

USING THE QUICK GUIDE

- Serves for safe handling with the KEB drive controller.
- Provides information on handling, assembly and installation.
- Remains for later use at the drive controller.
- 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 personnel!



Danger to life by electric shock and malfunction!

- Modification or repair is only permitted by KEB authorized personnel.

NOTICE

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 controller accordingly when using lifting gear.

NOTICE

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 controllers

- 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 controller was stored or out of operation for more than one year. See www.keb.de/nc/search with search term „electrolytic capacitors“.

INSTALLATION



Drive controllers contain electrostatic sensitive components.

- Avoid contact.
- Wear ESD-protective clothing.

- Do not allow moisture or mist to penetrate the unit. Mount the drive controller 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
- 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.

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 controllers.
- Never bridge upstream protective devices (also not for test purposes).
- Connect the protective earth conductor properly to drive controller 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 controller 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!
- For drive controllers that are not isolated from the supply circuit (in accordance with EN 61800-5-1) all control lines must be included in other protective measures (e.g. double insulation or shielded, earthed and insulated).
- Installations with additional safety or protective measures in accordance with their requirements have to be checked. When using drive controllers, to be in accordance with the given applications notes or recommendation when using these.

START-UP AND OPERATION

⚠ WARNING Function of the drive controller 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 controller if parameterization is compatible to application.
- The drive controller must not be started until it is determined that the installation complies with the machine directive; EN 60204-1 must be observed.

FS For devices with FS logo on the name plate, the corresponding KEB safety manual must be observed!

During the UL evaluation, only electrical safety and risk of fire aspects were investigated. Functional safety aspects were not evaluated. Devices with safety function are limited to a service life of 20 years. Then the devices must be replaced.

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 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.

The following maintenance work has to be carried out when required, but at least once a year by authorized and trained personnel.

- Clean drive controller 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 controller. The fans must be replaced in case of audible vibrations or squeak.
- 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 controller and can provide an appropriate replacement or induce the maintenance.

DISPOSAL

- For professional disposal, follow the instructions in the instructions for use.

MEASUREMENTS

Mounting position	Installation distances	Dimension	Distance in mm / inch
		A	150 / 6
		B	100 / 4
		C	30 / 1.2
		D	0
		E	0
		F ¹⁾	50 / 2

¹⁾ Distance to front operating elements in the cabinet door.

PROTECTION

NOTICE UL/CSA Branch Circuit Protection

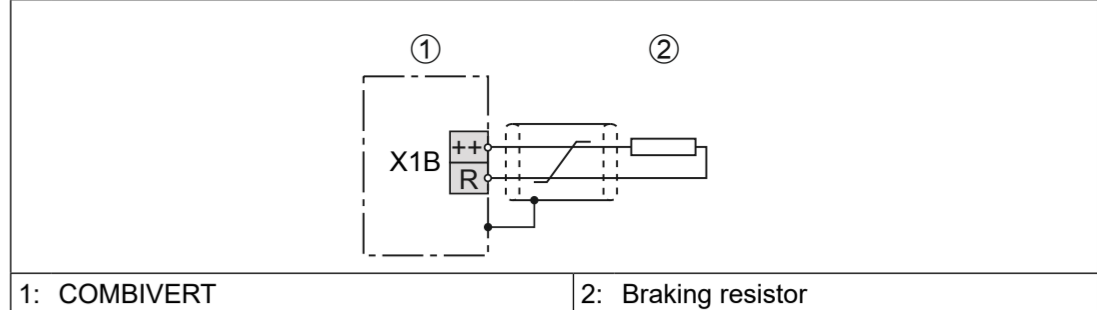
COMBIVERT Unit size	Input voltage		Max. fuse size ¹⁾			Motor protection switch
	IEC	UL	IEC	UL „CC“	UL „J“	
07S6 2	AC 1ph 230V	AC 1ph 200-230V	15A	15A ³⁾	15A ²⁾	Eaton PKZM0 20-E ²⁾ 115V, 1.5 HP 230V, 3HP
09S6 2			20A	20A ³⁾	20A ²⁾	
07S6 2	AC 3ph 230V	AC 3ph 200-230V	6A	6A ³⁾	–	Eaton PKZM0 (1) 10-E ³⁾ 200-230V, 3 HP
09S6 2			10A	10A ³⁾	–	
10S6 2			10A	10A ³⁾	–	
12S6 4			15A	15A ³⁾	15A ²⁾	Eaton PKZM0 (1) 32-E ²⁾ 200V, 7.5 HP 230V, 10 HP
13S6 4			20A	20A ³⁾	20A ²⁾	
14S6 4			25A	25A	25A	–
07S6 2	AC 3ph 400V	AC 3ph 480V	6A	6A ³⁾	–	Eaton PKZM0 (1) 10-E ³⁾ 480Y/277V, 7.5 HP
09S6 2			10A	10A ³⁾	–	
10S6 2			10A	10A ³⁾	–	
12S6 4			15A	15A ³⁾	15A ²⁾	Eaton PKZM0 (1) 32-E ²⁾ 480Y/277V, 20 HP
13S6 4			20A	20A ³⁾	20A ²⁾	
14S6 4			25A	25A ³⁾	25A ²⁾	–

- The rated voltage of the external fuse must be at least equal to the input voltage of the drives.
- Suitable for use on the mains, which can not supply more than 5 kA RMS (effective value) and a maximum of 480 V.
- Suitable for use on the mains, which can not supply more than 30 kA RMS (effective value) and a maximum of 480 V.

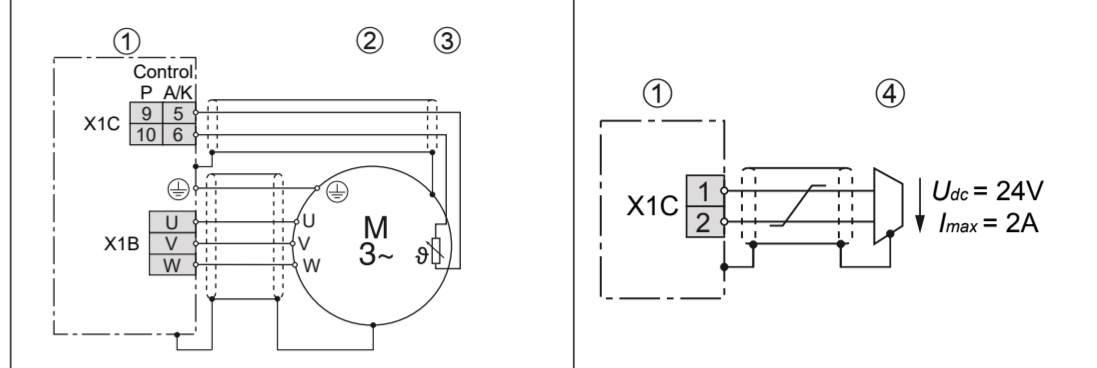
WIRING

Mains connection 1-phase (L1, N)	Mains connection 3-phase (L1, L2, L3)
1: Mains fuse	3: Mains choke (option)
2: Mains contactor	4: HF filter (option)
	5: COMBIVERT

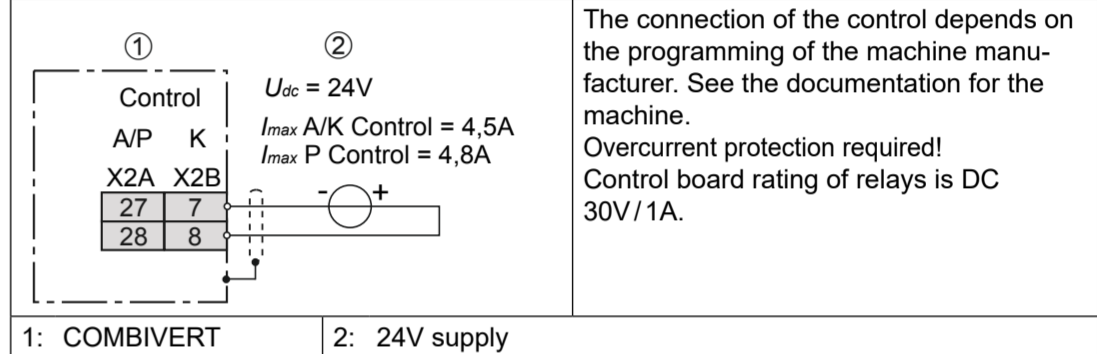
Connection brake resistor



Motor connection with temperature monitoring



24V supply control unit



No. from Table 2	Terminal strip(s)				
	X1A L1, L2, L3(N)	X1B U, V, W	X1C ++, --, R	X2A-D all PINS	PE
S6 2	2	2	2	1	1
S6 4	3	3	2		4

Table 1: Assignment of terminals to terminal numbers

No. from Table 1	Mounting type	Permissible cross-section		Tightening torque	
		mm ² with wire end ferrule	AWG without wire end ferrule	Nm	lb inch
1	Push-in clamp	0.14...1.5 ¹⁾	26...12	–	–
2		0.5...1.5	26...12	–	–
3		0.5...6	24...8	–	–
4	M4 Screw for cable lug	–	–	1.3	11

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

¹⁾ Malfunctions caused by loose cable connections and to short wireend ferrules!

- Use wire-end ferrules according to Table 3 :Wire-end ferrules and stripping length“.
- Strip cable according to Table 3 :Wire-end ferrules and stripping length“.

Cross-section	Wire-end ferrule	Metal sleeve length	Stripping length
0.50 mm ²	with plastic collars (DIN 46228-4)	10 mm	12 mm
0.75 mm ²		12 mm	14 mm
1.00 mm ²		12 mm	15 mm
1.50 mm ²	without plastic collars (DIN 46228-1)	10 mm	10 mm
0.14...1.5 mm ² single- or finewire	without wire-end ferrule	–	10...15 mm

Table 3: Wire-end ferrules and stripping length

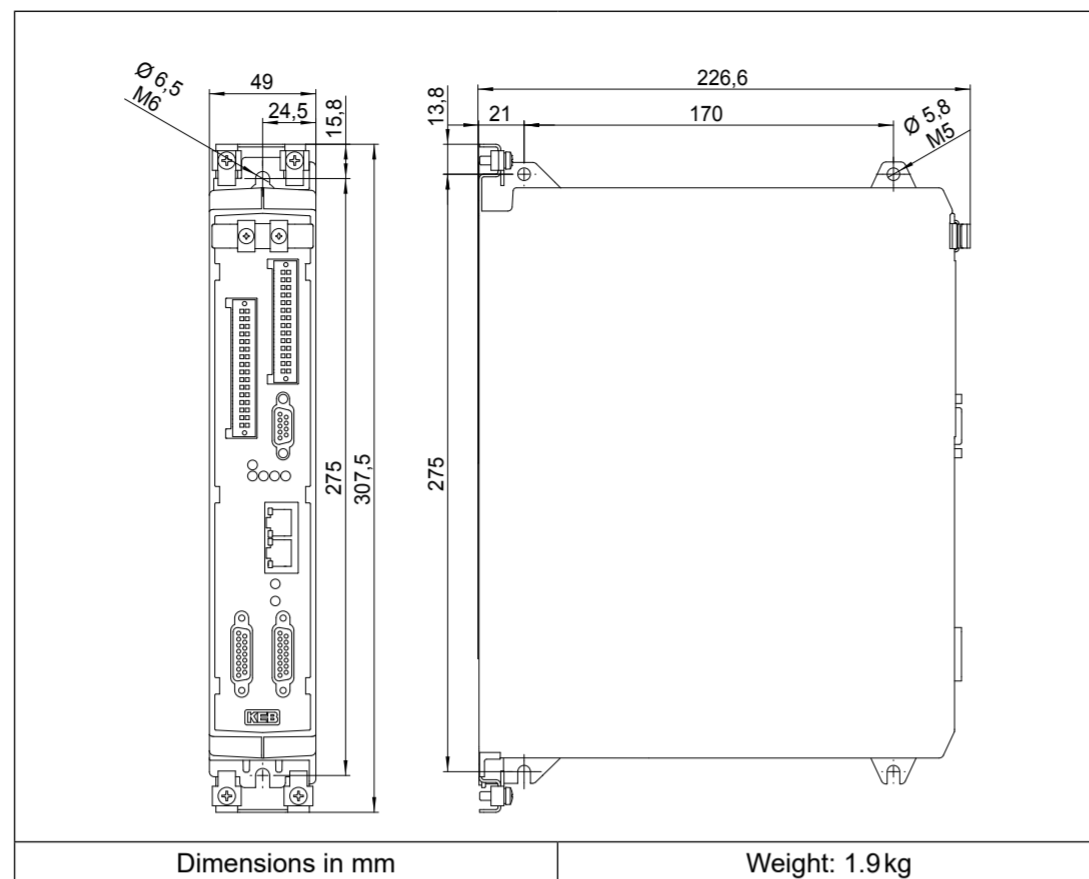
NOTICE The following accessory kits must be used for UL-compliant connections.

Accessory kits	Housing	Mains connection	Control type	Safety module
00S6ZC0-0000	2	3	S6-K	STO
00S6ZC0-0001	4	3	S6-K	STO
00S6ZC0-0002	2	3	S6-A	Typ 1
00S6ZC0-0003	4	3	S6-A	Typ 1
00S6ZC0-0004	2	3	S6-A	Typ 3
00S6ZC0-0005	4	3	S6-A	Typ 3
00S6ZC0-0006	2	1	S6-K	STO
00S6ZC0-0007	2	1	S6-A	Typ 1
00S6ZC0-0008	2	1	S6-A	Typ 3

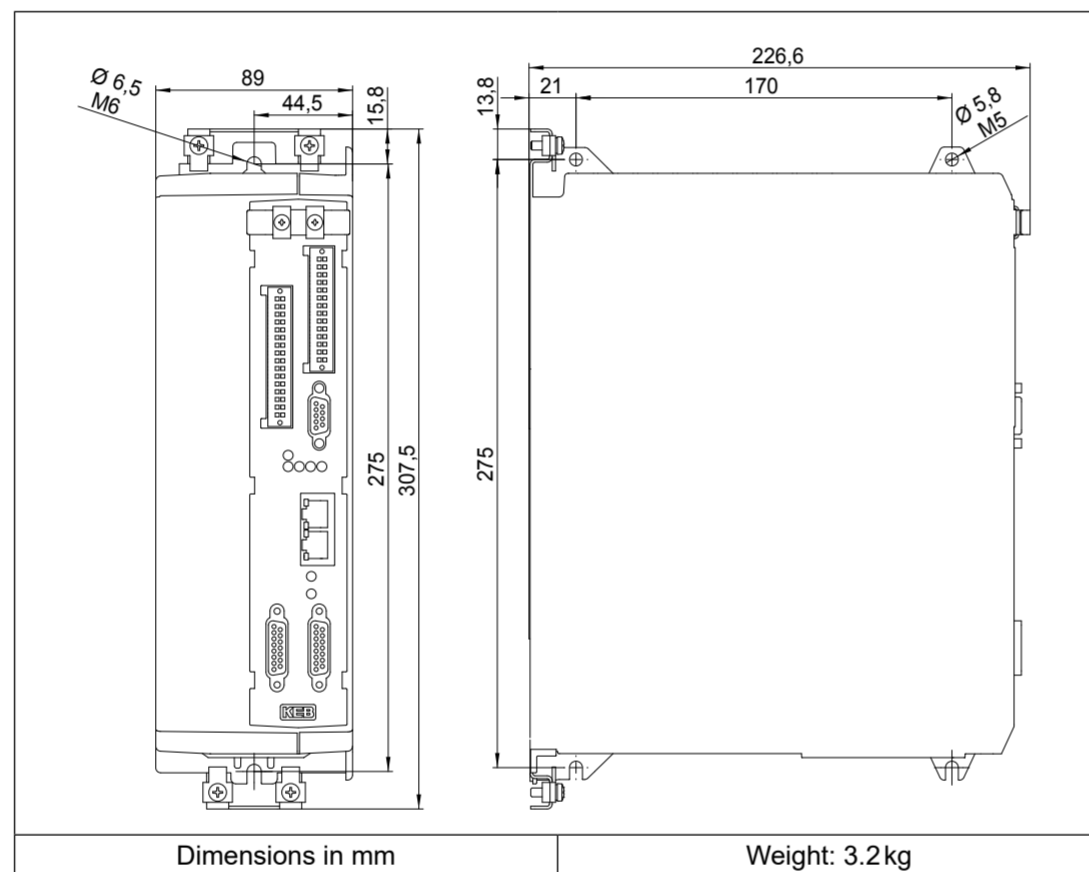
- Cable cross-sections and fuses must be dimensioned according to the design of the machine manufacturer. Specified minimum / maximum values may not be fallen below / exceeded.

HOUSING DIMENSIONS

HOUSING 2



HOUSING 4



CERTIFICATION

CE certification



CE certification

KEB products meet the requirements of the valid European and national directives. The conformity has been proven. The corresponding declarations can be downloaded from our website by entering the material number in the search field.

FS certification



For devices with FS logo on the name plate, the corresponding KEB safety manual must be observed !

During the UL evaluation, only electrical safety and risk of fire aspects were investigated.. Functional safety aspects were not evaluated. Devices with safety function are limited to a service life of 20 years. Then the devices must be replaced.



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UL certification

NOTICE

UL certification

Only devices with UL logo on the name plate are certified.



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 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 DÙ À UNE COUPURE QUI RÉSUITE 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.

UKCA conformity

UKCA conformity



KEB products with the logo comply with UK requirements and guidelines. The relevant information can be obtained from our website by entering the material number in the search box or from our authorized representative below:

KEB(UK) Ltd.
5 Morris Ct, Park Farm Industrial Estate,
Wellingborough NN8 6XF, UK

INSTRUCTIONS FOR USE



- ▶ 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 !

KEB Online	www.keb.de	KR	다른 언어도 사용할 수 있습니다.
BG	Други налични езици.	HR	Ostali dostupni jezici.
CN	其他语言可用。	HU	Más elérhető nyelvek.
CZ	Jiné jazyky k dispozici.	LV	Citas pieejamās valodas.
DK	Andre sprog til rådighed.	LT	Kitos kalbos.
DE	Weitere Sprachen verfügbar.	MT	Lingwi oħra disponibbli.
EN	Other languages available.	NL	Andere talen beschikbaar.
EE	Muud keeled on saadaval.	PL	Inne dostępne języki.
ES	Otros idiomas disponibles.	PT	Outros idiomas disponíveis.
FI	Muut kielet saatavilla.	RO	Alte limbi disponibile.
FR	Autres langues disponibles.	RU	Доступны другие языки.
GR	Άλλες διαθέσιμες γλώσσες.	SE	Andra språk finns tillgängliga.
IE	Teangacha eile ar fáil.	SK	Iné jazyky sú k dispozícii.
IT	Altre lingue disponibili.	SI	Drugi jeziki so na voljo.
JP	他の言語も利用できます。	TR	Mevcut diğer diller.



COMBIVERT S6

QUICK START GUIDE

Translation of the original manual
S6 Series Housing 2-4
Document 20162228 ENG 04

Mat.Nr. 00S6N1M-0001