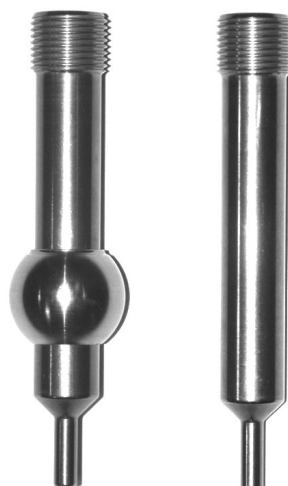


Thermowell for Temperature Sensor *omnigrad M TW 47*

Medium duty, built from bar
Hygienic design
Spare part of TR 47 sensor



TW 47 is a protection well for thermometers, employed in the temperature sensor TR 47. The thermowell omnigrad M type TW 47 is especially designed for hygienic applications (food, pharmaceutical and fine chemicals industry).

The installation on the plant is obtained by means of welding, executed on the thermowell

Features and Benefits

- 3-A® certification
- SS 316L/1.4435 for "wetted" parts (BN 2 compliance on request)
- Customized immersion length
- Reduced tip for fast response time
- Surface finishing down to $Ra < 0.4 \mu m$, with or without
- Material certification (3.1.B, ...)
- Ferrite content determination
- High pressure resistance



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Areas of application

- Food industry: milk, beer, fruit juice, syrup, chocolate, oils/fats, powders, auxiliary services, storage tanks/silos, CIP/SIP systems
- Biotechnology industry: fermenters, auxiliary services, CIP/SIP systems
- Pharmaceutical industry: fluids, acids, purified water, auxiliary services, CIP/SIP systems
- Fine chemicals industry: cosmetics, auxiliary services, CIP/SIP systems

Function and system design

Equipment architecture

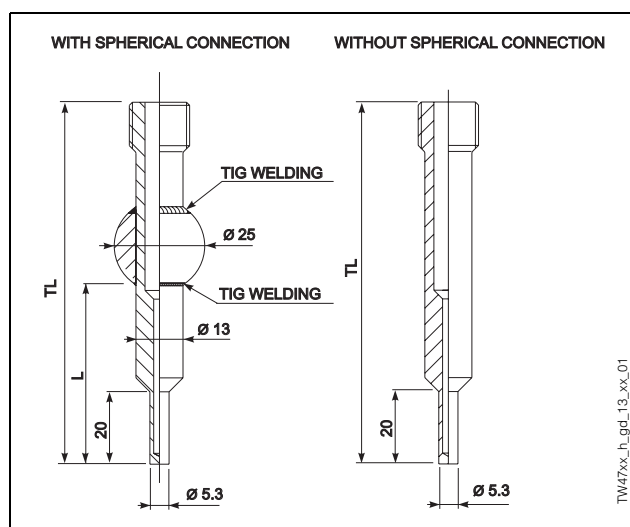


Fig. 1: TW 47 thermowells

The thermowell (TR 47) is obtained from a solid bar of stainless steel and, if properly welded to the plant, is able to withstand very high operating pressures. The final (sensing) part of the well is reduced (stepped).

The TR 47 construction, executed according to 3-A® design criteria, which allows the sensor to withstand the stresses caused by CIP (Cleaning In Place) and SIP (Sterilization In Place) processes.

Material

Wetted parts in SS 316L/1.4435.

Weight

From 0.1 to 0.2 kg for standard options.

Performance

Operating conditions

Maximum process pressure

- 17 MPa (170 bar) at 20°C
- 13 MPa (130 bar) at 150°C

Maximum flow velocity

The highest flow velocity tolerated by the sensor stem diminishes with increasing lengths of the well probe exposed to the stream of fluid.

Installation

Omnigrad M TW 47 can be mounted on the wall of pipes or vessels.

The thermowell TW 47 must be welded on the plant along its cylindrical side wall, or on an optional spherical connection that has already been welded on the well.

Care should be taken by the user in the execution of the welding on the process side (suitable weld material, welding radius > 3 mm, absence of pits, folds, crevices, ...). As a general rule, the sensors should be installed in such a way that does not adversely affect their cleanability (3-A® requirements must be adhered to).

The immersion depth may have an effect on the accuracy of the measurement. If the immersion is too low, an error may be generated in the recorded temperature due to the lower temperatures of the process fluid near the walls and heat transfer, which takes place through the sensor stem. The incidence of such an error can be not negligible if there is a big difference between the process and the ambient temperature. To avoid this source of inaccuracy, the immersion length (L) should be, if possible, at least 80 mm. In pipes with a small diameter, the axis line of the duct must be reached, and even slightly exceeded, by the tip of the probe (refer to figure 2).

Attention should be paid to the choice of the measurement point in the case of two-phase flows, since it may cause fluctuations in the detected temperature value.

With regard to corrosion, the base material of the wetted parts (SS 316L/1.4435) is capable of tolerating common corrosive media up to high temperatures. Besides being CIP and SIP-proof, the sleeves included in TR 48 process connection are resistant to a wide variety of aggressive substances. For further information on specific applications, please contact the E+H Service Department.

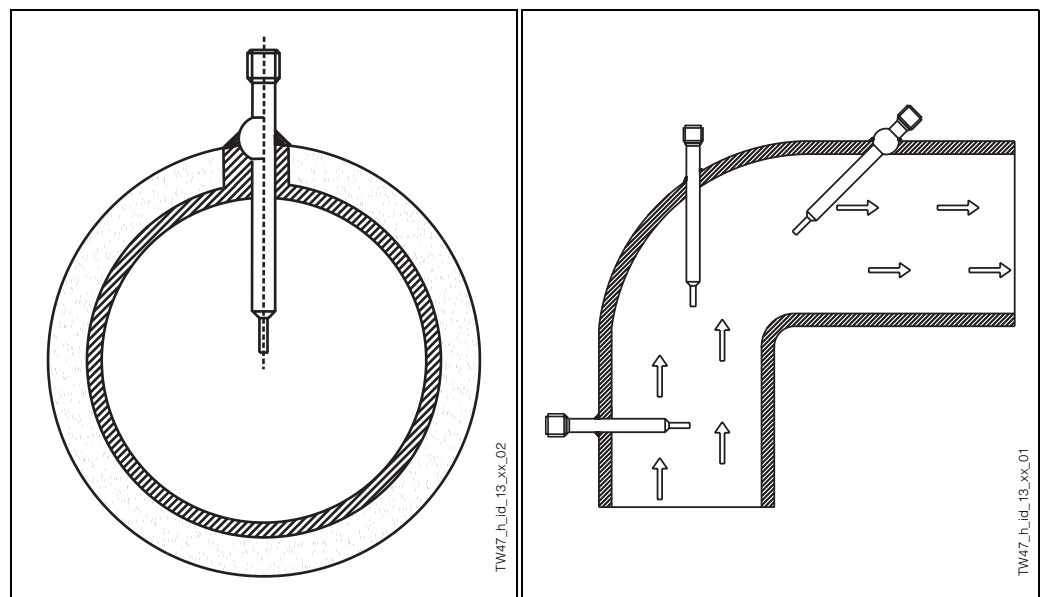


Fig. 2: General installation solutions

System components

Well	<p>The starting material for the wetted parts can be supplied in compliance with Basler Norm 2 (BN2), which imposes a limited ferrite content and consequently enhances corrosion resistance, on request. For some sensor's configurations the compliance with the requirements of BN2 can be assured also after the welding and machining operations, that is on the finished product. The surface roughness (Ra) of the wetted parts is supplied at a 0.4 µm level. A roughness below 0.4÷0.5 µm has not been proven to be advantageous for hygienic purposes. Electro-polishing is the electrolytic treatment of the metal surface, which results in cleaning, levelling and passivity.</p>
Process connection	<p>For the installation on the process, the welding can be executed directly on the side of the wall of the thermowell or on a spherical connection supplied already welded to the well.</p>

Certificates & approvals

Sanitary compatibility	<ul style="list-style-type: none">• 3-A® Authorization no. 1144 for the declaration of compliance with standard 74-01.
Material certification	<p>The 3.1.B material certificate, (according to standard EN 10204), is selectable directly from the sale structure of the product. Other types of material certification can be requested separately. The "standard" one is a simplified and cost effective version of the certificate, in which the documentation that specifies the origin of the materials utilised refers to each individual sensor. The "labelled" version also has a specific marking that relates to the wetted parts of the sensor, and ensures that the relevant data are placed in the archive by means of the serial number of the thermometer.</p>

Further details

Maintenance	<p>Omnigrad M thermowells do not require a specific maintenance.</p>
Delivery time	<p>For small quantities (about 10 units) and standard options, from 10 to 20 days depending on the requested configuration.</p>

Ordering information

Product structure

TW47		Lengths: TL, L, T			
	A	TL= 70 mm	cylindrical	T = 50 mm	
	B	TL= 100 mm	cylindrical	T = 35 mm	
	C	TL= 150 mm	cylindrical	T = 40 mm	
	D	TL= 200 mm	cylindrical	T = 50 mm	
	N	TL= 70 mm, L= 25 mm	weld. sphere	T = 50 mm	
	P	TL= 100 mm, L= 50 mm	weld. sphere	T = 35 mm	
	Q	TL= 150 mm, L= 100 mm	weld. sphere	T = 40 mm	
	R	TL= 200 mm, L= 150 mm	weld. sphere	T = 50 mm	
	Y	Special version			
		Tip design			
	R	Reduced tip, (stepped)			
	Y	Special version			
		Material and finishing of wetted parts			
	1	SS 316L/1.4435, Ra<=0.8 µm			
	3	SS 316L/1.4435, Ra<=0.4 µm			
	4	SS 316L/1.4435, Ra<=0.4 µm, electropolishing			
	4	Special version			
		Certificates			
	0	Certificates 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			
	L	3.1.B EN10204, labelled + ferrite content			
	J	3.1.B, labelled+roughness + ferrite content			
		Additional options			
	0	Additional options not required			
TW47-					Complete order code

Documentation

- ❑ RTD thermometers Omnigrad TST - General information
- ❑ Pt 100 inset - Omnigrad TET 100
- ❑ Pt 100 inset - Omnigrad TET 105
- ❑ Terminal housings - Omnigrad TA 20

TI 088T/02/en
TI 071T/02/en
TI 103T/02/en
TI 072T/02/en

Subject to modification

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