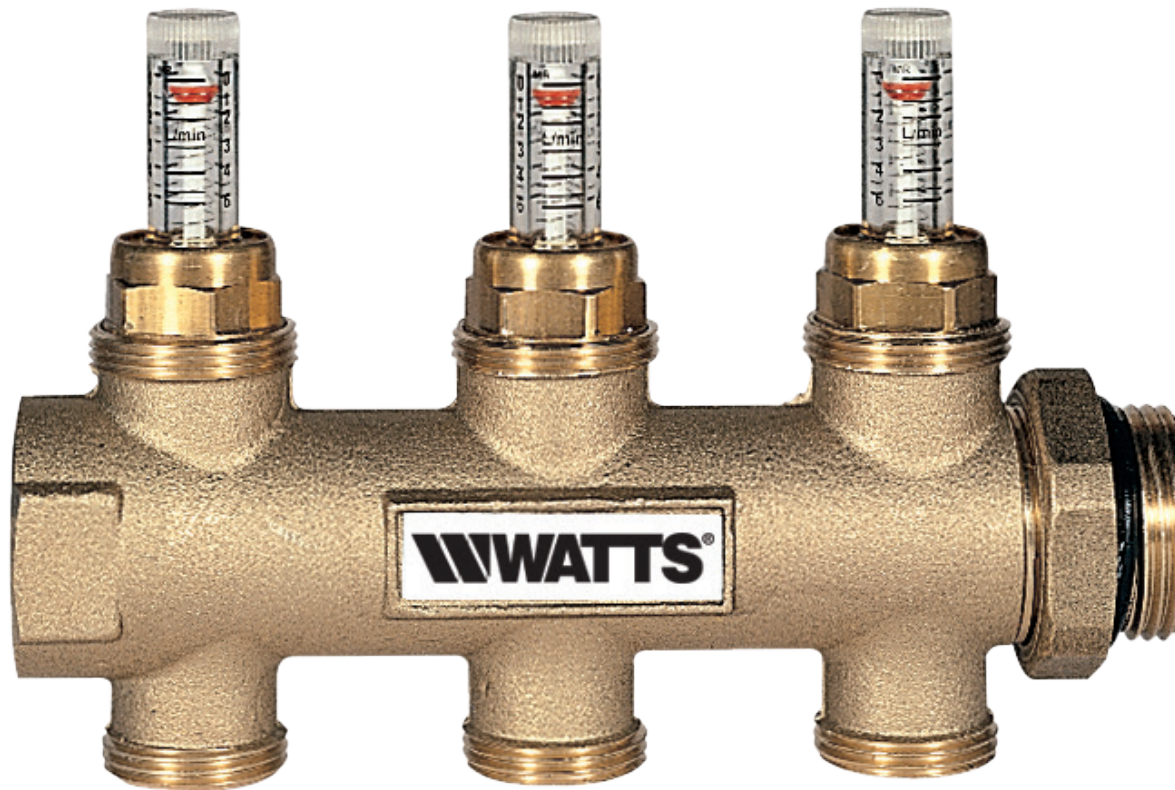


# FLMR, FLMRE Series

Manifolds with flow meter

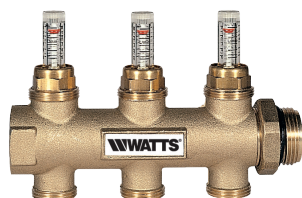
## Technical Data Sheet



## Description

**FLMR Series** manifolds with flow meter are for distributing, controlling and measuring the flows of heat-carrier fluid to the individual terminal units of closed-circuit heating systems. The manifolds have a brass body and are equipped with a flow meter with:

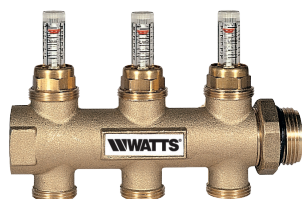
- flow rate indicator in l/min.;
- water flow control and shut-off device.



### FLMR

Single modular brass flow manifold complete with flow meter for controlling and measuring the flow rate in the circuits, with pre-assembled seal and locking nut. Side outlets: 3/4" M. MF head connections: 1"-1.1/4". Measuring range: 0-6 l/min. Differential pressure: 1.0 bar. Kvs outlets: 1.8. Centre distance: 50 mm.

Type	Part No.	DN	Outlets	Weight (g)
FLMR	FLMR1TM2	1"	2-3/4"	600
FLMR	FLMR1TM3	1"	3-3/4"	900
FLMR	FLMR1TM4	1"	4-3/4"	1,000
FLMR	FLMR54TM3	1.1/4"	3-3/4"	1,050
FLMR	FLMR54TM4	1.1/4"	4-3/4"	1,350



### FLMRE

Single modular brass flow manifold with pre-assembled seal and locking nut. Complete with flow meter for controlling and measuring the flow rate in the circuits. Side outlets: 3/4" M EUROCONE. Head connections: MF 1"-1.1/4". Measuring range: 0-6 l/min. Differential pressure: 1.0 bar. Kvs outlets: 1.8. Centre distance: 50 mm.

Type	Part No.	DN	Outlets	Weight (g)
FLMRE	FLMR1TME2	1"	2-3/4"	600
FLMRE	FLMR1TME3	1"	3-3/4"	900
FLMRE	FLMR1TME4	1"	4-3/4"	1,000
FLMRE	FLMR54TME3	1.1/4"	3-3/4"	1,050
FLMRE	FLMR54TME4	1.1/4"	4-3/4"	1,350



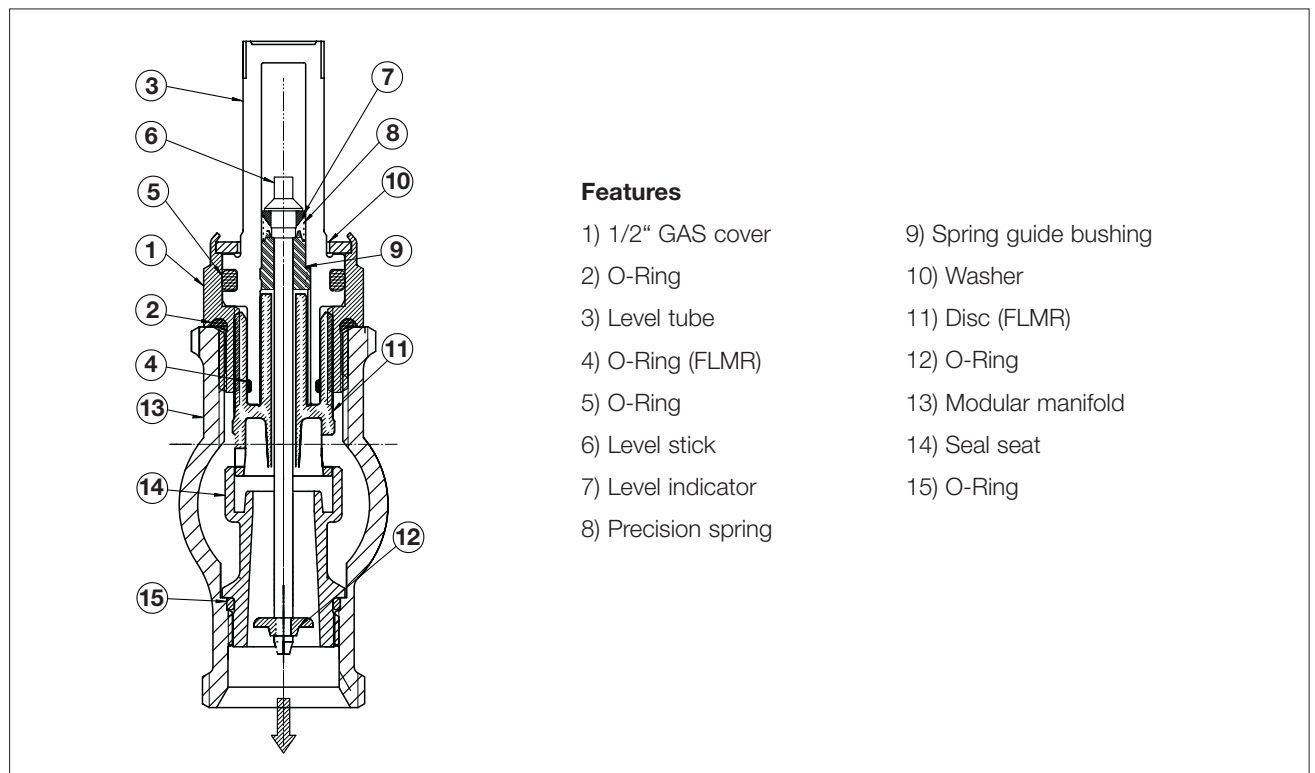
### FL

Device for controlling and measuring the flow rate in the individual circuits in FLMR manifolds. Measuring range: 0-6 l/min.

Type	Part No.	Description
FL	FLMR	
FL	226	Control cap

Technical features	
Measuring range	0-6 l/min
Maximum temperature	90°C
Operating temperature	80°C
Maximum pressure	10 bar
Maximum flow coefficient	Kvs=1.8 FLMR
Indication error	±10% FS or ±0.6 l/min. (FLMR with $\Delta p$ at the ends between 10 kPa and 50 kPa)
Operating $\Delta p$	from 10 kPa (1.45 PSI) to a maximum of 50 kPa (7.25 PSI) (from 1 to 5 mH <sub>2</sub> O) to obtain a reading with max. error within 10% of the full scale.
Leakage	Max. permitted leakage with disc closed $\leq$ 0.02% Kvs FLMR
Recommended tightening torque of flow meter onto manifold in the event of replacement	Seat tightening torque: 30 Nm

Design characteristics	
Body and internal parts	brass
O-Ring	EPDM



The reliability of the **FLMR Series** is guaranteed by the fact that every single product undergoes testing: testing consists of a water-tightness test of the flow meter/manifold assembly to check for possible leaks between the flow meter and the manifold, and a test of the body's resistance to the operating pressure.

## Application

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The flow meter is used for controlling and measuring the flow of water through the individual side outlets of distribution units supplying closed-circuit heating systems, in particular for radiant panel systems or mixed systems comprising conventional radiators and radiant panels. The flow meter is usually installed on a suitable mounting point on **822MR Series** single modular manifolds, to form the **FLMR Series**. These, together with **822MM Series** manifolds, constitute distribution units.

## Operation

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**FLMR Series** manifolds with flow meter are designed to fulfil four functions:

1. Flow distribution;
2. Flow measurement;
3. Flow control;
4. Flow shut-off;

**The flow** of water from the distribution unit to the individual terminal units is measured by means of the automatic movement of the level stick in the flow meter, caused by the flow of water into the sealing seat in the **822MR Series** modular manifold: a diaphragm, which is integral with the level stick, is struck by the flow of water and imparts linear movement to it. The level indicator, which moves up and down the graduated scale, therefore shows the corresponding flow rate in l/min. The scale goes from 0 to 6 l/min. To obtain a reading with max. error within 10% of the full scale, the pressure difference at the ends of the flow meter must be between 10 kPa and 50 kPa. Adding antifreeze to the heat-carrier fluid increases the reading error because it changes the fluid's viscosity.

**To control** the flow rate in the individual branch circuits, turn the transparent level tube with the aid of the 226 Series control cap, thus reducing the aperture of the sealing seat with the built-in disc.

**To shut off** the flow, turn the control cap clockwise until fully closed. The flow meter is designed to be fitted in the flow way of distribution manifolds to assist the operation of the control valve fitted in the return way: this control valve can be either manual or operated by an electrothermal or other type of actuator.

### **Benefits:**

- 1- The control valve's disc closes counter to (against) the direction of flow: this is the correct operating condition for a valve and thus avoids problems of noise.
- 2- There is no unwanted closure of the control valve disc when the valve is open at minimum with high pressure differential.
- 3- The control valve can be operated by a modulating actuator and works effectively in the minimum opening position.

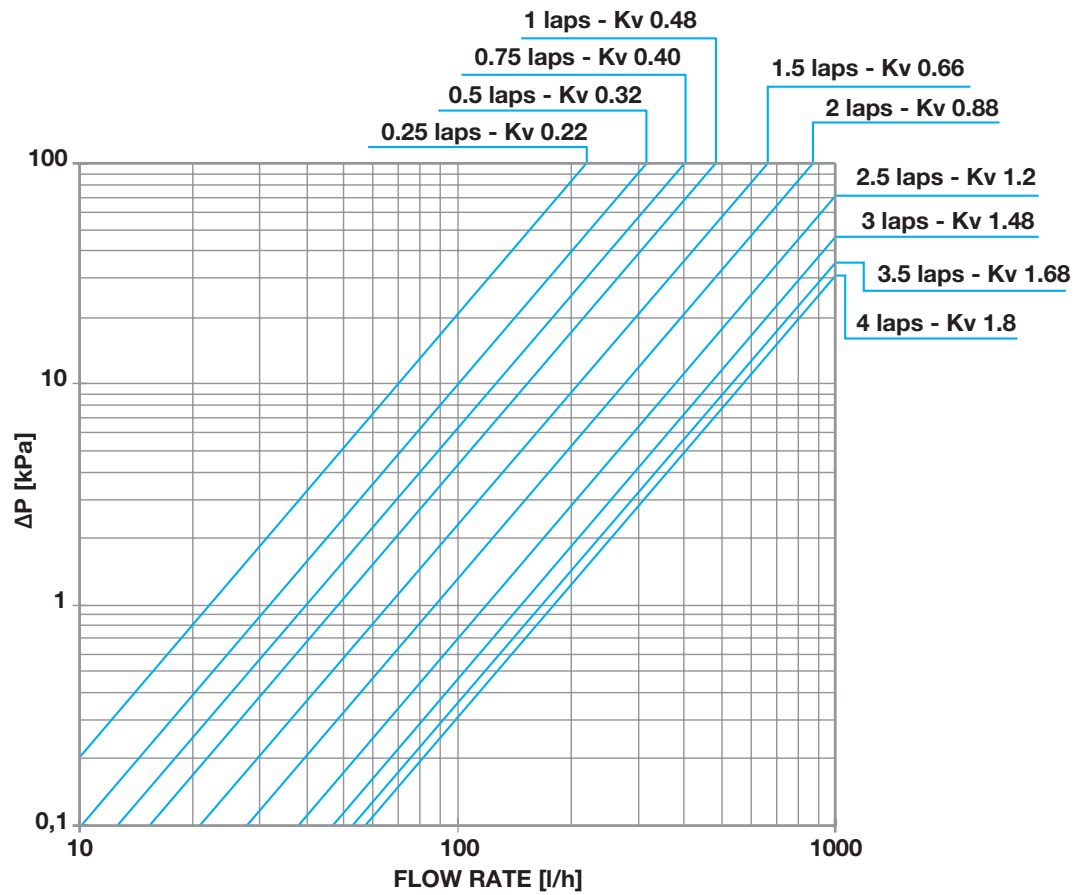
The flow meter is designed to work effectively with the water flowing in the same direction as the direction of closure of the disc, and to control and measure the water flow rate with the required accuracy of  $\pm 10\%$  of the full scale. To achieve these conditions, the flow meter is designed in such a way that the movement of the disc is independent of the movement of the level stick. Furthermore, the special geometry of the seat and disc ensure optimum mating of the two in the various operating positions. The flow meter disc (**Fig.3**) is designed in such a way that the inlet water flow is radial and the outlet water flow is axial in relation to the product's control axis. This was achieved by creating two triangular slits in the disc, so as to ensure highly linear control. The fluid flow rate and pressure drop of the manifolds can be determined from the appropriate flow curves.



**Fig.3**

## Chart

Flow meter 0-6 l/min measurement + control



## Installation

To install **FLMR Series** manifolds with flow meter on the system, proceed as follows:

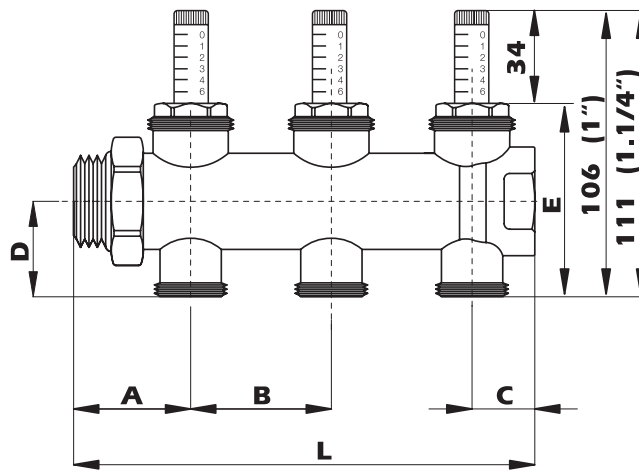
- 1) Fit the manifold complete with the flow meters supplied with the **822MM Series** manifolds that make up the distribution unit;
- 2) Fully open the flow meters (by turning anticlockwise with the flow meter fitted vertically);
- 3) Fill the system and bring it up to pressure; let the water circulate until the flow meters inside the measuring tube are fully de-aerated;
- 4) Balance the system by adjusting the flow meters for each branch.

After adjusting them, check again and make any fine adjustments that may be necessary to obtain the exact flow rate you want in all the branches.

You are advised to position the manifolds' distribution unit in such a way that the axis of the main conduit is horizontal. If replacing a faulty flow meter, fasten the new flow meter to the manifold with a tightening torque of 30 Nm.

## Overall dimensions (mm)

### FLMR-FLMRE-FL



DN	L			A	B	C	D	E
	2 outlets	3 outlets	4 outlets					
1"	114	164	214	40	50	24.5	33	72
1.1/4"	-	168	218	41	50	27.5	36	77

## Specification text

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### ***FLMR Series***

Single modular brass flow manifold **FLMR Series** – WATTS brand – complete with flow meter for controlling and measuring the flow rate in the circuits, with pre-assembled seal and locking nut. Side outlets: 3/4”M. Head connections: MF 1”-1.1/4”. Measuring range: 0-6 l/min. Differential pressure: 1.0 bar. Kvs outlets: 1.8. Centre distance: 50 mm.

### ***FLMRE Series***

Single modular brass flow manifold **FLMRE Series** – WATTS brand – with pre-assembled seal and locking nut. Complete with flow meter for controlling and measuring the flow rate in the circuits. Side outlets: 3/4”M EUROCONE. Head connections: MF 1”-1.1/4”. Measuring range: 0-6 l/min. Differential pressure: 1.0 bar. Kvs outlets: 1.8. Centre distance: 50 mm.

### ***FL Series***

Device for controlling and measuring flow rate **FL Series** – WATTS brand – in individual circuits in FLMR manifolds. Measuring range: 0-6 l/min.



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The descriptions and photographs contained in this product specification sheet are supplied by way of information only and are not binding.

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