PAS, PASF, PASM Series

Compact domestic hot water and mixing units

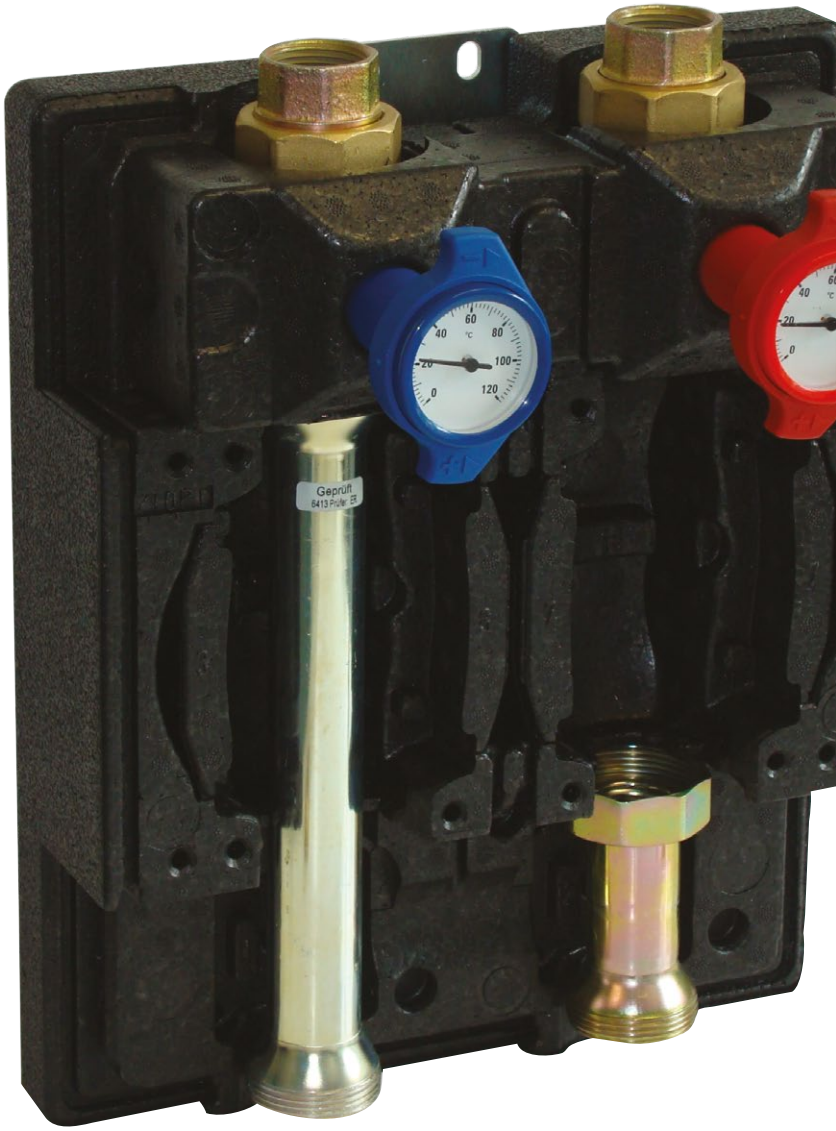
VB32 Series

Manifolds

HW, HW-Q60/80 Series

Hydraulic switches

Technical Data Sheet



WattsWater.eu

Description

PAS Series pre-assembled domestic hot water units, and **PASF** and **PASM Series** pre-assembled domestic hot water and mixing units are designed to manage, distribute and control the heat-carrier fluid in multi-zone heating and cooling systems. Featuring modular design, they meet a wide range of system requirements when installed in conjunction with **VB32 Series** distribution manifolds, and **HW** and **HW-Q60/80 Series** hydraulic switches.

PAS

Compact, **pre-assembled domestic hot water unit** for DN 25 and DN 32 heating and cooling systems. Complete with shut-off valves with built-in thermometer, gravity flow stop system, EPP insulation, fittings and bracket for wall mounting.
Maximum operating pressure: 10 bar.
Operating temperature range: -10÷40°C.
Fluid temperature: 90°C.
Supplied without pump, it suits all system requirements.
Compatible with high-efficiency pumps (ErP ready) with centre distance of 180 mm (and 130 mm with adaptor).

Type	Part No.	DN	Description	Weight (kg)
PAS25	10026450	25	Domestic hot water unit	1.7
PAS32	10026881	32	Domestic hot water unit	2.2
PA	PA-130	25	130 mm pump adaptor	0.5

PASF

Compact, **pre-assembled, fixed-point domestic hot water and mixing** unit for DN 25 heating systems with thermostatic mixing valve adjustable 20÷43°C. Complete with shut-off valves with built-in thermometer, gravity flow stop system, EPP insulation, fittings and bracket for wall mounting.
Maximum operating pressure: 10 bar.
Operating temperature range: -10÷40°C.
Fluid temperature: 90°C.
Supplied without pump, it suits all system requirements.
Compatible with high-efficiency pumps (ErP ready) with centre distance of 130/150 mm.

Type	Part No.	DN	Description	Weight (kg)
PASF25	10027565	25	Domestic hot water and mixing unit	4.0

PASM

Compact, pre-assembled, modulating domestic hot water and mixing unit for DN 25 and DN 32 heating and cooling systems with 3-way mixing valve and CLASSIC EVO2 Series 230V 3-point modulating electronic actuator.
Complete with shut-off valves with built-in thermometer, gravity flow stop system, EPP insulation, fittings and bracket for wall mounting.
Maximum operating pressure: 10 bar.
Operating temperature range: -10÷40°C.
Fluid temperature: 90°C.
Supplied without pump, it suits all system requirements.
Compatible with high-efficiency pumps (ErP ready) with centre distance of 180 mm (and 130 mm with adaptor).

Type	Part No.	DN	Description	Weight (kg)
PASM25	10026451	25	Mixing valve, Kvs = 6.3	4.0
PASM32	10026883	32	Mixing valve, Kvs = 18	5.0
PA	PA-130	25	130 mm pump adaptor	0.5

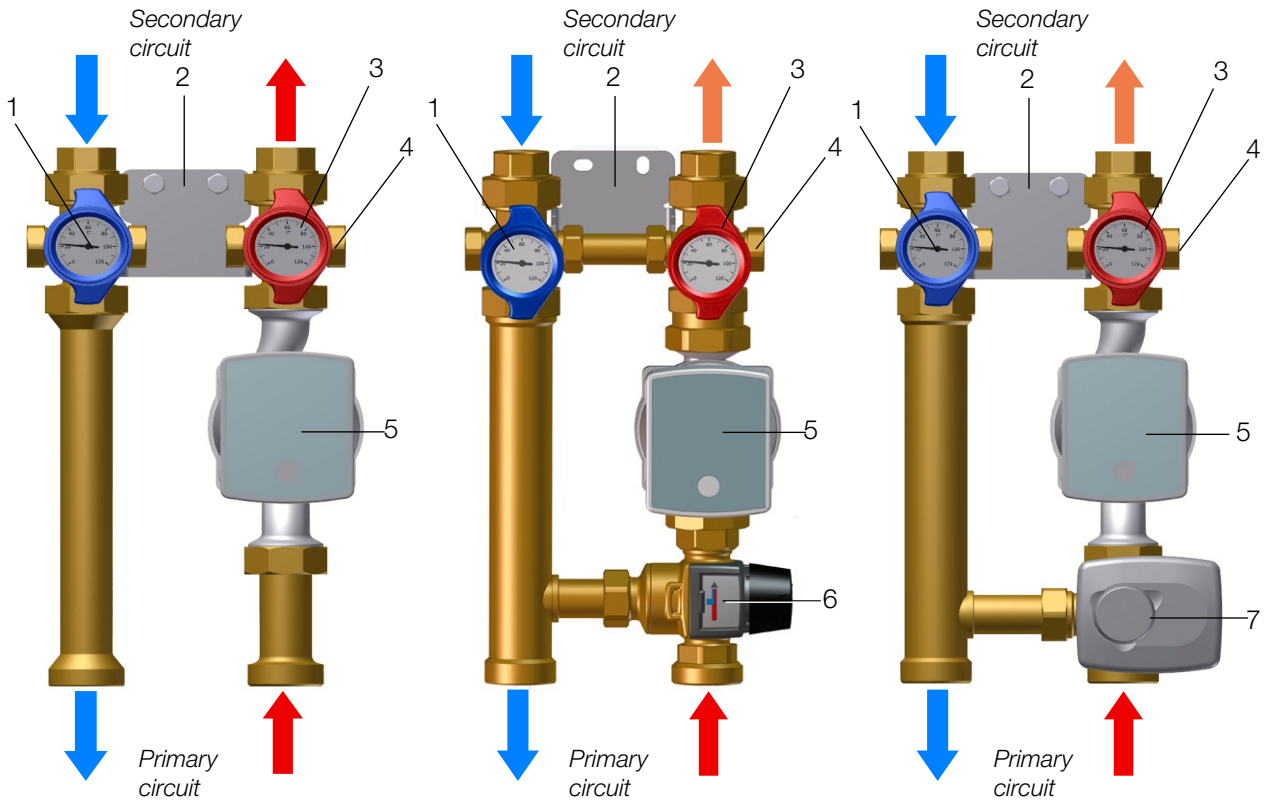
Technical features	PAS	PASF	PASM
Operating pressure	6 bar	6 bar	6 bar
Maximum operating pressure (max. 24 hrs with Tmax < 30°C)	10 bar	10 bar	10 bar
Operating temperature	-10÷40°C	-10÷40°C	-10÷40°C
Maximum fluid temperature	90°C or pump temperature if lower	90°C or pump temperature if lower	90°C or pump temperature if lower
Thermometer scale	0-120°C	0-120°C	0-120°C
Compatible pump centre distances	DN25 -180/130* mm DN32-180 mm	DN25-150 mm	DN25-180/130* mm DN32-180 mm
Thermostatic mixing valve temp. range	-	20-43 ± 3°C	-
Modulating actuator	-	-	3-point-230 VAC

** with adaptor*

Design characteristics	
Taps and fittings	CW614N brass
Pipes	Precision steel to EN 10305-3
Ball valve seals	PTFE
Flat seals	AFM34 and EPDM
O-Ring	EPDM
Insulation	EPP

Application and operation

Pre-assembled domestic hot water and mixing units are designed to manage, distribute and control the heat-carrier fluid in multi-zone heating and cooling systems. The **PAS Series** unit draws heat-carrier fluid from the primary circuit and pumps it to the terminal units of the secondary circuit according to the thermal power required by the connected thermal zone. The pump (5) provides the necessary head to pump the heat-carrier fluid through the secondary circuit. The flow and return temperature of the fluid in the secondary circuit can be read on the thermometers (1 and 3) built into the shut-off valves (visible even with the insulation fitted). The flow shut-off valve is a gravity flow stop system (4), which acts as a check valve to prevent natural circulation when the pump is not running. It is used in **heating and air conditioning systems** where the fluid in the primary circuit can be used by the terminal units of the secondary circuit without requiring further temperature control (e.g. radiators and fan-coils). In addition to the functions of the **PAS Series**, the **PASF Series** fixed-point **domestic hot water and mixing unit** controls the flow temperature of the fluid in the secondary circuit. This unit is equipped with a fixed-point thermostatic mixing valve (6), which keeps the flow temperature in the secondary circuit constant by appropriately mixing the primary circuit flow with the secondary circuit return. It is used in **radiant panel heating systems**, where the temperature of the heat-carrier fluid must be kept constant within certain values before it can be sent to the radiant circuits.
In addition to the functions of the **PAS Series**, the **PASM Series domestic hot water and mixing unit** controls the flow temperature of the fluid in the secondary circuit in response to an external signal. This unit is equipped with a 3-way mixing valve (7) actuated by a 3-point electronic modulating actuator. It is installed in **heating and air conditioning systems** equipped with **climate control** (or a modulating controller) where the flow temperature of the secondary circuit is controlled (modulated) continuously on the basis of the system parameters.
PASM Series domestic hot water and mixing units, in conjunction with **RCL-HC Series climate controllers**, control the flow temperature with external temperature compensation.

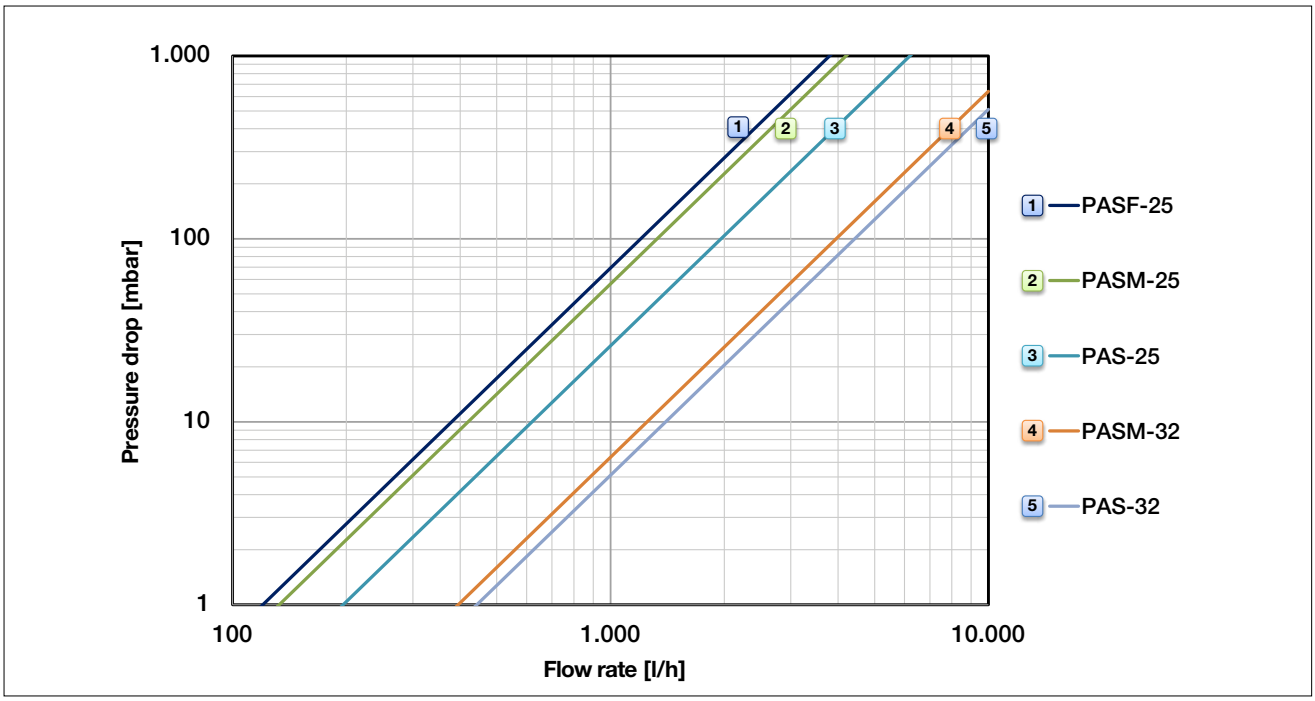


Key

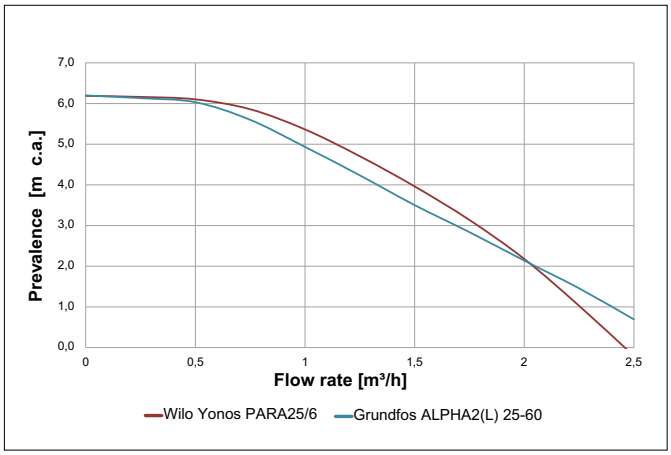
1. Return valve with built-in thermometer
2. Wall-mounting bracket
3. Flow valve with built-in thermometer
4. Check valve built into the ball valve
5. Pump
6. Thermostatic mixing valve
7. Mixing valve with 3-point actuator

Chart

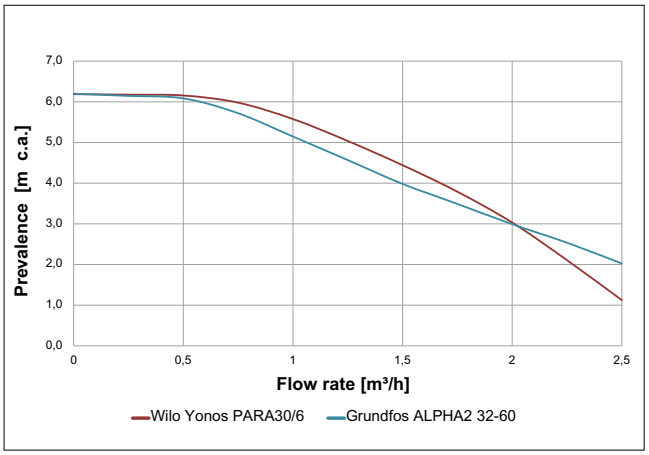
The graph below shows the total pressure drop of the individual **PAS, PASF and PASM Series** units as a function of flow rate. To facilitate sizing, a further series of graphs show the residual head calculated with the pumps typically installed in these types of unit.



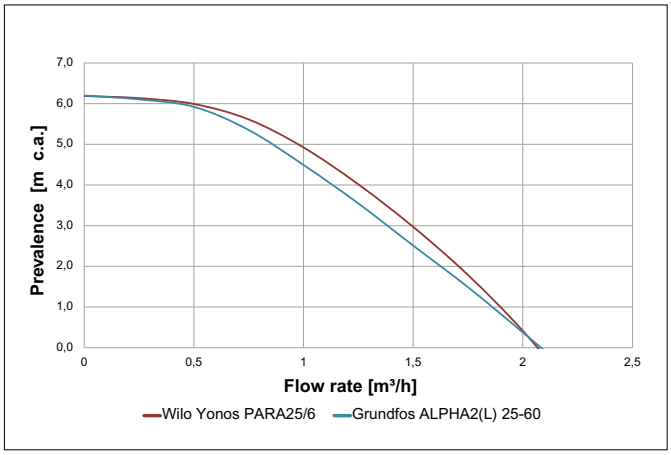
PAS DN25 - Residual head



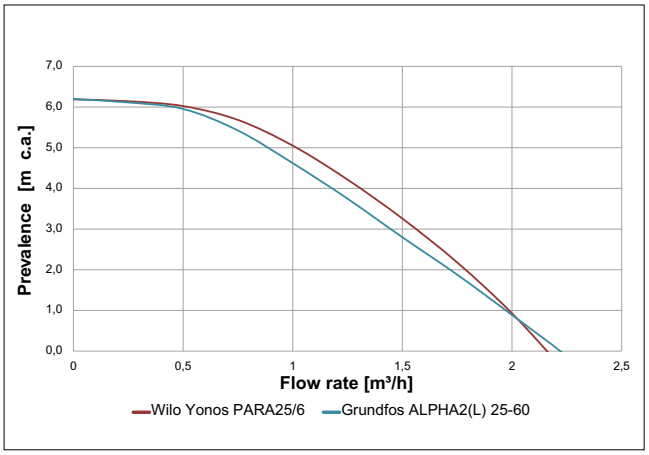
PAS DN32 - Residual head



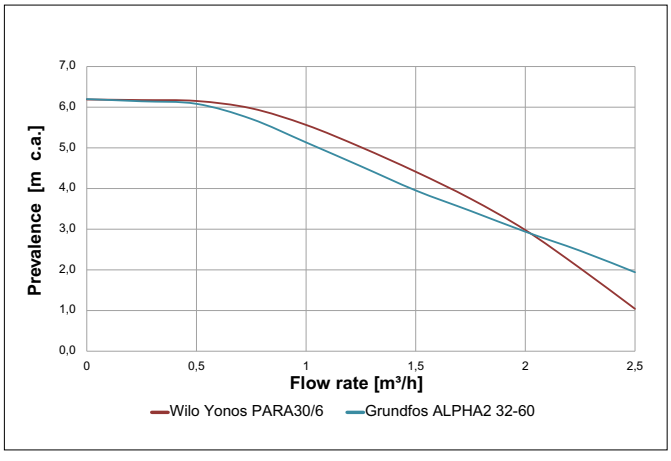
PASF DN25 - Residual head



PASM DN25 - Residual head



PASM DN32 - Residual head



Accessories

PAS, PASF and **PASM Series** pre-assembled units are designed for modular installation in conjunction with **VB32 Series** distribution manifolds and **HW** and **HW-Q60/80 Series** hydraulic switches.

VB32

Steel distribution manifold for PAS, PASF and PASM DN 25 and DN 32 domestic hot water and mixing units complete with EPP insulation, compatible with systems with flow from either left or right.
Equipped with 3 x 1.1/2" M flat sealing flow connections, including one with a cap, and 1.1/2" F flat sealing connections with union nut for domestic hot water units.

Type	Part No.	Description	Weight (kg)
VB32-2	10025900	for 2 domestic hot water units	5.5
VB32-3	10025901	for 3 domestic hot water units	8.5
VB32-4	10026672	for 4 domestic hot water units	13
VB32-5	10026931	for 5 domestic hot water units	17.5
WH-VB32	10026388	wall-mounting kit	1

HW-Q60-80

Compact stainless steel hydraulic switch for PAS domestic hot water units, and PASF and PASM domestic hot water and mixing units complete with EPP insulation and predisposition for immersion temperature probe (1/2" F – Ø 6.5 mm sleeve).
Maximum pressure 6 bar. 1.1/2" M x 1.1/2" F flat sealing connections with union nut.
Compatible with VB32 manifolds (maximum 2 circuits).

Type	Part No.	Description	Weight (kg)
HW-Q 60/80	10010424	1.5 m³/h – 17 kW (Δt = 10 K)	2.66

HW

Steel hydraulic switch for VB32 and HKV50 Series distribution manifolds, complete with EPP insulation, air vent valve, fill/drain cock, wall-mounting brackets and predisposition for immersion temperature probe (1/2" F – Ø 6.5 mm sleeve). Maximum pressure 6 bar.

Flat sealing connections:
- HW80/120 1.1/2"M connections
- HW40/140 2" M connections complete with two 2" F x 1.1/4" F union nuts

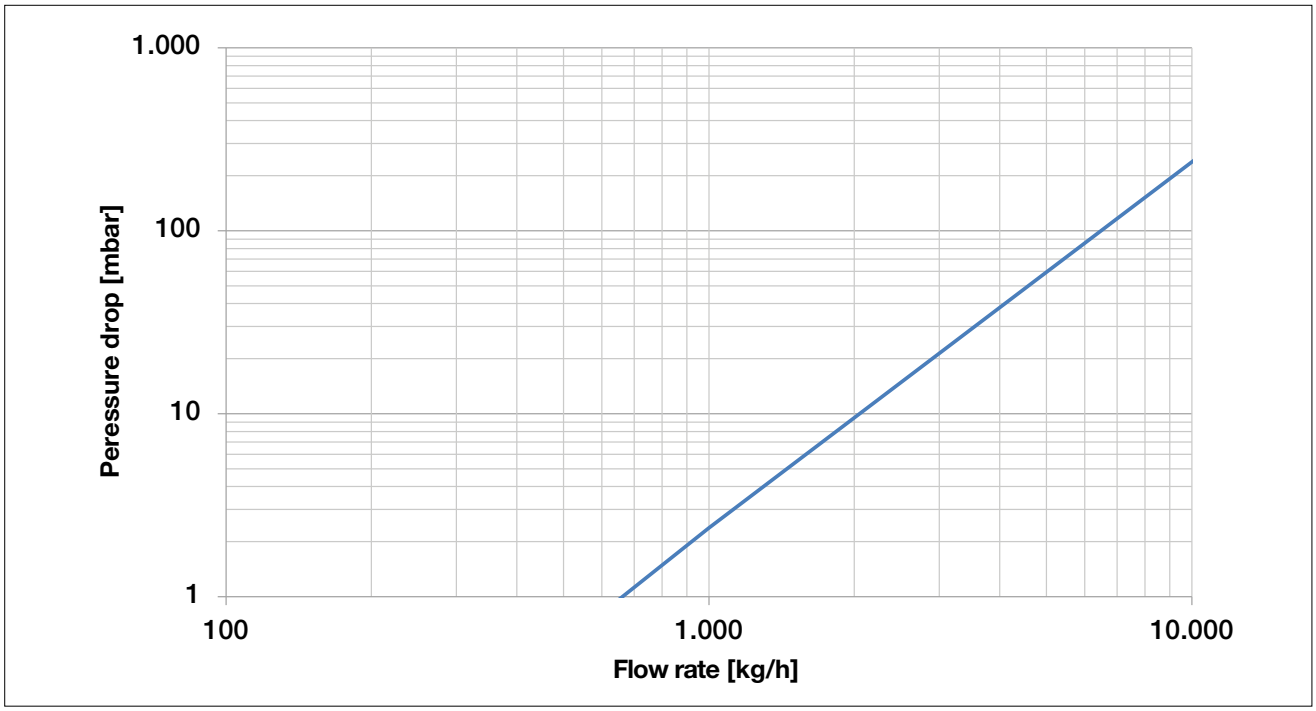
Pre-insulated pipes are available for connecting the HW80/120 hydraulic switch to **VB32 Series** manifolds.

Type	Part No.	Description	Weight (kg)
HW80/120	10010376	4 m³/h hydraulic switch – 44 kW (Δt= 10 K)	6.75
HW140/140	10010419	10 m³/h hydraulic switch – 114 kW (Δt= 10 K)	7.1
RB-HW80/120	10010378	Pair of pipes for connecting HK80/120 to VB32 manifolds	2.2

Technical features of accessories	VB32	HW-Q60/80	HW
Maximum flow rate	-	1.5 m³/h	4 m³/h - 10 m³/h
Maximum operating pressure	6 bar	6 bar	6 bar
Maximum operating temperature	110°C	110°C	110°C
Pocket for temperature probe	-	for Ø 6.5 mm probe	for Ø 6.5 mm probe
Air vent	-	manual valve	manual valve
Fill/drain	-	-	1/2" x 3/4" cock

Features	VB32	HW-Q60/80	HW
Nominal diameter	DN32	DN32	DN40 / DN50
Structure	Painted steel	Painted steel	Painted steel
Valves and fittings	CW614N brass and CW617N	CW614N brass and CW617N	CW614N brass and CW617N
Flat seals	AFM34 and EPDM	AFM34 and EPDM	AFM34 and EPDM
Insulation	EPP	EPP	EPP

Chart



Installation

Pump sizing and installation

PAS, PASF and PASM Series pre-assembled units are compatible with high-efficiency pumps (ErP ready) of various makes with centre distance of 130 mm, 150 mm and 180 mm (with or without adaptor) according to the models and DN shown in the table below.

Type	Part No.	Dn	Pump wheelbase 130 mm	150 mm	180 mm
PAS25	10026450	25	with adapter PA-130	-	Si
PAS32	10026881	32	-	-	Si
PASF25	10027565	25	Si	Si	-
PASM25	10026451	25	with adapter PA-130	-	Si
PASM32	10026883	32	-	-	Si

The pump must be sized according to the flow rates and heads required in the heating circuit that the unit is intended to supply.
For the pressure drop of the individual units, see the **technical features** section.

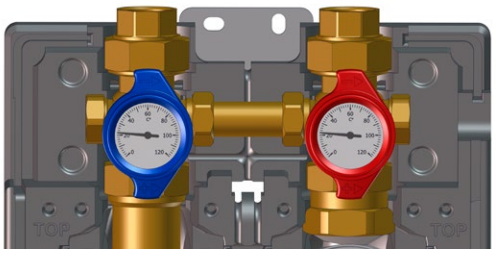
When fitting the pump, and fitting and removing other components with flat seals, adhere to the tightening torques shown in the table:

DN connection	3/4“	1“	1.1/4“	1.1/2“	2“
Tightening torque	35 Nm	55 Nm	90 Nm	130 Nm	190 Nm

Wall-mounting

PAS, PASF and PASM Series pre-assembled units are equipped with a built-in wall-mounting bracket, located at the top of the unit.

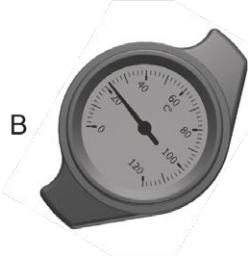
The unit must be mounted using suitable wall plugs for the construction material of the wall concerned.



Shut-off valves

Each unit is equipped with shut-off ball valves for shutting off the secondary circuit flow (red knob) and return (blue knob).
Both knobs are equipped with a built-in thermometer (which is visible even with the insulation fitted).
The flow shut-off valve is equipped with a gravity flow stop system, which acts as a check valve to prevent natural circulation when the pump is not running. This valve has three different operating positions.

A 

B 

C 

Position A: valve open and check valve in operation (operating position)

Position B: valve partially open and check valve open (filling/draining system)

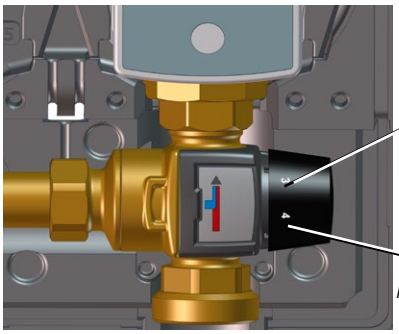
Position C: valve closed (service position)

Temperature control on the PASF Series model

The PASF Series unit is equipped with a fixed-point thermostatic mixing valve for secondary circuit flow temperature control.

To adjust the temperature, turn the thermostatic valve knob until the number corresponding to the desired temperature (see table) lines up with the reference mark on the valve body (see figure).

For more accurate control, you are advised to check the temperature on the flow thermometer.

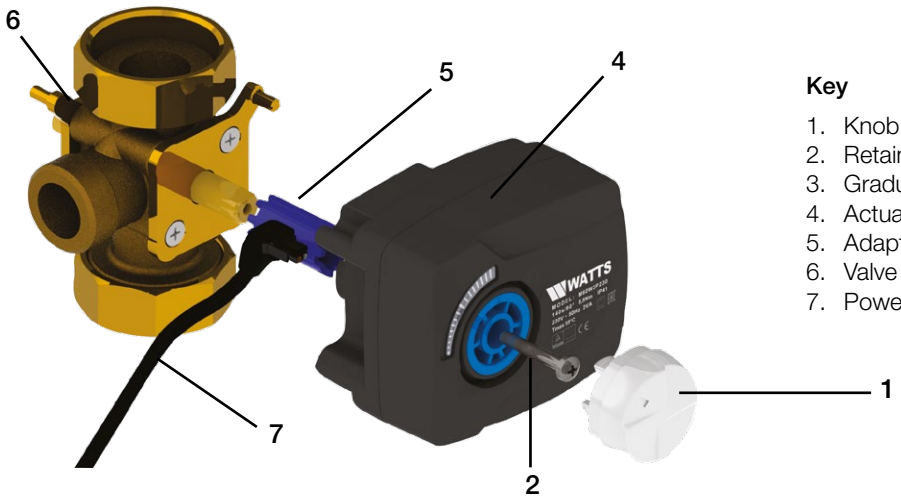


Knob position	1	2	3	4	5	6
Temperature	20 °C	30 °C	34 °C	38 °C	41 °C	50 °C

PASM Series modulating mixing valve

The PASM Series unit is equipped with a 3-way mixing valve actuated by a 3-point electronic modulating actuator.

The secondary circuit flow temperature is continuously controlled (modulated) according to the required parameters, by the control system to which the actuator has to be connected.
For electrical connections, see instructions for actuator and controller.



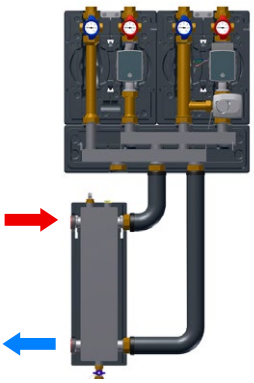
Key

1. Knob
2. Retaining screw
3. Graduated scale
4. Actuator
5. Adaptor
6. Valve body
7. Power cable

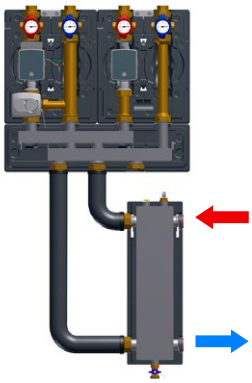
System modularity and reversibility

PAS, PASF and **PASM Series** pre-assembled units are designed for modular installation in conjunction with **VB32 Series** distribution manifolds and **HW** and **HW-Q60/80 Series** hydraulic switches.
Below is an example of how two units (PAS and PASM Series) mounted on a VB32-2 Series manifold can be connected to either an HW Series 4 m³/h hydraulic switch or to an HW-Q60/80 hydraulic switch with primary circuit from right or left.

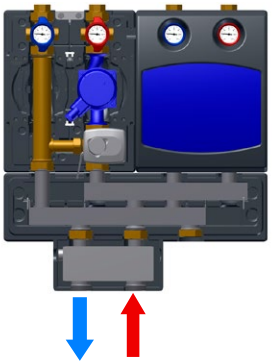
Connection with HW80/120 and primary flow on left



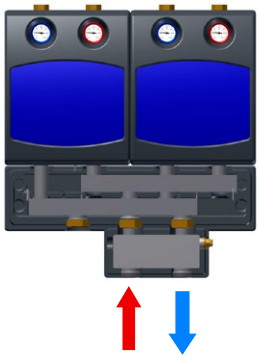
Connection with HW80/120 and primary flow on right



Connection with HW-Q60/80 and primary flow on right

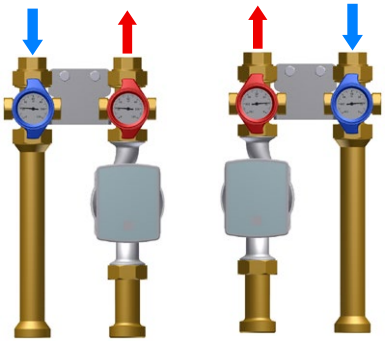


Connection with HW-Q60/80 and primary flow on left

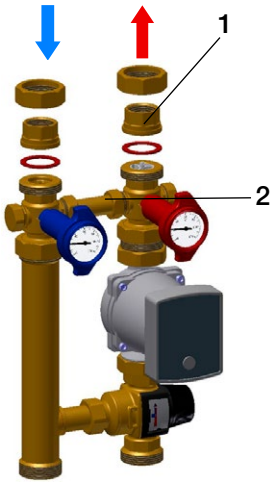


PAS, PASF and **PASM Series** units are all factory-assembled with the flow on the right and return on the left. This configuration can be inverted in a few simple steps, however, to obtain units with the flow on the left and return on the right.

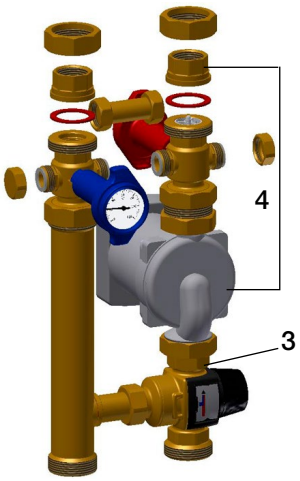
To convert a **right-hand PAS Series** into a **left-hand PAS Series**, simply invert the position of the two hydraulic elements in the insulation.



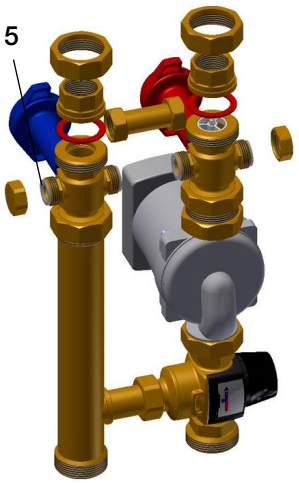
To convert a **right-hand PASF** into a **left-hand PASF** simply remove the hydraulic unit from the insulation and follow the instructions shown in the figure below.



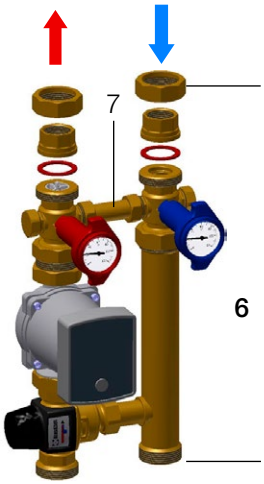
A. Remove the top reducers (1) and the spacer (2) between the flow and return



B. Unscrew the ring-nut (3) and turn the ball valve and pump (4) by 180°



C. Unscrew the ring-nut (5) and turn the return ball valve by 180°

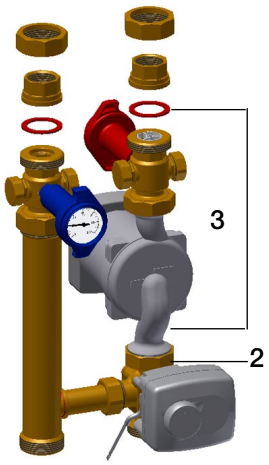


D. Turn the entire unit (6) by 180°, refit the spacer (7) and re-tighten all the connections

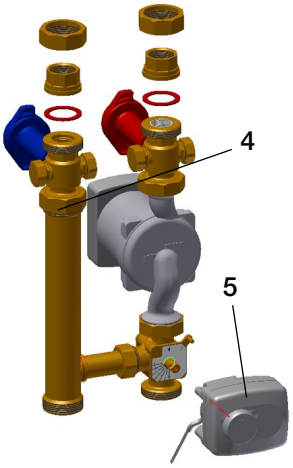
NOTE: For further information, refer to the instructions for the individual units.

To convert a **right-hand PASM Series** into a **left-hand PASM Series**, simply remove the hydraulic unit from the insulation and follow the instructions shown in the figure below.

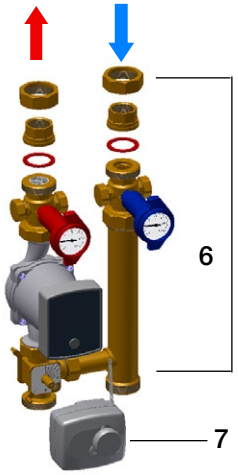
A. Remove the top reducers (1) and, if applicable, remove the spacer between the flow and return



B. Unscrew the ring-nut (2) and turn the ball valve and pump (3) by 180°



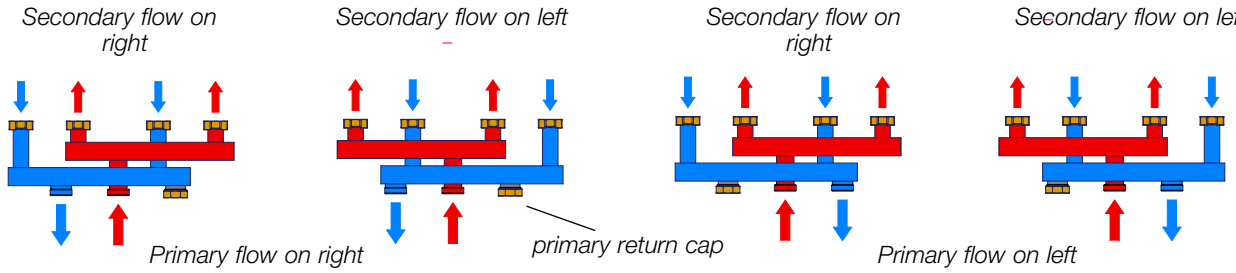
C. Unscrew the ring-nut (4), turn the return valve by 180°, then remove the actuator (5)



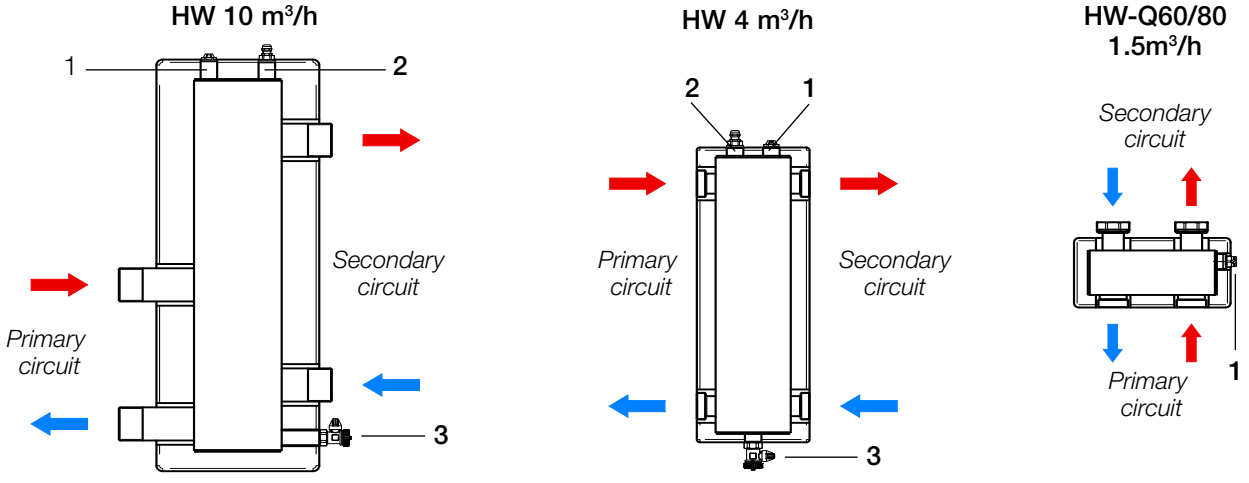
D. Turn the entire unit (6) by 180°, refit the actuator (7) and re-tighten all the connections

NOTE: For further information, refer to the instructions for the individual units.

As shown in the figure below, **VB32 Series** manifolds are also designed for modular installation, so can be used with **modules with either right-hand flow** or **left-hand flow**.
By turning the manifold to the appropriate position and capping one of the primary circuit's two return lines, you can have the primary flow on the right or left, regardless of whether the secondary flow is on the right or left.



For correct operation of the hydraulic switches, the water connections must be made in accordance with the direction of flow of the primary and secondary circuit as shown on the body of the hydraulic switch. For the **HW Series** model, you also need to make sure there are no air pockets trapped in the top, and vent them if necessary, using the air vent valve.



1. Air vent 2. Pocket for temperature probe 3. Fill/drain cock

Maintenance

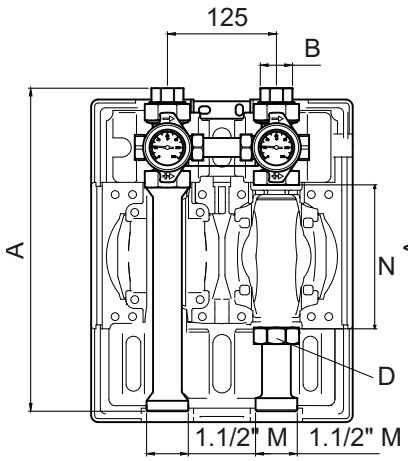
PAS, PASF and **PASM pre-assembled units, VB32 Series** manifolds, and **HW** and **HW-Q60/80 Series** hydraulic switches require only limited maintenance:

- **PAS, PASF, PASM Series** units: pump maintenance (see the manual for the installed pump)
- **PAS, PASF, PASM Series** units: annual check of opening/closing of shut-off valve and gravity flow stop system
- **PASF Series** unit: annual check of thermostatic valve setting
- **PASM Series** unit: annual check of operation of mixing valve
- **HW Series** hydraulic switch: air vent

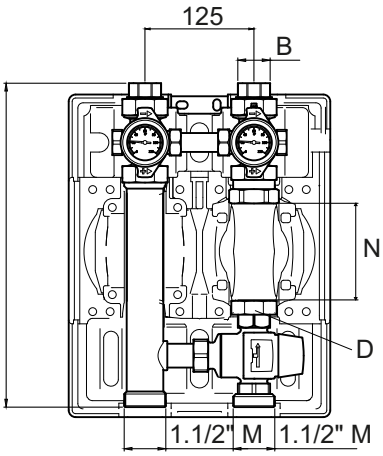
NOTE: For further information, refer to the instructions for the individual products.

Overall dimensions (mm)

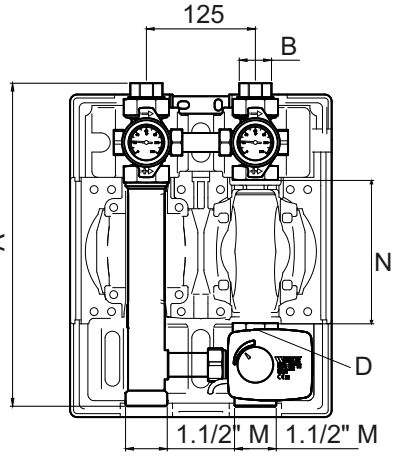
PAS



PASF



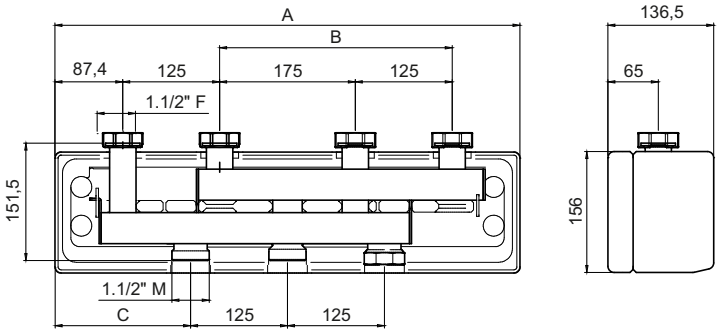
PASM



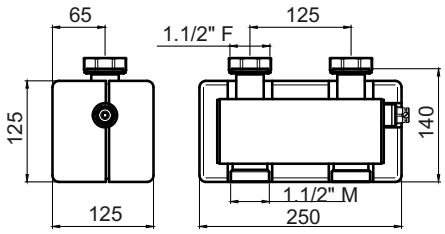
Type	DN	A	B	N	D
PAS	25	371	1“ FG	180*	1.1/2"
PAS	32	376	1.1/4“ FG	180	2"
PASF	25	371	1“ FG	130	1.1/2"
PASM	25	371	1“ FG	180*	1.1/2"
PASM	32	376	1.1/4“ FG	180	2"

*with adapter.

VB32



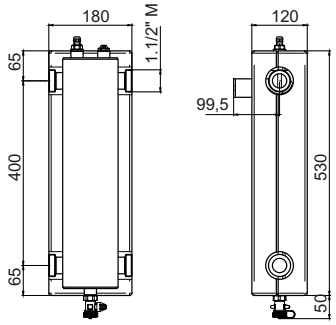
HW-Q60/80



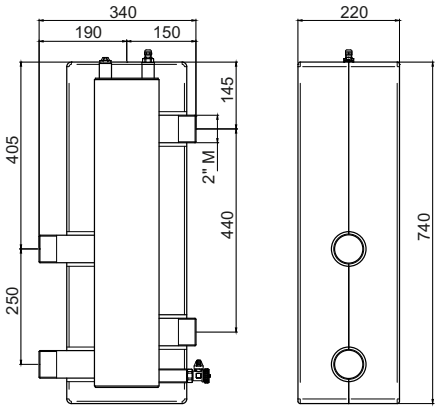
Type	Circuits	A	B	C
VB32-2	2	600	300	175
VB32-3	3	900	2x300	325
VB32-4	4	1200	3x300	475
VB32-5	5	1500	4x300	625

HW

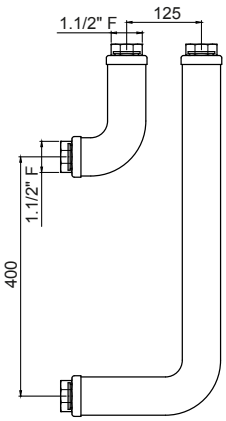
4 m³/h



10 m³/h



RB-HW80/120



Specification text

PAS Series **-** Compact, pre-assembled domestic hot water unit **PAS Series** – WATTS brand – for DN 25 and DN 32 heating and cooling systems. Complete with shut-off valves with built-in thermometer, gravity flow stop system, EPP insulation, fittings and bracket for wall mounting. Maximum operating pressure: 10 bar. Operating temperature range: -10÷40°C. Fluid temperature: 90°C. Supplied without pump, it suits all system requirements. Compatible with high-efficiency pumps (ErP ready) with centre distance of 180 mm (and 130 mm with adaptor).

PASF Series **-** Compact, pre-assembled, fixed-point domestic hot water and mixing unit **PASF Series** – WATTS brand – for DN 25 heating systems with thermostatic mixing valve adjustable 20÷43°C. Complete with shut-off valves with built-in thermometer, gravity flow stop system, EPP insulation, fittings and bracket for wall mounting. Maximum operating pressure: 10 bar. Operating temperature range: -10÷40°C. Fluid temperature: 90°C. Supplied without pump, it suits all system requirements. Compatible with high-efficiency pumps (ErP ready) with centre distance of 130/150 mm.

PASM Series **-** Compact, pre-assembled, modulating domestic hot water and mixing unit **PASM Series** – WATTS brand – for DN 25 and DN 32 heating and cooling systems with 3-way mixing valve and **CLASSIC EVO2 Series** 230V 3-point modulating electronic actuator. Complete with shut-off valves with built-in thermometer, gravity flow stop system, EPP insulation, fittings and bracket for wall mounting. Max. operating pressure: 10 bar. Operating temperature range: -10÷40°C. Fluid temperature: 90°C. Supplied without pump, it suits all system requirements. Compatible with high-efficiency pumps (ErP ready) with centre distance of 180 mm (and 130 mm with adaptor).

VB32 Series **-** Steel distribution manifold **VB32 Series** – WATTS brand – for **PAS**, **PASF** and **PASM Series** domestic hot water and mixing units complete with EPP insulation, compatible with systems with flow from either right or left. Equipped with 3 x 1.1/2" M flat sealing flow connections, including one with a cap, and 1.1/2" F flat sealing connections with union nut for domestic hot water units. Predisposed for 2, 3, 4 or 5 domestic hot water units.

HW Series **-** Steel hydraulic switch **HW Series** – WATTS brand – for **VB32 Series** distribution manifolds, complete with EPP insulation, air vent valve, fill/drain cock, wall-mounting brackets and predisposition for immersion temperature probe (1/2" F – Ø 6.5 mm sleeve). Maximum pressure 6 bar. HW80/120 model with 1.1/2" M connections and HW40/140 model with 2" M connections.

HW-Q60/80 Series**-** Compact stainless steel hydraulic switch **HW-Q60/80 Series** – WATTS brand – for **PAS** domestic hot water units and PASF and PASM Series domestic hot water and mixing units complete with EPP insulation and predisposition for immersion temperature probe (1/2" F – Ø 6.5 mm sleeve). Maximum pressure 6 bar. 1.1/2" M x 1.1/2" F flat sealing connections with union nut. Compatible with VB32 manifolds (maximum 2 circuits).

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