Profactor Armaturen GmbH

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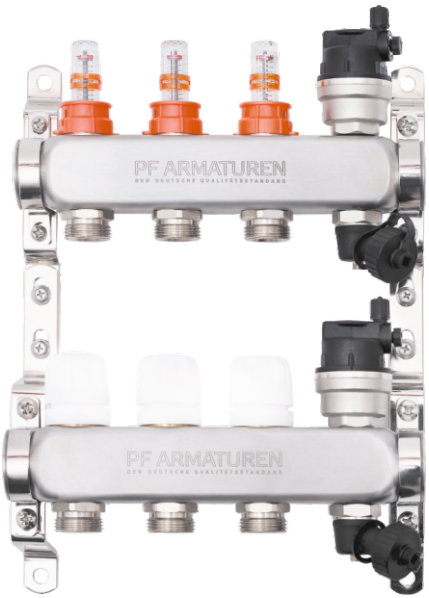
PROFACTOR®
DER DEUTSCHE QUALITÄTSSTANDARD

TECHNICAL DATA SHEET AND USER MANUAL



PRODUCT CODE

**PF MB 807.2 –
PF MB 807.12**

STAINLESS STEEL MANIFOLD GROUP

1. PURPOSE AND SCOPE

Stainless steel manifold groups are used in water supply systems, radiator or underfloor heating systems to distribute and regulate the working medium within the system. Each pipe of the water supply system, water-based heating system, or underfloor heating system is connected to the manifold, allowing individual adjustment and control of the heat carrier flow in each circulation loop.

The manifold group can be used in pipelines transporting liquid media that are non-aggressive to the product materials (water, ethylene glycol-based antifreeze). The maximum ethylene glycol content in the antifreeze is 30%. Antifreeze should be used if the system's operating conditions involve a carrier temperature below 0 °C.

2. TECHNICAL SPECIFICATIONS

Product Code	PF MB	807.2 – 807.12
Nominal size	DN	25
	G	1"
Maximum operating pressure	bar	6
Maximum pressure drop	bar	0,6
Maximum allowable head on supply manifold branches	m³/h	0,9
Maximum allowable head on return manifold branches	m³/h	1,6
Medium operating temperature	°C	–20 °C to +80 °C
Maximum ambient temperature	°C	60°C

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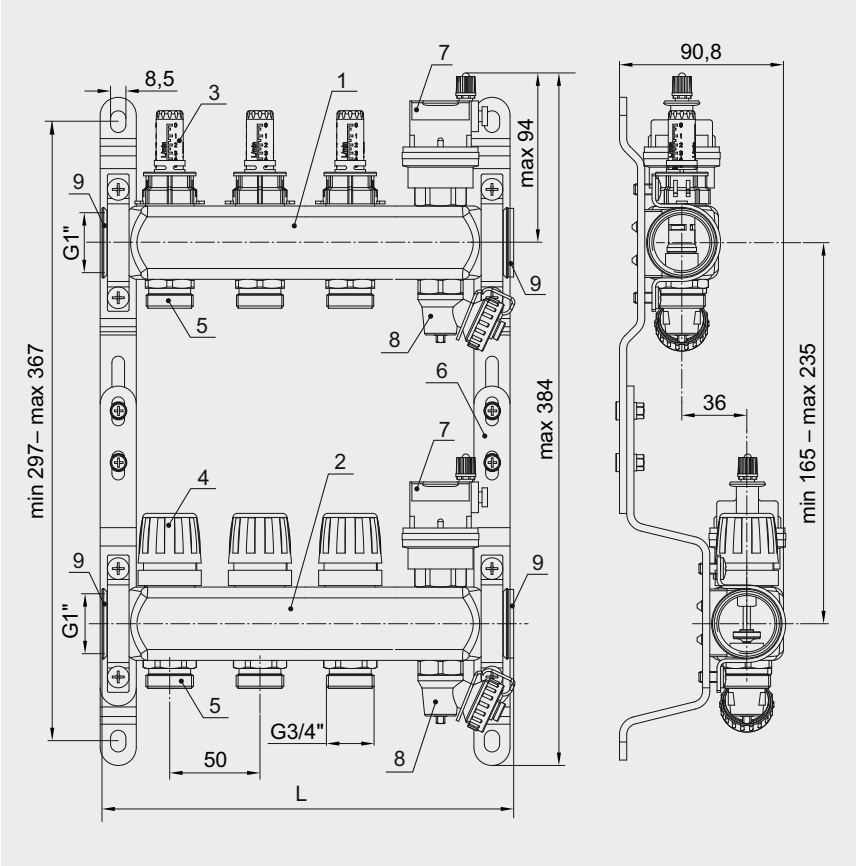
3. DESIGN



1 – Supply manifold
2 – Return manifold
3 – Control valve with flow meter
4 – Shut-off and control valve
5 – ¾" Euroconus adapter nipple
6 – Adjustable bracket
7 – Automatic air vent valve
8 – Drain valve
9 – Cap

PF MB	807.2	807.3	807.4	807.5	807.6	807.7	807.8	807.9	807.10	807.11	807.12
L, mm	190	240	290	340	390	440	490	540	590	640	690
Weight, g	2070	2400	2790	3210	3590	3990	4400	4750	5150	5510	5880

All cylindrical pipe threads are in an accordance with ISO 228-1, DIN 259, and all metric threads are in an accordance with ISO 261.

The supply (1) and return (2) manifolds are made of AISI 304 stainless steel (1.4301 according to the European standard DIN EN 10088). Each manifold has internal cylindrical threads of 1" at the ends for connection to the pipeline and 2 to 12 lateral outlets with ½" internal cylindrical threads for connecting valves on one side and adapter nipples on the other.

The supply manifold is equipped with manual control valves with flow meters (3) and allows each individual circulation loop of the system to be disconnected.

The return manifold is fitted with shut-off and control valves (4) for smooth flow regulation. These shut-off and control valves can be automated using electric thermal actuators with an M30×1.5 connection thread.

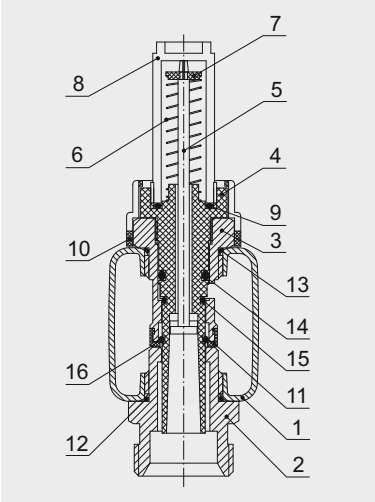
Connection of circulation loops is carried out via adapter nipples (5) using ¾" Euroconus fittings. The adapter nipples are made of CW617N brass (per European standard DIN EN 12165), with nickel-plated surfaces.

PF MB 807 manifold groups are equipped with two automatic air vent valves (7), two drain valves (8), and two caps (9), one for the supply manifold and one for the return manifold.

Connections between all elements of the manifold group are made using sealing rings made of EPDM (ethylene-propylene rubber) and sealed with adhesive. This eliminates the need for additional sealing or gasket materials.

The adjustable brackets (6) are made of S235JR structural steel (per DIN EN 10025).

3.1. DESIGN OF THE CONTROL VALVE WITH FLOW METER



1 – Supply manifold
2 – ¾" Euroconus adapter nipple
3 – Flow meter seat
4 – Flow meter body
5 – Flow meter stem
6 – Spring
7 – Flow indicator
8 – Cap
9 – Flow meter gasket
10 – Flow meter protective ring
11 – Valve seal
12 – Nipple O-ring
13 – Seat O-ring
14, 15, 16 – Flow meter O-rings

The manual control valve with flow meter is installed in the lateral outlets of the supply manifold (1). It consists of a flow meter seat (3) and the flow meter itself. The seat has a ½" external thread for connection to the manifold, a hole with an internal metric thread at the top for the flow meter, and slots at the bottom to allow the working fluid to pass through the valve. The seat-to-manifold connection is sealed with an O-ring (13) and adhesive.

A valve seal (11) is placed on the lower end of the flow meter seat. When the seat is screwed into the manifold, the valve seal fits tightly onto the seat of the adapter nipple (2). Both the flow meter seat and the adapter nipple are made of CW617N brass according to DIN EN 12165, with nickel-plated surfaces.

The flow meter consists of a body (4), stem (5), spring (6), flow indicator (7), and cap (8). The flow meter body is made of impact-resistant technical thermoplastic resin (acrylonitrile-butadiene-styrene, ABS) and is shaped as a tube with a control ring at the top and slots in the middle for the working fluid to pass through. The stem (5), made of polypropylene (PP), is inserted into the bottom of the body and has a stopper at its lower end.

The hole in the center of the flow meter body has varying diameters: the upper part (up to the slots for fluid passage) is significantly narrower than the lower part (below the slots). This prevents the stem stopper from moving above the slots that allow fluid passage. The lower part of the body is conical, widening toward the bottom.

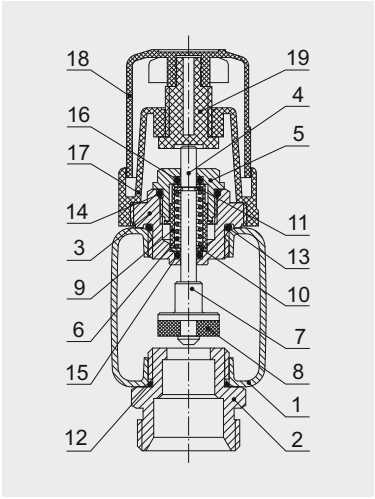
The flow indicator (7), also made of ABS (acrylonitrile-butadiene-styrene), is pressed onto the top end of the stem. It also serves as the upper stop for the spring (6), which holds the stem in the raised position. The spring is made of AISI 304 stainless steel according to DIN EN 10088 .

A protective cap (8) is screwed onto the top of the flow meter body. The cap has a scale ranging from 0 to 5 L/min for adjusting the flow through the valve. It is made of transparent, rigid, impact-resistant thermoplastic (polycarbonate, PC).

The control valve has three O-rings on the flow meter body. O-ring (14) seals the connection between the flow meter body and the seat above the fluid passage slots, preventing leakage under the flow meter adjustment nut. O-ring (15) ensures tight closure of the valve, and O-ring (16) seals the connection between the flow meter body and the seat below the fluid passage slots, preventing fluid from entering the space between the body tube and the seat.

The connection between the flow meter body and the cap is sealed with a gasket (9). All sealing components (9, 11, 12, 13, 14, 15, 16) are made of EPDM (ethylene-propylene rubber). A protective ring (10), made of ABS, is placed over the adjustment nut of the body to

3.2. DESIGN OF THE SHUT-OFF AND CONTROL VALVE



1 – Return manifold
2 – ¾" Euroconus adapter nipple
3 – Body
4 – Stem
5 – Bushing
6 – Spring
7 – Spool
8 – Valve seal
9 – Spring mechanism chamber
10 – Washer
11 – Spring clip
12 – Nipple O-ring
13 – Body O-ring
14 – Bushing O-ring
15, 16 – Stem O-rings
17 – Handle base
18 – Handwheel
19 – Screw stem of handwheel

The shut-off and control valve is installed in the lateral outlets of the return manifold (1). The valve body (3) has a ½" external thread for connection to the manifold, an M30×1.5 external metric thread for attaching a handle or a thermo-electric actuator, and a through-hole of varying diameters in which the stem (4) moves vertically.

The upper part of the body hole also has a metric thread for screwing in the centering bushing (5). The body-to-manifold connection is sealed with an O-ring (13) and adhesive.

The stem is held in the raised position by a spring (6). The lower stop of the spring is a washer (10), and the upper stop is a spring clip (11). The stem, spring, washer, and spring clip are made of AISI 304 stainless steel according to DIN EN 10088.

The spring mechanism is housed inside a chamber (9) made of ABS (acrylonitrile-butadiene-styrene), which protects the spring and spring clip. The bushing (5) is screwed into the body until it stops and slightly compresses the spring.

A spool (7) with a valve seal (8) is pressed onto the lower end of the stem. When the valve is closed, the seal tightly presses against the top surface of the adapter nipple (2). The body, bushing, and spool are made of CW617N brass according to DIN EN 12165.

The body-to-bushing connection is sealed with an O-ring (14). O-rings (15 and 16) prevent leakage along the stem. All sealing components (8, 12, 13, 14, 15, 16) are made of EPDM (ethylene-propylene rubber).

The handle consists of a base (17), a handwheel (18), and a screw stem (19). The base has an internal metric thread for screwing onto the valve body at the lower part and for guiding the screw stem at the upper part.

The handwheel is pressed onto the top end of the screw stem. Due to the square shape of the screw stem's upper end and the corresponding blind hole inside the handwheel, the handwheel cannot rotate independently of the screw stem. Therefore, when the handwheel is turned, the screw stem rotates and moves up or down along the thread. All handle components (17, 18, 19) are made of ABS (acrylonitrile-butadiene-styrene).

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4. PRINCIPLE OF OPERATION

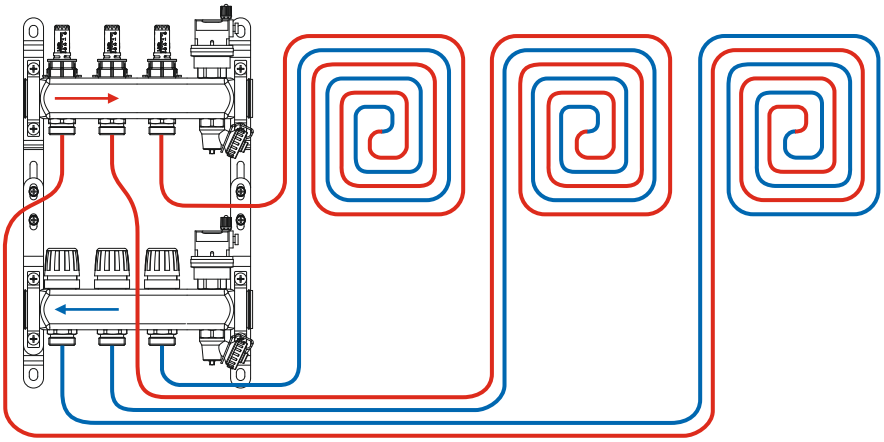
The pipeline of each circulation loop in the system is connected to a separate pair of supply and return manifold outlets, allowing individual adjustment of the heat carrier flow and, consequently, the thermal output of each loop. The working fluid enters the supply manifold and is distributed to the loops through the control valves.

In manifold groups equipped with control valves with flow meters, the working fluid flows through the slots of the flow meter seat and then through the slots in the flow meter body into the flow meter tube, pressing against the stem stopper in its path. This compresses the spring and lowers the stem with the indicator. The more the valve is opened and the higher the flow of the working fluid, the lower the stem descends.

Further adjustment of the flow through individual circulation loops is performed using the shut-off and control valves on the return manifold. When the handwheel of the shut-off and control valve is turned clockwise, the screw stem moves downward, pressing on the valve stem, compressing the spring, and lowering the stem with the spool onto the seat, thereby closing the valve.

When the handwheel is turned counterclockwise, the screw stem moves upward, and the spring lifts the valve stem with the spool, opening the valve. For automatic regulation, a thermo-electric actuator can be connected, which closes the corresponding outlet in response to a room thermostat signal.

Manifold Group Connection Diagram:
Underfloor Heating Loop Layout – "Spiral"



5. HYDRAULIC CHARACTERISTICS

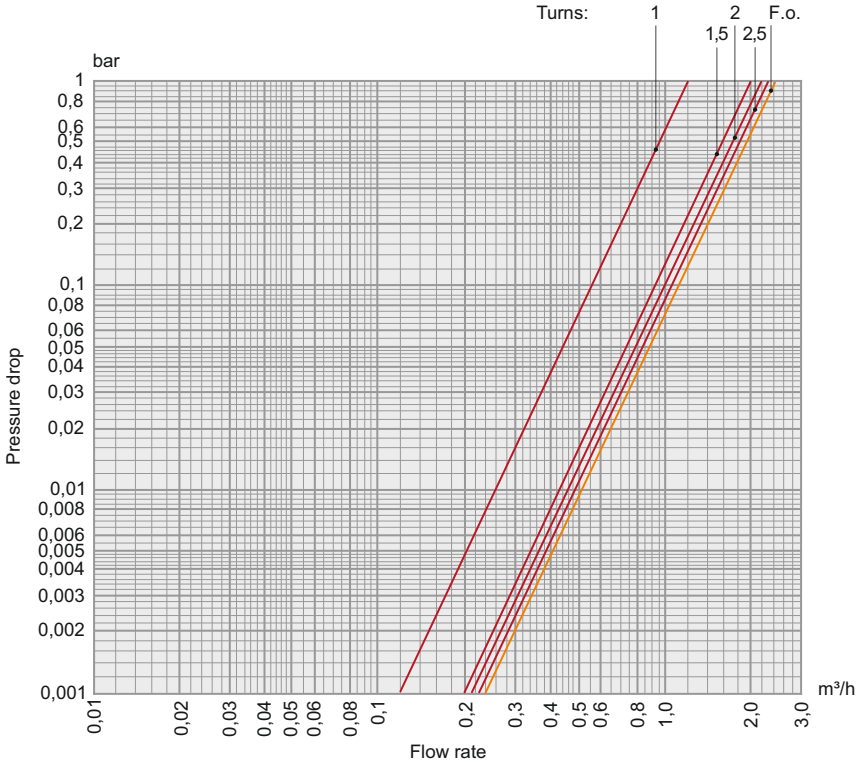
Flow capacity of the manual control valve with flow meter:

It is adjusted by turning the black nut using the inverted orange protective cap. Rotation is performed until the desired flow rate is reached, according to the scale (0–5 L/min) and the red indicator disc.

Flow capacity of the shut-off and control valve:

Number of handwheel turns	1	1,5	2	2,5	Fully open
Kv, m³/h	1,2	2,0	2,2	2,3	2,4

Pressure drop chart for the shut-off and control valve:



6. INSTALLATION INSTRUCTIONS

Before installing the manifold group, the pipeline must be cleaned of scale and rust. Heating systems, hot water and cold water supply systems, and boiler pipelines must be flushed with water after installation until it runs clear of any mechanical impurities .

The manifold block should be installed horizontally, connected to the pipeline via cylindrical pipe threads. Manifolds with flow meters must be connected to the supply pipeline, while manifolds with shut-off and control valves must be connected to the return pipeline.

The manifold group is secured in a manifold cabinet or on a wall using brackets. Ensure that the system air vent is positioned strictly vertically at the highest point of the system. The size of the manifold cabinet varies depending on the number of manifold outlets.

The manifold group must not be subjected to stresses from the pipeline (bending, compression, stretching, torsion, misalignment, vibration, misaligned fittings, unevenly tightened fasteners). If necessary, supports or compensators should be installed to reduce the load on the product from the pipeline.

Misalignment of connected pipelines must not exceed 3 mm for lengths up to 1 m, plus 1 mm for each additional meter. Installation of manual shut-off ball valves at the inlet of the supply manifold and the outlet of the return manifold is recommended. The manifold group must be securely fastened to the pipeline; leakage along the threaded connections is not permitted.

Threaded connections should be made using sealing materials such as PTFE tape, polyamide thread with silicone, or flax. Care must be taken to prevent excess sealing material from entering the seat of the nearest valve, as this may compromise valve tightness. Check the correctness of the installation.

During system filling, air vents must be closed. After installation, a pressure test of the system must be performed to ensure leak-free operation and prevent potential damage.

If the product is used in systems transporting fluids with a high content of mechanical impurities, a mechanical filter should be installed upstream. Hydraulic testing of the system is not permitted with installed air vents or with open shut-off valves upstream. Before commissioning the manifold group, tighten the compression nuts of the connectors.

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7. ADJUSTMENT, OPERATION AND MAINTENANCE INSTRUCTIONS

The stainless steel manifold group must be operated without exceeding the pressure and temperature limits specified in the technical specifications table.

Before operation, each circulation loop of the system must be balanced. To do this, set the required flow of the working fluid on the control valve of the supply manifold.

The manifold group is supplied to the customer with the control valves closed. First, fully open the valve. To do this, remove the protective ring and turn the flow meter via the adjustment ring on the body counterclockwise until it stops.

Flow adjustment through the valve is recommended to be done manually. As the working fluid passes through, the flow indicator will begin to descend. The transparent flow meter cap allows visual monitoring of the flow rate through the valve. To set the required flow for each loop, reduce the flow by turning the flow meter via the adjustment ring clockwise until the desired value is reached.

After setting the flow, reinstall the protective ring onto the adjustment ring until it clicks. Periodically, the flow meter cap should be cleaned of accumulated debris for easy reading of the flow rate. To do this, shut off the working fluid through the valve, unscrew the cap, rinse it, and reinstall it. Then readjust the flow for the given loop.

Further adjustment of each individual system loop to maintain the desired local temperature is performed using the shut-off and control valves on the return manifold. Turning the handwheel counterclockwise opens the valve, while clockwise closes it.

Installation, removal, or any repair or adjustment operations must be performed when the system is depressurized. Allow the equipment to cool to ambient temperature before handling.

8. WARRANTY OBLIGATIONS

The warranty period is 24 months from the date of sale to the end consumer. Throughout the entire warranty period, the manufacturer guarantees the proper functioning of the product and its compliance with safety requirements, provided that the consumer follows the rules for storage, transportation, installation, operation, and maintenance of the product. The warranty covers all defects arising through the manufacturer's fault.

The warranty does not cover defects resulting from:

— Violation of storage, transportation, installation, operation, or maintenance conditions;
— Exposure to substances aggressive to the materials of the product;
— Signs of mechanical damage;
— Damage caused by fire, natural disasters, or other force majeure circumstances;
— Damage caused by improper actions of the user;
— Evidence of unauthorized interference with the product design.

The product described in this technical manual is a technically complex device that must be installed by a qualified specialist with appropriate experience working with this type of equipment.

Installation and commissioning must be carried out by an authorized and certified company.

Profactor Armaturen GmbH reserves the right to make changes to the product design that do not affect its technical characteristics or functional features.

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INTERNATIONAL WARRANTY CARD

NAME OF THE PRODUCT _____

PRODUCT CODE, SIZE _____ **QUANTITY** _____

SELLER NAME AND ADDRESS _____

DATE OF PURCHASE _____

SELLER STAMP

SELLER SIGNATURE _____

For the warranty term refer to the Warranty obligation clause in the technical manual

FOLD LINE FOLD LINE

In case of any claims to the product quality the following documents should be submitted:

1. Application with customer and product detailes:
- Name of the customer, actual address and phone number
- Article of the product
- Reason for the claim and photo
- Plumbing system where installed (name, address, phone number)

2. Invoice copy and receipt

3. Warranty card

RETURN/EXCHANGE COMMENTS _____

DATE _____ **SIGNATURE** _____

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