

G6

COMBIVERT G6

MADE
IN
GERMANY



High Performance Inverter
0.75 ... 30 kW



High Performance Inverter: **KEB COMBIVERT G6**

The **KEB COMBIVERT G6** series was designed as an **“ALL-IN-ONE”** solution which covers all important requirements for controlled three-phase drives within one device. Therefor a high degree of variability, supporting actual and future technologies, is prepared.

The proven properties of **KEB frequency converters** and **SMM** control algorithm (**S**ensorless **M**otor **M**anagement) have been further developed using new 32 bit micro controllers.

The integrated LCD plain text display with multilingual operator guide and the two-stage parameter model with basic menu (customer parameters) and application menu (application parameters) lend one-of-a-kind user comfort to **KEB COMBIVERT G6**, along with easy handling and a high degree of functionality.

RoHS-compliant production pursuant to guideline 2002/95/EC and the long-life design with high-quality components ensure the investments that have been made into equipment and systems.

Demand-driven fan and stand-by functions reduce device loss / heat stress in the switching cabinet and increase the system's overall efficiency.

“Pro-active maintenance” features easy-to-replace fans with consistent air flow routing exclusively in the cooling element.

Based on the integrated EMC filters, all devices are ready for installation in the switching cabinet; for multi-use applications, the compact design with direct “row mounting” reduces space requirements to a minimum.

KEB COMBIVERT G6 - the new reference point for industrial applications in machine and plant construction.



COMBIVERT G6

Contents	Page
Integrated flexibility	3
Properties - control unit	4
Properties - power stage	5
Data table - electrical	6
Data table - mechanics	7
Applications	8
Operating software KEB COMBIVIS 6	9
Accessories: mains chokes, harmonic filters	10
Accessories: braking resistors, sine-wave filters	11
KEB addresses	12

KEB COMBIVERT G6 - Safety version

Control unit	
Separate 24V DC supply.	✓
RS 232/485 interface, open protocol KEB DIN 66019-II.	✓
Analog / digital inputs and outputs.	✓
STO function, 2-channel as per category 3 pursuant to EN ISO 13849-1 performance level "e", IEC EN 62061, SIL3.	✓
Power stage	
3-ph. 380 ... 480 VAC, $\pm 10\%$, 50/60 Hz and DC input	✓
EMC as per class C2 and C3 with integrated filter	✓
Integrated braking transistor (GTR7)	✓

KEB COMBIVERT G6 - ON-BOARD - Fieldbus versions

(with / without LCD display)	(without LCD display)	(with / without LCD display)	
CAN-Slave	CAN over EtherCAT DS 402	Communication Specification V1.0	in preparation
Profile DS 402	100 MBaud	Device description V1.0.1	

Flexible and customized production results in installation-ready units, without cumbersome unpacking and installation of optional assemblies or plug in cards and available in different variations - with 100% functional testing.



KEB COMBIVERT G6
Modular structure
of control card / user interface

OEM - User guide

- for direct use in series equipment, **KEB** offers the option of delivering devices ex works, which are fully preset and protected against unauthorised access with a password.

Quick input/output scanning

- for the 32-pole control clamp, such as for dynamic start-stop applications with high and reproducible repeat accuracy of the movement profile.

Digital inputs and outputs

- 8 Digital In
2 Digital Out
2 relays

Universal analog inputs / outputs

- 2 Analog In
set values 0 ... ± 10 V, 0 ... ± 20 mA, 4 ... 20 mA
2 Analog Out (0 ... ± 10 V)

8 Parameter sets

- with complete set programming offer extensive internal functionality for I/O handling tasks or sequential operation of multiple motors, and can also partially take over otherwise superordinated PLC tasks.

PID controllers

- process controllers for processing internal and external variables.

Brake control

- special parameters for controlling brake motors and the safe operation of sliding-rotor motors.

DC-braking

- for stopping drives without brake resistance by absorbing the movement energy in the motor.

No-Safety-Version

- on request:
available without integrated safety function.

No-Display-Version

- devices without LCD displays and keyboard are available for series use with serial communication and for users with only PC operation.



KEB COMBIVERT G6
No-Display-Version

Integrated EMC solution

built with new innovative core materials and configured

- according to EN61800-3 for environments **C2** and **C3**
- sized for long motor cables (low-capacity / standard line) **100 m / 50 m - C2**

for especially low leakage currents of the filter component towards the ground

- **< 5 mA** (low leakage EMC)

and installation-safe due to consistently separated mains and motor connection side

Thermo contact analysis

- flexibly adjustable analysis of thermal signals of connected motors (PTC and thermo switches) for advance warning or direct safety shut-down.

Fully dimensioned

- with high overload characteristic for acceleration and deceleration, primarily configured for load profiles with constant torque.
- true intermediate circuit capacity for absorbing impulse energy and robust behaviour for fluctuations in electricity supply.

Worldwide use

- proven through acceptance as per UL/cUL
- configured for mains voltages of min. 380 V to max. 480 V, 50/60 Hz, tolerance $\pm 10\%$
- series DC input includes precharging in device.



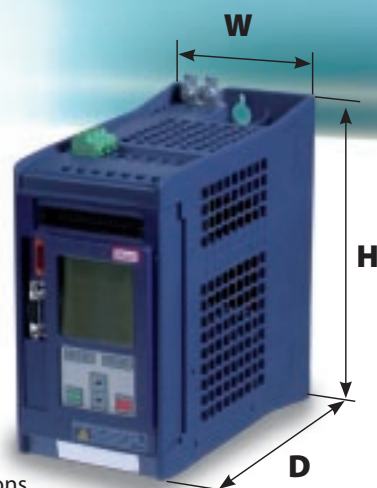
KEB COMBIVERT G6 mains connection



KEB COMBIVERT G6
Safety-Version with display

Data table – Electrical

Size	07	09	10	12	13	13	14	15	16	17	18	19
input rating U_N [V]	400											
mains phases	3											
mains frequency [Hz]	50/60 $\pm 2\%$											
installation size	A			B		C			E			
output power rating [kVA]	1.8	2.8	4	6.6	8.3	11	17	23	29	35	42	
max. motor power rating [kW]	0.75	1.5	2.2	4	5.5	7.5	11	15	18.5	22	30	
output rated current [A]	2.6	4.1	5.8	9.5	12	16.5	24	33	42	50	60	
max. short-time limit current [A]	4.7	7.2	10.4	17.1	21.6	29.7	36	49.5	63	75	90	
OC release current [A]	5.6	8.9	12.5	20.6	25.9	35.6	43.2	59	75	90	108	
input rated current [A]	3.6	6	8	13	17	23	31	43	55	65	80	
max. admissible mains fuse (gG) [A]	16	16	16	20	25	25	35	50	63	80	80	
rated switching frequency [kHz]	8	4	4	4	4	8	4	4	8	4	4	2
max. switching frequency [kHz]	8	8	8	8	8	16	8	8	16	8	8	4
power loss at nominal operation [W]	40	50	65	150	185	210	220	285	440	450	500	540
input voltage range U_{in} [V]	380 ... 480 (305 ... 528 ± 0)											
network configurations	TN, TT, IT											
output voltage [V]	3 x 0 ... U_{in}											
output frequency [Hz]	0 ... 400 ($f_s = 4$ kHz) / 0 ... 800 ($f_s = 8$ kHz)											
max. motor line length (screened EN 61800-3)												
limit class C2 (low-capacity / standard line) [m]	100 / 50											
leakage current [mA]	< 5											
protection type [EN60529]	IP 20 / VBG4											
operating temperature [°C]	-10 ... 45											
storage temperature [°C]	-25 ... 70											
climate category in operation [EN 60721-3-3]	3K3											
environment [IEC 664-1]	rate of pollution 2											
vibration / shock as per ...	EN 60721-3-3											
internal braking transistor GTR7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
intermediate circuit connection (+/-)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
motor PTC evaluation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓



KEB COMBIVERT G6 - dimensions

Optimally prepared for series production ...

- defined installation grid for back wall of switching cabinet.
- quick installation due to pluggable spring-type terminals.
- acceptance as per UL and configuration of mains voltages 380 ... 480 V AC, 50/60 Hz.
- size A and B devices with pluggable power and motor line terminals.
- simple parameterization via **KEB COMBIVIS 6** PC software.
- start-up or service with **KEB Portable-Operator**.

Installation size		A	B	C	E
width W	[mm]	90	90	117	170
height H	[mm]	185	269	260	340
depth D	[mm]	204	200	230	275
Mounting		2 x M4	2 x M4	4 x M5	4 x M6
width W₁	[mm]	-	-	100	125
height H₁	[mm]	175	240	240	330
weight	[kg]	1.5	2.5	4.6	in preparation
Cooling					
ventilated convection		✓	✓	✓	✓
Flat Rear heat transfer		✓	✓	option	option

**Order samples**

nominal power
fieldbus
LCD-display
safety

part no.

1,5 kW
without
with

09.G6.CDA-3910

4 kW
EtherCAT
not available
without

12.G6.F3B-3900

Applications - **Machine builder - Plant construction**

Food production

- high breakaway torque during start-up
- exact torque during process

Packaging technology

- fast set value processing at ± 10 V
- controlled positioning compensates dead times

Conveyor and storage technology

- long motor lines up to 100 m
- robust mechanics

Cranes, lifting devices

- high dynamics during acceleration
- internal braking transistor

Compressors

- output frequency up to 800 Hz
- PID controllers for process control

Elevators

- high starting torque
- consistent torque with change of loads
- suitable for modern three-phase motors and conventional elevating devices

Escalators

- energy savings in stand-by mode
- high starting torque, constant speed

Wood machining equipment

- operation of spindle drives
- conveyor systems, finishers

Textile equipment

- PID controllers for process control

Medical technology

- flexible fieldbus interfaces



KEB COMBIVERT G6
plain text LCD

In addition, **KEB COMBIVERT G6** can also be adapted to customer-specific applications beyond the described scope.

The existing platform has been prepared for additional variations, e.g. for special fieldbus protocols, operation of special motors or the expansion of software functions.

The software tool for comfortable and functional PC operation based on .net-technology. **KEB COMBIVIS 6** integrates the complete structure for administration, start-up, diagnostics and optimization of all drive tasks into one program.

Project management of the machine

- automatic and manual device search

Device editor

- parallel access to multiple devices
- complete data backup and copy function
- 16 channel oscilloscope

The online tool is available free of charge at **www.keb.de** or as a DVD against a nominal fee with part no. 00.C6.DA0-0001.

Accessories:

- **USB adapter** (on D-Sub 9) - HSP5 / DIN 66019 II, part no. 00.58.060-0020
- **service data line** 2.8 m, part no. 00.58.025-001D

As an alternative to PC operation, the **KEB Portable-Operator** is available in two designs for operating devices without integrated LCD displays:

- **Basic version (without battery)**
part no. 00.58.060-0110, wire-based communication, PC connection via USB interface
- **Wireless version**
part no. 00.58.060-0010, with the additional features
 - SD card reader
 - Lithium-Ion battery and
 - wireless transmission in combination with the **Wireless Device Adapter**, part no. 00.58.060-0030, for HSP5 and RS232 protocol DIN 66019 II.

For production areas that do not use PCs, the unit provides a serial interface and extensive internal flash memory as well as an SD card reader (wireless version) for data transmission purposes.

Prepared parameter settings can therefore quickly be imported into the various devices.

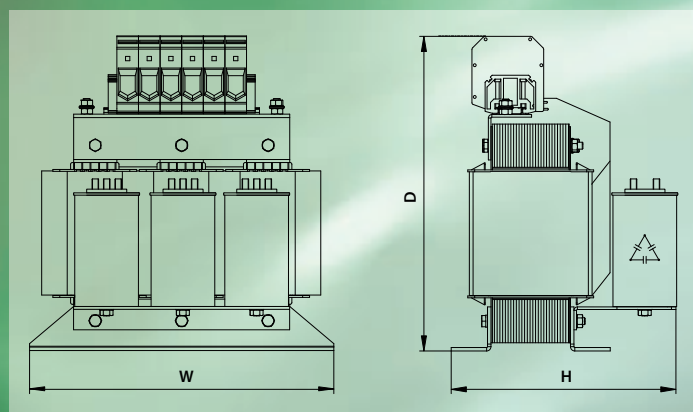


KEB Portable-Operator

KEB COMBILINE Accessories - mains chokes, harmonic filters

Mains chokes are used to optimize the voltage supply in equipment and plants. Voltage and power peaks, e.g. with hard networks or the addition of large power consumers can damage the input circuit of the devices.

In addition, mains chokes reduce the reaction into the network and extend the life of intermediate circuit capacitors.



Harmonic filters significantly dampen the network distortion of the rectifier switch and ensure that increasing global requirements regarding compliance with harmonic loading can be met.

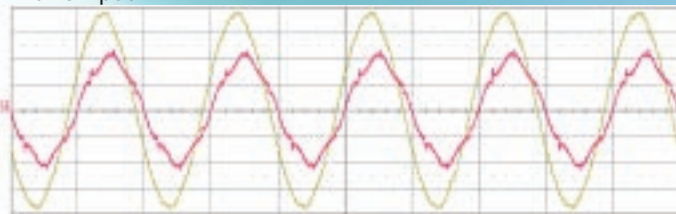
Using the patented **KEB COMBILINE** harmonic filters, it is possible to reach THD(i) values up to < 5%.

KEB COMBILINE mains chokes 50/60 Hz, 3ph. 400 V ($u_k = 4\%$)					
part no.	I_{Rating} [A]	W [mm]	H [mm]	D [mm]	weight [kg]
07.Z1.B04-1000	2.7	100	55	121	0.85
09.Z1.B04-1000	4.3	100	55	121	1.1
10.Z1.B04-1000	6.1	100	63.5	121	1.5
12.Z1.B04-1000	10	148	68	145	2.1
13.Z1.B04-1000	12.6	148	78	145	2.6
14.Z1.B04-1000	17.3	148	77	145	2.75
15.Z1.B04-1000	25.2	178	87	180	4.4
16.Z1.B04-1000	34.7	178	100	178	5.9
17.Z1.B04-1000	44.1	219	115	215	8.4
18.Z1.B04-1000	52.5	219	120	220	10
19.Z1.B04-1000	63	219	135	220	12

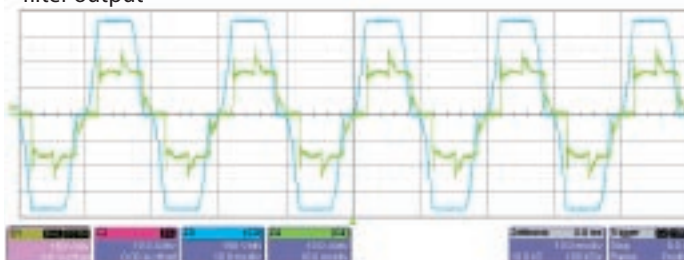
KEB COMBILINE harmonic filters THD $\leq 8\%$ / PWHD $\leq 15\%$					
part no.	I_{Rating} [A]	W [mm]	H [mm]	D [mm]	weight [kg]
09.Z1.C04-1000	4.3	178	142	170	5.8
12.Z1.C04-1000	10	219	170	233	11.5
13.Z1.C04-1000	12.6	243	195	230	13.4
14.Z1.C04-1000	17.3	291	192	256	18.3
15.Z1.C04-1000	25.2	291	214	257	25.5
16.Z1.C04-1000	34.7	352	240	324	38.5
17.Z1.C04-1000	44.1	352	261	324	47.1
18.Z1.C04-1000	52.5	352	260	337	54.6
19.Z1.C04-1000	63	352	355	326	63

Voltage and current in the network with KEB harmonic filters

mains input



filter output



KEB COMBILINE
harmonic filter

KEB COMBILINE
mains choke

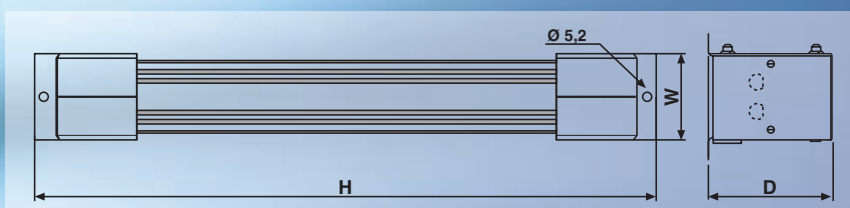
Braking resistors can be connected to the series clamps of the GTR7 brake transistor, and ensure that energy peaks are absorbed and discharged.

To protect against overheating and fire hazards, the brake resistors feature thermal monitoring, which can be integrated into the external circuit.

Additional model series have been configured for higher continuous output.

KEB COMBIVERT external braking resistor

part no.	R [Ω]	P _D [W]	W [mm]	H [mm]	D [mm]
07.BR.100-6620	620	56	40	165	24
09.BR.100-6390	390	90	40	240	24
10.BR.100-6270	270	130	40	300	24
12.BR.100-6150	150	230	80	300	26
13.BR.100-6110	110	350	80	400	26
14.BR.100-6853	85	410	80	400	26
15.BR.110-6563	56	620	63	370	96
16.BR.110-6423	42	820	63	470	96
17.BR.110-6303	30	1200	90	470	96



Universal **sine-wave filters** for maximum output frequencies of up to 100 Hz are available for motors with special requirements for voltage rise or current types.

Other versions are available for applications with output frequencies up to 800 Hz.

KEB COMBILINE sine-wave filter 100 Hz / 400 V

part no.	P _N [kW]	I _N [A]	W [mm]	H [mm]	D [mm]	weight [kg]
05.Z1.G04-1000	0.37	1.3	100	110	120	1.1
07.Z1.G04-1000	0.75	2.6	100	125	135	1.7
09.Z1.G04-1000	1.5	4.1	148	132	150	2.5
10.Z1.G04-1000	2.2	5.8	148	143	142	3.1
12.Z1.G04-1000	4	9.5	178	125	167	4.5
13.Z1.G04-1000	5.5	12	178	145	178	6.4
14.Z1.G04-1000	7.5	16.5	219	145	207	8.2
15.Z1.G04-1000	11	24	243	182	225	11.5
16.Z1.G04-1000	15	33	267	172	260	15.6
17.Z1.G04-1000	18.5	42	291	197	272	21.8
18.Z1.G04-1000	22	50	291	225	280	25
19.Z1.G04-1000	30	60	316	230	305	32.5

Take advantage of KEB application know-how for configuring the entire axis with suitable devices in combination with these options.



KEB COMBIVERT
external braking resistor



KEB COMBILINE
sine-wave filter

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