

Controller with Electric Actuator Type 5757



for domestic hot water heating

Application

Electric actuator with integrated digital controller used to position force-locking valves in nominal sizes DN 15 to DN 25. Domestic hot water heating control in instantaneous heating systems used in small to medium-sized buildings connected to a district heating or local heat supply network.



The Type 5757 is a combination of a linear actuator and an integrated digital controller. It is especially designed for DHW heating in instantaneous heating systems for small to medium-sized buildings. It is particularly suitable for mounting to SAMSON Types 3222, 3222 N, 2488 and 3267 Valves as well as to special versions of Type 3226 and Type 3260 Valves.

Special features

- Control using two different set points, e.g. DHW temperature and DHW temperature for thermal disinfection. A binary input is used to switch between the set points
- Function to maintain water temperature constant, preventing the heat exchanger from cooling down between tapping
- Direction of action reversible:
 - Globe valve opens when the actuator stem retracts (increasing/increasing)
 - Three-way mixing valve mixes/diverts the flow(s) when the actuator stem extends (increasing/decreasing)
- Limit value monitoring:
 - The valve is closed by the actuator when the maximum adjustable limit value is exceeded
 - The frost protection function is started when the temperature falls below the minimum adjustable limit
- Configuration, parameterization, diagnostic function and direct connection for monitoring over TROVIS-VIEW software:
 - Direct data transmission over a connecting cable (direct connection to PC)
 - Data transmission over a memory pen
- Special valve version available for small tapping amounts

Accessories

- TROVIS-VIEW configuration software (6661-1062) for Type 5757 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 5207-0060 Pt 1000 Sensor
- Sensor pocket, order no. 1990-9249
- Flow rate sensor with extension cable with mating connector, order no. 1400-9246
- Flow switch, order no. 1400-9247



Fig. 1 · Type 5757 Controller with Electric Actuator

Note:

Refer to Data Sheets T 5766 EN, T 5767 EN, T 5794 EN, T 5763 EN and T 5761 EN for more details about Types 3222, 3222 N, 3267, 3226 and 3260 Valves.

Principle of operation (Fig. 2)

The actuator consists of a digital controller which is integrated into the electric actuator housing.

The digital controller is connected to a temperature sensor on the input side which can be optionally upgraded by a flow rate sensor or a flow switch.

In addition to the temperature sensor input, the actuator has a 0(4) to 20 mA current input. This can be used either instead of the temperature sensor or to connect an external reference variable.

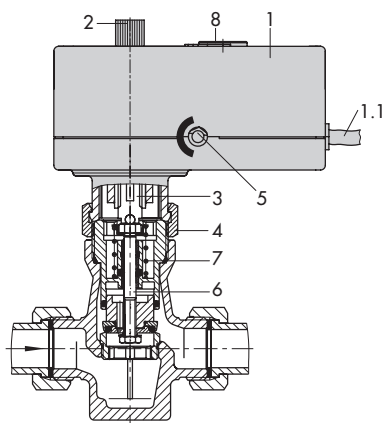
The set points W1 and W2 of the digital controller are set to 60 °C and 70 °C respectively and can be changed like all other settings with the help of the TROVIS-VIEW configuration software.

The output signal of the digital controller functions as a three-point stepping 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 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 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.



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

Fig. 2 · Functional diagram

Electrical equipment

The actuator requires a Pt 1000 temperature sensor (e.g. Type 5207-0060) to be connected for it to function. The fast-responding Pt 1000 sensor allows the temperature to be controlled to the corresponding set point almost immediately. Two set points W1 and W2 can be used. A binary input is used to switch between the set points.

The use of the Type 5207-0060 Pt 1000 Sensor is recommended in conjunction with a sensor pocket to provide the best positioning of the temperature sensor at the heat exchanger.

The 0(4) to 20 mA current input can be used in place of the Pt 1000 sensor for control purposes or as the reference variable.

In addition, a flow rate sensor or a flow switch can be connected to quickly recognize when hot water is being tapped or to improve the control accuracy even further.

Fig. 5 shows a typical application.

For **versions with a switching output**, this output can be configured as either a pump output (circulation pump for the DHW circuit or heating circuit), a fault alarm output or an output to report when hot water is tapped.

Installation

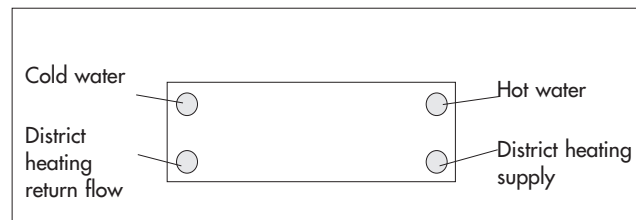
Prior to mounting the actuator on the valve, retract the actuator stem. The coupling nut may only be tightened after the stem has been retracted.

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

Note for operation without circulation circuit

The heat exchanger should be installed in a horizontal position with the connections at the side to protect the hot water system against hot water accumulation when operated from standstill and to prevent limescale in the heat exchanger.

First consult the heat exchanger manufacturer concerning this mounting position and the intended effect.



Note on tapping small amounts of hot water

A special version of Type 3222/5757 (DN 25, $K_{vs} = 2.5$, with Type 3222 N $K_{vs} = 2$) with a special plug design is available for small installations (apartment or single-family house). This allows even small tapping amounts to be controlled properly.

Electrical connection

2 cables both 2.5 m long, cable ends with wire end ferrules.

Any wires that are not used need to be insulated.

Ordering text

Type 5757 Controller with Electric Actuator

Digital controller settings

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

Configuration	Default setting
F 01 – DHW tapping recognition 0: Continuous control 1: Flow sensor active	1
F 02 – Flow sensor 0: Flow switch 1: Flow rate sensor	1
F 03 – Adaptation 0: Passive 1: Active	1
F 04 – Operating direction 0: Increasing/increasing 1: Increasing/decreasing	0
F 05 – Current input 0: Passive 1: Active	0
F 06 – Function of current input 0: Actual value 1: Set point	0
F 07 – Measuring range of current input 0: 0 to 20 mA 1: 4 to 20 mA	0
F 08 – Function of binary input 0: End function to maintain heat exchanger at a constant temperature 1: Switchover between set points	0
F 09 – Maintaining heat exchanger at a constant temperature 0: Time adjustable 1: Continuous	0
F 10 – Upper limit value GWH 0: No limitation 1: GWH sets Y to 0 %	0
F 11 – Lower limit value GWL 0: No frost protection 1: GWL starts frost protection	0
F 16 – Function of switching output 1: Passive 2: Fault indication 3: Circulation pump (DHW) 4: Circulation pump (heating circuit) 5: Tapping	1

Parameters	Default setting
P 01 – Set point W1 0.0 to 100.0 °C	60.0 °C
P 02 – Set point W2 0.0 to 100.0 °C	70.0 °C
P 03 – Lower measuring range value Xmin -50.0 to 90.0 °C	0.0 °C
P 04 – Upper measuring range value Xmax 10.0 to 150.0 °C	100.0 °C
P 05 – Upper limit value GWH 0.0 to 100.0 °C	95.0 °C
P 06 – Lower limit value GWL 0.0 to 20.0 °C	5.0 °C
P 07 – Proportional gain Kp 0.1 to 50.0 °C	0.8 °C
P 08 – Reset time Tn 0 to 999 s	15 s
P 09 – Derivative-action time Tv 0 to 999 s	0 s
P 10 – Actuator transit time Ty 10 to 240 s	25 s
P 11 – Set-back difference 0 to 30 K	8 K
P 12 – Heating period for heat exchanger 0 to 48 h	24 h

Technical data · Controller with Electric Actuator

Type 5757 Controller with Electric Actuator	
Connection to valve	Force locking
Rated travel	6 mm
Transit time for rated travel	20 s
Nominal thrust	300 N
Supply voltage	230 V ($\pm 10\%$)/50 Hz
Power consumption	Approx. 3 VA
Class of protection	II
Manual adjustment	Yes
Perm. ambient temperature	0 to 50 °C
Perm. storage temperature	-20 to 70 °C
Degree of protection	IP 42
Mounting position	Any position except suspended
Noise immunity	EN 61000-6-2
Noise emission	EN 61000-6-3
Weight	Approx. 0.7 kg
Binary input BE1 ¹⁾	Set point switchover
Binary input BE2 ¹⁾	Flow switch
Control input	0 (4) to 20 mA
Version with switching output	
Switching output	230 V/50 Hz, 1 A
Additional electrical equipment	
Temperature sensor	Pt 1000: -50 to 150 °C
Flow rate sensor	530 pulses/l
Flow switch	Floating contact

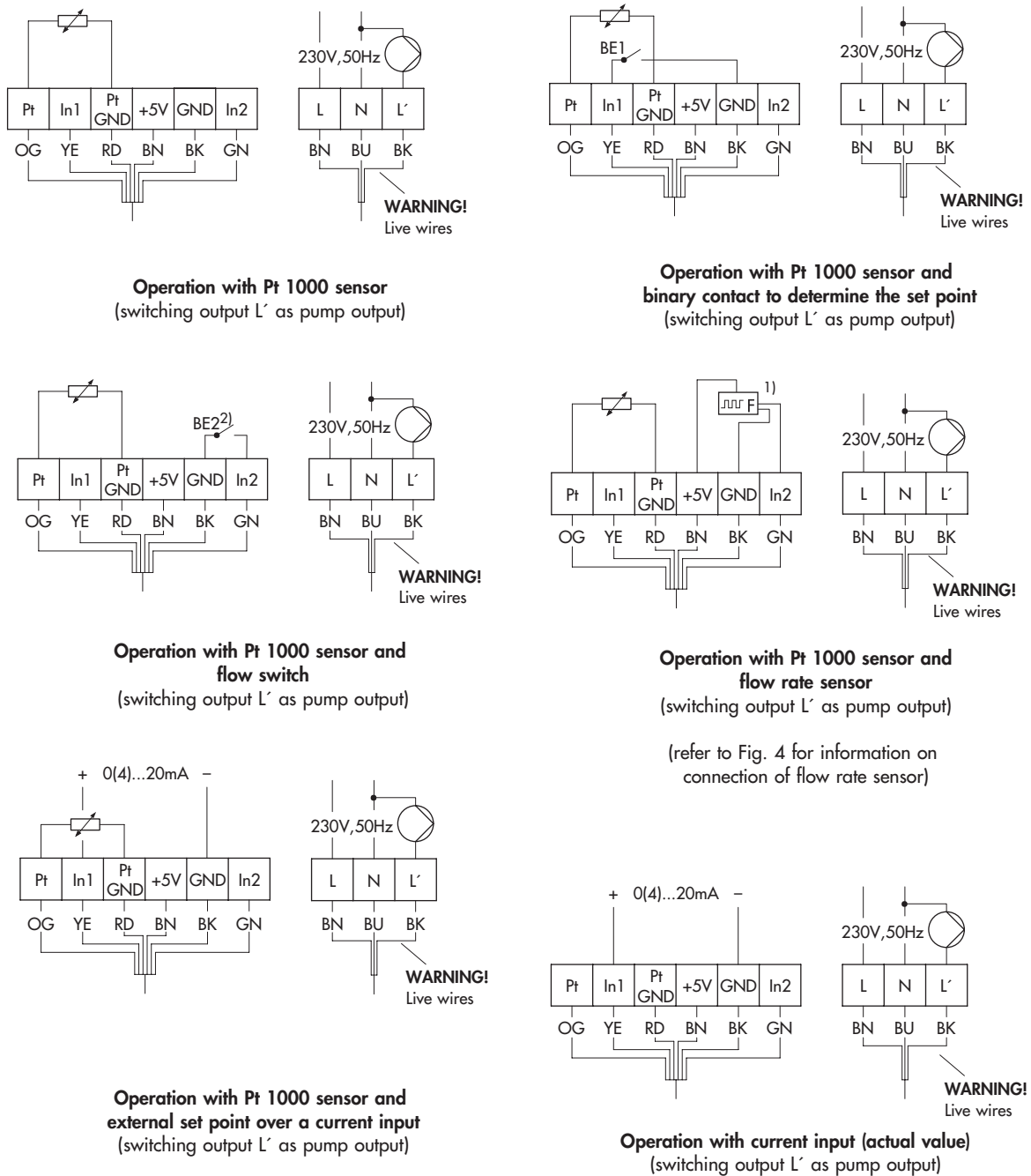
¹⁾ Recommendation: Use devices with gold contacts when using relays

Technical data · Accessories

Type 5207-0060 Pt 1000 Sensor	
Optimized temperature sensor with fast response which is simple to install	
Connection	Wire ends fitted with wire end ferrules with plastic sleeves
Connecting lead	PVC, 2000 mm long
Perm. ambient temperature	-5 to 80 °C
Perm. medium temperature	-5 to 90 °C
Threaded connection	Male thread G ¼, brass (2.0401.20)
Protective tubing	Stainless steel Inconel 600 (2.4816)
Time response	$t_{0.5} < 1 \text{ s}$ · $t_{0.9} < 3 \text{ s}$, in water 0.4 m/s
Thread length	52 mm
Nominal pressure	PN 16
Sensor pocket, order no. 1400-9249	
For Type 5207-0060 Pt 1000 Sensor for mounting on the heat exchanger, to provide the best positioning in DHW heating in instantaneous heating systems	
Material	Red brass CC491K (2.1096.01)
Threaded connection	Male thread G ¾ Female thread G ¼ Coupling nut G ¾
Nominal pressure	PN 16
Flow rate sensor with extension cable, order no. 1400-9246	
Axial turbine flowmeter for liquids	
Measuring range	1 to 30 l/min
Measuring accuracy	$\pm 1\%$ of upper measuring range value
Threaded connection	Male thread G ¾
Nominal size	DN 10
Nominal pressure	PN 10
Max. medium temperature	70 °C, briefly 90 °C
Supply voltage	4.5 to 24 V DC
Degree of protection	IP 54
Electrical connection	3 single wires with connector (JST) approx. 150 mm long
Sensor	Hall sensor
Pressure loss	0.25 bar at 15 l/min
Pipe socket/vane wheel	PPO Noryl
Flow switch, order no. 1400-9247	
Electrical connection	Wire ends fitted with wire end ferrules
Connecting lead	PVC, length 1500 mm
Mechanical connection	Male thread G ½ Coupling nut G ¾
Switching point	2.5 \pm 0.5 l/min increasing = closing
Pressure loss	0.25 bar at 15 l/min
Mounting position	Horizontal

Specifications subject to change without notice.

Electrical connection



- | | |
|---------------------|-----------|
| 1) Flow rate sensor | OR orange |
| 2) Flow switch | YE yellow |
| | RD red |
| | BN brown |
| | GN green |
| | BK black |
| | BU blue |

Note:

The switching output L' can be configured as a pump output, a fault alarm output or as an output to report when hot water is tapped.

Fig. 3 · Electrical connection of various applications

Information on connection of flow rate sensor

Connection of flow rate sensor (WSS)

WSS	Extension cable	Type 5757
GND BK	BN	BK GND
Signal GN	GN	GN Signal
5 V WH	WH	BN 5 V

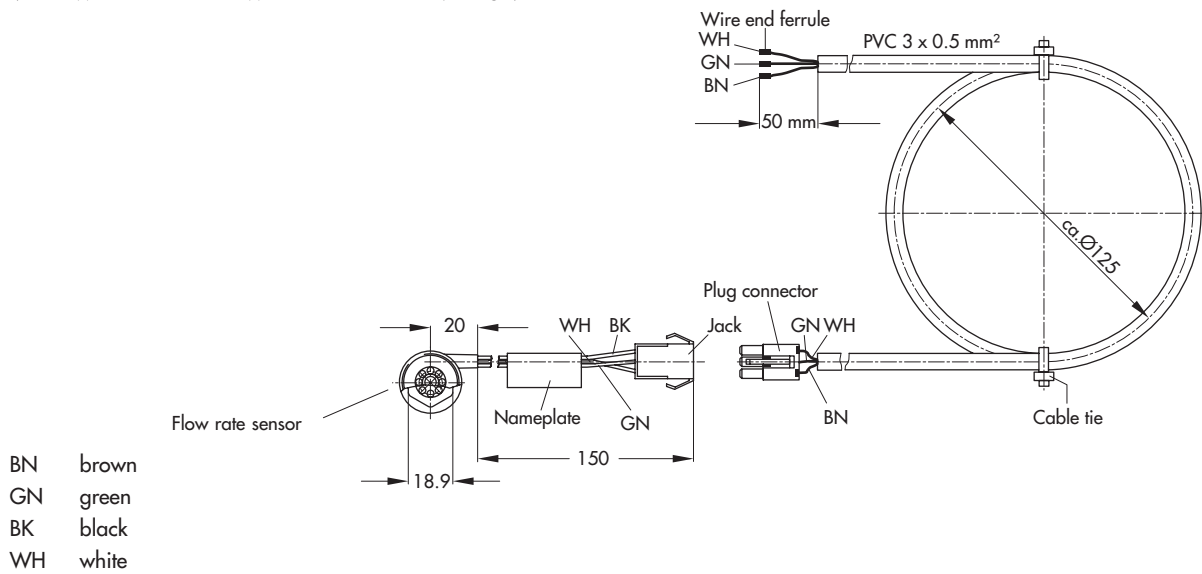


Fig. 4 · Connection of flow rate sensor (WSS)

Typical application

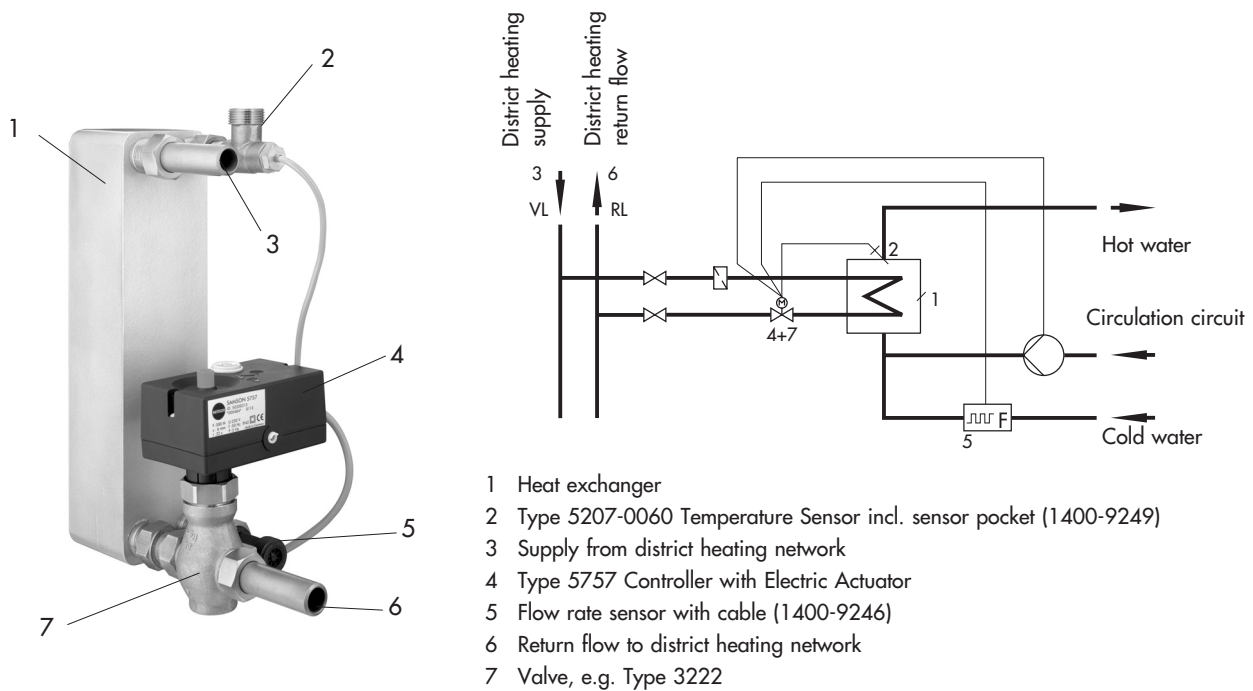
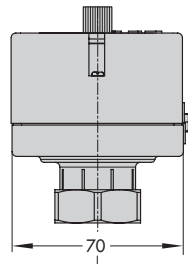
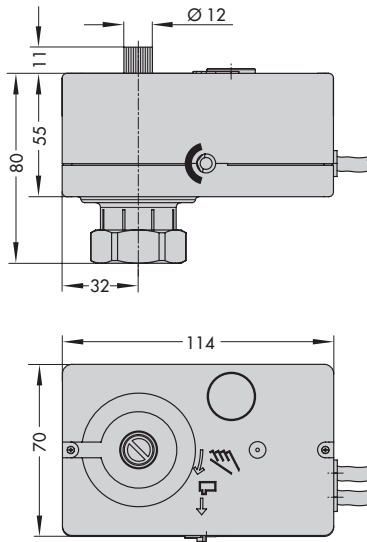


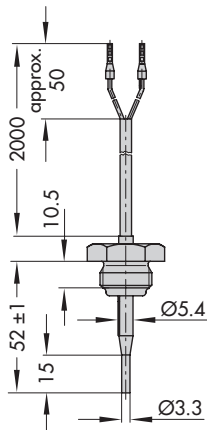
Fig. 5 · Typical application: Type 5757 with Type 5207-0060 Pt 1000 Sensor incl. sensor pocket and flow rate sensor

Type 5757

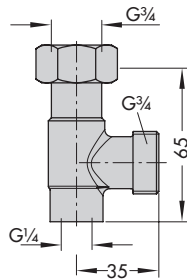


eL Actuator stem retracts

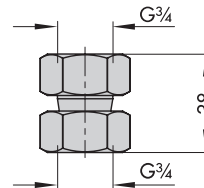
aL Actuator stem extends



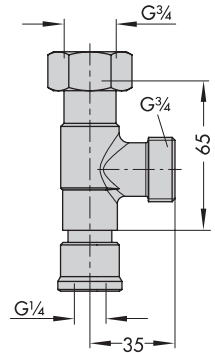
Type 5207-0060 Temperature sensor (Pt 1000)



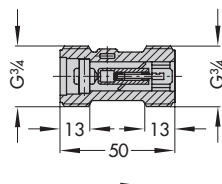
Sensor pocket (incl. gasket) for heat exchanger with G 3/4 (order no.1400-9249)



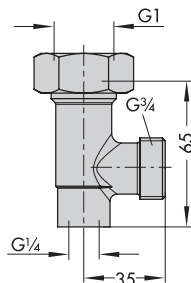
Connecting piece (incl. gasket) for valve G 3/4 (order no.1400-9236)



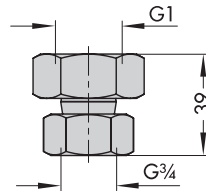
Circulation circuit connection (incl. gasket) (order no. 1400-9232)



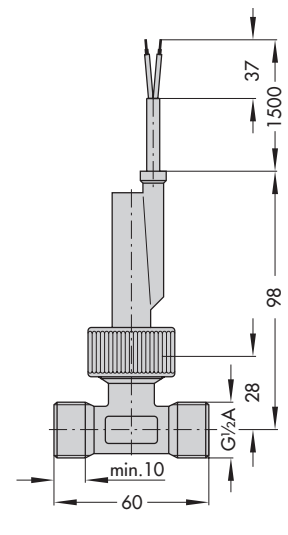
Flow rate sensor with extension cable (order no.1400-9246)



Sensor pocket (incl. gasket) for heat exchanger with G 1 (order no.1400-9252)



Connecting piece (incl. gasket) for valve G 1 (order no.1400-9237)



Flow switch (order no.1400-9247)



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