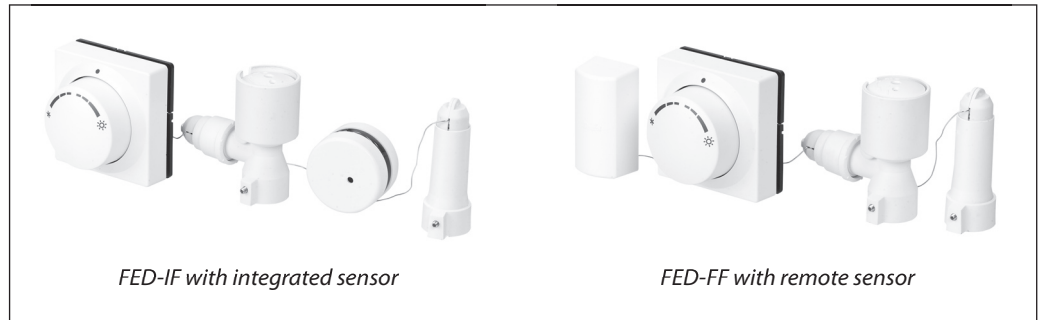


Data sheet

FED sensors Sequence control of cooling and heating circuit

Products



The FED sensors are used in applications in which a cooling and a heating circuit are to be controlled by one controller.

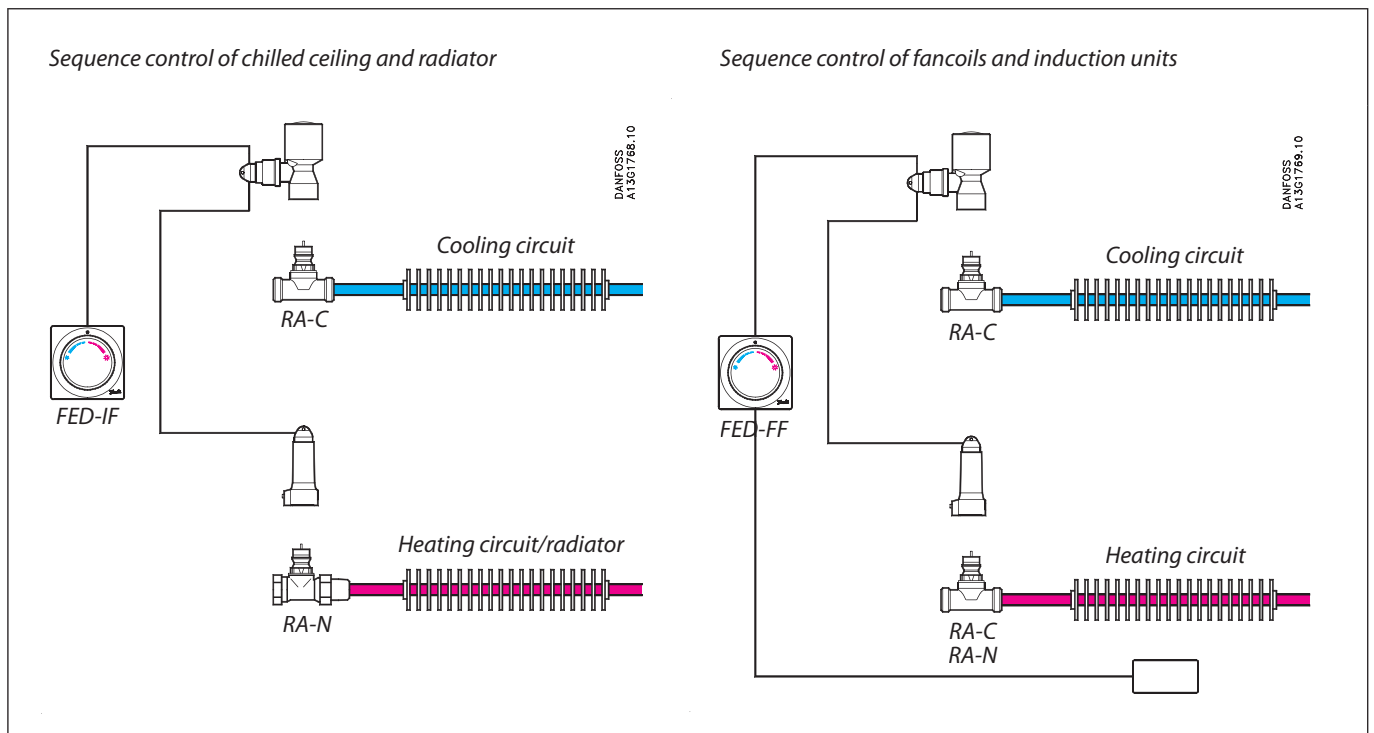
Both FED-IF and FED-FF sensors can be applied to chilled ceilings, fancoils and induction units. For control of cooling and heating circuits in fan-coil and induction units use the FED-FF with remote sensor.

By placing the sensor in the air inlet a quicker reaction time of the air temperature changes is achieved. Using the remote sensor, the remote temperature adjuster can be placed directly on the cabinet.

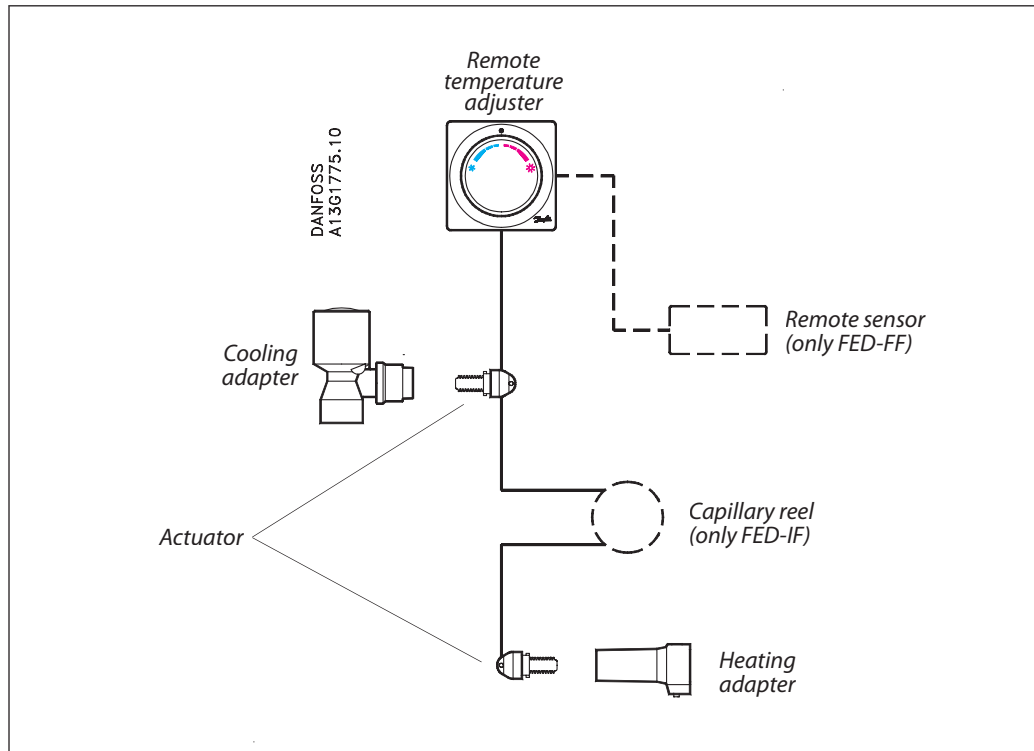
Ordering and specifications

Type	Code no.	Sensor	Capillary tube	Setting range
FED-IF	013G5461	Integrated	7 + 8 m	17 - 27°C
FED-IF	013G5463	Integrated	4 + 11 m	
FED-IF	013G5469	Integrated	6 + 11 m	
FED-FF	013G5462	Remote	2 + 2 + 2 m	

Application



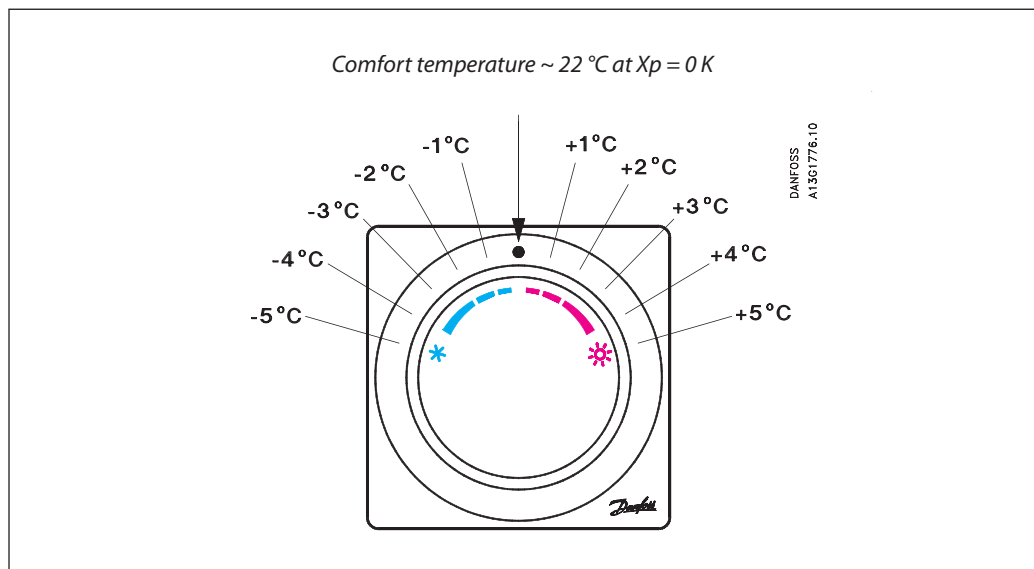
FED sensor design



The FED sensors are applied with the RA-N and the RA-C valves. The FED sensors are equipped with a reverse device for the control of cooling circuits. With the reverse device the valve in the cooling circuit will

open when the temperature rises above the set-point temperature. The valve in the heating circuit will open when the temperature falls below the set-point temperature.

Temperature setting



The FED sensors have been developed for room temperature control via water-based cooling and heating systems. The FED sensors are based on the self-acting principle. The liquid-filled sensors control the valves via capillaries and adapters.

The scale above shows the approximate set-point offset from the standard comfort temperature which is approximately 22° C at X_p = 0 K.

Sequence control

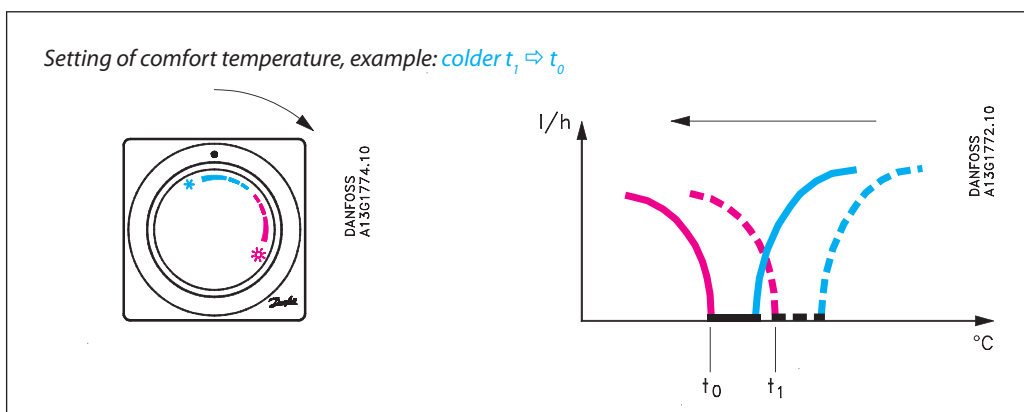
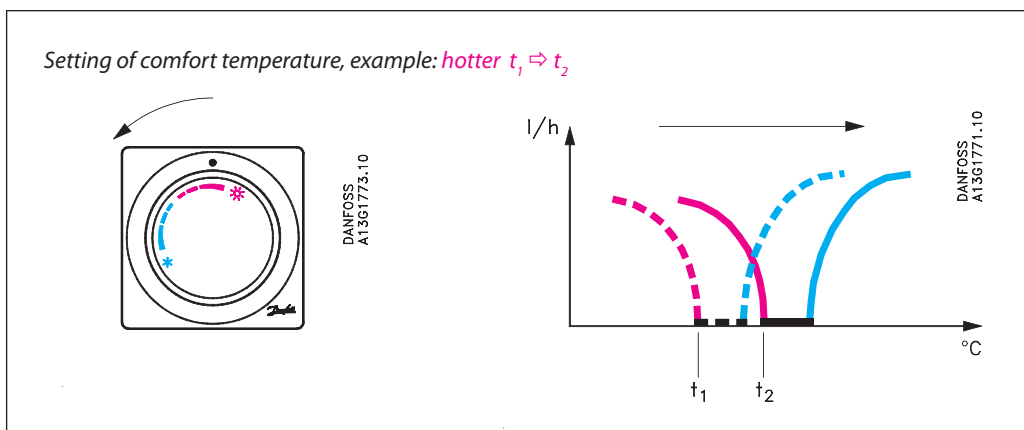
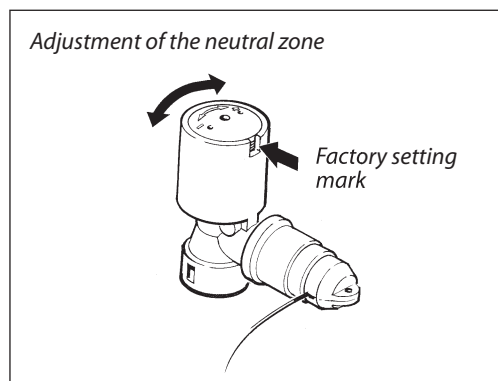
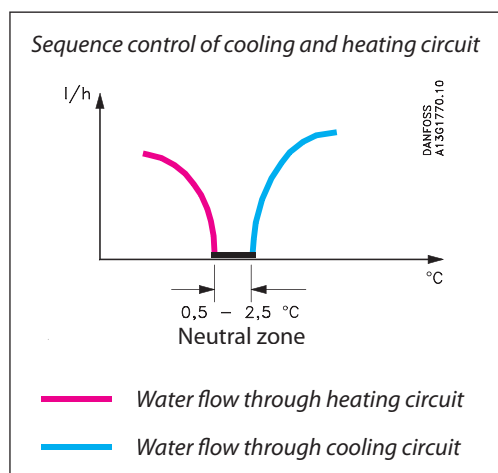
The temperature control is done by the sensor, in which a neutral zone is built-in. In the neutral zone neither an activation of the valve in the heating circuit nor of the valve in the cooling circuit takes place. This way it is secured that cooling and heating do not take place simultaneously.

The neutral zone is in the area from 0.5 - 2.5 °C, depending on the system design. If the differential pressure is high on both circuits (~0.6 bar), the neutral zone is at a minimum. On the other hand, if the differential pressure is low on both circuits (~0.1 bar), the neutral zone is at a maximum.

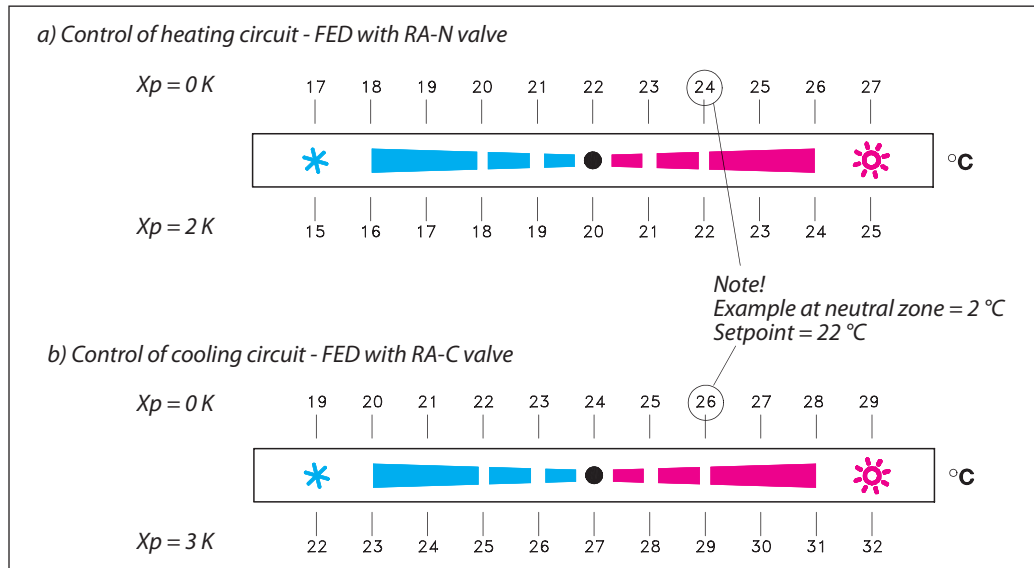
An adjustment of the neutral zone can be made by turning the knob of the cooling adapter with a pair of pointed pliers. Turning clockwise, the neutral zone is increased, turning counter-clockwise the neutral zone is decreased. The factory setting of the neutral zone is marked in the knob recess.

Irrespective of the temperature setting of the FED-sensor the necessary neutral zone will always be kept.

See also figures below.



Temperature control through sequence control with FED sensor

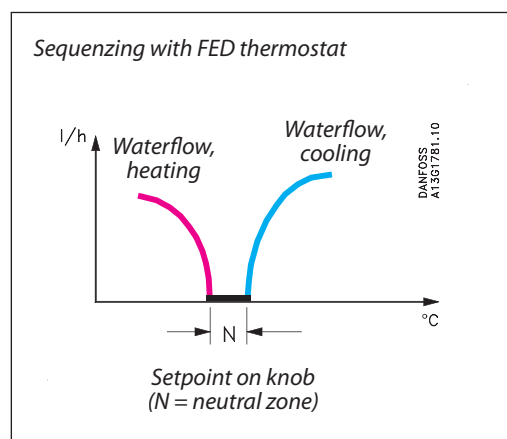


The FED sensor controls in sequence via two temperature scales: one for the heating circuit (a) and one for the cooling circuit (b).

When the setting knob is turned a parallel control of both temperature scales is taking place. The neutral zone ensures that cooling and heating do not take place simultaneously.

A setting in the red temperature area means that the set point of both cooling and heating circuit is raised.

A setting in the blue temperature area lowers the set point of both cooling and heating circuits.



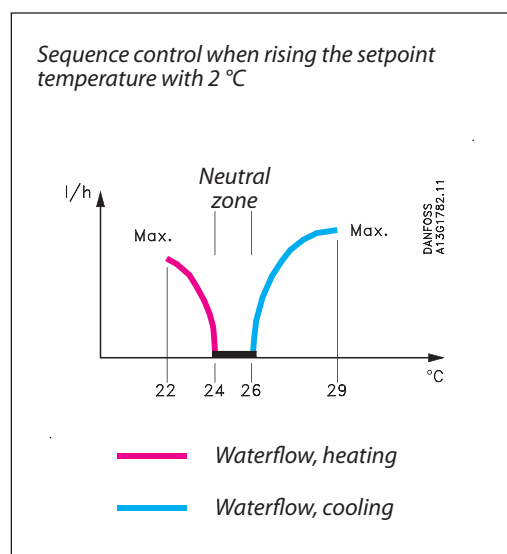
Example

The setting knob is turned to increase the room temperature with 2 °C from 22 °C to approximately 24 °C at $X_p = 0 K$ on the heating valve. Due to the neutral zone the set point of the cooling valve at $X_p = 0 K$ will be between 0.5-2.5 K higher, depending on the system design.

The valve in the heating circuit will open at a sensor temperature below 24 °C. If a RA-N valve is mounted in the heating circuit and dimensioned at the presetting N, the RA-N valve will provide full water quantity at a P-band of 2 K, i.e. a sensor temperature of 22°C.

If the neutral zone e.g. is 2 K, the valve in the cooling circuit will start opening at a sensor temperature above 26 °C (setpoint: 24 °C + neutral zone: 2 K).

With a RA-C valve in the cooling circuit (dimensioned at presetting N) the valve will provide full water quantity with a P-band of 3 K, i.e. at a sensor

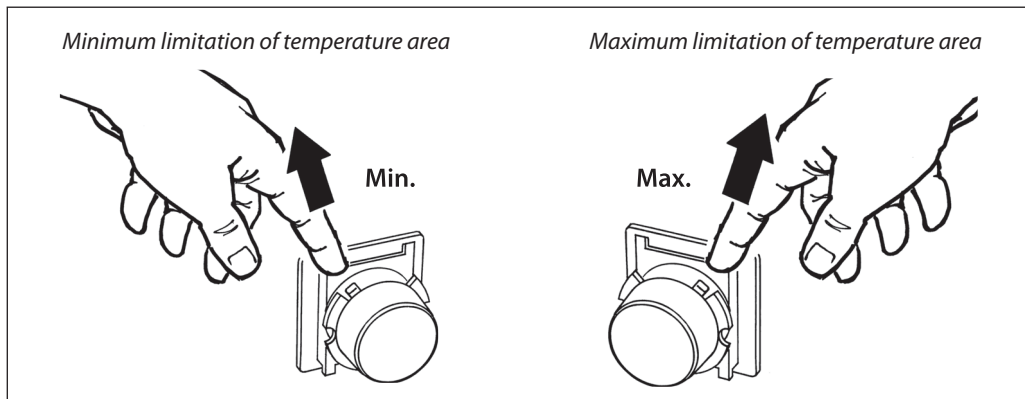


temperature of 29 °C (setpoint: 24 °C + neutral zone: 2 K + P-band: 3 K).

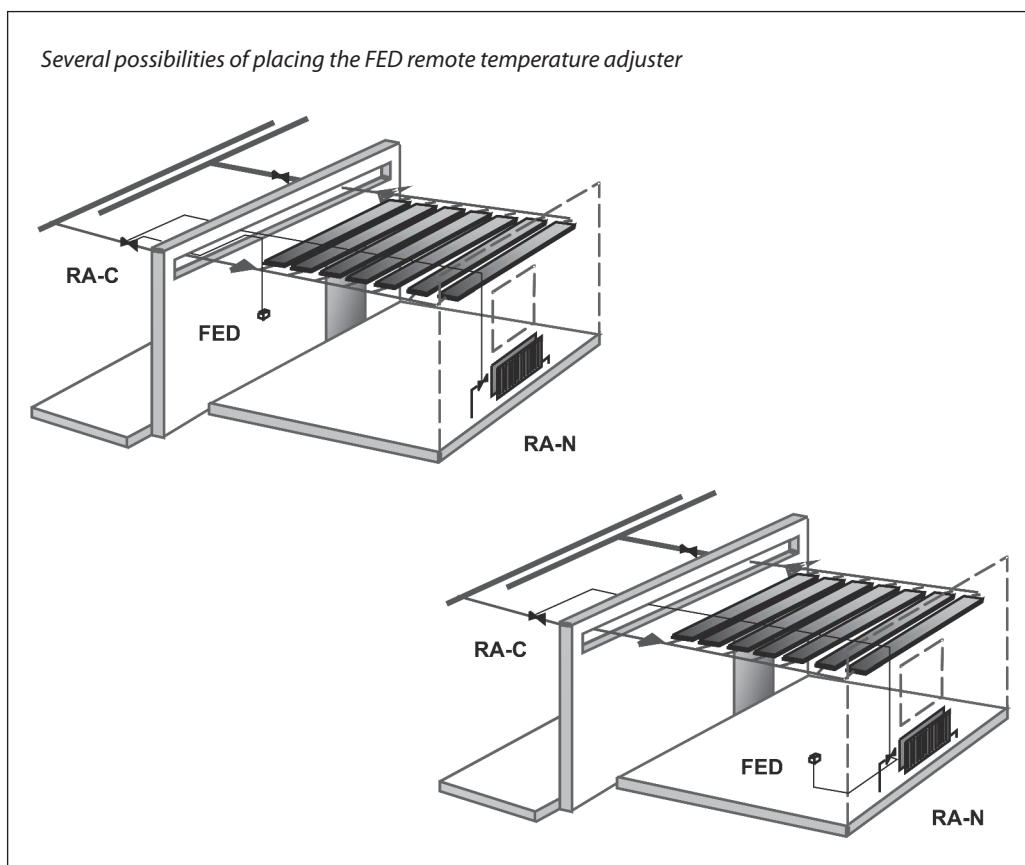
Limiting the set temperature of FED sensors

The set temperature of the remote temperature adjuster depends on the sensor type and the valves, which are used with the sensors.

It is easy to limit or lock the set temperature by means of the built-in locking/limiting device.



Serial coupling



Via the soft but strong $\varnothing 0.8$ mm capillary and the patented serial coupling of capillary and adapters it is possible to control two valves in sequence.

change the adapters. The FED sensor still controls in the right sequence.

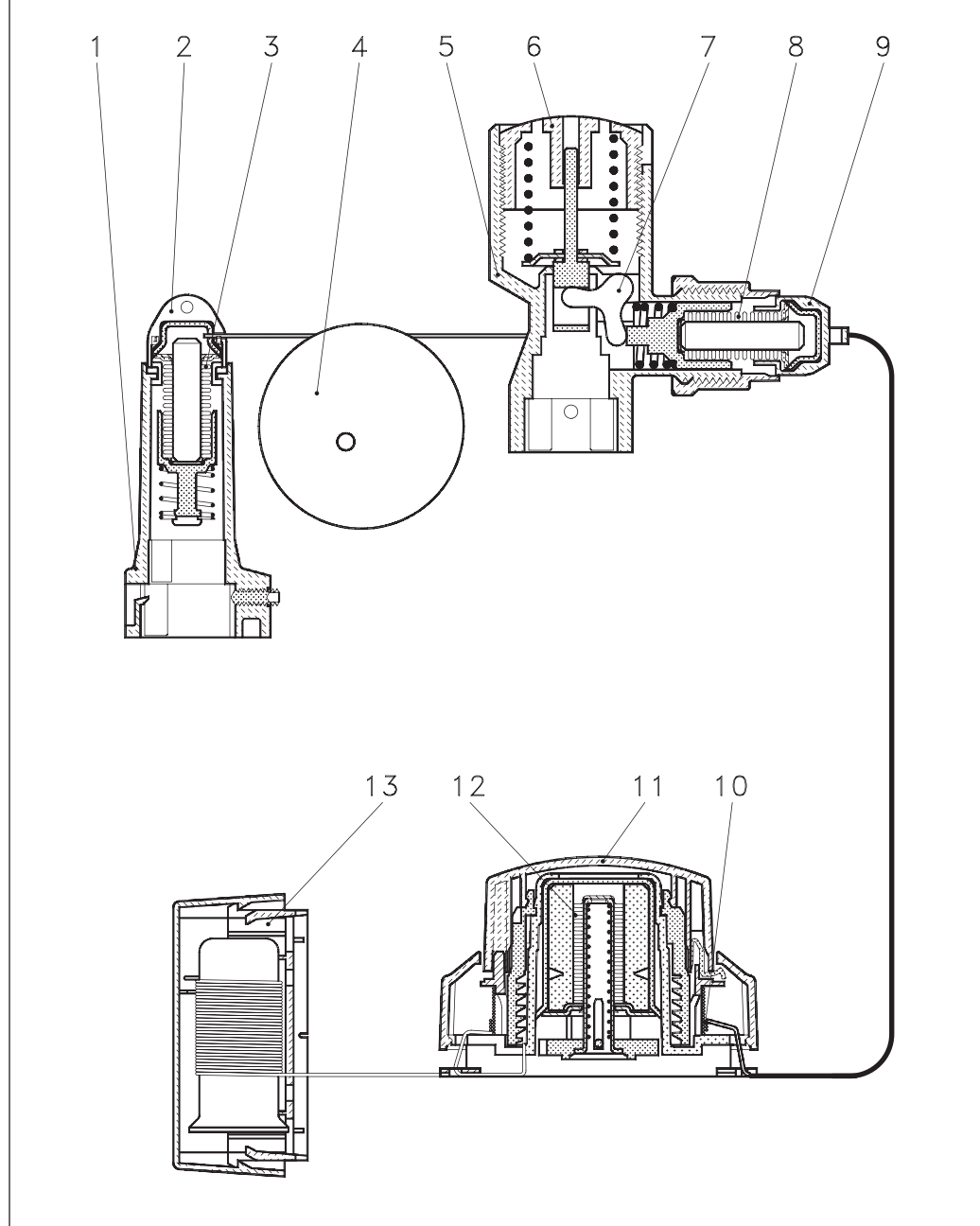
The FED sensors are delivered with the cooling adapter closest to the remote temperature adjuster and the heating adapter furthest away from the remote temperature adjuster.

The interchange of valve adapters provide several different possibilities of placing the FED remote temperature adjuster.

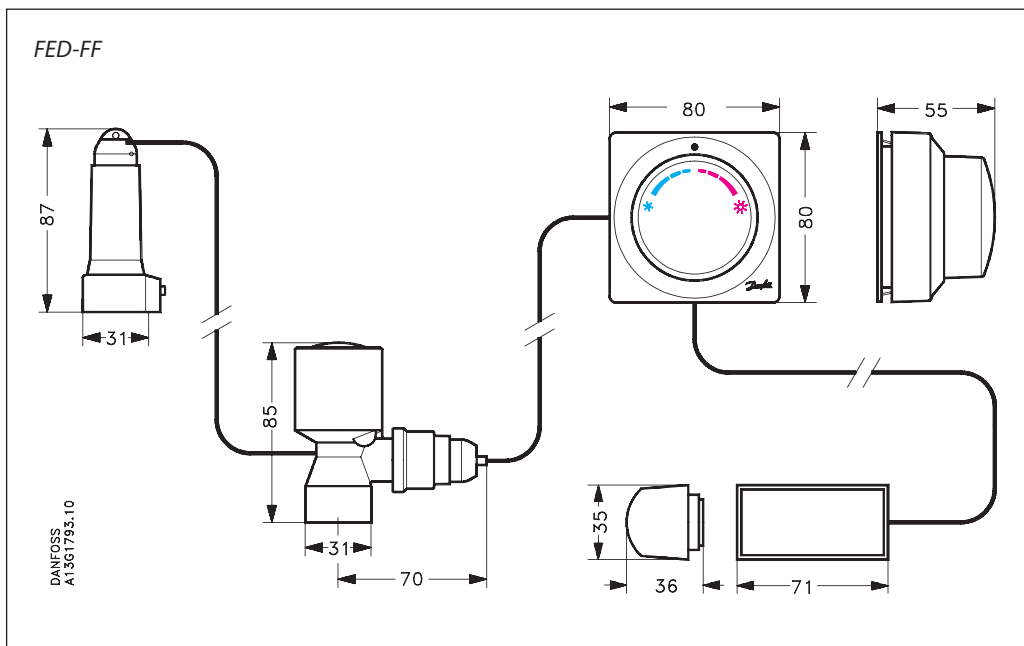
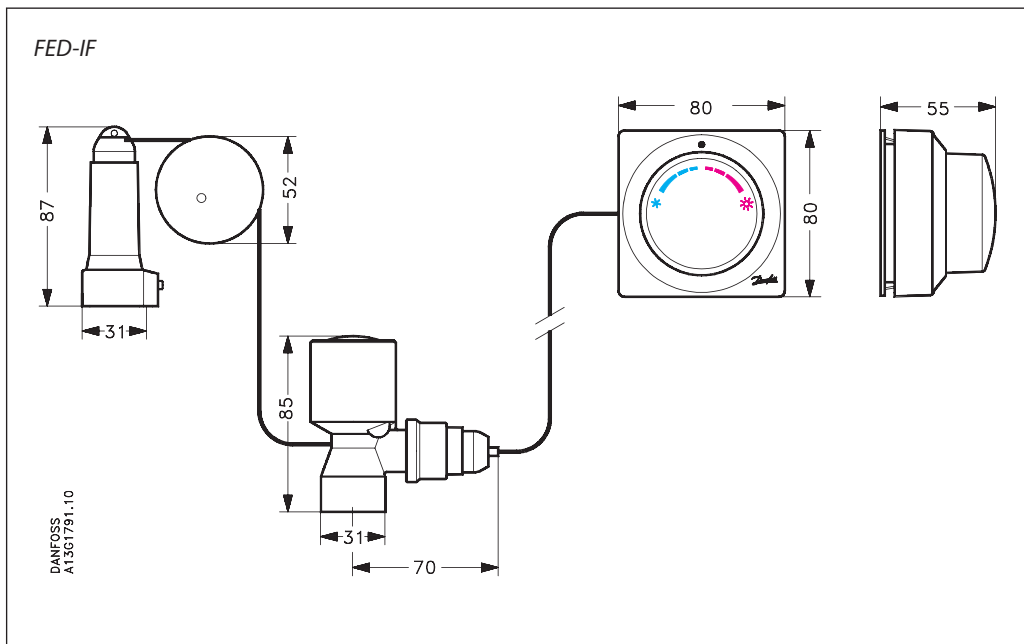
It is easy to change the order of the valves: Just loosen the actuators from the adapters and ex-

Design

- | | |
|---------------------------------|---|
| 1. Heating adapter | 8. Adjustment bellow |
| 2. Actuator | 9. Actuator |
| 3. Adjustment bellow | 10. Capillary reel |
| 4. Capillary reel (only FED-IF) | 11. Remote temperature adjuster |
| 5. Cooling adapter | 12. Bellow |
| 6. Neutral zone adjustment knob | 13. Remote temperature sensor (only FED-FF) |
| 7. Reverse device | |



Dimensions



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