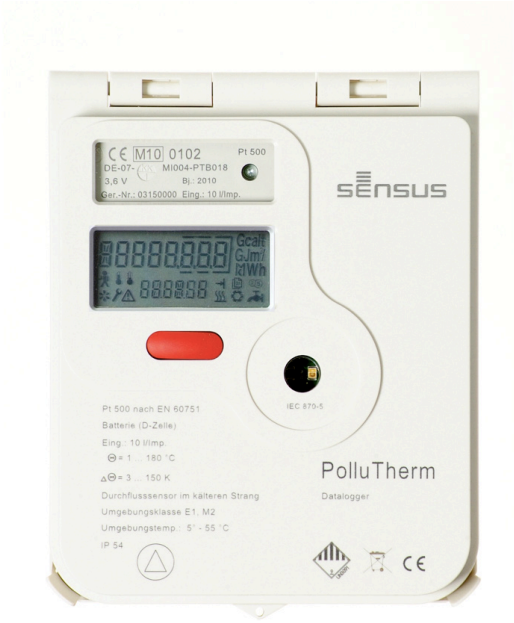
PolluTherm

Integrator for measuring heating and cooling energy



Main characteristics

- Compatible with almost any flow sensor type due to 9 different input pulse values (1 litre to 10,000 litres)
- For simplification of stock-keeping the input pulse values can also be programmed on site (order variant without surcharge)
- Standard possibility to connect temperature sensors Pt 500 in four- wire technology for quick and economic extension of temperature sensor cables
- High-resolution measuring cycles (2 seconds for temperatures, 4 seconds for power and flowrate)
- Back up of measuring and counting functions of mains-operated instruments for up to 3 months in case of external power failure
- Password-protected parameter setting right at the meter itself without any further peripheral equipment

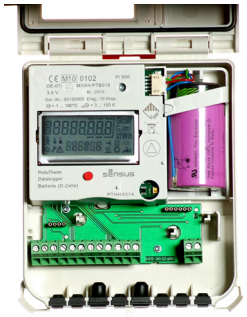
Available design

The integrator PolluTherm is applicable for energy consumption measurement in heating or cooling circuits. Optionally PolluTherm is available for the usage in combined heating and cooling systems, where an automatic switch-over point provides storing of heating and cooling energy in separate registers. This switch-over point can be changed in accordance with the heating and cooling system requirements even after the meter has already been installed (e.g. concrete core activation).

Regarding data communication and remote reading the novel casing conception offers two slots for anytime upgrade with various modules, e.g. M-Bus or remote reading pulses.

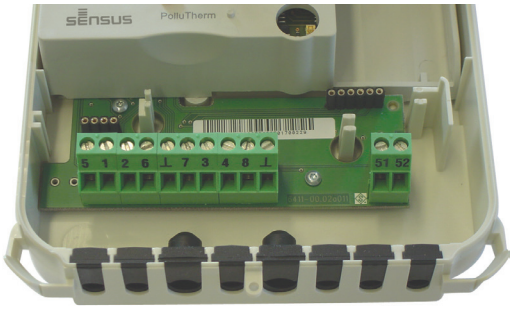
Casing Concept

Internal view, type Pt 500, battery-operated



Removable calibrated integrator unit

Spacious terminal box



- High-quality bevel terminal block
- Standard possibility to connect temperature sensors in four-wire technology
- Two slots for various upgrading modules
- Novel cable strain relief with removable preshaped parts

Consumption Registers

In addition to the calibrated main register there are two further registers available:

“Cooling” register – automatic switch-over between heat and cool metering

This option allows a measurement of the heating as well as of the cooling energy in combined heating and cooling systems, where the cooling energy is stored in the “cooling” register.

A so-called „automatic switch-over point”, which depends on the supply temperature as well as on the difference between supply and return temperature, specifies when heating or cooling energy is to be measured. Both values are suitably preset in the factory and, in case of need, can be changed on site according to the system requirements (e.g. in case of concrete core activation). The integrator allows a direct control of the active settings:

Example: Switch-over of heat to cool metering at a supply flow temperature ≤ 25 °C and a concurrent negative temperature difference of ≥ - 0,15 K

Tariff register 1

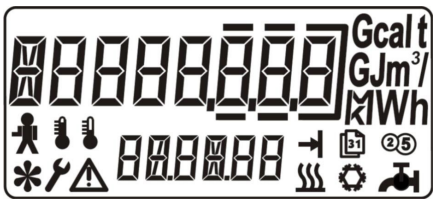
This standard tariff register stores the heating and cooling energy respectively, as well as exceeding or falling below programmable limit values for below system parameters:

- Heating and cooling power resp.
- Flowrate of heating and cooling fluid resp.
- Temperature in the warmer line
- Temperature in the colder line
- Temperature difference

The required settings or changes are possible via optical interface at any time.

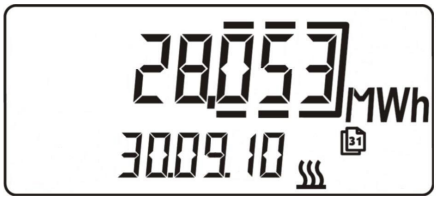
LC Display

PolluTherm is equipped with a comfortable LC display with eight-digit main reading line and six-figure subordinate reading line. Moreover 12 additional symbols support the read-out.



Segment test

One of many useful features of this conception is the simultaneous display of stored consumption values together with the associated date – an important contribution to avoid misreadings:



Example: monthly value for heating energy

Wherever it is appropriate, the display shows additional letters in the six-figure subordinate line in order to increase the read-out comfort:

Example: M-Bus secondary address

The available display items are clearly structured in 6 menus and include in substance:

L 1: User menu

- Accumulated consumptions
- Segment test
- Instantaneous values (power, flowrate, temperatures)
- Customer's reference number

L 2: Target day menu

Consumption values at a programmable annual target day

L 3: Archive menu

Rolling monthly storage of the following values for the last 16 months:

- Consumptions
- Volumina of the heating resp. cooling liquid
- Maxima for power and flowrate
- Potential failure hours

L 4: Service menu

- Maximum values since operational start-up
- Date and time
- Next target day
- Operation days
- M-Bus addresses

L 5: Control menu

- Set tariff parameters
- Switch-over point between heat and cool metering
- Correction factor in case of using water-antifreeze-mixtures

L 6: Parameter menu

This is the menu where, among other possibilities, following items can be set right at the meter itself (protected by password):

- M-Bus addresses
- Customer's reference number
- Date and time
- Next target date
- Reset of maximum values

For details of the complete scope of display possibilities please refer to the installation and operation instructions MH 6111 INT.

Upgrade Plugin Modules

For electronic reading and connection to building automation systems a variety of anytime upgrade plugin modules are available for the PolluTherm:

M-Bus according to EN 1434-3
Order number: 68504020

This plugin module allows reading the meter via its primary or secondary address with an M-Bus level converter (300 and 2400 Baud, automatic recognition). The secondary address is preset in the factory to the eight-digit meter serial number. If required both M-Bus addresses can be changed at the meter itself. Because of the short updating time for temperatures of 2 secons only as well as for power and flowrate values of 4 seconds only, the mains-operated PolluTherm is excellently suitable for the connection to district heating regulators.

Suitable read-out software:
DOKOM CS (leaflet LS 1300)

Suitable read-out hardware:
See leaflet LS 1100

M-Bus with two inputs for external consumption meters
Order number: 68504686

This plug-in module allows the additional connection of up to two external consumption meters (cold water, warm water, electricity, gas, „others“) with passive remote reading pulse output (reed switch, open collector). The consumptions of those meters can then be read out via the M-Bus interface of the PolluTherm.

Required pulse duration: > 100 ms

Pulse input frequency: < 3 Hz

Terminal voltage: 3 V

Remote reading pulses energy
For battery-operated PolluTherm
Order number: 68503922

Remote reading pulses energy and volume
For mains-operated PolluTherm
Order number: 68503920

Those two plugin modules provide potential-free and bounce-free remote reading pulses, which can be added up by a remote totalizer.

Closing time: 125 ms

Bounce time: none

Max. voltage: 28 V DC or AC

Max. power: 0.1 A

The pulse values depend on the size of the connected flow sensor:

Input pulse value in l	0.25 or 1	2.5 or 10	25 or 100	250, 1.000 or 10,000
Display of the integrator with decimal digits for MWh, GJ and m³	00000.000	000000.00	0000000.0	00000000
Pulse value in case of remote energy reading in MWh	0.001	0.01	0.1	1
Pulse value in case of remote volume reading in m³	0.001	0.01	0.1	1

USB interface
Order number: 68504688

This plugin unit allows the connection of the meter to a USB interface of a PC or a notebook.

USB-Port: 1.1 or 2.0

Connection plug: type A

Cable length: ca. 1.5 m

Baud rate: 19,200

LONWORKS®-FTT10A
Order number: 68505078

This plug-in module is used to implement the meter via LONTALK® protocol into a building automation system. For detailed informations please refer to data sheet LH 6130 INT.

Modbus RTU Plugin Unit
Order number: 08009144

The Modbus RTU option module is used to connect the PolluTherm heat calculator to the Modbus RTU network using EIA-485 channel. For details please see the Manual MH 6123.

Further Options

Integrated data logger

By this factory-set option the following values are stored in a selectable time interval (3 to 1440 minutes):

- Consumption (incl. tariff consumption and, if applicable, consumptions of the two external meters)
- Volume of the heating and cooling liquid resp.
- Flowrate of the heating and cooling liquid
- Heating and cooling power resp.
- Temperature in the warmer line
- Temperature in the colder line
- Temperature difference
- Potential failure hours

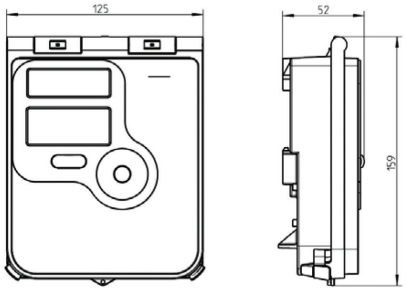
The capacity is ca. 1300 data records, i.e. for example covering ca. 54 days in case of hourly logger intervals.

The logger values are read out with the service software MiniCom, version 3.6.0.28 or higher.

Technical Data

Temperature measuring range	1 ... 180 °C (-20 ... 180 °C uncalibrated)
Temperature difference	3 ... 150 K
Cut-off threshold	0.15 K
Measuring accuracy	better than ± (0,5 + ΔΘmin / ΔΘ)
Approval	acc. EN 1434, Class 2 Directive 2004/22/EG (MID)
Updating times and integration cycles resp. Temperatures Flowrate, Power Energy, Volume	 2 sec 4 sec 4 sec (16 sec *) * for battery-operated instruments
Buffering of measuring and counting functions in case of power failure	≤ 3 months
Optical data interface	Physical acc. to EN 61107 Data telegram acc. to EN 1434-3
Permissible environmental temperature	5 ... 55 °C
Battery lifetime	6 years + 1 year storing reserve optional: 11 years
Electromagnetic environment	Class E 1
Mechanical environment	Class M 2
Storing temperature	- 20 °C ... + 65 °C
Dimensions (wall mounting)	ca. 125 x 159 x 52 mm (WxHxD)
Wall mounting	C-rail
Suitable types of temperature sensors	Pt 500 Two- or four-wire connection
Input pulse values for flow sensors	1 / 10 / 100 / 1,000 / 10,000 / 0.25 / 2.5 / 25 or 250 litres
Type of the pulsers	Reed switch, open collector
Input pulse frequency	≤ 3 Hz
Protection class	IP 54

Dimensional Drawings



Standard variants for complete instruments and internal integrator modules

- Adjusted for flow sensors in colder or warmer pipe
- Pulse input value 10l, 100l, 1.000l or programmable on site
- Battery or mains operation
- Physical unit MWh or GJ

Further variants on enquiry

Order details for accessories

* Those plugin units are compatible to the former version of PolluTherm and can, as far as already available, reused in the present PolluTherm.

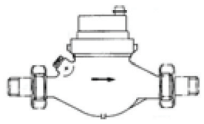
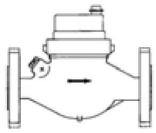
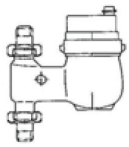
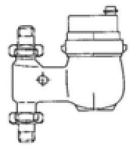
Regarding the plugin unit for remote reading of energy pulses (order no. 68503922) we recommend to use a new plugin unit after expiry of the verification period because of the soldered-on battery.

For further accessories please refer to our present price list for heating / cooling meters and system technology.

Description	Order no.
Power supply unit 230 V AC for modification from battery to mains operation 	68504532
Junction box for four-wire extension of temperature sensor cables	88599001
Upgrading plugin units	
Remote reading of energy and volume pulses * for mains-operated PolluTherm only	68503920
Remote reading of energy pulses for battery-operated PolluTherm only	68503922
M-Bus interface acc. to EN 1434-3 *	68504020
Accessories for data communication	
USB interface for connection to PC or notebook 	68504688
Optical data coupler with USB connection 	184023

* These plugin units are compatible to the former version of PolluTherm and can, as far as already available, reused in the present PolluTherm.

Order details for complete measuring points

Type	DN	Qp (Qn)	PN	Overall length (mm)
with screwed ends for horizontal mounting position				
		1,5	16	190
		2,5		190
		3,5		260
		6		260
		10		300
Flanged for horizontal mounting position				
	20	1,5	16	190
	20	2,5		190
	25	3,5		260
	25	6		260
	40	10		300
	20	1,5	25	190
	20	2,5		190
	25	3,5		260
	25	6		260
	40	10		300
for vertical mounting position in down pipe				
		1,5	16	105
		2,5		105
		3,5		150
		6		150
		10		200
for vertical mounting position in riser pipe				
		1,5	16	105
		2,5		105
		3,5		150
		6		150
		10		200

A complete measuring point includes following components:

- Integrator PolluTherm (battery- or mains operated)
- One pair of temperature sensors Pt 500
- One pair of wells (stainless steel V4A)
- Flow sensor with volume pulse output

For the order numbers for the complete kits (including the a.m. components) please refer to the present price list for heating / cooling meters.

Suitable flow sensors

Nominal flowrate from 1.5 to 10 m³/h (Qn or Qp 1.5 to 10), nominal size DN 20 to 40:

Multi-jet dry-dial meter type AN 130, leaflet: LH 7100

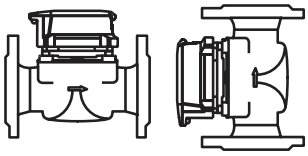
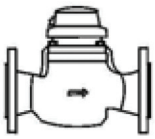
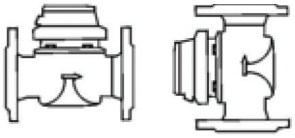
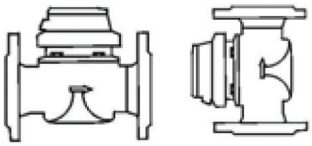
Order details for complete measuring points

Nominal flow from 15 to 600 m³/h (Qn or Qp 15 to 600), nominal size DN 50 to 300:

MeiStream Flow Sensor, leaflet LB 4020

Woltman Bauart WS, leaflet LB 4200

Woltman Bauart WP, leaflet LB 4100 and leaflet LB 5200

Type	DN	Qp (Qn)	Temperature	PN	Length (mm)
MeiStream Flow Sensor for horizontal and vertical mounting position (down or riser pipe)					
	50	25	90 °C	16	200
	65	25			200
	80	60			225
	100	60			250
	50	25			270
	65	25			300
	80	60			300
	100	60			360
Woltman type WS flanged for horizontal mounting position					
	150	150	130 °C	16	500
	50	15		40	270
	65	25			300
	80	40			300
	100	60			360
	150	150			500
Woltman type WP flanged for horizontal and vertical mounting position (down or riser pipe)					
	125	100	130 °C	16	250
	150	150			300
	50	15		40	200
	80	40			225
	100	60			250
	150	150			300
Woltman type WP flanged for horizontal and vertical mounting position (down or riser pipe)					
	200	250	130 °C	16	350
	250	400			450
	300	600			500
	200	250		40	350
	250	400		25	450