

# FLOW MEASUREMENT ULTRASONIC FLOW METER

## PCE-TDS 200 SERIES

### Flow velocity / volume flow and volume / heat quantity

The flow meter has a measuring range of  $\pm 32$  m/s. With an accuracy of  $\pm 1.5$  % f.s. for a pipe diameter of  $DN \geq 50$ ,  $\pm 3.5$  % f.s. for a pipe diameter of  $DN < 50$  and a reproducibility of  $\pm 0.5$  % f.s., the flow meter is a particularly precise measuring device. The installation aid graphically displays the signal quality from the flow meter. In addition, it is graphically displayed whether the sensors of the flow meter are positioned

at the correct distance from each other. To carry out flow measurement with the flow meter, the flow velocity, the volume flow and the volume are displayed after entering the pipe and medium specifications.

### ISO cal option

- » measuring range:  $\pm 32$  m/s
- » reproducibility of  $\pm 0.5$  % of the measured value
- » various ultrasonic probes available
- » heat quantity measurement (only PCE-TDS 200+ series)
- » data memory for 10 million measuring points (32 GB)
- » individually adjustable alarm limits
- » USB-C interface for data transfer
- » optional: software and calibration certificate ISO or DAkkS



## APPLICATION



## TECHNICAL SPECIFICATIONS

### Flow measurement

Measuring range	<b><math>\pm 32</math> m/s</b>
Resolution	0.001 m/s
Accuracy $DN \geq 50$ mm	$\pm 1.5$ % of Rd for velocities $> 0.3$ m/s
Accuracy $DN < 50$ mm	$\pm 3.5$ % of Rd for velocities $> 0.3$ m/s
Repeatability	$\pm 0.5$ % of Rd
Temperature resistance	-30 ... +160 °C
Measuring method	N / V / W / Z

### Medium

Petrol  
Diesel  
Ethanol  
Sea water  
Methanol  
Oil  
Petroleum  
Crude oil  
Water  
User defined (manual input of sound velocity from the medium)

### Temperature (only PCE-TDS 200+)

Measuring range	type B	600 ... 1800 °C
	type E	-100 ... 900 °C
	type J	-100 ... 1150 °C
	type K	-100 ... 1370 °C
	type N	-100 ... 1150 °C
	type R	0 ... 1700 °C
	type S	0 ... 1500 °C
	type T	-100 ... +400 °C
Resolution		0,1 °C
Accuracy	type B	$\pm(0,5 \% + 3 \text{ °C})$
	type E	$\pm(0,4 \% + 1 \text{ °C})$
	type J	$\pm(0,4 \% + 1 \text{ °C})$
	type K	$\pm(0,4 \% + 1 \text{ °C})$
	type N	$\pm(0,4 \% + 1 \text{ °C})$
	type R	$\pm(0,5 \% + 3 \text{ °C})$
	type S	$\pm(0,5 \% + 3 \text{ °C})$
	type T	$\pm(0,4 \% + 1 \text{ °C})$

Suitable for all liquids with an impurity of less than 5 %.

### Pipe material

Copper CU  
Steel FE  
Stainless steel VA  
Aluminium AL  
Brass ME  
Cast iron CI  
Iron FE  
Nickel NI  
Titanium TI  
Zinc ZI  
Acrylic AC  
Polyethylene PE  
Polypropylene PP  
Polyvinyl chloride PVC  
Nylon NY  
User defined (manual input of the sound velocity of the pipe material)

### Inner pipe lining

No lining  
Epoxy resin  
Rubber  
Mortar  
Polystyrene PS  
Polyethylene PE  
Polytetrafluoroethylene PTFE  
Polyurethane PU  
Polypropylene PP  
User defined (man. Input of the longitudinal sound velocity of the inner lining of the pipe)



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## TECHNICAL SPECIFICATIONS

### Further specifications

Measuring parameters PCE-TDS 200	flow velocity / volume flow / volume
Measuring parameters PCE-TDS 200+	flow velocity / volume flow / volume Temperature / Heat output / Heat quantity
Unit   linear dimension	mm / in
Unit   Flow velocity	m/s / ft/s
Unit   Flow rate	m <sup>3</sup> / l / gal / igl / mgl / cf / bal / ib / ob
Unit   Volume	m <sup>3</sup> / l / gal / igl / mgl / cf / bal / ib / ob
Unit   Temperature	°C / °F
Unit   Heat quantity	K / kJ / MJ / Wh / kWh / MWh / Btu / kBtu / MBtu
Unit   Heat output	W / kW / MW / J/h / kJ/h / MJ/h / Btu/h / kBtu/h / MBtu/h
Unit   Cost display	€ / £ / \$ / TL / Zł / ¥
Date / Time	second / minute / hour / day
Display	LCD of 2.8
Units	metric / Imperial
Memory	10 million values (32 GB)
Menu languages	German / Chinese / Danish / English / Turkish / French / Italian / English / Turkish / French / Italian Italian / Japanese / Dutch / Polish / Portuguese / Russian / Polish / Portuguese / Russian / Spanish
Operating and Storage conditions	-20 ... +65 °C
Interface	10 ... 95 % H.r. non-condensing USB   For online measurement, reading out of the internal memory and for recharging the battery
Protection class	IP52
Power supply	LiPo battery / 3.7 V / 2500 mAh
Charger	USB / 5 V DC / 500 mA
Operating time	approx. 10 h
Dimensions	165 x 85 x 32 mm
Weight	255 g

Sensor Order.-no.	Nominal diameter in DN *	Dimensions Sensor	Temperature Measuring range	Rail
PCE-TDS 200 L SENSOR	DN 300 ... 6000	70 x 40 x 37 mm	-30 ... 160 °C	no
PCE-TDS 200 M SENSOR	DN 50 ... 700	70 x 40 x 37 mm	-30 ... 160 °C	no
PCE-TDS 200 MR SENSOR	DN 50 ... 700	280 x 60 x 40 mm	-30 ... 160 °C	yes
PCE-TDS 200 S SENSOR	DN 15 ... 100	45 x 30 x 30 mm	-30 ... 160 °C	no
PCE-TDS 200 SR SENSOR	DN 15 ... 100	198 x 45 x 25 mm	-30 ... 160 °C	yes

\*The nominal diameter is the inside diameter of a pipe.  
Note : If you order the sensor later, we need the PCE-TDS 200 device to adapt the sensor to the device.

## TECHNICAL SPECIFICATIONS

### Model PCE-TDS 200

PCE-TDS 200 L  
PCE-TDS 200 M  
PCE-TDS 200 ML

PCE-TDS 200 MR  
PCE-TDS 200 S  
PCE-TDS 200 SL

PCE-TDS 200 SM

PCE-TDS 200 SML

PCE-TDS 200 SR

### Model PCE-TDS 200+

PCE-TDS 200+ L  
PCE-TDS 200+ M  
PCE-TDS 200+ ML

PCE-TDS 200+ MR  
PCE-TDS 200+ S  
PCE-TDS 200+ SL

PCE-TDS 200+ SM

PCE-TDS 200+ SML

PCE-TDS 200+ SR

### Accessories

CAL-PCE-TDS-ISO  
CAL-PCE-TDS-DAkkS  
CAL-T2

Additional sensors  
PCE-TDS 200 case  
PCE-TDS 200 SW  
TF-RA330  
TF-RA330-3  
TF-RA330-5  
TT-GEL  
K-Gel

### Sensors are included in the scope of delivery Standard version

PCE-TDS 200 L SENSOR for DN 300 ... 6000  
PCE-TDS 200 M SENSOR for DN 50 ... 700  
PCE-TDS 200 M SENSOR for DN 50 ... 700  
PCE-TDS 200 L SENSOR for DN 300 ... 6000  
PCE-TDS 200 MR SENSOR for DN 50 ... 700  
PCE-TDS 200 S SENSOR for DN 15 ... 100  
PCE-TDS 200 S SENSOR for DN 15 ... 100  
PCE-TDS 200 L SENSOR for DN 300 ... 6000  
PCE-TDS 200 S SENSOR for DN 15 ... 100  
PCE-TDS 200 M SENSOR for DN 50 ... 700  
PCE-TDS 200 S SENSOR for DN 15 ... 100  
PCE-TDS 200 M SENSOR for DN 50 ... 700  
PCE-TDS 200 L SENSOR for DN 300 ... 6000  
PCE-TDS 200 SR SENSOR for DN 15 ... 100

### Sensors included in the scope of delivery Version with temperature sensors

PCE-TDS 200 L SENSOR for DN 300 ... 6000  
PCE-TDS 200 M SENSOR for DN 50 ... 700  
PCE-TDS 200 M SENSOR for DN 50 ... 700  
PCE-TDS 200 L SENSOR for DN 300 ... 6000  
PCE-TDS 200 MR SENSOR for DN 50 ... 700  
PCE-TDS 200 S SENSOR for DN 15 ... 100  
PCE-TDS 200 S SENSOR for DN 15 ... 100  
PCE-TDS 200 L SENSOR for DN 300 ... 6000  
PCE-TDS 200 S SENSOR for DN 15 ... 100  
PCE-TDS 200 M SENSOR for DN 50 ... 700  
PCE-TDS 200 S SENSOR for DN 15 ... 100  
PCE-TDS 200 M SENSOR for DN 50 ... 700  
PCE-TDS 200 L SENSOR for DN 300 ... 6000  
PCE-TDS 200 SR SENSOR for DN 15 ... 100

ISO Calibration Certificate  
DAkkS Calibration Certificate  
Calibration certificate for 2-channel thermometer

see table above  
spare transport case  
software  
Temperature Contact Sensor Typ T, 1 m  
Temperature Contact Sensor Typ T, 3 m  
Temperature Contact Sensor Typ, 5 m  
Ultrasonic Contact Gel, 100 ml  
High Temperature Coupling Gel, 100 ml

### Delivery Scope

1 x Ultrasonic flow meter PCE-TDS 200  
1 x Flow sensors (depending on model)  
2 x Temperature sensor TF-RA330 (only PCE-TDS 200+)  
2 x Connection cable 5 m  
2 x detachable cable ties  
1 x power supply unit  
1 x USB-C cable  
1 x ultrasonic contact gel  
1 x PCE measuring tape  
1 x plastic case  
1 x instruction manual



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