

COMBIMASS®

Technical Information COMBIMASS® AL / SS 100



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The instruments of **COMBIMASS® flow meter** series are field transmitters for measuring the flow rate of compressed air and technical gases at medium temperatures up to 220°C. The flow transmitters apply thermal dispersion technology in order to measure directly the normal volumetric or gas mass flow in dry gases according to DIN 1343, regardless of the operating pressure and temperature of the medium.

These flow meters of the COMBIMASS® series already perform fully 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® AL / SS100 is located in a compact aluminium or stainless steel enclosure with an optionally local 8-digit display. On the integrated electronic board there are various configurations available:

- 2 analogue inputs for the processing of additional signals (temperature, humidity, gas composition), 3 analogue outputs for flow signal compensation, a field selectable pulse output, 1 current loop slave for further data transmission or
- 2 analogue inputs for the processing of additional signals (temperature, humidity, gas composition), 2 analogue outputs for flow signal compensation, a field selectable pulse output, RS 232 for further data transmission or
- 2 analogue inputs for the processing of additional signals (temperature, humidity, gas composition), 2 analogue outputs for flow signal compensation, a field selectable pulse output, Modbus RTU for further data transmission

A further option is a remote electronics with graphic display in a field cabinet **COMBIMASS® electronics** for wall assembly (indoors/ outdoors). At this graphic display (4.3" or 7") all data can be indicated at the same time. For transmission of the flow signal isolated 4-20 mA analogue outputs, digital and relay outputs as well as various bus versions (Modbus RTU, Modbus TCP, Profibus DP, Profinet) are available. Data can be stored internally on a USB-stick or SD-card.

If straight inlet and outlet piping is quite short as well as the requirements on accuracy are very high, a patented **COMBIMASS® flow conditioner** with low pressure drop can be installed in front of the flow sensor.

The **COMBIMASS® hot tapping unit** allows the removing of the sensor during operation for monitoring and maintenance even at higher gas temperatures and pressures, without any loss of air. There are different versions available: a simple ball valve with flexible insertion depth (version OEIN-S) and a more sophisticated unit with fixed insertion depth and mounting position/ orientation of the sensor (version OEIN-F).

Each **COMBIMASS® flow meter** will be tested prior to shipment and calibrated at our CAMASS® calibration Lab under actual operating conditions (e.g. piping layout, gas composition, pipe diameter, pipe orientation and flow direction, etc). Different calibration levels are available: starting from a standard calibration if straight inlet and outlet pipe run is sufficient long to a calibration with original pipe sections and/ or with a flow conditioner.

SMART FEATURES

- Thermal flow meter for direct measurement of standard volumetric or gas mass flows in dry gases according to DIN 1343
- Flow rate measurement unaffected by pressure and temperature fluctuations
- Aluminium / stainless steel enclosure
- Compact and rugged design for exceptional reliability, maintenance-free, corrosion-proof
- Unmatched accuracy due to digital signal processing and variety of special calibration
- Expandable modular design, easy to install and more or less maintenance-free
- Expandable due to modular design

TECHNICAL DATA

Measuring principle	Gas flow measurement based on thermal dispersion technology without additional temperature and pressure compensation
Measured parameter	<ul style="list-style-type: none"> • Gas mass flow [kg/h] • Standard volumetric flow [Nm³/h] • Standard flow velocity [Nm/s]
Signal processing	Microprocessor based, fully digital signal processing
Measuring mode	Constant current or constant temperature principle <u>Note:</u> The measuring mode will be selected by our qualified technicians depending on the application requirements and may not be changed by the operator.
Calibration	Various calibration level COMBIMASS® calibration available, depending on installation situation, incl. temperature compensation
Enclosure	cylindrical enclosure, aluminum (AL)/ stainless steel (SS), Ø 110 mm
Protection class	IP68
Ambient temperature	from -40°C to +80°C
Power supply	18-36 VDC (power supply via standard supply units possible)
Power consumption	Max. 7 Watt
Reproducibility	electronics: 0.125% of reading
Measuring accuracy flow	Standard: +/- 2.5% of reading + 0.2% of full scale at the test bench, better accuracies on request, depending on level of calibration and installation situation
Measuring range flow (1.013 mbar, 0°C)	0.46 – 46 Nm/s (Standard), 0.08 – 400 Nm/s (Option) N... Standard conditions according to DIN 1343
Turn-down-ratio	10:1 to 100 : 1

TECHNICAL DATA

Display and Operation (optional)	<ul style="list-style-type: none"> • 8 digits, alphanumeric LED-display for field indication of actual flow rate and total flow, integrated totalizer, easy programming of the flow meter with a magnetic pin, simple and logical menu for transmitter set-up • Monitoring on a remote graphic display, mounted in a field cabinet COMBIMASS® electronic (remote-version – electronics in a separate housing) or directly on DIN-rail
Choice of sensors (option)	<p>Sensor geometry: 2 Pin, stainless-steel-ceramic sensor without welded, soldered or pressed-in parts</p> <p>Process temperature: max. 220°C</p> <p>Operating pressure: max. 10 bar</p> <p>Diameter of sensor rod: 12 mm (standard), 18 mm (option)</p> <p>Type of flow element: Insertion sensor, directly mounted onto a welded sleeve, ½" or ¾" (when using the hot tapping unit, ½" or 1")</p> <p>Material: 1.4571 (316 TI, standard)</p> <p>Hot tapping: unit manually actuated with ball valve for flexible insertion depth COMBIMASS® hot tapping unit OEIN-S, as an option unit with fixed insertion depth and secured sensor orientation COMBIMASS® hot tapping unit OEIN-F, as an option with protection guard</p> <p>Process connections: Compression fitting or flange (if hot tapping unit OEIN-F shall be used)</p>

INLET AND OUTLET STRAIGHT PIPE RUNS

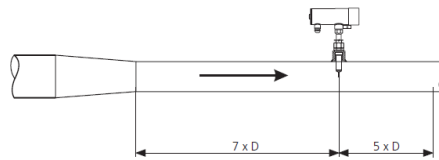
General information

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 specifications below.

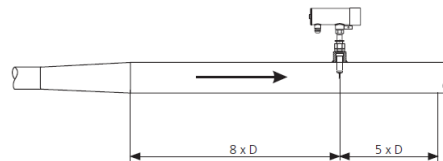
If sufficient inlet and outlet straight pipe runs are not available, it might be possible to achieve the required measurement accuracy if a special calibration can be carried out at our **CAMASS® calibration lab** by simulating the actual operating conditions, the range of flow rates and the pipe run.

Alternatively, with the installation of a **COMBIMASS® flow conditioner** or the use of multiple sensors **COMBIMASS® flow meter multi** may allow or help to achieve precise measuring results when available straight inlet and outlet pipe run is not sufficient long.

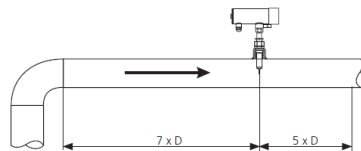
Reduction pieces



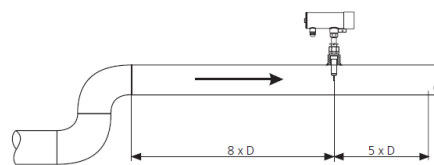
Extension pieces



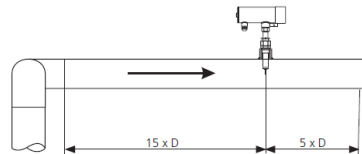
One 90° elbow



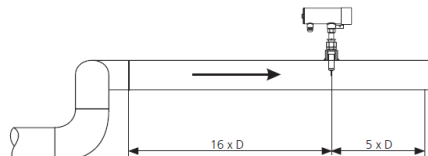
Two 90° elbows in one plane



Two 90° elbows in two planes



Three 90° elbows in three planes



IMPRINT

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