



# 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<sup>(1)</sup> or air velocity<sup>(2)</sup> 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 <sub>L</sub> ≥ 50 kΩ)
	0—20 mA	max. load 500 Ω (R <sub>L</sub> ≤ 500 Ω)
	0—100 % PWM	PWM Frequency: 1 kHz, R <sub>L</sub> ≥ 50 kΩ
Minimum differential pressure range span	50 Pa	
Minimum volume flow range span	10 m <sup>3</sup> /h	
Minimum air velocity range span	1 m/s	
Operating modes	Differential pressure	
	Volume flow <sup>(1)</sup>	
	Air velocity <sup>(2)</sup>	
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<sup>(1)</sup> or air velocity<sup>(2)</sup> 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 mm <sup>2</sup>

**\*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

- 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

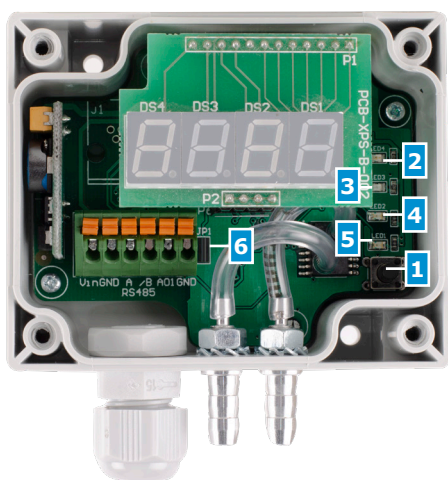


<sup>(1)</sup> Only when K-factor of fan / drive is known. If K-factor is unknown, volume flow can be calculated via multiplying the duct cross-sectional area (A) by the air velocity (V) using the formula: Q = A \* V  
<sup>(2)</sup> By using an external PSET-PTX-200 Pitot tube connection set.



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### Settings

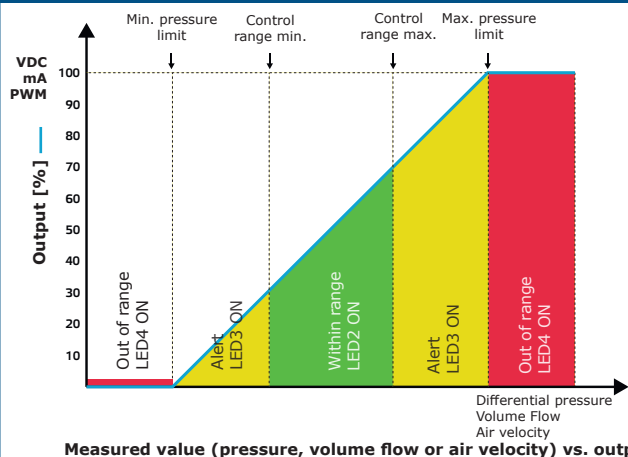


1 - Sensor calibration and Modbus register reset tact switch (SW1)		Push to start Modbus RTU register factory reset or sensor calibration
2 - Red LED4	Continuous	Measured differential pressure, air volume or air velocity is out of range
	Blinking	Sensor element failure
3 - Yellow LED3	On	Measured differential 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

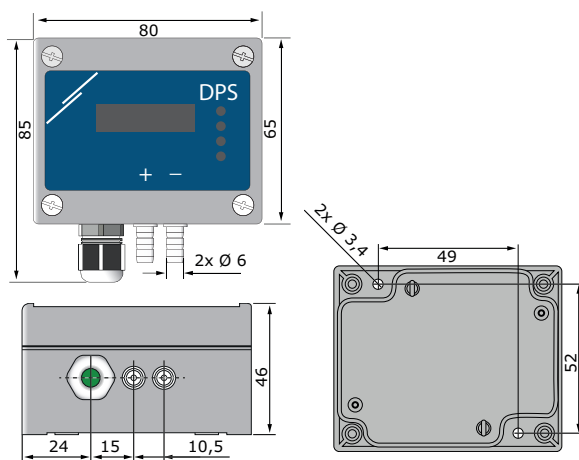
\* indicates closed position of the jumper.

\*\* The voltage source depends on the value in holding register 54.

### Operational diagram(s)



### Fixing and dimensions



### Modbus registers



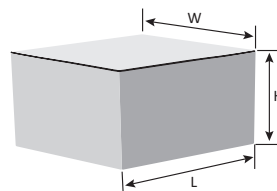
The Sensistant Modbus configurator allows you to easily monitor and/or configure Modbus parameters.

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.

### Packaging



### Global trade item numbers (GTIN)

Packaging	DPSPF-LP	DPSPG-LP
Unit	05401003001684	05401003001738
Carton	05401003300534	05401003300589
Box	05401003500538	05401003500583

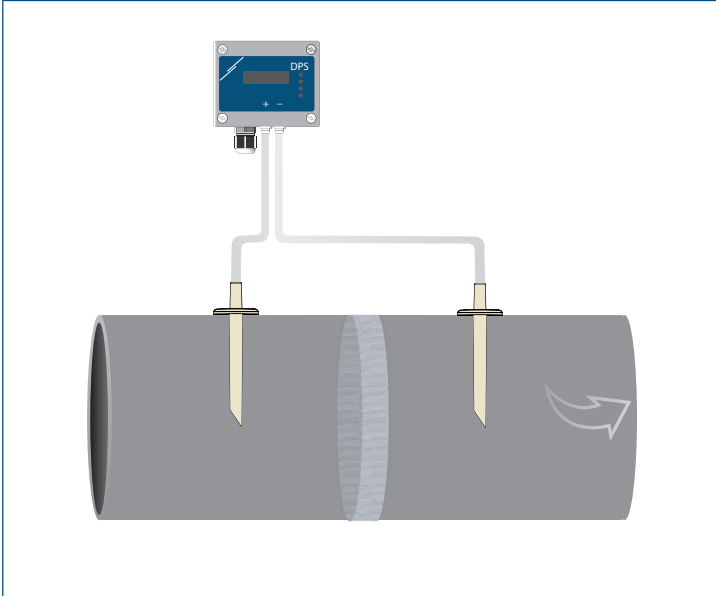
Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DPSPF-LP DPSPG-LP	Unit (1 pc.)	95	85	70	0,13 kg	0,14 kg
	Carton (10 pcs.)	495	185	87	1,30 kg	1,40 kg
	Box (60 pcs.)	585	375	280	7,80 kg	8,40 kg



## DPSPX-LP

Differential pressure PI controller with display

**Application 1:** Measuring differential pressure [Pa] or volume flow [m<sup>3</sup>/h] using PSET-PVC connection set



**Application 2:** Measuring supplied volume flow [m<sup>3</sup>/h] or air velocity [m/s] using PSET-PT Pitot tube connection set

