

Electropneumatic Positioner Type 4763

Pneumatic Positioner Type 4765



Application

Single-acting positioner for attachment to pneumatic control valves. Reference variable is either a standardized electric signal from 4(0) to 20 mA or 1 to 5 mA (Type 4763) or a pneumatic standardized signal from 0.2 to 1 bar (3 to 15 psi) (Type 4765).

Rated travels from 7.5 to 90 mm



The positioners ensure predetermined assignment of the valve stem position (controlled variable x) to the electric or pneumatic input signals (reference variable w) supplied by the controller. They compare the input signal coming from the controller to the travel of the control valve and produce the corresponding pneumatic output signal pressure p_{st} (output variable y).

Special features

- Compact, low-maintenance design
- Any mounting position possible
- Resistant to mechanical vibrations
- Reversible operating direction
- Excellent dynamic behavior
- Suitable for normal or split-range operation
- Adjustable proportional band (P-band)
- Adjustable air output capacity
- Low energy consumption
- Special versions for oxygen

Attachment to valves with cast yokes or rod-type yokes according to IEC 60534-6.

Optionally available with two pressure gauges to monitor supply air and signal pressure, with stainless steel housing and connections optionally nickel-plated or made of stainless steel.

The Type 4765 Pneumatic Positioner can be subsequently modified to an electropneumatic positioner.

Versions

All versions of Type 4763 Electropneumatic Positioner

Reference variable: 4(0) to 20 mA, 1 to 5 mA,

Supply air: 1.4 to 6 bar (20 to 90 psi),

Signal range: 0 to 6 bar (0 to 90 psi)

Type 4763-0 · Version for non-hazardous areas

Type 4763-1 · Version for hazardous areas

input circuit with type of protection $\text{Ex II 2 G EEx ia IIC T6 acc. to ATEX}$ (see explosion protection certificates" on pages 2 and 3)

Type 4763-8 · i/p Positioner in EEx nA "non-sparking"

Type 4765/6116 · i/p Positioner with type of protection "Flameproof Enclosure" EEx d with Type 6116 i/p Converter (Figs. 2 and 3; for certificates, refer to Data Sheet T 6116 EN).

Type 4765 · Pneumatic Positioner

Reference variable: 0.2 to 1 bar (3 to 15 psi)

Signal range: 0 to 6 bar (0 to approximately 90 psi)

Supply air: 1.4 to 6 bar (20 to 90 psi)



Fig. 1 · Type 4763 / Type 4765 Positioner



Fig. 2 · Type 6116 i/p Converter, opened



Fig. 3 · Type 4765/6116 Ex d Positioner Attachment to NAMUR rib

Principle of operation

The only difference between the Type 4765 Pneumatic Positioner and the Type 4763 Electropneumatic Positioner is that an electropneumatic (i/p) converter has been added to the latter in order to convert the electric signal received from a controller into a proportional pneumatic signal.

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

Operating direction

When the reference variable (p_e) increases, the pneumatic output signal pressure p_{st} can be selected to be increasing-increasing (direct action \gg) or increasing-decreasing (reverse action \ll). The operating direction depends on the position of the nozzle block that can be turned by 180° . The visible mark (\gg or \ll) indicates the respective operating direction. If the operating direction or the fail-safe position is to be subsequently modified, note that the positioner must also be mounted at a different position (Figs. 5 to 8)!

Attachment according to IEC 60534-6 and NAMUR

The various ways in which the positioner can be attached to the actuator correspond to the IEC 60534-6 and NAMUR recommendation. Positioners may be attached to valves with either cast yokes (e.g. SAMSON Series 240) or rod-type yokes. Each type of attachment requires special mounting parts.

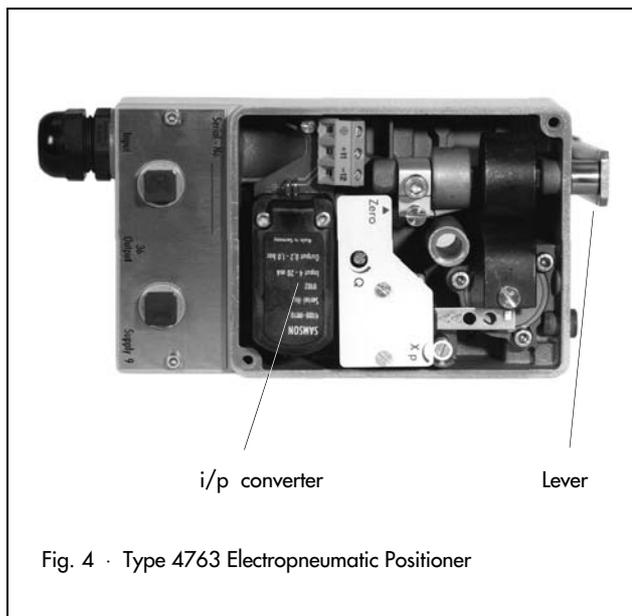


Fig. 4 · Type 4763 Electropneumatic Positioner

Combining the positioner and the actuator

Figs. 5 to 8 schematically illustrate the arrangement of the actuator, the mounting position of the positioner, the reference variable, and the operating direction.

Fail-safe action

The pneumatic actuators (Type 3271 and Type 3277) are available with the following fail-safe actions. They move the valve in the predetermined position whenever the signal pressure decreases or air supply fails:

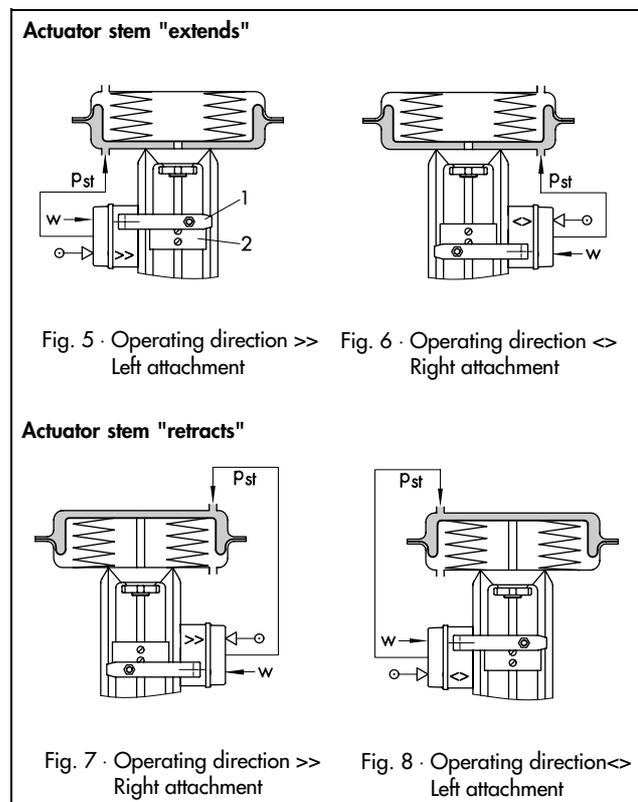
Actuator stem "extends" (Figs. 5, 6)

Whenever the pressure acting on the diaphragm decreases or air supply fails, the compression springs installed in the actuator force the actuator stem to extend.

Actuator stem "retracts" (Figs. 7, 8)

Same as above, except: the compression springs force the actuator stem to retract.

Refer to Data Sheets T 8310 EN and T 8311 EN for more details. Figs. 5 to 8 illustrate the different operating directions and the mounting positions of the positioner. "Right..." and "Left attachment" apply when looking onto the lever (1) and plate (2).



Summary of approved explosion protection certificates for Type 4763 Electropneumatic Positioner

Certificate type	Certificate number	Date	Comment
Statement of Conformity	PTB 03 ATEX 2183 X	2003-09-30	⊕ II 3 G EEx nA II T6, Zone 2
EC Type Examination Cert.	PTB 02 ATEX 2078	2002-07-19	⊕ II 2 G EEx ia IIC T6
Certificate of Conformity	PTB No. Ex-93.C.4031	1993-05-05	EEx ia IIC T6
1st Addendum		1993-11-22	-45 °C ambient temperature
2nd Addendum		1994-05-30	With i/p module 6109
SEV Certificate	98.5.50771.03	1998-04-24	EEx ia IIC T4-T6
FMRC Certificate	J.I. 1Y8A9.AX	1994-05-11	Class I, II, III; Div. 1
	J.I. 5Y2A3.AX	1995-04-26	Groups A, B, C, D, E, F, G; Div. 2
CSA	LR 54227-20	1996-04-22	Class I; Div. I; Groups A, B, C, D; Encl. 3

EEx d certifications for Type 6116 i/p Converter can be found in Data Sheet T 6116 EN.

Additional approval certificates for Type 4763

Certificate type	Certificate number	Date	Comment
CZ Certificate	FTZÜ 98 Ex 0987 X	1998-09-28	Ex II 1 G EEx ia IIC T6; valid until 2001-09-28
BKI Certificate 1st extension	Ex 96.C.094	1996 1999-11-01	EEx ia IIC T6; valid until 1998-12-31 Valid until 2002-11-01
GOST Certificate	A-0392	1996-07-05	1 Ex ia IIC T6, valid until 2001
JIS Certificate (Japan)	C 12589 C 12590	August 1997 August 1997	Ex ia IIC T6 (with Type 6109) Ex ia IIC T6; valid until 2002-11-01
Certificate for Type 4763 and Type 4765			
AIR LIQUIDE	2003/OL 216	2003-07-30	Oxygen as operating medium with Type 6109 i/p Converter, perm. ambient temperature 60 °C

Table 1 · Technical data

Positioner	Type 4763	Type 4765
Travel range with extended lever	7.5 ... 60 mm 7.5 ... 90 mm	
Reference variable (input signal) Span for split-range operation 0 to 50 % and 50 to 100 % (R _i = coil resistance at 20 °C)	4 ... 20 mA (only Ex) · R _i ≅ 250 Ω ± 7 % 4 ... 20 mA (non-Ex) · R _i ≅ 200 Ω ± 7 % 0 ... 20 mA · R _i ≅ 200 Ω ± 7 % 1 ... 5 mA · R _i ≅ 880 Ω ± 7 %	0.2 ... 1 bar (3 ... 15 psi)
Supply air	1.4 ... 6 bar (20 ... 90 psi)	
Output signal pressure	Max. 0 ... 6 bar	
Characteristic	Linear; deviation from terminal-based conformity < 1.5 %	
Hysteresis	< 0.5 %	
Sensitivity	< 0.1 %	
Operating direction	Reversible	
Proportional band X _p (at 1.4 bar supply air)	Springs 1, 2 Spring 3	1 ... 3 % 1 ... 1.5 %
Air consumption in steady state, X _p =1 %	Supply 1.4 bar 6 bar	0.19 m _n ³ /h 0.5 m _n ³ /h
Air output capacity for Δp	1.4 bar 6 bar	3 m _n ³ /h 8.5 m _n ³ /h
Transit time for Type 3271 Actuator "extends"	240 cm ² : ≤ 1.8 s · 350 cm ² : ≤ 2.5 s · 700 cm ² : ≤ 10 s	
Permissible ambient temperature	-20 ... 70 °C With metal cable entry: -35 ... 70 °C Special version: -45 ... 80 °C	
	-35 ... 80 °C Special version: -50 ... 80 °C	
	Version for oxygen as the operating medium up to max. 60 °C The limits in the EC type examination certificate also apply for explosion-protected devices	
Influence (X _p = 1 %)	Temperature < 0.03 %/°C, air supply < 0.3 %/0.1 bar	
Effect of vibration	< 2 % between 10 ... 150 Hz and 1.5 g	-
Variable position when turned by 180°	< 3.5 %	-
Degree of protection	IP 54 (special version IP 65)	
Weight	Approx. 1.2 kg	1.1 kg

Table 2 · Assignment of lever and measuring spring

Lever	Rated travel mm	Travel min./max. mm	Reference variable (input signal)	Measuring spring
Lever length L 40 ... 127 mm	15	7.5 ... 15	100 % 50 %	1 2
	30	14 ... 32	100 % 50 %	2 3
	60	30 ... 70	100 %	3
Lever length L with extension 40 ... 200 mm	20	7.5 ... 26	100 % 50 %	1 2
	40	14 ... 50	100 % 50 %	2 3
	>60	30 ... 90	100 %	3

