

# Series 3730

## Electropneumatic Positioner Type 3730-1



### Application

Single-acting or double-acting positioner for attachment to pneumatic control valves. Self-calibrating, automatic adaptation to valve and actuator.

Reference variable	4 to 20 mA
Travels	3.75 to 200 mm
Opening angle	24 to 100°



The positioner ensures a predetermined assignment of the valve (controlled variable  $x$ ) to the input signal (reference variable  $w$ ). It compares the input signal received from a control system to the travel or rotational angle of the control valve and issues a corresponding output signal pressure (output variable  $y$ ).

### Special features

- Simple attachment to all common linear and rotary actuators with interface for SAMSON direct attachment, NAMUR rib or valves with rod-type yokes according to IEC 60534-6-1, or to rotary actuators according to VDI/VDE 3845
- Any desired mounting position of the positioner
- Simple single-knob, menu-driven operation
- LCD easy to read in any mounted position due to selectable reading direction
- Variable, automatic start-up
- Preset parameters - only values deviating from the standard need to be adjusted
- Calibrated travel sensor without gears susceptible to wear
- Permanent storage of all parameters in non-volatile EEPROM (protected against power failure)
- Two-wire system with a small electrical load of 300  $\Omega$
- Activatable tight-closing function
- Continuous monitoring of zero point
- Two standard programmable position alarms
- Certified according to IEC 61508/SIL

### Version

- Type 3730-1 · Electropneumatic positioner with LCD for local operation

### Additional options

- Inductive limit switch with proximity switches
- Stainless steel housing

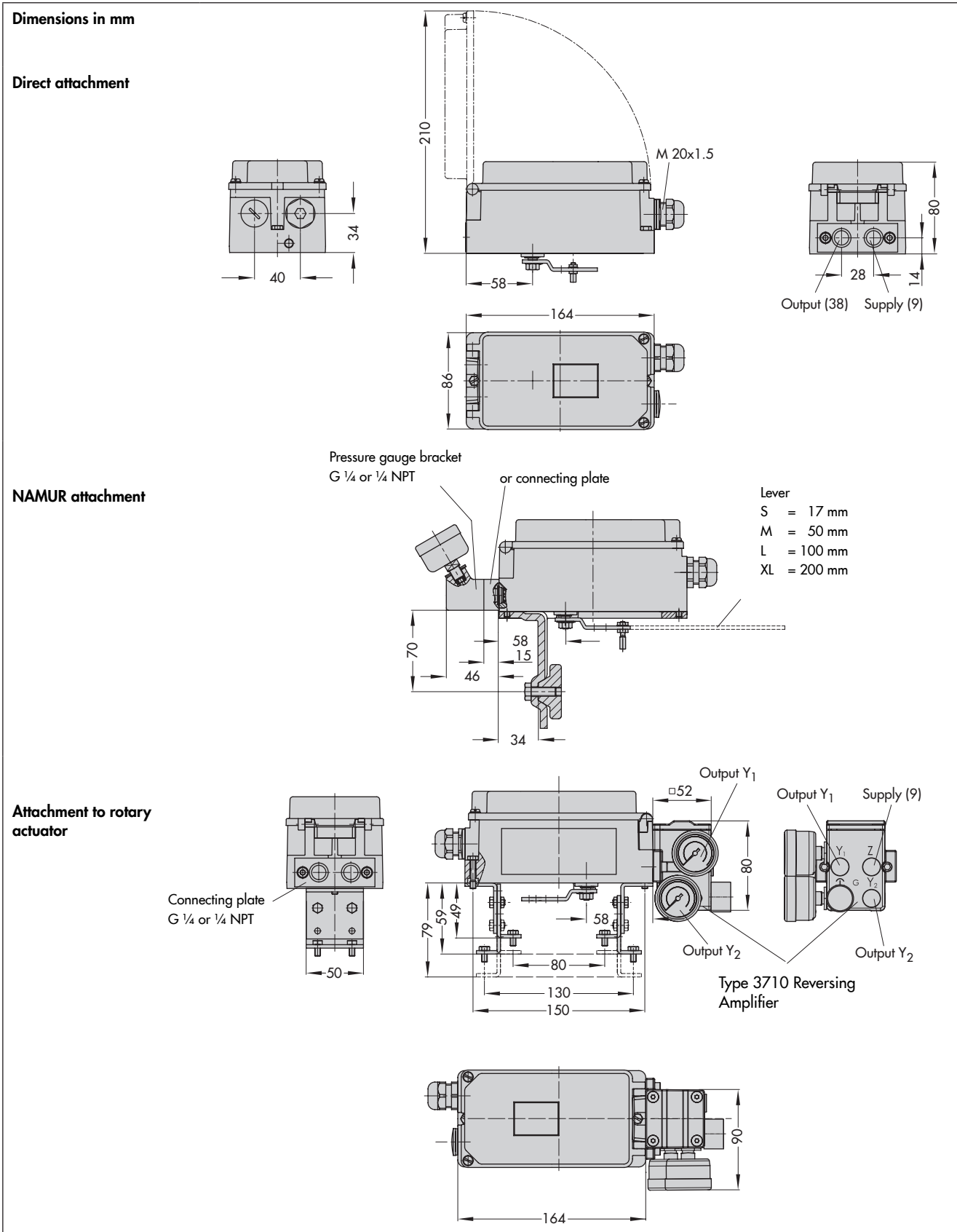




**Table 1 · Technical data**

<b>Type 3730-1 Positioner (technical data in test certificates additionally apply to explosion-protected devices)</b>			
Travel	Adjustable	Direct attachment to Type 3277 Actuator	3.6 to 30 mm
		Attachment according to IEC 60534-6 (NAMUR)	3.6 to 200 mm
		Attachment to rotary actuators acc. to VDI/VDE 3845	24 to 100° opening angle
Travel range	Adjustable within the initialized travel/angle of rotation; travel can be restricted to 1/5 at the maximum		
Reference variable w	Signal range	4 to 20 mA · Two-wire device, reverse polarity protection,	
	Split-range operation	4 to 11.9 mA and 12.1 to 20 mA	
	Static destruction limit	100 mA	
Minimum current	3.7 mA		
Load impedance	≤ 6 V (corresponding to 300 Ω at 20 mA)		
Power supply	Supply air	1.4 to 7 bar (20 to 105 psi)	
	Air quality acc. to ISO 8573-1 (2001-02)	Max. particle size and density: Class 4 · Oil content: Class 3 · Pressure dew point: Class 3 or at least 10 K beneath the lowest ambient temperature to be expected	
Signal pressure (output)	0 bar up to the capacity of the supply pressure · Can be limited to approx. 2.4 bar over software		
Characteristic	Optionally, 1 characteristic for globe valves · 8 characteristics for rotary valves		
Hysteresis	≤ 1 %		
Sensitivity	≤ 0.1 %		
Transit time	< 0.5 s for initialization not permissible · Adaptation over volume restriction Q		
Direction of action	Reversible		
Air consumption	Independent from supply pressure approx. 110 l <sub>n</sub> /h		
Air output capacity	Actuator filled with air	At Δp = 6 bar: 8.5 m <sub>n</sub> <sup>3</sup> /h · At Δp = 1.4 bar: 3.0 m <sub>n</sub> <sup>3</sup> /h · K <sub>v</sub> <sub>max(20 °C)</sub> = 0.09	
	Actuator vented	At Δp = 6 bar: 14.0 m <sub>n</sub> <sup>3</sup> /h · At Δp = 1.5 bar: 4.5 m <sub>n</sub> <sup>3</sup> /h · K <sub>v</sub> <sub>max(20 °C)</sub> = 0.15	
Permissible ambient temperature	-20 to +80 °C in all versions -45 to +80 °C with metal cable gland -25 to +80 °C with inductive limit switch (SJ2-S1N) and metal cable gland Limits in test certificate also apply for explosion-protected devices.		
Influences	Temperature	≤ 0.15 %/10 K	
	Power supply	None	
	Influence of vibrations	≤ 0.25 % up to 2000 Hz and 4 g according to IEC 770	
Electromagnetic compatibility	Complying with EN 61000-6-2, EN 61000-6-3, EN 61326-1 and NAMUR Recommendation NE 21		
Electrical connections	One M20 x 1.5 cable gland for 6 to 12 mm clamping range Additional second M20 x 1.5 threaded hole Screw terminals for 0.2 to 2.5 mm <sup>2</sup> wire cross-section		
Explosion protection	See Table 2		
Degree of protection	IP 66/NEMA 4X		
Use in safety-instrumented systems acc. to IEC 61508	Suitable for use in safety-instrumented systems up to SIL 2 (single device) and SIL 3 (with redundant configuration), emergency shutdown at a reference variable of 0 mA		
Weight	1.0 kg		
<b>Materials</b>			
Housing	Die-cast aluminum EN AC-ALSi12(Fe) (EN AC-44300) acc. to DIN EN 1706, chromated and powder paint coated · Special version: Stainless steel 1.4581		
External parts	Stainless steel 1.4571 and 1.4301		
Cable gland	M20x1.5, black polyamide		
<b>Binary contacts</b>			
Two software limit switches with adjustable limit values (in steps of 0.5 %), reverse polarity protection, floating · See below for default settings			
Signal state	<b>Version without explosion protection</b>	<b>Explosion-protected version</b>	
	No response: Conductive (R = 348 Ω) Response: Non-conducting	No response: ≥ 2.1 mA Response: ≤ 1.2 mA	
Operating voltage	For connection to the binary input of the PLC acc. to IEC 61131-2, P <sub>max</sub> = 400 mW or for connection to NAMUR switching amplifier acc. to EN 60947-5-6	For connection to NAMUR switching amplifier acc. to EN 60947-5-6	

Options	
Inductive limit switch	For connection to switching amplifier acc. to EN 60947-5-6. Can be used in combination with a software limit switch.
SJ2-SN proximity switch	NAMUR NC contact
SJ2-S1N proximity switch	NAMUR NO contact



**Table 2 - Explosion protection certificates**

Type of approval	Certificate number	Date	Comments
EC Type Examination Certificate First Addendum Second Addendum	PTB 04 ATEX 2033	2004-04-19 2005-01-25 2008-02-25	⊕ II 2 G Ex ia IIC T6 ⊕ II 2 D Ex tD A21 IP 66 T 80 °C Type 3730-11
IECEX approval	IECEX PTB 06.0055	2006-11-02	Ex ia IIC T6 Type 3730-11
Statement of Conformity First Addendum	PTB 04 ATEX 2114 X	2004-12-09 2008-02-26	⊕ II 3 G Ex nA II T6/II 3 G Ex nL IIC T6 ⊕ II 3 D Ex tD A21 IP 54/IP 66 T 80 °C Type 3730-18
FM certificate	3023478	2004-12-01 2008-11-03	Class I, Zone 0 AEx ia IIC Class I, II, III; Div.1; Groups A, B, C, D, E, F, G Class I, Div.2, Groups A, B; C, D Class II, Div.2; Groups F, G NEMA Type 4X; Typd 3730-13
CSA certificate	1675820	2005-08-29 2009-07-14 2010-07-19	Ex ia IIC T6; Class I, Zone 0; Class II, Groups E, F, G; Ex nA II T6; Class I, Zone 2 Class I, Div.2, Groups A, B, C, D Class II, Div.2, Groups E, F, G Type 4 Enclosure; Type 3730-13

**Article code**

Positioner	Type 3730-1	x	x	0	0	0	0	0	0	0	0	x	0	0	x	0	0	0
With LCD and autotune, 4 to 20 mA reference variable, two software limit switches*																		
Explosion protection																		
Without		0																
⊕ II 2 G Ex ia IIC T6, II 2 D Ex tD A21 IP 66 T 80 °C acc. to ATEX		1																
Ex ia/Ex n acc. to FM/CSA		3																
⊕ II 3 G Ex nA II T6/nL IIC T6, II 3 D Ex tD A21 IP 54/IP 66 T 80 °C acc. to ATEX		8																
Option: Inductive limit switch																		
Without		0																
With SJ2-SN proximity switch		1																
With SJ2-S1N proximity switch		2																
Housing material																		
Aluminum (standard)												0						
Stainless steel 1.4581												1						
Special applications																		
Without																		0
Device compatible with paint (lowest permissible ambient temperature -20 °C)																		1
Exhaust air port with ¼ NPT thread, back of housing sealed																		2
Special version																		
Without																		0 0 0

\* Additional functions such as limit switches, solenoid valve, position transmitter or external position sensor, e.g. with Type 3730-2 Positioner

## Mounting the positioner

The Type 3730 Electropneumatic Positioner can be attached directly to the Type 3277 Actuator over a connection block.

In actuators with fail-safe action "Actuator stem extends" and Type 3277-5 Actuator (120 cm<sup>2</sup>), the signal pressure is routed over an internal hole in the actuator yoke to the actuator.

In actuators with effective diaphragm areas of 240 cm<sup>2</sup> or larger, the signal pressure is routed to the actuator over ready-made external piping.

Using the appropriate bracket, the positioner can also be attached according to IEC 60534-6-1 (NAMUR recommendation). The positioner can be mounted on either side of the control valve.

A pair of universal brackets is used to mount the Type 3730 Positioner to a Type 3278 Rotary Actuator or other rotary actuators according to VDI/VDE 3845. The rotary motion of the actuator is transferred to the positioner over a coupling wheel with scale.

## Ordering text

Positioner Type 3730-1x

- Without pneumatic connecting rail (only when directly attached to Type 3277)
- With pneumatic connecting rail ISO 228/1-G ¼
- With pneumatic connecting rail ¼-18 NPT
- Without/with pressure gauge up to max. 6 bar
- Additional information inside the cover with a list of parameters and operating instructions in English/Spanish or English/French (standard version in German/English)
- Attachment to Type 3277 Actuator (120 to 700 cm<sup>2</sup>)
- Attachment to IEC 60534-6-1 (NAMUR)  
Travel: ... mm, if applicable, stem diameter: ... mm
- Attachment to Type 3278 Rotary Actuator (160/320 cm<sup>2</sup>)
- Attachment to rotary actuators acc. to VDI/VDE 3845
- Pneumatic reversing amplifier for double-acting actuators with connection according to ISO 228/1 - G ¼ or ¼-18 NPT
- Adapter M20x1.5 to ½ NPT
- Metal cable gland
- Free of substances that impair paint adhesion
- Exhaust air port with ¼ NPT thread
- Special version: housing made of CrNiMo steel

Specifications subject to change without notice.



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