

Installation, Operation & Maintenance Manual for Thermowells



1. Safety Instructions

The appropriate national safety regulations must be observed when installing, commissioning and operating thermowells. Serious injuries and/or damage can occur if the appropriate regulations not be observed. Only appropriately qualified personnel should work with thermowells.

2. Description

Thermowells are used to protect the temperature sensors against the process conditions. Furthermore, thermowells enable the removal of the temperature sensor without having to shut down the process and they guard against damage either to the environment or to personnel, which might be caused by escaping process media. Metal thermowells can be manufactured in solid machined or fabricated versions. Thermowells can be connected to the process by screw-, weld- or flange-fitting. The temperature sensor is directly fastened to the thermowell using a female or male thread or by means of a neck tube. If thermowells made of metallic materials do not show a sufficient temperature or corrosion resistance during permanent use at temperatures higher than 1200 °C, Ceramic thermowells are used.

3. Installation conditions and installation

Before installing the thermowell check if the used thermowell material (specified in the enclosed delivery note) is chemically resistant / neutral to the medium being measured and if it withstands the mechanical stress of the process. During storage and installation especially of the ceramic thermowells, make sure that the thermowells are not subject to thermal shocks or mechanical impacts.

The thermowell must be able to be introduced into the process-side adapter without being forced or damaged. The thermowell must not be bent or altered in order to mount it.

In general, the tip of the thermowell should be placed in the middle third of the pipe but the position may differ in special cases. It must be guaranteed that the measuring element (Pt100, thermocouple, bimetal, etc.) is completely exposed to the medium and is not shielded by the flanged nipple. If this cannot be guaranteed due to the small tube diameter, a tube extension can be inserted in the measuring area.

3.1 Screw-fitting thermowells

If using parallel threads, a suitable seal should be used when mounting. Tapered threads can be sealed by suitable seals or an additional welded seam. The correct tightening torques and suitable tools (e.g. spanner) should be used.

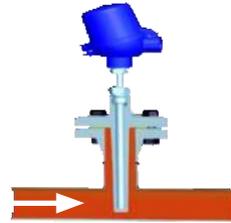
3.2 Weld-fitting thermowells

Weld-in thermowells can be fastened into the process (pipe or vessel wall) directly or by using a welding socket. Make sure that the weld seam is clean and that suitable equipment is used. If necessary, heat treat the weld seams.

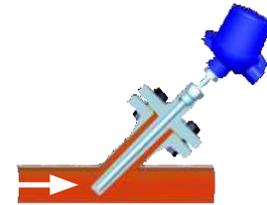
3.3 Thermowells with flange connection

The flange dimensions of the thermowell must match those of the mating flange on the process side. The seals used must be suitable for the process and the flange geometries (consult the delivery note). The correct tightening torques and suitable tools (e.g. spanner) should be used for installation. For thermowells with a collar, make sure that it matches the inner diameter of the coupling and is supported by it. In the case of an interference collar, they should be adapted to the inner diameter of the coupling.

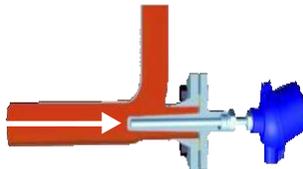
Irrespective of the process connection, three mounting positions of thermowells in pipes are possible: Right-angled position towards the flow (most unfavorable position)



Tilted position towards the flow (to be preferred, tip inclined towards the flow direction)



Flow towards the tip in an elbow (most favorable position)



The insertion length and the diameter of the thermowell depend on the process data, especially on the flow speed of the medium to be measured.

4. Troubleshooting

If it is not possible to insert the temperature sensor into the thermowell, there may be different causes:
 ++ There are foreign bodies in the thermowell
 ++ The fastening thread of the thermowell or temperature sensor is damaged or contaminated
 ++ The sensor dimensions and those of the inner diameter of the thermowell do not match
 ++ The thermowell has been bent or damaged during installation
 If the process media should leak at the connection between the process and the thermowell, errors might have been made during installation, or the seals are defective.

If the process medium should leak from the interface between the thermowell and the sensor, or at the sensor itself, safe operation of the plant can no longer be guaranteed.

A possible cause might be damage (e.g. caused by operating the thermowell with a resonant vibration load). In the worst case, this might result in a complete rupture of the thermowell. In the case of critical installations, we recommend calculating the harmonic frequency of the thermowell according to ASME PTC 19.3.

5. Applications

For hazardous media such as oxygen, acetylene, flammable or toxic media, and also for sewage treatment plants, pressure vessels, power stations, etc., the relevant current regulations / directives must be observed in addition to any general rules. Make sure that the thermowell is sufficiently earthed.

6. Maintenance / Cleaning

In general, thermowells are maintenance free. We recommend a visual check of the thermowell for leaks and damages at regular intervals. Make sure that the seal is in perfect condition.

7. Repairs

Repairs should only be carried out by the manufacturer or, following prior consultation, by correspondingly qualified personnel. For more technical data, see the appropriate Strataa Controls Inc. data sheets for current thermowell versions.

8. Disposal

Dispose of the thermowells or components and packaging materials in accordance with the relevant country specific waste treatment and disposal regulations for the region to which the device is supplied.

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