

+ Datasheet EE600

Differential Pressure Sensor



EE600

Differential Pressure Sensor

The EE600 is designed for the reliable measurement of differential pressure in HVAC, building automation and filter monitoring. The multi-range device is suitable for air as well as all non-flammable and non-aggressive gases. Optionally, the sensor is available with auto-zero function.

Measurement Performance

The EE600 is available with unidirectional ranges of 1 000 Pa (4 inch WC) and 10 000 Pa (40 inch WC) or with bidirectional ranges of $\pm 1\,000$ (± 4 inch WC) and $\pm 10\,000$ Pa (± 40 inch WC). All versions offer excellent accuracy of $\pm 0.5\%$ full scale. The piezoresistive, non-flow-through pressure sensing element ensures outstanding long-term stability.

Analogue and Digital Outputs

The measured data is available on a combined analogue voltage and current output, on a 2-wire (4 - 20 mA) current output or on the RS485 interface with Modbus RTU protocol.

Functional and Robust

The IP65/NEMA 4X enclosure minimizes installation costs. External mounting holes allow for installation with closed cover, the electronics are thus protected against construction site damage and pollution.

Configurable and Adjustable

A zero point and span adjustment can be easily performed with push buttons on the electronics board.

For analogue versions, DIP switches on the electronics board allow easy field setup. This includes measuring range, output signal, response time, displayed units and backlight.

Using an optional configuration stick and the free PCS10 Product Configuration Software, the EE600 can be set up for volume flow or air velocity measurement, as well as for filter monitoring or level indication. Additionally, the auto-zero interval can be configured.



EE600 with backlit display



EE600 without display

Features

Configurable and Adjustable

- Measuring range
- Output signal
- Response time
- Displayed units and backlight
- Zero point and span adjustment

Multi-range (Analogue Output)

- 0...250/500/750/1000 Pa
- 0...2500/5000/7500/10000 Pa
- $\pm 250/\pm 500/\pm 750/\pm 1000$ Pa
- $\pm 2500/\pm 5000/\pm 7500/\pm 10000$ Pa

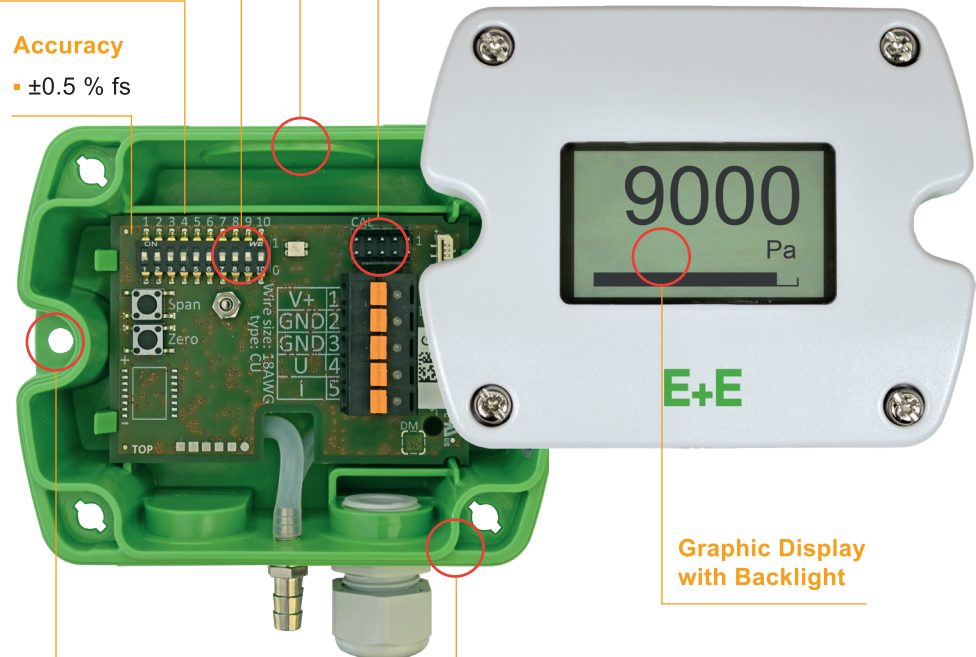
Accuracy

- $\pm 0.5\%$ fs

Knockout for 1/2" Conduit Fitting (US)

Service Interface for Configuration

- Measurands
 - Differential pressure Δp
 - Volume flow V' (k-Factor input)
 - Air velocity v (k-Factor input)
- Application setting
 - Filter monitoring
 - Level indicator
- Auto-zero interval (optional)



Graphic Display with Backlight

Enclosure

- IP65/NEMA 4X protection rating
- Bayonet screws - opened/closed with a 1/4 rotation

External Mounting Holes

- Mounting with closed cover
- Electronics protected against construction site pollution
- Easy and fast mounting

Test Report

According DIN EN 10204-2.2

Features

Accredited Traceable Calibration Certificate



Internationally recognised certificates for the calibration of measuring instruments from accredited laboratories document the traceability of the measurements to the International System of Units (SI). The calibration laboratory at E+E Elektronik offers traceable calibrations.

The E+E calibration laboratory is accredited by Akkreditierung Austria in accordance with DIN EN ISO/IEC 17025 with the identification number 0608. This allows the laboratory to issue ISO 17025 certificates for the measurands humidity, temperature, dew point temperature, air velocity, flow, pressure and CO₂.

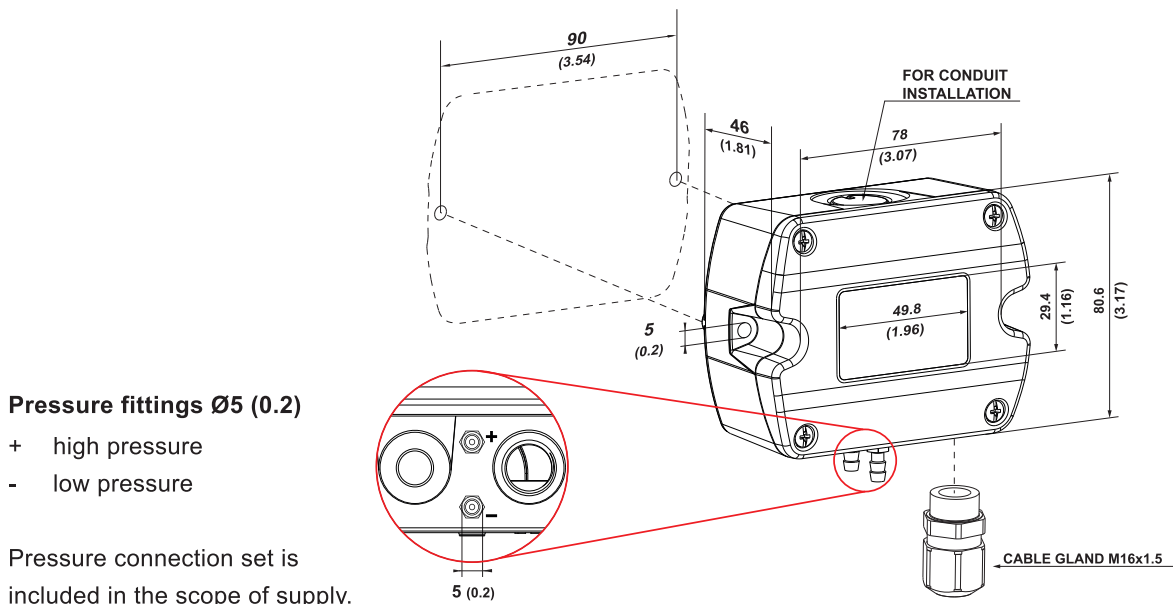
Visit www.eplusecal.com for detailed information on calibration and to enquire a certificate of accredited traceable calibration for the EE600 from the E+E Elektronik calibration laboratory.

ISO 9001 Calibration Certificate

An ISO 9001 calibration certificate documents the comparative measurement of a device against high quality reference equipment (factory level standard). The comparison is performed in accordance with internal procedures that comply with ISO 9001 and provides information on the specimen's measuring accuracy. The reference equipment is traceable to national standards, however, the calibration process is not accredited. Therefore, an ISO 9001 calibration is neither traceable nor internationally comparable.

Dimensions

Values in mm (inch)



Technical Data

Measurands

Differential Pressure (Δp)

Measurement principle		Piezoresistive, no flow-through
Measuring range	Analogue output	$\pm 1\,000\text{ Pa}$ ($\pm 4\text{ inch WC}$) $\pm 10\,000\text{ Pa}$ ($\pm 40\text{ inch WC}$)
	RS485	$0\ldots 1\,000\text{ Pa}$ ($0\ldots 4\text{ inch WC}$) $0\ldots 10\,000\text{ Pa}$ ($0\ldots 40\text{ inch WC}$)
Analogue scaling	Analogue output¹⁾	$\pm 250/\pm 500/\pm 750/\pm 1\,000\text{ Pa}$ field selectable with DIP switches $\pm 2\,500/\pm 5\,000/\pm 7\,500/\pm 10\,000\text{ Pa}$ field selectable with DIP switches
	with PCS10	$0\ldots 250/500/750/1\,000\text{ Pa}$ field selectable with DIP switches $0\ldots 2\,500/5\,000/7\,500/10\,000\text{ Pa}$ field selectable with DIP switches Configurable within max. measuring range
Accuracy @ 20 °C (68 °F), incl. hysteresis, non-linearity and repeatability		$\pm 0.5\text{ \% fs}$ fs = full scale (1 000 Pa or 10 000 Pa)
Temperature dependency, typ.		$< 0.03\text{ \% from fs/K}$
Response time t_{90}	Analogue output¹⁾	50 ms/500 ms/2 s/4 s field selectable with DIP switches
	Digital interface²⁾	Configurable from 0.05 to 30 s with PCS10 Configurable from 0.5 to 30 s with PCS10
Auto-zero interval	Factory setting	24 h
	4 - 20 mA (2-wire) output Voltage and current output/ RS485	Configurable from 90 min to 7 days with PCS10. Can be disabled. Configurable from 10 min to 7 days with PCS10. Can be disabled.
Long-term stability		$< 0.5\text{ \% fs/year}$ fs = full scale (1 000 Pa or 10 000 Pa)
Overload limits	1 000 Pa fs	$\pm 10\,000\text{ Pa}$
	10 000 Pa fs	$\pm 80\,000\text{ Pa}$

- 1) Factory setup A6: measuring range $\pm 100\text{ \% fs}$; response time t_{90} : 50 ms; displayed unit: Pa; other ranges selectable via order code.
Factory setup A7: measuring range $\pm 100\text{ \% fs}$; response time t_{90} : 50 ms; displayed unit: Pa; display backlight: on; other ranges selectable via order code.
- 2) Factory setup RS485: response time t_{90} : 500 ms; displayed unit: Pa; display backlight: on.

Calculated measurands

		Unit
Level Indicator	LI	cm
		inch
Volume flow	V'	m ³ /h
		l/s
		m ³ /s
		ft ³ /min
Air velocity	v	m/s
		ft/min
Filter contamination level	FCL	%

Technical Data

Outputs

Analogue




4 - 20 mA (2-wire) output	$R_L \leq 500 \Omega$	R_L = load resistance
Voltage and current output¹⁾	0 - 5 V or 0 - 10 V and 0 - 20 mA or 4 - 20 mA (3-wire)	-1 mA < I_L < 1 mA $R_L \leq 500 \Omega$ I_L = load current R_L = load resistance

1) Voltage and current output signals available simultaneously at the spring loaded terminals (factory setup: 0 - 10 V / 4 - 20 mA). Settings selectable with DIP switches.

Digital

Digital interface	RS485 (EE600 = 1/2 unit load)
Protocol Factory settings Supported Baud rates Data types for measuring values	Modbus RTU Baud rate see order information, parity even, 1 stop bit, Modbus address 43 9600, 19200 and 38400 FLOAT32 and INT16

General

Power supply class III  USA & Canada: Class 2 supply necessary, max. voltage 30 V DC 4 - 20 mA (2-wire) output Voltage and current output/RS485		15 - 35 V DC 15 - 35 V DC or 24 V AC ±20 %	
Current consumption , typ. @ 0 Pa (0 psi)/24 V DC		Analogue output	Digital interface
	Without display	23 mA	8 mA
	Display with backlight	49 mA	29 mA
	Display without backlight and 4 - 20 mA (2-wire)	According to output current, max. 20 mA	
Electrical connection	Analogue output Digital interface	Spring-loaded terminals, max. 1.5 mm ² (AWG16) Screw terminals, max. 2.5 mm ² (AWG14)	
Cable gland	M16x1.5		
Display	Graphic, with backlight		
Selectable units on display with analogue output via DIP switch analogue output and digital interface via PCS10		Pa, kPa, mbar, kPa Pa, kPa, mbar, kPa, inch WC, m ³ /h, m ³ /s, ft ³ /min, l/s m/s, ft/min, %	
Humidity range		0...95 %RH, non-condensing	
Temperature range	Operation Storage	-20...+60 °C (-4...+140 °F)/-20...+50 °C (-4...+122 °F) with display -40...+70 °C (-40...+158 °F)/-20...+60 °C (-4...+140 °F) with display	
Enclosure	Material Protection rating	Polycarbonate, UL94 V-0 (with display UL94 HB) approved IP65/NEMA 4X	
Electromagnetic compatibility		EN 61326-1 Industrial environment FCC Part15 Class A ICES-003 Class A	
Shock and vibration		Tested according to EN 60068-2-64 and EN 60068-2-27	
Conformity		 	

Technical Data

Configurability

Device	DIP switches	PCS10
Analogue output without auto-zero	✓	✓
Analogue output with auto-zero	✓	✓
Digital interface without auto-zero	✓	✓
Digital interface with auto-zero	✓	✓

Configuration options see above or manual at www.epluse.com/ee600.

Ordering Guide

Feature		Description	Code		
Hardware configuration			EE600-		
	Measuring range ¹⁾	0...1 000 Pa (0...4 inch WC, 0...10 mbar, 0...1 kPa)			HV52
		0...10 000 Pa (0...40 inch WC, 0...100 mbar, 0...10 kPa)			HV53
		±1 000 Pa (±4 inch WC, ±10 mbar, ±1 kPa)	HV54		
		±10 000 Pa (±40 inch WC, ±100 mbar, ±10 kPa)	HV55		
	Output	4 - 20 mA (2-wire)	A6		
		Analogue (voltage and current output)		A7	
		RS485			J3
	Display	Without display	No code		
		Display with backlight		D2	
Display without backlight		D1			
Auto-zero	Without auto-zero	No code			
	Auto-zero	AF8			
Software setup, Analogue Outputs	Output scaling low	-1 000/-10 000	No code		
		Value in Pa ²⁾	SALValue		
	Output scaling high	+1 000/+10 000	No code		
		Value in Pa ²⁾	SAHValue		
	Protocol	Modbus RTU ³⁾			P1
	Baud rate	9600			BD5
		19200			BD6
		38400			BD7
Accredited Traceable Calibration Certificate in accordance with DIN EN ISO/IEC 17025		see www.eplusecal.com			
ISO 9001 Calibration Certificate		see www.epluse.com			

1) Measuring ranges 0...25 %/50 %/75 %/100 % FS, selectable with DIP switches at analogue output or PCS10.

2) Minimum span 100 Pa for HV54 and 1000 Pa for HV55.

3) Factory setting: Even parity, 1 stop bit; Modbus Map and communication setting: See User Manual and Modbus Application Note at www.epluse.com/ee600.

Order Examples

EE600-HV54A7SAL-200SAH700

Feature	Code	Description
Measuring range	HV54	±1 000 Pa (±4 inch WC, ±10 mbar, ±1 kPa)
Output	A7	Analogue (voltage and current output)
Display	No code	Without display
Auto-zero	No code	Without auto-zero
Output scaling low	SAL-200	-200 ¹⁾
Output scaling high	SAH700	+700 ¹⁾

1) Value in Pa

EE600-HV53J3D2AF8P1BD5

Feature	Code	Description
Measuring range	HV53	0...10 000 Pa (0...40 inch WC, 0...100 mbar, 0...10 kPa)
Output	J3	RS485
Display	D2	Display with backlight
Auto-zero	AF8	Auto-zero
Protocol	P1	Modbus RTU
Baud rate	BD5	9 600

Accessories

For further information please refer to the [Accessories](#) datasheet.

Accessories	Code
Pressure connection set, 2 m (6.6 ft) PVC hose with two ABS pressure connection nipples (included in the scope of supply)	HA011304
USB-C configuration stick	HA011070
E+E Product Configuration Software (Free download: www.epluse.com/pcs10)	PCS10

