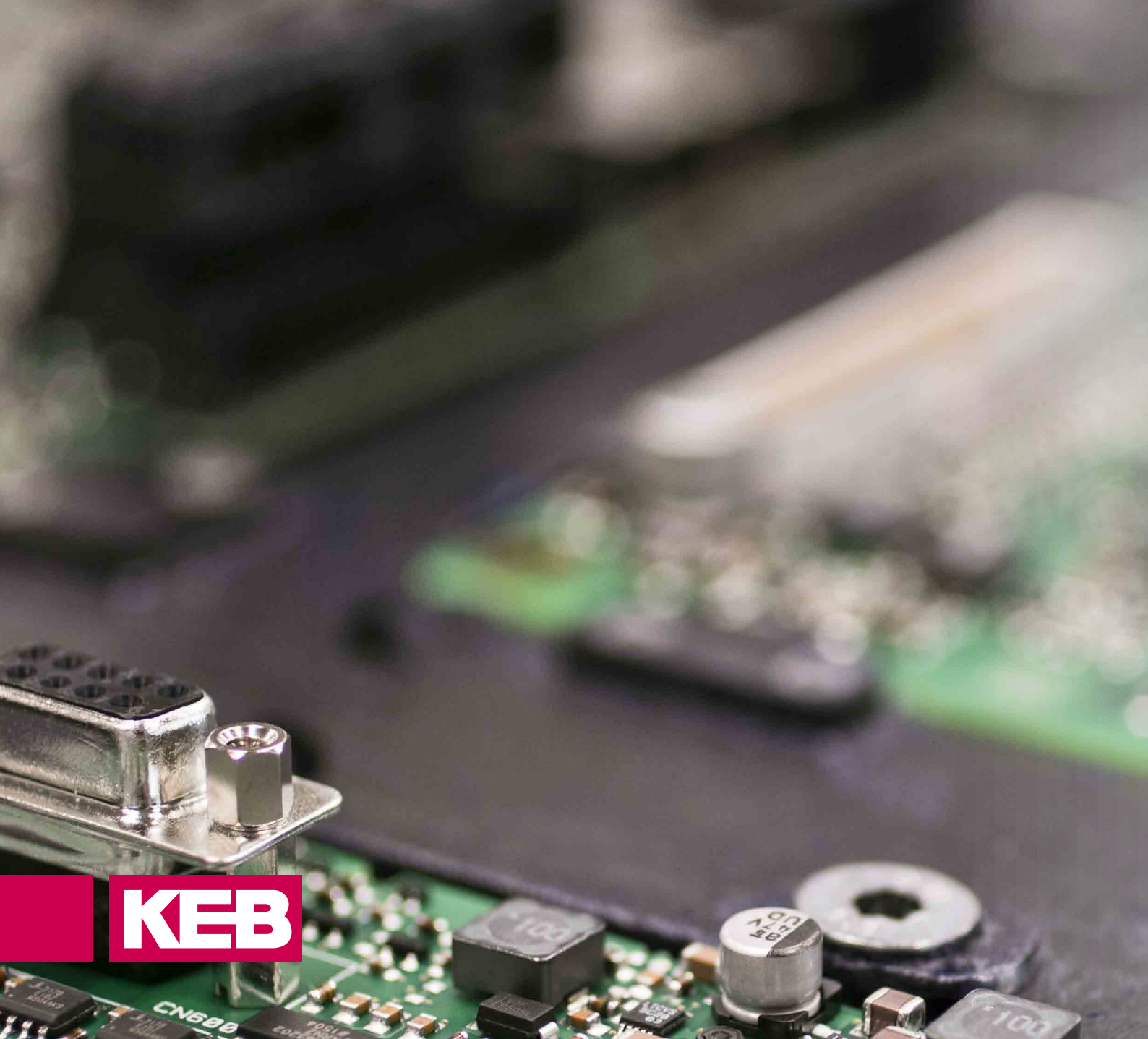




# COMBIVERT G6

FREQUENCY INVERTER 0.75 kW ... 30 kW

EN



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KEB worldwide	15

# SYSTEM OVERVIEW

## Automation with Drive

stands for the optimally selected combination of control and automation with the drive package as the key to successful machine concepts.

Let yourself be inspired by the versatility and performance of the COMBIVERT G6 frequency converters on the following pages and find solutions that reliably meet your requirements.

## IIoT



## CONTROL SOFTWARE

Visualisation



HMI

Engineering



Control Software

Remote Control



Router

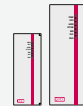
## CONTROL HARDWARE



Web HMI



Embedded Control



IPC



I/O



Safety PLC

## DRIVES



Inverter



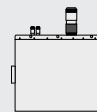
Servo Drive



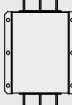
Drive Controller



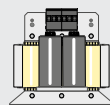
Pitch Drive



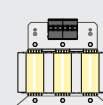
eMobility Drive



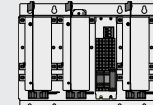
EMC & THD Filter



Sine Wave Filter



Motor Choke



Sine Wave EMC Filter

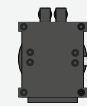
## MOTORS



AC Motor



PM Motor



PM Gear Motor



AC Gear Motor

## BRAKES AND CLUTCHES



Permanent Magnet Brake



Spring Applied Brake



Electromagnetic Brake



Electromagnetic Clutch

## COMBIVERT G6 – THE ADVANTAGES AT A GLANCE



The COMBIVERT G6 series has established itself as a reliable and versatile solution for controlled three-phase drives. Developed to meet a wide range of requirements in machine and plant engineering, it impresses with a well thought-out concept that supports both current technologies and future developments. Thanks to powerful 32-bit microcontrollers and the continuous development of proven KEB technology, the G6 series offers a high degree of flexibility and functionality.

### VERSATILE APPLICATION OPTIONS

The basic version in U/f operation with the proven **SMM** (Sensorless Motor Management) technology is ideal for standard applications with asynchronous motors – at output frequencies up to 599 Hz, optionally up to 800 Hz.

For applications that require high torque and speed stability, variants with sensorless control are available:

- **G6-ASCL** – (asynchronous-sensorless control) for asynchronous motors
- **G6-SCL** – (synchronous-sensorless control) for synchronous motors

### EASY TO USE – POWERFUL IN APPLICATION

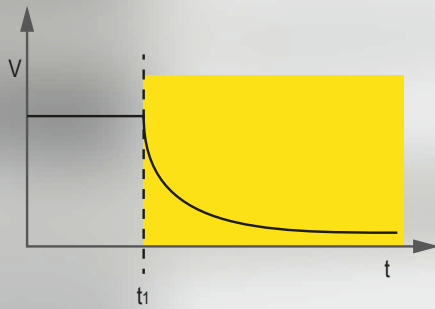
The two-stage parameter model with a clear basic menu (customer parameters) and application menu (application parameters) ensures particularly user-friendly operation. This is supported by an integrated, multilingual LCD plain text display, which simplifies commissioning and parameterisation.

### EFFICIENT AND MAINTENANCE-FRIENDLY

Demand-driven fans and standby mode for the control system reduce power loss and thus the heat load in the control cabinet, which increases the overall efficiency of the system. The fans are easy to replace, which facilitates preventive maintenance and ensures long-term stable performance. With its compact design for 'side-by-side mounting,' the COMBIVERT G6 offers a space-saving solution – ideal for multi-axis applications in limited installation situations.

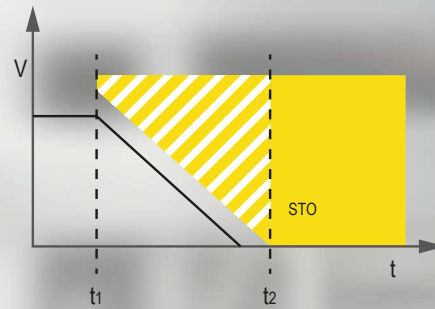
In line with the current requirements of the Machinery Directive, COMBIVERT G6 offers the integrated 2-channel STO safety function according to Category 3 - EN ISO 13849-1 Performance Level 'e' / IEC EN 62061, SIL 3.

## STO



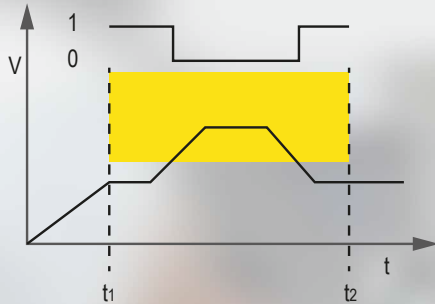
Safe Torque OFF

## SS1



Safe Stop 1

## SSM



Safe Speed Monitor (f = 0 Hz)

When connected to an external safety time relay, the **SS1** function can also be covered by braking the drive within a set time and setting it to **STO** (stop category 1 from EN 60204-1).

## COMBIVERT G6 – FILTER TECHNOLOGY ON BOARD

All device sizes are equipped with an integrated EMC filter ready for installation in the control cabinet, whose special features include minimal leakage currents to earth and motor cable lengths of up to 100 m.

## COMBIVERT G6 – FOR SERIAL COMMUNICATION

COMBIVERT G6 fulfils flexible connections to the control level with ON-BOARD fieldbus variants for

### EtherCAT

CAN over EtherCAT DS 402  
100 MBaud  
(without LCD display)

### CANopen

CAN slave  
Profile DS 402  
(with/without LCD display)

# TECHNICAL FEATURES – CONTROL UNIT

## DIGITAL INPUTS AND OUTPUTS

- 8 digital inputs
- 2 relays
- 2 digital outputs
- Pulse train (CAN)

## UNIVERSAL ANALOG INPUT / OUTPUTS

- 2 analog inputs, 0 V ...  $\pm 10$  V, 0 V ...  $\pm 20$  mA, 4 mA ... 20 mA
- 2 analog outputs (0 V ...  $\pm 10$  V) (not with EtherCAT)

## SAFETY FUNCTION

- STO function, 2-channel according to Category 3 in accordance with EN ISO 13849-1 Performance Level 'e', IEC EN 62061, SIL3
- Devices with EtherCAT control optionally fulfil the TÜV-certified SSM function with level 0 Hz

## CONTROL UNIT

- Internal and separate 24 V DC supply
- RS 232/485 interface, open protocol KEB DIN 66019-II

## DC-BRAKING

- Stopping drives without braking resistor

## BRAKE CONTROL

- Safe operation of brakes and sliding anchor motors

## PID CONTROLLERS

- Process controller for internal and external control variables

## OPERATOR GUIDE

- For use in series machines, devices can be preset ex works and delivered protected against unauthorised access by a password

## FAST INPUT / OUTPUT SAMPLING

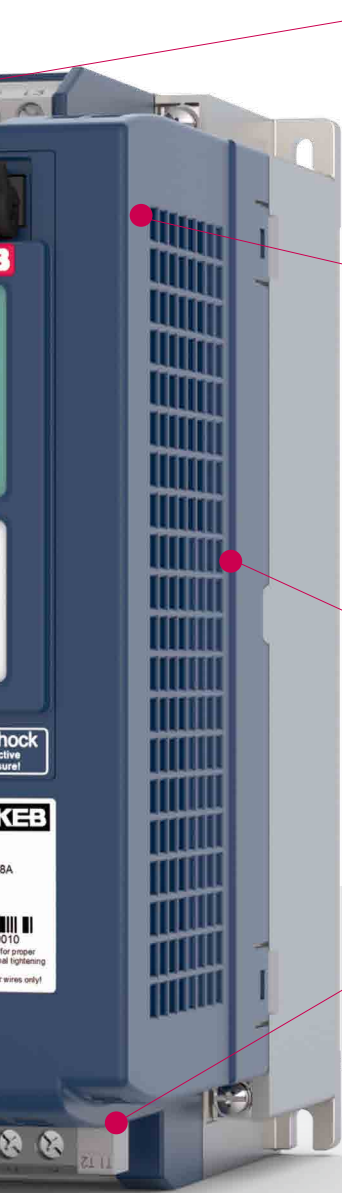
- The control terminals for dynamic start-stop applications with high repeatability

## 8 PARAMETER SETS

- Complete set programming with extensive functionalities in I/O handling and driving various motors, right through to taking over PLC tasks



EtherCAT®



COMBIVERT G6  
Safety variant with display

### POWER UNIT

- 1-phase 200 V AC ... 240 V AC,
- 3-phase 380 V AC ... 480 V AC, +10/-20 %, 50/60 Hz and DC input
- EMC according to class C1 and C2 with integrated filter
- Internal braking transistor

### EMC INCLUDED

- Internal filter with new core materials, designed
- in accordance with EN 61800-3 for environments C1 and C2, with motor cables up to 100 m - C2 / 50 m - C1
- with minimal leakage currents of the filter part to earth

and separate mains and motor connection sides

### FULLY DIMENSIONED

- With high overload characteristic for acceleration and deceleration, preferably designed for load profiles with constant torque
- Genuine intermediate circuit capacity for absorbing impulse energy and robust behaviour in the event of fluctuations in the mains supply

### THERMAL CONTACT EVALUATION

- Adjustable evaluation of thermal signals from connected motors (PTC and thermal switches) for early warning or protective shutdown

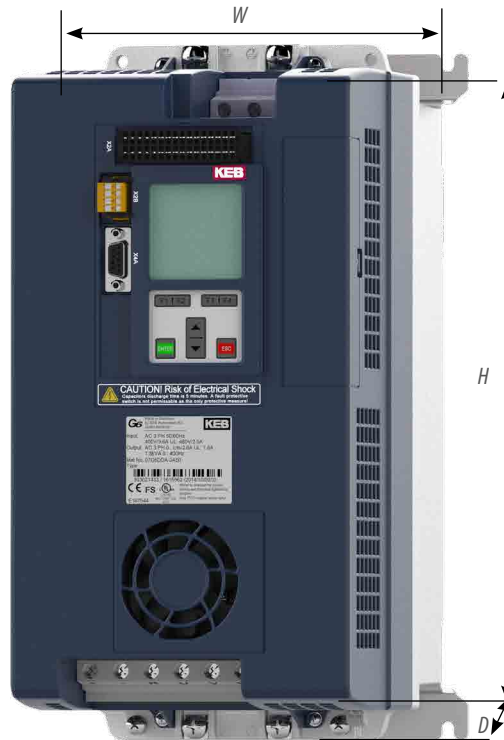
**CANopen**®



### READY FOR GLOBAL USE

- UL/cUL approved
- Designed for mains input voltages from 200 V to 240 V or 380 V to 480 V, 50/60 Hz, tolerance +10/-20 %
- DC supply with precharge as standard (enclosures A ... C)
- Protective coating on all circuit boards

# COMBIVERT G6



COMBIVERT G6  
Housing E - Flat Rear

COMBIVERT G6 is available in four physical sizes covering a power range from 0.75 kW to 30 kW and is designed for installation in control cabinets or machine bases.

Devices with a flat rear and push-through mounting are further variations for optimising heat transfer.

SIZE			A	B	C	E
Width	<b>B</b>	[mm]	90	90	117	170/198*
Height	<b>H</b>	[mm]	204	269	260	340
Depth	<b>T</b>	[mm]	200	200	230/175*	280/165*
Mounting			2 x M4	2 x M4	4 x M5	4 x M6 / 10 x M6*
Weight		[kg]	1.5	2.5	4.6/4.5*	11.3
Cooling						
Ventilated convection			■	■	■	■
Flat Rear*			■	■	option	option
External heat/push-through			—	—	—	■



	<b>230 V</b>		<b>400 V</b>											
Size	07	09	07	09	10	12	13	13	14	15	16	17	18	19
Rated input voltage $U_N$ [V]	230		400 / 480*											
Mains phases	1		3											
Mains frequency [Hz]	50/60 ±2 %		50/60 ±2 %											
Housing size	A		A			B		C			E			
Rated output power [kVA]	1.6	2.8	1.8	2.8	4	6.6	8.3	8.3	11	17	23	29	35	42
<b>Max. rated motor power [kW]</b>	<b>0.75</b>	<b>1.5</b>	<b>0.75</b>	<b>1.5</b>	<b>2.2</b>	<b>4</b>	<b>5.5</b>	<b>5.5</b>	<b>7.5</b>	<b>11</b>	<b>15</b>	<b>18.5</b>	<b>22</b>	<b>30</b>
Rated output current * [A]	4	7	2.6	4.1	5.8	9.5	12	12	16.5	24	33	42	50	60
Max. short-time limit current (60 sec.) [A]	7.2	12.6	4.7	7.2	10.4	17.1	21.6	21.6	29.7	36	49.5	63	75	90
OC trip current [A]	8.6	15.1	5.6	8.9	12.5	20.6	25.9	25.9	35.6	43.2	59	75	90	108
Rated input current [A]	8	14	3.6	6	8	13	17	17	23	31	43	55	65	66
Max. permissible mains fuse (gG) [A]	20	20	16	16	16	20	25	25	25	35	50	63	80	80
Rated switching frequency [kHz]	4	4	8	4	4	4	4	8	4	4	4	4	4	4
Max. switching frequency [kHz]	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Power loss at nominal operation approx. [W]	90	100	40	50	65	92	124	210	220	285	448	569	687	762
Input voltage range $U_{in}$ [V]	180...264 ±0%		380 ... 480 (305 ... 528 ± 0%)											
Network configurations	TN, TT		TN, TT, IT											
Output voltage [V]	3 x 0 ... $U_{in}$													
Output frequency [Hz]	0 ... 400 (fs = 4 kHz) / 0 ... 599 (fs = 8 kHz) optional 800													
Max. motor cable length (shielded EN 61800-3)														
Limit class C1 (low capacity/standard cable) [m]	30		50 / 25											
Limit class C2 (low capacity/standard cable) [m]	50		100 / 50											
Protection class [EN 60529]	IP 20 / VBG4													
Operating temperature [°C]	-10 ... 45 (55 with derating)													
Storage temperature [°C]	-25 ... 70													
Climate category during operation [EN 60721-3-3]	3K3													
Environment [IEC 664-1]	rate of pollution 2													
Internal braking transistor	■													
DC link connection	■													
Motor PTC evaluation	■													

\*for 400 V sizes with a rated voltage of 480 V:  $I_{nom} = 0.86 \times \text{rated output current}$



## VERSATILE SOLUTIONS FOR MACHINES AND PLANTS

### FOOD PRODUCTION

- High starting torque
- Precise torque during operation
- Protective coating

### PACKAGING TECHNOLOGY

- Fast setpoint processing with  $\pm 10$  V
- Controlled positioning compensates dead times

### CONVEYOR AND STORAGE TECHNOLOGY

- Long motor cables up to 100 m
- Robust mechanics

### CRANES, LIFTING DEVICES

- High dynamics during acceleration
- Internal braking transistor

### COMPRESSORS

- Output frequency up to 599 (800) Hz
- PID controllers for process control

### ELEVATORS

- High starting torque
- Constant speed under load changes
- Suitable for modern three-phase motors and conventional elevator motors

### WOODWORKING MACHINES

- Operation of spindle drives
- Conveyor systems, stacker
- Tool adjustment

### TEXTILE MACHINES

- PID controllers for process control
- Protective coating

### ESCALATORS

- Energy savings in stand-by mode
- High starting torque, constant speed

### MEDICAL TECHNOLOGY

- Flexible fieldbus interfaces



## FLEXIBILITY AND PERFORMANCE FOR DEMANDING DRIVE SOLUTIONS

The COMBIVERT G6 is the ideal solution for modern drive technology in mechanical engineering. Its modular architecture allows for seamless integration into a wide range of applications, including special fieldbus protocols, special motors and extended software functions. High performance, adaptability and integrated safety functions ensure maximum efficiency and system compatibility.



### YOUR ADVANTAGES AT A GLANCE

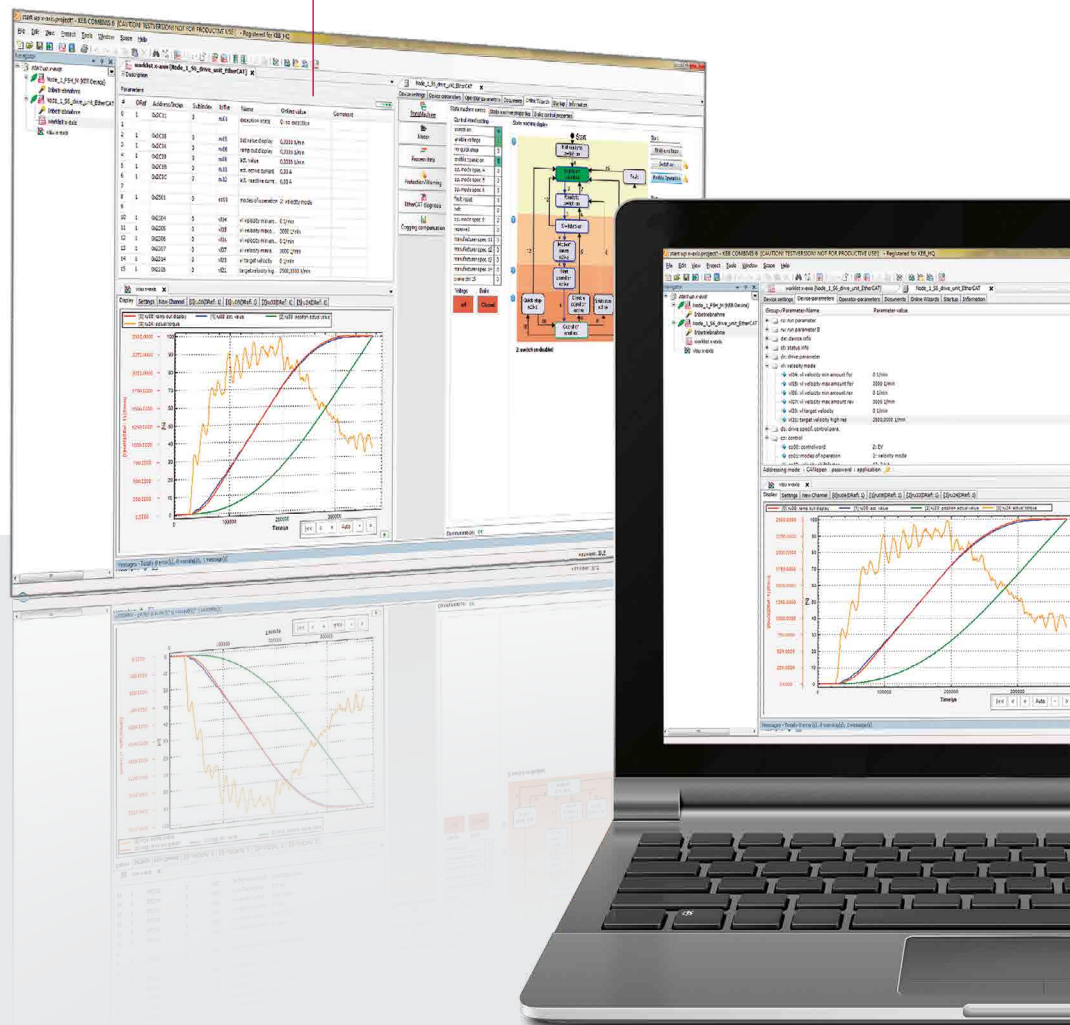
- **Modularity:** Consistent device concept across all performance ranges – ideal for scalable systems
- **Flexibility:** Adaptable to a wide range of applications and industry-specific requirements
- **Easy integration:** Different interfaces and safety functions for smooth system connection
- **Robustness:** Designed for use in harsh industrial environments with high availability

# COMBIVIS 6 – THE TOOL FOR ALL TASKS

## COMBIVIS 6

Commissioning software for parameterisation, diagnostics and project management

- Free and easy-to-use software for commissioning, management and analysis
- Direct access to device documentation
- 16-channel oscilloscope for comprehensive analyses, 4 channels of which can be displayed in the drive's control grid
- Online and offline parameter list comparison/Quick Compare Mode
- Parameterisation of safety parameters and functions

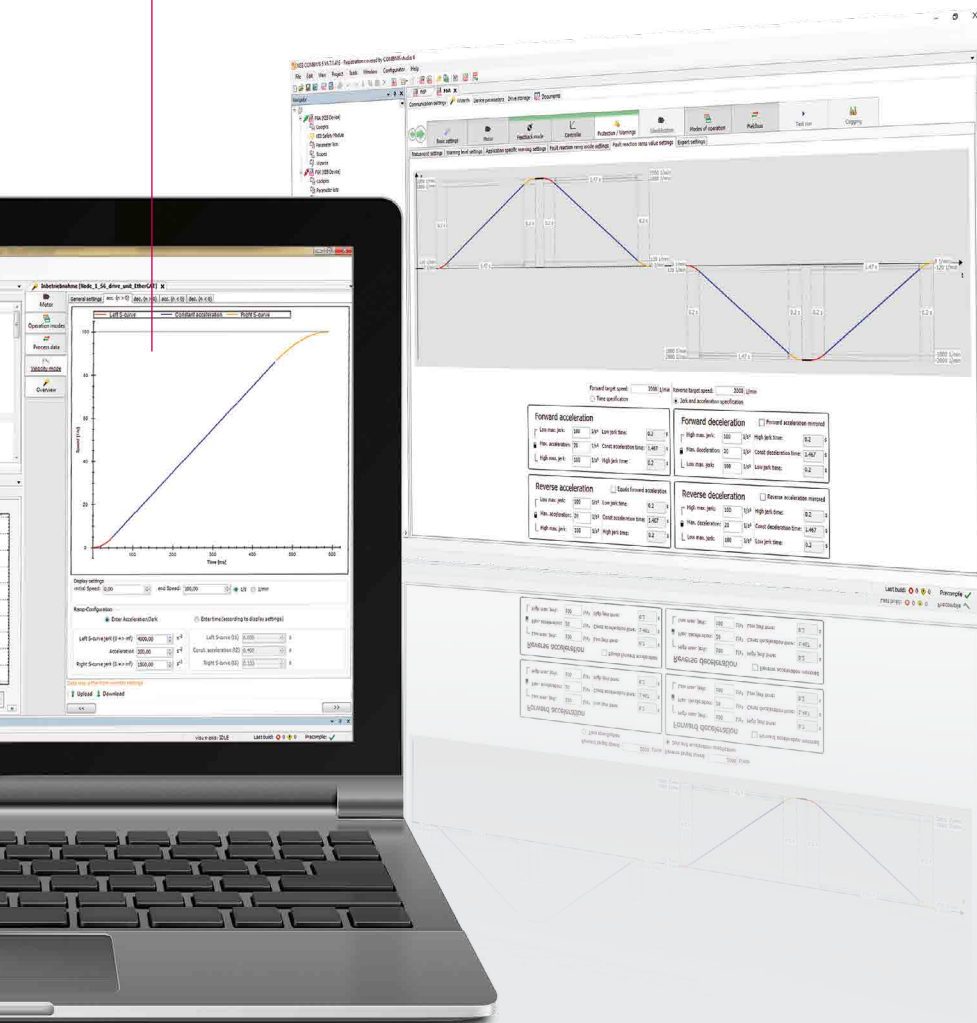


## COMBIVIS studio 6

The intelligent automation suite from KEB combines an assistant-guided component selection, fieldbus configuration, drive parameterisation, IEC 61131-3 project generation and motion control. Throughout the planning and layout phase, implementation of control sequences and multi-axis movement profiles, to start-up and fine tuning, the user is supported by a tool developed by experienced application engineers. With a foundation built on libraries, devices and template databases, rapid and simple solutions can be generated for a wide range of applications.

## COMMISSIONING ASSISTANT

- Complete user guidance through the commissioning process
- KEB Motor database, freely expandable
- Anti cogging
- Fieldbus diagnostic and optimisation
- Sine filter wizard
- Servo pump wizard



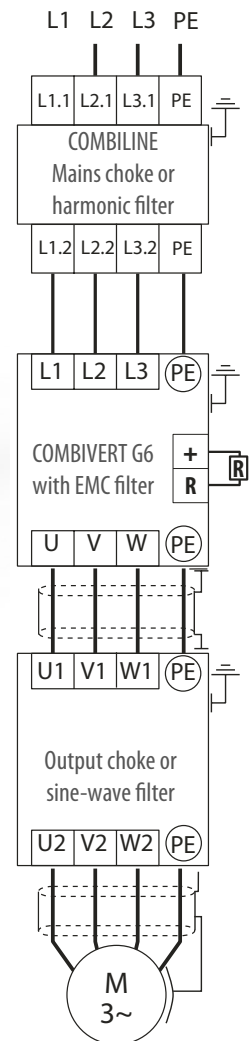
## HIGHLIGHTS

- IEC 61131-3 Applications development
- Start-up and diagnosis assistant
- COMBIVIS studio HMI integration
- Document database

# ACCESSORIES

## STABLE OPERATION IN INDUSTRIAL ENVIRONMENTS

An EMC-compliant design with efficient control cabinet and system interference suppression is essential for the safe operation of machines and systems. The current- and voltage-limiting COMBILINE modules for the mains and motor sides are designed to meet the requirements of the COMBIVERT G6 inverter series.



### MAINS CHOKES

reduce the input current and mains distortion. By smoothing the input currents, the service life of the frequency inverters is increased, especially at constantly high loads.

### OUTPUT CHOKES AND FILTERS

reduce the voltage and current stress of the motor winding.

### SINE-WAVE FILTERS

protect the motor winding from voltage peaks and allow the use of long motor cables.

### HARMONIC FILTERS

reduce the mains interference caused by low-frequency disturbances from consumers powered by B6 rectifiers. They are the new innovative solution that can be incorporated into the electrical switchgear as early as the planning stage – as easily as a mains choke – and enable compliance with many international standards.

### BRAKING RESISTORS

for use in systems with regenerative operation (e.g. hoists), KEB offers a wide range of braking resistors to suit your specific application.

### HIGH PERFORMANCE FERRITE CORES

reduces the values of  $du/dt$ 's also in the frequency range of the bearing currents.

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KEB'S GLOBAL PARTNER NETWORK





The information provided in this brochure contains merely general descriptions or characteristics of performance which in case of actual application do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of contract. We reserve the right to make technical changes.

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