
CERTIFIED MID MI004 CERTIFICATO

ENERGY CALCULATOR

ISONRG®
MANAGING ENERGY

# BTU METER

## HVAC&R - Building automation

Thermal energy is determined by a calculation which derives from the application of the following physical relation:

**E=V*K*Δt**

*Where:*

**V** = Volume of the thermal carrierfluid (to be measured)

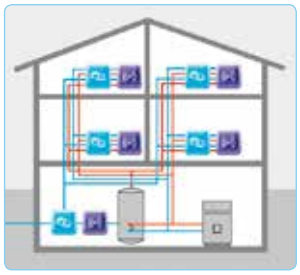
**K** = Specific calorific coefficient of the thermal carrier fluid called Enthalpy (in relation to the internal thermal fluid in use, see PTB tables)

**Δt** = Thermal carrier fluid temperature difference between IN-FLOW and RETURN-FLOW (to be measured)

HEATING/COOLING METER:
Direct measuring methodology requires the flow to be measured directly from the thermal carrier fluid and the energy is usually performed by using:

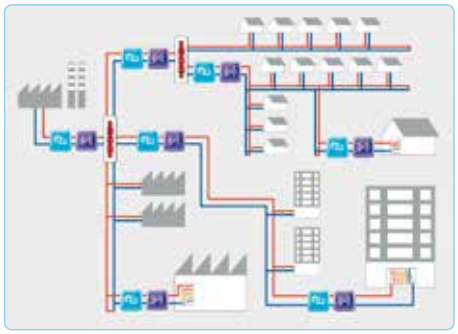
- **flow meter by pulses or analog**
- **energy calculator**
- **two paired temperature sensors**

## Applications



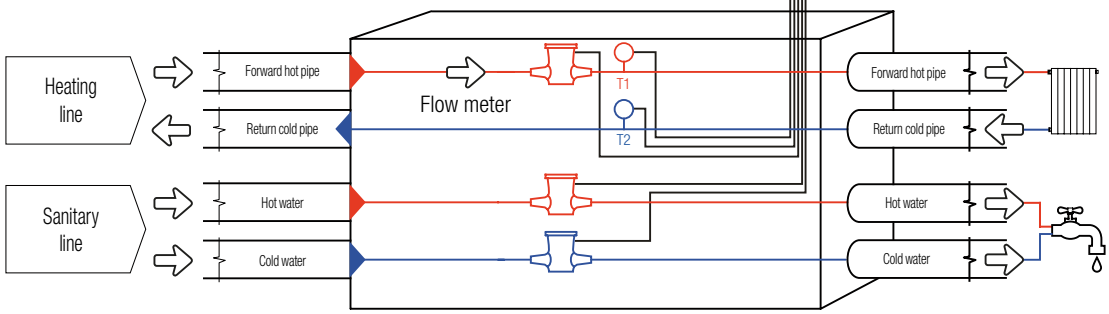
Commercial (offices, industrial, building automation)

Domestic (residential houses, condominium)



Facilities (cities heating/refrigeration)

| ML 311 HEAT METER | |
|---|---|
| Housing | PPO housing sealable |
| Protection rate | IP40/IP54 (with covering) |
| Version | Stand alone - Housing for mounting on DIN rail (acc. to DIN60715) |
| Display | 4 lines × 15 characters, back lighted (blue version opt.) |
| Language | 6 programmable languages (I, E , S, F, D, P) |
| Special function | Bi-directional; Dual range; Diagnostic; Energy Saving; Heat/cold switch; Reset input |
| Pulse/Freq Outs | Programmable functions/open collector (N° 2, 1250Hz, 100mA, 40Vdc - 12,5KHz opt.) |
| Digital/Analog Inputs | Programmable function: 1 Analog (flow rate) 3 Pulses (hot & cold water & volume) |
| Current Output | N°1, 0/4....20mA - RL=1000 (i.e. volume/energy) |
| Data logger | 12 months (i.e. consumption for heating/cooling) |
| Serial com | RS232, RS485, MODBUS, BACnet MS/TP, M-bus, N2Open |
| Power supply | 90÷265 Vac - 45÷66Hz or 18÷63Vdc/15÷45Vac - 45/66Hz optional |
| Accuracy | ± 0,2% r.v. |
| Repeatability | Better than 0,1% |



# TECHNICAL SPECIFICATIONS FLOW METERS

Wafer or insertion probe sensors available.
0,2% accuracy on request.

## ISOMAG ELECTROMAGNETIC FLOW METERS - CE-M marked

| DN | Lenght mm | $Q_i$ minimum flow $m^3/h$ | Qmax maximum flow $Q_p$ $m^3/h = Q_i \times R$ | Qs peak flow $m^3/h = Q_p \times 1,25$ |
|---|---|---|---|---|
| 25 | 200 | 0,20 | 10 | 12,5 |
| 32 | 200 | 0,32 | 16 | 20 |
| 40 | 200 | 0,50 | 25 | 31,2 |
| 50 | 200 | 0,80 | 40 | 50 |
| 65 | 200 | 1,26 | 63 | 78,7 |
| 80 | 200 | 2 | 100 | 125 |
| 100 | 250 | 3,20 | 160 | 200 |
| 125 | 250 | 5 | 250 | 312,5 |
| 150 | 300 | 8 | 400 | 500 |
| 200 | 350 | 12,6 | 630 | 787,5 |

The MID performances are referred to MC50, can be required also extended range Qp/Qi as MC: 10, 25 and 100 according to EN1434, OIML R 75 class 1 and MID class 2.

Available compact ultrasonic version MID certified.

## ISOFLUX ULTRASONIC FLOW SENSORS - CE-M marked

| Connection type | Lenght mm | Limits of low-rate $m^3/h$ | | | Pressure loss Δp at $q_p$ MPa, less than |
|---|---|---|---|---|---|
| | | lower $q_i$ | permanent $q_p$ | upper $q_s$ | |
| Thread G 1¼ | 260 | 0,035 (0,14) | 3,5 | 7,0 | 0,004 |
| Thread G 1¼ | 260 | 0,06 (0,25) | 6,0 | 12,0 | 0,01 |
| Thread G2 | 300 | 0,1 (0,4) | 10,0 | 20,0 | 0,018 |
| Flange DN50 | 270 | 0,15 (0,06) | 15,0 | 30,0 | 0,012 |
| Flange DN65 | 300 | 0,25 (1) | 25,0 | 50,0 | 0,02 |
| Flange DN80 | 350 | 0,4 (1,6) | 40,0 | 80,0 | 0,018 |
| Flange DN100 | 350 | 0,6 (2,4) | 60,0 | 120,0 | 0,018 |

## WP-D WOLTMANN FLOW METERS 50 °C

CE-M marked

| Nominal Diameter DN | Size of meter (acc. to EEC) $Q_n$ | $Q_{max}$ maximum peak flow once in life time 24h $Q_{max}$ or 5 min. 1,2 x $Q_{max}$ (±2%) $m^3/h$ | $Q_n$ continuous flow (±2%) $m^3/h$ | $Q_t$ transitio-nal flow (±2%) $m^3/h$ | $Q_{min}$ minimum flow (±5%) $m^3/h$ | Start-ing flow |
|---|---|---|---|---|---|---|
| 40 | 10 | 60 | 40 | 0.8 | 0.30 | 0.15 |
| 50 | 15 | 90 | 50 | 0.7 | 0.30 | 0.15 |
| 65 | 25 | 120 | 70 | 0.8 | 0.40 | 0.20 |
| 80 | 40 | 200 | 120 | 0.8 | 0.50 | 0.25 |
| 100 | 60 | 300 | 230 | 1.8 | 0.80 | 0.25 |
| 125 | 100 | 350 | 250 | 2.0 | 1.00 | 0.5 |
| 150 | 150 | 600 | 450 | 4.0 | 1.8 | 1.0 |
| 200 | 250 | 1200 | 800 | 6.0 | 4.0 | 1.5 |
| 250 | 400 | 1600 | 1250 | 11.0 | 6.0 | 3.0 |
| 300 | 600 | 2000 | 1400 | 15.0 | 12.0 | 8.0 |
| 400 | 1000 | 3000 | 2000 | 50 | 25 | 15 |

## WP-Z WOLTMANN FLOW METERS 130 °C

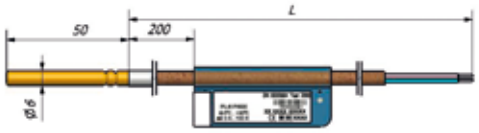
CE-M marked

| | | | | | | |
|---|---|---|---|---|---|---|
| 50 | 15 | 30 | 15 | 1.8 | 0.6 | 0.25 |
| 65 | 25 | 60 | 25 | 2.0 | 1.0 | 0.3 |
| 80 | 40 | 90 | 45 | 3.2 | 1.4 | 0.35 |
| 100 | 60 | 140 | 70 | 4.8 | 2.0 | 0.6 |
| 125 | 100 | 200 | 100 | 8.0 | 3.5 | 1.1 |
| 150 | 150 | 300 | 150 | 12 | 4.5 | 1.7 |
| 200 | 250 | 500 | 250 | 20 | 8 | 2.0 |
| 250 | 400 | 1000 | 500 | 45 | 20 | 10 |

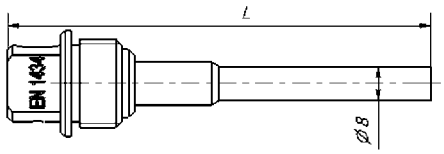
***CAN ALSO BE COMBINED TO ANY OTHER FLOW METER WITH PULSE OR ANALOG OUTPUT***

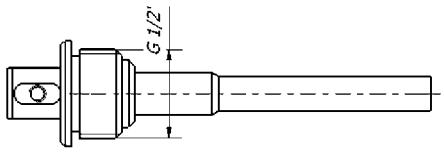
## *Temperature sensor pair PLT/PLH*

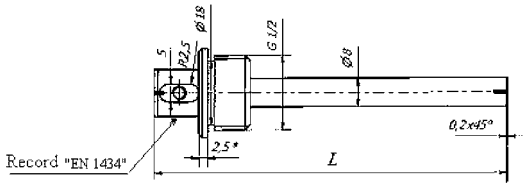
| | |
|---|---|
| Wire connection | **PLT**: 2 wire max 5 mt<br>4 wire max 10 mt - with head<br>**PLH**: until 30 mt |
| Sensor type | Pt500 (Pt 100 & Pt 1000 on request) |
| Measurement | Temperature difference, which is measured by temperature sensors pair and which is directly related to the quantity of thermal energy, calculated by the calculator, where are connected. |
| Measurement limits: | ▶ limits for temperature difference ranges:<br>**PLT**: Δ θ = 3.... 100K; 2.... 100K<br>**PLH**: Δ θ = 3.... 180 °K |
| Temp. measurement range | **PLT**: 0 °C … 150 °K - **PLH**: 180 °C |
| Maximum admissible temperature of medium | **PLT**: 150 °C - **PLH**: 180 °C |
| Tolerance class | B according to EN 60751<br>**PLH**: Δ on request |
| Connection cable length for 2/4 wires | **PLT**: 3 mt, 5 mt, 10 mt<br>**PLH**: longer cables by head version to be wired |
| Connection cable type for 2-wire | Not shielded, 2 × 0,5 $mm^2$<br>(connected permanently) |
| Connection cable type for 4-wire | Not shielded, 4 × 0,35 $mm^2$<br>(connected permanently) |
| Max permissible RMS value of sensor current | 0,5 mA |
| Response time t0,5 | < 10 s |
| Total resistance of signal leads (2-wire connection) | • 0,22 Ω - for cable length 3 m (2 wire)<br>• 0,36 Ω - for cable length 5 m (2 wire)<br>• 0,72 Ω - for cable length 10 m (4 wire) |
| Environmental | • Ambient temperature +5 °C … +55 °C<br>• Mechanical environment Class M1<br>• Electromagnetic environment class E1 |
| Approvals | Paired calibrated at EN1434-MI004 |
| Pockets | **PLT**: brass until DN150,<br>max stem length: 225 mm PN16<br>**PLH**: SSteel >I DN150,<br>max stem length: 225 mm PN40 |

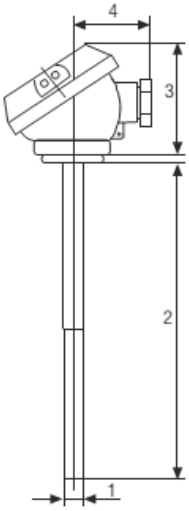


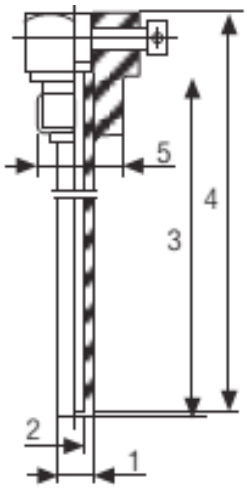





THE MANUFACTURER RESERVES THE RIGHT TO MAKE DESIGN IMPROVEMENTS WITHOUT NOTICE.



COMPANY WITH QUALITY SYSTEM CERTIFIED BY DNV GL = ISO 9001 =

**Production & Warehouse**
35044 Montagnana (PD) Italy
Via Piemonte, 1

20092 Cinisello Balsamo (MI) Italy
Viale Matteotti, 62

Cinisello Balsamo - Milano (Italy)
Via Fratelli Gracchi, 27
tel. +39 0266027.1 - fax +39 026123202
Italy: www.isoil.it - **isothermic@isoil.it**
International: www.isoil.com - **sales@isoil.it**