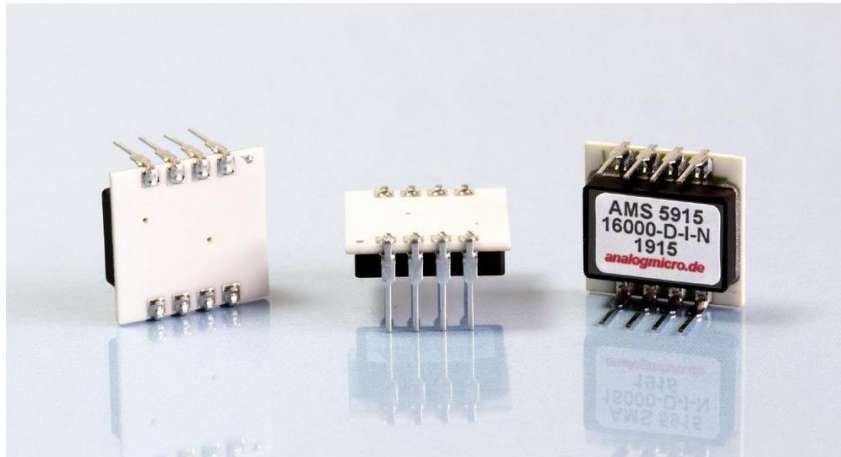


This application note describes the installation of the no-tube package variants (-N types) in the pressure sensor series AMS 5935, AMS 5915, AMS 5812, AMS 5612 and AMS 5105 within a suitable flange. It also offers recommendations how the flange should be designed.

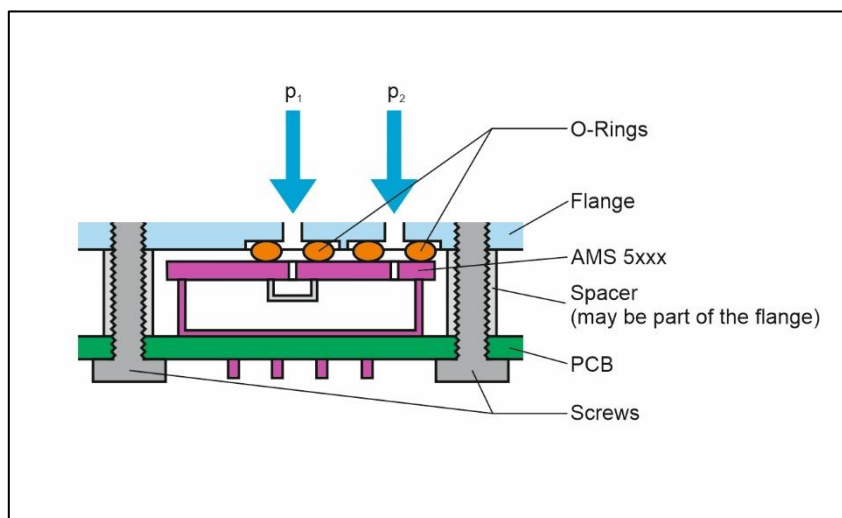
In the board-mount pressure sensor series AMS 5935, AMS 5915, AMS 5812, AMS 5612 and AMS 5105 (AMS 5xxx series) no-tube package variants (-N type) are available for manifold mount applications. These -N type packages feature a small installation volume, a small dead volume and allow a secure durable and media compatible sealing from one side with O-ring gaskets. A photo of the unique -N type ceramic package is shown in *Figure 1*.



**Figure 1: No-tube package in the AMS 5xxx series, here AMS 5915-16000-D-I-N**

The AMS 5xxx -N type package consists of a ceramic front plate (white), a ceramic lid (black) and DIL-pins for the assembly on PCBs. The lid seals the pressure sensor package hermetically and protects the delicate sensing elements. The sensor's electrical connection is established by soldering the DIL-pins to a PCB. Both pressure ports of the sensor are designed as holes in the front plate which have to be sealed against a suitable flange to establish the pressure connection.

In general, the no-tube package can be sealed using RTV-silicone adhesive sealant, a flat gasket or O-ring sealing. Below the installation to a flange with O-ring sealing will be described using *Figure 2*.

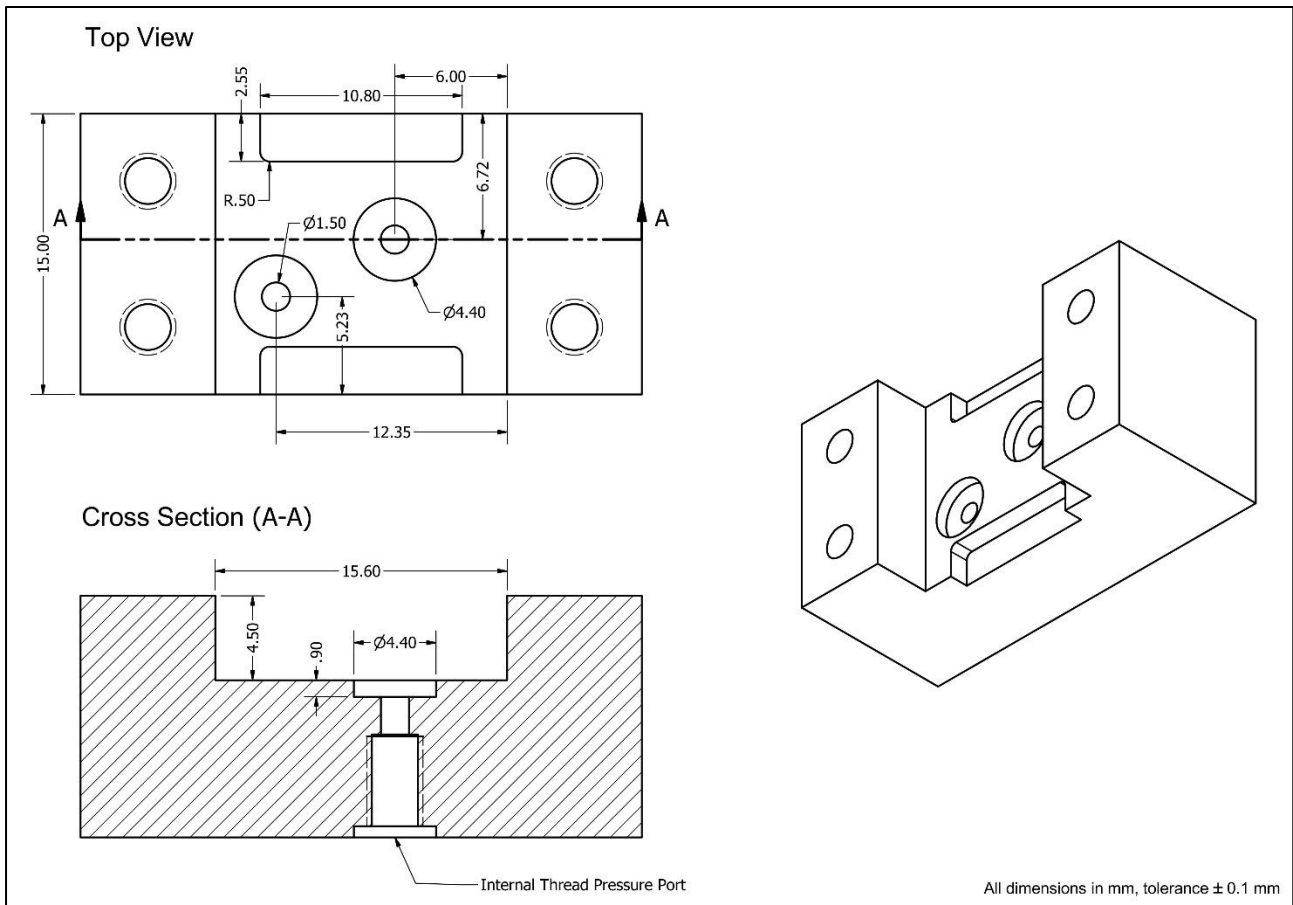


**Figure 2: Principle installation of AMS 5xxx's no-tube package variant with O-ring sealing**

The setup consists of the beforementioned flange (light blue), suitable O-rings (shown in orange), a PCB (green), screws (dark grey), spacers (light grey) and the pressure sensor (violet).

The -N type pressure sensor is soldered to a suitable PCB using the DIL pins of the package with the sensor package's lid lying flat on the PCB. Together with its PCB the assembled sensor is pressed against the flange using screws and spacers. The pressure sensor's ports are sealed against the flange with O-rings which are positioned in suitable grooves. The spacers are necessary to ensure that the sensor's ceramic package floats on the O-ring gaskets and does not come into direct contact with the flange.<sup>1</sup>

An example for the layout of a suitable flange for a single no-tube AMS 5xxx is shown in *Figure 3*. The spacers are integrated into the flange and the PCB is mounted using four internal threads in the spacer part.



**Figure 3: Technical drawing of a suitable flange for a single -N type AMS 5xxx pressure sensor**

The flange is designed for the usage of NBR 70 O-rings with an inner diameter of  $\varnothing_{ID} = 1.42$  mm and a cross section of  $\varnothing = 1.52$  [6]. It leaves a space between the sensor's ceramic and the flange of 0.2 mm and compresses the O-ring down to 72 % of its relaxed cross section. For more information see [7].

For further information, please contact [sales@analogmicro.de](mailto:sales@analogmicro.de).

<sup>1</sup> Due to the different thermal expansion coefficients of metal and ceramic it is recommended to leave a suitable gap between the pressure sensor's ceramic front plate and the opposing flange surface.

**References:**

1. AMS 5935's data sheet (see <https://www.analog-micro.com/products/pressure-sensors/board-mount-pressure-sensors/ams5935/ams5935-datasheet.pdf>)
2. AMS 5915's data sheet (see <https://www.analog-micro.com/products/pressure-sensors/board-mount-pressure-sensors/ams5915/ams5915-datasheet.pdf>)
3. AMS 5812's data sheet (see <https://www.analog-micro.com/products/pressure-sensors/board-mount-pressure-sensors/ams5812/ams5812-datasheet.pdf>)
4. AMS 5612's data sheet (see <https://www.analog-micro.com/products/pressure-sensors/board-mount-pressure-sensors/ams5612/ams5612-datasheet.pdf>)
5. AMS 5105's data sheet (see <https://www.analog-micro.com/products/pressure-sensors/board-mount-pressure-sensors/ams5105/ams5105-datasheet.pdf>)
6. O-ring inner diameter of  $\varnothing_{ID} = 1.42$  mm and a cross section of  $\varnothing = 1.52$  at [Technirub](#) (order number: 1250N0003282)
7. Parker O-Ring Handbook (<https://www.parker.com/content/dam/Parker-com/Literature/O-Ring-Division-Literature/ORD-5700.pdf>)

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