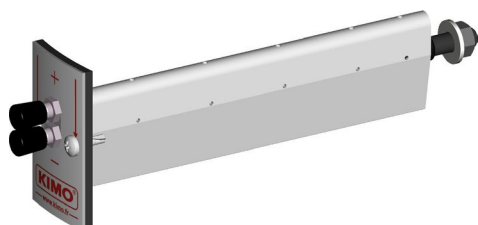


## DATA SHEET

# DEBIMO

## Air flow measurement blades



**Air velocity measurement**  
from 3 to 40 m/s



**Large offer of lengths**  
available (see next page)



**Airfoil section limiting**  
differential heads (<3%)  
and turbulences



**Anodic oxidising for**  
harsh environments

### Features

Associated to any of the Sauermann differential pressure instrument (transmitters, micromanometers, liquid column manometer, pressure switches...), the **DEBIMO air flow measurement blades** allow you to measure and control the average values of the air velocity and air flow inside the ductwork of any HVAC installation.

The **DEBIMO air flow measurement blades**, conceived and manufactured by Sauermann, can be installed in every aerualics system and works with the flow device element principle (flow depending on the differential pressure).

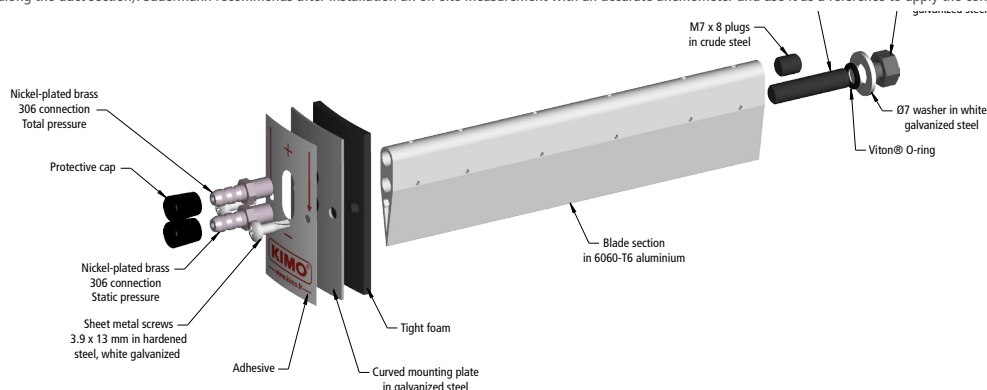
Application examples: air flow measurement in ventilation systems in clean rooms, CMV, smoke removal, smoke extraction installations, dust-removal systems, climatic engineering...

### Technical specifications

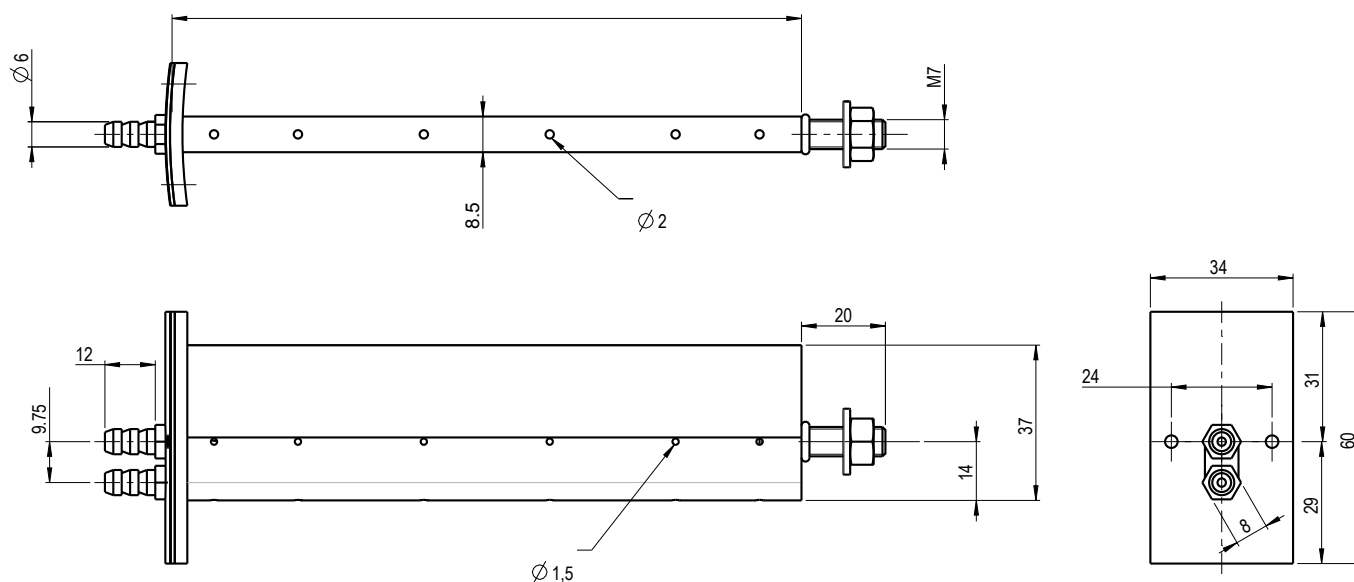
Model	Coefficient	Measuring range	Operating temperature	Static pressure	Accuracy on the installation
Debimo Air flow measurement blades	0.8165	3 to 40 m/s	0 to 210 °C	2 bars maximum in static <sup>1</sup> (check the holding of the used sensor), hereafter on request.	±5% ± accuracy of the pressure sensor, depending on the installation <sup>2</sup> .

<sup>1</sup> On the air flow measurement blade only.

<sup>2</sup> Depends on the low pressure controller used. The blade coefficient is theoretic, so the definitive measurement largely depends on the aerualic network (duct bending, changes of the diameter or other obstacles creating turbulences and changing velocity profile along the duct section). Sauermann recommends after installation an on-site measurement with an accurate anemometer and use it as a reference to apply the correction coefficients on the instrument using the Debimo blade.



## Dimensions (in mm)



Total and static pressure ports location according to the LOG-TCHEBYCHEV\*\* method.

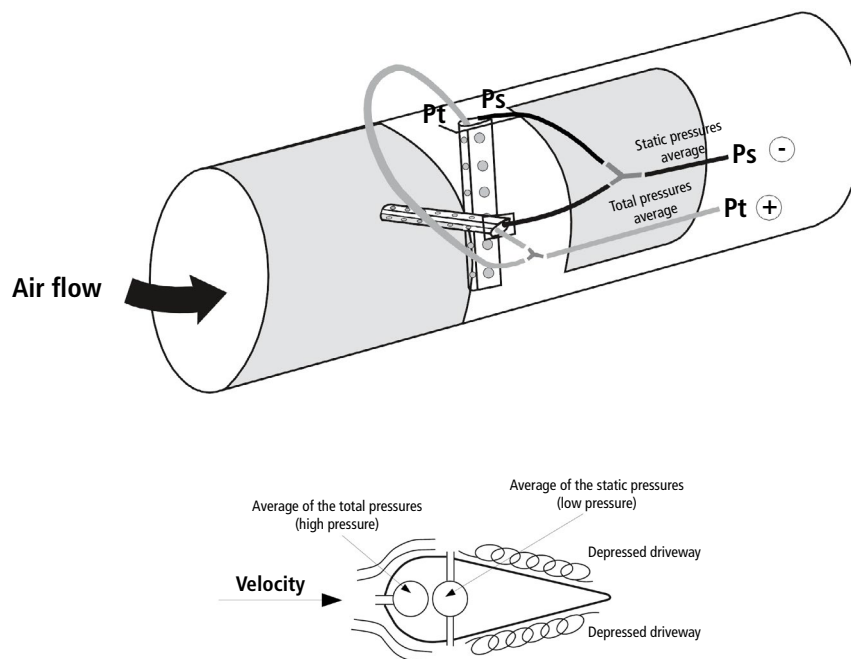
\*See below "Available lengths".

\*\*Distribution of the measurement points for circular sections. It is suitable for most ductwork installations when a proper installation is made and the needed corrections are applied.

## Available lengths

Reference	Useful length (in mm)
DEBIMO 100	100
DEBIMO 125	125
DEBIMO 160	160
DEBIMO 200	200
DEBIMO 250	250
DEBIMO 315	315
DEBIMO 400	400
DEBIMO 500	500
DEBIMO 630	630
DEBIMO 800	800
DEBIMO 1000	1000
DEBIMO 1500	1500
DEBIMO 2000	2000
DEBIMO 2500	2500
DEBIMO 3000	3000

## Working principle



The symmetric airfoil section limits head losses (<3%) and turbulences.

The measuring holes distribution on the blade enables the control of the average air flow across the duct section (average of the differential pressures).



Special dimensions available on request (from 100 to 3000 mm).

## Application



- Monitoring of the air flow

Low differential pressure transmitter sensor  
**CP210-R and SQR/3**



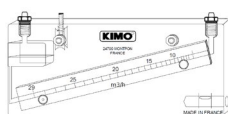
- Alarm
- Visualize
- Operate
- Monitoring of the air flow

Low differential pressure transmitter sensor with digital display  
**Si-C320 or CA310 with SPI 2 – 100, 500, 1000, 10000 and SQR/3**



- Alarm
- Visualize
- Record
- Analyze
- Live monitoring

Smart multifunction handheld  
**AMI310**



Inclined liquid column manometer with ruler m<sup>3</sup>/h, in special realizations, according to quantities.

## Measurement

- Measurement of Air Velocity average  $V_A$

Simplified formula:

$$V_M = C_F \times 1.289 \times \sqrt{\Delta P} = 1.052 \times \sqrt{\Delta P}$$

Complete formula:

$$V_A = C_F \sqrt{\frac{2 \Delta P}{\rho}} \quad \rho = \frac{P_o}{287.1 \times (T + 273.15)}$$

With:

$C_F$ : coefficient of the flow device element

**Debimo blade's coefficient \*\*\*:**  $C_F = 0.8165$

$\theta$ : given temperature (°C)

$P_o$ : given atmospheric pressure (Pa)

\*\*\*The Debimo coefficient is not constant, as it has different values across the air velocity range. The given value,  $C_F$ , is an average that was precisely stated in our calibration laboratory.

- Air flow measurement

**Air flow calculation:** Air flow =  $V_A \times \text{surface} \times 3600$

Surface: surface of the circular or rectangular duct section in m<sup>2</sup>

N.B: in the electronic devices, the surface is automatically adjustable.

With:

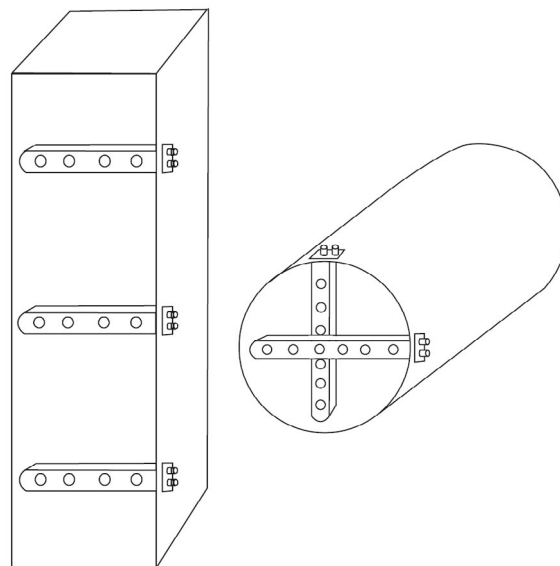
Flow: in m<sup>3</sup>/h

Surface: in m<sup>2</sup>

$V_A$ : in m/s

## Examples of mounting in a duct

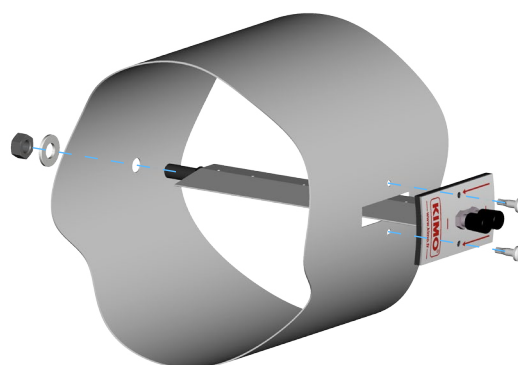
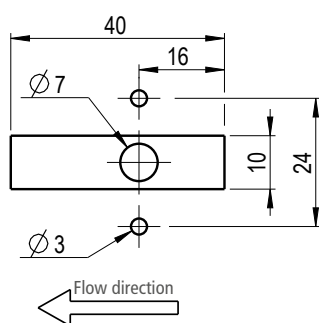
The number of blades chosen depends on the duct form and the desired accuracy. The installation is done by the insertion of one or several DEBIMO elements in the existing duct.



It is largely the accuracy of the measurement device of the differential pressure associated to the DEBIMO system which will make the quality of the flow measurement.

Sauermann, known by the quality of its low pressure measuring instruments, offers a broad range of products, like sensors, pressure switches, micromanometers and liquid column manometers, allowing the users to meet the metrological requirements of their installations.

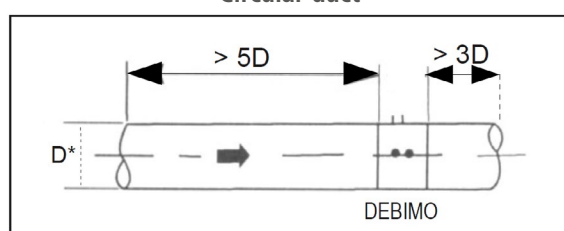
**Dimensions of the requested cutting in the duct (in mm)**



## Installation guideline

### Minimum right length necessary

### Circular duct



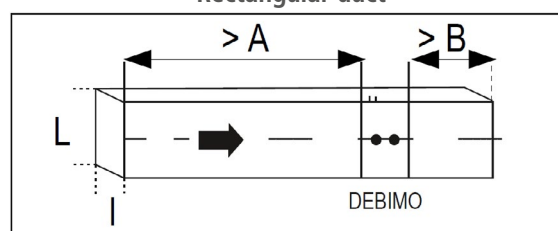
Mounting of a DEBIMO measurement system on an horizontal pipe.

Before DEBIMO, safety distance:  $5 \times D^*$

After DEBIMO, safety distance:  $3 \times D^*$

\* D = sheath diameter in m

### Rectangular duct



Mounting of a DEBIMO measurement system on an horizontal pipe.

Before DEBIMO, safety distance:

$$A > 5 \times \sqrt{\frac{4 \times L \times I^*}{\pi}}$$

After DEBIMO, safety distance:

$$B > 3 \times \sqrt{\frac{4 \times L \times I^*}{\pi}}$$



The more the right lengths are important, the more the accuracy increases.

## Options

- **ECTFE treatment** for severe environment

## Accessories

Name	Reference
Black silicone tubes, 4 x 7 mm (25 m rol)	12761
Transparent silicone tube, 4 x 7 mm (25 m rol)	15089
Cristal tube, 5 x 8 mm (25 m rol)	10321
Spherical ball valve female / female	10398
Junctions in Y for a tube Ø5 x 8 mm, bag of 10	11923
Junctions in T for a tube Ø5 x 8 mm, bag of 10)	11922



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