# Controller with Electric Actuator
# Type 5724 without safety function
# Type 5725 with safety function

SAMSON



*Fig. 1 · Type 5724 Controller with Electric Actuator*

# Mounting and
# Operating Instructions

# EB 5724 EN

Firmware version 1.0x

Edition July 2008

CE (DIN Geprüft)

## Contents

## General safety instructions

▶ *Assembly, start-up and operation of this device may only be performed by trained and experienced personnel familiar with the product.*
*According to these mounting and operating instructions, trained personnel refers to individuals who are able to judge the work they are assigned to and recognize possible hazards due to their specialized training, their knowledge and experience as well as their knowledge of the applicable standards.*

▶ *Any hazards which could be caused in the connected valve by the process medium, operating pressure or moving parts are to be prevented by means of the appropriate measures.*

▶ *Proper shipping and appropriate storage of the device are assumed.*

▶ *The electric actuators have been designed for use in electrical power installations. For wiring and maintenance, you are required to observe the relevant safety regulations. Only use power interruption devices which are protected against unintentional reconnection of the power supply.*

▶ **Note:**
*Actuators with a CE marking fulfill the requirements of the Directives 94/9/EC and 89/336/EEC.*
*The Declaration of Conformity is available on request.*

# 1  Design and principle of operation

The Type 5724/5725 Controller with Electric Actuators consist of an actuator and a digital controller integrated into the housing. They are especially designed for domestic hot water heating in instantaneous heating systems in small to medium-sized buildings and for fixed set point control circuits in mechanical engineering applications.
They are particularly suitable for mounting to SAMSON Types 3213, 3214, 3260, 3222 and 3226 Valves. Special versions of Types 3222 (DN 15) and 3222 N (DN 15) Valves with a specially designed plug can be used for small buildings (apartments or single-family dwellings). They ensure that even small amounts of tapped hot water can be regulated properly.
The input of the integrated digital controller is connected to a temperature sensor which can optionally be upgraded by a flow rate sensor or flow switch.
In mechanical engineering applications, an mA signal can alternatively be used.
The set point of the controller is set at 60 °C and can be manually changed at the set point potentiometer (11) or over the TROVIS-VIEW Operator Interface.
The electric actuator consists of a reversible synchronous motor and maintenance-free gearing.
A coupling nut (4) provides a force-locking connection between the actuator and the plug stem of the valve. For form-fit attachment, a stem connector is used.

## Type 5724 without safety function

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. The motor is switched off by torque-dependent switches when an end position is reached or in case the motor is overloaded.



1   Controller with actuator
1.1 Front cover
1.2 Cable entry
2   Handwheel
    (Type 5724 only)
3   Actuator stem
4   Coupling nut
8   Spring assembly
    (Type 5725 only)
9   Scale for travel indication
11  Set point potentiometer
12  Serial interface
    (RJ-12 jack)

*Caution!*
*Do not open the back housing cover!*

Fig. 2 · Type 5724/5725 Controller with Electric Actuator (front cover open), with force-locking attachment to valve

When the actuator stem retracts in actuators with force-locking connection, the plug stem follows the movement of the spring installed in the valve, causing it to retract.
The valve can be manually moved to the required position with the handwheel (2).

**Type 5725 with safety function**
The controller with electric actuator **with safety function** is basically the same as Type 5724. However, it contains a spring assembly (8) and an electromagnet. When the control voltage at the electromagnet is interrupted, the actuator moves to fail-safe position because the electromagnet voltage drops, causing the coupling between gear and actuator motor to be disengaged. The actuator stem is completely moved in the direction OUT by the spring mechanism. A mounted globe valve is closed (fail-safe position).

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*Caution!*
*Do not use the magnet for control tasks.*

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In Type 5725, there is no handwheel (2) on the housing cover. Manual override is possible, after removing the front cover, using a 4 mm hex screwdriver (section 4.1.2).

**Typetesting**
Type 5725 Controller with Electric Actuator is typetested in the force-locking version together with various SAMSON valves by the German Technical Inspectorate (TÜV) according to DIN 32730.
The register number is written on the nameplate.

## 1.1 Accessories

**Communication** (refer to section 8)

▶ **TROVIS-VIEW** Configuration and Operator Interface (6661-1060) for Type 5724 and Type 5725 Controller with Electric Actuator
▶ **Hardware package**
Accessories for direct and indirect data transmission (including a memory pen, connecting cable and modular adapter), order no. 1400-7704
▶ **Memory pen**
Indirect data transmission, order no. 1400-7697

**DHW in instantaneous heating system**

▶ Type 5207-0060 **Temperature Sensor**, optimized Pt 1000 temperature sensor with fast response time and easy to install
▶ **Sensor pocket**
for Type 5207-0060 Pt 1000 Sensor to mount it at the heat exchanger with G ¾ thread in the best position for DHW heating in instantaneous heating system (order no. 1400-9249)
▶ **Flow rate sensor**,
Axial turbine flowmeter for liquids with extension cable and mating connector (order no. 1400-9246)
▶ **Flow switch**
for recognizing when hot water is being tapped (order no. 1400-9247)

## 1.2 Technical data

| Controller with Electric Actuator | Type | 5724 | | | | | | 5725 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | -10 | -13 | -20 | -23 | -30 | -33 | -10 | -13 | -20 | -23 | -30 | -33 |
| Safety function | | Without | | | | | | With | | | | | |
| Connection to valve | | Force-locking | | | | Form-fit | | Force-locking | | | | Form-fit | |
| Rated travel | mm | 6 | 6 | 12 | 12 | 15 | 15 | 6 | 6 | 12 | 12 | 15 | 15 |
| Transit time for rated travel | s | 35 | 18 | 70 | 35 | 90 | 45 | 35 | 18 | 70 | 35 | 90 | 45 |
| Transit time in case of fail-safe action | s | – | | | | | | 4 | | 6 | | 7 | |
| Fail-safe action | | – | | | | | | Stem extends | | | | | |
| Nominal thrust | N | 700 | | | | | | 500 | | | | 280 | |
| Power supply | | 230 V (±10 %), 50 Hz | | | | | | 230 V (±10 %), 50 Hz | | | | | |
| Power consumption, approx. | VA | 3 | 7 | 3 | 7 | 3 | 7 | 5 | 9 | 5 | 9 | 5 | 9 |
| Manual override | | Yes | | | | | | Possible [1] | | | | | |
| Permissible ambient temperature | | 0 to 50 °C | | | | | | 0 to 50 °C | | | | | |
| Permissible storage temperature | | −20 to 70 °C | | | | | | −20 to 70 °C | | | | | |
| Perm. temperature at connecting stem | | 0 to 130 °C | | | | | | 0 to 130 °C | | | | | |
| Degree of protection (upright position) | | IP 54 | | | | | | IP 54 | | | | | |
| Noise immunity | | EN 61000-6-2 | | | | | | EN 61000-6-2 | | | | | |
| Noise emission | | EN 61000-6-3 | | | | | | EN 61000-6-3 | | | | | |
| Weight, approx. | | 1.1 kg | | | | | | 1.3 kg | | | | | |
| **Additional electrical equipment** | | | | | | | | | | | | | |
| Temperature sensor | | Pt 1000 | | | | | | | | | | | |
| Flow rate sensor | | 530 pulses/l, measuring range 1 to 30 l/min | | | | | | | | | | | |
| Flow switch [2] | | Yes · Alternative to flow rate sensor | | | | | | | | | | | |
| Binary input BE1 | | Floating contact to switch between internal set points or to deactivate the function to keep DHW temperature constant | | | | | | | | | | | |
| Binary input BE2 | | Flow switch | | | | | | | | | | | |
| Binary output | | 230 V/50 Hz, max. 1 A | | | | | | | | | | | |

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

[2] The flow switch or flow rate sensor is not required in DHW heating in instantaneous systems with a constant circulation.

# 2    Attachment to valve

Depending on the version of the valve, the actuator is connected to the valve either over a force-locking connection or over a form-fit connection using as a stem connector.
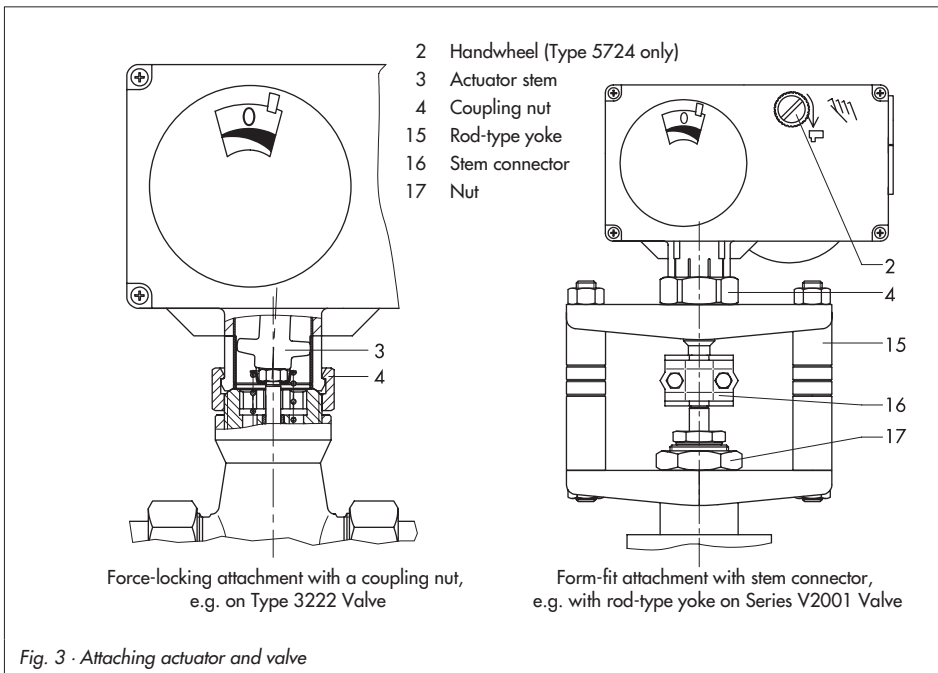
## 2.1    Type 5724

## 2.1.1 Force-locking attachment

1. Retract the actuator stem (3) by turning the handwheel (2) counterclockwise.

2. Position the actuator on the valve connection and tighten coupling nut (4) with a tightening torque of 20 Nm.

## 2.1.2 Form-fit attachment

1. Place actuator on the rod-type yoke (15) and tighten the coupling nut (4) with a tightening torque of 20 Nm.

2. Place actuator with yoke (15) on the valve and tighten the nut (17) with a minimum tightening torque of 150 Nm.

3. Pull plug stem until it reaches the actuator stem or extend actuator stem using the handwheel (2).

4. Position the clamps of the stem connector (16) included in the accessories on the ends of the actuator stem and plug stem and fasten tight.



2   Handwheel (Type 5724 only)
3   Actuator stem
4   Coupling nut
15  Rod-type yoke
16  Stem connector
17  Nut

Force-locking attachment with a coupling nut, e.g. on Type 3222 Valve

Form-fit attachment with stem connector, e.g. with rod-type yoke on Series V2001 Valve

Fig. 3 · Attaching actuator and valve

## 2.2 Type 5725

### 2.2.1 Force-locking attachment

1. Unfasten front cover and place a 4 mm hex screwdriver on the red actuating shaft.

2. Turn screwdriver **counterclockwise only** and only up to the final travel value at the point where the torque switch is activated (switching off the synchronous motor).

   ---
   *Caution!*
   *Turning the actuator too far will destroy it.*

   ---

3. Hold the screwdriver in place and fasten valve and actuator together using the coupling nut (tightening torque 20 Nm).

4. Remove screwdriver and carefully screw back on the front cover.

### 2.2.2 Form-fit attachment

Proceed as described in section 2.1.2.

## 2.3 Mounting position

The control valve must be mounted in the pipeline with the actuator on top to achieve the stated degree of protection.

## 2.4 Travel indicator scale

The travel indicator scale has two opposed scales for adaptation to different valve versions. Which scale should be used depends on the valve version (Fig. 4):

**Globe and three-way <u>diverting</u> valves**

The driving pin is in position 0 (delivered state).

**Three-way <u>mixing</u> valves**

Remove scale, turn it and replace it so that the pin is positioned over the appropriate hole (6, 12 or 15) corresponding to the rated travel (6 mm, 12 mm or 15 mm travel).
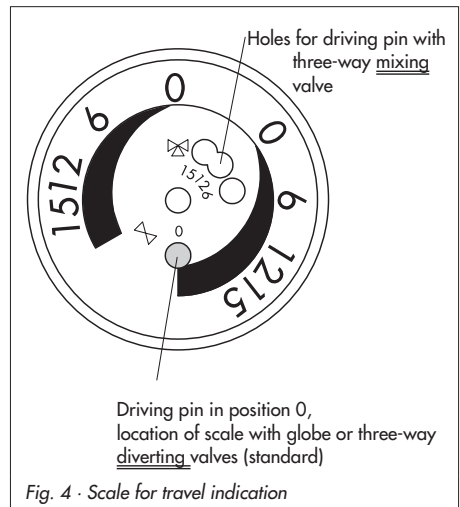


Fig. 4 · Scale for travel indication

# 3    Electrical connection

⚠ ⚡ *For installation of the electric cables, you are required to observe the regulations for electrical power systems according to DIN VDE 0100 as well as the regulations of your local power supplier.*
*Use a suitable power supply which guarantees that no dangerous voltages from the system or parts of the system reach the device in standard operation or in the event of a fault.*

*Caution!*
*Only connect the device to the main power network when the power is switched off. Make sure the power cannot be switched on unintentionally!*

The controller with electric actuator requires a Pt 1000 temperature sensor to be connected for it to function.

Two set points W1 and W2 can be used for DHW temperature control. The binary input BE1 is used to switch between the set points.

Additionally, a flow rate sensor or a flow switch can be connected to quickly recognize when hot water is being tapped.

Alternatively, a 0(4) to 20 mA current input can be used instead of the Pt 1000 sensor for control in mechanical engineering applications.

The connected temperature sensor and the current input configured as 4 to 20 mA are monitored for line breakages.
A fault in the line of a sensor is indicated by the red LED blinking slowly.

*Note!*
*Line breakages cannot be detected when a 0 to 20 mA signal is used.*

▶ Perform the electrical wiring as required by the application according to one of the following wiring diagrams (Fig. 5). As soon as the actuator is connected to the power supply, the initialization procedure starts:
The actuator stem extends (with direction of action increasing/increasing) and the red and yellow LEDs located underneath the serial interface light up.
As soon as the actuator stem has reached the final position, the red LED is turned off. The yellow LED remains illuminated and indicates that the controller with electric actuator is ready for operation.
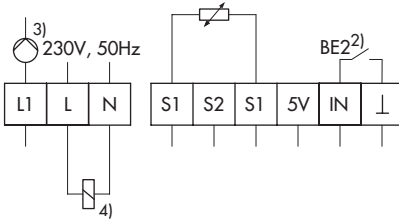
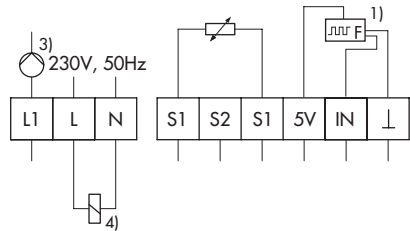**DHW heating in instantaneous heating system**
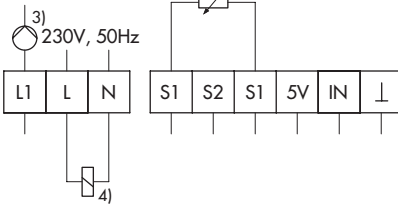
Operation with Pt 1000 sensor
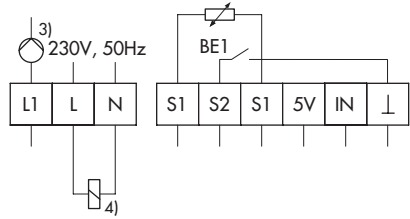
Operation with Pt 1000 sensor and
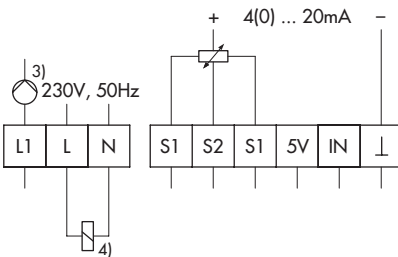binary contact for switching between set points

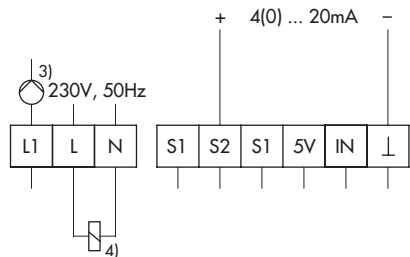Operation with Pt 1000 sensor and
flow switch

Operation with Pt 1000 sensor
and flow rate sensor
(refer to Fig. 6 on the connection of a flow rate sensor)

**Mechanical engineering applications**

Operation with Pt 1000 sensor and
external set point over an mA signal input

Operation with mA sensor input

[1] Flow rate sensor
[2] Flow switch
[3] Pump control or fault alarm output
[4] Electromagnet, for Type 5725 only

*Fig. 5 · Electrical connections*

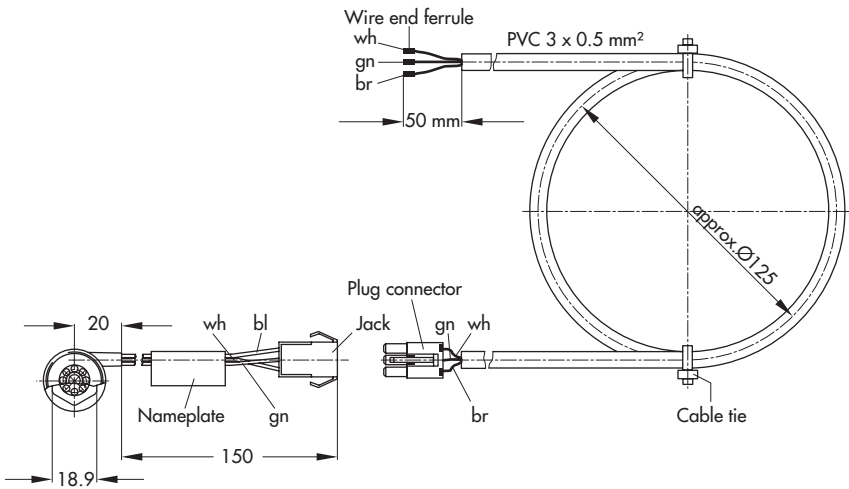**\* Connection of the flow rate sensor (WSS)**

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

Controller with electric
actuator

| **WSS** | **Extension cable** | **Type 5724/25** |
|---|---|---|
| GND | – bl —— br —— | —— ⊥ |
| Signal | – gn —— gn —— | —— IN |
| 5 V | – wh —— wh —— | —— 5V |

Wire end ferrule
wh
gn
br

PVC 3 x 0.5 mm²

50 mm

approx. Ø125

20    wh   bl

Nameplate    gn

Plug connector

Jack    gn  wh

br

Cable tie

150

18.9

br   brown
gn   green
bl   black
wh   white

*Fig. 6 · Connection of flow rate sensor*

# 4 Manual operation without TROVIS-VIEW

## 4.1 Changing the travel position

Direction of action and travel can be read off the travel indication scale (Fig. 7).
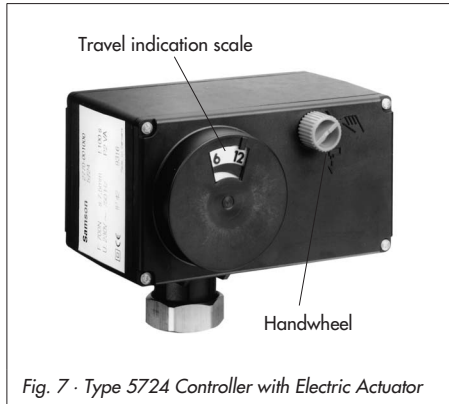


Fig. 7 · Type 5724 Controller with Electric Actuator

## 4.1.1 Type 5724

Use the handwheel to adjust the travel (Fig. 7):

▷ Turn clockwise ⇒ Actuator stem extends (approx. 4 turns for 1 mm travel)
▷ Turn counterclockwise ⇒ Actuator stem retracts (approx. 4 turns for 1 mm travel)

## 4.1.2 Type 5725

*Caution!*
*The actuator is live.*

1. Unfasten front cover and place a 4 mm hex screwdriver on the red actuating shaft.

2. Turn the screwdriver **clockwise only,** and only up to the final travel value at the point where the torque switch is activated (switching off the synchronous motor).

*Caution!*
*Turning the actuator too far will destroy it.*

After the safety release of the magnet, the actuator cannot hold the position. The spring assembly pushes the actuator stem back into the fail-safe position (actuator stem extends).

4. Remove screwdriver and carefully screw back on the front cover.

## 4.2   Changing set point W1

The default setting of the set point W1 is 60 °C and set point W2 70 °C.
These set point can be altered in the TROVIS-VIEW interface.

To manually adjust the W1 set point without TROVIS-VIEW, turn the set point potentiometer (11 in Fig. 2) located on the board of the actuator. The adjustable setting range is between 10 and 100 % of the measuring range (default: lower measuring range value Xmin = 0 °C and upper measuring range value Xmax = 100 °C).
In the delivered state, the set point potentiometer is set to 0 %, i.e. it does not have any effect on W1 set point (60 °C).

*Note:*
– *The set point potentiometer only takes effect when the actual value originates from a Pt 1000 sensor. In the combination with **F05 - 1** (Current input active) and **F06 - 1** (Current input function = set point), the set point potentiometer is not active.*
– *The manually adjusted value at the set point potentiometer for W1 is only used for control if function block F12 in TROVIS-VIEW is set to 1 (Set point potentiometer automatic: Manual setting effective, if above 10 %) , see section 6.10. The required setting **F12 - 1** is the default setting.*
– *The W2 set point can only be changed in TROVIS-VIEW.*

1. Unfasten front cover.

2. Set W1 set point as required at the set point potentiometer (11 in Fig. 2).
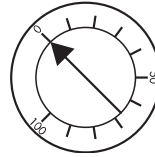


   Setting range: 0 to 100 % of the measuring range (default setting 0 to 100 °C)
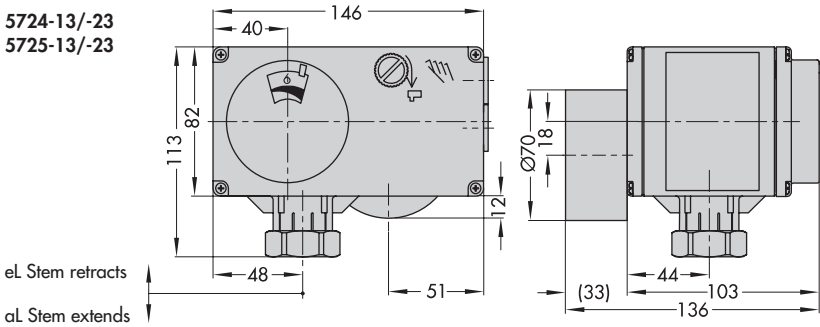   **Do not forget to check the set point potentiometer automatic function.**

3. Carefully refasten the front cover.
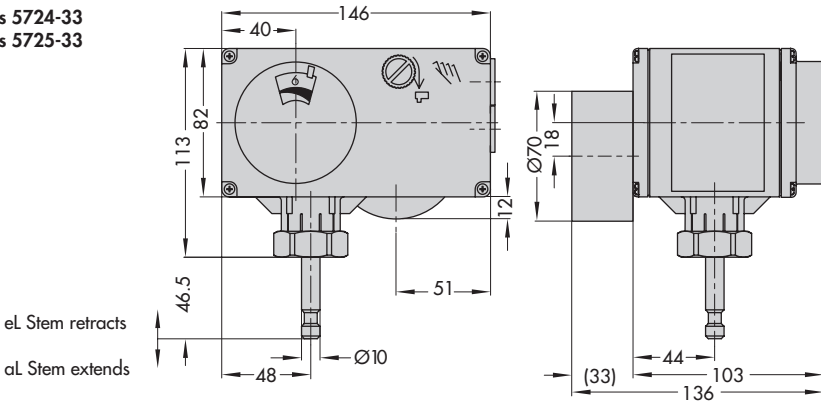
**Set point potentiometer automatic function**

▸ Any setting **below 10 %** at the set point potentiometer is ignored by the controller. The controller uses the W1 set point from the parameter list (TROVIS-VIEW interface) for control.
▸ Any setting **above 10 %** at the set point potentiometer is used by the controller for control. The W1 set point entered in TROVIS-VIEW is ignored.
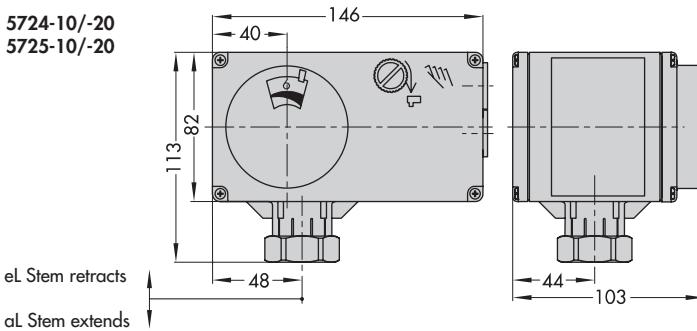
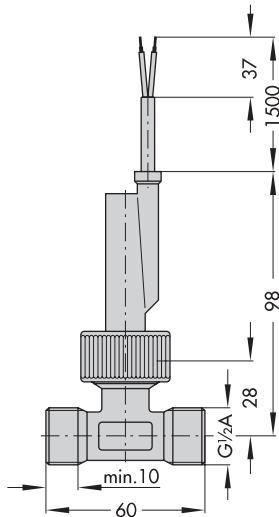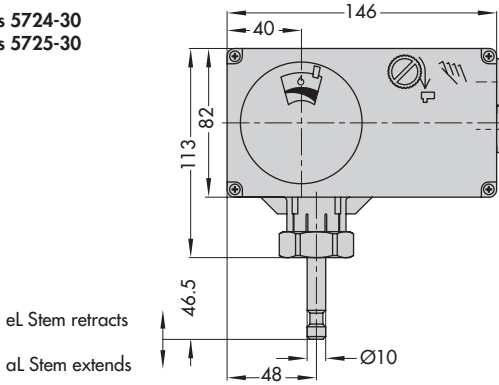# 5    Dimensions in mm

**Types 5724-13/-23**
**Types 5725-13/-23**



eL Stem retracts
aL Stem extends

**Types 5724-33**
**Types 5725-33**



eL Stem retracts
aL Stem extends

**Types 5724-10/-20**
**Types 5725-10/-20**



eL Stem retracts
aL Stem extends

**Types 5724-30**
**Types 5725-30**

146
40
82
113
46.5
Ø10
48

eL Stem retracts

aL Stem extends

37
1500
98
28
G½A
min.10
60

**Flow switch**
(order no. 1400-9247)
Switching point: 2.5 ± 0.5 l/min
increasing/closing
Horizontal mounting position!

**Accessories for domestic hot water heating:**
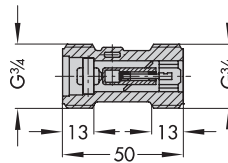
approx. 50
2000
10.5
52 ±1
15
Ø5.4
Ø3.3
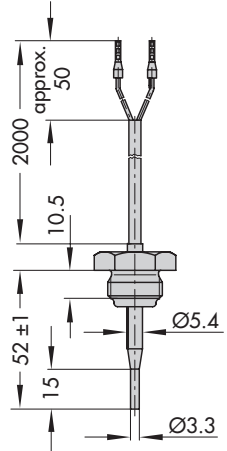
**Type 5207-0060 Temperature Sensor (Pt 1000)**
Response times: $t_{0.5} < 1$ s,
$t_{0,9} < 3$ s; in water 0.4 m/s
PN 16
max. medium temperature: 80 °C

G¾
G¾
13
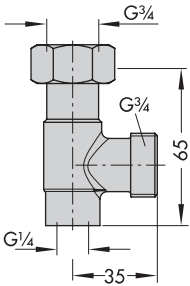13
50

**Flow rate sensor with extension cable**
(order no. 1400-9246)
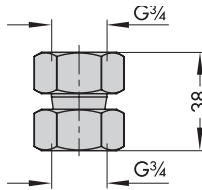Measuring range: 1 to 30 l/min,
DN 10, PN 10, IP 54
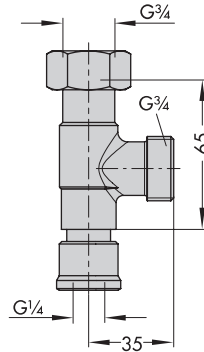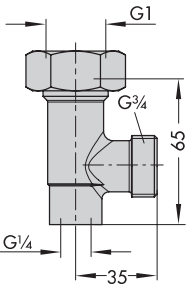max. medium temperature: 70 °C
2 m extension cable

G¾

G¾

65

G¼

35

**Sensor pocket** (incl. gasket)
for heat exchanger with G ¾
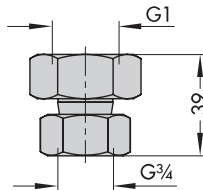(order no. 1400-9249)

G¾

G¾

38

**Connecting piece** (incl. gasket)
for valve G ¾
(order no. 1400-9236)

G¾

G¾

65

G¼

35

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

G1

G¾

65

G¼

35

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

G1

G¾

39

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

# 6 Functions

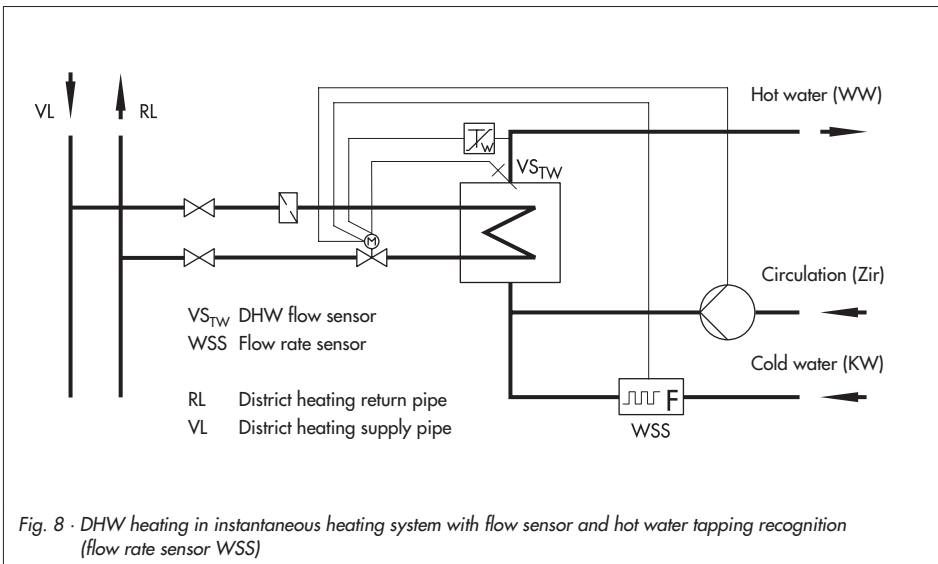Functions and parameters are entered in the TROVIS-VIEW Operator Interface (see section 7).

## 6.1 Domestic hot water heating in instantaneous heating system

In DHW heating in instantaneous heating systems, the hot water temperature is regulated to the selected set point:

▶ When the DHW temperature drops below the *Set point*, the actuator opens the valve to increase the DHW temperature.
▶ When the DHW temperature exceeds the *Set point*, the actuator closes the valve to reduce the DHW temperature.

| Function | WE | Configuration |
|---|---|---|
| F01 – Hot water tapping recognition | 1 | F01 - 0 |

| Parameter | WE | Range of values |
|---|---|---|
| P01 – W1 set point | 60 °C | 0 to 100 °C |
| P02 – W2 set point | 70 °C | 0 to 100 °C |



Fig. 8 · DHW heating in instantaneous heating system with flow sensor and hot water tapping recognition (flow rate sensor WSS)

**Application with DHW flow sensor**

A Pt 1000 temperature sensor (e.g. Type 5207-0060, ideally in combination with a sensor pocket to optimally position the sensor at the heat exchanger) measures the DHW temperature at the heat exchanger. The measured temperature is compared to the set point and the valve is open/closed to achieve the set point temperature (as described previously).

**Application with current input**

The actual flow temperature can also be input over the current input (0 to 20 mA or 4 to 20 mA) instead of the flow sensor. The input signal is based on the measuring range ($X_{min}$ to $X_{max}$). The measured DHW temperature (actual temperature) is compared to the set point and the valve is open/closed to achieve the set point temperature (as described previously).

*Note!*
*The function to keep the hot water temperature constant (see section 6.3) is not possible with an active current input.*

| Functions | WE | Configuration |
|---|---|---|
| F05 – Current input | 0 | F05 - 1 |
| F06 – Current input function | 0 | F06 - 0 |
| F07 – Measuring range of current input | 0 | F07 - 0: 0 to 20 mA<br>F07 - 1: 4 to 20 mA |

| Parameters | WE | Range of values |
|---|---|---|
| P03 – Lower measuring range value $X_{min}$ | 0 °C | 0 to 60 °C |
| P04 – Upper measuring range value $X_{max}$ | 100 °C | 95 to 150 °C |

## 6.1.1 Hot water tapping recognition with flow switch

The flow switch registers the start and end of hot water tapping. When the contact is closed, the pump starts to run; the DHW temperature control at the DHW flow sensor is active. When the contact is open, the valve closes and the pump is switched off.

| Functions | WE | Configuration |
|---|---|---|
| F01 – Hot water tapping recognition | 1 | F01 - 1 |
| F02 – Flow sensor | 1 | F02 - 0 |

## 6.1.2 Hot water tapping recognition with flow rate sensor

In contrast to the hot water tapping recognition with flow switch, the flow rate sensor registers the extent of the tapping as well as the start and end of the hot water tapping.

By activating the **Adaptation** function, the controller with electric actuator adapts itself automatically to the changing network conditions without having to change the control parameters (see section 6.6). The optimization function can only be activated when a flow rate sensor is used.

| Functions | WE | Configuration |
|---|---|---|
| F01 – Hot water tapping recognition | 1 | F01 - 1 |
| F02 – Flow sensor | 1 | F02 - 1 |
| F03 – Adaptation | 1 | F03 - 1 |

## 6.2 Switching between set points

The controller with actuator can use two different set points W1 and W2 for control, e.g. to regulate the hot water temperature for normal use and the hot water temperature for thermal disinfection. The change between the set points is made over the binary input (BE1):

▸ BE1 open:        W1 set point active
▸ BE1 closed:      W2 set point active

The option to change between W1 and W2 set points only exists when the DHW temperature is measured with a Pt 1000 sensor (F05 - 0).

---

*Note!*
*The current input cannot be used when the binary input BE1 is used.*
*The termination of the **function** to keep the DHW temperature constant (see section 6.3) is likewise not possible when the binary input is already used for switching between set points.*

---

| Functions | WE | Configuration |
|---|---|---|
| F05 – Current input | 0 | F05 - 0 |
| F08 – Function (binary input) | 0 | F08 - 1 |

## 6.3 DHW temperature in heat exchanger kept constant

When the **hot water tapping recognition function** is **active**, the actuator only controls the DHW temperature to the set point when there is a demand for hot water. The function to keep the **DHW temperature in the heat exchanger constant** prevents the water temperature in the heat exchanger from dropping to ensure that the water temperature reaches the required set point W1 quickly when there is a new demand for hot water. This is achieved by keeping the temperature reduced by the *Set-back difference* in between hot water tappings. Depending on the configuration, the reduced set point applies after hot water has been tapped until the next demand or until the time entered in *Heating period for exchanger* (P12) has elapsed.

---

*Note!*
*An active DHW temperature in the heat exchanger kept constant function stops after a power supply failure has occurred.*
*After the power supply has been reconnected, hot water needs to be tapped to reactivate the function.*

---

| Functions | WE | Configuration |
|---|---|---|
| F01 – Hot water tapping recognition | 1 | F01 - 1 |
| F09 – DHW temperature in heat exchanger constant | 0 | F09 - 0: Time period adjustable (P12)<br>F09 - 1: Continuous |

| Parameters | WE | Range of values |
|---|---|---|
| P11 – Set-back difference | 8 K | 0 to 30 K |
| P12 – Heating period for exchanger | 24 h | 0 to 48 h |

### Effect of binary input BE1

If the binary input BE1 is not needed to switch between set points, it can be used to terminate the function to keep DHW temperature in the heat exchanger constant.

▸ BE1 open: **DHW temperature in the heat exchanger kept constant** function after configuring function block F09.

▸ BE1 closed: Function inactive.
An active function to keep DHW temperature in the heat exchanger constant is terminated immediately when the contact of binary input BE1 is closed, even when the time entered in *Heating period for exchanger* has not yet elapsed.

*Note!*
*The current input cannot be used when the binary input BE1 is used.*

| Functions | WE | Configuration |
|---|---|---|
| F05 – Current input | 0 | F05 - 0 |
| F08 – Binary input function | 0 | F08 - 0 |

## 6.4 Excess temperature protection

The actuator closes the valve when the flow temperature measured at the flow sensor exceeds the *Upper limit GWH.*

The function block setting F10 - 0 means that the upper limit of the flow temperature is **not** monitored.

| Function | WE | Configuration |
|---|---|---|
| F10 – Upper limit GWH | 0 | F10 - 1 |

| Parameter | WE | Range of values |
|---|---|---|
| P05 – Upper limit GWH | 95 °C | 0 to 100 °C |

## 6.5 Frost protection

The lower limit of the flow temperature is monitored when this function is active. When the temperature falls below *Lower limit GWL,* the actuator opens the valve until the temperature exceeds the lower limit plus hysteresis.

The function block setting F11 - 0 means that the lower limit of the flow temperature is **not** monitored.

| Function | WE | Configuration |
|---|---|---|
| F11 – Lower limit GWL | 0 | F11 - 1 |

| Parameter | WE | Range of values |
|---|---|---|
| P06 – Lower limit GWL | 5 °C | 0 to 20 °C |

## 6.6    Control parameters

| Parameters | WE | Range of values |
|---|---|---|
| P07 – Proportional gain $K_P$ | 0.6 | 0.1 to 50 |
| P08 – Reset time Tn | 25 s | 0 to 999 s |
| P09 – Derivative-action time Tv | 0 s | 0 to 999 s |
| P10 – Actuator transit time Ty | 35 s | 0 to 240 s |

## 6.7    Processing an external demand for hot water

The controller with electric actuator can process an external demand for hot water depending on the configuration. For this purpose, a measuring range (Xmin to Xmax) is assigned to the current signal (0 to 20 mA or 4 to 20 mA, set point). The external hot water set point has priority over the internal set point.

*Note!*
*The controller can only use a Pt 1000 sensor to measure the DHW temperature when the external demand for hot water is active.*

| Functions | WE | Configuration |
|---|---|---|
| F05 – Current input | 0 | F05 - 1 |
| F06 – Current input function | 0 | F06 - 1 |
| F07 – Measuring range of current input | 0 | F07 - 0: 0 to 20 mA<br>F07 - 1: 4 to 20 mA |

| Parameters | WE | Range of values |
|---|---|---|
| P03 – Lower measuring range value Xmin | 0 °C | 0 to  60 °C |
| P04 – Upper measuring range value Xmax | 100 °C | 95 to 150 °C |

## 6.8    Binary output function

The binary output can be used either for pump control or as a fault alarm output.

**Pump control (F13 - 0)**
The controlled pump can be configured as a circulation pump in the DHW circuit or in the heating circuit.
The pump is activated when the contact of the binary output is closed.

| Functions | WE | Configuration |
|---|---|---|
| F13 – Binary output function | 0 | F13 - 0 |
| F14 – Pump control | 0 | F14 - 0: Circulation pump (DHW circuit) |
| | | F14 - 1: Circulation pump (heating circuit) |

Circulation pump (DHW circuit):   Binary output is active during hot water tapping and on keeping DHW temperature in the heat exchanger constant as well as when frost protection is active.

Circulation pump (heating circuit): Binary output is active when hot water is demanded for the heating circuit (valve position > 0 %).

**Fault alarm output (F13 - 1)**
The contact of the binary output is closed when a fault occurs.

| Function | WE | Configuration |
|---|---|---|
| F13 – Binary output function | 0 | F13 - 1 |

## 6.9 Direction of action

Specify the direction of action depending on the valve used.

| Function | WE | Configuration |
|---|---|---|
| F04 – Direction of action | 0 | F04 - 0: Globe valve increasing/increasing |
| | | F04 - 1: Three-way mixing valve increasing/decreasing |

**Globe valve (F04 - 0) and three-way diverting valve**
▶ Actual value < Set point: Actuator stem retracts (globe valve opens)
▶ Actual value > Set point: Actuator stem extends (globe valve closes)

**Three-way mixing valve (F04 - 1)**



Mixing valve for:
Mixing service

Flow

A    AB

B

Return flow
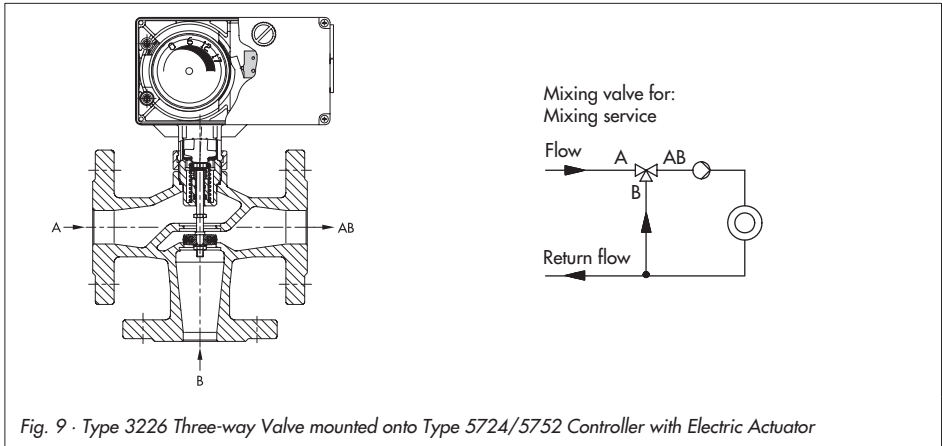
Fig. 9 · Type 3226 Three-way Valve mounted onto Type 5724/5752 Controller with Electric Actuator

▶ Actual value < Set point: Actuator stem extends (three-way mixing valve opens port A -> AB and closes port B -> AB)

▶ Actual value > Set point: Actuator stem retracts (three-way mixing valve closes port A -> AB and opens port B -> AB)

## 6.10  Manual setting

The function block F12 for a manually adjusted set point determines whether a *Set point W1* adjusted at the set point potentiometer is to be used for control (see section 4.2). The following then applies:

▶ F12 - 0:  The W1 set point entered in TROVIS-VIEW applies regardless of the setting at the set point potentiometer. The set point potentiometer setting is overridden.

▶ F12 - 1:  (Set point potentiometer automatic) Setting at the set point potentiometer is used for control if the setting is higher than 10 %. The internal W1 or W2 set point entered in TROVIS-VIEW is used when the setting is below 10 %.

| Function | WE | Configuration |
|---|---|---|
| F12 – Manually adjusted set point | 1 | F12 - 0: No manual setting<br>F12 - 1: Set point potentiometer automatic |

# 7 Configuration and operation using TROVIS-VIEW interface

## 7.1 General

The TROVIS-VIEW software allows various smart SAMSON devices to be configured over a common operator interface. It consists of the operator interface, communication server, and the device-specific module. The software has a Windows Explorer look and feel.
The entire configuration of the controller with electric actuator can be performed over the TROVIS-VIEW Configuration and Operator Interface.
The TROVIS-VIEW software containing online help and the database module for Type 5724/5725 Controller with Electric Actuator is delivered on a CD-ROM (order number 6661-1060).
Software updates are available in Internet (http://www.samson.de) in Services > Support and downloads.

---

*Note!*
*The following instructions include a description on the key functions of the TROVIS-VIEW software in conjunction with controllers with electric actuators. Refer to the online help in the ? menu for a detailed description.*

---

## 7.1.1 System requirements

**Hardware requirements**

▸ PC with Pentium II processor or equivalent (300 MHz or higher), 500 MHz recommended
▸ Serial interface or USB/RS-232 adapter
▸ Min. 96 MB RAM, 192 MB RAM recommended
▸ Min. 150 MB free hard disk space plus approx. 15 to 20 MB additional hard disk space per SAMSON module
▸ SVGA graphic card (min. 800 x 600)
▸ CD-ROM drive

**Software requirements**

▸ Operating system: Windows® 2000 (min. SP2), Windows® 2000 XP, Windows® Vista
▸ Microsoft.NET Framework Version 2.0 (included on the installation CD-ROM)
▸ Internet browser: MS Internet Explorer, version 6.0 and higher

## 7.2 Installing TROVIS-VIEW software

1. Insert the installation CD-ROM to start the installation program.
   Once inserted, the CD-ROM usually starts the installation program automatically, depending on the configuration of the operating system. If the program does not start automatically, double-click setup.exe in the root directory of the CD-ROM in order to install TROVIS-VIEW.

2. Follow the on-screen prompts and instructions of the installation program.

The TROVIS-VIEW Operator Interface can be used for several SAMSON devices. Note that the installation program also offers you the option of installing a demo module. To use the software without restrictions, the software needs to be activated as follows:

3. After installation, a dialog box will appear, prompting you to enter the CD key, which you will find on the cover of the original CD-ROM.
   Once you have entered the correct CD key, an activation is necessary. The software can be activated automatically or manually. Internet access on the computer on which TROVIS-VIEW is installed is required for automatic activation.

   **Manual activation:**
   Once you have entered the correct CD key, a request code will be automatically generated and displayed which contains computer identification details.
   ▸ Enter request code in SAMSON's product activation server over the Internet.
     (http://support.samson-ag.com/activate_eng.html)
     An activation code is generated which allows TROVIS-VIEW to be used without any restrictions in the purchased scope.
   ▸ Enter this activation code in TROVIS-VIEW.
     The TROVIS-VIEW software is now ready for use.

   **Automatic activation:**
   A request code containing the computer identification details is transferred to the SAMSON product activation server when an Internet connection is active and an activation code is automatically entered into TROVIS-VIEW.
   The TROVIS-VIEW software is now ready for use.

---

*Note!*
*Refer to the readme.txt file in the root directory of the CD-ROM for further information on installation, software updates and current system requirements.*

---

## 7.3 Starting TROVIS-VIEW and performing settings

You can perform the settings in TROVIS-VIEW either when the actuator is connected (online) to the computer or without direct connection (offline) (refer to section 8).

*Note!*

*When the device is not connected, the default settings appear on the operator interface or, alternatively, a stored TROVIS-VIEW file (\*.tro) can be loaded and overwritten by selecting* Open *in* File *menu.*

1. Start TROVIS-VIEW. The operator interface appears with menubar and toolbar as well as various folders.
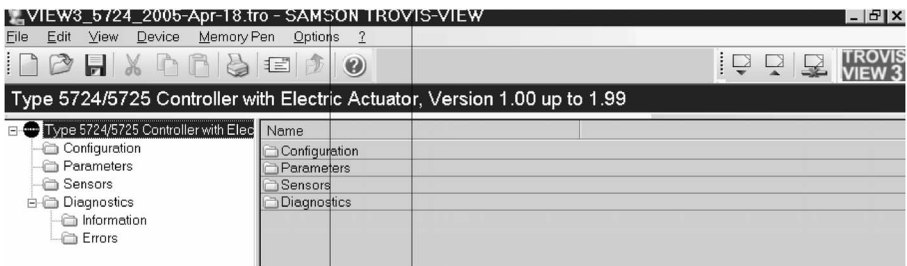


2. In *Options* menu, select *Languages* to change the interface language.
   **Note!**
   The language can be changed while the software is running.
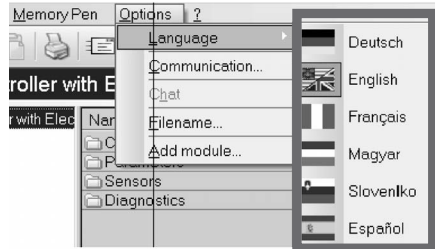


3. Select *Customer data* in, *Edit* menu to enter data relevant to the plant, e. g. project name, plant location, operator.

4. Select *Load Factory Defaults* in *Edit* menu (see sections 9.1 and 9.2) if you want to load default settings onto the operator interface.
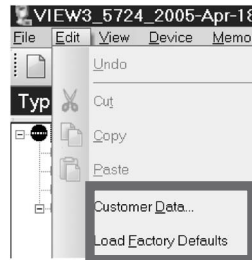
Properties of data points are indicated by icons on clicking on a folder:

| Icon | Meaning |
|------|---------|
| 🖨 | Data cannot be changed |
| 📄 | Data can be changed |
| ! | Data point can be executed |
| ▶ | Data point is user-defined |
| ✕ | Mark to indicate error |
| ⊤ | Value has exceeded maximum limit |
| ⊥ | Value has fallen below minimum limit |
| ⊗ | Connection to the device is interrupted or there is a write protection error |
| Source of data: | |
| 🖐 | Value has been modified manually |
| ▭ | Value has been uploaded from the controller with electric actuator. In online mode, $x$ in the icon indicates a value has been updated. |
| ▢ | Value originates from a stored file |
| ✎ | Value has been adopted from memory pen |
| 🖥 | Value has been changed by the software |

## 7.3.1 Activating/deactivating functions

1. Click on *Configuration* folder to view the function block settings.
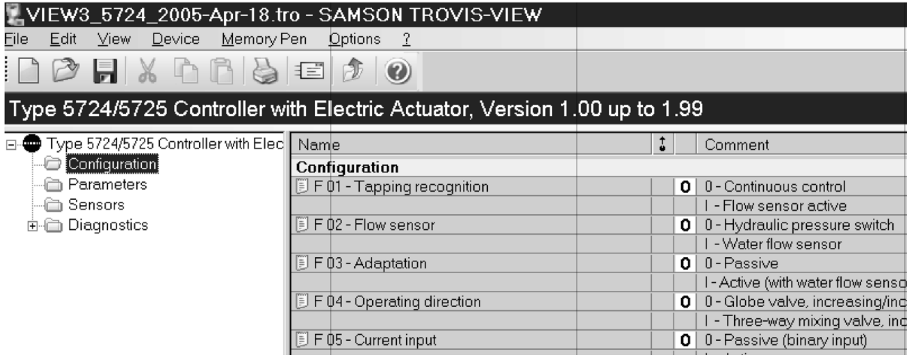


2. Double-click the function block status (0 or I) to change the status of the function.

Right-click on a row to open pop-up
window to modify configuration settings:
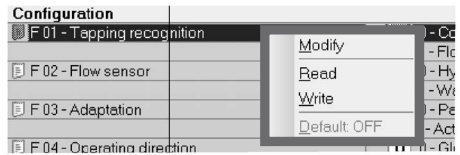


*Modify*    To change the status of the function block.

*Read*    Uploads status of the function block from device.

*Write*    Downloads status of the function block to device.

*Default: …*    Resets function block to default setting
(setting in gray to indicate that the status of the
function block is the same as the default setting)

## 7.3.2 Setting parameters

1. Click on *Parameter* folder to view the parameter settings.
   The parameters listed in the screenshot below are default settings.
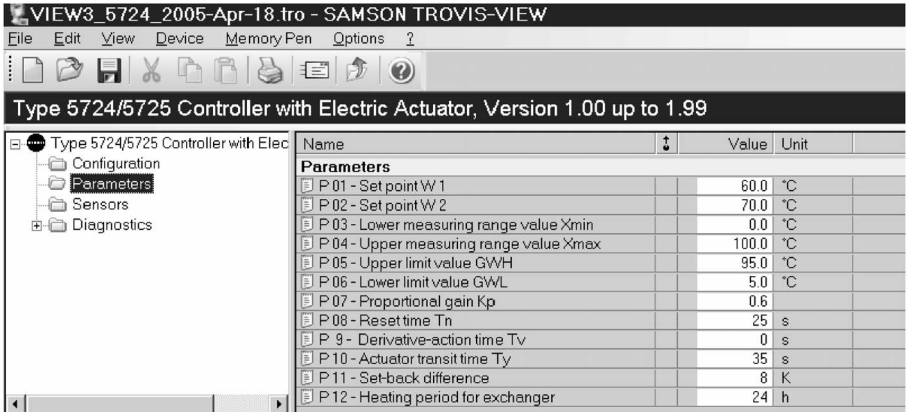


2. Double-click the required parameter to open pop-up window to modify parameter settings.

   Right-click the required parameter to open pop-up window to modify parameter settings:
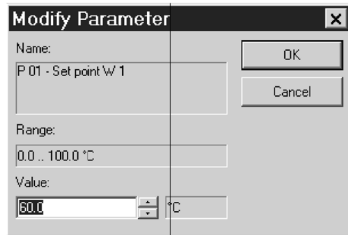


| | |
|---|---|
| *Modify* | Opens pop-up window to modify parameter settings. |
| *Read* | Uploads parameter value from device. |
| *Write* | Downloads parameter value to device. |
| *Default: …* | Resets parameter to default setting (setting in gray to indicate that the parameter value is the same as the default setting) |
| *Min …* | Set parameter to the displayed minimum value. |
| *Max …* | Set parameter to the displayed maximum value. |

# 7.3.3 Reading operational information

*Note!*
*Operational information can only be read when TROVIS-VIEW is directly connected to the*
*controller with electric actuator (i.e. in online mode, refer to section 8)*

▶ Select *Sensors* folder to display actual data measured by the connected sensors.



▶ Select the *Information* subfolder in the *Diagnostics* folder to display information concern-
ing the actuator.

▶ Select the *Information* subfolder in the *Diagnostics* folder to display information concerning the actuator.

# 8    Data transmission

The TROVIS-VIEW software installed on your computer allows you to configure the controller with electric actuator either in offline mode (device not connected to a computer ) or in online mode (device connected to a computer ). To activate online mode, click 🖳 on the device toolbar. The communication port must be set (see section 8.1)

**Online mode** 🖳 (direct data transmission)
The actuator and TROVIS-VIEW are connected constantly in online operation. Current configuration and operating data are uploaded from the actuator cyclically and displayed in TROVIS-VIEW. The settings configured in TROVIS-VIEW can be directly transferred to the controller with electric actuator.
To enable communication with the computer, connect the serial interface (COM port) to the serial interface of the controller with electric actuator using a SAMSON connecting cable.
In case the computer does not have a COM port, a USB/RS-232 adapter can be used when Windows 98, ME, 2000, or XP operating systems are installed on the computer.

**Offline mode** 🖳 (indirect data transmission)
There is no constant data communication between the computer and actuator. Communication must first be established to upload from the actuator or download data to the actuator.
Data can be transferred to the serial interface over the SAMSON connecting cable or over a memory pen together with a modular adapter.
A memory pen allows you to simply copy and download configuration data onto other devices.
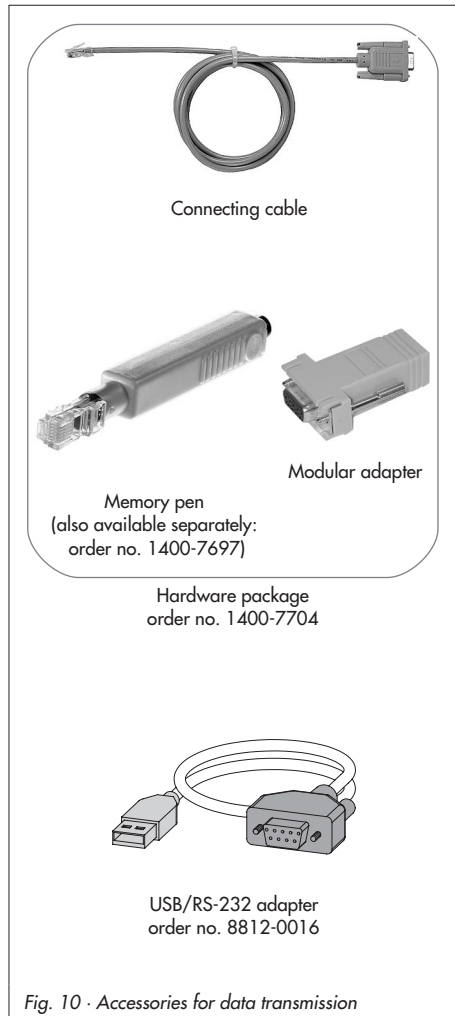


Connecting cable

Memory pen
(also available separately:
order no. 1400-7697)

Modular adapter

Hardware package
order no. 1400-7704

USB/RS-232 adapter
order no. 8812-0016

Fig. 10 · Accessories for data transmission

*Note!*
*You can only transfer data to the controller with electric actuator after the electrical connection has been completed as described in section 3.*
*Unfasten the front cover for data transmission.*

## 8.1 Data transmission between TROVIS-VIEW and the actuator (connecting cable)

1. Connect the serial port of the computer using the SAMSON connecting cable to the serial interface connection of the actuator.

2. Select *Communications* in *Options* menu to open the server settings window. Click *Server settings* button.

3. Check *Local connection* and *Automatically local connect* boxes and click *OK* button to confirm server settings.

   The *Communication* window reappears.

4. Click *Port settings* button.

5. The settings window opens and State: not yet searched appears in the Automatic detection field.
   Click *Start* button.
   TROVIS-VIEW has found the actuator when State: Device found on ....
   appears, click on *OK* button twice to confirm settings.
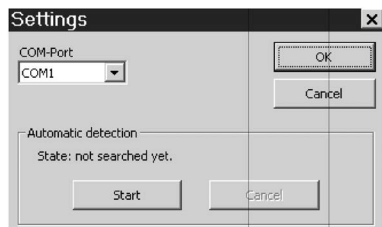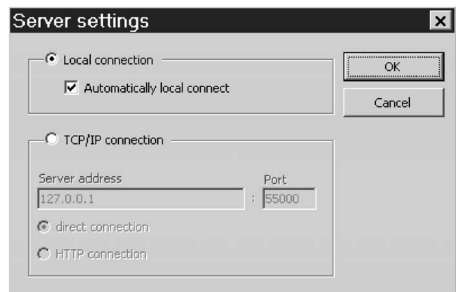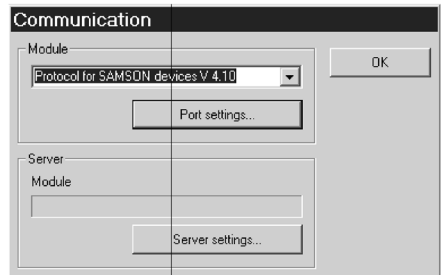
## 8.1.1 Offline operation (indirect data transmission)

In offline mode, there is no constant data communication between the computer and actuator. Communication must first be established to upload from the actuator and download data to the actuator.

**Downloading data to the actuator:**
Select *Download to Device* in *Device* menu to transfer data to the actuator. The actuator starts to control after data are downloaded from TROVIS-VIEW.

**Uploading data from the actuator:**
Select *Upload from Device* in *Device* menu to transfer all the data from the actuator. Uploaded data are indicated in TROVIS-VIEW by the ⬚ icon.

---

*Note!*
*Data transmission can also be performed by clicking the icons in the device toolbar: click ⬚ to download data from TROVIS-VIEW to the actuator and, click ⬚ to upload data from the actuator and to display them in TROVIS-VIEW.*

---

## 8.1.2 Online operation (direct data transmission)

The actuator and TROVIS-VIEW are constantly connected in online operation. Current configuration and operating data are uploaded from the actuator cyclically and displayed in TROVIS-VIEW. Likewise, any settings performed in TROVIS-VIEW are directly transferred to the actuator.
In the event of a sensor breakage, the interruption in sensor connection is shown without delay in the *Sensors* folder.

**Activate online operation:**
Select *Online* in *Device* menu to activate online mode.
In online mode, ⬚ in the device toolbar is animated.

**Deactivate online operation:**
Select *Online* in *Device* menu while the online mode is activated.
The online mode is canceled.

---

*Note!*
*Alternatively, click ⬚ in the device toolbar to activate and deactivate online operation.*

---

## 8.2    SAMSON memory pen

The SAMSON memory pen serves as a data carrier and is able to load and store data in its non-volatile memory.

The memory pen can be loaded with data configured in TROVIS-VIEW and the settings transferred to one or several controllers with electric actuators. In the same way, the memory pen can be used to upload data from the actuator allowing you to simply copy the configuration data from one actuator to another actuator of the same type.

---

*Note!*
*On inserting a memory pen that is empty or that contains data from another type of device into the serial interface port of the actuator, the data from the actuator are uploaded to the memory pen regardless of the status of the memory pen and any other data on the memory pen are overwritten.*

---

## 8.2.1 Data transfer between TROVIS-VIEW and memory pen

1. Plug memory pen (3) together with modular adapter (2) into the serial interface (COM port) of the computer (Fig. 11).



1  Serial interface
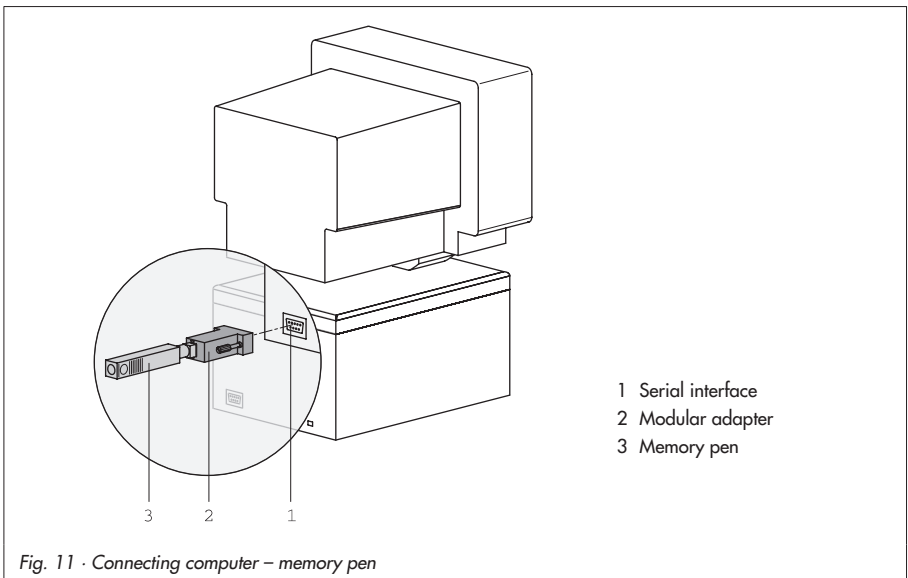2  Modular adapter
3  Memory pen

Fig. 11 · Connecting computer – memory pen

2. Select *Interface* in the *Memory Pen* menu.

3. Click the *Start* button in Automatic detection field of the dialog box. The computer auto-matically searches for the interface assigned to the memory pen.
Message: "Memory pen found at COM …"
Confirm interface setting by clicking *OK* button.
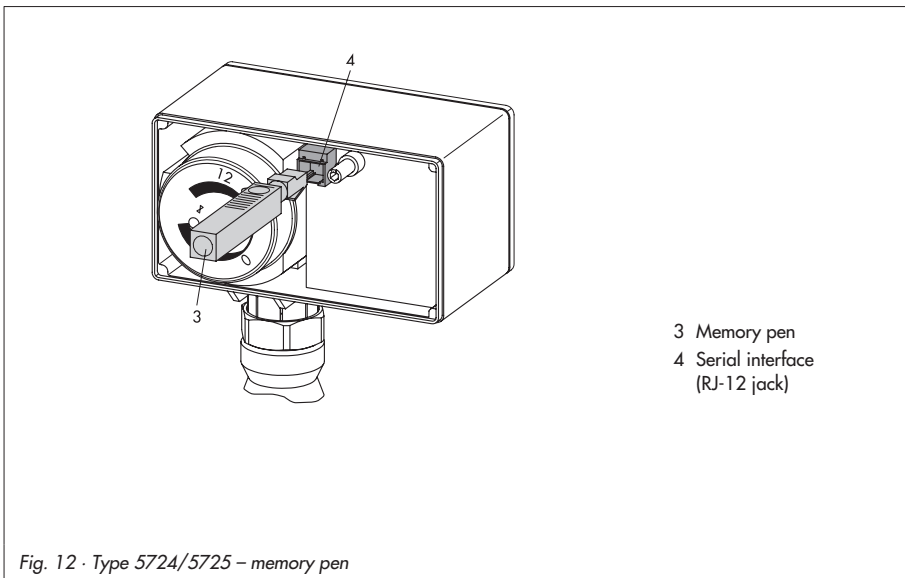
**Downloading data from TROVIS-VIEW to the memory pen**

4. Select *Download to Memory pen* in *Memory pen* menu

5. Click *OK* button to start data transmission.

**Uploading data from memory pen to TROVIS-VIEW**

4. Select *Upload from Memory pen* in *Memory pen* menu to start data transmission.

## 8.2.2 Data transfer between actuator and memory pen

▸ Perform steps 1 to 3 described in section 8.2.1.



3 Memory pen
4 Serial interface
(RJ-12 jack)

*Fig. 12 · Type 5724/5725 – memory pen*

## Uploading data from the actuator to memory pen

4. Select *Modify memory pen status* in *Memory pen* menu.
   Check *Automatically write to memory pen* in the dialog box.
   Click *OK* button to confirm.

5. Remove memory pen from the computer and plug it into the serial interface of the actuator (Fig. 12).
   Actuator data are uploaded onto the memory pen.
   The yellow LED underneath the serial interface **blinks twice** several times to indicate that data transmission is in progress.
   Data transmission is completed when the LED is illuminated continuously.
   Remove the memory pen from the actuator.
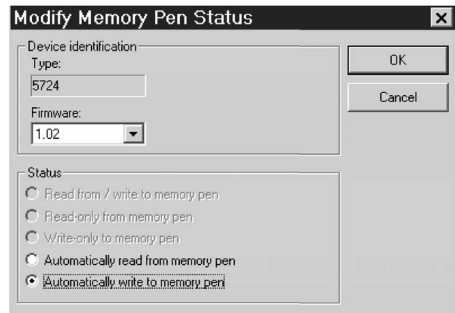
## Downloading data from the memory pen to the actuator

4. Select *Modify memory pen status* in *Memory pen* menu.
   Check *Automatically read from memory pen* in the dialog box.
   Click *OK* button to confirm.

5. Remove memory pen from computer and plug it into the serial interface of the actuator (Fig. 12).
   Data are downloaded from the memory pen into the actuator.
   The yellow LED underneath the serial interface **blinks** several times to indicate that data transmission is in progress.
   Data transmission is completed when the LED is illuminated continuously.
   Remove the memory pen from the actuator.
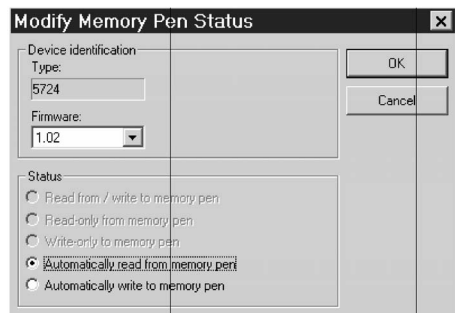
## 8.2.3 Copy function

The memory pen can be used to copy setting data to other Type 5724/5725 Actuators as soon as the data from the actuator have been transferred to the memory pen (indicated by the yellow LED blinking twice several times). *Automatically write to memory pen* is reset after the first data transmission from the actuator.

# 9 Appendix

## 9.1 Function block list

The function blocks F01 to F14 have the following listed functions.

F = Function block      WE = Default setting      0 = OFF, 1 = ON

| F | Function | WE | Comment |
|---|----------|----|---------|
| 01 | Hot water tapping recognition | 1 | 0 – Continuous control → Section 6.1<br>1 – Flow sensor active → Sections 6.1.1, 6.1.2 |
| 02 | Flow sensor | 1 | 0 – Flow switch → Section 6.1.1<br>1 – Flow rate sensor → Section 6.1.2 |
| 03 | Adaptation | 1 | 0 – Inactive<br>1 – Active → Section 6.1.2 |
| 04 | Direction of action | 0 | 0 – Globe valve increasing/increasing → Section 6.9<br>1 – 3-way mixing valve increasing/decreasing → Sec. 6.9 |
| 05 | Current input | 0 | 0 – Inactive → Sections 6.2, 6.3<br>1 – Active → Sections 6.1, 6.7 |
| 06 | Current input function | 0 | 0 – Actual value → Section 6.1<br>1 – Set point (processing for external demand)<br>    → Section 6.7 |
| 07 | Measuring range of current input | 0 | 0 – 0 to 20 mA → Sections 6.1, 6.7<br>1 – 4 to 20 mA → Sections 6.1, 6.7 |
| 08 | Binary input function | 0 | 0 – Termination of function to keep temperature in heat exchanger constant → Section 6.3<br>1 – Switching between internal set points → Section 6.2 |
| 09 | DHW temperature in heat exchanger constant | 0 | 0 – Time adjustable → Section 6.3<br>1 – Continuous → Section 6.3 |
| 10 | Upper limit GWH | 0 | 0 – No limitation<br>1 – DHW exceeds GWH causes Y to be set to 0 %<br>    → Sec. 6.4 |
| 11 | Lower limit GWL | 0 | 0 – No frost protection<br>1 – DHW falls below GWL starts frost protection → Sec. 6.5 |
| 12 | Manually adjusted set point | 1 | 0 – No manual adjustment → Section 6.10<br>1 – Set point potentiometer automatic → Section 6.10 |

| F | Function | WE | Comment |
|---|----------|----|---------|
| 13 | Binary output function | 0 | 0 – Pump control → Section 6.8<br>1 – Fault alarm output → Section 6.8 |
| 14 | Pump control | 0 | 0 – Circulation pump (DHW circuit) → Section 6.8<br>1 – Circulation pump (heating circuit) → Section 6.8 |

## 9.2  Parameter list

The parameters have the setting ranges as listed below.

P = Parameter      WE = Default setting

| P | Parameter | WE | Setting range |
|---|-----------|----|---------------|
| 01 | Set point W1 | 60 °C | 0 to 100 °C |
| 02 | Set point W2 | 70 °C | 0 to 100 °C |
| 03 | Lower measuring range value Xmin | 0 °C | 0 to  60 °C |
| 04 | Lower measuring range value Xmax | 100 °C | 95 to 150 °C |
| 05 | Upper limit GWH | 95 °C | 0 to 100 °C |
| 06 | Upper limit GWL | 5 °C | 0 to  20 °C |
| 07 | Proportional gain Kp | 0.6 | 0.1 to  50 |
| 08 | Reset time Tn | 25 s | 0 to 999 s |
| 09 | Derivative-action time Tv | 0 s | 0 to 999 s |
| 10 | Actuator transit time Ty | 35 s | 0 to 240 s |
| 11 | Set-back difference | 8 K | 0 to 30 K |
| 12 | Heating period for heat exchanger | 24 h | 0 to 48 h |

## 9.3   Customer settings

| | |
|---|---|
| Station | |
| Operator | |
| SAMSON office responsible | |

| Function blocks | | |
|---|---|---|
| **F** | **WE** | **Setting performed** |
| 01 | 1 | |
| 02 | 1 | |
| 03 | 1 | |
| 04 | 0 | |
| 05 | 0 | |
| 06 | 0 | |
| 07 | 0 | |
| 08 | 0 | |
| 09 | 0 | |
| 10 | 0 | |
| 11 | 0 | |
| 12 | 1 | |
| 13 | 0 | |
| 14 | 0 | |

| Parameters | | | |
|---|---|---|---|
| **P** | **WE** | **Setting performed** | **Setting range** |
| 01 | 60 °C | | 0 to 100 °C |
| 02 | 70 °C | | 0 to 100 °C |
| 03 | 0 °C | | 0 to 60 °C |
| 04 | 100 °C | | 95 to 150 °C |
| 05 | 95 °C | | 0 to 100 °C |
| 06 | 5 °C | | 0 to 20 °C |
| 07 | 0.6 | | 0.1 to 50 |
| 08 | 25 s | | 0 to 999 s |
| 09 | 0 s | | 0 to 999 s |
| 10 | 35 s | | 0 to 240 s |
| 11 | 8 K | | 0 to 30 K |
| 12 | 24 h | | 0 to 48 h |

## Index

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