

EN - english



## Instructions for installation and operation

Data Display

**DD 109**



Dear customer,

Thank you very much for deciding in favour of the data display DD 109. Please read this installation and operation manual carefully before mounting and initiating the device and follow our advice. A riskless operation and a correct functioning of the data display are only guaranteed in case of careful observation of the described instructions and notes.

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### 1 Safety instructions



**Please check whether this manual corresponds with the instruments type.**

Please observe all notes indicated in this instruction manual. It contains essential information which have to be observed during installation, operation and maintenance. Therefore this instruction manual has to be read categorically by the technician as well as by the responsible user / qualified personnel before installation, initiation and maintenance.

This instruction manual has to be available at the operation site of data display at any time.

Regional respectively national regulations have to be observed in addition to this instruction manual if necessary.

In case of any obscurities or questions with regards to this manual or to the instrument please contact BEKO TECHNOLOGIES.



**Warning!**

**Supply voltage!**

**Contact with supply voltage carrying non-insulated parts may cause an electric shock with injury and death.**

**Measures :**

- Observe all applicable regulations for electrical installations (e. g. VDE 0100)!
- **Carry out maintenance work only in strainless state!**
- All electric works are only allowed to be carried out by authorized qualified personnel.



**Warning !**

**Inadmissible operating parameters !**

**Undercutting or exceeding of limit values may cause danger to persons and material and may lead to functional and operational disturbances.**

**Measures :**

- Make sure that the data display is only operated within the admissible limit values indicated on the type label.
- Careful observation of the performance data of the data display in connection with the application.
- Do not exceed the admissible storage and transportation temperature.

### Further safety instructions:

- Also the applicable national regulations and safety instructions have to be observed during installation and operation.
- The data display is not allowed to be used in explosive areas.

### Additional remarks:

- Do not overheat the instrument!



#### **Attention !**

#### **Malfunctions at the data display**

**Faulty installation and insufficient maintenance may lead to malfunctions of the data display which may affect the measuring results and which may lead to misinterpretations.**

## Field of application

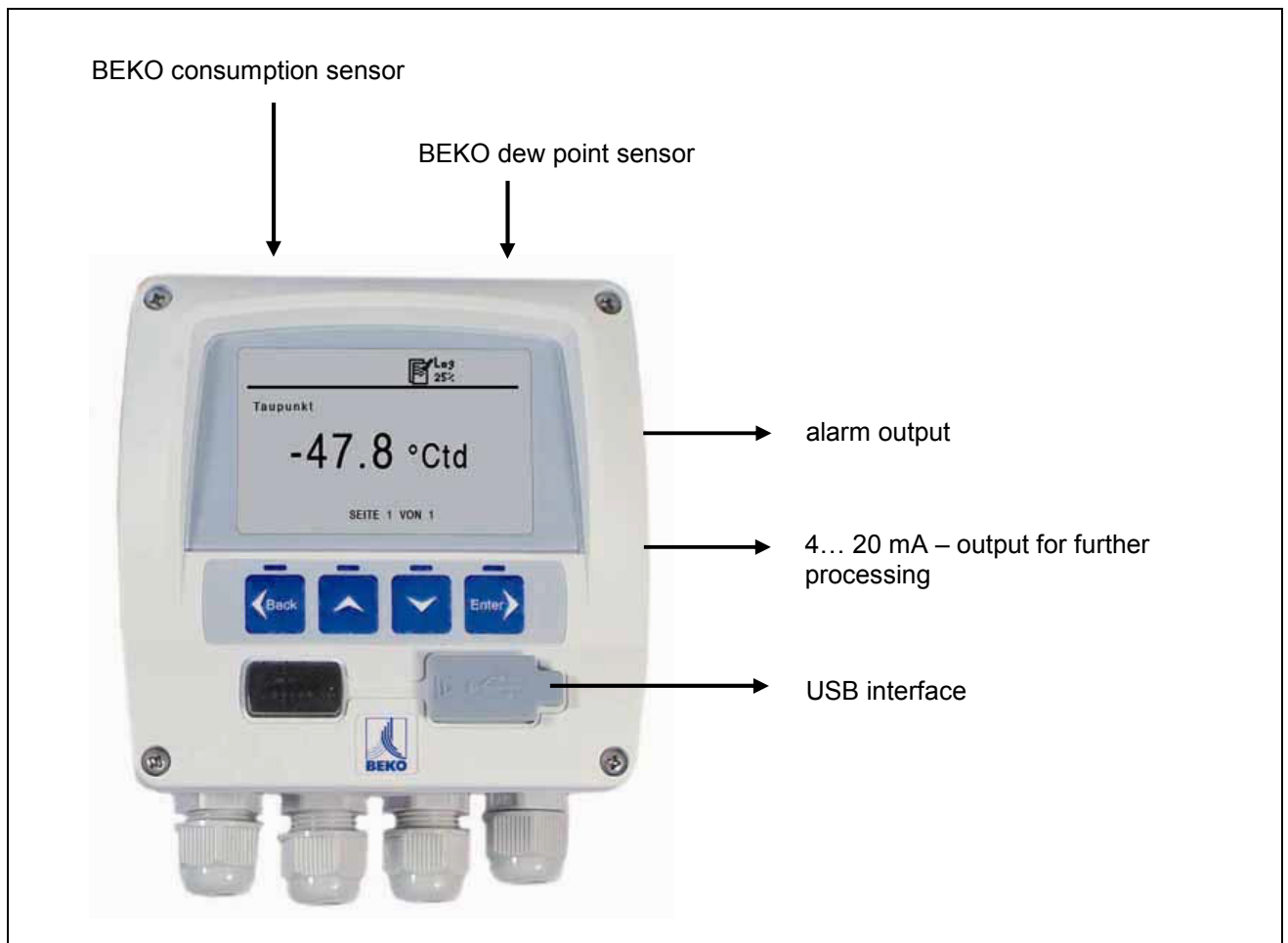
### 2 Field of application

- The data display is a stationary display instrument with data logger e. g. for corresponding consumption and dew point sensors (please see "Technical data")
- The data display is used e. g. in the following applications
  - Flow station
  - Dew point set
- For functioning the data display requires an operating voltage (see Technical data).
- The data display is not suitable for an application in explosive areas


### 3 Functions of the data display

- Graphics display for an easy user interface
- Flexible voltage supply: 100... 240 VAC/ 50... 60Hz
- 2 inputs for BEKO consumption and dew point sensors
- 4... 20 mA – output for further processing
- 2 relay outputs for alarm
- USB interface
- Housing mountable at the wall or in the panel
- Data logging function for 1,000,000 values

### 4 Data display with sensors

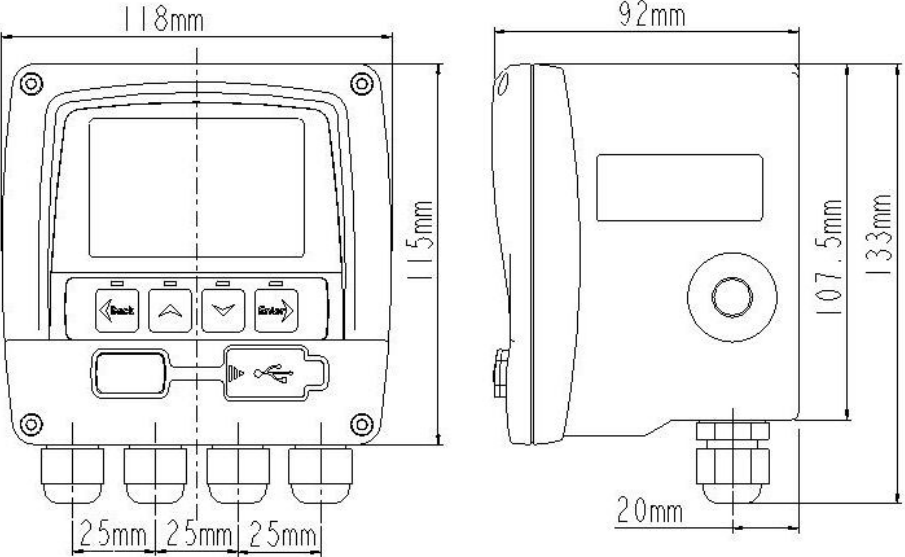
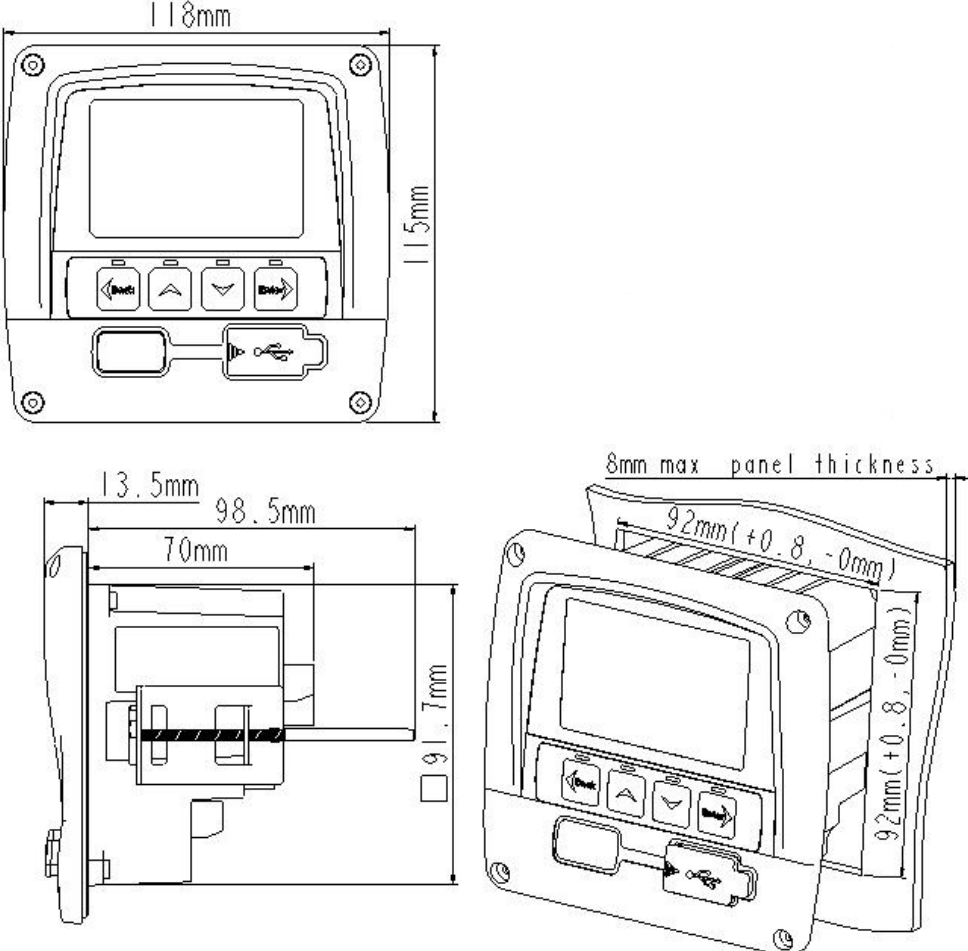


5 Technical data

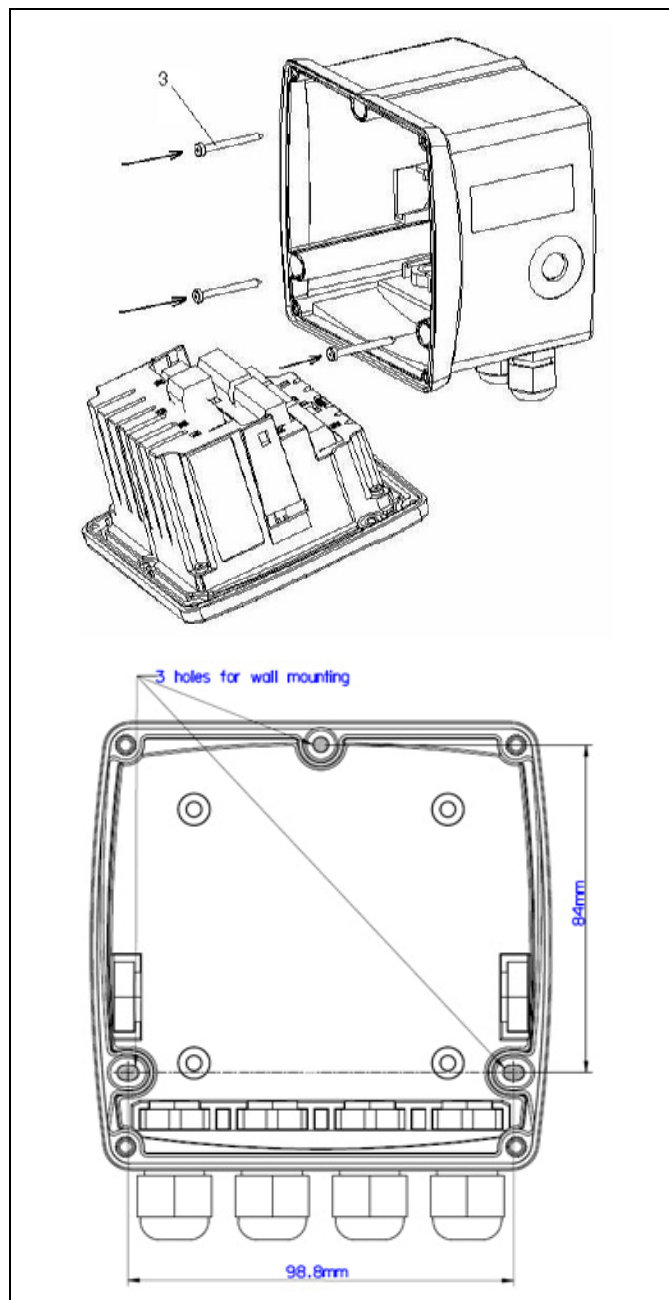
	
Dimensions wall housing	Dimensions: 118mm x 115mm x 93mm
Dimensions panel mounting	Dimensions: 92mm x 92mm
Housing material	ABS synthetic material
Protection type housing	IP 65
Operating temperature	0... 50°C
Transportation temperature	-20... 70 °C
Sensor inputs	2 inputs for dew point and consumption sensors (optional 2 analogue inputs)
Interface	USB
Keypad	4 keys
Power supply	100 .... 240 VAC / 50-60 Hz / 10 VA
Display	Graphics display, 160 x 100 pixels
Settings	The data display is supplied with standard settings
Alarm output	2 relays, 230 VAC, 3 A, potential-free, change-over contact
Analogue output	Connection of the 4... 20 mA signals of the dew point and consumption sensors (maximum burden < 500 Ohm)
Data logger	<ul style="list-style-type: none"> <li>▪ up to 1,000,000 values</li> <li>▪ start time programmable and manually adjustable</li> <li>▪ logging interval, Min. 1 Sec., Max. 59 Min. 59 Sec.</li> <li>▪ average value storage</li> </ul> <p>Factory settings:                      Logging interval 10 Sek.                      Wrap around mode                      The data logging starts as soon as the instrument is put into operation</p>
Software	The BEKO software SW 109 is available as an option. With this software all settings can be done at DD 109 and the logger data can be read-out.

# Dimensions

## 6 Dimensions

 <p>118mm</p> <p>115mm</p> <p>92mm</p> <p>107.5mm</p> <p>133mm</p> <p>20mm</p> <p>25mm 25mm 25mm</p>	<p>Dimensions wall housing</p>
 <p>118mm</p> <p>115mm</p> <p>13.5mm</p> <p>98.5mm</p> <p>70mm</p> <p>91.7mm</p> <p>8mm max panel thickness</p> <p>92mm (+0.8, -0mm)</p> <p>92mm (+0.8, -0mm)</p>	<p>Dimensions for panel mounting</p>

7 Mounting



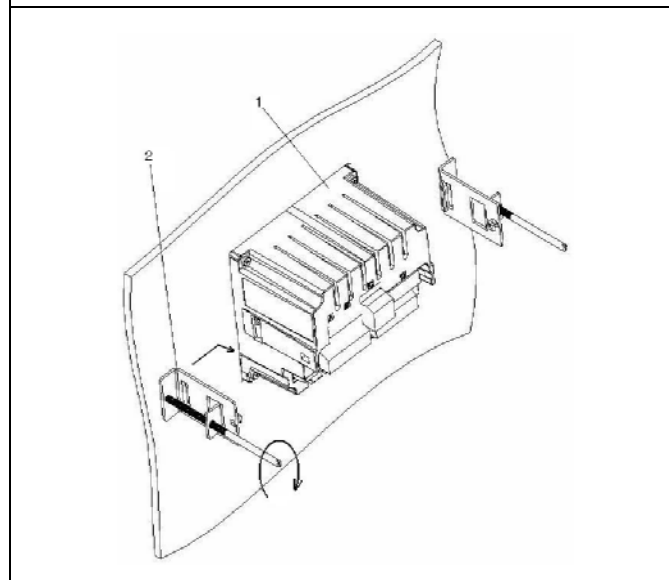
Mounting wall housing:

The cables for sensors and for the power supply are already wired at DD10:

- Do not connect mains cable to the power line
- Release the 4 screws at the front housing
- Remove plug from the reverse side of the front housing
- Drill holes into the wall according to the given grid dimension (please see drawing)
- Mount wall housing (anchor and screws included in the scope of delivery)
- Attach again plug for the power supply and for the sensors
- Insert the front housing into the wall housing and tighten the 4 screws

At DD 109 the cables for sensors and for the power supply are not wired:

- Release the 4 screws at the front housing
- Drill holes into the wall according to the given grid dimension (please see drawing)
- Mount wall housing (anchor and screws included in the scope of delivery)
- Carry out wiring of the power supply and the sensor(s) according to the below instructions
- Insert the front housing into the wall housing and tighten the 4 screws
- Tighten the clamp screwings of the cables



Panel mounting

- Cut-out  
92 mm (+0.8, -0.0) x 92 mm (+0.8, -0.0)  
Maximum sheet thickness 8 mm (see above drawing)
- Insert front housing for panel mounting into the prepared cut-out
- Insert the fixing clips and fix the housing by twisting the thread rods
- Carry out wiring of the power supply and the sensor(s) according to the below instructions

## Plug reverse side

### 8 Plug reverse side

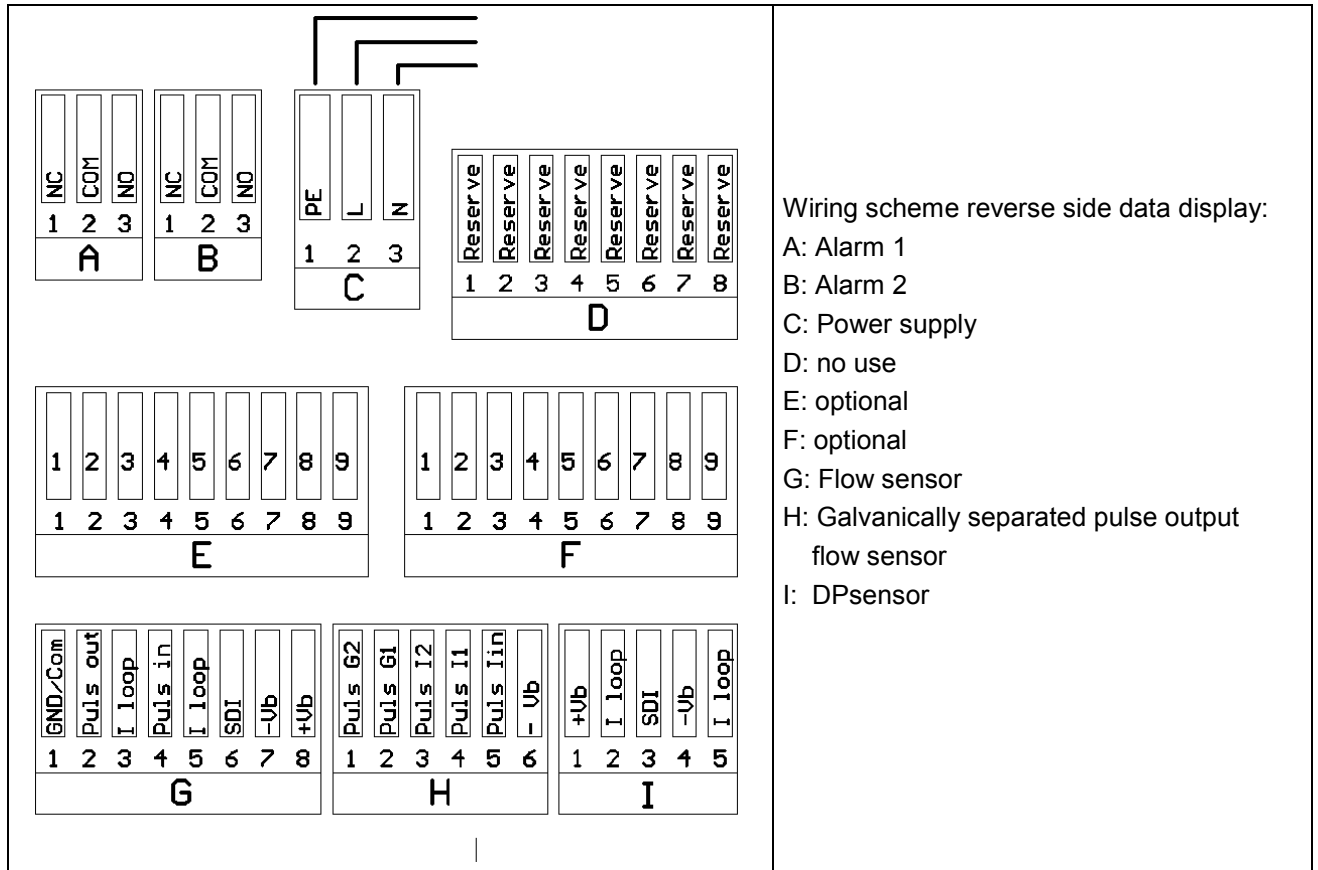
Supply:

AWG12 – AWG24, cable cross-sections: 0.2 ... 2.5 mm<sup>2</sup>

Signals:

AWG16 ... AWG28, cable cross-sections: 0.14 ... 1.5 mm<sup>2</sup>

### 9 Connecting diagram reverse side

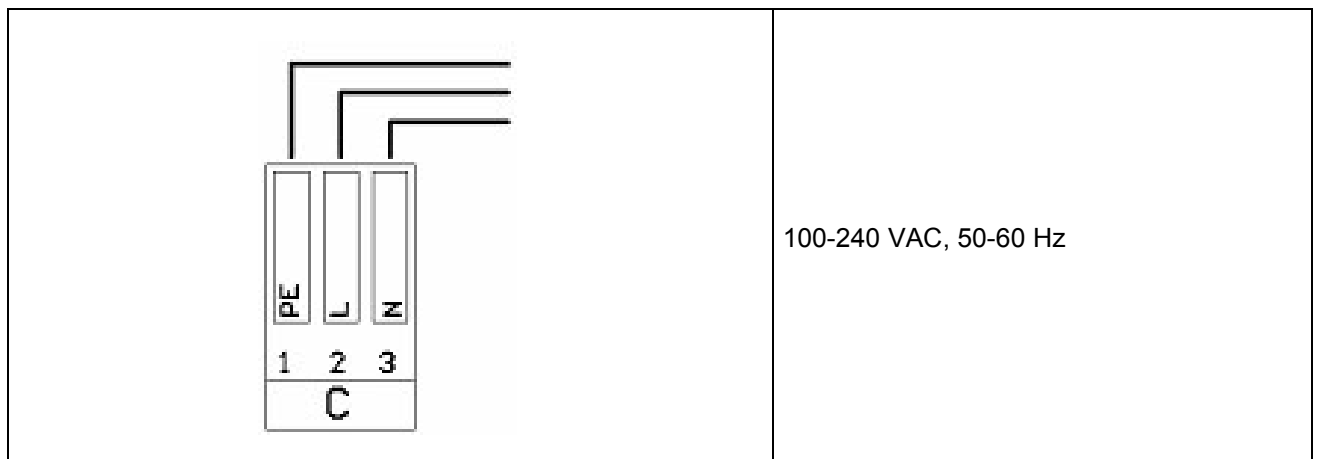


Important information:

Please make sure that the configuration you ordered has been matched with the sensors.

### 10 Connecting diagrams

#### 10.1 Power supply



10.2 Alarm connection

NC and COM are closed in case of:

- alarm
- power failure
- sensor break

11 Analogue current signal

The flow sensor and the DP sensor offer the possibility to provide the measured values as analogue current signal 4...20 mA for further process treatment . The connection schemes have already been set for this.

11.1 Analogue current signal flow sensor

Terminal G "Flow sensor"

The flow sensor is connected to the clamps at terminal G according to the scheme indicated at the left. The analogue signal (4...20mA) is at clamp 1 and 3 and can be tapped if required (maximum burden < 500 Ohm)

11.2 Analogue current signal DP sensor

Terminal I „DP sensor“

The DP sensor is connected to the clamps at terminal I according to the scheme indicated at the left. The analogue signal (4...20mA) is at clamp 1 and 2 and can be tapped if required (maximum burden < 500 Ohm). If the analogue signal is not used a wire jumper has to be inserted here obligatorily (factory-provided)

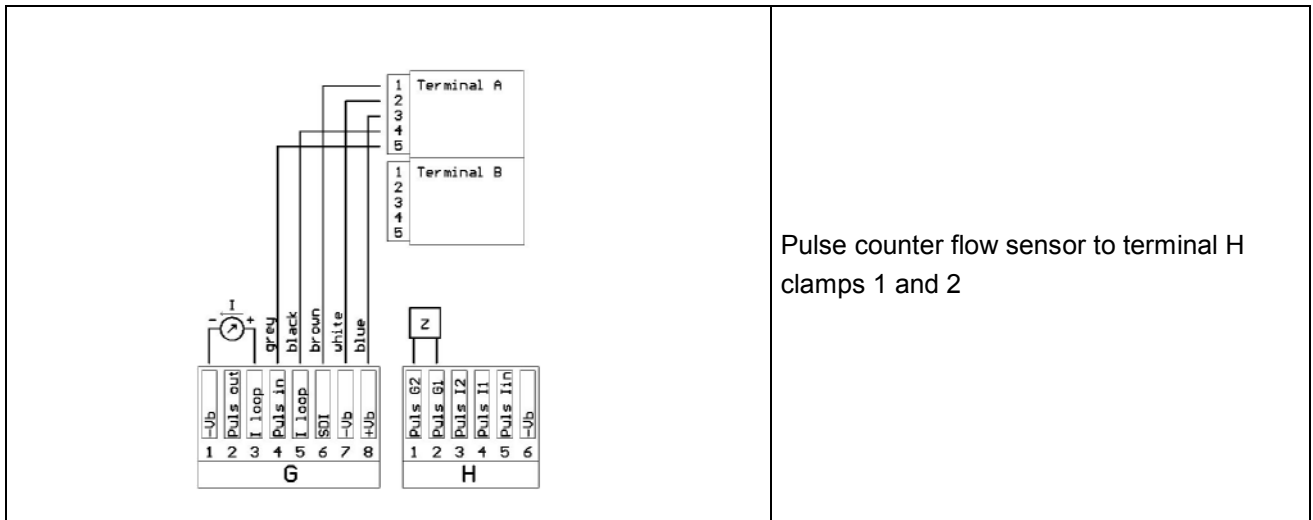
## Galvanic isolated pulse output

### 12 Galvanic isolated pulse output

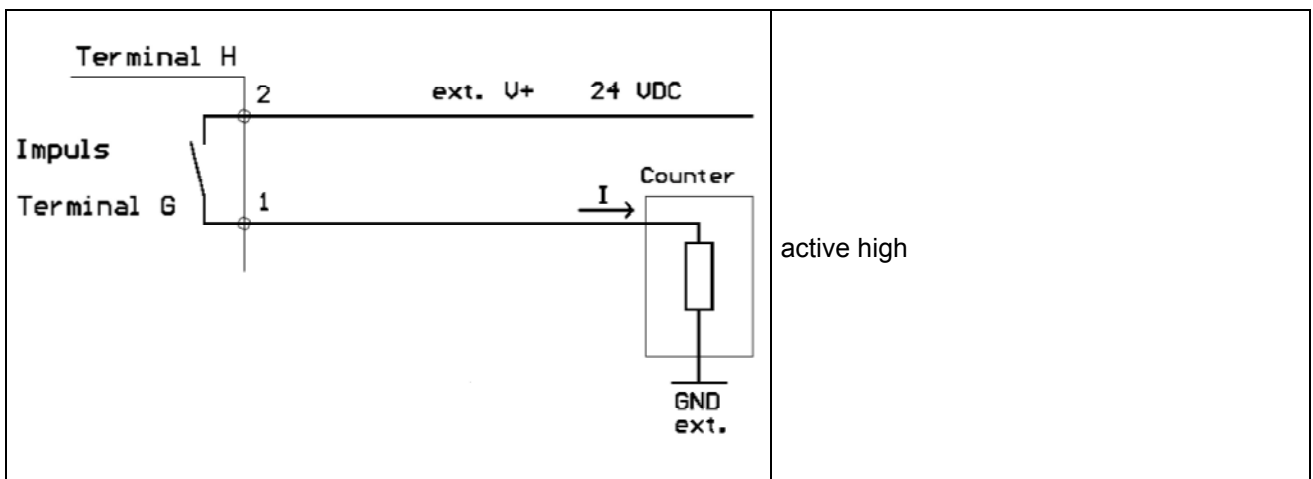
A galvanic isolated pulse output is available for the flow sensor. It deals with a semi-conductor relay which is galvanic isolated from the supply voltage by means of optoelectronic couplers.

Maximum switching capacity :  $U_{max}$ : 32V,  $I_{max}$ : 20 mA

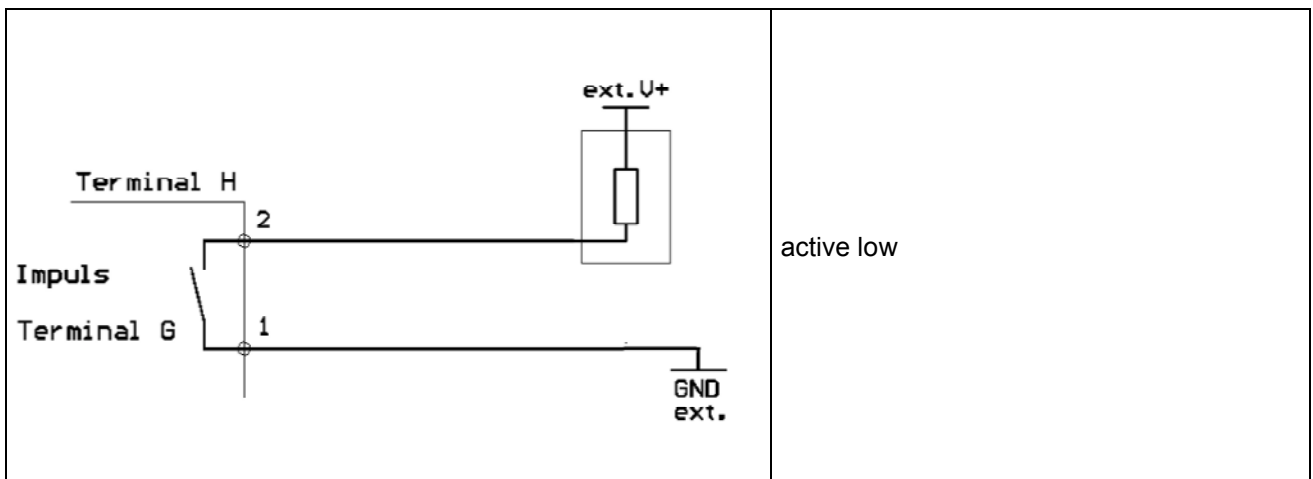
#### 12.1 Connecting diagram pulse output flow sensor



### 13 Connection pulse: active high



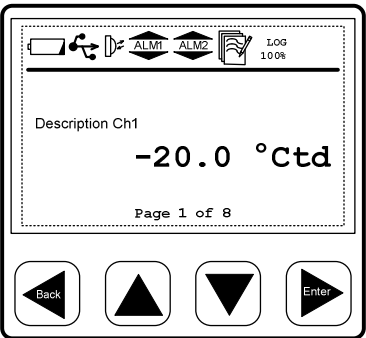
#### 13.1 Connection pulse: active low










## 14 Operation

The measured values will be indicated page by page. Depending on the sensor and the settings one or several values can be indicated on one display page. These settings can be changed via the optional software or - on request - by BEKO TECHNOLOGIES.

### 14.1 Description of the display icons

	<p>Status display</p> <p>Indication of measured value: Only one page of measured values will be shown at a time. The user can utilize the „arrow up“ or „arrow down“ keys in order to scroll through all available pages.</p> <p>Page view indication: Shows the current number of pages of measured values as well as the total number of pages.</p>
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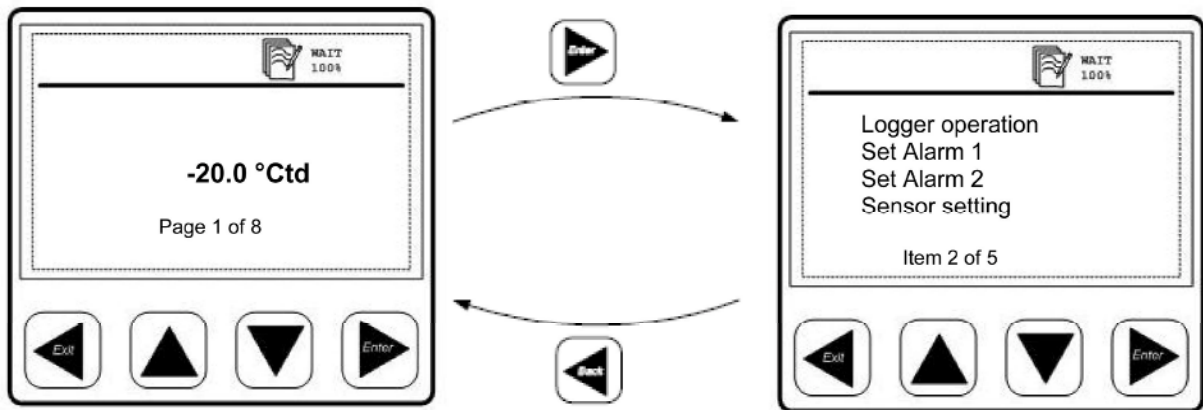
#### 14.1.1 Description of the status icons




	<p>These icons show the system status.</p> <p>Explanation of the single icons:</p>
	<p>USB connection icon: The data display is connected to a PC via USB</p>
	<p>Alarm status icon: Alarm 1 (pre-alarm) Alarm 1 is exceeded</p>
	<p>Alarm status icon: Alarm 1 (pre-alarm) Alarm 1 is undercut</p>
	<p>Alarm status icon: Alarm 2 (main alarm) Alarm 2 is exceeded</p>
	<p>Alarm status icon: Alarm 2 (main alarm) Alarm 2 is undercut</p>
	<p>Logger module icon: WAIT: Time and start conditions are set, waits for start logging LOG: Logger module is recording data STOP: Logging stopped DEL: Logger deletes protocol data ERR: Error occurred during data logging LOG 100%: Free memory of logger module in percent CYCLE: Logger memory works in circular mode</p>

## Operation


### 14.2 Operation of the main keys

#### 14.2.1 Concept for key operation

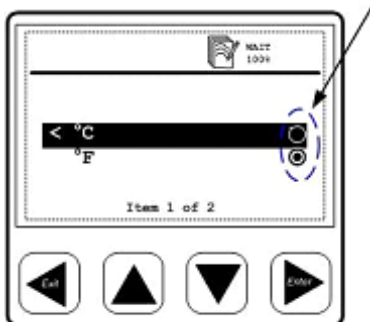


	<ul style="list-style-type: none"> <li>• use these keys to browse and select different items in the menu and scroll through different pages of measurement values</li> <li>• use these keys to alter or adjust the setting option or numbering</li> </ul>
	<ul style="list-style-type: none"> <li>• use this key to exit the current menu level</li> <li>• use it to leave all setting state without saving the changes</li> </ul>
	<ul style="list-style-type: none"> <li>• use this key to enter the submenu or next menu level of the currently selected menu item</li> <li>• use it to confirm the setting changes</li> </ul>

#### 14.3 Typical menu display layout

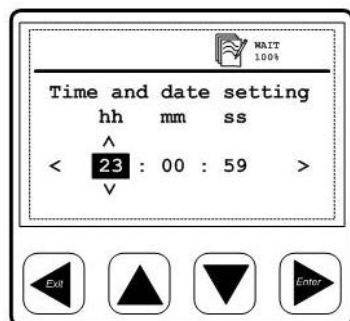
	<ul style="list-style-type: none"> <li>• The currently selected menu item will be shown in negative colour</li> <li>• If there is a "&gt;" sign at the right edge it means we can exit the current menu or go to the next higher level</li> <li>• If there is a "&lt;" sign at the left edge it means we can go into the submenu of the currently selected menu</li> <li>• Selectable menu item. It shows 4 items at the same time. If the total items in the current menu are more than 4 items the menu items can be scrolled through</li> <li>• Indication at the bottom: Shows how many items exist in the currently selected menu and it shows the current menu item</li> </ul>
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14.3.1 Selection fields



- Options for selection of the parameters
  - - Selection field for deselected point
  - - Selection field for selected point
- Selection of the selection field via the "arrow up" and "arrow down" keys
- By means of the "Enter" key the selected option can be activated
- Leaving the menu point:
  - Use the "Back" key to get back to the last menu level without activating the selected option

14.3.2 Figure settings

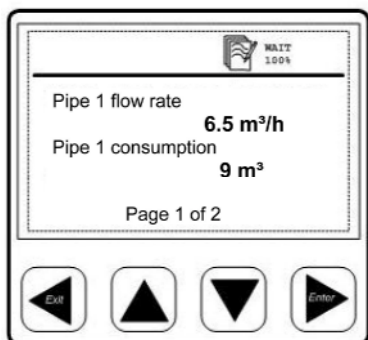


- Example figure settings:  
Time and date setting in submenu "system status and setting"
1. Time setting via "arrow up" and "arrow down" keys
  2. Change from HOUR to MINUTE to SECOND with the "Enter" key
  3. Upon entry of the SECONDS the setting is terminated and stored by the "Enter" key.  
By using the "Back" key the menu point "Time and date setting" can be left without storing the settings.

14.4 Information after switching on the instrument



System information are indicated for approx. 5 seconds after switching on the data display:  
The system information is helpful for service questions in order to determine e. g. the version number and the firmware version.  
The system information can be called up at any time in the menu point "system info".



If the sensors are connected in accordance with the configuration the data display will automatically recognize them and start to indicated real time measured values which are received from the sensors. It is possible that measured values are indicated on more than one page. The "arrow up" or the "arrow down" key can be used in order to indicate a further page.

## Operation

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### 14.5 Main menu points

The data display is supplied with standard settings.

Main menu points in the data display:

- Logger operation
- Set Alarm 1
- Set Alarm 2
- Sensor setting
- Communication settings (Option BUS systems)
- System status and setting

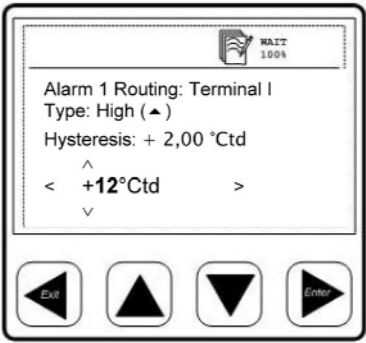
#### 14.5.1 Logger operation

<b>Set logging rate</b>	Set storage interval and average value determination The storage interval defines the time interval in which the data should be recorded. One value is recorded of each activated channel. The option average value determination can be used in order to determine the average value, i. e. the data display measures every second and if the storage interval is 10 seconds the average from the last 10 values will be made up and stored as measured value.
<b>Key start logging</b>	Start/stop, recording Starts or stops the data recording. A new file is created in the memory as soon as a new recording is started.
<b>Set time start condition</b>	Set time, start conditions The data display can be programmed so that it starts measurement at a certain point of time.
<b>Memory status</b>	Show logger memory status Shows the status and the size of the available memory
<b>View protocol</b>	Single protocols (files) or the whole memory can be indicated and if necessary deleted. The data display shows the available protocols with date, the number of channels, the number of recorded data per channel and the min/max/average value.
<b>Delete protocol</b>	Deletes the selected protocol.
<b>Format logger</b>	Deletes the internal memory.

**14.5.2 Alarm settings**

It is possible to set 2 individual alarm thresholds:

1. "Set Alarm 1 threshold"
2. "Set Alarm 2 threshold"

	<p>In this example the sensor is connected to terminal I.                  „Type: High" means:                  The alarm is triggered if the value is higher than the threshold.                  If the alarm is exceeded or dropped below the background becomes red resp. starts blinking.</p> <p>The factory setting of the hysteresis is 2.00 °Ctd.</p> <p>Please observe that these adjustments cannot be changed directly in the Data Display.                  Please turn to BEKO TECHNOLOGIES GMBH</p>
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**14.5.3 Sensor settings**

Sensor settings for our consumption or dew point sensors are stored within the sensor itself. The Data Display can be used in order to change those settings. For this purpose select in the menu the function "Sensor settings". On the next screen the available inputs are shown: e. g.

- Terminal I: Dew point
- Terminal G: Consumption

Select the desired entry mask in order to carry out the sensor settings.

If a sensor is connected to a switched on Data Display the configuration of the Data Display will be transferred to the sensor without any prior query. (e.g. analogue output, diameter for consumption probes ...)

On delivery of a unit Data Display/sensor the adjustments are matched. Please check the coordination if you connect sensors with deviant adjustments to the Data Display.

**14.5.4 System status and settings**

Setup time/date	Set the integrated clock.
Show system status	This screen contains important information for service enquiries.
Change LCD contrast	Contrast of the display can be changed.
System reset	In case other sensors are connected it is recommended to use this function in order to update the system settings.

**15 Scope of delivery**

- Data Display in wall housing according to your order
- Fastening clips for panel mounting
- Instruction manual

## 16 Conformity declaration

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### EG-Konformitätserklärung

Wir erklären hiermit, dass die nachfolgend bezeichneten Produkte in der von uns gelieferten Ausführung den Anforderungen der einschlägigen Normen entsprechen:

Produktbezeichnung:	DD109
Spannungsversorgung:	100 – 240 VAC / 50-60 Hz / 10 VA
Produktbeschreibung und Funktion:	Datendisplay zum Erfassen und Anzeigen von Messwerten

<b>Niederspannungs-Richtlinie 2006/95/EG</b> Angewandte harmonisierte Normen:	EN 61010-1:2001 EN 61010-31:2002 + A1:2008
Anbringungsjahr der CE-Kennzeichnung:	09

<b>EMV-Richtlinie 2004/108/EG</b> Angewandte Normen:	Störaussendung: EN 61326:1997 + A1:1998 + A2:2001 + A3:2003  Störfestigkeit: EN 61326:1997 + A1:1998 + A2:2001 + A3:2003
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Die Produkte sind mit dem abgebildeten Zeichen gekennzeichnet:



Diese Erklärung bezieht sich nur auf die Produkte in dem Zustand, in dem sie in Verkehr gebracht wurden; nicht vom Hersteller angebrachte Teile und/oder nachträglich vorgenommene Eingriffe bleiben unberücksichtigt.

Neuss, 30.03.2009

BEKO TECHNOLOGIES GMBH

  
i.V. Christian Riedel  
Leiter Qualitätsmanagement

**BEKO TECHNOLOGIES GMBH**  
41468 Neuss, GERMANY  
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## EC Declaration of Conformity

We herewith declare that the product indicated in the following in the version supplied by us corresponds with the requirements of the relevant standards:

Product designation:	DD 109
Voltage supply:	100 – 240 VAC / 50-60 Hz / 10 VA
Product description and function:	Data display for recording and indication of measured data

### **Low voltage directive 2006/95/EG**

Applied harmonized standards:	EN 61010-1:2001 EN 61010-31:2002 + A1:2008
Year of fitting with CE mark:	09

### **EMV directive 2004/108/EG**

Applied standards:	Emitted interference: EN 61326:1997 + A1:1998 + A2:2001 + A3:2003
	Interference resistance: EN 61326:1997 + A1:1998 + A2:2001 + A3:2003

The products are labeled with the indicated mark:



This declaration only refers to the products in the state in which they are put into circulation, parts which are not attached by the manufacturer and/or subsequently taken interventions stay unconsidered.

Neuss, 30.03.2009

**BEKO TECHNOLOGIES GMBH**

i.V. Christian Riedel  
Head of Quality Management

<b>A</b>		<b>L</b>	
Active high .....	12	Logger module icon .....	13
Active low.....	12	Logger operation.....	16
Alarm 1 (pre-alarm) .....	13	<b>M</b>	
Alarm 1 exceeded.....	13	Main functions of the data display .....	6
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