

Controller with Electric Actuator Type 5725-7, with fail-safe action



for heating and cooling applications

Application

Electric actuator with integrated digital controller for heating, ventilation and air-conditioning systems.

For globe and three-way valves, e.g. Types 3213, 3214, 3260, 3222 or 3226 Valves in nominal sizes DN 15 to 50.



The Type 5725-7 is a combination of a linear actuator and an integrated digital controller.

They are particularly suitable for mounting to SAMSON Types 3213, 3214, 3260, 3222 and 3226 Valves.

Special features

- Outdoor temperature compensated control of a heating circuit:
The flow temperature is controlled based on the outdoor temperature over an adjustable heating characteristic. An external binary contact allows switching between rated and reduced operation or between rated and stand-by operation with frost monitoring. As an alternative to the binary input, the gradient or a level displacement of the heating characteristic can be changed by the adjustment knob of the Type 5257-2 Room Sensor.
- Fixed set point control · This function is used to control the heating circuit to a fixed set point.
- Fixed set point control with room sensor · The set point is changed by the room temperature. A permanently active flash adaptation adapts the supply of heat to the required demand by changing the flow temperature.
- Return flow temperature limitation · The temperature of the return flow is monitored to an adjustable maximum value. When this value is exceeded, the flow temperature is reduced until the return flow temperature falls below the monitored value again.
- Type 5257-7 Room Panel can be connected:
 - Convenient operating mode settings (Day mode · Night mode · OFF/frost protection)
 - Binary input in the room panel for remote switchover
 - Possible override of the flash adaptation based on the room temperature or heating characteristic (gradient or level with outdoor temperature compensated control) implemented by the controller
- Frost monitoring and automatic initiation of protective action
- Automatic anti-blocking function prevents circulation pumps from seizing up
- Configuration, parameterization, diagnostic function and direct connection for monitoring over TROVIS-VIEW Configuration and Operator Interface
 - Direct data transmission over a connecting cable (direct connection with PC)
 - Indirect data transmission over a memory pen



Fig. 1 · Type 5725-7 Controller with Electric Actuator for heating applications

Accessories

- TROVIS-VIEW Configuration and Operator Interface for Type 5725-7 Controller with Electric Actuator
- Hardware package including a memory pen – 64 (1400-9753), a connecting cable and a modular adapter, order no. 1400-9998
- Memory pen – 64, order no. 1400-9753
- Type 5267-2 Pt 1000 Contact Sensor
- Type 5257-2 Pt 1000 Room Sensor with potentiometer
- Type 5257-7 Room Panel with potentiometer and mode selector switch
- Type 5227-2 Pt 1000 Outdoor Sensor

Note:

Refer to Data Sheets T 5768 EN, T 5769 EN, T 5761 EN, T 5766 EN and T 5763 EN for details on Types 3213, 3214, 3260, 3222 and 3226 Valves.

Principle of operation (Fig. 2)

The Type 5725-7 Controller with Electric Actuator consists of a digital controller integrated into a linear actuator with fail-safe action.

The digital controller is connected to a flow temperature sensor on the input side, which can optionally be upgraded by a return flow sensor, outdoor sensor, or a room sensor. In addition to the temperature sensor input to measure the flow temperature, the digital controller has a potentiometer input (1000 to 1100 Ω /2000 Ω). This changes the heating characteristic when outdoor temperature compensated control is used. Alternatively, the room set point is changed when a fixed set point control with room sensor is used. The heating characteristic and set point can be entered in the TROVIS-VIEW configuration software.

The actuator contains a reversible synchronous motor and a maintenance-free gear. The motor is switched off by torque-dependent switches when an end position is reached or in case of overload. The force of the electric motor is transmitted via gearing and crank disk to the actuator stem (3) and to the plug stem of the mounted valve. As the actuator stem retracts, the plug stem follows the movement of the spring installed in the valve.

A coupling nut (4) provides a force-locking connection between the actuator and the plug stem of the valve. The actuator contains a spring assembly (8) and an electromagnet. When the electromagnet is de-energized, the actuator moves the valve to its fail-safe position.

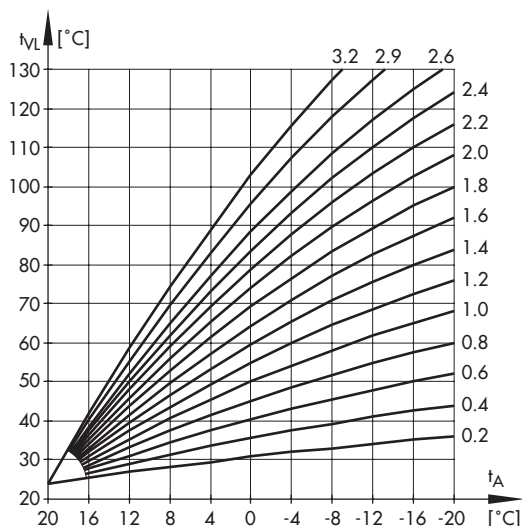
After disconnecting the actuator from the power supply and removing the housing cover (1.1), manual override is possible using an Allen key. As soon as the Allen key is released, the actuator immediately moves back to its original position.

Additional electrical equipment

The actuator requires a Pt 1000 temperature sensor to be connected to measure the flow temperature. Depending on the control task, an outdoor sensor or a room sensor or room panel (Type 5257-7 only) can be connected. They can all be combined with a return flow sensor.

The control circuit can be influenced over the potentiometer input. The non-floating switching output can alternatively be used as a binary output to process a demand for an externally required signal.

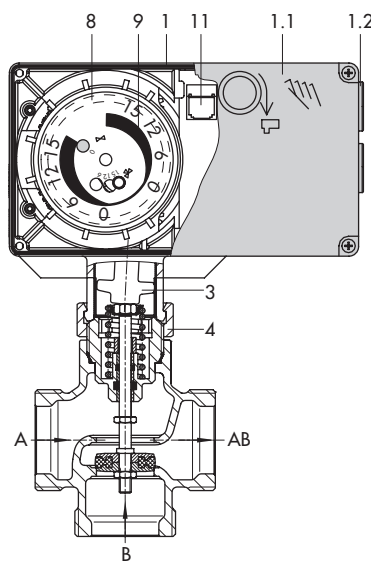
| | |
|--|--|
| Type 5267-2 Pt 1000 Contact Sensor (see Data Sheet T 5220 EN) | |
| Perm. medium temperature | -20 to 120 °C |
| Perm. ambient temperature | -20 to 120 °C |
| Degree of protection | IP 42 |
| Type 5257-2 Room Sensor with potentiometer (see T 5220 EN) | |
| Perm. medium temperature | -35 to 70 °C |
| Perm. ambient temperature | -35 to 70 °C |
| Degree of protection | IP 20 |
| Type 5257-7 Room Panel with potentiometer and mode selector switch (see Data Sheet T 5220 EN) | |
| Operating mode switch | Day and night mode, OFF/frost protect. |
| Operating temp. range | -20 to 60 °C |
| Perm. ambient temperature | -20 to 60 °C |
| Degree of protection | IP 30 |
| Type 5227-2 Pt 1000 Outdoor Sensor (see T 5220 EN) | |
| Operating temp. range | -35 to 85 °C |
| Perm. ambient temperature | -35 to 85 °C |
| Degree of protection | IP 44 |



t_A Outdoor temperature
 t_{VL} Flow temperature

Fig. 2 · Heating characteristics:

Correlation between outdoor temperature (t_A) and flow temperature (t_{VL}) for outdoor temperature compensated control



- | | |
|-------------------------------------|----------------------------------|
| 1 Controller with electric actuator | 8 Spring assembly |
| 1.1 Front cover | 9 Travel indication scale |
| 1.2 Cable entry | 10 Plug stem |
| 3 Actuator stem | 11 Serial interface (RJ 12 jack) |
| 4 Coupling nut | |

Fig. 3 · Functional drawing

Digital controller settings

The digital controller settings can be changed in the TROVIS-VIEW Configuration and Operator Interface.

| Function | Default setting |
|--|-----------------|
| F01 – Control mode: 0: Fixed set point control 1: Control with reference variable | 1 |
| F02 – Selecting the reference variable 0: Outdoor sensor 1: Room sensor | 0 |
| F03 – Operating direction 0: Increasing/increasing >> 1: Increasing/decreasing << | 0 |
| F04 – Delayed outdoor temperature 0: Without delay 1: With delay | 0 |
| F05 – Potentiometer input 0: Inactive, binary input 1 active 1: Active | 0 |
| F06 – Resistance range of potentiometer 0: Type 5257-7 Room Panel 1: Type 5257-2 with remote adjuster | 0 |
| F07 – Function of potentiometer 0: Level of heating characteristic 1: Gradient shift | 0 |
| F08 – Function binary input BE1 0: BE1 short-circuited: OFF with frost protection 1: BE1 short-circuited: Reduced operation | 0 |
| F09 – Function of switching output 0: BA for circulation pump control 1: BA for demand (ON in rated operation) | 0 |
| F10 – Anti-block protection of pumps 0: No anti-block protection 1: When pumps are deactivated: switched on every 24 h for 1 min | 1 |
| F11 – Return flow temperature sensor 0: Inactive; Binary input 2 active 1: Active, with return flow temperature limitation | 1 |
| F12 – Function binary input BE2 0: BE2 short-circuited: OFF with frost protection 1: BE2 short-circuited: Reduced operation | 0 |
| F13 – Manual operation 0: No manual operation 1: Manual operation (priority operation) | 0/1 |

| Parameter | Default setting |
|--|-----------------|
| P01 – Flow temperature set point 0 to 150 °C | 70 °C |
| P02 – Flow temperature set-back in reduced operation 0 to 50 K | 15 K |
| P03 – Min. flow temperature 0 to 150 °C | 20 °C |
| P04 – Max. flow temperature 0 to 150 °C | 120 °C |
| P05 – Heating characteristic gradient 0.2 to 3.2 | 1.6 |
| P06 – Heating characteristic level -30 to 30 K | 0 K |
| P07 – Gradient shift range via potentiometer 0.0 to 1.5 | 1.0 |
| P08 – Level shift range via potentiometer 0 to 30 K | 15 K |
| P09 – Kp flow temperature control 0.1 to 50.0 | 2.0 |
| P10 – Tn flow temperature control 0 to 999 s | 120 s |
| P11 – Ty actuator transit time for valve travel 10 to 240 s | 35 s |
| P12 – Dead band (switching range) 0.5 to 5.0 % | 2.0 % |
| P13 – Max. return flow temperature 10 to 90 °C | 50 °C |
| P14 – Kp return flow temperature limitation 0.1 to 50.0 | 1.0 |
| P15 – Tn return flow temperature limitation 0 to 999 s | 400 s |
| P16 – Delayed time for outdoor temperature 1.0 to 6.0 °C/h | 3.0 °C/h |
| P17 – Outdoor temperature set limit at rated operation 0 to 50 °C | 22 °C |
| P18 – Outdoor temperature limit at reduced operation 0 to 50 °C | 15 °C |
| P19 – Room temperature set point at rated operation 10 to 40 °C | 20 °C |
| P20 – Room temperature set point at reduced operation 10 to 40 °C | 15 °C |
| P21 – Max. room temperature boost for switch-off 1 to 6 K | 2 K |
| P22 – Time interval for flash adaptation 0 to 100 min | 10 min |
| P23 – Pump lag time 1 to 999 min | 5 min |

Mounting

Before connecting the actuator to the valve, the actuator stem must be retracted. To do this, first remove the housing cover. Place a 4 mm hex screwdriver on the actuating shaft, turn it counterclockwise to retract the stem and hold it in position. Tighten the coupling nut while the stem is held in the retracted position.

The actuator can be mounted in any position, except for a suspended position.

Ordering text

Controller with Electric Actuator Type 5725-7

Closing force ... N

Valve travel ... mm

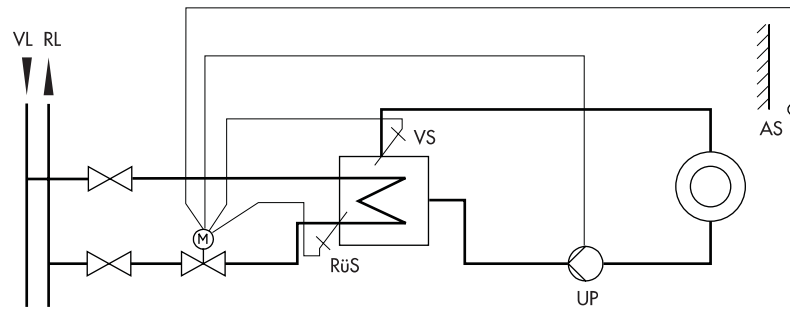
Supply voltage 230 V/50 Hz

Technical data

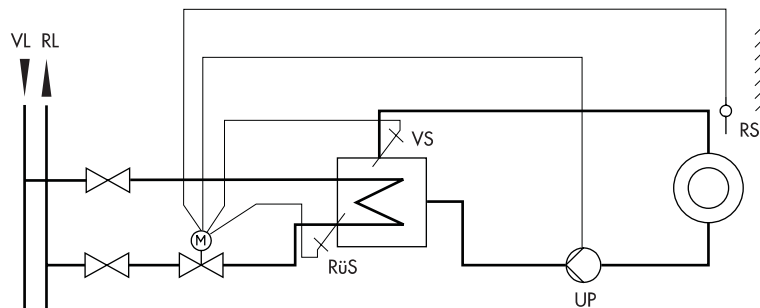
| Controller with Electric Actuator Type | 5725 | | | | | |
|--|--|---------------|--------------|---------------|--------------|---------------|
| | -710 | -715 | -720 | -725 | -730 | -735 |
| Connection to valve | Force-locking | | | Form-fit | | |
| Rated travel | 6 mm | | 12 mm | | 15 mm | |
| Transit time for rated travel | 35 s | | 70 s | | 90 s | |
| Transit time in case of fail-safe action | 4 s | | 6 s | | 7 s | |
| Fail-safe action | Stem extends | Stem retracts | Stem extends | Stem retracts | Stem extends | Stem retracts |
| Nominal thrust | 500 N | | | 280 N | | |
| Power supply | 230 V ($\pm 10\%$), 50 Hz | | | | | |
| Power consumption, approx. | 5 VA | | | | | |
| Manual override | Yes ¹⁾ | | | | | |
| Permissible ambient temperature | 0 to 50 °C | | | | | |
| Permissible storage temperature | -20 to 70 °C | | | | | |
| Perm. temperature at connecting stem | 0 to 130 °C | | | | | |
| Degree of protection | IP 54 (mounted in an upright position) | | | | | |
| Class of protection | II | | | | | |
| Noise immunity | EN 61000-6-2 | | | | | |
| Noise emission | EN 61000-6-3 | | | | | |
| Weight, approx. | 1.3 kg | | | | | |

¹⁾ Manual override using a 4 mm hex screwdriver (after removing the housing cover), always returns to fail-safe position after safety release.

Typical applications



Outdoor temperature compensated flow temperature control with return flow temperature limitation; binary contact to switch over between operating modes

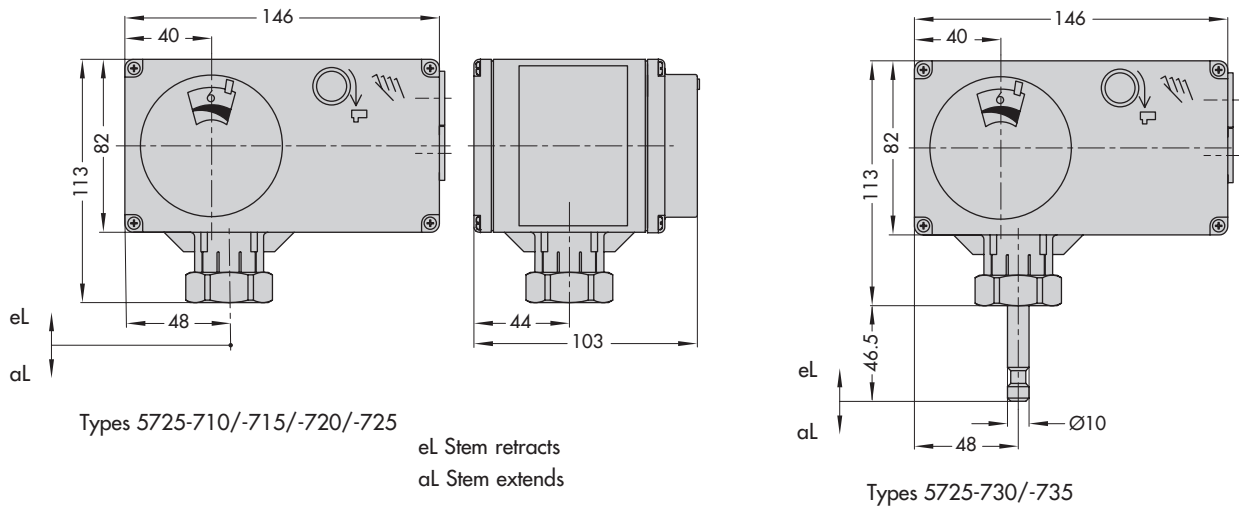


Fixed set point control with room sensor and return flow temperature limitation, operating mode switchover at room panel RS (Type 5257-7)

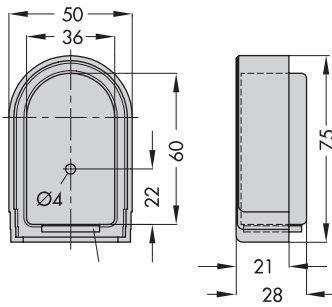
- AS Outdoor sensor
- RS Room sensor/room panel
- RüS Return flow sensor
- VS Flow sensor

- UP Circulation pump
- RL District heating return
- VL District heating supply

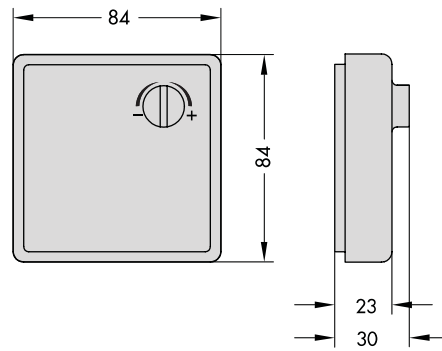
Type 5725-7 Controller with Electric Actuator



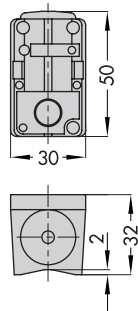
Accessories for heating control



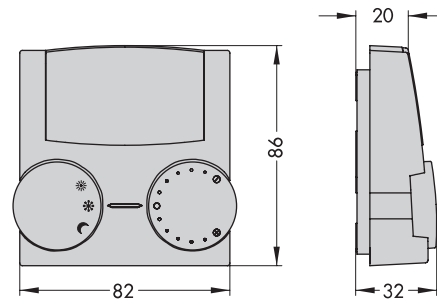
Type 5227-2 Outdoor Sensor,
Pt 1000
Color: RAL 9016



Type 5257-2 Room Sensor with remote adjuster, Pt 1000



Type 5267-2 Contact Sensor, Pt 1000
(flow and return flow temperature
measurement)



Type 5257-7 Room Panel, Pt 1000

- ☀ Continuous day mode (rated operation)
- ☾ Continuous night mode (reduced operation)
- ❄ OFF/frost protection

Specifications subject to change without notice.



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T 5725-7 EN

2011-01