

RLP 10: Pneumatic volume-flow controller

How energy efficiency is improved

For demand-led control of the air volume in office rooms.

Areas of application

Control of the supply and exhaust air of individual rooms or duct pressures. Can be used in potentially explosive areas.

Features

- ATEX certification for use in Zone 1 potentially explosive areas
- Conformity tested as per EN 13463-1 and EN 1127-1 (Ex II 2 G T6)
- Control of constant, switchable or variable air volumes
- Static differential pressure sensor with large measuring range (10 to 250 Pa)
- Controller front panel is printed with circuit diagram for rapid identification of function
- Thermoplastic housing suitable for wall or top-hat rail mounting (rail EN 60715)
- Compressed-air connections with Rp 1/8" female thread
- Low-pressure connections in form of stepped nipples for flexible plastic hose (internal Ø 4 and 6 mm)
- Complies with directive 97/23/EC Art. 3.3 on pressure equipment

Technical description

- Supply pressure 1.3 bar \pm 0.1
- Response sensitivity of sensor 0.5 Pa
- Linearity, square root extraction accuracy 2%
- One input for command variable
- Two outputs for:
 - actual value
 - activation of damper drive
- Two setpoint adjusters for maximum and minimum limiting of volume flow

Type	Control action	Setpoint range Volume flow % \dot{V}	Pressure diff. ¹⁾ Pa	Air capacity l _n /h	Weight kg
Integral volume-flow controller for supply and return air					
RLP 10 F001	B	20...100	10...250	330	0,2
RLP 10 F905	A	20...100	10...250	330	0,2
Integral volume-flow controller for aggressive gases in return air					
RLP 10 F904	B	20...100	10...250	330	0,2
RLP 10 F916	A	20...100	10...250	330	0,2
Output pressure		0,2...1,0 bar	Input: setpoint shift w ³⁾		
Response sensitivity		0,5 Pa	20...100 % $\dot{V} \triangleq$		0,2...1,0 bar
Linearity; accuracy of root extraction ²⁾		2%	Usable range p_{stat}		0...3 kPa
			Permissible pressure (low-pressure connections)		10 kPa
Supply pressure ⁴⁾		1,3 bar \pm 0,1	Connection diagram		A02888
Air consumption		44 l _n /h	Dimension drawing		M297240
Permissible ambient temp.		0...55 °C	Fitting instructions		MV 505677
Type of protection		IP 20			

Accessories

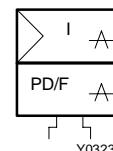
- 0226551 015** Scale (10...250 Pa) when used as duct pressure controller
- 0226551 017** Scale (20...500 Pa) when used as duct pressure controller ¹⁾
- 0296936 000*** Fixing bracket for rail EN 60715, 35 × 7,5 and 35 × 15
- 0297354 000*** Short screw-type connector (R 1/8") for soft plastic tubing, int. Ø 4 mm; 3 pcs required
- 0297680 001** Setpoint \dot{V} min. and \dot{V} max. set and marked
- 0297680 002** Influence E set and marked

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

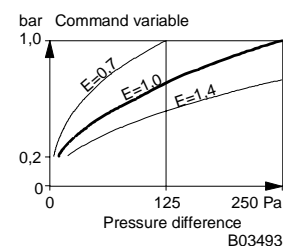
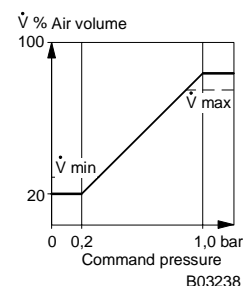
- 1) Factory setting 10...250 Pa. Using the XYP 3 test unit, the range can be altered from 5...125 Pa (E = 0,7) to 20...500 Pa (E = 1,4)
- 2) The percentages refer to 100% air volume
- 3) For connection 6, we recommend the use of temp. controllers without amplifier (TS. P 80 or TK. P 80), since they are supplied directly by the internal restrictor of the RLP
- 4) See Section 60 on regulations concerning the quality of supply air, especially at low ambient temperatures

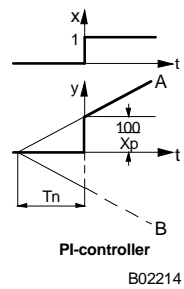


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Operation RLP 10

The pressure difference (10...250 Pa) created at the orifice plate or dynamic pressure sensor is converted by the root-extracting transducer into a fluidic-linear standard signal (0,2...1,0 bar). The command variable *w* at connection 6 (e.g. TSP 80 temperature controller) shifts the air volume. This variable is limited by the min. and max. adjusters, and is compared with the actual value. For fixed value control no command variable *w* is needed, the adjuster „min“ then serves as setpoint adjuster. The integral controller compensates without lasting error for the control deviation.
On the F904 and F916 models, a small amount of air is constantly fed into the two low-pressure lines in order to protect the diaphragm from aggressive gases.

Technical information

Technical manual: VAV 7000 621 003

Engineering and fitting notes

The TS . P 80 and the TK . P 80 (without amplifier) are a good choice of temperature controller. It is supplied by an internal restrictor fitted at terminal 6 of the RLP.

Influence E: the output pressure 0,2...1,0 bar of the temperature controller (20...100% command variable) changes the volume-flow setpoint between 10 and 250 Pa (factory setting *E* = 1.0). A small internal screw allows this setpoint range to be increased or decreased by a factor of 2.

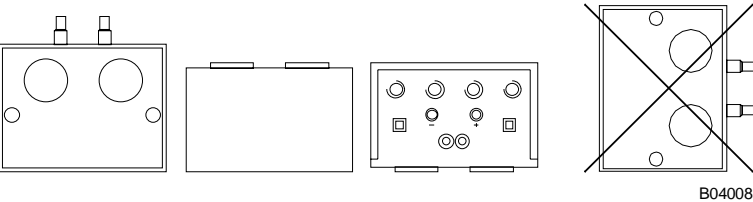
E = 1,4: 100% command variable equals 1,4 times air volume, pressure difference 500 Pa.

E = 0,7: 100% command variable equals 0,7 times air volume, pressure difference 125 Pa.

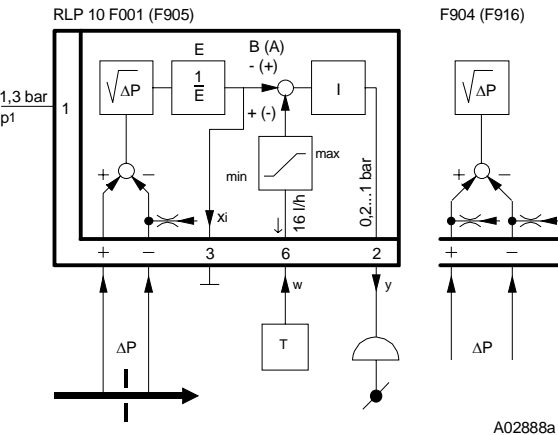
To be able to adjust the influence *E*, the XYP 3 test unit is required.

There should be no positioner connected between the integral controller (RLP 10) and the actuator or valve drive. The output pressure must go directly to the drive.

The unit should not be fitted standing on its end!

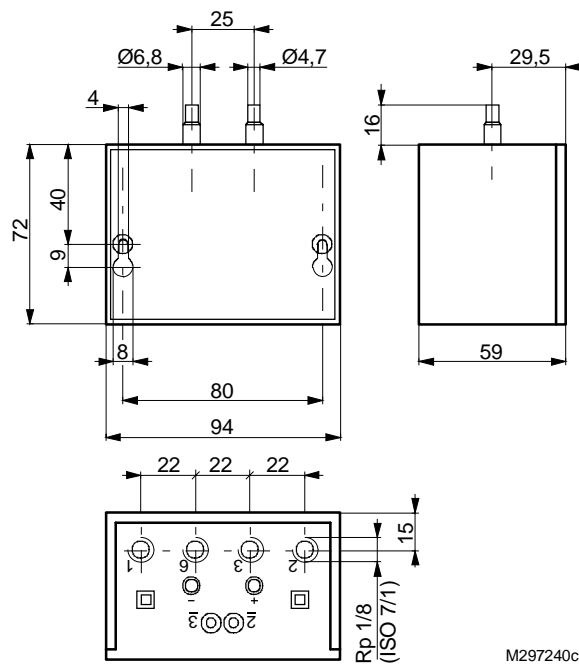


Connection diagrams



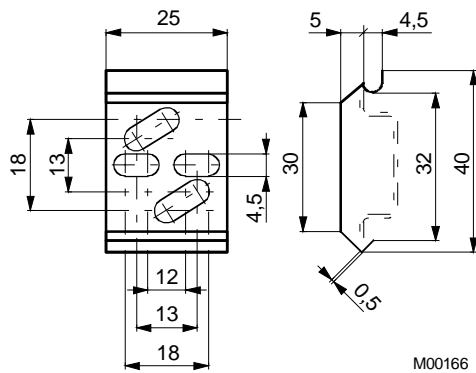
- w* command variable
- Δp pressure difference
- y* output pressure
- I* – controller

Dimension drawing

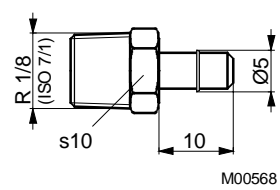


Accessories

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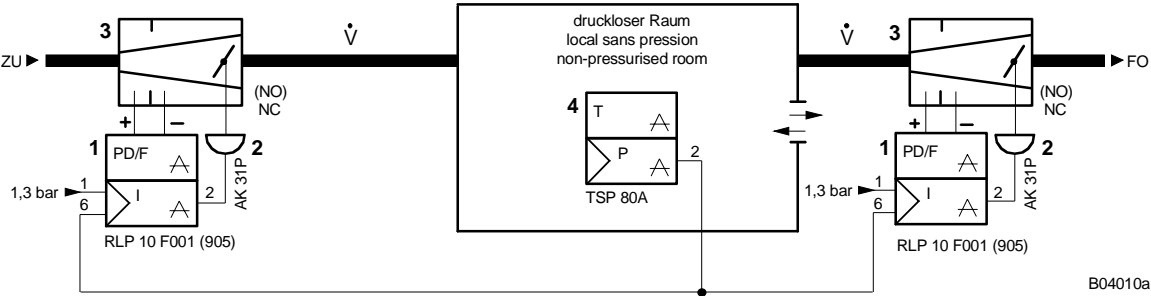


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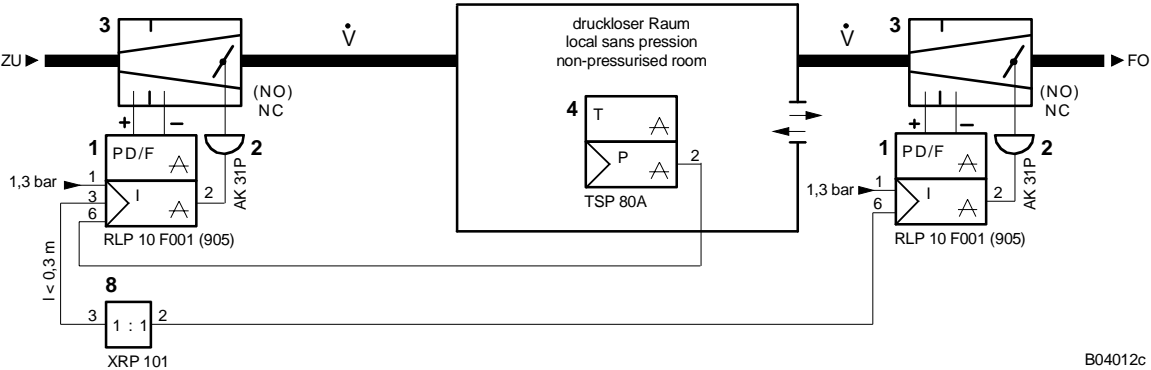


Examples of use with RLP 10

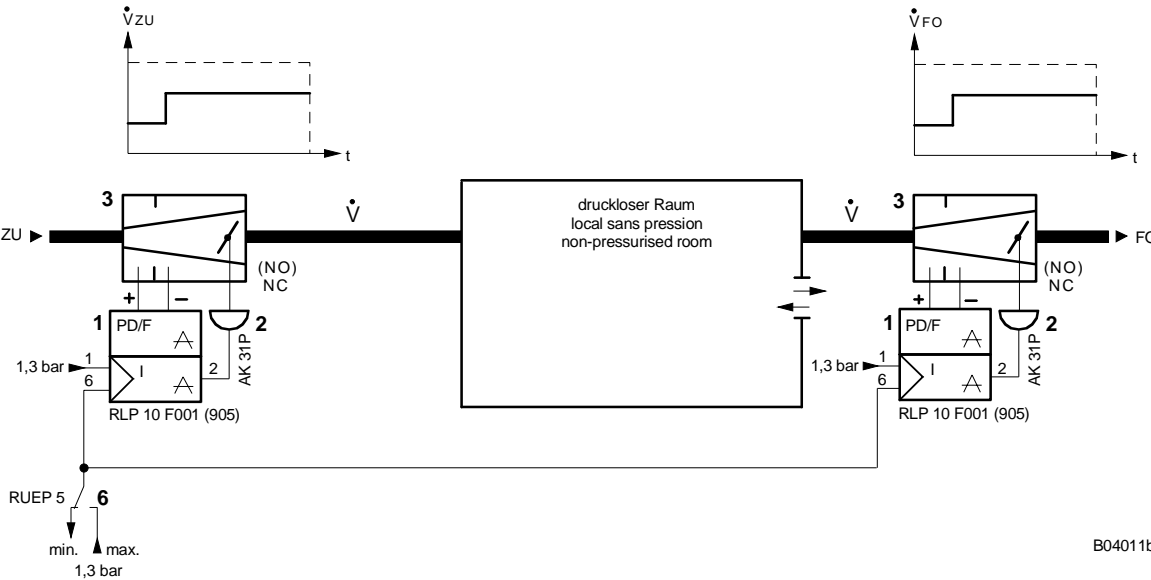
1. Control facility for variable air volume, for 'open rooms'.



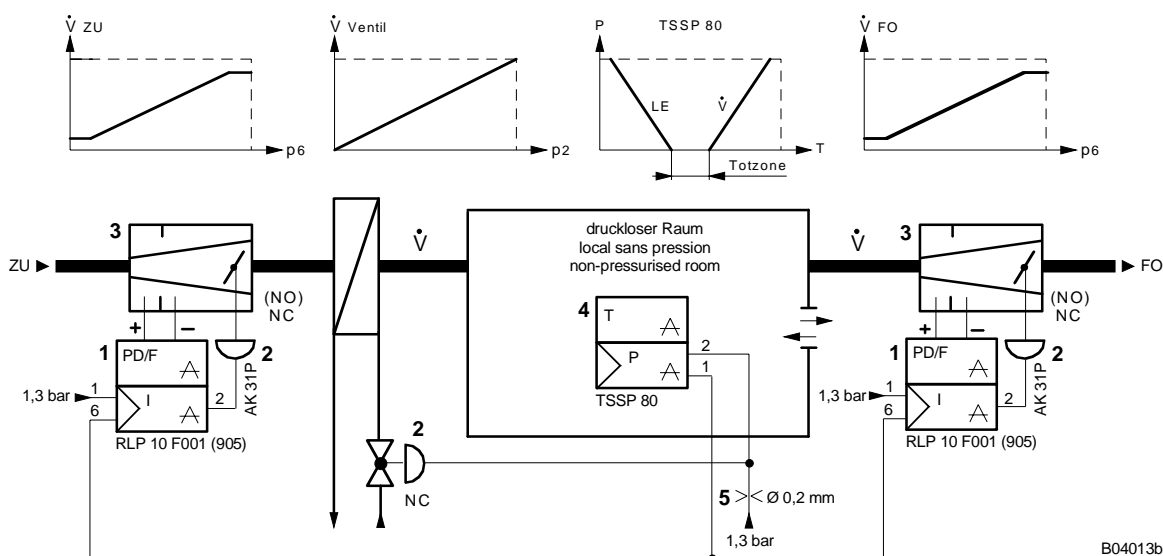
2. Control facility only for variable air volume, for 'open rooms'; exhaust-air controller controlled by supply-air controller.



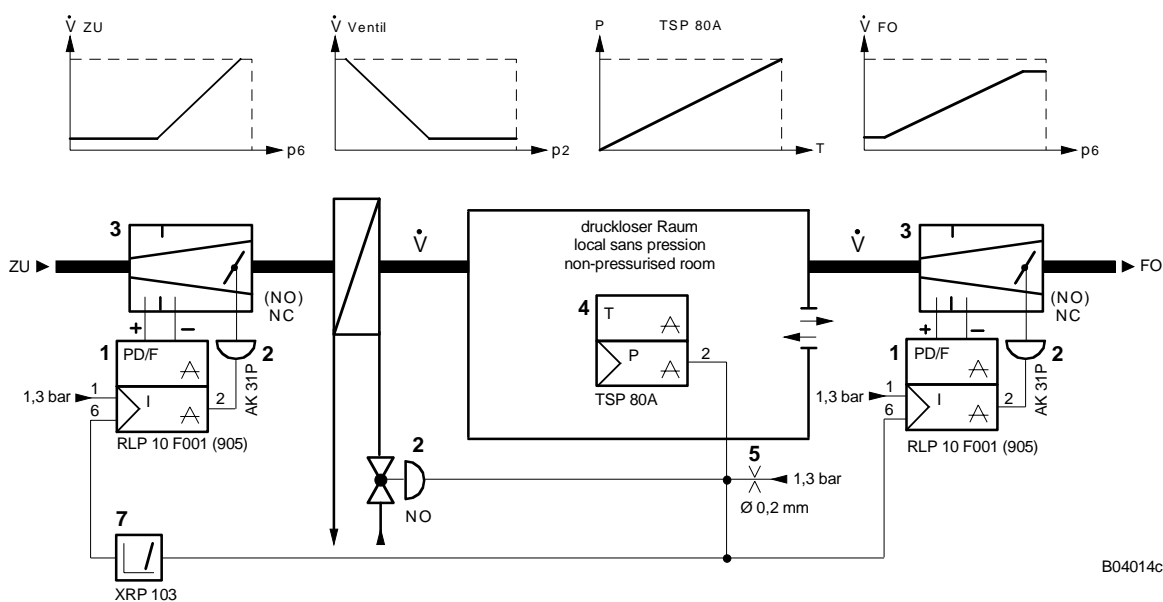
3. Control facility for constant air volume, for 'open rooms', with setpoint options.



4. Control facility for variable air volume, with re-heater, for 'open rooms', with dead zone; normally closed re-heater; room-temperature controller has control action A and B.



5. Control facility for variable air volume, with re-heater, for 'open rooms'; normally-open re-heater; room-temperature controller has control action A.



1	Volume-flow controller	6	Electropneumatic relay	FO	EA (exhaust air)
2	Damper or valve drive	7	Sequence relay	ZU	SA (supply air)
3	Pressure-release unit	8	Interface relay	LE	HC (heating coil)
4	Room-temperature controller	Ventil	Valve	Totzone	Dead zone
5	External line restrictor			NO	normally open
				NC	normally closed