

Controller with Electric Actuator Type 5757-7



for heating and cooling applications

Application

Electric actuator with integrated digital controller used to position force-locking valves in nominal sizes DN 15 to 25. Designed for installations in small to medium-sized buildings for outdoor temperature compensated control, fixed set point control or fixed set point control with room temperature sensors. The Type 5757-7 is a combination of a linear actuator and an



integrated digital controller. It is particularly suitable for mounting to SAMSON Types 3222, 3222 N, 2488 and 3267 Valves (DN 15 to 25) as well as to special versions of Type 3226 and Type 3260 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. A binary input 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. When an adjustable maximum limit is exceeded, the flow temperature is reduced until it remains below the limit.
- Type 5257-7 Room Panel can be connected:
 - Convenient room panel with various operating mode settings (Day mode · Night mode · OFF/frost protection)
 - Binary input on 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 circulating pumps from seizing up
- Configuration, parameterization, diagnostic function, and direct connection for monitoring over TROVIS-VIEW software:
 - Direct data transmission over a connecting cable (direct connection with PC)
 - Data transmission over a memory pen



Fig. 1 · Type 5757-7 Controller with Electric Actuator for heating and cooling applications

Accessories

- TROVIS-VIEW Configuration and Operator Interface for Type 5757-7 Controller with Electric Actuator
- Hardware package with a memory pen – 64, 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 5766 EN, T 5767 EN, T 5794 EN, T 5763 EN and T 5761 EN for details on Type 3222, Type 3222 N, Type 3267, Type 3226 and Type 3260 Valves.

Principle of operation (Fig. 2)

The Type 5757-7 consists of a digital controller integrated into the housing of an electric actuator.

The digital controller is connected to a flow temperature sensor on the input side, which can optionally be upgraded by a return flow sensor, an outdoor sensor or a room sensor. In addition to the temperature sensor input to measure the flow temperature, the actuator has a potentiometer input (1000 to 1100 Ω /200 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 changed over the TROVIS-VIEW configuration software.

The output signal of the digital controller is applied as a three-point stepping signal to the synchronous motor of the actuator. The signal is transferred over the connected gear to the actuator stem (3) and used as the positioning force. The motor is switched off by torque-dependent switches when an end position is reached or in case of overload.

The actuator is mounted onto the valve using a coupling nut (4). When the actuator stem extends, the valve is closed, opposing the force of the valve spring (7). When the actuator stem retracts, the valve is opened as the plug stem (6) follows the motion of the return spring.

The valve can be moved to any position by the handwheel (2) in the de-energized state. Travel and direction of action can be read off the travel indicator (5) on the side of the actuator.

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 for 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 remote adjuster (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 remote adjuster and mode selector switch (see Data Sheet T 5220 EN)	
Operating mode switch	Day mode, night mode, OFF/frost protection
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

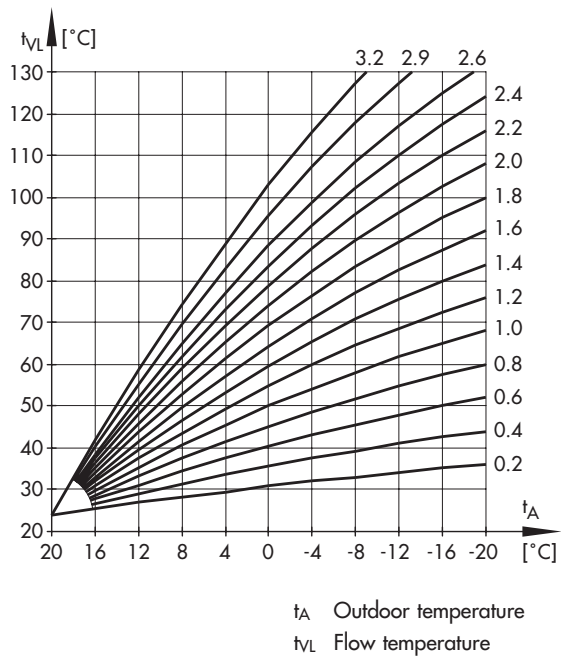
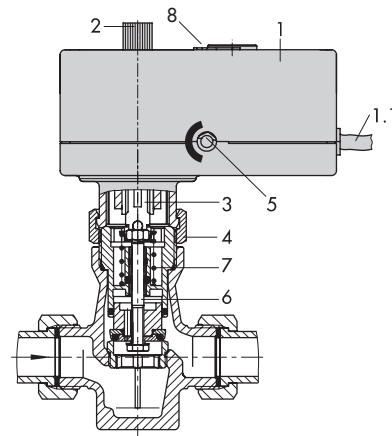


Fig. 3 · Heating characteristics:
Correlation between outdoor temperature (t_A) and flow temperature (t_{VL}) in the outdoor temperature compensated control



- | | | | |
|-----|-----------------------------------|---|------------------|
| 1 | Controller with electric actuator | 5 | Travel indicator |
| 1.1 | Connecting cable | 6 | Plug stem |
| 2 | Handwheel | 7 | Valve spring |
| 3 | Actuator stem | 8 | Serial interface |
| 4 | Coupling nut | | |

Fig. 2 · Principle of operation

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 – Direction of stem action 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: Heating characteristic level shift 1: Gradient shift	0
F08 – Function of binary input BE1 0: BE1 short-circuited: OFF w. frost protection 1: BE1 short-circuited: Reduced operation	0
F09 – Function of switching output 0: BA as circulation pump control 1: BA as heat 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 of binary input BE2 0: BE2 short-circuited: OFF w. frost protection 1: BE2 short-circuited: Reduced operation	0
F13 – Manual mode 0: Inactive 1: Manual mode (absolute priority)	0 ¹⁾

¹⁾ The default setting F13 - 1 applies for level #2.

Parameters	Default setting
P01 – Flow temperature set point 0 to 150 °C	70 °C
P02 – Flow temperature set-back in red. operation 0 to 50 K	15 K
P03 – Minimum flow temperature 0 to 150 °C	20 °C
P04 – Maximum flow temperature 0 to 150 °C	120 °C
P05 – Heating characteristic gradient 0.2 to 3.2	1.6
P06 – Heating characteristic level –30 bis 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	24 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 temp. set limit at rated operation 0 to 50 °C	22 °C
P18 – Outdoor temp. limit at reduced operation 0 to 50 °C	15 °C
P19 – Room temp. set point at rated operation 10 to 40 °C	20 °C
P20 – Room temperature set point at red. 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. The coupling nut can only be tightened after the stem has been retracted.

Any mounting position may be used, however, the actuator must not be installed suspended downwards.

Electrical connection

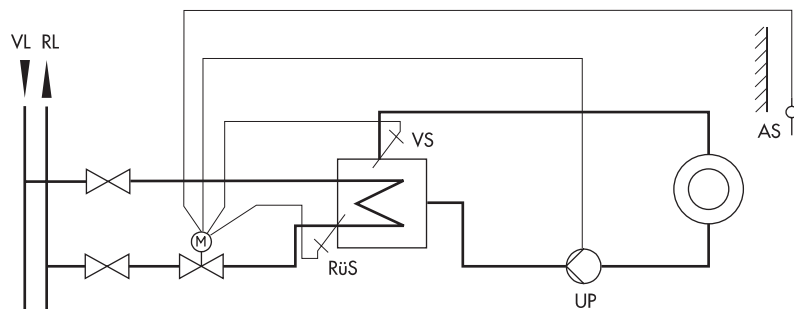
2 cables both 2.5 m in length; cable ends fitted with wire-end ferrules

Ordering text

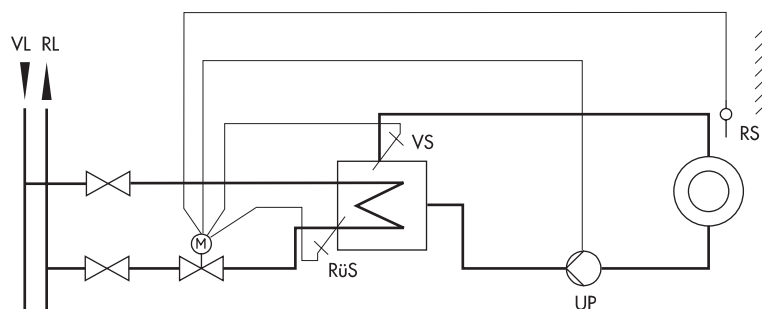
Type 5757-7 Controller with Electric Actuator

Technical data

Type 5757-7 Controller with Electric Actuator	
Temperature sensor	Max. 3 x Pt 1000
Setting range	0 to 150 °C
Potentiometer input	1000 to 1100 Ω or 1000 to 2000 Ω
Binary output	230 V/50 Hz/1 A Circulating pump or demand for externally required signal
Connection to the valve	Force-locking
Rated travel	6 mm
Transit time for rated travel	20 sec
Nominal thrust	300 N
Supply voltage	230 V (±10 %) / 50 Hz
Power consumption	Approx. 3 VA
Class of protection	II
Perm. ambient temperature	0 to 50 °C
Perm. storage temperature	-20 to 70 °C
Degree of protection	IP 42
Mounting position	Any, but not suspended
Noise immunity	EN 61000-6-2
Noise emission	EN 61000-6-3
Weight	Approx. 0.7 kg



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



Fixed set point control with room sensor with return flow temperature limitation; Operating mode switchover at room panel (Type 5257-7)

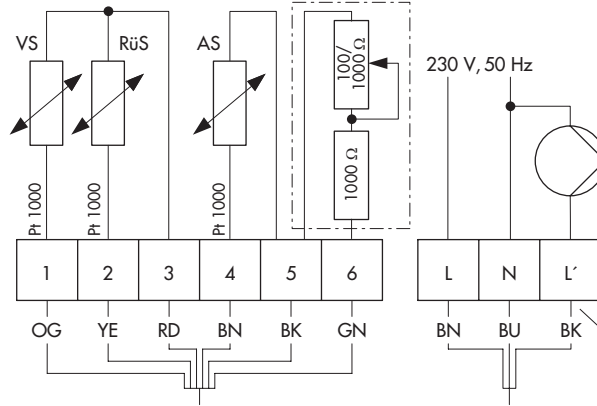
- AS Outdoor sensor
- RS Room sensor/room panel
- RüS Return flow sensor
- VS Flow sensor

- UP Circulation pump
- RL Return flow to district heating network
- VL Supply from district heating network

Fig. 4 · Typical applications

Electrical connection

Application with flow sensor (VS) return flow sensor (RüS) and outdoor sensor (AS) and potentiometer functioning as set point adjuster

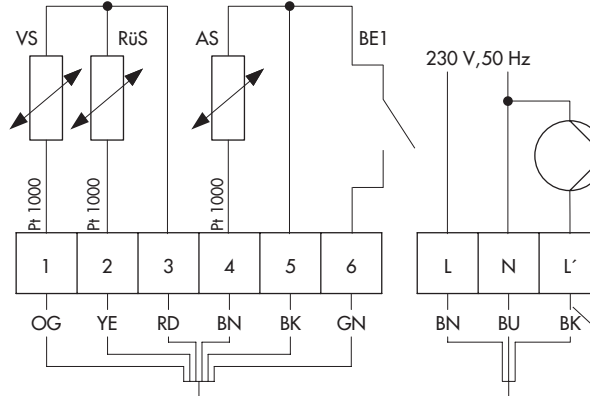


Note:
Terminals at point of installation not included in the scope of delivery

OG orange	BN brown
YE yellow	BU blue
RD red	BK black
BN brown	
BK black	
GN green	

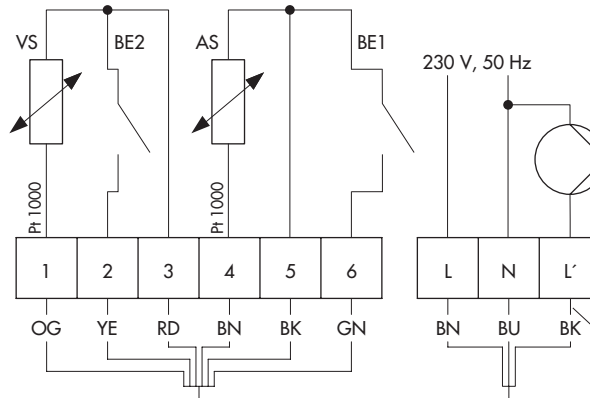
Caution!
Live wires

Application with flow sensor (VS), return flow sensor (RüS) and outdoor sensor (AS) and binary input to switch between operating modes



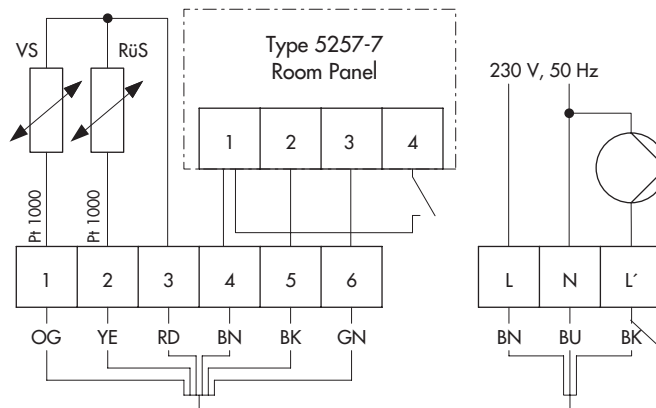
Caution!
Live wires

Application with flow sensor (VS) and outdoor sensor (AS)



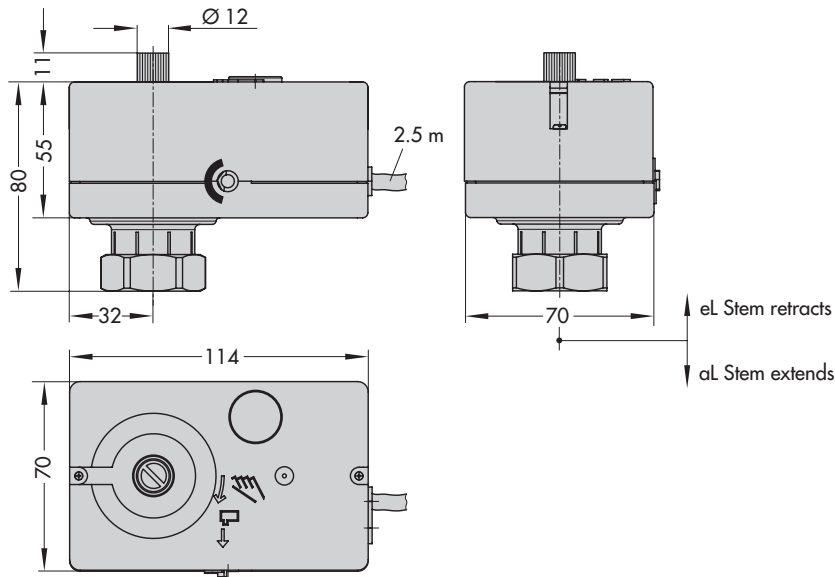
Caution!
Live wires

Application with flow sensor (VS), return flow sensor (RüS) and room sensor with mode selector switch and room set point adjuster



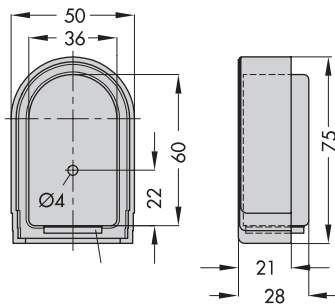
Caution!
Live wires

Dimensions in mm

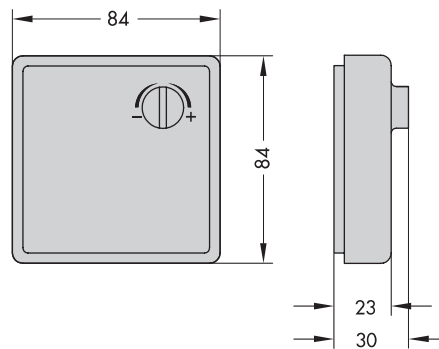


Type 5757-7 Controller with Electric Actuator

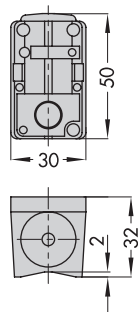
Accessories



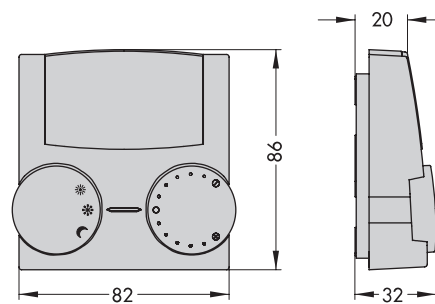
Type 5227-2 Outdoor Sensor,
Pt 1000
Color: RAL 9016



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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