

Data Sheet

FHM-Cx Compact Mixing Shunts for Floor Heating

Application



Fig. 1: Mixing shunt FHM-C5 (UPS pump)



Fig. 2: Mixing shunt FHM-C6 (UPS pump)



Fig. 3: Mixing shunt FHM-C7 (Alpha2 pump)



Fig. 4: Mixing shunt FHM-C8/C9 (Alpha2 pump)

The Danfoss compact mixing shunts are used for regulation of flow and supply temperature in hydronic floor heating systems. The compact, flexible design allows mounting the mixing shunt directly to the manifold on both left and right side, with the primary pipe connection from the side or below.

A self-acting proportional regulator is used to regulate the supply temperature. The regulator ensures that the desired supply temperature to the underfloor heating system always remains constant. A safety thermostat (standard in models FHM-C1, FHM-C5 and FHM-C7) protects the floor against too high temperatures.

A built-in check valve ensures correct flow direction and the mixing shunts are prepared for inserting temperature sensors. An air-vent on top and a thermometer completes the mixing shunt.

FHM-C5 and -C6 have a standard 3-speed pump (UPS). FHM-C7, -C8 and -C9 are equipped with low-energy, variable speed pumps (Grundfos Alpha2), including a selectable night set-back function.

The FHM-Cx compact mixing shunts can be mounted directly to the Danfoss manifold system without the use of special equipment.

By using Danfoss floor heating controls all expectations of a professional floor heating system are fulfilled.

Technical Data

Product	Max. effect at sec. $\Delta t = 5K^2$	Max. effect at sec. $\Delta t = 10K^2$	Pump, Grundfoss	Safety Thermostat FH-ST55 ³	Code no.
FHM-C5	4.5 kW	9 kW	UPS 15-40	Standard	088U0084
FHM-C6	7 kW	13 kW	UPS 15-60	Optional	088U0085
FHM-C7 ¹	7 kW	13 kW	Alpha2 15-60	Standard	088U0086
FHM-C8	7 kW	13 kW	Alpha2 15-60	Optional	088U0087
FHM-C9	4.5 kW	9 kW	Alpha2 15-40	Optional	088U0088

1. FHM-C7 is delivered with FHM-FL flow limiter and FHM-MS measuring set.
2. Max effect at $\Delta t = 30K$ in primary (70/40) and $\Delta t = 5K$ (10K) in secondary line with heatloss 50 W/m².
3. Safety thermostat with prewired plug 230 V (length 1m) and wire for i.e. pump connection or together with CF2, switch off temp. 55° C, $\pm 4K$.

Supply voltage	230 VAC
Primary connection	1/2"
Max. differential pressure	0.6 bar
Max. working pressure	PN10
Max. flow temperature	90 °C
FH-TC flow temperature control	18-52 °C
FH-DT supply flow thermometer	0-60 °C
Integrated check valve	POM / Stainless steel
Body, unions and other meal parts	Brass / Stainless steel
O-rings and seals	EPDM
Weight	approx. 3.5-4 kg (depending on model)

Accessories

Product	Type	Code no.
Thermometer 0-60 °C, Ø35 mm	FH-DT	088U0029
Safety thermostat	FH-ST55	088U0301
Temperature controller, 15-52 °C	FH-TC	088U0302
Flow limiter	FHM-FL	088U0303
Measuring set for needles	FHM-MS	088U0304
Angle fittings (set of 2 pcs.)	FHM-AF	088U0305
Conversion set, FHM-C to ABV - ECL110	FHM-AB	088U0090

FH-ST55 Safety Thermostat

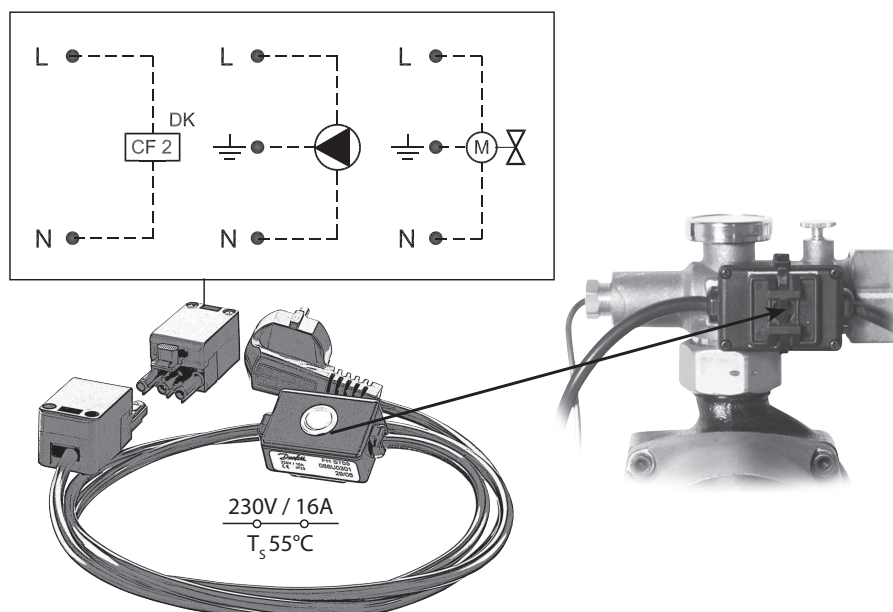


Fig. 5: Electrical connection

The FH-ST safety thermostat is fixed on the tube and protects floor and system against too high temperatures, especially important for wooden floors. The FH-ST thermostat switches off the power supply of the floor heating base unit, when the temperature reaches 55° C. By switching off the power supply of the floor heating base unit, the actuators (NC) will close

automatically and the floor heating system is protected. The FH-TC can also be connected to a pump or a zone valve.

Note! The electrical installation must be carried out by an authorized installer only (230V DC).

Technical Data

Code no.	088U0301
Shut-off temperature	55 °C
Switch difference	4 K
Classification	IP 40 (mounted)

FH-TC Temperature Controller

FH-TC is a self-acting thermostatic sensor, used for flow temperature control of floor heating and radiator heating systems. The water temperature is directly measured by a stainless steel immersion sensor.

Features:

- Closes on rising sensor temperature.
- Closes against differential pressure of up to 6 bar.
- Temperature range: 18 - 52° C.
- Designed for pressure PN 10.

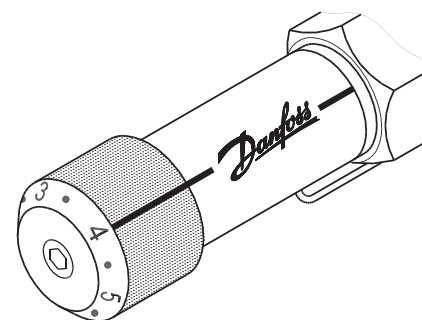


Fig. 6: FH-TC temperature controller

1	2	3	4	5	6	max.
20 °C	25 °C	30 °C	35 °C	40 °C	45 °C	52 °C

FHM-MS Measuring Set

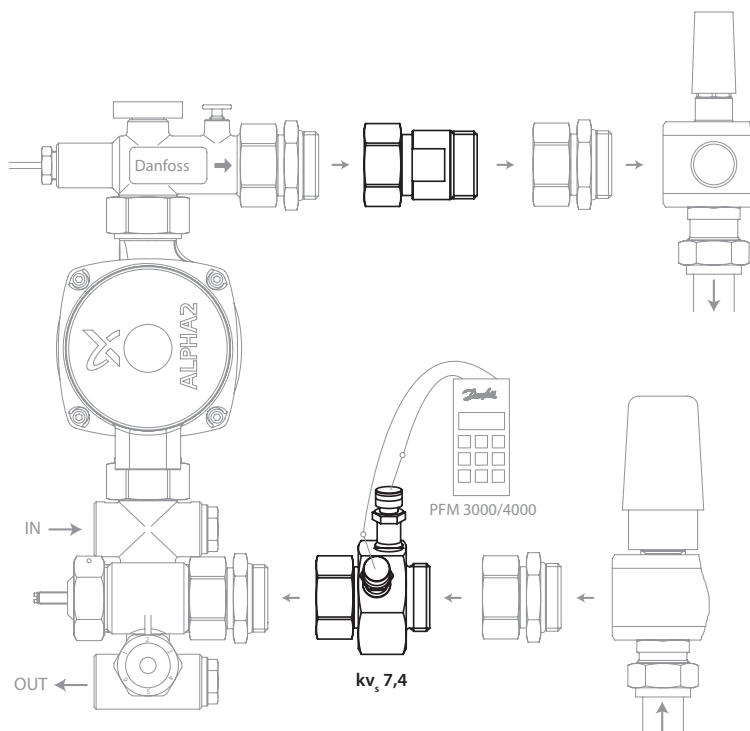


Fig. 7: FHM-MS measuring set

The flow running through the FHM-MS (fixed orifice) can be measured by using the Danfoss measuring instruments PFM 3000 / 4000 or other brands of measuring equipment. The FHM-MS valve is supplied with two measuring nipples for 3 mm needles. The measuring nipples are placed across a fixed orifice and the differential pressure can be measured across this orifice.

The value of the fixed orifice ($kvs\ 7,4$) and the differential pressure will be used in the measuring equipment to define the flow. Measuring on a fixed orifice valve is very fast and easy.

FHM-ML Flow Limiter

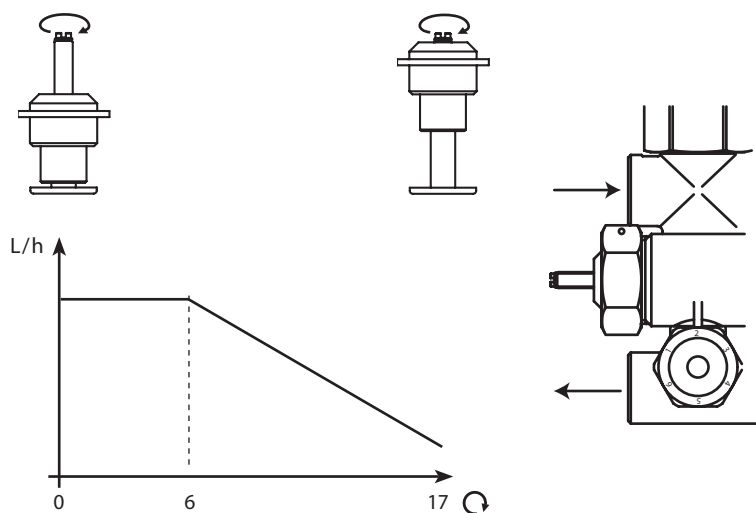


Fig. 8: FHM-FL flow limiter

FHM-AB Conversion Set

The FHM-AB is an accessory kit for outdoor temperature compensation, which can be used with both existing and new shunts.

Other sensors can be supplied as extra components on request.

The FHM-AB conversion set contains:

- ECL 110, 230 V 087B1661
- ABV NC, 230 V 082F0051
- Sensor S1 084N1012
- Sensor S3 087B1184
- Adapter for ABV 088U0306
- Sensor pocket

When using ECL110 together with CF2 and the pump exercise function is used, the setting in application menu 7000 have to be changed at position 7022 to OFF. If the conversion set is used with floor heating systems in a heavy construction like pipe in concrete the setting in menu 6000 "control parameter" at position 6185 value should be increased to max. 999s.

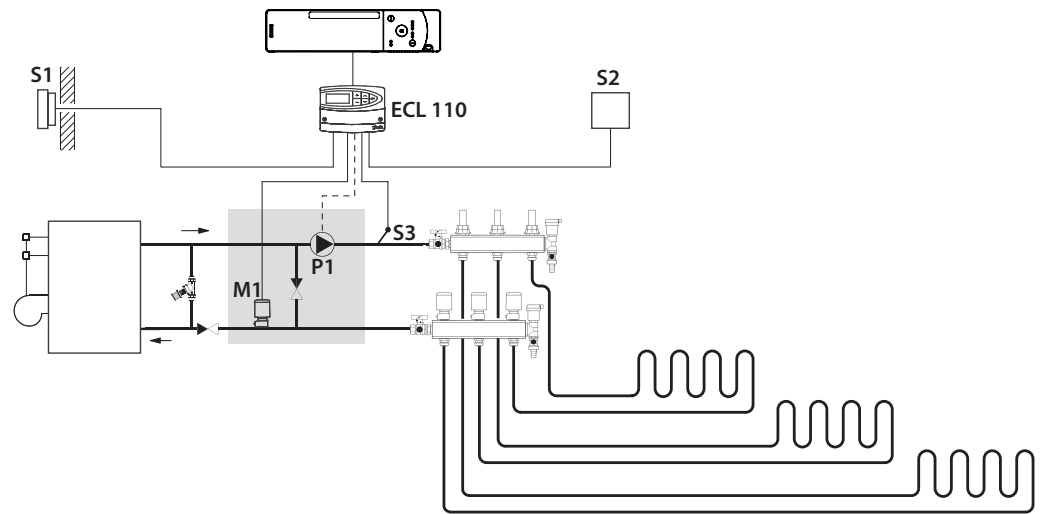


Fig. 9: Floor heating system with ECL 110

System

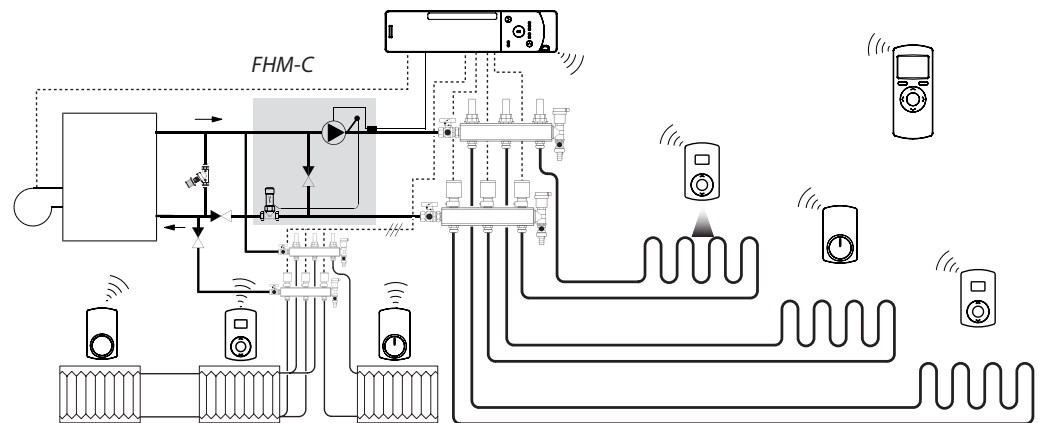


Fig. 10: Combined floor heating system with boiler

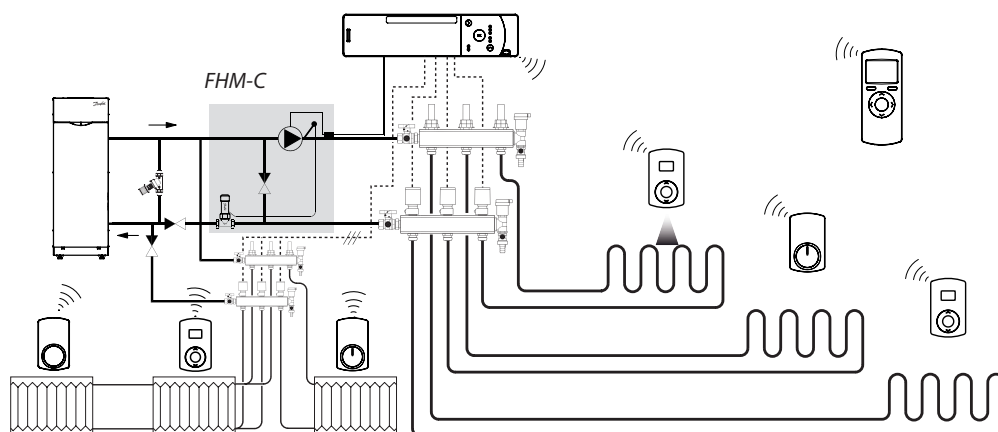


Fig. 11: Combined floor heating system with heat pump

Dimensions

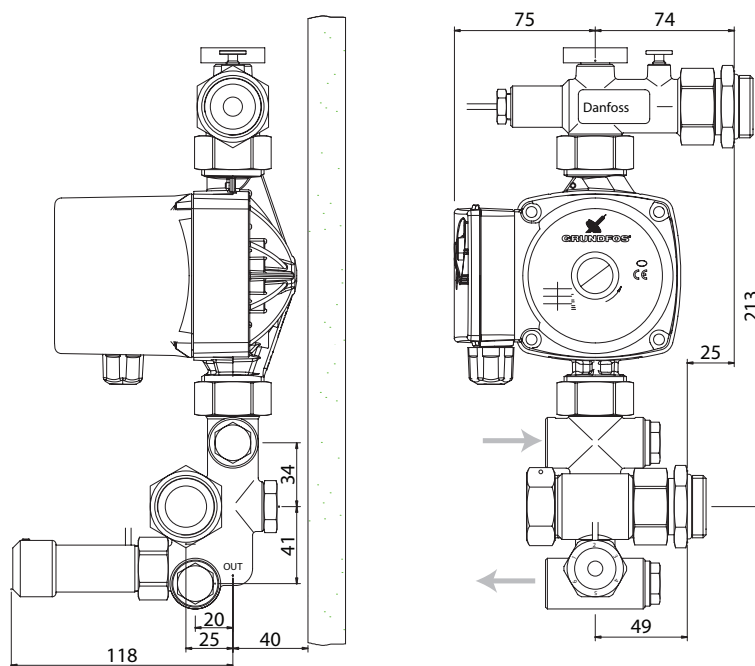


Fig. 12: FHM-C5 & FHM-C6

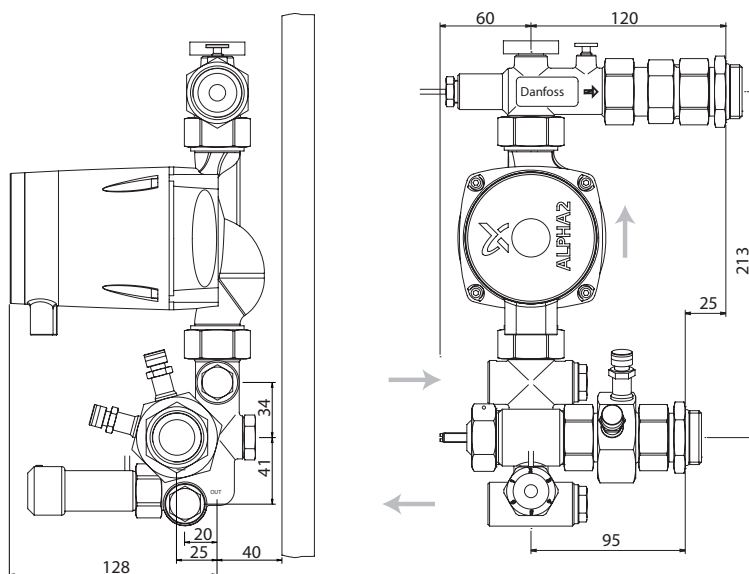


Fig. 13: FHM-C7

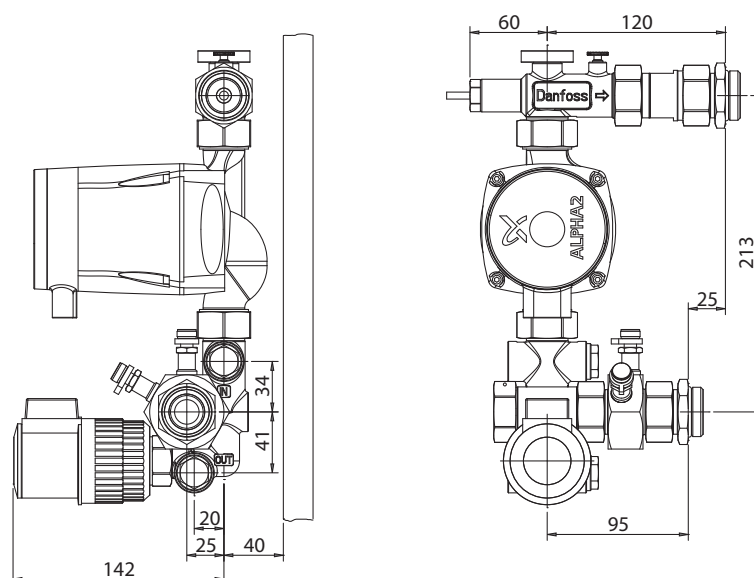


Fig. 14: FHM-C7 with ABV actuator for outdoor temperature compensation

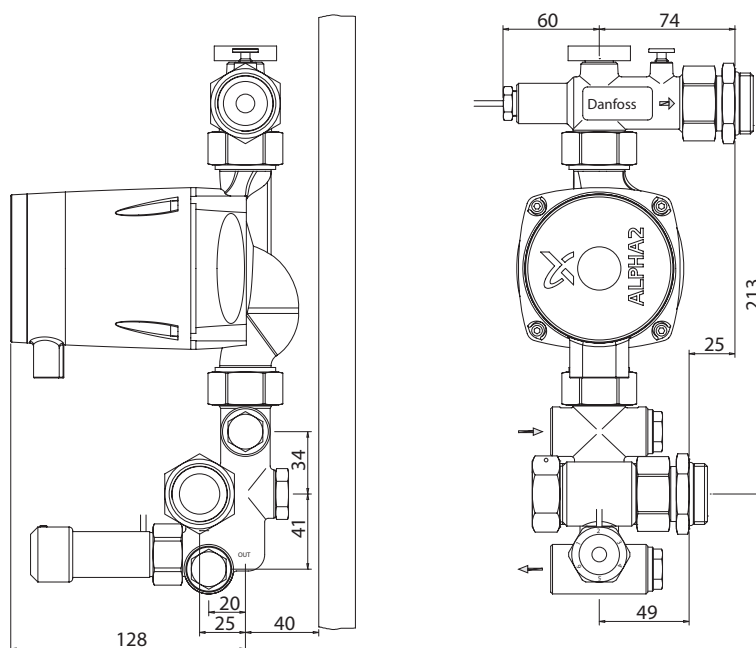


Fig. 15: FHM-C8 & FHM-C9

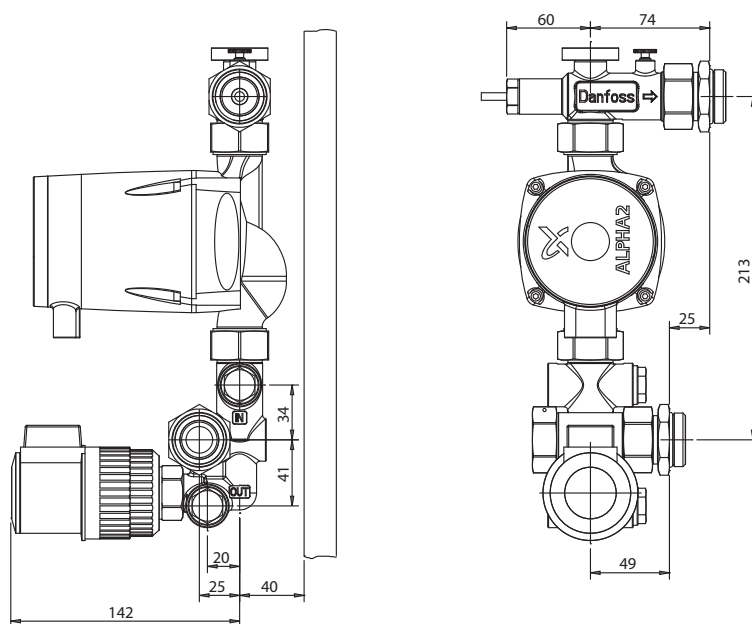


Fig. 16: FHM-C8 & FHM-C9 with ABV actuator for outdoor temperature compensation

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