

PAUL GOTHE BOCHUM

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Manufacturer of Emissions Control Technology



Product info: Prandtl-Pitot-Tube (L-Pitot-Tube)

This Prandtl-Tube is suitable for measurements in aggressive gases and can be used without any correction-factor (VDI 2640, page 3). The velocity can calculate with a simple formula (see box). For the total pressure is the hole at the tip of the nose. The static pressure is three head-diameters from the tip. The difference pressure can be measured with a pressure-sensing device. The L-Pitot Tube described in ISO 10780 has a longer leg and can also be ordered to the same price like the Prandtl-Pitot-Tube. In this case use instead of the index "PR" the index "L", the Art.-number remains.

p: difference pressure mbar
d: density

$$v = \sqrt{\frac{200p}{d}}$$

Prandtl-Pitot Tube:

Nominal length [mm] L	Ø- Outer [mm] D 1	Leg length [mm] (S)	Leg length minimum. [mm] (S)	Radius [mm] R	Ø-Opening total pressure [mm] d	Art.-No.	Available Material * ² A: 1.4541, C: 1.4841 T: Titanium
300	3	38	38	6	0,9	PR-3-	-A
250	5	60	40	10	1,5	PR-5-1-	-A
500	5	60	40	10	1,5	PR-5-2-	-A
250	6	72	55	12	1,8	PR-6-1-	-A
500	6	72	55	12	1,8	PR-6-2-	-A
250	8	97	60	16	2,4	PR-8-1-	-A
500	8	97	60	16	2,4	PR-8-2-	-A
800	8	97	60	16	2,4	PR-8-3-	-A
250	10	121	65	36	3	PR-10-1-	-A / -C / -T
500	10	121	65	36	3	PR-10-2-	-A / -C / -T
1000	10	121	65	36	3	PR-10-3-	-A / -C / -T
500	15	181	130	40	4,5	PR-15-2-	-A / -C / -T
1000	15	181	130	40	4,5	PR-15-3-	-A / -C / -T
1500	15	181	130	40	4,5	PR-15-4-	-A / -C / -T
500	20	242	150	56	6	PR-20-2-	-A / -C / -T
1000	20	242	150	56	6	PR-20-3-	-A / -C / -T
1500	20	242	150	56	6	PR-20-4-	-A / -C / -T
2000	20	242	150	56	6	PR-20-5-	-A / -C / -T
2500	20	242	150	56	6	PR-20-6-	-A / -C / -T
3000	20	242	150	56	6	PR-20-7-	-A / -C / -T
3500 * ¹	20	242	150	56	6	PR-20-8-	-A
4000 * ¹	20	242	150	56	6	PR-20-9-	-A
4500 * ¹	20	242	150	56	6	PR-20-10-	-A
5000 * ¹	20	242	150	56	6	PR-20-11-	-A

*¹ These pitot-tubes fortify after approximately 200 mm on Ø 30 mm (D2).

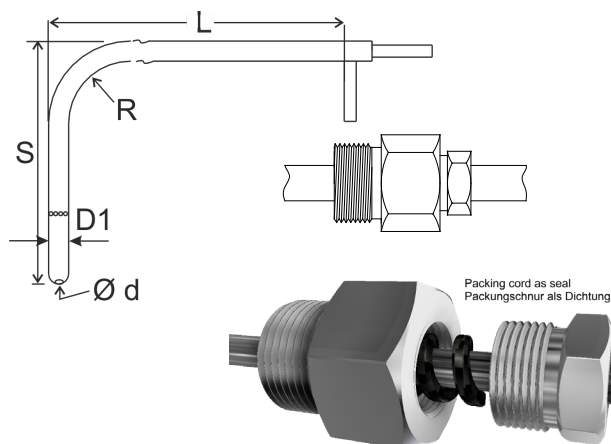
*² Material: stainless steel: 1.4541 up to 500 °C, stainless steel: 1.4841 up to 1000 °C, titanium up to 400 °C.

Exit of the pressure-tubes: olive for hoses Ø 6 - 10 mm

Mounting for pitot-tubes

The mounting is used for solidly installing a pitot-tube at the pipeline. Through solving of the stuffing box, the pitot-tube can push easy into each position and can be fixed afterwards again. Hint: The mounting must be installed during the manufacture of the pitot-tube. An additional montage, as well as dismantling is not possible.

Art.-No.: 47.5



Product info: S-Pitot-Tube

S-Pitot in accordance to ISO 10780: 1994 (E). Pitot-tube with calibration factor $\sim 0,84$. Each S-Pitot-tube is controlled in a flow test-system. If required a calibration-certificate can deliver - ISO 10780: 1994 (E).

To calculated the velocity use following formula:

$$v = K \cdot \sqrt{\frac{200p}{d}}$$

K: calibration factor; p: difference pressure mbar; d: density

The S- Pitot has an outer-tube for protection. If require a thermocouple can installed inside the protection tube (NiCr-Ni).

Advantages:

- big opening for the total pressure \varnothing 4 mm
- small leg (for openings: > 30 mm) **special small leg possible: 10 mm, ask for details**

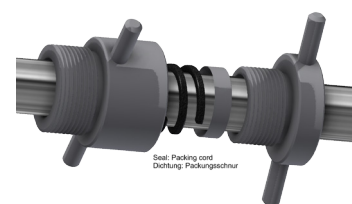
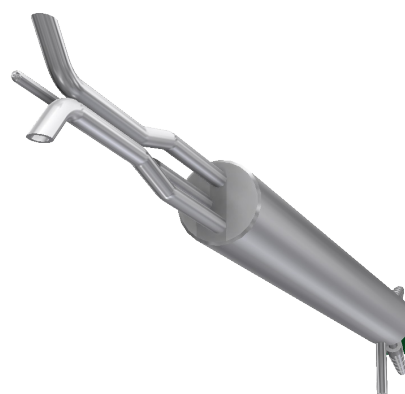
Disadvantage:

- to measure the static pressure is an additional tip tube necessary.

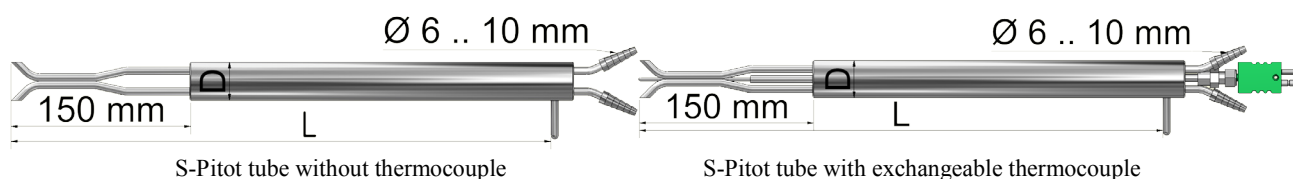
Special edition with short legs are possible. Available leg length (d/D): 30 mm, 25 mm, 20 mm, 15 mm, 10 mm.

30 mm S-Pitot-tube in accordance ISO 10780: 1994 (E)

Length [mm] L	Protection tube D	Material 1.4541: T _{max} 500°C 1.4841: T _{max} 1000°C Titanium: T _{max} 400°C	Art.-No.	with exchangeable Thermocouple NiCr-Ni type K Art.-No.
500	30 x 2 mm	1.4541	52.1-A-05	52.1-A-05-t
		1.4841	52.1-C-05	52.1-C-05-t
		Titan	52.1-T-05	52.1-T-05-t
1000	30 x 2 mm	1.4541	52.1-A-10	52.1-A-10-t
		1.4841	52.1-C-10	52.1-C-10-t
		Titan	52.1-T-10	52.1-T-10-t
1500	30 x 2 mm	1.4541	52.1-A-15	52.1-A-15-t
		1.4841	52.1-C-15	52.1-C-15-t
		Titan	52.1-T-15	52.1-T-15-t
2000	30 x 2 mm	1.4541	52.1-A-20	52.1-A-20-t
		1.4841	52.1-C-20	52.1-C-20-t
		Titan	52.1-T-20	52.1-T-20-t
2500	30 x 2 mm	1.4541	52.1-A-25	52.1-A-25-t
		1.4841	52.1-C-25	52.1-C-25-t
		Titan	52.1-T-25	52.1-T-25-t
3000	30 x 2 mm	1.4541	52.1-A-30	52.1-A-30-t
		1.4841	52.1-C-30	52.1-C-30-t
		Titan	52.1-T-30	52.1-T-30-t
3500	30 x 2 mm	1.4541	52.1-A-35	52.1-A-35-t
		1.4841	52.1-C-35	52.1-C-35-t
		Titan	52.1-T-35	52.1-T-35-t
4000	30 x 2 mm	1.4541	52.1-A-40	52.1-A-40-t
		1.4841	52.1-C-40	52.1-C-40-t
		Titan	52.1-T-40	52.1-T-40-t



Holder for G 1 1/2



Product info: Pitot Tube - extensible

With the extensible Pitot-tubes 40 x 1 mm can make velocity measurements in big chimneys without any transportation-problems. The Prandtl- or S-Pitot-Tube has 1" external thread. The extensions can be screwed easy together in the length you want. The exit of the pressure-tubes at the Prandtl- or S-Pitot -Tube can deliver with outer-Ø 6 mm smoothly, with hose-olive or with Swagelok connections. If hoses are used, they lie loose inside the extensions. The operating-temperature is dependent on the material of the hoses (silicone: 60 ..+ 180°C; Teflon (PTFE and PFA): -200 ..+ 260°C; Viton: -70 ..+ 300°C). If Swagelok-connections are chosen, stainless steel-inside-tubes (6 x 1 mm) can be used for the pressure (up to 600°C).

Prandtl-Pitot-Tube - extensible with G1- external threads (stainless steel)

Ø D [mm]	Ø-d [mm]	Nominal length L [mm]	Leg-length [mm]	Radius R [mm]	Art.-No.	Connection Version: smooth: -g Olive: -O Swagelok: -S
10	3	500	121	20	51-10-500-	-g, -O or -S
10	3	1000	121	20	51-10-1000-	
15	4,5	500	181	30	51-15-500-	-g, -O or -S
15	4,5	1000	181	30	51-15-1000-	
20	6	500	242	40	51-20-500-	-g, -O or -S
20	6	1000	242	40	51-20-1000-	

S-Pitot-Tube – extensible with G1-external threads (stainless steel)

Ø D:	length:	Leg length S: 30	With integrated thermocouple NiCr-Ni:
6	L: 200	Art.-No.: 51-S	Art.-No.: 51-ST

Extensions

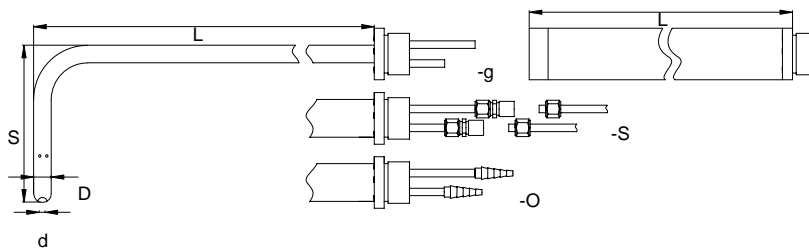
(stainless steel 40 x 1 with G1-thread)

Length [mm]	Art.-No.:
1000	51.1-1
1500	51.1-15
2000	51.1-2

Inox-inner tube (6 x 1 mm)

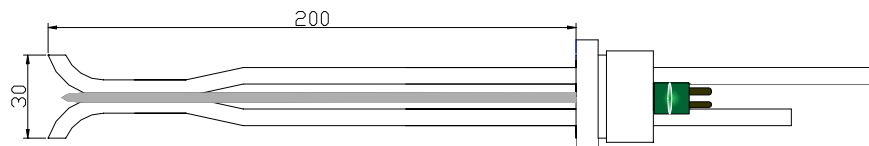
with Swagelok-connections
 (you require 2 inner tubes per extension)

Length [mm]	Art.-No.:
1100	51.2-1
1600	51.2-15
2100	51.2-2

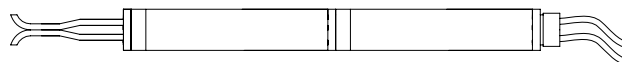


Extensible S-Pitot-Tube

(Grey: option integrated NiCr-Ni)



Example with two extensions:



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Product info Z: Cylindrical-Pitot-Tube (according to VDEh)

This cylindrical pitot-tube is suitable for measurements in tube-systems with small openings.

This pitot-tube has a factor of $c = 0,79 \dots 0,83$ (see calibration certificate).
The velocity can be calculated with a simple formula.

Advantage: fits through openings with \varnothing 15 mm.

Disadvantage: Sensitivity when contorting over an axis vertically to the direction of the flow.
In small tube-diameters (< 100 mm) faulty-measurement through tube-wall-effects.
Accuracy less than 5% only with matching factor.

The static pressure is grasped at the top. The total-pressure (dynamic + static pressure) is grasped at a hole against the flow direction. The difference pressure can be measured with all manual gauges or digital difference-pressure-measuring instruments.

Cylindrical Pitot Tube:

nominal length [mm]	\varnothing -outer [mm]	Art.-No.	available material * ¹ A = 1.4541: T_{\max} 500°C C = 1.4841: T_{\max} 1000°C
1000	15	53.15-3-	-A / -C
2000	20	53.20-5-	-A / -C

p: diff. pressure mbar
 δ : density
c: factor

$$v = C \cdot \sqrt{\frac{200 \cdot \Delta p}{\delta}}$$

*¹ material: stainless steel: 1.4541 up to 500 °C, material: stainless steel: 1.4841 up to 1000° C,

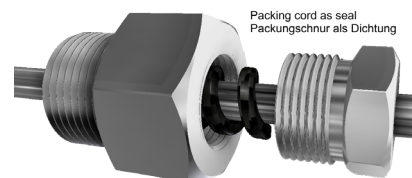
Exit of the pressure tube: hose-olive for hoses with inner- \varnothing 6 up to 10 mm tube 10 x 1 smooth.

Other lengths can be manufactured on inquiry.



Mounting for Pitot-tubes

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