

RLP100F903, F908: Pneumatic air-volume transducer

How energy efficiency is improved

Allows demand-based volume flow control for fume cupboards, laboratories and clean rooms

Features

- Root-extracted output signal as command variable for extended control loops
- Special version available for measuring aggressive gases
- Suitable for explosion hazard zone 1 II 2 G T6
- Conformity tested as per EN 13463-1 and EN 1127-1 (ex zone 1 II 2 G T6)
- Accurate, static differential pressure sensor with large measuring range
- Front plate printed with circuit diagrams for easy identification of the controller functions
- Compressed-air connections with Rp $\frac{1}{8}$ " female thread
- Special measuring connection for detecting the air volume
- Low-pressure connections with dual-diameter connector for soft plastic tubing (internal \varnothing 4 and 6 mm)
- 1 input
 - Setpoint shift $\Delta\dot{V}$
- 1 output
 - Actual value, air volume
- 1 adjuster for calibrating the sensor measuring range
- 1 setpoint adjuster for limiting the setpoint shift $\Delta\dot{V}$ to max. $\pm 20\%$

Technical data

Parameters

Supply pressure ¹⁾	1.3 bar ± 0.1
Measuring range Δp ²⁾	1.6...160 Pa
Response sensitivity	0.1 Pa
Measuring range, volume flow	10...100% \dot{V}
Air capacity	320 l _n /h
Air consumption	38 l _n /h
Operating range P _{stat}	0...3000 Pa
Output pressure	0.1...1.0 bar
Low-pressure connections	3000 Pa

Ambient conditions

Admissible ambient temperature	0...55 °C
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Inputs/Outputs

Input for setpoint shift $\Delta\dot{V}$	3...20% \dot{V}
Linearity, accuracy of root extraction 20...100% \dot{V}	2% of \dot{V}_{100}
Linearity, accuracy of root extraction 10...20% \dot{V}	4% of \dot{V}_{100}

Construction

Housing material	Glass-fibre-reinforced thermoplastic
Fitting	To walls or top-hat rails (EN 60715 rail)
Weight	0.6 kg

Standards and directives

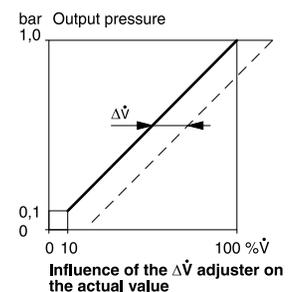
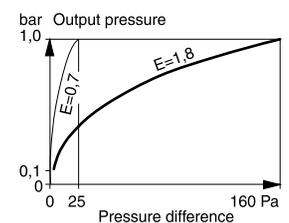
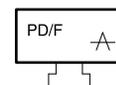
Type of protection	IP 30
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¹⁾ For regulations concerning the quality of the supply air, particularly at low ambient temperatures, see www.sauter-controls.com/en/pneumatic_plants

²⁾ Factory setting ($E = 1.8$), can be reduced to 1...25 Pa ($E = 0.7$) using E adjuster



RLP100F90*



Overview of types

Type	Properties
RLP100F903	–
RLP100F908	for aggressive gases

Accessories

Type	Description
0297354000	Short screw-in connector R $\frac{1}{8}$ " , for soft plastic tubing \varnothing 4 mm (internal)
0297762001	Restrictor \varnothing 0.8 mm for damping turbulent low-pressure signals
0274571000	Restrictor \varnothing 0.5 mm for damping turbulent low-pressure signals
0297870001	Bracket for fixing to ceilings, floors or in panels

- ⚡ 0297354000: 3 pieces required
- ⚡ 0297762 001: Can be plugged into soft plastic hose, inner \varnothing 4 mm. If attenuation is insufficient, instead of the \varnothing 0.8 mm restrictor, the \varnothing 0.5 mm restrictor can be used (accessory 0274571; this restrictor is not suitable for RLP100F908, F914, F123).
- ⚡ 0274571 000: Can be plugged into soft plastic hose, inner \varnothing 4 mm. Suitable for extreme cases when the \varnothing 0.8 mm restrictor (accessory 0297762) does not provide sufficient attenuation. Not suitable for volume flow controllers (RLP100F914, F123) and transducers (RLP100F908) where the "+" and "-" low pressure line is constantly supplied with a very small quantity of air, because the pressure signals in the lower measuring range are falsified and the positioning time of 1...2 s (RLP100F123) is not achieved.

Additional information

Fitting instructions	MV 505019
VAV technical manual	7 000 621 001

Description of operation

The square root transducer converts the pressure difference (1.6...160 Pa) produced at an orifice plate or pitot tube into a standard signal (0.1...1.0 bar) that is linear to the flow. The standard signal is proportional to the volume flow or the air velocity. An isolation amplifier is installed to decouple the measuring system from the output signal.

The measuring range for the pressure difference is set on the E adjuster. If E = 1.8 the measuring range is 1.6...160 Pa (factory setting), at E = 1.4 it is 1...100 Pa (evaluable output pressure 0.2...1.0 bar, measurable volume flow 20...100%). If E = 0.7 the measuring range is only 1...25 Pa because pressure differences of less than 1 Pa cannot be measured (evaluable output pressure 0.2...1.0 bar, measurable volume flow 20...100%).

The output signal of the transducer can be reduced using the $\Delta\dot{v}$ adjuster by 3...20% \dot{v} . This allows a lower volume flow to be simulated to the downstream controller. A difference between the supply and return air volume flow is produced, leading to negative or positive room pressure, provided the supply air volume controller is equipped with a $\Delta\dot{v}$ adjuster. The output signal can be adjusted externally via connection 8, and the value set using the $\Delta\dot{v}$ adjuster is used as the minimum limit.

Additional RLP100F908 function

To protect the measuring membranes from corrosive gases, a very small quantity of air is constantly fed to the "+" and "-" low-pressure line.

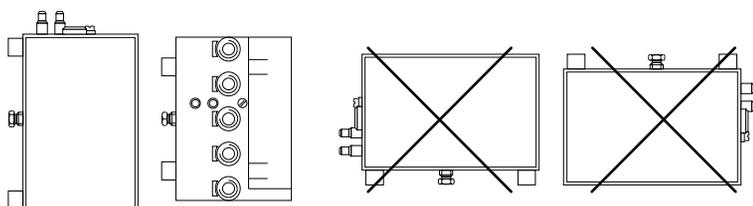
Intended use

This product is only suitable for the purpose intended by the manufacturer, as described in the "Description of operation" section.

All related product documents must also be adhered to. Changing or converting the product is not admissible.

Engineering and fitting notes

Crosswise mounting is not permitted.



To prevent turbulent flow causing vibrations that affect the low pressure signal, there must be a smoothing sector in front of the cross meter for measuring the differential pressure.

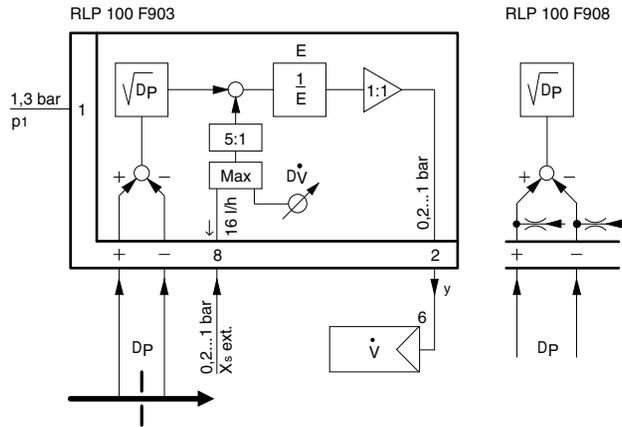
Where there are unfavourable inflows – bends, elbows or branches immediately in front of the cross meter – a restrictor (accessory 0297762 or 0274571) must be installed in the plastic hose of the + and – connection to attenuate turbulent low pressure signals.

Disposal

When disposing of the product, observe the currently applicable local laws.

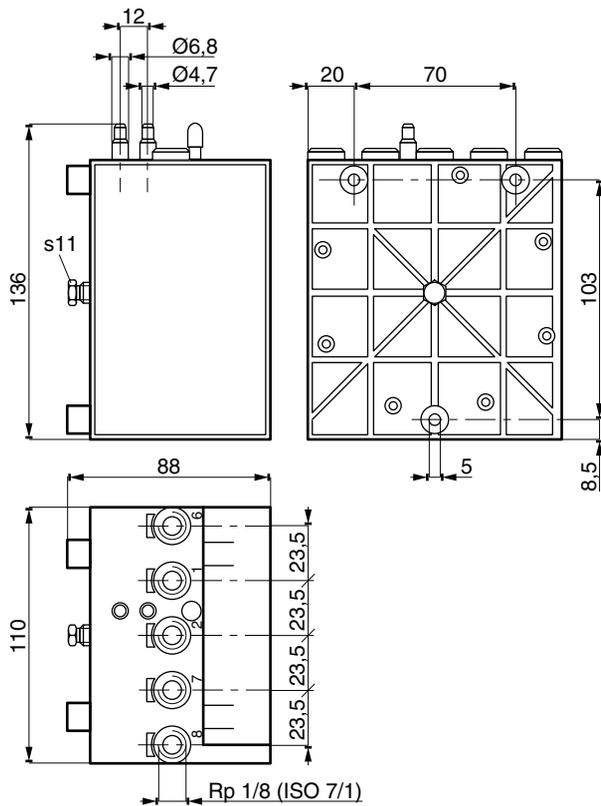
More information on materials can be found in the Declaration on materials and the environment for this product.

Connection diagram



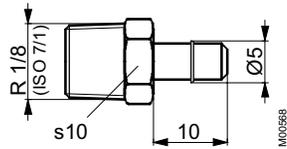
Δp = pressure difference
 y = output pressure

Dimension drawing

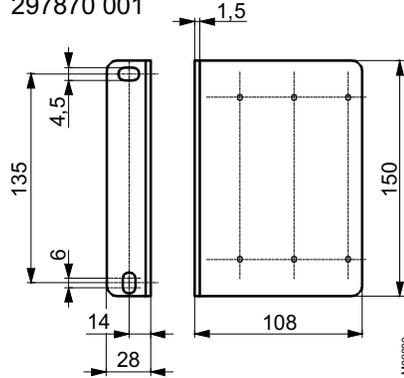


Accessories

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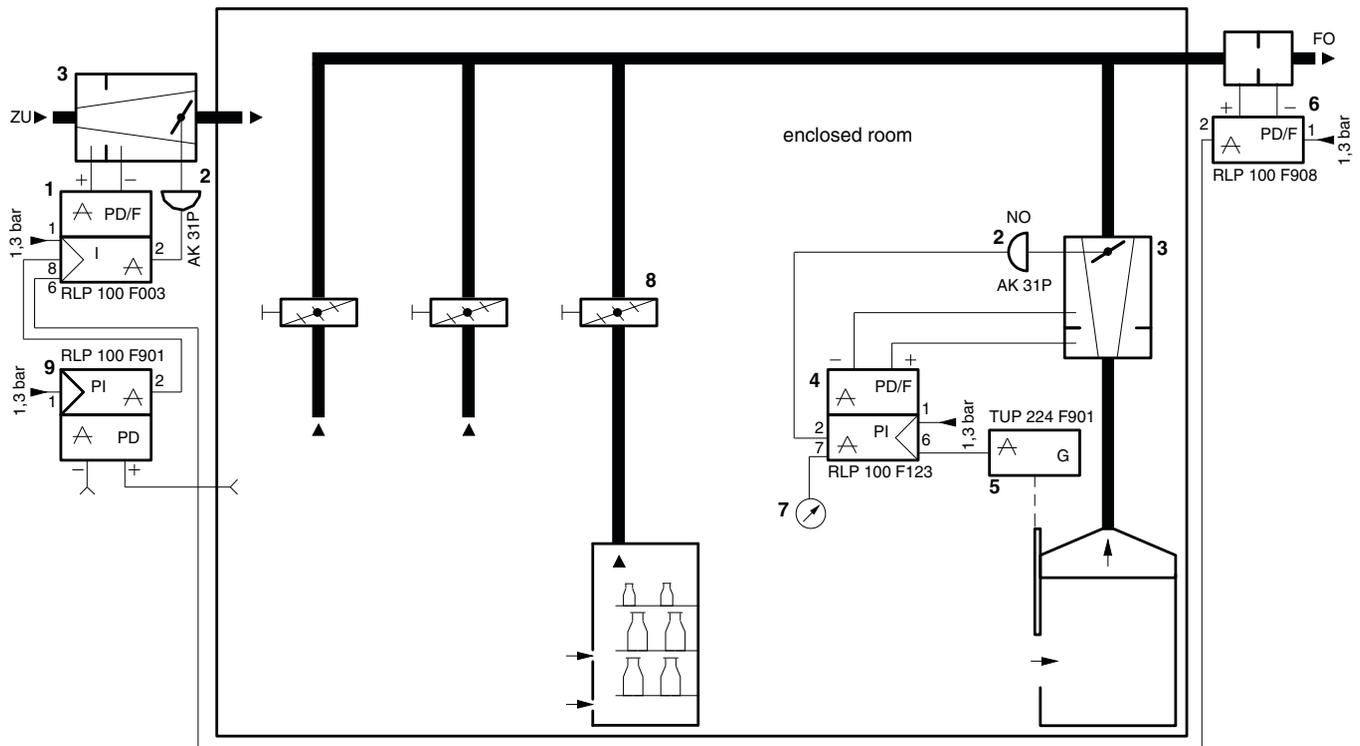


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Application example

Return air quantity controlled in proportion to the sash opening of the fume cupboard with VAV transducer for corrosive gases.



1	VAV controller	6	VAV transducer for corrosive gases
2	Damper actuator NO	7	Pressure gauge, 0297797
3	Reducing box	8	Manual damper
4	VAV return-air controller for fume cupboards	9	Pressure controller
5	Travel sensor	NO	Normally open

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