

Application

Electrohydraulic actuator for plant engineering and HVAC



Special features

- Compact design with electric or mechanical override
- Safe functioning due to force-dependent deactivation of the motor when end positions are reached or when overload occurs
- Installation of positioner, resistance transmitters and electric or inductive limit contacts in the terminal box
- Optionally with fail-safe action for version with electric override

Versions with electric override (Fig. 1)

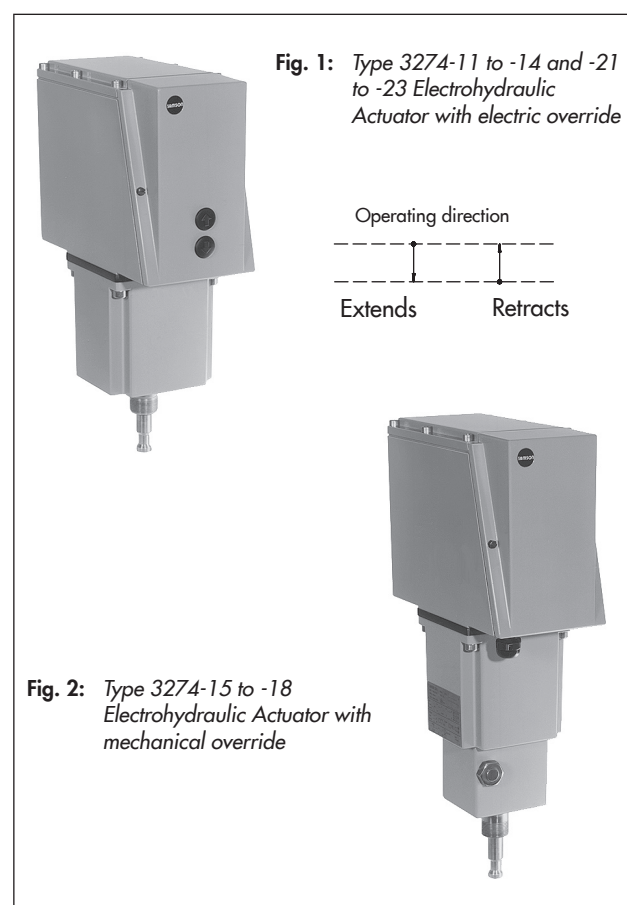
Override activated by two pushbuttons

Type	Thrust and operating direction
3274-11	F_{retracts} 2100 N (operating direction: stem retracts) F_{extends} 1800 N (operating direction: stem extends)
3274-12	F_{retracts} 500 N F_{extends} 3000 N
3247-13	F_{retracts} and F_{extends} both 4300 N
3274-14	F_{retracts} 500 N F_{extends} 7300 N

Versions with mechanical override (Fig. 2)

Mechanical override implemented using an Allen key (width across flats 24 mm) at the additional gearing housing

Type	Thrust and operating direction
3274-15	F_{retracts} 2100 N (operating direction: stem retracts) F_{extends} 1800 N (operating direction: stem extends)
3274-16	F_{retracts} 500 N F_{extends} 3000 N
3247-17	F_{retracts} and F_{extends} both 4300 N
3274-18	F_{retracts} 500 N F_{extends} 7300 N



Versions with fail-safe action and electric override, operating direction of the spring return mechanism (Fig. 1)

Type	Thrust, operating direction and fail-safe action
3274-21	F_{retracts} 2100 N (operating direction: stem retracts) F_{extends} 1800 N (operating direction: stem extends) Operating direction of fail-safe action: stem extends
3274-22	F_{retracts} 1800 N F_{extends} 2100 N Operating direction of fail-safe action: stem retracts
3274-23	F_{retracts} 500 N F_{extends} 3000 N Operating direction of fail-safe action: stem extends

Versions tested according to DIN EN 14597

The Type 3274-21 and Type 3274-23 Actuators (with fail-safe action: stem extends) are tested by the German technical surveillance association (TÜV) according to DIN EN 14597 in combination with various SAMSON valves. The registration number is available on request.

Other certification

- CSA for 110 V/60 Hz version
- NEMA 3

Principle of operation (Fig. 3)

The pressure-tight actuator housing (1) also serves as oil reservoir and incorporates the cylinder housing (2), cylinder (5.1) and piston (5.2), motor (6.1), pump (6.2) and solenoid pilot valves (6.4). The required electric lines are oil-tight and pressure-tight and lead from the terminal box (3) to the actuator housing.

The oil pump (6.2) driven by the motor (6.1) feeds compressed oil to the corresponding cylinder chamber over the check valve (6.3) and pilot valve (6.4). The solenoid valves are closed in the de-energized state. They open when the controller issues a signal.

Depending on the version, the actuators are equipped without compression springs or with one or two compression springs (5.10, 5.11). These springs are used to return the actuator to its fail-safe position.

The motor is controlled by a relay in its electronics section. The relay is directly connected to the power supply. Therefore, the contacts of the controller are subjected to a load of maximum two solenoid valves, while the electronics section of the motor is only subjected to a low load.

When reaching an end position or when the thrust is exceeded due to external forces, the force-dependent switches (4.3) or (4.4) deactivate the motor.

CAUTION: Do not open the housing cover (1.1). The hydraulic equipment does not need any maintenance and an oil change is not necessary.

Versions with fail-safe action have a spring return mechanism and an additional safety solenoid valve which opens when the power supply is interrupted, reducing the pressure on the cylinder chamber. In this case, electric override is not possible.

Manual override

Depending on the version, the actuator is fitted with an electric or mechanical override.

Versions with fail-safe action are always fitted with an electric override.

Electric override · There are two pushbuttons on the side cover (3.1). Any position can be reached independent of the control signal.

After the pushbutton is released, the actuator reacts again according to the controller signal. The control signal can be interrupted by opening the isolator terminal (81 in Fig. 4 to Fig. 6).

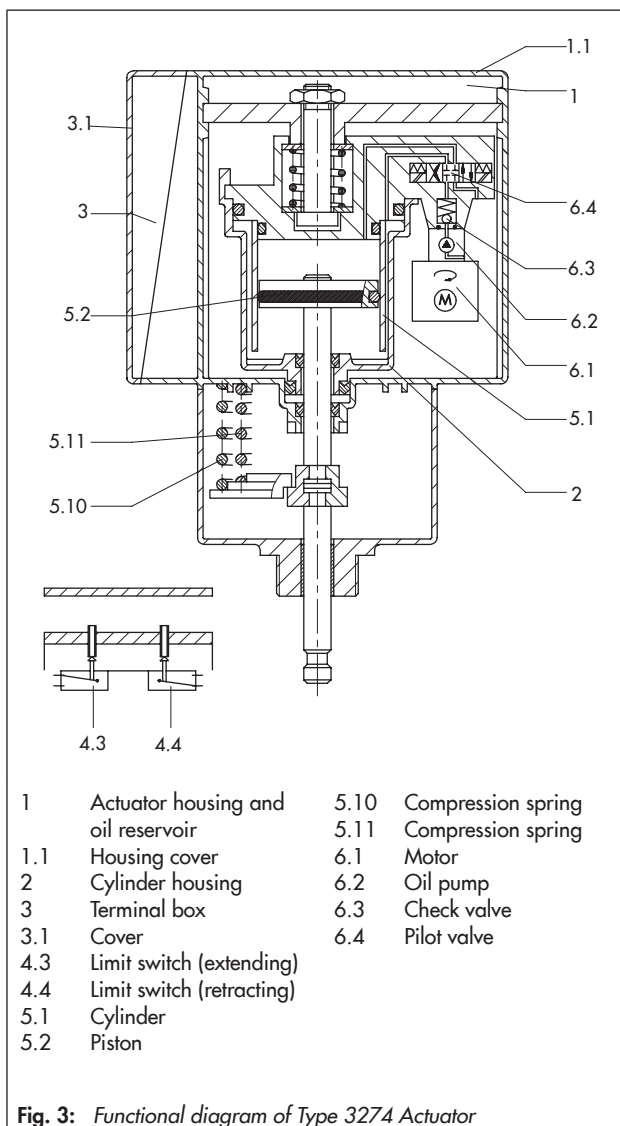


Fig. 3: Functional diagram of Type 3274 Actuator

Mechanical override · The release button on the top of the actuator housing must be activated. An Allen key (SW 24) can be used for adjustment. As soon as the button is released, the actuator reacts again according to the controller signal.

Additional electrical equipment

All the electrical equipment can be accessed in the terminal box (3). Table 2 shows the possible equipment.

Positioner · The positioner compares the controller signal to the signal issued by a resistance transmitter. This signal is proportional to the travel. The output variable produced by the positioner is a three-step control signal.

Zero and span for normal and split-range operation are adjustable within a broad range.

The operating direction (increasing/increasing or increasing/decreasing) can be selected. An external make contact can be used to move the actuator to one of the end positions. This does not affect the fail-safe function. The positioner has an additional output for valve position feedback.

Position transmitter · Output signal 0/2 to 10 V or 0/4 to 20 mA with 0 to 1000 Ω resistance transmitter for versions with three-step signal.

Resistance transmitter · Actuators can be equipped with one or two resistance transmitters. Versions with a positioner require an internal potentiometer for valve position feedback to the positioner.

Electric limit contacts · Actuators can be equipped with maximum three electric or two inductive limit contacts on request. The electric limit contacts are activated over continuously adjustable cam disks.

Heating resistor · The actuator can optionally be fitted with a heating resistor, which allows the actuator to be operated down to a temperature of -35°C .

The heating resistor is not protected by the internal fuse. We recommend using an external fuse to match the power consumption data indicated on the nameplate.

Refer to the instructions for mounting positions in the Mounting and Operating Instructions ► EB 8340 EN.

Table 1: Technical data

Actuator			Type 3274-	-11	-12	-13	-14	-15	-16	-17	-18	-21	-22	-23
Version with handwheel				Electric				Mechanical				Electric		
Fail-safe action				Without								Extends	Retracts	Extends
Rated travel				15 or 30 mm										
Transit time for rated travel, approx.				60 s for 15 mm; 120 s for 30 mm 60 s for 30 mm (not for actuators with 24 V power supply)										
Stroking speed for fail-safe action [mm/s]			Standard	–								1	1	1.3
			Optional									3.3	3.3	5
Thrust (N) with travel	15 mm stem	Retracts	2100	500	4300	500	2100	500	4300	500	2100	1800	500	
		Extends	2000	3400	4300	7700	2000	3400	4300	7700	2000	2300	3400	
	30 mm stem	Retracts	2100	500	4300	500	2100	500	4300	500	2100	1800	500	
		Extends	1800	3000	4300	7300	1800	3000	4300	7300	1800	2100	3000	
Power supply				230 V, 110 V, 24 V; 50 or 60 Hz (both ±10 %)										
Power consumption with power supply				24 V, 110 V, 230 V/50 Hz 24 V, 110 V, 230 V/60 Hz 110 V, 230 V/50 Hz with faster motor 110 V, 230 V/60 Hz with faster motor Positioner								90 VA 110 VA 150 VA 185 VA 3 VA		
Permissible ambient temperature				–10 to +60 °C Extended range (with heating resistor): –35 to +60 °C										
Permissible storage temperature				–25 to +70 °C										
Degree of protection				IP 65 according to EN 60529										
Operating mode				Intermittent periodic duty (S4) according to EN 60034-1 with 50 % on-time										
Installation				Central attachment M30x1.5 · Special version for Type 3214 Valve, DN 150 to 250										
Weight kg (approx.)				12				15				12		
Additional electrical equipment														
Electric positioner	Power supply			230 V, 110 V, 24 V; 50 or 60 Hz (both ±10 %)										
	Input signal			0 to 20 mA, 4 to 20 mA (R _i = 50 Ω) · 0 to 10 V, 2 to 10 V (R _i = 10 kΩ)										
	Zero shift			0 to 100 %										
	Change of range			30 to 100 %										
	Output signal			0/4 to 20 mA, R ≤ 200 Ω · 0/2 to 10 V, R ≥ 2 kΩ										
Resistance transmitters (other ranges on request)				0 to 1000 Ω, 0 to 200 Ω, 0 to 100 Ω, 0 to 275 Ω, 0 to 138 Ω (when the rated travel is at approx. 80 % of its final value); permissible load 0.5 W										
Electric limit contacts				Maximum three separately adjustable limit contacts (see Table 2)										
Permissible load				250 V~, 5 A										
Inductive limit contacts				SJ2-N proximity switch										
Control circuit				Values according to downstream transistor relay (not included in delivery)										
Heating resistor, approx. 45 W				With thermostat, activated at approx. –10 °C, deactivated at approx. 0 °C										

Table 2: Additional electrical equipment

Accessories	Max. equipment combination (arranged by columns)							
Positioner	•	•	–	–	–	–	–	–
Position transmitter	–	–	•	•	–	–	–	–
Resistance transmitter 1	• 1)	• 1)	• 1)	• 1)	•	•	–	–
Resistance transmitter 2	•	•	•	•	•	•	–	–
Electric limit contact 1	–	–	–	–	–	–	•	•
Electric limit contact 2	•	–	•	–	•	–	•	–
Electric limit contact 3	•	–	•	–	•	–	•	–
Inductive limit contact 1	–	•	–	•	–	•	–	•
Inductive limit contact 2	–	•	–	•	–	•	–	•

1) A potentiometer of 1000 Ω is required for position feedback for positioner/position transmitter.

Table 3: Materials

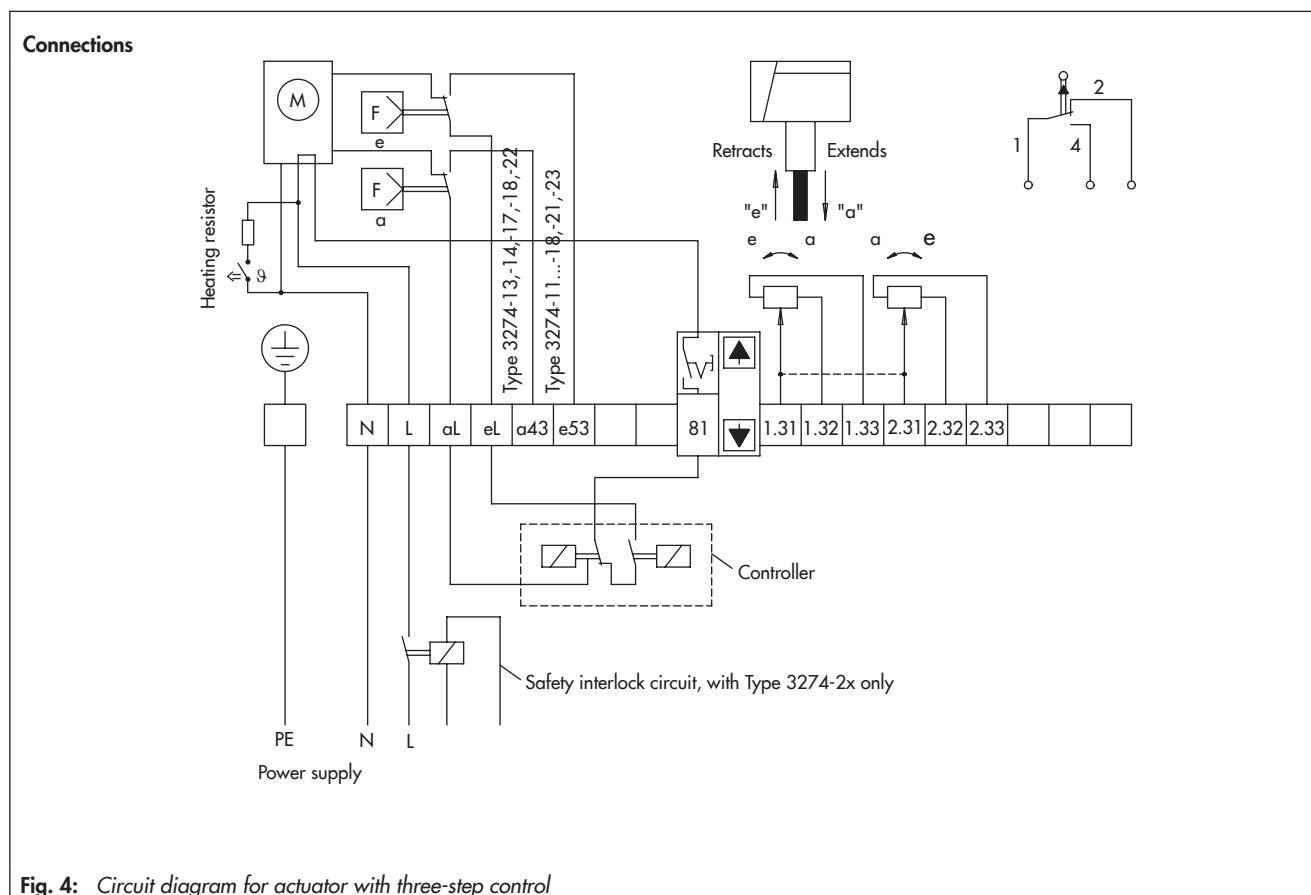
Housing and housing cover	Die-cast aluminum, plastic-coated
Cylinder	Hydraulic cylinder tube
Piston	Steel/NBR combination
Piston rod	C45, hard chrome-plated
Actuator stem	1.4104
Hydraulic oil	Special HLP, silicone-free

Electrical connection (see Fig. 4 to Fig. 6)

Figs. 4 and 6 schematically illustrate the different means of connection, depending on how the version is equipped. The electric limit contacts are provided with screwed connections. They are connected directly, not over the terminal block.

Especially for 24 V actuators, lines with a sufficiently large cross-section must be laid in order to guarantee that the permissible voltage tolerances of $\pm 10\%$ are kept.

The heating resistor does not need a separate connection.



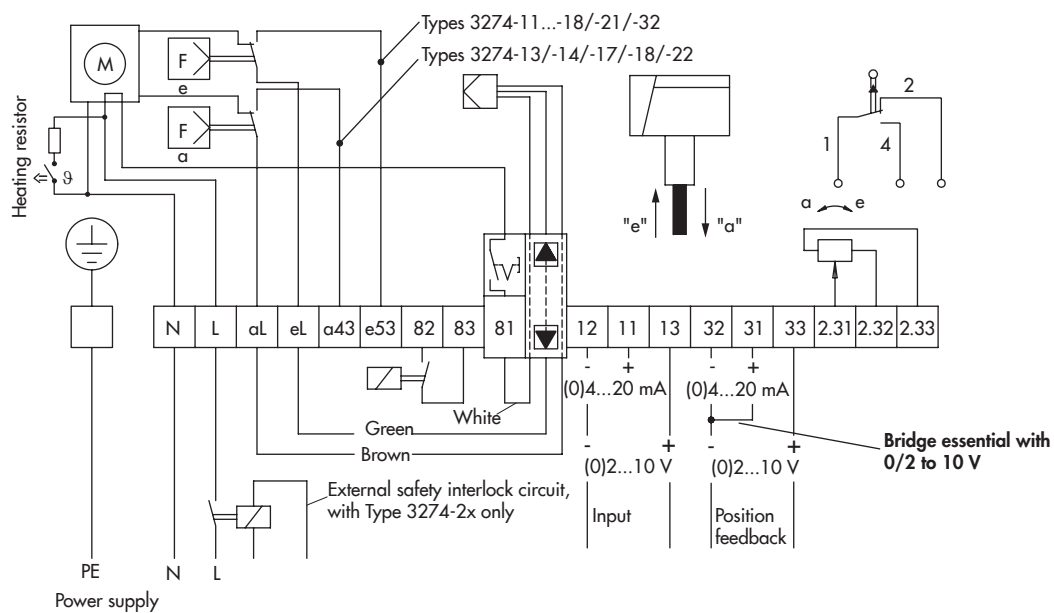


Fig. 5: Circuit diagram for actuator with positioner

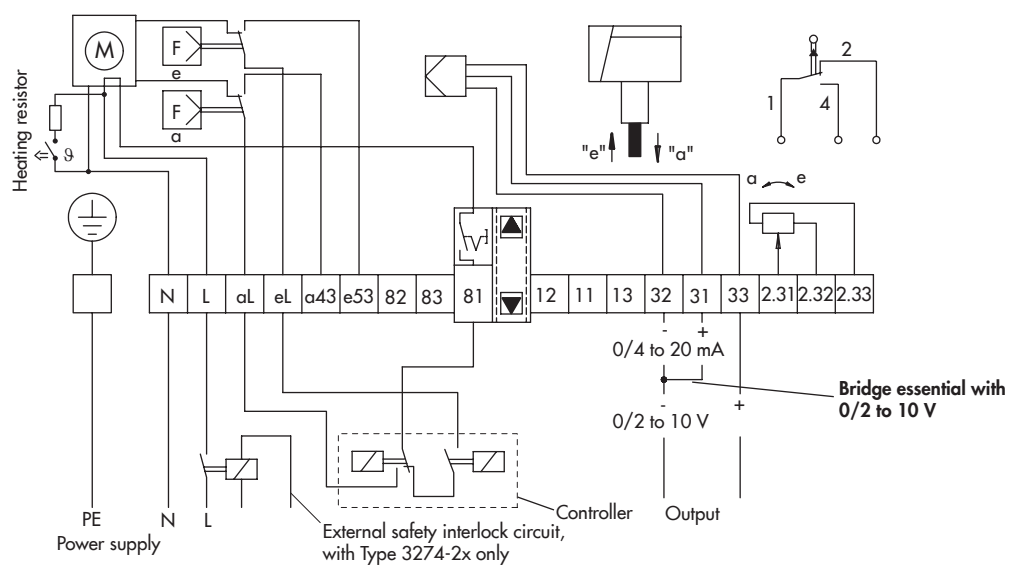
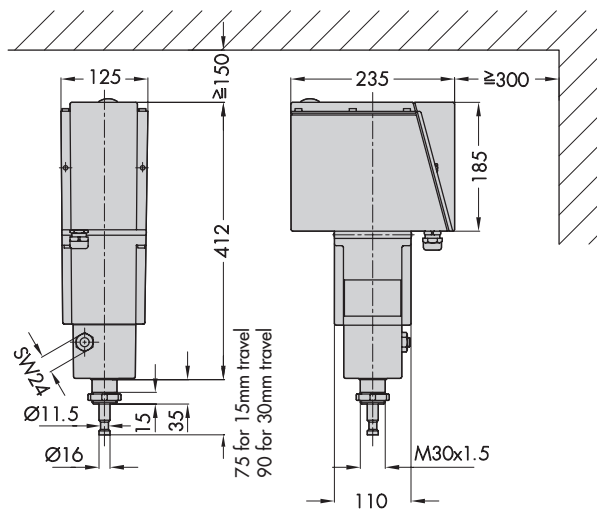
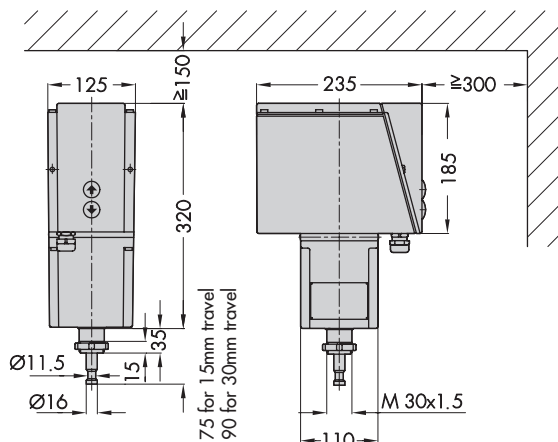


Fig. 6: Circuit diagram for actuators with position transmitter

Dimensions in mm



Type 3274-... Actuator with mechanical override



Type 3274-... Actuator with electric override

Ordering text

Electrohydraulic actuator Type 3274- ...
 Rated travel 15/30 mm
 Fail-safe action (only with electric override)
 Operating direction Retracts or extends
 Power supply 230/110/24 V; 50/60 Hz
 Version for Type 3214 Valves, DN 150 to 250, if needed

Additional electrical equipment (see Table 2)

Positioner
 Input signal 0/2 to 10 V or 0/4 to 20 mA
 Position transmitter 0/2 to 10 V or 0/4 to 20 mA
 Resistance transmitters 0 to 1000 Ω
 0 to ... Ω
 Limit contacts Electric/inductive
 Heating resistor for wider temperature range

Specifications subject to change without notice



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2015-03-02 · English