

# Electropneumatic Positioner Type 4763

# Pneumatic Positioner Type 4765



### Application

Single-acting electropneumatic and pneumatic positioners for operation of pneumatic control valves. Standardized electric (mA or V) or pneumatic (psi or bar) input signals.

**Electric input signals** from 4(0) to 20 mA, 1 to 5 mA or 0(2) to 10 V

**Pneumatic input signals** from 3 to 15 psi (0.2 to 1 bar)

**Output signal range** from 0 to 90 psi (0 to 6 bar)

**Rated valve stem travel** from 0.3" to 6" (7.5 to 90 mm)

The positioners consist of a pneumatic proportional controller using a flapper-nozzle system, feedback and optional i/p converter and operate according to the force-balance principle.



The positioners provide accurate valve stem positioning ensuring a pre-selected relationship between the valve stem position (controlled variable  $x$ ) and the electric or pneumatic input signal supplied by the controller (reference variable  $w$ ). They compare the input signal received from the control device to the position of the control valve and produce the corresponding pneumatic output signal pressure  $p_{st}$  (output variable  $y$ ) to the actuator.

### Features

- Corrosion-resistant epoxy-coated aluminum enclosure with stainless steel hardware
- Compact design requiring very little maintenance
- Insensitive to mechanical vibrations
- Field reversible operating action
- Excellent dynamic response
- Suitable for normal or split-range operation
- Adjustable proportional band (P-band)
- Adjustable air output capacity (speed control)
- Low air consumption
- Attachment to valves according to IEC 534-6 and NAMUR
- Output range: 0 to 90 psi (0 to 6 bar)
- Air supply: 20 to 90 psi (1.4 to 6 bar)

### Versions

#### Type 4763 · Electropneumatic positioner

- Input signal ranges: 4(0) to 20 mA, 1 to 5 mA, 2(0) to 10 V
- Enclosure classifications CSA Enclosure 3, NEMA 3R, IP 54

Type	Authority	Hazardous locations information
4763-3	CSA	Class I, II, III, Division1, Groups A, B, C, D Class I, Division2, Groups A, B, C, D
	FM	Class I, II, III, Div.1, Groups A, B, C, D, E, F, G Class I, Division 2, Groups A, B, C, D Class II, Division 2, Groups F and G Class III, Division 2
4763-1	PTB	EEx ia IIC T6 according to CENELEC
	SEV	EEx ia IIC T4-T6
4763-0	–	For non-hazardous locations



Fig. 1 · Type 4763 / Type 4765 Positioner

#### Type 4765 · Pneumatic Positioner

- Input signal range: 3 to 15 psi (0.2 to 1.0 bar)

#### Accessories

- Pressure gauges for input and output signal pressures
- Retrofit kits for subsequent conversion from a Type 4765 pneumatic positioner to a Type 4763 electropneumatic positioner and vice versa
- Mounting kits according to IEC 534-6 and NAMUR
- Adaptors to convert non-standard mounting to standardized
- Vent port filter valve for protection against high intensity sprays and foreign matter

### Principle of operation (Fig. 3)

Both positioners use a flapper-nozzle system which operates according to the force-balance principle. They can be applied for normal or split-range operation.

The only difference between the Type 4765 Pneumatic Positioner and the Type 4763 Electropneumatic Positioner is the addition of an electropneumatic (I/P) converter which converts the electric current signal received from a controller into a proportional pneumatic signal.

For more detailed principle of operation, refer to the installation and operation manuals EB1-8359

### Operating action

When the input signal ( $p_e$ ) increases, the pneumatic output signal pressure  $p_{st}$  can be selected to be increasing (direct action  $\gg$ ) or decreasing (reverse action  $\ll$ ). The operating action depends on the reversing (nozzle) block installation. The symbol  $\gg$  or  $\ll$  indicates the respective operating action. Reversal of the operating action or fail-safe is possible in the field, taking care to note the required positioner orientation according to Figs. 3 to 6.

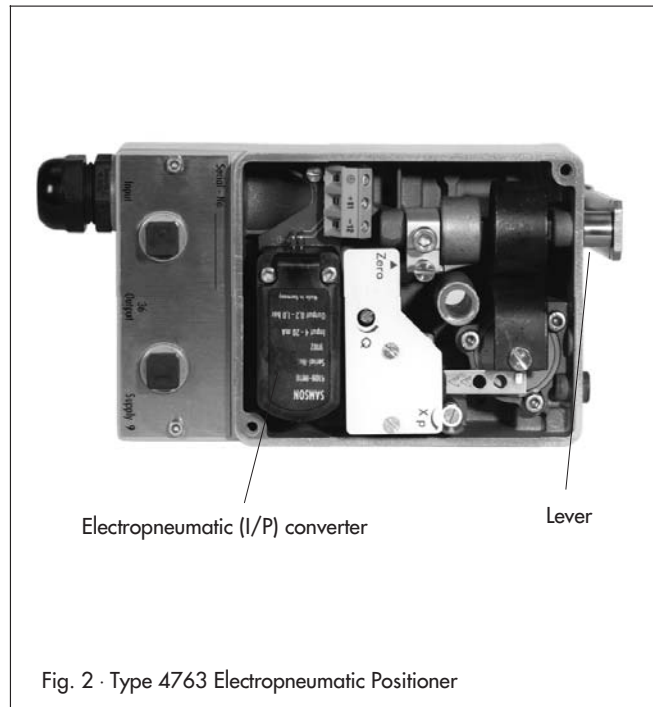
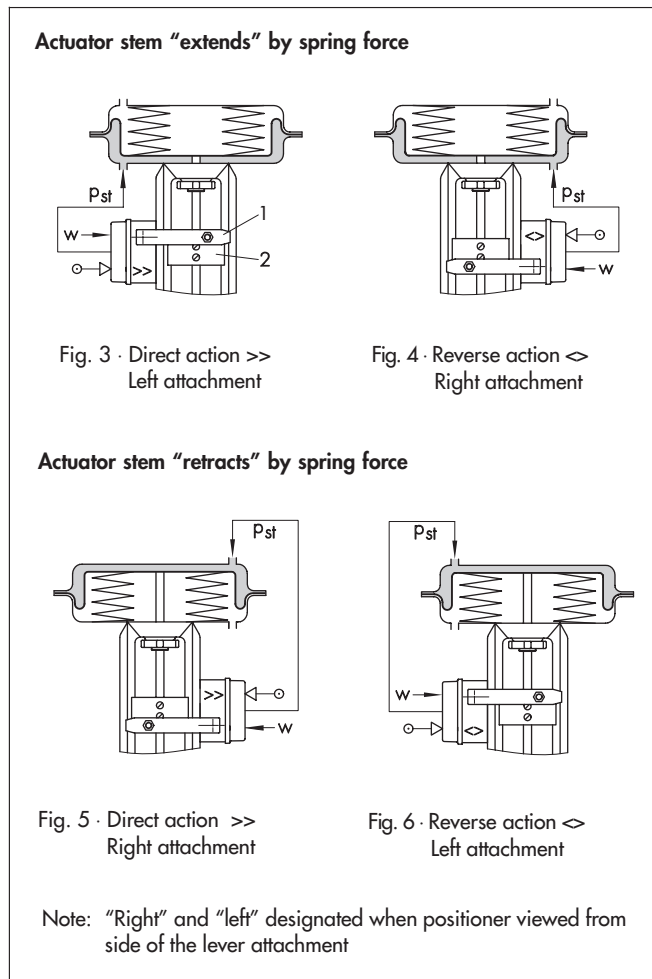


Fig. 2 · Type 4763 Electropneumatic Positioner



### Attachment according to IEC 534-6 and NAMUR

The various ways in which the positioner can be attached to the actuator correspond to the IEC 534 and NAMUR recommendation. Positioners may be attached to valves with either cast yokes (e.g., SAMSON Series 3240) or pillar yokes.

Combining the positioner and the actuator Figs. 3 to 6 schematically illustrate the arrangement of the actuator, mounting of the positioner, reference input signal, and the operating direction.

### Fail-safe action

The pneumatic actuators (Type 271 and Type 3277) feature the following fail-safe actions which move the valve to a pre-determined position when the signal pressure or the air supply fails:

- **Actuator stem "extends"** (Figs. 3, 4)

When the pressure acting on the surface of the diaphragm is decreased or the air supply fails, the force of the installed springs "extend" the actuator stem to the lower position.

- **Actuator stem "retracts"** (Figs. 5, 6)

Same as above, except: The force of the springs "retracts" the actuator stem to the upper position.

For additional actuator details, see Data Sheets T 8310 and T 8311.

Figs. 3 to 6 illustrate the relationship between the positioner attachment and operating action, whereby the specifications "Right attachment" and "Left attachment" apply when looking onto the lever (1) and plate (2).

**Table 1 · Technical data**

Positioner	Type 4763 (electropneumatic)		Type 4765 (pneumatic)
Travel range	0.3" to 4" (7.5 to 60 mm), with extended lever: 0.3" to 6" (7.5 to 90 mm)		
Input signal w	4 to 20 mA 0 to 20 mA	Internal resistance R <sub>i</sub> at 70 °F (20 °C), Approximately 200 Ω	3 to 15 psi (0 to 1 bar)
(for split-range operation, input span 0 to 50 % and 50 to 100 %)	1 to 5 mA	Internal resistance R <sub>i</sub> at 70 °F (20 °C), Approximately 880 Ω	
	2 to 10 V 0 to 10 V	Internal resistance approx. 20 kΩ Power supply 24 V (15 to 30 V)	
Air supply requirement	20 to 90 psi (4 to 6 bar)		
Pneumatic output signal pressure p <sub>st</sub>	Maximum 0 to 90 psi (0 to 6 bar)		
Characteristic	Linear		
Deviation from terminal-based conformity	< 1.5 %		
Hysteresis	< 0.5 %		
Sensitivity	< 0.1 %		
Operating action	Reversible (direct >> or reverse <<)		
Proportional band X <sub>p</sub> at supply 20 psi (1.4 bar)	Springs 1, 2 Spring 3	1 to 3 % 1 to 1.5 %	
Air consumption, steady state, X <sub>p</sub> = 1 %	Supply 20 psi (1.4 bar) 90 psi (6 bar)	6.7 scfh (0.19 m <sub>n</sub> <sup>3</sup> /h) 18 scfh (0.5 m <sub>n</sub> <sup>3</sup> /h)	4.6 scfh (0.13 m <sub>n</sub> <sup>3</sup> /h) 12 scfh (0.33 m <sub>n</sub> <sup>3</sup> /h)
Air output capacity	Supply 20 psi (1.4 bar) 90 psi (6 bar)	106 scfh (3 m <sub>n</sub> <sup>3</sup> /h) 300 scfh (8.5 m <sub>n</sub> <sup>3</sup> /h)	
Permissible ambient temperature	-5 to 160 °F (-20 to 70 °C), Extended temperature range on request; Ex-versions, see Table 3		
Influence (X <sub>p</sub> = 1 %)	Temperature	< 0.03 %/°F (°C),	
	Air supply	< 0.3 %/1.5 psi (0.1 bar)	
	Vibration	< 2 % between 10 to 150 Hz and 1.5 G	-
Variable position when turned 180°	< 3.5 %		-
Enclosure protection	CSA Enclosure 3, NEMA 3R, IP 54 <sup>1)</sup>		
Weight (approximate)	2.6 lb (1.2 kg)		2.4 lb (1.1 kg)

1) CSA Enclosure/NEMA 4/IP 65 with vent port protector on request

**Table 2 · Materials**

Housing	Die-cast aluminum, plastic coated		
External parts	Stainless steel	AISI 316	WN 1.4571
		AISI 304	WN 1.4301
Measuring diaphragm	ECO (Epichlorhydrine rubber)		

**Table 3 · Type 4763 Electropneumatic Positioner**

Entity parameters for certified Intrinsically safe circuits

V <sub>max</sub>	≤ 28 V
I <sub>max</sub>	≤ 100 mA
R <sub>min</sub>	≥ 280 Ω
C <sub>i</sub> ; L <sub>i</sub>	negligible

Note: Certification identification numbers can be provided on request

**Table 4 · Measuring spring selection**

Lever	Rated travel inch (mm)	Travel range inch (mm)	Input signal range	Measuring spring
Lever length L with standard lever I 1.6" ... 5" (40 ... 127 mm)	0.6" (15)	0.3" ... 0.7" (7.5 ... 18)	100 %	1
	1.2" (30)	0.55" ... 1.25" (14 ... 32)	50 %	2
			100 %	3
	2.4" (60)	1.2" ... 2.75" (30 ... 70)	100 %	3
Lever length L with lever I with extension 1.6" ... 8.0" (40 ... 200 mm)	0.8" (20)	0.3" ... 1.0" (7.5 ... 26)	100 %	1
	1.6" (40)	0.55" ... 2.5" (14 ... 50)	50 %	2
			100 %	3
	>2.4" (> 60)	1.2" ... 6" (30 ... 90)	100 %	3

