Technical Information
TI245T/02/en
71105488

Thermowell for temperature sensors *omnigrad TW251*

Thermowell for general applications
Integrated compression fitting
Threaded or weld-in process connection



TW 251 is a tube well fitted with an integrated compression fitting, suitable for different industrial applications including hygienic applications.
It is normally fitted onto pipes and vessels or tanks where attachment to the process can be threaded or welded.
Its construction, capable of housing probes with a diameter of 6 mm, allows for the combination with TST 42, TST 425, TST 310, TEC 420 and TSC 310 temperature sensors.
Available in different executions (straight, reduced or tapered), it has a an immersion length that can be chosen according to the demands of the process.

Features and Benefits

- The compression fitting allows for the replacement of the faulty probes without having to suspend the process underway
- Sleeves for the compression fitting available in PTFE or SS 316
- Different process connections can be selected as standard within the sales structure:
  – threaded (G ½", G ¼", NPT ½", ...)
  – weld-in (cylindrical, spheric)
- The 3.1.B material certificate (according to standard EN 10204), is selectable directly from the sale structure of the product

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Areas of application

Suitable for numerous applications including the food industries, it is generally used in all systems that require a protection well for temperature sensors with a 6 mm diameter.
Especially suitable when the operator does not want to interrupt the process for replacement of a damaged sensor, or to check for its correct operation.

Function and system design

Equipment architecture

TW 251 is a thermowell made from a tube with an outer diameter of 9 mm. The inner diameter of the well allows for the combination of an insert with a 6 mm diameter in the straight execution, while the tapered and reduced executions can house an insert with a 3 mm tip. For further details on the type of execution and process connections, refer to the chapter “System components”.

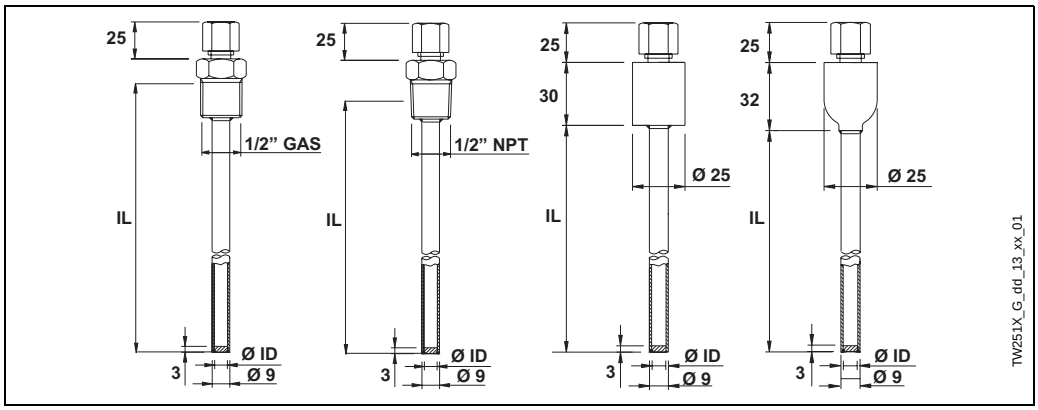


Fig. 1: Overall dimensions of the TW 251

Material

Wetted parts in SS 316L/1.4404.

Weight

From 0.5 to 1.5 Kg for standard options.

Performance

Operating conditions

Maximum process pressure

- 5 Mpa (50 bar) at 20°C
- 3.3 Mpa (33 bar) at 250°C
- 2.4 Mpa (24 bar) at 400°C

Maximum process temperature

- well stem 600°C

Maximum temperature of the compression fitting

- compression fitting with PTFE sleeve 180°C
- compression fitting with SS 316 sleeve 400°C

Maximum flow velocity
The maximum velocity of the process medium supported by the well is reduced when the immersion length exposed to the stream increases.

Installation

Omnigrad TW 251 may be installed onto tubes or tanks through the use of threaded connections G ½", G ¼", ½" NTP, or using the cylindrical or spheric connections to be welded; different process connections from the ones indicated may be provided upon request.
During installation it is necessary to consider the immersion length, as an incorrect evaluation may alter the accuracy of the sensor; for this reason the immersion should possibly be at least 80 mm. In the case of the installation in tubes with a reduced diameter, the axis line of the duct should be reached and if possible it should be slightly exceeded from the tip of the well (see Fig. 2).
Installation of the well inclined and with its sensitive part counterposed to the normal flow of the process, may be a valid alternative to the most commonly used perpendicular one (see Fig. 2).
Special attention should be paid in the case of the installation of processes with two-phase flows, since they may cause fluctuations in the detected temperature values.
In the case of hygienic applications it is better to avoid empty spaces in the area below the process connection. Furthermore, for connections to be welded the user must choose suitable welding materials, using a bead ray of welding exceeding 3 mm, avoiding the formation of pits, folds, crevices.
The measuring insert has to be assembled to the thermowell, in the way that the tip of the probe must be in contact with the base of the pipe; after that it has to be fixed in this position by means of the compression fitting.
A thermoconductive paste may be used till 200°C, in order to optimise the heat transfer between thermowell and insert.

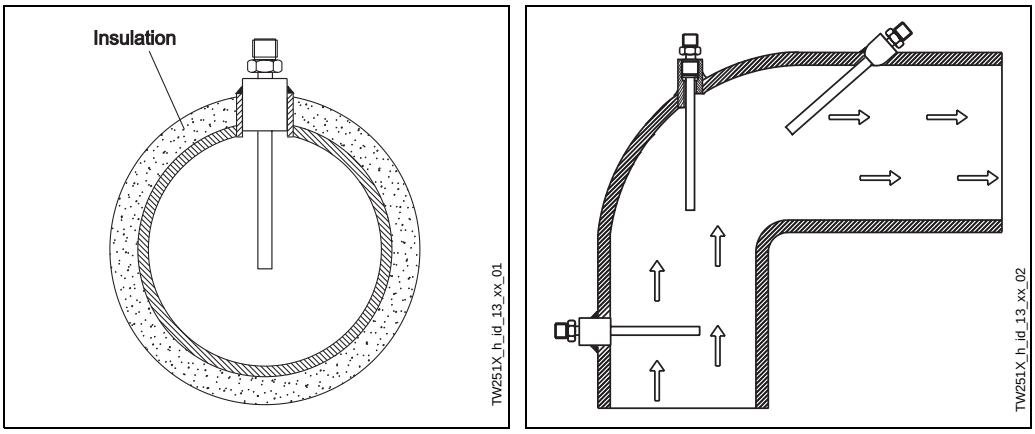
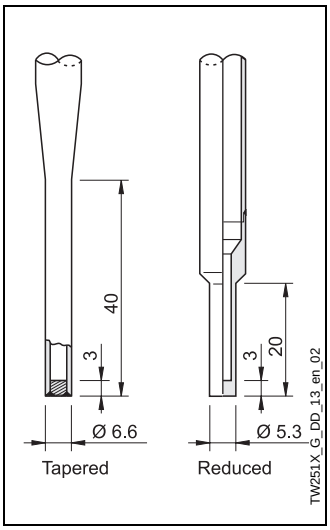


Fig. 2: Installation in tubes (on the left); alternatives to installation (on the right)

System components

Thermowell



The immersion length is available in the most commonly used dimensions; alternatively, dimensions that are different from standard ones may be chosen upon request by the client within the range of values indicated in the sales structure (refer to the last page of this document).
The finishing of all the parts in contact with the process medium is available with a minimum value of Ra < 0.4 microns; at this moment no values below this figure have turned out to be advantageous, especially in the food industries. TW 251 is available in various executions (see Fig. 3): straight, reduced (by using a welded cap of a diameter of 5.3 mm - L=20 mm to close the end of the well) or tapered (with a gradual reduction of the well stem that allows for the outer diameter to be reduced from 9 mm to 6.6 mm). In the case of a reduced execution a minimum immersion length of 45 mm is requested, while for the tapered version it must be of at least 85 mm; in both cases the well can be used in combination with a probe with a 3 mm tip (TST 42 with a reduced end).

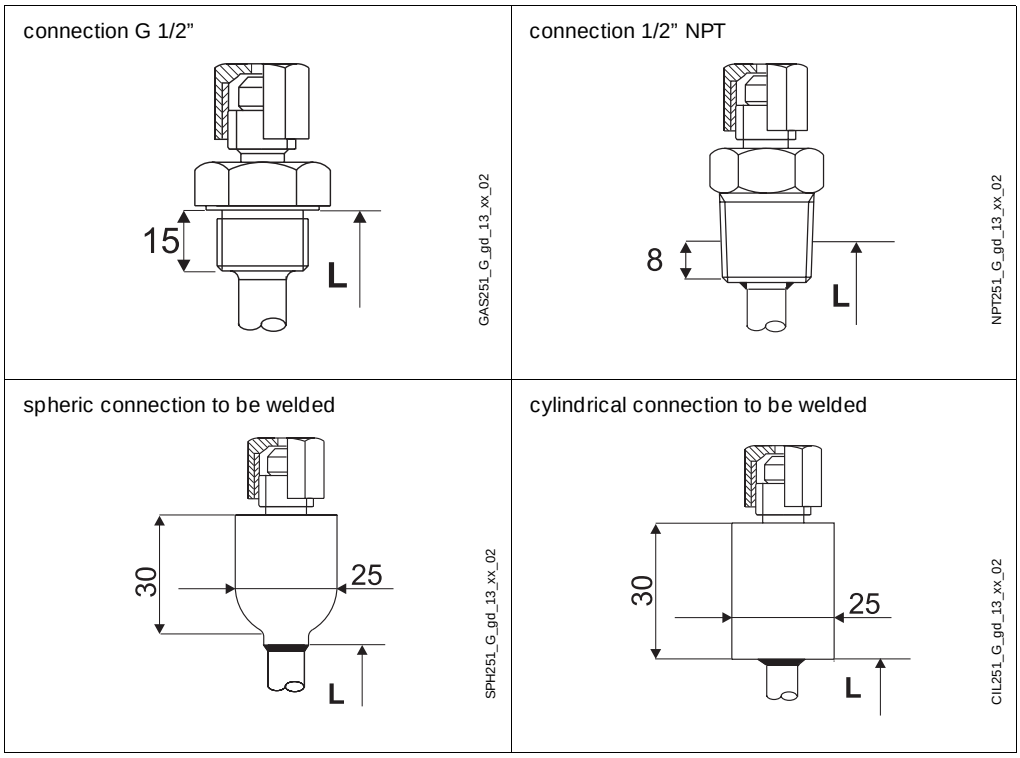
Fig. 3:Different executions for the tip of TW 251

Compression fitting

The compression fitting is an integral part of the well. Available in different alternatives, with a PTFE (equivalent to Teflon®) or stainless steel sleeve, it allows for fixing of the sensor in the correct position. The version with the PTFE sleeve is ideal for the repeated replacement of the probe, while the steel sleeve is used for permanent fixing of a sensor as the pressure ring blocks it into position.

Process connection

The threaded connections (G ½", G ¼", ½" NTP) as well as the connections to be welded (cylindrical or spheric) can be selected directly from the sale structure. Upon request different connections can be chosen.



Certificates & approvals

Material certification

The 3.1.B material certificate (in compliance with the standard EN 10204) can be selected directly from the sale structure, in its various versions. The base certificate includes a simplified declaration, including enclosures of the documents related to the materials used in the construction of each well. Besides the previous certificates, a "labelled" version also exists which guarantees traceability of the certificate thanks to the registration of the serial numbers of each single well.

Additional information

Maintenance

The Omnigrad TW 251 well does not require any specific maintenance. For the version with the sleeve in PTFE, it should be controlled periodically and possibly substituted, when the mechanical sealing is no longer efficient.

Delivery time

For small quantities (approx. 10 units) and standard options, delivery time is from 10 to 20 working days.

Ordering information

Product structure

TW251	Process connection
	G2 Process connection G 1/2”
	G4 Process connection G 1/4”
	N2 Process connection 1/2” NPT
	WC Cylindrical connection to be welded: D25xL30 mm
	WS Spheric connection to be welded D25xL30 mm
	YY Special option

	Sleeve material
	(for the compression fitting)
	B Sleeve in SS 316
	P Sleeve in PTFE (Teflon®)
	Y Special option

	Immersion length
	(50-1000 mm)
	A 50 mm immersion length L
	C 100 mm immersion length L
	E 150 mm immersion length L
	G 200 mm immersion length L
	H 300 mm immersion length L
	X mm immersion length L to specify
	Y mm immersion length L to specify

	Diameter of the protecting tube D, material and finishing of wetted parts
	5 9 mm, SS 316L/1.4404, Ra<=1.2 µm
	6 9 mm, SS 316L/1.4404, Ra<=0.8 µm
	7 9 mm, SS 316L/1.4404, Ra<=0.4 µm
	9 Special version

	Type of tip
	S Straight tip
	R Reduced (with step), only for L>=45 mm (it can be used only in combination with a TST42 with a 3 mm tip)
	T Tapered, only for L>=85 mm (it can be used only in combination with a TST42 with a 3 mm tip)
	Y Special version

	Certificates
	0 Certificate not required
	B 3.1.B EN10204, standard for wetted parts
	G 3.1.B EN10204, labelled for wetted parts
	D 3.1.B EN10204, standard + roughness
	H 3.1.B EN10204, labelled + roughness

TW251-							complete order code

Accessories

- ❑ 60011599 KIT of 10 sleeves in SS 316 Ø 6 mm
- ❑ 60011600 KIT di 10 sleeves in PTFE Ø 6 mm
- ❑ 60007126 Thermoconductive paste

Supplementary documentation

- ❑ General technical information on TST — TI 088T/02/en
- ❑ Technical information on the thermometric sensor TST42 — TI 184T/02/en
- ❑ Technical information on the thermometric sensor TST425 — TI 113T/02/en
- ❑ Technical information on the thermometric sensor TST310 — TI 085T/02/en
- ❑ Technical information on the thermometric sensor TEC420 — TI 076T/02/en

Subject to modification

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