

In air ducts and processes

MEASUREMENT OF VOLUME FLOWS

VOLUME FLOW MEASUREMENT

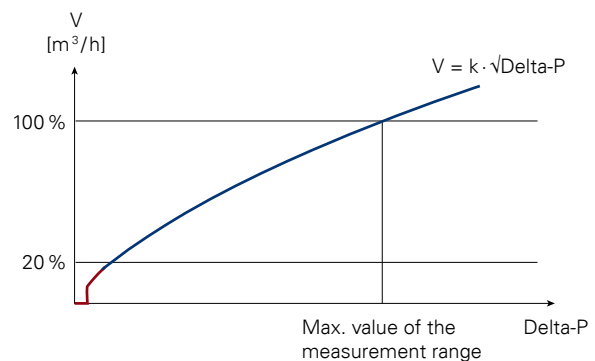
In building and process technology, it is necessary to measure the quantities of air flowing into rooms or processes or being circulated in the plant. The quantity of air transported in a given period of time is known as the volume flow (most common unit: m³ or ft³ per hour). Accuracy down to the last decimal point is not usually critical in these applications. The key features are reliability, robust build quality and good value for money.

The most commonly used method of measuring volume flows is based on the principle of differential pressure. This has a number of specific advantages:

- low investment costs, especially for ducts with medium or large cross-sections
- minimal calibration costs
- process technology: can also be used in plants where temperatures differ significantly from room conditions




Please note that the differential pressure method of measuring volume flow cannot accurately record very

small volume flows. These low measurement values are therefore suppressed (*creep suppression*), e.g. the lowest 3 % of the differential pressure measurement range. However, in typical air conditioning and ventilation systems, as well as in most process technology plants, the volume flows lie between 20 and 100 % of the maximum measurement range so this does not result in any significant limitations.



SUITABLE DEVICES

halstrup-walcher offers a choice of high quality differential pressure transmitters with square-root output. All these devices are designed for indoor room conditions as well as for overpressures of up to 6 bar optional. Please contact Luftmeister GmbH, a company in the Halstrup-Walcher Group (www.luftmeister.com), for selecting a primary element and for on-site calibration.

	P26	P34	P29
Details on	p. 20	p. 21	p. 22
			
Special feature	Scalable, large selection of units	Similar to P26, specifically designed for the control cabinet	Similar to P26, can be used in applications with natural gas
Volume flow	✓	✓	✓
Volume (consumption)	✓ (optional)	-	-
Differential pressure	✓	✓	✓
Accuracy	✓ ✓	✓ ✓	✓ ✓
Pressure / temperature compensation	-	✓ (optional: Absolute pressure sensor on board, temperature analogue input)	-
20-point curve	-	✓ (can be stored)	-

CONVERSION TABLE

	m ³ /h	m ³ /min	ft ³ /h	ft ³ /min
m³/h	1	0.0167	35.3147	0.5886
m³/min	60	1	2 118.8800	35.3147
ft³/h	0.0283	0.0005	1	0.0167
ft³/min	1.6990	0.0283	60	1

Please read the lines from left to right.
Example: 1 m³/h corresponds to 35.3147 ft³/h.

Measurement ranges (also \pm measurement ranges) others available upon request	10/50/100/250/500 Pa 1/2.5/5/10/20/50/100 kPa freely scalable from 10..100 % within a measurement range
Margin of error (0.3 Pa margin of error for reference)	$\pm 0.2\%$ or $\pm 0.5\%$ of the scaled range (40..100 % of max. value) (min. 0.3 Pa)
Temperature coefficient span	0.03 % of max. value/K (10..50 °C)
Temperature coefficient zero point	$\pm 0\%$ (cyclical zero-point correction)
Max. system pressure/ Overload capacity	600 kPa for measurement ranges ≥ 2.5 kPa 200 x for measurement ranges < 2.5 kPa
Medium	air, all non-aggressive gases
Sensor response time	25 ms
Time constants	25 ms..40 s (adjustable)
Operating temperature	10..50 °C
Storage temperature	-10..70 °C
Power consumption	approx. 6 VA
Weight	approx. 750 g
Cable glands	3 x M16
Pressure ports	for tubing NW 6 mm, others available on request
Protection class	IP65, with USB: IP40
Certificates	CE, CSA

Output (linear/ root-extracted) ¹⁾	A
0..10 V ($R_L \geq 2$ k Ω)	1
0..20 mA ($R_L \leq 500$ Ω)	0
4..20 mA ($R_L \leq 500$ Ω)	4
± 5 V ($R_L \geq 2$ k Ω)	5

¹⁾ output signals can be configured freely

Measurement range	C
Measurement range e.g. 0..10 Pa, -10..50 mbar, ± 100 mmHg (etc.)	

Power supply	B
24 VAC/DC $\pm 10\%$	24ACDC
24 VAC +6 % (with galvanic separation)	24AC
230/115 VAC -15 %	230/115

Margin of error	D
$\pm 0.2\%$ ²⁾	2
$\pm 0.5\%$ ²⁾	S

²⁾ of the scaled range (40..100 % of
max. value) (min. 0.3 Pa)

Display + keyboard	E
none	0
multi-coloured LCD and keyboard	LC



Contact points	F
none	0
air meter	1
2 relays (changeover contacts) max. 230 VAC, 6 A	2

Data interface	G
none	0
USB (data cable supplied)	U0
External zero-point calibration	0X
External zero-point calibration and USB (data cable supplied)	UX

Order code	A	B	C	D	E	F	G
P 26	-	-	-	-	-	-	-

Can be pre-set on request:
Time constant, relay parameter, analogue output root-
extracted / linear, deactivation of the cyclic zeroing

P 26

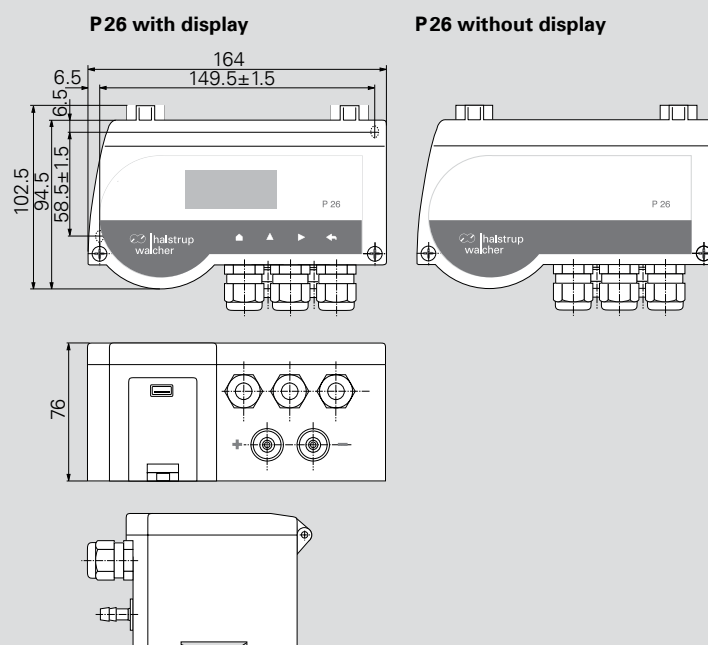


Features

- High precision differential pressure transmitter for top-hat rail or wall mounting (air-conditioning, cleanroom, process)
- Wide range of units available for pressure and volume flow, also \pm measurement ranges
- Scalable measurement ranges and units
- Zero-point correction prevents zero-point drift
- Built-in valve provides a high level of overpressure protection
- Multilingual menu (English/French/German/Italian)

Optional

- Contact points with adjustable switching outputs
- Set the zero-point via the interface
- USB interface (free parameterisation software at www.halstrup-walcher.com)
- Air meter function



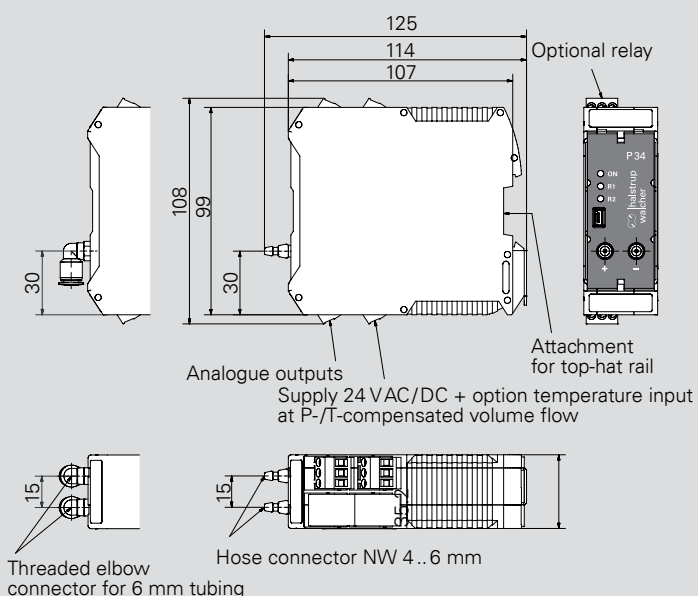


Features

- Differential pressure transmitter with very small dimensions – ideal for control cabinet installation
- Optionally with temperature analogue input and internal stat. pressure sensor for P-/T-compensated volume flow
- Optionally with relay
- Zero-point correction prevents zero-point drift
- Built-in valve provides a high level of overpressure protection
- Volume flow can be configured via k-factor, dP_{max}/V_{max} or 20 individual values
- With USB interface via PC-software: scaling, characteristic line form and many other parameters can be set
- Delivery possible already completely integrated into the control cabinet (on request)

Easy Mounting

The differential pressure transmitter P34 is particularly developed for space-saving mounting in control cabinets.



Measured data differential pressure

Measurement ranges (also \pm measurement ranges) others available upon request	10/50/100/250/500 Pa 1/2.5/5/10/20/50/100 kPa freely scalable from 10..100 % within a measurement range
Margin of error (0.3 Pa margin of error for reference)	$\pm 0.2\%$ or $\pm 0.5\%$ of the scaled range (40..100 % of max. value) (min. 0.3 Pa)
Temperature coefficient span	0.03 % v. E./K (10..50 °C)
Temperature coefficient zero point	$\pm 0\%$ (cyclical zero-point correction)
Max. system pressure/ Overload capacity	400 kPa measurement ranges ≥ 2.5 kPa 200 x measurement ranges < 2.5 kPa
Medium	air, all non-aggressive gases
Sensor response time	25 ms
Time constants	25 ms..60 s (adjustable)
Operating temperature	10..50 °C
Storage temperature	-10..70 °C
Power consumption	approx. 6 VA
Weight	approx. 450 g
Connections	Screw terminals (connection capacity 0.25..2.5 mm ²)
USB interface	USB 2.0 Full-Speed Slave (Mini USB)
Pressure ports	for tubing NW 4..6 mm
Protection class	IP20
Certificates	CE

Measured data for P-/T-compensated volume flow (optional)

Measured range absolute pressure	200 kPa
Accuracy absolute pressure	$\pm 2.0\%$ of max. value
Temperature input	4..20 mA, $R_i = 130\ \Omega$ Temperature range freely scalable

Power supply

24 VAC/DC $\pm 10\%$

Output (linear/ root extracted) ¹⁾

0..10 V ($R_L \geq 2\ k\Omega$)	1
0..20 mA ($R_L \leq 500\ \Omega$)	0
4..20 mA ($R_L \leq 500\ \Omega$)	4

¹⁾ output signals can be configured freely

Margin of error

$\pm 0.2\%$ ²⁾	2
$\pm 0.5\%$ ²⁾	5

²⁾ of the scaled range (40..100 % of
max. value) (min. 0.3 Pa)

Application

standard	A
P-/T-compensated volume flow	B

Measurement range

Measurement range
e.g. 0..10 Pa,
-10..50 mbar,
 ± 100 mmHg (etc.)

Contact points

none	0
2 relays (changeover contacts) max. 230 VAC, 6 A	2

Tubing connectors

standard grommet for NW 4..6 mm tubing	0
threaded elbow connector for 6 mm tubing	W

Order code

	A	B	C	D	E	F
P34	-	-	-	-	-	-

Can be pre-set on request:

Time constant, relay parameter, analogue output root-
extracted / linear, deactivation of the cyclic zeroing

Measurement ranges others available upon request	250/500 Pa 1/2.5/5/10/20/50/100 kPa freely scalable from 10..100 % within a measurement range
Margin of error	± 0.2 % of max. value or ± 0.5 % of max. value
Temperature coefficient span	0.03 % of max. value/K (10..50 °C)
Temperature coefficient zero point	± 0 % (cyclical zero-point correction)
Overload capacity	100 kPa for measurement ranges ≥ 2.5 kPa 200 x for measurement ranges < 2.5 kPa
Medium	natural gas
Max. system pressure	100 kPa for all measurement ranges
Sensor response time	25 ms
Time constants	25 ms..60 s (adjustable)
Operating temperature	10..50 °C
Storage temperature	-10..70 °C
Power consumption	approx. 6 VA
Weight	approx. 750 g
Cable glands	2 x M 16
Pressure ports	2 x laboratory nozzle DIN 12898
Protection class	IP 65
Certificates	CE, EN1127-1:2007

Output (linear/ root-extracted) ¹⁾	A
0..10 V ($R_L \geq 2 \text{ k}\Omega$)	1
0..20 mA ($R_L \leq 500 \Omega$)	0
4..20 mA ($R_L \leq 500 \Omega$)	4
± 5 V ($R_L \geq 2 \text{ k}\Omega$)	5

¹⁾ output signals can be configured freely

Measurement range	C
Measurement range e.g. 0..250 Pa, -10..50 mbar, 0..100 mmHg (etc.)	

Display + keyboard	E
none	0
multi-coloured LCD and keyboard	LC



Power supply	B
24 VDC ± 10 %	24 DC

Margin of error	D
± 0.2 % of max. value	2
± 0.5 % of max. value	S

Tubing connections	F
standard for tubing NW 5..8 mm	0
cutting ring coupling 8 mm	S

Order code	A	B	C	D	E	F
P 29						

Can be pre-set on request:
Time constant, relay parameter, analogue output root-extracted / linear, deactivation of the cyclic zeroing

TÜV-tested

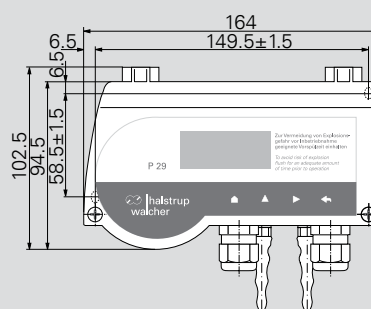
As long as a specified flushing process is observed, special electronic encapsulation safely separates any ignition sources from natural gas.



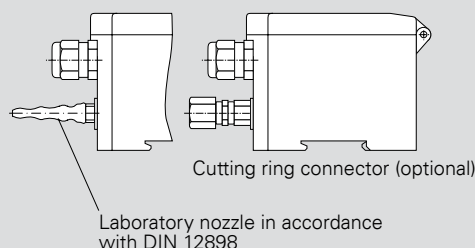
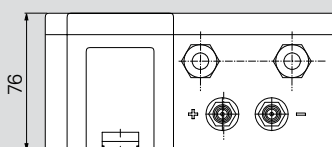
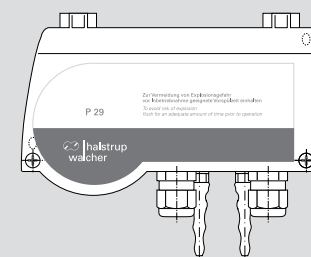
Features

- TÜV-tested differential pressure transmitter for natural gas
- Design changes and technical modifications keep ignition source and gas mixture safely separated (not suitable for Ex-applications)
- Also ± measurement ranges
- Scalable measurement range and display
- For pressure and volume flow measurement
- Zero-point correction prevents zero-point drift
- Built-in valve provides a high level of overload protection
- Also suitable for top-hat rail mounting
- Multilingual menu (English/French/German/Italian)

P 29 with display



P 29 without display



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