

# Compressed air meter DN 15-50

**testo 6451**  
**testo 6452**  
**testo 6453**  
**testo 6454**

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Fits all common pipe diameters DN 15 / 25 / 40 / 50

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Four measurement parameters in one instrument:  
Flow-through, totalizer, temperature, operating pressure

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Direct compressed air monitoring with simultaneous display  
of three measurement values thanks to TFT display as  
standard

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Best system integration thanks to two analog outputs  
4 to 20 mA

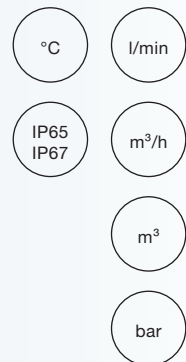
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Highest measurement accuracy, integrated measurement  
section avoids measurement errors

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Easy and cost-effective installation

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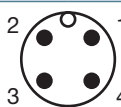
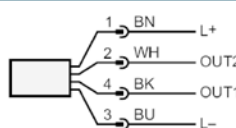
In industrial companies, compressed air is an important source of energy which incurs high consumption costs. Testo compressed air meters allow a highly accurate measurement of compressed air consumption, enabling energy-saving potential to be identified and costs lowered. The compressed air meters can also be used for the targeted implementation of environmental management – e.g. according to ISO 50.001 or ISO 14.001. A further area of application is leakage monitoring in a compressed air system. The compressed air meter can also be used to carry out a peak load analysis in order to

determine whether compressed air of sufficient capacity is being generated. The newly developed “all-in-one sensor” records not only the compressed air consumption and the temperature, but also the pressure, eliminating the need for a separate pressure measurement.

The compressed air meters from the testo 645X family use the calorimetric measurement principle, making any additional pressure and temperature measurement superfluous, and which is not subject to wear on moving parts.

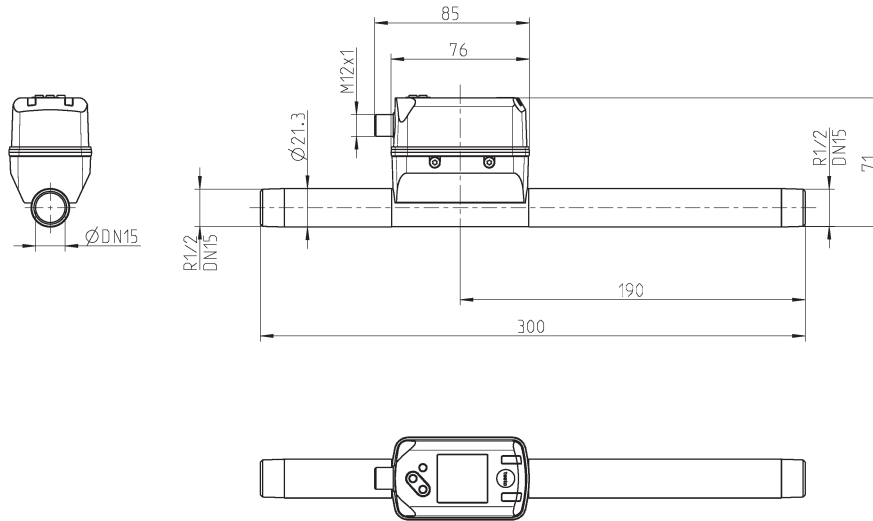
# Technical data

|                                                      | testo 6451                                                                                                                                   | testo 6452                                               | testo 6453                                               | testo 6454                                               |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|
| Product features                                     |                                                                                                                                              |                                                          |                                                          |                                                          |
| Diameter                                             | DN15                                                                                                                                         | DN25                                                     | DN40                                                     | DN50                                                     |
| Process connection                                   | Thread connection R ½                                                                                                                        | Thread connection R 1                                    | Thread connection R 1 ½                                  | Thread connection R 2                                    |
| Measuring/adjustment range for flow-through          |                                                                                                                                              |                                                          |                                                          |                                                          |
| Measuring range                                      | 4 to 1250 l/min<br>0.3 to 99.8 m/s<br>0.25 to 75 m³/h                                                                                        | 14 to 3750 l/min<br>0.4 to 103.7 m/s<br>0.8 to 225 m³/h  | 20 to 6830 l/min<br>0.3 to 81 m/s<br>1.4 to 410 m³/h     | 40 to 11670 l/min<br>0.3 to 84 m/s<br>2.5 to 700 m³/h    |
| Temperature coefficient                              | ±0.07 % m.v. 1/K                                                                                                                             |                                                          |                                                          |                                                          |
| Accuracy<br>(in measuring range)                     | Class 141: ±(2 % m.v. + 0.5 % f.v.); class 344: ±(6 % m.v. + 0.6 % f.v.) ; air quality acc. to ISO 8573-1:2010; at medium temperature +23 °C |                                                          |                                                          |                                                          |
| Repeat accuracy                                      | 0.8 % m.v.+ 0.2 % f.v.                                                                                                                       |                                                          |                                                          |                                                          |
| Display range                                        | 0 to 1500 l/min<br>0 to 119.8 m/s<br>0 to 90 m³/h                                                                                            | 0 to 4500 l/min<br>0 to 124.4 m/s<br>0 to 270 m³/h       | 0 to 8200 l/min<br>0 to 97.2 m/s<br>0 to 492 m³/h        | 0 to 14000 l/min<br>0 to 100.8 m/s<br>0 to 840 m³/h      |
| Resolution                                           | 1 l/min / 0.1 m/s / 0.05 m³/h                                                                                                                | 2 l/min / 0.1 m/s / 0.1 m³/h                             | 10 l/min / 0.1 m/s / 0.2 m³/h                            | 10 l/min / 0.1 m/s / 0.5 m³/h                            |
| Analog starting point ASP                            | 0 to 1000 l/min<br>0 to 79.8 m/s<br>0 to 60 m³/h                                                                                             | 0 to 3000 l/min<br>0 to 83 m/s<br>0 to 180 m³/h          | 0 to 5460 l/min<br>0 to 64.8 m/s<br>0 to 327.9 m³/h      | 0 to 9330 l/min<br>0 to 67.2 m/s<br>0 to 560 m³/h        |
| Analog end point AEP                                 | 250 to 1250 l/min<br>20 to 99.8 m/s<br>15 to 75 m³/h                                                                                         | 750 to 3750 l/min<br>20.7 to 103.7 m/s<br>45 to 225 m³/h | 1370 to 6830 l/min<br>16.2 to 81 m/s<br>82.1 to 410 m³/h | 2330 to 11670 l/min<br>16.8 to 84 m/s<br>140 to 700 m³/h |
| Low flow cut-off LFC                                 | 1 to 13 l/min<br>0.1 to 1.1 m/s<br>0.09 to 0.8 m³/h                                                                                          | 4 to 40 l/min<br>0.1 to 1.1 m/s<br>0.3 to 2.4 m³/h       | 10 to 70 l/min<br>0.1 to 0.9 m/s<br>0.5 to 4.4 m³/h      | 30 to 120 l/min<br>0.2 to 0.8 m/s<br>2 to 7 m³/h         |
| Incremental range                                    | 1 l/min / 0.1 m/s / 0.01 m³/h                                                                                                                | 1 l/min / 0.1 m/s / 0.1 m³/h                             | 1 l/min / 0.1 m/s / 0.1 m³/h                             | 1 l/min / 0.1 m/s / 0.1 m³/h                             |
| Measuring/adjustment range for flow-through quantity |                                                                                                                                              |                                                          |                                                          |                                                          |
| Measuring range                                      | 0 to 100000000 m³   0 to 353146667.2 scf                                                                                                     |                                                          |                                                          |                                                          |
| Display range                                        | 0 to 100000000 m³   0 to 353146667.2 scf                                                                                                     |                                                          |                                                          |                                                          |
| Measuring/adjustment range for pressure              |                                                                                                                                              |                                                          |                                                          |                                                          |
| Measuring range                                      | -1 to +16 bar                                                                                                                                |                                                          |                                                          |                                                          |
| Display range                                        | -1 to +20 bar                                                                                                                                |                                                          |                                                          |                                                          |
| Resolution                                           | 0.05 bar                                                                                                                                     |                                                          |                                                          |                                                          |
| Analog starting point                                | -1 to +12.8 bar                                                                                                                              |                                                          |                                                          |                                                          |
| Analog end point                                     | 2.2 to 16 bar                                                                                                                                |                                                          |                                                          |                                                          |
| In steps of                                          | 0.01 bar                                                                                                                                     |                                                          |                                                          |                                                          |
| Measuring//adjustment range for temperature          |                                                                                                                                              |                                                          |                                                          |                                                          |
| Measuring range                                      | -10 to +60 °C   +14 to +140 °F                                                                                                               |                                                          |                                                          |                                                          |
| Display range                                        | -24 to +74 °C   -11.2 to +165.2 °F                                                                                                           |                                                          |                                                          |                                                          |
| Resolution                                           | 0.2 °C  0.5 °F                                                                                                                               |                                                          |                                                          |                                                          |
| Analog starting point                                | -10 to +46 °C   +14 to +114.8 °F                                                                                                             |                                                          |                                                          |                                                          |
| Analog end point                                     | +4 to +60 °C   +39.2 to +40 °F                                                                                                               |                                                          |                                                          |                                                          |
| In steps of                                          | 0.1 °C  0.1 °F                                                                                                                               |                                                          |                                                          |                                                          |
| Field of application                                 |                                                                                                                                              |                                                          |                                                          |                                                          |
| Media                                                | Operational compressed air                                                                                                                   |                                                          |                                                          |                                                          |
| Medium temperature                                   | -10 to +60 °C   +14 to +140 °F                                                                                                               |                                                          |                                                          |                                                          |
| Min. rupture pressure                                | 64 bar                                                                                                                                       |                                                          |                                                          |                                                          |
| Pressure resistance                                  | 16 bar                                                                                                                                       |                                                          |                                                          |                                                          |
| Electrical data                                      |                                                                                                                                              |                                                          |                                                          |                                                          |
| Operating voltage                                    | 18 to 30 VDC (acc. to EN 50178 SELV/PELV)                                                                                                    |                                                          |                                                          |                                                          |
| Current consumption                                  | < 80 mA                                                                                                                                      |                                                          |                                                          |                                                          |

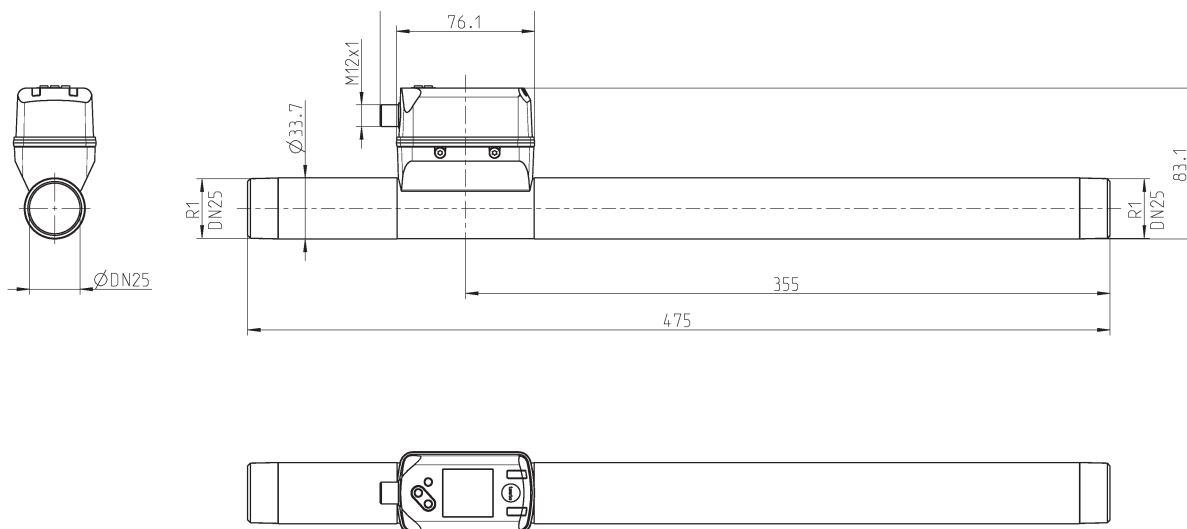
|                                | testo 6451                                                                                                                                                                                                                                               | testo 6452                                                                                                                                                | testo 6453 | testo 6454                      |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------------------------|
| Outputs                        |                                                                                                                                                                                                                                                          |                                                                                                                                                           |            |                                 |
| Output signal                  | 2 x analog output signal; 4 to 20 mA (scalable)                                                                                                                                                                                                          |                                                                                                                                                           |            |                                 |
| Max. load                      | 500 Ω                                                                                                                                                                                                                                                    |                                                                                                                                                           |            |                                 |
| Short circuit protection       | Yes                                                                                                                                                                                                                                                      |                                                                                                                                                           |            |                                 |
| Pressure monitoring            |                                                                                                                                                                                                                                                          |                                                                                                                                                           |            |                                 |
| Repeat accuracy                | ±0.2 % of full scale value                                                                                                                                                                                                                               |                                                                                                                                                           |            |                                 |
| Characteristic curve deviation | < ±0.5 % of final value; (BFSL = Best Fit Straight Line (smallest value adjustment))                                                                                                                                                                     |                                                                                                                                                           |            |                                 |
| Greatest TC of the span        | ±0.15 % f.v. / 10 K                                                                                                                                                                                                                                      |                                                                                                                                                           |            |                                 |
| Greatest TC of the zero point  | ±0.25 % f.v. / 10 K                                                                                                                                                                                                                                      |                                                                                                                                                           |            |                                 |
| Temperature monitoring         |                                                                                                                                                                                                                                                          |                                                                                                                                                           |            |                                 |
| Accuracy                       | ±0.5 K; (for media flow at the limits of the flow measuring range)                                                                                                                                                                                       |                                                                                                                                                           |            |                                 |
| Reaction times                 |                                                                                                                                                                                                                                                          |                                                                                                                                                           |            |                                 |
| Response time                  | 0.1 s; (dAP = 0)                                                                                                                                                                                                                                         |                                                                                                                                                           |            |                                 |
| Pressure monitoring            |                                                                                                                                                                                                                                                          |                                                                                                                                                           |            |                                 |
| Response time                  | 0.05 s                                                                                                                                                                                                                                                   |                                                                                                                                                           |            |                                 |
| Temperature monitoring         |                                                                                                                                                                                                                                                          |                                                                                                                                                           |            |                                 |
| Response dynamic               | T <sub>09</sub> = 0.5 s                                                                                                                                                                                                                                  |                                                                                                                                                           |            |                                 |
| Ambient conditions             |                                                                                                                                                                                                                                                          |                                                                                                                                                           |            |                                 |
| Ambient temperature            | 0 to +60 °C                                                                                                                                                                                                                                              |                                                                                                                                                           |            |                                 |
| Storage temperature            | -20 to +85 °C                                                                                                                                                                                                                                            |                                                                                                                                                           |            |                                 |
| Humidity                       | max. permitted relative humidity < 90 %                                                                                                                                                                                                                  |                                                                                                                                                           |            |                                 |
| Protection class               | IP 65; IP 67                                                                                                                                                                                                                                             |                                                                                                                                                           |            |                                 |
| Approvals / tests              |                                                                                                                                                                                                                                                          |                                                                                                                                                           |            |                                 |
| EMC                            | DIN EN 60947-5-9                                                                                                                                                                                                                                         |                                                                                                                                                           |            |                                 |
| Vibration resistance           | DIN EN 68000-2-6   5 g (10 to 2000 Hz)                                                                                                                                                                                                                   |                                                                                                                                                           |            |                                 |
| Mechanical data                |                                                                                                                                                                                                                                                          |                                                                                                                                                           |            |                                 |
| Weight                         | 728.5 g                                                                                                                                                                                                                                                  | 1598.5 g                                                                                                                                                  | 2262 g     | 2650.5 g                        |
| Materials                      | PBT+PC-GF30; PPS GF40; 1.4301 (stainless steel / 304); 1.4305 (stainless steel / 303); 1.5523 (steel) galvanized; 2.0401 (brass / CW614N); FKM                                                                                                           |                                                                                                                                                           |            |                                 |
| Media contact                  | 1.4301 (stainless steel / 304); 1.4305 (stainless steel / 303); FKM; glass-passivized ceramic; PPS GF40; Al2O3 (ceramic); acrylate                                                                                                                       |                                                                                                                                                           |            |                                 |
| Display / control elements     |                                                                                                                                                                                                                                                          |                                                                                                                                                           |            |                                 |
| Display                        | Colour display - 1.44"   pixel resolution - 128 x 128                                                                                                                                                                                                    |                                                                                                                                                           |            |                                 |
| Comments                       |                                                                                                                                                                                                                                                          |                                                                                                                                                           |            |                                 |
| Comments                       | m.v. = measurement value<br>f.v. = final value of measuring range<br>Measurement, display and adjustment ranges refer to norm volume flow according to DIN ISO 2533.<br>Please see the instruction manual for information on installation and operation. |                                                                                                                                                           |            |                                 |
| Electrical connection          |                                                                                                                                                                                                                                                          |                                                                                                                                                           |            |                                 |
| Plug-in connection             |                                                                                                                                                                       |                                                                                                                                                           |            |                                 |
| Connections                    |                                                                                                                                                                       | 1 - 18 to 30 VDC (+)<br>2 - Analog output pressure, temperature or flow-through<br>4 - Analog output pressure, temperature or flow-through<br>3 - GND (-) |            | brown<br>white<br>black<br>Blue |

# Technical drawings

## testo 6451



## testo 6452





## Ordering data

### testo 6451

testo 6451 compressed air meter including inflow/outflow section, diameter DN15 (½"), analog output and integrated pressure measurement \*

Order no. 0555 6451



### testo 6452

testo 6452 compressed air meter including inflow/outflow section, diameter DN25 (1"), analog output and integrated pressure measurement \*

Order no. 0555 6452



### testo 6453

testo 6453 compressed air meter including inflow/outflow section, diameter DN40 (1½"), analog output and integrated pressure measurement \*

Order no. 0555 6453



### testo 6454

testo 6454 compressed air meter including inflow/outflow section, diameter DN50 (2"), analog output and integrated pressure measurement \*

Order no. 0555 6454



\* a connection cable, e.g. order no. 0699 3393 is required for operation

## Accessories

#### Connections

Order no. 0699 3393



|                    |                                                                                                                                                                                                                   |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connections        | 1 Supply connection 18 to 30 VDC (+)<br>2 Analog output pressure, temperature, or flow-through (4 to 20 mA)<br>4 Analog output pressure, temperature, or flow-through (4 to 20 mA)<br>3 Supply connection GND (-) |
| Cable length       | 5 metres                                                                                                                                                                                                          |
| Plug-in connection | M12 plug connection                                                                                                                                                                                               |

brown  
white  
black  
Blue

#### Mains unit (desktop appliance)

Order no. 0554 1748



|        |                |
|--------|----------------|
| Input  | 110 to 240 VDC |
| Output | 24 VDC/ 350 mA |

#### Mains unit (top-hat rail mounting)

Order no. 0554 1749



|        |                                |
|--------|--------------------------------|
| Input  | 85 to 264 VAC   110 to 300 VDC |
| Output | 24 VDC/ 2.5 A                  |

msp/10.2021

Subject to change, including technical modifications.