COMBICONTROL

C6

Instruction Manual

C6-COMPACT
C6-COMPACT II

Original Manual		
Document	Part	Version
20102768	GBR	00

KEB

Table of Contents

List of figures

1.   Preface

The described hard- and software are developments of the Karl E. Brinkmann GmbH. The enclosed documents correspond to conditions valid at printing. Misprint, mistakes and technical changes reserved.

1.1   Information on special measures

The used pictograms have following significance:

Danger	⚠	Is used, if death or serious bodily injury may be the consequence of non-observance of the measure.

Warning	⚠	Is used, if death or serious bodily injury may be the consequence of non-observance of the measure.

Caution	⚠	Is used, if property damage may be the consequence of non-observance of the measure.

Attention	⚠	Is used, if noise sensitive or unrequested operation may be the consequence of non-observance of the measure.

Info	ℹ	Is used, if a better or simpler result can be the consequence of the measure.

For a special case the instructions can be supplemented by additional pictograms and text.

1.2   Documentation

Attention ⚠	**Further documentation via www.keb.de**
📖	Prior to performing any work on the unit, it is absolutely necessary to download and read the documentation, especially the safety precautions and instructions for use. Follow these steps to get the documentation:
Step 1:	Read the material number (Mat.No.) from nameplate
Step 2:	Input the material number at "www.keb.de => Service => Downloads" and click "search". **Downloads** **Search for specific material numbers** **Please enter a comlete (11-digit) material number.** Search for: `15G6DCD-3510` [search]
	further on next side

Step 3:	The entire documentation associated with the device will be displayed, including the instruction manuals in German and English. If available, other translations are also indicated. Make sure that the user understands the provided language.
⚠	**Should you be unable to read or understand the documentation, do not take any further steps. Please inform our support network for further assistance.**

Non-observance of the safety and operating instructions leads to the loss of any liability claims. The warnings and safety instructions in this manual work only supplementary. This list is not exhaustive.

1.3   Validity and liability

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 machine manufacturer, system integrator or 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 application. However, they are considered for information only without responsibility. 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 application by the machine manufacturer. They must be repeated, even if only parts of hardware, software or the unit adjustment are modified.

Danger	⚠	**by tamper from unauthorized personnel**

	Unauthorised opening and tampering may lead to death, bodily injury, property damage and malfunctions. Modification or repair is permitted only by authorized personnel by KEB. Infringement will annul the liability for resulting consequences.

The suspension of liability is also valid especially for operation interruption damages, loss of profit, data loss or other damages. Disclaimer of warranty will cause void the guarantee. This is also valid, if we referred first to the possibility of such damages.

If individual regulations should be futile, not effective or impracticable, then the effectivity of all other regulations or agreements is not affected by this.

Through multitude applications not each possible case of installation, operation or maintenance can be considered. If you require further information or if special problems occur which are not treated detailed in the documentation, you can request the necessary information via the local Karl E.Brinkmann GmbH agency.

1.4   Copyright

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

KEB®, COMBIVERT®, COMBICONTROL® and COMBIVIS® are registered trademarks of Karl E. Brinkmann GmbH.

Other wordmarks or/and logos are trademarks (™) or registered trademarks (®) of their respective owners and are listed in the footnote on the first occurrence.

When creating our documents we pay attention with the utmost care to the rights of third parties. Should we have not marked a trademark or breach a copyright, please inform us in order to have the possibility of remedy.

1.5 Specified Application

KEB COMBICONTROL C6-COMPACT is a programmable control with direct connection upto four KEB frequency inverters/servo axes of the series F5. The connection to the axes is created as HSP5/485. All axes can be operated directly and synchronously with an inexpensive operator with this fast, reliable connection. Cycle times down to one millisecond are realizable. Additionally the connection to the axes can also be done via EtherCAT, whereby C6 serves as EtherCAT master. The axis control is programmed with the uniform IEC 61131-3 programming system KEB COMBIVIS Studio 6.

KEB COMBICONTROL C6-COMPACT II ist eine weiterentwickelte programmierbare Steuerung mit leistungsfähiger CPU und Gleitkommaeinheit, FPU (Floating Point Unit). Program- and calculation function operation is approx.5 times faster than at C6 COMPACT. The flash file system (drive C:) offers faster access and more capacity (256 MB).

The used semiconductors and components of the Karl E.Brinkmann GmbH are developed and dimensioned for the use in industrial products. If the KEB COMBIVERT F5 is used in machines, which work under exceptional conditions or if essential functions, life-supporting measures or an extraordinary safety step must be fulfilled, the necessary reliability and security must be ensured by the machine builder.

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

1.6 Product description

The control consists of following modules:
• CPU and memory
• internal flash file system
• Switched-mode power supply
• Real-time clock
• HSP5/485 interfaces to the inverter/servo axes
• Ethernet interfaces
• serial interface
• Control and error LED's
• RUN/Reset switch
• Voltage supply connection
• four digital inputs
• four digital outputs
• Field bus interface (optional)

1.7   CE-certifications

This unit was tested in accordance with the generic standard EN 61000-6-2 in the range of noise immunity and corresponds to the EMC directive 89/336/EWG with changes/extensions.

[1]   EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany

1.8 Unit identification

C6	Material number	Description
Compact	00C6BA1-(x)A(y)0	4DI/4DO
COMPACT II	00C6BD1-(x)C(y)0	4DI/4DO

(x) = fieldbus module: A = no, B = PROFIBUS slave, C = CAN, D = INTERBUS slave

(y) = soft option: A = no, B = soft motion

Examples:

00C6BA1-AAB0	C6-Compact 4DI/4DO + soft motion
00C6BA1-BAB0	C6-Compact 4DI/4DO + PROFIBUS slave + soft motion
00C6BA1-CAA0	C6-Compact 4DI/4DO + CAN
00C6BA1-DAA0	C6-Compact 4DI/4DO + INTERBUS slave
00C6BD1-ACA0	C6-Compact II 4DI/4DO
00C6BD1-BCA0	C6-Compact II 4DI/4DO + PROFIBUS Slave
00C6BD1-CCB0	C6-Compact II 4DI/4DO + CAN + Softmotion

1.9 Technical data

General	
Dimensions (HxBxT)	125 x 44 x 144 mm
Weight	approx. 260 g
Installation method	35 mm Mounting rail
Grounding	via terminal strip or plug-in contact
Protective system (EN 60529):	IP20
Operation temperature	-10…45 °C (14…113 °F)
Storage temperature	-25…70 °C (-13…158 °F)
Climatic category (EN 60721-3-3):	3K3
Environment (IEC 664-1)	Pollution degree 2

Control	
Operating voltage control (US)	18…30 V DC ±0 %
Power input control	3 W max.

Digital inputs/outputs	
Wiring system	Push-In terminal
Operating voltage inputs/outputs (UM)	18…30 V DC ±0 %
Output current	max. 0.7A per channel, short-circuit proof, free-wheeling diode integrated
Input voltage/current	according to IEC 61131-2 Type 1

Axis interface X1A...X1D	
Type	HSP5/485
Connector	RJ-45, 8-pole, screened
Cable	Cat5, max. 100 m
Speed	38.4…250 kBaud
Use	Connection to KEB F5 inverter/servo, process data transmission, communication channel

Ethernet interfaces X6B, X6C	
Type	IEEE802.3 10/100BaseTx
Connector	RJ-45, 8-pole, screened
Speed	10/100 MBaud autocrossover
Use	Connection to programming system (debugging, visualization). Connection to parameterizing system (control and axis adjustment, scope). Connection to any devices (SysSocket). The 2nd Ethernet interface X6C is only accessible by the IEC program and is used e.g. for the EtherCAT master.

Serial interface	
Type	DIN66019II, RS232, RS485 full/half duplex
Connector	D-Sub 9 female
Speed	9.6…115.2 kBaud
Use	Connection to parameterizing system (control and axis adjustment, scope). Connection to any devices (SysCom).

Memory of the programming system
The program memory size (code, data, flags, input, output) is not limited and depends only on the available free total memory (max. 32 MBytes).

1.10 Accessory

Operators	Material number
F5 HSP5/485, screw terminal	00F5060-9001
F5 HSP5/485, RJ45	00F5060-9002

Connection cable	Material number
Cable RS232 for COMBIVIS	0058025-001D
Cable RJ45 open end (for operator -9001), 2,5 m	00F50C3-2025
Patch cable RJ45 (for operator -9002), 5 m	00F50C3-1050

2. Functional Description

The C6 compact is mounted on a 35 mm mounting rail. The earthing occurs with a plug-in contact or terminal connection X2.19/20.

2.1 Real-time clock

The integrated realtime clock is maintenance-free (no battery) and operates without power supply for approx.30 days. After this it must be adjusted again. A read out parameter indicates the validity of the date and time. The control shall remain switched on min. 30 minutes for complete loading. Leap years are recognized automatically up to the year 2099. Date and time can be read and set via COMBIVIS or the control program (library „SysTime").

2.2 HSP5/485-interfaces to the inverter/servo axes

Up to four KEB COMBIVERT F5 can be connected via the terminals X1A to X1D. The connection occurs via reliability RS485 cables, which can be up to 100 m long. A shielded standard cable with RJ-45 connector is used on the control side and appropriate operator on the frequency inverter/servo. The type of communication is determined by the IEC program, see library description and demo program HSP5_Master. This means that no connection to the axis is possible without IEC control program.

2.2.1 View of the inverter interfaces X1A...X1D for the axes 1..4

Figure 1:   Inverter interfaces

2.2.2 Assignment of the HSP5/485 interfaces

X1A…D	Name	Description	Socket (top view)
1	TXD+	Transmission signal+	
2	TXD-	Transmission signal-	
3	GND	Reference potential	
4	RXD+	Receive signal+	
5	RXD-	Receive signal-	
6	GND	Reference potential	
7	EnTXD+	Handshake transmission signal+	
8	EnTXD-	Handshake transmission signal-	
-	Shield	Shielding	
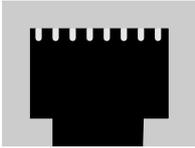
2.2.3 HSP5 Operator with screw terminal (00F5060-9001)

Figure 2:   X6E

Figure 3:   HSP5 Operator
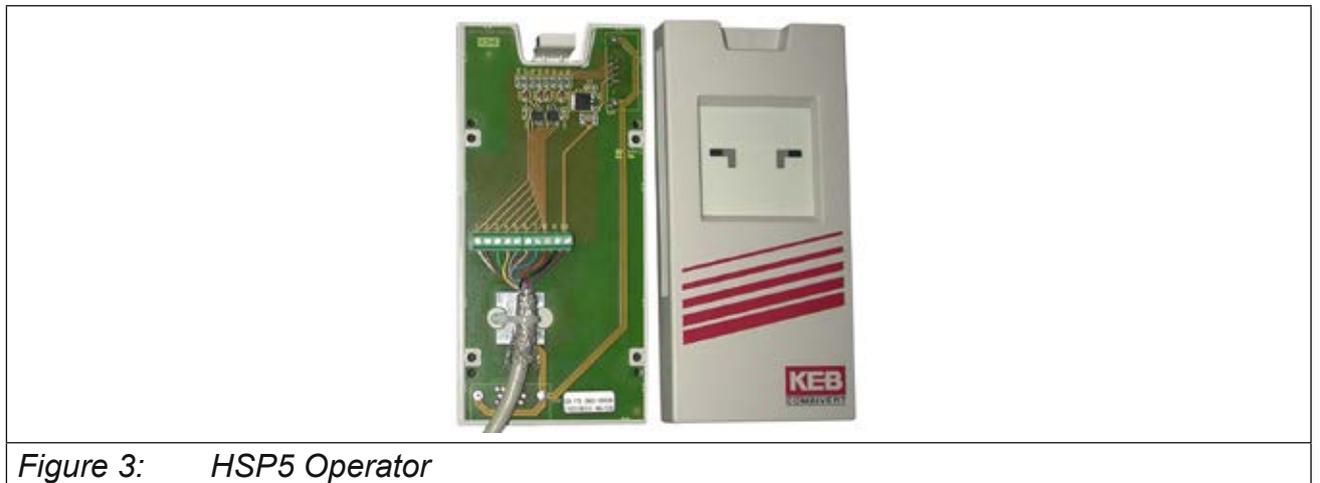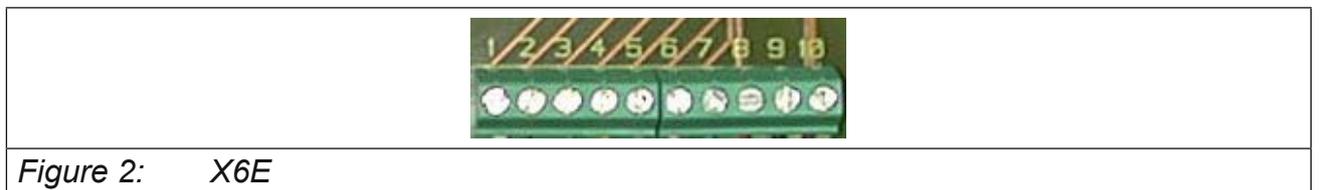
X6E	Name	Description
1	TXD-	Transmission signal-
2	TXD+	Transmission signal+
3	RXD-	Receive signal-
4	RXD+	Receive signal+
5	EnTXD-	Handshake transmission signal-
6	EnTXD+	Handshake transmission signal+
7	EnRxD-	Handshake receive signal-
8	EnRxD+	Handshake receive signal+
9	GND	Reference potential
10	VCC	+24 V voltage output
-	Shield	Shielding (see figure)

⚠ No cables may be connected to terminal VCC. High voltage can destroy the interface in the control.

2.2.4 HSP5 Operator with RJ45 socket (00F5060-9002)

RJ45	Name	Description
1	RXD+	Receive signal+
2	RXD-	Receive signal-
3	GND	Reference potential
4	TXD+	Transmission signal+
5	TXD-	Transmission signal-
6	GND	Reference potential
7	EnRxD+	Handshake receive signal+
8	EnRxD-	Handshake receive signal-
-	Shield	Shielding

The connection to the control is realized with a commercial CAT5 Patch cable for this operator.

2.2.5 Adapter cable HSP5 interface operator

Screw terminal:

Color	see below								C6 PCC X1A...H
Signal	TXD+	TXD-	GND	RXD+	RXD-	GND	EnTXD+	EnTXD-	
PIN	1	2	3	4	5	6	7	8	
PIN	4	3	9	2	1	9	8	7	Operator X6E
Signal	RXD+	RXD-	GND	TXD+	TXD-	GND	EnRxD+	EnRxD-	
Color	see below								

RJ45 connection:

Color	see below								C6 PCC X1A...H
Signal	TXD+	TXD-	GND	RXD+	RXD-	GND	EnTXD+	EnTXD-	
PIN	1	2	3	4	5	6	7	8	
PIN	1	2	3	4	5	6	7	8	Operator RJ45
Signal	RXD+	RXD-	GND	TXD+	TXD-	GND	EnRxD+	EnRxD-	
Color	see below								

> ⚠ In case of production of own connecting cables please pay attention that the signal pairs (e.g. TxD+ and TxD -) are assigned to the corresponding twisted cables (e.g. green and green/white). Connect unused scores always to GND.

2.2.6 Comparison of the standards

Pair	PIN	EIA/TIA568B	EIA/TIA568A	DIN 47100	IEC 189.2	USOC
3	1	orange/white	green/white	green	red	black
3	2	orange	green	yellow	orange	yellow
2	3	green/white	orange/white	grau	black	orange
1	4	blue	blue	brown	blue	red
1	5	blue/white	blue/white	white	white	green
2	6	green	orange	pink	green	brown
4	7	brown/white	brown/white	blue	yellow	gray
4	8	brown	brown	red	brown	blue

2.3 Voltage supply and digital inputs and outputs

Figure 4:	Socket X2

Voltage supply | **Digital inputs and outputs**

	1	
+ Voltage input (UM)	2	
(internally interconnected)	3	
	4	
	5	
- Voltage input (UM)	6	
(internally interconnected)	7	
	8	
+ Voltage input (US)	9	
- Voltage input (US)	10	

11	Digital input 0
12	Digital input 1
13	Digital input 2
14	Digital input 3
15	Digital output 0
16	Digital output 1
17	Digital output 2
18	Digital output 3
19	PE
20	

⚠️ **Changing of the terminal block**
Another terminal strip was used until 02/2015. Details can be found in the manual Rev.1D.

2.3.1 Assembly of the PUSH IN terminal

Assembly of connecting wires with wire-end ferrules according to DIN46228/4			Assembly of connecting wires without wire-end ferrules	
Cross-section / AWG	Metal sleeve length	Stripping length	Cross-section / AWG	Stripping length
0.50 mm² / 21	10 mm	12 mm	0.14 1.5 mm² / 25…16	10 mm
0.75 mm² / 19	12 mm	14 mm	Connecting wires rigidy and flexible	
1.00 mm² / 18	12 mm	15 mm		

- Press pusher by hand. Insert connecting wires into the respective hole, that no single wires can be seen from the outside or bend outward.
  A first resistance must be overcome when inserting. Release the pusher.
- Check that the connecting wire is fixed and can not be pulled-out. It is important to ensure that the connecting wire and not the insulation is clamped. The connecting wire can also be inserted without pressing the pusher in case of cross-sections upto 1.00 mm².

Front view	Side view
a) Pusher b) Connecting wire hole	

⚠	A safe clamping can not be guaranteed when using shorter wire-end ferrules.

ℹ	KEB generally recommends the use of wire-end ferrules in industrial environments.
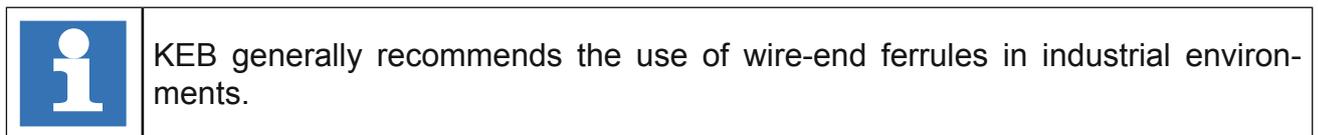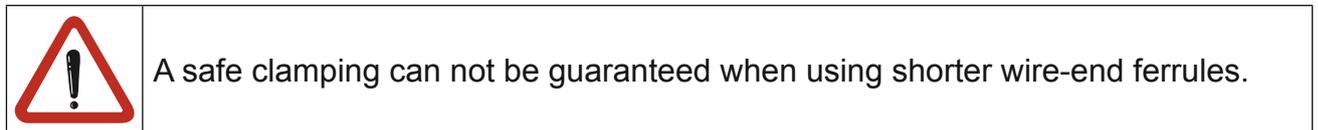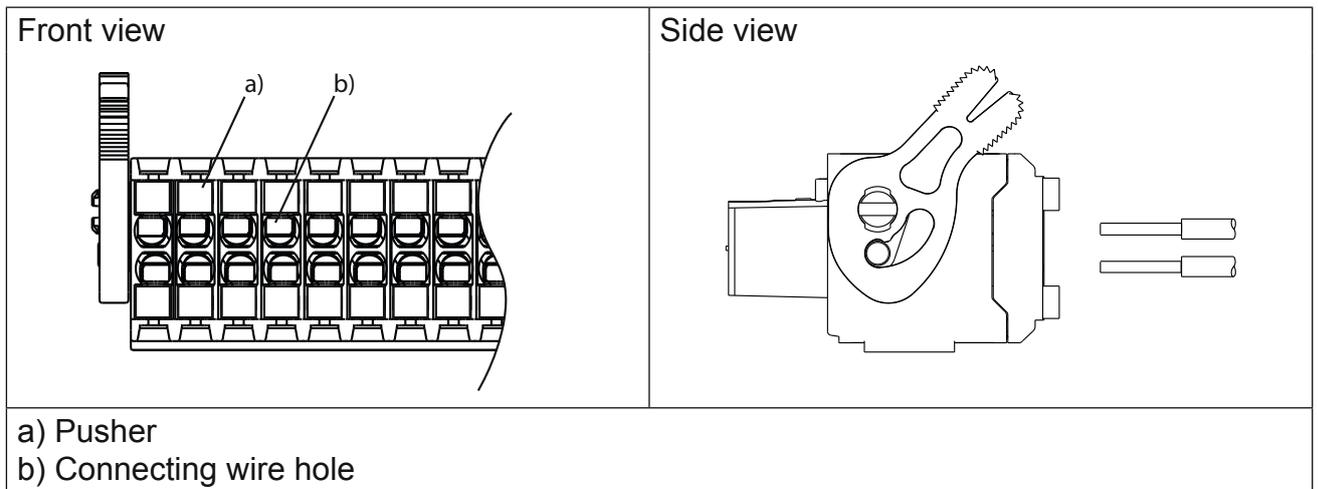
2.3.2 Voltage supply of the control

The voltage for supply of the control (US) occurs via terminals X2.9 and X2.10 in accordance with picture 2.3.2 and is electrically insulated from UM. If the control is supplied with voltage, the VCC-LED flashes (green).

Figure 5: *Voltage supply of the control*
$U = 18…30\,V\,DC\,\pm 0\,\%$ $F1 = 2A\;type\;gG$
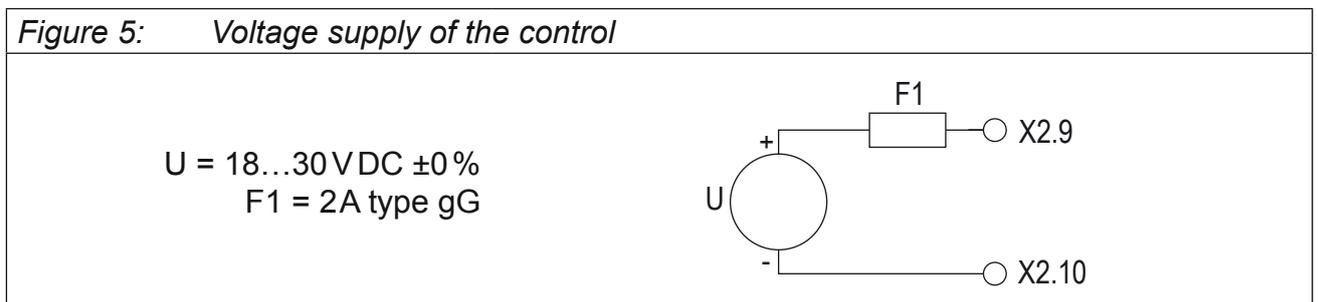
2.3.3 Voltage supply for the inputs and outputs

The voltage for supply of the digital inputs and outputs (UM) occurs via the terminals X2.1 to X2.8 in accordance with picture 2.3.3 and is electrically insulated from US.

%IB1	Is set in case of overload at one or several outputs. Additionally the OL-LED (red) is set.
%IB2	Condition of the supply voltage in/outputs (UM)
	Address can be changed in the unit editor.

Figure 6:	Voltage supply for the inputs and outputs

$U = 18\ldots30\,V\,DC \pm 0\,\%$
$F2 = 6.3A$ type gG
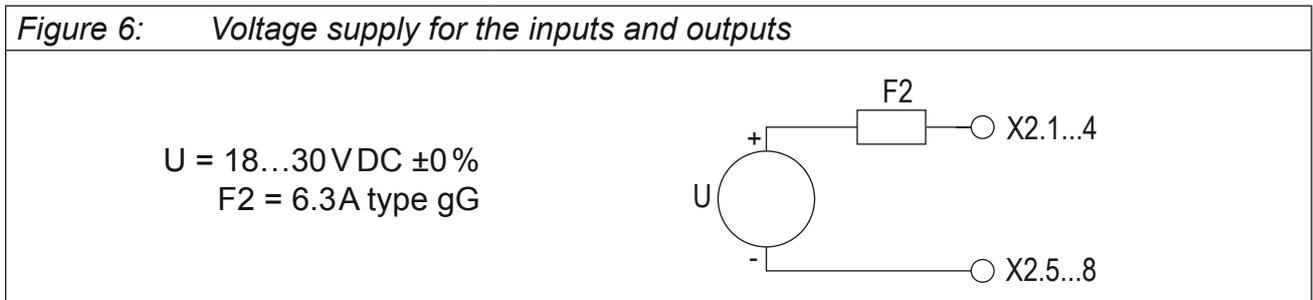
2.3.4 Digital inputs (X2.11…14)

The digital inputs are potential-free to the control voltage US.

4 digital outputs 0...3
%IB0   Condition of the digital inputs 0…3.
Address can be changed in the unit editor.

Figure 7:	Connection of the digital inputs
Potential-free connection	Connection e.g. via PLC
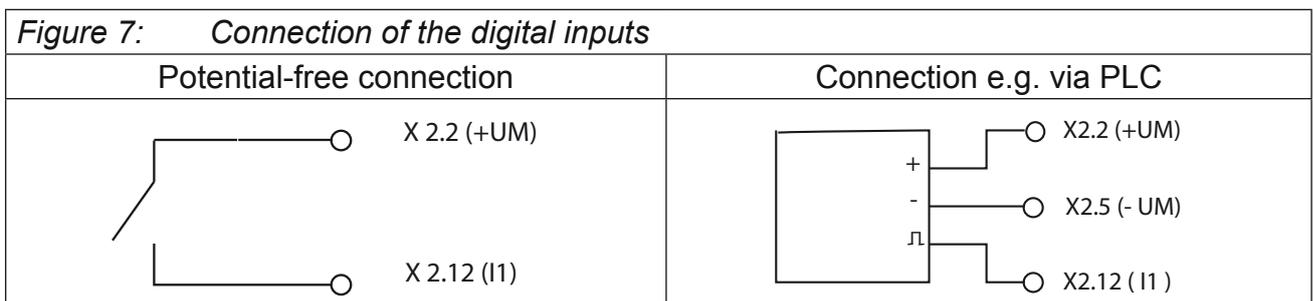
2.3.5 Digital outputs (X2.15…18)

The digital outputs are potential-free to the control voltage US. A free-wheeling diode is integrated in the unit, so that no external wiring is necessary at inductive load.

4 digital outputs 0...3
%QB0   Condition of the digital inputs 0…3.
![i] Address can be changed in the unit editor.

Figure 8: Connection of the digital outputs	
Ohmic load	Inductive load
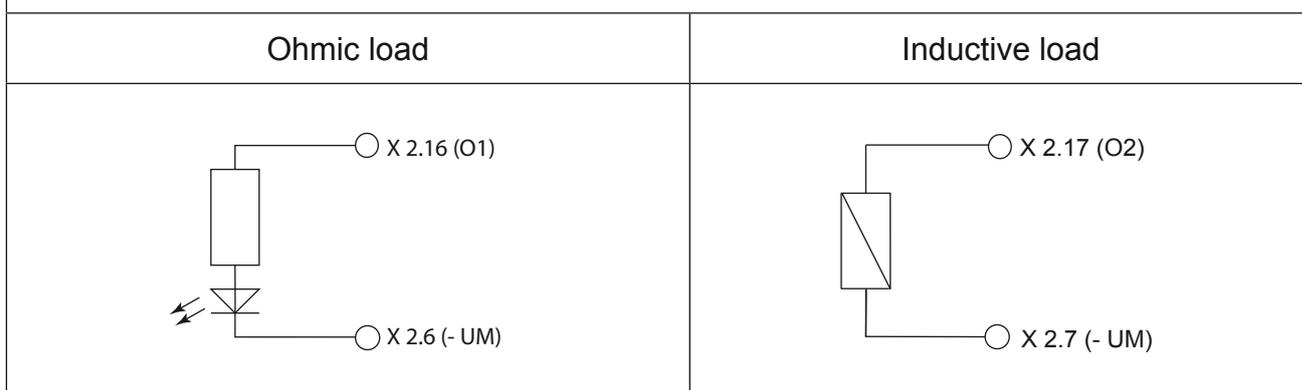
3. Operating unit

View Front	Name	Function	Addition	View from the bottom
	S1	Multi function switch/button		
	RUN	Run-LED	green	
	ERROR	ERROR-LED	red	
	OL	Overload	red	
	VCC	Voltage supply (US)	green	
	X6A	Serial interface	COMBIVIS	
	X6B	Ethernet interface	COMBIVIS/	
	X6C	Ethernet interface	CoDeSys	
	X1A…D	Axis interfaces		

3.1 Serial interface (X6A)

The socket X6A is a serial RS232/485 interface. It serves for the connection of the control with a PC or other operating units via the protocol DIN66019II, whereby the node address is set to 0. Alternatively any access to this interface can be done by the IEC control program and this offers different protocol variants (library „SysCom").

X6A	Name	Description	SUB-D9 socket
			(top view)
1	PGM	No wiring!	
2	TxD	Transmission signal RS232	
3	RxD	Receive signal RS232	
4	RxD-A	Receive signal RS485 A	
5	RxD-B	Receive signal RS485 B	
6	PGM+	No wiring!	
7	DGND	Datenbezugspotential	
8	TxD-A	Transmission signal RS485 A	
9	TxD-B	Transmission signal RS485 B	
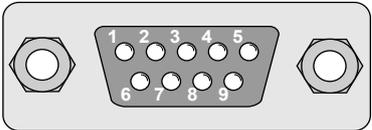
9-pol. SUB-D coupling   9 pole SUB-D connector

Part.No.: 0058025-001D
RS 232 cable
2.8 m   Housing (PE)

PC   C5
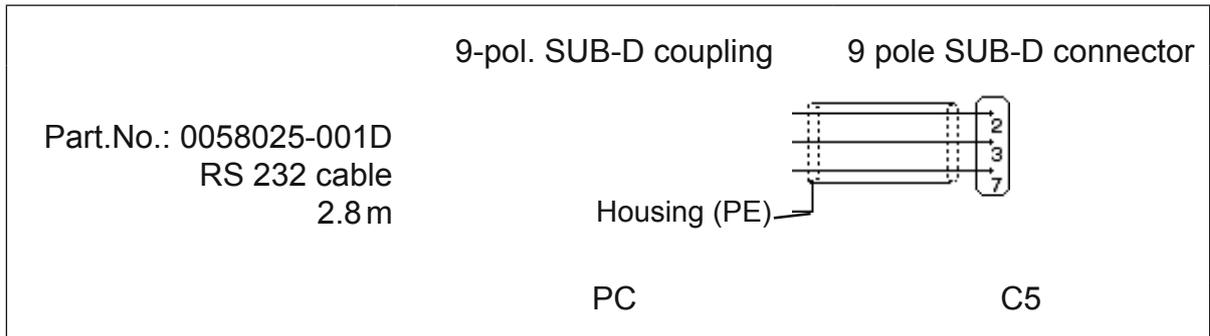
3.2   Ethernet interface (X6B)

The standardized 10/100 base-T interface supports the protocols TCP/IP and UDP/IP. The following ports have these functions:

The run-time system uses ports 1740-1743 for out-connection. Firmware parameters are available on port 8001. TCP or UDP is possible as protocol, whereby encapsulated DI-N66019II data telegrams will be transferred (the node address is set to 0). The file system can be read/written via port 8002 (only UDP) with KEB ftp-file transfer protocol (writing only with supervisor password). Furthermore access to other ports of this interface can be done via the IEC control program (library SysSocket ").

A correct adjustment is important for the programming system connection. The used IP address can be adjusted with parameter Et.01. The subnet mask is adjusted with parameter Et.11.
A power on reset is necessary after the change!

The interface supports automatic polarity detection, Auto-crossover and automatic speed detection, adjustable with parameter Et.15.

Protect C6 against unauthorized access.

Each user within a network can take access to the control with knowledge of the IP address. For protection the write access can be limited via port 8001 with parameter et.09.

3.3   • Ethernet interface (X6C)

The standardized 10/100 base Tx-Ethernet interface is protocol independent accessible via the IEC control program. The data are exchanged here by system libraries (library „SysEthernet ") or by inserting an EtherCat master.

3.4 Description of the LED's

Run-LED	green
off	PLC program stopped or not available
an	PLC program in run mode

ERROR-LED	red
off	O.K.
an	Program error
fast blinking	Hardware error, control must be restarted

OL-LED	red
off	no error at the outputs
an	Overload or short circuit at the outputs

VCC-LED	green
off	No power supply
an	Voltage supply available

3.5 Multi-function switch/button S1

The multi function switch/button is constructed as follows:

run (switch)

stop/reset

clear (button)

The button S1 is assigned with the following functions

Action	**Function**
Run → Stop	Program is started
Run → Stop	Program is stopped, all variables are reset (reset warm)
Stop → Clear and hold (> 3 s) until ERROR-LED lights	After releasing the switch all retain variables are reset (reset cold)
Stop → Clear and hold (>10 s) until ERROR and RUN-LED light	All variables and the boot project are cleared (reset origin) after releasing the button.

Since a C6 permits several IEC programs simultaneously (applications) all applications are started/stopped/cleared with Run/Stop/Clear. The switch operation can be limited by functions of the library "KEB PLC".

3.6   File system

The file system consists of an internal built-in flash memory (drive C:) and an internal RAM memory (drive B:). Access is possible via the programming system, KEB ftp or directly by the IEC control program (library „SysFile").

From firmware version 3.4.1.3 single files are protected on drives B: and C: by an access level. The access level is depending on the adjusted password via parameter ud.01.

The actual level is saved when creating/copying a file. The actual access level must be greater or equal to the file level to delete or rename a file.

When using KebFtp only the user read/write password can be used for compatibility reasons and appears internally as file level 1. From KebFtp 1.5.0.0 the actual access level is displayed when selecting a drive and the file level when selecting a file.

3.7   Internally Ram-Memory

Drive B: is a temporary memory which is deleted after power on.
• Access is possible only to files in the root directory.
• Long file names to 32 characters are possible.

3.8   Internal flash memory

This memory is accessed as drive C:. Any other files (boot projects, documentation, down-loadlists, prescriptions, etc.) can be stored and read here.

The following particularities must be observed:

- Access is possible only to files in the root directory.
- Long file names to 32 characters are possible. For COMPACT II up to 60 characters.
- Reading takes place with high speed.
- Writing occurs at a slow rate, because the flash must be programmed here. New files are first created and stored in RAM. When closing the file, the data are stored in the background to the flash.
- Compact   Data are not physically deleted. First they are internal marked as deleted. Thus the available memory capacity decreases. Format and clear can be activated with parameter FI.07 (can also be started by the IEC control program with the function "OdWrite").
- COMPACT II   Data are automatically deleted in the background and assigned again as free memory space. Parameter FI.07 has no function here.

3.9 Fieldbus interface

Depending on the article number different fieldbus modules are integrated via the fieldbus option cards X6D. Fieldbuses PROFIBUS-DP, CAN and INTERBUS are available at the time. The fieldbus modules operate as slave and are accessed via the library "KebPLC". Furthermore there are finished function blocks for each supported fieldbus, which allow process data allocation and access via the parameterizing channel.

3.9.1 Fieldbus interface PROFIBUS DP
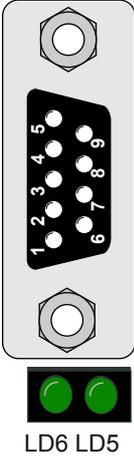
PIN	Signal	Description
1	----	Reserved
2	----	Reserved
3	RxD/TxD-P	transmit/receive signal P
4	----	Reserved
5	DGND	Datenbezugspotential
6	VP	supply voltage for terminating resistor
7	----	Reserved
8	RxD/TxD-N	transmit/receive signal N
9	----	Reserved

LED	Signal	Leuchtmuster	Bedeutung
LD5	Ready	on	ready for operation
		off	not ready for operation
LD6	Data	on	Data are transmitted by the PROFI-BUS
		off	no data transmission

LD6 LD5

The connection is described in the installation instruction (8.021). These can be downloaded from www.profibus.com.

3.9.2 CAN Bus interface
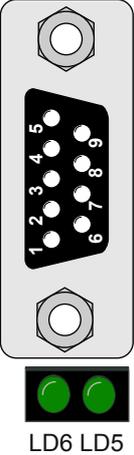
PIN	Signal	Description
1	Reserviert	Here not connected
2	CAN_L	CAN bus signal dominant low
3	CAN_GND	Here not connected
4	Reserviert	Here not connected
5	CAN_SHLD	Here not connected
6	GND	Here not connected
7	CAN_H	CAN bus signal dominant high
8	Reserviert	Here not connected
9	CAN_V+	Here not connected

LED	Signal	Light pattern	Description
LD5	Ready	on	ready for operation
		off	not ready for operation
LD6	CAN node status	on	operational
		off	Others
		blinking	pre_Operational, cyclic with 200 ms OFF

The basic physical characteristics and the connection are described in CiA Draft Standard 102 Version 2.0 and are not explained here.

3.9.3 INTERBUS-Interface
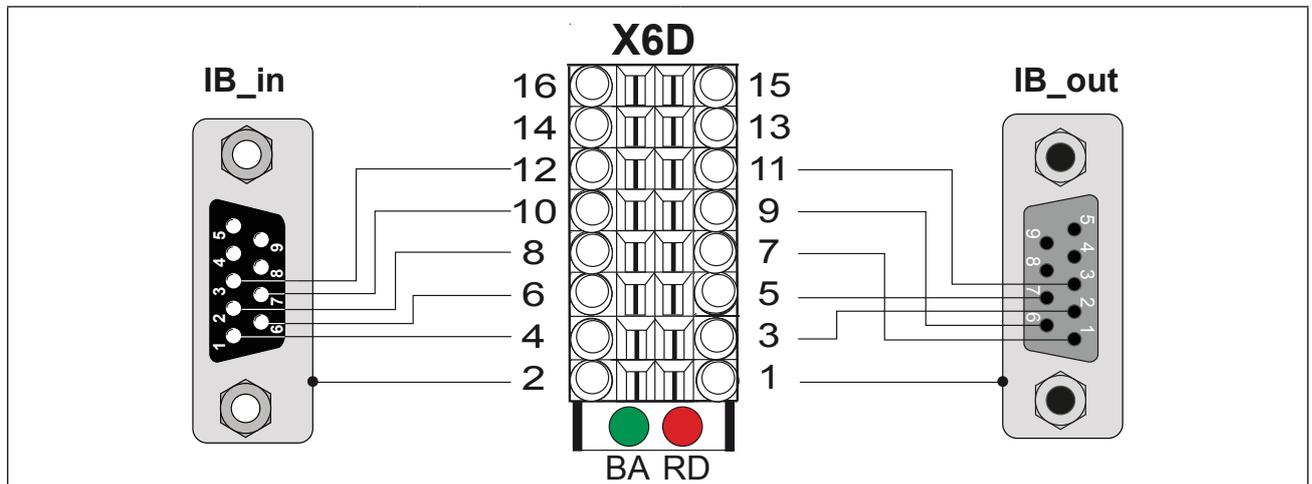
PIN	Signal	Description
1	Shild	Connect-up at connector housing IB_in
2	Shielding2	Connect-up at connector housing IB_out
3	DI2	Data input IB_out
4	DO1	Data input IB_in
5	/DI2	Data input inverted IB_out
6	/DO1	Data input inverted IB_in
7	DO2	Data output IB_out
8	DI1	Data output IB_in
9	/DO2	Data output inverted IB_out
10	/DI1	Data output inverted IB_in
11	GND2	Functional earth
12	GND1	Functional earth
13…16	nc	not connected

LED	Signal	Light pattern	Description
BA	green	on	Data transmission active
		off	Data transmission inactive
RD	red	on	Interbus output deactivated
		off	Interbus output activated

Connection at wiring with D-Sub9 cable		
IB_in	Connector	Interbus input
IB_out	Socket	Interbus output (not assigned at the last unit)

4. Software

The units of the series C6 are programmed with the programming system KEB COMBIVIS Studio 6. There are programmable and parameterizing components.

4.1 Programming system

A device description file as well as different libraries are required for the programming of the C6 compact. These are already installed during the installation of COMBIVIS Studio 6. If necessary, they can also be installed later. The use of the library components are explained in available sample projects.

The connection to C6 occurs via the Ethernet interface X6B. IP address and subnet mask can be preset via the parameterizing system.

The programming system is provided by inserting an unit of category "Controls (PLC)" in the project. The IEC program can be loaded and started by inserting a task configuration and at least one task.

4.2 Boot projects

Boot projects are stored as file in drive C: and registered in the runtime system. Then they are automatically loaded and started when switching on. Maximally 4 applications = 4 boot projects are possible in the C6 compact. Boot projects can be written directly online in the control or offline transmit as file.

Offline: An additional file "bootproject.ini" is required on drive C: in order that the applications are registered at offline operation in runtime system. This file is read, evaluated and deleted at the next power on start. In this file the names of the boot projects are listed (up to 4) in their own line. The name is the file name of the boot project (e.g. Application) without extension „.app".

	The file name of the boot project must be exactly written as the name of the application in the project (case sensitivity). COMBIVIS Studio 6 offers this already at the generation of the offline boot project file.

4.3 Parameterizing system

The parameterizing system is provided by inserting an unit of category COMBIVIS 6 units in the project. Serial, if no running IEC program has access to the serial interface X6A, or the internal parameters of the runtime system are displayed via UDP port 8001. The node address is set to 0. Parameters of the connected axes can also be displayed depending on the node address with running IEC program.

4.4 Parameter description

The following parameters are available in the runtime system and enable the configuration and diagnostics of it. Access to the parameters can also be done via the IEC control program (Library „KebPlc") (OdRead/OdWrite):

4.4.1 Ethernet Parameter

Et00	MAC address	Adresse	0300h

The MAC address (Media Access Control) is formed of 6 byte. Only the lowest 4 bytes are displayed here „FAxxxxxx". This address is assigned by the manufacturer and cannot be changed.

Et01	IP address	Adresse	0301h

The IP address consists of 4 bytes and is the clear identification of one Internet participant. In case of doubt the network administrator gives the address to be adjusted.

Et04	IP error count	Adresse	0304h

Serves for the diagnosis of the IP protocol stack.

Et05	TCP connections	Adresse	0305h

This parameter displays the number of active TCP/IP connections.

Et06	UDP connections	Adresse	0306h

This parameter displays the number of active UDP connections.

Et08	TCP multicount	Adresse	0308h

This parameter serves only for diagnostic purposes.

Et09	data port password	Adresse	0309h

This parameter defines the write protection password for the access via port 8001. If the password is active first this password must be entered again for a write access. Error message "operation not possible" is displayed in case of locked data port write access. Value 0 switches off the write protection password (only possible if the active password is correct entered).

Et10	Gateway address	Adresse	030Ah

This parameter determines the IP address of the appropriate gateway. As soon as a connection to IP slave address outside the own network shall be made by the IEC control program, this address will be used. In case of doubt the gateway address to be adjusted can be ask for by the network administrator.

Et11	**Subnet mask**	**Adresse**	**030Bh**
The decision whether an IP slave address is outside of the own network is determined with this mask. The mask presents as follows: 0.0.0.0 the standard masks are used depending on network classes A, B or C. In case of doubt the subnet mask to be adjusted can be ask for by the network administrator.			

⚠ The correct subnet mask must be adjusted for the connection with the programming system!

Et12	**data port response delay**	**Adresse**	**030Ch**
This parameter adjusts the response delay for the port 8001 in ms. The network utilization can be reduced by setting of higher values. A value of 0 enables the fastest communication with the control, but a high network utilization is also generated.			

Et14	**link state**	**Adresse**	**030Eh**
Displays state informations for the Ethernet link.			

Et15	**Link mode**	**Adresse**	**030Fh**
Determines the adjustments of the Ethernet interface. Fixed values or automatic recognition can be adjusted here. The additional clearlock value 32 activates a special behaviour, which corrects link problems automatically with automatic detection on both sides (control and switch).			

4.4.2 Real-time clock

The internal realtime clock is adjusted and/or read-out with the following parameters:

Rc00	**time**	**Adresse**	**0400h**
This parameter displays the time in hours and minutes in a 24-hours format. Writing on this parameter adjusts the time.			

Rc01	**seconds**	**Adresse**	**0401h**
This parameter displays the seconds in a range of 0...59. Writing on this parameter adjusts the seconds.			

Rc02	**Date**	**Adresse**	**0402h**
This parameter displays the date in a DD-MM format. Writing on this parameter adjusts the date.			

Rc03	year	Adresse	0403h
This parameter displays the year in four digits. Writing on this parameter adjusts the year.			

Rc04	data valid	Adresse	0404h
The realtime clock is running for approx. 30 days after switching off the supply. After this it must be adjusted again. If this parameter has the value „false", the date and/or time is not correct. The clock must be adjusted.			

4.4.3 User surface

Ud01	Passwort	Adresse	0801h
Enter the password for the appropriate user level and file access level. Following values are possible:			

100	CP mode write protection	File level 0
200	CP mode read/write	File level 1
330	CP mode service	File level 2
440	Application mode	File level 3
xxx	Supervisor	File level 7

Ud02	Features	Adresse	0802h
Display of the actual disconnected special functions (e.g. SoftMotion)			

Ud03	IO module	Adresse	0803h
This parameter displays the installed I/O module.			

Ud04	fieldbus module	Adresse	0804h
This parameter displays the installed Fieldbus module.			

Ud09	indirect set pointer	Adresse	0809h
Display and adjustment of the set indicator for indirect parameter access.			

4.4.4 Flash file system

FI00	max. bytes	Adresse	0900h
Displays the max. bytes in the flash. This is the sum of used, deleted and free bytes.			

FI01	max. files	Adresse	0901h
Displays the max. files in the flash.			

FI02	used bytes	Adresse	0902h
Displays the actual used bytes in the flash.			

FI03	used files	Adresse	0903h
Displays the actual used files in the flash.			

FI04	deleted bytes	Adresse	0904h
Displays the cleared bytes in the flash. The flash must be formatted or cleared in order to make this place available again (not at COMPACT II).			

FI05	deleted files	Adresse	0905h
Displays the cleared files in the flash.			

FI06	free bytes	Adresse	0906h
Displays the free bytes in the flash.			

FI07	flash function	Adresse	0907h
Displays the flash status and enables the following functions by writing of a special value: Formatting = -359074020 clearing = 597981618. Farmatting only possible with supervisor password!			

4.4.5 Debugging

Parameters 06xxh are only used for the diagnosis during the production process.

4.4.6 System parameter

Sy01	Software date	Adresse	0001h
This parameter displays the date of the installed firmware.			

Sy02	device identifier	Adresse	0002h
This parameter displays the software identification number (CFG-ID).			

Sy07	baud rate 66019II	Adresse	0007h
The baud rate for the KEB DIN 66019II protocol is adjusted with this parameter. If the serial interface X6A is used by the IEC control program, this adjustment is no longer valid.			

Sy08	response delay 66019II	Adresse	0008h
The response delay for the KEB DIN 66019II protocol is adjusted with this parameter. If the serial interface X6A of the IEC control program is used, this adjustment is no longer valid.			

KEB

KEB Automation KG
Südstraße 38 • D-32683 Barntrup
fon: +49 5263 401-0 • fax: +49 5263 401-116
net: www.keb.de • mail: info@keb.de

KEB worldwide…

KEB Antriebstechnik Austria GmbH
Ritzstraße 8 • A-4614 Marchtrenk
fon: +43 7243 53586-0 • fax: +43 7243 53586-21
net: www.keb.at • mail: info@keb.at

KEB Antriebstechnik
Herenveld 2 • B-9500 Geraadsbergen
fon: +32 5443 7860 • fax: +32 5443 7898
mail: vb.belgien@keb.de

KEB Power Transmission Technology (Shanghai) Co.,Ltd.
No. 435 Qianpu Road, Chedun Town, Songjiang District,
CHN-Shanghai 201611, P.R. China
fon: +86 21 37746688 • fax: +86 21 37746600
net: www.keb.de • mail: info@keb.cn

KEB Antriebstechnik Austria GmbH
Organizační složka
K. Weise 1675/5 • CZ-370 04 České Budějovice
fon: +420 387 699 111 • fax: +420 387 699 119
mail: info.keb@seznam.cz

KEB Antriebstechnik GmbH
Wildbacher Str. 5 • D–08289 Schneeberg
fon: +49 3772 67-0 • fax: +49 3772 67-281
mail: info@keb-drive.de

KEB España
C/ Mitjer, Nave 8 - Pol. Ind. LA MASIA
E-08798 Sant Cugat Sesgarrigues (Barcelona)
fon: +34 93 897 0268 • fax: +34 93 899 2035
mail: vb.espana@keb.de

Société Française KEB
Z.I. de la Croix St. Nicolas • 14, rue Gustave Eiffel
F-94510 LA QUEUE EN BRIE
fon: +33 1 49620101 • fax: +33 1 45767495
net: www.keb.fr • mail: info@keb.fr

KEB (UK) Ltd.
Morris Close, Park Farm Industrial Estate
GB-Wellingborough, NN8 6 XF
fon: +44 1933 402220 • fax: +44 1933 400724
net: www.keb.co.uk • mail: info@keb.co.uk

KEB Italia S.r.l.
Via Newton, 2 • I-20019 Settimo Milanese (Milano)
fon: +39 02 3353531 • fax: +39 02 33500790
net: www.keb.de • mail: kebitalia@keb.it

KEB Japan Ltd.
15–16, 2–Chome, Takanawa Minato-ku
J-Tokyo 108-0074
fon: +81 33 445-8515 • fax: +81 33 445-8215
mail: info@keb.jp

KEB Korea Seoul
Room 1709, 415 Missy 2000
725 Su Seo Dong, Gang Nam Gu
ROK-135-757 Seoul/South Korea
fon: +82 2 6253 6771 • fax: +82 2 6253 6770
mail: vb.korea@keb.de

KEB RUS Ltd.
Lesnaya Str. House 30, Dzerzhinsky (MO)
RUS-140091 Moscow region
fon: +7 495 632 0217 • fax: +7 495 632 0217
net: www.keb.ru • mail: info@keb.ru

KEB America, Inc.
5100 Valley Industrial Blvd. South
USA-Shakopee, MN 55379
fon: +1 952 224-1400 • fax: +1 952 224-1499
net: www.kebamerica.com • mail: info@kebamerica.com

More and latest addresses at http://www.keb.de

© KEB		
Document	20102768	
Part/Version	GBR	00
Date	2016-10-07	