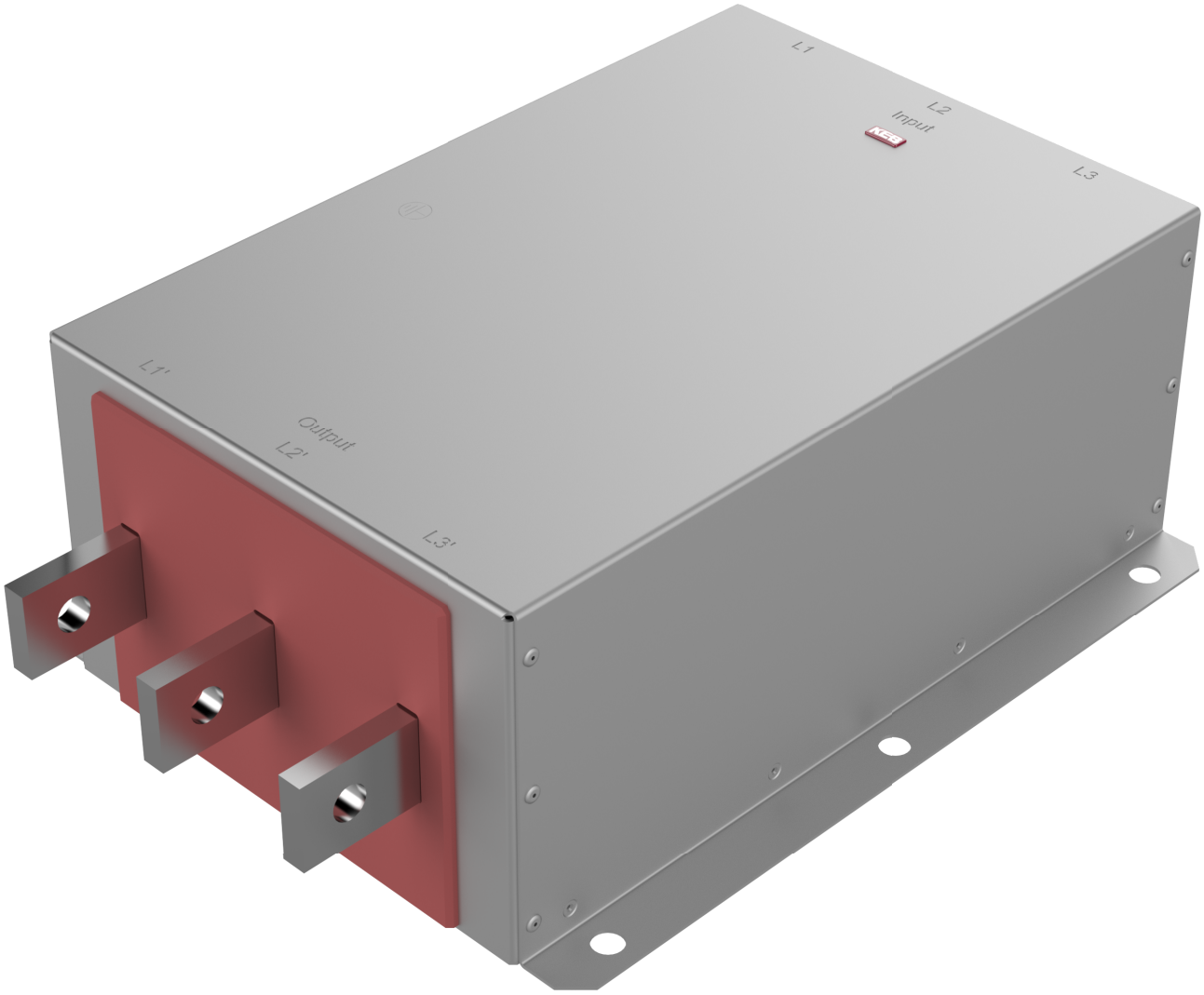

Instructions for Use

COMBILINE E6

Installation HF-Filter side-mounted Size 33

Translation of the original manual - Pre-Series

Document 20337731 EN 03

Imprint

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ma_dr_e6-hf-33-nb-20337731_en
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Table of Contents

List of Figures

List of Tables

1 Introduction

The described devices, accessories, hardware and/or software are products of KEB Automation KG. The enclosed documents correspond to conditions valid at printing. Misprint, mistakes and technical changes reserved.

1.1 Markings

1.1.1 Warnings

Certain operations can cause hazards during the installation, operation or thereafter. There is safety information in the documentation in front of these operations.

Warnings contain signal words for the severity of the hazard, the type and/or source of the hazard, the consequence of non-compliance and the measures to avoid or reduce the hazard.

⚠ DANGER

Type and/or source of the hazard.

Leads to death or serious bodily injury if not observed.

a) Measures to avoid the hazard.

b) Can be supplemented by an additional danger sign or pictogram.

⚠ WARNING

Type and/or source of the hazard.

May cause death or serious injury if not observed.

a) Measures to avoid the hazard.

b) Can be supplemented by an additional danger sign or pictogram.

⚠ CAUTION

Type and/or source of the hazard.

May cause bodily injury if not observed.

a) Measures to avoid the hazard.

b) Can be supplemented by an additional danger sign or pictogram.

NOTICE

Type and/or source of the hazard.

Can cause damage to property if not observed.

a) Measures to avoid the hazard.

b) Can be supplemented by an additional danger sign or pictogram.

1.1.2 Information notes

Indicates to the user a special condition, prerequisite, scope or simplification.

This is a reference to further documentation. The barcode is for smartphones, the following link is for online users or for typing.

(🌐► https://www.keb-automation.com/search)

Notes on conformity for use in the North American or Canadian market.

1.1.3 Symbols and markers

✓	Condition
a)	Action step
⇨	Result or intermediate result
(≡► Reference [▷ 8])	Reference to a chapter, table or picture with page reference
ru21	Parameter name or parameter index
(🌐►)	Hyperlink
<Strg>	Control code
COMBIVERT	Lexicon entry

1.2 Laws and guidelines

KEB Automation KG confirms with the CE mark and the EU declaration of conformity that our device complies with the essential safety requirements.

The EU declaration of conformity can be downloaded on demand via our website.

1.3 Warranty and liability

The warranty and liability on design, material or workmanship for the acquired device is given in the general conditions of sale.

Here you will find our general sales conditions.

(🌐► https://www.keb-automation.com/terms-conditions)

Further agreements or specifications require a written confirmation.

1.4 Support

Through multiple applications, not every possible case has been taken into account. If you require further information or if problems occur which are not treated detailed in the documentation, you can request the necessary information via the local KEB Automation KG agency.

The use of our units in the target products is beyond of our control and therefore exclusively the responsibility of the customer**.**

The information contained in the technical documentation, as well as any support provided verbally, written or through testing, is made to the best of our knowledge and information regarding intended use of KEB products. However, due to technical changes, any information provided is considered non-binding and is subject to change. This also applies to any violation of industrial property rights of a third-party.

Selection of KEB units in view of their suitability for the intended use must be done by the user.

Tests can only be carried out within the scope of the intended end use of the product (Application**) by the** Customer**. They must be repeated, even if only parts of hardware, software or the unit adjustment are modified.**

1.5 Copyright

The customer may use the instructions for use as well as further documents or parts from it for internal purposes. Copyrights are with KEB Automation KG and remain valid in its entirety.

Other wordmarks and/or logos are trademarks (™) or registered trademarks (®) of their respective owners.

1.6 Validity of this manual

These instructions for use are valid for the units specified in the product description. It can be supplemented by corresponding options or special designs. It contains:

- Safety instructions to be observed
- Information on intended use
- Description of the device
- Technical Data
- Installation
- Connection
- Operation
- Maintenance, service and disposal

1.7 Target group

The instructions for use is determined exclusively for electrical personnel. Electrical personnel for the purpose of this instruction manual must have the following qualifications:

- Knowledge and understanding of the safety instructions.
- Skills for installation and assembly.
- Start-up and operation of the product.
- Understanding of the function in the used machine.
- Detection of hazards and risks of the electrical drive technology.
- Knowledge of IEC 60364.
- Knowledge of national safety regulations (e. g. DGUV Regulation 3).

2 General Safety Instructions

The products are developed and built according to the state of the art and recognized safety rules. Nevertheless, their use may create dangers to life and limb of the user or third parties or damage to the machine and other material property.

The following safety instructions have been created by the manufacturer for the area of electric drive technology. They can be supplemented by local, country- or application-specific safety instructions. This list is not exhaustive. Non-observance of the safety instructions by the customer, user or other third party leads to the loss of all resulting claims against the manufacturer.

NOTICE

Hazards and risks through ignorance!

a) Read the instructions for use.

b) Observe the safety and warning instructions.

c) Ask if something is unclear.

2.1 Installation

⚠ DANGER

Explosion hazard due to sparking!

a) Do not operate the unit in a potentially explosive environment.

⚠ CAUTION

Design-related edges and heavy weight

Contusions and bruises

a) Never stand under suspended loads.

b) Wear safety shoes.

c) Secure product accordingly when using lifting tools.

2.2 Electrical installation

⚠ DANGER

Electrical voltage at terminals and in the device!

Danger to life due to electric shock !

✓ For any work on the device

a) Switch off the supply voltage.

b) Secure it against switching on.

c) Wait until all drives has been stopped in order that no regenerative energy can be generated.

d) Await capacitor discharge time (min. 5 minutes). Measure DC voltage at the terminals.

e) Never bridge upstream protective devices. Also not for test purposes.

2.3 Start-up and operation

⚠ CAUTION

High temperatures at the unit!

Burning of the skin

a) Cover hot surfaces safe-to-touch.

b) If necessary, attach warning signs on the system.

c) Before any working let the unit cool down.

d) Check the temperature before touching any parts.

3 Product description

The EMC filters of the product series COMBILINE serve to comply with normative limit values of high-frequency, conducted interference voltages at the mains input of the drive controllers.

The filters consist of an LC network that has a particularly high attenuation in the entire frequency range. This reduces the effective leakage current of the drive system.

Device type	HF filter
Series	COMBILINE E6
Design	Side-mounted

The COMBILINE E6 filters are characterised by the following features:

- Designed for interference suppression of individual devices.
- They can be used on TN, TT and IT systems.
- Large rated voltage range.
- High saturation strength, designed for shielded motor cable lengths up to 100 m.
- Increasing the interference immunity of the drive controllers.

3.1 Intendend use

The filters of the COMBILINE product series are only suitable for use in conjunction with drive converters. They are intended for installation in electrical systems or machines.

Technical data and information for connection conditions shall be taken from the type plate and from the instruction manual and must be strictly observed.

3.2 Unintended use

Operation of our products outside the limits specified in the technical data leads to the loss of any liability claims and specified approvals/acceptances.

3.3 Part code

1. and 2. digit	Device size
12…33	Input current 12...840 A

3. and 4. digit	Series
E6	COMBILINE E6

5.-7. digit	Version
T60	Complete filter including housing

8. digit	Design / voltage class
1	Back mount filter / 3-phase / 400 V
3	Side mount filter / 3-phase
4	4-conductor filter
5	NHF filter / 3-phase / 400 V
7	DC filter

9. digit	Limit class
0	C1
1	C2
2	C3
A	C2

B	C1

10. digit	Mains form
0	TN, TT
5	IT, TN, TT

11. digit	Version
0	Sequential numbering

3.4 Functional description

3.4.1 HF filter for IT, TN and TT mains

3.4.1.1 Schematic diagram HF mains filter for IT, TN and TT systems

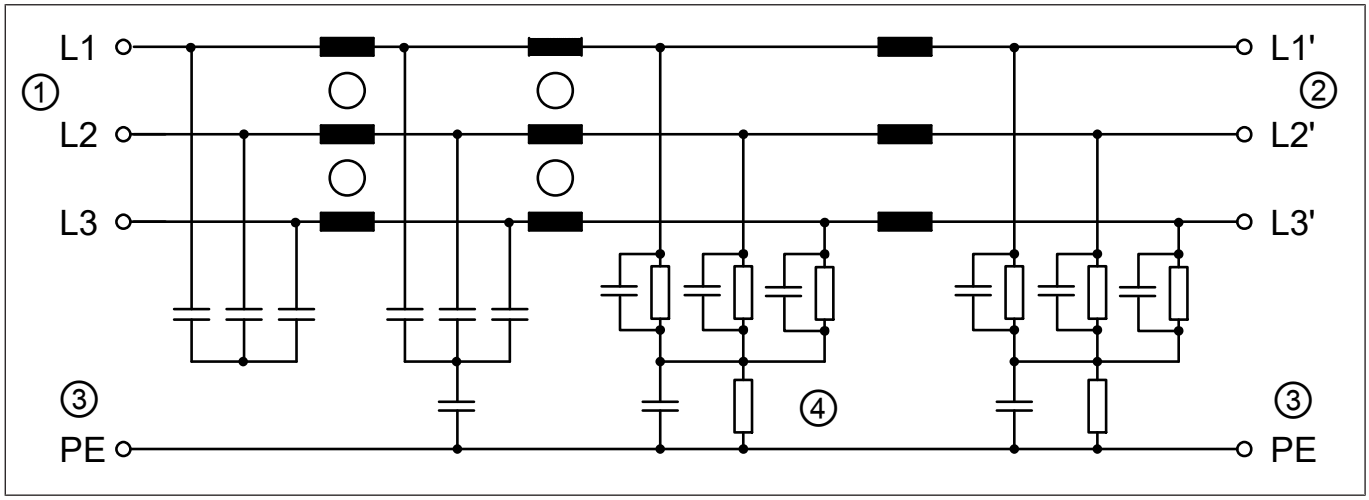


Fig. 1: Schematic diagram HF mains filter for IT, TN and TT systems

① Mains input (L1, L2, L3)	② Mains output (L1‘, L2‘, L3‘)
③ Protective earth (PE)	③ Protective earth (PE)
④ Insulation resistance to earth typ. 16 MΩ	

3.4.1.2 Use at the IT system

The rated voltage between a phase conductor and earth potential (or the star point in the IT mains) must not exceed 300 V, USA UL: 480 / 277 V.

A short-term shutdown must be ensured for the IT mains.

Use of IT monitoring devices

HF filter in conjunction with drive controllers achieve an insulation resistance of approx. 500 kΩ. Especially when connecting several systems in parallel, the value must be observed when presetting IT monitoring devices.

4 Technical data

4.1 Operating conditions

4.1.1 Climatic ambient conditions

Storage	Standard	Class	Notes
Ambient temperature	EN 60721-3-1	1K4	-25…55 °C
Relative humidity	EN 60721-3-1	1K3	5…95 % (without condensation)
Storage height	-	-	Max. 3000 m above NHN

Transportation	Standard	Class	Notes
Ambient temperature	EN 60721-3-2	2K3	-25…70 °C
Relative humidity	EN 60721-3-2	2K3	95 % at 40 °C (without condensation)

Operation	Standard	Class	Notes
Ambient temperature	EN 60721-3-3	3K3	5…40 °C (extended to -10…45 °C)
Relative humidity	EN 60721-3-3	3K3	5…85 % (without condensation)
Site altitude	-	-	Max. 2000 m above NHN From 1000 m, a power reduction of 1 % per 100 m must be taken into account.

4.1.2 Mechanical ambient conditions

Storage	Standard	Class	Notes
Vibration limit	EN 60721-3-1	1M3	Vibration amplitude 3.0 mm (2…9 Hz) acceleration amplitude 10 m/s² (9…200 Hz)
Shock limit values	EN 60721-3-1	1M3	100 m/s²; 11 ms

Transport	Standard	Class	Notes
Vibration limits	EN 60721-3-2	2M1	Vibration amplitude 3.5 mm (2...9 Hz) Acceleration amplitude 10 m/s² (9...200 Hz)
Shock limit values	EN 60721-3-2	2M1	100 m/s²; 11 ms

Operation	Standard	Class	Notes
Vibration limits	EN 60721-3-3	3M4	Vibration amplitude 3.0 mm (2...9 Hz) Acceleration amplitude 10 m/s² (9...200 Hz)
Vibration limit	EN 61800-5-1	-	Vibration amplitude 0.075 mm (10…57 Hz) acceleration amplitude 10 m/s² (57…150 Hz)
Shock limit values	EN 60721-3-3	3M4	100 m/s²; 11 ms

4.1.3 Chemical/mechanical active substances

Storage	Standard	Class	Notes
Contamination gases	EN 60721-3-1	1C2	-
Contamination solids	EN 60721-3-1	1S2	-

Transportation	Standard	Class	Notes
Contamination gases	EN 60721-3-2	2C2	-
Contamination solids	EN 60721-3-2	2S2	-

Operation	Standard	Class	Notes
Contamination gases	EN 60721-3-3	3C2	-
Contamination solids	EN 60721-3-3	3S2	-

4.1.4 Electrical operating conditions

4.1.4.1 Device classification

Requirement	Standard	Class	Notes
Overvoltage category	EN 61800-5-1	III	-
Pollution degree	EN 60664-1	2	Non-conductive pollution, occasional condensation when PDS is out of operation.

4.2 Electrical data

	33E6T60-3150
Rated input voltage	400 V
Rated input voltage (UL)	480/277 V
Input voltage range	0…528 V
Peak input voltage	550 V für max. 1 min/h
Mains phases	3
Mains frequency	50/60 Hz ±2 Hz
Mains form	TN, TT, IT
Leakage current according to EN 60939-1: 2010 (Annex A9)	0,8 mA @ 400 V; 1,0 mA @ 480 V
Rated input current	840 A
Rated input current (UL)	726 A
Overload (60s)	150 %
Power dissipation	110 W
Construction and protection class	IP00

Tab. 1: Electrical data

4.2.1 Fuse protection according to

The following table shows the maximum fuse size of the type gG with a 1:1 dimensioning and an input voltage of 400 V. In case of other dimensioning, the values must be designed for the current and the SCCR rating of the weakest element in the drive system (choke, filter, drive controller).

	SCCR 30kA	SCCR 100kA
33E6T60-3150	-	2 x 450 A

Tab. 2: Fuse protection according to IEC

4.2.2 Fusing according to UL

The following fuses must be used for conformity for the use on the North American or Canadian market.

4.2.2.1 SCCR 42kA (Class L)

The following fusing is suitable for a circuit that cannot supply more than 42 kA rms at max. 480/277 V.

Part number	SCCR	Fuse	Class
33E6T60-3150	42 kA	900A	Class L

Tab. 3: Fusing according to UL Class L

4.2.2.2 SCCR 100kA (Class gR/aR)

The following fusing with semiconductor fuses is suitable for a circuit that cannot supply more than 100 kA rms at max. 480/277 V.

Part number	Fuse	Manufacturer	Model [1)]
33E6T60-3150	900A	Siba GmbH (E180276)	206xy32.900
		Cooper Busmann LLC (E125085)	170M5xy5
		Littlefuse INC (E71611)	PSR032xy0900

Tab. 4: Fusing according to UL Class gR/aR

1) x stands for different indicators; y for different connection variants.

4.2.3 Interference suppression level

To comply with the required limit class the specified motor cable length must not be exceeded, depending on the switching frequency.

Filter	33E6T60-3150		
Interference voltage (limit class EN 61800-3)	C2 (C3)		
Rated switching frequency	2 kHz	4 kHz	8 kHz
Maximum motor cable length (low-capacity)	100 m	50 m (100 m)	100 m

Tab. 5: Interference suppression level 33E6T60-3150

4.2.4 Insertion loss

Measurement results of insertion loss in accordance with EN 55017.

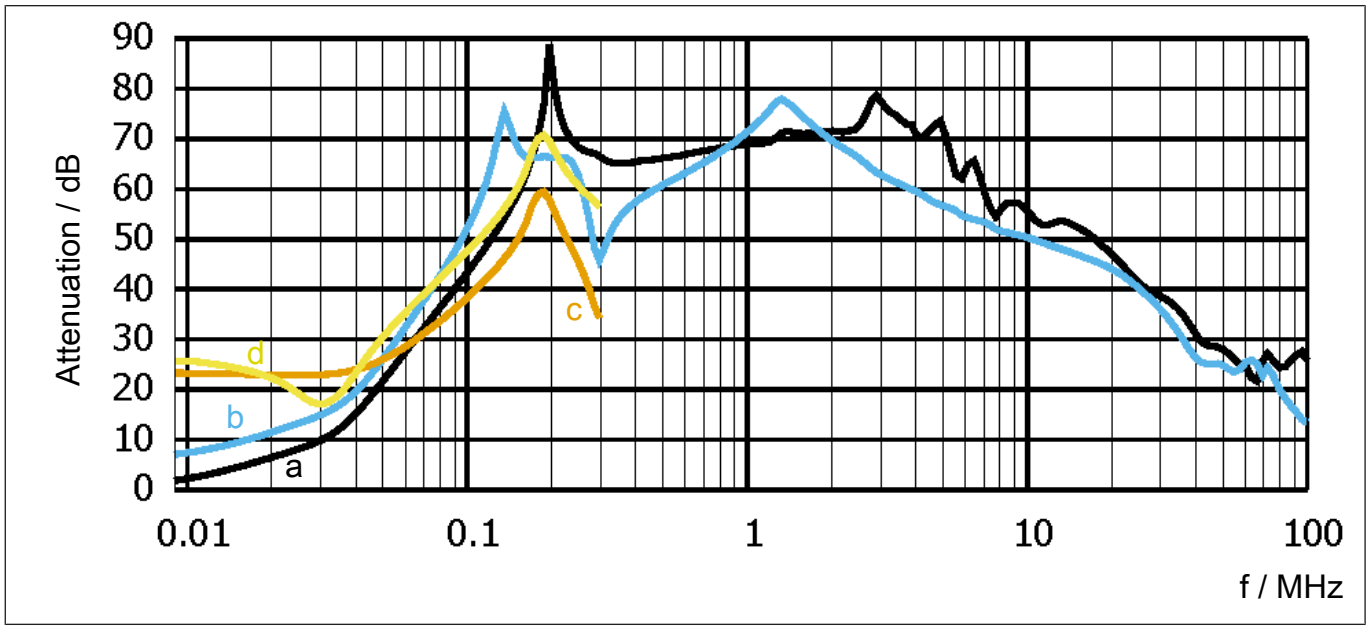


Fig. 2: 33E6T60-3150 insertion loss

a Asymmetrical insertion loss (Common Mode)	b Unsymmetrical insertion loss (Differential Mode)
c Symmetrical insertion loss (0.1Ω/100Ω system)	d Symmetrical insertion loss (100Ω/0.1Ω system)

5 Assembly

5.1 Assembly instructions

To prevent damage to the product, the following instructions must be observed:

- Make sure that no components are bent and/or insulation distances are changed.
- In case of mechanical defects, the product must not be put into operation. Compliance with applied standards is no longer guaranteed.
- No moisture or mist may penetrate the product.
- The penetration of dust must be avoided. When installing in a dust-tight housing, ensure sufficient heat dissipation.
- (≡► Minimum installation distances of the filter [▸ 18]) to surrounding elements.
- Do not cover ventilation openings.
- Install the product in accordance with the specified construction and protection degree.
- Make sure that no small parts (drilling chips, screws, etc.) fall into the product during assembly and wiring. This also applies to mechanical components, which can lose small parts during operation.

During assembly <link linkid="341440780" use="grab">Mechanische Umweltbedingungen</link> are only observed under the following conditions:

- Use fixing material with the described quality.
- Observe tightening torques

5.1.1 EMC notes on assembly

90% of the interferences caused by EMC can be prevented by the following measures:

a) The contact surface of the filter on the mounting plate must be electrically conductive.

b) The contact surface between the drive controller and the filter must be free of impurities in order to have a low-resistance, large-area transition here as well.

c) Use the optionally available shield connection bracket.

d) The motor shield must be placed over a large area on the shield connection bracket of the drive controller.

⇨ Electromagnetic interference can now be dissipated over a large area via the mass.

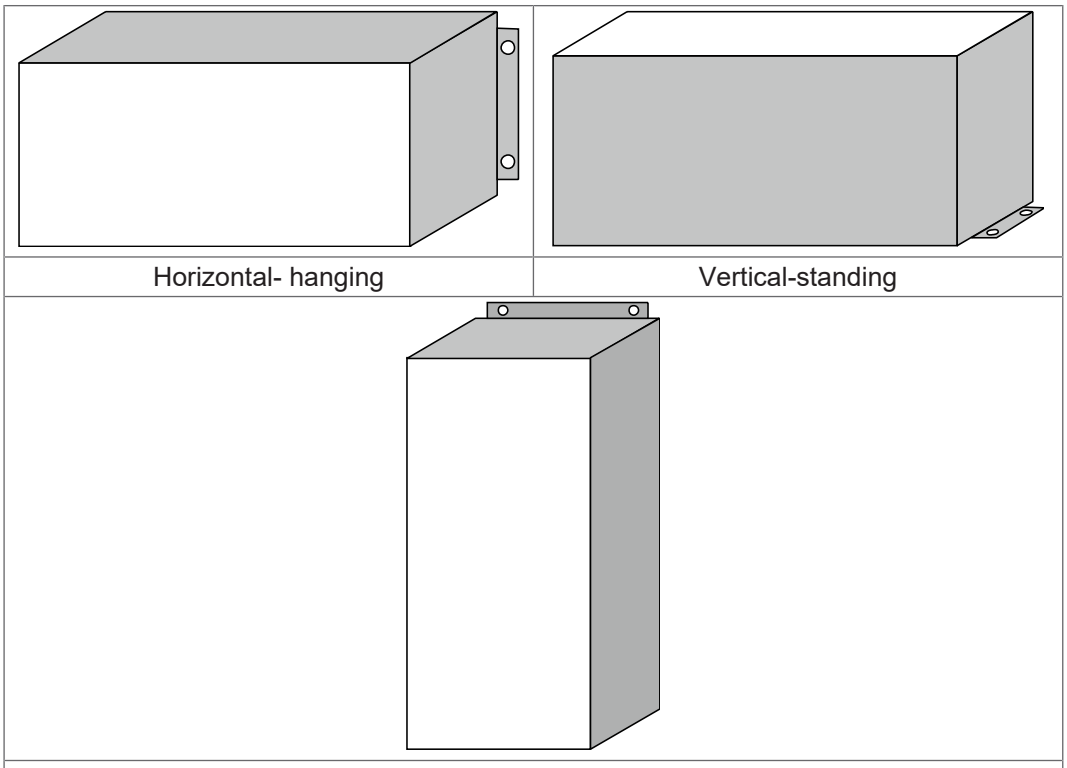
	Electromagnetic compatibility: (🌐► https://www.keb.de/fileadmin/media/Techinfo/dr/tn/ti_dr_tn-emc-00011_en.pdf)	

5.2 Mounting the filter

- Prepare drill holes
- Screw the filter onto the mounting plate with the specified torque.
- Connect the filter.
- Tighten the screws with the specified torque.

5.3 Mounting direction

a) Mount the device only in the permitted mounting orientation.



Horizontal- hanging	Vertical-standing
Vertical-hanging	

Tab. 6: Permitted mounting orientations

5.4 Minimum installation distances of the filter

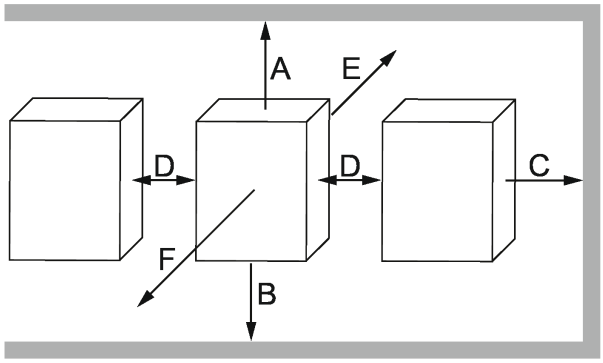


Fig. 3: Installation distances

Dimension	Distance	
A	150 mm	6 inch
B	100 mm	4 inch
C	30 mm	1.2 inch
D	0 mm	0 inch
E	0 mm	0 inch
F [1)]	50 mm	2 inch
1) Distance to front operating elements in the cabinet door.		

5.5 Dimensions

Unless otherwise indicated, all length specifications in the following chapter are in mm.

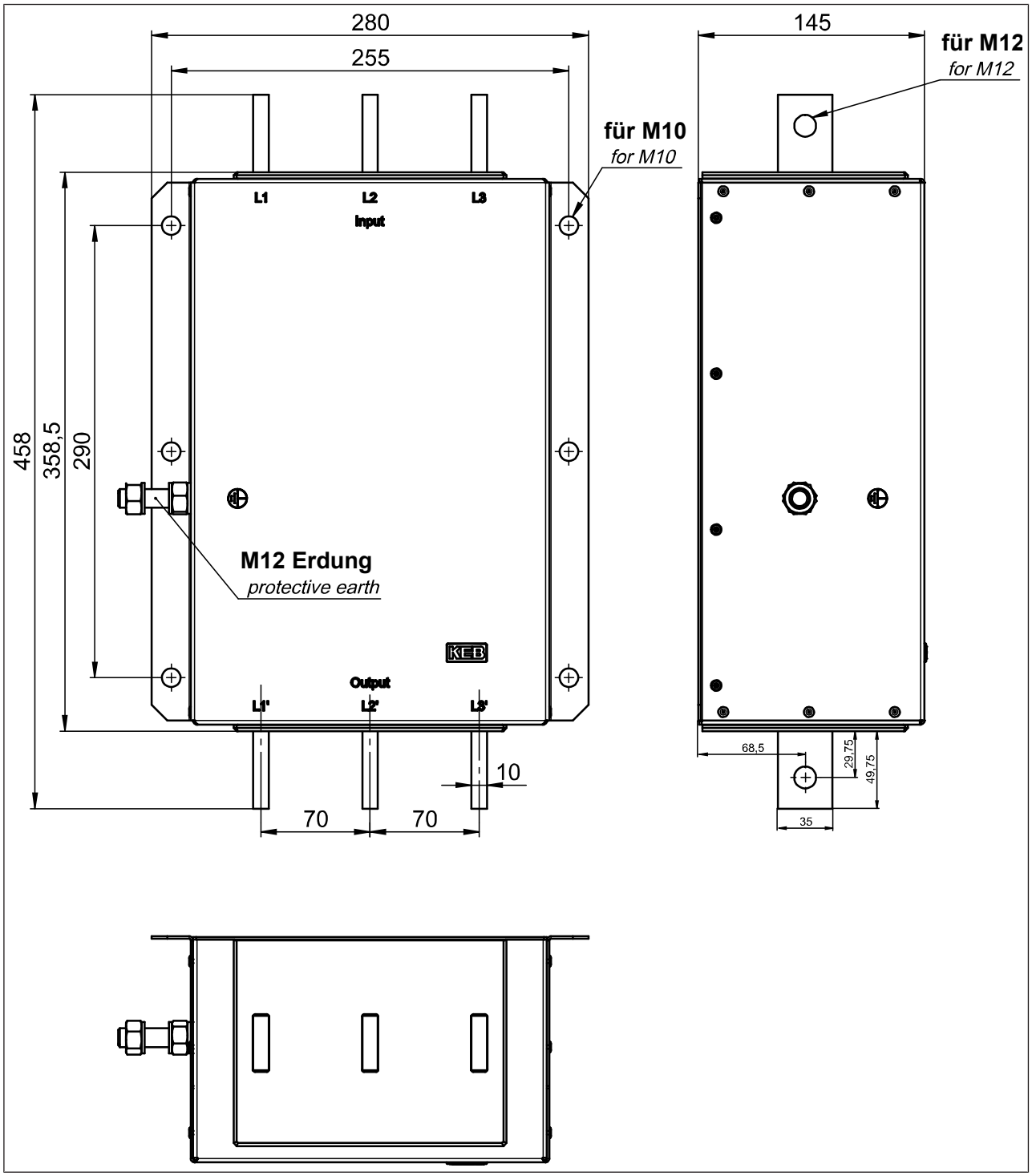


Fig. 4: Dimensions 33E6T60-3150

5.6 Fixing material

Filt	Number	Fixing material	Tightening torque	Suitable for
33E6T60-3150	6 pieces	Hexagon head screw ISO 4017 M10 - 8.8 washer ISO 7090-10-200 HV	50 Nm 440 lbin	Filter on control cabinet

5.7 Weight

Material number	Weight
33E6T60-3150	28.65 kg

6 Electrical connection

6.1 Connection instructions

The electrical installation shall be carried out in accordance with the relevant requirements.

With existing or newly wired circuits the person installing the units or machines must ensure the EN requirements are met.

To prevent malfunctions during operation, please pay attention to the following instructions:

- Cable cross-sections and fuses must be dimensioned according to the design of the machine manufacturer. Specified minimum / maximum values may not be fallen below /exceeded.
- Only use accessories approved for the product.
- The cables between the filter and the drive controller and between the choke and the filter must be kept as short as possible.
- The protective earth (PE) of the drive controller cannot/must not be done via the filter. The protective earth must be connected separately directly to the drive controller.

After connection:

- Check all device connections for tight fit to avoid contact resistances and sparking.
- Replace all required covers.

The assembly kits for connection listed below must be used for conformity with UL.

Part number	Locking screw with nut	Quantity	Tightening torque
00E6V80-0004	M12 x 35	6	40 Nm / 354 lbin

6.2 Mains connection

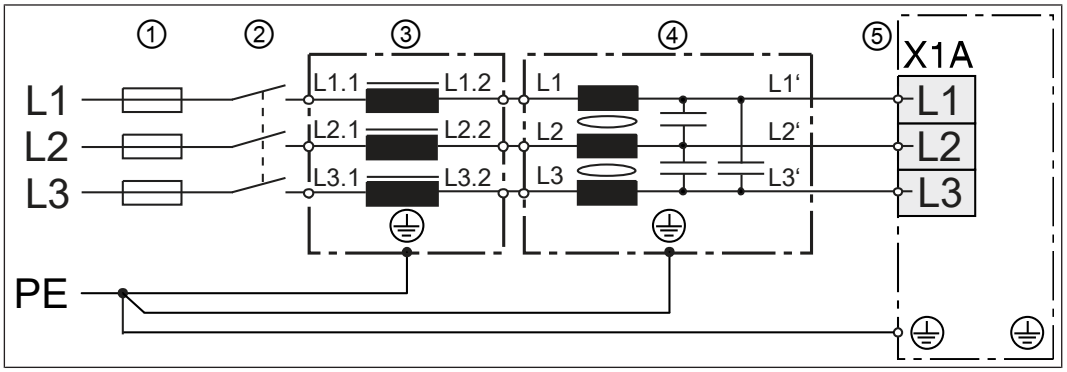


Fig. 5: Connection 3ph choke-filter-drive controller

① Mains fuses	② Mains contactor
③ Mains choke	④ HF filter
⑤ Drive controller	

6.3 Connection description

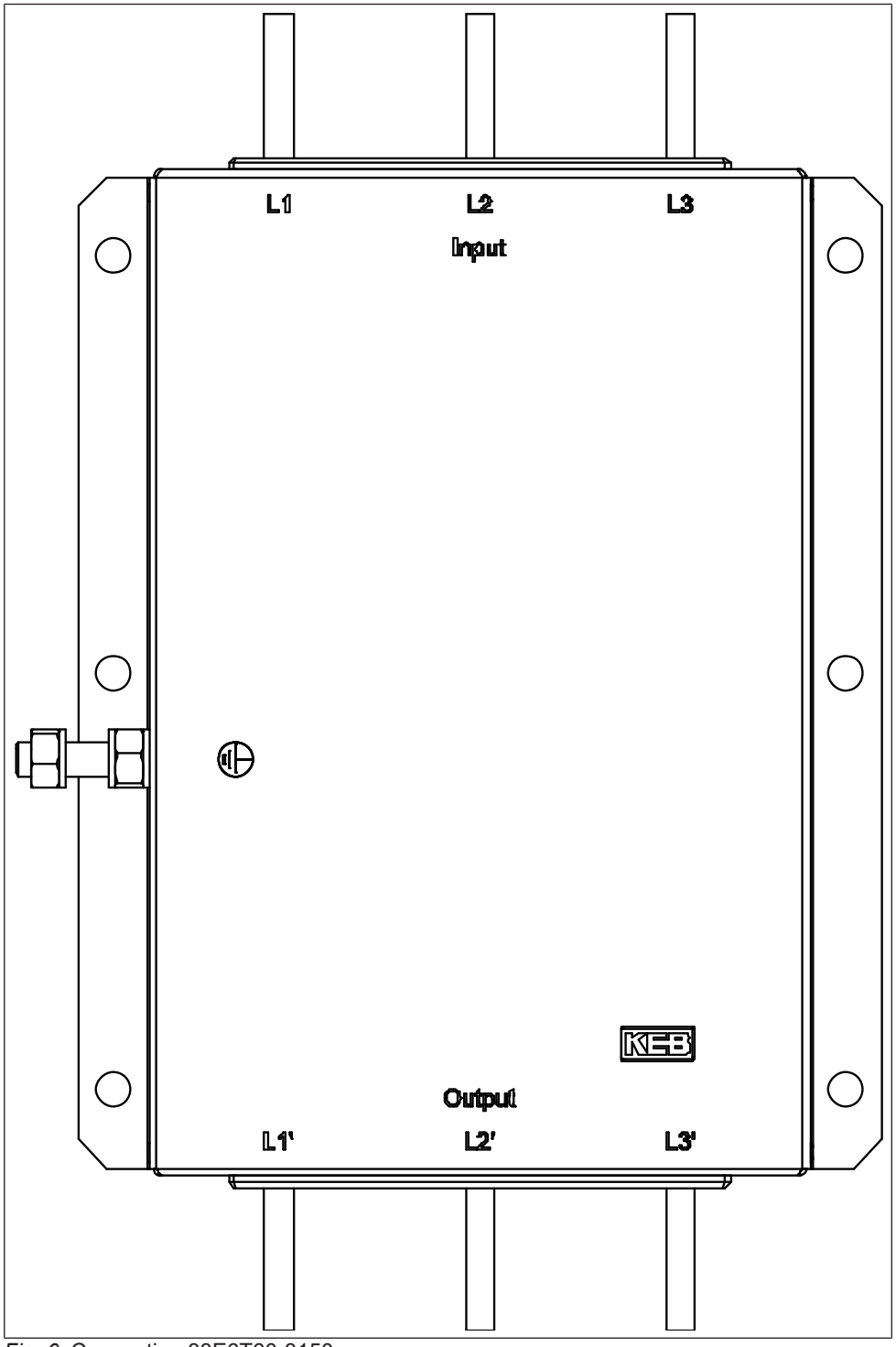


Fig. 6: Connection 33E6T60-3150

Filt	Function	Name	Reference
33E6T60-3150	Mains input	L1, L2, L3	Copper bar
	Drive controller	L1‘, L2‘, L3‘	Copper bar

	Protective earth	PE	Earth connection screw

7 Maintenance, service and disposal

⚠ DANGER

Electrical voltage at terminals and in the device!

Danger to life due to electric shock !

✓ For any work on the device

a) Switch off the supply voltage.

b) Secure it against switching on.

c) Wait until all drives has been stopped in order that no regenerative energy can be generated.

d) Await capacitor discharge time (min. 5 minutes). Measure DC voltage at the terminals.

e) Never bridge upstream protective devices. Also not for test purposes.

7.1 Maintenance

The following maintenance work must be carried out as required, but at least once a year, by authorised and instructed personnel.

- Check the system for loose screws and plugs and tighten if necessary.
- Remove dirt and dust deposits from the devices.
- Checking or cleaning ventilation inlets and outlets. Pay particular attention to cooling fins and protective grilles of fans (if available).
- Check or clean the exhaust air filter and the supply air filter of the control cabinet.
- If available, check the function of the fans of the device. If there are audible vibrations or squeaking, replace the fans.

7.2 Service

In case of malfunction, unusual noises or smells inform a person in charge!

In case of failure, please contact the machine manufacturer. He can supply an appropriate original unit or an approved successor item or arrange for maintenance.

⚠ CAUTION

Unauthorized exchange, repair and modifications

Malfunctions and failures of connected devices or the machine

a) When replacing, only replace with original filter.

b) Carefully replace the shielding in particular.

Technical support and repairs

KEB offers wide-ranging, complete after-sales technical support. The staff who deal with this handle questions on the entire range of products skilfully, quickly, and efficiently.

You can phone our staff in the service department, and they will give you complete, prompt advice on how to resolve your problems.

Telephone: +49 (0) 5263 401-0

Fax: +49 (0) 5263 401-116

E-Mail: (🌐► service@keb.de)

7.3 Disposal

Electronic devices of KEB Automation KG are intended for professional, commercial processing (so-called B2B devices).

Manufacturers of B2B devices are obliged to take back and recycle devices manufactured after 14.08.2018. In principle, these devices may not be left at public or communal recycling or collection points.

Unless otherwise agreed between the customer and KEB or unless there is a deviating mandatory legal regulation, KEB products labelled in this way can be returned. Company and keyword for the return point can be found in the list below.

Shipping costs are at the expense of the customer. The devices are then professionally recycled and disposed of.

The entry numbers are listed country-specifically in the following table. KEB addresses can be found on our website.

Withdrawal by	WEEE registration no.	Keyword
Germany		
KEB Automation KG	EAR: DE12653519	Keyword: "Withdrawal WEEE"
France		
RÉCYLUM – Recycle point	ADEME: FR021806	Mots clés "KEB DEEE"
Italy		
COBAT	AEE: (IT) 19030000011216	Parola chiave "Ritiro RAEE"
Austria		
KEB Automation GmbH	ERA: 51976	Keyword: "Withdrawal WEEE"
Spain		
KEB Automation KG	RII-AEE: 7427	Palabra clave "Retirada RAEE"
Czech republic		
KEB Automation KG	RETELA: 09281/20-ECZ	Kličové slovo "Zpětný odběr OEEZ"
Slovakia		
KEB Automation KG	ASEKOL: RV22EEZ0000421	Kľúčové slovo: "Spätný odber OEEZ

The packaging must be sent for paper and cardboard recycling.

8 Certification

see also

- EU Declaration of Conformity E4, E5, E6 [▶ 27]
- UK Declaration of Conformity E4, E5, E6 [▶ 29]

8.1 EU Declaration of Conformity E4, E5, E6

EU DECLARATION OF CONFORMITY

Document No. / month.year: ce_dr_rns-e4-e5-e6-k_en.docx / 06.2024

Manufacturer:	KEB Automation KG Südstraße 38 32683 BARNTRUP Germany	
Product type:	EMC - Filter - series	yy**E4 or E5 or E6**xxx - xxxx
	size	yy = 03 bis 33 x = any number or letter for different versions
	Voltage category	230 / 400 / 690 V ac

This declaration of conformity is issued under the sole responsibility of KEB Automation KG.

The above given product is in accordance with the following directives of the European Union

Number:	**Low voltage : 2014 / 35 / EU**
Text:	Directive on the approximation of the laws of the Member States relating to all electrical equipment that has a voltage rating between 50V and 1000V AC or 75V and 1500V DC.
Number:	**Hazardous Substances: 2011 / 65 / EEC (incl. 2015 / 863 / EU)**
Text:	Directive on the approximation of the laws of the Member States relating on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Responsible: KEB Automation KG
Südstraße 38
32683 BARNTRUP

Place, date Barntrup, 6. June 2024

Issued by:

i. A. W. Hovestadt / Conformance Officer

W. Wiele / Technical Manager

This declaration certifies the conformity with the named directives, but does not contain any assurance of quality.

The safety instructions, described in the instruction manual are to be followed.

KEB Automation KG, Südstr. 38, D-32683 Barntrup www.keb.de E-Mail: info@keb.de Tel.: +49 5263 401-0 Fax: -116

EU DECLARATION OF CONFORMITY

ANNEX

Document-Nr. / Month.year:	ce_dr_rns-e4-e5-e6-k_en.docx / 06.2024	
Product type:	EMC - Filter - series	yy**E4 or E5 or E6**xxx - xxxx
	size	yy = 03 bis 33 x = any number or letter for different versions
	Voltage category	230 / 400 / 690 V ac

The conformity of the above given product to the

European Directive 2014/35/EU (for electrical equipment designed for use within certain voltage limits) is given by complete approval / testing to the following European harmonized standards:

EN - standard	
EN 61800-5-1: 2007 /A1: 2017	Adjustable speed electrical power drive systems – part 5-1: Safety requirements - Electrical, thermal and energy
Informative:	
EN 60939 – 1: 2010	Passive filter units for electromagnetic interference suppression – Part 1: Generic specification
EN 60939 – 2: 2005	Passive filter units for electromagnetic interference suppression – Part 1: Sectional specification: Passive filter units for which safety tests are appropriate - Test methods and general requirements
EN 60938 – 1: 2007 + A1	Fixed inductors for electromagnetic interference suppression – Part 1: Generic specification
EN 60938 – 2: 2007 + A1	Fixed inductors for electromagnetic interference suppression – Part 2: Sectional specification

European Directive 2011/65/EU with changes of 2015/863/EU (for restrictions of the use for certain hazardous substances in electrical and electronic equipment) is given by qualification of components and manufacturing process within the ISO 9001 QM system. The necessary information and declarations are documented and memorized.

EN 63000: 2018	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

The above given product was developed, manufactured and tested within an internal quality management system. This ISO 9001 QM system was approved by:

Notified body:	TÜV - CERT
Adress:	Zertifizierungsstelle des RWTÜV Steubenstrasse 53 D - 45138 Essen
No. of approval	041 004 500
Dated:	20.10.1994
Valid until:	December 2024

8.2 UK Declaration of Conformity E4, E5, E6

Supplier's UKCA declaration of conformity	in accordance with EN ISO/IEC 17050-1
DoC number:	ce_dr_uk-rns-e4-e6-a_en.xlsx
Manufacturer's name and address:	KEB Automation KG
	Südstrasse 38, D 32683 Barntrup, Germany
Authorised representative name and address:	KEB(UK) Ltd
	5 Morris Cl, Park Farm Industrial Estate, Wellingborough NN8 6XF, UK
Declares under sole responsibility that the product as originally delivered	
Product Name:	KEB Combivert (Assessories EMC-Filters)
Model Number:	yyE4xxx-xxxx, yyE5xxx-xxxx, yyE6xxx-xxxx with yy=05 to 33 and x = 0...9 or A....Z
voltage category	230 / 400V
complies with the following statutory requirements and carries the UKCA marking accordingly:	**and are conform with the following designated standards:**
Electrical Equipment (Safety) Regulations 2016 No.1101 [as amended] Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 No.3032 [as amended]	EN 61800-5-1-: 2007 + A1: 2017 EN 61800 - 5 - 1: 2017 EN IEC 63000: 2018
Barntrup, 6th June 2024 Signed for and on behalf of: W. Hovestadt	 Wiele
i.A. W. Hovestadt / Conformance Officer	W. Wiele / Technical Manager

8.3 UL certification

Acceptance according to UL is indicated on the nameplate by the adjacent logo.

For conformity according to UL for the use on the North American and Canadian markets, the following instructions must be observed (original text in English):

- Only for use in non-corner grounded type WYE source not exceeding (≡► 277 V [▸ 14]) phase to ground.
- Maximum surrounding air temperature (≡► 45°C [▸ 13]).
- Use 75°C Copper Conductors Only
- (≡► Terminal torque [▸ 21]) of field wiring terminals / max AWG size.
- Use in a Pollution Degree 2 and Overvoltage Category III Environments.
- (≡► Branch Circuit Protection [▸ 14]) when protected by (≡► Class L [▸ 14]) Fuses / (≡► Semiconductor [▸ 15]) Fuses
- Use the (≡► assembly kits [▸ 21]) for connecting

WARNING – The opening of the branch circuit protective device may be an indication that a fault current has been interrupted. To reduce the risk of fire or electrical shock, current-carrying parts and other components of the controller should be examined and replaced if damaged.

AVERTISSEMENT – LE DÉCLENCHEMENT DU DISPOSITIF DE PROTECTION DU CIRCUIT DE DÉRIVATION PEUT ÊTRE DÛ À UNE COUPURE QUI RÉSULTE D'UN COURANT DE DÉFAUT. POUR LIMITER LE RISQUE D'INCENDIE OU DE CHOC ÉLECTRIQUE, EXAMINER LES PIÈCES PORTEUSES DE COURANT ET LES AUTRES ÉLÉMENTS DU CONTRÔLEUR ET LES REMPLACER S'ILS SONT ENDOMMAGÉS.

9 Annex

9.1 Measurement diagrams

Interference voltage measurement limit value C2 according to EN 61800-3.

Specifications:

Motor cable length	50 m
Output frequency	5 Hz
Switching frequency	4 kHz

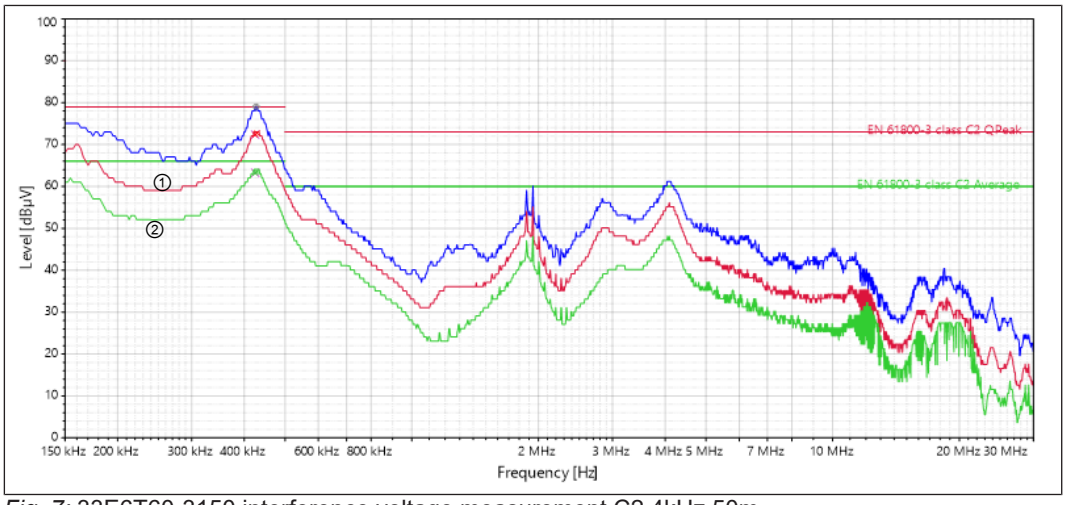


Fig. 7: 33E6T60-3150 interference voltage measurement C2 4kHz 50m

② Average ① QPeak

Interference voltage measurement limit value C3 according to EN 61800-3.

Specifications:

Motor cable length	100 m
Output frequency	5 Hz
Switching frequency	4 kHz

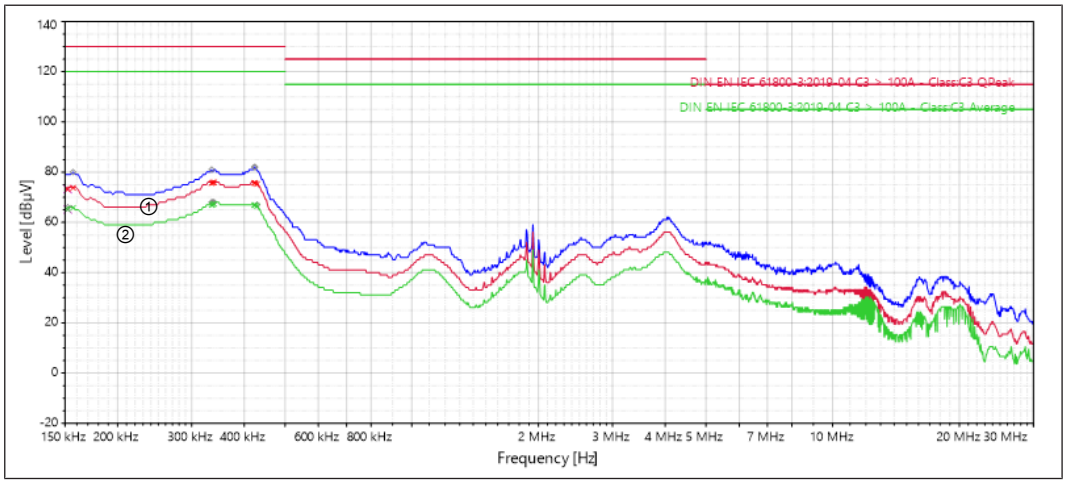


Fig. 8: 33E6T60-3150 interference voltage measurement C3 4kHz 100m

① QPeak ② Average

Interference voltage measurement limit value C2 according to EN 61800-3.

Specifications:

Motor cable length	100 m
Output frequency	5 Hz
Switching frequency	8 kHz

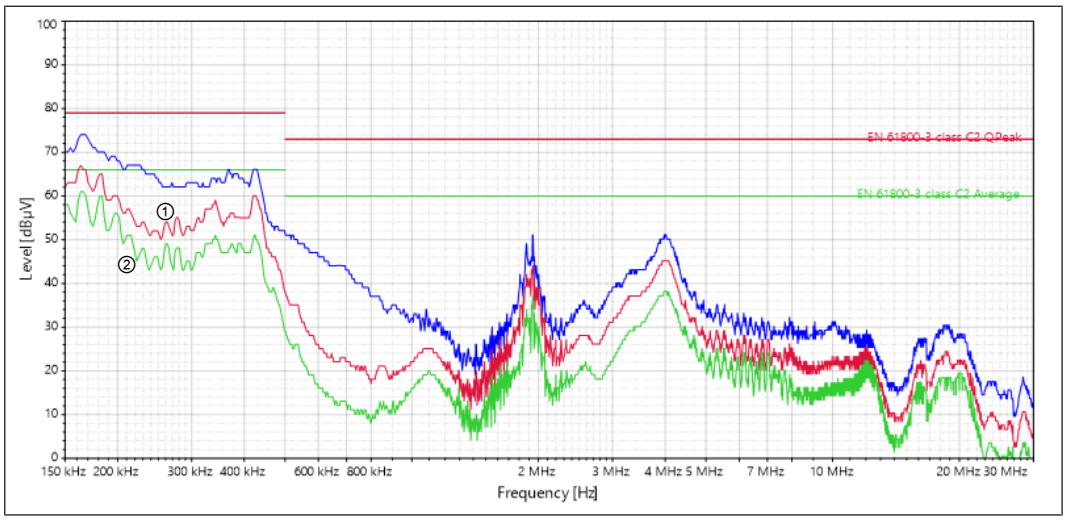


Fig. 9: 33E6T60-3150 interference voltage measurement C2 8kHz 100m

① QPeak ② Average

9.2 Informative values for the use of RCDs

Filt	Switching frequency drive controller	RCD Doepke DFS 4B NK			
		30 mA	100 mA	300 mA	500 mA
		Tripping current			
33E6T60-3150	2 kHz	-	-	-	-

Tab. 7: Informative values with RCD Doepke 4B NK

Filt	Switching frequency drive controller	RCD Doepke DFS 4B SK			
		30 mA	100 mA	300 mA	500 mA
		Tripping current			
33E6T60-3150	2 kHz 50 m	43 %	26 %	25 %	25 %
	2 kHz 100 m	-	36 %	35 %	35 %
	4 kHz 50 m	46 %	24 %	24 %	24 %
	4 kHz 100 m	-	36 %	36 %	36 %
	8 kHz 50 m	39 %	39 %	39 %	39 %

Tab. 8: Informative values with RCD Doepke 4B SK

10 Revision history

Edition	Version	Note
2023-04	00	Pre-series
2023-09	01	Material numbers in English version corrected.
2024-06	02	UL information incorporated. Editorial changes incorporated for series version.
2024-09	03	CE certificate extended.

Glossary

Application

The application is the intended use of the KEB product.

COMBILINE

COMBILINE designates the product line of filter technology at KEB.

COMBIVERT

Proper name for a KEB Drive Controller.

Customer

The customer has purchased a product from KEB and integrates the KEB product into his product (customer product) or resells the KEB product (reseller).

Drive Controller

Designation for a frequency inverter or servo controller

EN 55017

Methods of measurement of the suppression characteristics of passive EMC filtering devices (CISPR 17:2011); German version EN 55017:2011

EN 60664-1

Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests.

EN 60721-3-1

Classification of environmental conditions - Part 3-1: Classification of groups of environmental parameters and their severities - Main section: Long-term storage (IEC 60721-3-1)

EN 60721-3-2

Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severitiesMain section 2: Transportation and Handling (IEC 60721-3-2)

EN 60721-3-3

Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severitiesMain section 3: Stationary use at weatherprotected locations (IEC 60721-3-3)

EN 61800-3

Adjustable speed electrical power drive systems.Part 3:EMC requirements and specific test methods (VDE 0160-103, IEC 61800-3)

EN 61800-5-1

Adjustable speed electrical power drive systems. Part 5-1: Safety requirements - Electrical, thermal and energy requirements (VDE 0160-105-1, IEC 61800-5-1)

Fuse type gG

Full-range fuse: Standard type general application, mainly used for cable and line protection (medium-blow).

HF filter

KEB specific term for an EMC filter (description see EMC filter).

NHN

Standard altitude zero; related to the established height definition in Germany (DHHN2016). The international data usually deviate from this by only a few cm to dm, so that the value is given can be taken from the regionally applicable definition.

PDS

Power drive system incl. motor and measuring probe

RCD

Residual current circuit breaker; formerly also FI circuit breaker

SCCR

The Short Circuit Current Rating indicates the maximum short circuit current that the device can withstand.

Index

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