



# HPSPX-LP

## Differential pressure PI controller

The HPSPX-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 tact 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

- 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, air 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 transmitter 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
HPSPF-LP	18–34 VDC	1,3W	1,26 W	71 mA	-125–125 Pa
HPSPG-LP	18–34 VDC	1,3 W	1,26 W	70 mA	
	15–24 VAC ±10 %	1 W	1 W		

### Technical specifications

Selectable analogue / modulating output	0–10 VDC	$R_L \geq 50 \text{ k}\Omega$
	0–20 mA	$R_L \leq 500 \Omega$
	0–100 % PWM	PWM Frequency: 1 kHz, $R_L \geq 50 \text{ k}\Omega$
Operating modes	Differential pressure	
	Air volume	
	Air velocity	
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

- Differential pressure, air volume flow<sup>(1)</sup> or air velocity<sup>(2)</sup> measurement in HVAC applications
- Overpressurizing applications: clean rooms to avoid particle contamination or staircases for fire safety
- Underpressurizing applications: restaurant kitchens and biohazard laboratories
- Volume flow application: ensuring the minimum legal ventilation rate (m<sup>3</sup>/h) for buildings

### Wiring and connections

Article type	HPSPF-LP	HPSPG-LP	
Vin	18–34 VDC	18–34 VDC	13–26 VAC
GND	Ground	Common 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.

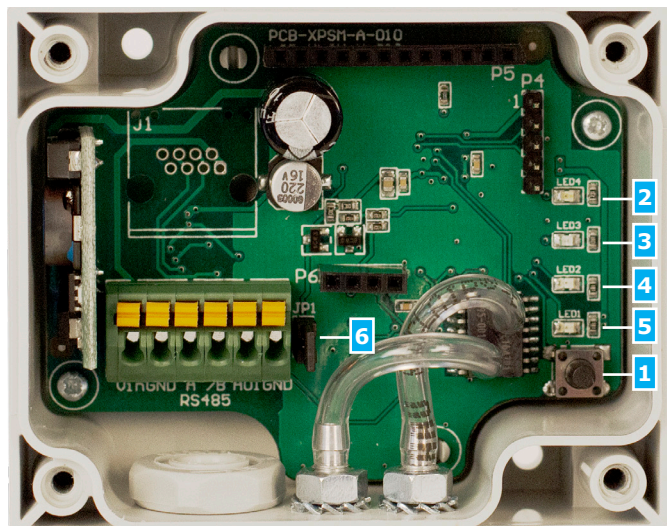
The -G version is intended for 3-wire connection and features a 'common ground'. This means that the ground of the analogue output is internally connected with the ground of the power supply. For this reason, -G and -F types cannot be used together on the same network. Never connect the common ground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

<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> Only when duct cross section is known 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 reset or sensor calibration
2 - Red LED4	Continuous	The differential pressure, air volume or air velocity has exceeded the minimum or maximum alarm threshold
	Blinking	Sensor element failure
3 - Yellow LED3	On	The differential pressure, air volume or air velocity has exceeded the minimum or maximum span threshold
4 - Green LED2	On	The actual differential pressure, air volume or air velocity is stabilized between the minimum span and maximum span
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.

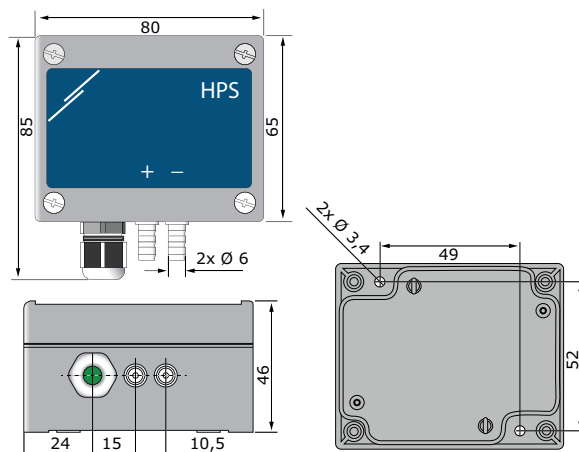
### Standards

- 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

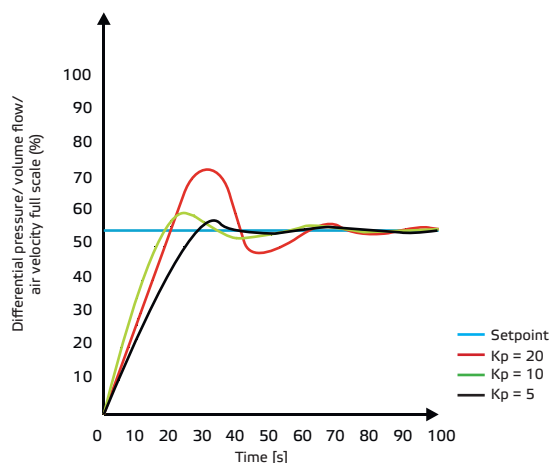
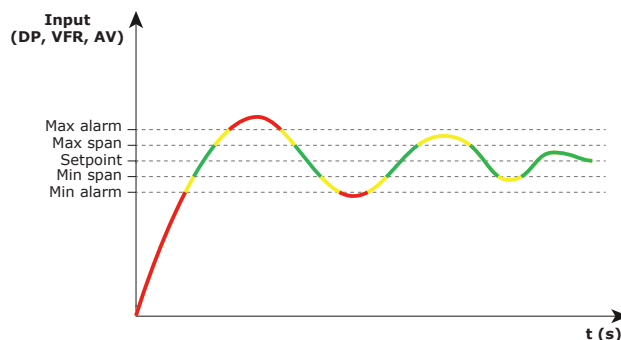


- WEEE Directive 2012/19/EC
- RoHS Directive 2011/65/EC

### Fixing and dimensions



### Operational diagrams

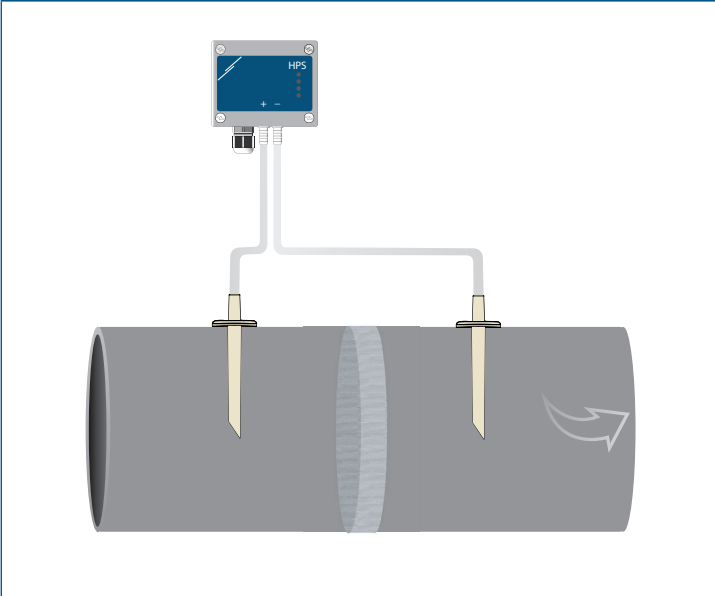




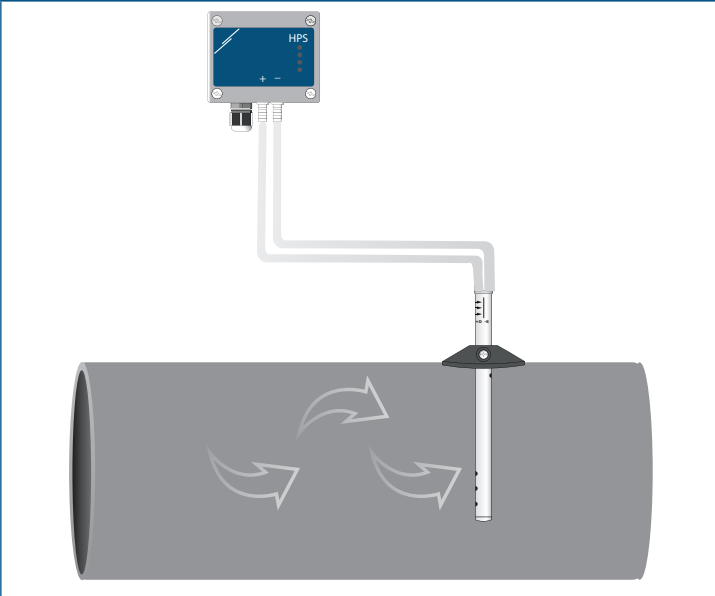
# HPSPX-LP

## Differential pressure PI controller

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



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



### Modbus registers



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

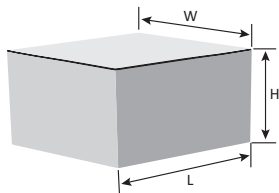
The parameters of the unit can be monitored / configured through the 3SModbus software platform. You can download it from the following link:

<https://www.sentera.eu/en/3SMCenter>



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

### Packaging



Article code	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
HPSPF-LP HPSPG-LP	Unit (1 pc.)	95	85	70	0,12 kg	0,13 kg
	Carton (10 pcs.)	495	185	87	1,20 kg	1,30 kg
	Box (60 pcs.)	590	380	280	7,2 kg	7,8 kg

### Global trade item numbers (GTIN)

Packaging	HPSPF-LP	HPSPG-LP
Unit	05401003007938	05401003007983
Carton	05401003301173	05401003301227
Box	05401003501696	05401003501740