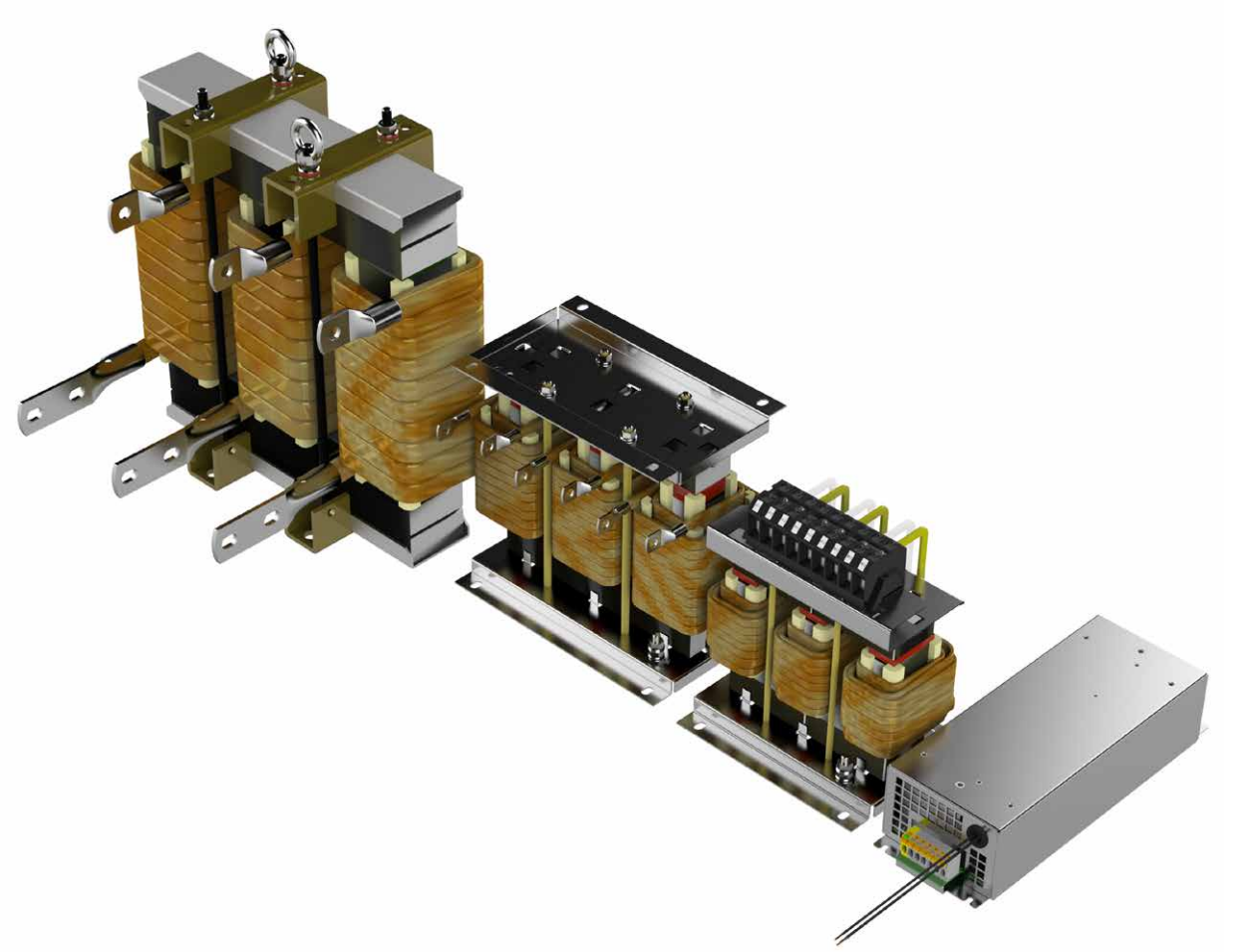


COMBILINE **Z2**

INSTRUCTIONS FOR USE | **INSTALLATION Z2 OUTPUT FILTER**

Translation of the original manual
Document 20184032 EN 05

Preface

The hardware and software described in this document are products of KEB. The information contained in this document is valid at the time of publishing. KEB reserves the right to update this document in response to misprints, mistakes or technical changes.

Signal words and symbols

Certain procedures within this document can cause safety hazards during the installation or operation of the device. Refer to the safety warnings in this document when performing these procedures. Safety signs are also located on the device where applicable. A safety warning is marked by one of the following warning signs:

⚠ DANGER	Dangerous situation, which will cause death or serious injury iif this safety warning is ignored.
⚠ WARNING	Dangerous situation, which may cause death or serious injury if this safety warning is ignored.
⚠ CAUTION	Dangerous situation, which may cause minor injury if this safety warning is ignored.
NOTICE	Situation, which can cause damage to property if this safety warning is ignored.

RESTRICTION

Used when the following statements depend on certain conditions or are only valid for certain ranges of values.

Used for informational messages or recommended procedures.

More symbols

►	This arrow starts an action step.
• / -	Enumerations are marked with dots or indents.
=>	Cross reference to another chapter or another page.

Note to further documentation.
www.keb.de/service/downloads

Laws and guidelines

KEB Automation KG confirms with the EC declaration of conformity and the CE mark on the device nameplate that it complies with the essential safety requirements.

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

Warranty and liability

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

Here you will find our general sales conditions.
www.keb.de/terms-and-conditions

Further agreements or specifications require a written confirmation.

Support

Although multiple applications are referenced, not every case has been taking into account. If you require further information or if problems occur which are not referenced in the documentation, you can request the necessary information via the local KEB agency.

The use of our units in the target products is outside of our control and therefore lies exclusively in the area of responsibility of the customer.

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 intended use. However, they are regarded as being only informal and changes are expressly reserved, in particular due to technical changes. This also applies to any violation of industrial property rights of a third-party. Selection of our units in view of their suitability for the intended use must be done generally by the user.

Tests can only be done within 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.

Copyright

Table of Contents

List of Figures

List of Tables

Standards for EMC components

Product standards:

EN 61558-1	Safety of transformers, reactors, power supply units and combinations thereof - Part 1: General requirements and tests (IEC 96/449/CD:2015)
EN 61558-2-20	Safety of transformers, reactors, power supply units and combinations thereof - Part 2-20: Particular requirements and tests for small reactors (IEC 61558-2-20:2010); German version EN 61558-2-20:2011
EN 61800-5-1	Adjustable speed electrical power drive systems - Part 5-1: Safety requirements - Electrical, thermal and energy (IEC 61800-5-1); German version EN 61800-5-1
UL 61800-5-1	American version of the EN 61800-5-1 with „National Deviations“

Basic standards:

EN 60529	Degrees of protection provided by enclosures (IP Code) (IEC 60529)
EN 60664-1	Insulation coordination for equipment within low-voltage systems Part 1: Principles, requirements and tests (IEC 60664-1)
EN 60721-3-1	Classification of environmental conditions - Part 3-1: Classification of groups of environmental parameters and their severities - Section 1: Storage (IEC 60721-3-1); German version EN 60721-3-1
EN 60721-3-2	Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 2: Transportation and handling (IEC 104/670/CD)
EN 60721-3-3	Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities; section 3: Stationary use at weatherprotected locations; Amendment A2 (IEC 60721-3-3); German version EN 60721-3-3

General standards:

DGUV regulation 3	Electrical installations and equipment
DNVGL-CG-0339	Environmental test specification for electrical, electronic and programmable equipment and systems
DIN IEC 60364-5-54	Low-voltage electrical installations - Part 5-54: Selection and erection of electrical equipment - Earthing arrangements, protective conductors and protective bonding conductors (IEC 64/1610/CD)
EN 60204-1	Safety of machinery - electrical equipment of machines Part 1: General requirements (VDE 0113-1, IEC 44/709/CDV)
EN 61373	Railway applications - Rolling stock equipment - Shock and vibration tests (IEC 61373); German version EN 61373
ISO 4762	Hexagon socket head cap screws

1 Basic Safety Instructions

The COMBIVERT is designed and constructed in accordance with state-of-the-art technology and the recognized safety rules and regulations However, the use of such devices may cause functional hazards for life and limb of the user or third parties, or damages to the system 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. Violation 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.

► Read the instructions for use !

► Observe the safety and warning instructions !

► If anything is unclear, please contact KEB Automation KG !

1.1 Target group

This instruction manual 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 *DIN IEC 60364-5-54.*
- Knowledge of national safety regulations.

1.2 Transport, storage and proper use

The transport is carried out by qualified persons in accordance with the environmental conditions specified in this manual. The filters shall be protected against excessive strains.

The filters contain electrostatic sensitive components.

► Avoid contact.

► Wear ESD-protective clothing.

Do not store the filters

- in the environment of aggressive and/or conductive liquids or gases.
- with direct sunlight.
- outside the specified environmental conditions.

1.3 Installation

⚠ DANGER

Do not operate in an explosive environment!

► The COMBIVERT is not intended for the use in potentially explosive environment.

⚠ CAUTION

Design-related edges and high weight!

Contusions and bruises!

► Never stand under suspended loads.

► Wear safety shoes.

► Secure drive controller accordingly when using lifting gear.

To prevent damages to the device:

- Make sure that no components are bent and/or isolation distances are changed.
- The device must not be put into operation in case of mechanical defects.
- Do not allow moisture or mist to penetrate the unit.
- Avoid dust permeating the device. Allow for sufficient heat dissipation if installed in a dust-proof housing.
- Note installation position and minimum distances to surrounding elements. Do not cover the ventilation openings.
- Mount the drive controller according to the specified degree of protection.
- Make sure that no small parts fall into the COMBIVERT during assembly and wiring (drilling chips, screws etc.). This also applies to mechanical components, which can lose small parts during operation.
- Check the reliable fit of the device connections in order to avoid contact resistances and sparking.
- Do not walk-on drive controller.
- Follow all safety instructions!

1.4 Electrical connection

⚠ DANGER

Voltage at the terminals and in the device!

Danger to life due to electric shock!

- ► For any work on the unit switch off the supply voltage and secure it against switching on.
- ► The supplied drive converters and filters form a technical unit and must therefore not be disconnected from the mains independently of one another.
- ► Wait until the drive has stopped in order that no regenerative energy can be generated.
- ► Observe capacitor discharge time, if necessary measure DC voltage at the terminals.
- ► Never bridge upstream protective devices (even for testing purposes).

For a trouble-free and safe operation, please pay attention to the following instructions:

- The electrical installation shall be carried out in accordance with the relevant requirements.
- 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.
- With existing or newly wired circuits the person installing the units or machines must ensure the EN requirements are met.

1.5 Start-up and operation

⚠ CAUTION

High temperatures at the components!

Burning of the skin!

- ► Cover hot surfaces safe-to-touch.
- ► Before working let the unit cool down.
- ► If necessary, attach warning signs on the system.

- During operation, all covers and cabinet doors shall be kept closed.
- Use only approved accessories.
- Never touch terminals, busbars or cable ends.

1.7 Repair

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

⚠ DANGER

Unauthorized exchange, repair and modifications!

Unpredictable malfunctions!

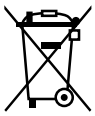
- ► The function of the drive controller is dependent on its parameterization. Never replace without knowledge of the application.
- ► Modification or repair is permitted only by KEB Automation KG authorized personnel.
- ► Only use original manufacturer parts.
- ► Infringement will annul the liability for resulting consequences.

In case of failure, please contact the machine manufacturer. Only the machine manufacturer knows the parameterisation of the used drive controller and can provide an appropriate replacement or induce the maintenance.

1.6 Disposal

Electronic devices of the KEB Automation KG are exclusively professional devices for further industrial processing (so-called B2B devices).

Manufacturers of B2B devices are obliged to take back and recycle devices manufactured after 14.08.2018. These devices may not be disposed at the collection centres of public sector disposal organisations.



If no deviating agreement has been made between the customer and KEB or no deviating mandatory legal regulation exists, KEB products marked in this way can be returned. Company and keyword to the return point can be taken from the list below. Shipping costs are paid by the customer. Thereupon the devices will be professionally recycled and disposed.

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

Withdrawal by	WEEE-Reg.-No.		Keyword
Austria			
KEB Automation GmbH	ERA:	51976	Stichwort „Rücknahme WEEE“
France			
RÉCYLUM - Recycle point	ADEME:	FR021806	Mots clés „KEB DEEE“
Germany			
KEB Automation KG	EAR:	DE12653519	Stichwort „Rücknahme WEEE“
Italy			
COBAT	AEE: (IT)	19030000011216	Parola chiave „Ritiro RAEE“
Spain			
KEB Automation KG	RII-AEE	7427	Palabra clave „Retirada RAEE“
Česko			
KEB Automation KG	RETELA	09281/20 ECZ	Klíčové slovo: Zpětný odběr OEEZ

The packaging must be feed to paper and cardboard recycling.

2 Product Description

This instructions for use describe the output filters of the COMBILINE Z2 series. These are consisting of a motor choke, a capacitor module and an appropriate cable set.

Component	Material number
Z2 motor choke	xxZ2F04-1003
Z2 capacitor module	00Z2G24-xxxx
Z2 cable set	00Z2T09-xxxx

The use of the motor choke is also possible on its own. It reduces the ripple of the motor current and the dv/dt to protect the motor insulation.

If the capacitor unit is connected downstream, a sine-wave filter is obtained. The sine-wave filter acts as a low-pass filter for the switching frequency components of the drive converter output voltage and provides a sinusoidal voltage between the phases.

The components can be combined with each other in such a way that there is an optimal solution for every application!

2.1 Specified application

The output filters are intended for the installation into electrical systems or machines.

Technical data and information for connection conditions shall be taken from the name-plate and from the instructions for use and must be strictly observed.

2.2 Unintended use

The operation of our products outside the indicated limit values of the technical data leads to the loss of any liability claims.

2.3 Product features

This instructions for use describe the components of the Z2 output filters:

Device type:	Output filter
Series:	COMBILINE Z2
Application range:	0...1600 Hz

The COMBILINE Z2 output filters are characterized by the following features:

When using a motor choke

Reduction of the:

- rate of voltage rise (dv/dt)
- motor bearing currents
- motor losses
- motor noises

When using an output filter

Sinusoidal output voltage, resulting in a reduction of:

- motor losses
- motor warming
- motor noises
- bearing currents
- EMC emitted interference

The structure itself is determined by:

- Low-loss winding strands as conductor material
- Core material specially designed for this frequency range
- Special capacitors for operation up to 800 / 1600 Hz

These features lead to a significant extension of the motor lifetime.

3 Technical Data

3.1 Operating conditions

3.1.1 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 sea level
Transport		**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)
Coolant inlet temperature	Air	–	–	5…40 °C (-10…45 °C)
Relative humidity		*EN 60721-3-3*	3K3	5…85 % (without condensation)
Version and degree of protection		*EN 60529*	IP00	
Site altitude		–	–	Max. 2000 m above sea level • With site altitudes over 1000 m a derating of 1 % per 100 m must be taken into consideration.

Table 1: Climatic ambient conditions

3.1.2 Mechanical ambient conditions

Storage	**Standard**	**Class**	**Notes**
Vibration limits	*EN 60721-3-1*	1M2	Vibration amplitude 1.5 mm (2…9 Hz) Acceleration amplitude 5 m/s² (9…200 Hz)
Shock limit values	*EN 60721-3-1*	1M2	40 m/s²; 22 ms
Transport	**Standard**	**Class**	**Notes**
Vibration limits	*EN 60721-3-3*	2M1	Vibration amplitude 3.5 mm (2…9 Hz) Acceleration amplitude 10 m/s² (9…200 Hz) (Acceleration amplitude 15 m/s² (200…500 Hz)) [1]
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 0.3 mm (2…9 Hz) Acceleration amplitude 10 m/s² (9…200 Hz)
Shock limit values	*EN 60721-3-3*	3M4	100 m/s²; 11 ms

Table 2: Mechanical ambient conditions

[1] *Not tested.*

3.1.3 Chemical/mechanical active substances

Storage		**Standard**	**Class**	**Notes**
Contamination	Gases	*EN 60721-3-1*	1C2	–
	Solids		1S2	–
Transport		**Standard**	**Class**	**Notes**
Contamination	Gases	*EN 60721-3-2*	2C2	–
	Solids		2S2	–
Operation		**Standard**	**Class**	**Notes**
Contamination	Gases	*EN 60721-3-3*	3C2	–
	Solids		3S2	–

Table 3: Chemical/mechanical active substances

3.1.4 Electrical operating conditions

3.1.4.1 Device classification

Requirement	**Standard**	**Class**	**Notes**
Pollution degree	*EN 60664-1*	2	Non-conductive pollution, occasional condensation when PDS is out of service.

Table 4: Device classification

3.2 Device data

3.2.1 Mechanical data of the motor chokes

Material number	Connection			Cross-section area in mm²/AWG	Tightening torque in Nm / lb inch		With temperature switch
	Type	U, V, W	PE		U, V, W	PE	
07Z2F04-1003	Terminal	Push-Lock		0.2...6 / 24...10	—	—	—
09Z2F04-1003							—
10Z2F04-1003							—
12Z2F04-1003							—
13Z2F04-1003		RK 6-10/35	M6	0.2...10 / 22...8	2 / 17.7	4.5 / 39.8	—
14Z2F04-1003							—
15Z2F04-1003							—
16Z2F04-1003							—
17Z2F04-1003		RK 16/35	M8	2.5...16 / 10..6	4 / 35.4	10 / 88.5	—
18Z2F04-1003							—
19Z2F04-1003		RK 35/35		2.5...35 / 12...2	5 / 44.3		—
20Z2F04-1003	Bolt	M10		—	20 / 177		—
21Z2F04-1003				—			—
22Z2F04-1003				—			—
23Z2F04-1003			M10	—		20 / 177	—
24Z2F04-1003				—			—
25Z2F04-1003				—			✓
26Z2F04-1003		M12		—	40 / 354		✓
27Z2F04-1003				—			✓
28Z2F04-1003				—			✓
29Z2F04-1003				—			✓
30Z2F04-1003				—			✓
31Z2F04-1003				—			✓
32Z2F04-1003				—			✓
33Z2F04-1003				—			✓

Table 5: Mechanical data of the motor chokes

- *All data are rated values except minimum and maximum values.*

NOTICE

Overheating of the motor choke!

► Motor chokes from size 25 to size 30 must be ventilated! => *„4.8.3 Ventilation of the motor chokes from size 25 to 30“*.

3.2.2 Electrical data of the motor chokes

Material number	Current in A	Inductance in mH [1]	Resistance in mΩ [1]	Frequency in Hz	Typically power loss			Frequency range in Hz
					at 600Hz in W	at 800Hz in W	at 1600Hz in W	
07Z2F04-1003	2.6	3.5	407	800		18	26.5	
09Z2F04-1003	4.1	2.2	198	800		32	44	
10Z2F04-1003	5.8	1.58	172	800		48	74	
12Z2F04-1003	9.5	0.88	68	800		99	136	
13Z2F04-1003	12	0.766	52	800		35	46	
14Z2F04-1003	16.5	0.557	31	800		44	61	
15Z2F04-1003	24	0.383	22	800		66	92	
16Z2F04-1003	33	0.278	16	800	—	102	135	
17Z2F04-1003	42	0.219	9.52	800		115	148	
18Z2F04-1003	50	0.184	6	800		92	109	
19Z2F04-1003	60	0.153	6	800		124	152	
20Z2F04-1003	75	0.123	6.1	800		152	180	0...1600
21Z2F04-1003	90	0.102	3.6	800		147	177	
22Z2F04-1003	115	0.08	3.7	800		224	264	
23Z2F04-1003	150	0.082	2.4	600	264		340	
24Z2F04-1003	180	0.068	2.4	600	390		530	
25Z2F04-1003	210	0.058	1.5	600	430		572	
26Z2F04-1003	250	0.049	1	600	492		732	
27Z2F04-1003	300	0.041	1	600	515	—	852	
28Z2F04-1003	370	0.033	0.58	600	515		935	
29Z2F04-1003	460	0.027	0.48	600	777		1079	
30Z2F04-1003	570	0.021	0.39	600	963		1122	
31Z2F04-1003	630	0.019	0.285	600	945	1018	—	0...1000
32Z2F04-1003	710	0.017	0.236	600	953	1067	—	0...1000
33Z2F04-1003	800	0.015	0.176	600	949	1071	—	0...1000

Table 6: Electrical data of the motor chokes

[1] *Limit deviation ±10%.*

- *Rated voltage corresponds to U_N = 400V / 480V.*
- *All data are rated values except minimum and maximum values.*
- *The output frequency is to be limited in such a way that it does not exceed 1/10 of the switching frequency.*
- *Switching frequency range f_{SN}*: 2...16kHz

3.2.3 Mechanical data of the capacitor modules

Material number	Connection		Tightening torque in Nm / lb inch	
	U1.3, V1.3, W1.3	PE	U1.3, V1.3, W1.3	PE
00Z2G24-0005	Push-Lock Terminal 3 x 10 mm²	Crimp connector M4	—	2.5 / 21.1
00Z2G24-0015				
00Z2G24-0025				
00Z2G24-0035				
00Z2G24-0045				
00Z2G24-0055				
00Z2G24-0065				
00Z2G24-0006				
00Z2G24-0016				
00Z2G24-0007				
00Z2G24-0017				
00Z2G24-0027				
00Z2G24-0037				
00Z2G24-0047				
00Z2G24-0057				
00Z2G24-0051	3 x M12 bolt	Crimp connector M6	10 / 88.5	8 / 70.8
00Z2G24-0061				
00Z2G24-0001				
00Z2G24-0011				
00Z2G24-0021				
00Z2G24-0031				
00Z2G24-0002	3 x FlatAL 80x2 mm drilling:⌀ = 13mm	Crimp connector M6	25 / 221	8 / 70.8
00Z2G24-0012				
00Z2G24-0022				
00Z2G24-0032				
00Z2G24-0041				
00Z2G24-0003				
00Z2G24-0042				
00Z2G24-0052				
00Z2G24-0053				
00Z2G24-0013				
00Z2G24-0004				
00Z2G24-0062				
00Z2G24-0023				
00Z2G24-0033				
00Z2G24-0043				
00Z2G24-0014				

Table 7: Mechanical data of the capacitor modules

- *All data are rated values except minimum and maximum values.*

3.2.4 Electrical data of the capacitor modules

Material number	Max. current @ f_{max} in A	Capacity in µF [1)]	Max. frequency in Hz	Typical power dissipation in W
00Z2G24-0005	0.21	0.0226	1600	<10
00Z2G24-0015	0.45	0.05		
00Z2G24-0025	0.68	0.073		
00Z2G24-0035	1	0.11		
00Z2G24-0045	1.45	0.157		
00Z2G24-0055	2	0.227		
00Z2G24-0065	3	0.33		
00Z2G24-0006	4.5	0.49		<15
00Z2G24-0016	6.1	0.67		
00Z2G24-0007	7.6	0.82		
00Z2G24-0017	9.2	1		
00Z2G24-0027	10.6	1.15		<20
00Z2G24-0037	12.3	1.33		
00Z2G24-0047	15.3	1.67		
00Z2G24-0057	18.4	2		
00Z2G24-0051	33	3.6		<70
00Z2G24-0061	43	4.7		
00Z2G24-0001	80	8		
00Z2G24-0011	80	10		
00Z2G24-0021	80	12		
00Z2G24-0031	80	15		
00Z2G24-0002	150	18		<120
00Z2G24-0012	150	20		
00Z2G24-0022	150	25		
00Z2G24-0032	160	30		
00Z2G24-0041	115	33	800	<70
00Z2G24-0003	200	38	1600	<170
00Z2G24-0042	160	41	800	<120
00Z2G24-0052	160	45		
00Z2G24-0053	190	53		<170
00Z2G24-0013	240	45	1600	<170
00Z2G24-0004	280	52		<220
00Z2G24-0062	230	66	800	<120
00Z2G24-0023	270	76		<170
00Z2G24-0033	270	78		
00Z2G24-0043	345	99		
00Z2G24-0014	420	132		<220

Table 8: Electrical data of the capacitor modules

[1)] *3-phase in delta connection.*

- *All data are rated values except minimum and maximum values.*

All maximum values are to be considered separately and must not be exceeded

3.2.5 Technical data of the cable sets

Cupal washers must be used between the aluminium connection and the copper line at the capacitor connection => *„4.6.1 Connecting example for capacitor modules with M12 screw connection“*.

Material number	Cable lengths in mm	Conductor cross-section in mm²	Conductor connection		Max. current per conductor in A
00Z2T09-0002	3 x 300	1.5	Wire-end ferrule 1.5 mm²		26
00Z2T09-0010	3 x 1000	10	Ring crimp connector M12		80
00Z2T09-1010		10	Ring crimp connector M12	Ring crimp connector M10	80
00Z2T09-2010		10	Ring crimp connector M12	Wire-end ferrule 10 mm²	80
00Z2T09-0025		25	Ring crimp connector M12		140
00Z2T09-1025		25	Ring crimp connector M12	Ring crimp connector M10	140
00Z2T09-1035		35			174
00Z2T09-0035			Ring crimp connector M12		
00Z2T09-0070		70			273
00Z2T09-0095		95			334

Table 9: Technical data of the cable sets

3.2.6 Possible combination of output filters

The technical specifications are designed for standard motors with max. 400V rated voltage.

Cable cross-sections are to be dimensioned according to local regulations.

Size	Motor choke		Capacitor modules and cable set				
	Current in A	Material number	0...600 Hz @ f_S = 6 kHz	0...800 Hz @ f_S = 8 kHz	0...1000 Hz @ f_S = 10 kHz	0...1200 Hz @ f_S = 12 kHz	0...1600 Hz @ f_S = 16 kHz
07	2.6	07Z2F04-1003	—	00Z2G24-0006 (00Z2T09-0002)*	00Z2G24-0065 (00Z2T09-0002)*	00Z2G24-0055 (00Z2T09-0002)*	00Z2G24-0035 (00Z2T09-0002)*
09	4.1	09Z2F04-1003	—	00Z2G24-0016 (00Z2T09-0002)*	00Z2G24-0007 (00Z2T09-0002)*	00Z2G24-0065 (00Z2T09-0002)*	00Z2G24-0055 (00Z2T09-0002)*
10	5.8	10Z2F04-1003	—	00Z2G24-0017 (00Z2T09-0002)*	00Z2G24-0007 (00Z2T09-0002)*	00Z2G24-0006 (00Z2T09-0002)*	00Z2G24-0055 (00Z2T09-0002)*
12	9.5	12Z2F04-1003	—	00Z2G24-0047 (00Z2T09-0002)*	00Z2G24-0037 (00Z2T09-0002)*	00Z2G24-0007 (00Z2T09-0002)*	00Z2G24-0006 (00Z2T09-0002)*
13	12	13Z2F04-1003	—	00Z2G24-0057 (00Z2T09-0002)*	00Z2G24-0047 (00Z2T09-0002)*	00Z2G24-0017 (00Z2T09-0002)*	00Z2G24-0006 (00Z2T09-0002)*
14	16.5	14Z2F04-1003	—	00Z2G24-0051 (00Z2T09-2010)*	00Z2G24-0057 (00Z2T09-0002)*	00Z2G24-0047 (00Z2T09-0002)*	00Z2G24-0016 (00Z2T09-0002)*
15	24	15Z2F04-1003	—	00Z2G24-0061 (00Z2T09-2010)*	00Z2G24-0051 (00Z2T09-2010)*	00Z2G24-0057 (00Z2T09-0002)*	00Z2G24-0017 (00Z2T09-0002)*
16	33	16Z2F04-1003	—	00Z2G24-0061 (00Z2T09-2010)*	00Z2G24-0061 (00Z2T09-2010)*	00Z2G24-0051 (00Z2T09-2010)*	00Z2G24-0037 (00Z2T09-0002)*
17	42	17Z2F04-1003	—	00Z2G24-0001 (00Z2T09-2010)*	00Z2G24-0061 (00Z2T09-2010)*	00Z2G24-0051 (00Z2T09-2010)*	00Z2G24-0047 (00Z2T09-0002)*
18	50	18Z2F04-1003	—	00Z2G24-0001 (00Z2T09-2010)*	00Z2G24-0001 (00Z2T09-2010)*	00Z2G24-0061 (00Z2T09-2010)*	00Z2G24-0057 (00Z2T09-0002)*
19	60	19Z2F04-1003	—	00Z2G24-0011 (00Z2T09-2010)*	00Z2G24-0001 (00Z2T09-2010)*	00Z2G24-0061 (00Z2T09-2010)*	00Z2G24-0051 (00Z2T09-2010)*
20	75	20Z2F04-1003	—	00Z2G24-0021 (00Z2T09-1010)*	00Z2G24-0001 (00Z2T09-1010)*	00Z2G24-0001 (00Z2T09-1010)*	00Z2G24-0051 (00Z2T09-1010)*
21	90	21Z2F04-1003	—	00Z2G24-0031 (00Z2T09-1010)*	00Z2G24-0011 (00Z2T09-1010)*	00Z2G24-0001 (00Z2T09-1010)*	00Z2G24-0051 (00Z2T09-1010)*
22	115	22Z2F04-1003	—	00Z2G24-0002 (00Z2T09-1010)*	00Z2G24-0021 (00Z2T09-1010)*	00Z2G24-0011 (00Z2T09-1010)*	00Z2G24-0061 (00Z2T09-1010)*
23	150	23Z2F04-1003	00Z2G24-0041 (00Z2T09-0025)*	00Z2G24-0002 (00Z2T09-1010)*	00Z2G24-0021 (00Z2T09-1010)*	00Z2G24-0011 (00Z2T09-1010)*	00Z2G24-0061 (00Z2T09-1010)*

continued on the next page

Size	Motor choke		Capacitor modules and cable set				
	Current in A	Material number	0...600 Hz @ f_S = 6 kHz	0...800 Hz @ f_S = 8 kHz	0...1000 Hz @ f_S = 10 kHz	0...1200 Hz @ f_S = 12 kHz	0...1600 Hz @ f_S = 16 kHz
24	180	24Z2F04-1003	00Z2G24-0042 (00Z2T09-0025)*	00Z2G24-0012 (00Z2T09-1025)*	00Z2G24-0031 (00Z2T09-1025)*	00Z2G24-0021 (00Z2T09-1010)*	00Z2G24-0001 (00Z2T09-1010)*
25	210	25Z2F04-1003	00Z2G24-0052 (00Z2T09-1035)*	00Z2G24-0022 (00Z2T09-1025)*	00Z2G24-0012 (00Z2T09-1025)*	00Z2G24-0021 (00Z2T09-1025)*	00Z2G24-0001 (00Z2T09-1010)*
26	250	26Z2F04-1003	00Z2G24-0062 (00Z2T09-0035)*	00Z2G24-0041 (00Z2T09-0035)*	00Z2G24-0012 (00Z2T09-0025)*	00Z2G24-0031 (00Z2T09-0025)*	00Z2G24-0001 (00Z2T09-0010)*
27	300	27Z2F04-1003	00Z2G24-0062 (00Z2T09-0035)*	00Z2G24-0041 (00Z2T09-0035)*	00Z2G24-0032 (00Z2T09-0035)*	00Z2G24-0012 (00Z2T09-0025)*	00Z2G24-0011 (00Z2T09-0010)*
28	370	28Z2F04-1003	00Z2G24-0033 (00Z2T09-0070)*	00Z2G24-0052 (00Z2T09-0070)*	00Z2G24-0032 (00Z2T09-0035)*	00Z2G24-0022 (00Z2T09-0035)*	00Z2G24-0021 (00Z2T09-0025)*
29	460	29Z2F04-1003	00Z2G24-0043 (00Z2T09-0095)*	00Z2G24-0062 (00Z2T09-0070)*	00Z2G24-0003 (00Z2T09-0070)*	00Z2G24-0032 (00Z2T09-0070)*	00Z2G24-0011 + 00Z2G24-0051 (2x00Z2T09-0025)*
30	570	30Z2F04-1003	00Z2G24-0014 (2x00Z2T09-0070)*	00Z2G24-0062 (00Z2T09-0095)*	00Z2G24-0004 (00Z2T09-0095)*	00Z2G24-0003 (00Z2T09-0070)*	00Z2G24-0002 (00Z2T09-0035)*
31	630	31Z2F04-1003	00Z2G24-0014 (2x00Z2T09-0070)*	00Z2G24-0043 (2x00Z2T09-0070)*	—	—	—
32	710	32Z2F04-1003	00Z2G24-0014 + 00Z2G24-0041 (2x 00Z2T09-0070 + 00Z2T09-0025)*	00Z2G24-0043 (2x 00Z2T09-0070)*	—	—	—
33	800	33Z2F04-1003	00Z2G24-0014 + 00Z2G24-0041 (2x 00Z2T09-0070 + 00Z2T09-0025)*	00Z2G24-0043 (2x 00Z2T09-0070)*	—	—	—

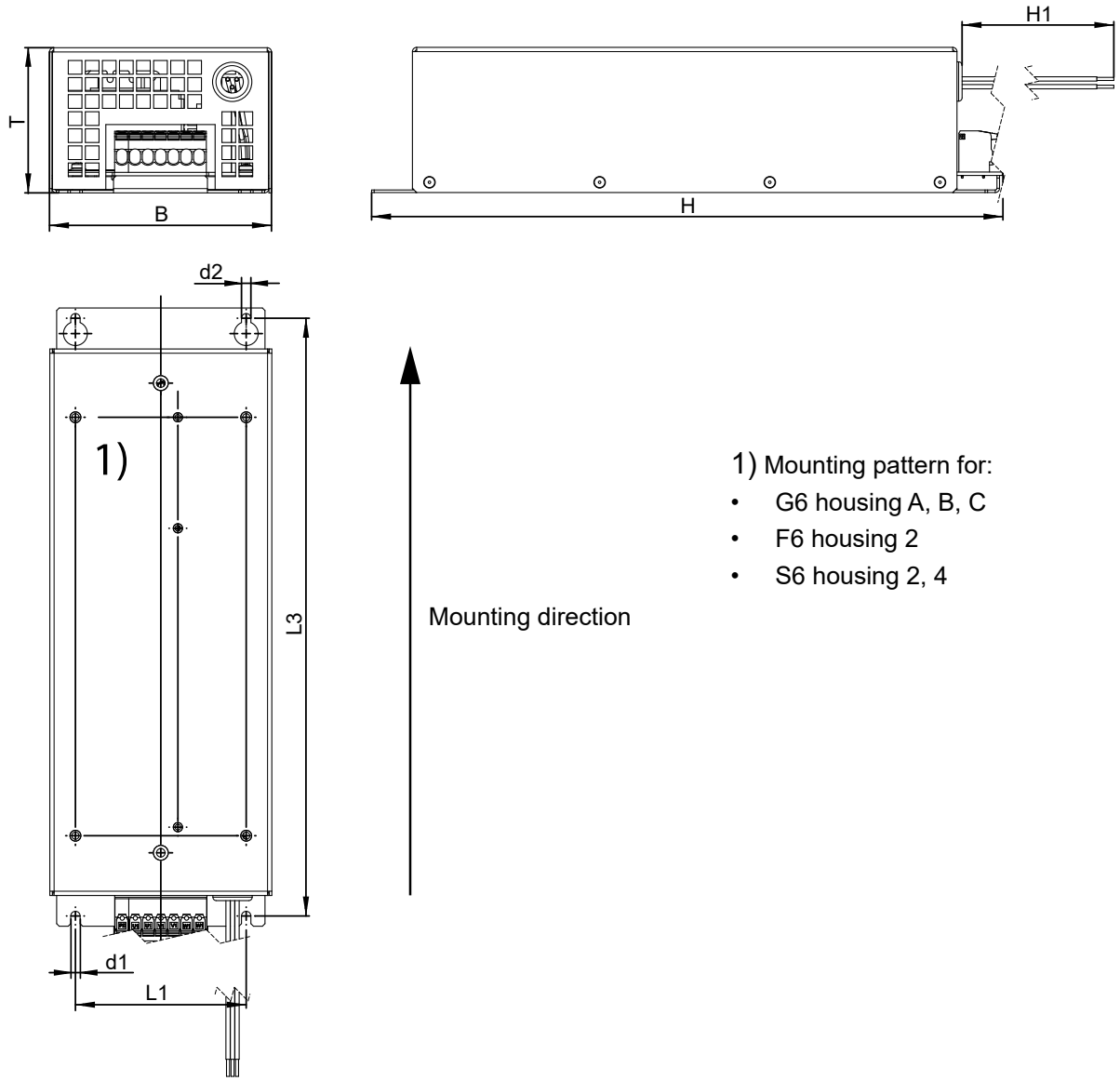
Table 10: Possible combination of output filters

* *Recommended cable*

3.3 Dimensions and weights

The windings can have large tolerances in geometry for manufacturing reasons.

3.3.1 Motor chokes size 07 to 12

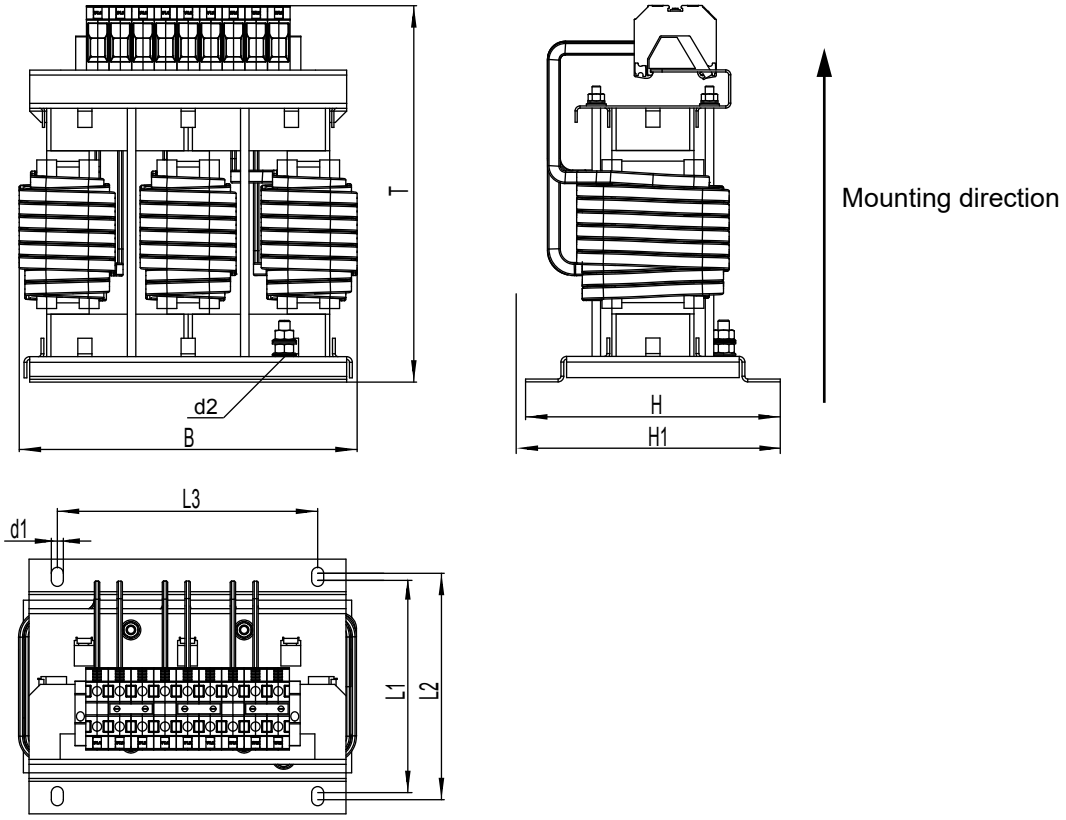


Size	B	H	H1	T	L1	L2	L3	d1	d2	Weight
07Z2F04-1003	130	371	200	85	100	—	350	5.5	5.5	3.5
09Z2F04-1003										3.9
10Z2F04-1003										4.1
12Z2F04-1003										4.7

Figure 1: Dimensions and weights motor chokes size 07 to 12

All dimensions in mm; all weights in kg.

3.3.2 Motor chokes size 13 to 19

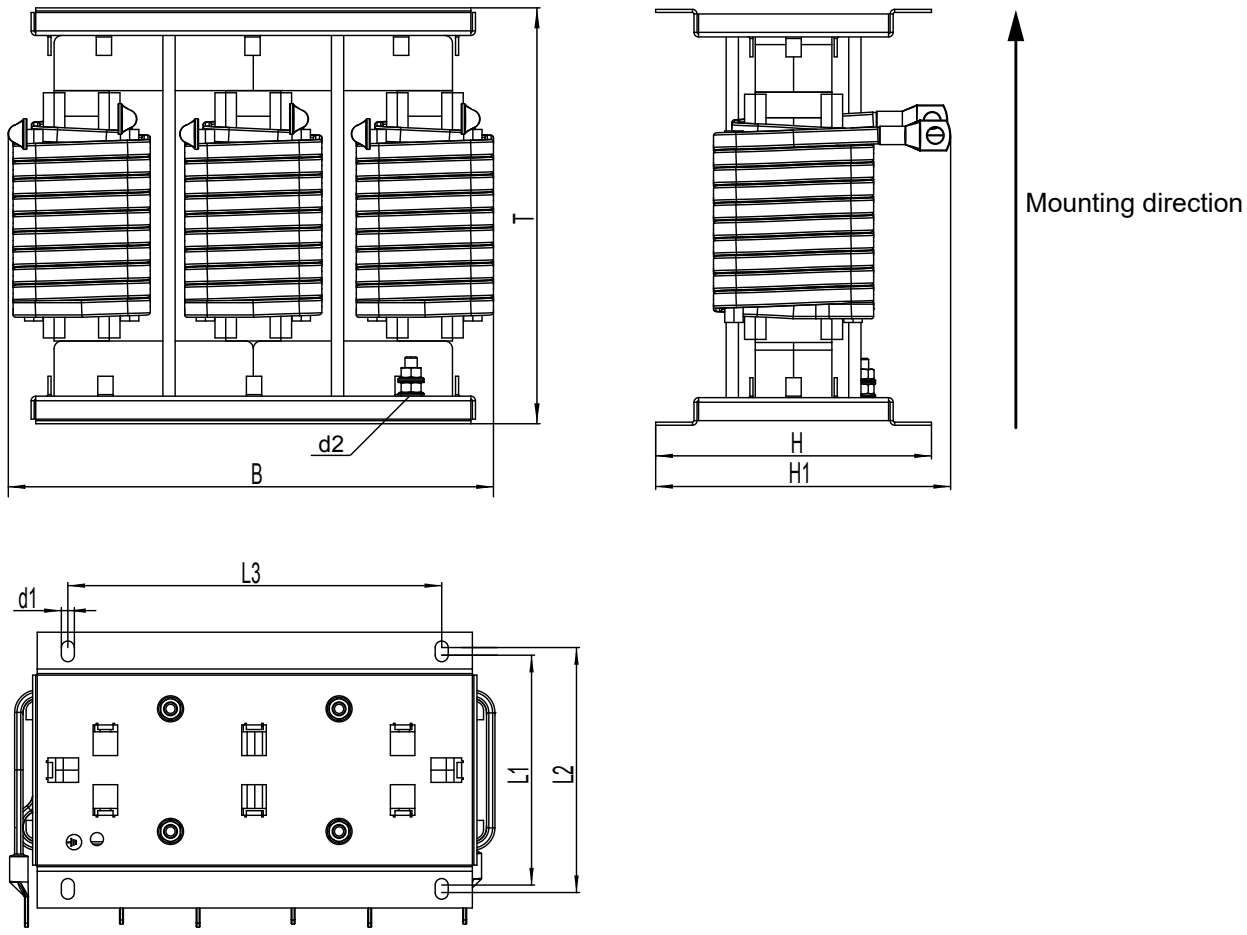


Size	B	H	H1	T	L1	L2	L3	d1	d2	Weight
13Z2F04-1003	168	160	160	280	135	145	120	7	6.5	5.2
14Z2F04-1003	168	160	160	280	135	145	120	7	6.5	5.5
15Z2F04-1003	168	160	160	310	135	145	120	7	6.5	6.6
16Z2F04-1003	168	160	160	315	135	145	120	7	6.5	7.0
17Z2F04-1003	232	180	180	255	150	160	184	8.5	8.5	10.0
18Z2F04-1003	245	180	180	260	150	160	184	8.5	8.5	11.2
19Z2F04-1003	250	180	190	270	150	160	184	8.5	8.5	11.7

Figure 2: Dimensions and weights motor chokes size 13 to 19

All dimensions in mm; all weights in kg.

3.3.3 Motor chokes size 20 to 22

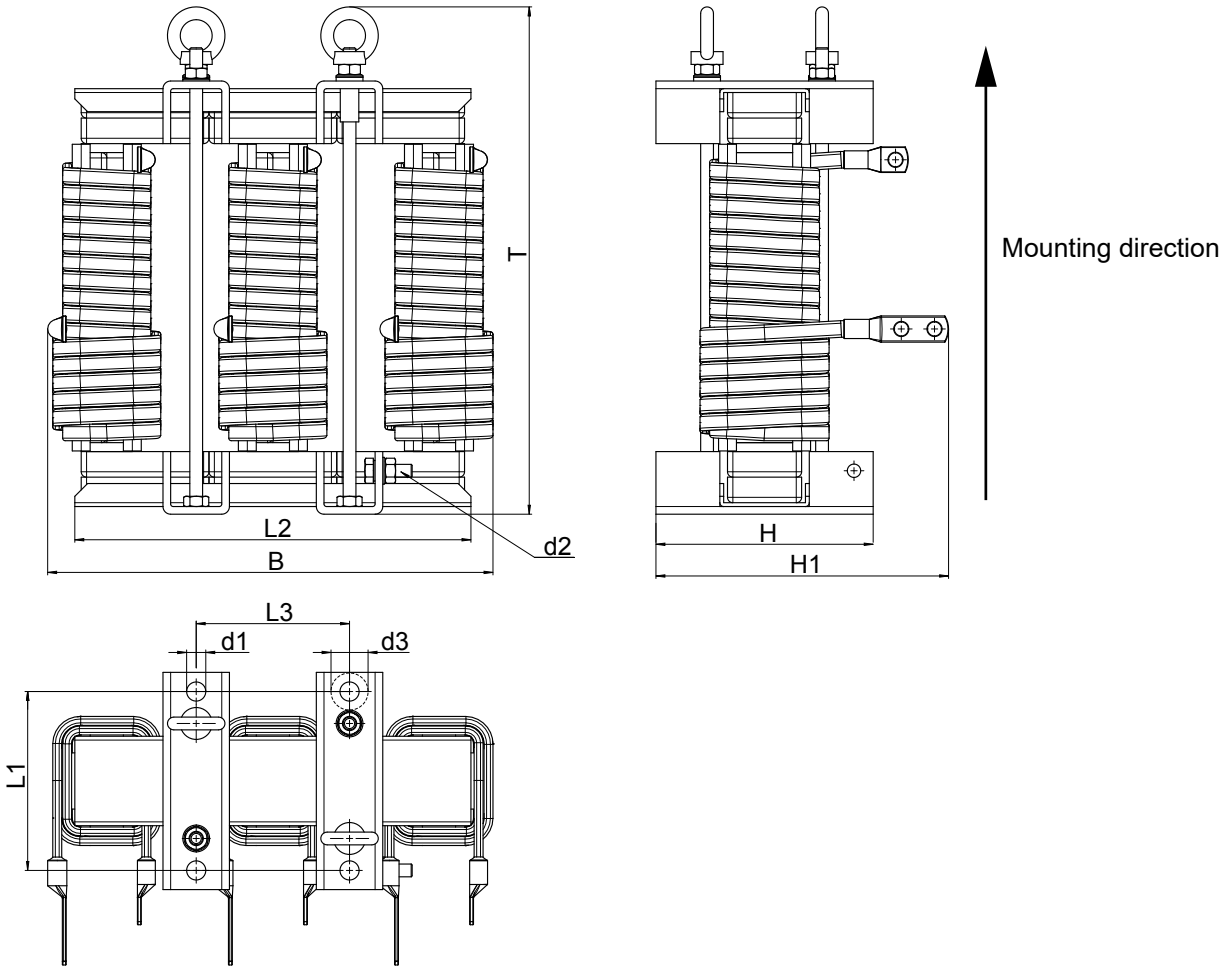


Size	B	H	H1	T	L1	L2	L3	d1	d2	Weight
20Z2F04-1003	313	180	205	275	150	160	244	8.5	8.5	15.0
21Z2F04-1003	335	180	220	275	150	160	244	8.5	8.5	17.3
22Z2F04-1003	335	180	240	265	150	160	244	8.5	8.5	17.0

Figure 3: Dimensions and weights motor chokes size 20 to 22

All dimensions in mm; all weights in kg.

3.3.4 Motor chokes size 23 to 30

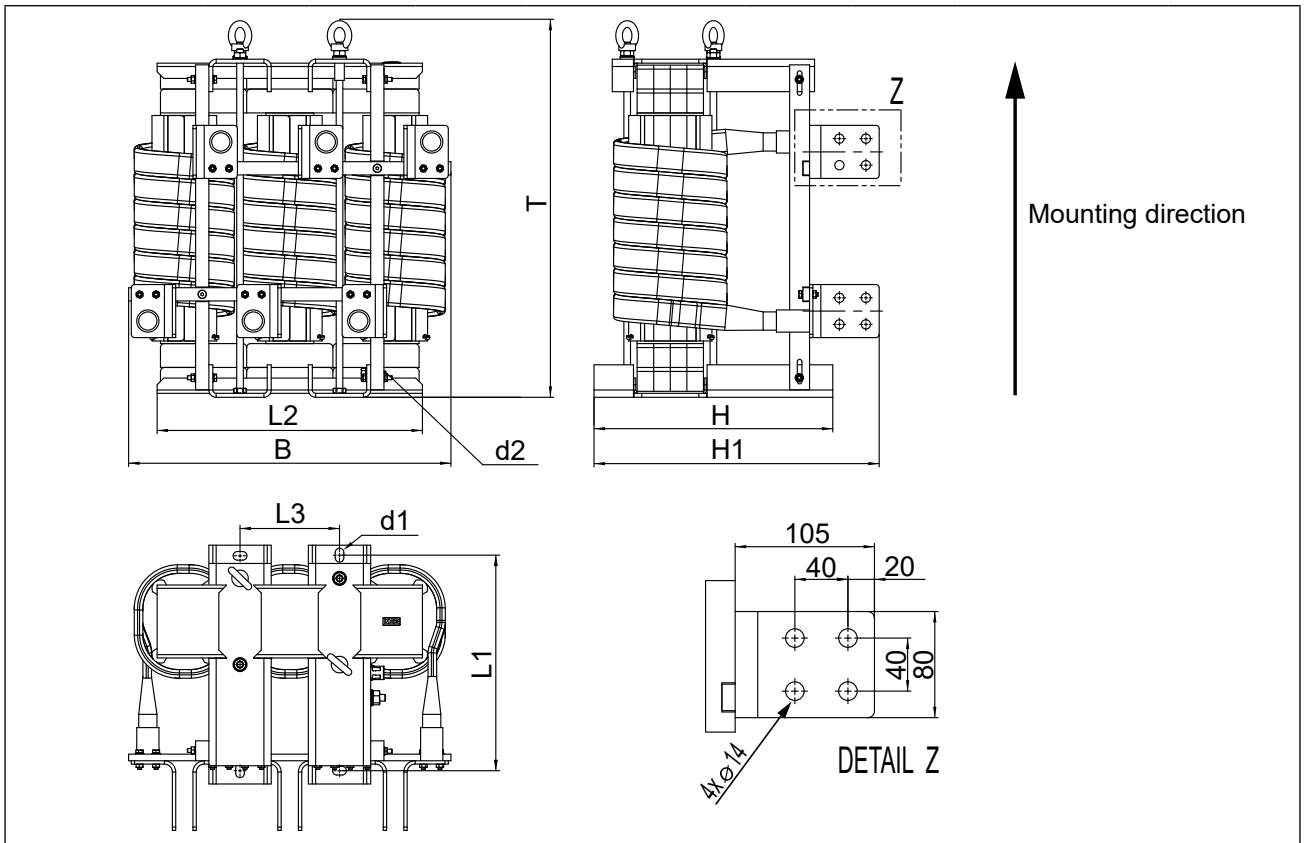


Size	B	H	H1	T	L1	L2	L3	d1	d2	d3	Weight
23Z2F04-1003	370	170	250	405	144	310	120	15	10.5	25	32.0
24Z2F04-1003	365	170	270	415	144	310	120	15	10.5	25	32.8
25Z2F04-1003	350	170	270	425	144	310	120	15	10.5	25	35.0
26Z2F04-1003	370	170	300	435	144	310	120	15	10.5	25	41.0
27Z2F04-1003	465	180	300	440	150	400	160	15	10.5	25	45.0
28Z2F04-1003	450	180	325	465	150	400	160	15	10.5	25	58.5
29Z2F04-1003	460	180	330	480	150	400	160	15	10.5	25	62.0
30Z2F04-1003	465	180	350	500	150	400	160	15	10.5	25	72.0

Figure 4: Dimensions and weights motor chokes size 23 to 30

All dimensions in mm; all weights in kg.

3.3.5 Motor chokes size 31 to 33

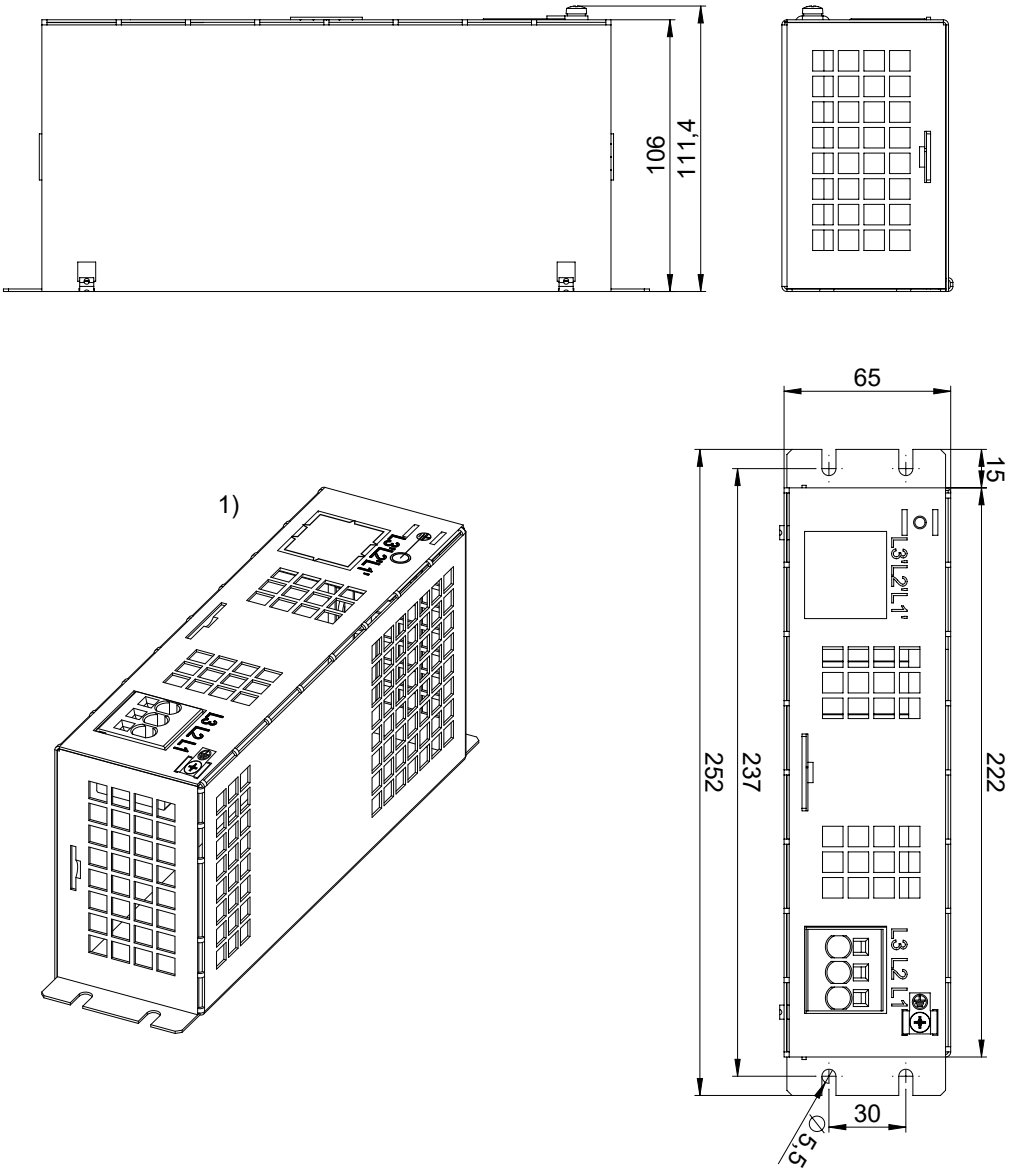


Size	B	H	H1	T	L1	L2	L3	d1	d2	Weight
31Z2F04-1003	500	360	430±10	518±10	325	400	150	M12	M10	97
32Z2F04-1003	500	360	430±10	565±10	325	400	150	M12	M10	109
33Z2F04-1003	500	400	455±10	561±10	350	400	150	M12	M10	135

Figure 5: Dimensions and weights motor chokes size 31 to 33

All dimensions in mm; all weights in kg.

3.3.6 Capacitor modules in housing

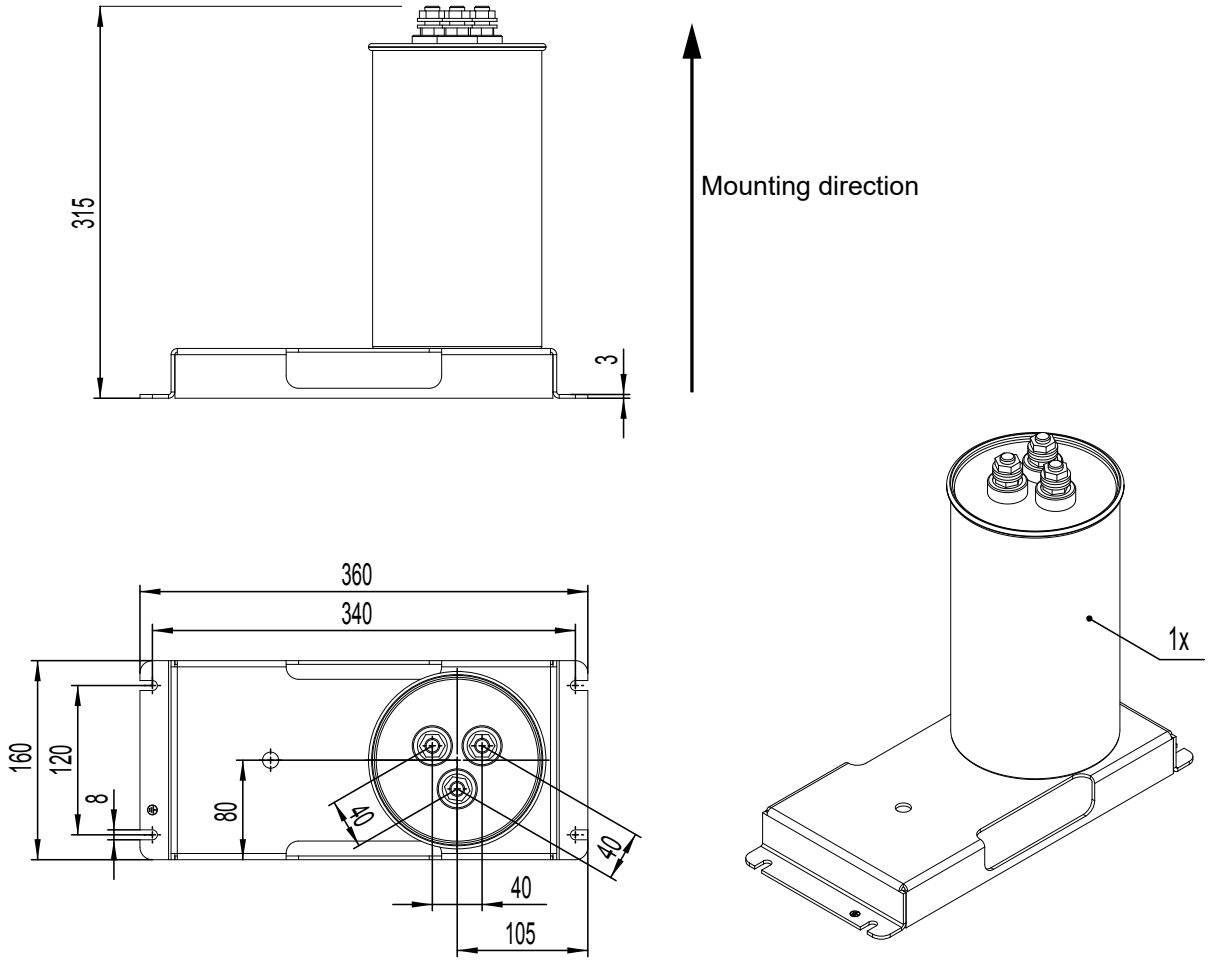


Material number	00Z2G24-00x5, 00Z2G24-00x6, 00Z2G24-00x7
Weight	1.6 kg
Dimensions	All dimensions in mm

Figure 6: Dimensions and weight of capacitor modules in housing

[1] *Installation position variable.*

3.3.7 Capacitor module with a power capacitor



Material number	00Z2G24-00x1
Weight	5.6 kg
Dimensions	All dimensions in mm

Figure 7: Dimensions and weight capacitor module with a power capacitor

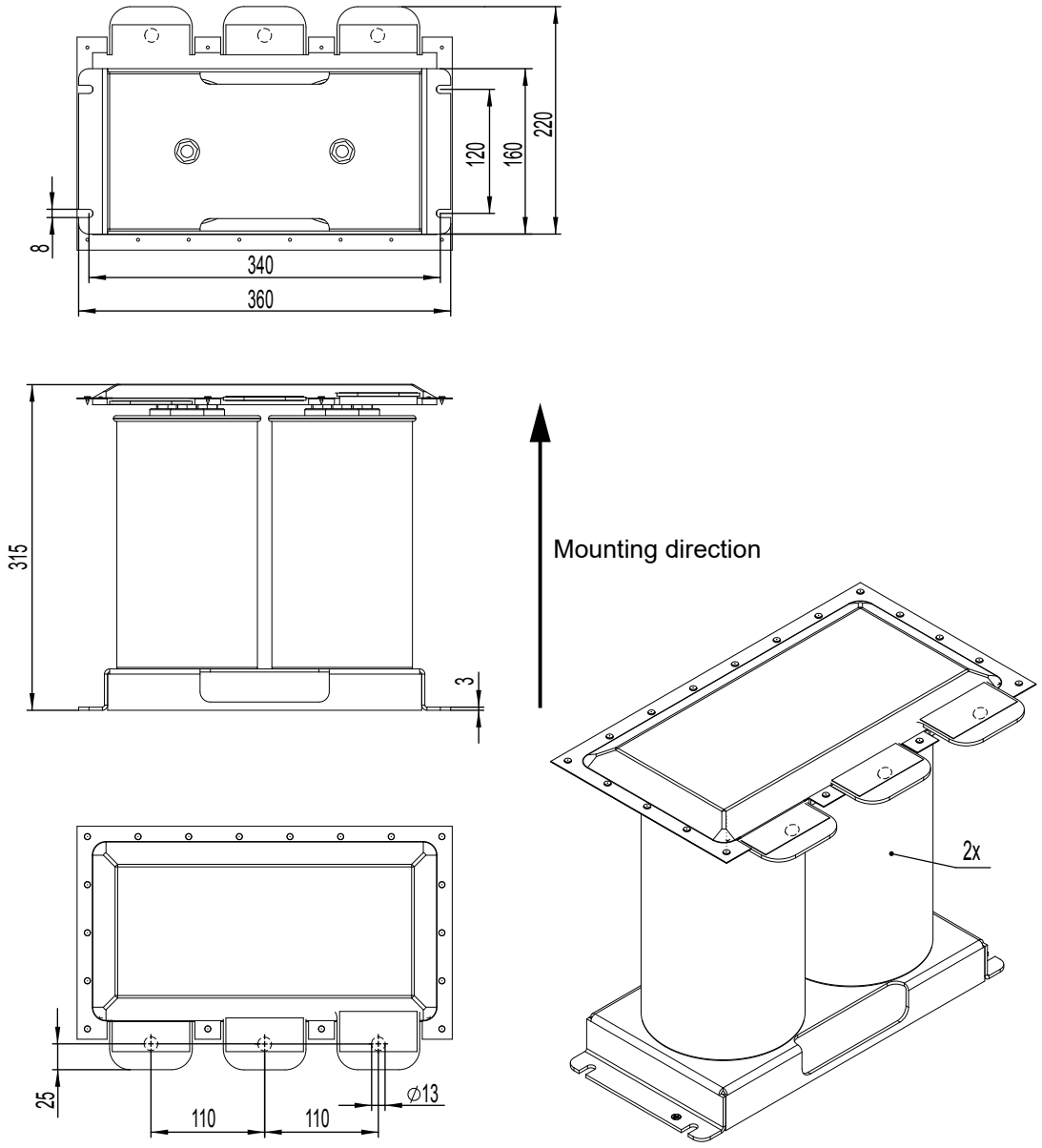
⚠ CAUTION

Transport instructions

There is a risk of injury when lifting at the bus bar.

► Use only the recessed grips for transport.

3.3.8 Capacitor module with two power capacitors



Material number	00Z2G24-00x2
Weight	11.6 kg
Dimensions	All dimensions in mm

Figure 8: Dimensions and weight capacitor module with two power capacitors

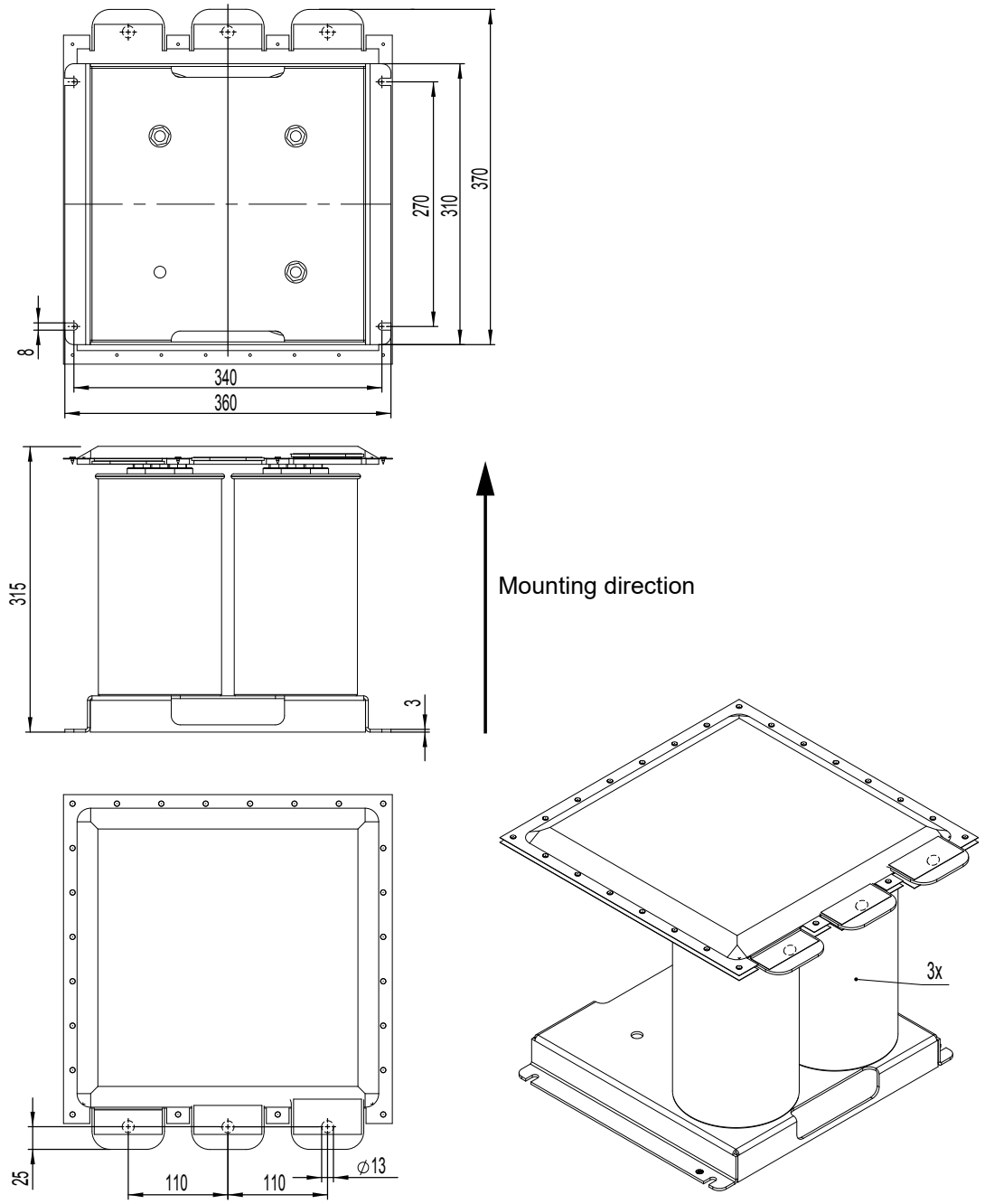
⚠ CAUTION

Transport instructions

There is a risk of injury when lifting at the bus bar.

► Use only the recessed grips for transport.

3.3.9 Capacitor module with three power capacitors



Material numbers	00Z2G24-00x3
Weight	17.7 kg
Dimensions	All dimensions in mm

Figure 9: Dimensions and weight capacitor module with three power capacitors

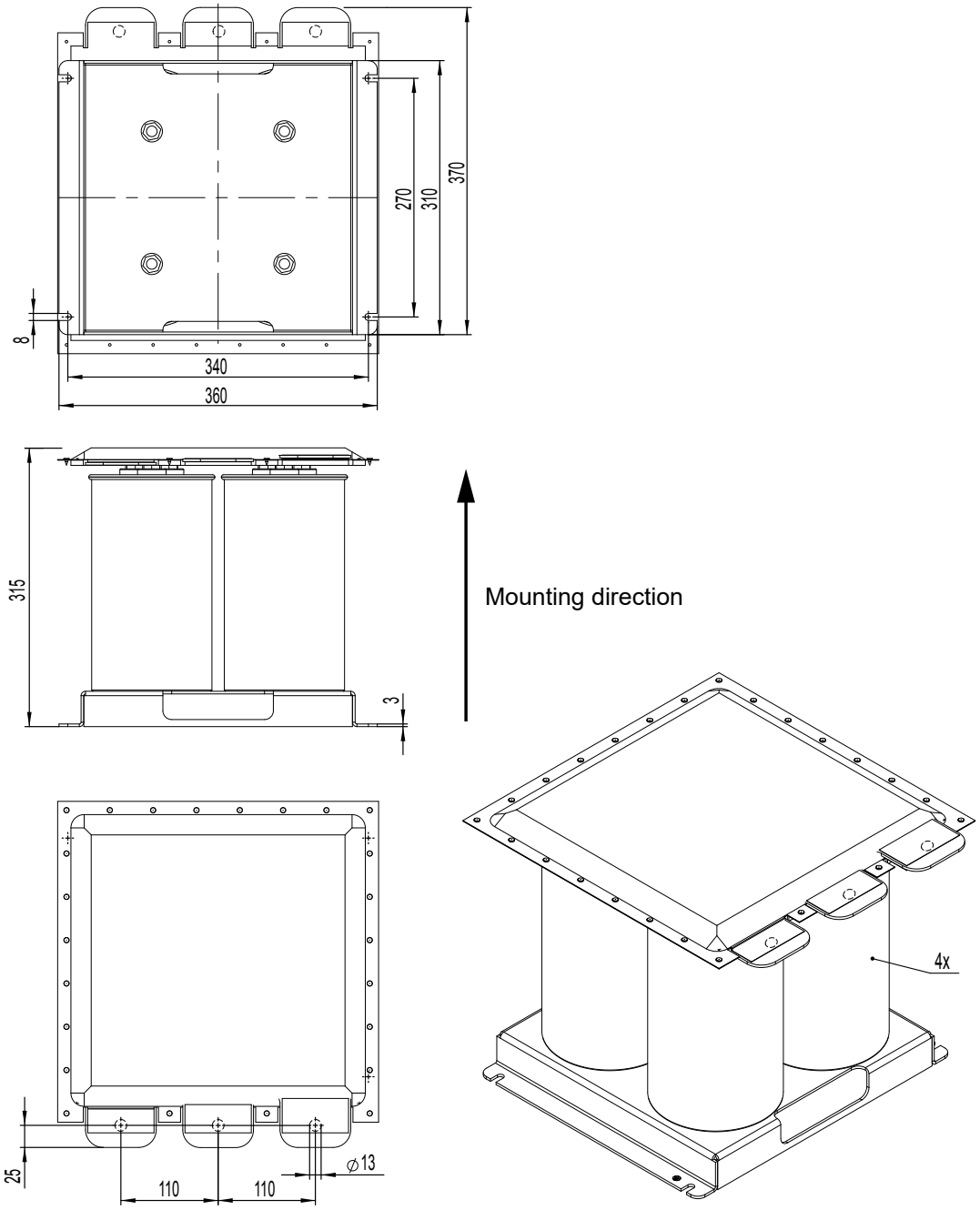
⚠ CAUTION

Transport instructions

There is a risk of injury when lifting at the bus bar.

► Use only the recessed grips for transport.

3.3.10 Capacitor module with four power capacitors



Material numbers	00Z2G24-00x4
Weight	22.5 kg
Dimensions	All dimensions in mm

Figure 10: Dimensions and weight capacitor module with four power capacitors

⚠ CAUTION

Transport instructions

There is a risk of injury when lifting at the bus bar.

► Use only the recessed grips for transport.

4 Installation and Connection

NOTICE

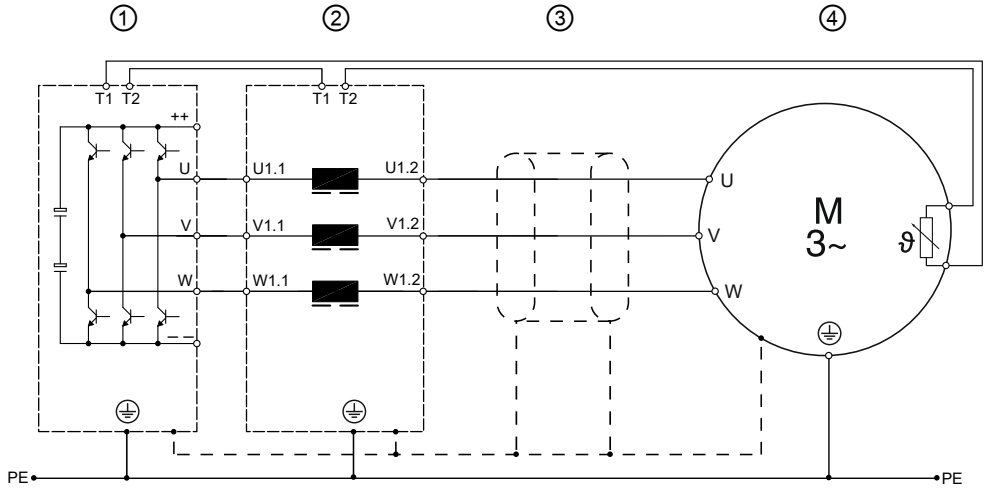
Destruction of the motor filter!

► The connecting cables must be fixed with a distance of 100 mm in order to ensure vibration resistance.

Information about the wiring

- Keep the connections between the drive converter and output filter or motor choke as short as possible.
- Do not lay any other cables parallel to the motor cables.
- Only use shielded cables between output filter / motor choke and motor.
- For capacitors with double-hole cable lug, the inner hole must be used for the motor connection and the outer hole for the capacitor connection.
- Operation without a motor leads to an unpredictable discharge time of the capacitors and is therefore inadmissible.

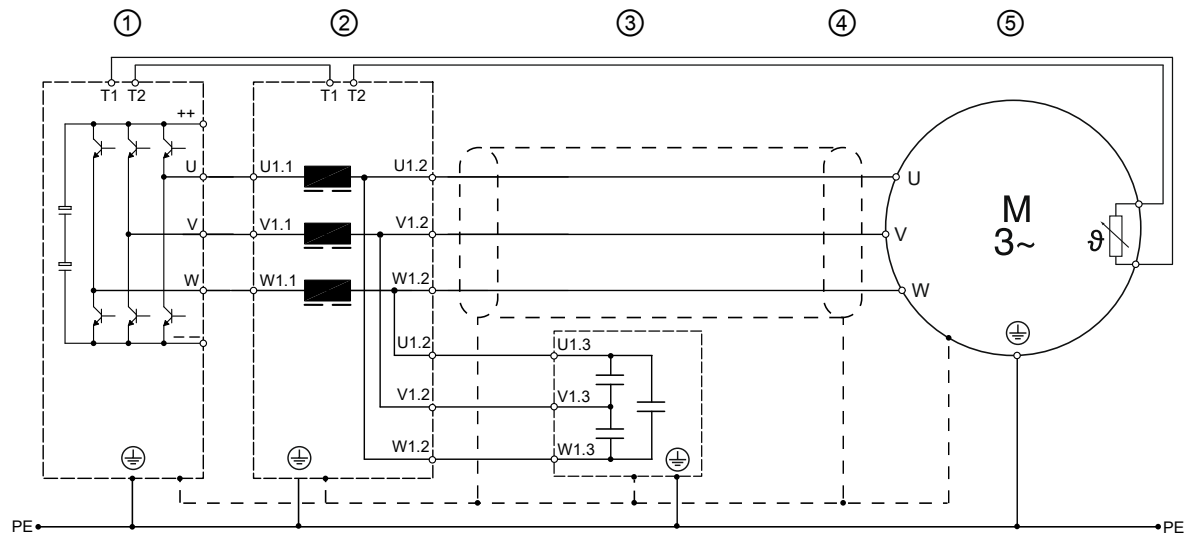
4.1 Schematic diagram with motor choke



Legend	
1	Drive controller
2	Motor choke
3	Shielded motor cable
4	Motor
T1, T2	Connection temperature monitoring
U, V, W	Output drive controller
++, - -	Connection DC link
U1.1, V1.1, W1.1	Input motor choke
U1.2, V1.2, W1.2	Output motor choke
PE / ⏚	Protective earth connection
– – –	Functional equipotential bonding via metal housing on galvanized mounting plate

Figure 11: Schematic diagram with motor choke

4.2 Schematic diagram with output filter



Legend		
1	Drive controller	
2	Motor choke	Output filter
3	Capacitor module	
4	Shielded motor cable	
5	Motor	
T1, T2	Connection temperature monitoring	
U, V, W	Output drive controller	
++, - -	Output terminal DC link	
U1.1, V1.1, W1.1	Input motor choke	
U1.2, V1.2, W1.2	Output motor choke	
U1.3, V1.3, W1.3	Connection capacitor	
PE / ⏚	Protective earth connection	
– – –	Functional equipotential bonding via metal housing on galvanized mounting plate	

Figure 12: Schematic diagram with output filter

4.3 Notes on the motor cable

The maximum motor cable length is 50m.

From a motor frequency of >200Hz, high inductances can be generated in case of long motor cable lengths, which can cause voltage differences at the motor.

The resulting motor cable length for parallel operation of motors, or for parallel laying due to multi-wire connection, results from the following formula:

$$\text{resulting motor cable length} = \sum \text{single cable lengths} \times \sqrt{\text{number of motor cables}}$$

The motor cable cross-section is dependent

- on the characteristic of the output current (e.g. harmonic content)
- on the real effective value of the motor current
- on the cable length
- on the type of the used cable
- on the ambient conditions such as bundling and temperature
- on the skin effect

4.4 Overtemperature shutdown

In order to protect the system against overtemperatures, the chokes from size 25 are equipped with temperature switches. This must be connected with the input terminals T1/T2 of the drive controller.

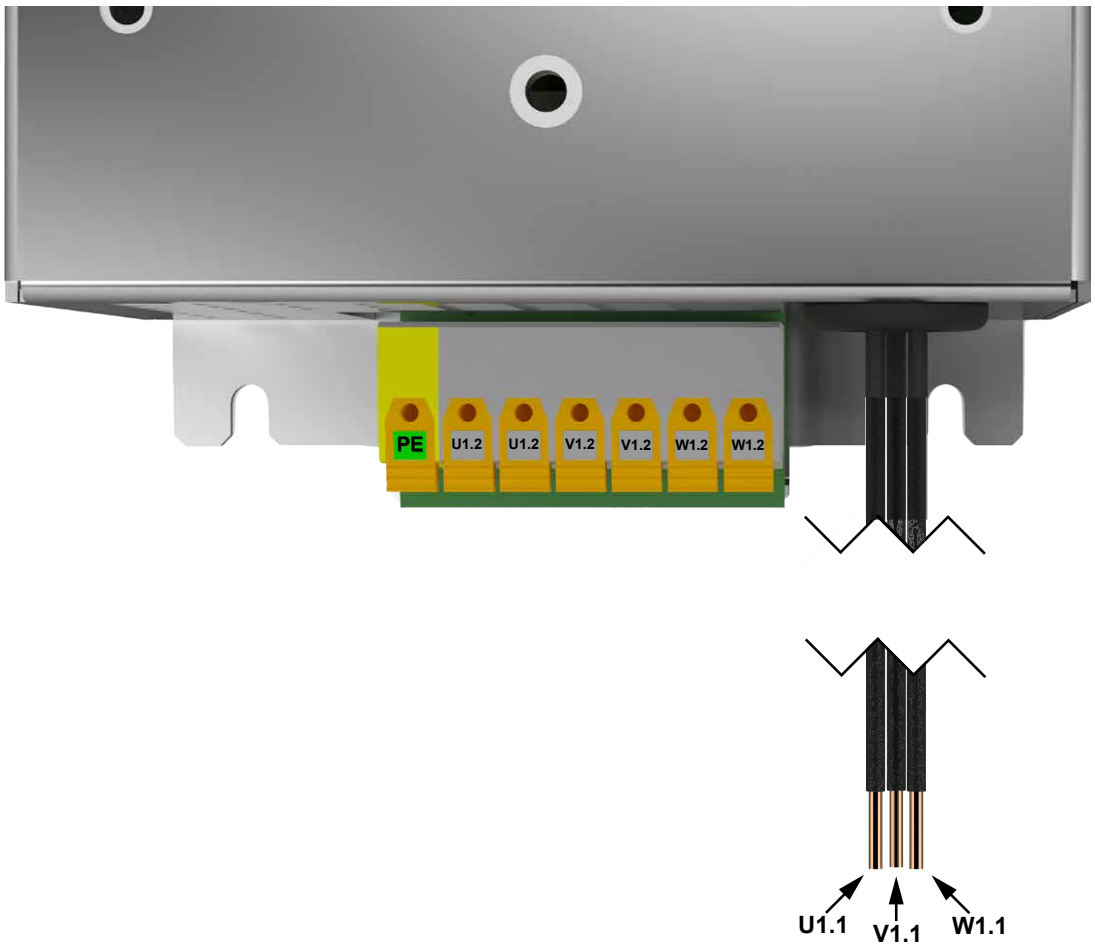
4.4.1 Rated data NC contact temperature monitoring

Contact	Data
Tripping temperature	155 °C
AC cos φ = 1.0	2.5A/250V
AC cos φ = 0.6	1.6A/250V
DC ohmic	1.6A/24V
DC ohmic	1.25A/48V

Table 11: Rated data NC contact

4.5 Connection of the motor chokes

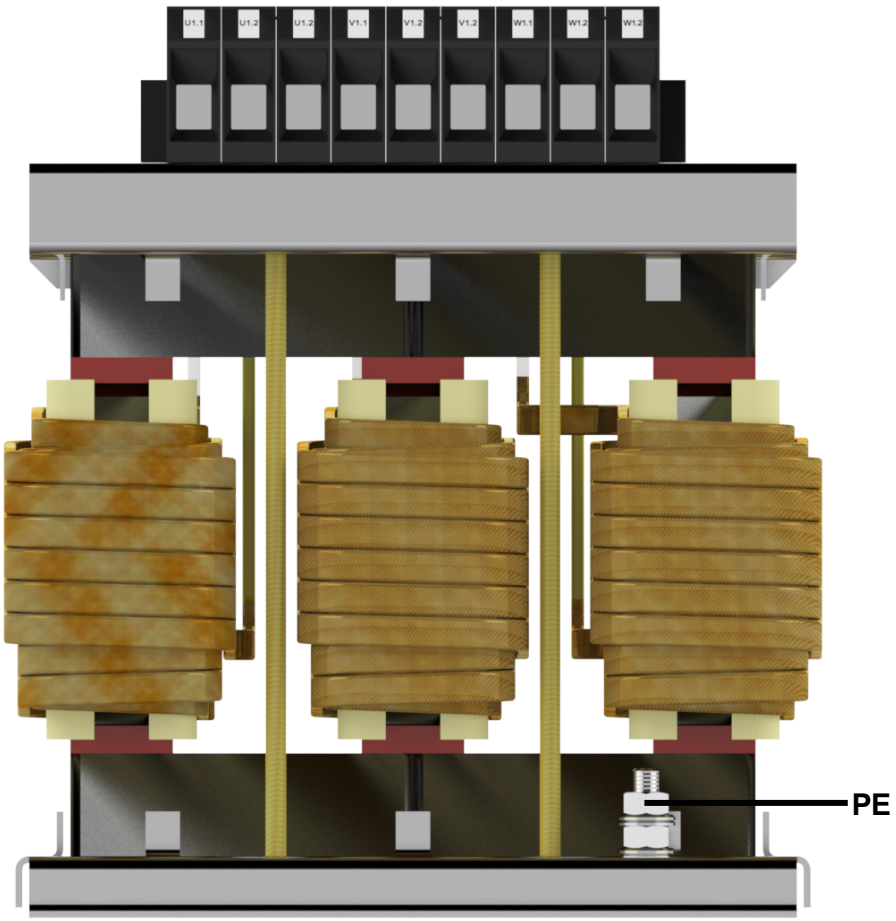
4.5.1 Connection of the motor chokes size 07 to 12



Legend	
PE	Protective earth connection
U1.1, V1.1, W1.1	Input motor choke at the stranded wires
U1.2, V1.2, W1.2	Output motor choke at the terminal block

Figure 13: Connection of the motor chokes size 07 to 12

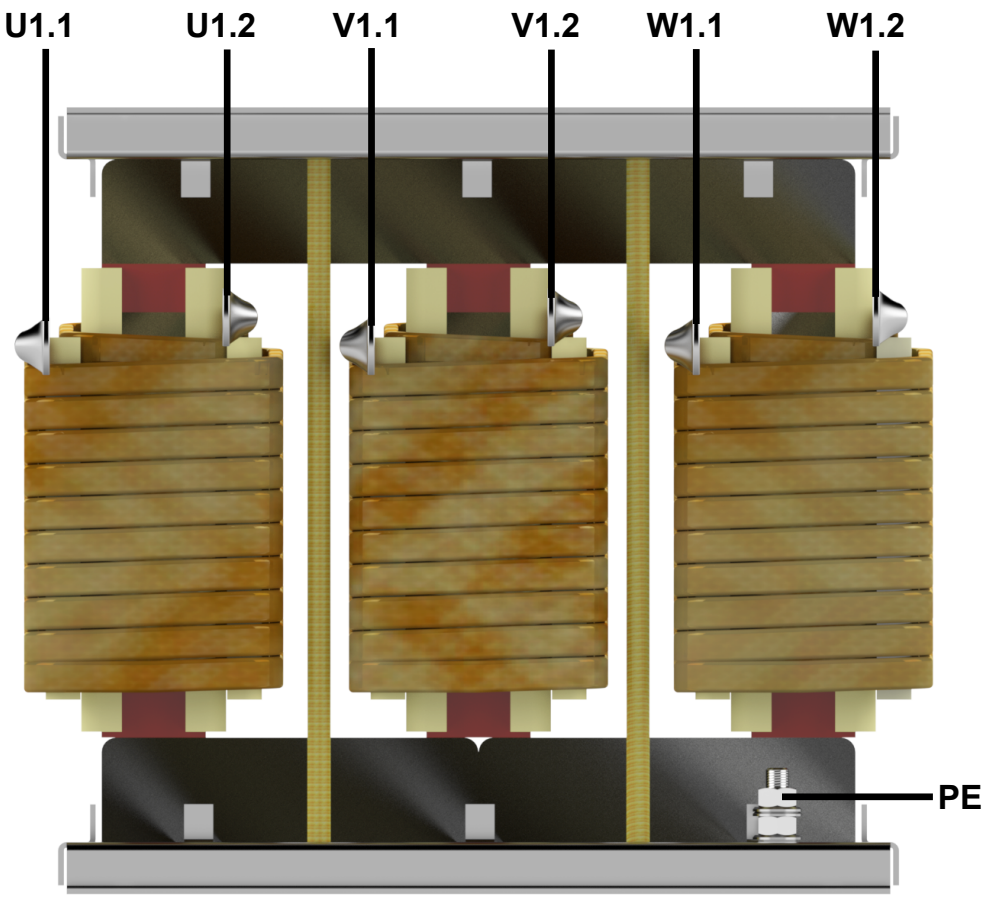
4.5.2 Connection of the motor chokes size 13 to 19



Legend	
PE	Protective earth connection
U1.1, V1.1, W1.1	Input motor choke
U1.2, V1.2, W1.2	Output motor choke

Figure 14: Connection of the motor chokes size 13 to 19

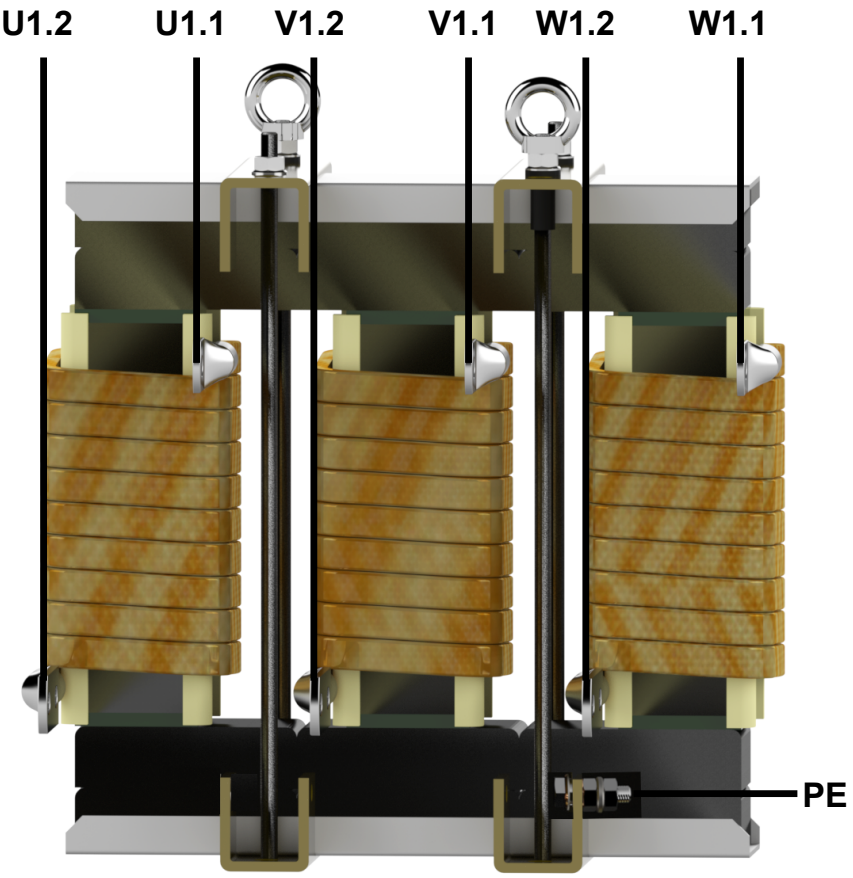
4.5.3 Connection of the motor chokes size 20 to 22



Legend	
PE	Protective earth connection
U1.1, V1.1, W1.1	Input motor choke
U1.2, V1.2, W1.2	Output motor choke

Figure 15: Connection of the motor chokes size 20 to 22

4.5.4 Connection of the motor chokes size 23 to 30

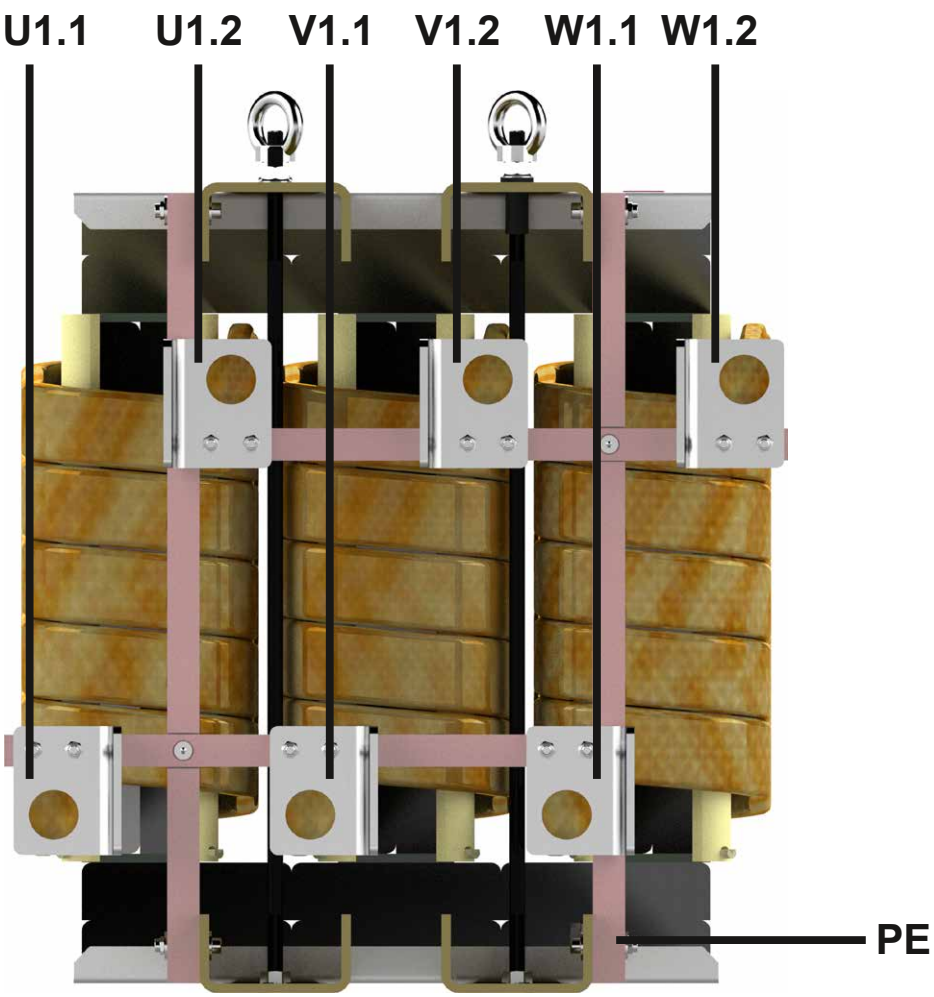


Legend	
PE	Protective earth connection
U1.1, V1.1, W1.1	Input motor choke
U1.2, V1.2, W1.2	Output motor choke

Figure 16: Connection of the motor chokes size 23 to 30

Motor chokes of sizes 25 to 30 have a temperature switch (NC). This must be connected with the input terminals T1/T2 of the drive controller.

4.5.5 Connection of the motor chokes size 31 to 33

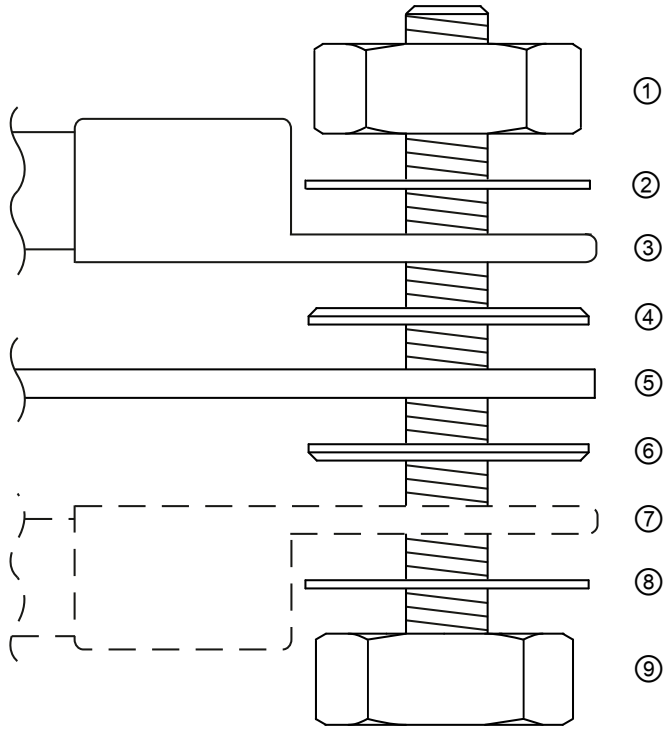


Legend	
PE	Protective earth connection
U1.1, V1.1, W1.1	Input motor choke
U1.2, V1.2, W1.2	Output motor choke

Figure 17: Connection of the motor chokes size 31 to 33

4.6 Connection of the capacitor modules

4.6.1 Connecting example for capacitor modules with M12 screw connection



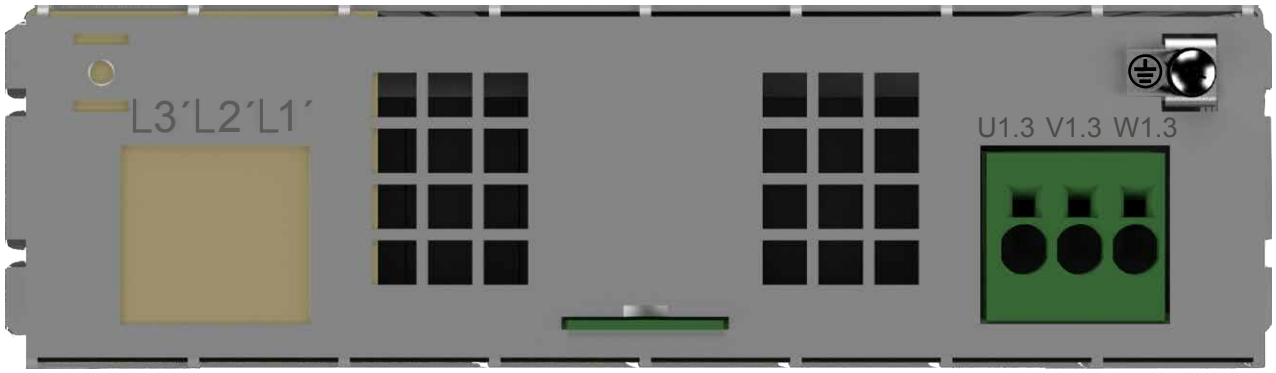
Legend	
1	Nut for M12 screw
2	Brass disc
3	Ring crimp connector
4	Cupal-washer (copper side top)
5	Aluminium sheet
6	Cupal-washer (copper side bottom)
7	Optional ring crimp connector
8	Brass disc
9	M12 screw

Figure 18: Connecting example for capacitor modules with M12 screw connection

The M12 screw must be countered during assembly.

The tightening torques can be found in chapter => *„3.2.1 Mechanical data of the motor chokes“*.

4.6.2 Connection of the capacitor module in the housing



Legend	
⏚	Protective earth connection
U1.3, V1.3, W1.3	Capacitor connection

Figure 19: Connection of the capacitor module in the housing

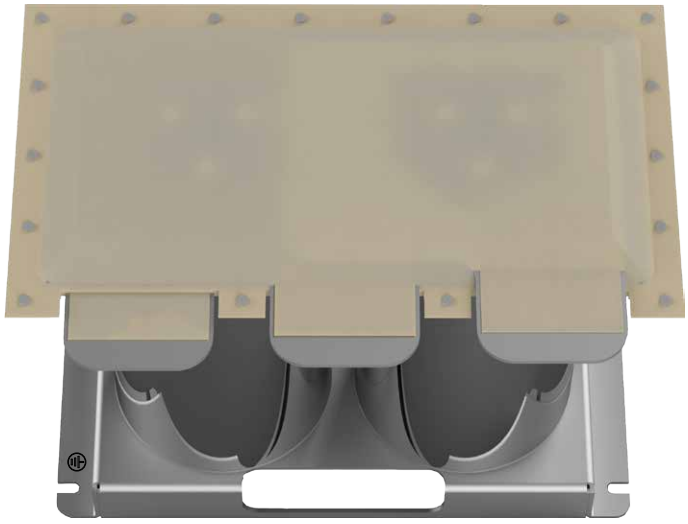
4.6.3 Connection of the capacitor module with a power capacitor

The 3 phases can be contacted at the 3 connection points.

Legend	
PE	Protective earth connection via connection point on the retaining plate
3 x M12 bolt	Capacitor connections U1.3, V1.3, W1.3

Figure 20: Connection of the capacitor module with a power capacitor

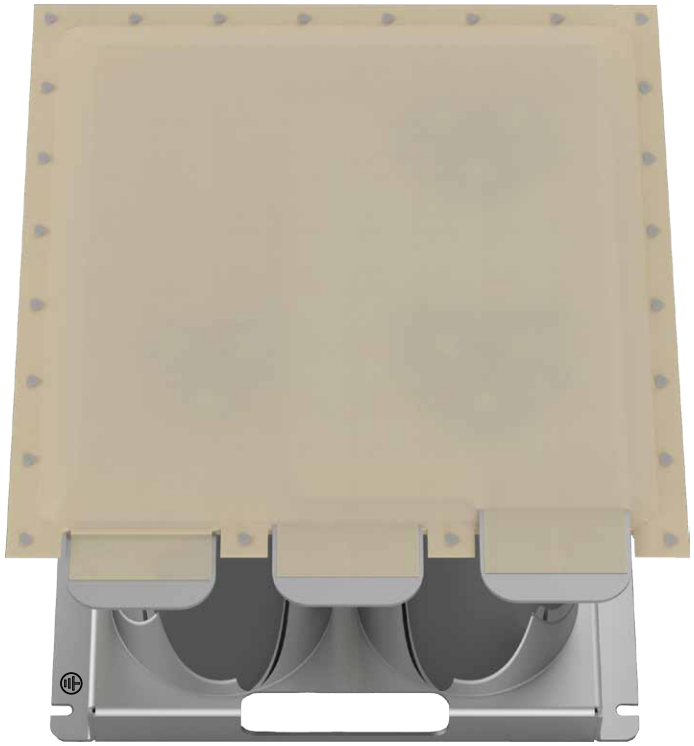
4.6.4 Connection of the capacitor module with two power capacitors



Legend	
PE	Protective earth connection via connection point on the retaining plate
3 x FlatAL 80 x 2mm; Drilling: ∅ = 13 mm	Capacitor connection M12 screw for U1.3, V1.3, W1.3

Figure 21: Connection of the capacitor module with two power capacitors

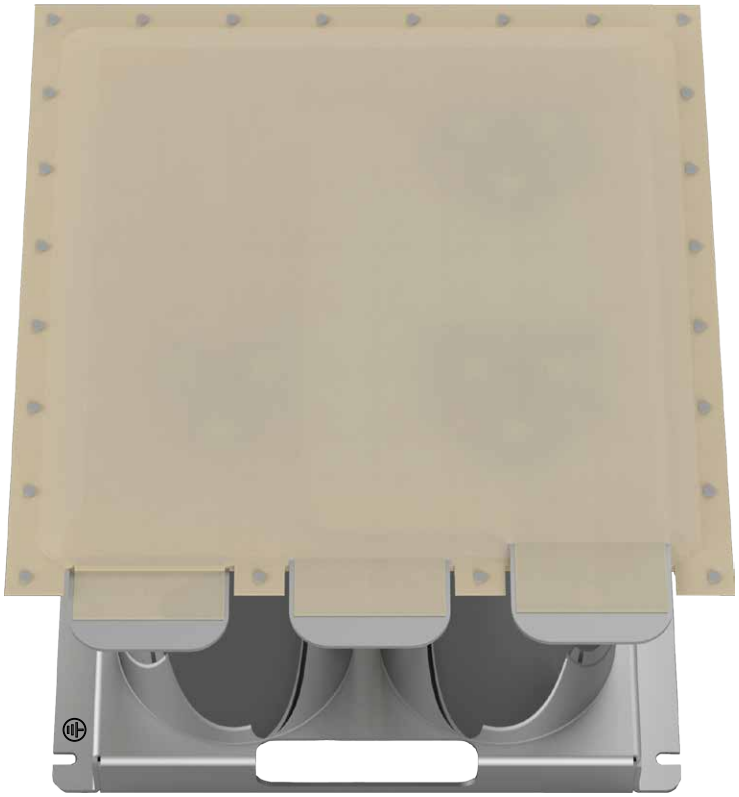
4.6.5 Power capacitors



Legend	
PE	Protective earth connection via connection point on the retaining plate
3 x FlatAL 80 x 2mm; Drilling: ⌀ = 13 mm	Capacitor connection M12 screw for U1.3, V1.3, W1.3

Figure 22: Connection of the capacitor module with three power capacitors

4.6.6 Connection of the capacitor module with four power capacitors



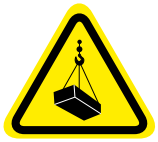
Legend	
PE	Protective earth connection via connection point on the retaining plate
3 x FlatAL 80 x 2mm; Drilling: ∅ = 13 mm	Capacitor connection M12 screw for U1.3, V1.3, W1.3

Figure 23: Connection of the capacitor module with four power capacitors

4.7 Transport of the motor chokes from size 23

Size 23...33 chokes are supplied with lifting eyes. These serve to accommodate the appropriate lifting devices for the transport.

⚠ WARNING



Incorrect chain angle damages the lifting eyes !

- ► Maintain a chain angle of max. 60°.
- ► Always attach to two lifting eyes simultaneously.
- ► Only place the chokes on the stand.
- ► Do not stand under suspended chokes during the transport.

Figure 24: Transport of a motor choke

4.8 Control cabinet installation

Power loss for the control cabinet dimension => *„3.2.2 Electrical data of the motor chokes“.*
A lower value can be used here depending on the load / frequency.

NOTICE

Destruction of the output filters due to overheating!

- ► Keep distance to other components!
- ► Do not ventilate the devices with preheated air from other components!

4.8.1 Mounting orientation of the motor chokes

Material number	Mounting orientation
07Z2F04-1003…12Z2F04-1003	Hanging, vertical
13Z2F04-1003…33Z2F04-1003	Standing

Illustrations of the motor chokes in mounting orientation are listed in chapter => *„3.3 Dimensions and weights“*.

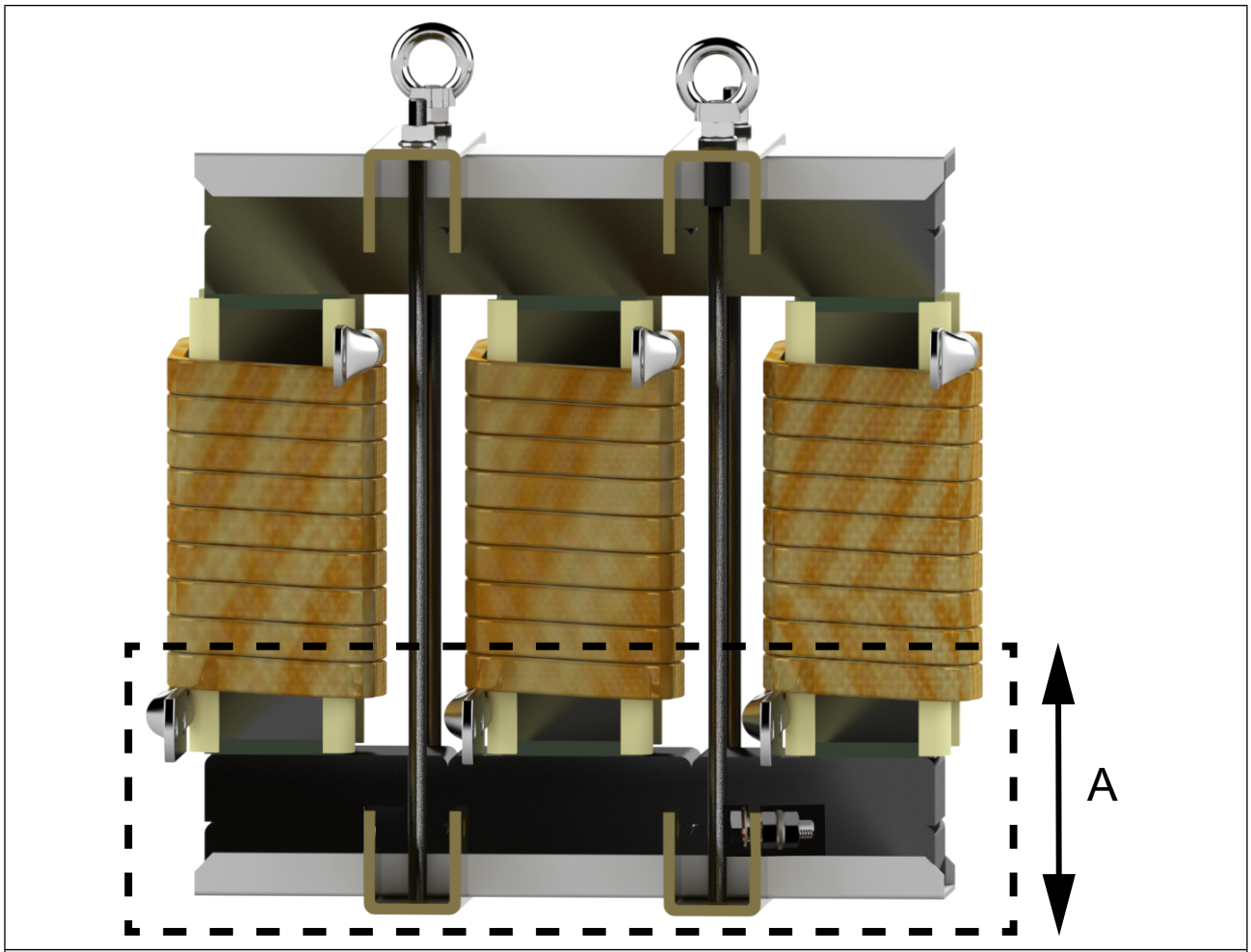
4.8.2 Mounting orientation of the capacitor modules

Material number	Mounting orientation
00Z2G24-00x1...00Z2G24-00x4	Standing
00Z2G24-00x5...00Z2G24-00x7	Hanging

Illustrations of the capacitor modules in mounting orientation are listed in chapter => *„3.3 Dimensions and weights“*.

4.8.3 Ventilation of the motor chokes from size 25 to 30

Motor chokes must be ventilated from size 25 up to size 30 and from an operating frequency of 600 Hz. Ventilation must be in the lower third of the motor choke height. The air flow must be at least 15 m³ / min.



Legend	
A	1/3 of the motor choke height

Figure 25: Ventilation of the motor chokes from size 25 to size 30

4.8.4 Installation distances for wall mounting

Observe the installation distances for the following components:

Capacitors	Motor chokes
00Z2G24-00x5	07...12Z2F04-1003
00Z2G24-00x6	
00Z2G24-00x7	

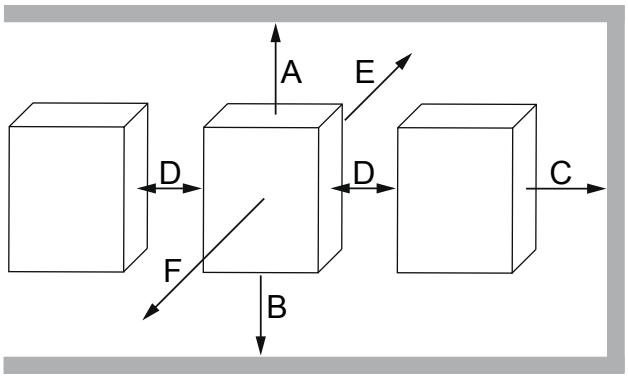
Installation distances	Dimen-sion	Distance in mm	Distance in inch
	A	150	6
	B	150	6
	C	150	6
	D	150	6
	E	0	0
	F	150	6

Figure 26: Installation distances for wall mounting

4.8.5 Installation distances for floor mounting

Observe the installation distances for the following components:

Capacitors	Motor chokes
00Z2G24-00x1	13...33Z2F04-1003
00Z2G24-00x2	
00Z2G24-00x3	
00Z2G24-00x4	

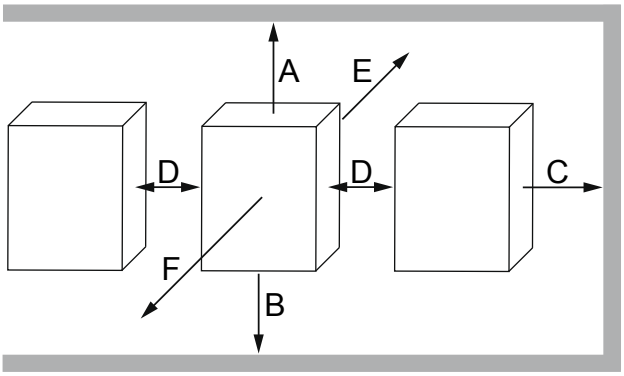
Installation distances	Dimen-sion	Distance in mm	Distance in inch
	A	100	4
	B	0	0
	C	100	4
	D	100	4
	E	100	4
	F	100	4

Figure 27: Installation distances for floor mounting

5 Certification

5.1 CE-Marking

CE marked output filters have been developed and manufactured in accordance with *EN 61558-1*. CE marked capacitor modules have been developed and manufactured in accordance with *EN 61800-5-1*.

5.2 UL certification

	Acceptance according to UL is marked at KEB filters and chokes with the adjacent logo on the nameplate.

To be conform according to UL for use on the North American and Canadian Market the following additionally instructions must be observed (original text of the UL-File):

All models

Maximum Surrounding Air Temperature: 45°C

- Use 75°C Copper Conductors Only
- CSA: For Canada, this information must be provided on the nameplate (not required for CSA if rated 30A or less).

This marking is only applicable for all power field wiring terminals.

- For Use in a Pollution Degree 2 environment
- For installations according to Canadian National Standard C22.2 No. 274-13:
- For use in Pollution Degree 2 and Overvoltage Category III environments only.

Models with UR-marking

Conditions of Acceptability - In order to be judged acceptable as a component of electrical equipment, the following conditions shall be met:

When operated at 601 – 1600 Hz, these devices shall be mounted into an ultimate enclosure having an actively fan-forced air cooling, as follows:

Models	Max. distance from choke, (mm)	Min. fan performance (m^3/min)	No. of fans
All	300	15	1

- Field wiring terminals are marked to show a nominal value of tightening torque in pound-inches (Nm) to be applied to the terminals as shown below:

  Power terminals: Model 25Z2F (M10) - 177.0 lb-in (20.0 Nm)
  All other models - 354.0 lb-in (40.0 Nm)

  Grounding terminal:
  All models (M12) – 354.0 lb-in (40.0 Nm)

  Control supply (Thermal Protector) - 4.4..5.3 lb-in (0.5…0.6 Nm)

- Control Circuit Overcurrent Protection Required

- Only for use in non-corner grounded type WYE source not exceeding 230V, 277V, 346V phase to ground

Models with UL-marking

Field wiring terminals are marked to show a nominal value of tightening torque in pound-inches (Nm) to be applied to the terminals as shown below:

- Core designation E55/25, E65/27, E70/32:

Power terminals - Push-Lock

Grounding terminal – Push-Lock

- Core sizes 130x180x36, 130x210x36, 200x160x58, 260x202x50, 260x192x50, 300x280x58

Power Terminals and Grounding Terminals (depending on the max. Current) – see table:

- Terminal tightening torque

RK 6-10/35 17.7 lb-in (2 Nm)
RK 16/35 35.4 lb-in (4 Nm)
RK 35/35 44.3 lb-in (5 Nm)
WFF 35 39.8 lb-in (4.5 Nm)
WFF 70 88.5 lb-in (10 Nm)
HSKG 120 88.5-177 lb-in (10-20 Nm)
WFF 120 132 lb-in (15 Nm)
WFF 185 177 lb-in (20 Nm)
HSKG 185 123.9- 274.4 lb-ln (14-31 Nm)
HSKG 300 221.3-531 lb-in (25-60 Nm)
WFF 300 354 lb-in (40 Nm)

- By using cable lugs (depending on the max. Current):

Screw size M10 - 177.0 lb-in (20.0 Nm)
Screw size M12 - 354.0 lb-in (40.0 Nm)

- Grounding terminal:

Screw size M12 – 354.0 lb-in (40.0 Nm)

- All power terminals (M12) for units 00Z2G24-xxx1:

88,5 lb-in (40.0 Nm)

- All power terminals (M12 screw with nut) for units 00Z2G24-xxxy, where y can be 2, 3 or 4:

354 lb-in (40 Nm)

- Grounding terminal (M8):

70.8 lb-in (8 Nm)

- All power terminals for units 00Z2G24-xxxz, whre z can be 5, 6 or 7:

Push-in spring connection

- Grounding terminal (M4)

21.1 lb-in (2.5 Nm)

- These products are not intended for use in corner-grounded delta systems, the phase-to-ground rated system voltage is 277V ac.

6 Revision History

Version	Date	Description
00	2018-09	Completion of pre-series
01	2019-02	Completion of the series version
02	2020-01	Corrections to the drawings; editorial changes
03	2020-06	Dimensions adapted to size 23-26Z2; editorial changes
04	2021-04	Note on winding tolerances included
05	2022-08	Inclusion of chokes of size 31...33, UL and UR certification adapted.

Austria | KEB Automation GmbH
Ritzstraße 8 4614 Marchtrenk Austria
Tel: +43 7243 53586-0 Fax: +43 7243 53586-21
E-Mail: info@keb.at Internet: www.keb.at

Benelux | KEB Automation KG
Dreef 4 - box 4 1703 Dilbeek Belgium
Tel: +32 2 447 8580
E-Mail: info.benelux@keb.de Internet: www.keb.de

Brazil | KEB South America - Regional Manager
Rua Dr. Omar Pacheco Souza Riberio, 70
CEP 13569-430 Portal do Sol, São Carlos Brazil
Tel: +55 16 31161294 E-Mail: roberto.arias@keb.de

Czech Republic | KEB Automation GmbH
Videnska 188/119d 61900 Brno Czech Republic
Tel: +420 544 212 008
E-Mail: info@keb.cz Internet: www.keb.cz

France | Société Française KEB SASU
Z.I. de la Croix St. Nicolas 14, rue Gustave Eiffel
94510 La Queue en Brie France
Tel: +33 149620101 Fax: +33 145767495
E-Mail: info@keb.fr Internet: www.keb.fr

Germany | **Geared Motors**
KEB Antriebstechnik GmbH
Wildbacher Straße 5 08289 Schneeberg Germany
Telefon +49 3772 67-0 Telefax +49 3772 67-281
Internet: www.keb-drive.de E-Mail: info@keb-drive.de

Italy | KEB Italia S.r.l. Unipersonale
Via Newton, 2 20019 Settimo Milanese (Milano) Italia
Tel: +39 02 3353531 Fax: +39 02 33500790
E-Mail: info@keb.it Internet: www.keb.it

Japan | KEB Japan Ltd.
15 - 16, 2 - Chome, Takanawa Minato-ku Tokyo 108 - 0074 Japan
Tel: +81 33 445-8515 Fax: +81 33 445-8215
E-Mail: info@keb.jp Internet: www.keb.jp

P. R. China | KEB Power Transmission Technology (Shanghai) Co. Ltd.
No. 435 QianPu Road Chedun Town Songjiang District
201611 Shanghai P.R. China
Tel: +86 21 37746688 Fax: +86 21 37746600
E-Mail: info@keb.cn Internet: www.keb.cn

Poland | KEB Automation KG
Tel: +48 60407727
E-Mail: roman.trinczek@keb.de Internet: www.keb.de

Republic of Korea | KEB Automation KG
Deoksan-Besttel 1132 ho Sangnam-ro 37
Seongsan-gu Changwon-si Gyeongsangnam-do Republic of Korea
Tel: +82 55 601 5505 Fax: +82 55 601 5506
E-Mail: jaeok.kim@keb.de Internet: www.keb.de

Spain | KEB Automation KG
c / Mitjer, Nave 8 - Pol. Ind. LA MASIA
08798 Sant Cugat Sesgarrigues (Barcelona) Spain
Tel: +34 93 8970268 Fax: +34 93 8992035 E-Mail: vb.espana@keb.de

Switzerland | KEB Automation AG
Witzbergstrasse 24 8330 Pfaeffikon/ZH Switzerland
Tel: +41 43 2886060 Fax: +41 43 2886088
E-Mail: info@keb.ch Internet: www.keb.ch

United Kingdom | KEB (UK) Ltd.
5 Morris Close Park Farm Indusrial Estate
Wellingborough, Northants, NN8 6 XF United Kingdom
Tel: +44 1933 402220 Fax: +44 1933 400724
E-Mail: info@keb.co.uk Internet: www.keb.co.uk

United States | KEB America, Inc
5100 Valley Industrial Blvd. South
Shakopee, MN 55379 United States
Tel: +1 952 2241400 Fax: +1 952 2241499
E-Mail: info@kebamerica.com Internet: www.kebamerica.com

MORE KEB PARTNERS WORLDWIDE:

... www.keb.de/contact/contact-worldwide

Automation **with Drive**

www.keb.de

KEB Automation KG Suedstrasse 38 32683 Barntrup Tel. +49 5263 401-0 E-Mail: info@keb.de