

Electric Actuators



Type 5824 (without safety function)

Type 5825 (with safety function)

Application

Electric actuators designed for control valves used in heating, ventilation and air-conditioning systems as well as process engineering and industrial energy transfer systems.



The linear actuators are controlled by a three-point stepping signal issued by digital controllers. They are especially suitable for attachment to SAMSON Types 3260, 3222, 3226, 3213 and 3214 Valves as well as V2001 Valves. In addition, they can be used as an additional electric actuator together with self-operated differential pressure and flow regulators.

Special features

- Type 5824 Actuator without safety function and Type 5825 Actuator with safety function
- Voltage supply: 230/24 V, 50 Hz; 120 V, 60 Hz
- Synchronous motor with maintenance-free gearing
- Torque switches switch off the motor in end positions and in case of overload
- Type 5824 with manual override (handwheel)
- Optional: Version with faster motor (standard transit time halved)

Versions

Type	Valve attachment	Rated travel	Transit time
Versions without safety function			
5824-10	Force-locking	6 (7.5) mm	35 (45) s
5824-12 ¹⁾	Force-locking	6 mm	18 s
5824-13 ¹⁾	Force-locking	6 mm	18 s
5824-20	Force-locking	12 mm	70 s
5824-23 ¹⁾	Force-locking	12 mm	36 s
5824-30	Form-fit	15 mm	90 s
Versions with safety function – Fail-safe action: “Actuator stem extends”/“Actuator stem retracts”			
5825-10/-15	Force-locking	6 (7.5) mm	35 (45) s
5825-13 ¹⁾ / —	Force-locking	6 mm	18 s
5825-20/-25	Force-locking	12 mm	70 s
5825-23 ¹⁾ / —	Force-locking	12 mm	36 s
5825-30/-35	Form-fit	15 mm	90 s

¹⁾ Version with faster motor (Type 5825-x3 only with fail-safe action “Actuator stem extends”)



Fig. 1 · Type 5824 Electric Actuator (standard transit time)

Other versions with

- Two adjustable limit switches
- Potentiometer
- Positioner (for actuators with 24 V only)
- With integrated controller (see T 5724 EN)
- Control over LON on request

Typetested version

The Type 5825 Electric Actuators with fail-safe action “Actuator stem extends” in the force-locking version are typetested in conjunction with various SAMSON valves by the German Technical Inspectorate (TÜV) according to DIN 32730. Register numbers are available on request.

Principle of operation (Fig. 2)

The electric actuators consist of a reversible synchronous motor and maintenance-free gearing. Torque-dependent switches serve to disconnect the motor in the end positions or in case of overload.

The force of the electric motor is transmitted to the actuator stem (3) via gearing and crank disk. When the actuator stem extends, it presses on the plug stem of the valve. When the actuator stem retracts, the plug stem follows the movement of the return spring in the valve (force-locking connection).

Actuator and valve are connected by the coupling nut (4).

Form-fit valves without return spring can be combined with the Type 5824-30 and Type 5825-30/-35 Actuator using a yoke/adaptor:

- Yoke for V2001 Valves: Order no. 1400-7414
- Adapter for other valve types: Order no. 1400-7415

Type 5824

This actuator without safety function is equipped with a handwheel (2) to move the valve manually to the required position. The direction of action and the travel can be read off the scale (9).

Type 5825

Actuators with safety function largely correspond to the previously described Type 5824 Electric Actuator. However, these actuators contain a spring assembly (8) and an electromagnet which in de-energized state move the connected valve to its fail-safe position. The Type 5825 Actuators are available with fail-safe action "Actuator stem extends" or "Actuator stem retracts".

A handwheel (2) is not fitted. After disconnecting the actuator and remove the housing lid (1.1), you can use a key to adjust the actuator manually. On releasing the key, the actuator immediately resumes its initial position.

Versions with faster motors

Types 5824-12/-13/-23 and Type 5825-13/-23 Actuators have a faster motor, resulting in considerably shorter transit times.

This motor is located in an additional housing at the back of the actuator in Types 5824-13/-23 and 5825-13/-23 Actuators.

Additional electrical equipment

Electric positioner · Actuators with 24 V power supply can optionally fitted with a positioner. These positioners compare the 0 (4) to 20 mA or 0 (2) to 10 V signal issued by the electric control equipment to the position of a potentiometer which is proportional to the valve travel and controls the synchronous motor accordingly.

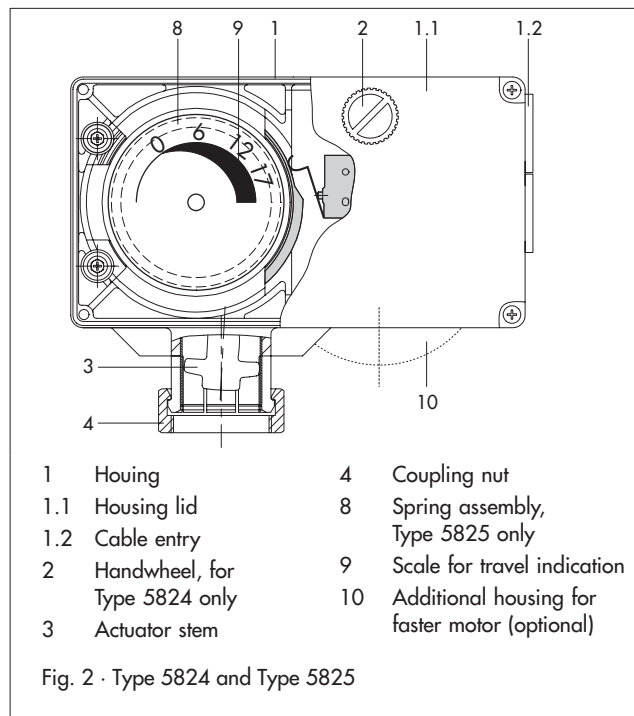
The positioner is suitable for standard and split-range operation. Its characteristic is reversible (increasing >> or decreasing <>).

Potentiometer · The potentiometer is linked to the gearing and provides a resistance between 0 to 1000 Ω proportional to the valve travel.

Limit switches · Actuators can be optionally fitted with two limit switches which are activated over continuously adjustable cam disks.

Supply voltage, inputs and outputs are not electrically isolated. The two additional switches cannot be retrofitted.

Priority circuit · The version with positioner can optionally be fitted with a priority circuit when limit switches are used.



Installation

Before attaching the actuator to the valve, make sure that the actuator stem is retracted. In order to retract the actuator stem of Type 5825 with fail-safe action "Actuator stem extends", remove the housing lid and retract and retain the actuator stem in place by turning the actuating shaft in a counterclockwise direction using a 4 mm Allen key. Only then proceed to tighten the coupling nut.

Electrical connection

The diagram at the back of the data sheet illustrates the wiring of the actuators. The controller output signals are connected to terminals eL and aL. If voltage is applied to terminal eL, the actuator motor retracts the actuator stem into the actuator. If the control signal is applied to terminal aL, the actuator stem extends.

Ordering text

Electric Actuator Type 5824-.../5825-...

Closing force ... N

Form-fit/force-locking connection

Without/with safety function

Valve travel ... mm

Voltage: 230 V/24 V, 50 Hz; 120 V, 60 Hz

Optionally positioner II with/without priority circuit, limit switches, potentiometer

Specifications subject to change without notice.

Actuators	Type	5824						5825								
		-10	-12	-13	-20	-23	-30	-10	-13	-20	-23	-30	-15	-25	-35	
Safety function		Without						With								
Fail-safe action		-						Stem extends					Stem retracts			
Rated travel	mm	6 ¹⁾	6	6	12	12	15	6 ¹⁾	6	12	12	15	6 ¹⁾	12	15	
Transit time for rated travel	s	35 ¹⁾	18	18	70	36	90	35 ¹⁾	18	70	36	90	35 ¹⁾	70	90	
Transit time in case of fail-safe action	s	-						4	4	6	6	7	4	6	7	
Nominal thrust	Stem extends	N	700	300	700			500				280	500		280	
	Stem retracts	N	-				700	-				280	-		280	
Nominal thrust of safety spring	N	-						500				280	- ³⁾		280	
Attachment	Force-locking		•	•	•	•	•	•	•	•	•	•	•	•	•	
	Form-fit						•					•			•	
Power supply																
24 V, 50 Hz		•	•		•		•	•		•		•	•	•	•	
230 V, 50 Hz		•	•	•	•	•	•	•	•	•	•	•	•	•	•	
120 V, 60 Hz		•	•		•		•	•		•		•	•	•	•	
Power consumption, approx.	VA	3	3	6	3	6	3	4	8	4	8	4	4	4	4	
Manual override		Yes						Optional ²⁾								
Permissible temperatures																
Ambient		0 to 50 °C														
Storage		-20 to 70 °C														
At connecting stem		0 to 130 °C														
Degree of protection		IP 54 (upright position, acc. to DIN IEC 529)														
Class of protection		II (acc. to VDE 0106)														
Overvoltage category		II (acc. to VDE 0110)														
Degree of contamination		2 (acc. to VDE 0110)														
Noise immunity		EN 61000-6-2														
Noise emission		EN 61000-6-3														
Weight	Approx. kg	0.75	0.75	1	0.75	1	0.75	1	1.25	1	1.25	1	1	1	1	
Additional electrical equipment⁵⁾																
Positioner⁴⁾ · For 24 V only; Input 0 (2) to 10 V or 0 (4) to 20 mA, output 0 to 10 V, reversible characteristic, split-range (0 to 5 V, 5 to 10 V)		•	•		•		•	•		•		•	•	•	•	
2 limit switches · Max. 230 V, 3 A; cannot be retrofitted!		•	•	•	•	•	•	•	•	•	•	•	•	•	•	
1 potentiometer · 0 to 1000 Ω ± 15 % (90 % of final value at rated travel); max. 1 mA, 5 V		•	•		•		•	•		•		•	•	•	•	
Materials																
Housing, housing lid		Plastic (PPO glass fiber reinforced)														
Coupling nut		Brass														

¹⁾ Actuators with 6 mm travel can also be used for valves with 7.5 mm travel (transit time 45 s)

²⁾ Manual override using a 4 mm Allen key after removing the housing lid, always returns to fail-safe position after safety release

³⁾ Safety spring pulls the actuator stem into the retracted final position; valve operated over the valve spring

⁴⁾ Supply voltage, inputs and outputs are not electrically isolated. Max. 2 current inputs may be connected in series.
 R_i (10 V) = 10 kΩ, R_i (20 mA) = 50 Ω, R_o (min) = 1 kΩ

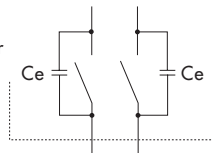
⁵⁾ Control over LON on request

Electrical connection

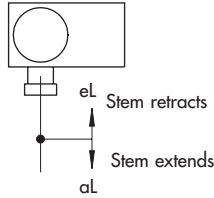
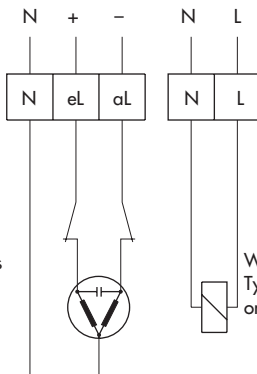
Actuator without positioner

Caution! The interference suppression capacitors C_e installed in the output circuit of the connected controllers may not exceed a value of 2.5 nF, otherwise the proper functioning of the actuator cannot be guaranteed. When actuators are to be connected to controllers with larger interference suppression capacitors, a special version is available on request.

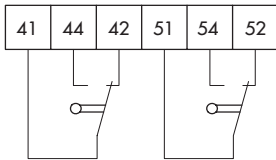
Controller



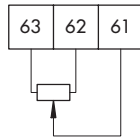
Three-point stepping signal



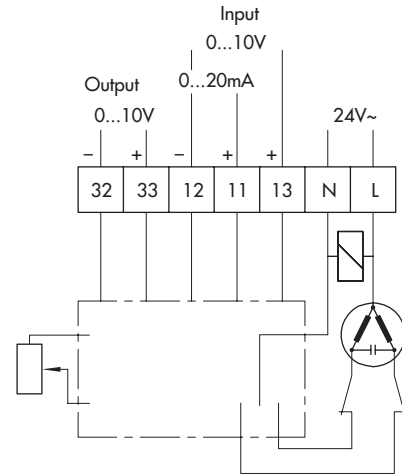
Switches



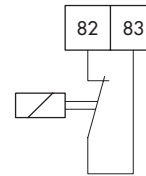
Potentiometer



Actuator with positioner II

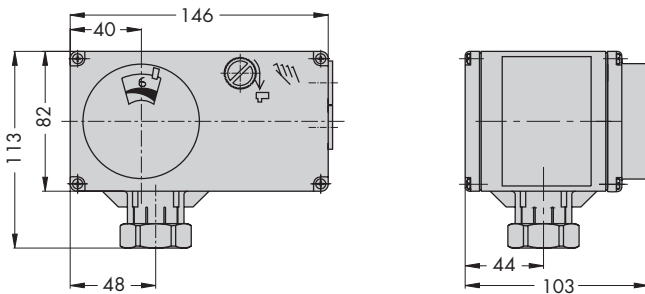


Priority circuit (option, only with positioner II and with switches)

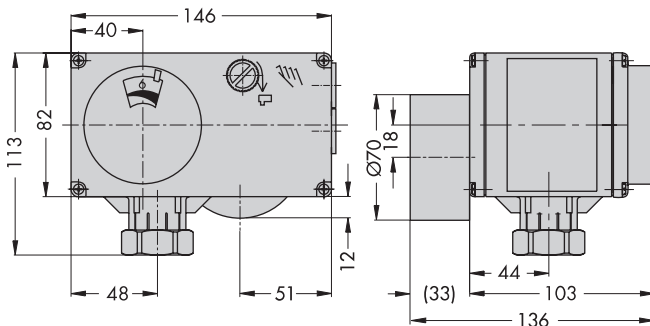


Dimensions in mm

Types 5824-10/-12/-20 and 5825-10/-20/-15/-25

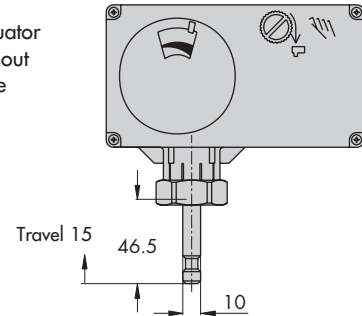


Types 5824-13/-23 and 5825-13/-23



Types 5824-30, 5825-30/-35

Actuator without yoke



Actuator with yoke 1400-7414

