

Technical Information

Edition: 1

Installation and Design Notes

Position Sensors, F90 Series

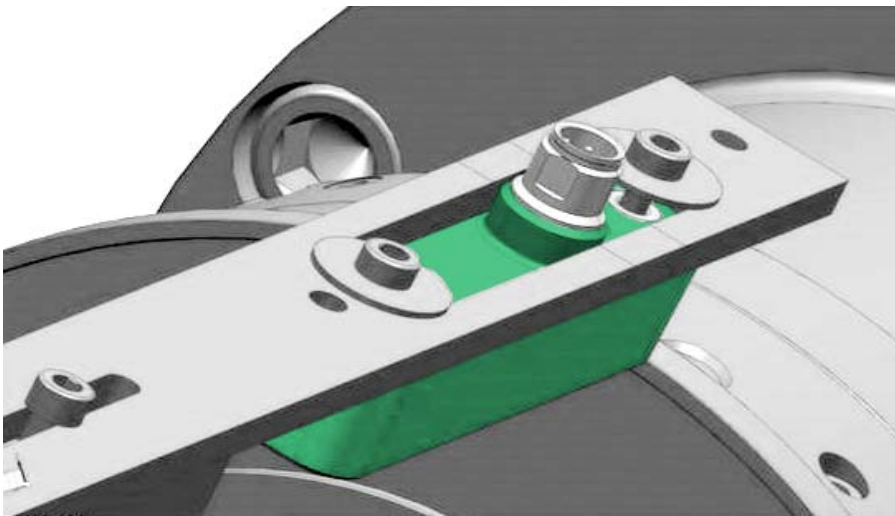
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Mounting the Sensor

The support surface for mounting of series F90 sensors is the sensor back. There are two M5 threaded inserts made of metal, which are injected into the plastic housing. When mounting the sensor, make sure that the fastening element is supported on the edge of the thread inserts.

Note: An installation in the following way must be avoided in any case:



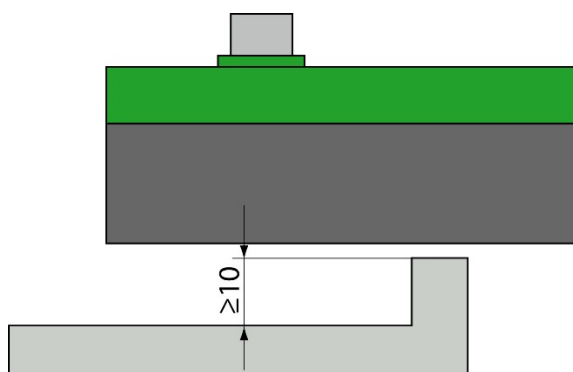
In the application shown, the plastic surface of the sensor is used as a contact surface. This is not allowed! Despite negative-conical shape, the threaded insert would be pulled out from the plastic housing over time, even with a low tightening torque. The fixation shown (threaded insert + screw) is not designed structurally for this type of attachment. The support must be absolutely on the edge of the threaded bushing.

With proper support on the edge of the thread inserts, we recommend a tightening torque of the mounting screws of 3 Nm.

Distances to be Maintained

Distance to Metallic Background Objects

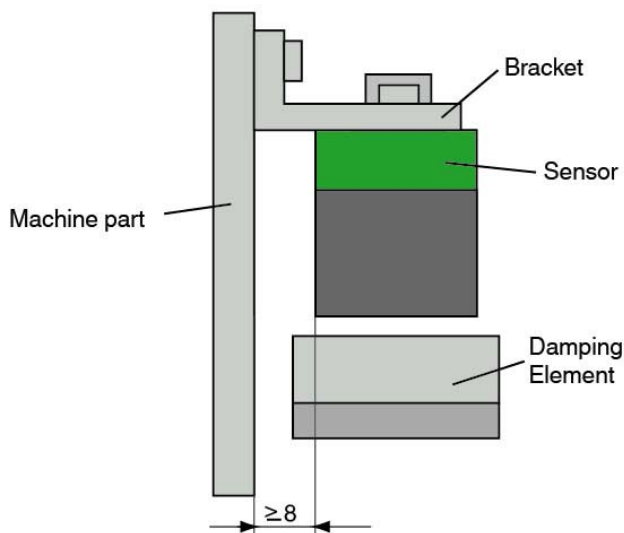
The magnetic field of the sensor also "sees" metallic objects, which are located at a greater distance than the maximum distance of the Damping Element. For a sufficiently good signal quality, it is necessary to make the distance between Damping Element and background object as large as possible. The distance difference between Damping Element and background object should be at least 10 mm.



Distance to Adjacent Metal Objects

F90 Series sensors are completely shielded. That means, the sensor can be fully embedded into metallic objects from all sides up to the sensor. This applies under the condition that the metallic objects ends at the level of the sensor surface or below. If metallic objects extend over the sensor surface, and in particular on the longitudinal sides of the sensor, they will affect the magnetic field of the sensor. This can lead to malfunction, or even a complete sensor failure.

At installation locations where an adjacent metallic object, which towers above the sensor surface is unavoidable, the sensor must be installed at a sufficiently large distance to this object, see the following figure:

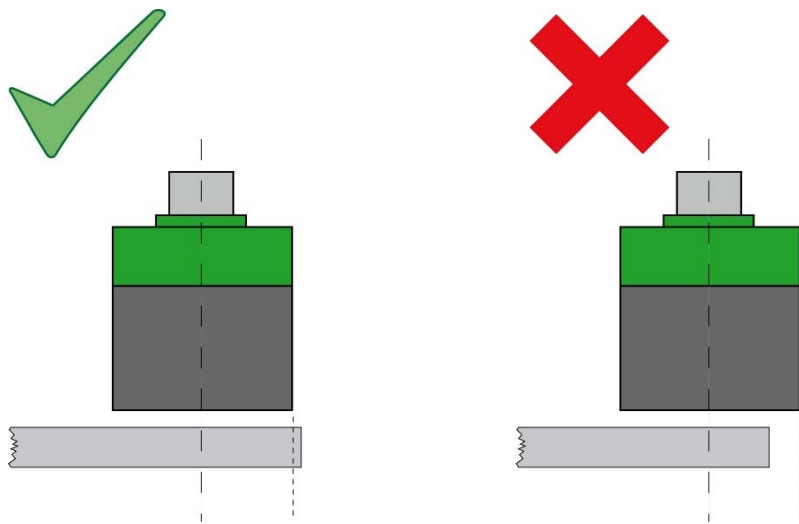


The Damping Element

Using own Damping Elements

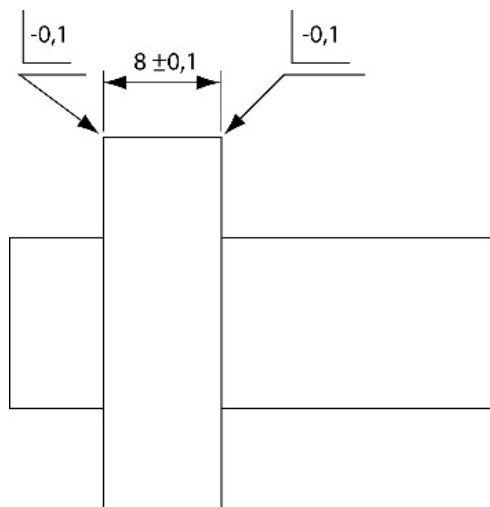
The use of own Damping Elements is generally possible. Guidance on how the own Damping Element must be constituted, can be found in the manual.

The Damping Element must cover the entire detection range of the sensor!



Damping Element Width

The Damping Element width is to be observed within a tolerance of ± 0.1 mm. The Damping Element edges should be trimmed. The edge breaking should, however, not exceed -0.1 mm.



The figure shows schematically the Damping Element ring on a rotationally symmetric shaft.

Distance between Damping Element and Sensor Surface

Straight Damping Elements

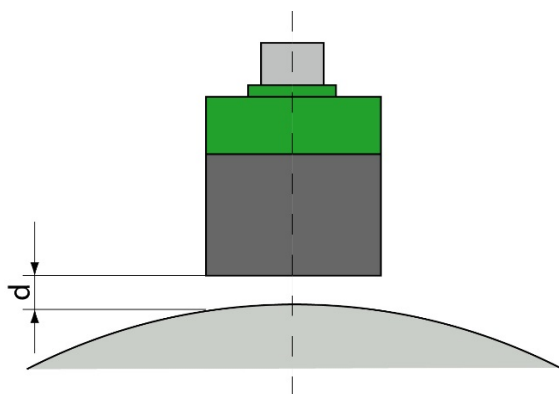
The specified distance range between Damping Element and sensor surface only applies for Damping Elements made of construction or tool steel. The use of own damping elements of other metals is generally possible. The geometry of the damping element (width, length ...) is independent of the choice of materials. When using metals other than construction or tool steel, a material-dependent reduction factor is effective. It reduces the allowable distance range between Damping Element and sensor surface.

The following distances must be observed:

Damping Element of construction or tool steel:	0.5 mm ... 3 mm
Damping Element of stainless steel:	0.2 mm ... 2 mm
Damping Element of aluminum:	0.1 mm ... 0.8 mm

Curved Damping Elements

In the case of a curved or cylindrical Damping Element basically the same applies as for straight Damping Elements, see above. In addition, it must be ensured that the allowable distance between Damping Element and sensor surface is maintained over the entire sensor width.

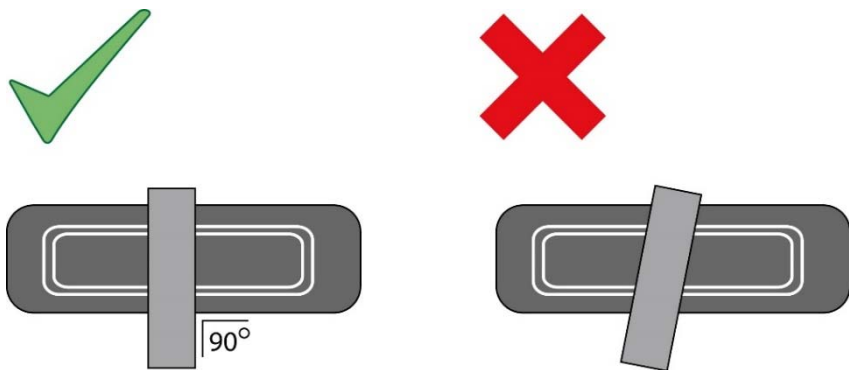


Note: It should be noted that the distance "d" at the edge sensor does not exceed the maximum allowable value, even with a small Damping Element radius.

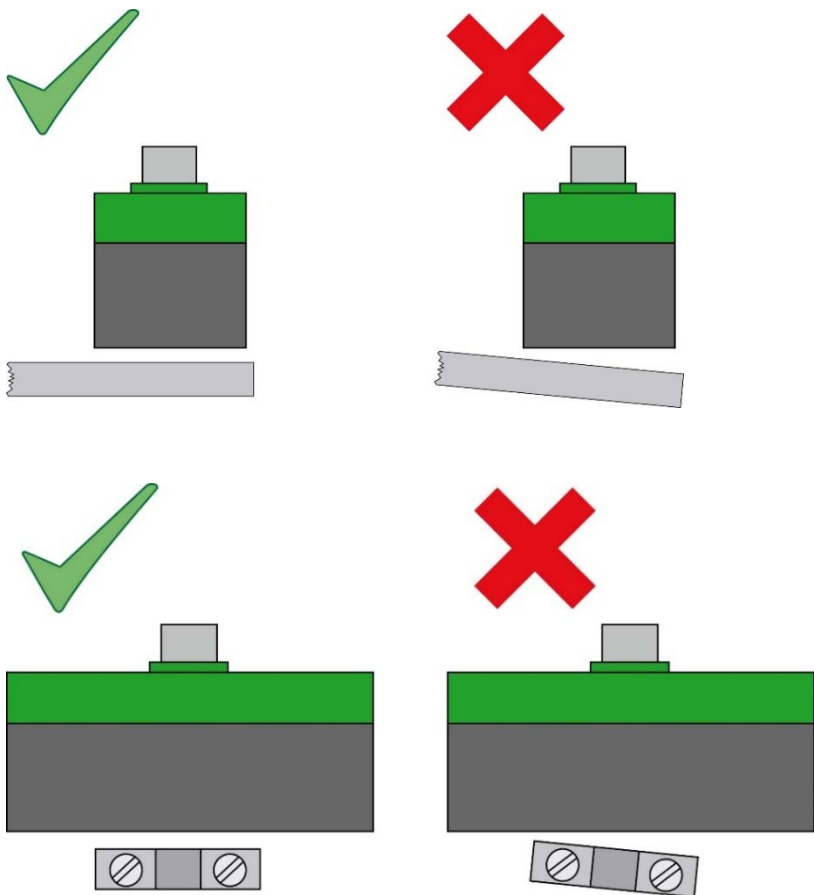
Damping Element Alignment

Damping Element Tilt and Rotation

The longitudinal axis of the Damping Element must be disposed at right angles to the longitudinal axis of the sensor's measuring field. Damping Element rotation leads to the nonlinearity of the position measurement.

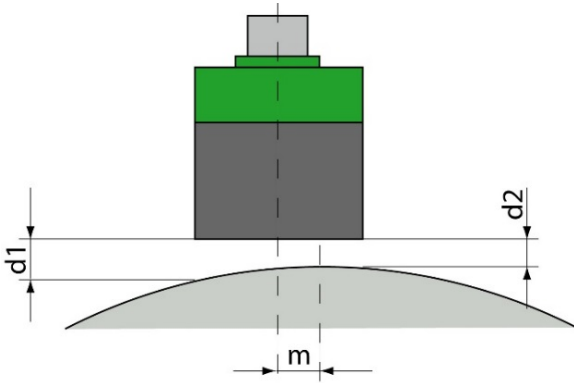


The surface of the Damping Element must be aligned parallel to the measurement surface of the sensor. A tilt leads to non-linearity and / or an error in the position measurement.



Centering of Curved Damping Elements

When using a curved Damping Element a lateral offset "m" relative to the sensor's centerline is not allowed.



Note: In the same way, a straight Damping Element must be mounted parallel to the sensor surface such that the distance $d1$ and $d2$ at the right and left sensor edge is equal.