Electric Actuators

Type 5824 (without fail-safe action)
Type 5825 (with fail-safe action)

Application

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

The linear actuators are particularly suitable for attachment to SAMSON Types 3260, 3222, 3226, 3213, 3214 and V2001 Valves. In addition, they can be used as additional electric actuators on self-operated differential pressure and flow regulators.

Special features:

- Type 5824 Actuator without fail-safe action and Type 5825 with fail-safe action
- Three-point stepping version with synchronous motor and maintenance-free gearing or version with digital positioner and stepper motor
- Switched off by torque-dependent switches
- Type 5824 with manual override (handwheel)
- Optional three-point stepping versions:
  - With faster motor (half the standard transit time)
  - With two adjustable limit switches
  - With potentiometer

Digital positioner

- Automatic initialization when applying the operating voltage
- Reversed direction of action by moving a slide switch
- Current travel calculated from transit time
- Operating states and errors indicated by LEDs
- Adjustable positioning rates (10 to 30 s)
- Blocking protection
- Adjustable input voltage range
- Configuration, parameterization, diagnostics and online connection for monitoring in the TROVIS-VIEW software
  - Direct data transmission using connecting cable (online connection)
  - Indirect data transmission using memory pen

Accessories for version with digital positioner

- TROVIS-VIEW software module (6661-1059) for Type 5824 or Type 5825 Electric Actuator
- Hardware package including memory pen, connecting cable and module adapter, order no. 1400-7704
- Memory pen, order no. 1400-7697

Fig. 1 · Type 5824-10 Electric Actuator (version without digital positioner)

Type	Valve attachment	Rated travel	Optional version with digital positioner
Versions without fail-safe action			
5824-10	Force-locking	6 (7.5) mm	Yes
5824-13[1]	Force-locking	6 mm	No
5824-20	Force-locking	12 mm	Yes
5824-23[1]	Force-locking	12 mm	No
5824-30	Form-fit	15 mm	Yes
Versions with fail-safe action "actuator stem extends" or "actuator stem retracts"			
5825-10/-15	Force-locking	6 (7.5) mm	Yes
5825-13[1]**/—**	Force-locking	6 mm	No
5825-20/-25	Force-locking	12 mm	Yes
5825-23[1]**/—**	Force-locking	12 mm	No
5825-30/-35	Form-fit	15 mm	Yes

[1] Version with faster motor (Type 5825-x3) only with fail-safe action "actuator stem extends"

Principle of operation (Fig. 2)

The three-point stepping version consists of a reversible synchronous motor and maintenance-free gearing. The synchronous motor is switched off by torque-dependent switches in the end positions or in case of overload.

In the version with digital positioner, the stepper motor allows for supply by frequency-independent voltages.

The motor's force is transmitted to the actuator stem (3) via the gearing and a crank disk. When the actuator stem extends, it pushes against the valve's plug stem. When the actuator stem retracts, the return spring in the valve causes the plug stem to follow the movement (force-locking connection).

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

Form-fit valves without return spring can be combined with a Type 5824-30 or Types 5825-30/-35 Actuators using a yoke or adapter:

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

Type 5824

The actuator without fail-safe action is equipped with a handwheel (2) to manually move the valve to the desired position. The direction of action and travel can be read off the travel indication scale (9).

Type 5825

The actuator with fail-safe action largely corresponds to the Type 5824 described above. However, it contains a spring assembly (8) and an electromagnet, which move the valve to its fail-safe position when de-energized. The Type 5825 is available with fail-safe action **actuator stem extends** (when the power supply fails) or **actuator stem retracts** (when the power supply fails).

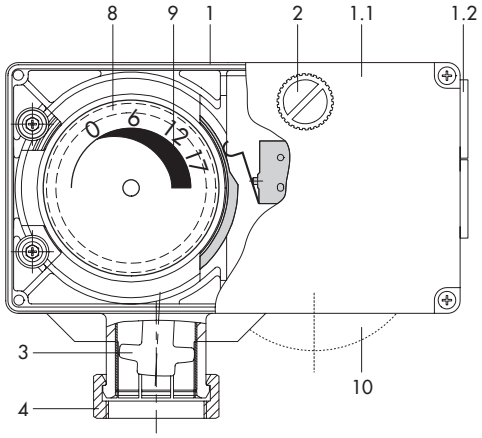
A handwheel (2) is not fitted. Before adjusting the actuator manually, the actuator must be switched off and the cover (1.1) removed. An Allen key is used to adjust the actuator. The actuator immediately returns to its initial position when the key is released.

Typetested version

The Type 5825 Electric Actuator with fail-safe action "actuator stem extends" for force-locking attachment is typetested by the German technical surveillance association TÜV according to DIN EN 14597 in combination with different SAMSON valves. Registration numbers are available on request.

Version with faster motor (three-point stepping version)

The Types 5824-13/-23 and Types 5825-13/-23 are equipped with a faster motor in a housing flanged to the back of the actuator.



1 Housing
1.1 Cover
1.2 Cable entry
2 Handwheel, Type 5824
3 Actuator stem
4 Coupling nut
8 Spring assembly, Type 5825
9 Travel indication scale
10 Housing for faster motor (optional)

Fig. 2 · Type 5824 and Type 5825

Additional electrical equipment

Three-point stepping version

- **Potentiometer** · The potentiometer is linked to the gearing and allows for a resistance signal between 0 and 1000 Ω proportional to the valve travel.
- **Limit switches** · Optionally, the actuators can be equipped with two limit switches, which are actuated by continuously adjustable cam disks.
  The supply voltage as well as the inputs and outputs are not electrically isolated. The two additional limit switches cannot be retrofit.

Version with digital positioner

- Positioners guarantee a predetermined assignment between valve position and control signal.
  For position feedback, an 0 to 10 V signal can be picked off terminals 32 and 33.
  The version with positioner allows the characteristic to be reversed and is suitable for split-range operation.
- **Limit switches** (positioners with 24 V DC/AC only) · Optionally, the actuators can be equipped with two limit switches, which are actuated by continuously adjustable cam disks.
  The supply voltage as well as the inputs and outputs are not electrically isolated. The two additional limit switches cannot be retrofit.
- **Priority circuit** · When limit switches are used, the actuator can optionally be equipped with a priority circuit.

Settings of the digital positioner

The positioner settings can be edited in the TROVIS-VIEW software.

Configuration	Default settings	Adjustment range
Input variable		
Lower range value	0.0	0.0 to 7.5
Upper range value	10.0	2.5 to 10.0
Unit	V	V/mA
Position feedback signal		
Lower range value	0.0 V	0.0 to 10.0 V
Upper range value	10.0 V	0.0 to 10.0 V
Reference variable		
Detect input variable failure	No	No/Yes
Reference value upon input variable failure	Internal	Internal/Last travel value
Internal reference variable	0.0 %	0.0 to 100.0 %
Priority position	No	No/Yes
Priority position when stem	Extended	Extended/Retracted
Final position guiding: actuator stem extends	1.0 %	0.0 to 49.9 %
Final position guiding: actuator stem retracts	99.0 %	50.0 to 100.0 %
Functions		
Blocking protection of valve	No	No/Yes
Valve travel		
Travel	100.0 %	30.0 to 130.0 %
Travel adjustment	Absolute	Absolute/Relative
Speed of stem movement	Normal	Slow/Normal/Fast
Dead band (switching range)	1.0 %	0.5 to 5.0 %
Characteristic	Linear	Linear/Equal percentage/ Reverse equal percentage/User-defined

Installation

Before attaching the actuator to the valve, make sure the actuator stem is retracted. To do so in Type 5825 with fail-safe action "actuator stem extends", remove the cover and turn the actuating shaft counterclockwise using a 4 mm Allen key to retract the actuator stem. Hold the actuator stem in this position. Proceed by tightening the coupling nut.

Electrical connection

The diagram on page 6 of this data sheet illustrates the actuator's electrical connections.

Ordering text

Type 5824-... or Type 5825-... Electric Actuator

– Three-point stepping version

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

Additional electrical equipment:
With/without limit switches
With/without potentiometer

– Version with digital positioner:

Voltage: 24 V DC
24 V, 50 and 60 Hz

Additional electrical equipment:
With/without limit switches
With/without potentiometer

Technical data · Three-point stepping version

Three-point stepping version	Type	5824					5825							
		-10	-13	-20	-23	-30	-10	-13	-20	-23	-30	-15	-25	-35
Fail-safe function		Without					With							
Fail-safe action		–					Stem extends					Stem retracts		
Rated travel	mm	6[1]	6	12	12	15	6[1]	6	12	12	15	6[1]	12	15
Transit time for rated travel	s	35[1]	18	70	36	90	35[1]	18	70	36	90	35[1]	70	90
Transit time for fail-safe action	s	–					4	4	6	6	7	4	6	7
Nominal thrust, Stem extends	N	700	700				500				280	500		280
Nominal thrust, Stem retracts	N	–				700	–				280	–		280
Nominal thrust of safety spring	N	–					500				280	–[3]		280
Attachment, Force-locking		•	•	•	•		•	•	•	•		•	•	
Attachment, Form-fit						•					•			•
Electrical connection														
24 V, 50 Hz		•		•		•	•		•		•	•	•	•
230 V, 50 Hz		•	•	•	•	•	•	•	•	•	•	•	•	•
120 V, 60 Hz		•		•		•	•		•		•	•	•	•
Power consumption, approx.	VA	3	6	3	6	3	4	8	4	8	4	4	4	4
Handwheel		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, according to DIN IEC 529)												
Class of protection		II (according to VDE 0106)												
Overvoltage category		II (according to VDE 0110)												
Degree of contamination		2 (according to VDE 0110)												
Noise immunity		EN 61000-6-2												
Noise emission		EN 61000-6-3												
Weight	kg	0.75	1.00	0.75	1.00	0.75	1.00	1.25	1.00	1.25	1.00	1.00	1.00	1.00
Additional electrical equipment														
2 limit switches · Max. 230 V, 3 A Cannot be retrofit!		•	•	•	•	•	•	•	•	•	•	•	•	•
1 potentiometer · 0 to 1000 Ω ±15 % (90 % of final value at rated travel); max. 1 mA, 5 V		•		•		•	•		•		•	•	•	•
Materials														
Housing, cover		Plastic (PPO with glass fiber reinforcement)												
Coupling nut		Brass												

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

2) Manual override using 4 mm Allen key after removing the cover; actuator always moves to fail-safe position when fail-safe action has been triggered

3) Safety spring pulls actuator stem to retracted end position; valve operated by valve spring

Technical data · Actuator *with* digital positioner

Actuators *with* digital positioner	Type	5824			5825					
		-10	-20	-30	-10	-20	-30	-15	-25	-35
Fail-safe function		Without			With					
Fail-safe action		–			Stem extends			Stem retracts		
Rated travel	mm	6[1]	12	15	6[1]	12	15	6[1]	12	15
Transit time for rated travel[2] [3]	s	45/**31**/17	89/**61**/33	111/**76**/41	45/**31**/17	89/**61**/33	111/**76**/41	45/**31**/17	89/**61**/33	111/**76**/41
Transit time for fail-safe action	s	–			4	6	7	4	6	7
Nominal thrust Stem extends	N	700			500		280	500		280
Nominal thrust of safety spring	N	–			500		280	–[4]		280
Attachment Force-locking		•	•		•	•		•	•	
Attachment Form-fit				•			•			•
Electrical connection[6]										
Operation with 24 V DC (–10 %, +20 %)		•			•					
Operation with 24 V, 50 and 60 Hz		•			•					
Power consumption										
Operation with 24 V DC (–10 %, +20 %)	VA	3			5					
Operation with 24 V, 50 and 60 Hz	VA	7			10					
Manual override		Yes			Optional[5]					
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, according to DIN IEC 529)								
Class of protection		II (according to VDE 0106)								
Overvoltage category		II (according to VDE 0106)								
Degree of contamination		2 (according to VDE 0110)								
Noise immunity		EN 61000-6-2								
Noise emission		EN 61000-6-3								
Weight	kg	0.75			1.00					
Additional electrical equipment										
2 limit switches · Max. 230 V, 3 A Cannot be retrofit!		•			•					
Materials										
Housing, cover		Plastic (PPO with glass fiber reinforcement)								
Coupling nut		Brass								

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

2) Adjustable; default settings in bold print

3) With a fast positioning speed and 24 V DC supply voltage, make sure the voltage does not fall below the specified value

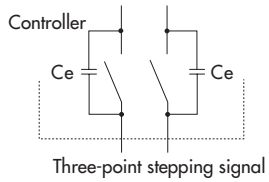
4) Safety spring pulls actuator stem to retracted end position; valve operated by valve spring

5) Manual override using 4 mm Allen key after removing the cover; actuator always moves to fail-safe position when fail-safe action has been triggered

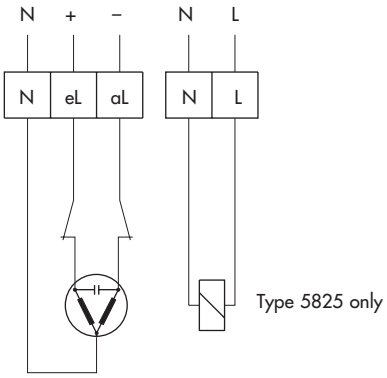
6) Additionally, an actuator with 100 to 240 V, 50 and 60 Hz is in preparation

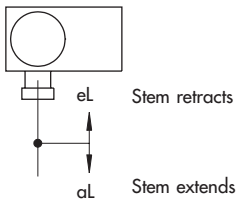
Electrical connection

Three-point stepping version

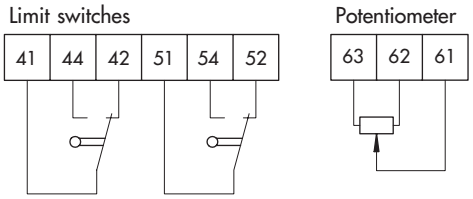


Caution! The interference suppression capacitors C_e in the output circuit of the connected controller must not exceed a value of 2.5 nF to ensure the proper functioning of the actuator. A special actuator version is available on request for connection to controllers with larger interference suppression capacitors.



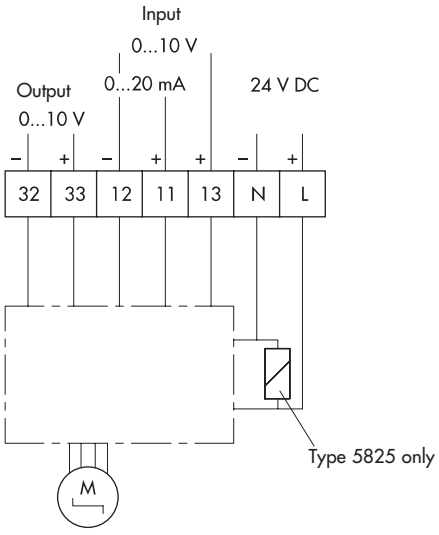


Additional electrical equipment for actuators in three-point stepping version

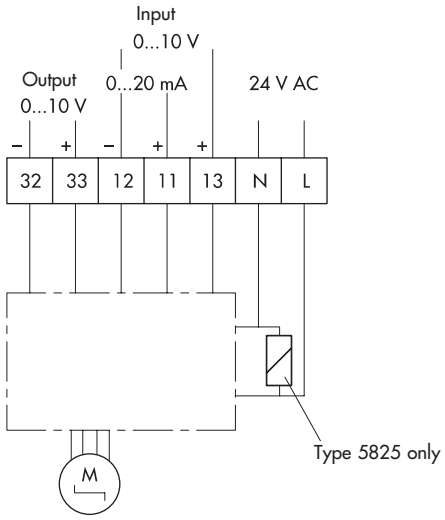


Actuator with digital positioner

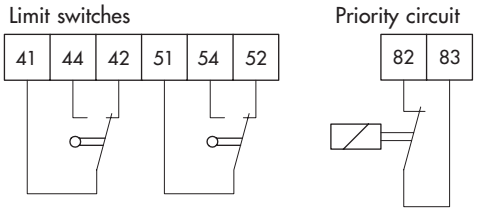
... with 24 V DC



... with 24 V AC

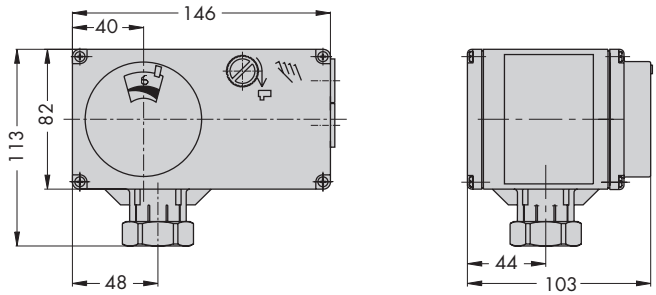


Additional electrical equipment for actuators with digital positioner

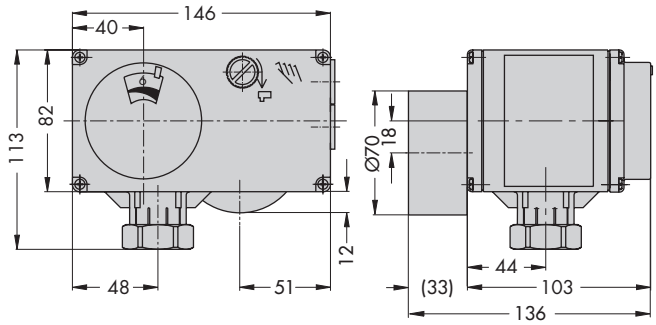


Dimensions in mm

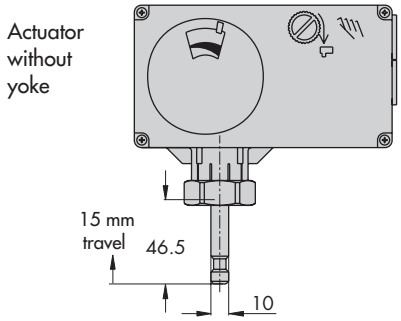
Types 5824-10/-20 and 5825-10/-20/-15/-25

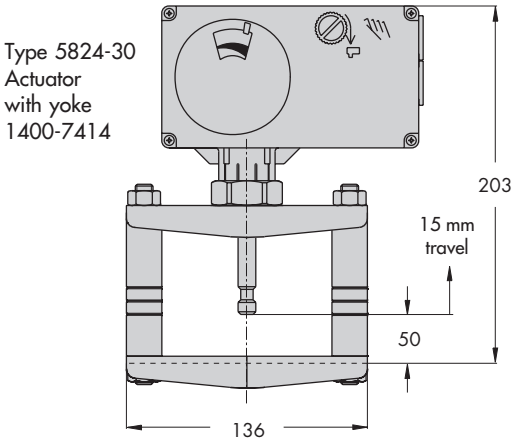


Types 5824-13/-23 and 5825-13/-23



Types 5824-30, 5825-30/-35





Specifications subject to change without notice.

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