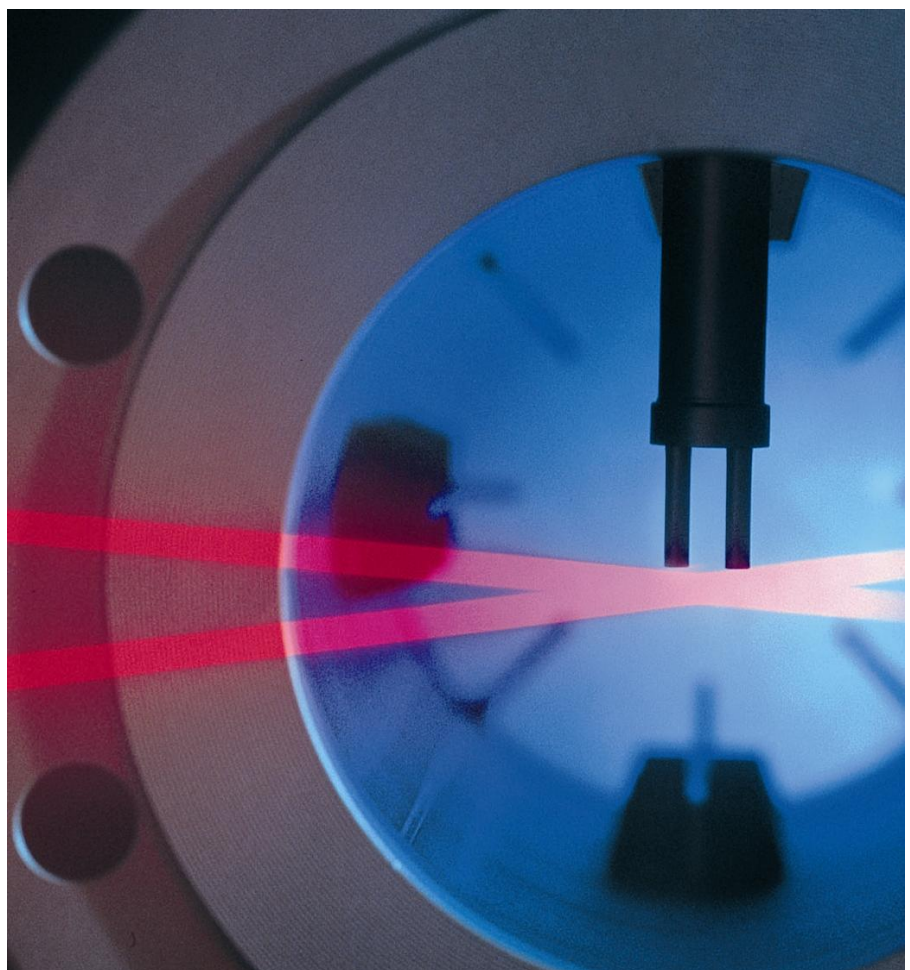


COMBIMASS®

Technical data
COMBIMASS® compact
Version 2012-01



THE SYSTEM

The COMBIMASS® compact series of gas mass flow meters are field transmitters for flow rate measurement. They are especially designed for process applications at temperatures of up to 290°C and operating pressures of up to 63 bars. Optionally, the units are available in explosion-proof versions for Zone 1 or Zone 0. The flow transmitters apply thermal dispersion technology in order to measure directly the normal volumetric or gas mass flow, regardless of the operating pressure and temperature of the medium.

All units of the COMBIMASS® series are characterized by high-performance digital signal processing. Important features of the transmitter electronics for the purposes of practical operation are the temperature compensation and the opportunity to select different measuring modes (choice between constant current or constant temperature principle).

The electronics of the COMBIMASS® compact is located in a compression-proof dual compartment stainless steel enclosure. The slewable cable gland for easy installation is ideally suited for outside operation of the flow transmitter. Optionally a 10 digits LED display with control panel is available for indication of actual flow rate or totalized flow as well as for field programming of the flow meter.

For transmission of the flow signal an isolated 4-20 mA analog output as well as a field selectable pulse output are available. For intrinsically safe operation a dedicated process interface module has been developed for the power supply of the flow transmitter. In such a case, the signal output is done via an I/O module installed downstream of the process interface module. The circuitry of the process interface module and the I/O module is located in a top hat rail housing for easy switch cabinet assembly. Also an optionally available graphic display can be installed there.

The flow transmitter can be assembled individually according to the specific application. Each flow meter will be tested prior to shipment and calibrated at our CAMASS® calibration lab under actual operating conditions.

SMART FEATURES

- Thermal flow meter for direct measurement of normal volumetric or gas mass flows
- Flow rate measurement unaffected by pressure and temperature fluctuations
- Pressure-proof dual compartment stainless steel enclosure
- Slewable packing gland avoids moisture permeation in outside installations
- Compact and rugged design for exceptional reliability
- Easy to install and service
- Unmatched accuracy due to digital signal processing
- Temperature compensated flow rate measurement
- Choice of different measuring modes
- Expandable due to modular design
- Suitable for process temperatures of up to 290°C
- EEx [ia] Zone 0 optionally available

APPLICATIONS VERSATILITY

- Air and technical gases
- Combustion gases such as methane, propane, natural gas, etc.
- Waste gas measurement, especially at high process temperatures
- Combustion air in incineration plants
- Highly corrosive, explosive and flammable gases
- Gases at extreme process conditions
- Process gases such as acetylene, H₂, phosgene, ozone, etc.
- Gases and gas mixtures of known composition

SPECIFICATIONS

| | |
|-------------------------------|--|
| Measuring principle | Gas flow measurement based on thermal dispersion technology |
| Applications | Compressed air, air, technical gases, inert gases, supply gases, combustion gases, process gases, explosive and flammable gases, dirty and moist gases, gases and gas mixtures of known composition |
| Measured parameter | <ul style="list-style-type: none"> • Gas mass flow [kg/h] • Normal volumetric flow [Nm³/h] • Normal flow velocity [Nm/s] |
| Signal processing | Microprocessor based, fully digital signal processing |
| Measuring modes | Constant current or constant temperature principle <u>Note:</u> The measuring mode will be selected by our qualified technicians depending on the application requirements during calibration of the flow meter and may not be changed by the operator. |
| Calibration | One calibration group with advanced temperature compensation |
| Enclosure | Pressure proof dual compartment enclosure, 1.4571, Ø 62 mm |
| Protection class | IP 68 |
| Explosion protection | Approvals according to ATEX (as an option only): EEx [ia] – Zone 0 |
| Ambient conditions | Ambient temperature -40°C to 80°C, relative humidity 80% |
| Power supply | 18 – 36 VDC Power supply via standard supply units possible For intrinsically safe operation – EEx [ia] – power supply via process interface module |
| Power consumption | max. 1,1 Watt |
| Reproducibility (electronics) | 0,075% of reading |

SPECIFICATIONS

| | |
|---|--|
| System accuracy (electronics) | 0,2% of reading + 0,025% of full scale |
| Measuring accuracy (depending on application and type of calibration) | 2% of reading + 0,1% of full scale (standard applications) 2% of reading + 0,2% of full scale (extreme applications) 1% of reading + 0,1% of full scale (optional – please, call factory) |
| Flow range (1013 mbar, 0°C) | 0,46 – 46 Nm/s (standard) 0,08 – 400 Nm/s (optional) |
| Turndown ratio | 10 : 1 up to 1000 : 1 |
| Field display / control (optional) | <ul style="list-style-type: none"> • 10 digits, alphanumeric LED display for field indication of flow rate or totalized flow • Integrated totalizer • Control pad for field programming of the flow meter using a magnetic pin • Easy-to-use menu for transmitter set-up |
| Graphic display (optional) | <ul style="list-style-type: none"> • Remote graphic display (wall or switch cabinet mounting) • Simultaneous indication of flow rate and totalized flow • Integrated totalizer • Touch pad for easy programming of the flow meter • Easy-to-use menu for transmitter set-up |
| Signal output (isolated) | 1 x analog output: 4-20 mA, active load < 400 Ohm 10 bit resolution 1 x impulse output: field selectable max. 2 impulse/s |
| Choice of sensors | Sensor geometry: 2-pin type, special geometries (on request) Process temperature: max. 290°C Operating pressure: max. 63 bar Diameter of sensor rod: 12 mm, 18 mm, 25 mm Materials: 1.4571 (standard) 1.4435, HC 22, special materials (optional) Approvals: PED test certificate, modules B+F or module G (optional) Certificates: 3.1B material certificate (optional) Type of flow element: Insertion flow element /Inline flow element Process connections: Compression fitting, butt weld, screw, flange (DIN, ANSI), retractable packing gland Hot tapping: depending on the operating pressure of the medium <ul style="list-style-type: none"> • manually actuated with ball valve • lead-screw actuated with ball valve • hydraulically actuated with ball valve |

INLET AND OUTLET STRAIGHT PIPE RUNS

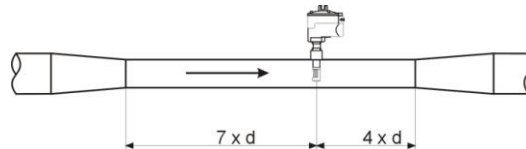
General information

To achieve high accuracy in flow rate measurement as specified, consideration of sufficient inlet and outlet straight pipe runs according to DIN ISO 5167-1 is crucial during installation of the flow transmitter. Reasonable measuring results can also be achieved with shortened inlet and outlet straight pipe runs according to the below specifications.

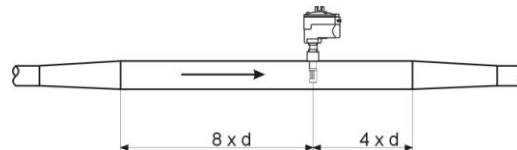
If sufficient inlet and outlet straight pipe runs are not available, please call factory. It might be possible to achieve the required measurement accuracy, if a special calibration can be carried out at our CAMASS[®] calibration lab by simulating the actual operating conditions, the range of flow rates and the piping.

Alternatively, the installation of a COMBIMASS[®] flow conditioner may allow to achieve accurate measuring results when space is restricted.

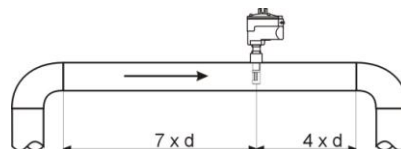
Reduction piece



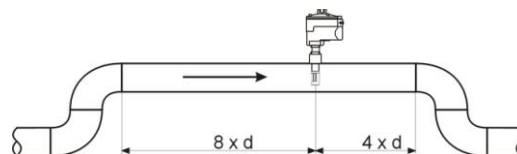
Extension piece



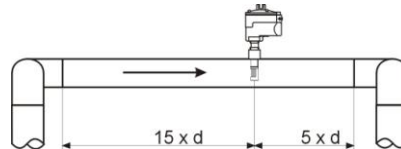
One 90° elbow



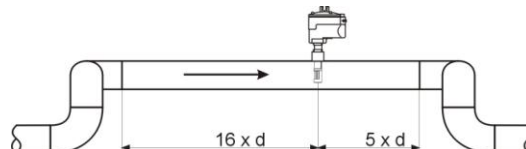
Two 90° elbows in one plane



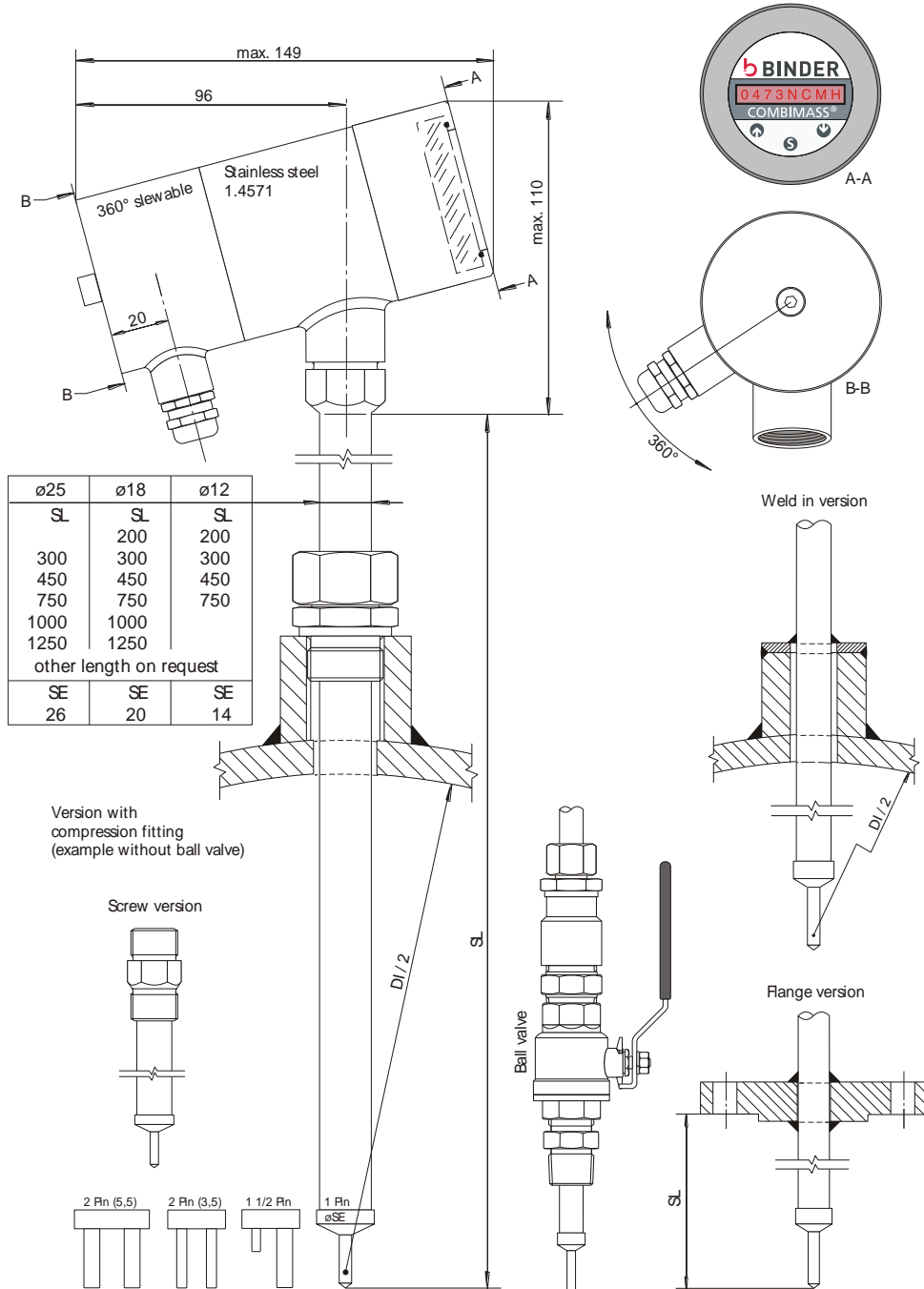
Two 90° elbows in two planes



Three 90° elbows in three planes



DIMENSIONS



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