

RLP 100 F916, F918, F910: Dual-channel air-volume controller

How energy efficiency is improved

For demand-led volume flow control of dual-channel systems in offices.

Areas of application

Room air-conditioning using VAV in dual-channel ventilation systems.

Features

- Optimal use of energy thanks to RLP 100 dual-channel controller in combination with room control equipment in the TSP, TSFP, TSSP series
- Can be combined with virtually all mixing boxes currently on the market
- 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
- Highly accurate, static differential pressure sensor with large measuring range (1 to 160 Pa)
- Controller front panel is printed with circuit diagram for rapid identification of function
- Glass-fibre-reinforced thermoplastic housing suitable for wall or top-hat rail mounting (rail EN 60715)
- Compressed-air connections with Rp 1/8" female thread
- Special measuring connection for recording the volume flow with M4 connector
- 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 0.1 Pa
- Linearity, square root extraction accuracy 2%
- Two inputs for:
 - command variable
 - day/night changeover or heating/cooling signal
- Three outputs for:
 - actual value of air volume
 - activation of two damper drives, heating and cooling
- Adjuster for adjustment of the sensor measuring range
- Two setpoint adjusters for maximum and minimum limiting of volume flow

Type	Description			Weight kg	
RLP 100 F916	constant air-volume controller (PI) for sequence drives			0,6	
RLP 100 F918	VAV controller (Integral) for full-range drives			0,6	
RLP 100 F910	Constant air-volume controller (PI) for full-range drives ¹⁾			0,6	
Output pressures	0,2...1,0 bar		Input: setpoint shift w ₁ , w ₂		
Setpoint range for air volume	20...100% $\checkmark$		20...100% $\checkmark$	0,2...1,0 bar	
Measuring range Δp (factory setting)	6,4...160 Pa		Usable range p _{stat}	0...3000 Pa	
reducible to	1...25 Pa				
Response sensitivity	0,1 Pa		Permissible pressure		
Linearity; accuracy of root extraction	2% of 100% $\checkmark$		(low-pressure connect.)	3000 Pa	
Supply pressure ²⁾	1,3 bar $\pm$ 0,1			Permissible amb. temp.	0...55 °C
Air capacity	F916	F918	F910	Degree of protection	IP 30
Output 2, cooling	100 l _n /h	120 l _n /h	400 l _n /h	Connection diagr.	F916 A02881
Output 7, heating	18 l _n /h	80 l _n /h	400 l _n /h		F918 A02882
Air consumption	60 l _n /h	80 l _n /h	53 l _n /h		F910 A08620
P-band (fixed)	400%	—	100%	Dimension drawing	M297570
				Fitting instructions	F916 MV 505338
					F918 MV 505262
					F910 MV 505089

Accessories

0297354 000* Short screw-type connector (R 1/8") for soft plastic tubing, internal Ø 4 mm; five pieces required.

0297762 001 Restrictor Ø 0,8 mm for attenuating turbulent low-pressure signals; 2 pcs required

0274571 000 Restrictor Ø 0,5 mm for attenuating turbulent low-pressure signals; 2 pcs required

0297870 001* Fixing bracket for fitting the controller to ceilings, floors or panels.

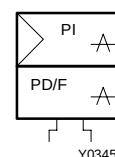
^{*)} Dimension drawing or wiring diagram are available under the same number

¹⁾ Can be used for mixing boxes made by *Hesco-Trox* and *Buensas*

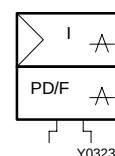
²⁾ See Section 60 on regulations concerning the quality of supply air, especially at low ambient temperatures



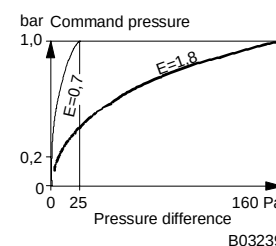
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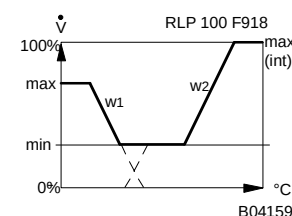
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Operation

The pressure difference (6,4...160 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 pressure difference of the setpoint range ($E = 0,7...1,8$) is set via adjuster E. The integral controller compensates without lasting error for the control deviation.

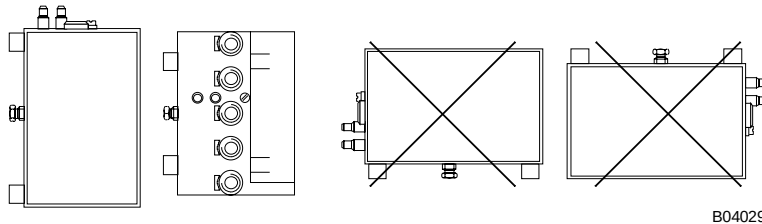
RLP 100 F916: The command variable w shifts the air volume (e.g. TSP 80 B temperature controller). An external setpoint signal can be fed in via connection 8 and limited by the $\dot{V}_{\min}$ and $\dot{V}_{\max}$ adjusters. When the connection is open, $\dot{V}_{\min}$ is active; when closed, $\dot{V}_{\max}$ is active.

RLP 100 F918: The command variables w_1 (heating) and w_2 (cooling) shift the air volume (e.g. TSSP 80 temperature controller). The $\dot{V}_{\min}$ and $\dot{V}_{\max}$ adjusters and the internal $\dot{V}_{\max}$ (int.) adjuster allow the air volumes for heating and cooling to be limited individually.

RLP 100 F910: The command variable w shifts the air volume for heating (e.g. TSP 80 B temperature controller). The ratio of warm air to cold air is fixed at 1:2. An external setpoint signal can be fed via connection 8 and limited using adjusters $\dot{V}_{\min}$ and $\dot{V}_{\max}$. When the connection is open, $\dot{V}_{\min}$ is in force; when the connection is closed, $\dot{V}_{\max}$ is in force.

Engineering and fitting notes

The unit should not be fitted laterally (as depicted below, right).



In order to prevent turbulence which, in the form of oscillations, affects the low-pressure signal, there should be a smoothing sector in front of the measuring cross for the measurement of differential pressure.

Where the flow may be problematical – e.g. right-angles, bends or junctions directly in front of the measuring cross –, a restrictor should be fitted into the plastic tubing of the '+' and '-' connection in order to attenuate turbulent low-pressure signals.

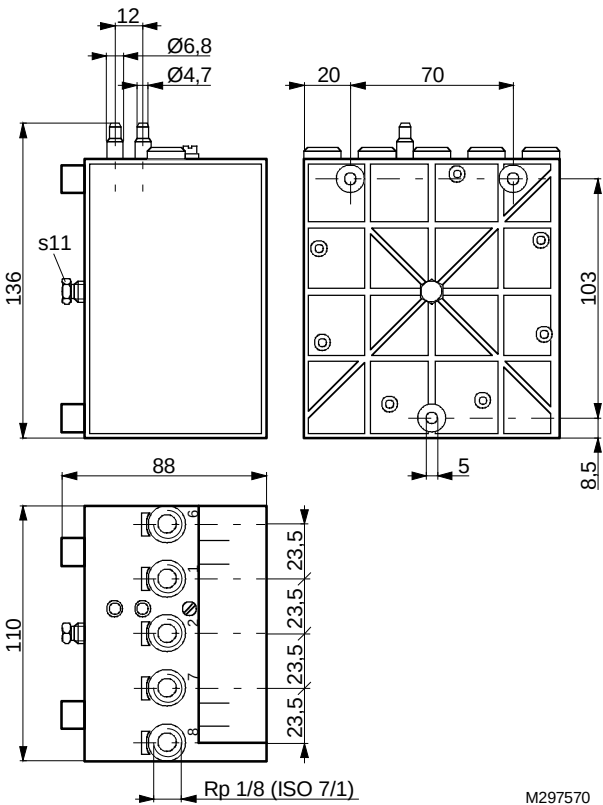
Engineering and fitting notes

Technical manual: VAV 7 000 621 003

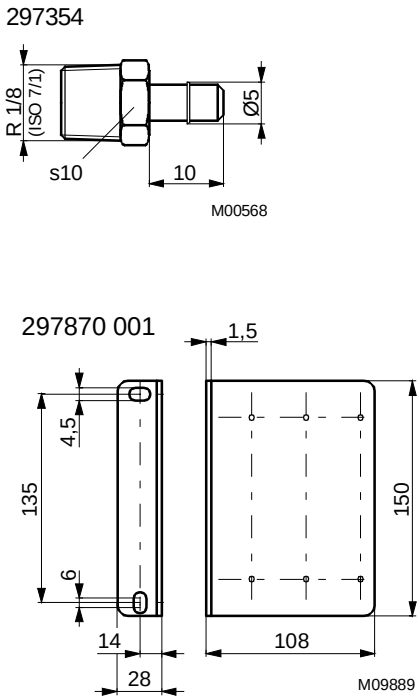
Additional information on accessories

- 0297762 001** Restrictor (Ø 0,8 mm) for damping turbulent low-pressure signals; push-on connector for soft plastic tubing of Ø 4 mm internal. If the damping is insufficient, a Ø 0,5 mm restrictor can be used instead (accessory no. 0274571; not suitable for RLP 100 F908, F914, F123).
- 0274571 000** Restrictor (Ø 0,5 mm) for damping turbulent low-pressure signals; push-on connector for soft plastic tubing of Ø 4 mm internal. Used in extreme cases where the Ø 0,8 mm restrictor has proved to be inadequate. Unsuitable for any volume-flow controllers (RLP 100 F914 and F123) and transducers (RLP 100 F908) that have a very small amount of air fed constantly into the '+' and '-' low-pressure line, since the pressure signals in the lower part of the measuring range are falsified, and the positioning time of 1...2 seconds (RLP 100 F123) is not attained.

Dimension drawing

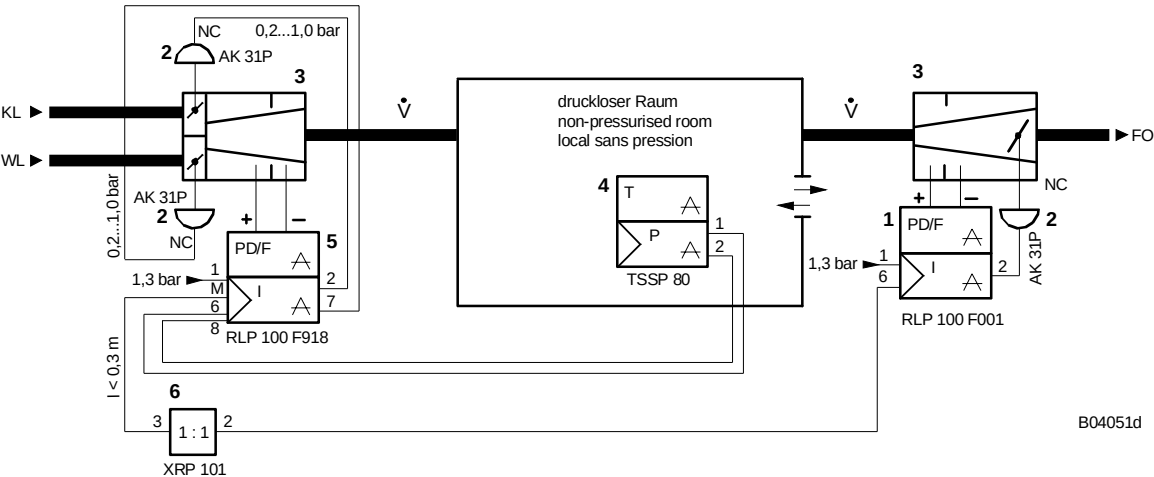


Accessories



Example of use for RLP 100 F918

Control facility for a variable air volume for dual-channel systems with room temperature for heating-cooling



1	Volume-flow controller	4	Room-temperature controller	KL	Cold air
2	Damper drive	5	Dual-channel air-volume contr.	WL	Warm air
3	Pressure-release unit	6	Interface relay	FO	EA (exhaust air)
				NC	normally closed