COMPACT TURBINE-DRIVEN ENERGY METERS

M←BUS

MET ... Eng.

- **Power supply:**
  – lithium battery incorporated (min. 5 years)
- **Sensors:**
  – flow (pocket included)
  – return (incorporated with pocket)
- **Unions:**
  – threaded male (supplied)
- **Installation:**
  – vertical/horizontal
- **Approval PTB 22.52 00.02**

1. APPLICATION

Heat meters are used mainly on heating sites for metering the thermal energy consumed. Its compact form renders MET … suitable for installation where space is limited.
In order to meet the various use requirements the meters are available with different metering capacities.

2. OPERATION

MET … incorporates a turbine the number of revolutions of which is directly proportional to the volume of fluid in circulation: in this way the volume of water flowing past is metered. Two very accurate temperature sensors record the thermal difference between the site flow and return.
The measurements made are processed by a microprocessor which calculates immediately the thermal energy totalled. The figure calculated can be read on the display.
MET … is provided with an **M-Bus** output; using the COSTER **CMC 328** convertor, the M-Bus is converted into C-Bus suitable for local and/or remote readout, in conformity with the COSTER standard.

3. AVAILABLE MODELS

Code	DN inches	Tmax °C	**Qn m³/h**	Qmax m³/h	Qstart l/h	Qmin l/h	Kvs m³/h	Δp Qn kPa	Weight approx Kg.	Approval Class C2-EN 1434
MET 15-0.6 M	1/2"	90	**0.6**	1.2	2	6	2.4	6	0.9	22.52 00.02
MET 15-1.5 M	1/2"	90	**1.5**	3	4	15	6,0	6	0.9	22.52 00.02
MET 20-2.5 M	3/4"	90	**2.5**	5	6	25	10	6	1.0	22.52 00.02

Qn – Nominal flow: maximum continuous flow measurable by meter.
Qmax – Maximum flow: temporary flow sustainable by the meter.
Qstart – Minimum flow: limit flow for the measurement (with lower flow meter does not totalise).
Qmin – Minimum flow: minimum flow with error less than 3%.
Kvs – Flow coefficient: flow in m^3/h with pressure drop of 100 kPa = 10 m water column = 1 bar.
Δp Qn – Pressure drop with nominal flow Qn.

4. TECHNICAL DATA

Power supply	Lithium batter (5 years minimum.)
Sensors supplied	PT 500
Temperature interval measurable on flow	0...150 °C
Temperature interval measurable on return	5...90 °C
Interval difference flow/return	3...147 °C
Ambient temperature range - operation	0...55 °C
Ambient temperature range- transport	–20...55 °C
Accuracy according to standards	EN 1434 Class C2

Nominal pressure	PN 16
Protection	IP 54
Data communication	M-Bus
M-Bus cable (connected)	3 m, 3 x 0.5 mm^2
Approval	Class (C2) EN 1434
Protection electronic module	shock-proof plastic
Body	OT 58 brass
Weight	see section 3

5. ACCURACY IN RESPECT OF EN 1434 STANDARDS:

– From Qmin to Qt (a tenth of the nominal flow): Standard = +/– 5% MET... = +/– 2.5 %
– From Qt to Qn Standard = +/– 3% MET... = +/– 1.5%

6. SIZING

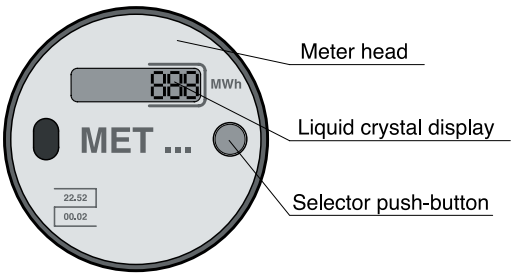
In order to ensure that the accuracy meets the standards, the maximum flow of the site must be as close as possible to the nominal flow (Qn) of the meter, but must never exceed it.

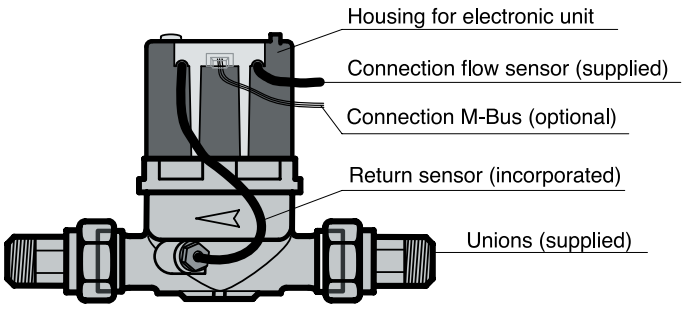
7. INSTALLATION

In order for the volumetric meter to maintain its metering capacity within the stated error margins, the installation instructions must be strictly followed:.

- It must be installed on the return pipe of the site, respecting the direction of flow shown on the body, and positioned between the two shut-off valves so as to ensure accessibility for maintenance.
- A filter must be installed upstream of the meter to ensure that any impurities present in the system do not compromise the accuracy of the meter. It is advisable to clean this filter a few days after the first start-up of the site because the first water usually contains many impurities. Subsequently, a periodic cleaning of the filter should be programmed..
- Upstream of the meter, there should be a straight length of pipe equal to **three** times the pipe diameter, and, downstream, a length of pipe **the same length** as its diameter.

8. DESCRIPTION OF DISPLAY PAGES AND METER





During normal operation the display is switched off in order to save battery power..

– **By a rapid depression of the push-button you access the main readings.**

– **By depressing the push-button for at least 7 seconds you pass from the main readings to the auxiliary readings.**

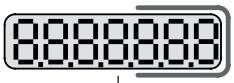
– **Five minutes after the last depression of the push-button the display goes out in order to conserve power.**

8.1 Sequence of pages for main readings

ON PRESSING PUSH-BUTTON APPEARS :

Thermal energy totalled from moment of installation (in MWh)
- non-adjustable
- cannot be cancelled

ON PRESSING PUSH-BUTTON APPEARS:



SELF-DIAGNOSIS OF ALL THE DISPLAY

Check of functioning of all the segments on the display which compose the numbers for the read-outs.
NB: this page is displayed for about one second after which the second page is automatically displayed.

1 SECOND

RECORDING OF THE READOUT MADE ON THE DATE SHOWN

A reading is automatically made at 24.00 on 31 December of the year just passed; this readout is recorded in order to calculate the consumption during the current year as the difference between the two readings.
e.g. **73,500** = reading made on 30 April 2006.
1,507 = reading recorded on 31.12.2005 at 24.00.
73,500 – 1,507 = 71,993 = consumption up to 30.04.06 regarding the year 2006

3 SECONDS
displayed alternately
1 SECOND

DATE OF RECORDING:

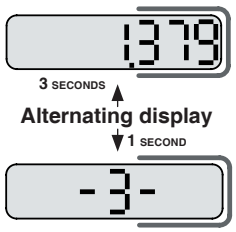
WARNING: when these two pages are selected they are displayed alternately.

Press the selection button to pass again to the base display (first page). If the button is not pressed for more than 5 minutes the display is switched off.

NB: To pass to the readout of all the main data (next section) keep the button pressed for at least 7 seconds, before the 5 minutes expire after which the display is switched off and you have to pass again via the main readouts..

We reserve the right to make changes without notice

8.2 Sequence of pages of auxiliary readings
From the main readouts, press the button for at least 7 seconds: there will appear:



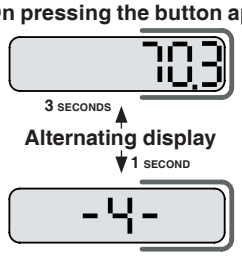
VALUE OF INSTANTANEOUS FLOW IN m³/h:

This is the value of the instantaneous flow which in that moment passes through the meter. The update time depends on the flow itself and is usually a few seconds.
The data displayed has a measurement resolution equal to **0.001**
WARNING: when these two pages are selected they are displayed alternately.

3 = PAGE NUMBER REGARDING FLOW

The number 3 indicates that the flow is being measured.

On pressing the button appears:



FLOW TEMPERATURE:
- measurement in °C

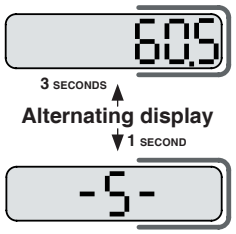
Measurement of site flow temperature; measured inside the pipe by appropriate immersion sensor (supplied).
The data displayed has a measurement resolution equal to **0.1 °C**.

4 = PAGE NUMBER REGARDING THE FLOW TEMPERATURE

The number 4 indicates that the flow temperature is being measured.

WARNING: when these two pages are selected they are displayed alternately.

By pressing button appears:



RETURN TEMPERATURE:
- measurement in °C

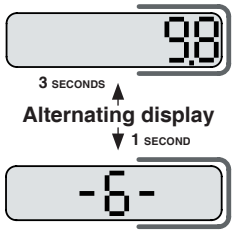
Measurement of site return temperature; measured inside pipe by appropriate immersion sensor (supplied).
The data displayed has a measurement resolution equal to **0.1 °C**.

5 = PAGE NUMBER REGARDING THE FLOW TEMPERATURE

The number 5 indicates that the return temperature is being measured.

WARNING: when these two pages are selected they are displayed alternately.

By pressing button appears:



TEMPERATURE DIFFERENCE:
- measurement in °C.

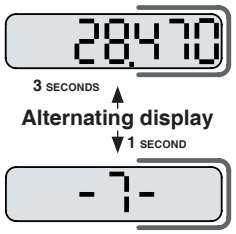
Measurement of difference between the two previous temperatures (flow less return).
The data displayed has a measurement resolution equal to **0.1 °C**.

6 = PAGE NUMBER REGARDING DIFFERENCE OF TEMP. BETWEEN FLOW & RETURN

The number 6 indicates that the difference between flow and return temperatures is being measured.

WARNING: when these two pages are selected they are displayed alternately.

By pressing button appears:



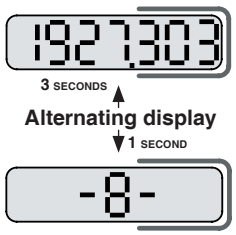
INSTANTANEOUS POWER:
- measurement in KW.

Measurement of instantaneous power used to meet demand. The data displayed has a measurement resolution equal to **0.001 KW**.
WARNING: when these two pages are selected they are displayed alternately.

7 = PAGE NUMBER REGARDING INSTANTANEOUS POWER

The number 7 indicates that the instantaneous power is being measured.a.

By pressing button appears:



VOLUME OF WATER TOTALLED:
- measured in m³.

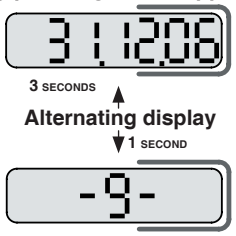
Totalling the quantity of fluid passing through the meter from the moment of its installation.
The data displayed has a measurement resolution equal to **0.001 m³**.

WARNING: when these two pages are selected they are displayed alternately.

8 = PAGE NUMBER REGARDING VOLUME OF FLUID TOTALLED

The number 8 indicates that the m³ of fluid totalled by the site is being read.

By pressing button appears:



EXPIRY DATE OF NEXT RECORDING

Display of next expiry date for automatic readout with recording. The readout will then be presented in the main data after the expiry date.

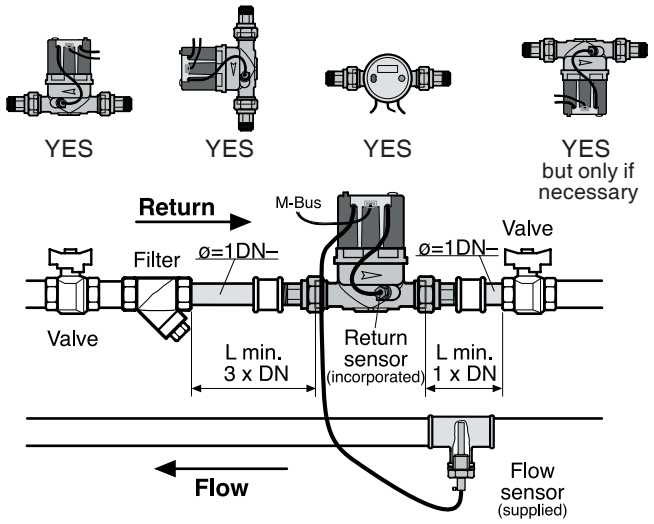
WARNING: when these two pages are selected they are displayed alternately.

9 = PAGE NUMBER REGARDING DATE OF NEXT RECORDING

The number 9 indicates that you are reading the date of the next recording; this regards the end of the current calendar year.

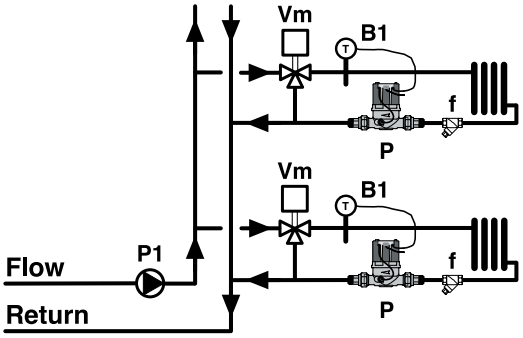
By pressing briefly the selection button you return to the start of the sequence.
By pressing the button for at least 7 seconds you return to the sequence of basic readout pages.
Five minutes after the last depression of the button the display switches off.

8. INSTALLATION



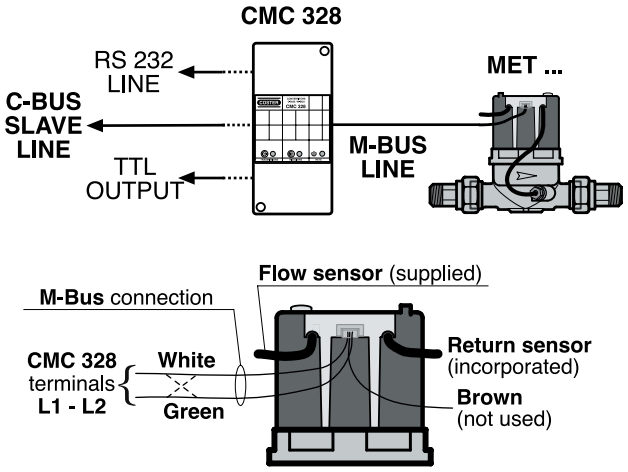
MAINTENANCE: Periodic cleaning of the filter is recommended. Every five years the internal battery should be replaced and the meter completely overhauled.

10. OPERATIONAL DIAGRAM



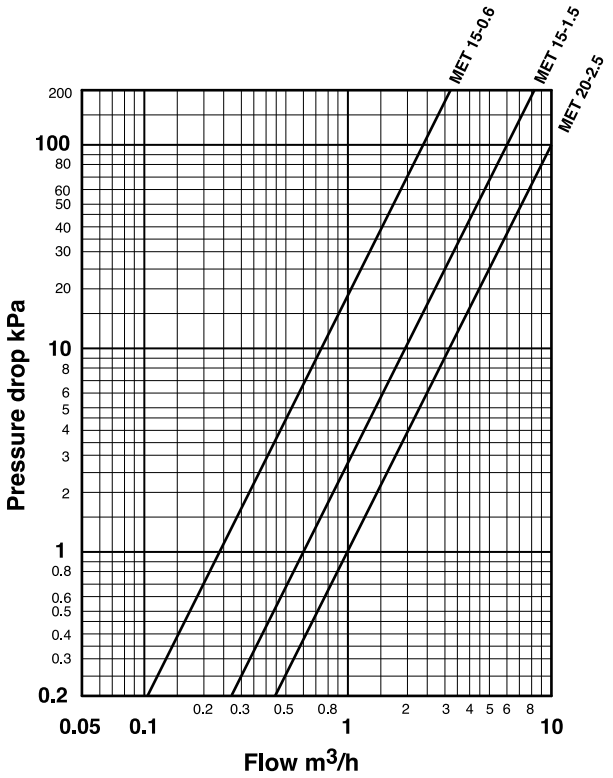
B1 – Flow sensor
f – Impurities filter
P1 – Circolation pump
P – Meter
Vm – Motorised valve

12. CONNECTION FOR REMOTE READOUT



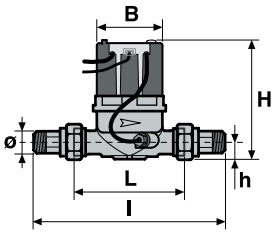
9. PRESSURE DROP

(100 kPa = 10 mWG = 1 bar)



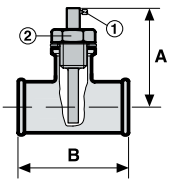
11. OVERALL DIMENSIONS

METERS WITH UNIONS



Model	ø threaded union	L mm	l mm	H mm	h mm	B mm	Weight kg
MET 15-0.6 M	1/2"	110	190	75	14	63	0.9
MET 15-1.5 M	1/2"	110	190	75	14	63	0.9
MET 20-2.5 M	3/4"	130	228	75	17	63	1.0

POCKETS WITH COUPLINGS



Pockets with with "T" junctions	Internal ø threading	A mm	B mm
For **MET 15-0.6 M**	1/2"	46.5	50
For **MET 15-1.5 M**	1/2"	46.5	50
For **MET 20-2.5 M**	3/4"	50	52

1 – Blocking screw for sensor cable (do not tighten too much)
2 – Blocking nut for pocket on union (tighten firmly)
NB: unions and pockets are in **BRASS**.

Update to data sheet

From version	to version	Page	Section	Details amendment
14.03.06 MC	28.04.06 MC	4	9. Pressure drop	Amendment diagram.

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