DPSP -2

Differential pressure PI controller

The DPSP -2 series are high resolution differential pressure controllers with analogue / modulating output. 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. All parameters are accessible via Modbus RTU (3SModbus software or Sensistant).

Key features

- 4-digit 7-segment LED display for indicating differential pressure, air volume flow and air velocity
- Built-in digital high resolution differential pressure sensor
- PI control with anti wind-up function and auto-tune function
- Active setpoint selection between differential pressure, air flow volume or air velocity
- Air velocity control (by using an external PSET-PTX-200 Pitot tube connection set)
- Minimum and maximum output value selection
- Integrated K-factor
- Selectable response time: 0,1—10 s
- Differential pressure, air volume[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 LEDs with light guides for controller status indication
- Modbus RTU communication
- Zero-point calibration via tact switch
- Selectable minimum and maximum setpoint span
- Selectable analogue / modulating output
- Aluminium pressure connection nozzles

Article codes

Codes	Power supply	Maximum power consumption	Nominal power consumption	Imax	Operating range
DPSPF-1K0-2	18—34 VDC	1,8 W	1,35 W	100 mA	0—1.000 Pa
DPSPF-2K0-2					0—2.000 Pa
DPSPF-4K0-2					0—4.000 Pa
DPSPF-10K-2					0—10.000 Pa
DPSPG-1K0-2	18—34 VDC	1,71 W	1,28 W	95 mA	0—1.000 Pa
DPSPG-2K0-2					0—2.000 Pa
DPSPG-4K0-2	15—24 VAC ±10 %	3,3 W	2,475 W	220 mA	0—4.000 Pa
DPSPG-10K-2					0—10.000 Pa

Technical specifications

Selectable analogue / modulating output	0—10 VDC	R_L ≥ 50 kΩ
	0—20 mA	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	
	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)

*[1] Only when K-factor of fan / drive is known. If K-factor is unknown, air volume flow can be calculated via multiplying the duct cross-sectional area (A) by the air flow velocity (V) using the formula: Q = A * V*

[2] By using an external PSET-PTX-200 Pitot tube connection set

Area of use

- Differential pressure, air velocity[1] or volume flow [2] 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 (m³/h) for buildings

Wiring and connections

Article type	DPSPF -2	DPSPG -2	
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 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.

SENTERA CONTROLS

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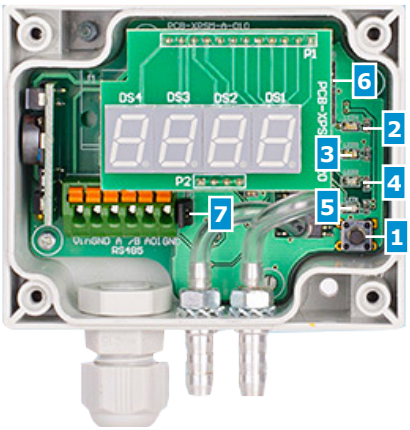
Settings



1 - Sensor calibration and Modbus register reset tact switch (SW1)		Push to start the Modbus RTU register factory reset or the sensor calibration
2 - Red LED4	On	Measured value (pressure, volume or air velocity depending on operating mode selected) is in the alarm range
	Blinking	Sensor element failure or no feedback
3 - Yellow LED3	On	Measured differential pressure, air volume or air velocity (depending on the selected setpoint) is out of the setpoint span
4 - Green LED2	On	Measured differential pressure, air volume or air velocity (depending on the selected setpoint) is within the setpoint span
5 - Green LED1	On	Power OK; active Modbus RTU communication
6 - Modbus holding registers reset jumper (P4)*	1 2 3 4 5	Put a jumper onto pins 1 and 2 for at least 20 s to reset holding registers 1—3
7 - Internal pull-up resistor jumper JP1	**	Connection to internal voltage source

** The reset jumper is not included in the set*
*** indicates closed position of the jumper.*

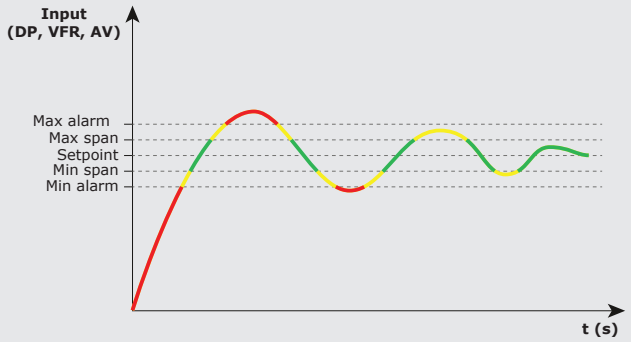
Modbus registers

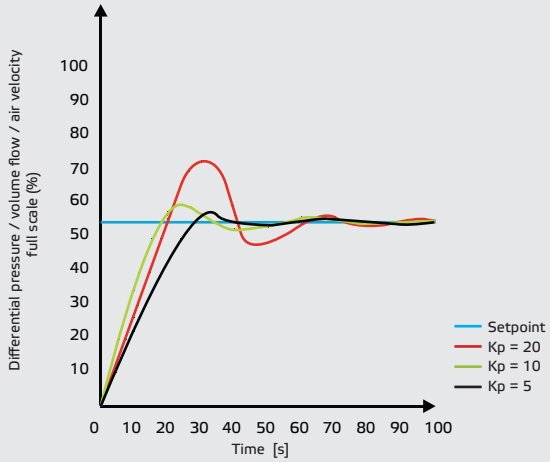
The Sensistant Modbus configurator allows you to easily monitor and/or configure Modbus parameters.

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

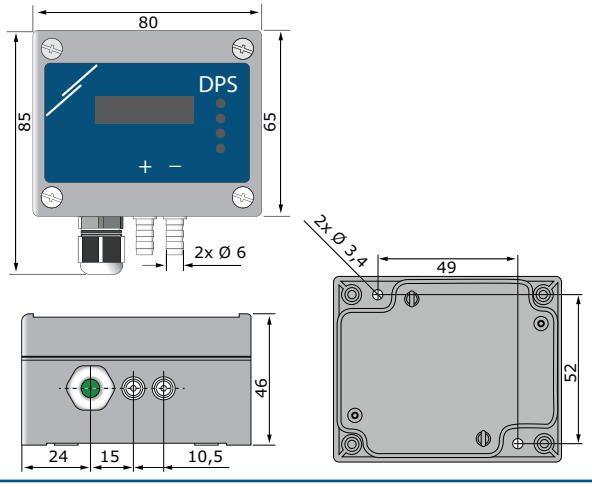
For more information about the Modbus registers, please refer to the product Modbus Register Map.

Operational diagrams





Fixing and dimensions



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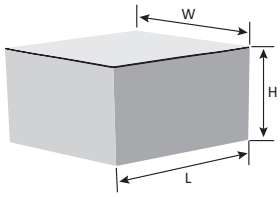
Packaging



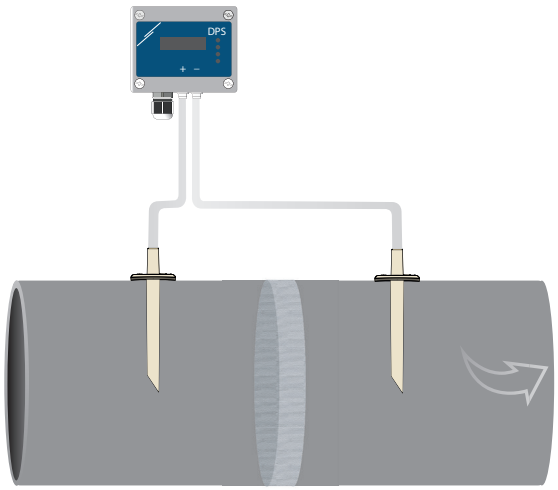
Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DPSP -2	Unit (1 pc.)	95	85	70	0,132 kg	0,142 kg
	Carton (10 pcs.)	495	185	87	1,32 kg	1,55 kg
	Box (60 pcs.)	590	380	280	7,92 kg	9,93 kg

Standards

CE

- EMC directive 2014/30/EU:
  - 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

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