

## TemCon

### Application

TemCon is a control valve designed for domestic hot water installations with circulation.

The valve automatically controls the temperature of water in circulation pipes. Thus the thermal balance is ensured throughout the domestic hot water system.

The valve is adjusted on a scale to a desired temperature in a range between 37°C and 65°C.

TemCon is used in hot water installations with bacterial problems, e.g. Legionella. Here a procedure of raising the temperature of the water to between 70°C and 80°C is carried out to periodically pasteurise the system.

The integrated by-pass in TemCon allows for water flow through the valve to enable the system disinfection during pasteurization.

TemCon is constructed in stainless steel AISI 316 for all parts in connection with water, to secure the highest resistance against corrosion.



### Advantages

- TemCon is constructed in stainless steel AISI 316 for all parts in connection with water
- Insulation supplied as standard for increased energy efficiency
- The thermostatic element is out of contact with the circulating water, and its dry location prevents scaling problems
- Each valve is calibrated individually
- Approved according to the British WRAS standards.
- The thermostatic element can be disassembled without closing the water. Hereby the valve can be exercised
- Built in magnifying glass to make reading of pre-setting easier

### Functions

- The setting of the valves is stepless between 37°C and 65°C with an accuracy of  $\pm 2^\circ\text{C}$
- Available in DN15 Female/Female and DN20 Female/Female and Male/Male
- Factory pre-setting 57°C
- By-pass enabling thermal system disinfection during the high temperature operation from 70°C to 80°C
- Manual adjustment of By-pass
- Automatic legionella treatment is possible by mounting the actuator kit on the by-pass in connection with the BMS control

## TemCon

### Control at Two Operating Temperatures

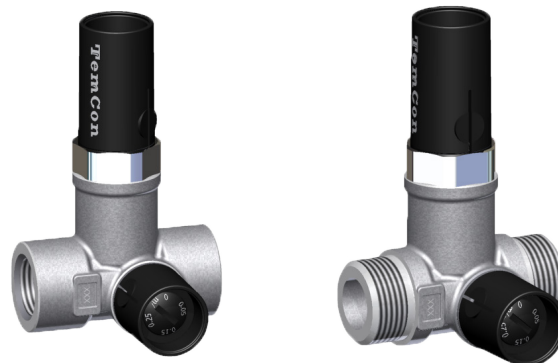
TemCon is designed to operate in two ranges of temperatures.

#### Normal operating temperature:

Normal operation occurs at temperatures from approx. 50°C to 60°C. That is economic operation at low precise flow rates, which ensures a high level of comfort at all draw-off taps and exact temperature in all circuits.

#### High operating temperature:

High operating temperature is used at intervals for the pasteurization of domestic water at 70°C to 80°C through the by-pass.



Female/Female

Male/Male

*TemCon with scale and built in by-pass*

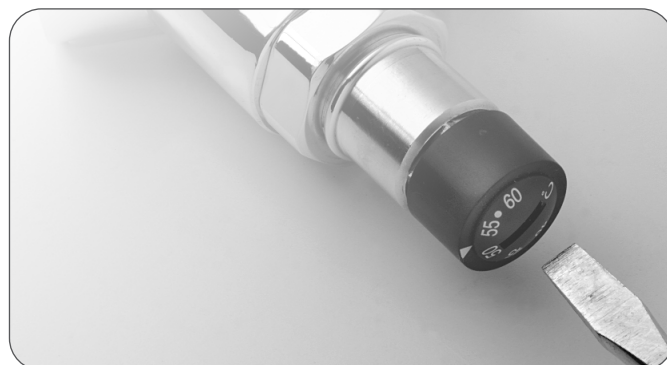
### Setting the Valve

Temperature setting between 37°C and 65°C.

Remove the cap, and the temperature is easily set e.g. by a screwdriver as shown here.

#### Example:

If the valve is set to a temperature of 50°C, and the temperature of the circulating water is under 50°C, the valve opens. If the temperature is over 50°C, the valve closes.



### Manual Setting of By-pass

The plastic cap is removed by means of a screwdriver that fits into the slot in the cap.

Once removed, the manually operated by-pass can be set to a Kv-value between 0.0 and 0.3.



### Mounting of Actuator Kit

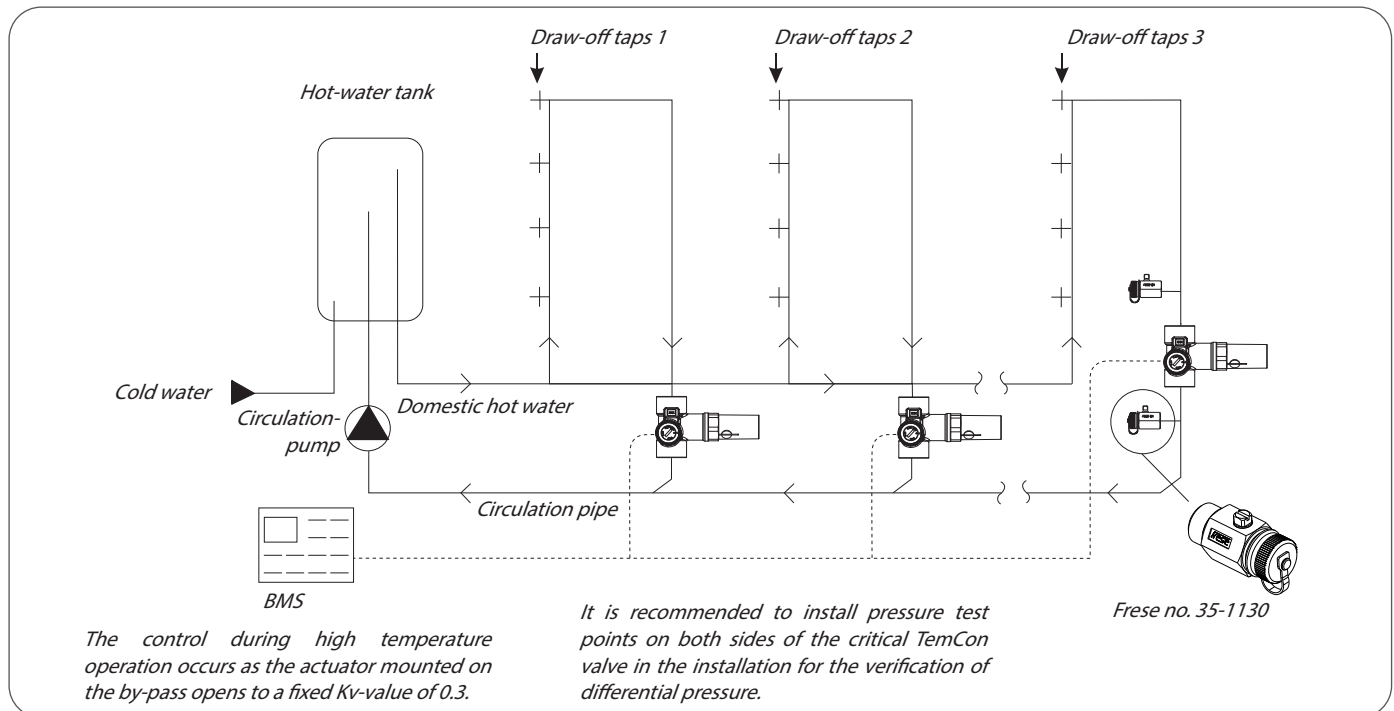
The manual by-pass is unscrewed and the actuator kit is fitted in its place.

The adapter ring is then mounted and the actuator fitted.



## TemCon

### Actuator Operated By-pass · Application Example



### Dimensioning Example · Actuator Operated By-pass

#### Normal operation:

During normal operation a TemCon with an actuator operated by-pass is dimensioned in the same way as CirCon, on the basis of the thermal loss in the circuit. (CirCon Technote page 3)

#### High temperature operation:

The automatic heater or the BMS opens the by-pass to a fixed Kv-value of 0.3. In this example, a sufficient quantity of water is ensured to compensate for the thermal loss in the pipe.

In an installation with 4 floors and basement a circulation line is dimensioned.

#### Length of pipe: 30 meters

Total length of pipe controlled by TemCon.

#### Thermal loss

#### (high temperature operation):

#### 14 W/meter pipe

Thermal loss from a 27 mm external diameter pipe with 30 mm insulation (laminated Rockwool) and a difference of 60°C between room temperature and pasteurization temperature.

#### Δ temperature differential: 8°C

Between a temperature of 80°C in the hot-water tank and a temperature of 72°C after the TemCon.

The flow rate Q through the TemCon valve can be calculated using the following formula:

$$Q = \frac{(30 \text{ m} \times 14 \text{ W/m}) \times 0.86}{8^\circ\text{C}} = 45 \text{ l/h}$$

The minimum differential pressure across the TemCon valve at a constant Kv-value of 0.3 can be calculated using the following formula:

$$\Delta p = \left( \frac{45}{0.3 \times 1000} \right)^2 = 2 \text{ kPa}$$

### Example · Adjustable By-pass

#### High temperature operation:

On the basis of the dimensioning example for actuator controlled by-pass and high temperature operation the flow rate is calculated using the formula:

$$Q = \frac{(30 \times 14) \times 0.86}{8} = 45 \text{ l/h}$$

The differential pressure across TemCon at the given location in the system should be known in order to determine the Kv-value of the adjustable by-pass. Here we use 35 kPa across the valve. The Kv-value can be calculated using the formula:

$$K_v = \frac{Q}{\sqrt{\Delta p}} = \left( \frac{0.045}{\sqrt{0.35}} \right) = 0.08$$

Consequently, the by-pass should be opened to min. 0.08 to ensure a temperature of 72°C after the valve.

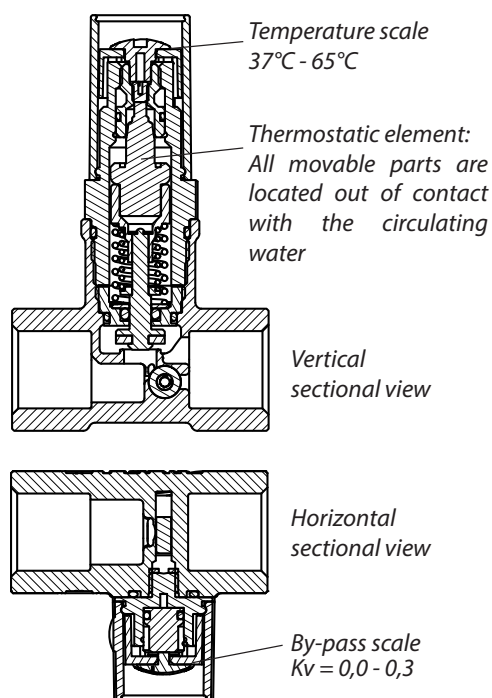
#### Normal operation:

During normal operation, it is recommended to close the adjustable by-pass to gain all the benefits of the thermal control of the TemCon valve.

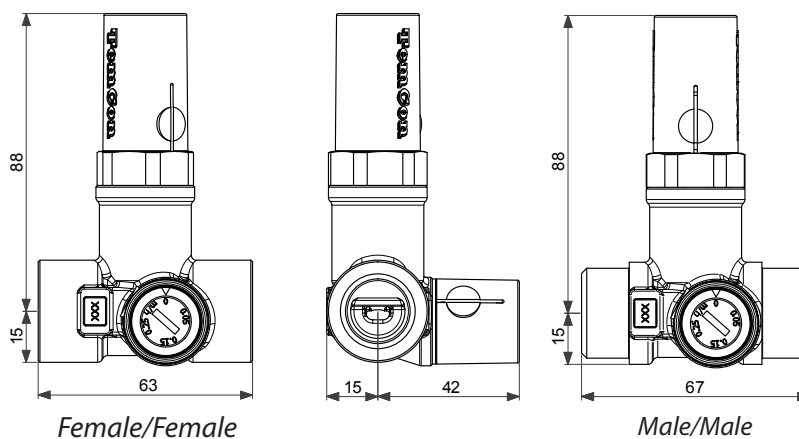
# TemCon

## Technical data

<b>Valve body:</b>	Stainless steel AISI 316
<b>O-rings:</b>	EPDM
<b>Springs:</b>	Stainless steel AISI 304
<b>Element:</b>	Wax
<b>Plastic parts:</b>	POM, ABS, PC
<b>By-pass:</b>	Stainless steel AISI 316
<b>Insulation jacket:</b>	EPP (Max 80°C)
<b>Temperature rating:</b>	37°C - 65°C
<b>Accuracy:</b>	+/- 2°C < 100 kPa Dp
<b>P-band:</b>	10°C (Xp = 10K)
<b>Max. Kv-value:</b>	1.10 (m <sup>3</sup> /h)
<b>Recommended DP:</b>	3 - 10 kPa
<b>Max. differential pressure:</b>	100 kPa
<b>Max. temperature:</b>	100°C
<b>Pressure rating:</b>	PN10
<b>Approvals:</b>	WRAS
<b>Kv-value, open by pass:</b>	0.3 (m <sup>3</sup> /h)



TemCon female/female section drawing



## Temperature and KV-values

The opening KV-value is depending on the difference between setting temperature and water temperature.

Differential temperature between pre-adjustment temperature and temperature of the circulating water $\Delta T$	KV-value [m <sup>3</sup> /h]
0 °C	0
1 °C	0.11
2 °C	0.22
3 °C	0.33
4 °C	0.44
5 °C	0.55
6 °C	0.66
7 °C	0.77
8 °C	0.88
9 °C	0.99
10 °C	1.10

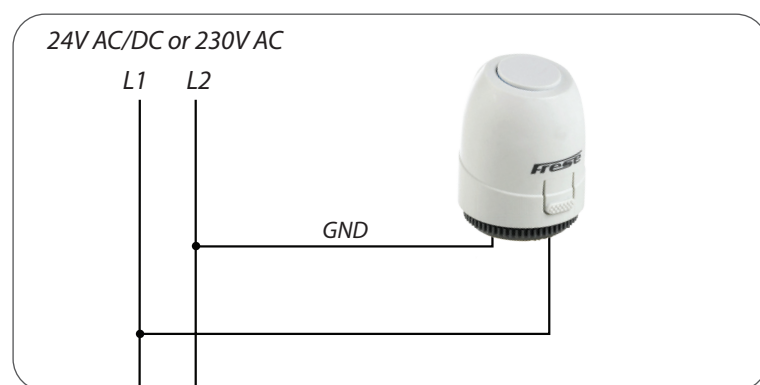
## TemCon

### Product Programme

Frese no.	Dimension	Weight [kg]
47-2890	DN15 Female/Female	0.46
47-2891	DN20 Female/Female	0.41
47-2892	DN20 Male/Male	0.46

### Actuators

Frese no.	Item	Weight	Supply voltage	Power consumption	Running time
47-2899	Actuator kit 230V	0.15 kg	230V AC	1W	180s
47-2898	Actuator kit 24V	0.15 kg	24V AC/DC	1W	180s



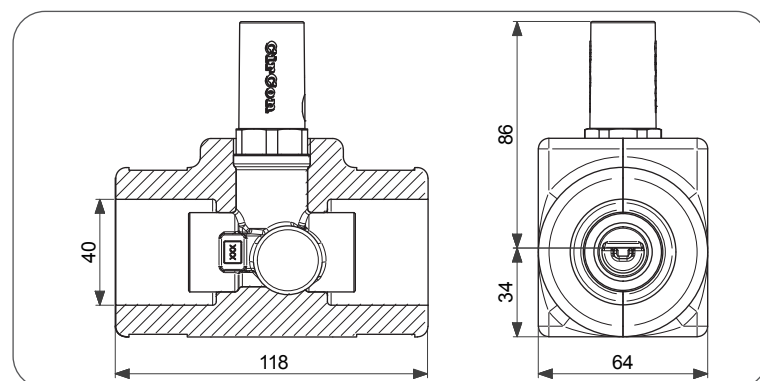
Actuator wiring



TemCon mounted with actuator

### Insulation jacket

Frese no.	Type	Weight [kg]
38-0856	Insulation jacket DN15/20	0.03



Dimensions incl. insulation



TemCon valves are delivered as standard with insulation for increased energy efficiency.

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