Data sheet
testo 445

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VAC measuring instrument

testo 445 – The service instrument for ventilation and air conditioning systems

- Point and timed mean value calculation
- Direct display of the volume flow
- Automatic allocation of duct cross-section area to measurement site (max. 99 measurement sites)
- Internal measurement value store (3000 measurement values)
- PC software for the analysis, archiving and documentation of the measurement values (option)
- Measurement of up to 6 measurement parameters simultaneously

°C
%RH
m/s
hPa
ppm CO_2
ppm CO

This service instrument is s real multi-talent: the testo 445 has two probe inputs for the connection of a broad range of probes for measurements on ventilation/air conditioning systems. The instrument records flow velocity values in a duct, at a duct outlet or on extraction systems. In addition to this, the allrounder measures or calculates the parameters volume flow, Indoor Air Quality, temperature, relative humidity, dewpoint, absolute humidity, degree of humidity, enthalpy, pressure and CO.

At the simple press of a button, the testo 445 displays the last measurment value measured as well as minimum, maximum and mean values. In addition to this, measurement data can be stored according to measurement site and analyzed on a PC, or documented on site with the Testo fast printer.

Technical data

testo 445

testo 445, VAC measuring instrument, incl. battery and calibration protocol

Part no. 0560 4450

General technical data

Operating temperature	0 to +50 °C
Storage temperature	-20 to +70 °C
Display	LCD, 4 lines
Battery type	9V block battery
Battery life	45 h
PC	RS232 interface
Weight	255 g
Housing material	ABS
Warranty	2 years
Memory	3000
Dimensions	215 x 68 x 47 mm

Battery life: 6-45 h (depending on probe)
Mains conn. and batt. rech. in instr.
Calculated humidity parameters: td, g/m³, g/kg pressure-compensated, J/g
Calculated volume flow: m³/h (e.g. 0 to 99999 m³/h), m³/min, m³/s, l/s, cfm
Calculated velocity values (density-compensated): 0 to 100 m/s; 0 to 99999 m³/h
Humidity measurement: Measuring range -50 to 180 °C; See Probes for accuracy
Accuracy of Type K, J: Additional error via operation temperature 0.2 °C (adjustment point)

Display of 2 measurement parameters

Simultaneous measurement of up to 6 parameters

Technical data / Accessories

Sensor type	Measuring range	Accuracy ±1 digit	Resolution
Type K (NiCr-Ni)	-200 to +1370 °C	±0.5% of m.v. (-200 to -60.1 °C) ±0.5% of m.v. (+60.1 to +1370 °C) ±0.3 °C (-60 to +60 °C)	0.1 °C (-200 to +1370 °C)
Type J (Fe-CuNi)	-200 to +1000 °C	±0.5% of m.v. (-200 to -60.1 °C) ±0.5% of m.v. (+60.1 to +1000 °C) ±0.3 °C (-60 to +60 °C)	0.1 °C (-200 to +1000 °C)
NTC	-50 to +150 °C	±0.5% of m.v. (+100 to +150 °C) ±0.2 °C (-25 to +74.9 °C) ±0.4 °C (-50 to -25.1 °C) ±0.4 °C (+75 to +99.9 °C)	0.1 °C (-50 to +150 °C)
Testo humid. sensor, cap.	0 to +100 %RH	See probe data	0.1 %RH (0 to +100 %RH)
Vane	0 to +60 m/s	See probe data	0.01 m/s (0 to +60 m/s)
Thermal	0 to +20 m/s	See probe data	0.01 m/s (0 to +10 m/s) 0.1 m/s (+10.1 to +20 m/s)
Pressure	See pressure probes	±0.1% of m.v.	0.001 hPa (Sonde 0638 1345) 0.001 hPa (Sonde 0638 1445) 0.01 hPa (Sonde 0638 1545) 1 hPa (Sonde 0638 1645)
CO2 probe	0 to +1 Vol. % CO_2	See probe data	0 Vol. % CO_2(0 to +1 Vol. % CO_2)
CO2 probe	0 to +10000 ppm CO_2	±(100 ppm CO_2 +3% of m.v.) (+5000 to +10000 ppm CO_2) ±(500 ppm CO_2 +2% of m.v.) (0 to +5000 ppm CO_2)	1 ppm CO_2 (0 to +10000 ppm CO_2)
CO probe	0 to +500 ppm CO	±5% of m.v. (+100 to +500 ppm CO) ±5 ppm CO (0 to +100 ppm CO)	1 ppm CO (0 to +500 ppm CO)

Transport and Protection	Part no.	
System case (plastic) for measuring instrument, probes and accessories probes in lid make it easy to find parts in case (540 x 440 x 130 mm)	0516 0400	
TopSafe (indestructible protection case), with bench stand and belt clip	0516 0440	

Printer and Accessories		
Testo fast printer IrDA with wireless infrared interface; 1 roll thermal paper; 4 AA batteries	0554 0549	
External fast charger for 1-4 AA rech. batteries, incl. 4 Ni-MH rech. batteries with individual cell charging and charge control display, incl. impulse trickle charging, integrated discharge function, with built-in international mains plug, 100-240 V, 300 mA, 50/60 Hz	0554 0610	
Spare thermal paper for printer (6 rolls), permanent ink measurement data documentation legible for up to 10 years	0554 0568	

Software and Accessories		
ComSoft Professional Pro software incl. data archiving	0554 1704	
RS232 cable connects instrument to PC (1.8 m) for data transfer	0409 0178	

Accessories

Additional accessories and spare parts	Part no.	
9V rech. battery for instrument, instead of battery	0515 0025	
Desk-top power supply with international connection options	0554 1143	
Professional telescopic handle for plug-in vane probes, max. 1 m long	0430 0941	
Handle for plug-in vane probes	0430 3545	
Extension cable, 5 m long, between plug-in head cable and instrument, PUR coating material	0409 0063	
Connection hose; silicone; length 5 m; max. load 700 hPa (mbar)	0554 0440	
Silicone heat paste (14g), Tmax = +260°C, improves heat transfer in surface probes	0554 0004	
Cable, 1.5 m long, connects probe with plug-in head to meas. instrument, PUR coating material	0430 0143	
Cable, 5 m long, connects probe with plug-in head to measuring instrument, PUR coating material	0430 0145	
Adapter to connect NiCr-Ni thermocouples and probes with open wire ends	0600 1693	
Control and adjustment set for Testo humidity probes, salt solution with 11.3% RH and 75.3% RH, incl. adapter for Testo humidity probes	0554 0660	
testo saline solution pot for checking humidity probes, 33 %RH	0554 0636	

Calibration Certificates		
ISO calibration certificate velocity hot wire, vane anemometer, Pitot tube; calibration points 1; 2; 5; 10 m/s	0520 0004	
ISO calibration certificate velocity hot wire, vane anemometer, Pitot tube; calibration points 5; 10; 15; 20 m/s	0520 0034	
DAkkS calibration certificate velocity hot wire, vane anemometer; calibration points 0.5; 1; 2; 5; 10 m/s	0520 0244	
DAkkS calibration certificate/velocity hot wire, vane anemometer, Pitot tube; calibration points 2; 5; 10; 15; 20 m/s	0520 0204	
ISO calibration certificate humidity Calibration points 11.3 %RH and 75.3 %RH at +25 °C	0520 0006	
ISO calibration certificate/humidity saturated saline solutions: calibration point 11.3%RH	0520 0013	
ISO calibration certificate/humidity saturated saline solutions, calibration point 75.3%RH	0520 0083	
DAkkS calibration certificate/humidity electronic hygrometers; calibration points 11.3%RH and 75.3%RH at +25°C	0520 0206	

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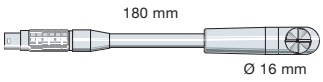
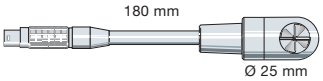
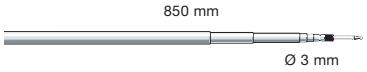
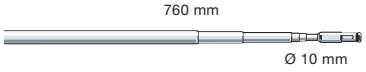
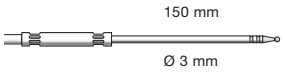
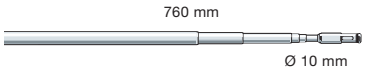
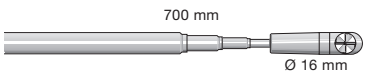
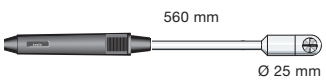
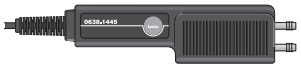
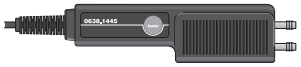
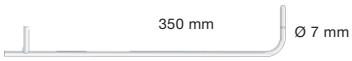
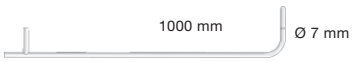
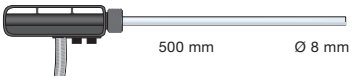
Probes

Probe type	Dimensions Probe shaft/probe shaft tip	Measuring range	Accuracy	Part no.
Flow velocity probes				
Vane/temperature probe, Ø 16 mm, attachable to 0430 3545 handle or 0430 0941 telescopic handle		+0.6 to +60 m/s -30 to +140 °C	±(0.2 m/s +1% of m.v.) (+0.6 to +40 m/s) ±(0.2 m/s +2% of m.v.) (+40.1 to +50 m/s)	0635 9540
Vane/temperature probe, Ø 25 mm, can be attached to 0430 3545 handle or 0430 0941 telescopic handle		+0.6 to +40 m/s -30 to +140 °C	±(0.2 m/s ±1% of m.v.) (+0.6 to +40 m/s)	0635 9640
Bendable vane probe (can be bent by 90°), Ø 60 mm, attachable to handle 0430 3545 or telescopic handle 0430 0941, for meas. on ventilation outlets		+0.25 to +20 m/s Operating temperature 0 to +60 °C	±(0.1 m/s ±1.5% of m.v.) (+0.25 to +20 m/s)	0635 9440
Bendable vane probe (can be bent by 90°), Ø 100 mm, attachable to handle 0430 3545 or telescopic handle 0430 0941, for measurements on ventilation outlets		+0.1 to +15 m/s Operating temperature 0 to +60 °C	±(0.1 m/s ±1.5% of m.v.) (+0.1 to +15 m/s)	0635 9340
Affordable, robust hot bulb probe, Ø 3 mm, for measurements in the lower velocity range, with handle		0 to +10 m/s -20 to +70 °C	±(0.03 m/s ±5% of m.v.) (0 to +10 m/s)	0635 1549
Robust hot bulb probe, Ø 3 mm, with handle and telescopic handle for measurements in the lower velocity range		0 to +10 m/s -20 to +70 °C	±(0.03 m/s ±5% of m.v.) (0 to +10 m/s)	0635 1049
Quick-action hot wire probe, Ø 10 mm, with telescopic handle, for measurements in the lower velocity range with direction recognition		0 to +20 m/s -20 to +70 °C	±(0.03 m/s ±4% of m.v.) (0 to +20 m/s)	0635 1041
Robust hot bulb probe, Ø 3 mm, for measurements in the lower velocity range, 2m cable (PVC)		0 to +10 m/s -20 to +70 °C	±(0.03 m/s ±5% of m.v.) (0 to +10 m/s)	0628 0035
Thermal anemometer probe, Ø 10 mm, w. telescopic handle, measures air flow in lab fume cupboards to DIN EN 14175		0 to +5 m/s 0 to +50 °C	±(0.02 m/s ±5% of m.v.) (0 to +5 m/s)	0635 1047
Vane probe, Ø 16 mm, with telescopic handle, Tmax +60°C		+0.6 to +40 m/s	±(0.2 m/s ±1.5% of m.v.) (+0.6 to +40 m/s)	0628 0005
High temperature vane probe, Ø 25 mm, with handle for continuous measurements up to +350°C		+0.6 to +20 m/s -40 to +350 °C	±(0.3 m/s ±1% of fsv) (+0.6 to +20 m/s)	0635 6045
testovent 415, volume flow funnel, Ø 210 mm/210x210 mm, incl. case				0554 0415
testovent 410, volume flow funnel, Ø 340 mm/330x330 mm, incl. case				0554 0410

Probes

Probe type	Dimensions Probe shaft/probe shaft tip	Measuring range	Accuracy	Part no.
Pressure				
Precision pressure probe, 100 Pa, measures differential pressure and velocities (in combination with Pitot tube)		0 to +100 Pa	±(0.3 Pa +0.5% of m.v.) (0 to +100 Pa)	0638 1345
Pressure probe, 10 hPa, measures differential pressure and velocities (in combination with Pitot tube)		0 to +10 hPa	±0.03 hPa (0 to +10 hPa)	0638 1445
Pressure probe, 100 hPa, measures differential pressure and velocities (in combination with Pitot tube)		0 to +100 hPa	±0.5% of m.v. (+20 to +100 hPa) ±0.1 hPa (0 to +20 hPa)	0638 1545
Pressure probe, 2000 hPa, measures absolute pressure		0 to +2000 hPa	±5 hPa (0 to +2000 hPa)	0638 1645

Probes

Probe type	Dimensions Probe shaft/probe shaft tip	Measuring range		Part no.
Pitot tubes				
Pitot tube, 500 mm long, Ø 7 mm, stainless steel, for measuring flow velocity		Operating temperature 0 to +600 °C		0635 2045
Pitot tube, 350 mm long, Ø 7 mm, stainless steel, for measuring flow velocity		Operating temperature 0 to +600 °C		0635 2145
Pitot tube, 1000 mm long, stainless steel, for measuring flow velocity		Operating temperature 0 to +600 °C		0635 2345
Pitot tube, stainless steel, 1000 mm long, measures velocity with temperature, for pressure probes 0638 1345/..1445/..1545		Probe type Type K (NiCr-Ni) -40 to +600 °C		0635 2240
Pitot tube, stainless steel, 500 mm long, measures velocity with temperature, for pressure probes 0638 1345/..1445/..1545		Probe type Type K (NiCr-Ni) -40 to +600 °C		0635 2140

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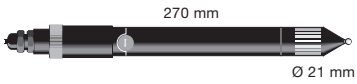
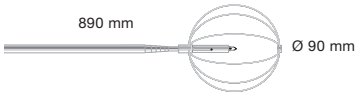
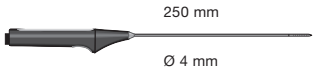
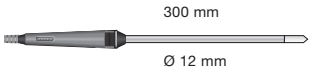
Probes

Probe type	Dimensions Probe shaft/probe shaft tip	Measuring range	Accuracy	t_{90}	Part no.
More probes					
3-function probe for simultaneous measurement of temperature, humidity and velocity. With plug-in head, 0430 0143 connection cable required		0 to +10 m/s 0 to +100 %RH -20 to +70 °C	±(0.03 m/s +5% of m.v.)(0 to 10 m/s) ±2 %RH (+2 to +98 %RH) ±0.4 °C (0 to +50 °C) ±0.5 °C (remaining range)		0635 1540
Comfort level probe for measuring degree of turbulence, with telescopic handle and stand. Fulfills EN 13779 requirements		0 to +5 m/s 0 to +50 °C	±(0.03 m/s +4% of m.v.) (0 to +5 m/s) ±0.3 °C (0 to +50 °C)		0628 0009
Ambient CO2 probe, Plug-in head, connection cable 0430 0143 or 0430 0145 required		0 ... +1 Vol. % CO_2 0 ... +10000 ppm CO_2	±(75 ppm CO_2 +3% of m.v.) (0 to +5000 ppm CO_2) ±(150 ppm CO_2 +5% of m.v.) (+5001 to +10000 ppm CO_2)		0632 1240
Ambient CO probe, for detecting CO in buildings and rooms; 0 to +500 ppm		0 to +500 ppm CO	±5% of m.v. (+100.1 to +500 ppm CO) ±5 ppm CO (0 to +100 ppm CO)		0632 3331
Humidity probes					
Standard ambient air probe up to +70°C, Plug-in head. connection cable 0430 0143 or 0430 0145 required		0 to +100 %RH -20 to +70 °C	±2 %RH (+2 to +98 %RH) ±0.4 °C (-10 to +50 °C) ±0.5 °C (remaining range)	12 s	0636 9740
Thin humidity probe incl. 4 attachable protection caps for ambient air measurements, measurements in exhaust air ducts and equilibrium moisture measurements , Plug-in head. connection cable 0430 0143 or 0430 0145 required		0 to +100 %RH -20 to +70 °C	±2 %RH (+2 to +98 %RH) ±0.4 °C (-10 to +50 °C) ±0.5 °C (-20 to -10.1 °C) ±0.5 °C (+50.1 to +70 °C)	15 s	0636 2130
Highly accurate reference humidity/ temp. probe, Plug-in head. connection cable 0430 0143 or 0430 0145 required		0 to +100 %RH -20 to +70 °C	±1 %RH (+10 to +90 %RH)* ±2 %RH (remaining range) ±0.2 °C (+10 to +40 °C) ±0.4 °C (remaining range) * in the temperature range from +15°C to +30°C	12 s	0636 9741
High humidity level probe w/ heated sensor element, no humidity on sensor, Plug-in head. connection cable 0430 0143 or 0430 0145 required		0 to +100 %RH -20 to +85 °C	±2.5 %RH (0 to +100 %RH) ±0.4 °C (-10 to +50 °C) ±0.5 °C (-20 to -10.1 °C) ±0.5 °C (+50.1 to +100 °C)	30 s	0636 2142

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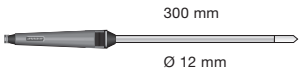
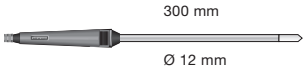
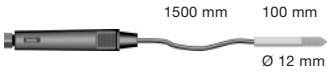
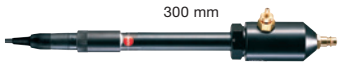
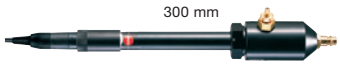
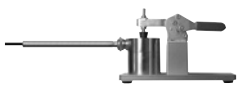
Probes

Probe type	Dimensions Probe shaft/probe shaft tip	Measuring range	Accuracy	t_{90}	Part no.
Humidity probes					
Robust humidity probe e.g. for measuring equilibrium moisture or for measurements in exhaust ducts to +120°C, Plug-in head. connection cable 0430 0143 or 0430 0145 required		0 to +100 %RH -20 to +120 °C	±2 %RH (+2 to +98 %RH) ±0.4 °C (-10 to +50 °C) ±0.5 °C (remaining range)	30 s	0636 2140
Robust high temperature/humidity probe up to +180°C , Plug-in head. connection cable 0430 0143 or 0430 0145 required		0 to +100 %RH -20 to +180 °C	±2 %RH (+2 to +98 %RH) ±0.4 °C (+0.1 to +50 °C) ±0.5 °C (remaining range)	30 s	0628 0021
Flexible humidity probe (does not retain shape) for measurements in inaccessible places , Plug-in head. connection cable 0430 0143 or 0430 0145 required		0 to +100 %RH -20 to +180 °C	±2 %RH (+2 to +98 %RH) ±0.4 °C (+0.1 to +50 °C) ±0.5 °C (-20 to 0 °C) ±0.5 °C (+50.1 to +180 °C)	30 s	0628 0022
Standard pressure dewpoint probe for measurements in compressed air systems , Plug-in head. connection cable 0430 0143 or 0430 0145 required		0 to +100 %RH -20 to +50 °C tpd	±0.9 °C tpd (+5 to +50 °C tpd) ±1 °C tpd (0 to +4.9 °C tpd) ±2 °C tpd (-5 to -0.1 °C tpd) ±3 °C tpd (-10 to -5.1 °C tpd) ±4 °C tpd (-20 to -10.1 °C tpd)		0636 9840
Precision pressure dewpoint probe for measurements in compressed air systems incl. cert. with test point -40 °C tpd, Plug-in head. connection cable 0430 0143 or 0430 0145 required		0 to +100 %RH -40 to +50 °C tpd	±0.8 °C tpd (-4.9 to +50 °C tpd) ±1 °C tpd (-9.9 to -5 °C tpd) ±2 °C tpd (-19.9 to -10 °C tpd) ±3 °C tpd (-29.9 to -20 °C tpd) ±4 °C tpd (-40 to -30 °C tpd)		0636 9841
Humidity/temperature probe , Plug-in head. connection cable 0430 0143 or 0430 0145 required		0... +100 %RH -20 to +70 °C	±2 %RH (+2... +98 %RH) ±0.4 °C (+0.1 to +50 °C) ±0.5 °C (-20 to 0 °C) ±0.5 °C (+50.1 to +70 °C)	12 s	0636 9742
Probes aw value					
aw value set: pressure-tight precision humidity probe with certificate, measurement chamber and 5 sample bowls (plastic), Reproducibility of aw value ±0.003		0 to +1 aW 0 to +100 %RH -20 to +70 °C	±0.01 aW (+0.1 to +0.9 aW) ±0.02 aW (+0.9 to +1 aW) ±1 %RH (+10 to +90 %RH) ±2 %RH (0 to +10 %RH) ±2 %RH (+90 to +100 %RH) ±0.4 °C (-10 to +50 °C) ±0.5 °C (remaining range)		0628 0024
Measuring chamber completely					0554 9860

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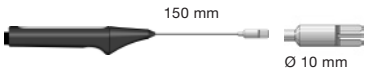
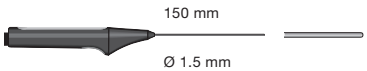
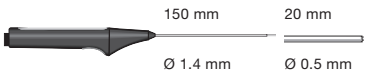
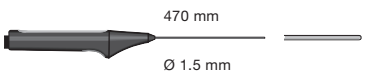
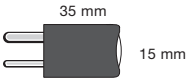
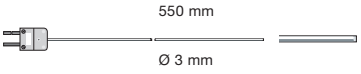
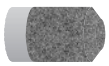
Probes

Probe type	Dimensions Probe shaft/probe shaft tip	Measuring range	Accuracy	t_{99}	Part no.
Type K (NiCr-Ni)					
Quick-action surface probe, Plug-in head. connection cable 0430 0143 or 0430 0145 required		-200 to +300 °C	Class 2 [1]	3 s	0604 0194
Super quick-action immersion/ penetration probe for measurements in liquids , Plug-in head. connection cable 0430 0143 or 0430 0145 required		-200 to +600 °C	Class 1 [1]	1 s	0604 0493
Super quick-action immersion/ penetration probe for measurements in gases and liquids with a low-mass tip, Plug-in head. connection cable 0430 0143 or 0430 0145 required		-200 to +600 °C	Class 1 [1]	1 s	0604 9794
Super quick-action immersion/ penetration probe for high temperatures , Plug-in head. connection cable 0430 0143 or 0430 0145 required		-200 to +1100 °C	Class 1 [1]	1 s	0604 0593
Spare meas. head for pipe wrap probe, TC Type K		-60 to +130 °C	Class 2 [1]	5 s	0602 0092
Plug-in measuring tip, 550mm long, flexible, for high temperatures, outer casing: Inconel 2.4816 . Please order handle with Part no. 0600 5793		-200 to +1100 °C	Class 1 [1]	4 s	0600 5793

1) According to standard EN 60584-2, the accuracy of Classes 1 / 2 refer to -40 to +1000/+1200 °C.

Covering caps

	Illustration	For humidity probes	Part no.
Caps for humidity probes Ø 12m and 21mm			
Metal protection cage, Ø 12 mm for humidity probes, for measurement in flow velocities of less than 10 m/s	 Ø 12 mm	0636 9740, 0636 9715	0554 0755
Cap with wire mesh filter, Ø 12 mm		All humidity probes with Ø 12 mm	0554 0757
PTFE sintered filter, Ø 21 mm, for corrosive substances, high humidity range (long-term measurements), high velocities	 Ø 21 mm	All humidity probes with Ø 21 mm	0554 0666
Sintered PTFE filter, Ø 12 mm, for corrosive media, High humidity range (long-term measurements), high flow velocities.	Ø 12 mm	0636 9769, 0636 9740, 0636 9715	0554 0756
PTFE sintered filter, Ø 12 mm, for corrosive substances, high humidity range (non-stop measurements), high flow speeds	Ø 12 mm	0628 0021, 0628 0022, 0636 2140, 0636 2142	0554 0758
Stainless steel sintered cap, Ø 21 mm, can be screwed onto humidity probe, protection in case of high mechanical load and high velocities	 Ø 21 mm	All humidity probes Ø 21 mm	0554 0640
Stainless steel sintered filter, pore size 100 µm, probe protection in dusty atmospheres or higher flow velocities, for measurements at higher flow velocities or in contaminated air	 Ø 12 mm	0636 9740, 0636 9715	0554 0641

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