DPSPX-LP

Differential pressure PI controller with display

The DPSPX-LP series are high resolution differential pressure controllers (-125—125 Pa). The integrated PI control with anti-windup function offers the possibility to directly control EC motors / fans. They are equipped with a fully digital state-of-the-art pressure transducer designed for a wide range of applications. Zero point calibration and Modbus registers reset can be executed via a tactile switch. They also feature integrated K-factor and an analogue / modulating output (0—10 VDC / 0—20 mA / 0—100 % PWM). All parameters are accessible via Modbus RTU (3SModbus software or Sensistant).

Key features

- 4-digit 7-segment LED display for indicating differential pressure or volume flow
- Built-in digital high resolution differential pressure sensor
- Air velocity detection (by using an external PSET-PTX-200 Pitot tube connection set)
- Variety of operating ranges
- Selectable response time: 0,1—10 s
- Implemented K-factor
- Differential pressure, volume flow(1) or air velocity(2) readout via Modbus RTU
- Modbus registers reset function (to factory pre-set values)
- Selectable internal voltage source for PWM output: 3,3 / 12 VDC
- Four LED indicators for the status of the controller and the controlled values
- Modbus RTU communication
- Sensor calibration procedure
- Selectable minimum and maximum span
- Selectable analogue / modulating output
- Aluminium pressure connection nozzles

Article codes

Codes	Power supply	Maximum power consumption	Nominal power consumption	Imax	Operating range
DPSPF-LP	18—34 VDC	1,8 W	1,35 W	100 mA	-125—125 Pa
DPSPG-LP	18—34 VDC	1,71 W	1,28 W	95 mA	
	15—24 VAC ±10 %	3,3 W	2,475 W	220 mA	

Technical specifications

Selectable analogue / modulating output	0—10 VDC	min. load 50 kΩ (R_L ≥ 50 kΩ)
	0—20 mA	max. load 500 Ω (R_L ≤ 500 Ω)
	0—100 % PWM	PWM Frequency: 1 kHz,R_L ≥ 50 kΩ
Minimum differential pressure range span		50 Pa
Minimum volume flow range span		10 m³/h
Minimum air velocity range span		1 m/s
Operating modes		Differential pressure
		Volume flow(1)
		Air velocity(2)
Accuracy		±2 % of the operating range
Protection standard		IP65 (according to EN 60529)
Enclosure		ASA, grey (RAL9002)
Ambient conditions	Temperature	-5—65 °C
	Rel. humidity	< 95 % rH (non-condensing)

Area of use

- Building and controlled ventilation
- Differential pressure, volume flow(1) or air velocity (2) measurement in HVAC applications
- Differential pressure / volume flow monitoring in clean rooms
- Clean air and non-aggressive, non-combustible gases

Wiring and connections

Article type	DPSPF-LP	DPSPG-LP	
Vin	18—34 VDC	18—34 VDC	13—26 VAC
	Ground	Common ground*	AC ~*
GND	Ground / AC ~		
A	Modbus RTU (RS485), signal A		
/B	Modbus RTU (RS485), signal /B		
AO1	Analogue / modulating output (0—10 VDC / 0—20 mA / PWM)		
GND	Ground AO1	Common ground*	
Connections	Cable cross section	1,5 mm²	

*__Attention!__ *The -F version of the product is not suited for 3-wire connection. It has separate grounds for power supply and analogue output. Connecting both grounds together might result in incorrect measurements. Minimum 4 wires are required to connect -F type sensors.*

The -G version is intended for 3-wire connection and features a 'common ground'. This means that the ground of the analogue output is internally connected with the ground of the power supply. For this reason, -G and -F types cannot be used together on the same network. Never connect the common ground of -G type articles to other devices powered by a DC voltage. Doing so might cause permanent damage to the connected devices.

Standards

CE

- EMC Directive 2014/30/EC:
  - EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
  - EN 61326-2-3:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-3: Particular requirements. Test configuration, operational conditions and performance criteria for transducers with integrated or remote signal conditioning
- WEEE Directive 2012/19/EC
- RoHs Directive 2011/65/EC

*(1) Only when K-factor of fan / drive is known. If K-factor is unknown, volume flow can be calculated via multiplying the duct cross-sectional area (A) by the air velocity (V) using the formula: Q = A * V*
(2) By using an external PSET-PTX-200 Pitot tube connection set.

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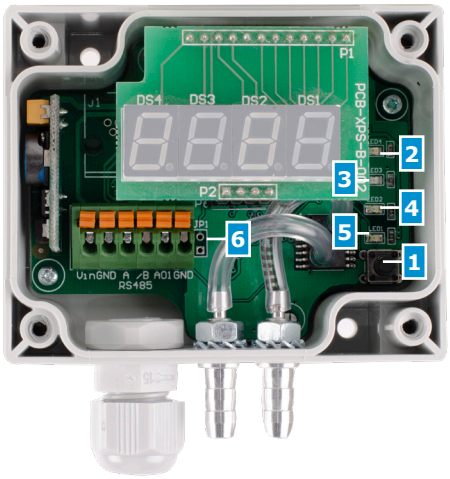
Settings



1 - Sensor calibration and Modbus register reset tact switch (SW1)		Push to start Modbus RTU register factory reset or sensor calibration
2 - Red LED4	Continuous	Measured differential pressure, air volume or air velocity is out of range
	Blinking	Sensor element failure
3 - Yellow LED3	On	Measured differential pressure, air volume or air velocity is in the alert range
4 - Green LED2	On	Measured differential pressure, air volume or air velocity is within range
5 - Green LED1	On	Power OK; active Modbus RTU communication
6 - Internal pull-up resistor jumper JP1	▬▬*	PWM output is connected to internal +3,3 VDC or +12 VDC source**
	□□	PWM has to be connected to external voltage source via external pull-up resistor

* ▬▬ *indicates closed position of the jumper.*
*** The voltage source depends on the value in holding register 54.*

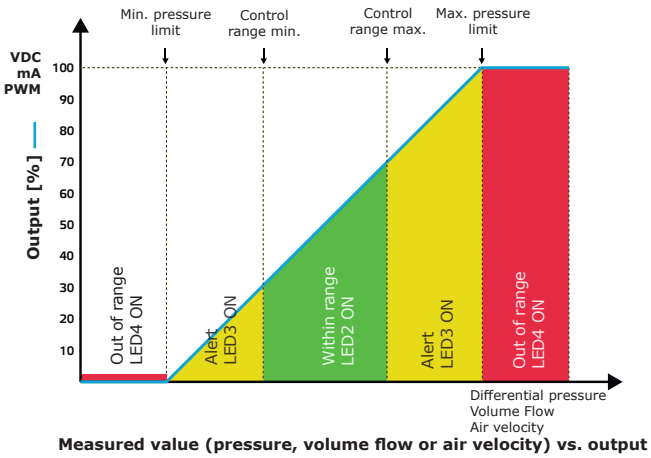
Modbus registers

The Sensistant Modbus configurator allows you to easily monitor and/or configure Modbus parameters.

The parameters of the unit can be monitored / configured through the 3SModbus software platform. You can download it from the following link:
https://www.sentera.eu/en/3SMCenter

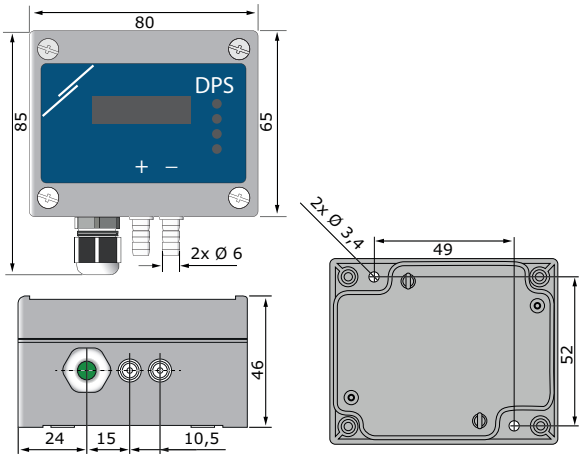
For more information about the Modbus registers, please refer to the product Modbus Register Map.

Operational diagram(s)

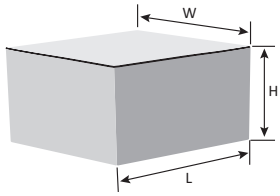


Measured value (pressure, volume flow or air velocity) vs. output

Fixing and dimensions



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DPSPF-LP DPSPG-LP	Unit (1 pc.)	95	85	70	0,13 kg	0,14 kg
	Carton (10 pcs.)	495	185	87	1,30 kg	1,40 kg
	Box (60 pcs.)	585	375	280	7,80 kg	8,40 kg

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Application 1: Measuring differential pressure [Pa] or volume flow [m³/h] using PSET-PVC connection set	**Application 2:** Measuring supplied volume flow [m³/h] or air velocity [m/s] using PSET-PT Pitot tube connection set