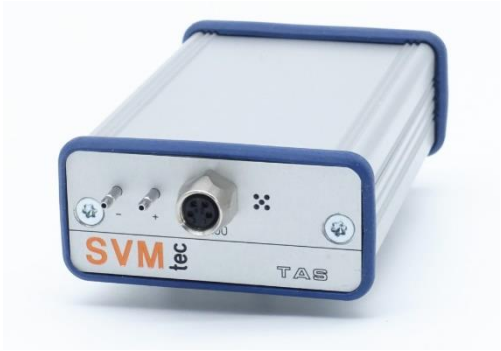
True Air Speed

Airspeed measurement for aerodynamic probes (e.g. Prandtl probes)

- Wide measuring range (1-250m/s)
- Pressure measurement ranges selectable from 250Pa to 15kPa
- Barometric pressure sensor
- PT100 temperature sensor
- Humidity sensor
- USB or CAN (optional)
- Sampling rate per channel up to max. 100Hz
- Software and libraries for LabVIEW and DBC files are included



General Description

The measuring instrument is suitable for determining the flow velocities of air flows in conjunction with a pressure probe (e.g. Prandtl probes) or a restriction flow meter. The following quantities can be measured:

- Differential pressure = Pitot or differential pressure of the probe
- Differential pressure of the static pressure of the probe versus ambient pressure
- Ambient pressure (barometric air pressure)
- Temperature
- Relative humidity

These variables and the flow velocity calculated from them are output via the interface.

Two pressure sensors with different measuring ranges are installed to measure the differential pressure. Depending on the measured pressure, the sensor with the highest accuracy is automatically used to calculate the flow velocity.

For the determination of the dynamic pressure, which is necessary for the determination of the flow velocity, a suitable pressure probe is additionally required, e.g. Prandtl probe, Pitot probe or nozzle pressure. In order to be able to cover a large velocity range, two pressure sensors with different ranges are installed, which are internally connected in parallel.

The second variable necessary for determining the flow velocity is the density. This is determined via the measured variables air pressure, temperature and humidity. In order to also be able to measure in flows with negative or positive pressure to the environment, another differential pressure sensor is installed, which determines the difference between the environment and the static pressure connection of the probe.

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The data transmission uses ASCII text in the respective SI units. Via a simple protocol, the transmission rate can be set in the range between 1 and 100 Hz. For the differential pressure sensors an offset deduction (TARA) can be done via the software.

Power is supplied via the USB interface. An additional power supply is not necessary in this case. Optionally, the CAN bus can be used. In this case, an external supply in the range of 7 to 24VDC is necessary, which is supplied via the interface connector with M8 plug.

The configuration is done via the USB connection. When connected via USB, the scanner logs on to the system as a virtual COM port. This allows any software that supports a serial protocol to be used. A sample program for use with LabVIEW is included.

For the devices with CAN bus, a DBC file is also supplied.

Accessories

Available as accessories:

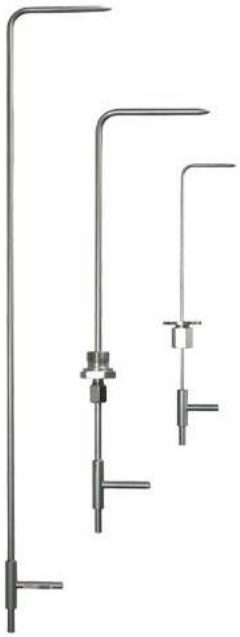

Figure g 2: Prandtl-probes

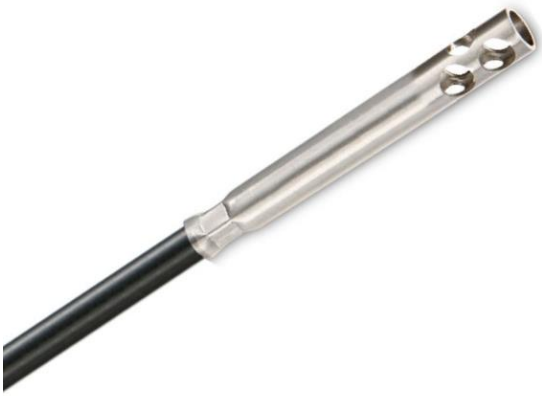

Figure 1: PT100 Air Temperature Sensor

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Technical Specifications

Differential pressure				
Measurement range, 0 to …		**Proof pressure**		
kPa	**mbar**	**kPa**	**bar**	**Uncertainty**
0,25	2,5	25	0,25	max. ±0,1% FSS
0,50	5.0	25	0.25	
1,25	12,5	50	0,50	
2,50	25	50	0,50	
5,0	50	50	0,75	
7,5	75	50	1,20	
15	150	50	1,20	
Uncertainty		Max. ±0.1% FSS, typ. 0.05% FSS		
Data rate		1 to 100Hz		
Airpressure				
Measuring range		600 to 1100 hPa (mbar)		
Uncertainty		±2 hPa		
Temperature				
Measuring range		-50 to 220°C		
Uncertainty		Class A		
Humidity				
Measuring range		3 to 97%		
Uncertainty		±2 %		
Power supply				
USB		Power over USB		
CAN		7-24 V, 100 mA		
Environmental conditions				
Temperature		5° C…50° C		
Humidity		Non-condensing		
Dimensions				
Housing		60 x 29 x 117 mm (B x H x D)		
Pressure ports		Push-On D = 2,0 mm		
Recommended tubes		Silicone Tubes 1,5 x 3,5 mm		

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Serial Interface

The virtual COM port can be operated at any baud rate. We recommend 19200, 8 data bits, no parity, 1 stop bit. **DTR (Data Terminal Ready) must be set.**

Command	Function	Answer
CAL a x	Set scaling factor for sensor a to value x	#Scaler=…. Offset=….
CAL? A	Read scaling factors for sensor a	#Scaler=…. Offset=….
EE_LOAD	Load calibration data from EEPROM	#EEPROM:loaded
EE_SAVE	Save calibration data to EEPROM	#EEPROM:saved
*IDN?	Read device ID	#PSC5B-CAN 2.4.0 #SN31000
RATE x	Define sample rate range x = 10 …5000 [ms] standard: 1000 [ms] → 1 [Hz]	#Rate=x ms #Error: Rate-Range
RATE 0	Activate request and trigger mode actual values are read only after manual command “?” is sent	#Request-Mode active
?	Read actual value (request-mode only)	0.00 0.00 0.00 0.00 0.00
*RST	Load default settings	#RESET
TARA	Zero adjustment for all sensors	#TARA
FILTER x	Activate exponential filter 0: deactivated; >0: filter range in ms	#FILTER=x
CAN_ID x	Set CAN-ID	#OK
CAN_IT x	Set interface x = 0: normal (11bit, CAN 2.0A) x = 1 extended 23bit (23bit, CAN 2.0B)	#OK
CAN?	Request CAN configuration	#ID:0x[…]_Speed:[baud]_IDT:[0,1]
CAN_Speed x	Set CAN bus rate 0: 125 kBaud 1: 250 kBaud 2: 500 kBaud 3: 1 MBaud	#OK
Each command is terminated by a line break (CR, LF or CR+LF). Sensor enumeration starts with the number 1. Sensor readings are separated with horizontal tab (0x09).		

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