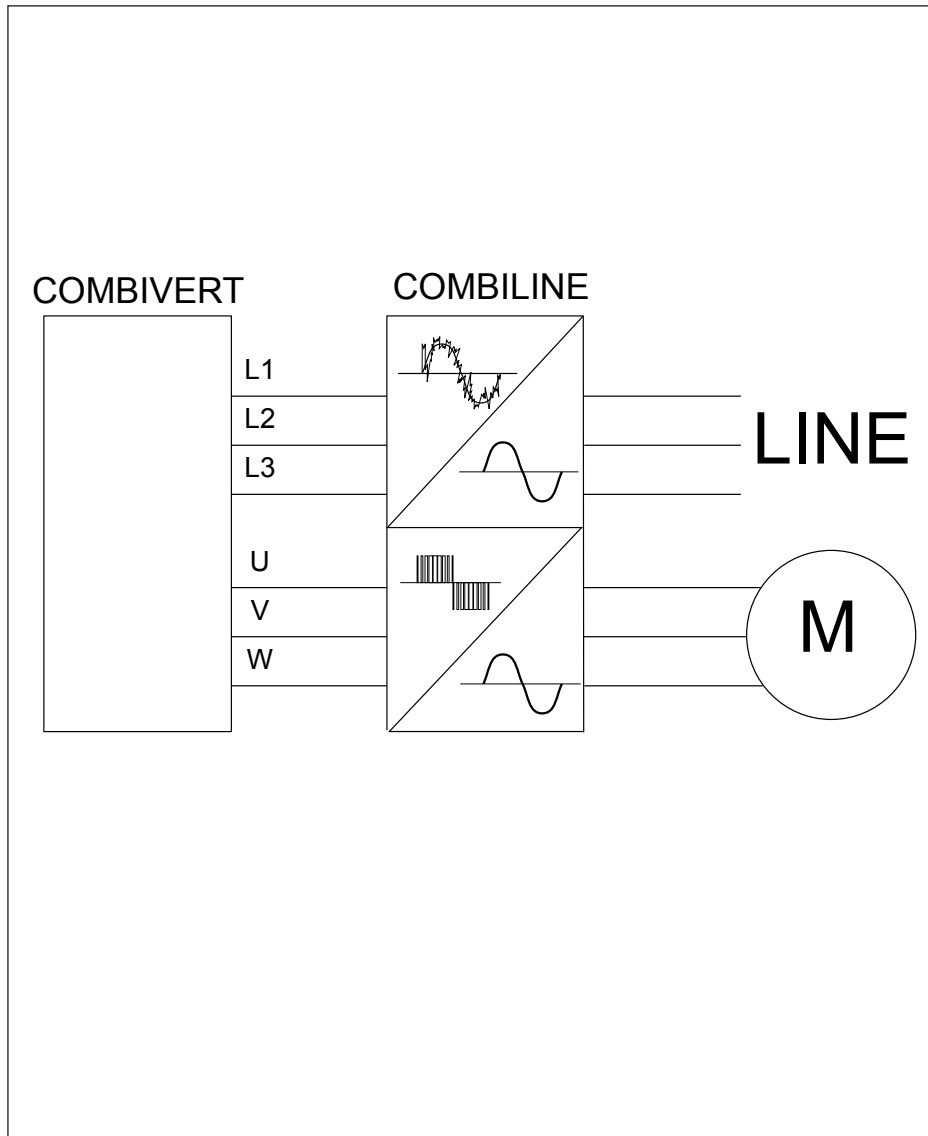


# COMBIVERT



**GB** INSTRUCTION MANUAL

IO-Filter

Mat.No.	Rev.
13E53ED-K320	1B

**KEB**



## 1. Safety

### 1.1 About this Instruction Manual

Prior to performing any work on the unit the user must familiarize himself with the unit. This includes especially the knowledge and observance of the **safety and warning directions**. The pictographs used in this Instruction Manual have following meaning:



**Danger** Refers to danger of life by electric current.



**Warning** Refers to possible danger of injury or life.



**Note** Refers to tips and additional information.

### 1.2 Validity

The information contained in the technical documentation, as well as any user-specific advice in spoken and written and through tests, are made to best of our knowledge and information about the application. However, they are considered for information only without responsibility. This also applies to any violation of industrial property rights of a third-party.

Inspection of our units in view of their suitability for the intended use must be done generally by the user. Inspections are particularly necessary, if changes are executed, which serve for the further development or adaption of our products to the applications (hardware, software or download lists). Inspections must be repeated completely, even if only parts of hardware, software or download lists are modified.



**Controlling by the user** Application and use of our units in the target products is outside of our control and therefore lies exclusively in the area of responsibility of the user.



**Use under special conditions** The used semiconductors and components of KEB are developed and dimensioned for the use in industrial products. If the KEB COMBIVERT is used in machines, which work under exceptional conditions or if essential functions, life-supporting measures or an extraordinary safety step must be fulfilled, the necessary reliability and security must be ensured by the machine builder.

### 1.3 Qualification

All work from the transport, to installation and initial operation as well as maintenance may only be done by qualified personnel (IEC 364 and/or CENELEC HD 384 and IEC-Report 664 and note national safety regulations). According to this manual qualified staff means those who are able to recognise and judge the possible dangers based on their technical training and experience and those with knowledge of the relevant standards and who are familiar with the field of power transmission (VDE 0100, EN 50178, EN 60204 as well as the appropriate regulations for your area).



**Danger by high voltage** KEB electronics components contain dangerous voltages which can cause death or serious injury. In operation, drive converters, depending on their degree of protection, may have live, uninsulated, and possibly also moving and hot surfaces. In case of inadmissible removal of the required covers, of improper use, wrong installation or maloperation, there is the danger of serious personal injury and damage to property.



**Attention** The filter will be destroyed, if the dc link circuit (terminal block +, -) is not connected.

# IO-Filter

## 1.4 Use as directed

I/O-filters combine a line-side HF-filter and a motor-side dv/dt-filter in one compact unit. The compact mechanical installation with pre-wired lines permits a space-saving installation with inverters of the COMBIVERT F5 series as submounted version as well as side-mounted version (generally).

The part of the input filter which is dimensioned with high damping at low leakage current reduces the cable-based disturbances to limit value B. A passive output dv/dt-filter with choke serves for a limitation of the dv/dt at the output.

I/O filters are designed for operation at line lengths over 30 m upto 100 m and protect connected motors against inadmissible high voltage rise as well as inadmissible high peak voltages. By this way they protect the lifetime of the winding isolation of the motor. This is especially reasonable in case of re-designs, i.e. operation of old motors at frequency inverters.

## 1.5 Conformity

The IO-filter meets the requirements of the Low-Voltage-Directive 2006/95/EG as well as the the requirements in accordance with the EMC directive 2004/108/EG.

## 1.6 Product description

Unit type:	IO-filter
Series:	E5
Construction:	Sub-mounted for F5 housing size D
Other features:	Listing: CE f = 0,15...30MHz

## 2. Technical Data

### 2.1 General

Part number		13E5T60-10G2
Type of protection	–	IP20
Climatic category	3K3	extended to T <sub>max</sub> = 45°C
Weight	[kg]	3,0
Interference grade according to EN 61800-3		C1

### 2.2 Input filter

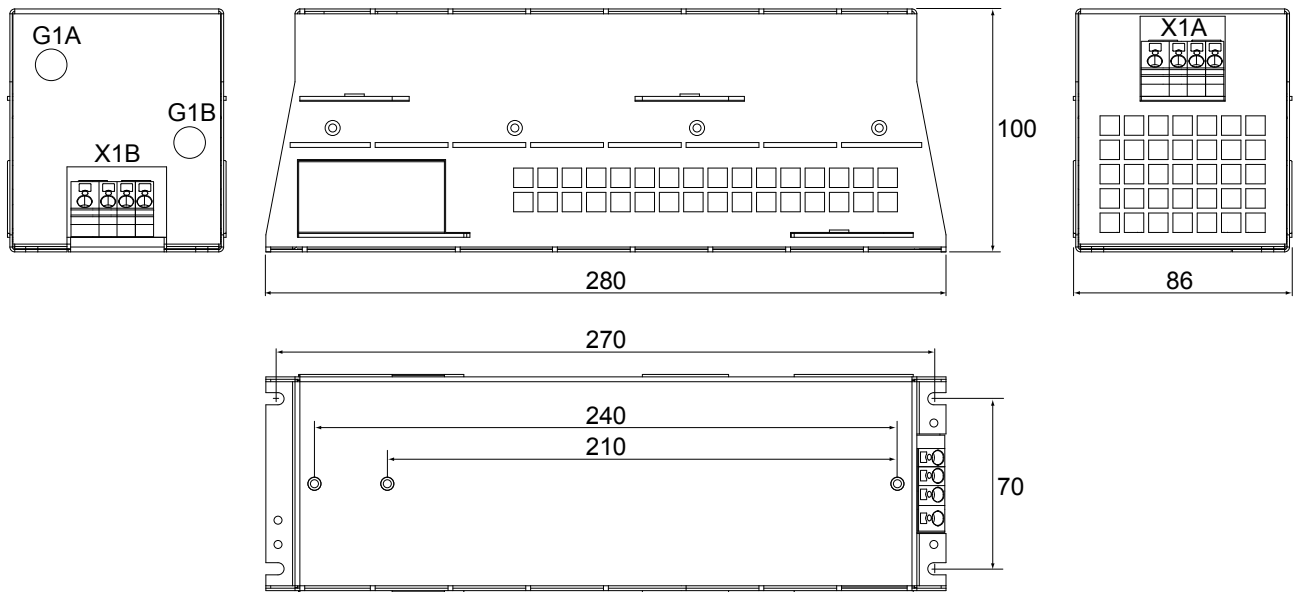
Input rated voltage	[VAC]	3 x 400/480 ± 10 %
Mains frequency	[Hz]	50/60 ± 2
Input rated current I <sub>N</sub> at T <sub>max</sub>	[A]	16
Power loss at I <sub>N</sub>	[W]	11,5
Leakage current (one phase to PE)	[mA]	117

### 2.3 Output filter

Input rated voltage	[VAC]	3 x 400/480 ± 10 %
Motor rated power	[kW]	5,5
Maximum output frequency	[Hz]	1600
Output rated current I <sub>A</sub> at T <sub>max</sub>	[A]	12
Maximum inverter switching frequency	[kHz]	16
Maximum motor line length (shielded)	[m]	Limit value class C1 = 50
Maximum rate of voltage rise (du/dt)	[V/μs]	500
Voltage drop at I <sub>A</sub> , f <sub>N</sub>	[V]	16

## 2.4 Dimensions

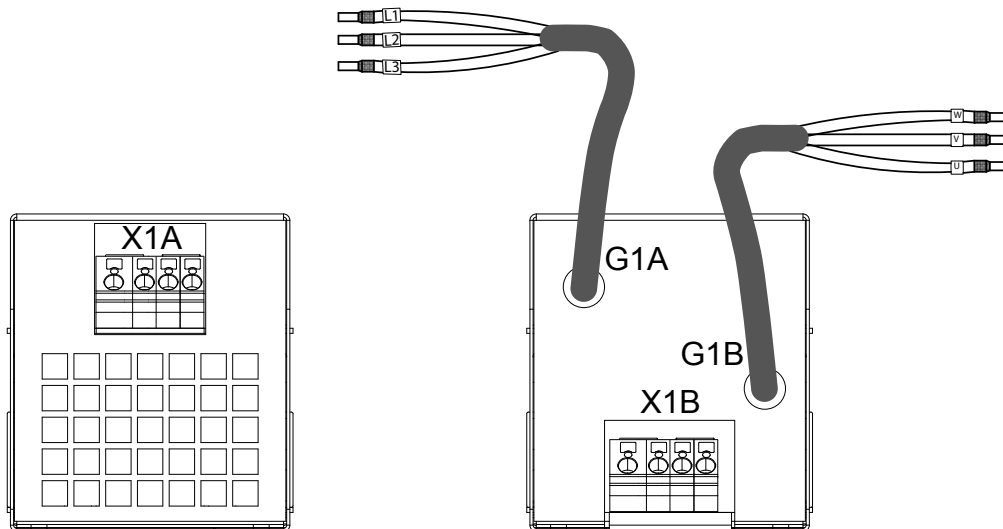
Picture 2.4 Dimensions 13E5T60-10G2



Mounting material for the installation of the KEB COMBIVERT onto the filter:  
2 pieces M4x12 (9905071-412K)

## 2.5 Description of the connections

Picture 2.5 Connections 13E5T60-10G2



Terminals / cable		Name	Connection
X1A	L1, L2, L3	HF-filter input	Mains supply
G1A	L1, L2, L3	HF-filter output	Connection at the mains input of the inverter
G1B	U, V, W	du/dt-filter input	Connection at the motor output of the inverter
X1B	U', V', W'	du/dt-filter output	Motor connection

# IO-Filter

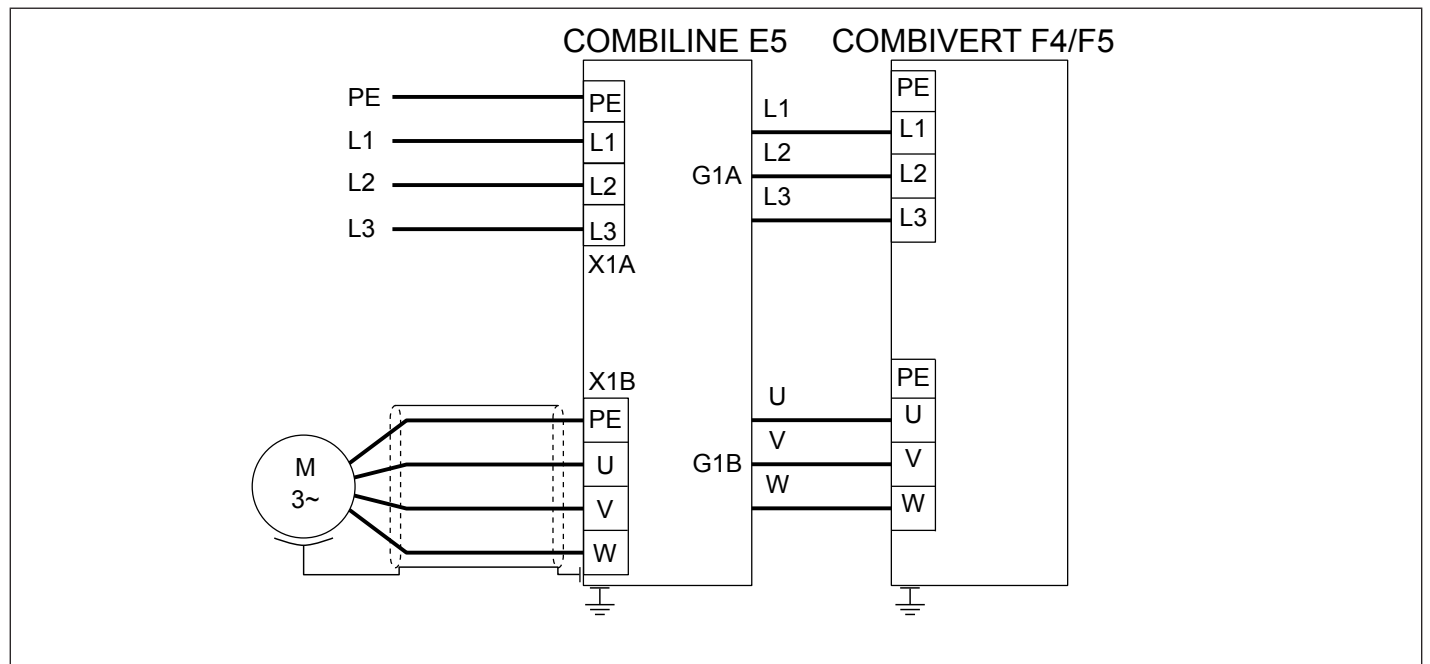
## 2.5.1 Permissible cable cross-sections of the connection terminals

Terminals	permissible cross-section flexible with wire-end ferrule				Strip length	
	mm <sup>2</sup>		AWG/MCM		mm	inch
	min	max	min	max		
X1A, X1B	0,2	4	24	12	10	0,4

## 2.5.2 Description of the connection cable

Cable	Name	Color	Core cross-section	
			mm <sup>2</sup>	AWG/MCM
G1A	L1	black	2.5	14
	L2	brown		
	L3	purple		
G1B	U	black		
	V	brown		
	W	purple		

## 2.6 Connection of the filter







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