Static Heat- and Cold Meter UH50
Residential + Local supply

Landis+Gyr
manage energy better

T550 ULTRAHEAT® (UH50…)
T550 ULTRACOLD® (UH50…)
T550 Flow Sensor (UH50…)

Configuration Instructions

Date: January 2011
Dateiname: UH106-000m
Landis+Gyr GmbH

Outstanding features

Meter for measurement of flow and energy in a heat or cold circuit with water using the ultrasonic principle. Important properties are:

- **Non-wearing due to non-moving parts**
- **Measuring range of flow 1:100 according to EN 1434, 1:1000 total range**
- **Any mounting orientation, in flow or return, no setting sections or flow straighteners.**
- **Power measurement with maximum values, tariffs selectable**
- **Data logger for system monitoring**
- **60 monthly values**
- **Logbook**
- **Battery or mains operated**
- **Optical interface according to EN 62056-21**
- **Big range of communication modules**
- **2 module slots for using 2 communication modules coincidental**
- **Also operable as a flow meter, cold or heat/cold meter**
- **Self-diagnostics**

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1 Safety Information

Note: In the following text the term Meter covers the Heat Meter as well as the Cold Meter and the Flow Sensor if not mentioned otherwise.

- The meter is designed for circulating water of heating systems (not for drinking water!).
- Do not pick up by the electronic unit
- Be careful of sharp edges (thread, flange, measuring tube)
- Installation and removal must be performed by qualified personnel only
- Mounting and unmounting are only permitted when the system is not under pressure
- After installation, a tightness test must be conducted with cold pressure
- Only ever use under service conditions, otherwise dangers can arise and the warranty may be voided
- Breaking the security seal voids the warranty
- The 110 V / 230 V versions must only be connected by an electrician
- The meter contains Lithium batteries, so it is not allowed to dispose it wih the household waste. Return of the Lithium batteries must be carried out professionally. It is possible to return the product after use for proper disposal to the manunfacturer. Please follow the legal regulations at the shipment of Lithium batteries, which rules amongst others the declaration and the packaging of hazardous good.
- Lightning protection cannot be ensured; this must be provided by the building wiring
- Only one compartment for the power supply must be equipped – do not remove the red locking hatch

2 General information

The UH50 meter is used for energy consumption metering in short and long-distance district heating and in apartment buildings. It is suitable both for cold metering (alone or in conjunction with metering quantities of thermal energy) or for pure flowrate metering in water systems.

Measuring accuracy	Class 2 or 3 (EN 1434)
Environment class	A (EN 1434) for indoor installation
Mechanical class	M1 *)
Electrical class	E1 *)
*) according 2004/22/EG EC directive	
Ambient humidity	< 93% r. h. at 25°C without condensation
Electronic unit	
Storage temperature	- 20 to 60°C
Max. altitude	2000 m above MSL
Ambient temperature	5 to 55°C
Housing degree of prot.	IP 54 per EN 60529
Safety class	
Line 110 / 230 V AC	II per EN 61558
Line 24 V ACDC	III per EN 61558
Response threshold f. ΔT	0.2 K
Temperat. difference ΔT	3 K to 120 K
Temperat. meas. range	2...180°C
Sensors	
Type	Pt500 or Pt100 per EN 60751

Temperature range	0...150°C (< 45 mm overall length) 0...180°C (> 100 mm overall length)

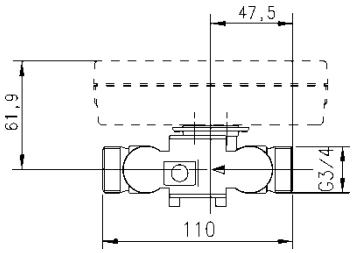
All volume measuring units (Consider the details on the meter)

Mounting location	return of flow
Mounting orientation	any
Settling section	none
Metrological class	1:100
Temperature range	5 to 130°C *)
Recommended for…	
…heat application	10 to 130°C
…cooling application	5 to 50°C
*) national approvals may differ	
Maximum temperature	150°C for 2000 h
Maximum overload	2.8 x qp
Nominal pressure	**PN16**, PN25

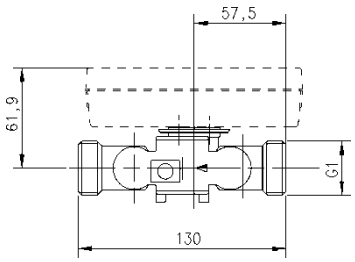
Nominal flowrate q_p	Overall length	Connection	Maximum flowrate q_s	Minimum flowrate q_i	Response threshold (variable)	Pressure lost at q_p	Kv flowrate at Δp 1 bar	Kv flowrate at Δp 100 mbar	Weight
m^3/h	mm	G/DN	m^3/h	l/h	l/h	mbar	m^3/h	m^3/h	kg
0,6	110	G $^3/_4$	1,2	6	2,4	150	1,5	0,5	1
	190	G1							1,5
		DN20				125	1,7		3
1,5	110	G $^3/_4$	3	15	6	150	3,9	1,2	1
	130	G 1				160	3,8		1,5
	190	DN20							3
2,5	130	G1	5	25	10	200	5,6	1,8	1,5
	190	DN20				195	5,7		3
3,5	260	G 1 $^1/_4$	7	35	14	60	14	4,5	3
		DN25							5
6	150	G 1 $^1/_4$	12	60	24	240	12	3,8	3
	260	DN25	12	60	24	180	14	4,5	3
									5
10	200	G 2	20	100	40	130	28	8,8	2,6
	300	DN40				100	32	10	4
						165	25	7,8	7
15	200	DN50	30	150	60	95	48	14	5
	270					100	47	15	8
25	300	DN65	50	250	100	105	77	24,4	11
40	300	DN80	80	400	160	160	100	31,6	13
60	360	DN100	120	600	240	115	177	56	22

Toleranz beim Druckverlust: +/- 5%

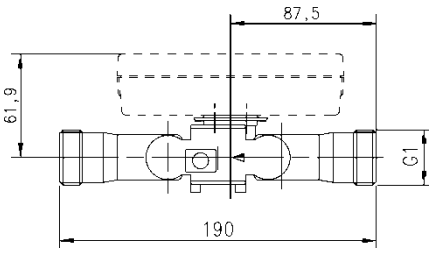
Small meters (qp 0,6 – 2,5 m³/h)



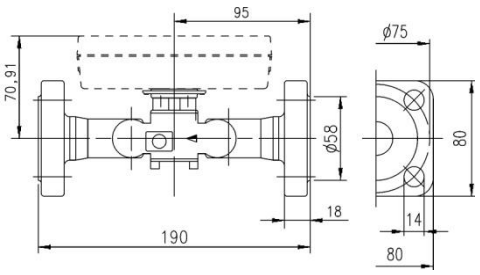
Overall length 110 mm (thread)



Overall length 130 mm (thread)

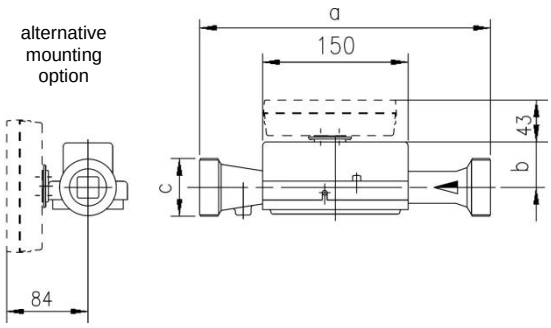


Overall length 190 mm (thread)



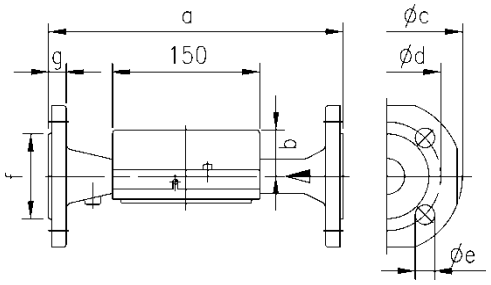
Overall length 190 mm (flange)

Large meters with threaded joint



Order-No.	qp m³/h	PN bar	a	b	c
UH50-x45	3,5	16	260	51	G 1¼
UH50-x47		25			
UH50-x50	6	16	260	51	G 1¼
UH50-x60	10	16	300	48	G 2
UH50-x63		16	200		

Large meters with flange joint

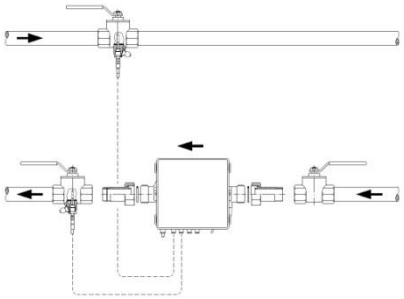


Order-No.	qp m³/h	PN bar	DN	a	b	Øc	Ød	Øe	No. of holes	f	g
UH50-x46	3,5	25	25	260	51	115	85	14	4	68	18
UH50-x52	6	25	25	260	51	115	85	14	4	68	18
UH50-x61	10	25	40	300	48	150	110	18	4	88	18
UH50-x65	15	25	50	270	46	165	125	18	4	102	20
UH50-x69				200							
UH50-x70	25	25	65	300	52	185	145	18	8	122	22
UH50-x74	40	25	80	300	56	200	160	18	8	138	24
UH50-x82	60	16	100	360	68	235	180	18	8	158	24
UH50-x83	60	25	100	360	68	235	190	22	8	158	24

3 Installation

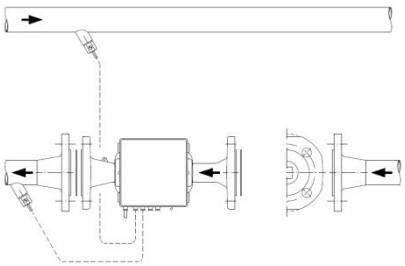
Based on the dimension drawings, choose a mounting location with sufficient clearance. Mount the volume measuring unit between two shut-off valves in accordance with the arrow on the volume measuring unit for the direction of flow.

Ball valve



Example of mounting with a ball valve (recommended up to DN25)

Welded sleeve with protection pocket



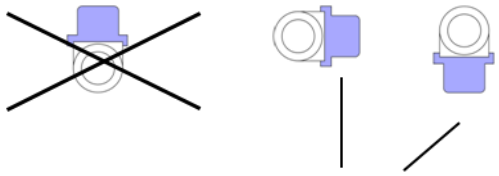
Example of mounting with protection pockets (recommended above DN25)

No inlet or outlet sections are necessary. However, if the meter is installed in the shared return of two systems, the mounting location must be a sufficient distance from the T element that forms the junction (min. 10 x DN) to allow the different water temperatures to mix well.
The sensor can be mounted in ball valves or in protection pockets. The sensors must be inserted at least up to the center of the pipe cross-section. Cavitation must be avoided over the entire measuring range by overpressure, i.e. at least 1 bar at qp and approx. 3 bar at qs (at 80°C).

If the **water temperature is below 10°C or above 90°C**, a split mounting is necessary. In this case the electronic unit is to be mounted separately from the volume measuring unit.
A meter with a **removable control cable** may be separated during the installation. When installation is done be sure that only paired parts (volume part, calculator) are connected together.

4 Mounting as a cold meter

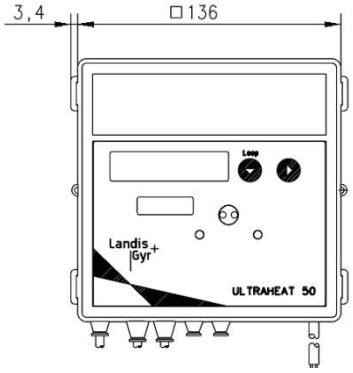
When mounting a **cold meter** or **combined heat/cold meter**, make sure the black cover on the measuring tube is oriented to the side or downward (because of water condensation). The protection pockets should also mounted to the side or downwards.
The electronic unit must be separated from the flowrate measuring tube and, for example, mounted on the wall (split mounting). Make sure that condensed water cannot run along the connected pipes into the electronic unit (building a loop downwards).



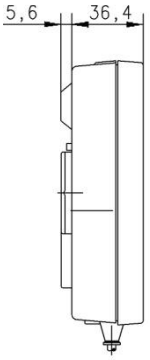
cover of flow sensors

Allowed position of the cold meter

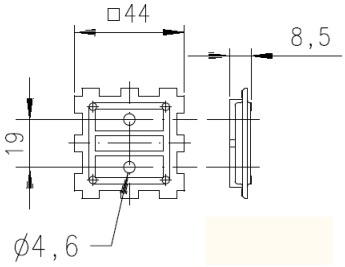
5 Size electronic unit



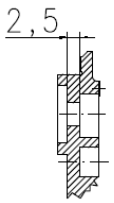
electronic unit: top view



side view



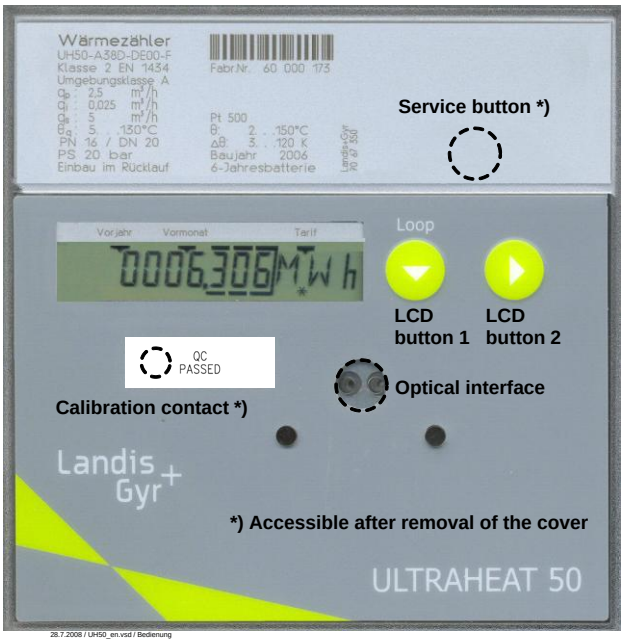
adapter plate



cross-section

6 Operating elements

The service button and calibration contact are not accessible until the housing cover is removed.
The calibration contact is additionally protected by a security seal.
The optical interface permits data communication via a computer with the necessary service software.

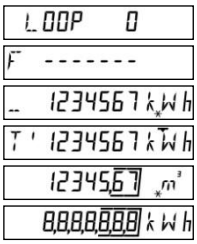


LCD button 1 (“Loop“); advances to the next loop
LCD button 2; advances to the next line within a loop
Service button: inside
Calibration contact: inside (to be operated with a service tool – not included in scope of supply)

7 Displays

The places after the decimal point of displayed values are indicated by a surrounding border.
Calibrated values can be recognized by the star symbol shown in addition to the value.
The displays of the meter are arranged on several levels (LOOPs). LCD button 2 advances the display of the user loop (LOOP 0) cyclically.
Note: Depending on how the unit is parameterized, the number of items displayed and the data shown may differ from this description. Certain button functions may also be disabled.

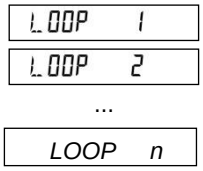
User loop (“LOOP 0”)



Head of the loop
Error message with error code number (only in case of error)
Accumulated quantity of energy with tariff status
Tariff register 1 (optional)
Accumulated volume
Segment test

LCD button 1 is used to switch the display from the user loop to the selection of service loops (LOOP 1...n).

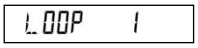
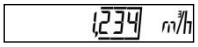
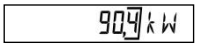
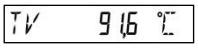
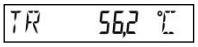
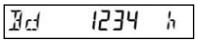
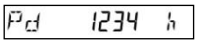
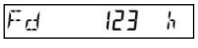
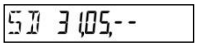
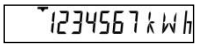
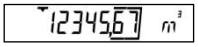
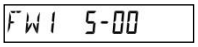
Service loop (selection)



Service loop 1
Service loop 2
Service loop n

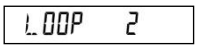
LCD button 1 advances the display to the next loop. After the last loop, the user loop (LOOP 0) appears again.
LCD button 2 displays the content of the selected service loop.
Within a loop, the LCD button 2 is used to advance to the next line of the display. After the last line of the display, the first display line appears again.

Service loop 1 (“LOOP 1”)

	Head of the loop
	Current flowrate
	Current power
	Current flow/return temperature at 2s intervals
	
	Operating time
	Operating time with flowrate
	Missing time
	Property number, 8-digit
	Date
	Yearly set day (DD.MM)
	Quantity of energy previous year on set day
	Volume for previous year on set day
	Firmware version

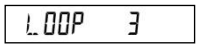
Service loop 2 (“LOOP 2”)

In service loop 2, the measuring period for maximum calculation is displayed.

	Head of the loop
	Measuring period for maximum calculation

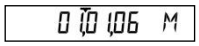
Service loop 3 (“LOOP 3”)

Service loop 3 shows the **monthly values**. LCD button 1 is used to select a month out of the previous months. The data for that month are then opened with LCD button 2. Each further press of LCD button 2 shows the next value for the selected month.



Head of the loop

...



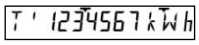
Set day for December 2005

Set day for November 2005

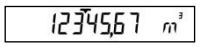
...

using LCD button 2: ⇩

Quantity of energy on the set day



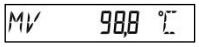
Tariff register 1 on the set day

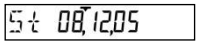


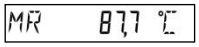
Volume on the set day

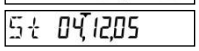
Max. flowrate on the set day,
at 2s intervals with date stamp

Max. power on the set day,
at 2s intervals with date stamp

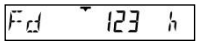








Max. temperatures on the set day,
at 2s intervals with date stamp
for flow and return maximum



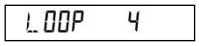
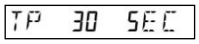
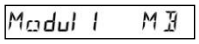
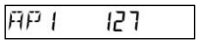
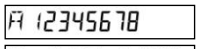
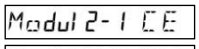
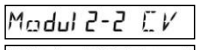
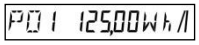
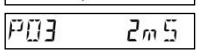
Missing time count on the set day

After the last display, the previously selected set day is displayed again. Pressing LCD button 1 selects the next set day.

Notice: If the number of months to be read out is changed with the service software, this will have an impact on the number of retrievable months in the LCD.

Service loop 4 (“LOOP 4”)

Service loop 4 shows the **unit parameters**. LCD button 2 calls the displays one after the other.

	Head of the loop
	Current tariff,
	at 2s intervals with threshold value 1
	Measuring interval for flowrate
	Measuring interval for temperature
	Module 1: M-bus module
	M-bus primary address 1
	M-bus secondary address 8-digit
	Module 2: pulse module; chan. 1 = energy quantity, Channel 2 = volume, at
	2s intervals
	Significance for energy quantity pulses *)
	Significance for volume pulses *)
	Pulse duration in ms *)
	*) for “fast pulses”

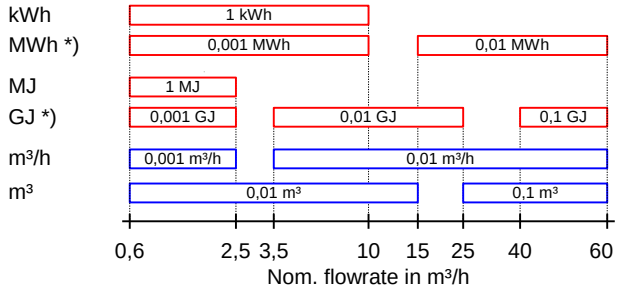
Previous year’s values

The electronic unit stores the meter readings for quantity of energy, volume, the tariff register, missing time, and flowrate measuring time as well as the current maxima for flowrate, power, temperature difference, flow temperature, and return temperature with their date stamps on a yearly set day.

Monthly values

The electronic unit stores the meter readings for quantity of energy, volume, the tariff register, missing time, and flowrate measuring time as well as the monthly maxima for flowrate, power, temperature difference, flow temperature and return temperature with their date stamp for up to 60 months on the set day of each month.
Note: The standard time used is Central European Time (CET). If daylight-saving time is activated, storage will be performed accordingly.
The previous year´s values and monthly values can also be read out via the optical and the 20 mA interface.

8 Resolution of the display



*) Places after decimal point "blinking", "static" or "suppressed"

The number of places after the decimal point of a value is based on the chosen measurement path and the chosen dimension.

9 Power supply

The *UH50* can be powered from a power supply module or with a battery.

The lifetime of battery depends on the type of battery and on the requirements (e.g. short timebase, analog module etc.).

Requirements (for measuring timebase Q = 4 s and measuring time base T = 30 s)	6 years	11 years	16 years
Standard pulses M-bus read out (max. each 15 min.), CL-Module	2x AA	C	D
M-bus fast read-out, fast pulses, analog module, radio module	D	--	--

Automatic power supply detection

The power supply unit detects whether a line voltage is applied. This signal is routed to the UH50. That enables the device to detect automatically whether it is being powered from a battery or power supply unit.

Power supply modules

24 V ACDC

110 V AC, 230 V AC

Pollution degree	per EN 61010 (no or only dry, non-conductive soiling)
Ambient temperature	+ 5...+ 55°C

Storage temperature	- 20…+ 60°C
Back-up time during power failure (power reserve)	> 20 minutes

24 V safety extra-low voltage

Voltage	12...36 V AC or 12..42 V DC
Frequency	50 / 60 Hz or DC
Galvanic isolation	1000 V DC
Power consumption	maximal 0,8 VA
Terminals	2 x 1,5 mm²
For connecting cable	about, Ø 5,0...6,0 mm

110 V or 230 V alternating voltage

Voltage	85…121 V AC
or	196…253 V AC
Type	Safety class II
Frequency	50 / 60 Hz
Line voltage fluctuations	max. 10% of the nom.voltage
Overvoltage category II per EN60010	2500 V impulse voltage
Power consumption	maximal 0,8 VA
relative humidity	less than 93 % for T < 50°C
Cable length	1,5 / 5 / 10 m
Fuse protection	6 A MCB

10 Interfaces of the electronic unit

The UH50 meters are equipped with an optical interface per EN 62056-21:2002 as standard. Moreover, up to two of the following **communication modules** can be used for remote reading (for restrictions pay attention):

- Pulse module (pulses for quantity of energy / volume / unit status / tariff register 1 / tariff register 2; isolated, bounce-free)
- CL module (passive 20 mA current loop per EN 62056-21:2002)
- M-bus module per EN 1434-3, fixed and extended, variable protocol (also for coupling with a suitable controller)
- M-bus module G4
- M-bus module G4-MI with 2 pulse inputs
- Analog module
- Radio module

These modules are have no effect on consumption metering and can therefore also be replaced at any time without violating the security seal.

Terminals

Multipolar terminals are used for connecting external cables to the modules.

Strip-back length: 5 mm

Connection capacity

- rigid or flexible, 0.2 – 2.5 mm²
- flexible with end ferrules, 0.25 - 1.5 mm²
- conductor sizes 26 - 14 AWG

Multiple-conductor connection (2 conductors of same cross-section)

- rigid or flexible, 0.2 – 0.75 mm²
- flexible with end ferrules without plastic sleeve, 0.25 – 0.34 mm²

– flexible with TWIN ferrules with plastic sleeve, 0.5 – 0.75 mm²

Recommended screwdriver: 0.6 x 3.5 mm

Tightening torque: 0.4 Nm

Permissible combinations of modules

AM = Analog module
MB, MB G4, MB MI = M-bus module
CL = CL-module
RM = Radio module
GPRS = GPRS-module

Slot for module #1 can be equipped with...	Slot for module #2 is equipped with...								
		AM (5)	Pulse module „standard“	Pulse module „fast“ *)	MB	MB G4	CL	RM	GPRS
AM		yes	yes	yes	yes (4)	yes	yes	yes	no
Pulse module **) „standard“		yes	yes (3)	yes (2)	yes (4)	yes	yes	yes	yes
Pulse module **) „fast“		no	no	no	no	no	no	no	no
MB		yes	yes	yes	yes (4)	yes	yes (1)	yes	yes
MB G4		yes	yes	yes	yes	yes	yes (1)	yes	yes
MB MI		yes	yes	yes	yes	yes	yes (1)	yes	no
CL		yes	yes	yes	yes (1)	yes (1)	no	yes	yes
RM		no	no	no	no	no	no	no	no
GPRS		no	no	no	no	no	no	no	no

Restrictions:

*) only 1 module with fast pulses is possible;
only permissible on slot 2;
min. pulse duration :
- 2 ms, if pulse module 1 not fitted
- 5 ms, if pulse module 1 fitted

**) Subsequent mounting of a further pulse module in module slot 1 can result in changed output values for module 2!

(1) For M-bus with fast read out, the CL read-out can take up to 40 s

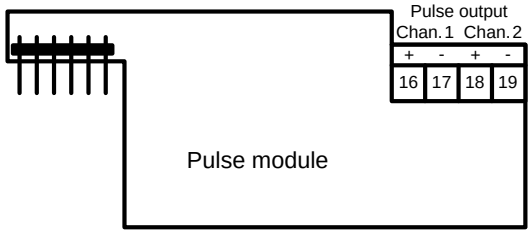
(2) Pulse length of the fast pulses min. 5 ms

(3) The first and second channel can be parameterized individually

(4) The secondary address for both modules can only be changed via module No. 1

(5) The analog module is not possible in module slot 2, when the meter has a power supply module 110 V / 230 V.

10.1 Pulse module



The pulse module permits the output of pulses that can be derived from the quantity of energy, the volume, tariff register 1 or tariff register 2. Two channels are available whose functions can be parameterized with the service software.

Output takes the form of standard pulses or “fast pulses”. The pulse duration is identical for channel 1 and channel 2.

Note: If two pulse modules are plugged, please note the restrictions!

Parameter setting for standard pulses

Output mode		Output value
Channel 1	**CE** (Count Energy)	Pulses for quantity of energy
	C2 (Count Tariff 2)	Pulses for tariff register 2
Channel 2	**CV** (Count Volume)	Pulses for volume
	CT (Count Tariff 1)	Pulses for tariff register 1
	RI (Ready Indication)	Pulses for the operating states „Ready / Fault“

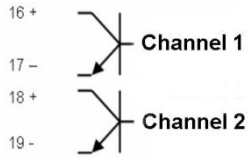
Parameter setting for “fast pulses”

Channel 1	Channel 2
CE (Count Energy)	**CV** (Count Volume)
	- (no function)
CV (Count Volume)	**CV** (Count Volume)
	- (no function)
CE / CV *) (Count Energy / Count Volume)	**CV** (Count Volume)
	- (no function)

*) automatic output of the higher pulse rate

Labeling	pulse module
Display in LCD	**CE, C2, CV, CT** or **RI**
Type	open collector
Voltage	maximal 30 V =
Current	maximal 30 mA
Dielectric strength	500 V_{rms} against ground
Classification	OB (per EN 1434-2)
Voltage drop	approx. 1.3 V at 20 mA

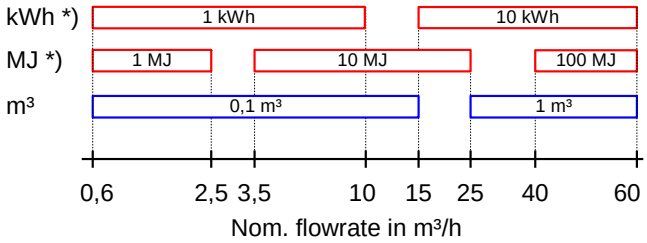
Classification	OC (per EN 1434-2)
Voltage drop	approx. 0.3 V at 0.1 mA
Output connection (standard version):	



A special version of the pulse module is available with an Opto-MOS output. Advantages: low voltage drop and polarized (bipolar).

Standard pulses

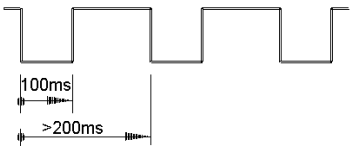
Standard pulse significances



*) depending on the unit for heat display

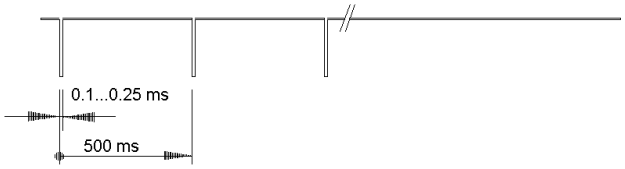
Pulses for quantity of energy, volume, tariff register

Period duration	> 200 ms
Pulse duration	100 ms conducting



Pulses for operating states

Ready”	pulsed “conducting”, i.e. 0.1…0.25 ms pulse duration, 500 ms period
“Fault”	constantly “non-conducting”



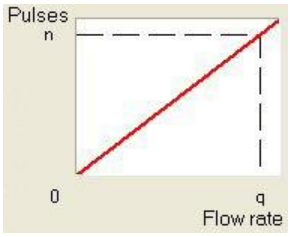
Fast pulses

Note: In battery operation, a D cell is required!
For applications, such actuating controllers or as flowrate transmitters, higher pulse rates are required. The parameters required for this (pulse significance, pulse duration), can be configured with the service software.
The maximum pulse frequency is 33 Hz.
The following can be set:

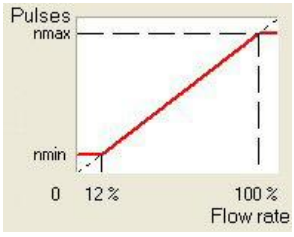
- Pulse type: “linear” or “scaled” pulses *)
- Pulse output: energy or volume
- Pulse duration, if only 1 pulse module is fitted:
  from 2 ms to 100 ms in steps of 1 ms;

Pulse duration, if 2 pulse modules are fitted:
  von 5 ms to 100 ms in steps of 5 ms

The pulses can be received and evaluated with a suitable device. The settings must be made in accordance with the information on the data sheet of the controller.
*) Linear pulses are output proportionally to the measured value. In the case of scaled pulses, the number of pulses at the upper and lower end of the range can be defined. In this case, the pulse receiving device can detect, for example, a connection error.



linear pulses

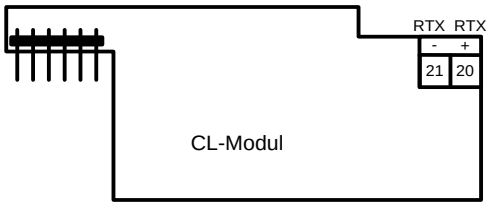


scaled pulses (example)

10.2 CL module

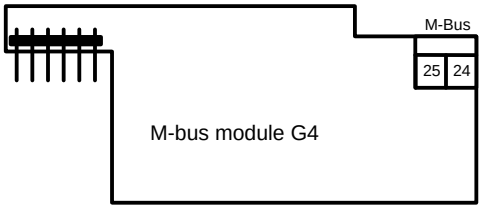
The CL module can be used to set up a point-to-point link enabling the meter to be read remotely, for example, at the front door.

Display in LCD	CL (current loop)
Standard	per EN 1434-3
Type	passive current loop
Baudrate	2400 Baud, fest
Isolation	galvanic
Polarity	yes
Voltage	30 V maximal
Current	30 mA maximum
Voltage drop	< 2 V at 20 mA
Literature	TKB 3436



Data scope
- Update on each read-out
Property number; unit number; firmware version; fault messages; missing time; operating time; quantity of energy; tariff register; volume; mounting location; adjustment values; unit configuration data; measuring range; M-bus addresses; system date and time; previous year's values with set day for quantity of energy, tariff and volume; maximum power; fault duration and 18 monthly values for quantity of energy, tariff register, volume, missing time, maximum power, maximum flowrate, measuring period with maxima for power, flowrate and temperatures; actual values for power, flowrate and temperatures.

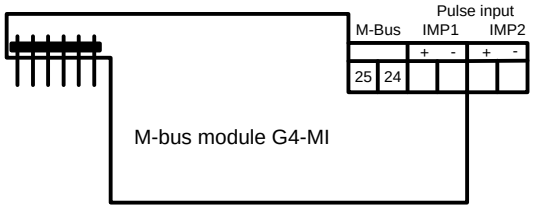
10.3 M-bus module G4



Display in LCD MB, G4 alternating

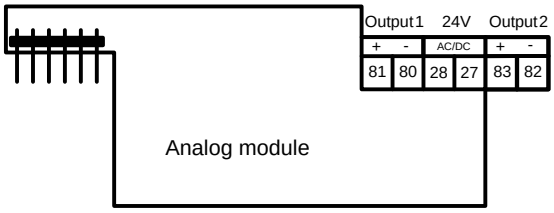
Consider the appropriate instructions manual (attached to the meter/module)

10.4 **M-bus module MI** with 2 pulse inputs



Display in LCD MI, G4 alternating
Consider the appropriate instructions manual (attached to the meter/module).

10.5 Analog module



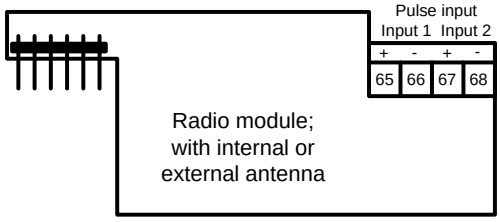
Display on LCD **AM** (analog module)
Please read the appropriate instructions manual for more information (attached to the meter/module).
The analog module converts a selectable measured value of the meter into an analog output signal (2 output signals, channel 1, channel 2).
The following measured values can be selected:

- power
- flowrate
- flow temperature
- return temperature
- temperature difference

The following can be selected as the output signal:

- 0…20 mA
- 4...20 mA
- 0…10 V

10.6 Radio module



Display on LCD **RM** (radio module)
Consider the appropriate instructions manual (attached to the meter/module).

Technical data radio

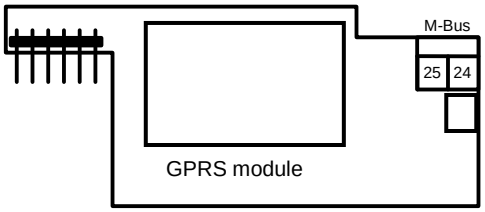
Frequency	433 MHz
Range	up to 200 meters (with integrated antenna)
Read-out frequency	max. 1 read-out per day (average)

Technical data pulse meters

Pulse meters:	2 inputs for external pulses
Meter range:	0…99,999,999
Pulse significance:	0.001...999.99
Meter identifier:	8-digit
Min. pulse length:	50 ms
Max. pulse rate:	5 pulse/s when using both channels
Max. pulse rate:	10 pulse/s when using only one channel

The radio module reads the data either when data is requested or only once per day.
The meter must be functioning in normal mode.The data are packed and output in various telegram types.

10.7 GPRS module



Display on LCD: MB or MB,G4 alternating
Consider the short instructions manual (attached to the meter/module)!
A detailed manual is in the internet available.

GSM/GPRS module for data acquisition via email, http, ftp or transparent M-Bus. The module has an integrated M-Bus Master, which allows to read out up to 8 additional M-Bus Meter.
The module is delivered with an external antenna.

11 Tariff control (optional)

The following options are available for tariff control.

Note: The summation of the quantity of energy and volume in the standard registers is performed independently of the tariff situation!

Threshold value tariff (tariffs T2, 3, 4, 5, 6)

Tariff registers 1, 2 and 3 can be controlled via up to 3 threshold values.

Either the quantity of energy or the volume can be summated in the tariff registers.

The threshold values can be derived from the flowrate (tariff T2), the power (tariff T3), the return temperature (tariff T4), the flow temperature (tariff T5) or the temperature difference (tariff T6).

Supplied quantity of energy (tariff T7)

In tariff register 1, a quantity of energy is summated that is calculated from the flow temperature (instead of from the temperature difference).

Returned quantity of energy (tariff T8)

In tariff register 1, a quantity of energy is summated that is calculated from the return temperature (instead of from the temperature difference).

Heat/cold meter (tariff T9)

In tariff register 1, the measured quantity of cold; in tariff register 2, the measured quantity of energy is summated. In both cases a threshold can be defined via the flow temperature (“cold threshold”, “heat threshold”).

Temperature above “heat threshold” and temperature difference > +0.2 K --> quantity of heat is acquired

Temperature below “cold threshold” and temperature difference < -0.2 K --> quantity of cold is acquired

Tariff control via timer switch (tariff T10)

For tariff control, one switch-off time and one switch-on time per day can be defined. At the switch-on time, summation of the quantity of energy or volume is started in tariff register 1; at the switch-off time, it is ended.

Tariff control via M-bus (tariff T11)

In tariff registers 1, 2 and 3, either the quantity of energy or the volume can be summated. With the relevant M-bus command, one of the 3 tariffs can be activated or all tariffs can be deactivated.

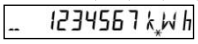
Surcharge quantity tariff by means of return temperature (tariff T12)

The quantity of energy is summated depending on the return temperature in tariff registers 1 or 2.
The summated quantity of energy is calculated from the difference of the return temperature from the defined return temperature threshold (instead of from the temperature difference).
Above return threshold: T1 is summated
Below return threshold: T2 is summated

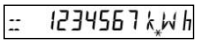
Display of the tariff situation on the LCD

The current tariff status is shown in the user loop together with the quantity of energy or the volume.
No tariff status is shown for tariffs T7 and T8.

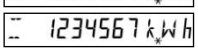
For tariffs T2, T3, T4, T5, T6, T10, T11 and T12:



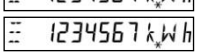
no tariff register active



tariff register 1 active

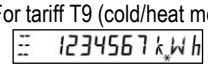


tariff register 2 active

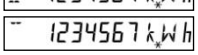


tariff register 3 active

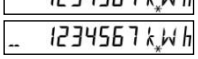
For tariff T9 (cold/heat meter)



no tariff register active



tariff register 1 active

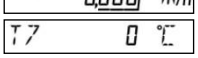


tariff register 2 active

The type of tariff and the associated parameters are displayed in service loop LOOP 4.

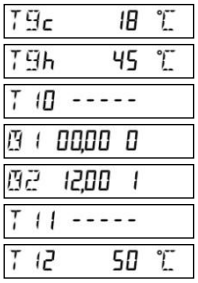
for T2, T3, T4, T5, T6

at intervals of 2s with threshold value 1/2/3



for T7

for T8



for T9;
at intervals of 2s

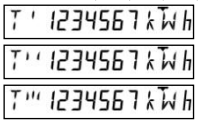
for T10;
switching times at intervals of 2s

for T11

for T12

The contents of the tariff registers are displayed in the user loop after the quantity of energy.

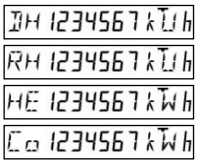
For tariffs T2, T3, T4, T5, T6, T10, T11 and T12



tariff register 1

tariff register 2

tariff register 3 (not for T12)



for tariff T7

for tariff T8

for tariff T9

12 Error messages

The meter constantly performs self-diagnostics and can display various error messages.

Error code Error / action to be taken:

F0	No flow; air in measuring unit / pipe, vent pipe
F1	Interruption of flow sensor
F2	Interruption of return sensor
F3	Electronic for temperature evaluation defective
F4	Battery empty; replace!
F5	Short-circuit flow sensor
F6	Short-circuit return sensor
F7	Fault in the internal memory
F8	F1, F2, F3, F5 or F6 pending for longer than 8 hours. No more measurements are performed.
F9	Error in the electronics

Message F8 has to be reset in parameter setting mode (manually or service software). All other error messages are cleared automatically once the error has been corrected.

13 Log functions

In the internal logbook, metrologically relevant events (errors, states, actions) are stored in chronological order with their time of occurrence. The events acquired are predefined. The data of the logbook cannot be deleted.

Each event is stored in a separate 4-level shift register; the overflows are transferred to a 25-level circulating buffer. Therefore, at least the last 4 times can be traced for each event.

In a monthly register, the error states are stored for the current month and for the past 18 months (without time stamp).

Ser.No.	Description
1	F0 = Air in measuring tube
2	F1 = Interruption flow sensor
3	F2 = Interruption return sensor
4	F3 = Error temperature electronics
5	F5 = Short-circuit flow sensor
6	F6 = Short-circuit return sensor
7	F8 = Sensor error > 8 hours
8	F9 = ASIC error
9	Above max. temperature in the volume measuring unit
10	Below min. temperature in the volume measuring unit
11	Max. flowrate qs was exceeded
12	Soiling prewarning
13	Line voltage off
14	CRC error occurred
15	Adjustment values parameterized
16	F7-(EEPROM) pre-warning
17	Reset made
18	Date / time parameterized
19	Yearly set day parameterized
20	Monthly set day parameterized
21	Master reset performed
22	All times deleted
23	Missing time deleted
24	Maxima deleted

Read-out is performed via the optical interface with the service software.

14 Data logger (optional)

The data logger permits the archiving of data that the user can select from a predefined set of values. The data logger contains four archives whose 8 channels can be assigned.The data can be assigned to any of the channels. Parameterization is performed with the service software.

Archive	Timebase	Storage depth	Averaging time for maximum
Hourly archive	1 hour	45 days	1 hour
Daily archive	1 day	65 days	1 hour
Monthly archive	1 month	15 months	1 hour
Yearly archive	1 year	15 years	1 hour / 24 hours

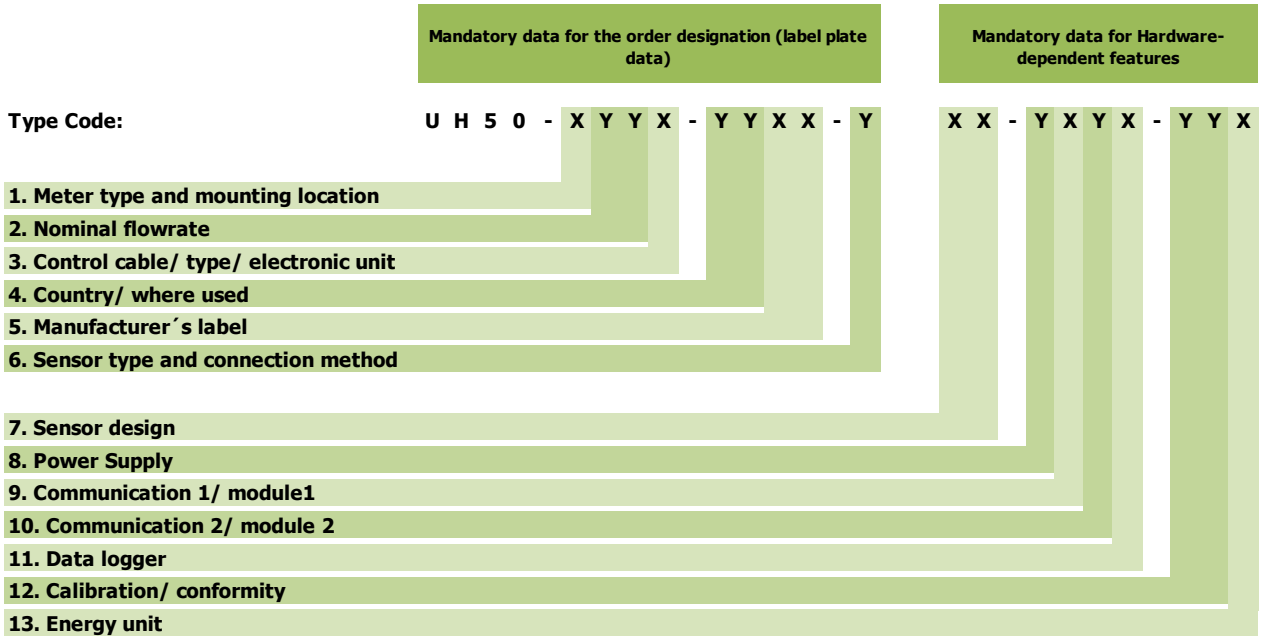
*) For a shorter measuring period than 1 hour, the largest value from the maximum values calculated within one hour applies.

The data are recorded with the value and time stamp. Parameterizing and read-out is performed via the optical interface with the service software.

Note: Data transmission is in a manufacturer-specific format.

	Value set for data to be recorded
Meter readings at the end of the period for...	Quantity of energy Tariff register 1, 2, 3 Volume Operating duration *) Fault duration *) Pulse input 1 Pulse input 2 *) depending on parameter setting: hours or days
Instantaneous values at the end of the period for...	Power Flowrate Flow temperature Return temperature Temperature difference Error display
Maximum for...	Power Flowrate Flow temperature Return temperature Temperature difference

15 Order codes (type number key)



Order codes for label plate data	
1. Type of meter and mounting location	**Code**
Heat meter for two wire temperature measurement and for mounting in return	A
Heat meter for two wire temperature measurement and for mounting in flow	B
Combined heat/cooling meter for two wire temperature measurement and for mounting in return (only in connection with temperature sensor Pt500)	C
Flow sensor	D
Cooling meter for two wire temperature measurement and for mounting in return (only in connection with temperature sensor Pt500)	G
Heat meter for four wire temperature measurement and for mounting in return	L
Heat meter for four wire temperature measurement and for mounting in flow	M
Combined heat/cooling meter for four wire temperature measurement and for mounting in return (only in connection with temperature sensor Pt500)	N
Cooling meter for four wire temperature measurement and for mounting in return (only in connection with temperature sensor Pt500	T
2. Nominal flowrate	**Code**
Nominal flowrate 0.6 m³/h, length 110mm, nominal pressure PN16, connection G ¾ B	05
Nominal flowrate 0.6 m³/h, length 110mm, nominal pressure PN25, connection G ¾ B	06
Nominal flowrate 0.6 m³/h, length 190mm, nominal pressure PN16, connection G 1 B	07
Nominal flowrate 0.6 m³/h, length 190mm, nominal pressure PN25, connection flanged DN 20	08
Nominal flowrate 0.6 m³/h, length 190mm, nominal pressure PN25, connection G 1 B	09
Nominal flowrate 1.5 m³/h, length 110mm, nominal pressure PN16, connection G ¾ B	21
Nominal flowrate 1.5 m³/h, length 110mm, nominal pressure PN25, connection G ¾ B	22
Nominal flowrate 1.5 m³/h, length 190mm, nominal pressure PN16, connection G 1 B	23
Nominal flowrate 1.5 m³/h, length 190mm, nominal pressure PN25, connection flanged DN 20	24
Nominal flowrate 1.5 m³/h, length 190mm, nominal pressure PN25, connection G 1 B	25
Nominal flowrate 1.5 m³/h, length 130mm, nominal pressure PN16, connection G 1	26
Nominal flowrate 1.5 m³/h, length 130mm, nominal pressure PN25, connection G 1	27
Nominal flowrate 2.5 m³/h, length 130mm, nominal pressure PN16, connection G 1 B	36
Nominal flowrate 2.5 m³/h, length 130mm, nominal pressure PN25, connection G 1 B	37
Nominal flowrate 2.5 m³/h, length 190mm, nominal pressure PN16, connection G 1 B	38
Nominal flowrate 2.5 m³/h, length 190mm, nominal pressure PN25, connection flanged DN 20	39
Nominal flowrate 2.5 m³/h, length 190mm, nominal pressure PN25, connection G 1 B	40
Nominal flowrate 3.5 m³/h, length 260mm, nominal pressure PN16, connection G 1¼ B	45
Nominal flowrate 3.5 m³/h, length 260mm, nominal pressure PN25, connection flanged DN 25	46
Nominal flowrate 3.5 m³/h, length 260mm, nominal pressure PN25, connection G 1¼ B	47
Nominal flowrate 6.0 m³/h, length 260mm, nominal pressure PN16, connection G 1¼ B	50
Nominal flowrate 6.0 m³/h, length 260mm, nominal pressure PN25, connection flanged DN 25	52
Nominal flowrate 6,0 m³/h, length 150mm, nominal pressure PN16, connection G 1 ¼ B	55
Nominal flowrate 10 m³/h, length 300mm, nominal pressure PN16, connection G 2 B	60
Nominal flowrate 10 m³/h, length 300mm, nominal pressure PN25, connection flanged DN 40	61
Nominal flowrate 10 m³/h, length 200mm, nominal pressure PN16, connection G 2 B	63
Nominal flowrate 15 m³/h, length 270mm, nominal pressure PN25, connection flanged DN 50	65
Nominal flowrate 15 m³/h, length 200mm, nominal pressure PN25, connection flanged DN 50	69
Nominal flowrate 25 m³/h, length 300mm, nominal pressure PN25, connection flanged DN 65	70
Nominal flowrate 40 m³/h, length 300mm, nominal	74

pressure PN25, connection flanged DN 80	
Nominal flowrate 60 m³/h, length 360mm, nominal pressure PN16, connection flanged DN 100	82
Nominal flowrate 60 m³/h, length 360mm, nominal pressure PN25, connection flanged DN 100	83
3. Control cable / type / electronic unit	**Code**
Compact version (until 90°C, with 0.3m control cable)	A
Split version with 1.5m control cable	C
Split version with 3.0m control cable	D
Split version with 5.0m control cable	E
Compact version (until 90°C, with 0.3m control cable),control cable removable	M
Split version with 1.5m control cable, control cable removable	P
Split version with 3.0m control cable, control cable removable	Q
Split version with 5.0m control cable, control cable removable	R
4. Country / where used	**Code**
Dial plate for Armenia (Armenian)	AM
Dial plate for Austria (German)	AT
Dial plate for Bosnia-Herzegovina (Croatian)	BA
Dial plate for Belgium (French/Flemish)	BE
Dial plate for Bulgaria (Bulgarian)	BG
Dial plate for Belarus (Russian)	BY
Dial plate for Switzerland (German/French)	CH
Dial plate for China (Chinese)	CN
Dial plate for Serbia and Montenegro (Serbian)	CS
Dial plate for Czech Republic (Czech)	CZ
Dial plate for Germany (German)	DE
Dial plate for Denmark (Danish)	DK
Dial plate English neutral	EN
Dial plate for Spain (Spanish)	ES
Dial plate for Finland (Finnish)	FI
Dial plate for Great Britain (English)	GB
Dial plate for Greece (Greek)	GR
Dial plate for Croatia (Croatian)	HR
Dial plate for Hungary (Hungarian)	HU
Dial plate for Iceland (Icelandic)	IS
Dial plate for Italy (Italian)	IT
Dial plate for Japan (Japanese)	JP
Dial plate for Kazakhstan (Russian)	KZ
Dial plate for Lithuania (Lithuanian)	LT
Dial plate for Macedonia (Macedonian)	MK
Dial plate for Mongolia (Mongolian)	MN
Dial plate for The Netherlands (Dutch)	NL
Dial plate for Poland (Polish)	PL
Dial plate for Romania (Romanian)	RO
Dial plate for Russia (Russian)	RU
Dial plate for Sweden (Swedish)	SE
Dial plate for Slovak Repuplic (Slovakian))	SK
Dial plate for Southern Tyrol	I2
Dial plate for Ukraine (Ukrainian)	UA
Dial plate for Uzbekistan (Russian)	UZ
5. Manufacturer's label	**Code**
Logo Landis+Gyr	00
other labels on request	xx
6. Sensor type and method of connection	**Code**
Flow sensor (without temperature sensors)	0
Sensor Pt100, removable, not mounted in the tube	A
Sensor Pt100, removable, mounted in the tube	B
Sensor Pt100, removable, mounting in the tube as an option	C
Sensor Pt100, removable, mounted in the tube within a pocket	D
Sensor Pt500, removable, not mounted in the tube	E
Sensor Pt500, removable, mounted in the tube	F
Sensor Pt500, removable, mounting in the tube as an option	G
Sensor Pt500, removable, mounted in the tube within a pocket	H
Sensor Pt100, not removable, not mounted in the tube	N
Sensor Pt100, not removable, mounted in the tube	P
Sensor Pt100, not removable, mounting in the tube as an option	R
Sensor Pt100, not removable, mounted in the tube within a pocket	S
Hardware-dependent features	
7. Sensor type	**Code**
Without temperature sensors	00
Type DS, 25 bar/150°C/ M10x1 / length 27,5mm, cable length 1,5m	0B
Type DS, 25 bar/150°C/ M10x1 / length 27,5mm, cable length 2,5m	0C
Type DS, 25 bar/150°C/ M10x1 / length 38mm, cable length 1,5m (only Pt500)	0D
Type DS, 25 bar/150°C/ M10x1 / length 38mm, cable length 2,5m (only Pt500)	0E
Type PS, 16 bar/150°C/ Ø5,2x45mm, cable length 1,5m	0H
Type PS, 16 bar/150°C/ Ø5,2x45mm, cable length 5m	0J
Type PL, 25 bar/180°C/ Ø6x100mm, cable length 2m	0M
Type PL, 25 bar/180°C/ Ø6x100mm, cable length 5m (only Pt500)	0N
Type PL, 25 bar/180°C/ Ø6x150mm, cable length 2m	0P
Type PL, 25 bar/180°C/ Ø6x150mm, cable length 5m (only Pt500)	0Q
8. Power supply	**Code**
Without power supply	0
Standard battery for 6 years (2xAA cells)	A
Battery for 6 years for all applications (D-cells)	B
Battery for 11 years (C cell)	C
Battery for 11 years (D-cell)	E
Battery for 16 years (D cell)	F
Battery without printing of the year	G
Power supply 24V AC/DC with plug	M
Power supply 230V AC with 1.5m cable	N
Power supply 230V AC with 5m cable	P
Power supply 230V AC with 10m cable	Q
Power supply 110V AC with 1.5m cable	R
Power supply 110V AC with 5m cable	S
Power supply 110V AC with 10m cable	T
9. Communication module 1	**Code**
No module in slot1	0
Analog module in slot1	A
M-Bus module G4 in slot1	B
CL-module in slot1	C
M-bus 30s module in slot1	D
M-bus module G4-MI with 2 pulse inputs	N
Pulse module with OptoMOS in slot1	L
Pulse module standard in slot1	P
10. Communication module 2	**Code**
No module in slot2	0
Analog module in slot2	A
M-Bus module G4 in slot2	B
CL-module in slot2	C
M-bus 30s module in slot2	D

Pulse module with OptoMOS in slot2	L
Pulse module standard in slot2	P
Radio module in slot2	R
Radio module with external antenna in slot2	X
11. Data logger	**Code**
Without data logger	0
Data logger with 8 channels	8
12. Calibration / conformity	**Code**
certified acc. to national regulations	CL
compliant to MID class 2	M2
compliant to MID class 3	M3
compliant with CEN 1434, class 2	T2
compliant with CEN 1434, class 3	T3
compliant acc. to national regulations	TL
13. Energy unit	**Code**
Display: kWh (until qp 10)	A
Display: MWh with 3 decimal places (as of qp 15 with 2 decimal places)	B
Display: MJ (until qp 2.5)	C
Display: GJ with 3 decimal places (as of qp 3.5 with 2 decimal places))	D
Display: kWh (until qp 10), flashing	G
Display: MWh with 3 decimal places (as of qp 15 with 2 decimal places), flashing	H
Display: GJ with 3 decimal places (as of qp 6 with 2 decimal places), flashing	K
Display: m³ (for the flow meter) with 2 decimal places (as of qp 40 with 1 decimal place)	V
Further features	
Measurement dynamics	**Code**
Dynamic range 1:100	C
other ranges on request	

Notes

- All regulations on the use of meters must be observed.
- Cavitation in the system must be avoided.
- Meters up to DN25 may only be installed with directly immersed sensors according to German calibration law!
- Install the unit in such a way that no water can enter the electronic unit during operation.
- User seals may only be removed by authorized persons for service purposes and must be replaced afterwards.
- The unit is supplied with Installation and Service Instructions and with Operating Instructions.
- No later than 30 seconds after installation, the meter detects the plugged modules automatically and is ready for communication or pulse output.
- The type of modules plugged can be displayed in the service loop depending on how the display is parameterized.
- For fast pulses, the parameters must be set accordingly with the service software.
- Up-to-date versions of all instructions can be found in the Internet at www.landisgyr.com

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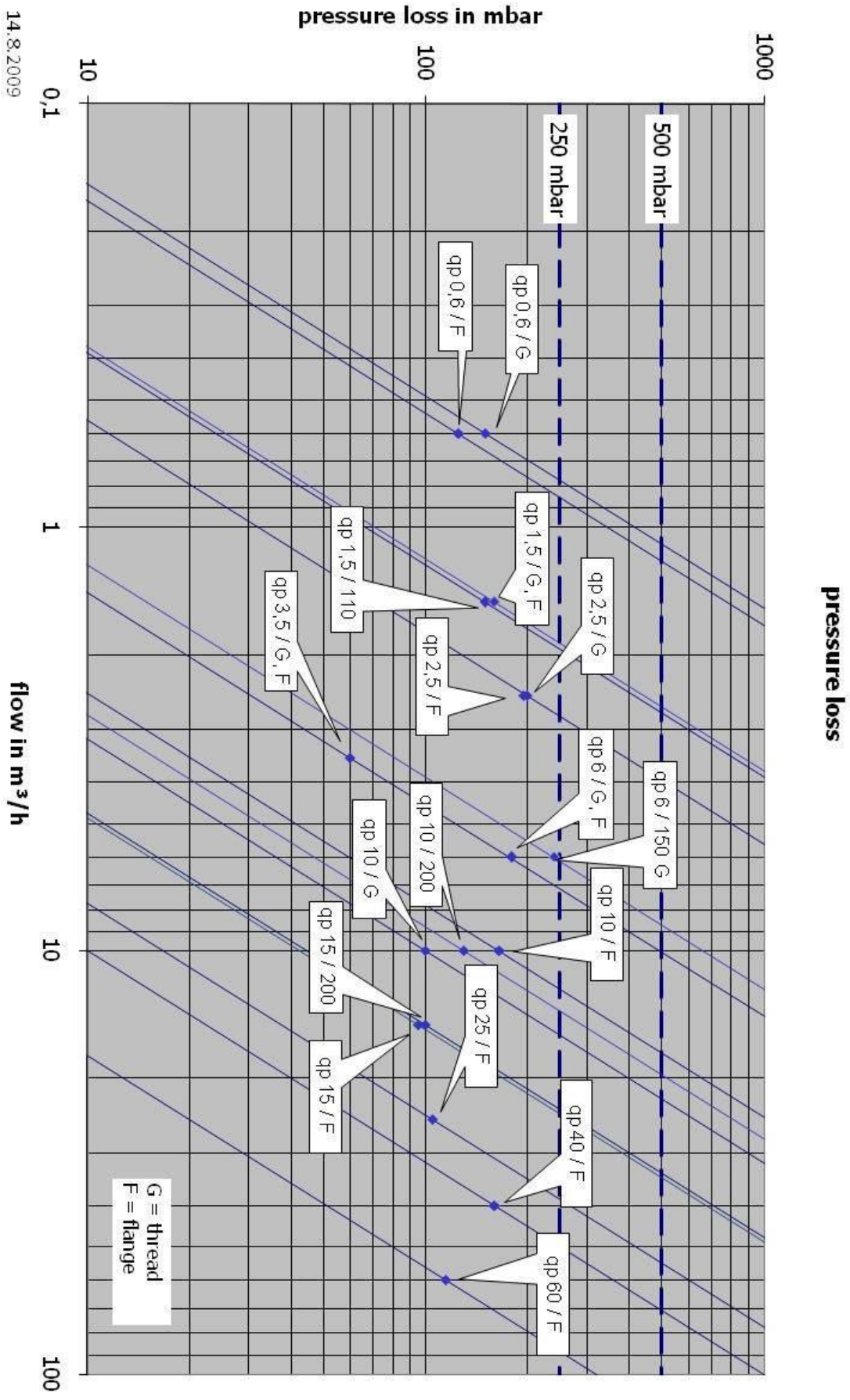
16 Pressure loss