

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 include:

- 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

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

Optionally available with two pressure gauges for monitoring the supply air and the signal pressure. Pressure gauge housings made of stainless steel. Connecting piece optionally nickel plated or made of stainless steel.

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

Versions

Type 4763 Electropneumatic Positioners

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

Version -1 for hazardous areas, input circuit with type of protection Ex II 2 G EEx ia IIC T6 acc. to ATEX (see "Summary of approved explosion protection certificates" on p. 2 and 3).

Type 4765/6116 · Electropneumatic Positioner

Type of protection "Flameproof Enclosure" EEx d with Type 6116 i/p Converter (Figs. 2 and 3; for explosion protection certifications, 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)

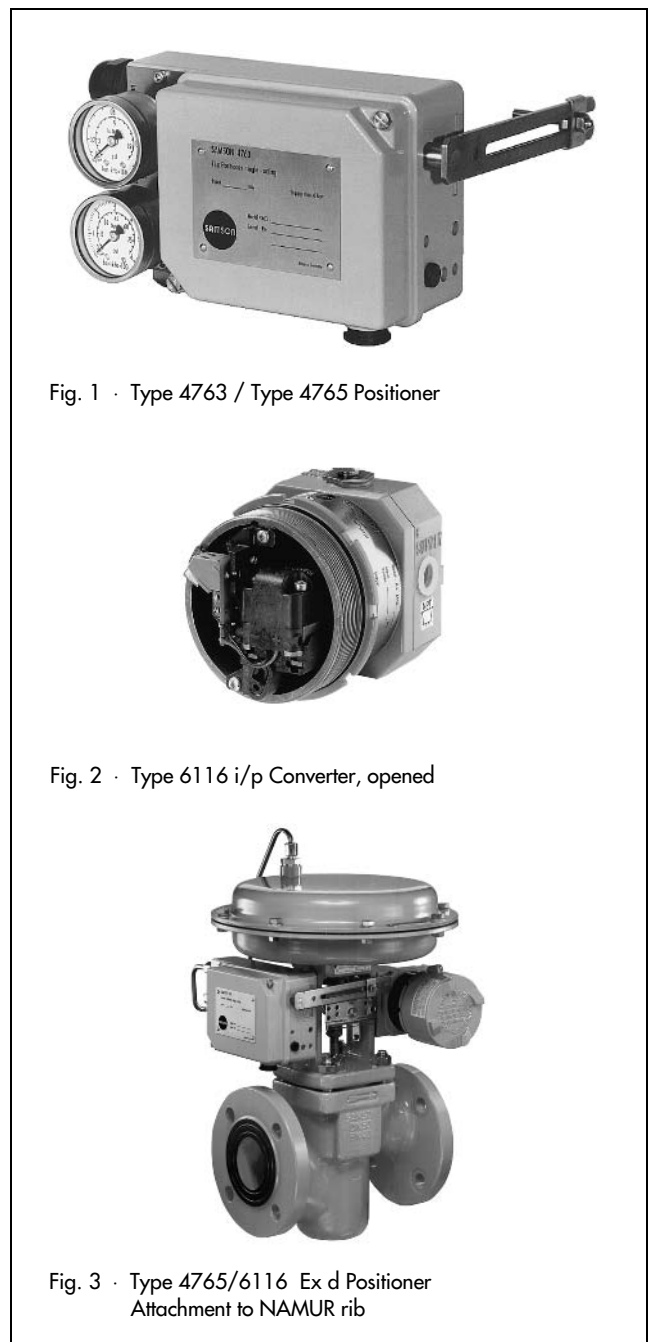


Fig. 1 · Type 4763 / Type 4765 Positioner

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 hardware.

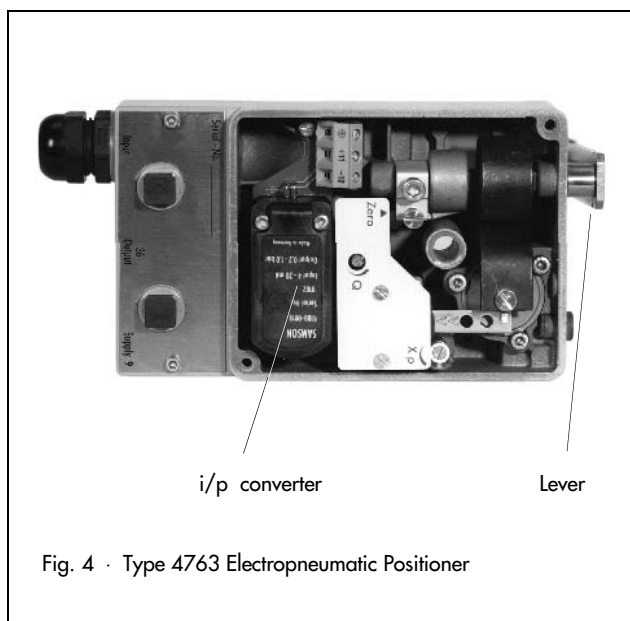


Fig. 4 · Type 4763 Electropneumatic Positioner

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:

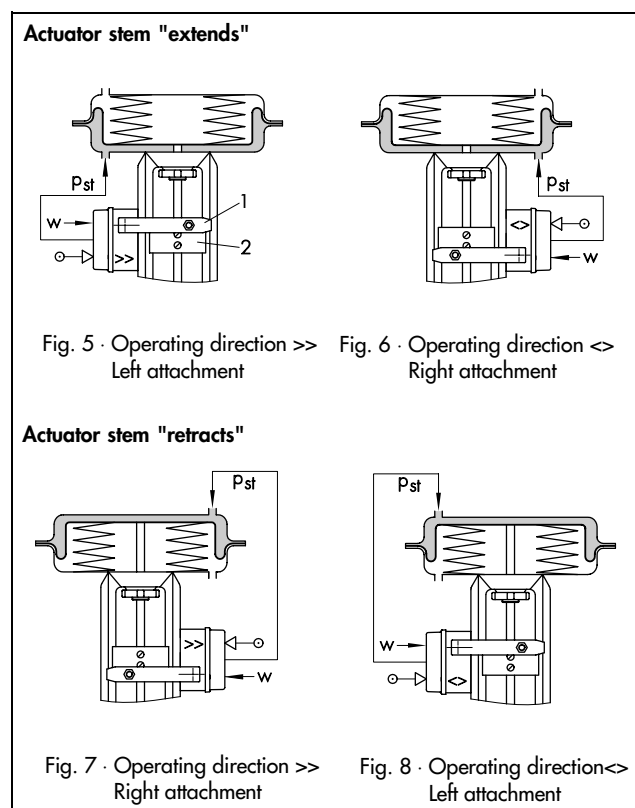
Actuator stem "extends" (Figs. 5, 6)

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 to the lower end position.

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

Same as above, except: the compression springs force the actuator stem to retract into the upper end position.

For additional details, see Data Sheets T 8310 EN and T 8311 EN. 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
EC Type Examination Cert.	PTB 02 ATEX 2078	2002-07-19	Ex 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. 1; 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 explosion protection certificates for Type 4763

Certificate type	Certificate number	Date	Comment
CZ Certificate	FTZU 98 Ex 0987X	1998-09-28	Valid until 2003-09-30
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

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 ³ /h 0.5 m ³ /h
Air output capacity for Δp	1.4 bar 6 bar	3 m ³ /h 8.5 m 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 (for Ex versions, see Table 2)	-20 ... 70 °C With metal cable entry: -35 ... 70 °C Special version: -45 ... 70 °C	-35 ... 80 °C Special version: -50 ... 80 °C
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 · Type 4763 with type of protection EEx ia IIC T6
Maximum values for connection to certified intrinsically safe circuits

U ₀	28 V			
I _k	85 mA	100 mA		
Internal inductance and capacitance negligibly small				
Permissible ambient temperature				
Temperature rating	T6	T5	T4	
	60 °C	55 °C	70 °C	80 °C

Table 3 · Coordination 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

Ordering nomenclature

Type designation 4763 - 0 1 0 0 0

Explosion protection							
Without	0						
⊕ II 2 G EEx ia IIC T6	1						
Ex ia FMRC/CSA	3						
Measuring spring							
1		1					
2		2					
3		3					
Pneumatic connections							
G 1/4				1			
1/4 NPT				3			
Electrical connections							
M 20x1.5, blue				1			
M 20x1.5, black				2			
Plug connector Harting HAN 7 D				5			
Reference variable							
4 ... 20 mA				1	1		
0 ... 20 mA				2	2		
1 ... 5 mA				2	3		

Type designation 4765 - 0 1 0 0 1

Measuring spring						
1		1				
2		2				
3		3				
Pneumatic connections						
G 1/4				1		
1/4 NPT				3		

Accessories

Adapter 1/2 NPT for electrical connections

Materials (WN = material number)

Case	Die-cast aluminum, plastic-coated
External parts	Stainless steel, WN 1.4571 and WN 1.4301
Measuring diaphragm	Silicone

Additional ordering details

Without/with pressure gauges
Pressure gauge housing of CrNiMo steel, nickel-plated connection, compl. CrNiMo steel

Specify when mounting on the control valve

Adjusted reference variable ... ; supply air ... bar

Operating direction: increasing-increasing/
increasing-decreasing

Tubing: Zinc-plated steel/compl. CrNiMo steel/
PE nature. Orifice DN 6/10

Specify when attaching to valves with cast yokes

Travel ... mm

Specify when attaching to valves with rod-type yokes

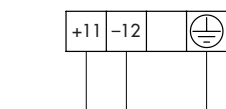
Travel ... mm

Rod diameter ... mm

When the positioner is delivered without a specific arrangement to a particular control valve, the attachment parts required are specified in Mounting and operating instructions EB 8359-1 EN (Type 4765 Pneumatic Positioner) or EB 8359-2 EN (Type 4763 Electropneumatic Positioner).

Specifications subject to change without notice.

Electrical connection and dimensions in mm



Input control signal
4(0) to 20 mA

