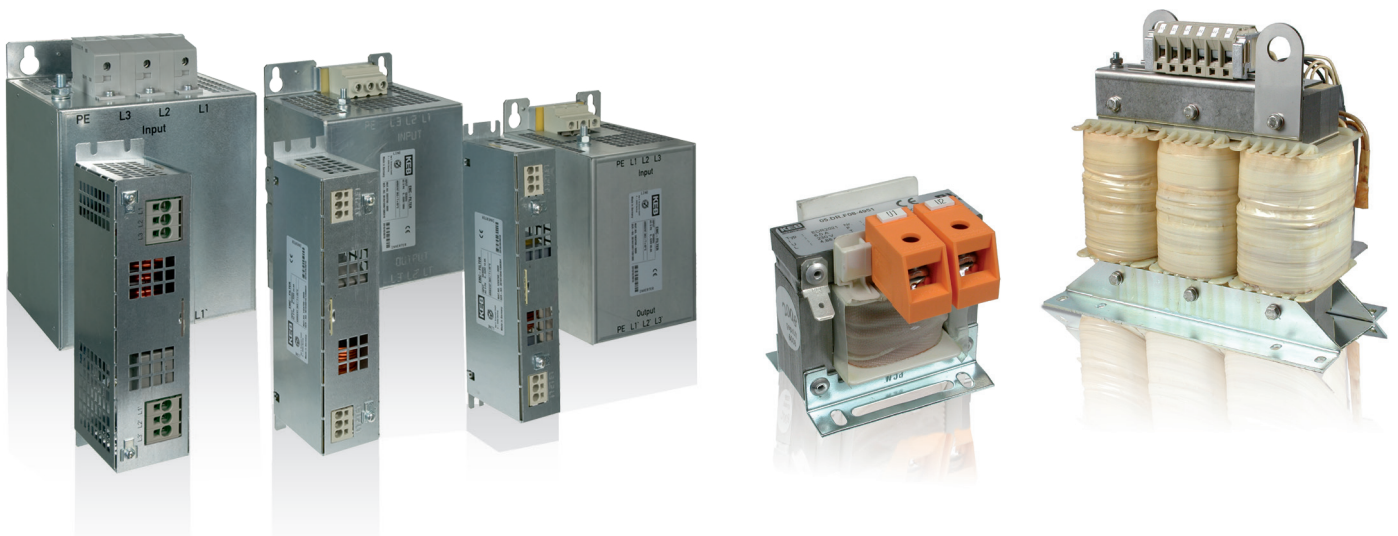
Stable operation under industrial environments

For safe and compliant equipment, the **KEB COMBIVERT F6-K** range is supported by the KEB COMBILINE range, comprising of:

- **EMC filters**
limits grid-bound emissions in compliance with IEC 61800-3 Class C1/C2.
- **Mains chokes**
reduce current spikes, voltage notching and noise feedback between utility mains and inverters.
- **Output chokes and filters**
reduce the voltage and current load on the motor windings.
- **Sinusoidal filters**
protects motor windings against voltage peaks associated with the use of long motor cables; allows the use of unscreened cable.
- **Harmonic filters**
ensures compliance with many international standards, including IEEE 519-1992

EMC - Service

KEB offers consultations during the planning phase and on-site analysis of installed equipment. We work with your engineers to optimize the EMC solution.



	Power [Hp]	frame size	EMC filters	Mains line choke	Motor choke	Harmonic filter	Sinus filter
230 V-class	2	D	10U5B0D-2000*	09Z1B03-1002	Available, Contact KEB		
	3	D	10U5B0D-2000*	10Z1B03-1002			
	5	D	12U5B0D-2000	12Z1B03-1002			
	7.5	E	13U5B0E-2000	13Z1B03-1002			
	10	E	14U5B0E-2000	14Z1B03-1002			
	15	G	15U5B0G-2000	15Z1B03-1002			
	20	H	16U5B0H-2000	16Z1B03-1002			
	25	H	17U5B0H-2000	18Z1B03-1002			
	30 ★	R	18U5B0R-2000	18Z1B03-1002			
	40 ★	R	19U5B0R-2000	19Z1B03-1002			
	50 ★	R	20U5B0R-2000	20Z1B03-1002			
60 ★	R	21U5B0R-2000	21Z1B03-1002				
400 V-class	2	D	10U5B0D-3000	09Z1B05-1002	Available, Contact KEB		
	3	D	10U5B0D-3000	10Z1B05-1002			
	5	D	12U5B0D-3000	12Z1B05-1002			
	7.5	D	13U5B0D-3000	13Z1B05-1002			
	10	D	14U5B0D-3000	14Z1B05-1002			
	15	E	15U5B0E-3000	15Z1B05-1002			
	20	E	16U5B0E-3000	16Z1B05-1002			
	25	G	17U5B0G-3000	17Z1B05-1002			
	30	G	18U5B0G-3000	18Z1B05-1002			
	40	H	19U5B0H-3000	19Z1B05-1002			
	50	H	20U5B0H-3000	20Z1B05-1002			
	60 ★	R	23U5B0R-3000	21Z1B05-1002			
	75 ★	R	23U5B0R-3000	22Z1B05-1002			
	100 ★	R	23U5B0R-3000	23Z1B05-1002			
	125 ★	R	25U5B0U-3000	24Z1B05-1002			
	150 ★	U	25U5B0U-3000	25Z1B05-1002			
	175 ★	U	27U5B0U-3000	26Z1B05-1002			
	200 ★	U	27U5B0U-3000	27Z1B05-1002			
	250 ★	P	28U5A0W-3000	28Z1B05-1002			
	300 ★	P	30U5A0W-3000	29Z1B05-1002			
500 ★	2 x P	30U5A0W-3000	2 x 28Z1B05-1002				
600 ★	2 x P	32U5A0W-3000	2 x 28Z1B05-1002				
650 ★	2 x P	32U5A0W-3000	2 x 29Z1B05-1002				
750 ★	2 x P	2 x 28U5A0W-3000	2 x 29Z1B05-1002				
800 ★	3 x P	3 x 30U5A0W-3000	3 x 29Z1B05-1002				
900 ★	3 x P	3 x 30U5A0W-3000	3 x 28Z1B05-1002				

* single phase 230 V AC filters and chokes upon request

★ generally operated with mains line choke

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