

Linear Actuator Type SAM

Application

Electric actuators designed for control valves used in process industries. They are especially suitable for valves of Series 240, 250 and 280.

Nominal thrusts	2 kN to 25 kN
Rated travels	15 to 120 mm

These electric linear actuators contain reversible AC or three-phase AC motors. The rotary motion of the motor is transferred to the actuator stem via a gear unit and the corresponding transfer elements.

Versions are available with 230 V AC or 400 V three-phase AC motor for connection to three-step controllers. Transit times range from 18 s to 144 s. The standard versions include a mechanical handwheel.

The following limit switches and signalling components are included in the standard hardware:

- Two torque-dependent switches
- Three travel-dependent switches

Optional electrical equipment:

- Brake motors (required for positioners)
- One or two potentiometers 100, 200 or 1000 Ω
- One electronic position transmitter with an output signal from 4(0) to 20 mA
- One positioner with input signals from 4(0) to 20 mA or 0 to 10 V

Versions

With surface-cooled squirrel-cage motor for 230 V AC or 400 V three-phase alternating current. Equipped with two torque-dependent limit switches and three limit contacts. Motor with temperature monitor (optional for Type SAM -01 to -23).

Type SAM -01 and SAM -1x · Electric actuator with 30 mm rated travel and nominal thrusts from 2 kN (SAM -01 and SAM -10) to 6 kN (SAM -13).

Type SAM -2x · Electric actuator with 30 mm rated travel and nominal thrusts from 6 kN (SAM -20) to 15 kN (SAM -23).

Type SAM -3x · Electric actuator with 60 mm rated travel and nominal thrusts from 6 kN (SAM -30) to 15 kN (SAM -33).

Type SAM -4x · Electric actuator with 60 mm rated travel and nominal thrusts from 15 kN (SAM -40) to 25 kN (SAM -42).

Type SAM -5x · Electric actuator with 120 mm rated travel and nominal thrusts from 15 kN (SAM -50) to 25 kN (SAM -52).

All actuators are available with the optional electrical equipment described above.

For further technical details, see next page.



Fig. 1 · Type SAM Electric Actuator attached to Type 241 Globe Valve



Fig. 2 · Type SAM Electric Actuator attached to Type 284 Steam Converting Valve

Principle of operation

The actuator motor converts the output pulses of the three-step controller into steps of travel. The length of these steps and the direction of rotation depend on the quantity and the sign of the control deviation.

The rotary motion of the motor is transferred to the gear wheel via the gearing; the gear wheel is shrunk on a bushing with female thread. The top section of the actuator stem which is provided with the matching male thread engages the female thread. Due to the rotary motion of the gear wheel and bushing, the actuator stem screws into the female thread and performs a lifting, linear motion. The actuators can be adjusted manually after disengagement of the motor.

All versions are equipped with two torque-dependent and three travel-dependent limit switches which stop the motor when the predetermined limits are reached. These electrical components are housed below the sealed cover where they are separated from the gearing and protected from moisture and dust. They can be easily accessed after lifting off the cover.

The torque-dependent switches (S1 and S2 in Fig. 4) switch off the motor when the adjusted force is reached, e.g., when the valve plug rests against the seat or when the linear motion is obstructed in any way. The three floating travel-dependent switches (S3 to S5) issue a limit signal when the adjusted limit values are exceeded. Usually, one switch (S3) is used to limit the travel in the opening direction of the control valve. Whereas the other two switches (S4 and S5) indicate intermediate or end positions.

The electric actuators can optionally be equipped with two potentiometers and/or an electric position transmitter with an output signal from 4 (0) to 20 mA. They are used for analog remote transmission of the valve position. It is also possible to install a positioner with input signals 4 (0) to 20 mA or 0 to 10 V when AC brake motors for 230 V, 50 Hz are used. The installation and start-up effort for three-phase AC brake motors is considerably higher because additional external reversing contactors are required.

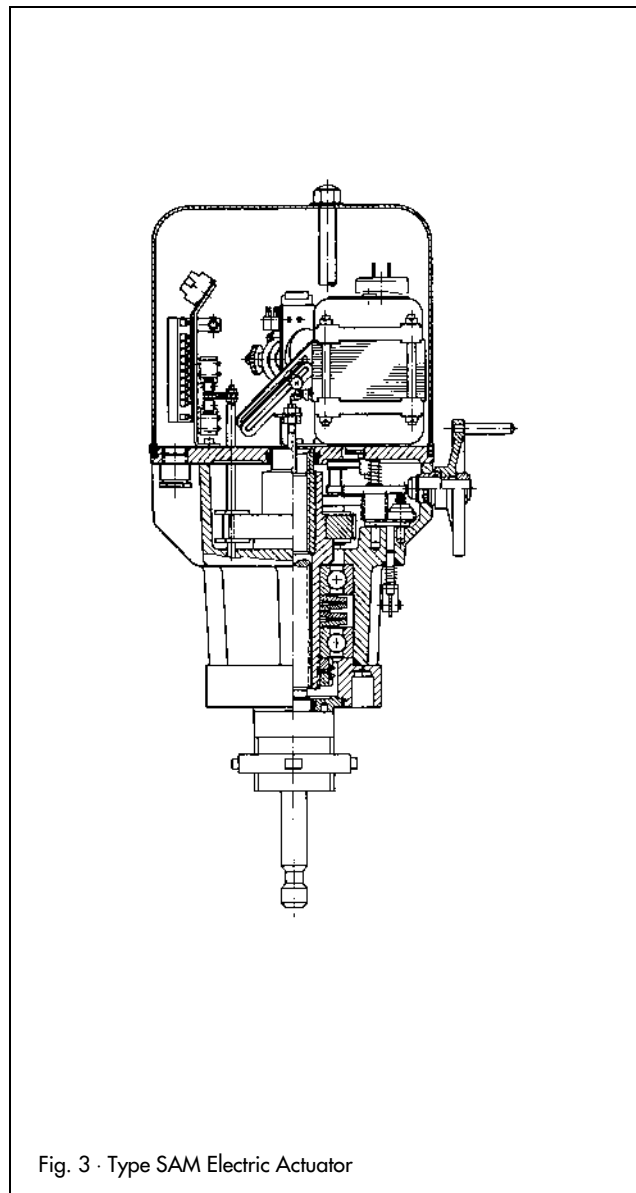


Fig. 3 · Type SAM Electric Actuator

Table 1 · Technical data

Type	SAM -	01	10	11	12	13	20	21	22	23	30	31	32	33	40	41	42	50	51	52
Nominal thrust	kN	2	2	3.5	4.5	6	6	8	12	15	6	8	12	15	15	20	25	15	20	25
Rated travel	Standard	30									60						120			
	Optional	15									30						60			
Speed of response	mm/min	15	17 · 25 · 50			17 34	13.5 · 25 · 50			13.5 22 40	13.5 · 25 · 50			13.5 22 40	25 · 50					
Connecting thread		M 30 x 1.5									M 60 x 1.5						M 100 x 1.5			
Degree of protection		IP 65																		
Perm. ambient temperature		-20 to +60 °C																		

Table 2 · Electrical connection data

Type	SAM -	01	10 · 11 · 12			13		20 · 21 30 · 31		22 · 23 32 · 33		23 33	20 · 21 · 22 30 · 31 · 32		23 33	40 · 41 · 42 50 · 51 · 52		
Speed of response	mm/min	15	17 · 25	50	17	34	13.5	25	13.5	22	50	40	25	50				
Motor and power consumption [A]	230 V/50 Hz	0.029	0.16	0.18	0.16	0.18	0.1	0.225	0.145	0.225	0.7	0.7	0.66	0.93				
	400 V/50 Hz	0.015	0.11	0.08	0.11	0.08	0.062	0.11	0.85	0.11	0.29	0.29	0.4	0.7				
	Version	Synchronous motor											Asynchronous motor ¹⁾					
	Temperature monitoring	Only on request, not required											Bimetallic release					

¹⁾ Actuators with positioner require brake motors

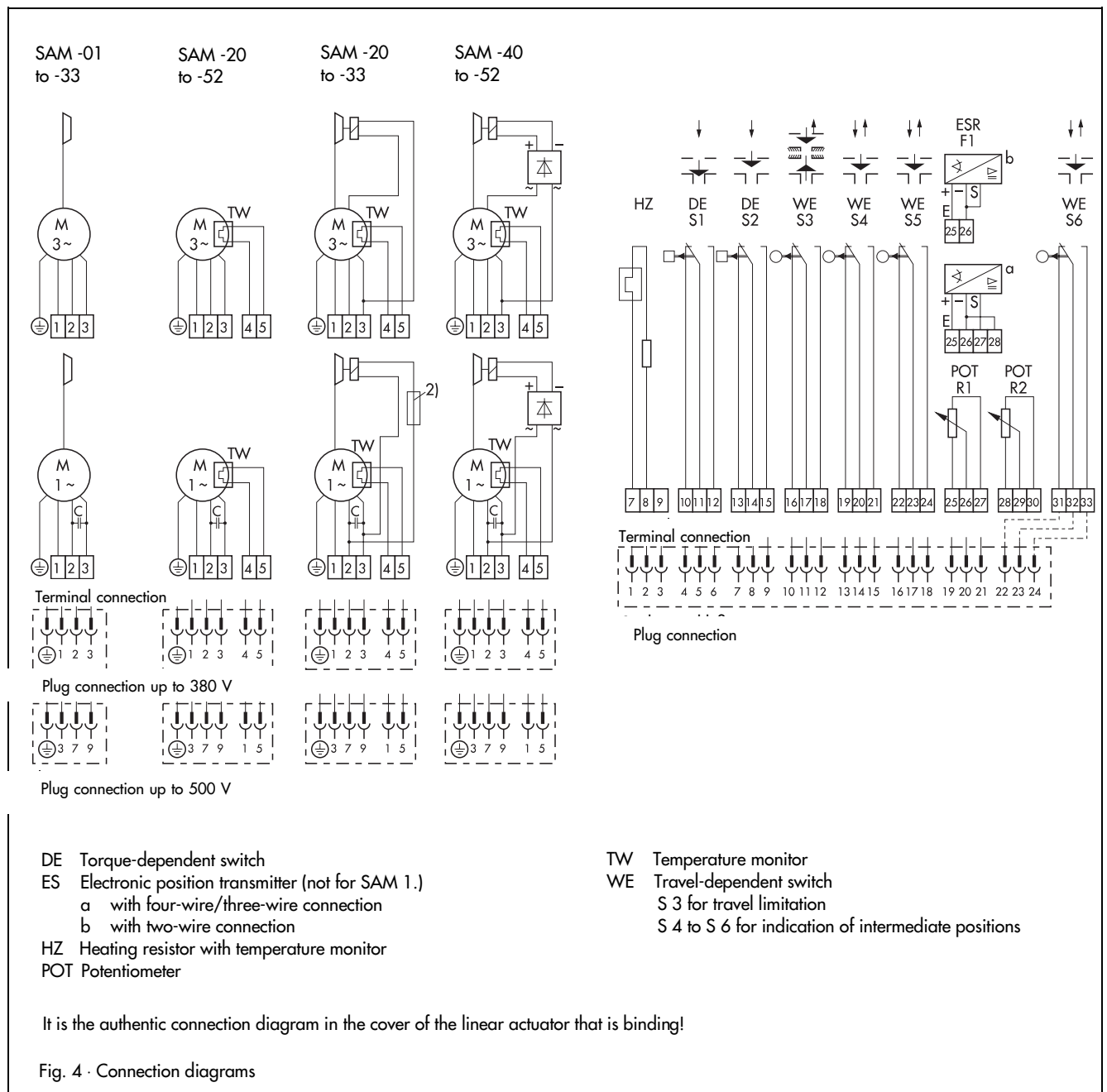
Table 3 · Electrical equipment

Standard version	2 torque-dependent switches 3 travel-dependent switches Motor coil with temperature monitor (see Table 2)
Options	1 or 2 potentiometers 100, 200 or 1000 Ω 1 position transmitter with output 4(0) to 20 mA 1 positioner with input 4(0) to 20 mA or 0 to 10 V (only with brake or synchronous motor) 1 heating resistor with temperature monitor

Electrical connection

The electric actuators can be connected in three ways: 1) via internal terminal blocks (standard version), 2) via 32-pin terminal blocks in a terminal box or 3) via a compact connector. A 10-pin plug insert (silver-plated sockets and pins) is used to connect the motor; a 24-pin unit containing either silver or gold-plated contacts is used to connect the limit switches and signalling equipment.

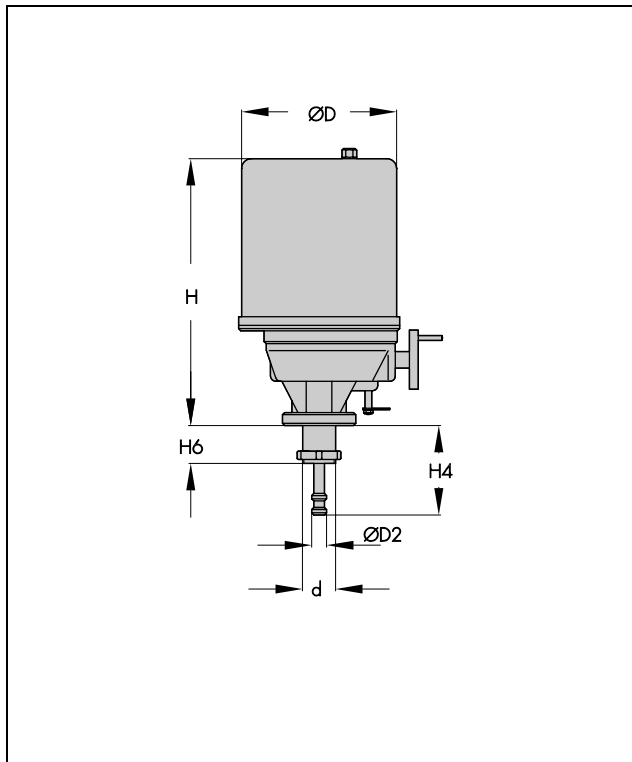
When a plug connector is used, only one potentiometer (R1) can be provided in case a 4th travel-dependent switch (S6) is desired. The travel-dependent switch S3 must be adjusted in such a way that the travel of the final control element is limited in the opening direction by switching off the motor.



Dimensions in mm and weights

Type	SAM -01 to -13 ¹⁾	SAM -20 to -23	SAM -30 to -33	SAM -40 to -42	SAM -50 to -52
Rated travel	30	30	60	60	120
H	248	319	304	385	395
H4 max.	90	90	165	165	315
H6	34	34	54	54	92
ø D	144	188	188	216	216
ø D2	16	16	22	40	40
ø d (thread)	M 30x1.5	M 30x1.5	M 60x1.5	M 60x1.5	M 100x2
Approx. weight in kg	5	6	7	15	19

¹⁾ Without positioner and position transmitter ES, apart from this, it is the same as for SAM -20.



Ordering text

Electric Actuator	Type SAM -...
AC motor	230 V, 50 Hz
AC brake motor	230 V, 50 Hz
Three-phase AC motor	400 V, 50 Hz
3-phase AC brake motor	400 V, 50 Hz
Attached to Control Valve	Type ...
Valve travel	15/ 30/ 60/ 120 mm

Options:

Potentiometers	1 or 2
	100, 200 or 1000 Ω
1 electronic position transmitter	
Output	4 to 20 mA
1 positioner,	
Input	4 to 20 mA
	0 to 10 V.

Specifications subject to change without notice.

