DPSA -2

Differential pressure PI controller for damper actuators

The DPSA -2 series are high resolution differential pressure controllers with display. The integrated PI control with anti-windup function offers the possibility to directly control damper actuators. 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

- 4-digit 7-segment LED display for indicating differential pressure, volume flow and air velocity
- The differential pressure setpoint can be adjusted via Modbus RTU
- Built-in digital high resolution differential pressure sensor
- Air velocity control (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) control
- 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	Imax	Operating range
DPSAF-1K0 -2	18—34 VDC	100 mA	0—1.000 Pa
DPSAF-2K0 -2			0—2.000 Pa
DPSAG-1K0 -2	15—24 VAC / 18—34 VDC	160 mA / 80 mA	0—1.000 Pa
DPSAG-2K0 -2			0—2.000 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
		Volume flow
		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)

Wiring and connections

Article type	DPSAF	DPSAG	
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.

Area of use

- Differential pressure, volume flow(1) or air velocity(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

(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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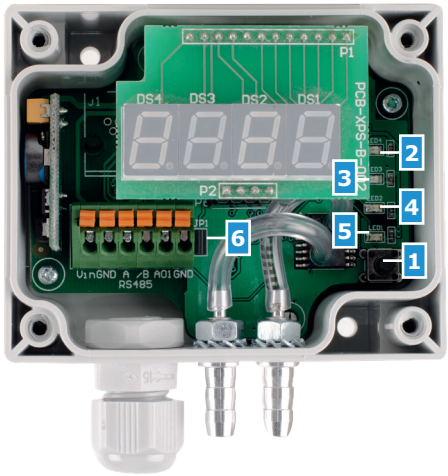
Settings



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, volume flow or air velocity is out of range
	Blinking	Sensor element failure
3 - Yellow LED3	On	Measured differential pressure, volume flow or air velocity is in the alert range
4 - Green LED2	On	Measured differential pressure, volume flow 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.*

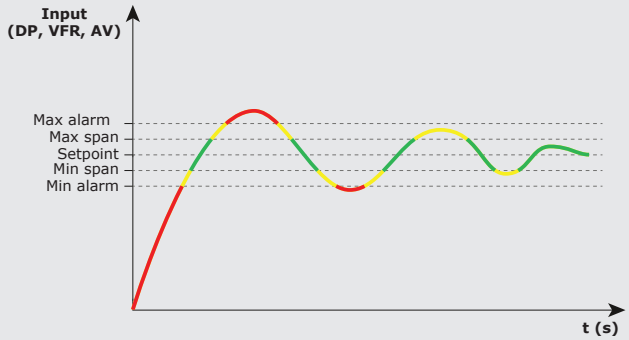
Modbus registers

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

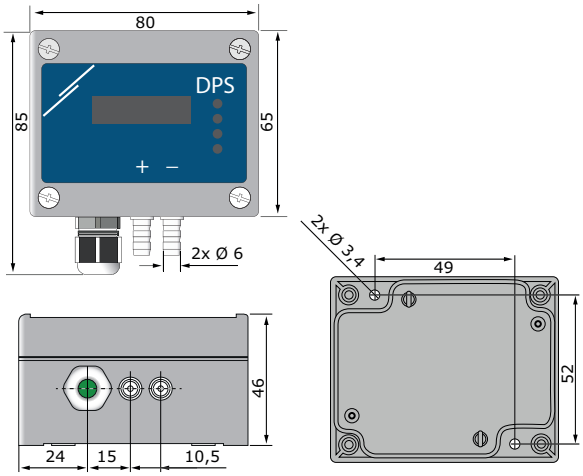
The parameters of the unit can be monitored / configured through the 3SModbus software platform. You can download it from the following link:
https://www.sentera.eu/en/3SMCenter

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

Operational diagram



Fixing and dimensions



Standards

- Low Voltage Directive 2014/35/EC
  - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
  - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
- EMC Directive 2014/30/EC
  - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
  - EN 61000-6-1:2007 Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light industrial environments
  - EN 61000-6-3:2007 Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments. Amendments A1:2011 and AC:2012 to EN 61000-6-3
  - 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
- WEEE Directive 2012/19/EC
- RoHs Directive 2011/65/EC

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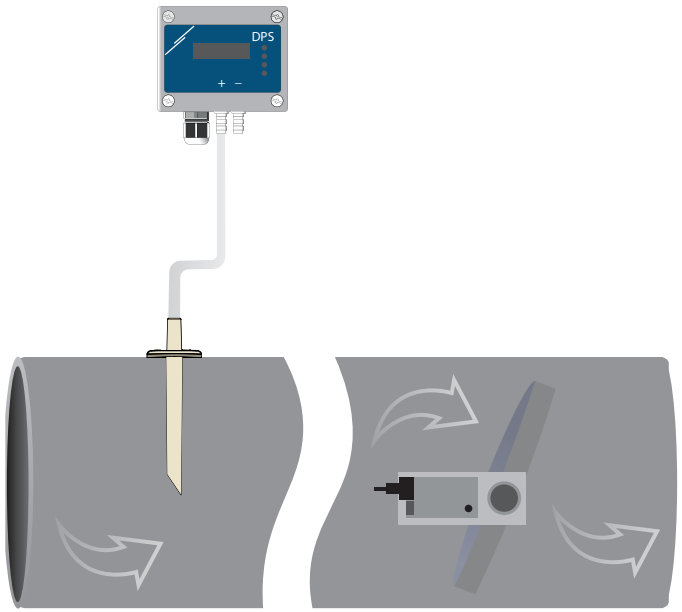
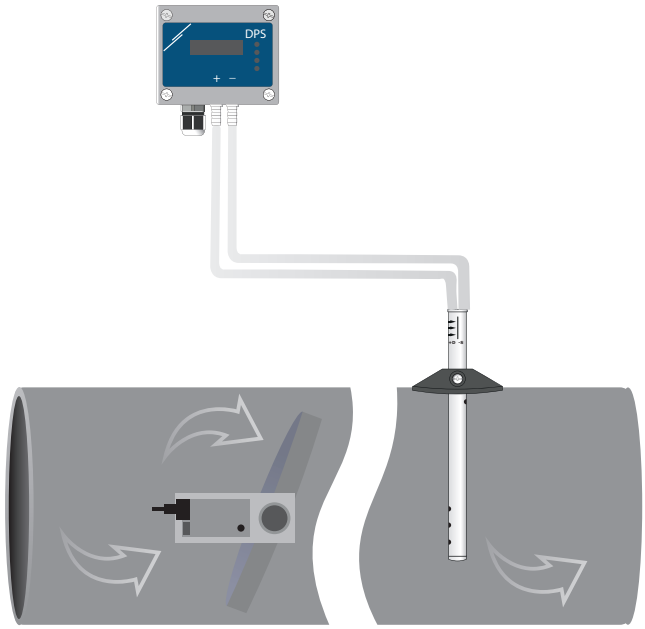
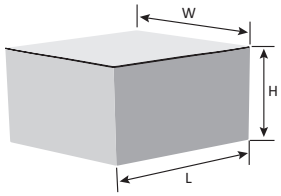
Application 1: Controlling volume flow [m³/h] using PSET-PVC



Application 2: Controlling volume flow [m³/h] or airflow velocity [m/s] using PSET-PT



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DPSA -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

Global trade item numbers (GTIN)

Packaging	DPSAF-1K0 -2	DPSAF-2K0 -2	DPSAG-1K0 -2	DPSAG-2K0 -2
Unit	05401003017579	05401003017586	05401003017593	05401003017609
Carton	05401003302286	05401003302293	05401003302309	05401003302316
Box	05401003503386	05401003503393	05401003503409	05401003503416