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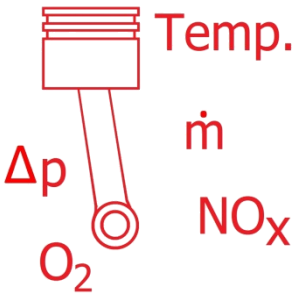

Installation instructions for airflow meter PB-LMS Pierburg (7.22684.00) Part.-No. 50000

Content:

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1. Flow Laminarisation

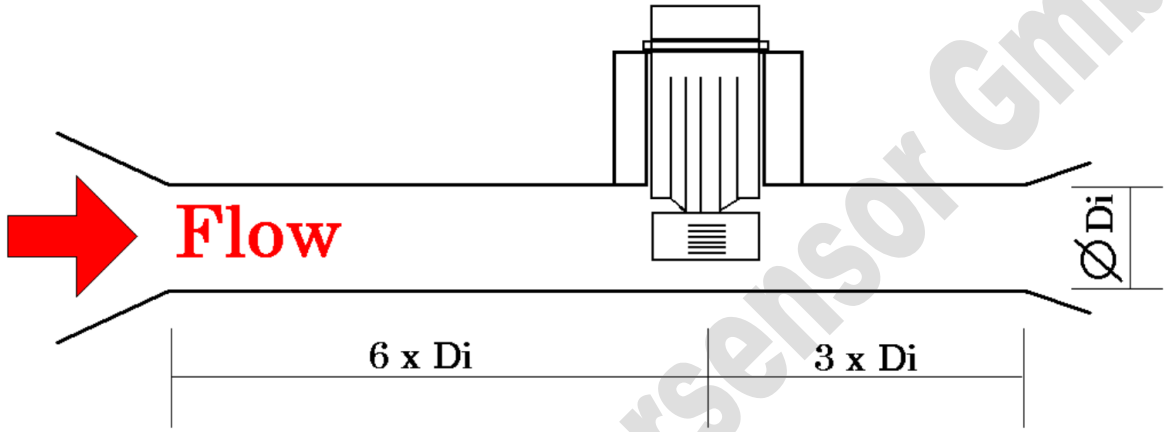
To achieve a laminar a flow pattern the sensor has to be mounted into a long straight pipe with constant cross section. Optimal results are reached with the following intake lengths:

$$L_{IN} = 6 \times D_i$$

In other words, the intake distance in front of the sensor element should not fall below the six fold inside diameter.

The distance after the sensor element is calculated as follows:

$$L_{OUT} = 3 \times D_i$$

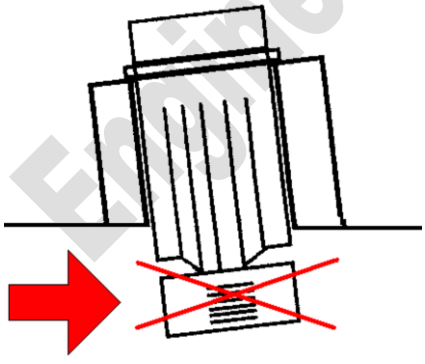


From this arises for the most frequent application:

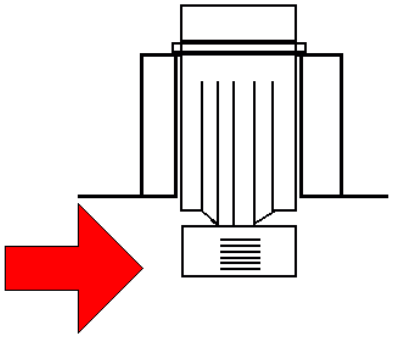
D_i = 70 mm
L_{IN} = 420 mm
L_{OUT} = 210 mm

2. Mounting Notes

It is to be ensured that the sensor-lateral intake distance is aligned parallel to the flow.

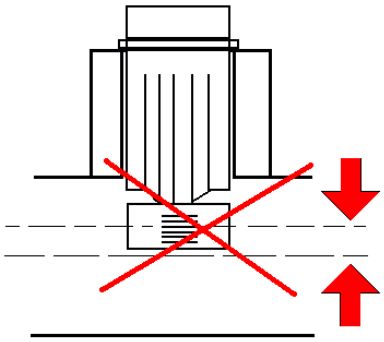


To be avoided!



Ok!

Furthermore the centre line of the sensor's intake should meet the centre of the diameter of the intake tube.



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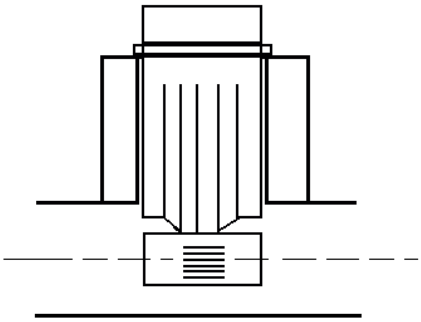
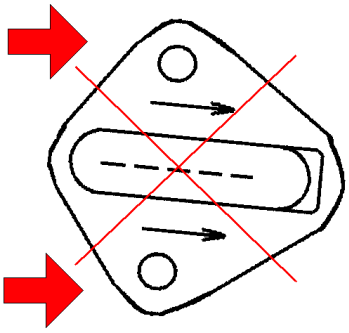


Ok!

The mounting direction has to be similar to the direction of flow.



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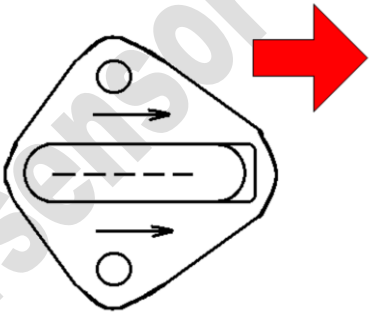
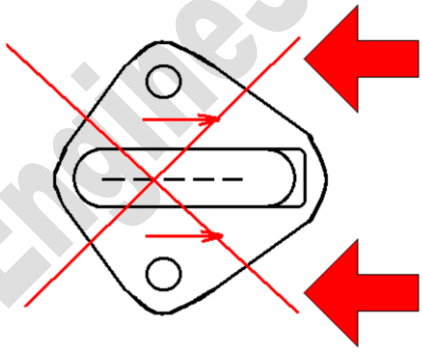
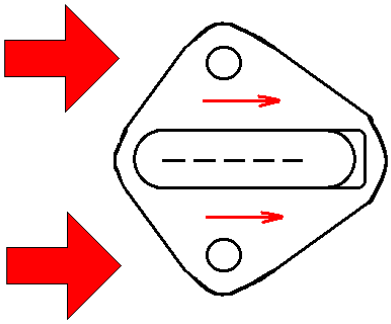


Ok!

The main direction of the flow represents the direction of an arrow indicated on the top side of the housing. With inverse installation only a signal 0V.....1 V will be put out.



To be avoided! In this case signal 0 V ... 1 V.



Ok! Signal 1 V ....5 V.

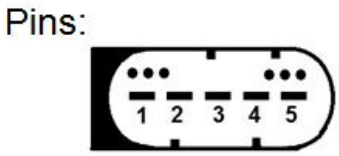
The fixing bolts are to be tightened evenly. The airflowsensor has to be installed in a mounting hole Ø 34.0 mm. The sealing ring must lock cleanly, in order to avoid pressure losses.

3. Choice of the tube Diameter

The airflowsensor can be mounted in tubes with freely selectable diameters. The maximally recommended light diameter should not exceed Di = 120 mm. Generally spoken: With given mass flow a larger diameter leads to smaller flow rate. By variation of the diameter an adjustment is possible. According to the tube diameter used a flow range from 7 kg/h...2,500 kg/h can be determined. In the range of very small flow rates a small tubing cross section is to be selected. Pipes worked satisfactorily so far, rectanglular forms or other cross sections are also suited locations.

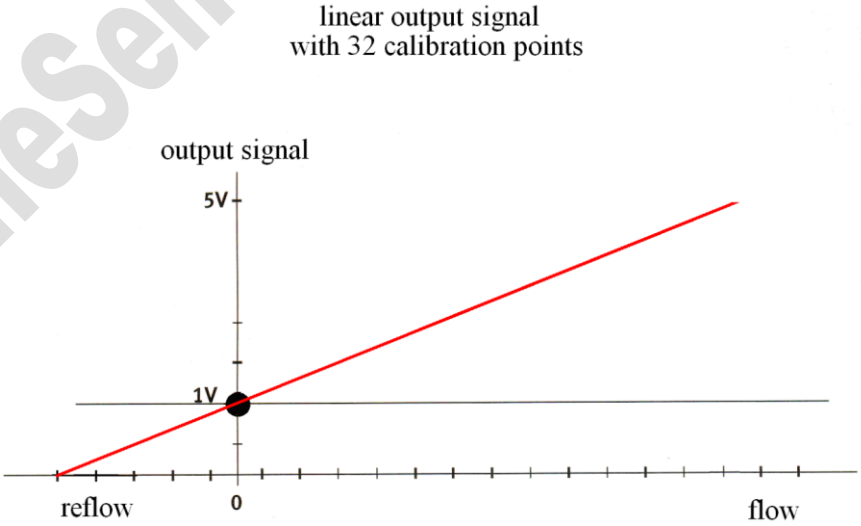
4. Electric Connection

The connection contacts are to be attached in accordance to the sketch underneath.



1. **Ua Signal**
2. **Uref (5 Volt)**
3. **GND**
4. **UBatt (12 Volt)**
5. **N.C**

The connection U_{ref} represents a stabilized 5V voltage supply, which is usually taken from the engine ECU. With external supply voltage stabilization is to be connected. U_{Batt} is 12 V DC supply for the heating elements. Here a load of up to 40 Watts arises. An appropriate circuit breaker of 5 A is to be inserted. U_{ref} and U_{Batt} are connected through at the same time by a two-fold switch. Pin 3 is to be put at mass. The output signal is on pin 1. With flow against the main direction the output signal varies 0V...1V. Under circumstances in main direction the signal varies 1V... 5V. Under the name "PB-LMS Powerpack" a 220V power pack with integrated 12V supply, voltage stabilizer components, safety device, control LED, in-/ circuit breaker and set of cables is available at EngineSens Motorsensor GmbH.
Always good success!



5. Calibration

Depending upon installation position can result an easily curved characteristic. In order to obtain qualitatively good results of measurement, a calibration of the overall system is recommendable. This can be done with calibrated equipment. The measured masses are noted and afterwards the airflow sensor is mounted in its final environment. Precisely a spreadsheet (signal table) can be assigned to the masses measured.
The air mass measurer is subject to an aging, which can be expressed in a signal drift according to extremely frequent heating and cooling cycles. Depending upon quality of the installation accuracies of ± 2 % of the mass flow can be achieved. After a distance of approximately 150,000 km the value can double itself.

6. Technical Data

airflow temperature:	-30°C ... +130°C
mass airflow:	7 kg/h .. 2,500 kg/h according to tube diameter
power supply:	8-16,5 V DC for heating element
	5 V DC stabilized for electronic device
output signal:	0-1 V reflow
	1-5 V flow
accuracy:	+/- 2 % when new
	+/- 4 % after 160,000 km

Important note: Enumeration on connector housing (connector kit not included) is not equivalent to enumeration of pins on the sensor!

Always good success!

Your Team

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