USING THE QUICK GUIDE

- Serves for safe handling with the KEB drive converter.
- Provides information on handling, assembly and installation.
- Remains for later use at the drive converter.
- Does **not** replace the electronically provided instructions for use.

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.
- Understanding of the function in the used machine.
- Detection of hazards and risks of the electrical drive technology.
- Knowledge of IEC 60364-5-54.
- Knowledge of national safety regulations.

SAFETY INSTRUCTIONS

⚠ DANGER **Interventions by unauthorized personne!**

Danger to life by electric shock and malfunction!

► Modifikation oder Instandsetzung ist nur durch von KEB autorisiertem Fachpersonal zulässig.

ACHTUNG **Getting more documentation**

Hazards and risks through ignorance.

► Open the KEB homepage at *www.keb.de*.
► By entering the material number in the search field, you will get the corresponding parts of the instructions for use.
► Read the instructions for use carefully !
► Observe the safety and warning instructions !
► If you have any questions, please contact*service@keb.de*!

TRANSPORT

The transport must be carried out by instructed persons, observing the following instructions.

⚠ CAUTION **Maximum design edges and high weight!**

Contusions and bruises!

► Never stand under suspended loads.
► Wear safety shoes.
► Secure drive converter accordingly when using lifting gear.

ACHTUNG **Behaviour in case of transport damage**

► When receiving goods, check the device for transport damage such as deformations or loose parts.
► In case of damage, contact the carrier immediately.
► Do not operate the device in case of transport damage!

STORAGE

Do not store drive converters

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

UNPACKING AND CHECKING

- 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. There is no compliance with applicable safety standards any more.

The electrolytic capacitors of the DC link must be reformed if the drive converter was stored or out of operation for more than one year.
See *www.keb.de/nc/search* with search term *„electrolytic capacitors“*.

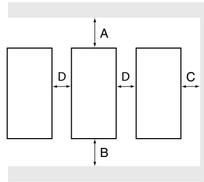
INSTALLATION

Drive converters contain electrostatic sensitive components.

► Avoid contact.
► Wear ESD-protective clothing.

- Do not allow moisture or mist to penetrate the unit. Mount the drive converter according to the required degree of protection.
- Make sure that no small parts fall into the device during assembly and wiring (drilling chips, screws etc.). This also applies to mechanical components, which can lose small parts during operation.
- The device is intended for the use in a pollution degree 2 environment.
- Maximum surrounding temperature 45°C
- Maximum pressure for liquid-cooled drive converters 10 bar (145 psi) at +5…+40°C.
- UL/CSA: For push-through versions, the part of thends to “NEMA Type 1”.
- UL/CSA: Use only 75°C copper cables for UL-compliant connections for all power connections!
- CSA: For installations according to the Canadian National Standard C22.2 No. 274-13 overvoltage category III.

MEASURMENTS

Mounting position	Minimum distances	Dimension	Dimension in mm
 Direction of airflow		A	150
		B	100
		C	30
		D	0
		X [1]	50

[1] Abstand zu vorgelagerten Bedienelementen in der Schaltschranktür.

INSTALLATION / ELECTRICAL CONNECTION

⚠ DANGER **Voltage at the terminals and in the device!**

Danger to life by electric shock !

► Never work under voltage on the open device or touch exposed parts.
► For any work on the unit switch off the supply voltage and secure it against switching on.
► Wait until the drive has stopped in order that no regenerative energy can be generated.
► Wait until the DC link capacitors are discharged (5 minutes). Verify by measuring the DC voltage at the terminals.
► If personal protection is required, install suitable protective devices for drive converters.
► Never bridge upstream protective devices (also not for test purposes).
► Connect the protective earth conductor properly to drive converter and motor.
► Leakage current higher than 3,5 mA: The minimum cross-section of the protective earth conductor must comply with local safety regulations for protective earth conductors for equipment with high leakage current.
► Install all required covers and protective devices for operation.
► Residual current: This product can cause a DC current in the protective earth conductor. When a residual current device (RCD) or a residual current monitor (RCM) is used for the protection of direct or indirect contact, only a RCD or RCM of Type B is permitted for this product on the power supply side.

For a trouble-free and safe operation, please pay attention to the following instructions:
► Check for reliable fit of the device connections in order to minimize contact resistance and avoid sparking.
► Connection of the drive converter is only permissible on symmetrical networks with a maximum line voltage (L1, L2, L3) with respect to earth (N/PE) of maximum 300 V. USA UL: 480 / 277 V. An isolating transformer must be used for supply networks which exceed this value. In case of non-compliance the control is not longer considered as "safe separate circuit".
► Within systems or machines the person installing electrical wiring must ensure that on existing or new wired safe ELV circuits the EN requirement for safe insulation is still met!
► Bei Antriebsstromrichtern ohne sichere Trennung vom Versorgungskreis (gemäß *EN 61800-5-1*) sind alle Steuerleitungen in weitere Schutzmaßnahmen (z.B. doppelt isoliert oder abgeschirmt, geerdet und isoliert) einzubeziehen.
► Installations with additional safety or protective measures in accordance with their requirements have to be checked. When using drive converters, to be in accordance with the given applications notes or recommendation when using these.

PROTECTION

ACHTUNG **Important:**

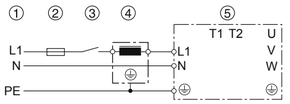
UL/CSA Branch Circuit Protection

COMBIVERT Unit size	Input voltage		Max. fuse size		Motor protection switch
	IEC	UL	IEC „gG“	UL „J,CC, RK5“ [1]	
07G6 A	AC 1ph 230 V	AC 1ph 200-230 V	20A	15A	Eaton PKZM0 (1) 16-E 480Y/277V, 2.0 Hp
09G6 A				20A	Eaton PKZM0 (1) 20-E 480Y/277V, 3.0 Hp
07G6 A	AC 3ph 400 V	AC 3ph 480 V	16A	6A	Eaton PKZM0 (1) 6.3-E 480Y/277V, 3.0 Hp
09G6 A				10A	Eaton PKZM0 (1) 10-E 480Y/277V, 7.5 Hp
10G6 A					
12G6 B			20A	15A	Eaton PKZM0(1) 16-E 480Y/277V, 10.0 Hp
13G6 B			25A	20A	Eaton PKZM0(1) 25-E 480Y/277V, 15.0 Hp
13G6 C					
14G6 C				25A	
15G6 C			35A	40A	Eaton PKZM0(1) 32-E 480Y/277V, 20.0 Hp
16G6 E			50A	50A	–
17G6 E			63A	60A	–
18G6 E			80A	70A	–
19G6 E				90A	–

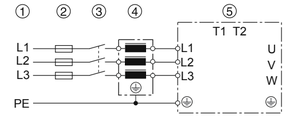
[1] Die Angaben zu den Herstellern der für die Geräte zulässigen UL-Sicherungen finden sich in der Gebrauchsanleitung des entsprechenden Gehäuses.

WIRING

Mains connection 1-phase (L1, N)

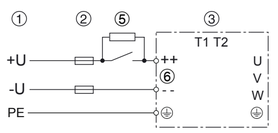


Mains connection 3-phase (L1, L2, L3)

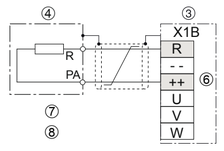


1: Netzspannung	3: Mains contactor	5: COMBIVERT
2: Mains fuse	4: Mains choke (option)	

DC connection

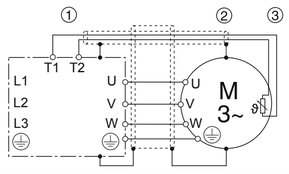


Connection brake resistor

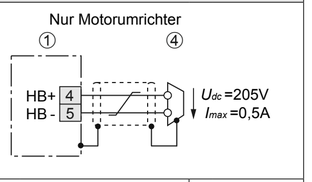


1: U_{dc} 480…746V ±0%	2: DC fuse	3: COMBIVERT	4: Braking resistor
5: Externe Einschaltstrombegrenzung (nur bei Gehäuse E)		6: Alternativ +/- bei Gehäuse E	
7: Nur eigensichere Bremswiderstände		8: Max. Einschaltzeit 50 % / Spielzeit 120 s	

Motor connection with temperature monitoring

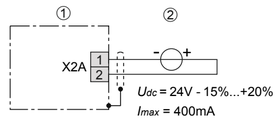


Brake connection



1: COMBIVERT	2: Motor 3-phase	3: Temperature measurement	4: Brake

24V supply control unit



Connection of control unit

The connection of the control depends on the programming of the machine manufacturer. See the documentation for the machine.
Overcurrent protection required!

1: COMBIVERT	2: 24V supply

No. from Table 2 / Housing	Terminal strip(s) X1A L1, L2, L3, N	X1B U, V, W	X1B +, -, ++, --, R (PB)	X1C all PINs	PE ⏚
G6 A	3	3	3	1	7
G6 B	4	4	4		7
G6 C	5	5	5	2	7
G6 E	6	6	6	1	8

Table 1: Assignment of terminals to terminal numbers

No. from Table 1	Mounting type	Zulässiger Querschnitt Litze mm² with wire end ferrule	Zulässiger Querschnitt Litze AWG without wire end ferrule	Tightening torque Nm	Tightening torque lb inch
1	Steckerteil	0,25…1,5 [1]	30...14	0,22...0,25	2
2	Steckverbinder	0,25...1	24...16	–	–
3	Steckerteil	0,25...2,5	24...14	0,5…0,6	5…6
4	Steckerteil	0,25...6	24...10	0,5...0,8	7
5	Screw clamp	2,5...10	20...8	1,2...1,5	12
6	Screw clamp	1,5...16	16...4	2,4...4	26
7	M4 Screw for cable lug	–	–	1,3	11
8	M6 Bolt for cable lug	–	–	4,5	40

Table 2: Assignment of terminal number to cross-section and tightening torque

- 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.

[1] **Malfunctions caused by loose cable connections and to short wireend ferrules!**
► Aderendhülsen gemäß *Tabelle 3 „Aderendhülsen und Abisolierlänge“* verwenden.
► Kabel gemäß *Tabelle 3 „Aderendhülsen und Abisolierlänge“* abisolieren.

Cross-section	Wire-end ferrule	Metal sleeve length	Stripping length
0,50 mm²	with plastic collars (DIN 46228-4)	10 mm	12 mm
0,75 mm²		12 mm	14 mm
1,00 mm²		12 mm	15 mm
1,50 mm²	without plastic collars (DIN 46228-1)	10 mm	10 mm
0,14…1,5 mm² single- or finewire	without wire-end ferrule	–	10…15 mm

Table 3: Wire-end ferrules and stripping length

START-UP AND OPERATION

⚠ WARNING **Function of the drive converter determines the machine manufacturer!**

Hazards caused by unintentional behavior of the drive!

► The documentation of the machine manufacturer is required for the start-up and operation of the product.
► Check especially during initial start-up or replacement of the drive converter if parameterization is compatible to application.
► The drive converter must not be started until it is determined that the installation complies with the machine directive; EN 60204-1 must be observed.

FS **Bei Geräten mit FS-Logo auf dem Typenschild ist das entsprechende KEB Sicherheitshandbuch zu beachten!**

Bei der UL-Bewertung wurden nur die Aspekte elektrische Sicherheit und Brandgefahr ermittelt. Functional safety aspects were not evaluated.

See *www.keb.de/nc/search* with search term *„safety manual“*.

⚠ WARNING **Triggering of overcurrent protection devices**

Risk of fire or electric shock!

► Triggering of an overcurrent protection device will be a hint for an overload or short circuit. Triggering a RCD may be caused by a leakage current.
► In order to reduce the risk of fire or electric shock, live parts and other components of the controller should be checked and replaced in case of damage.
► If the contacts of an overload relay are burned, the complete relay must be replaced.

MAINTENANCE

⚠ DANGER **Unauthorized exchange, repair and modifications!**

Unpredictable malfunctions!

► The function of the drive converter 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.

The following maintenance work has to be carried out when required, but at least once a year by authorized and trained personnel.
► Clean drive converter from dirt and dust deposits. Pay attention especially to cooling fins and protective grid of the fans.
► Check the function of the fans of the drive converter. The fans must be replaced in case of audible vibrations or squeak.
► Make a visual test of the cooling circuit for leaks and corrosion at liquid-cooled drive converters.
► In case of malfunction, unusual noises or smells inform a person in charge!
► In case of failure, please contact the machine manufacturer. Only the machine manufacturer knows the parameterisation of the used drive converter and can provide an appropriate replacement or induce the maintenance.

DISPOSAL

► For professional disposal, follow the instructions in the instructions for use

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

Automation with Drive

www.keb.de

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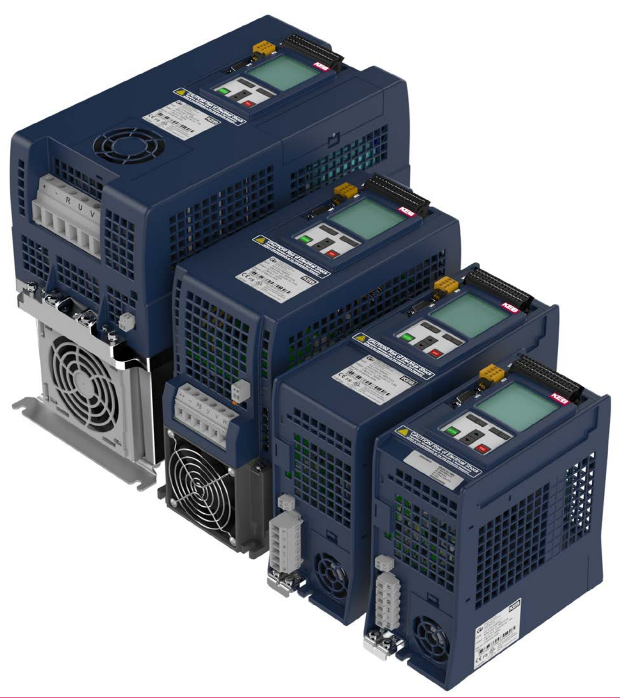


COMBIVERT G6

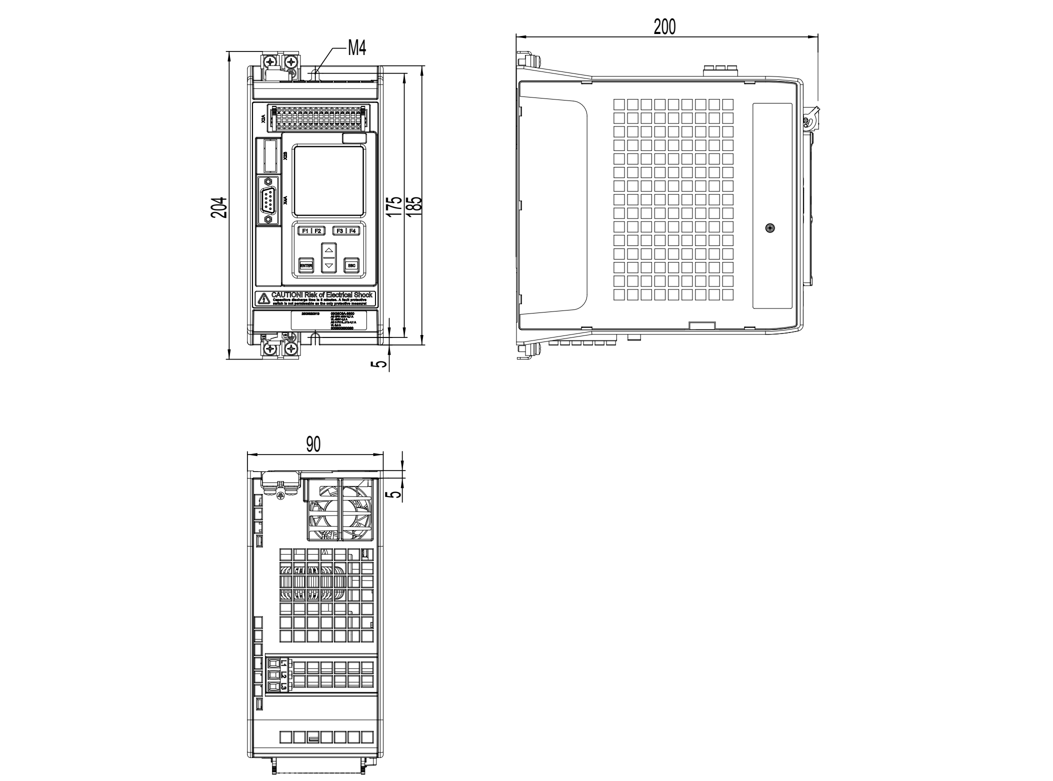
QUICK START GUIDE

Translation of the original manual
G6 Serie Gehäuse A-E
Dokument 20162226 DEU 01
Mat.Nr. 00G6N1M-0000

HOUSING DIMENSIONS

GEHÄUSE A

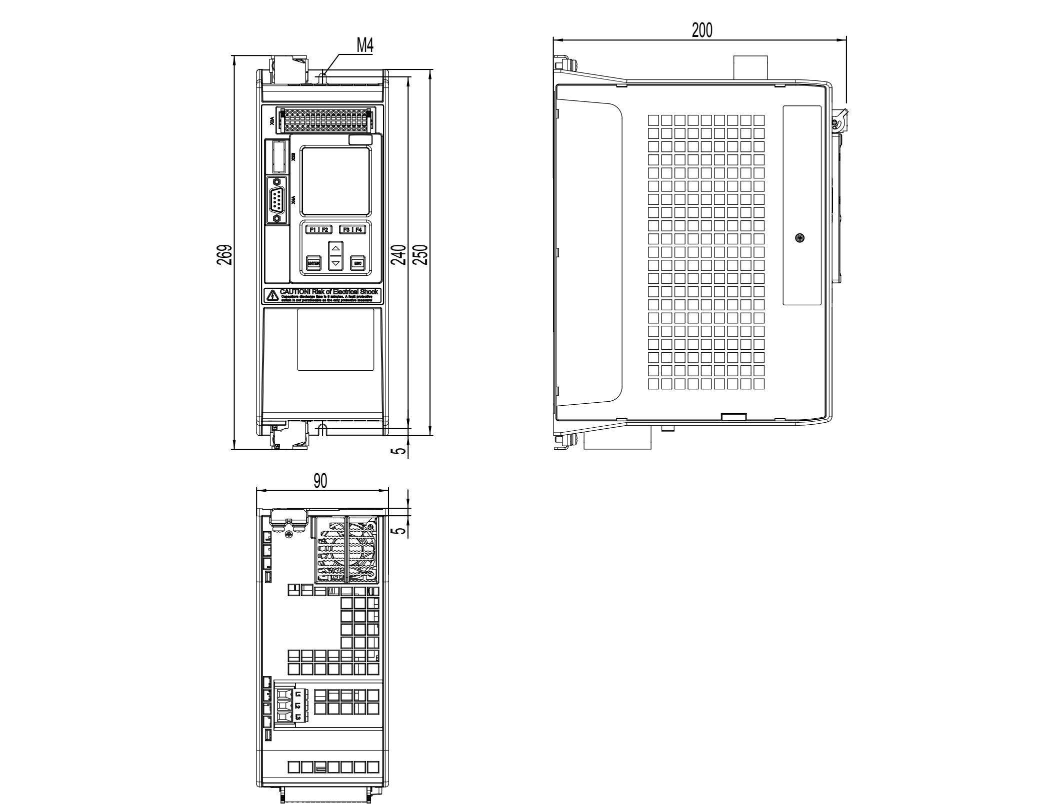
Gehäuse A Einbauversion (Standard)



Dimensions in mm	Weight: 1,3 kg

GEHÄUSE B

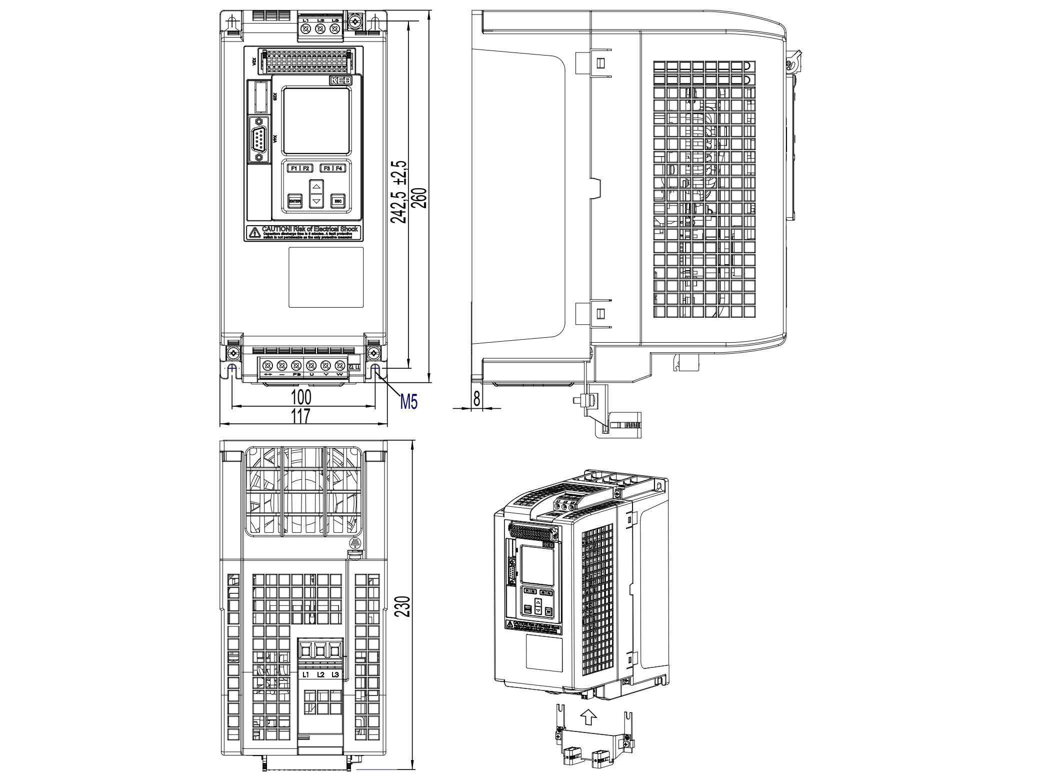
Gehäuse B Einbauversion (Standard)



Dimensions in mm	Weight: 2,3 kg

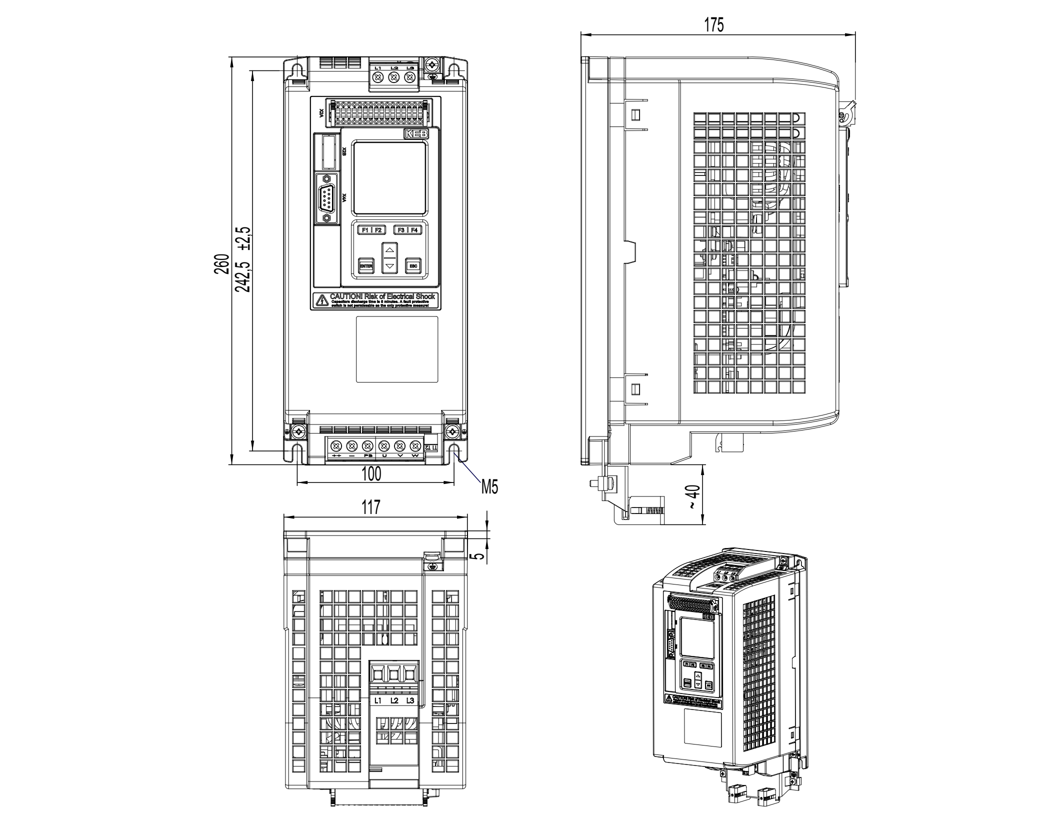
GEHÄUSE C

Gehäuse C Einbauversion (Standard)



Dimensions in mm	Weight: 4,6 kg

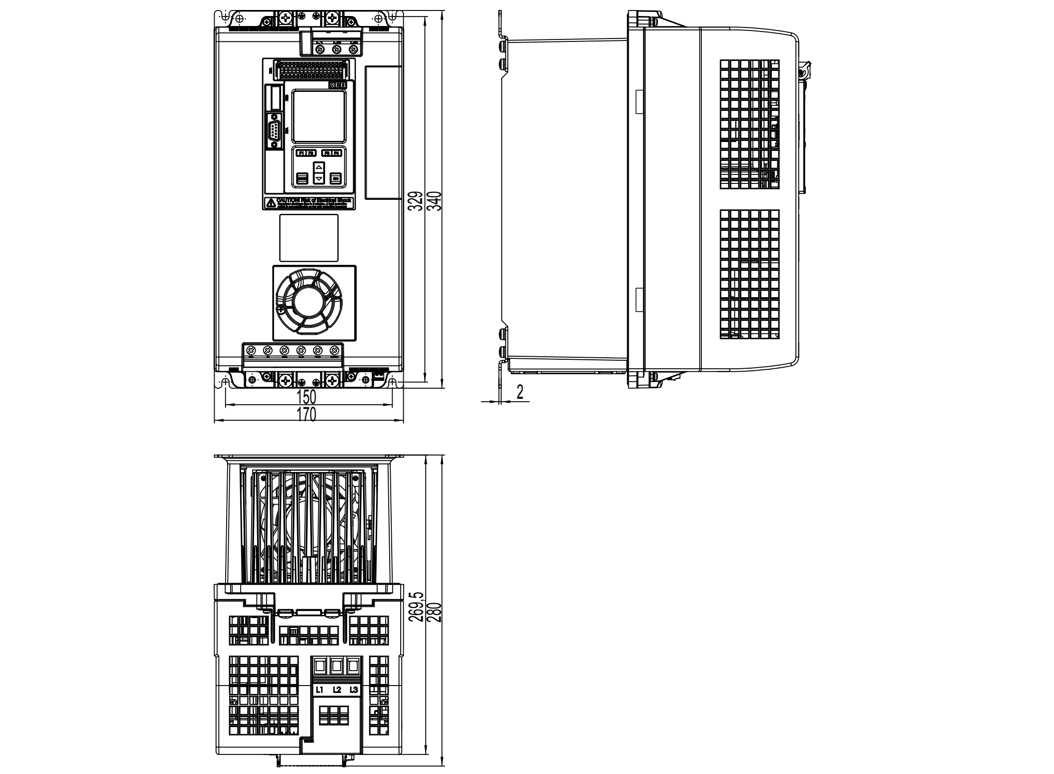
Gehäuse C Flat-Rear-Version



Dimensions in mm	Weight: 3,9 kg

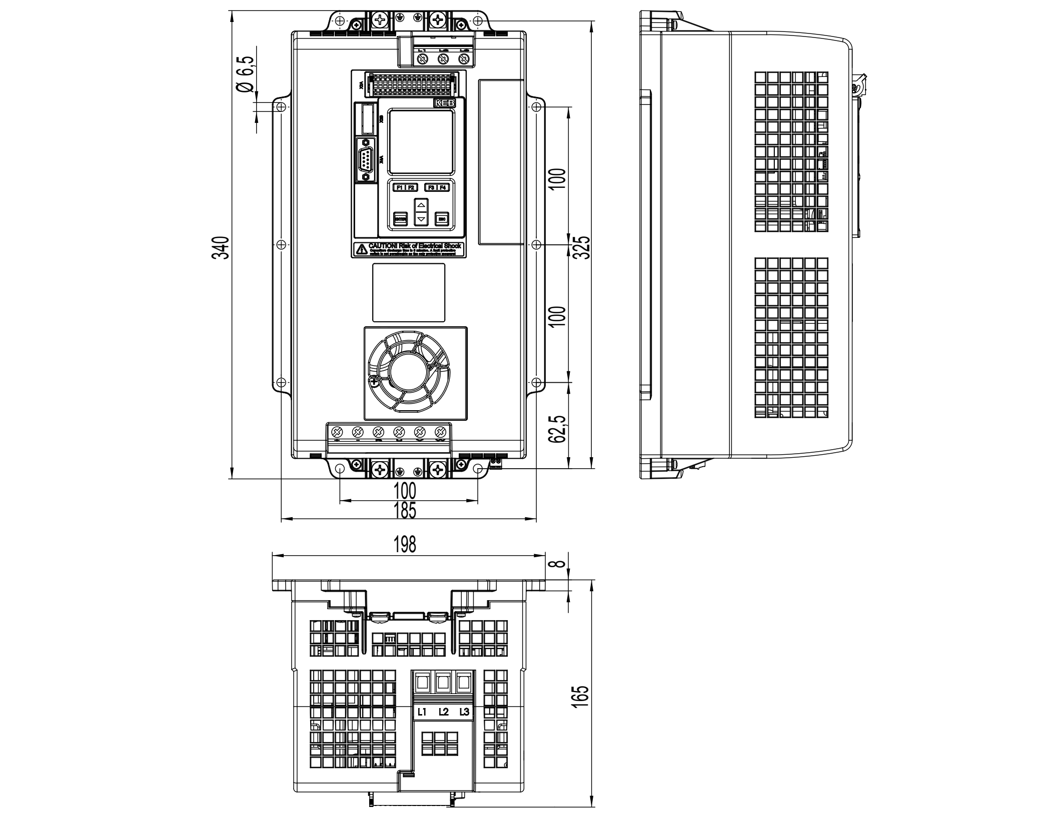
GEHÄUSE E

Gehäuse E Einbauversion (Standard)



Dimensions in mm	Weight: 11,3 kg

Gehäuse E Flat-Rear-Version



Dimensions in mm	Weight: 8,3 kg

Gehäuseabmessungen weiterer Modellvarianten finden sich in der Gebrauchsanleitung des entsprechenden Gehäuses

UL COMPLIANCE

ACHTUNG **UL certification**

Nur Geräte mit UL-Logo auf dem Typenschild sind zertifiziert.

For compliance with UL for use on the North American and Canadian Market, the following additional information must be observed (English original text):

Branch circuit protection

- Integral solid state short circuit protection does not provide branch circuit protection.
- Branch circuit protection must be provided in accordance with the Manufacturer Instructions, National Electrical Code and any additional local codes".
- CSA: For Canada: Branch circuit protection must be provided in accordance with the Canadian Electrical Code, Part I.

⚠ 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 ELECTRIC SHOCK, CURRENT-CARRYING PARTS AND OTHER COMPONENTS OF THE CONTROLLER SHOULD BE EXAMINED AND REPLACED IF DAMAGED. IF BURNOUT OF THE CURRENT ELEMENT OF AN OVERLOAD RELAY OCCURS, THE COMPLETE OVERLOAD RELAY MUST BE REPLACED.

⚠ 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. EN CAS DE GRILLAGE DE L'ÉLÉMENT TRAVERSÉ PAR LE COURANT DANS UN RELAIS DE SURCHARGE, LE RELAIS TOUT ENTIER DOIT ÊTRE REMPLACÉ.

Grounding system

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

	www.keb.de/nc/search
BG	Други налични езици.
CN	其他语言可用。
CZ	Jiné jazyky k dispozici.
DK	Andre sprog til rådighed.
DE	Weitere Sprachen verfügbar.
EN	Other languages available.
EE	Muud keeled on saadaval.
ES	Otros idiomas disponibles.
FI	Muut kielet saatavilla.
FR	Autres langues disponibles.
GR	Άλλες διαθέσιμες γλώσσες.
IE	Teangacha eile ar fáil.
IT	Altre lingue disponibili.
JP	他の言語も利用できます。
KR	다른 언어도 사용할 수 있습니다.

	www.keb.de/nc/search
HR	Ostali dostupni jezici.
HU	Más elérhető nyelvek.
LV	Citas pieejamās valodas.
LT	Kitos kalbos.
MT	Lingwi oħra disponibbli.
NL	Andere talen beschikbaar.
PL	Inne dostępne języki.
PT	Outros idiomas disponíveis.
RO	Alte limbi disponibile.
RU	Доступны другие языки.
SE	Andra språk finns tillgängliga.
SK	Iné jazyky sú k dispozícii.
SI	Drugi jeziki so na voljo.
TR	Mevcut diğer diller.