DATA SHEET

T 5757-7 EN

TROVIS 5757-7 Electric Actuator with Process Controller

For heating and cooling applications

Application

Electric actuator with process controller for heating, ventilation and air-conditioning systems

Special features

The electric actuator with process controller is an electric actuator combined with an integrated digital controller for force-locking valves (DN 15 to 25). It is 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. It is particularly suitable for mounting to SAMSON Types 3222, 3222 N and 2488 Valves as well as to special versions of Type 3226 and Type 3260 Valves.

- 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.
- Possible connection of Type 5257-71 Room Panel:
  - Convenient room panel with various operating mode settings (Day mode · Night mode · OFF/frost protection)
  - Binary input on room panel for remote switchover

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

  - 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
- Configuration, parameterization, diagnostic function and online 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

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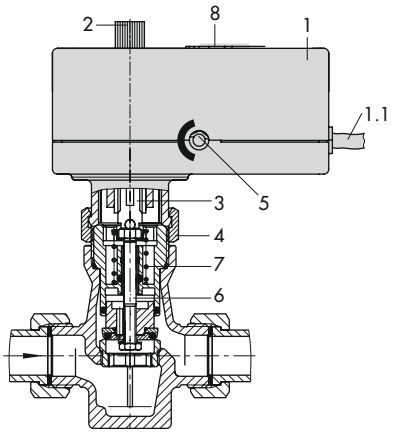
Design and principle of operation



1 Electric actuator with process controller
1.1 Connecting cable
2 Manual adjuster
3 Actuator stem
4 Coupling nut
5 Travel indicator
6 Plug stem
7 Valve spring
8 Serial interface

Fig. 2: *Valve and TROVIS 5757-7 Electric Actuator with Process 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 (see Fig. 3) 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 software.

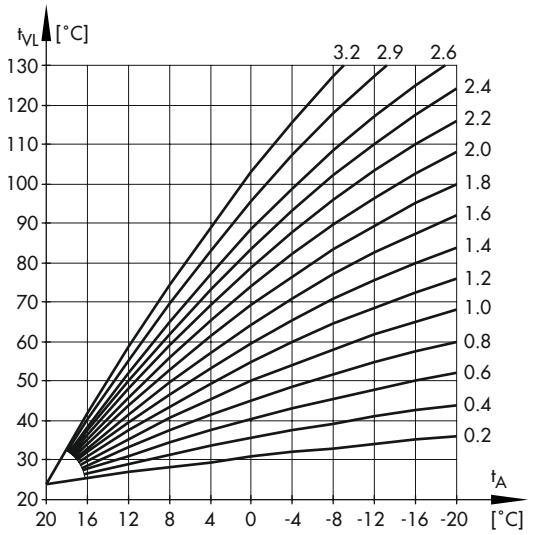


Fig. 3: *Heating characteristics · Correlation between outdoor temperature (t_A) and flow temperature (t_{VL}) in the outdoor-temperature-compensated control*

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 in Fig. 2) and used as the positioning force. The motor is switched off by torque switches when an end position is reached or in case the motor is overloaded.
When the actuator stem extends, the valve is closed, opposing the force of the valve spring (7 in Fig. 2). When the actuator stem retracts, the valve is opened as the plug stem (6 in Fig. 2) follows the motion of the return spring.

– **Inputs**

  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, room sensor or room panel (Type 5257-7 or Type 5257-71 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.

Installation

The electric actuator with process controller is mounted onto the valve using a coupling nut (4 in Fig. 2). Before mounting the actuator on the valve, retract the actuator stem. Hold the actuator stem in this position, while tightening the coupling nut with 20 Nm at the maximum.
Any mounting position may be used, however, the actuator may not be installed in a suspended position.

Any wires of the connecting cable that are not used need to be insulated.

Manual override

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

Digital controller settings

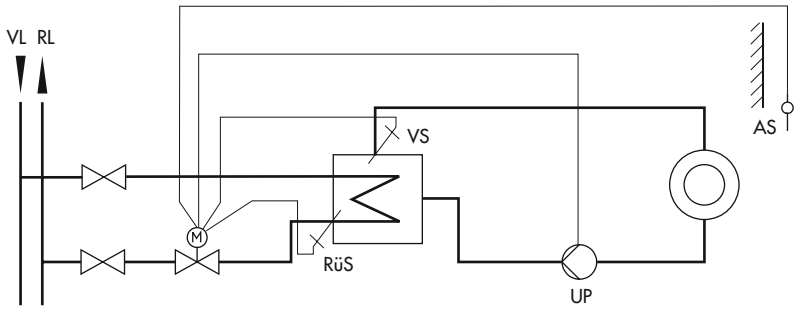
The digital controller settings can be changed in the TROVIS-VIEW software.

Function		Default setting
F01 –	Control mode 0: Fixed set point control 1: Control with reference variable	1
F02 –	Reference variable 0: Outdoor sensor 1: Room sensor	0
F03 –	Direction of 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 (1000 to 1100 Ω) 1: Type 5257-2 with remote adjuster (1000 to 2000 Ω)	0
F07 –	Function of potentiometer 0: Heating characteristic level shift 1: Gradient shift	0
F08 –	Function of binary input 1 0: OFF with frost protection 1: Reduced operation	0
F09 –	Function of switching output 0: Circulation pump (heating) 1: Demand (ON in rated operation)	0
F10 –	Pump protection 0: Not active 1: Active	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 2 0: OFF with frost protection 1: Reduced operation	0
F13 –	Manual mode 0: Not active 1: Active	0 [1)]

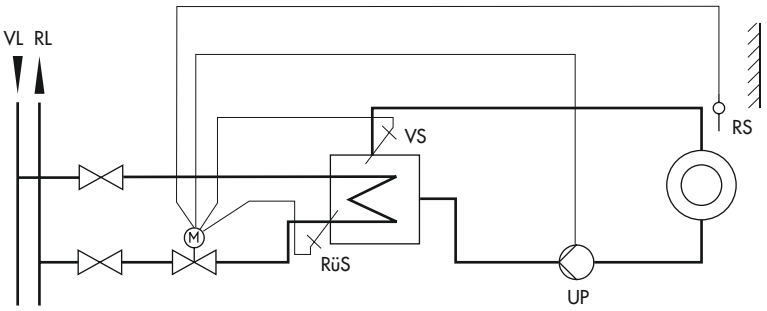
[1)] The default setting F13 - 1 applies for level #2.

Parameters		Default setting
P01 –	Flow temperature set point 20 to 120 °C	70 °C
P02 –	Flow temperature set-back in reduced operation 0 to 50 K	15 K
P03 –	Min. flow temperature 0 to 120 °C	20 °C
P04 –	Max. flow temperature 20 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 –	Actuator transit time Ty 10.0 to 240.0 s	24.0 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 to 6 °C/h	3 °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

Application



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

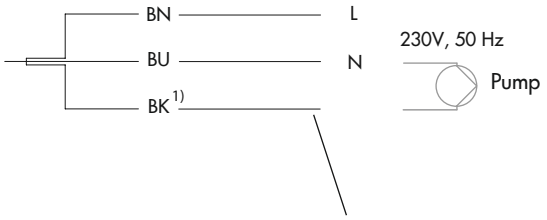


Fixed set point control with room sensor with return flow temperature limitation; Operating mode switchover at room panel (Type 5257-71)

AS	Outdoor sensor
RS	Room sensor/room panel
RüS	Return flow sensor
VS	Flow sensor
UP	Circulation pump (heating)
RL	District heating return
Sales	District heating supply

Fig. 4: *Sample applications*

Electrical connection



⚠ DANGER

Live wires

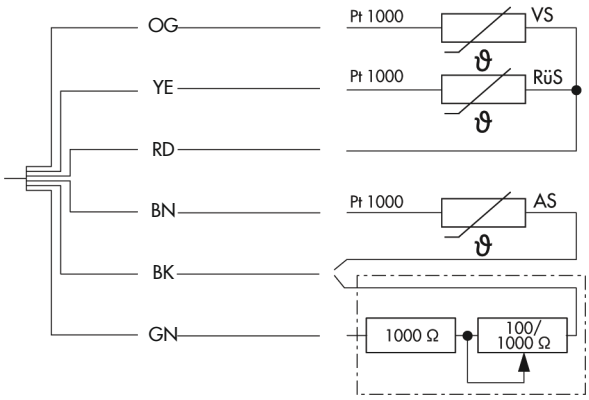
➔ *Do not touch wire ends.*

➔ *Insulate any wires that are not used.*

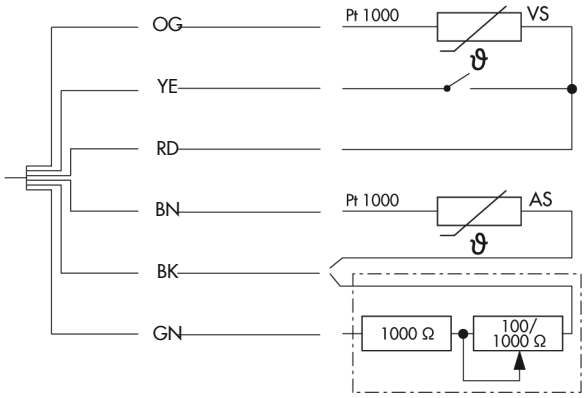
1) Switched output

Fig. 5: *Electrical connection of TROVIS 5757-7 · Supply line*

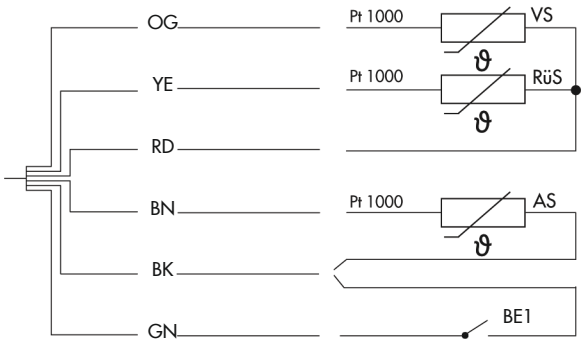
Application with flow sensor (VS), return flow sensor (RüS) and outdoor sensor (AS) and potentiometer functioning as set point adjuster



Application with flow sensor (VS), outdoor sensor (AS), binary input to switch between operating mode and potentiometer for adjusting the set point



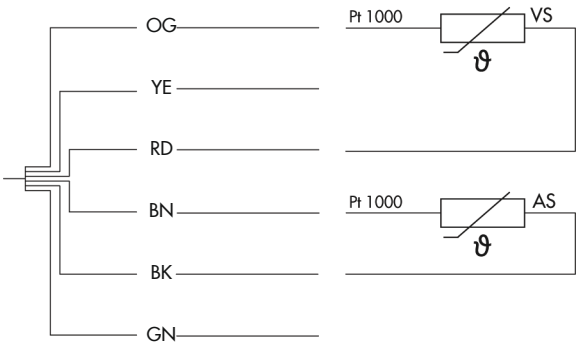
Application with flow sensor (VS), return flow sensor (RüS) and outdoor sensor (AS) and binary input to switch between operating modes



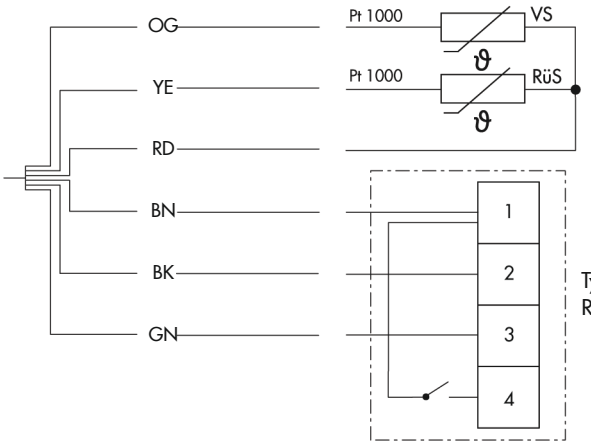
OG Orange
YE Yellow
RD Red
BN Brown
BK Black
GN Green

Fig. 6: *Electrical connection of TROVIS 5757-7 · Control line (part 1)*

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



OG	Orange
YE	Yellow
RD	Red
BN	Brown
BK	Black
GN	Green

Fig. 7: *Electrical connection of TROVIS 5757-7 · Control line (part 2)*

i ***Note***

The terminals are not included in the scope of delivery.

Table 1: *Technical data · Electric actuator with process controller*

TROVIS 5757-7	
Connection to valve	Force-locking
Rated travel	6 mm
Transit time for rated travel	20 s
Thrust	300 N
Supply voltage	230 V (±10 %), 50 Hz
Power consumption	5 VA
Temperature sensor	Max. 3x Pt 1000
Operating temperature range	–40 to +150 °C
Binary inputs	
BI1 [1] (instead of the 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
Electrical connection	Wire end ferrules required [2]
Number of connecting cables	2
Connecting cable length	2.5 m
Permissible temperature ranges [3]	
Ambient	0 to 50 °C
Storage	–20 to +70 °C
Degree of protection	IP 42 according to EN 60529
Class of protection	II according to EN 61140
Device safety	According to EN 61010-1
Noise immunity	According to EN 61000-6-2 and EN 61326-1
Noise emission	According to EN 61000-6-3 and EN 61326-1
Conformity	CE · EAC
Materials	
Housing	Plastic (PPO with glass fiber reinforcement)
Coupling nut M32x1.5	Brass
Weight	Approx. 0.7 kg

1) Recommendation: use devices with gold contacts when using relays.
2) Insulate any wires that are not used.
3) 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.

Table 2: *Technical data · Accessories*

Type 5267-3 Contact Sensor (Pt 1000)	
Permissible temperature ranges	
Ambient	–50 to +100 °C
Medium	–50 to +120 °C
Degree of protection	IP 65
Type 5257-71 Room Panel	
Permissible temperature range	
Ambient	–35 to +70 °C
Degree of protection	IP 30
Type 5227-4 Outdoor Sensor (Pt 1000)	
Permissible temperature range	
Ambient	–50 to +90 °C
Degree of protection	IP 43

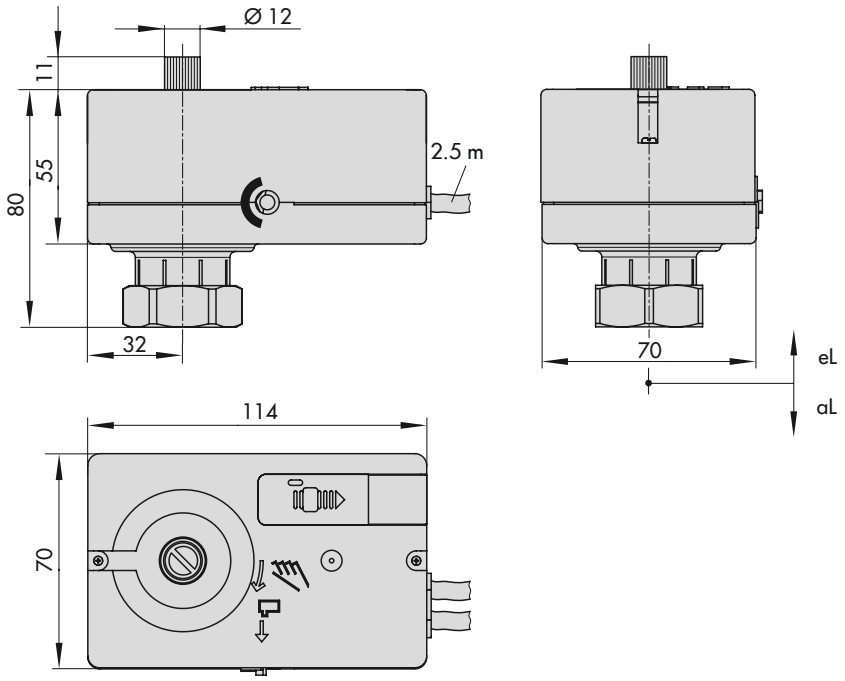
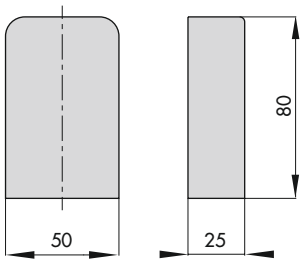
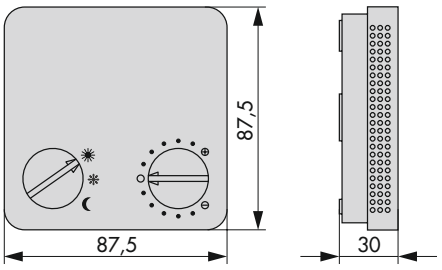


Fig. 8: *Dimensions in mm · TROVIS 5757-7 Electric Actuator with Process Controller*

Accessories for heating control

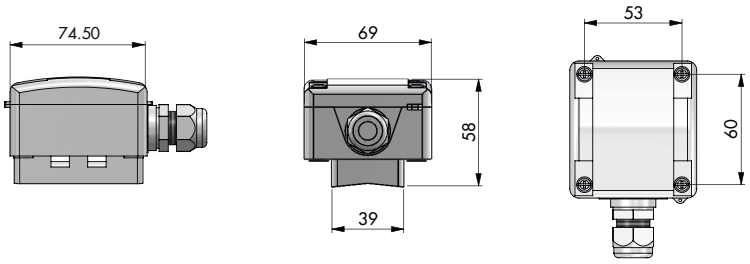


Type 5227-4 Outdoor Sensor (Pt 1000)



Type 5257-71 Room Panel (Pt 1000)

☼ Day mode (rated operation)
❄ Off/frost protection
☾ Night mode (reduced operation)



Type 5267-3 Contact Sensor (Pt 1000)
(flow and return flow temperature measurement)

Fig. 9: *Dimensions in mm · Accessories*

Accessories

Memory pen-64	Order no. 1400-9753
Connecting cable RJ-12/D-sub, 9 pin	Order no. 1400-7699
Modular adapter D-sub 9-pin/RJ-12 for memory pen	Order no. 1400-7698
Hardware package consisting of: – Memory pen-64 – Connecting cable – Modular adapter	Order no. 1400-9998
USB to RS232 adapter	Order no. 8812-2001
TROVIS-VIEW software (free of charge)	▶ www.samsongroup.com > Service & Support > Downloads > TROVIS-VIEW
Outdoor sensor (Pt 1000)	Type 5227-4
Room panel (Pt 1000) with potentiometer and mode selector switch	Type 5257-71
Contact sensor (Pt 1000)	Type 5267-3

Ordering text

TROVIS 5757-7 Electric Actuator with Process Controller

- With switching output
- 2.5 m connecting cable

Associated mounting and operating instructions

- TROVIS 5757-7 Electric Actuator with Process Controller ▶ **EB 5757-7**

Quick guide

- TROVIS 5757-7 Electric Actuator with Process Controller ▶ **KA 5757-7**

Associated configuration manual

- TROVIS 5757-7 Electric Actuator with Process Controller ▶ **KH 5757-7**

Associated data sheets

- Type 5267-3 Contact Sensor (Pt 1000) ▶ **T 5220**
- Type 5257-71 Room Panel ▶ **T 5220**
- Type 5227-4 Outdoor Sensor ▶ **T 5220**
- Type 3222 Valve ▶ **T 5866**
- Type 3222 N Valve ▶ **T 5867**
- Type 3226 Valve ▶ **T 5863**
- Type 3260 Valve ▶ **T 5861**