

TROVIS 5757-7

Electric Actuator with Process Controller



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 TROVIS 5757-7 is a combination of an electric 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 a 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 electric actuator with process controller
- Frost monitoring and automatic initiation of protective action
- Automatic anti-blocking function prevents circulating pumps from seizing up



Fig. 1: TROVIS 5757-7 Electric Actuator with Process Controller

- Configuration, parameterization, diagnostic function and direct connection for monitoring using the TROVIS-VIEW software
 - Direct data transmission using a connecting cable (direct connection to computer)
 - Data transmission using a memory pen

Accessories

- TROVIS-VIEW configuration software for TROVIS 5757-7 Electric Actuator with Process Controller
- 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 Contact Sensor (Pt 1000) (Var.-ID: 1058683)
- Type 5257-7 Room Panel (Pt 1000) with potentiometer and mode selector switch (Var.-ID: 1180319)
- Type 5227-2 Outdoor Sensor (Pt 1000) (Var.-ID: 1043862)

Note: Details on Type 3222, Type 3222 N, Type 3267, Type 3226, and Type 3260 Valves can be found in the Data Sheets ▶ T 5866, ▶ T 5867, ▶ T 5894, ▶ T 5863, and ▶ T 5861.

Edition September 2016

Data Sheet

T 5757-7 EN

Principle of operation (Fig. 3)

The TROVIS 5757-7 is a combination of an electric actuator and an integrated digital controller. The digital controller is connected to a flow sensor on the input side, which can be optionally upgraded by a return flow, outdoor or 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 or 1000 to 2000 Ω). This input influences the heating characteristic in the case of outdoor-temperature-compensated control and the room temperature set point in the case of fixed set point control with room temperature influence.

The heating characteristic and set point can be changed over the TROVIS-VIEW configuration software.

The output signal of the digital controller functions as a three-step signal on the synchronous motor of the actuator and 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 the motor is overloaded.

The electric actuator with process controller 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 in the de-energized state by the handwheel (2). Travel and direction of action can be read off the travel indicator (5) on the side of the actuator housing.

Accessories

The electric actuator with process controller 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 Contact Sensor (Data Sheet ► T 5220)	
Perm. medium temperature	-20 to 120 °C
Perm. ambient temperature	-20 to 120 °C
Degree of protection	IP 42
Type 5257-7 Room Panel with potentiometer and mode selector switch (Data Sheet ► T 5220)	
Mode selector 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 Outdoor Sensor (Data Sheet ► T 5220)	
Operating temp. range	-35 to 85 °C
Perm. ambient temperature	-35 to 85 °C
Degree of protection	IP 44

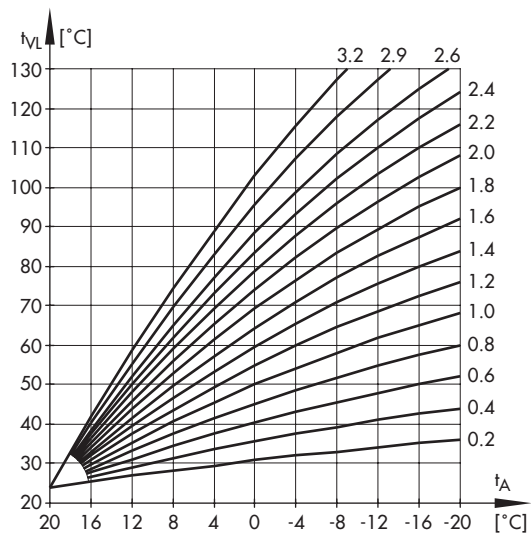
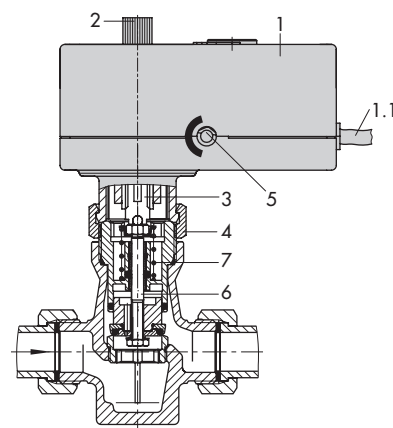


Fig. 2: Heating characteristics: Correlation between outdoor temperature (t_A) and flow temperature (t_{VL}) in the outdoor-temperature-compensated control



- | | |
|---|--------------------|
| 1 Electric actuator with process controller | 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. 3: Functional diagram

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: Remote adjuster	0
F07 – Function of potentiometer 0: Heating characteristic level shift 1: Gradient shift	0
F08 – Function of binary input BI1 0: BI1 short-circuited: OFF with frost protection 1: BI1 short-circuited: Reduced operation	0
F09 – Function of switching output 0: BO as circulation pump control 1: BO 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 BI2 0: BI2 short-circuited: OFF with frost protection 1: BI2 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 settings
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	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 – Delay time for outdoor temperature 1.0 to 6.0 °C/h	3.0 °C/h
P17 – Outdoor temperature limit value at rated operation 0 to 50 °C	22 °C
P18 – Outdoor temperature limit value 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

Installation

Before mounting the actuator on the valve, retract the actuator stem. Hold the actuator stem in this position, while tightening the coupling nut.

Any mounting position may be used, however, the actuator may not be installed in a suspended position.

Electrical connection

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

Ordering text

TROVIS 5757-7 Electric Actuator with Process Controller

Technical data

TROVIS 5757-7 Electric Actuator with Process Controller	
Temperature sensor input	Max. 3 x Pt 1000
Operating temperature range	-40 to 150 °C
Binary inputs	
BI1 ¹⁾ (instead of potentiometer)	Floating contact, contact load 5 V/1 mA
BI2 ¹⁾ (instead of return flow sensor)	Floating contact, contact load 5 V/1 mA
Potentiometer input	1000 to 1100 Ω or 1000 to 2000 Ω
Switching output	230 V/50 Hz/1 A Circulation pump or demand for externally required signal

TROVIS 5757-7 Electric Actuator with Process Controller	
Rated travel	6 mm
Transit time for rated travel	20 s
Thrust	300 N
Power supply	230 V (±10 %)/50 Hz
Power consumption	5 VA
Class of protection	II
Permissible temperatures ²⁾	
Ambient	0 to 50 °C
Storage	-20 to 70 °C
Degree of protection	IP 42
Installation	Any position except suspended
Electromagnetic compatibility	According to EN 61000-6-2, EN 61000-6-3 and EN 61326
Weight	Approx. 0.7 kg
Compliance	CE ENEC

- ¹⁾ Recommendation: use devices with gold contacts when using relays.
- ²⁾ The permissible medium temperature depends on the valve on which the electric actuator with process controller is mounted. The limits in the valve documentation apply.

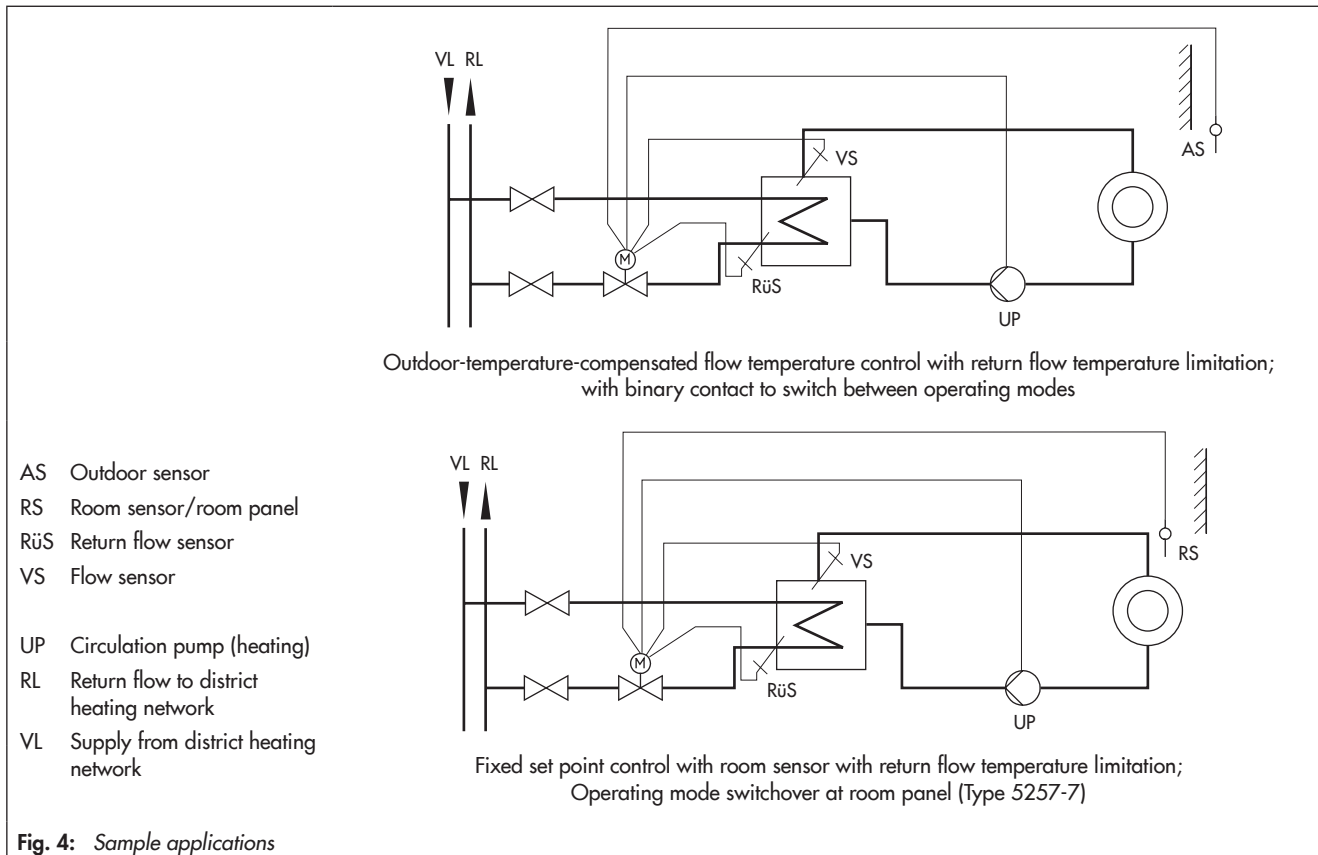
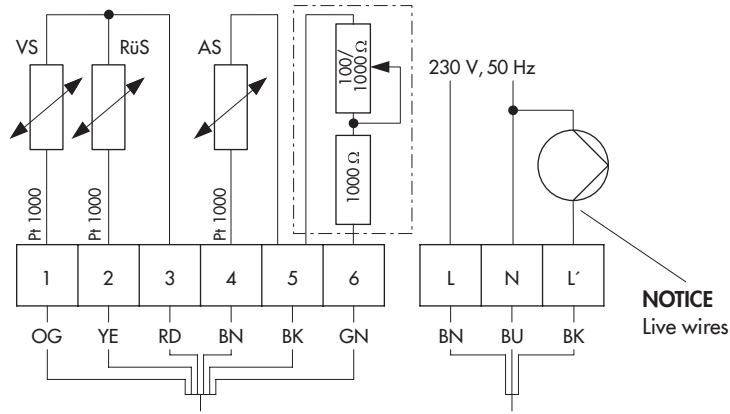


Fig. 4: Sample applications

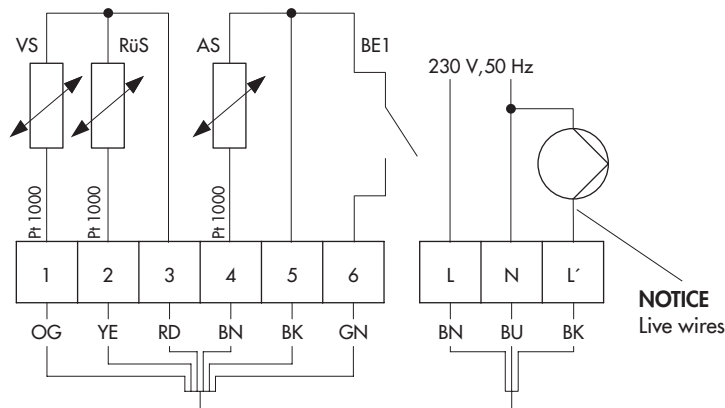
Electrical connection

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



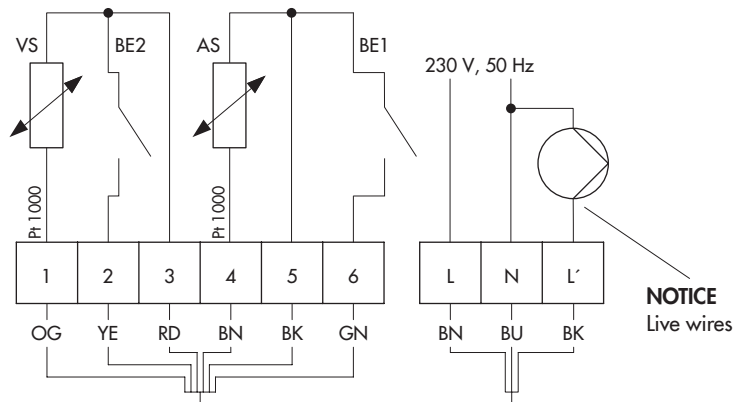
Note: Terminals at point of installation not included in the scope of delivery.

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

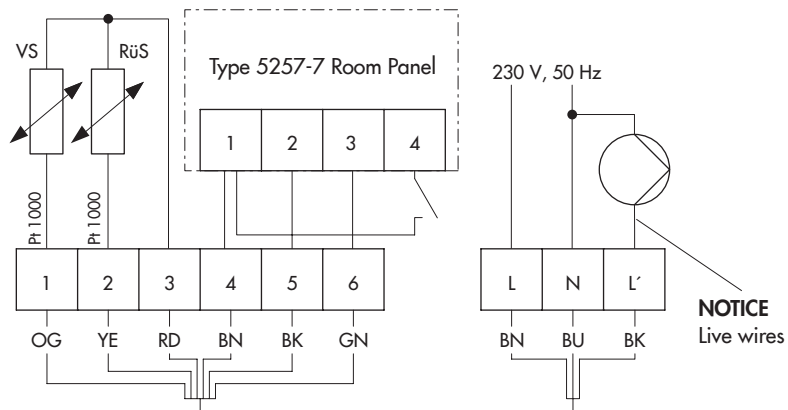


OG orange
YE yellow
RD red
GN green
BN brown
BU blue
BK black

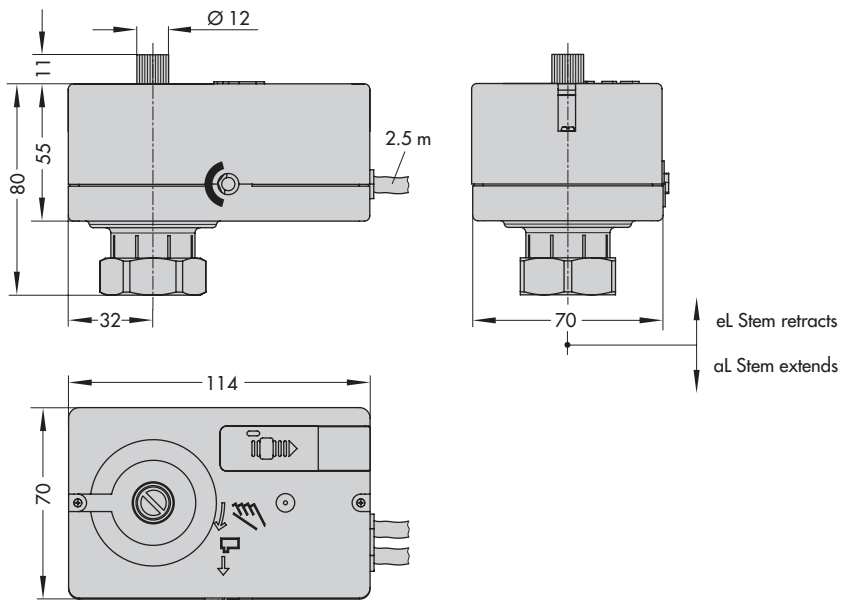
Application with flow sensor (VS) and outdoor sensor (AS)



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

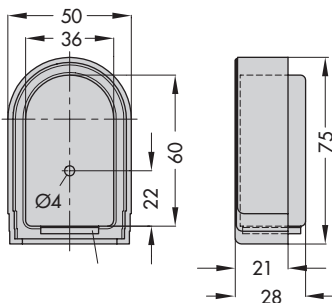


Dimensions in mm

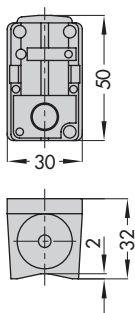


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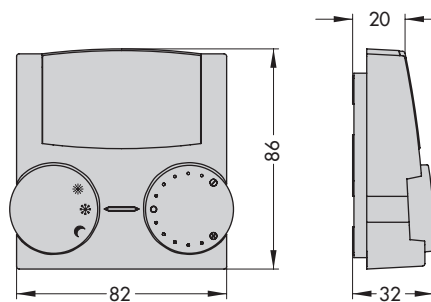
Accessories for heating control



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



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



SAMSON AG · MESS- UND REGELTECHNIK
Weismüllerstraße 3 · 60314 Frankfurt am Main, Germany
Phone: +49 69 4009-0 · Fax: +49 69 4009-1507
samson@samson.de · www.samson.de

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