

EN - English

Installation and operating manual

Data logger

METPOINT® BDL



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1. General

1.1. Pictograms and symbols



1.2. Signal words according to ISO 3864 and ANSI Z.535



1.3. General safety instructions

NOTICE	Before reading this manual, make sure that it refers to your device model.
	Strictly observe all safety instructions provided in this operating manual. It provides general information and instructions for the installation, operation and maintenance of your device. Therefore, it is important that the installation technicians and all operators / skilled technical personnel read these instructions prior to installation, start-up and maintenance. A copy of this installation and operating manual must be kept near the METPOINT [®] BDL where it is at all times accessible to staff. In addition to this installation and operating manual, observe all applicable local and statutory regulations. Ensure that the METPOINT [®] BDL is only operated within the permissible limits as specified on the type plate. Non-compliance might result in injury or damage to property, malfunction or device failure. If you have any queries regarding the content of this installation and operating manual, please contact BEKO TECHNOLOGIES GmbH.

Warning!	Risk of injury to personnel with insufficient qualification!
	Incorrect operation of the device might cause serious injury or damage to property. All tasks described in this operating manual must be performed by skilled technical personnel who meet the criteria outlined below.

Skilled technical personnel

Skilled technical personnel are persons who, due to their professional qualification and knowledge in the field of measuring, control and pneumatic technology, and their knowledge of the applicable statutory regulations, guidelines and standards are in a position to foresee potential dangers in relation to the use of the device and who are qualified to perform the tasks described in this manual.

Special operating conditions (e.g. aggressive media) require additional knowledge.

Caution!	Malfunction of BDL
	Incorrect installation or insufficient maintenance can result in malfunction of the BDL, so that the incorrect values are displayed.

Danger!	Inadmissible operating parameters!	
	If the specified limits are exceeded, there is a risk of device malfunction, potentially resulting in injury and/or damage to property.	

Actions:

- Make sure that the BDL is operated only within the permissible limit value range indicated on the type plate.
- Strictly comply with the performance data of the BDL permissible for your application.
- Always adhere to the specified transport and storage temperatures.

Additional safety instructions:

- For the installation and operation of the device, always comply with the statutory safety regulations.
- Do not operate the BDL in potentially explosive atmospheres.

Additional instructions:

Prevent overheating of the device!

2. Device features

The BDL has been developed and designed by engineers who have many years of practical experience in measuring and control technology. The BDL caters for a range of tasks – from measurement recoding, automatic sensor detection and display of measurements on the large colour display, alarm signal output and data storage to remote data access via web server. With the BEKO METPOINT connect software, alarm messages can be sent by SMS or e-mail to the relevant recipients.

All relevant information is displayed on the large 7" colour display with touch screen designed for intuitive operation. The display shows measurements, curves and limit exceedances. To trace a curve from the start of the measurement, simply follow it with your finger.

The system caters for daily, weekly and monthly reports including costs in the currency of your choice (e.g. €) and m³ counter readings for all consumption sensors.

The user-friendly setup steps and the evaluation options for measurements are two of the main advantages of the BDL over conventional paperless screen recorders. All sensors are detected and powered by the BDL. Everything is thus perfectly matched for trouble-free operation.



Multifunctional:

The BDL automatically detects up to 12 sensors including all BEKO sensors (consumption, dew point, pressure, current, KTY, Pt100, Pt1000).

Analog sensors (0/4 - 20 mA, 0 - 1/10/30 V, pulse) can be connected and configured in user-friendly menus. Digital sensors can be connected via RS 485, Modbus RTU, and SDI.

Alarm relays / error messages:

Up to 32 limit values can be configured and assigned to 4 different alarm relays. The BDL caters for collective alarms.

Flexible:

Network-compatible, data transmission via Ethernet, integrated web server.

3. Proper use

EN

The METPOINT[®] BDL data logger has been specifically designed for the stationary measured data acquisition and storage of analog and digital input signals.

The METPOINT[®] BDL data logger is exclusively designed and constructed for the proper application purpose that is described herein and must only be used correspondingly.

A check in order to ascertain whether or not the device is suitable for the chosen employment must be carried out by the user. Ensure that the parts that come into direct contact with the medium are compatible with the medium. The technical data specified in data sheet are binding.

Improper handling or operation of the device outside the technical specifications is not permissible. Claims for compensation for damage caused by improper use are excluded.

4. Type plate

The type plate is attached to the device housing. It contains all relevant technical data of the METPOINT[®] BDL. Please have these details to hand when contacting the manufacturer or supplier:

METPOINT® BDL Supply Voltage: 100 ... 240 V AC / 1 Ph. / PE Frequency Range: 50 ... 60 Hz Max. Power Input: 75 VA Degree of Protection: IP 65 Ambient Temperature: 0 ... +50°C Weight: 7,3 kg

Type: 4024289 S/N: 12319345



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METPOINT® BDL:	Product designation
Supply Voltage:	Supply voltage
Frequency Range:	Frequency range
Max. Power Input:	Max. power consumption
Degree of Protection:	IP class
Ambient Temperature:	Ambient temperature
Weight:	Weight
Туре:	Internal product no. (example)
S/N:	Serial no. (example)

NOTICE	Type plate
	Do not remove or cover the type plate, and protect it against damage.

5. Storage and transport

Despite our best efforts regarding packaging, etc., the device might be damaged during transport. Upon receipt, please remove all packaging material and inspect the METPOINT[®] BDL for visible damage. If you detect such damage, immediately notify the carrier company and BEKO TECHNOLOGIES GmbH or one of its agents.

Warning!	Overheating
	Overheating can damage the evaluation electronics. Observe the permissible storage, transport and operating temperature (protect measuring device from direct sunlight).

Warning!	Risk of damage
	Incorrect transport or storage, or the use of unsuitable lifting equipment might cause damage to the METPOINT [®] BDL.

Preventive measures

- The METPOINT[®] BDL must only be transported and stored by authorised and suitably skilled technical personnel.
- To transport the device, use only suitable lifting gear that is in proper working order.
- Always observe the relevant statutory requirements.

Caution!	Risks from damaged components!
	If you suspect that the METPOINT [®] BDL is damaged, do not start it. Defective components might impair the operational safety of the METPOINT [®] BDL or result in incorrect measurements.



The METPOINT[®] BDL must be stored in the original packaging. Seal the packaging and store it in a dry and frost-free room. Ensure that the storage temperature does not exceed the limits specified on the type plate.

Even when packaged, take suitable measures to protect the METPOINT[®] BDL against the elements.

While in storage, secure the METPOINT[®] BDL so that it cannot topple over or fall, and protect it against vibration.

6. Technical data of BDL

CE	
Colour display	7" touch screen, TFT transmissive, for charts, curves and statistics
Supply voltage	100 – 240 V AC / 50 – 60 Hz, max. 75 VA
Supply voltage for sensors	Output voltage: 24 VDC ± 10% electrically insulated Output current: 130 mA in continuous mode, peak 180 mA
	Max. output current through all channels with - one power supply: 400 mA - two power supplies: 1 A
Ambient temperature	0 +50 °C
Storage and transport temperature	-20 +70°C
Protection class	IP 65
Connections	16 x cable terminals, M12 x 1.5, terminal size 3-7 mm 1 x RJ45 Ethernet port
Interfaces	USB memory stick, USB cable, Ethernet/RS 485 Modbus RTU/ TCP, SDI; other bus systems available on request; WEB server (optional)
Sensor inputs	4/8/12 sensor inputs for analog and digital sensors (free assignment) Digital BEKO TECHNOLOGIES GmbH sensors for dew point and consumption monitoring with SDI interface, FS109/211 DP109/110 series Digital third-party sensors RS 485/Modbus RTU; other bus systems available on request Analog BEKO TECHNOLOGIES GmbH sensors for pressure, temperature, current clamp, preconfigure Analog third-party sensors 0/4 – 20 mA, 0 - 1/10/30 V, pulse, Pt100/Pt1000
Dimensions of housing	Dimensions: 300 x 220 x 109 mm
Weight	7.3 kg
Housing material	Powder-coated aluminium, polyester front foil
Outputs	4 relays (max. switching voltage: 400 VAC / 300 VDC, Switching current min. 10 mA, max. 6 A), alarm management, relay freely programmable, general alarm Analog output and pulse with sensors with own signal output, looped, e.g. DP/FS series
Memory card	2 GB memory card (standard), optional up to 4 GB
Accuracy	See sensor specifications
Optional	Web server
Optional	Fast measuring with sensing rate of 10 ms analog sensor, display of max./min. value per second
Optional	Optional consumption statistics, daily/weekly/monthly reports

Input signals		
Signal current	Measuring range	0 – 20 mA / 4 – 20 mA
(0 - 20 mA/4 - 20 mA)	Resolution	0.0001 mA
	Accuracy	± 0.003 mA ± 0.05 %
	Input resistance	50 Ω
Signal voltage	Measuring range	0 – 1 V
(0 – 1 V)	Resolution	0.05 mV
	Accuracy	± 0.2 mV ± 0.05 %
	Input resistance	100 kΩ
Signal voltage	Measuring range	0 – 10 V/30 V
(0 – 10 V/30 V)	Resolution	0.5 mV
	Accuracy	± 2 mV ± 0.05 %
	Input resistance	1 MΩ
RTD	Measuring range	-200 – 850 °C
Pt100	Resolution	0.1 °C
	Accuracy	± 0.2 °C at -100 – 400 °C ± 0.3 °C (outside above range)
RTD	Measuring range	-200 850 °C
Pt1000	Resolution	0.1 °C
	Accuracy	± 0.2 °C at -100 400 °C ± 0.3 °C (outside above range)
Pulse	Measuring range	Min. pulse time 100 µS Frequency 0 – 1 kHz Max. 30 VDC

6.1. Cable cross-sections

Power supply 100 – 240 VAC, 50 – 60 Hz, special version 24 VDC: Cable cross-section of power cable: $0.75\ mm^2$

Sensor connections/output signals: Cable cross-section for sensor power cable: **Terminal size 3-7 mm**

6.2. Dimensions



7. Installation on site

Secure the housing of the METPOINT® BDL to the wall, using suitable wall plugs and screws.



NOTICE	Wall mounting
	For wall mounting, use fixtures that can carry at least 4 times the weight of the device (7.3 kg).

8. Installation

8.1. Safety instructions

Danger!	Mains voltage
4	Risk of serious or even fatal injury from electric shock when coming into contact with non-in- sulated, powered components.

Actions:

- For the electrical installation of the device, adhere to all applicable regulations (e.g. VDE 0100). All electrical work must only be carried out by authorised and skilled technical personnel.
- For the connection of the power mains and the installation of suitable safety devices, strictly adhere to all statutory regulations that apply at the location of installation of the METPOINT[®] BDL. The connection must be established by suitably skilled technical personnel. Make sure that no parts of the measuring devices are energized and that the measuring devices cannot be •
- connected to the electric supply mains while maintenance work is in progress.

Danger!	Operation without earth connection!
4	If there is a fault but no earth connection (protective earth), conductive components might become energised, posing a risk of serious or even fatal injury. The device must therefore be connected to an earth conductor. Do not use plug adapters at the power plug. If required, have the power plug replaced by a qualified electrician.

Danger!	Operation without circuit breaker!
4	All components that are powered and exposed must be disconnectable by means of dedicat- ed external circuit breakers. The circuit breaker must be installed in the vicinity of the device. The circuit breaker must conform to IEC 60947-1 and IEC 60947-3. The circuit breaker must disconnect all electrical conductors from the mains power supply. The circuit breaker must not be installed in the power supply line. The circuit breaker must at all times be easily accessible to operating personnel.

To disconnect the device from the power mains, pull the plug from the socket. Ensure that the power plug is clearly identified and easily accessible by operating personnel. The plug must conform to CEE7/7.

All electrical cables carrying supply voltage or other dangerous voltage (main supply cable, alarm cable, signalling relays) must be equipped with double or reinforced insulation (EN 61010-1). This can be achieved by using plastic-sheathed cables, a second insulation (e.g. flexible insulating tubing), or cables with reinforced insulation. The power cables can for example be protected with flexible insulating tubing. The additional flexible insulating tubing must withstand the electrical and mechanical stresses that are likely to occur in connection with the intended use (see EN 61010-1, section 6.7.2.2.1).

Danger!	Mains voltage
4	When wiring the power supply line, ensure that the double or reinforced insulation between the electric circuits and the secondary circuit remains intact.

NOTICE	Insulation
	The additional insulation must be suitable for a test voltage of 1500 VAC. The thickness of the insulation must be at least 0.4 mm (e.g. insulating tubing, type BI 85 from Bierther GmbH).

The additional insulation of the power cables (mains connection, alarm and signalling relays) can be implemented as follows:



(1) - Terminals (plug-type connectors)

- (2) Flexible insulating tubing for the power cables
- (3) Power cable

8.1.1. Prevention of electrostatic discharge (ESD)

Danger!	Risk of damage from ESD	
	The device contains electronic components that might be destroyed by electrostatic discharge (ESD). Avoid contact with persons or objects that are electrically charged. In the worst case, components sensitive to ESD might be instantly destroyed when touched or fail after start-up. In order to minimise or prevent possible damage from sudden electrostatic discharge, observe the requirements of EN 61340-5-1. Do not touch electronic components while they are powered.	

Basic safety precautions

In order not to cause damage when handling electronic devices, take the necessary precautions for the prevention of electrostatic charges laid down in DIN EN 61340-5-1, IEC 63140-5, and DIN EN 100 015.

These precautions prevent electronic discharge and thus protect your equipment.

Preventive measures

When opening the housing of the METPOINT[®] BDL for maintenance or servicing, take the following protective measures:

- Stand on an earthed ESD mat
- Wear a wrist strap
- Discharge tools prior to use by rubbing them over the ESD mat



8.2. BDL wiring diagrams

Danger!	Mains voltage
4	Incorrect connection of the device to the power mains can lead to serious or even fatal injury and cause malfunction of the BDL.

Preventive measures

When connecting the device to the power supply, strictly adhere to the instructions in chapters 8.1 and 8.1.1.

8.2.1. BDL with 4 channels





8.2.4. BDL standard model 100 - 240 VAC

X 1.1		
- •	L1	
	N	100 – 240 VAC, 50 – 60 Hz
m	PE	
L	1	1

8.2.5. Power supply for special version 24 VDC

X2.1		
- •	L1′	
Image: Image	N	External power supply with 24 VDC (X2.2 not assigned)
() m	PE	Internal 100 – 240 VAC/24 VDC power supplies are not connected. Connect the 24 VDC power supply to pins 4 and 5.
• 4	GND	
	U+ (24VDC)	

8.2.6. X2.1 and X2.2 in standard version 100 – 240 VDC, factory-wired

X2.1; X2.2		
-	L1′	
~	N	
() m	PE	For internal use only
0 4	GND	
	U+ (24VDC)	

X 3.1 - X3.4		
-	NO	X3.1: Alarm relay 1 X3.2: Alarm relay 2
► ●	СОМ	X3.3: Alarm relay 3 X3.4: Alarm relay 4
m	NC	NC and COM are closed in the event of: alarm, power failure, sensor break

8.2.8. Bus systems X4.1 and S4.1

9. Connection of sensors

The values measured by consumption and dew point sensors can be output for subsequent processing in the form of analog current signals (4 – 20 mA). The output of the current signal to an external PLC/building control system or external display (third-party display) is shown in the wiring diagrams.

The following wiring diagrams apply to XA.1 - XC.4!

SD/DP series = dew point transmitters FS series = consumption sensors SP series = pressure transducers

9.1. Pin assignment of sensors XA.1 - XA.4, XB.1 - XB.4, XC.1 - XC.4



10. Connection of BEKO sensors

The connection diagram shows the options for the connection of the BEKO sensors.

Sensor	RS485	SDI	0 - 10 V		4 - 20 mA			
			2-wire	3-wire	4-wire	2-wire	3-wire	4-wire
SD11 / SD21						Х		
SD23	Х				Х			Х
SP11 / SP21 / SP61						Х		
SP22 / SP62				X	Х			
SF13 / SF53	Х							
FS109 / FS211		Х						

10.1. Connection of METPOINT[®] SD11 / SD21



10.1.1. Analog, 2-wire, 4 ... 20 mA



Pin assignment - sensor		Function	Wire colour (4025252)	Pin assignment - BDL	
PIN-1	+ U _v	Plus (+) output, power supply	brown	PIN-7	+ U _v
PIN-3	+ I _{out}	Current output	blue	PIN-4	Analog IN +
PIN-4		not assigned			
PIN-2		not assigned			

10.2. Connection of METPOINT[®] SD23

Pin assignment of plug-type connector, M12 x 1, 8-pin, A-coded							
Pin assignment of connector Transmitter side	Pin assignment of connector Socket side	Pin assignment of connector Screw side					
	$ \begin{array}{c} 5 \\ 6 \\ 3 \\ 0 \\ 0 \\ 2 \\ 1 \end{array} $	6 5 4 7 8 3 1 2					

10.2.1. Analog, 4-wire, 4 ... 20 mA



Pin assignment - sensor		Function	Wire colour (4025252)	Pin assign	ment - BDL
PIN-1	+ U _v	Plus (+) connection, power supply	brown	PIN-7	$+ U_v$
PIN-4	+ I _{оυт}	Current output	white	PIN-4	Analog IN +
PIN-6	GND	Analog reference potential	black	PIN-5	Analog IN -
PIN-5	- U _v	Minus (-) connection, power supply	blue	PIN-8	- U _v

10.2.2. Analog, 4-wire, 0 ... 10 V



Connection diagram for METPOINT® SD23 and METPOINT® BDL



Pin assignment - sensor		r Function Wire (40		Pin assign	ment - BDL
PIN-1	+ U _v	Plus (+) connection, power supply	brown	PIN-7	$+ U_v$
PIN-7	Bus A (+)	Non-inverted signal (+) from RS485 interface	white	PIN-1	(+) A / RS485
PIN-8	Bus B (-)	Inverted signal (-) from RS485 interface	black	PIN-2	(-) B / RS485
PIN-5	- U _v	Minus (-) connection, power supply	blue	PIN-8	- U _v

10.3. Connection of METPOINT® SP11 / SP21 / SP61



10.3.1. Analog, 2-wire, 4 ... 20 mA



PIN-1	+ U_v	Plus (+) connection, power supply	brown	PIN-7	$+ U_v$
PIN-3	+ I _{OUT}	Current output	blue	PIN-4	Analog IN +
PIN-4		not assigned			
PIN-2		not assigned			

10.4. Connection of METPOINT[®] SP22 / SP62



10.4.1. Analog, 4-wire, 0 ... 10 V



Pin assignment - sensor		Function	Wire colour (4025252) Pin assign		ment - BDL
PIN-1	$+ U_v$	Plus (+) connection, power supply	brown	PIN-7	+ U _v
PIN-4	+ U _{out}	Plus (+) connection, measuring signal	white	PIN-4	Analog IN +
PIN-2	GND	Analog reference potential	black	PIN-5	Analog IN -
PIN-3	- U _v	Minus (-) connection, power supply	blue	PIN-8	- U _v

10.4.2. Analog, 3-wire, 0 ... 10 V



		(4025252)	r in doorgin		
PIN-1	+ U _v	Plus (+) connection, power supply	brown	PIN-7	+ U_v
PIN-4	+ U _{OUT}	Plus (+) connection, measuring signal	white	PIN-4	Analog IN +
PIN-2		not assigned			
PIN-3	- U _v	Minus (-) connection, power supply	blue	PIN-8	- U _v



10.5.1. Bidirectional RS485 bus system



Pin assignment - sensor		Function	Wire colour (4036463)	Pin assignment - BDL	
PIN-1	$+ U_v$	Non-inverted signal (+) from RS485 interface	brown	PIN-7	$+ U_v$
PIN-2	Bus A (+)	Inverted signal (-) from RS485 interface	white	PIN-1	(+) A / RS485
PIN-4	Bus B (-)	Minus (-) connection, power supply	black	PIN-2	(-) B / RS485
PIN-3	- U _v	Plus (+) connection, pulse signal	blue	PIN-8	- U _v
PIN-5		not assigned	grey		

EN

10.6. Connection of METPOINT[®] FS109 / FS211



10.6.1. SDI interface



Pin assignment - sensor		Function	Wire colour (4014064/5)	Pin assignment - BDL	
PIN-3	+ U _v	Plus (+) connection, power supply	blue	PIN-7	+ U _v
PIN-1	SDI	Digital interface	brown	PIN-3	SDI
PIN-2	- U _v	Minus (-) connection, power supply	white	PIN-8	- U _v
PIN-4	+ _{оит}	Plus (+) connection, pulse signal	black	PIN-9	Ext. display
PIN-5		not assigned			

11. Connecting the BDL with a PC

Important:

The IP addresses of the PC and the BDL must be static (DHCP off) and part of the same network. If the IP address of the BDL has been changed, you must restart the device!

Notice:

IP address of BDL: see chapter 13.2.5.3 Network settings Restarting BDL: see chapter 13.2.5.7 Reset to factory settings

To connect the BDL to a PC, use an 8-wire crossover cable with RJ45 plug-type connectors at both ends. Alternatively use an Ethernet cable with a crossover adapter.





Crossover cable with RJ45 plug-type connectors

Crossover adapter

After the BDL has been connected to the PC, you can use the BEKO Soft Basic software for the evaluation of data in the form of charts and tables.

Network settings for Windows PC:

Windows 7:

Start ► Control Panel ► Network and Sharing Center ► Change adapter settings
LAN Connection ► Properties ► Internet Protocol Version 4 (TCP/IPv4)
Use the following IP address ► Enter the IP address and subnet mask Then: OK ► OK ► Close

Windows Vista:

Start ► Control Panel ► Network and Sharing Center ► Manage network connections
LAN Connection ► Properties ► Internet Protocol Version 4 (TCP/IPv4)
Use the following IP address ► Enter the IP address and subnet mask
Then: OK ► OK ► Close

Windows XP:

Start ► Settings ► Control Panel ► Network Connection ► LAN Connection ► Properties ► Internet Protocol (TCP/IP) ► Use the following IP address ► Enter the IP address and subnet mask. Then: OK ► OK ► Close

12. SD card and battery

To store measuring results for subsequent processing, the BDL features an SD card slot.

An integrated battery (button cell) ensures that the configuration data of the METPOINT® BDL is not lost when the device is shut down.

Danger!	Battery and SD card!
4	The battery and the SD card must be changed by authorised skilled technical personnel. Before changing the battery or SD card, ensure that the device is de-energised.

Danger!	Risk of damage from ESD
	The device contains electronic components that might be damaged or even destroyed by electrostatic discharge (ESD).

Preventive measures

For maintenance and service work that requires you to open the housing of the device, observe the instructions in chapter 8.1.1 to prevent damage from electrostatic discharge.

Use only SD cards and batteries that meet the following specifications:

SD card					
Card size/type:	SD card				
Max. capacity:	4 GB				
File system:	FAT32				
Dimensions:	32 x 24 x 2.1 mm				

Battery					
Battery type:	CR2032 button cell				
Capacity:	170 mAh				
Dimensions:	20 x 3.2 mm				
Voltage:	3 V				
System	Lithium				



SD card replacement

- 1.
- Unscrew the screws of the housing cover and open the cover Slightly press down the installed SD card and remove it from the SD card slot 2.
- 3. Insert the new SD card into the SD card slot until it engages for position, see diagram
- 4. Mount the cover and tighten the screws

Battery replacement

- 1. Unscrew the screws of the housing cover and open the cover
- Carefully remove the existing battery 2.
- Insert the new battery for position. see diagram
 Mount the cover and tighten the screws

13. Operation of BDL

The BDL is operated through a menu-driven, intuitive touch screen. To select a menu option, touch it lightly with your finger or a soft-pointed pen.

Caution:

Do not use normal pens or pointed implements as these could damage the foil!

After the sensors have been connected, they must be configured.

Entries or changes can be made in the white fields. The measured values are displayed as values or in the form of curves.

Text in green letters refers mainly to figures in the respective chapter. Important menus and menu options are also shown with green letters.

The menu navigation is generally shown in green letters!

13.1. Main menu (home)

From the main menu, you can access all available submenus.

13.1.1. Initialisation



After the BDL has been switched on, all channels are initialised and the main menu is displayed.

<u>Caution:</u> At the first start-up, there might be no preset channels.

Configure the individual sensors. The relevant information is compiled in chapter 13.2.2.



Important: Before entering the sensor settings, select the language and set the time.

Notice:

Chapter 13.2.5.1 (English menu navigation: Main ► Settings ► Device Settings ► Set Language) Chapter 13.2.5.2 (English menu navigation: Main ► Settings ► Device Settings ► Date & Time)

13.2. Settings

All settings are password-protected!

Settings or changes must always be confirmed with OK!

Notice: When returning to the main menu and then calling up the settings menu again, you must once more enter the password!

Main menu Settings



Overview of Settings

The optional Report settings and the related Costs can be found in chapters13.2.6 Report settings (optional) and 13.8.2 Costs (optional). To view the result tables, select menu option13.8.1 Report/consumption analysis (optional).

13.2.1. Password







Default password (factory settings): 4321

If required, change the password under: Password.

Enter the new password twice and confirm with OK.

If the two password entries do not match, message Enter password or Confirm new password is displayed in red.

If you have forgotten your password, enter the master password and then a new password.

The master password is included in the device documentation.

13.2.2. Sensor settings

Main menu ► Settings ► Sensor settings

Important:

Sensors from BEKO TECHNOLOGIES GmbH are generally pre-configured and can be connected without further adjustments to a free sensor channel!

A1	A2	A3	A4
unused		unused	unused
B1	B2	B3	B4
unused	unused	unused	unused
Back 🙆	Virtual Ch	annels Alarm Lg.st Repo	op 1 days, In 31.07.2015 ort 07:13:24

Enter the password. An overview of the available channels is displayed. Depending on your device mode, there are 4, 8, or 12 channels.

Note:

Normally, no channels are preset!

Note:

BDL models and versions:

No extension board	4
One extension board	8
Two extension boards	12

4 channels/setups 8 channels/setups 12 channels/setups

13.2.2.1. Selecting sensor type (example: BEKO Digital sensor)

Main menu ► Settings ► Sensor settings ► A1

		*** Channel A1 ***	~ 0.0 V ~ 0 mA
Туре	No Sensor	Store	
Name			
		No Sensor defined	
Back	0		

If no sensor has been configured yet, No sensor is displayed in the type field.

Touch the No sensor text field to call up a list of sensor types (see next step).

Main menu ► Settings ► Sensor settings ► A1 ► Type ► Digital

Select Type of Hardware Channel								
	BEKO	-Digital						
0 - 1 V	0 - 10 V	0 - 30 V	0 - 20 mA					
4 - 20 mA	PT100	PT1000	KTY81					
Pulse	BEKO-Digital	Modbus	BEKO-PM710					
PC400	BEKO-PM600	BEKO-PM600 US	FA450					
No Sensor								
	ОК	Cancel	Custom Sensor					

For FS/DP series sensors, select type Digital and confirm with OK.

Main menu ► Settings ► Sensor settings ► A1 ► Diameter



Important: Unless it has been automatically set, enter the Inside diameter of the flow pipe.

Important:

The Inside diameter should be as exact as possible, as this parameter affects the accuracy of the measuring results!

There is no general standard for inside diameter of pipes! (Please ask the manufacturer or measure the pipe yourself!)

Main menu ► Settings ► Sensor settings ► A1

	*** Channel A1 ***						
Туре	BEKO-Digital	Store	Unit	m³/h m³			
Name	Flow		Diameter	53.100	mm		
Part: 0	Serial: 65 V	ersion:	Gas Constant	Air (287.0)	J/Kg*k		
Record		Alarm	Ref. Pressure	1000.00	hPa		
P	A1a 13.162	A	Ref. Temp.	20.000	°C		
P	A1b 129519	°C	counter	0	m³		
/P	A1c 39.49	A	4mA = 0.000 m/s	20mA = 1.#QO	m/s		
ОК	Cancel	Min/Max	Cost-Settings	More-Settings			

Main menu ► Settings ► Sensor settings ► A1

			*** Chan	nel A1 ***			~ 0.0 V ~ 0 mA
Туре	E	BEKO-Digital	Store	Unit	m³/h	m ³	
Name		Flow		Diameter	53.	100	mm
Part: 0 Serial: 65 Version:			ion:	Gas Constant	Air (28	7.0)	J/Kg*k
Record			Alarm	Ref. Pressure	1000	0.00	hPa
P	A1a	13.162 A	· 🗌	Ref. Temp.	20.	000	°C
\$P	A1b	129519 °c		counter	0		m ³
%	A1c	39.49 A			20mA :	= 1.#QO	m/s
OK		Cancel	Min/Max	Cost-Settings	More-Se	ettings	

See also chapter 13.2.2.7 Labelling and configuring text fields

Note:

After confirming with OK, the field labels change to black. The values and settings are applied.

Caution:

Reference temperature and reference pressure (factory settings 20°C, 1000 hPa):

All volume flow (m³/h) and consumption (m³) values shown on the display refer to 20 °C and 1000 hPa (according to ISO 1217). Alternatively, enter 0°C and 1013 hPa (=standard cubic metre according to DIN 1343) as the reference values. Do not enter the operating pressure or the operating temperature as the reference values!

Enter the Name of the sensor. If the new sensor replaces another one, enter the Counter value of the previous sensor (optional).

Confirm the changes with OK. The sensor configuration is now completed.

13.2.2.2. Labelling measurements and defining resolution (decimals)

Note:

To configure the Resolution (decimal places), the Short name and the Value name, click the Tool button!

Tool button:



Main menu ► Settings ► Sensor settings ► A1



For the Value to be recorded, enter a Name with max. 10 characters. This name is then used in the Charts and Chart/current values menus. Otherwise, the default name (e.g. A1a) is displayed. A1 indicates the channel; a is the first value in

the channel, b would be the second, and c the third.

To adjust the Resolution of the decimal places, touch the arrow buttons (0 to 5 decimals places).

See also chapter 13.2.2.7 Labelling and configuring text fields

Important:

In the menus Main menu ► Settings ► Sensor settings and Main menu ► Current values, the Value name is only indicated at the BDL standard version with four channels!

The Short name is only used in the above two menu items and the BDL version with one or two extension boards (8 or 12 channels).

Main menu ► Settings ► Sensor settings ► A1 ► Record button

*** Channel A1 ***									
Туре	BEKO-Digital	EKO-Digital Store		m³/h m³					
Name	Flow	Flow		53.100	mm				
Part: 0	Serial: 65 Ver	sion:	Gas Constant	Air (287.0)	J/Kg*k				
 Record Aları			Ref. Pressure	1000.00	hPa				
~ &	A1a 1165.2	2 m³/h 🔽	Ref. Temp.	20.000	°C				
~ }	А1ь 27366	27366 m³		0	m³				
1	A1c 180.0	180.0 m/s		20mA = 1.#QO	m³/h				
OK	Cancel	Min/Max	Cost-Settings	More-Settings					

Press the Record buttons to select the measurements to be recorded and stored on the **activated data logger**.

Caution:

Prior to recording the selected measuring data, configure the data logger and then start it (see chapter 13.2.4Logger settings (data logger)).

13.2.2.4. Alarm settings

Main menu ► Settings ► Sensor settings ► A1 ► Alarm button

Pressing an Alarm button to call up the following window:

Alarm settings for channel A1 (A1a)								
Upper limit	Value m³/h	ł	Hysteresis +/-	1	Re 2	elay 3	4	
Alarm 1	0.000	-	0.000					
Alarm 2	0.000	- [0.000					
Lower limit								
Alarm 1		+						
Alarm 2	0.000	+	0.000					
		OK	Cancel	1		Setup	Dela	

In the alarm settings, you have the option to enter Alarm 1 and Alarm 2 including the Hysteresis for each channel.

The alarm settings can also be configured in the Alarm overview menu (accessible from Main menu).



		Alarm setti	ngs	for channe	I A1 (A	.1a)		
— Upper	limit	Value m³/h		Hysteresis +/-	1	Re 2	elay 3	4
~	Alarm 1	1400.00	-	5.000		то		
	Alarm 2	1500.00	- [10.000	то			
- Lower	limit		- ,					
	Alarm 1	1000.00	+	5.000				то
	Alarm 2	900.000	+	20.000			то	
			OK	Cancel			Setup	Delay

Note:

Any relay can be set 32x to Alarm 1 or Alarm 2 respectively.

In the example, Alarm 1 is set to relay 2 and relay 4, and Alarm 2 is set to relay 1 and relay 3.
Main menu ► Settings ► Sensor settings ► A1 ► Alarm button ► Relay buttons



You can choose between 5 different delays.

Main menu ► Settings ► Sensor settings ► A1 ► Alarm button ► Delay



Main menu ► Settings ► Sensor settings ► A1



Press OK to save and apply the settings.

The set delays (T1 to T4) apply to all the relays.

Enter the desired delay for T1.

Delay T0 cannot be modified and is used for instant alarms.

Confirm with OK.

Screen of channel A1 after alarm configuration and activation.

13.2.2.5. Advanced settings (scaling of analog output)

Main menu ► Settings ► Sensor settings ► A1 ► Advanced settings

More-Settings A1-Flow 4...20mA Output of Sensor **Calibration Data** m³/h Base Gas Air (287.0) Temperature 0.000 °K scale manual Pressure 0.000 hPa 4mA = m/s 0.00 mm² Area 20mA = 1.#QO m/s Cal. Date 31.07.2015 Max Velocity 92.700 m/s ΟK Cancel More-Settings A1-Flow 4...20mA Output of Sensor Calibration Data Base m³/h Gas Air (287.0) 0.000 °K Temperature ~ scale manual 0.000 hPa Pressure 0.000 4mA =m/s Area 0.00 mm² 20mA = 200.000 m/s Cal. Date 31.07.2015 Max Velocity 92.700 m/s OK Cancel

Press OK to save and apply the settings.

In the Advanced settings, you can determine whether the 4-20 mA analog output of the sensor is to be based on flow volume or velocity.

The selected field is displayed in green.

To set the measuring range, touch the Manual scaling button.

Press OK to save and apply the settings.

Note:

Advanced settings are only available for Digital.

13.2.2.6. Dew point sensor DP 109 - SDI Digital

Step 1: select a free sensor channel Main menu ► Settings ► Sensor settings ► B1

Step 2: select type "BEKO Digital" Main menu ► Settings ► Sensor settings ► B1 ► Type ► BEKO Digital

Step 3: confirm 2x with OK

Configuration:

- Enter Name (see chapter 13.2.2.7 Labelling and configuring text fields)
- Enter alarm settings (see chapter 13.2.2.4Alarm settings)
 Enter recording settings (see chapter 13.2.2.3 Recording measuring data)
- Enter the Resolution (decimal places) (see chapter 13.2.7.5 Defining resolution (decimals)

Main menu ► Settings ► Sensor settings ► B1

		*** Channel B1 '	**	~ 0.0 ~ 0 m
Туре	BEKO-Digital	Store		
Name	Dew point			
Part: 0	Serial: 0 Vers	lon:		
Record		Alarm		
🖌 🎉 B1a	437.69 %	RH		
🏏 🎉 B1b	525.26 %	RH		
🖌 🎉 B1c	612.77 %	RH		
OK	Cancel	Min/Max		

The BDL recognises whether the connected sensor is a BEKO flow or a dew point sensor, and automatically sets the Digital subtype.



13.2.2.7. Labelling and configuring text fields

Main menu ► Settings ► Sensor settings ► A1



If the data logger is activated, the following window appears. Press Yes to activate the data logger. (Data loggers are only activated if the relevant settings

(Data loggers are only activated if the relevant settings and recordings have been configured.)

Note:

Before entering or changing sensor settings, set the data logger to STOP.

			*** Char	inel	A1 ***		~ 0.0 V ~ 0 mA
Туре	BEKO-Dig	gital	Store		Unit	m³/h m³	
Name		Flow			Diameter	53.100	mm
Part: 0	Serial: 65	Versi	on:	1	Gas Constant	Air (287.0)	J/Kg*k
Record			Alarm	-	Ref. Pressure	1000.00	hPa
🖌 🖗 A'	1a	1165.2	m³/h 🔽		Ref. Temp.	20.000	°C
	lb	27366	m³ 🔄		counter	0	m³
🖌 🖗 A	1c	180.0 ı	n/s		4mA = 0.000 m³/h	20mA = 1.#QO	m³/h
ОК	Ca	ncel	Min/Max	-	Cost-Settings	More-Settings	

To enter or change a value, touch a white field.

The Alarm (see chapter 13.2.2.4 Alarm settings) and Record buttons (see chapter 13.2.2.3 Recording measuring data), the Resolution for digital places and the Short name and the Value name (see chapter 13.2.2.2 Labelling measurements and defining resolution), as well as the Advanced settings (see chapter 13.2.2.5 Advanced settings) are described in chapter 13.2.2 Sensor settings.

4/24	V24 Channel Name								
			Fl	ow				+	Clr
1	2	3	4	5	6	7	8	9	0
q	w	е	r	t	z	u	i	o	р
а	s	d	f	g	h	j	k	I	+
У	x	с	v	b	n	m	,		-
ABC	Abc	@#\$							
				ок	Can	cel			

Main menu ► Settings ► Sensor settings ► A1 ► Name

Field names must not be longer than 24 characters.

METPOINT® BDL

Main menu ► Settings ► Sensor settings ► A1 ► Type

0 - 10 V

PT100

BEKO-Digital

BEKO-PM600

Select Type of Hardware Channel
BEKO-Digital

OK Cancel Custom Sensor

0 - 30 V

PT1000

Modbus

BEKO-PM600 US

0 - 20 mA

KTY81

BEKO-PM710

FA450

See also chapter 13.2.2.8 Configuring analog sensors



Main menu ► Settings ► Sensor settings ► A1 ► Diameter

				<u></u>				
		Diameter						
			1	1				
	27	5	CIr.					
		.•	← U			53.10		
				- 8				
			1	1 🗰				60 H
Part 0 Si	1	2	3					
				- 1		1000.0) HC	14
	4	F	6					
Record	4	5	0					
			1	7 III		<i>2</i> 0 094		
p Ala	7	8	9					
		U U	l v					
]				
A1b		-						
		0						
Aic				- 88	u ni Vh	200mA # 1	HEAD HT I	1
· · · · ·								
	OK		Cancel					
A								
						NA 19 0910	iya (

Touch the Type text field and select one of the available options

(see screenshot).

Preselection of matching Units.

Important:

Unless it has been automatically set, enter the Inside diameter of the flow pipe.

In this example, the Inside diameter is 27.5 mm.

Important:

The Inside diameter should be as exact as possible, as this parameter affects the accuracy of the measuring results!

There is no general standard for inside diameter of pipes! (Please ask the manufacturer or, if possible, measure the diameter yourself!)

0-1V

4 - 20 mA

Pulse

PC400

No Sensor

	Air (287.0)						
	Air (287.0)	CO2 (188.9)	N2O (187.8)	N2 (296.8)			
	O2 (259.8)	NG (446.0)	Ar (208.0)	He			
****	H2	СЗН8	CH4				
•••							
		ОК	Cancel				

Main menu ► Settings ► Sensor settings ► A1 ► Gas constant

Preselection of matching Gas constants.

The remaining text fields can be labelled and configured in the same manner. For details, see chapter 13.2.2.7 Labelling and configuring text fields!



Main menu ► Settings ► Sensor settings ► A1

If a text field is displayed with red text, the respective values (e.g. Diameter or Name) have been changed.

The values for flow rate, consumption, and velocity will be recorded (green tick), as soon as the data logger is activated.

See also chapter 13.2.3.1 Selecting sensor type (example: digital sensor)

Note:

After confirming with OK, the field labels change back to black and the settings are applied.

Caution:

Reference temperature and reference pressure (factory settings 20°C, 1000 hPa): All volume flow (m³/h) and consumption (m³) values shown on the display refer to 20 °C and 1000 hPa (according to ISO 1217).

Alternatively, enter 0°C and 1013 hPa (=standard cubic metre according to DIN 1343) as the reference values. Do not enter the operating pressure or the operating temperature as the reference values!

13.2.2.8. Configuring analog sensors

Overview of the possible Type settings, including examples.

Exception: BEKO Digital; for details, see chapters 13.2.3.1 Selecting sensor type (example: BEKO Digital sensor) and 13.2.2.6 BEKO Digital dew point sensor.

The Alarm (see chapter 13.2.2.4 Alarm settings) and Record buttons (see chapter 13.2.2.3 Recording measuring data), the Resolution for digital places and the Short name and the Value name (see chapter 13.2.2.2Labelling measurements and defining resolution) are described in chapter 13.2.2 Sensor settings.

For the labelling of the text fields, see chapter 13.2.2.7 Labelling and configuring text fields!

13.2.2.8.1. Type 0 - 1/10/30 V and 0/4 – 20 mA

Main menu ► Settings ► Sensor settings ► C3 ► Type ► 0 - 1/10/30 V

Raw: 559	.94 Hz	*** Chanı	nel C3 ***		~ 0.0 V ~ 0 mA
Туре	0 - 10 V	Store	Unit	°C	
Name	Measurement 2	2	Scale 0V	0.000	°C
Part: 0	Serial: 1 Vers	ion:	Scale 10V	250.000	°C
Record		Alarm	Offset	0.000	°C
			(Offset) Set	Value to	Reset
>	Value 167.3		set Total to]
			Cost-Setting:	S	
Back	0	Min/Max	Sensor S	upply Voltage C	n

Raw: 559	94 Hz	*** Chanı	nel C3 ***		~ 0.0 V ~ 0 mA
Туре	0 - 10 V	Store	Unit	°C	
Name	Measuremen	t 2	Scale 0V	0.000	°C
Part: 0	Serial: 1 Ve 	rsion:	Scale 10V	250.000	°C
Record		Alarm	Offset	0.000	°C
			(Offset) Se	t Value to	Reset
~ }	Value 167.3		set Total to]
			Cost-Setting	JS	
Back	0	Min/Max	Sensor S	Supply Voltage O	'n

Tyree С 170 ← Clr Name 0.000 ÷С. 2 3 250 000 1 6 0.000 ۱c 4 5 d) Set Value to Rese > A2a 8 9 / A2b 0 2 A26 Cancel OK Васк Ð, sor Supply Voltage On

For details regarding the scaling of the sensor (here: type 0 - 10 V, corresponding to $0 - 250^{\circ}$ C), refer to the data sheet of the sensor.

In Scal. 0 V, enter the lower scale limit. In Scal. 10 V enter the upper scaling limit.

The Ext. sensor supply voltage is switched on when the sensor requires it.

Press the Set value to (offset) button to set the measured data from the sensor to a certain value (offset).

The positive or negative difference of the Offset is displayed.

Press the Reset button, to reset the Offset to zero.

Main menu ► Settings ► Sensor settings ► C1 ► Type ► 0/4-20mA

Raw: 590	.94 kg	*** Chan	nel C3 ***		~ 0.0 V ~ 0 mA
Туре	4 - 20 mA	Store	Unit	psi	
Name	Measurement	3	Scale 4mA	0.000	psi
Part: 0	Serial: 1 Ver 	sion:	Scale 20mA	232.000	psi
Record		Alarm	Offset	0.000	psi
			(Offset) Set	t Value to	Reset
✓	Value 1	67.3	set Total to		
			Cost-Setting	S	
Back	Ø	Min/Max	Sensor S	Supply Voltage	Dn

Main menu ► Settings ► Sensor settings ► C1 ► Unit

		psi	🌮 Edit	
mbar	bar	psi	mV	v
μV	kV	mA	Α	kg
kg/s	kg/min	kg/h	kW	mg/m³Oil
User_1	User_2	User_3	User_4	User_5
User_6	User_7	User_8	User_9	User_10
Page		OK Can	cel	

Here: Type 4 – 20 mA.

Preselection of suitable units for Type 0 - 1/10/30 V and 0/4 – 20 mA.

13.2.2.8.2. Type PT100x

Main menu ► Settings ► Sensor settings ► C4 ► Type ► PT100x

*** (Channel C4 ***	~ 0.0 V ~ 0 mA
Type PT100 Store	e Unit	°C
Name Measurement 4	Sensortype:	PT100 PT1000 KTY81
Part: 0 Serial: 1 Version: 		
Record	Alarm Offset	0.00 °C
	(Offset) Set T	emp. to Reset
🔽 🎤 Temp. 127.64 °C		
Back 🙆 Min/M	lax	

In the example sensor type PT100 and Unit °C have been chosen. Alternatively, select the sensor types PT1000 and KTY81, and Unit °F.

For additional options, refer to chapter 13.2.2.8.1Type 0 - 1/10/30 V and 0/4 - 20 mA!

13.2.2.9. Type "Pulse"

Main menu ► Settings ► Sensor settings ► B3 ► Type ► Pulse

*** Channel B3 *** Pulse Туре Store Unit Pulse т³ Measurement 5 Name 1 Pulse = 0.005 m³ Part: 0 Serial: 0 Version Consumption ltr/min Alarm Unit Counter ltr P Consuption 9000 ltr/min 🔽 ltr counter Consuption 361007 ltr Frequency 50 Hz Cost-Settings Sensor Supply Voltage On Back ø Min/Max

Normally, the numerical value and the unit for 1 pulse is displayed at the sensor and can be entered in the 1 pulse field.

Notice:

In the example, all text fields are already labelled and/or assigned.



Main menu ► Settings ► Sensor settings ► B3 ► Pulse unit

For the Pulse unit, choose a flow rate or a power consumption value.

Main menu ► Settings ► Sensor settings ► B3 ► Consumption

			ltr/min		
14	ltr/min	ltr/s			
Part					
Rev.					
			OK Can	cal	

Units for the current Consumption for Type "Pulse".

Notice: Here: cubic metres!

Main menu ► Settings ► Sensor settings ► B3 ► Counter unit

m°						
m³	ltr					
	m ³	m ³ tr	m³ Itr Itr Itr<			

Available units for Counter unit and type "Pulse"

The Counter can be reset or set to a desired value at any time.

For additional options, see chapter 13.2.2.8.1 Type 0 - 1/10/30 V and 0/4 - 20 mA!

13.2.2.9.1. Type RS485

Main m	enu 🕨 Settings 🖡	Sensor settings ► C3 ►	Type ► RS485
		*** Channel C3 ***	~ 0.0 V ~ 0 mA
Туре	RS485	Store	
Name	Measurement 6		
Back	N O	o Sensor defined	Th co to

The RS485 bus/interface allows customers to connect their own systems (BMS, PLC, SCADA) to the BDL.

13.2.2.9.2. Type "No sensor"

Main menu ► Settings ► Sensor settings ► A1 ► Type ► No sensor

	*** Channel A1 ***	~ 0.0 V ~ 0 mA
Туре	No Sensor Store	
Name	Measurement 7	
	No Sensor defined	
Back	٥	

This option is used to temporarily disable a channel that is not in use.

A1	A2	A3	A4			
unused	unused	unused	unused			
B1	B2	B3	B4			
unused	unused	unused	unused			
Back 🙆	Back Virtual Channels Alarm Lastep 1 days, In 31.07.2015 Report 07:13:24					

When returning from No sensor to the respective sensor settings, the respective channel (here: channel A1) displayed as free.

13.2.3. Type "Modbus"

13.2.3.1. Selecting and activating sensor type

Step 1: select a free sensor channel

Main menu ► Settings ► Sensor settings ► B3

Step 2: select Modbus type

Main menu ► Settings ► Sensor settings ► B3 ► Type ► Modbus

Step 3: confirm with OK

Enter a name (see chapter "13.2.2.7).

Main menu ► Settings ► Sensor-settings ► B3 ► VA ► use



Via Modbus, up to 8 register values (from the input or holding registers) of the sensor can be read out.

Select one or more registers (Va -Vh) and activate by checking the use box.

13.2.3.2. General Modbus settings

Main menu ► Settings ► Sensor settings ► ► Modbus ID



Enter the Modbus ID of the sensor; available values: 1 - 247.

The Modbus ID is specified in the sensor data sheet.

Main menu ► Settings ► Sensor settings ► B3 ► Modbus settings

Modbus Settings Modbus ID 1 2400 9600 19200 38400 Baudrate 1200 4800 2 Stopbits odd Parity even Response Timeout 100 msec allow Modbus Extended Channels OK Cancel Set to Default

Enter all serial transmission settings such as baud rate, stop bit, parity bit, and timeout. For details, refer to the data sheet of the sensor/ transducer.

Confirm the changes with OK. To reset the values to the default settings, press the Restore defaults button.

Main menu ► Settings ► Sensor settings ► B3 ► Reg. address

Id:1 B:19200 P:E S:1

Timeout:100 msec

ModBus ID

Reg.Address

Reg.Format

Unit Scale **Generic Modebus**

Va Vb Vc Vd Ve Vf Vg Vh

1

0

[HR] R4

don't Scale

Sensor Supply Voltage On

Modbus Settings

🔽 use

*** Channel B3 **

Store

Alarm

Modbus

Serial: 0

Modbus

Version

983.43 ba

Cancel

The sensor stores the measured values in registers. These values can be addressed by the BDL and read out via Modbus. For this purpose, specify the register addresses in the BDL. The Register/data address is a decimal value between 0 and 65535.

Important:

OK

Ensure that the correct Register address is entered.

Min/Max

The register address might deviate from the register number (offset). For details, refer to the sensor/transducer data sheet.

Main menu ► Settings ► Sensor settings ► B3 ► Reg. format



Supported data types:

Data type:	1111(8b) – unsigned Integer	-> 0	-	255
Data type.		=> 0		200
	I1 (8b) = signed integer	=> -128	-	127
	UI2 (16b) = unsigned Integer	=> 0	-	65535
	I2 (16b) = signed integer	=> -32768	-	32767
	UI4 (32b) = unsigned Integer	=> 0	-	4294967295
	I4 (32b) = signed integer	=> -2147483	648-	2147483647
	R4 (32b) = floating point numb	er		

Byte order:

The Modbus register has a capacity of 2 bytes. For a 32-bit value, two Modbus registers are read by the BDL. For a 16-bit value, only one register is read.

The Modbus specifications do not accurately describe the byte order in which data is transferred. In order to cater for all possible configurations, the byte order can be freely adjusted in the BDL, as it must be adjusted to match that of the respective sensor (see sensor/transducer data sheet).

Example: high byte before low byte, high word before low word, etc.

The byte order must be configured based on the information in the sensor/transducer data sheet.

EN

Type

Name

Part:

Record



Select the Data type and the Byte order. These settings are used in combination.

Examples:

Holding register - UI1(8b) - numerical value: 18



Select register type Holding register, data type U1 (8b) and byte order A / B.

18 =>	HByte 00	LByte 12
Data order	1st byte	2nd byte
A	00	12
B	12	00

Holding register – UI4(32) - numerical value: 29235175522 ► AE41 5652



Main menu ► Settings ► Sensor settings ► B3 ► Unit

	*** Channel B3 *** ~ 0.0 V ~ 0 mA							
Type Name	Modb	us Si Modbus	tore Id:1 E	Generic Modebus Id:1 B:19200 P:E S:1 Timeout:100 msec Modbus Settings				
Part: 0) Serial: 0 	Version:	Va	Regis Vb Vc Vo	ster Setup d Ve Vf \	/g Vh		
Record	Record Alarm ModBus ID 1 ✔ use ✔ 𝔅 𝔅 𝔅 𝔅 𝔅 𝔅 𝔅 𝔅 𝔅 𝔅 𝔅 𝔅 𝔅 𝔅 𝔅 𝔅 𝔅 𝔅 𝔅							
N.	Ø kg/h	Ø cf/h	kg/h	kg/min	Ω			
Part	Hz	%	kW	kWh	PCS			
54-C	kVA	kVAr	-	€	cts/m³			
	w	Wh	h	% O2	ppm CO2			
	ppm CO	ppm SO2	ppm NOx	ppm H2O	°C td			
DK Cancel								

Select register type Holding register, data type U1 (32b) and byte order A-B-C-D. HWord LWord HByte LByte HByte LByte						
292351755	22 =>	AE	41	56	52	
Data order byte	1st byte	2nd	byte 3	d byte	4th	
A-B-C-D	AE	41	56	52		
D-C-B-A	52	56	41	AE		
B-A-D-C	41	AE	52	56		
C-D-A-B	56	52	AE	41		

Touch the "Unit" text field to call up a list of the available units.

Select the unit by pressing the respective unit button. Press the OK button to apply the unit.

To change between the individual list pages, press the Page button. If the required unit is not available, create it yourself. To do this, press one of the pre-defined User_x buttons.

Main menu ► Settings ► Sensor-settings ► B3 ► Scal. text field



Enter a factor that is applied to adjust the respective output value.

	*** Channel B3 *** ~ 0.0 V ~ 0 mA						
Туре	Modbus Store	Generic Modebus					
Name	Modbus	Id:1 B:19200 P:E S:1 Timeout:100 msec					
Part: 0	Serial: 0 Version:	Register Setup Va Vb Vc Vd Ve Vf Vg Vh					
Record	Alarm	ModBus ID 1 vse					
		Reg.Address 0					
🖌 🦻 B3a	983.43 bar	Reg.Format [HR] R4					
		Unit					
		Scale don't Scale					
ОК	Cancel Min/Max	Sensor Supply Voltage On					

Press the OK button to store and apply the user-defined factor.

13.2.3.3. Modbus settings for METPOINT[®] SD23

When connecting a $\mathsf{METPOINT}^{\otimes}\,\mathsf{SD23}$ via Modbus, the following settings are required:

Step 1: select a free sensor channel

Main menu ► Settings ► Sensor settings ► Select a free channel (here: channel A1)

Step 2: select Modbus type

Select Main menu ► Settings ► Sensor settings ► A1 ► Type ► Modbus and confirm with >OK<.

Step 3: enter a name

Main menu \blacktriangleright Settings \blacktriangleright Sensor settings \blacktriangleright A1 \blacktriangleright Name Enter a name.

Step 4: define the Modbus settings

Main menu ► Settings ► Sensor settings ► A1 ► Modbus settings

Modbus Settings								
Modbus ID	1							
Baudrate	1200	2400	4800	9600	19200	38400		
Stopbits	1	2			Term	Bias		
Parity	none	even	odd					
Response Ti	meout	100	mse	ec	HW-Versi	on: 0.00		
allow	Modbus	Extende	d Chann	els				
		(ок	Cancel	1		Set to Default	
						_		

The Modbus ID is specified in the data sheet of the sensor (here: 1).

Adjust the other parameter settings according to the screenshot.

METPOINT® BDL



Step 5: select register

Main menu ► Settings ► Sensor-settings ► A1 ► VA ► use

	*** Channel A1 *** ~ 0.0 V ~ 0 mA						
Type Name	Modbus Store METPOINT SD23	Generic Modebus Id:1 B:19200 P:E S:1 Timeout:100 msec Modbus Settings					
Part: 0	Serial: 65 Version: 	Register Setup Va Vb Vc Vd Ve Vf Vg Vh					
Record	Alarm	ModBus ID 1 use Reg.Address 1216 Reg.Format [HR] R4 Unit °C Scale don't Scale					
Back	Min/Max	Sensor Supply Voltage On					



Step 6: enter Modbus parameters



Proceed in the same manner to select the other registers.

The settings for the register/data format apply to all registers.

To enter the Modbus parameters, press the white buttons (1) - (4).

The following parameters can be retrieved from the respective registers:

Register	Designation	Register ad- dress	Register format	Unit	Scal.
Va	Temperature	1216	[HR] R4	°C	No scal.
Vb	Rel. humidity	1152	[HR] R4	% rH	No scal.
Vc	Dew point/frost point	1536	[HR] R4	°C	No scal.
Vd	Dew point	1472	[HR] R4	°C	No scal.
Ve	Temperature	2944	[HR] R4	°C / °F	No scal.

Vf	Dew point/frost point	3008	[HR] R4	°F _{td}	No scal.

13.2.4. Logger settings (data logger)

Main menu ► Settings ► Logger settings





In the top row, select one of the pre-defined Intervals (1, 2, 5, 10, 15, 30, 60, and 120 seconds) for recording.

Alternatively, enter a user-defined Interval in the white text field in the top right corner showing the currently selected Interval (here: 20 seconds).

<u>Notice:</u> The longest possible Interval is 300 seconds (5 minutes).

<u>Notice:</u> If more than 12 measurements are recorded simultaneously, the shortest possible data logger interval is 2 seconds.

If more than 25 measurements are recorded simultaneously, the shortest possible data logger interval is 5 seconds.

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Main menu ► Settings ► Logger settings ► Enforce new logger file

or Main menu ► Settings ► Logger settings ► Enforce new logger file ► Comment

*** Logger settin	igs ***
Time interval (se	ec)
1 2 5 10 15	30 60 120 5
force new record file	
Comment: no com	iment
Logger stopped timed	Start timed Stop
START STOP	
Back Remaining logger capacity = 2174 days	Alarm Lg.stop pacity = 2 31.07.201
b channels selected / time interval (min 1 sec)	Report 13:31:49
*** Logger settir	ngs ***
Time interval (es	
1 2 5 10 15	30 60 120 1
force new record file	
Comment:	ment
	initian
Logger stopped	Chart Kinned Char
	start timed Stop
START STOP	
- Pempining longer capacity = 442 down	
Back S channels selected / time interval (min 1 sec)	Report 13:48:09

Main menu ► Settings ► Logger settings ► Start time button

	U	00		· ·			
	*** Log	iger se	ttings	***			
	Tim	ne interval	(sec)				
1 2	5 10	15	30	60	120	1	
force new rec	ord file			1			
Comment:		no (comment	t			
Logger stopped		🖌 tin	ned Start		timed S	Stop	
START STO	P	13:46	- 31.07.1	5			
Back Back Schannels select	er capacity = 442 c sted / time interval	lays (min 1 sec)		Alarm	Report rval =	1 s 31.07.2 13:45	215 24:

Check the Enforce new logger file box to create a new recording file with the name/comment entered in the Comment text field.

Important:

To create a new logger (recording) file, check the Enforce new logger file box.

Otherwise, the last created logger (recording) is used.

Check the Start time box and enter the start date/ time for the data logger recording in the fields below the box.

Notice:

When the Start time box is checked, the current time plus 1 minute is displayed in the date/time field.

Main menu ► Settings ► Logger settings ► Stop time button



Check the Stop time box and enter the stop date/ time for the data logger recording in the fields below the box.

Notice:

When the Stop time box is checked, the current time plus 1 hour is displayed in the date/time field.

Main menu ► Settings ► Logger settings ► Start time button/Stop time button ► Date/time



Touch the Date/time text field. A window where you can enter the date and time by entering the relevant values in the yellow box.

Main menu ► Settings ► Logger settings ► Start time button/Stop time button ► Date/time ► Calendar button



Press the Calendar button to select the date from the calendar.

Main menu ► Settings ► Logger settings ► Start button

			**	* Log	ger se	ttings	***			
				Tim	e interval	(sec)				
	1	2	5	10	15	30	60	120	1	
	for	ce new r	ecord file	•						
		Setting	gs can o	nly be c	hanged	while Lo	ogger is	stoppe	d	
	Log	gger activ	/e		🖌 tin	ned Start		✔ ti	med Stop	
	START	r s	ТОР		13:00	- 31.07.1	5	14:50	- 31.07.15	
Back	© Re	emaining lo channels se	egger capac elected / tin	ity = 442 di ne interval	ays (min 1 sec)		Alarm	Lg.run Report	days, Int	31.07.2015 14:01:58

After the Start time and/or Stop time has been set, press the Start button to set the data logger to "armed".

The data logger will start recording at the set time!

Main menu ► Settings ► Logger settings ► Start button/stop button

		***	Log	ger set	tings	***			
			Time	e interval	(sec)				
1	2	5	10	15	30	60	120	1	
	force new r	ecord file							
	Settin	gs can onl	ly be cl	hanged v	/hile Lo	gger is	stoppe	d	
							_		
	Logger activ	/e		tim	ad Start		e ti	mod Stop	
				(iii)	eu otart	L	· ·	med Stop	
STA	RT S	ТОР		13:00	· 31.07.15	5	14:50	- 31.07.15	
STA	RT S	TOP		13:00	· 31.07.15	5	14:50	- 31.07.15	

The data logger can also be started and stopped without time settings. To do this, simply press the Start and Stop button. The field in the bottom left corner indicates the number of values that are recorded and the remaining recording time.

<u>Notice:</u> The settings cannot be changed while the data logger is recording.

Important:

If a new logger (recording) file is to be created, check the Enforce new logger file box. Otherwise, the last created logger (recording) is used.

13.2.5. Device settings

Main menu ► Settings ► Device settings

	*** Devic	e se	ettings **	*			
	Set language			SD-	Card		
	Date & Time		Re	elais	Settings		
	Network settings		Up	date	System	1	
	ModBus settings		Fa	actor	y Reset		
			AI	arm	Lg.stop	davs. Int	31.07.201
Back					Report		14:05:58

13.2.5.1. Language

Main menu► Settings ► Device settings ► Language

	***	Choose language	***
		Can you read this text?	
	English	Deutsch	Spanish
	Italian	Danish	Русский
	Polski	French	Portuguese
	Romanian	Czech	
Back			Alarm Lg.stop days, Int 31.07.201 Report 14:08:12

Select the language for the BDL interface.

Overview of device settings

Notice:

At the moment, only German and English are available!

13.2.5.2. Date & time

Touch the Time zone field and enter the correct UTC.



To cater for daylight saving time, check the Daylight saving box.

13.2.5.3. Network settings





Enter the Subnet mask and Gateway address in the respective fields. (For Host name, see chapter 13.2.2.7 Labelling and configuring text fields.)



Here, a connection to a computer can be configured, with or without DHCP.

Notice:

If the DHCP box is ticked, the BDL is automatically integrated into the existing network. In this case, there is no need to manually configure the network settings.

Alternatively, enter the relevant network settings in the fields:

Touch the IP address field. An input window is displayed where the relevant entries can be made in the yellow box. Touch the Host name field to enter or change the host name.

For the IP address, observe the IP address classes.

Notice: Private address range in class A networks: 10.0.0 to 10.255.255.255 Private address range in class B networks: 172.16.0.0 to 172.31.255.255 Private address range in class C networks: 192.168.0.0 to 192.168.255.255 Subnet mask: e.g. 255.255.0

13.2.5.4. Modbus

Main menu► Settings ► Device settings ► Modbus settings

	**	* ModBus	s settings	***	
Enable I	MB-RTU		Modbus	ID 1	
Baudrate	1200 2400	4800 96	600 19200	38400 57600	115200
Stopbits	1 2				
Parity	none even	odd			
Data Form	nat RTU			Set to Default	
Apply Rx: Tx:	0 CRC-Err: 0 Par-Err:	0 F	Res.Diag		Ø

Enter the transmission parar	neters for
Modbus ID, baud rate, stop I	oit and parity. To
activate Modbus, check the	Enable Modbus
RTU(RS485)" box.	
To reset the values to the de	fault settings, press
the Restore defaults button.	•
Default values: Baud rate:	19200
Stop bit:	1
Parity:	even

13.2.5.5. SD card

Main menu ► Settings ► Device settings ► SD card ► Reset logger database

Main menu ► Settings ► Device settings ► SD card ► Erase SD card

	*** SD-Card ***		
	Reset Logger Database		
	Erase SdCard		
	Format SdCard		
Back			

To lock the currently stored data for use by the BDL, press the Reset logger database button. The data remains stored on the SD card and is thus available for external use.

To delete all data from the SD card, press the Erase SD card button.

NOTICE	SD card settings and card replacement
\bigcirc	For detailed information regarding the SD card and its replacement, see chapter 12.

13.2.5.6. System update

Important:

Before carrying out an update, save the device settings to a USB memory stick!

Notice:

The yellow field shows the update options that are available.

Main menu► Settings ► Device settings ► System update



Main menu▶ Settings ▶ Device settings ▶ System update ▶ Save device settings



Saves Channel and system settings in XML format to a USB memory stick.

Main menu ► Settings ► Device settings ► System update ► Check for updates on USB memory stick

		*** Update System *	**
	Ch act. Firmwa Software Fonts Pictures Languages Channel SW WebUI	eck USB Stick for new Softwate updates tre = V99.88 U:DEV0001/Update/DS500COD.bin <no file=""> U:DEV0001/Update/DS500FNT.bin <no file=""> U:DEV0001/Update/DS500BMP.bin <no file=""> U:DEV0001/Update/DS500LAN.bin <no file=""> U:DEV0001/Update/DS500WEB.bin <no file=""></no></no></no></no></no>	Channel Version A1 = V0.00 <new> A2 = V0.01 <new> A3 = V0.02 A4 = V0.03 <new> B1 = V0.04 <new> B2 = V0.05 <new> B3 = V0.06 <new> B4 = 00.07 <new> M1 M2 M3 M4</new></new></new></new></new></new></new>
Ba	Update Fi	rmware force all	Update Channels Serial # 00000000 Product # 00000000

If the message shown here is displayed after pressing the Check for updates on USB memory stick button, the USB memory stick is not correctly connected to the BDL or the required data is not available.

Check USB Stick for new Softwate undates	- Channel Versi
Check DOD Dick for new Softwate updates	A1 = V0.00 < new
act. Firmware = V99.88	A3 = V0.02
Software	A4 = V0.03 <new< th=""></new<>
Fonte	B1 = V0.04 <new B2 = V0.05 <new< th=""></new<></new
Disture	B3 = V0.06 <new< th=""></new<>
Pictures	B4 = V0.07 <new< th=""></new<>
Languages	M1
Channel SW	M2 M3
WebUI	M4
Update Firmware force all	Undate Chann

If the USB memory stick is correctly connected to the BDL, the letters change to black and the various available update options (software, pictures, etc.) are shown with a green tick to the left.

To the right, the current (old) and the available (new) versions are displayed.

If you wish to install a previous software version, the update options (software, graphs, etc.) must be selected manually.

Main menu▶ Settings ▶ Device settings ▶ System update ▶ Update selection

BDL update for all of the selected options (software, pictures, etc.).

Important:

If, subsequent to the update, the Restart button is displayed, you must press it to restart the BDL!

Main menu► Settings ► Device settings ► System update ► Update channels

Check	USB Stick for new Softwate updates	A1 = V0.00 <new> A2 = V0.01 <new></new></new>
act. Softwa Fonts Picture	Set Channels to BOOT mode	ew> ew> ew>
Langu Chann WebUI		ew>
Update Firmwa	are force all	pdate Channe

Update for the BDL channels.

Important:

If, subsequent to the update, the Restart button is displayed, you must press it to restart the BDL!

Main menu▶ Settings ▶ Device settings ▶ System update ▶ Restore device settings



Settings restored, please reboot system

OK

Press the restore system settings button to reset the channel and system settings to the last saved settings.

Important:

After the channel and system settings have been reset, press the OK button and then press the Restart button to restart the BDL.

13.2.5.7. Restoring factory settings



Main menu▶ Settings ▶ Device settings ▶ Restore factory settings

If required, the BDL can be re-booted by pressing the Restart button.

13.2.6. Report settings (optional)

Main menu ► Settings ► Report settings

*** Re	port Settings	***			
Data Storrage Report Data stored for 0 d	ays	[Er	ase	
Activation report active	Currency Unit				
START STOP					
Back		Alarm	Lg.stop Rp.run	nterval =	03.08.201 07:33:10

*** R	eport Settings	***			
Data Storrage Report Data stored for 0	days	[Er	rase	
Activation restart in 3595 sec	Settings Currency Unit				
START STOP					
Back		Alarm	Lg.stop Rp.stop	ys, Interv restarts i	03.08.2015 07:33:32

To start or stop reporting, press the Start or Stop button respectively.

Notice: After the "Stop" button has been pressed, reporting resumes automatically after 1 hour, unless the "Start" button has been pressed again.

Main menu ► Settings ► Report settings ► Delete button

See also chapter 13.9 Data export

Main menu Settings	Report sett	ings	► C	urrenc	;y
***	Report Settings	***			
Data Storrage Report Data stored for Activation	0 days		Er	ase	
report active	Currency Unit		E	Euro	
START STOP					
		Alarm	Lg.stop	= 1531 da	03.08.201
Васк			Rp.run		07:52:30

To delete Report data, press Yes.

Important: Prior to deleting the data, export the Report data to a USB memory stick!

Press the Currency field to enter the currency that is to be used for the cost calculations and the Report.

<u>Notice:</u> If no currency is entered, the respective fields remain empty.

See also chapters 13.8.1 Report/consumption analysis (optional) and 13.8.2 Costs (optional).



13.2.7. Virtual channels (optional)

The "Virtual channels" option offers 4 additional channels (no HW channels) for the display of calculations regarding the HW channels, virtual channels, and freely definable constants. For each virtual channel, up to 8 calculations with 3 operands and 2 operations can be configured.

Calculations are used to calculate:

- Specific performance of system
- Total consumption of system (with multiple compressors)
- Energy costs, etc.

13.2.7.1. Activating virtual channels

After having acquired the "Virtual channels" option, you must activate it.

Main menu ► Settings ► About BDL

*** Ab	put BDL ***
Device	Options
Device Type: BDL	Consumption report
Serial Number: 00000000	Webserver Buy
Hardware Version: 0.00	Fast measurement
Software Version: 0.99	Virtual Channels
WebUI Version 0.01	☑ Analog Total
Contact: www.beko-technologies.com	Alarm Lg.stop 1531 day 03.08.2015
	Kp.run 07:54:20
Enter Co	de for Option 3



Press the Buy button for virtual channels. You are prompted to enter the activation code.

Enter your activation code and press the OK button.

13.2.7.2. Virtual channel settings

Main menu ► Settings ► Sensor settings ► Virtual channels

V1		V2	
V3		V4	
			unused
Back 🙆	Hardware C	hannels Alarm	Lg.stop terval = 0 03.08.2015 Rp.run 07:56:20

After the virtual channels have been activated, the 4 available channels are shown in the sensor settings menu.

<u>Note:</u> By default, the channels are not preconfigured.

13.2.7.3. Selecting sensor type

Main menu ► Settings ► Sensor settings ► Virtual channels ► V1

5	
*** Channel V1 ***	
Type No Sensor Store	
Name	If no sensor has been configured yet. No senso
	is displayed in the type field.
No Sensor defined	Touch the type field (reading No sensor) to call up a list of available sensor types (see next step
Back 🕲	

Main menu ► Settings ► Sensor settings ► Virtual channels ► V1 ► Type

	Select Type of Virtual Channel	
N	No Sensor	
	Generic No Sensor	
	OK Cancel	
8.		

If no sensor has been configured yet, No sensor is displayed in the top field.

Pressing the Generic to select the virtual channel. Press the No sensor button to reset the channel. Press the OK button to confirm the selection.

Main menu 🕨	Settinas 🕨	Sensor settings	Virtual	channels	V1	Name

		*** Channel V1 ***
Туре	No Sensor	Store
Name		
		No Sensor defined
Back	0	

	*** Chan	nel V1 ***
Туре	Generic Store	Virtual Value Setup
Name	Ch-V1	
Part: 0	Serial: 0 Version: MbExt	1st Operand 0.000
		1st Operation
Record	Alarm	2nd Operand 0.000
		2nd Operation
		3rd Operand 0.000
		Unit of Result
OK	Cancel Min/Max	V1a = 0.000

Enter a Name for the virtual channel.

The Save button is intended for a future function and is currently **not** in use.

13.2.7.4. Configuring virtual values

For each virtual channel, up to 8 virtual values can be calculated. These values must be activated separately:

13.2.7.4.1. Activating virtual values

Main me	enu 🕨 Settings	s 🕨 Sen	sor settings	s 🕨 Virtual c	hannels	► V1 ► V1a ► use
		*** Chan	nel V1 ***			
Type Name	Generic Ch-V1	Store	Via V1a V1b V1c V1 use	tual Value Setup	/1g V1h	
Part: 0	Serial: 0 Vers	ion: MbExt	1st Operand	0.000		
Record		Alarm	2nd Operand	0.000		Value button (e.g.
P	25.68 k	g/s	2nd Operation 3rd Operand	0.000		
	1		Unit of Result			
OK	Cancel	Min/Max		V1a = 0.000		

To activate a virtual value, press the respective Value button (e.g. V1a and confirm with OK.

13.2.7.4.2. Defining operands

Main menu ► Settings ► Sensor settings ► Virtual channels ► V1 ► 1st operand

*** Channel V1 ***								
Type Name	Generic Store Ch-V1	Virtual Value Setup V1a V1b V1c V1d V1e V1f V1g V1h v use use						
Part: 0	Serial: 0 Version: MbExt	1st Operand 0.000						
Beenrd		1st Operation						
Record	Alam	2nd Operand 0.000						
6	25.68 km/n	2nd Operation						
	23.00 kg/s	3rd Operand 0.000						
		Unit of Result						
ОК	Cancel Min/Max	V1a = 0.000						

Touch the 1st operand field. A list of the available hardware channels, virtual channels, and constant values is displayed.

Main menu ► Settings ► Sensor settings ► Virtual channels ► V1 ► 1st operand ► A1



Press a hardware or virtual channel button (e.g. A1) to call up a list of the available measuring channels and measurements.



Press a channel button (e.g. A1b) to apply it.

If the Const. value button has been pressed, enter the value in the field, using the numerical keypad. Press the OK button to apply the value.

To correct a value, press the \leftarrow or Clr button.

The \leftarrow button deletes the last character The Clr button deletes the entire value

The procedure described here applies to all operands (1st operand, 2nd operand, and 3rd operand).

.....

13.2.7.4.3. Defining operations

Main menu ► Settings ► Sensor settings ► Virtual channels ► V1 ► 1st operation

		*** Chann	nel V1 ***					
Туре	Generic	Store	Virtual Value Setup					
Name	Ch-V1		V1a V1b V1c	V1d V1e V	If V1g V1h			
			use .					
Part: 0	Serial: 0 Vers	ion: MbExt	1st Operand	0.000				
Record		Alarm	1st Operation					
			2nd Operand	0.000				
<i>»</i>	25.68 k	g/s	2nd Operation					
			3rd Operand	0.000				
			Unit of Result					
ОК	Cancel	Min/Max		V1a = 0.000				
Type	Generic		Vi	rtual Value Setu	2			
Name	Cr-v1	Oper	ation		n vig vin			
Part 9	Secol 9 9	*	/	8.000				
Record		+	-					
		not u	Jsed					
<u> </u>	65.6	,						
			Lind of Days					
ОК	Cancel	Min/Max		Vic = 0.000				

Touch the 1st operation. The available mathematical operations are displayed.

Press the respective button to select and apply an operation.

To reset a selected operation, press the not used button.

The procedure described here applies to all operators (1st operation and 2nd operation)

13.2.7.4.4. Defining unit

Main menu ► Settings ► Sensor settings ► Virtual channels ► V1 ► Unit for result

	*** Chanı	nel V1 ***
Type Name	Generic Store Ch-V1	Virtual Value Setup V1a V1b V1c V1e V1f V1g V1h v use use v
Part: 0	Serial: 0 Version: MbExt	1st Operand 0.000
Record	Alarm	2nd Operand 0.000
	25.68 kg/s	2nd Operation 3rd Operand 0.000
		Unit of Result
ОК	Cancel Min/Max	V1a = 0.000

Touch the Unit for result field. The available units are displayed.

			🌮 Edit]
	°C	°F	%RH	°Ctd
°Ftd	mg/kg	mg/m³	g/kg	g/m³
m/s	Ft/min	Nm/s	Nft/min	m³/h
m³/min	ltr/min	ltr/s	cfm	Nm³/h
Nm³/min	NI/min	NI/s	Ncfm	m ³
D Page		OK Can	cel	

			🌮 Edit	
mg/m³O	il barg	User_1	User_2	User_3
^{tert} User_4	User_5	User_6	User_7	User_8
User_9	User_10	User_11	User_12	User_13
User_14	User_15	User_16		
Page		OK Can	cel	

6/	9				Unit	Name				
	User_1									
	1	2	3	4	5	6	7	8	9	0
	q	w	е	r	t	z	u	i	o	р
	а	s	d	f	g	h	j	k	Т	+
	У	x	с	v	b	n	m	,	•	-
	АВС	Abc	@#\$							
OK Cancel										

Select the unit by pressing the respective unit button. Press the ${\sf OK}$ button to apply the selected unit.

To change between the individual list pages, press the Page button. If the required unit is not available, create it

yourself. To do this, press one of the pre-defined User_x

buttons.

To enter the new unit, press the Edit button.

Enter the unit and accept with OK.

To correct an entry, press the \leftarrow or Clr button.

The \leftarrow button deletes the last character The Clr button deletes the entire value

Important: After all values and operators have been entered, the system is able to perform calculations with 3 values and 2 operands as follows: Example:

V1a = (1st operand 1st operation 2nd operand) 2nd operation 3rd operand V1a = (A1c - A2a) * 4.6

13.2.7.5. Resolution of decimal places – labelling and recording data values

	*** Ch	nnel V1 ***
Type Name	Generic Store Ch-V1	Virtual Value Setup V1a V1b V1c V1d V1e V1f V1g V1h use
Part: 0	Serial: 0 Version: MbExt	1st Operand 0.000
Pacard		1st Operation
Record		2nd Operand 0.000
	25.68 ka/s	2nd Operation
	23.00 kg/s	3rd Operand 0.000
		Unit of Result
ОК	Cancel Min/Max	V1a = 0.000

Main menu ► Settings ► Sensor settings ► Virtual channels ► V1 ► Tool button

Press the Tool button to view the Resolution for decimal places, the Short name and the Value name.

Press the Record button to record and store the selected data on the activated data logger.



For the Value to be recorded, enter a Name with max. 10 characters. This name is then used in the Charts and Chart/current values menus. Otherwise, the default name (e.g. V1a) is displayed.

V1 indicates the channel; a is the first value in the channel, b would be the second, and c the third.

To adjust the Resolution of the decimal places, touch the arrow buttons (0 to 5 decimals places).

Main menu ► Settings ► Sensor settings ► Virtual channels ► V1 ► Record button

	*** Channel V1 ***								
Туре		Gen	eric	Store	Vi V1a V1b V1c	rtual Value Setup	V1g V1h		
Name			Ch-V1		use				
Part: 0	S	Serial:	0 Vers	ion: MbExt	1st Operand	A1c	Nft/min		
Record				Alarm	1st Operation	+			
					2nd Operand	A3c	Nft/min		
	A1a		167.213 N	Il/min	2nd Operation	+			
					3rd Operand	1200.000	-		
					Unit of Result	m³/h			
ОК			Cancel	Min/Max	V1a = ((A1c + A3c) + 1200.000			

Press the Record buttons to select the measurements to be recorded and stored on the activated data logger.

<u>Caution:</u> Prior to recording the selected measuring data, configure the data logger and then start it (see chapter 13.2.4Logger settings (data logger)).

See also chapters 13.2.2.2 Labelling measurements and 13.2.2.3 Recording measuring data.
13.2.7.6. Example: calculation of "specific performance"

This example is based on a compressor plant with 5 compressors. The consumption is measured with an FS109 consumption probe at inputs A1 - A4 & B1, and an electricity meter at input B2.



The total consumptions for air and energy, and the "specific performance" of the entire plant are calculated.

Main menu ► Settings ► Sensor settings ► Virtual channels ► V1 ► V1a ► use



For instructions regarding the input of the operands and operations, see chapters 13.2.7.4.2 and 13.2.7.4.3.

The result for V1a is the sum of consumption sensors A1 + A2 + A3 (see result panel). In this example, it is 28856,8 m³

		*** Chan	nel V1 ***
Туре	Generic	Store	Virtual Value Setup
Name	Ch-V1		use
Part: 0	Serial: 0 Ver	sion: MbExt	1st Operand A4a %RH
Decent		A 1	1st Operation +
Record		Alarm	2nd Operand B1a %RH
🖌 🎉 A1a	2885	56,8 m³	2nd Operation
			3rd Operand 0.000
%	3723	33,4 m ³	Unit of Result m ³
OK	Cancel	Min/Max	V1b = A4a + B1a

	***	Chan	nel V1 ***
Туре	Generic Sto	ore	Virtual Value Setup
Name	Ch-V1	_	V1a V1b V1c V1d V1e V1f V1g V1h
Part: 0	Serial: 0 Version: Mb	Ext	1st Operand V1a mg/m³
Record		Alarm	1st Operation +
🖌 🎉 A	1a 28856,8 m [:]		2nd Operation V1b mg/m ³
%	37233,4 m [:]		3rd Operand 0.000
%	66090,2 m ³		Unit of Result m ³
		 1	
OK	Cancel Min	/Max	V1c = V1a + V1b

Туре	Generi	с	Store	Vi V1a V1b V1c	rtual Value Setu	p 1f V1g V1h
Name	(Ch-V1		use		
Part: 0	Serial: 0	Vers	sion: MbExt	1st Operand	B2a	ltr/min
Descert			A 1	1st Operation		
Record	A1a	2885	6.8 m ³	2nd Operand	0.000	
- <u>-</u> % -	-	3723	3.4 m ³	2nd Operation		
 % -	-	6609	0.2 m ³	3rd Operand	0.000	
	-	4720,	75 kWh	Unit of Result	kWh	
OK	Ca	ncel	Min/Max		V1d = B2a	

		***	Chan	nel V1 ***		
Type Name	Generic Ch-	Sto V1	re	Vir V1a V1b V1c	tual Value Setup V1d V1e V1f	V1g V1h
Part: 0	Serial: 0	Version: MbE	ixt	1st Operand	B2a	kjøa⁰/h
Record			Alarm	1st Operation	1	
Record	<u>-</u>	l		2nd Operand	V1c	kipa³/h
J.	Specific performance	0,072 kWh/m ³		2nd Operation		
				3rd Operand	0.000	
	Costs	991.36 €		Unit of Result	kWh/m ³	
ОК	Cance	el Min/	Max		V1e = B2a / V1c	

For instructions regarding the input of the operands and operations, see chapters 13.2.7.4.2 and 13.2.7.4.3.

The result for V1b is the sum of consumption sensors A4 + B1 (see result panel). In this example, it is 37233,4 m³.

For instructions regarding the input of the operands and operations, see chapters 13.2.7.4.2 and 13.2.7.4.3.

The result for V1c is the sum of consumption sensors V1a + V1b (see result panel). In this example, it is $66090,2 \text{ m}^3$. Alternatively, a total sum could be calculated in V1b, using the third operand in V1b: V1b = A4 + B1 +V1a -> not displayed

The total consumed energy is shown in V1d.

This information is read from the electricity meter at input B2.

 $\begin{array}{l} V1c \rightarrow total \ compressed \ air \ consumption \\ V1d \rightarrow power \ consumption \end{array}$

The Specific performance is calculated as follows: V1e = B2 / V1c = 0.072 kWh/m^3

The costs are calculated as follows: $V1f = B2 * 0.21 = 991.36 \in$ As there are more than 4 values used in this virtual channel, the display is split onto two screens. To change between the screens, press the Page button.

13.2.8. Analog total (optional)

The "Analog total" option allows you to calculate the consumption based on sensors with analog outputs, e.g. 0-1/10/30 V or 0/4 - 20 mA.

13.2.8.1. Activating "Analog total" option

After having acquired the "Analog total" option, you must activate it.

Main menu ► Settings ► About BDL

Device		Options	
Device Type:	BDL	Consumption report	Buy
Serial Number:	0000000	Webserver	Buy
Hardware Version:	0.00	Fast measurement	
Software Version:	0.99	Virtual Channels	
WebUI Version	0.01	Malog Total	
ontact: www.beko.tech	nologies com		

Press the Buy button for "Analog total". You are prompted to enter the activation code.



Enter your activation code and press the OK button.

13.2.8.2. Selecting sensor type

See also chapter 13.2.2.8 Configuring analog sensors

Main m	Main menu ► Settings ► Sensor settings ► A1							
		*** Channel V1 ***						
Туре	No Sensor	Store						
Name								
		No Sensor defined						
Back	0							

If no sensor has been configured yet, No sensor is displayed in the type field.

Touch the type field (reading No sensor) to call up a list of available sensor types (see next step).

	:	Select Type of H	ardware Channe	I
		4 - 2	0 mA	
	0 - 1 V	0 - 10 V	0 - 30 V	0 - 20 mA
Part	4 - 20 mA	PT100	PT1000	KTY81
Reci	Pulse	BEKO-Digital	Modbus	BEKO-PM710
	PC400	BEKO-PM600	BEKO-PM600 US	FA450
	No Sensor			
		ОК	Cancel	Custom Sensor

Select the required sensor type by pressing the respective button (here: 4-20 mA).

Confirm with OK.



Select the units by touching the Measured value or Consumption unit field. Enter scaling values for 4 mA and 20 mA (here: 0 m³/h and 170m³/h). If required, enter the start value for consumption (counter value) in the Set total to field. Confirm with OK.

Notice:

The "Consumption unit" field can only be edited, if the unit of the measurement is a consumption unit, i.e. unit for a volume over time.

For the labelling and configuration of the text fields, see chapter 13.2.2.7 Labelling and configuring text fields.

13.3. Charts

Main menu ► Charts

<u>Caution:</u> Only recordings that are completed can be viewed in the form of charts!

Currently running recordings can be viewed with Chart/current values (see chapter 13.4 Chart/current values).



Zooming and scrolling in Charts:

While a measurement is running, no values are displayed!



EN

The maximum time period that can be viewed in a chart is 1 day (24h).



The shortest possible interval in the recording is displayed.

Additional zooming and scrolling options in Charts and Chart/current values:



								_
	<		31	July 20	15		>	
	Mon	Tue	Wed	Thu	Fri	Sat	Sun	
			1	2	3	4	5	
	6	7	8	9	10	11	12	
	13	14	15	16	17	18	19	
	20	21	22	23	24	25	26	
	27	28	29	30	31			
					1]	
				OK				100.00
🕸 Home 🛛 🔴 🚽								

	2 File(s) exist	on 31.07.2015, Please select	
File name	START	STOP	Comment	
S150731B	14:01:53	14:01:53	no comment	
S150731A	09:06:07	09:06:07	no comment	
			ОК	

Press the Date field to call up a calendar where you can select the desired date.

Select saved measurements by Time (Start and Stop time), by Comment and/or by File name (contains date in UK format).

Main menu ► Charts ► Setup

In the setup menu, you can configure up to 4 y-axes and select the unit, the y-axis scale (min, max, grid), multiple channels (curves), and the colour to be displayed.

				*** (Chart Set	up ***				
use	Y-Axis	Unit	DP	min	max	step	Colour	Plot	;	A.Scale
~	left 1.		?	0.000	100.000	10.000		- noi	1e -	
	left 2.		?	0.000	100.000	10.000		- noi	10 -	
	right 1.		?	0.000	100.000	10.000		- noi	1e -	
	right 2.		?	0.000	100.000	10.000		- noi	1e -	
OF	<	Cancel	0			A	larm L	g.stop erval :	= 0	03.08.2015 09:01:03

1.

The left 1. y-axis is selected. You can now assign a Colour to it.

Notice: While the grid settings can already be made at this point, it is generally more useful to make them at a later stage, for instance after a recording has been selected!

Main menu ► Charts ► Setup► Unit

m³/h	m³	m/s	m³/min	°Ctd	%rF	mba
°C						
_						

Main menu ► Charts ► Setup► Curve

	Available records for Ur	hit A
Use	Channel - Name - Value	Colour
~	(A2a) "Measurement 3" A2a	
	(A3a) "Measurement 4" Temp.	
	(B1a) "Dew point" B1a	
	(B1b) "Dew point" B1b	
	(B1c) "Dew point" B1c	
	OK	

Main menu ► Charts ► Setup

				*** (Chart Set	up ***			
use	Y-Axis	Unit	DP	min	max	step	Colour	Plots	A.Scale
~	left 1.	A	3	0.000	100.000	10.000		A2a	
	left 2.		?	0.000	100.000	10.000		- none -	
	right 1.		?	0.000	100.000	10.000		- none -	
	right 2.		?	0.000	100.000	10.000		- none -	
Oł	<	Cancel	0			A	arm Lg.s	top 31 days, I	03.08.2015 09:04:53

2. Select the Unit of the recording to be displayed.



4. Select the y-axis scaling with min., max. and grid.

Main menu ► Charts ► Setup ► Curve

				1
	Available records for Un	it A		
Use	Channel - Name - Value		Colour	
~	(A2a) "Measurement 3" A2a			
~	(A3a) "Measurement 4" Temp.			
~	(B1a) "Dew point" B1a			
	(B1b) "Dew point" B1b			
	(B1c) "Dew point" B1c			
	ок			

5.

It also is possible to view multiple recordings with the same unit along the y-axis, using different colour intensities.

Unit Measurement / consumption

Main r	menu	► C	harts	s 🕨 S	etup	Meas	urem	ent / con	sumpti
				*** C	hart Set	up ***		*	
use	Y-Axis	Unit	DP	min	max	step	Colour	Plots	A.Scale
~	left 1.	A	3	0.000	100.000	10.000		A2a,A3a,B1a	
	left 2.		?	0.000	100.000	10.000		- none -	
	right 1.		?	0.000	100.000	10.000		- none -	
	right 2.		?	0.000	100.000	10.000		- none -	
ОК	С	ancel	Ø			AI	arm Lg.	top days, Inte	03.08.2015 09:07:16

To configure the other y-axes, proceed as described above!

			*** (Chart Se	tup ***			
use Y-A	cis Unit	DP	min	max	step	Colour	Plots	A.Scale
✓ left 1	A	3	0.000	100.000	10.000		A2a,A3a,B1a	
r left 2		?	0.000	100.000	10.000		- none -	
right *	1.	?	0.000	100.000	10.000		- none -	
right 2	2.	?	0.000	100.000	10.000		- none -	
ОК	Cancel	Ø			A	larm Lg	eport ity = 1531	03.08.2015 09:08:00

6. The Curve field shows the channel on which the measurements were recorded. It also indicates how many recordings are being displayed along one y-axis.

Four different grid settings with different Units and Colours.



Main menu ► Charts

13.4. Chart/current values

Main menu Chart/current values



One or more channels for the recording and the visualisation of the measurements can be selected here (e.g. on dew point sensor or a number of different sensors).

Main menu ► Chart/current values ► Setup #1- #12



*** Chart / real time va	lues Settings (Plot 1) ***
- Select Channel	Select Colour
1.Value (Chart)	
2.Value (Button)	
Other settings	
	min 0.00000
	max 0.00000
	step 0.00000
ок 🙆	Alarm Lg.stop = 1531 d 03.08.20

Select this menu option to simultaneously activate and view up to 12 channels (depending on your BDL version). Main menu \rightarrow Chart/current values

Here: channel A1 has been selected. For each channel, select a value ("Chart") for visualisation in the chart, and one value to be displayed (2nd value).

In addition, you can define the y-axis scaling factors (as described in Main menu \rightarrow Charts, a Colour: min, max, grid).

Main menu► Chart/current values







Proceed as described above to configure all other setups!

Channel A1:

In the example, the flow volume has been selected for the Chart and the consumption as the 2nd value (numeral in small font).

The selected channel colour is orange.

If more than one channel has been selected (here: 2 channels), all related charts are displayed. Please note that only the y-axis of the selected channel is displayed (here: Setup #2).

When no y-axis scaling is entered in the setup, min. is set to 0, max. is set to 100, and grid is set to 10 (setup #3).

13.5. Current values

Main menu Current values

A1	Ch-A1	A2		A3		A4	
☑ A1a min max 	57.202 mV 562848 °C 171.603 mV 286 mV	A2a	114 mV	A3a A3b A3c	172 mV 229 mV 286 mV	A4a	229 mV
B1		B2		B3		B4	
B1a B1b B1c	286 mV 343 mV 400 mV	B2a B2b B2c	343 mV 400 mV 458 mV	B3a B3b B3c	400 mV 458 mV 515 mV	B4a B4b B4c	458 mV 515 mV 572 mV
Back	Ø		Virtual Ch	annels	Alarm Lg.st	pacity = 1	03.08.2015 09:22:44

The Current values menu shows the current measurements of all the connected sensors. If a set alarm limit has been exceeded, the respective measured value flashes in yellow (Alarm 1) or red (Alarm 2).

Main menu ► Current values ► A1



You have the option to select a channel to call up and check the settings. It is however not possible to change the settings here.

Notice:

Changes to the settings must always be made in the Settings menu!

13.6. Alarm overview

Main menu ► Alarm overview



In the alarm overview, you can immediately see whether the alarm is an Alarm 1 or an Alarm 2. The type of the alarm is also shown in other menu:

Main menu ► Current values and in Main menu ► Settings ► Sensor settings

The channel name field flashes in yellow for an Alarm 1 and red for an Alarm 2.

In addition, the relays that have been set for the channels for Alarm 1 and/or Alarm 2 are indicated by yellow and red or red/yellow squares at the intersections between the measuring channel and the relays.

In the example, there is an Alarm 1 at channel A3 and an Alarm 2 at channel A4!

Main menu ► Alarm overview ► A1

	*** Ch	annel A1 *** ~ 0.0 V ~ 0 mA
Туре	4 - 20 mA Store	Unit m ³ /h m ³
Name	Ch-A1	Scale 4mA 0.000 m³/h
Part: 0	Serial: 65 Version:	Scale 20mA 170.000 m³/h
Record	Ala	ırm Offset m³/h
¥ 9	A1a 57.740 Nm ³	(Offset) Set Value to Reset
	min 568137 °C max 173.216 Nm³	set Total to m ³
P	289 Nm ³	Cost-Settings
Back	Min/Max	x Sensor Supply Voltage On

As in Main menu ► Current values, you can select an individual channel.

In the Alarm overview, the measurement that has triggered the alarm can be quickly identified.

Notice: In this menu, you can set and edit the alarm parameters.

13.7. Other settings

13.7.1. Brightness

Main menu ► Settings ► Brightness

	*** Backlight settings ***
	Backlight 50%
Back	Alarm Lg.stop val = 0 sec 03.08.2015 Report 09:30:46
	*** Backlight settings ***
	Backlight 50%
	Backlight dimming after 1 minutes
Back	Alarm Lg.stop ays, Inter 03.08.2015 Report Report 09.31:04

Notice: When the display is touched again, the Brightness returns to 50%. Subsequently, the bar works like a normal slider bar.

Important:

If the Dim after box is not checked, the panel remains backlit with the currently set Brightness.

13.7.2. Calibrating touch screen

Main menu ► Settings ► Touch screen calibration

	*** Touchscreen calibra	tion ***
	Please check position, press Calibrate	if necessary
	[0/0] <0/0> <0/0> <0/0>	
	<0/0> <0/0> <0/0>	
Cancel	Calibrate	

13.7.3. Cleaning

Main menu ► Settings ► Cleaning

This function can be used to clean the touch screen while measurements are running. The screen is temporarily disabled for 60 seconds.
If 60 seconds are not sufficient for cleaning, restart the function.
If cleaning is completed before the 60 seconds have elapsed, press and hold the Press and hold to abort button for one to two seconds.

NOTICE	Cleaning
	For more information regarding the cleaning of the touch screen, see chapter 14

If required, the touch screen calibration can be changed.

Press the Calibrate button. A calibration cross appears, first in the top left corner, then in the bottom right corner and finally at the centre of the display. Touch these crosses one after the other. After calibration has been completed and the display has been properly centred on the screen, confirm with OK.

If the display is not centred, repeat the calibration process by pressing the Cancel button and then pressing the Calibrate button.

ΕN

13.7.4. System overview

Main menu ► Settings ► System overview

- Main	Statu	s ——						letwo	rk Stat	tus —			
Tem	peratu	ire			0.0	0°C		P-Add	ress				1.2
Supp	ly Vo	ltage 1			0.0	0 V	H	lost n	ame			C	S500
Supp	ly Vo	ltage 2	2		0.0	0 V 0	N	1AC			31-3	32-33-3	34-35
			-	u 1011	21111	175	(alibra	tion S	tatus			
- Char	inel S	atus —			27111	115		alibra	ation S	itatus			
- Chan A1	inel S A2	atus — A3	A4	B1	B2	B3	B4	M1	M2	itatus M3	 M4	Total	
- Chan A1 0.0	nel S A2 0.0	atus — A3 0.0	A4 0.0	B1 0.0	B2 0.0	B3 0.0	B4 0.0	M1	M2 -	M3	 M4	Total	v

The System overview menu provides information on the applied voltages and currents of the individual Channels, as well as on the voltage supply of the power supply units. In addition, the most important network parameters such as IP, Hostand MAC are displayed. In addition, the total Operating hours of the BDL are displayed.

13.7.5. About BDL

Main menu ► Settings ► About BDL

		*** Abc	out BDL *	**			
Γ	Device		Options -				
	Device Type:	BDL	Consu	mption rej	port	Buy	
	Serial Number:	00000000	Webse	rver		Buy	
	Hardware Version:	0.00	🗹 Fast me	easureme	nt		
	Software Version:	0.99	Virtual	Channels			
	WebUI Version	0.01	Manalog	Total			
С	ontact: www.beko-tech	nologies.com					
ack				Alarm	Lg.stop	days, Int	03.08.2
aur					Report		09:34

The Hardware version, the Software version, and the Serial number of the BDL are displayed.

The Options panel shows the optional functions that can be ordered.

13.8. Report/consumption analysis with costs - exporting data

The optional Report function allows you to calculate and call up daily, weekly, monthly, and annual total consumption figures.

The currency is entered in the Report settings (see chapter 13.2.6 Report settings (optional)). The consumption costs, at a set point in time, are entered as described in chapter 13.8.2 Costs (optional).

The optional Web server function enables you to view the current BDL values from anywhere in the world.

13.8.1. Report/consumption analysis (optional)

Main menu Report

ท							
Week			<no report=""></no>			Tot	al
	Consumption per week m³/h	Costs	min value m³/h	max value m³/h	average m³/h		
2015 Week 31							
2015 Week 32							
2015 Week 33							
2015 Week 34							
2015 Week 35							
2015 Week 36							
2015 Week 37							
2015 Week 38							
2015 Week 39							
2015 Week 40							
🗟 Home 🙆	Day/Week	Week	Month/Year			<	>

When the Report menu is called up, the weekly overview is automatically displayed.

<u>Notice:</u> The Costs refer to the set channel (here: A1). The last column shows the total costs of all channels that are included in the calculation overall, the costs of all the registered channels can be found.

Main menu ► Report ► Day/week

*ท						
Day/Week			<no report=""></no>			Total
	Consumption per day m³/h	Costs	min value m³/h	max value m³/h	average m³/h	
27.07.2015 Mon						
28.07.2015 Tue						
29.07.2015 Wed						
30.07.2015 Thu						
31.07.2015 Fri						
01.08.2015 Sat						
02.08.2015 Sun						
Total Week 31						
03.08.2015 Mon						
04.08.2015 Tue						
💼 Home 🛛 🙆	Day/Week	Week	Month/Year	•		< >

Main menu ► Report ► Month/year

ึ่ง							
Month/Year		<no report=""></no>				То	tal
	Consumption	Costs	min value	max value	average		
	m³/h		m³/h	m³/h	m³/h		
2011 January							
2011 February							
2011 March							
2011 April							
2011 May							
2011 June							
2011 July							
2011 August							
2011 September							
2011 October							
🔒 Home 🙆	Day/Week	Week	Month/Year			<	>

Press the respective buttons to compile a daily or weekly Consumption analysis.

Also available are a monthly and an annual Consumption analysis.

Touch screen operation for reporting

With the Report function, you can view consumption and cost figures of a channel for any chosen time period or date on the touch screen.



Note: The selected channel is displayed in green on the Report screen!

13.8.2. Costs (optional)

Main menu ► Settings ► Sensor settings ► A1 ► Costs

_1	Cost Settings	A1-Ch-A1 [m ³]	
use in Report		dual tariff	
tariff 1		tariff 2	
from	until	from	until
6:00:00	19:59:59	20:00:00	5:59:59
cost p	er unit	cost p	per unit
0.	000 / m ³	0.	.000 / m ³
		11	
	OK	Cancel	

For Type **BEKO Digital** and **pulse** the costs can be entered in the Costs menu in the Sensor settings.

Main menu ► Settings ► Sensor settings ► A1 ► Costs ► Include in consumption analysis box



Enter the consumption costs per unit for a specific tariff.

Main menu ► Settings ► Sensor settings ► A1 ► Costs ► Include in consumption analysis box and Dual tariff box



You have for example the option to enter daytime and night-time tariffs and the relevant switching times.

For instructions on how to label the text fields, see chapters 13.2.2.7 Labelling and configuring text fields and 13.2.4 Logger settings (data logger).

13.8.3. Web server (optional)

The METPOINT[®] BDL data logger can be operated in conjunction with an optional web server that provides a graphic user interface. The web server allows for remote configuration of the device, and all measuring data and system information can be accessed from anywhere in the world.

The web server provides the following functionalities:

- Reading and analysis of measurements
- Display of system information
- Automatic e-mail alerts in the event of alarms (limit exceedances)
- Starting/stopping data logger
- Configuration of METPOINT[®] BDL

13.8.3.1. Activating web server

The web server services are subject to a fee and must be activated before they are available. When ordering the web server, quote the serial number of the METPOINT[®] BDL ⁽¹⁾ and the serial number on the type plate ⁽²⁾. You then receive the activation code.

Main menu ► Settings ► About BDL

To activate the web server, touch the >>Buy<< button and enter the activation code.

- Device	*** Ab	out BDL ***	Are Ober BDL ***
Device Type:	BDL	Consumption report Buy	Con Enter Code for Option 2
Serial Number:	0000000	Webserver Buy	8
Hardware Version:	0.00	✓ Fast measurement	Har I I I I I I I I I I I I I I I I I I I
Software Version:	0.99	Virtual Channels	807 <u>1 2 3 4 5 6 7 8 9 0</u>
WebUI Version	0.01	☑ Analog Total	We OK Abbruch
Contact: www.beko-techn	ologies.com		Kontaki wana baka kachastarina com
Back		Alarm Lg.stop days, Int 03.08.20* Report 09:34:24	Alarm Alarm Alarm

13.8.3.2. Web server configuration

13.8.3.2.1. Network settings

To access the web server, the BDL must be integrated into the network. The web server can be assigned a static IP address. With a DHCP server, use the automatically assigned IP address.

Network settings at BDL: Main menu▶ Settings ▶ Device settings ▶ Network settings

		*** Networl	k settings ***		
	Basic Setup —		IP-V4 Address Setup		
1	► IP address via	DHCP	IP address	0.0.0.0	
2	- MAC	00-00-00-00-00	Subnet Mask	0.0.0.0	- (11
3	- Host name	DE-0000	Gateway address	0.0.0.0	(12
(4)	+ HTTP Port	0	DNS address	0.0.0.0	
0	Web-Admin Set	up			
(5)	- WebAdmin Pas	ssword	123	4	
0					
	Back	Apply & Restart	ne	MAC	Ø
	(6)	(7)		8	9

No.	Description
1	Check box for automatic IP address assignment by DHCP server. If this box is checked, the IP address fields for manual input $(10, (11), (12), (13))$ are disabled.
2	MAC address of web server
3	Host name/network name of web server
4	HTTP port of web server
5	Administrator password for login to web server
6	Back to >>Device settings<< menu. All entries made are ignored.
7	Apply changes and restart METPOINT [®] BDL
8	Assign new MAC address to web server
9	Takes a screenshot of the current configuration settings. This screenshot can be saved to an USB memory stick or the SD card of the METPOINT [®] BDL.
10	IP address of web server (enter only if no DHCP server is used)
11	Subnet mask of web server (enter only if no DHCP server is used)
12	Gateway address of web server (enter only if no DHCP server is used)
13	DNS address of web server (enter only if no DHCP server is used)

NOTICE	Enabling remote access
	To enable remote access to the web server from outside the network, you might need to change the firewall settings and set up a VPN connection.

13.8.3.3. User interface

The user interface can be called up with any conventional web browser. To call up the user interface, enter the IP address of the web server in the address bar of the web browser (e.g. http:\\172.16.4.56). The start page is the information page.

13.8.3.3.1. Information

This page shows all relevant system information of the METPOINT® BDL in the form of a table.

ВЕКО	BDL the quality of your compressed air	18.3.2016-09.22.30 Vells User admin <mark>Logouti</mark> et 8.3
english •	Manager B.	System Information
	Brandname	BDL
Info	Company	BEKO TECHNOLOGIES
Favourites	Senalnumber	06140407
Status	Hardware Version	V0.00
Screen	Software Version	V4.07
Chart	Channel Version	V0.05
MailOnAlarm	Language Version	V1.66
	WebUI Version	V1.06
Users/Passw.	Total Channels	12
e.man comig	Hostname	BDLHQBEC
	Calling IP	172 16 26 141
	Logger State	nun
	Alarm State	OK

Designation	Description
Series/brand name	Device product name
Company	Device manufacturer
Serial number	Serial number of device
Hardware version	Current hardware version
Software version	Current software version
Channel version	Current channel version
Language version	Current language versions
WebUI version	Current version of web interface (WebUserInterface)
Total number of chan- nels	Number of available channels at METPOINT® BDL
Host name	Network name of METPOINT [®] BDL - see also chapter 13.8.3.2.1, page 92
Called from IP	IP address of PC from which the web server is accessed
Logger status	Current status of data logger
Alarm status	Current alarm status

13.8.3.3.2. Selecting language

The web server user interface language is factory-set to German. If required, choose a different language from the dropdown list (1).



Available languages:

- German English
- •

NOTICE	Restriction of access
	Access to certain menu options is restricted. To have read and write access to all settings, you must log in ⁽²⁾ as Administrator and enter the password specified in 13.8.3.2.1, page 92 (e.g. 1234).
	For the configuration of additional users, call up the User menu, see chapter 13.8.3.11, page 99.

METPOINT® BDL

13.8.3.4. Login

To log in to the web server, press the >>Login << \bigcirc button.

BEKO	BDL the quality of your compressed air			18.3.2016 - 09:22:30 Vole: 14 User: admin: Lagout-
english •	A second design of the second s	System Information		
	Brandname		BDL	

To be read and write access to all settings, you must log in as Administrator.

Username	admin	
Password	1	

User name: admin
Password: e.g. $1234 \rightarrow see 13.8.321$ page 92
1 doomond: o.g. 1201 · 000 rononon211, page 02

NOTICE	Restriction of access
\bigcirc	For the configuration of additional users and access rights, call up the User menu, see chap- ter 13.8.3.11, page 99.

13.8.3.5. Favourites

This menu provides access to 4 user-defined web pages (favourites) that can be configured for the display of measurements. This menu is accessible without prior login.



No.	Description
1	Select user-defined page (favourite)
2	Select channels and measurements to be displayed
3	Select update interval for display
4	Select font size for measurements

13.8.3.6. Status

The status menu shows the statuses of the individual relays and the data logger.



13.8.3.7. Current value

This menu shows the current measurements transmitted by the connected sensors. You have the option to narrows the overview down to selected sensors and measurements.

next U	pdate (1) in 59 sec		12		Actual Values (18.	3.2016 - 09:25:14)		
	show S	ensors				show Values	5	
1 + 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11 + 12 + 13 + 14 + 15				15 2 +1+2+3+4+5+6+7+8				
Channel	Value 1	Value 2	Value 3	Value 4	Value 5	Value 6	Value 7	Value 8
\$1 (A1) dew point KAT in	A1a 23.51 'C	A1b 8.05 %RH	A1d -12.58 'Ctd					
S2 (A2) pressure KAT in	A2a 0.08 bar				~	-	-	
53 (A3) pressure KAT out	A3a 0.07 bar		3 1	-	-	-	-	
S4 (A4) dew point KAT out	A4a 23.12 'C	A4b 6.91 %RH	A4d -14.75 *Ctd		-	-	-	-
S5 (B1) pressure x.x.x	B1a 9.019 bar		=	-	-	-	~	-
S6 (B2) oil vapor	B2a 8.0003 mg/m*				-			
87 (B3) flow x.x.2	83a 73.270 m ³ /h	B3b 109968 m ³	B3c 45,992 m/s	-	-		-	-
\$8 (B4) flow x.x.1	84a 10.689 m ⁴ /h	54b 34628 m ⁴	54c 5.710 m/s	-	-		-	-
S9 (C1) dew point x.x.2	C1a 22.60 10	C15 26.87 %RH	C1c 2.66 *Ctd					
S10 (C2) pressure x.x.2	C2a 8.82 bar	3		-	<	-	3	-
S11 (C3) dew point x.x.1	C3a 22.58 °C	C3b 29.38 %RH	C3c 3.90 *Ctd	-	-	-	-	-
\$12 (C4) pressure x.x.1	C4a Range ? bar			-	-	-	-	-
\$13 (V1) V12	Verbrauch 144596 m ^y	Kosten 2602.73 €	-			-		~
S14 (V2) delta P KAT	0.00 bar			-	=	-	-	-
S15 (V3) delta P Production hall	0.20 bar							

No.	Description
1	Select sensors to be displayed
2	Select measurements to be displayed
3	Select update interval for display
4	Select font size

13.8.3.8. display

The menu shows the current METPOINT[®] BDL GUI and enables you to configure the BDL. The display is automatically updated every 60 seconds. It is thus not a real-time display.

BEKO	BDL the quality of your compressed air			18.3.2016 - 09.26.20 Vee Usettadmin Logad in 1	5 11 436
english •		Actual MMI-Screen (18.3:2016 - 09:26:20)		
		*** BEKO TECHNOL	OGIES *** BDL ***		
Info Favourites Status Actuals Screen Chart		Chart	Alarm oververw		
MailOnAlarm		Chart/Real time values	Consumption report		
Users/Passw EMail Config.		Channels	Import / Export		
		Real time values	Settings		
		Transmit Province 2.07	Stown Alarm Lynns eal = 5 sec 18,03,2010		
	Chan/R7	Charmelle, Realtime	Alarm Report	Settings	
		Alarm	State		
	Relay 1	Relay 2	Relay 3	Rolay 4	
	OK.	OK	OK	OK	
		Logge	r State		
	state	time ir	nterval	remaining capacity	
	run	53	0C.	304 days	

No.	Description
1	Current METPOINT [®] BDL touch screen display
2	Buttons for the operation and configuration of the METPOINT [®] BDL
3	Current alarm status of relays
4	Current status of data logger

Press the buttons ⁽²⁾ to change the settings as if you were operating the BDL on site.

13.8.3.9. Chart

This menu is used to view charts. All measurements stored on the SD card can be displayed in the form of charts.



No.	Description
1	Selection of measurements stored on the SD card Press the >>previous<< and >>next<< to move to the previous/next data record
2	Period for the display of the measurements
3	Select channel to be displayed
4	Draw chart for selected channel
5	Chart plotting area
6	Select measurements to be displayed

13.8.3.10. AlarmMail

This menu allows you to have e-mail alerts sent to certain e-mail addresses, if a limit value is exceeded.



The content of the message is preset, but you can add a brief comment.

	BDL ALARM
	Event: 12.06.2012 18:14:57
	Alarm for Relais_1 Level_1 Comment: Flowmeter FS109 - Alarm
(2)-	Channel (A1) "FS109" Value "A1c"
\bigcirc	Actual = 5.42 m/s > 2.0000 ms (Limit ± Hyst.)
	End of message

No.	Description
1	Brief comment re. alert
2	Channel and measurement
3	Measured value and respective alarm limit



13.8.3.11. User

In this menu, you can configure the users of the web server and define their access rights.

ВЕКО	BDL the quality of your compressed air				18.3.2016 - 11:25:11 Valls: 11 User; admin <mark>Logott</mark> in: 14.67
english *		1	User & Password Serting		
		Usernanie	Pasaword	Group	
Info Favourites		visitor		Misitor	
Status		(LESART)	The finance	User	
Screen		operator		Operator •	
Char			1	Visitor.	
MailOnAlarm			1	13 Garden - 1	
Users/Passw.			1 1 3	Visitor	
EMail Config				Visitor •	
			Submit Refresh		
		1-	tarrent lange	-	

The access rights are assigned to user groups. The available user groups are listed in the table below:

		Access rights								
User groups	Info	Status	display	Chart	AlarmMail	User/mail recipi- ent management				
no login	Х									
Guest	Х	Х	Х							
User	Х	Х	Х	Х						
Operator	Х	Х	Х	Х	X					
Administrator	Х	Х	Х	Х	Х	Х				

Available:

min. 4 characters; max. 12 characters No special characters

13.8.3.12. EMail

This menu is used to set up e-mail recipients for alarm mails. You also have the option to test the e-mail alert function. For configurations, consult your IT department.

ВЕКО	BDL the quality of your compressed air			18.3.2016 - 11.25.56 Vales 11 User: admin Logout In: 14:57
english *		1	EMail Configuration	
Terfe		from	bdl@beko-(echnologies.com	
Favourites		to rep 1	kaweh alizadeh@beko-technologies.com	
Actuals		to rop 2		
Chart		Mail Account ServerName	1172.16.1.32	
MalOnAlarm		SMTP Port	26	
		need Authentification		
EMail Config			Test EMail setting	
			Submit Refresh	

Press the >>Test e-mail settings<< button to call up a browser window showing the process of the test.

EMail Test ... OK see below MailServer IP = 172.16.1.32 try to Connected Connected tcp_close !!!! NG !!!! SMTP-Task ready

Successfully completed e-mail test

13.9. Exporting data

This menu allows you to export stored data to a USB memory stick.

Main menu ► Export data

	***	Import / Export ***
	Export Logger data	
	Export Screenshots	
	Export system settings	Import system settings
	Export Report (.csv)	
💼 Ho	ome	

Press the Export logger data, Export system settings, and Export report buttons to export the measuring data as well as the settings to a USB memory stick.

Main menu ► Export data ► Export logger data

	*** Export Logger data ***							
	Date	Time	Comment					
start	31.07.2015	14:01:53	no comment	Change				
end	31.07.2015	14:01:53	no comment	Change				
			Files to export: 1					
	export							
Back								

Main menu ► Export data ► Export logger data ► Selection

								_		
		1				_				
	<		31	July 20	15		>			
Da	Mon	Tue	Wed	Thu	Fri	Sat	Sun			
start 21.07			1	2	3	4	5			
	6	7	8	9	10	11	12		8.	
end 31.07	13	14	15	16	17	18	19	Char	98	
	20	21	22	23	24	25	26			
	27	28	29	30	31					
export										
					1					
				OK						
Back					_					

Press the Select buttons to select the Start and End time of the period you with to export. The stored measured data captured within the set period is exported.

The selected date is highlighted in green. Sundays are highlighted in red.

The buttons of dates for which there are measuring data are raised.

ſ	2 File(s) exist on 31.07.2015, Please select	
	File name START STOP Comment	
	S150731B 14:01:53 14:01:53 no comment]
	S150731A 09:06:07 09:06:07 no comment	
	OK	

If there are several measurements for a date, they are listed after you have confirmed the selected date with OK.

Select the desired record from the list.

Main menu ► Export data ► Export logger data ► Export

The measuring data of the selected period are exported to a USB memory stick.

Main menu Export data
Export system settings

Press the Export system settings button to export all existing sensor settings to a USB memory stick.

Main menu ► Export data ► Export report

Press the Export report button to export the Report in CSV format to a USB memory stick.

13.9.1. Creating screenshots

To create a screenshot, press



Screenshots can be taken in the following menus:

- Main menu ► Charts ► -
- Main menu ► Chart/current values ► Main menu ► Channels ► Main menu ► Current values ► -
- _
- -
- Main menu ► Settings ► Sensor Settings





The screenshots can be saved to a USB memory stick or the SD card.

The screenshots are automatically dated (current date) and numbered consecutively.

Syntax of the screenshot file name: Dyymmdd = Identifier (D=date) D yy = Year (last 2 digits)mm = Month dd = Day

File path: DEV0001/Hostname/Bitmap

For more information regarding the host name, see: Main menu ► Settings ► System overview

Example:

First screenshot created on 26 February 2014 \\DEV001\DE-5001/Bitmap/D140226\B00000. bmp

13.9.2. Exporting screenshots

The saved screenshots can be exported to a USB memory stick.

Main menu ► Export data

	***	Import / Export ***
	Export Logger data	
	Export Screenshots	
	Export system settings	Import system settings
	Export Report (.csv)	
🚖 Ho	ome	

To export the saved screenshots, press the Export screenshots button.

Main menu ► Export data ► Export screenshots



Main menu ► Export data ► Export screenshots ► Selection

	<		3 A	ugust 20)15		>	
	Mon	Tue	Wed	Thu	Fri	Sat	Sun	
Sull's						1	2	
end	3	4	5	6	7	8	9	
	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	
Filles I	24	25	26	27	28	29	30	
	31							
					1			
				OK				

Press the Select buttons to define the period for which you wish to export the screenshots.

All the screenshots that have been created during this period are exported when the Export button is pressed.

The selected period is highlighted in green.

The buttons of dates for which there are measuring data are raised (bold print).

14. Cleaning/decontamination

NOTICE	Cleaning
	The METPOINT [®] BDL has a cleaning function which protects the display against unintentional operation when cleaning it. For details, see chapter 13.7.3.

Clean the METPOINT[®] BDL with a slightly damp (not wet) cotton cloth or disposable wipe, and a mild, conventional cleaner/soap.

To decontaminate the device, spray the decontamination product on a clean cotton cloth or disposable wipe and thoroughly wipe the device. Then dry the device with a clean cloth or let it dry at room temperature.

Observe the locally applicable hygiene regulations.

WARNING	Risk of damage to device
	Excessive humidity, the use of hard and pointed implements and aggressive cleaners can cause damage to the data logger and to the integrated electronic components.

Preventive measures

- Never clean the device with a wet cloth.
- Do not use aggressive detergents.
- Do not clean or operate the device with hard or pointed implements.

15. Dismantling and disposal

Disposal of the device according to the WEEE Directive (Waste Electrical and Electronic Equipment): Electrical and electronic waste must not be disposed as normal household waste. To dispose of the product, dismantle it. Materials such as glass, plastics and some chemical compounds are, recoverable, reusable, or recyclable.

According to the above Directive, the METPOINT[®] BDL is classified in category 9. According to §5, section 1 of the German Electrical and Electronic Equipment Act (ElektroG), the METPOINT[®] BDL is not subject to any restrictions regarding hazardous substances. According to §9, section 7 (ElektroG),

the METPOINT® BDL from BEKO TECHNOLOGIES GmbH can be returned to the manufacturer for disposal.

WARNING	Risk to health and the environment!
	Never dispose of the device with normal household waste! Depending on the medium used in the device, it might be contaminated with residues that can pose a risk to health and the environment. Therefore, take suitable protective measures and dispose of the device through the proper channels.

Actions:

When dismantling components, clean them without delay to remove any medium residue.

16. Declaration of Conformity

BEKO TECHNOLOGIES GMBH Im Taubental 7 41468 Neuss, GERMANY Tel: +49 2131 988-0 www.beko-technologies.com



EU-Konformitätserklärung

Wir erklären hiermit, dass die nachfolgend bezeichneten Produkte den Anforderungen der einschlägigen Richtlinien und technischen Normen entsprechen. Diese Erklärung bezieht sich nur auf die Produkte in dem Zustand, in dem sie von uns in Verkehr gebracht wurden. Nicht vom Hersteller angebrachte Teile und/oder nachträglich vorgenommene Eingriffe bleiben unberücksichtigt.

Produktbezeichnung:	METPOINT® BDL
Тур:	BDL04, BDL08, BDL12
Spannungsversorgung:	100 240 VAC / 1Ph. / PE / 50-60 Hz
IP-Schutzart	IP65
Umgebungstemperatur:	0 +50°C
Datenblatt:	DB_BDL-0114-FP-A
Produktbeschreibung und Funktion:	Datenlogger zur stationären Messdatenerfassung und Speicherung, für industrielle Anwendungen.
Niederspannungs-Richtlinie 2014/35/EU Angewandte harmonisierte Normen:	EN 61010-1:2010

EMV-Richtlinie 2014/30/EU Angewandte harmonisierte Normen:

EN 61326-1:2013

ROHS II-Richtlinie 2011/65/EU

Die Vorschriften der Richtlinie 2011/65/EU zur Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten werden erfüllt.

Die Produkte sind mit dem abgebildeten Zeichen gekennzeichnet:

CE

Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller.

Neuss, 20.04.2016

Unterzeichnet für und im Namen von: BEKO TECHNOLOGIES GMBH

i.V. Christian Riedel Leiter Qualitätsmanagement International

CE_BDLc-858-0416-FP-A

BEKO TECHNOLOGIES GMBH Im Taubental 7 41468 Neuss, GERMANY Phone: +49 2131 988-0 www.beko-technologies.com



EU Declaration of Conformity

We hereby declare that the products indicated hereafter comply with the stipulations of the relevant directives and technical standards. This declaration only refers to products in the condition in which they have been placed into circulation. Parts which have not been installed by the manufacturer and/or modifications which have been implemented subsequently remain unconsidered.

Product designation:	METPOINT [®] BDL
Types:	BDL04, BDL08, BDL12
Power supply:	100 240 VAC / 1-phase / PE / 50-60 Hz
Degree of protection	IP65
Ambient temperature:	0+50°C
Data sheet:	DB_BDL-0114-FP-A
Product description and function:	Data logger for stationary data recording and storage; designed for industrial applications
Low Voltage Directive 2014/35/EU	EN 64040 4 0040
Applied narmonized standards:	EN 61010-1:2010

EMC Directive 2014/30/EU Applied harmonized standards:

EN 61326-1:2013

RoHS II Directive 2011/65/EU

The products meet the requirements laid down in European Directive 2011/65/EU concerning the restriction of the use of certain hazardous substances in electrical and electronic devices.

The products bear the CE Mark:

CE

This Declaration of Conformity has been issued by the manufacturer.

Neuss, 20/04/2016

Signed: BEKO TECHNOLOGIES GMBH

ppa Christian Riedel Head of International Quality Management

EN
Headquarter Deutschland / Germany BEKO TECHNOLOGIES GMBH Im Taubental 7 D - 41468 Neuss Tel. +49 2131 988 0 beko@beko-technologies.de	United Kingdom BEKO TECHNOLOGIES LTD. Unit 11-12 Moons Park Burnt Meadow Road North Moons Moat Redditch, Worcs, B98 9PA Tel. +44 1527 575 778 info@beko-technologies.co.uk	France BEKO TECHNOLOGIES S.à.r.I. Zone Industrielle 1 Rue des Frères Rémy F - 57200 Sarreguemines Tél. +33 387 283 800 info@beko-technologies.fr
Benelux BEKO TECHNOLOGIES B.V. Veenen 12 NL - 4703 RB Roosendaal Tel. +31 165 320 300 benelux@beko-technologies.com	中华人民共和国 / China BEKO TECHNOLOGIES (Shanghai) Co. Ltd. Rm. 606 Tomson Commercial Building 710 Dongfang Rd. Pudong Shanghai China P.C. 200122 Tel. +86 21 508 158 85 info.cn@beko-technologies.cn	Česká Republika / Czech Republic BEKO TECHNOLOGIES s.r.o. Na Pankraci 58 CZ - 140 00 Praha 4 Tel. +420 24 14 14 717 info.cz@beko-technologies.cz
España / Spain BEKO Tecnológica España S.L. Torruella i Urpina 37-42, nave 6 E - 08758 Cervelló Tel. +34 93 632 76 68 info.es@beko-technologies.es	中華人民共和國香港特別行政區 / Hong Kong SAR of China BEKO TECHNOLOGIES LIMITED Unit 1010 Miramar Tower 132 Nathan Rd. Tsim Sha Tsui Kowloon Hong Kong Tel. +852 5578 6681 (Hong Kong) Tel. +86 147 1537 0081 (China) tim.chan@beko-technologies.com	India BEKO COMPRESSED AIR TECHNOLOGIES Pvt. Ltd. Plot No.43/1 CIEEP Gandhi Nagar Balanagar Hyderabad IN - 500 037 Tel. +91 40 23080275 madhusudan.masur@bekoindia.com
Italia / Italy BEKO TECHNOLOGIES S.r.I Via Peano 86/88 I - 10040 Leinì (TO) Tel. +39 011 4500 576 info.it@beko-technologies.com	日本 / Japan BEKO TECHNOLOGIES K.K KEIHIN THINK Building 8 Floor 1-1 Minamiwatarida-machi Kawasaki-ku, Kawasaki-shi JP - 210-0855 Tel. +81 44 328 76 01 info@beko-technologies.jp	Polska / Poland BEKO TECHNOLOGIES Sp. z o.o. UI. Pańska 73 PL - 00-834 Warszawa Tel. +48 22 314 75 40 info.pl@beko-technologies.pl
South East Asia BEKO TECHNOLOGIES S.E.Asia (Thailand) Ltd. 75/323 Soi Romklao, Romklao Road Sansab Minburi Bangkok 10510 Tel. +66 2-918-2477 info.th@beko-technologies.com	臺灣 / Taiwan BEKO TECHNOLOGIES Co.,Ltd 16F5 No.79 Sec.1 Xintai 5th Rd. Xizhi Dist. New Taipei City 221 Taiwan (R.O.C.) Tel. +886 2 8698 3998 info.tw@beko-technologies.tw	USA BEKO TECHNOLOGIES CORP. 900 Great SW Parkway US - Atlanta, GA 30336 Tel. +1 404 924-6900 beko@bekousa.com

Translation of the original instructions. Original instructions are in German. Subject to technical changes. Errors and omissions excepted. metpoint_bdl_manual_en_10-045_v07