SDA-P, Programmable differential pressure transmitter

Features

- Pressure measurement from 300 Pa up to 5 kPa (1.2 to 20 in WC)
- Programmable pressure display range
- Minimum and maximum pressure memory
- 0/2…10 V or 0/4…20 mA measuring signals, selectable with jumpers
- Signal range programmable
- Selectable averaging signal

Applications

- Pressure measurement in the field of heating, ventilation and air conditioning
- Measuring of air flow velocity
- Measuring and control of positive or negative pressure for example for clean rooms
- Measure exactly the range you need
- Recording of minimum and maximum values for critical environments
- Supervision of critical pressures

Functions

The transmitter measures the pressure by the use of a diaphragm that transfers the force onto a ceramic fulcrum lever. The signal is temperature compensated and calibrated. The microprocessor samples the pressure once per second. It calculates an averaging signal over a preset number of seconds and generates an output signal based on minimum and maximum pressure values.

Minimum and maximum values

Using the programming tool, the user has the option to read out and reset minimum and maximum values. The minimum and maximum values may be sent to the output using OP00. This way the sensor may be used to supervise the temperature for critical environments. The minimum and maximum values are saved into the EEPROM every minute. They will still be available after a power failure.

Square root function

The input signal is multiplied with a square root function. The signal curve will thus change to the typical square root shape. This is useful to directly measure and control air flows. As air flow is proportional to the square root of differential pressure.

Signal fine tuning

The pressure-signal may be fine-tuned to fit your system. Define your signal through a minimum and maximum pressure limit. The output will then only react if the pressure is above the lower limit. The output signal will be spanned to the upper limit. The full output signal resolution may this way be used even only a fraction of the pressure sensor signal range is used. A 0…300 Pa transmitter may thus be converted into a 0…100 Pa transmitter. (Note: the sensing resolution will thus not be improved, only the output signal resolution).

Ordering

Item Name	Description/Option
SDA-Px	Standard: 0…10 VDC output signal
Pressure Ranges:	
SDA-P1	0…300 Pa (1.2 in WC)
SDA-P2	0…500 Pa (2 in WC)
SDA-P3	0…1 kPa (4 in WC)
SDA-P4	0…3 kPa (12 in WC)
SDA-P5	0…5 kPa (20 in WC)

Options and accessories

Use with OPA-S, OPU-S remote terminals and displays and OPH-S handheld operation terminals

Analog output configuration

The analog output may be configured with a jumper for 0…10 VDC or 0…20 mA control signals. The jumper is located besides the terminal connector. See table jumper placement. The factory setting is to 0…10 VDC.

Signal Type	Jumper selection
DC 0…10 V	(1-2)
DC 0…20 mA	(2-3)

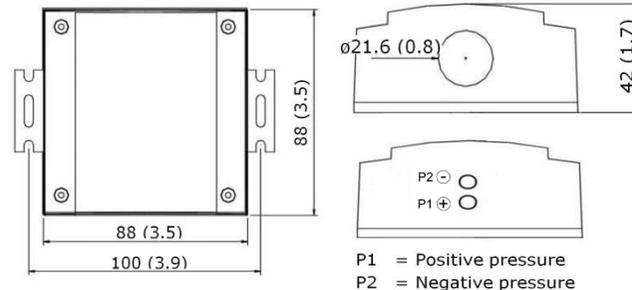The signal range is specified in software by setting a minimum and a maximum limit. Default is 0…10 V, 0…20 mA.

Installation and safety advice

Caution! This device is intended to be used for comfort applications. Where a device failure endangers human life and/or property, it is the responsibility of the owner, designer and installer to add additional safety devices to prevent or detect a system failure caused by such a device failure. Vector Controls or its affiliates cannot be held liable for any damage caused by such a failure. Failure to follow specifications and local regulations may endanger life, cause equipment damage and void warranty.
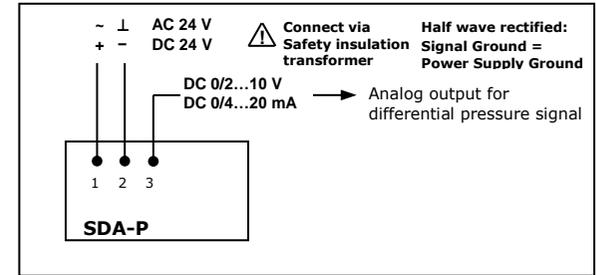
Technical specification

Power supply	Operating voltage	24 VAC 50/60 Hz ± 10%, 24 VDC ± 10%				
	Power consumption	Max 1 W, 2 VA				
	Terminal connectors	For wire 0.34…2.5 mm^2 (AWG 22…13)				
Probe	Product type	SDA-P1	SDA-P2	SDA-P3	SDA-P4	SDA-P5
	Pressure range	300 Pa 1.2" WC	500 Pa 2" WC	1 kPa 4" WC	3 kPa 12" WC	5 kPa 20" WC
	Linearity	± 0.5%	± 0.5%	± 0.3%	± 0.3%	± 0.3%
	Hysteresis	0.5%	0.4%	0.3%	0.2%	0.2%
	Stability over 1 year	0.5%	0.5%	0.5%	0.5%	0.5%
	Temperature coefficient sensitivity and zero point	± 0.04%/°C				
	Tolerable overload	10 kPa (40 in WC)				
	Rupture pressure	15 kPa @ 70 °C (60 in WC @ 158 °F) 20 kPa @ 25 °C (80 in WC @ 77 °F)				
	Sensing probe	Diaphragm: Silicone polymer (LSR), Ceramic Fulcrum Lever				
	Pressure connection	Pipe ∅ 6.2mm, P1 = Positive Pressure, P2 = Negative Pressure				
Signal Outputs	Analog outputs Output signal Resolution Maximum load	DC 0/2…10 V or 0/4…20 mA 10 Bit, 9.7 mV, 0.019.5 mA 20 mA, 500 Ω				
Environment	Operation Climatic conditions Temperature Humidity	To EN 60721-3-3 class 3K5 0…70 °C (32…158 °F) < 95% RH, non-condensing				
	Transport & storage Climatic conditions Temperature Humidity Mechanical conditions	To EN 60721-3-2 and EN 60721-3-1 class 3K3 and class 1K3 -30…80 °C (-22…176 °F) < 95% RH, non-condensing class 2M2				
Standards	CE conformity EMC Directive Low voltage directive	2004/108/EC 2006/95/EC				
	Product standards Automatic electrical controls for household and similar use	EN 60730-1				
	Special requirement on temperature dependent controls	EN 60730-2-9				
	Electromagnetic compatibility for domestic and industrial sector	Emissions: EN 60730-1 Immunity: EN 60730-1				
	Degree of protection	IP30 to EN 60529				
	Safety class	III				
General	Dimensions (H x W x D)	42 x 112 x 88 mm (1.7 x 4.4 x 3.5 in)				
	Housing Material	Fire proof ABS plastic (UL 94 V-0)				
	Weight (including package)	249 g (8.8 oz)				

Dimensions [mm]

P1 = Positive pressure
P2 = Negative pressure

Wiring diagram

~ ⊥	AC 24 V	
+ –	DC 24 V	

Connect via Safety insulation transformer

Half wave rectified: Signal Ground = Power Supply Ground

DC 0/2…10 V
DC 0/4…20 mA
→ Analog output for differential pressure signal

SDA-P

Terminal connections and jumper settings

JP1: Signal type AO1
- 3 / 2-3 : 0…20 mA
- 1 / 1-2 : 0…10 VDC

JP2: Signal range AO1
- 3 / 2-3 : 2…10 VDC / 4…20 mA
- 1 / 1-2 : 0…10 VDC / 0…20 mA
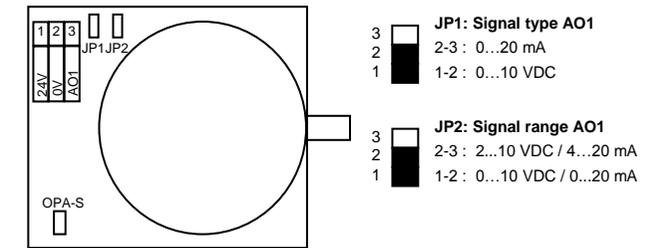
Configuration parameters

By the use of parameters the transmitter can be adapted to fit perfect into the application. The parameters are set with the operation terminal OPA-S. The OPA-S may be used as remote indicator.

Pressure input configuration

Parameter	Description	Range	Standard
IP 00	Show Percent	ON, OFF	ON
IP 01	Samples taken for averaging control signal	1…255	1
IP 02	Calibration	-10…10%	0
IP 03	Minimum pressure range in % full scale (Pressure when output is at its minimum.	0…IP04	0%
IP 04	Maximum pressure range in % full scale (Pressure when output is at its maximum.	IP03…100%	100%
IP 05	Square root measurement function OFF = Linear measurement ON = the input signal is processed with a square root function.	ON, OFF	OFF

Analog output configuration

Parameter	Description	Range	Standard
OP 00	AO1: Configuration output Signal: 0 = Feedback pressure input 1 = Feedback pressure minimum value 2 = Feedback pressure maximum value	0…2	0
OP 01	AO1: Minimum limitation of output signal	0…Max %	0%
OP 02	AO1: Maximum limitation of output signal	Min…100%	100%