Differential pressure sensor Water

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.

5 YEAR WARRANTY

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 pressure (dp) within this range.

The maximum operating pressure (relative pressure to atmosphere 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 mm²
	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 unpowerered state
	Mechanical connection	pressure connector: G 1/4"
	Display	LCD, 16x38 mm Measured values pressure: bar
	Typical response time	<0.5 s
Measuring data	Measured values	Differential pressure
Specification Pressure	Measuring range pressure settings	Type Range1 [bar] Range2 [bar] Range3 [bar] Range4 [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

Technical data

Specification Pressure	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: pressure difference between high and low pressure prel: relative pressure to atmosphere

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 <= measuring range (dp)

Operating pressure <= 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)

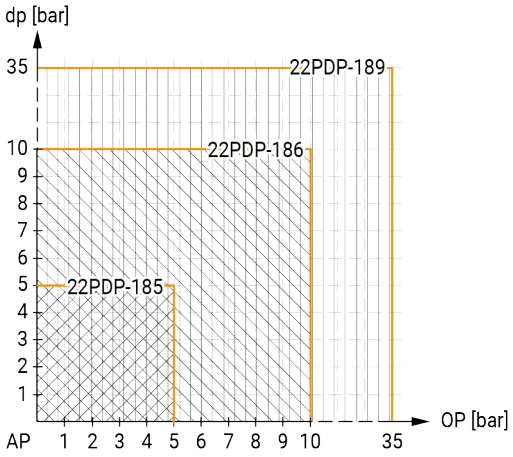
Maximum relative pressure (prel) that the device can withstand without permanent damage. No measurement is possible within the overpressure range.

Negative Overpressure (prel)

Maximum relative pressure (prel) below atmospheric 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.



OP: Operating pressure (prel) in bar – high pressure side
dp: Differential pressure in bar
AP: Atmospheric pressure

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 atmospheric pressure (HIGH and LOW connection).

Indicators

Indicators

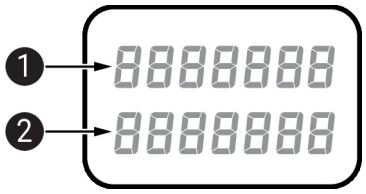
The display has 2 lines with 8 characters each.

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 ø6...8 mm	
Dowels	
Screws	

Accessories

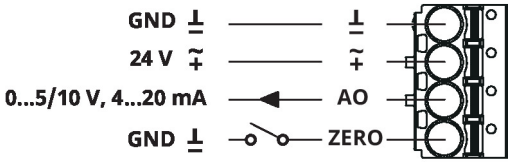
Optional accessories

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

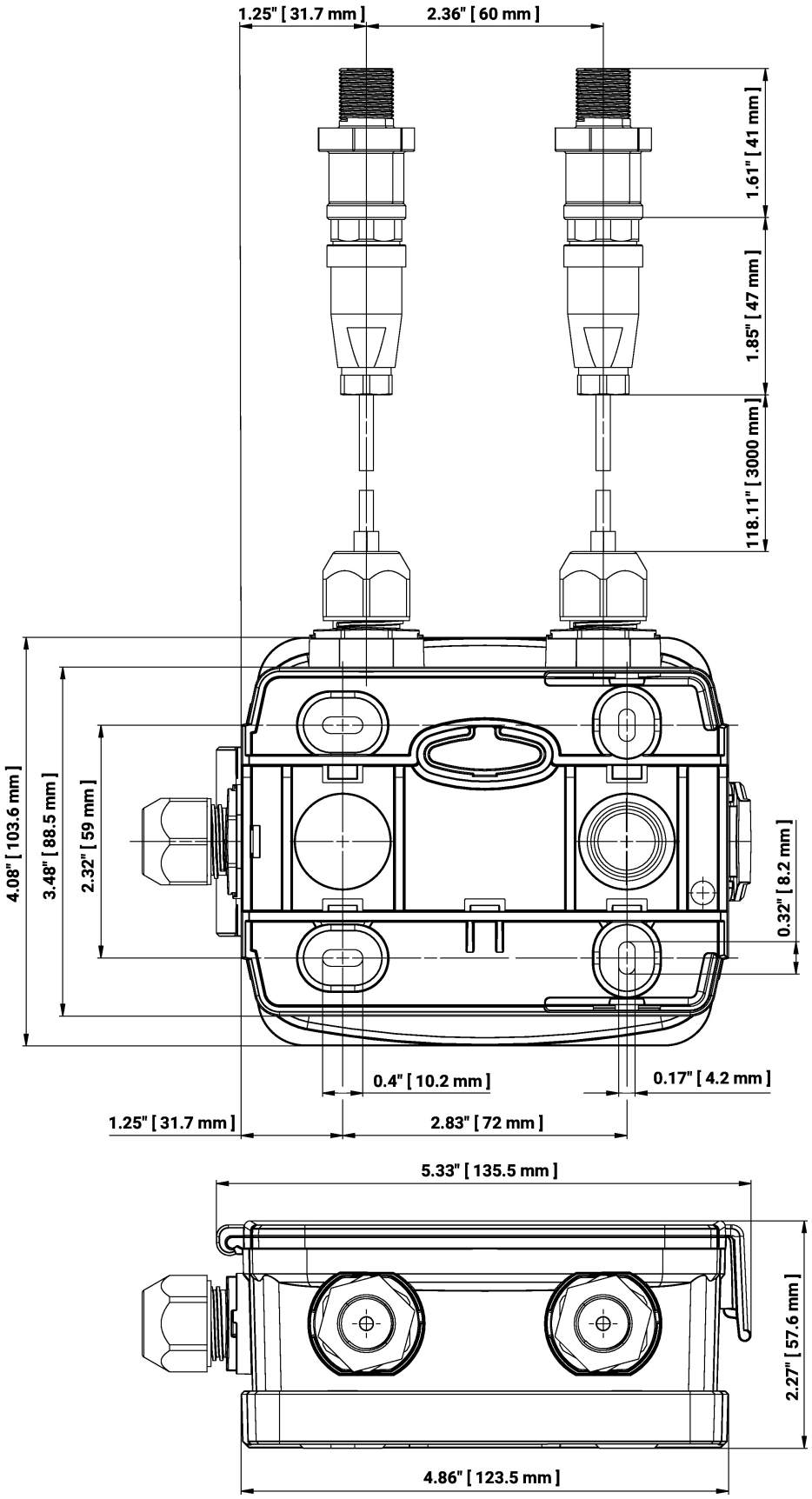
Wiring diagram

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	Weight
22PDP-185	0.58 kg
22PDP-186	0.58 kg
22PDP-189	0.58 kg

Further documentation

- Installation instructions
- Operating instructions