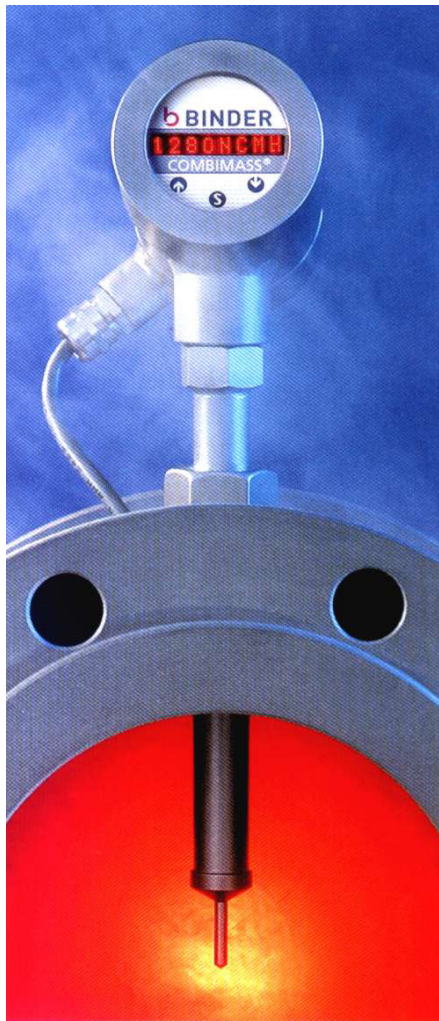


### COMBIMASS

It enables direct measurements of volume gas flow independently of pressure and temperature changes. Different basic modules can be combined with various sensors. The characteristics of the modular concept are as follows :



- progressive evaluation electronics
- possibility of combining the modules
- system extensibility

The COMBIMASS sensors are based on the thermic principle of gas flow measuring :

- they are designed for minimum pressure loss
- they are robust, corrosion resistant, and require minimum maintenance
- they have no mechanical moving parts
- different models and probe dimensions are available

Using innovative technical equipment makes it possible to achieve precise measurement results which are time stable even under extreme conditions and at high temperatures. The COMBIMASS sensors are available in different materials, with different dimensions and connection types.

They are used for the following measurements :

- compressed air, supply air
- pure gases and gas mixtures
- pure and sterile gases
- polluted, humidified or corrosive gases
- inflammable and explosive gases in all branches of industry for various uses

The COMBIMASS devices are available with different sensor geometry types :

**1-pin-sensor** a special sensor, whose heated measuring resistor and reference resistor are placed on a ceramic element. The symmetrical construction enables a flow around both thin film resistors. There are no measurement errors caused by sensor rotation. This certainly contributes to the high measuring accuracy.

**2-pin-sensor** – flow direction must be respected when building in this sensor. The advantage of this sensor is its accuracy with very quick temperature changes. This accuracy has been confirmed by longtime practical experience.

**1 ½ -pin –sensor** has even better reaction to temperature changes. The influence on flow direction is lower than that of the 2-pin-sensor. The 1 ½ -pin –sensor model is recommended for high operation temperatures and hard conditions.



## **BASIC VERSIONS :**

### **COMBIMASS basic**

Basic flow meter for pressure air and technical gases flow measurements at temperatures up to 130°C.

### **COMBIMASS eco**

Flow meter for various standard applications as well as for explosion hazard areas and for temperatures up to 220°C.

### **COMBIMASS compact**

Precise flow meter for extreme applications as well as for explosion hazard areas and for temperatures up to 1100°C.

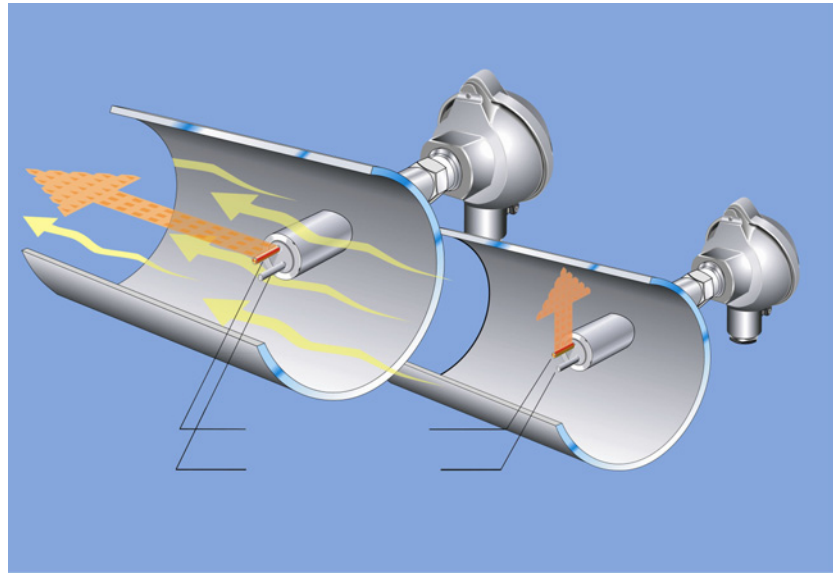
### **COMBIMASS master**

Electronic module with a microprocessor with additional signal input and output as well as with extended monitoring, correction and evaluation ability for highly exacting applications.

### **COMBIMASS multi**

Electronic module for multi-point measurements or redundant gas flow monitoring with checking possibility and various evaluation possibilities (individual measuring point analysis, callipering, etc.)

	<b>COMBIMASS Basic</b>	<b>COMBIMASS Eco</b>	<b>COMBIMASS Compact</b>
<b>Medium temperature</b>	max. 130°C	max. 220°C	-30 to max. 1.100°C
<b>Ambient temperature</b>	-40 to 80°C	-40 to 80°C	-40 to 80°C max. 140°C with hybrid electronics
<b>Service pressure</b>	max. 40 bar	max. 100 bar	max. 100 bar
<b>Measuring range</b>	10 : 1 min / 100 : 1 max	10 : 1 min / 100 : 1 max	10 : 1 min / 100 : 1 / 1000 : 1
<b>Flow rate</b>	0,08 – 46 Nm/s standard max.150 Nm/s spec. cal.	0,08 – 46 Nm/s standard max.240 Nm/s spec. cal.	0,08 – 46 Nm/s standard max.400 Nm/s spec. cal.
<b>Material</b>	pouze 1.4571	Pouze 1.4571 a 1.4435	1.4571, 1.4435 a další Hastelloy, tantal a další
<b>Ex – construction</b>	no	Ex(e)d and Ex(i)a	Ex(e)d and Ex(i)a
<b>Cover</b>	aluminium	stainless steel 1.4571	stainless steel 1.4571 with cable bushing
<b>IP code</b>	IP 65 / IP 54	IP 65 / IP 68	IP 65 / IP 68
<b>Connection</b>	deformation screwing only 12 mm, 1 pin sensor only	deformation screwing only 12 mm or 18 mm flange connection	deformation screwing only 12, 18 mm or 25 mm flange connection
<b>Output signal</b>	analog 4-20 mA pulse max. 30impul./s	analog 4-20 mA pulse max. 30impul./s	analog 4-20 mA pulse max. 30impul./s
<b>Reproducibility (electronics)</b>	0,125 % of displayed value		
<b>Measuring accuracy (depending on application and calibration type)</b>	2,5 % +0,2 % of max. value	2,5 % +0,1 % of max. value 2,5 % +0,2 % of max. value (extreme applications) 1 % +0,1 % of max. value (only after consulting the manufacturer)	2 % + 0,1 % of max. value 2 % + 0,2 % of max. value (extreme applications) 1 % + 0,1 % of max. value (only after consulting the manufacturer)
<b>Medium</b>	pressure air, technical gases	pressure air, biogas, natural gas, flue gases	technologic air, chemical industry applications, explosive gas



## Options :

- display with device control in the “head” of the device
- display with control electronics for switchboard mounting
- shut-off cock

## **Electronics**

The use of the most modern components leads to miniaturization of the electronics, and thus the calibration data memory and sensor data can be located in the “head” of the device as well as the whole signal evaluation control. The sensor data can thus be read and checked.

If a defective sensor is connected to the external electronic module, an error message is displayed at the starting up of the system. Device errors can thus be discovered.

The electronics of the COMBIMASS device enables free selection of the measuring mode. The measuring system can be based on the constant current principle (for lower flow rates, polluted and humid gases, regulating) or the constant temperature principle (ideal for high flow rates and for control of dynamic systems) and it offers maximum flexibility for every measurement. The measuring mode is adjusted by software prior to system calibration and it can be changed at any time later.

## **COMBIMASS offers the optimum solution for your application**

The series of devices was developed for a variety of uses in different areas and branches of industry.

For sterile environments such as pharmaceutical or food processing industry there are large surface sensors which are made of permitted materials and which are specially connected to the process. Sensors made of special materials such as titanium, tantalum, Incotel or Hastelloy are used for corrosive, aggressive, or abrasive gases or gas mixtures measurements.

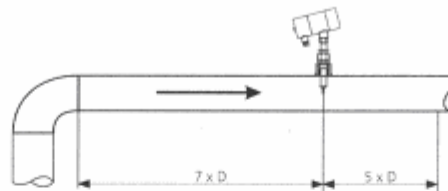
COMBIMASS thus covers a broad spectrum of uses and can be configured optimally for every measurement task.



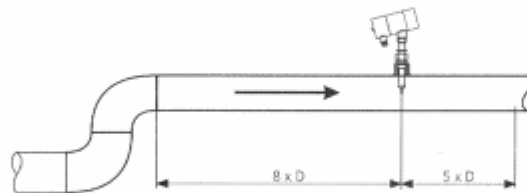
## Mounting conditions :

- the mounting conditions must correspond with the specification (see the questionnaire) in the order. This specifies the calibration conditions. Nonobservance of the conditions will result in measurement error.
- the angle between the flowing gas and the sensor must be  $90^\circ$ .
- the head of the sensor must be in the middle of the piping. For multi-point measurements follow the supplier's measurement instructions.

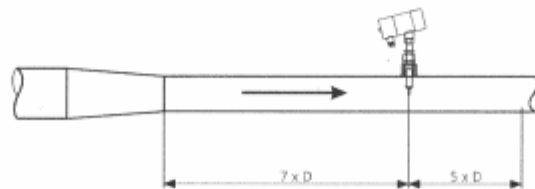
1 x 90° bend



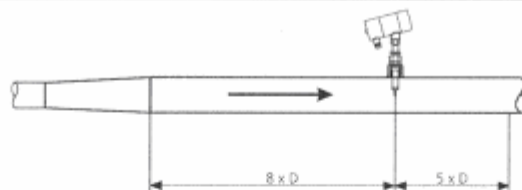
Pipe bend 2 x 90° one way



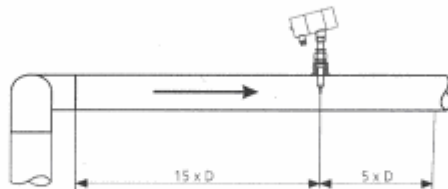
Cross section reduction



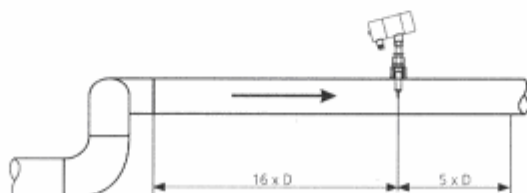
Cross section enlargement



Pipe bend 2 x 90° two way



Pipe bend 3 x 90° three way



The catalogue sheet contains only some parameters important for your decision. For planning always require a corresponding user manual and eventually a technical consultation on the possibilities of use.