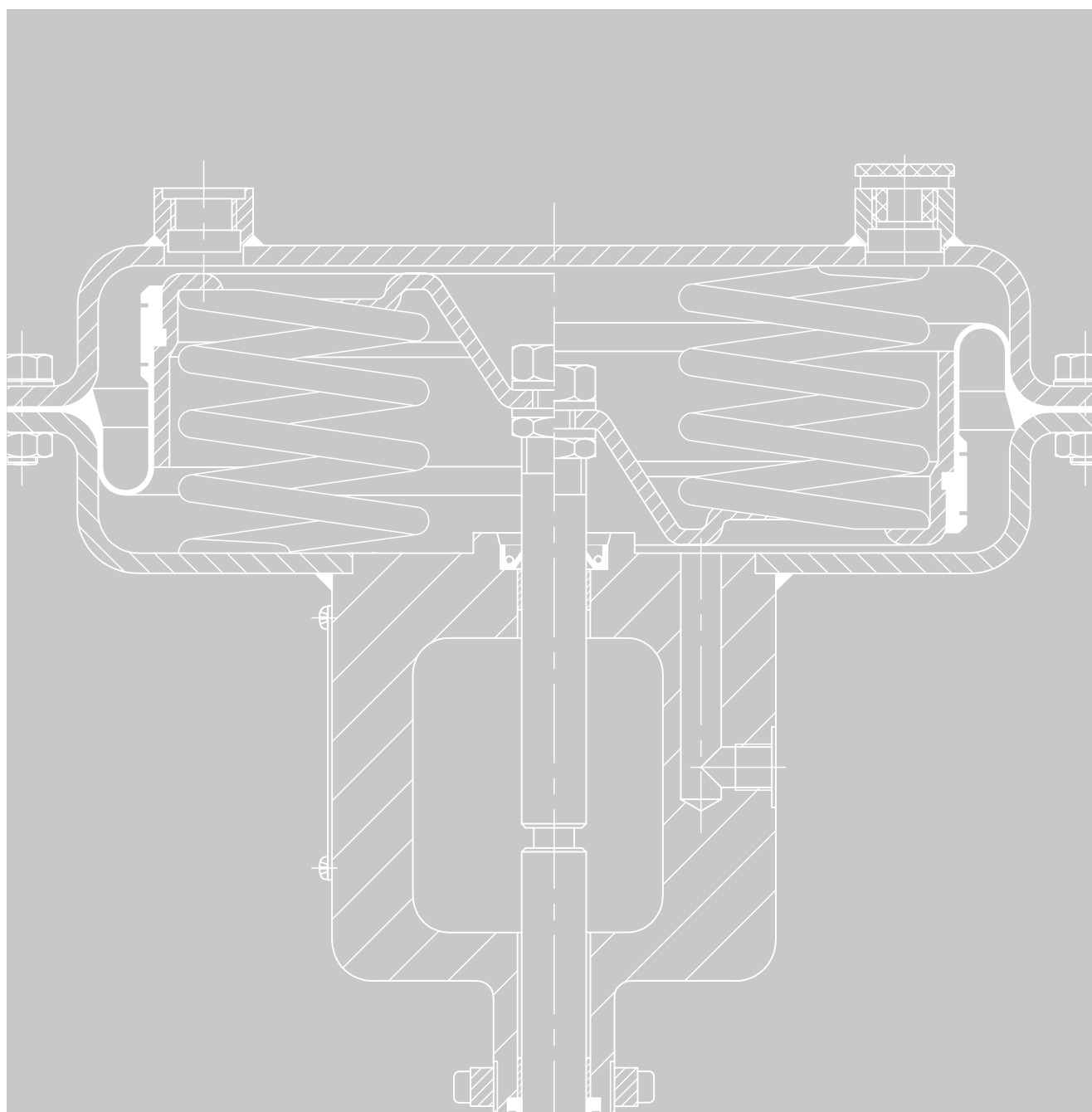


# Actuators



Pneumatic, electric and electrohydraulic actuators  
for control valves and butterfly valves

Diaphragm actuators with effective areas up to 2800 cm<sup>2</sup>  
Electric actuators with nominal thrusts up to 87 kN  
Electrohydraulic linear actuators with nominal thrusts up to 7.3 kN  
Hand-operated actuators



# Selection and application

Actuators convert the instrument control signal supplied by an automation device (controller, control station, process control system) into a linear or rotary motion used to position the corresponding adjusting member of the final control element - e.g., the valve plug of a control valve - in direct proportion to the control signal received. With control valves, this converted motion may be either a linear, upward or downward motion. For butterfly valves, ball valves or rotary plug valves, this may be a rotary, circular motion up to 70° opening angle for control operation. For on-off (two-position) operation, this may be a rotary motion up to 90°. The actuator sub-assembly plus the valve sub-assembly constitute the complete control valve assembly, commonly referred to as the control valve.

To match system requirements, the actuators can be equipped with a wide range of transfer elements, e.g. positioners, converters, solenoid valves, position transmitters and limit switches. For details on selecting the accessory units, see Data Sheet T 8350 EN.

## Application and instrumentation

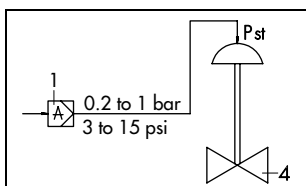
Pneumatic actuators are field-proven, require little maintenance, and are inexpensive devices intended for pneumatic or electropneumatic instrumentation.

Accessories, such as positioners or converters, also act as a servo-amplifier because they convert the low-volume output signal  $y$  (0.2 to 1 bar) received from a controller into a powerful signal pressure  $p_{st}$  up to 6 bar (90 psi).

Electric and electrohydraulic actuators are primarily used in applications where compressed air is not available. A series of modules can also be added to the actuators, permitting them to be matched to specific control tasks.

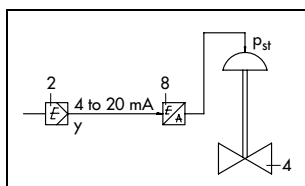
## A Pneumatic instrumentation

**A1**  
Instrumentation  
without a positioner  
Signal range 0.2 ... 1 bar  
(3 ... 15 psi)



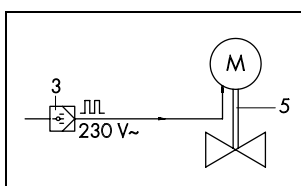
## B Electropneumatic instrumentation

**B1**  
Instrumentation  
with an i/p converter  
Signal press.  $p_{st} \leq 6$  bar  
(90 psi)

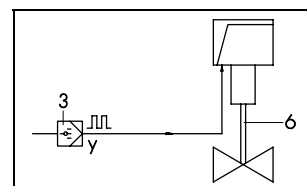


## C Electric instrumentation

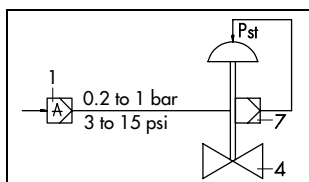
**C1**  
Instrumentation  
with an AC motor  
230 V ~



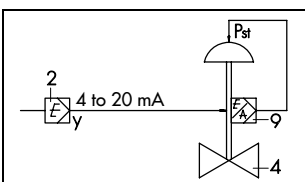
**C3**  
Electrohydraulic actuator  
with a three-step (three-point)  
input signal



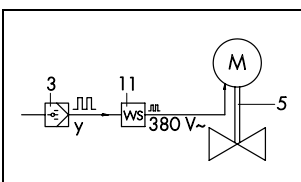
**A2**  
Instrumentation  
with a pneumatic positioner  
Signal pressure  $p_{st} \leq 6$  bar  
(90 psi)



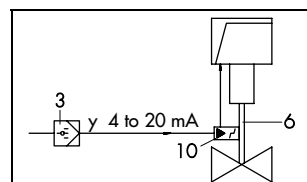
**B2**  
Instrumentation  
with an i/p positioner  
Signal pressure  $p_{st} \leq 6$  bar  
(90 psi)



**C2**  
Instrumentation  
with an electric contactor  
and three-phase AC motor  
380 V ~



**C4**  
Electrohydraulic actuator  
with a continuous electric  
control signal



### Legend for Figs. A1 to C4

1 Pneumatic controller  
2 Electric controller or automation system with mA output

3 Electric controller or automation system with three-step output  
4 Pneumatic control valve

5 Electric control valve  
6 Electrohydraulic control valve  
7 Pneumatic positioner

8 i/p converter  
9 i/p positioner  
10 Electric positioner  
11 Electric contactor

## Pneumatic actuators

The pneumatic actuators are diaphragm actuators, equipped with a rolling diaphragm and internal compression springs.

They provide the following advantages:

- Designed for signal pressures up to 6 bar (90 psi)
- Low overall height
- Powerful actuator thrusts and fast transit times
- Minimum friction
- Various bench ranges
- No special tools required to change the bench range or reverse the actuator action

### Fail-safe action

Depending on the version, actuators are equipped with two different fail-safe positions that become effective when the pressure acting on the actuator diaphragm is reduced or the air supply fails:

**Actuator stem "extends"** (marked FA on the actuator)

The spring force extends the actuator stem in the lower end position.

**"Actuator stem "retracts"** (marked FE on the actuator)

The spring force retracts the actuator stem.

### Type 3271 Pneumatic Actuator (Figs. 1 and 2)

Designed for rated travels from 7.5 to 120 mm and effective diaphragm areas of 60, 80, 120, 240, 350, 700, 1400 and 2800 cm<sup>2</sup>. Tandem actuators with twin diaphragms have a total effective area of 2 x 2800 cm<sup>2</sup>.

Optional version equipped with handwheel (120 cm<sup>2</sup> effective area and larger). Top-mounted handwheel with effective diaphragm areas of 120 to 700 cm<sup>2</sup> ( Fig. 1); side-mounted handwheel with effective diaphragm areas of 1400 to 2800 cm<sup>2</sup>.

See Data Sheet T 8310 EN for details.

### Type 3277 Pneumatic Actuator (Fig. 3)

Designed for integral positioner attachment. The completely protected positioner is fastened to the yoke attached to the bottom diaphragm case. Effective diaphragm areas of 120, 240, 350 or 700 cm<sup>2</sup>. Rated travels from 7.5 to 30 mm. Optionally with top-mounted handwheel.

See Data Sheet T 8311 EN for details.

### Type 204-1 and Type 204-7 Pneumatic Actuators with Rotary Lever (Fig. 4)

Pneumatic diaphragm actuators for final control elements with rotary closure members, especially designed for use with butterfly valves and shutters. Nominal opening angle 90°. Diaphragm areas of 350 or 700 cm<sup>2</sup>. Optional handwheel.

Type 204-7 is designed for integral positioner attachment.

See Data Sheet T 8316 EN for details.

### Type 3278 Pneumatic Rotary Actuator (Fig. 5)

Single-acting, spring-opposed actuator designed for use with butterfly valves and other final control elements utilizing rotary closure members. Nominal opening angle 70° or 90°. Effective diaphragm areas of 160 or 320 cm<sup>2</sup>. Optional handwheel.

See Data Sheet T 8321 EN for details.

### Pfeiffer Type AT Pneumatic Rotary Actuator (Fig. 6)

Single or double-acting piston actuator designed for use with final control elements utilizing rotary closure members. Maximum opening angle 90°. Optional handwheel. For throttling or on-off services. See Data Sheet T 9929 EN for details.



Fig. 1  
Type 3271 Pneumatic Actuator  
with top-mounted handwheel  
on Type 241 Globe Valve

Fig. 2  
Type 3271 Pneumatic Actuator  
on Type 241 Globe Valve



Fig. 3  
Type 3277 Pneumatic Actuator  
on Type 241 Globe Valve

Fig. 4  
Type 204-1 Pneumatic  
Actuator



Fig. 5  
Type 3278 Rotary Actuator  
with Type 3331 Butterfly  
Valve and attached Type  
3767 Positioner

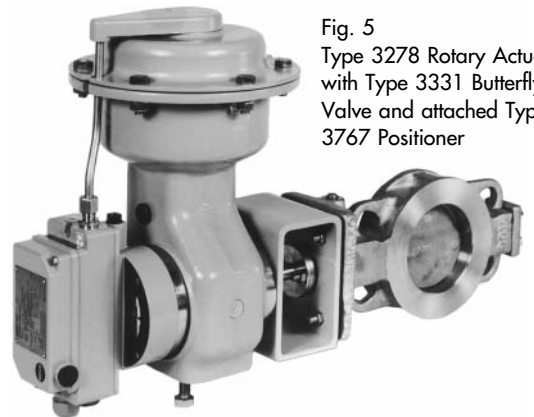


Fig. 6  
Pfeiffer Type AT  
Rotary Actuator



## Electrohydraulic and electric actuators

### Type 3274-11 to -23 Electrohydraulic Linear Actuators (Fig. 7)

Designed for nominal thrusts up to 7.3 kN and rated travels of 15 or 30 mm.

Transit times comprise 60 s or faster for connection to three-step controllers. Also with electric positioner for continuous control signals from 4 (0) to 20 mA or 0 (2) to 10 V-.

Optional electrical or mechanical override. Versions available with fail-safe function.

See Data Sheet T 8340 EN for details.

### Type SAM Electric Actuators (Fig. 8)

Self-locking, linear motion actuators with reversible AC or three-phase AC motor for nominal thrusts from 2 to 25 kN and rated travels from 15 to 120 mm. Transit times 30 s and faster for connection to three-step controllers. Also with electric positioner for continuous control signals from 4 (0) to 20 mA or 0 to 10 V. Standard versions contain a mechanical override and two torque-dependent/three stroke-dependent limit switches.

See Data Sheet T 8330 EN for details.

Electric actuators of other manufacturers, such as AUMA, available on request.

### Type 3374 Electric Actuator (Fig. 9)

Electric actuator for industrial plants as well as heating, ventilation and air-conditioning systems. Optionally with or without fail-safe function. Additional version with digital positioner.

See Data Sheet T 8331 EN for details.

### Type 273 Hand-operated Actuator (Fig. 10)

Designed for attachment to final control elements used as manual control valves.

Especially designed for Series 240, 250 and 260 Control Valves. Rated travels of 15 and 30 mm. Nominal thrusts up to 32 kN.

See Data Sheet T 8312 EN for details.

Specifications subject to change without notice.

Fig. 7  
Type 3274- ... Electrohydraulic  
Linear Actuator with mechanical  
override



Fig. 8  
Type 241-2 Electric Control Valve  
with Type SAM Electric Actuator



Fig. 9  
Type 3374 Electric  
Actuator



Fig. 10  
Type 273 Hand-operated  
Actuator on Type 241 Globe  
Valve

