

Dynamically controlled underfloor heating

Comfort and energy efficiency made easy





Overview

Underfloor heating systems are becoming increasingly popular due to their thermal comfort and energy efficiency. To achieve these benefits, correct regulation of the flows in the individual circuits is required. The flows are calculated by the designer. However, it can be a challenge to maintain these flows both during commissioning and operation. Installers using conventional manifolds find during commissioning that changing the settings on one circuit affects the settings already made on other circuits. It can therefore be a lengthy and tedious process to achieve the correct settings everywhere. In larger systems, if other manifolds close e.g. when neighbours are on holiday, the floor may receive more flow than intended, causing the floor slab to overheat. Due to the inertia of wet lay systems, the room thermostat cannot react in time. An undesirable increase in room temperature and energy wastage are the result. This leads to the need to maintain differential pressure across the underfloor heating circuits. It should be noted that all heating circuits within the same manifold start within the same flow manifold and end within the same return manifold. According to Pascal's law, the pressure in a closed vessel is the same everywhere. In the case of the underfloor heating manifold, this is admittedly an idealisation.

However, in view of the large cross-sectional area and slim design of the control elements within the HERZ manifolds, the constant pressure within the manifold length is not far from reality. It is then only necessary to maintain the pressure difference between the two manifolds to ensure that all heating circuits have the same differential pressure. There is no need to install special pressure reducers in each thermostatic valve of the manifold. One differential pressure regulator per manifold does the job more robustly, more efficiently and more durably.

Hydraulically, this is the solution. However, there is usually not much room for a differential pressure regulator in the manifold cabinet, let alone an additional ball valve to isolate the manifold. This is why HERZ offers the compact differential pressure regulator **4012 VS-TS** with integrated isolation and zone valve. If the manifold serves a single comfort control zone the valve can be used to mount an actuator so that the entire zone is controlled by a single actuator.



☑ Benefits

- 4 functions in 1 valve (differential pressure control, throttle, isolation and zone valve function)
- Maintains the differential pressure at the manifold and thus the Keeps the flow rate in the heating circuits con-
- stan
 - The integrated zone valve with mounting for the entire manifold can be controlled or isolated.
- For a cost-effective solution, an entire zone can be controlled with a room thermostat and a suitable actuator on the differential pressure regulator
- Short overall lengths simplify installation in distribution distribution cabinets. Fits in an only 80 mm deep distribution cabinet
- ☑ The differential pressure control range is optimal for Underfloor heating systems
- ☐ The supplied red shut-off cap can alternatively be used for manual isolation of the zone valve
- With the same hydraulic control function, the differential pressure regulator is much less sensitive to poor heating water quality than dynamic thermostatic valves



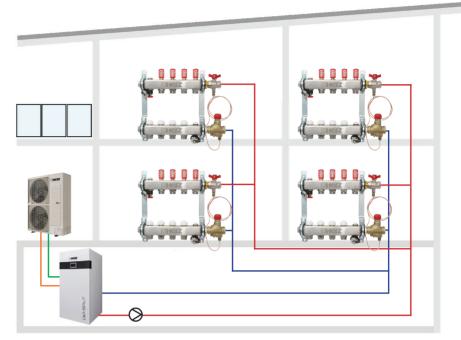


☑ Example

Hydraulic balancing of several manifolds

In heating systems with manifolds for underfloor heating, the hydraulic balancing is carried out automatically by the 4012 differential pressure regulator, in that each valve on the manifold has a constant differential pressure and thus the desired flow rate. regardless of pressure fluctuations.

The combination of thermostatic valve and differential pressure regulator is hydraulically comparable to dynamic thermostatic valves on the manifold, but this solution is significantly more robust and less sensitive to dirt.



Schematic illustration without further installations

Serie 4012/4212 VS-TS

Differential pressure regulator with fixed setpoint of 20 kPa or 35 kPa depending on model. With integrated throttle valve within the pressure-regulated circuit. Can be used as a zone valve and isolation valve for the manifold. Compact design, housing made of dezincification-resistant brass.

Impulse line can be connected to isolation valves 4115, 4125 or line regulating valves **4017**, **4217** or strainer **4111** with the 1/4" connecting nipple supplied.

With the M 10 x 1 connection nipple 1 4007 77, the impulse line can also be connected to ball valve 2202 with sensor receptacle.



4012 VS-TS with external thread flat sealing



4212 VS-TS with threaded socket

l/h	Regulated differential pressure	DN	Dim.	Order number	Dim.	Order number
50-1400 l/h	20 kPa	15 LP	G ¾"	1 4012 31	Rp ½"	1 4212 31
50-1950 l/h	20 kPa	20 LP	G 1"	1 4012 32	Rp ¾"	1 4212 32
50-2000 l/h	35 kPa	15 HP	G ¾"	1 4012 41	Rp ½"	1 4212 41
50-2100 l/h	35 kPa	20 HP	G 1"	1 4012 42	Rp ¾"	1 4212 42

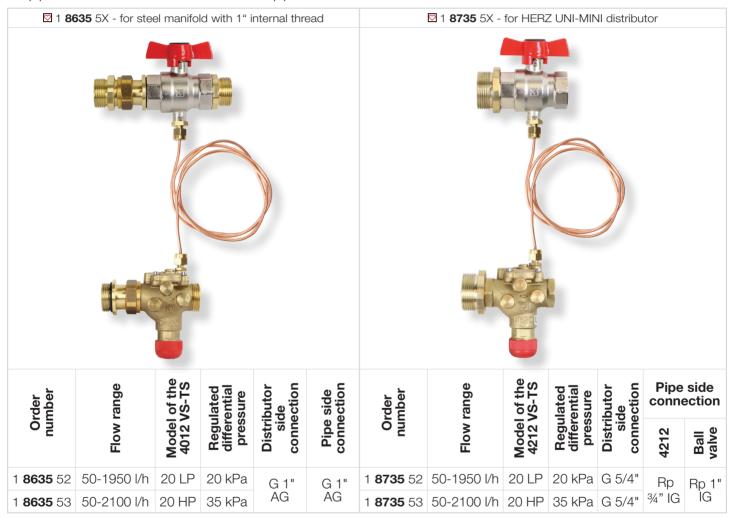


Dynamic control sets for underfloor heating manifolds

The dynamic control sets are an installer-friendly, time-saving and cost-effective solution for the dynamic control of underfloor heating manifolds with reliable tightness and easy selection of pipe connections. The **8635** control sets are suitable for manifolds with G 1" internal thread, e.g. for HERZ **863X** stainless steel manifolds or HERZ **853X** brass manifolds.

The sets include a **4012** VS-TS valve in LP or HP version, a ball valve with mounting for the impulse line, the impulse line itself, soft-sealing connections to the manifold and have a G1" male thread with flat seal on the pipe side to accommodate HERZ PIPEFIX pipe connections. The **8735** control sets are designed for the UNI-MINI manifolds.

The sets include a **4212** VS-TS valve in LP or HP version, a ball valve with a receptacle for the impulse line, the impulse line itself, soft-sealing connections to the UNI-MINI manifold with G 5/4" free-turning nut and have an Rp 1" or Rp ¾" threaded sleeve on the pipe side to accommodate HERZ PIPEFIX pipe connections.



Recommended cabinet for HERZ stainless steel distributor 8632 / 8633 or HERZ UNI-MINI distributor 8732 / 8733 with dynamic control set 1 8635 5X or 1 8735 5X

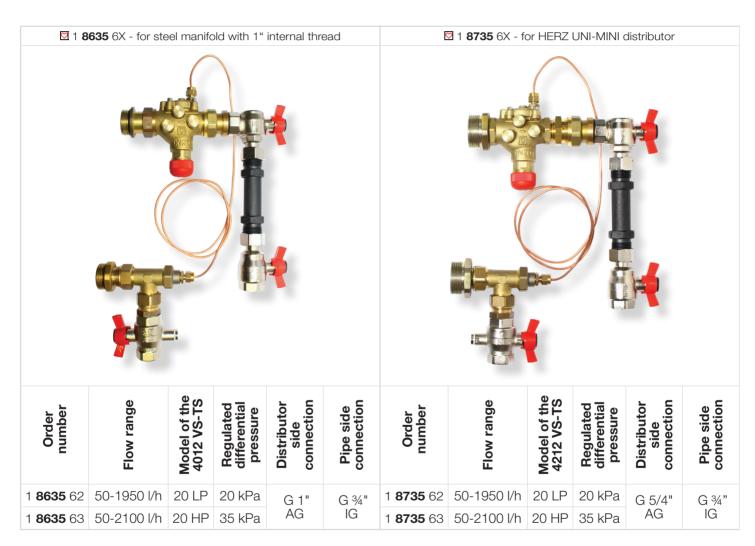
Number of distribution outlets	Recommended cabinet	Cupboard size
3-4	1 8569 10	600 mm
5-7	1 8569 15	750 mm
8-10	1 8569 20	900 mm
11-12	1 8569 25	1050 mm



Dynamic control sets for underfloor heating manifolds with heat meter

The dynamic control sets for underfloor heating manifolds with heat meter represent an installation- and service-friendly allin-one connection set for flats. In combination with actuator and room thermostat, these sets offer a complete solution for regulation, control and heat metering of underfloor heated flats.

These sets for manifolds with heat meters are designed for a practical floor connection of the supply and return lines. The return manifold is to be mounted on top, the supply manifold on the bottom. In addition to the 4012/4212 VS-TS on the return side, the sets also include two ball valves with free-turning G 3/4" nuts and a 110 mm fitting for convenient installation and replacement of the heat meter. On the flow side there is a shut-off ball valve as well as a T-piece with connection for the impulse pipe of the 4012/4212 VS-TS and a ball valve with receptacle for the temperature sensor of the heat quantity meter. All necessary seals are included in the scope of delivery. The connection on the pipe side is a Rp ¾".



/ 8633 with dynamic control set with heat meter

Number of Recommended **Cupboard size** distribution outlets cabinet 3 1 **8569** 10 600 mm 4 - 6 1 **8569** 15 750 mm 7 - 9 1 **8569** 20 900 mm 10 - 12 1 **8569** 25 1050 mm

☑ Recommended cabinet for HERZ stainless steel manifold 8632 ☑ Recommended cabinet for HERZ UNI-MINI manifolds 8732 / 8733 with dynamic control set with heat meter

Number of distribution outlets	Recommended cabinet	Cupboard size
3 - 5	1 8569 15	750 mm
6 - 8	1 8569 20	900 mm
9 - 11	1 8569 25	1050 mm
12	1 8569 30	1200 mm



☑ HERZ PIPEFIX connecting elements

T 70XX compression fitting for multilayer and PEX pipes, for 4012 valves with male thread flat sealing

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Order number	Order number Dim.		Pipe	
T 7016 41	DN 15	G ¾"	16 x 2	
T 7020 41	DN 15	G ¾"	20 x 2	
T 7016 42	DN 20	G 1"	16 x 2	
T 7020 42 DN 20		G 1"	20 x 2	
T 7026 42 DN 20		G 1"	26 x 3	

T 70XX compression fitting for multilayer and PEX pipes, for 4212 valves and 2202 ball valves with threaded socket



Order number	Dim.	Thread on valve	Pipe
T 7016 61	DN 15	R ½"	16 x 2
T 7020 61	DN 15	R 1/2"	20 x 2
T 7016 62	DN 20	R ¾"	16 x 2
T 7020 62	DN 20	R ¾"	20 x 3
T 7026 62	DN 20	R ¾"	26 x 3
T 7026 63	DN 25	G 1"	26 x 3

Accessories

Illustration	Order number	Dim.	Description
	1 2202 81	DN 15 G ½" Threaded sleeve	HERZ partner ball valve for impulse line connection in the flow by means of the G 1/8" x M10 x 1 connection nipple. 1 4007 77. Closing
(4) 20°	1 2202 82	DN 20 G ¾" Threaded sleeve	the ball valve also closes the impulse line outlet
	1 2202 83	DN 25 G 1" Threaded sleeve	
	1 4007 77	G 1/8" x M 10x1	G 1/8" connection nipple of the impulse line for the 2202 ball valve with M10 x 1 sensor receptacle
	1 4007 79	G 1/8" x G 1/4"	Impulse line 1 m for differential pressure regulator with connection nipple G 1/8" x G 1/4"
	1 0269 19	G 1/8" x G 1/4"	Connection nipple for impulse line G 1/8" x G 1/4



☑ Favourable control solution

If the underfloor heating distributor supplies a single comfort zone, an actuator mounted on the **4012/4212 VS-TS** valve can be used to control this zone. Only one room thermostat is then needed, the electrical distributor and the actuators on each line are not required. Due to the long inertia of underfloor heating systems, a simple two-point actuator is often used. This makes it possible to realise a very cost-effective electronic control that simultaneously provides the desired user comfort and energy savings.

If, on the other hand, the manifold supplies several comfort zones, the thermal actuators can be attached to the thermostatic valves of the individual underfloor heating circuits. One **F799** thermostat can control up to 5 thermal actuators without the need for an additional electrical manifold.

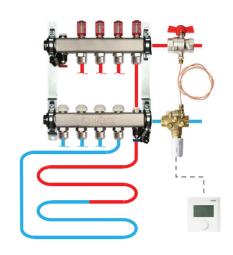


Illustration	Order number	Dim.	Description
2704	1 7990 31	24 V / AC Control signal 010V / DC	HERZ thermomotor for continuous control, NC M 28 x 1,5, 010V, 5 mm stroke, adapter M 28 x 1.5 colour blue integrated, plug, cable loose, without limit switch, closing force 125 N, 1.2 Watt, operating voltage 24 V / AC, control signal 0 10 V / DC.
ZHGZ.	1 7708 53	230 V/AC	HERZ thermomotor for 2-point, NC, M 28 x 1.5, 2 points, also suitable for pulse-pause operation, 5 mm stroke, adapter M28 x 1.5, colour red integrated, cable fixed, without limit switch, closing force 100 N, power consumption 1 Watt, operating voltage 230 V / AC.
	1 7708 52	24 V/AC	HERZ thermomotor for 2-point, NC, M 28 x 1.5, 2 points, also suitable for pulse-pause operation, 5 mm stroke, adapter M28 x 1.5, colour red integrated, cable fixed, without limit switch, closing force 100 N, power consumption 1 Watt, operating voltage 24 V / AC.
EHerz	3 F799 15	230V/AC	Electronic room thermostat with display Heating, lowering, frost protection function
	3 F799 16	24 V/AC	Electronic room thermostat with display Heating, lowering, frost protection function
	3 F799 17	230 V/AC	Electronic room thermostat with display Heating/cooling, setback, time programme, frost and valve protection valve protection function, cooling block, pilot timer input
	3 F799 18	24 V/AC	Electronic room thermostat with display Heating/cooling, setback, time programme, frost and valve protection valve protection function, cooling block, pilot timer input





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