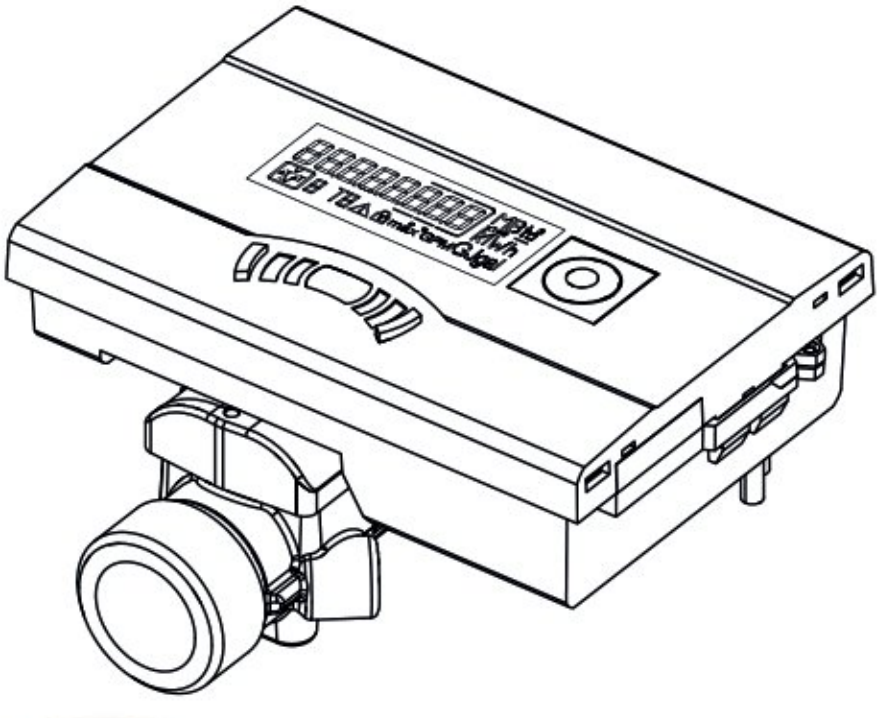
English | Italiano | Dansk | Svenska

DIEHL
Metering

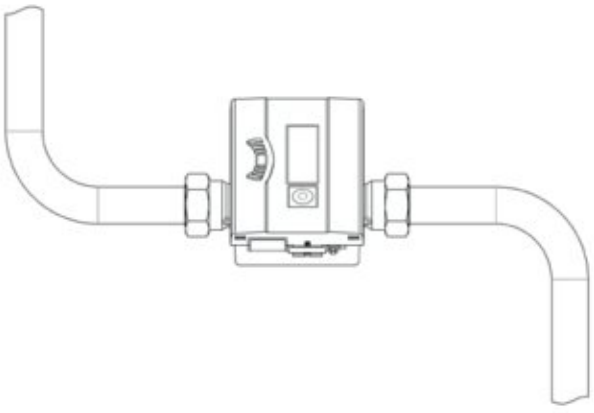
Ultrasonic energy meter
Contatore di energia ad ultra suoni
Ultralydsenergimålere
Ultraljuds-energimätare

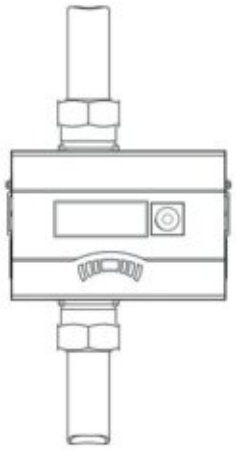
Installation guide
Istruzioni per il montaggio
Installationsvejledning
Monteringsanvisning

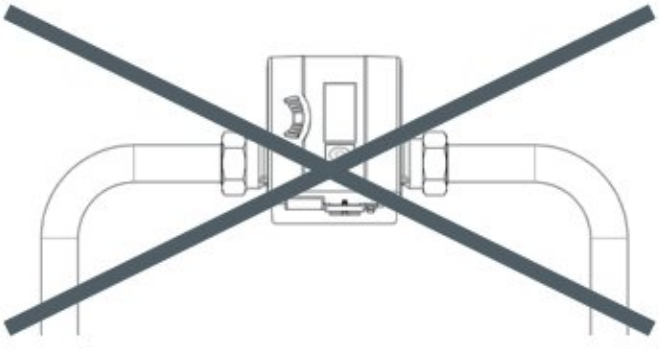


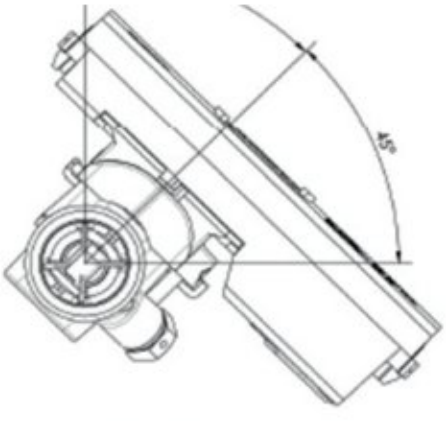
This guide must be given to the end consumer. Consegnare queste istruzioni al cliente finale. Denne vejledning skal afleveres til montøren. Denna bruksanvisning ska överlämnas till kunden.

I









II

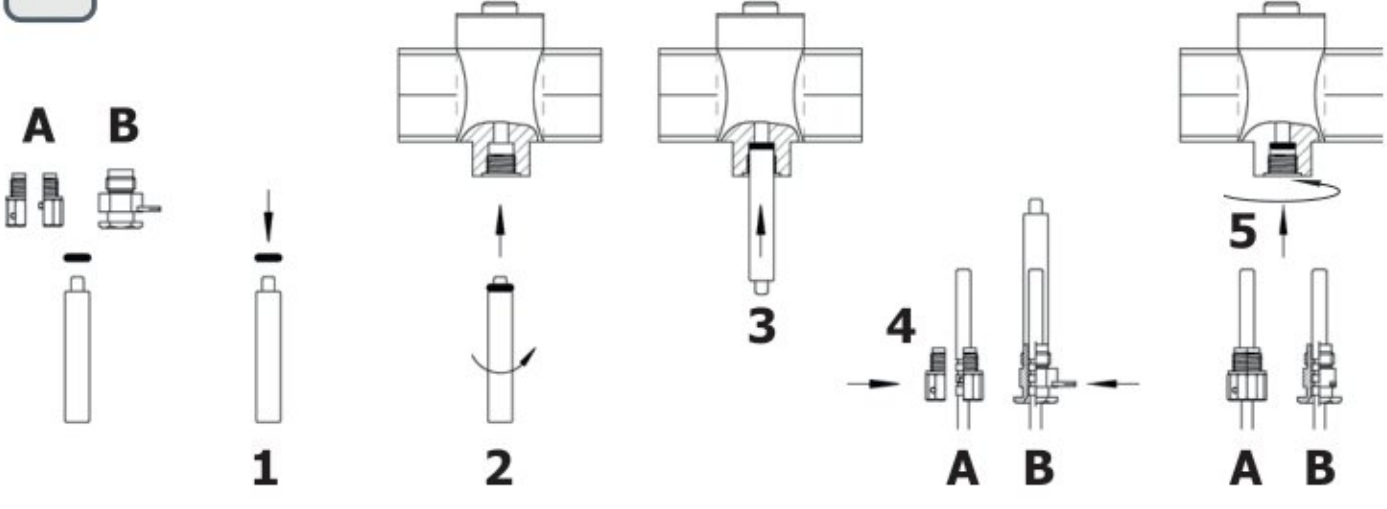


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1. General

This guide is intended for trained specialised personnel. Therefore, it does not include basic working steps.



The seal on the energy meter must not be damaged!
A damaged seal will result in immediate invalidation of the factory warranty and verification. The cables supplied with the meter must neither be shortened, extended nor changed in any other way.



Legal regulations and operating instructions for the use of energy meters must be observed!
The installation must only be carried out by a specialist energy meter installation and electrical company. The personnel must be trained in the installation and handling of energy meters and electrical devices as well as the applicable guidelines.
Medium: Water, according to CEN/TR 16911.
If water additives are used (e.g. corrosion protection), the user must make sure that the corrosion resistance is adequate.



This product is designated (where relevant) as a pressure maintaining component in the sense of the Pressure Equipment Directive (PED) and may only be operated as a pressure maintaining component with temperature sensors suitable for this purpose.
This product is not intended for used as a safety device in the sense of the Pressure Equipment Directive (PED).

- The medium temperature is specified as 5 ... 105 °C (130 °C)
- The temperature range depends on variant and nominal size.
- The exact temperature range is shown on the type plate.
- The encapsulated variant is to be used if condensation is expected.
- The operating/ambient conditions are 5 ... 55 °C; IP 54/65; 93 % rel. humidity.
- Ambient temperatures below 35 °C have a positive effect on battery lifetime.



If the flow sensor is insulated with the pipeline, the calculator must be accessible.

Detailed user guide available at https://www.diehl.com/metering/en/support-center/download-center/.
The Software IZAR@Mobile2 is used for reading out data and configuration and can be downloaded from the Internet under:
https://www.diehl.com/metering/en/support-center/download-center/

Changing of communication relevant parameters can result in the loss of OMS certification.

2. Transport and storage

Unpacking

Energy meters are measuring devices and must be handled with care. To protect against damage and soiling, they should only be unpacked immediately prior to installation.

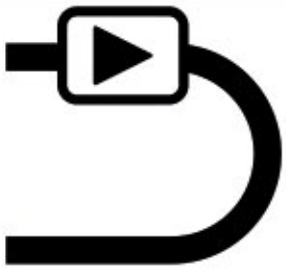
Transport

The transport of the meter is permitted only in the original package.

When sending wireless measuring instruments / components by air, disable the wireless (place in aircraft mode) before shipping.

3. Installation of energy meter (fig. I)

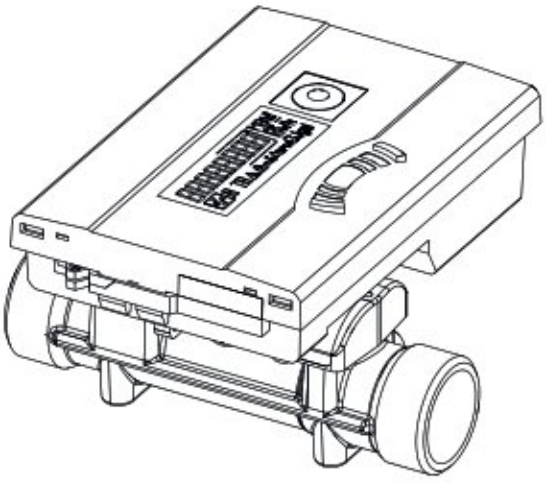
- Depending on the design and application (heat or cooling meter), the energy meter is installed in either the hot or cold line of the system.
- The flow sensor must be installed so that the flow direction matches the arrow direction on the sensor.
- Depending on the version, the flow sensor must be installed in inlet or outlet. The installation position is displayed in the info loop 3.4 (see "Information loop (3)" on page 14) and, if necessary, also by means of a pictogram.

 Inlet	 Outlet	no pictogram (Installation position can be set on site, 5.1 on page 10)

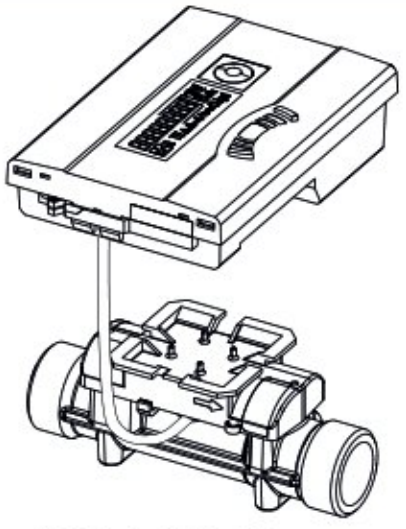
- Calming sections are not necessary before and after the flow sensor. For systems without temperature mixing, a straight calming section of 3-10 x DN upstream of the flow sensor is recommended.

The meter can be installed in both horizontal and vertical pipe sections, provided air bubbles cannot collect in the meter.
The flow sensor must always be filled with liquid.
Avoid frost at the meter.

- We recommend installing the flow sensor in a tilted position.
- The minimum system pressure must be 1 bar to avoid cavitation.
- Electrical and magnetic fields might disrupt electronic components in the energy metering device. Make sure there is sufficient distance (approx. 10 cm) between the calculator and its measurement signal lines and possible sources of electromagnetic disturbance (e.g. transformers, electric motors, supply lines, etc.).
- If possible install the cables of the flow sensor or temperature sensor freely suspended (not bundled - aerial effect) with sufficient distance from electromagnetic interference sources.
- The measurement signal lines (temperature and flow rate) must not be routed in direct proximity to other lines, such as mains supply lines, low-voltage supply lines and data transmission cables. The minimum distance of 5 cm for low-voltage lines must be observed according to EN 1434-6.

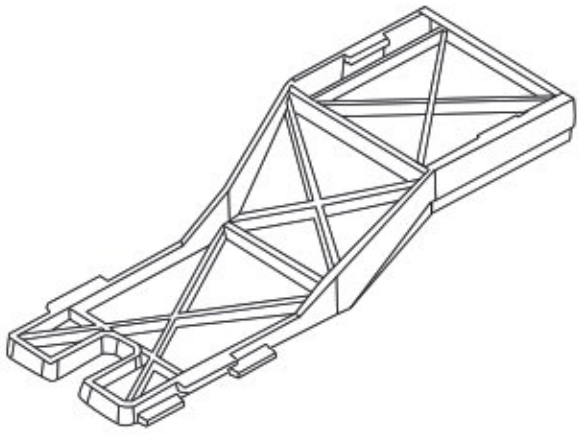


T: 5 ... 90 °C
$T_{water} > T_{ambient}$

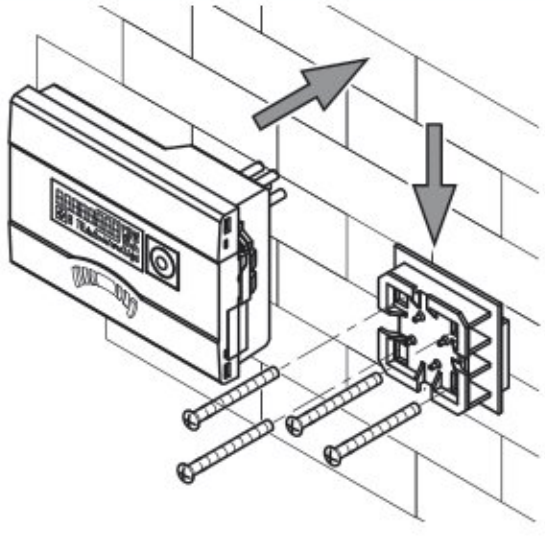


T: 5 ... 105 / 130 °C
$T_{water} < T_{ambient}$

- For medium temperatures **from 90°C** or for $T_{Water} < T_{Ambient}$ (cooling meter application or heat meter with cooling tariff application) the calculator must be removed and fitted at a sufficient distance from any heat sources. A wall holder (optional) or a spacer holder (optional) is available for this purpose.



Spacer holder



Wall mounting

- It is recommended that shut-off valves are fitted before and after the energy meter to simplify removing the meter.
- The meter should be installed in a conveniently accessible position for service and operating personnel.
- Initial operation is to be carried out and recorded after installation.

4. Temperature sensor

Handle the temperature sensor carefully!
The sensor cables are provided with coloured type plates:
- Red: Sensor in the hot line
- Blue: Sensor in the cold line

- It is not permissible to shorten or lengthen the connection lines.
- The free temperature sensors can be installed directly immersed (e.g. ball valve) or in an immersion sleeve that has been conformity tested for this sensor type.
- The sensors should preferably be installed symmetrically.
- The following limit values apply to asymmetrically thermally insulated installations:
  qp 0.6 m³/h => 10 K > 30 l/h....5 K > 120 l/h
  qp 1.5 m³/h => 10 K > 15 l/h....5 K > 150 l/h
  qp 2.5 m³/h => 10 K > 30 l/h....3 K > 250 l/h
- The following limit values apply to asymmetrical, thermally uninsulated installation:
  qp 0.6 m³/h => this type of installation is not permissible!
  qp 1.5 m³/h => 10 K > 150l /h
  qp 2.5 m³/h => 5 K > 250 l/h

4.1 Installation in the ball valve with adapter

(coupling set in a separate bag)
Use ball valves with installation option for temperature sensor with thread M10 x 1.

Preparatory measures

- Close the ball valve.
- Unscrew the plug screw from the ball valve.

Installation (see fig. II)

1. Place the O-ring from the attached coupling set (type A or B) on the mounting pin.
2. Insert the O-ring with the mounting pin into the sensor hole of the ball valve (turn the mounting pin).
3. Position the O-ring in its final position using the other end of the mounting pin.

4. Fastening screws

- Type A (plastic) - plug the fastening screw onto the temperature sensor.
- Type B (brass) - insert the temperature sensor in the fastening screw and place the sensor in the mounting pin. Press in the dowel pin completely and remove the mounting pin.

5. Insert the temperature sensor with the securing fitting in the ball valve and manually tighten (2-3 Nm).

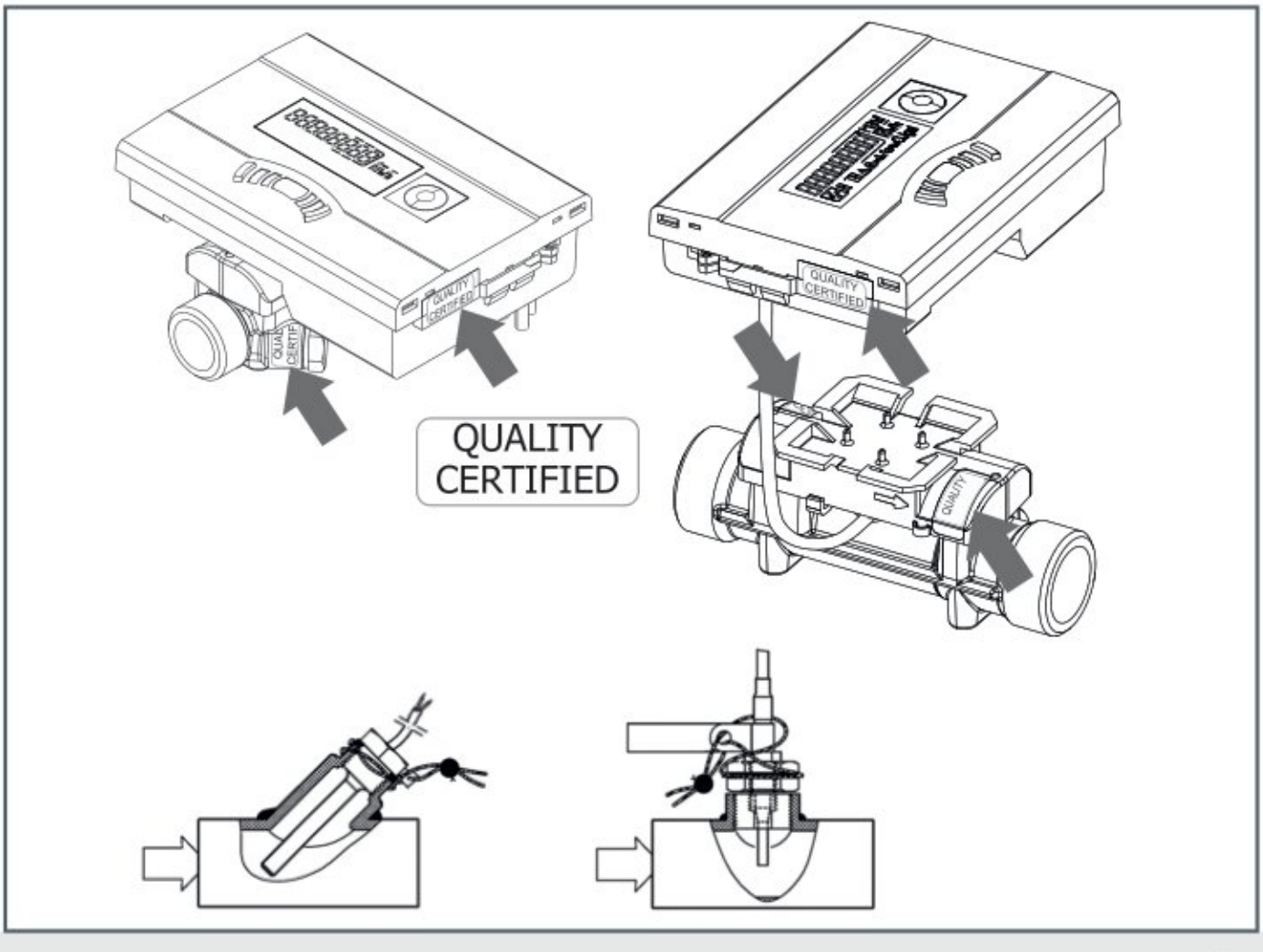
4.2 Installation in a pocket

It is recommended that temperature sensors for DN25 rated sizes or smaller are only fitted in new installations such that they are directly immersed.

This ensures higher measuring accuracy.

5. Start-up operation

Once the meter has been installed, the components (calculator, volume measuring component and both temperature sensors) must be sealed with a tamper-proof seal and the meter started up by a specialist company approved according to the legislation.



- Check the display for a plausible indication of flow rate and temperatures.

User guide for further Information is available at
https://www.diehl.com/metering/en/support-center/download-center/

5.1 Inlet / outlet setting (optional ex works)

Optionally, the installation position of the meter can be set in-situ in loop 3 ("3.4" on page 14). Consequently installation in the inlet (flow) or outlet (return) is possible.

This setting must be made **prior** to initial operation of the meter.

As supplied, the outlet (return) is pre-set and is shown as follows in the display.



Setting and number of possible changes.

To changeover, switch to the "Outlet" window in loop 3 (see "8. Operation" on page 14).

Pressing and holding the button for > 6 s changes the display/setting to "Inlet".

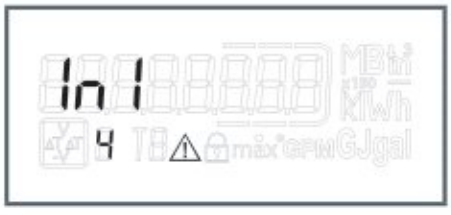
This setting can be changed a total of 8 times by pressing the button.

The display changes during the 6 s.
This does not influence functioning.

Sequence during changing







Button pressed <3s Button pressed >3s

If the button is pressed and then held for > 6 s, the meter performs the command shown in the display.



In each change, the framed number in the display is reduced by 1.

After 8 changes, it is no longer possible to change the installation position.

The possibility of changing lapses either immediately upon detection of water, or after three hours' operation without error detection (pre-set ex works).

The following indication appears in the display (example):



The changes indication disappears.

When changing the installation position, the sensors must be matched to the actual installation (see "4. Temperature sensor" on page 8).

6. Communication



Communication modules must be secured so that opening of meters is only possible by destroying the securing points.

The calculator supports two communication channels (radio (wireless) or M-Bus). The protocols may be different for all two communication channels and are pre-set ex works. The telegrams can be defined for each customer using the IZAR@MOBILE 2 software.

6.1 Communication via radio

The integrated radio module is an interface for communication with Diehl Metering radio receivers.

Unidirectional communication has the following specification:

- The module transmits every 8 ... 256 s (send period **max.** 0.1 % of duty cycle (min. 8s); variable, depending on protocol length and programming)
- The communication always transfers the currently measured data
- Transmission frequencies:
  - 434 MHz, transmission power (EN 300 220-2 V3.2.1): 10mW e.r.p.
  - 868 MHz, transmission power (EN 300 220-2 V3.2.1): 25mW e.r.p.
- Various Diehl Metering receivers are available for receiving the protocol (e.g. Bluetooth, GPRS, LAN, ...)
- The protocol corresponds to OMS Profile A or Profile B and is encrypted.
- Reading modes: Walk-By, Drive-By, Fixed-Network
- For problematic radio installations (shield) the external wireless module set can also be used

6.2 M-Bus Communication module

The M-Bus communication module is a serial interface for communication with external devices (M-Bus control centres), e.g. IZAR CENTER. A number of meters can be connected to a control centre.

- The connection is not polarity-sensitive and is electrically isolated
- M-Bus protocol standardised according to EN 1434;
- 300 or 2400 baud (auto baud detect)
- Connection for 2 x 2.5 mm²;
- Power consumption: **One** M-Bus load

7. Display

The data generated by the calculator can be viewed in several displays. These displays contain the assigned system information (e.g. energy quantities, water volumes, operating days, water quantities, actual temperatures, maximum values) and can be accessed by calling the displays in the pre-defined sequence / loop. The energy meter has up to 6 different display sequences.

Main loop, due date loop, information loop, month loop.

The month loop comprises up to seven readings alternatingly displayed for 2 s - 4 s each. For quick visual identification, the loops are labelled 1 to 6 in the display. As standard, the main loop contains the actual data, e.g. energy, volume, flow and temperatures. The verified register is marked with a padlock icon.

Main loop (1)

Sequence	Window 1	Window 2
1.1	Accumulated energy	
1.2	Accumulated volume	
1.3	Accumulated cold energy (heat meters with cooling tariff)	
1.4	Flow	
1.5	Power	
1.6	Flow temperature Return flow temperature *)	Return flow temperature **)
1.7	Differential temperature	
1.8	Operating days	
1.9	Error status	Error hours
1.10	Display test	

*) without a decimal place; **) with one decimal place respectively

Due date loop (2)

Sequence	Window 1	Window 2	Window 3
2.1	Due date 1 date	Due date 1 energy	"Accd 1"
2.2	"Accd 1"	Date of future due date 1	
2.3	Due date 1 previous year date	Due date 1 previous year energy	"Accd 1L"
2.4	Due date 2 date	Due date 2 energy	"Accd 2A"
2.5	"Accd 2"	Date of future due date 2	
2.6	Due date 2 previous year date	Due date 2 previous year energy	"Accd 2L"

Information loop (3)

Sequence	Window 1	Window 2
3.1	Actual date	
3.2	"SEC_Adr"	Secondary address
3.3	"PRI_Adr 1"	Primary address
3.4	"Inlet" / "Outlet" * (installation position)	*depending on the setting (5.1 on page 10)*
3.5	"UHF ON" (status of integrated radio)	
3.6	Software version	Check sum

Tariff loop (5) [1]

Month loop (6)

Sequence	Window 1	Window 2	Window 3	Window 4
6.1	"LOG"	Date-1	Energy	Volume
6.2	"LOG"	Date-2	Energy	Volume
:	:	:	:	:
6.24	"LOG"	Date-24	Energy	Volume
* Example	1Only for heat meters with activated cooling tariff			

8. Operation

Use the push button to page through the individual displays. When doing so a differentiation is made between short and long button presses. With a short button press (<3 seconds) you get to the next display within a loop; with a long button press (>3 seconds) you get to the next display loop. The "Energy" window (sequence 1.1) of the main loop is the basic display. If the button is not pressed for approx.4 minutes, the meter automatically switches off the display to save power (exception: an error exists). If you press the button again, the meter returns to the basic display.

9. Display Error codes

If an error occurs, the error code is displayed in the main loop. All windows, however, can still be accessed by pressing the button. If the button is not pressed for approx. 4 min, the error code is automatically displayed again.

The error message disappears automatically as soon as the source of the error is corrected. All errors that exist for longer than 6 min, are saved in the error memory.

Error code	Description
C - 1	Basic parameter error in flash or RAM - Meter must be replaced
E 1	Temperature range outside [-19.9 °C...199.9 °C] e.g. sensor short-circuit, sensor break
E 3*	Forward and return sensor reversed
E 4	Hardware error US measurement, e.g. transducer or control defective or short circuit
E 5	Communication not possible (too frequent read-out)
E 6*	Flow direction of flow meter incorrect
E 7	No plausible ultrasound receiver signal, e.g. air in the measuring path
E 9	Battery nearly discharged, design lifetime reached

* application dependent

10. Disposal

The transposed European Directives on waste batteries and waste electrical and electronic equipment supervise the actions necessary to limit the negative impact of the product end of life.

This product is subject to special collection and disposal. It should be deposited at an appropriate facility to enable recovery and recycling.

For further details about recycling this product, please contact your Diehl Metering agency.

11. Declaration of conformity for MID meters

See from page 55 onwards.

Further information as well as the actual declaration of conformity are available at:

https://www.diehl.com/metering/en/support-center/download-center/