

Liquid differential pressure sensor

Active sensor (4...20 mA / 0...5 V / 0...10 V) for differential pressure measurement in HVAC systems. The sensor is suitable for water and water-glycol mixtures. IP65 / NEMA 4X rated housing and with LCD display.


Type Overview

Type	Measuring range [bar]	Output signal active pressure	Overpressure	Negative overpressure	Burst pressure
22PDP-185	0...5	4...20 mA, 0...5 V, 0...10 V	10 bar	-1 bar	100 bar
22PDP-186	0...10	4...20 mA, 0...5 V, 0...10 V	20 bar	-1 bar	200 bar
22PDP-189	0...35	4...20 mA, 0...5 V, 0...10 V	70 bar	-1 bar	700 bar

Measuring range: The sensor can measure differential pressures (dp) within this range.

The maximum operating pressure (relative pressure to ambient pressure prel) must be within the measuring range. For further information, please refer to "Product features".

Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage range	AC 21.6...26.4 V / DC 21.6...26.4 V
	Power consumption AC	3.1 VA
	Power consumption DC	1.8 W
	Electrical connection	Pluggable spring loaded terminal block max. 2.5 mm ²
	Cable entry	Cable gland with strain relief ø6...8 mm
Functional data	Medium	Water Water-glycol mixture
	Multirange	4 measuring ranges selectable
	Voltage output	1 x 0...5 V, 0...10 V, min. resistance 10 kΩ
	Current output	1x 4...20 mA, max. resistance 500 Ω
	Output signal active note	0...5/10 V or 4...20 mA output, selectable with switch in unpowered state
	Mechanical connection	pressure connector: G 1/4"
	Display	LCD, 16x38 mm Measured values pressure: bar
	Display type	LCD
	Display size	16x38 mm
Measuring data	Typical response time	<0.5 s
	Measured values	Differential pressure

Technical data

Specification Pressure	Measuring range pressure settings	Type	Range1	Range2	Range3	Range4
			[bar]	[bar]	[bar]	[bar]
		...-185	0...5	0...2.5	0...1	0...0.5
		...-186	0...10	0...5	0...2	0...1
		...-189	0...35	0...17.5	0...7	0...3.5
Factory setting: Range1						
Accuracy		Range1: ±1.0% FS Range2: ±0.5% FS Range3: ±0.4% FS Range4: ±0.4% FS ...@ 22°C [72°F] ±0.03% FS / K for each pressure transmitter FS = full scale (FS always references the maximum sensor measuring range, independent of the selected measuring range)				
Long term stability		±0.25% FS p.a. and per pressure transmitter				
Safety data	Protection class IEC/EN		III, Safety Extra-Low Voltage (SELV)			
	Power source UL		Class 2 Supply			
	Degree of protection IEC/EN		IP65			
	Degree of protection NEMA/UL		NEMA 4X			
	Housing		UL Enclosure Type 4X			
	EU Conformity		CE Marking			
	Certification IEC/EN		IEC/EN 60730-1 and IEC/EN 60730-2-6			
	Quality Standard		ISO 9001			
	UL Approval		cULus acc. to UL60730-1/-2-6, CAN/CSA E60730-1/-2			
	Type of action		Type 1			
	Rated impulse voltage supply		0.8 kV			
	Pollution degree		4			
	Ambient humidity		Max. 95% RH, non-condensing			
	Ambient temperature		0...50°C [32...122°F]			
	Fluid temperature		-40...105°C [-40...220°F]			
	Fluid temperature note		At a fluid temperature of <2°C [<36°F], frost protection must be guaranteed			
	Storage temperature		-40...60°C [-40...140°F]			
Materials	Housing		Cover: PC, transparent Bottom: PC, orange Seal: NBR			
	Cable gland		PA6, black			
	Cable		PVC			
	Fluid wetted parts		Stainless steel 17-4 PH			
Terms	Abbreviations		dp: differential pressure between high and low pressure prel: relative pressure to ambient pressure			

Safety notes



This device has been designed for use in stationary heating, ventilation and air-conditioning systems and must not be used outside the specified field of application. Unauthorised modifications are prohibited. The product must not be used in relation with any equipment that in case of a failure may threaten humans, animals or assets.

Ensure all power is disconnected before installing. Do not connect to live/operating equipment.

Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied with during installation.

The device contains electrical and electronic components and must not be disposed of as household refuse. All locally valid regulations and requirements must be observed.

Product Features

Application

The device is designed with two remote sensors. Each sensor measures the corresponding relative pressure prel on the high- and low-pressure side. The device reads both pressure signals and calculates the differential pressure value. Consequently, both the maximum differential pressure (dp) and the maximum operating pressure (prel) must be within the measuring range.

Differential pressure $\leq$ measuring range (dp)

Operating pressure $\leq$ measuring range (dp)

Measuring range (dp)

The sensor can measure differential pressures (dp) within this range. The maximum operating pressure (prel) must be within the measuring range.

Overpressure (prel)

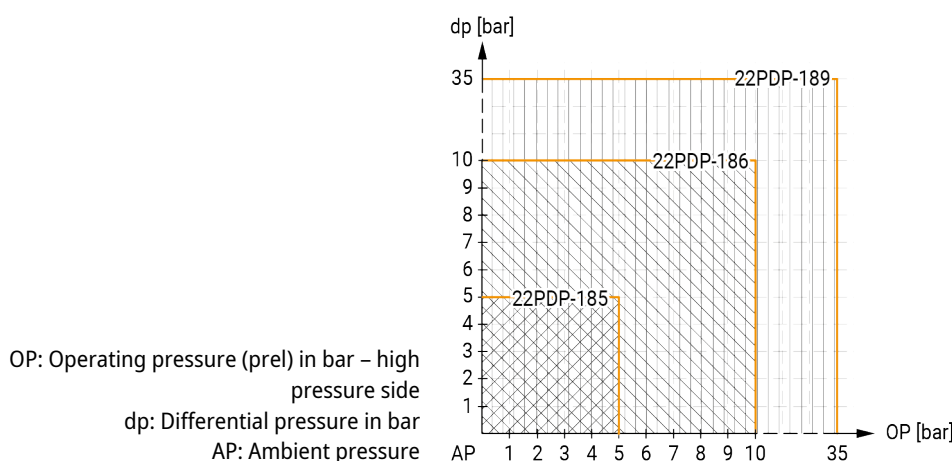
Maximum relative pressure (prel) that the device can withstand without permanent damage. No measurement is possible within the overpressure range.

Negative overpressure (prel)

Maximum relative pressure (prel) below ambient pressure that the device can withstand without permanent damage.

Burst pressure (prel)

Maximum relative pressure (prel) up to which the device housing is tight. If this pressure is exceeded, the sensor will leak or burst.

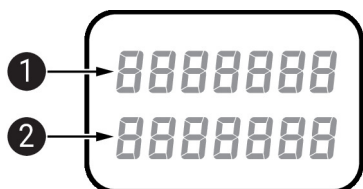


Remarks

- Manual zero-point calibration** In normal operation, zero-point calibration should be executed every 12 months.
- A zero-point calibration can be initiated by pressing and holding the internal ZERO switch for at least 3 seconds. If both pressure ports are close to zero pressure, the device will calibrate with a new zero point. The zero-point calibration can also be initiated by pressing the optionally connected remote switch and holding the ZERO terminal low for 3 seconds.
- Note: A zero-point calibration can only be carried out under ambient pressure (HIGH and LOW connection).

Indicators

- Indicators** The display has 2 lines with 8 characters each.
- The software version, model pressure range and output signal type are displayed during booting.
- The display is menu-guided and used for programming during installation as well as for display of pressure read from sensors.
- The menu allows to set parameters such as output signal, pressure range, pressure scale, pressure port, damping and backlight.
- For a convenient reading of the display, an upright wall mounting of the sensor housing with the display at the top, electrical connections on the right and at the bottom is recommended.


1 Start and programming

Line 1: Parameter
Line 2: Value

2 Operation

Line 1: Differential pressure value
Line 2: Differential pressure unit

Installation notes



Important: Before installing the sensors, ensure the sensor ports are free from any fluids. Failure to remove excessive fluids may damage the sensors.

Avoid pressure peaks (e.g., with fast opened valves).

Parts included

Description	Type
Mounting plate L housing	A-22D-A10
Cable Gland with strain relief $\varnothing 6...8$ mm	
Dowels	
Screws	

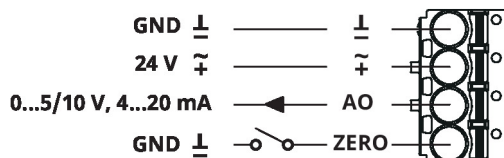
Accessories

Optional accessories	Description	Type
	Reduction adapter, G 1/4" (internal thread) to G 1/2" (external thread)	A-22WP-A02
	Connection adapter flex conduit, M20x1.5, for cable gland 1x 6 mm, Multipack 10 pcs.	A-22G-A01.1

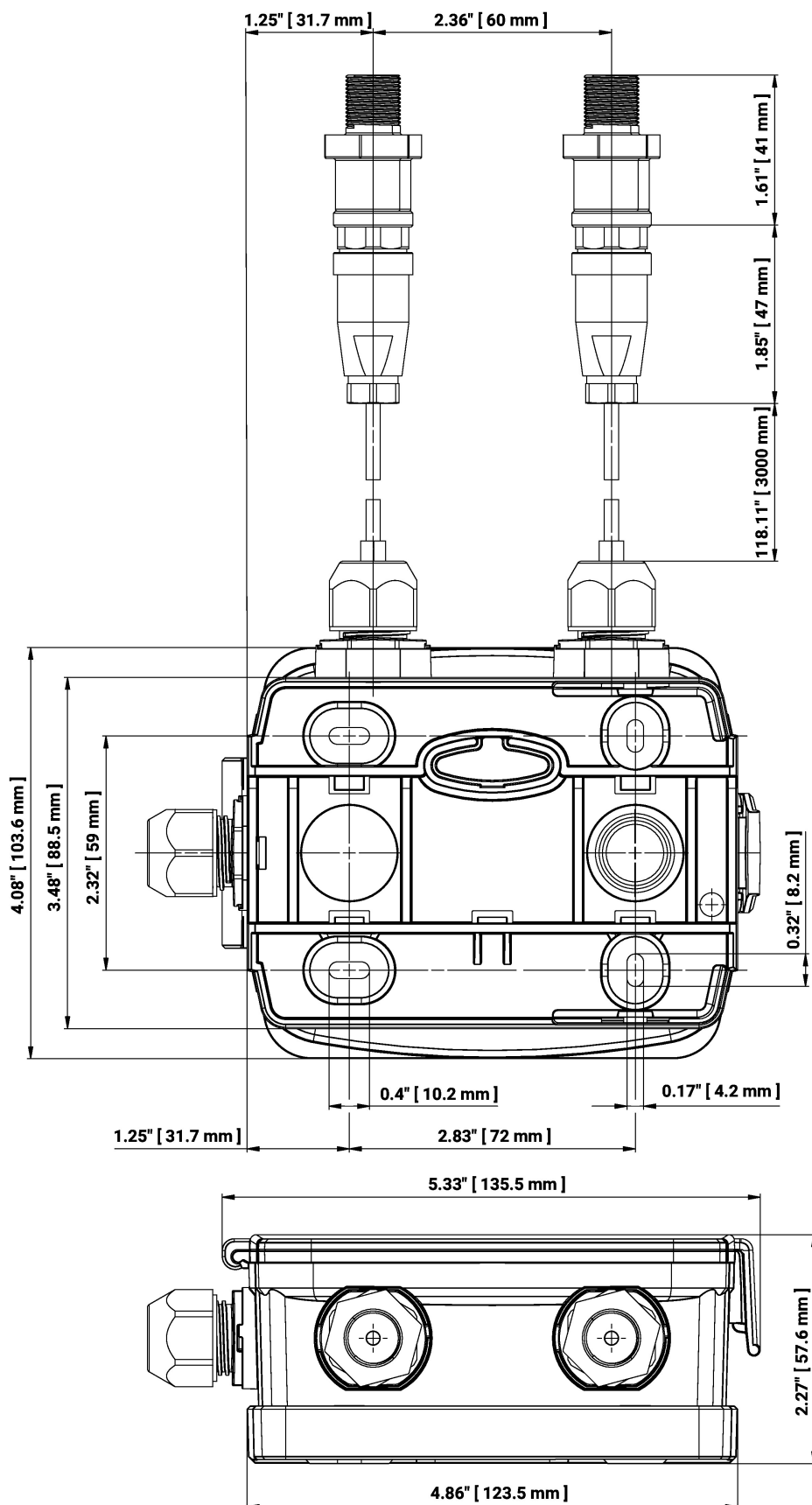
Wiring diagram


The external switch at terminal ZERO is optional. It can be used in case remote zeroing is required. Otherwise, ZERO terminal can be left open. Zeroing can be initialised by pressing the internal ZERO key in this case.

See also details under chapter manual zero-point calibration.



Dimensions



Type

22PDP-185

22PDP-186

22PDP-189

Weight

0.58 kg

0.58 kg

0.58 kg

Further documentation

- Installation instructions
- Operating instructions