

Ultrasonic Cooling Meters with Integrator

Features

- "Long-life" ultrasonic heat meter
- Pulse, M-Bus or Lon output options
- Large dynamic range



Specification

Display type	7 digit LCD, 7.6mm high
Non. Flow rate (Qn)	1.5m ³ /h to 100m ³ /h
Supply voltage	3.6V ±0.1V
Battery	3.65Vdc, D-cell lithium
Battery life	Wall mounted <30°C 10 Years
Mains supply:	
	230Vac +15/-30%
	24Vac/dc ±50%
Power consumption	<1W
Temperature sensors	Matched pair PT500b (EN60751)
Temperature range	0 to 50°C
Ambient temp.	5 to 55°C
Storage temp.	-20 to 60°C
Flow sensor cable	2.5m
Pressure step:	
Threaded	PN16
Flanged	PN25
Meter material (1.5m ³):	
Housing	Brass
Gaskets	EPDM
Transducer	S/S 1.4401
Reflectors	S/S 1.4401 & Thermoplastic
Meter material (all others):	
Housing	Brass
Gaskets	EPDM
Transducer	S/S 1.4401
Reflectors	S/S 1.4301
Protection	IP54
EMC	EN1434 class A, MID-204/22/EC
Country of origin	Denmark

Product Codes

MW-65-1 Cooling Meter Integrator
(build with the following options)

Flow meter (add to above code)

-CDAA	qp 1.5m ³ /h, ½" screwed
-CDAD	qp 1.5m ³ /h, ¾" screwed
-CDAF	qp 1.5m ³ /h, ¾" screwed
-CEAF	qp 2.5m ³ /h, ¾" screwed
-CGAG	qp 3.5m ³ /h, 1" screwed
-CHAG	qp 6m ³ /h, 1" screwed
-CJAJ	qp 10m ³ /h, 1½" screwed
-CHBB	qp 6m ³ /h, DN25 flanged
-CJBD	qp 10m ³ /h, DN40 flanged
-CKBE	qp 15m ³ /h, DN50 flanged
-CLBG	qp 25m ³ /h, DN65 flanged
-CMCH	qp 40m ³ /h, DN80 flanged
-FACL	qp 60m ³ /h, DN100 flanged
-FBCL	qp 100 ³ /h, DN100 flanged

Top output modules (add to above code)

-67-0	No module
-67-8	Pulsed output

Base output modules (add to above code)

-00	None
-20	M-bus/pulse inputs
-24	LonWorks FTT10A*

Supply modules (add to above code)

-2	Battery
-7	230Vac
-8	24Vac

PT500 Temp. sensors (add to above code)

-A	Pocket sensors 1.5m
-B	Pocket sensors 3m
-C	Pocket sensors 5m
-D	Pocket sensors 10m

* Supply modules 7 & 8 ONLY

Technical Overview

The MW-65-1 series is used for the measurement of cooling systems, with flow temperatures from 2 to 50°C.

The flow is measured using bi-directional ultrasonic technique based on the transit time method, with long term proven stability and accuracy. The meter is not suitable for use with any other media than water, and should not be used with non-freezing additives like glycol.

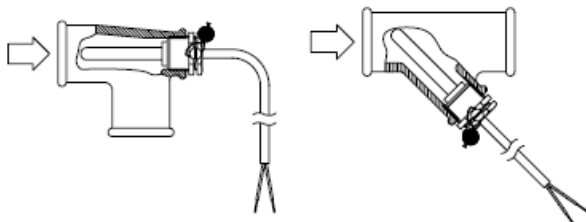
Mounting Of Temperature Sensors

Temperature sensors used to measure flow and return temperatures make up a matched pair of sensors and must never be separated.

Usually, the MW-65-1 is supplied with mounted temperature sensors. The cable length must not be changed. Replacement of sensors, if required, must always be made in pairs. One sensor is marked with a red sign, and must be installed in the flow pipe (cold pipe). The other sensor is marked with a blue sign, and must be installed in the return pipe (warm pipe).

Preferably, sensor pockets must be mounted in tee-pieces or in 45°C lateral Y-pieces. The tip of the sensor pocket must be placed pointing towards the flow direction and in the middle of the water flow.

Temperature sensors must be mounted from below.



Temperature sensors should be inserted to the bottom of the pockets. If a quick response time is required, "non-hardening" heat conducting paste can be used. Push the plastic sleeve on the sensor cable into the sensor pocket and secure the cable with the supplied M4 sealing screw. Fasten the screw with your fingers only. Seal the pockets using seal and sealing wire.

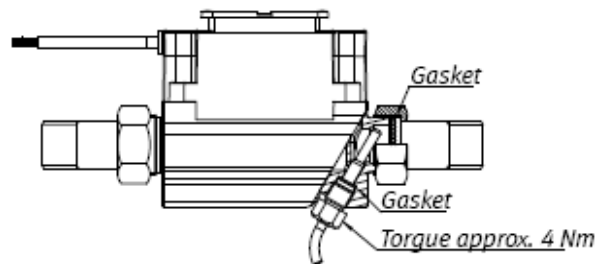
Information Codes

The MW-65-1 constantly monitors a series of important functions. If a serious error occurs in the measuring system or in the installation, an "Info" appears in the display and an info code can be read by activating the upper front plate button until the measuring unit shows an "Info" in the display. The info code is only visible while the error exists.

Info code	Description	Response time
0	No error	-
1	No supply voltage	-
8	Sensor T1 outside measuring range	1...10 min
4	Sensor T2 outside measuring range (if activated CCC=4XX)	1...10 min
16	Flow sensor error, signal low or wrong flow direction	Reset & 1 day
2048	Flow sensor, wrong meter factor	Reset & 1 day
4096	Flow sensor signal to low (air)	Reset & 1 day
16384	Flow sensor, wrong flow direction	Reset & 1 day

Mounting of Flow Sensor

Before mounting the flow sensor, flush the system thoroughly and remove protection plugs/plastic membranes from the flow sensor. Correct flow sensor position (flow or return pipe) appears from the front label placed on the MW-65-1. The flow direction is indicated by an arrow on the side of the flow sensor.



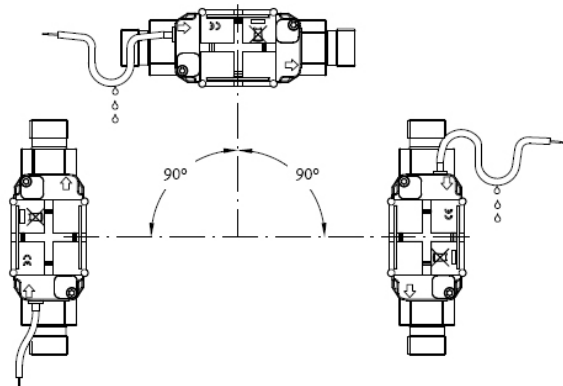
Glands and gaskets must be mounted as shown on the above drawing.

Straight inlet: MW-65-1 requires neither straight inlet nor outlet to meet the Measuring Instruments Directive (MID) 2004/22/EC, OIML R75:2002 and EN 1434:2007. Only in case of heavy flow disturbances before the meter will a straight inlet section be necessary. We recommend to follow the guidelines in CEN CR 13582.

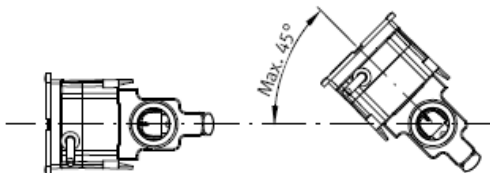
To prevent cavitation, the operating pressure at the MW-65-1 must be min. 1.5 bar at qp and min. 2.5 bar at qs.

The MW-65-1 must not be exposed to pressures below ambient pressure (vacuum).

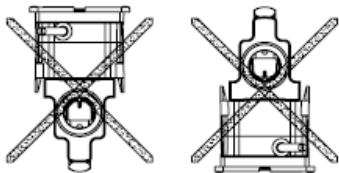
Mounting Of Ultrasonic Meter



The MW-65-1 must be mounted vertically, horizontally or at any angle between.



The MW-65-1 may be turned up to 45° in relation to horizontal.

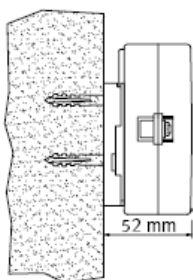


It must not be installed mounted facing upwards or downwards.

Mounting of The Calculator

In cooling applications the MW-65-1 can be mounted in two different ways.

Wall mounting:

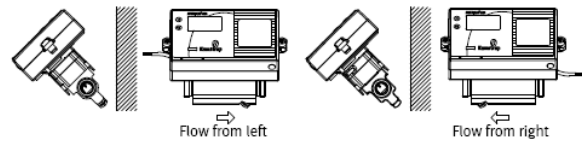


The wall bracket gives you the opportunity of mounting the MW-601 directly on an even wall. Use the bracket as a template to mark and drill two holes with a diameter of 6 mm in the wall.

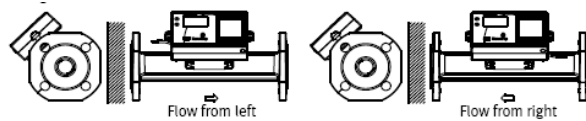
Mounting of The Calculator (continued)

In applications when the media is less than 5°C under ambient temperature the calculator can be mounted on the flow part.

Threaded meter:



Flanged meter:



Power Supply

Battery supply.

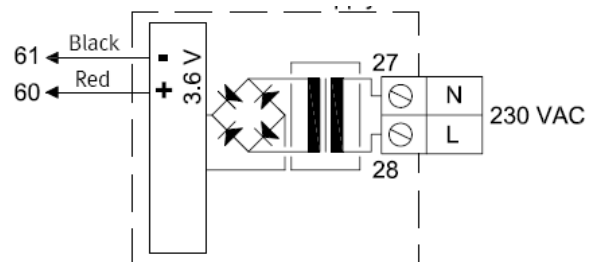
The MW-65-1 uses a lithium battery, D-cell. The battery is marked with installation year, e.g. 2009, as well as production date.

Optimal battery life is obtained by keeping the battery temperature below 30°C, e.g. by wall mounting.

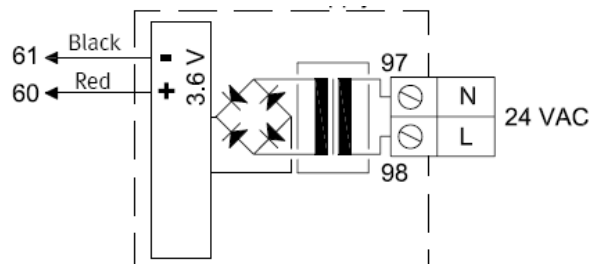
The voltage of a lithium battery is almost constant throughout the whole lifetime of the battery (approx. 3.65 V). Therefore, it is not possible to determine the remaining capacity by measuring the voltage.

The battery cannot and must not be charged and must not be short-circuited.

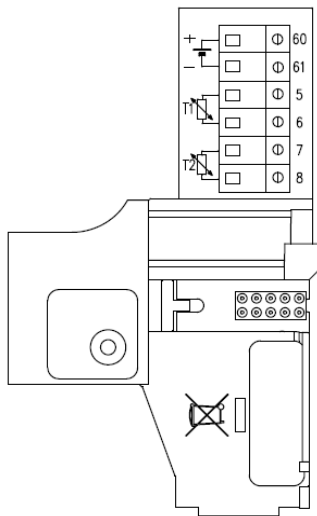
230Vac supply.



24Vac supply.



Sensor Connections

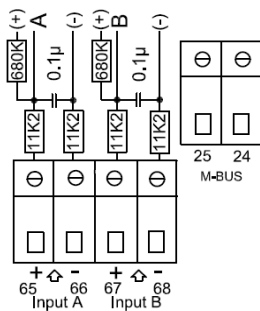


	Terminal No.	Sensor position
T1	5 & 6	Hottest pipe
T2	7 & 8	Coolest pipe

M-bus Connections

M-bus can be mounted in star, ring or bus topology. Depending on the power supply of the M-bus master as well as the total cable resistance, up to 250 meters can be connected.

Cable resistance < 29 Ohm
 Cable capacity < 180 nF



The M-Bus network is to be connected to terminals 24 and 25. The polarity is unimportant. M-bus is supplied with pulse inputs.

LonWorks Connections

Please contact The Customer Services Team for full details.

Pulsed Output

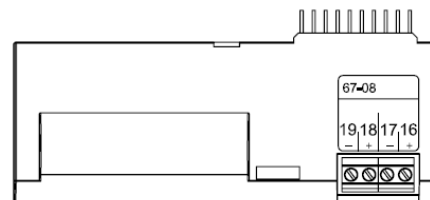
This top module has two configurable pulse outputs, which are suitable for volume and energy pulses for heat meters, cooling meters and combined heat/cooling meters.

The pulse resolution follows the display (determined in the CCC-code). E.g. CCC=119 (qp 1.5):

1 pulse/kWh and 1 pulse/0.01 m3.

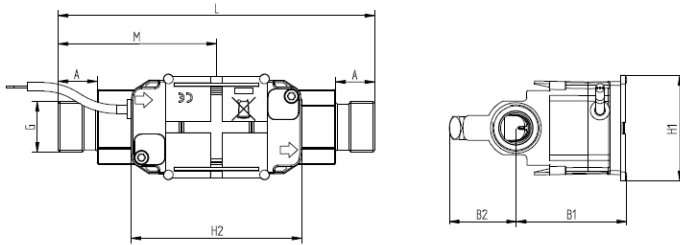
The pulse outputs are optoisolated and stand 30 VDC and 10 mA. Normally energy (CE) is connected to 16- 17 and volume (CV) to 18-19, but other combinations can be selected via the PC program METERTOOL which is also used for selecting pulse widths 32 or 100 ms.

Furthermore, the module includes a hourly data logger.

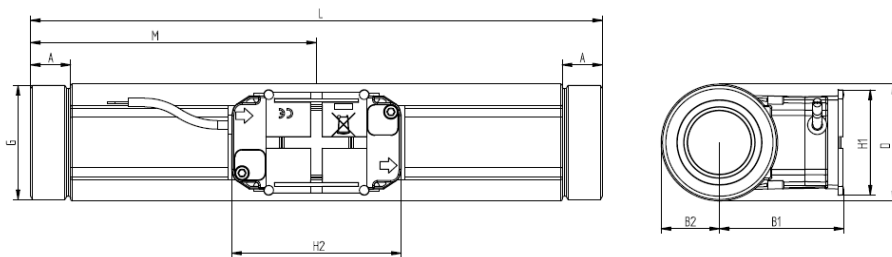


Meter Dimensions

Screwed types:



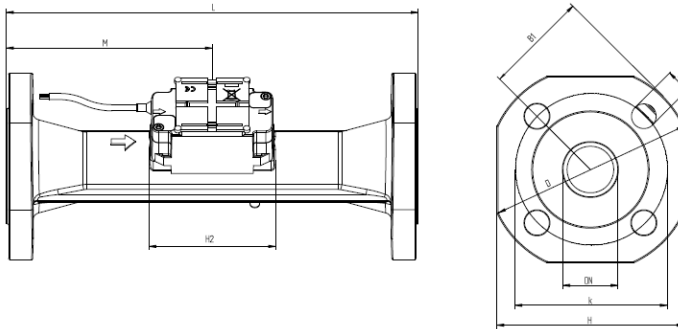
Thread	L	M	H2	A	B1	B2	H1	Weight
G $\frac{3}{4}$ (R $\frac{1}{2}$)	110	L/2	89	10.5	58	35	55	0.8
G1 (R $\frac{3}{4}$)	130	L/2	89	20.5	58	35	55	0.9
G1 (R $\frac{3}{4}$ (Op 1.5))	190	L/2	89	20.5	58	35	55	1.4
G1 (R $\frac{3}{4}$ (Op 2.5))	190	L/2	89	20.5	58	36	55	1.3



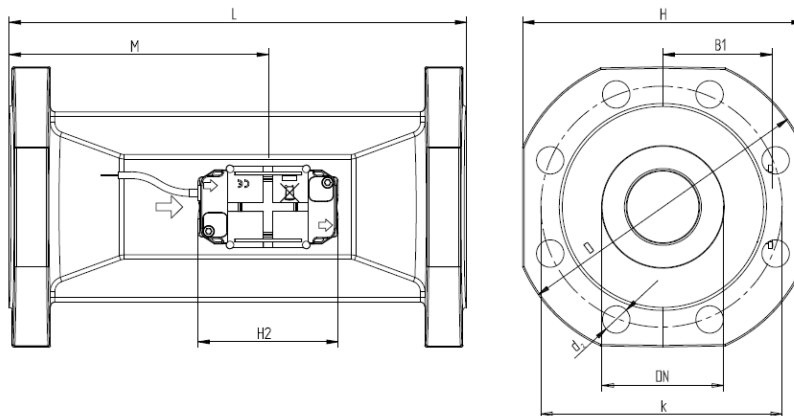
Thread	L	M	H2	A	B1	B2	H1	Weight
G $\frac{5}{4}$ (R1)	260	L/2	89	17	58	22	55	2.3
G2 (R1 $\frac{1}{2}$)	300	L/2	89	21	65	31	55	4.5

Dimensions (continued)

Flanged types:



Nom. Dia.	L	M	H2	B1	D	H	K	Bolts			Weight
								No.	Thread	d ₂	
DN25	260	L/2	89	58	115	106	85	4	M12	14	5
DN40	300	L/2	89	<D/2	150	136	110	4	M16	18	8.3
DN50	270	155	89	<D/2	165	145	125	4	M16	18	10.1



Nom. Dia.	L	M	H2	B1	D	H	K	Bolts			Weight
								No.	Thread	d ₂	
DN65	300	170	89	<H/2	185	168	145	8	M16	18	13.2
DN80	300	170	89	<H/2	200	184	160	8	M16	18	16.8
DN80	350	170	89	<H/2	200	184	160	8	M16	18	18.6
DN100	360	210	89	<H/2	235	220	190	8	M20	22	21.7