

XEP: E-P and P-E converter

How energy efficiency is improved

Combines the advantages of electronic controls with those of pneumatic controls for optimal system operation.

Areas of application

Connecting module between electronic and pneumatic controllers. Electronic activation of pneumatic drives in HVAC systems.

Features

- Available with or without electric amplifier for use in combination with devices with small air capacity
- XEP 301 has an electric amplifier and p/e converter for bi-directional conversion of signals
- Simplest integration of standard pneumatic signals at automation level
- Compressed-air connections with Rp 1/8" female thread
- Thermoplastic housing suitable for wall or top-hat rail mounting (rail EN60715)
- Complies with directive 97/23/EC Art. 3.3 on pressure equipment.

Technical description

- Power supply 24 V~/=
- Linearity e/p <2%
- Linearity p/e 0.3%

Type	Curve		Air capacity I _r /h	Voltage	Weight kg
	input	output			
E-P converter without electric pre-amplifier					
XEP 1 F001	2...10 V	0,2...1,0 bar	19 ¹⁾	–	0,24
XEP 1 F002	4...20 mA	0,2...1,0 bar	19 ¹⁾	–	0,24
XEP 10 F001	2...10 V	0,2...1,0 bar	400	–	0,26
XEP 10 F002	4...20 mA	0,2...1,0 bar	400	–	0,26

E-P converter with electric pre-amplifier					
XEP 110 F001	2...10 V	0,2...1,0 bar	400	24 V~/=	0,27
XEP 110 F011	0...10 V	0,2...1,0 bar	400	24 V~/=	0,27

E-P converter with electric pre-amplifier and additional P-E converter					
XEP 301 F001	2...10 V	0,2...1,0 bar	16 ²⁾	24 V~/=	0,26
XEP 301 F011	0...10 V	0,2...1,0 bar	16 ²⁾	24 V~/=	0,26

	XEP 1, XEP 10	XEP 110	XEP 301
Power supply	24 V~ 24 V =	± 20%, 50...60 Hz ± 20%	± 20%, 50...60 Hz +20%, -10%
Power consumption	–	2 VA	2 VA
Input resistance	590 Ω	100 kΩ	100 kΩ
Input resistance F002 (current input)	120 Ω	–	–
Temperature influence	± 0,04%/K	± 0,02%/K	± 0,05%/K
Perm. ambient temp.	0...55 °C	0...50 °C	0...55 °C
Linearity E-P	< 2%	1%	1% ²⁾
Air consumption	20 l/h	20 l/h	16 l/h ²⁾
Linearity P-E	–	–	0,3%
Max. load P-E	–	–	> 5 kΩ

Supply pressure ³⁾	1,3 ± 0,1 bar	Connection diagram	
Control action	A (direct)	XEP 1	A02055
		XEP 10	A02057
		XEP 110	A02056
		XEP 301	A02058
Perm. ambient humidity	< 90 %rh	Dimension drawing	M274950
Degree of protection	IP 54 (EN 60529)	Fitting instructions	MV 505428

1) Normally, supply is via an in-built restrictor in connection 1. If there is continuous air recovery from RCP or RLP (connection 6), connection 1 should be closed off.

2) Normally, supply is from another bleed-off Sauter device with restrictor of Ø 0,14 mm (e.g. RLP). In autonomous mode with a line restrictor (e.g. XP 4), or in circuitry supplied by TSFP 80 (restrictor of Ø 0,2 mm), the following applies: air capacity = air consumption = 33 l/h; linearity 2%; zero offset approx. +3%, can be corrected as per [MV 505428](#).

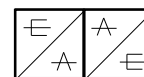
3) See Section 60 for regulations on the quality of the air supply, particularly at low ambient temperatures.



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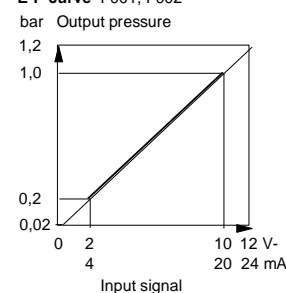


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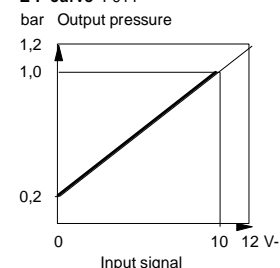


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E-P curve F001, F002

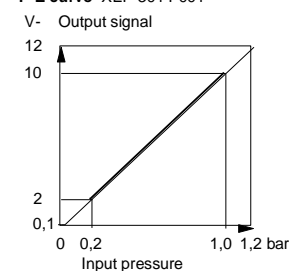


E-P curve F011

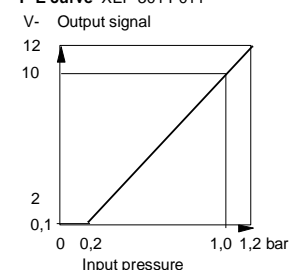


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P-E curve XEP 301 F001



P-E curve XEP 301 F011



B00971

Accessories

- 0274700 000*** Fixing bracket for AVP 142, AV 43, AV 44 (including connecting parts to the drive).
0274701 000* Fixing bracket for AV 45 P (including connecting parts to the drive).
0296936 000* Fixing bracket for rail EN 50022, 35 × 7,5 and 35 × 15
0370560 011 Cable screw fitting (Pg 11) of glass-fibre-reinforced polyamide, grey, with brass nut.

*) Dimension drawing or wiring diagram are available under the same number

Operation

Using the bleed-off force-comparison principle, the unit converts the electrical input signal into a pneumatic output signal. The electrical input signal passes through a moving coil with permanent magnet, thereby producing a force proportional to the input signal. This is balanced against the nozzle-ball system. Types XEP 1 and XEP 10 do not require a power supply since the moving coil is activated directly by the electrical input signal.

Type XEP 110 requires a power supply because the input resistance is increased due to its having an amplifier.

The XEP 301 also has an in-built piezo-resistive pressure sensor (p-e function). This converts the pneumatic standard pressure into an electrical standard signal.

Depending on type, the air capacity is increased by a pneumatic amplifier.

Control action A: The output pressure rises in relation to the rising input signal.

Engineering and fitting notes

The unit should be mounted in a horizontal position only, and with its connection facing downwards.

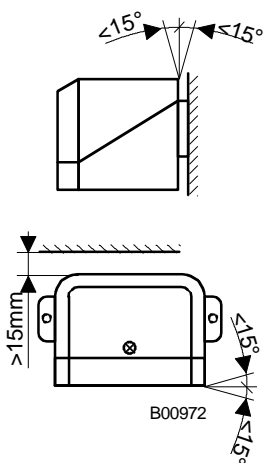
The pneumatic drives require a control pressure range of 0...1,2 bar if the full positioning forces are to be attained. If the electrical input signal is limited to the nominal range, then the drive must be equipped with a positioner.

A fixing bracket is required to fit the XEP to the AV42...45 P. If the AV42 P is mounted vertically, the XEP can be fitted directly.

For the pneumatic/electric conversion of the actual-value signal of VAV controllers (RLP 100), use type XEP 301 F001.

Compatibility of XEP with electronic controllers:-

- **E-P converter with voltage input:**
The input resistance of the XEP must be larger than the permissible load of the controller.
- **E-P converter with current input:**
The input resistance of the XEP must be smaller than the permissible load of the controller.
- **P-E converter with voltage output:**
The input resistance of the connected controllers must be larger than the permissible load of the converter.



Electronic controller (Sauter)	Permissible load of the controller output		Input resistance of the controller for XEP 301 voltage signal
	Voltage signal	Current signal	
flexotron M10, ERA 100	> 5 kΩ	–	> 100 kΩ
flexotron M300, RDT 100	> 5 kΩ	–	> 100 kΩ
flexotron M3000, RRK 100	> 5 kΩ	–	> 100 kΩ
EGE 110, 112	> 500 Ω	< 500 Ω	–
EY 2400-ecos	> 1 kΩ	–	> 10 kΩ
rse, rsk	> 500 Ω	–	> 50 kΩ
rsz with EYS 3A 341B card	> 500 Ω	–	–
rsz with EYS 3A 324B card	–	–	> 20 kΩ
rsz with EYS 3A 325B card	–	–	> 20 kΩ
EYZ 3A 342	–	< 560 Ω	–
EY 3600-ecos	> 1 kΩ	–	> 10 kΩ
nova 210, 220, 230	> 500 Ω	< 500 Ω	> 50 kΩ
nova 106	> 500 Ω	–	> 50 kΩ
nova Link 170	> 500 Ω	< 500 Ω	–
nova 106 with EYS 141 card	> 500 Ω	–	–
nova 106 with EYS 124 card	–	–	> 20 kΩ
nova 106 with EYS 135 card	–	–	> 20 kΩ

Additional technical data

XEP 10 F001

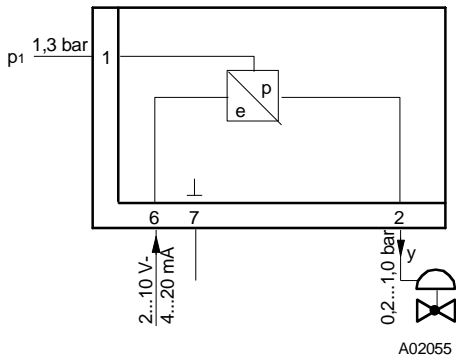
Complies with:-
 EMC directive 2004/108/EC EN 61000-6-1/ EN 61000-6-2
 EN 61000-6-3/ EN 61000-6-4

XEP 110 F001, XEP 301 F001

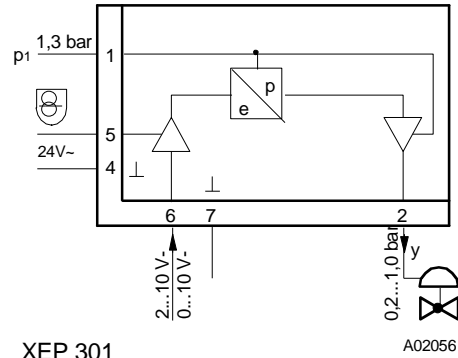
Complies with:-
 EMC directive 2004/108/EC EN 61000-6-1/ EN 61000-6-3
 EN 61000-6-4

Connection diagrams

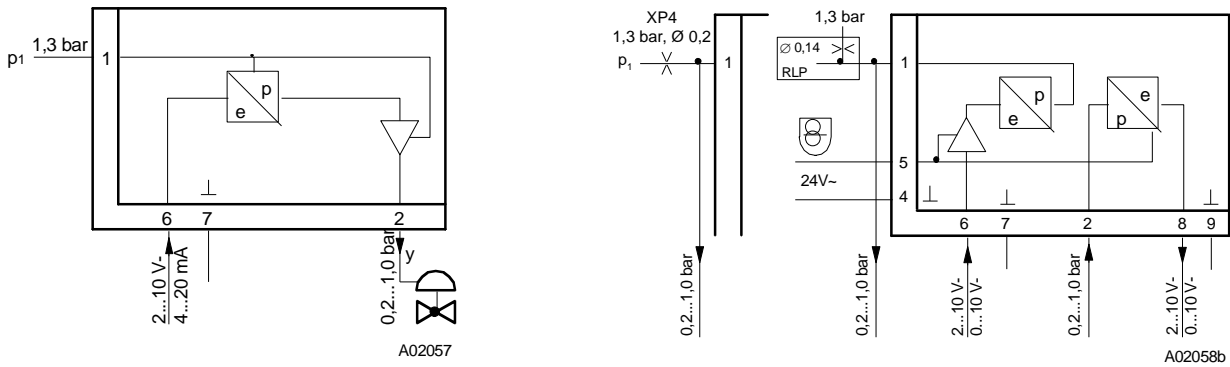
XEP 1



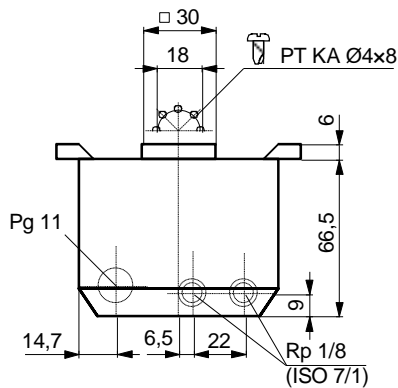
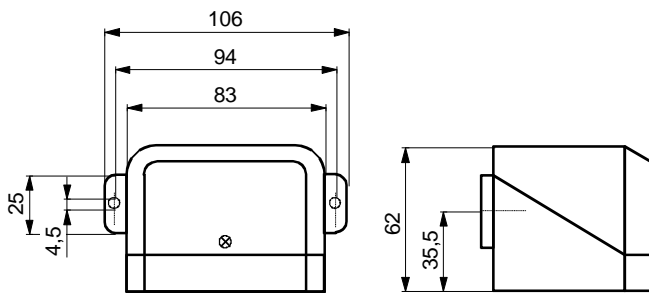
XEP 110



XEP 301

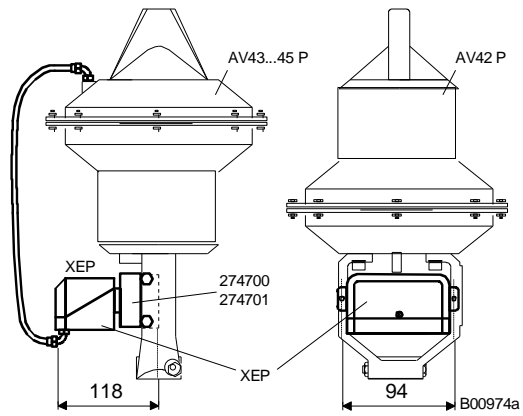


Dimension drawing



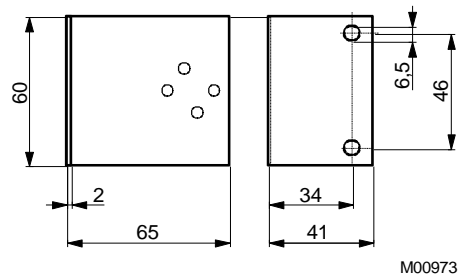
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Mounting onto AV42...AV45 P

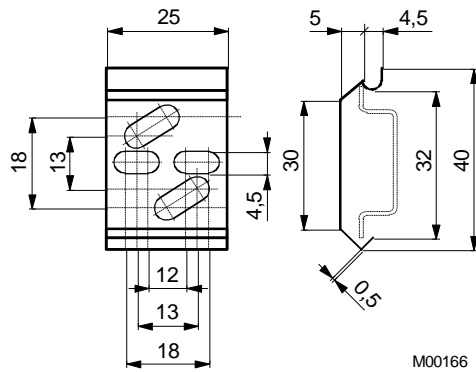


Accessories

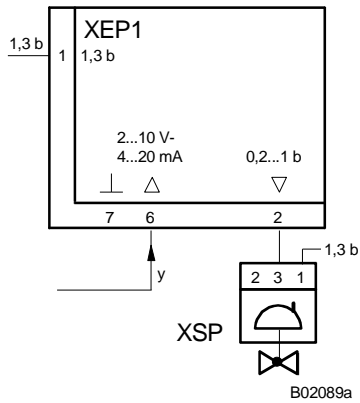
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274701



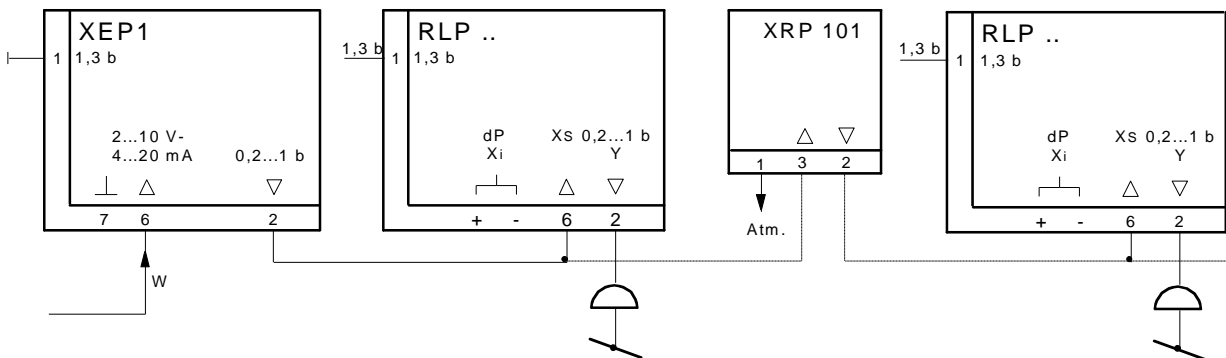
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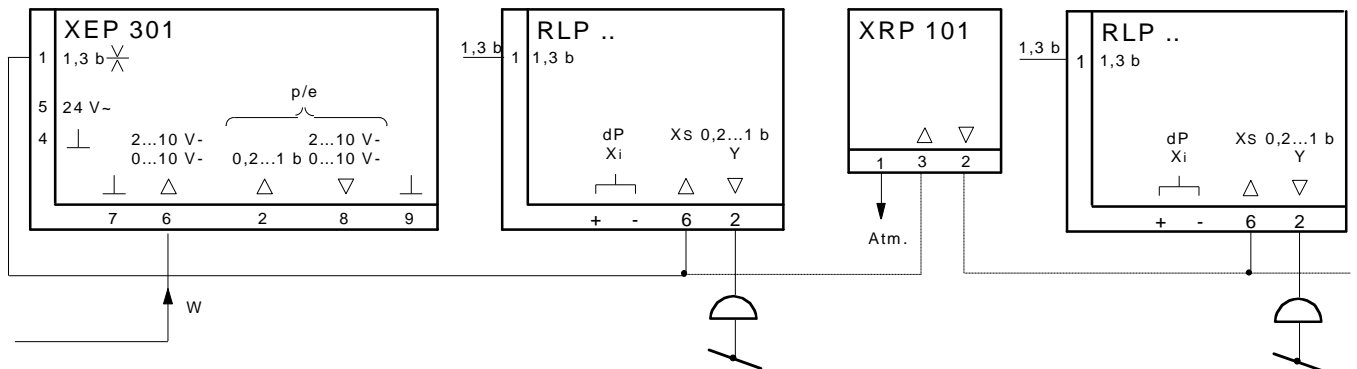
Examples of application



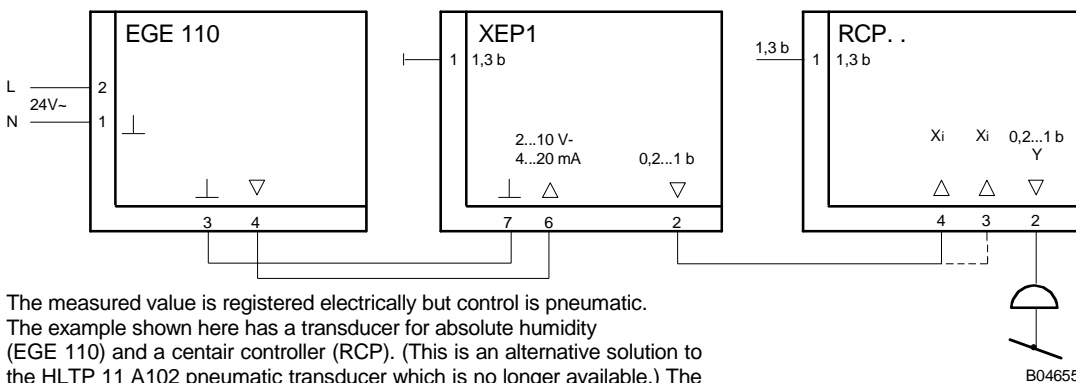
Electronic control, pneumatic positioning: the electrical signal *y* is converted by the XEP 1 into a pneumatic signal and transmitted to an XSP positioner.



The setpoint *w* for pneumatic VAV controller is set electrically via the XEP 1. The XEP 1 is fed by connection 6 of the RLP, which is why the supply-pressure connection 1 must be closed. If more than one RLP is desired, then an interface relay XRP 101 must be employed (up to three RLP units for each interface relay).



The setpoint *w* for pneumatic VAV controller is set electrically via the XEP 301. The XEP 301 is fed by connection 6 of the RLP. If more than one RLP is desired, then an interface relay XRP 101 must be employed (up to three RLP units for each interface relay).



The measured value is registered electrically but control is pneumatic. The example shown here has a transducer for absolute humidity (EGE 110) and a centair controller (RCP). (This is an alternative solution to the HLT P 11 A102 pneumatic transducer which is no longer available.) The XEP 1 is fed by the RLP, which is why the supply-pressure connection 1 must be closed.