

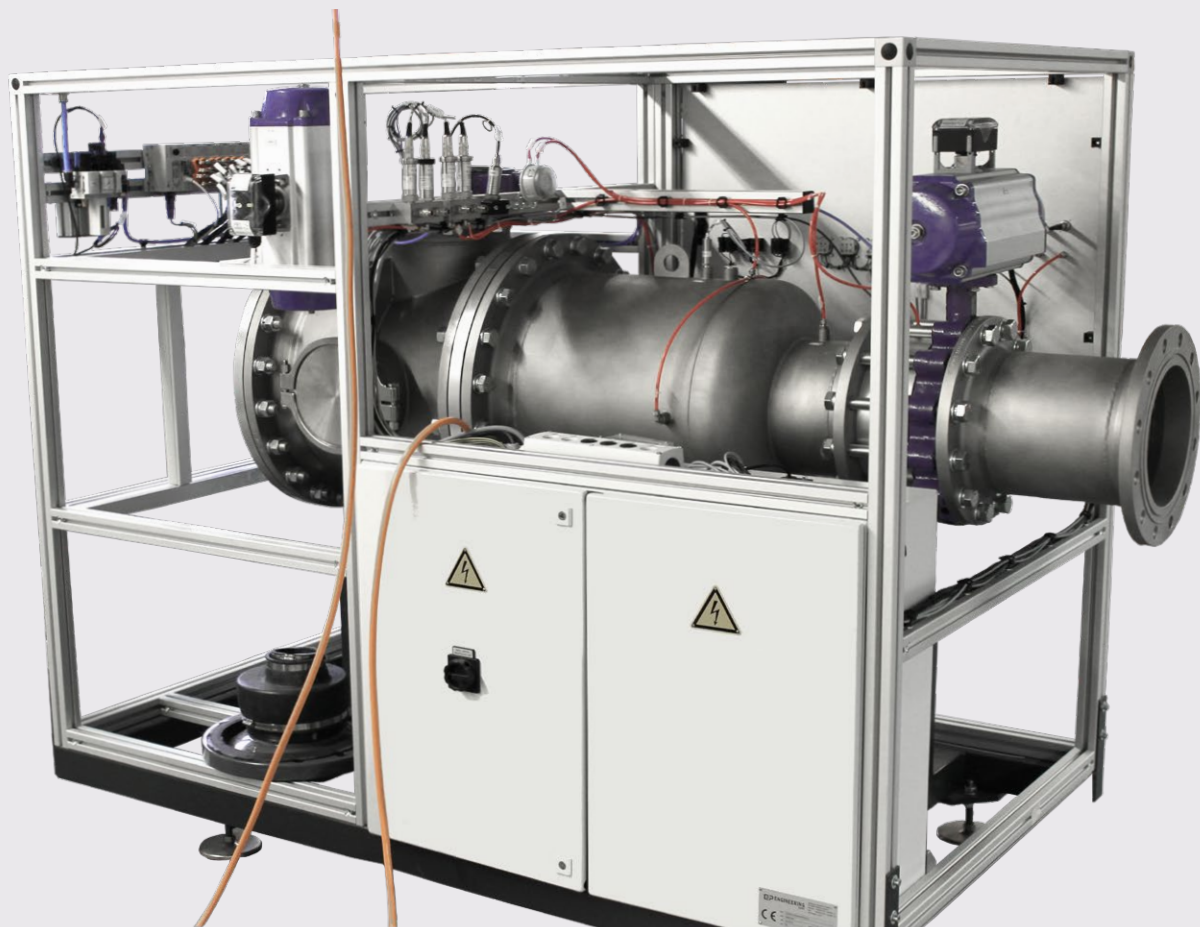
Perfection in fluids.

The right *flow*  
by German engineering.



# SMF<sup>®</sup>10,000 - DD SonicMasterFlow<sup>®</sup>

Data sheet EPE-160302



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GERMANY

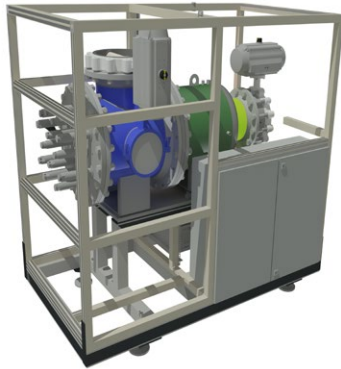


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## Calibration rig with sonic nozzles Drum Design

Calibration rig with up to 18 sonic nozzles  
Flow Generation up to 10,000 m<sup>3</sup>/h  
Nozzle equipment according to customer requirements



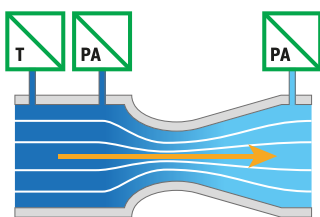
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### Technical data

Volume flow	1...10,000 m <sup>3</sup> /h
Medium	air, compressed air
Dimensions (D x W x H)	1600 x 2500 x 2000 (mm)
Weight	approx. 2000 kg

### Measurement parameters

Absolute pressure – ambient	$p_{amb}$
Temperature - ambient	$T_{amb}$
Absolute pressure – in front of nozzles	$p_{NOZZLE UP}$
Temperature – in front of nozzles	$T_{NOZZLE}$
Rel. humidity - in front of nozzle	$rH_{NOZZLE}$
Absolute pressure - downstream from nozzle	$p_{NOZZLE DOWN}$



Measurement  
principle

### Description

The series of SMF<sup>®</sup> nozzle test rigs has been designed specifically for calibration with air. Depending on customer requirements, up to 18 sonic nozzles can be combined. The different circuits resulting therefrom allow a flow generation of 2<sup>18</sup> = 262,144 different flow rates. A precise flow can be adjusted in a very short period of time (about 500 ms). The register is made of drum configuration and equipped with appropriate sensors (temperature, pressure and humidity) for density determination. A calibration assembly provides an atmospheric suction through the specimen and the nozzle barrel. A vacuum pump, or the connection to the house vacuum power, ensures the necessary sonic pressure ratio downstream of the nozzles. Alternatively, operation can also be realised with overpressure, according to customer requirements.

The system is controlled by a PC with precise data acquisition hardware and control software in LabVIEW.

### Advantages

- ✓ Compact design
- ✓ Integrated inlet section
- ✓ Highest accuracy – up to 0.15%
- ✓ Approved by the PTB as a calibration standard
- ✓ Representation of the volume flow or mass flow
- ✓ Flexible nozzle adjustment per customer requirements
- ✓ Gas meter calibration up to G 6500
- ✓ Excellent long-term stability - recalibration period up to 10 years for sonic nozzles



### Standard solutions

#### Application examples:



#### Gas and flow measurement technology:

Calibration rig for gas meters, MFM, MFC, LFE, Venturi nozzles



Automotive: Balance stand for valves, actuators, flow meters, HFM, ...



Filtration technology: Characteristic line test bench for intake filters



Valve technology: Characteristic line test bench for valves



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For special requirements we are happy to advise you. Subject to change. / EPE-160302 / Last update: 01/2018 / V02  
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