SDE-P
Programmable differential pressure transmitter

Features

- Pressure measurement from
  ± 25 Pa up to ± 2.5 kPa (± 0.1 to ± 10 inH$_2$O)
- Programmable pressure output signal range
- Selectable square root function
- Set display range and value. This may be used to visualize air flow or air volume.
- Minimum and maximum pressure memory
- 0…10 V / 4…20 mA measuring signal (range programmable)
- Selectable averaging signal
- Compact housing, easy installation

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

Depending on the type of the device, the transmitter measures the pressure either by the use of a ceramic or a micro thermal flow sensor. 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. The picture on the right shows the shape of the square root function.
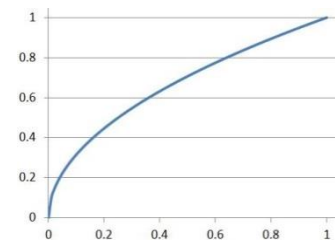
Signal fine tuning

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

Name	Item code	Description/Option
SDE-P1	40-300105	Pressure range ± 25 Pa (± 0.1 in H$_2$O)
SDE-P2	40-300158	Pressure range ± 100 Pa (± 0.4 in H$_2$O)
SDE-P3	40-300106	Pressure range ± 500 Pa (± 2 in H$_2$O)
SDE-P4	40-300107	Pressure range ± 2.5 kPa (± 10 in H$_2$O)

Accessories

|		
OPA-S	40-500006	External display module square form factor
OPU-S	40-500030	External display module rectangular form factor
AMP-1	40-510087	Differential pressure probes with 0.5m tube Ø 6 mm

Technical Specifications

Important notice and safety advice

This device is for use as a pressure transmitter. It is not a safety device. Where a device failure could endanger human life and property, it is the responsibility of the client, installer and system designer to add additional safety devices to prevent such a device failure. Ignoring specifications and local regulations may cause equipment damage and endangers life and property. Tampering with the device and misapplication will void warranty.

| 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)			
Sensing probe	Product type	SDE-P1	SDE-P2	SDE-P3	SDE-P4
	Pressure range	± 25 Pa ± 0.1 in H$_2$O	± 100 Pa ± 0.4 in H$_2$O	± 500 Pa ± 2 in H$_2$O	± 2.5 kPa ± 10 in H$_2$O
	Offset	0.4% FSS	0.2% FSS	0.2% FSS	0.2% FSS
	Accuracy (5 °C to 55 °C)	2.5%	2.5%	2.5%	1% FSS
	Accuracy (0 °C to 70 °C)	3.5%	3.5%	3.5%	2% FSS
	Stability over 1 year	0.1 Pa	0.1% FSS	0.1% FSS	0.1% FSS
	Pressure sensing element	Thermal micro flow			Ceramic
	Tolerable overload	200 kPa (30 PSI)			69 kPa (10 PSI)
	Burst pressure	500 kPa (75 PSI)			200 kPa (30 PSI)
Signal outputs	Analog outputs Output signal Resolution Maximum load	DC 0/2…10 V / 0/4…20 mA 10 Bit, 9.7 mV Voltage signal: ≥1 kΩ Current signal: ≤ 250 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 RoHS directive EMC directive Low voltage directive	2011/65/EU 2014/30/EU 2014/35/EU			
	Degree of protection	IP30 to EN 60529			
	Safety class	III to EN 60536			
General	Material	Polycarbonate PC (UL94 class V-0)			
	Colour	RAL 9016 (Traffic white)			
	Dimensions (H x W x D):	104 x 60 x 23 mm (4.1" x 2.4" x 0.9")			
	Weight (including package)	75 g (2.7 oz.)			

Dimensions mm (inch)
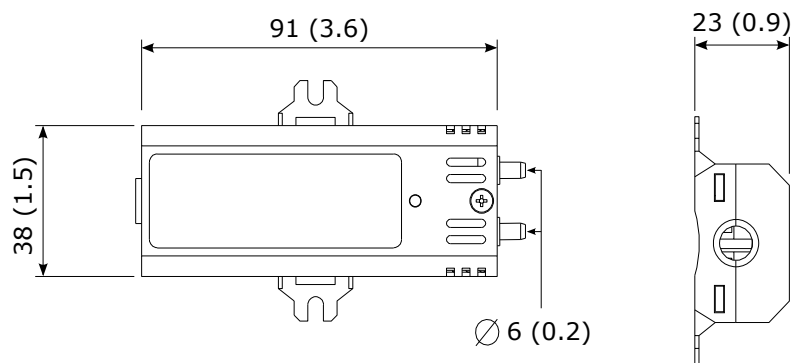
Installation

See installation sheet no. 70-000549 (www.vectorcontrols.com).

Wiring diagram
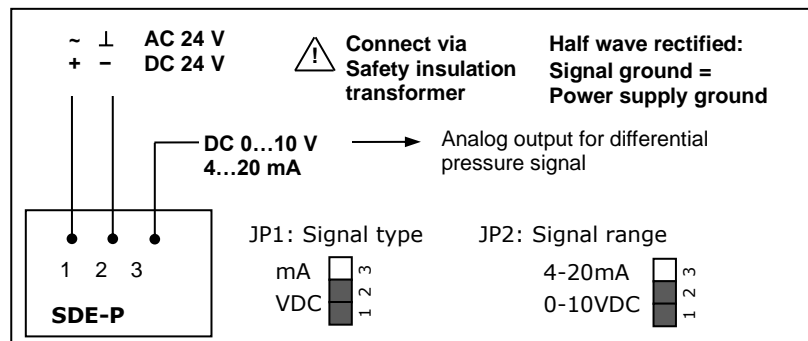
Signal range selection:
Both JP1 and JP2 must be placed for current or voltage signals.
For different ranges than 4-20mA or 0-10VDC, adjust OP01 and OP02.

Example:
For a 2-10VDC signal place JP1 to VDC, JP2 to 0-10VDC and set OP01 to 20%.

Configuration parameters

The transmitter can be adapted to fit perfect into the application. Its parameters are set with the operation terminal OPA-S or OPU-S. These devices may be used as remote indicator. In order to use all the functions outlined below and have a correct display, use only OPA-S or OPU-S devices with firmware version V1.5 or later.

Pressure input configuration

Parameter	Description	Range	Standard
IP 00	Display of pressure signal: OFF = no unit, range is defined with IP06 and IP07, ON = range is fixed to -100 to 100%	ON/OFF	ON (%)
IP 01	Samples taken for averaging control signal. The SDE-P is a fast sensor. It measures every 0.1 seconds and applies a low pass filter that is controlled through this parameter. A setting of 20 equals an averaging time of about 3 seconds.	1…255	20
IP 02	Calibration	-10…10%	0
IP 03	Minimum pressure range. Pressure when output is at its minimum If used with OPA-S V1.5 or later: -100%...100% If used with earlier versions of OPA-S, the value is shown in percent of full measuring scale: 0 = - 100%, 100 = 0%, 200 = + 100%	-100…100%	W00: -100% W01: 0% W02: -100%
IP 04	Maximum pressure range. Pressure when output is at its maximum. If used with OPA-S V1.5 or later: -100%...100% If used with earlier versions of OPA-S, the value is shown in percent of full measuring scale: 0 = - 100%, 100 = 0%, 200 = + 100%	-100…100%	W00: 100% W01: 100% W02: 0%
IP 05	Square root measurement functions OFF = linear measurement ON = the input signal is processed with a square root function	ON/OFF	OFF
IP 06*	Only has an impact on OPA-S V1.5 or later: Display value range. Converts the display range when IP00 is OFF. Value shown on the display unit when output is 100%. Can be used to visualize air pressure in Pa or inch H_2O, air flow or air volume based on differential pressure.	0…255	100
IP 07*	Only has an impact on OPA-S V1.5 or later: Display value scale. 0 = x 0.01 (only for OPU-S) 1 = x 0.1 (only for OPU-S) 2 = x 1 3 = x 10 4 = x 100	0…4	2

* See chapter "Display value as pressure (Pa, inches H_2O) instead of percentage value (%)"

Analog output configuration

Parameter	Description	Range	Standard
OP 00	Configuration output signal: 0 = Feedback pressure input 1 = Feedback pressure minimum value 2 = Feedback pressure maximum value	0…2	0
OP 01	Minimum limitation of output signal. Keep at 0% for selection with JP2	0…Max. %	0%
OP 02	Maximum limitation of output signal Keep at 100% for selection with JP2	Min.…100%	100%

Display value as pressure (Pa, inches H²O) instead of percentage value (%)

When **IP 00** = **OFF**, the following parameter combinations can be used to convert from percentage display to pressure display in Pa or inches H2O. These parameters do not affect the analog output value.

Parameter	SCC-P2		SCC-P3		SCC-P4	
	-100 … 100 Pa	-0.40 … 0.40 inch H²O	-500 … 500 Pa	-2.00 … 2.00 inch H²O	-2500 … 2500 Pa	-10.0 … 10.0 inch H²O
IP 00	OFF	OFF	OFF	OFF	OFF	OFF
IP 06	100	40	50	200	250	100
IP 07	2	0	3	0	3	1

Calculation of displayed pressure value: $Value\ [\%] * IP06 * IP07$

Pa to inch H²O conversion: $\frac{xxx\ Pa}{250} = xxx\ in\ H2O$

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