WellTEMP 70

Thermowells for General and Harsh Industrial Applications

- **Pressure up to 400 bar, temperature up to 620 °C.**
- **Designed for welding on, screwing in or flanged connection according to customer specifications. Outer or inner metric / inch and cylindrical / tapered thread.**
- **Cylindrical or conical shape for measuring inserts with diameter 3 to 8 mm.**
- **Protective coats with high resistance against corrosion and abrasion.**
- **EC Type Examination Certificate acc. to Directive PED 97/23/EC, issued by TÜV.**
- **Standard and highly resistant materials:**
  - carbon steel 1.0570, 1.0425 (P265GH)
  - fire-resistant steel 1.7715, 1.4903
  - stainless steel 1.4541,1.4571
  - special materials, Titanium Gr. 2, Tantalum 99%, Monel 400, Hastelloy C-22, Nickel 200/201 and others.

Application

Thermowells are designed to protect thermometer measuring stems against mechanical and chemical effect of measured medium. They are used for completion of resistance and thermocouple temperature sensors that do not have their own thermowell. Thermowells are designed for welding on, screwing in or flanged connection on pieces or walls of the technological equipment. Screwed thermowells for high parameters are usually secured by securing welds. Depending on used material and design the thermowells can be used within range of temperatures -200 °C to +620 °C and pressures up to 40 MPa. Conical thermowells for high parameters allow use for superheated steam with velocity of flow up to 90 m/s.

In the case that there is chosen a suitable material or protective coat, the thermowells can be also used for various corrosive and abrasive media. Thermowells meet requirements of standards EN 61152, EN ISO 15614-1, EN 288-3, EN 287-1, EN 10204, EN 473, EN 61520 and DIN 43772. Thermowells are certified as pressure accessories of energetic equipment, category III acc. to European Directive PED and certified acc. to Directive 97/23/ES, issued by TÜV.

Description

Thermowells are either welded or drilled. Welded thermowells consist of head, thermowell body and bottom, possibly reduced end of the thermowell. Drilled thermowells are made from one piece and they are more resistant against high parameters of measured medium.

Design of the thermowells differ in their inner and outer connection threads, diameters for welding or used flanges. The connection dimensions are based on metric or inch size series. Thermowells WT70 D acc. to DIN 43772 are welded into special welded on pieces with tolerated diameter.

Basic materials of thermowells:

Standard - steel 1.0570, 1.0425, 1.4541, 1.4571.

High parameter drilled thermowells - 1.7715, 1.4541, 1.4903.

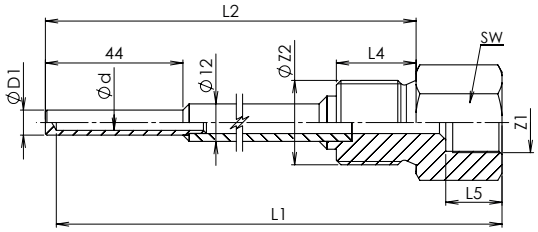
High chemical resistance thermowells - Monel 400, Nickel 200/201, Hastelloy C-22, Titanium Gr. 2, Tantalum 99%.

Quality of production of the thermowells is ensured using a quality system. Within the scope of this system all thermowells are subjected to checks of tightness using inner overpressure and drilled thermowells are additionally checked by X-ray snaps.

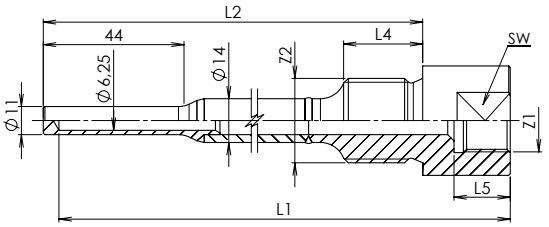
Dimensional drawings

WT70 C, for screwing

WT70 C 01 V700 / V500 / V350 ...

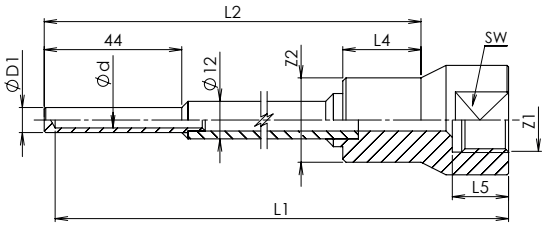


WT70 C 01 V625 ...

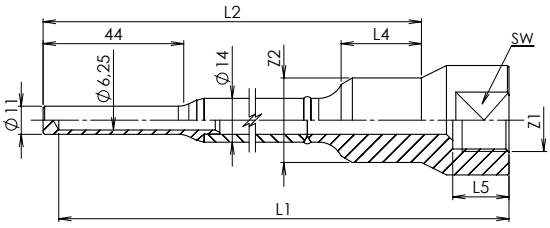


WT70 C, for welding

WT70 C 02 V700 / V500 / V350 ...

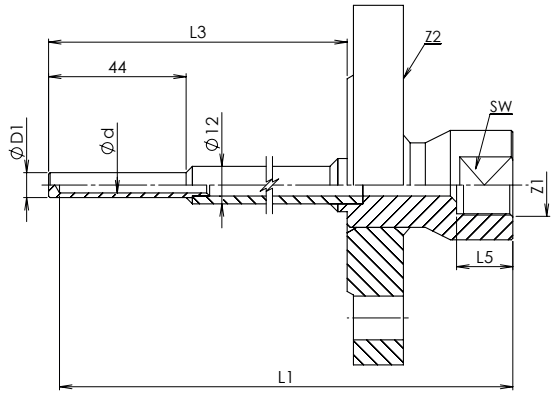


WT70 C 02 V625 ...

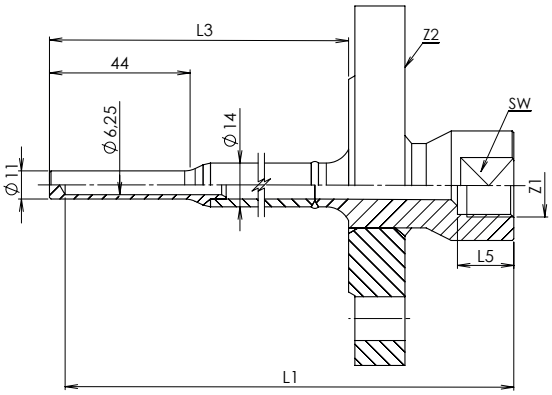


WT70 C, with flange

WT70 C 03 V700 / V500 / V350 ...

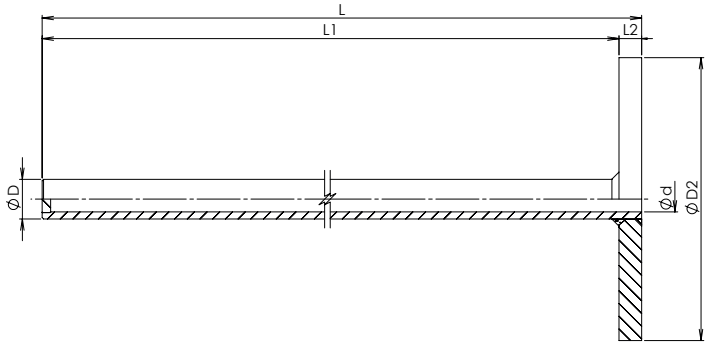


WT70 C 03 V625 ...



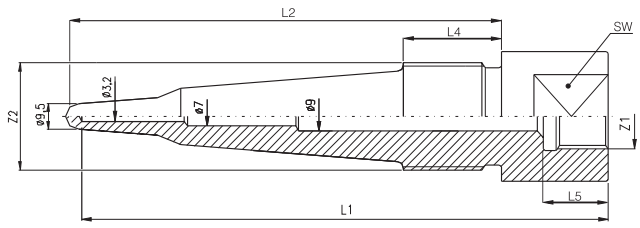
WT70 C, between flanges

WT70 C 03 ... P89

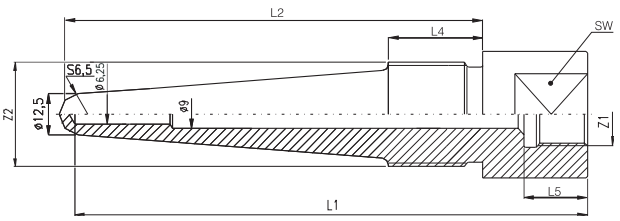


WT70 T, for screwing

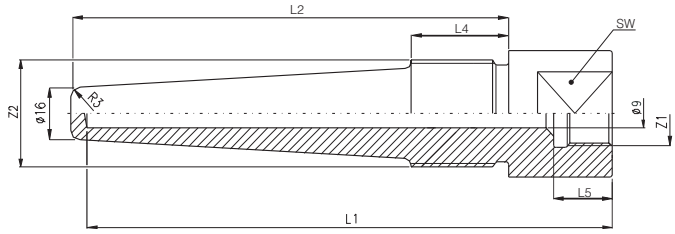
WT70 T 21 V320 ...



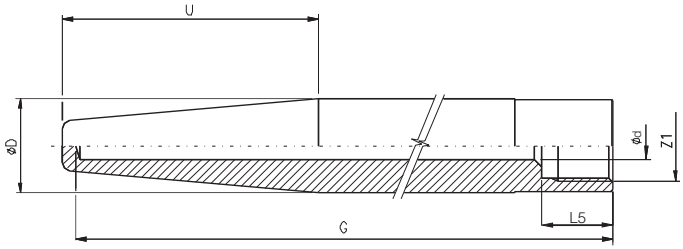
WT70 T 21 V320 ...



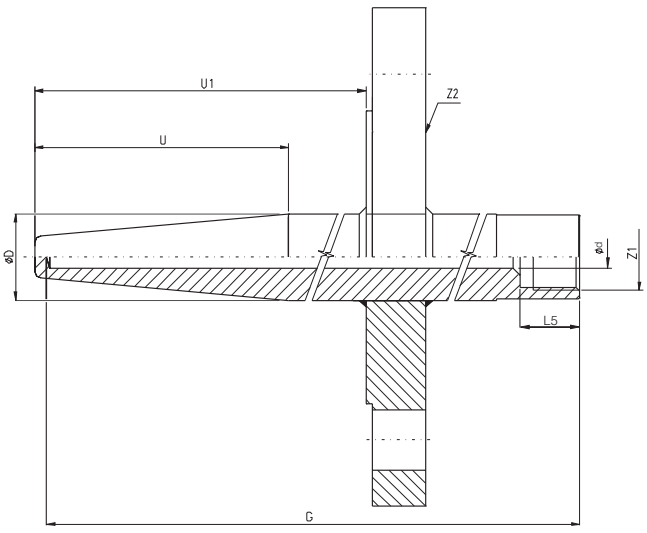
WT70 T 21 V900 ...



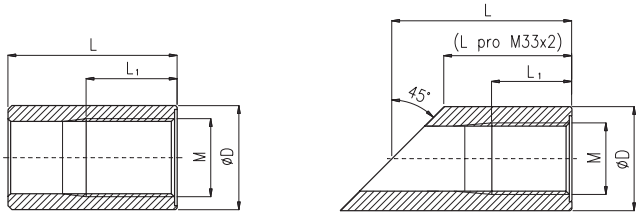
WT70 D, for welding



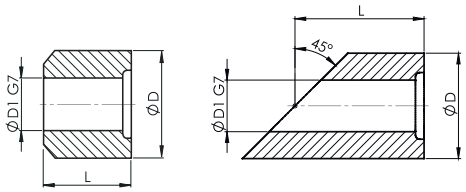
WT70 D, with flange



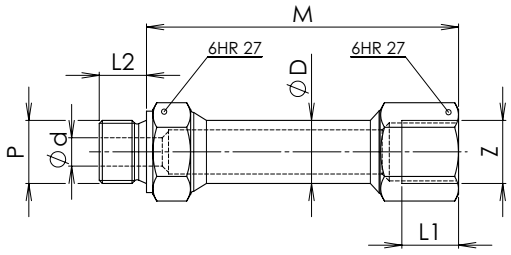
NV Welded on piece for WT70 C and WT70 T



NV D Welded on piece for WT70 D



NT70 Extension piece for temperature sensors



Technical specifications

Nominal pressure:

PN 160 - version WT70 C (according to used material)
PN 250 - version WT70 D (according to used material)
PN 400 - version WT70 T (according to used material)

Maximal operating temperature:

400 °C - thermowell material 1.0570
450 °C - thermowell material 1.0425, P265GH
500 °C - thermowell material 1.4571
575 °C - thermowell material 1.7715
600 °C - thermowell material 1.4541
620 °C - thermowell material 1.4903

Used materials:

1.0570
1.0425, P265GH
1.4571
1.7715
1.4541
1.4903
Monel 400 (2.4360)
Hastelloy C-22 (2.4602)
Nickel 200/201 (2.4068)
Titan Gr. 2
Tantal 99 %
for other options contact the supplier

Process connection:

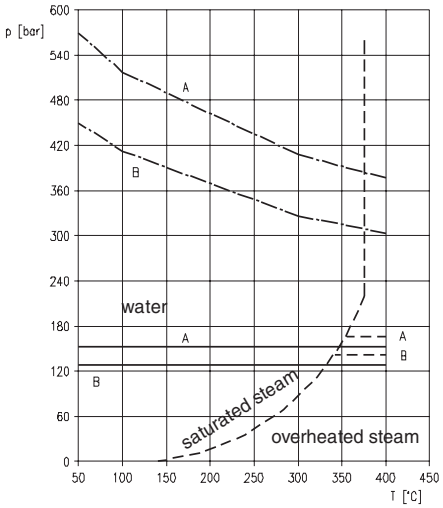
outer thread M33x2
outer thread M27x2
outer thread M20x1,5
outer thread G1“
outer thread G3/4“
outer thread G1/2“
outer thread 1“ NPT
outer thread 3/4“ NPT
outer thread 1/2“ NPT
for welding, outer diameter 27, 26h7, 24h7, 18h7(mm)
flange acc. to EN 1092-1, design B1/B2,
DN 25 to DN 40, PN 16 to PN 63
flange acc. to ANSI B 16.5, nominal size 1“ to 1,5“,
150 to 600 lbs
between flanges
for other options contact the supplier

Inner thread:

M20x1,5
M18x1,5
M16x1,5
M14x1,5
G1/2“
G1/4“
1/2“ NPT
for other options contact the supplier

Load diagrams

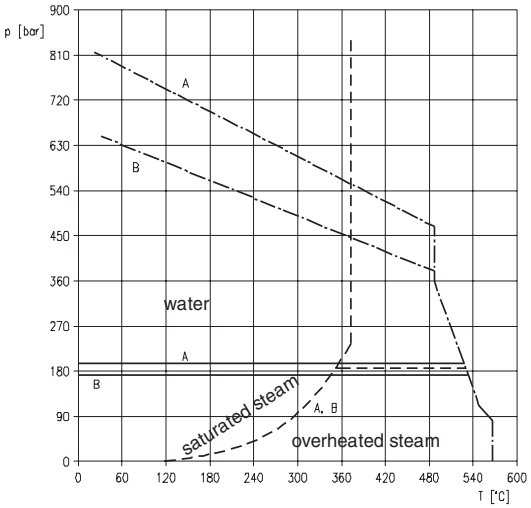
WT70 D 31 (32)



A - version WT70 D 31 Z.. L110 M04 (outside diameter 18h7 mm, inner diameter 3.5 mm, U = 65 mm, material 1.4571)

B - version WT70 D 32 Z.. L201 M04 (outside diameter 24h7 mm, inner diameter 7 mm, U = 125 mm, material 1.4571)

——— air (v = 60 m/s)
– – – steam (v = 60 m/s)
—·— water (v = 5 m/s)

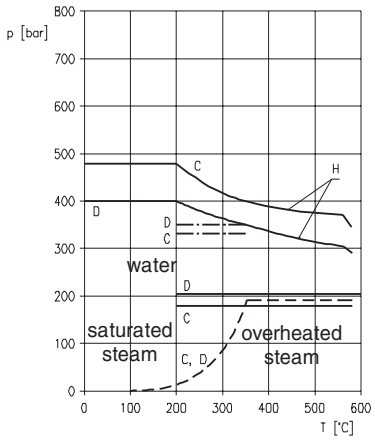


A - version WT70 D 31 Z.. L110 M02 (outside diameter 18h7 mm, inner diameter 3.5 mm, U = 65 mm, material 1.7715)

B - version WT70 D 32 Z.. L201 M02 (outside diameter 24h7 mm, inner diameter 7 mm, U = 125 mm, material 1.7715)

——— air (v = 60 m/s)
– – – steam (v = 60 m/s)
—·— water (v = 5 m/s)

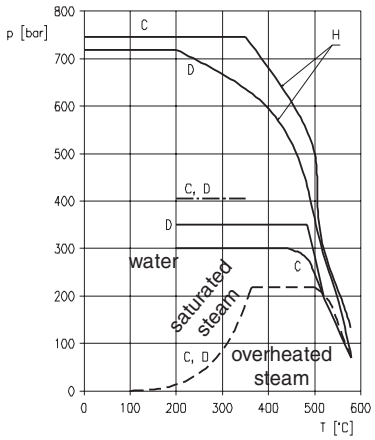
WT70 T 21 V... Z01 P01 L160



C - version WT70 T 21 V320 Z01 P01 L160 M03 (M33x2 inner diameter 3.2 mm, material 1.4541)

D - version WT70 T 21 V625 Z01 P01 L160 M03 (M33x2 inner diameter 6.25 mm, material 1.4541)

——— air (v = 80 m/s)
– – – steam (v = 80 m/s)
—·— water (v = 10 m/s)



C - version WT70 T 21 V320 Z01 P01 L160 M02 (M33x2 inner diameter 3.2 mm, material 1.7715)

D - version WT70 T 21 V625 Z01 P01 L160 M02 (M33x2 inner diameter 6.25 mm, material 1.7715)

——— air (v = 80 m/s)
– – – steam (v = 80 m/s)
—·— water (v = 10 m/s)

Operating medium		Steam								Air							
Thermowell material		1.7715				1.4541				1.7715				1.4541			
Velocity of flow [m/s]		40		60		40		60		40		60		40		60	
Wells version according to diagrams		C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Coefficient S for temperature of operating medium	to 370 °C	1	1	1	1	1	1	1	1	1.54	1.37	1.36	1.25	1.51	1.36	1.32	1.19
	over 370 °C	1.1	1.05	1.07	1.03	1.17	1.16	1.11	1.06	1.2	1.12	1.12	1.07	1.32	1.19	1.2	1.11

The value of pressure found in the respective diagram is multiplied by the coefficient S according to the table below for velocities of steam and air flow 40 m/s and 60 m/s. However, the obtained values shall not exceed the limit H given in the diagrams.

Supplementary parameters

For thermowells can be provided following:

(see the ordering table):

- stainless steel closing plug
- material certificate acc. to EN 10204
- pressure test by internal overpressure
- degreasing for oxygen
- check of the thermowell by a calculation

Surface treatment:

Standard thermowells are polished and can be also delivered with optional protective coats that increases resistance of the thermowells in hard chemical or abrasive environment.

Materials used for protective coats:

- polyamide PA11, T_{MAX} = 100 °C (depends on the measured medium)
- ethylene - chlortrifluorethylene E-CTFE “Halar”, T_{MAX} = 170 °C (depends on the measured medium)
- perfluoralkoxy-copolymer of tetrafluorethylene and perfluorated vinylether PFA, T_{MAX} = 260 °C (depends on the measured medium)
- ethylentetrafluorethylene ETFE “Hyflon”,T_{MAX} = 130 °C (depends on the measured medium)
- polytetrafluorethylene PTFE, T_{MAX} = 260 °C (depends on the measured medium)
- corundum spray for extremely abrasive media, T_{MAX} acc. to particular composition of the coat.

Based on the customer’s requirement the particular design of the protective coat of the thermowell or protective pipe of the temperature sensor is developed after specification of the basic information concerning the measured medium (chemical composition, temperature, pressure, flow velocity and level of abrasion in case of abrasive media).

Properties of protective coats based on fluoroplastic materials E-CTFE, PFA, ETFE, PTFE:

- Resistance against high temperatures
Very good resistance against high temperatures, high melting points, limits of thermal degradation and self-ignition temperatures. Their flammability, released heat and amount of smoke are relatively low.

Fluoroplastic materials remain functional at temperatures highly above limits of other thermoplastic or elastomer materials.

Depending on the type these materials may be exposed permanently up to 260 °C.

- Non-adhesivity
Low surface energy in solid state creates excellent non-adhesive surfaces. Therefore only very few solid substances adheres to these coats and if so, it is very easy to remove them from the surface.

- Friction coefficient
These coats show the lowest values of all known solid substances. The values of fluoroplastic coats vary from 0.05 to 0.2, depending on loading, velocity and type of the fluoroplastic material.

- Wettability
Coats based on fluoroplastic materials are exceptionally hydrophobic and oleophobic. Cleaning of the surface is therefore easy and simple. In many cases surface is self-cleaning.

- Dielectric properties
These materials show excellent dielectric properties, low relative permittivity, low loss coefficient and exceptionally high specific resistance. Therefore they exceed most materials in resistance against electric breakdown and electric arc within a wide scope of working conditions.

- Cryogenic properties
These coats remain solid, stable and fully functional even at cryogenic temperatures, i.e. up to approximately -270 °C, without any loss of these properties.

Properties of protective coats based on polyamide PA11:

Polyamide PA11 (meets requirements of the standards BSI WIS 4-52-01, KIWA BRL K759-01 and UL 1091) is suitable as coating material for use with media and showing excellent resistance against corrosion, abrasion, shocks and vibrations and all of them together. Therefore this coat is suitable e.g. for the applications below:

- salt mists
- electrochemical reactions
- hydrocarbons, solvents and other inorganic and organic media

Properties of protective coats based on oxides or carbides of metals:

A series of coats based on oxides or carbides of metals is available for various applications. By combination and composition of additional materials in the applied coat may provide properties that cannot be achieved by any known methods.

Based on the customer's requirement the particular design of the protective coat of the thermowell or protective pipe of the temperature sensor is developed after specification of the basic information concerning to the measured medium (chemical composition, temperature, pressure, flow velocity and size of solid particles).

Lifetime of the thermowell

Lifetime of the thermowell depends on many parameters that relate to the design of the thermowell, parameters of the measured medium and other operational conditions. The thermowell may be exposed to corrosive and erosive effects of corrosive substances, high temperatures, mechanical load from flowing medium or other technological elements. As for mechanical load, the most important factor is load of the thermowell by vibrations that may be transferred to the thermowell from the technological equipment (pumps, motors, fans, etc.) or from the flowing medium. Flowing medium creates whirls behind the thermowell. Frequency of ripping off of these whirls is given, primarily by dimensions of the thermowell, velocity and viscosity of the measured medium. In case this frequency is close to own frequency of the thermowell, equality of these frequencies may cause massive absorption of energy by the thermowell and vibrations at the resonance frequency; this may result in strong vibrations of the thermowell and lead to its damage or damage of the built-in temperature sensor. Regulations ASME require the ratio of the excitation frequency from the flowing medium to the own frequency of the thermowell lower than 0.8. In case where the ratio is higher that 0.8, it is necessary to make some changes in the design of the thermowell and way of its installation. There are available following two basic solutions:

A) Decrease the excitation frequency from the flowing medium

- decrease velocity of the flow (enlarge diameter of the piping at the point of installation of the thermowell)

B) Increase own frequency of the thermowell

- shorten the length of the thermowell
- change the material of the thermowell
- use another type of the thermowell with a larger diameter or other shapes

Applicability of use of the thermowell for a particular application can be read from the loading diagrams or let it checked by a strength calculation. Such strength calculation is based on theoretic methods and therefore it cannot be considered as a guarantee against possible failures of the thermowell, because the given particular application may be exposed to other effects that cannot be included in the calculation.

	Type	Description			
•	WT70 C	Temperature cylindrical thermowell, PN 160			
	Code	**Version**			
•	01	Cylindrical for screwing			
•	02	Cylindrical for welding			
	03	Cylindrical with flange			
	99	Other			
	Code	**Inner bore [mm] diameter d[1)]**	**Outer diameter [mm] diameter D[1)] / diameter D1[1)]**		
•	V900	9	14 / 14		
	V700	7	12 / 12 (D1=10 for thermowell material Monel 400 - M08 and Hastelloy C-22 - M09)		
	V625	6.25	14 / 11		
	V500	5	12 / 8		
	V350	3.5	12 / 6.5		
	V999	Other			
	Code	**Inner thread Z1[1)]**	**Length L5 [mm] [1)]**		
•	Z01	M20x1.5	18		
•	Z02	M18x1.5	16		
	Z03	M16x1.5	14		
	Z04	M14x1.5	12		
•	Z05	G1/2”	18		
	Z06	G1/4”	16		
	Z07	1/2” NPT	19		
	Z99	Other			
	Code	**Process connection Z2[1)]**	**Length L4 [mm] [1)]**	**Wrench size SW [1)]**	
•	P02	M27x2	25.5	30	
	P03	M20x1.5	15	27	
•	P05	G3/4”	25.5	30	
•	P06	G1/2”	15	27	
	P08	3/4” NPT	21	30	
	P09	1/2” NPT	19	27	
•	P31	Diameter 27 for welding	25		
	P51	Flange DN 25/PN 16 according to EN 1092-1, Design B1	-		
	P52	Flange DN 40/PN 16 according to EN 1092-1, Design B1	-		
	P53	Flange DN 50/PN 16 according to EN 1092-1, Design B1	-		
	P54	Flange DN 25/PN 40 according to EN 1092-1, Design B1	-		
	P55	Flange DN 40/PN 40 according to EN 1092-1, Design B1	-		
	P56	Flange DN 50/PN 40 according to EN 1092-1, Design B1	-		
	P57	Flange DN 25/PN 63 according to EN 1092-1, Design B2	-		
	P58	Flange DN 40/PN 63 according to EN 1092-1, Design B2	-		
	P71	Flange 1”, 150 lbs according to ANSI B 16.5	-		
	P72	Flange 1.5”, 150 lbs according to ANSI B 16.5	-		
	P74	Flange 1”, 300 lbs according to ANSI B 16.5	-		
	P75	Flange 1.5”, 300 lbs according to ANSI B 16.5	-		
	P77	Flange 1”, 600 lbs according to ANSI B 16.5	-		
	P78	Flange 1.5”, 600 lbs according to ANSI B 16.5	-		
	P89	Between flanges	-	- consult with supplier (see dimensional drawing)	
	P99	Other			
	Code	**Nominal length L [mm] [1)]**	**Length L1 [mm] [1)]**	**Length L2 [mm] [1)2)]**	**Length L2 [mm] [1)3)]**	**Length L3 [mm] [1)]**
•	L100	100	101+1	76	80	50
•	L160	160	161+1	136	140	110
•	L250	250	251+1	226	230	200
•	L400	400	401+1	376	380	350
	L630	630	631+1.5	606	610	580
	L . . .	Other	- fill nominal length L and other dimensions in mm			
	Code	**Thermowell material**	**Tmax**		
	M01[4)]	1.0570	400 °C		
•	M03	1.4541	600 °C		
	M04	1.4571	500 °C		
	M06	Titan grade 2	- specific thermowell version consult with supplier		
	M07	Tantal 99%	- specific thermowell version consult with supplier		
	M08	Monel 400	- specific thermowell version consult with supplier		
	M09	Hastelloy C-22	- specific thermowell version consult with supplier		
	M10	Nickel 200/201	- specific thermowell version consult with supplier		
	M99	Other	- specific thermowell version consult with supplier		
		OPTIONAL ACCESSORIES			
	Code	**Protective coat**		**Tmax (with spray)**	
	X01	Polyamide PA11		100 °C (depending on measured medium)	
	X02	Ethylene-chlortrifluorethylene E-CTFE “Halar”		170 °C (depending on measured medium)	
	X03	Perfluoralkoxy - copolymer tetrafluorethylene and perfluorated vinylether PFA		260 °C (depending on measured medium)	
	X04	Ethylentetrafluorethylene ETFE “Hyflon”		130 °C (depending on measured medium)	
	X05	Polytetrafluorethylene PTFE		260 °C (depending on measured medium)	
	X08	Corundum spray for highly abrasive media		according to specific composition of coating	
	X09	Other			
	Code	**Accessories**			
•	BZS	Stainless steel tag (70x15 mm) with description according to order			
•	PPZ	Product description according to customer requirements			
	UZ	Stainless steel plug, dimension according to thermowell inner thread, including coupling chain			
•	Q1	Material certificate according to EN 10204, 3.1			
•	TZI	Pressure test of thermowell by inside over-pressure			
	TZE	Pressure test of thermowell by outside over-pressure (consult with supplier)			
•	PZ	Penetration test of thermowell welds			
	KY	Degreasing version for oxygen			
	VY	Strength calculation of thermowell (frequency, pressure stress)	- see configuration sheet No. 0993		

Example of order: WT70 C 01 V700 Z01 P02 L160 M03

• ... Ex stock version [1)]… See dimensional drawings [2)]… Only for process connection codes P02, P05, P31.

[3)]… For all process connection except codes P02, P05, P31. [4)]… Only for nominal length max. 250 mm.

	Type	Description		
•	WT70 T	Temperature conical thermowell for screwing, PN400		
	Code	**Version**		
•	21	Conical for screwing		
	99	Other		
	Code	**Inner bore diameter d [mm] 1)**		
•	V900	9		
•	V625	6.25		
	V320	3.2 - only for nominal length L160		
	V999	Other		
	Code	**Inner thread Z1 1)**	**Length L5 [mm] 1)**	
•	Z01	M20x1.5	18	
	Z02	M18x1.5	16	
	Z03	M16x1.5	14	
	Z05	G1/2”	18	
	Z06	G1/4”	16	
	Z07	1/2” NPT	19	
	Z99	Other		
	Code	**Process connection Z2 1)**	**Length L4 [mm] 1)**	**Wrench size SW 1)**
•	P01	M33x2	30	30
	P04	G1”	30	30
	P07	1” NPT	30	30
	P99	Other		
	Code	**Nominal length L [mm] 1)**	**Length L1 [mm] 1)**	**Length L2 [mm] 1)**
•	L160	160	161+1	136
	L250	250	251+1	226
	L . . .	Other	- fill nominal length L and other dimensions in mm	
	Code	**Thermowell material**	**Tmax**	
•	M02	1.7715	575 °C	
•	M03	1.4541	600 °C	
	M04	1.4571	500 °C	
	M05	1.4903	620 °C	
	M06	Titan grade 2	- specific thermowell version consult with supplier	
	M07	Tantal 99%	- specific thermowell version consult with supplier	
	M08	Monel 400	- specific thermowell version consult with supplier	
	M09	Hastelloy C-22	- specific thermowell version consult with supplier	
	M10	Nickel 200/201	- specific thermowell version consult with supplier	
	M99	Other	- specific thermowell version consult with supplier	
	Code	**OPTIONAL ACCESSORIES Accessories**		
•	BZS	Stainless steel tag (70x15 mm) with description according to order		
•	PPZ	Product description according to customer requirements		
	UZ	Stainless steel plug, dimension according to thermowell inner thread, including coupling chain		
•	Q1	Material certificate according to EN 10204, 3.1		
•	TZI	Pressure test of thermowell by inside over-pressure		
	KY	Degreasing version for oxygen		
	VY	Strength calculation of thermowell (frequency, pressure stress)	- see configuration sheet No. 0993	
Example of order: WT70 T 21 V625 Z01 P01 L160 M03				

• ... Ex stock version 1)… See dimensional drawings

	Type	Description		
•	NV	Welded on piece for thermowells WT70 C and WT70 T		
	Code	**Thread dimension M**	**Nominal pressure**	**L / L1 / D [mm] 1)**
•	M20	M20x1.5	PN160	50 / 25 / 30 (28)
•	M27	M27x2	PN160	65 / 30 / 40 (35)
•	M30	M30x2	PN160	65 / 35 / 40 (38)
•	M33	M33x2	PN250	40 / 35 / 55
	99	Other (specify thread in the order)		
	Code	**Version**		
•	P	Straight		
•	S	Oblique 45°		
	J	Other (specify angle in the order)		
	Code	**Material**	**Tmax**	
•	0	1.0308, (PN40 only)	300 °C	
•	1	1.0570	400 °C	
•	2	1.7715	575 °C	
•	4	1.4541	550 °C	
	5	1.4903	620 °C	
	9	Other		
	Code	**OPTIONAL ACCESSORIES Accessories**		
•	PPZ	Product description according to customer requirements		
•	Q1	Material certificate according to EN 10204, 3.1		
Example of order: NV M27 P1				

• ... Ex stock version 1) … Other length of the welded-on piece specify in brackets of ordering code, in brackets are information for material 1.0308.

	Type	Description			
•	WT70 D	Temperature conical thermowell for welding according to DIN 43772, PN250			
	Code	**Version**	**Design**	**Process connection diam. D [1)]**	**Inner bore diameter d [1)]**
•	31	Conical for welding	4	diameter 18h7	3,5 - only for inner thread M14x1.5 and nom. length max L260
•	32	Conical for welding	4	diameter 24h7	7 - only for inner thread M18x1.5
•	33	Conical for welding	4	diameter 26h7	7
•	34	Conical for welding	4	diameter 26h7	9
	99	Other			
	Code	**Inner thread Z1 [1)]**	**Length L5 [1)]**		
•	Z01	M20x1.5	19	- not for codes 31,32	
•	Z02	M18x1.5	16	- only for code 32	
•	Z04	M14x1.5	16	- only for code 31	
	Z05	G1/2"	19	- not for codes 31,32	
	Z07	1/2" NPT	19	- not for codes 31,32	
	Z99	Other			
	Code	**Nominal length L [1)]**	**Length U [1)]**	**Length G [1)]**	**Length U1 [2)]**
	L110	110	65+2	105+1	-
	L111	110	73+2	105+1	-
•	L140	140	65+2	135+1	-
•	L170	170	133+2	165+1	-
•	L200	200	65+2	195+1	130±2
	L201	200	125+2	195+1	-
	L260	260	125+2	255+1	190±2
	L410	410	275+2	405+1	340±2
	L . . .	Other	- fill nominal length L and other dimensions in mm		
	Code	**Thermowell material**	**Tmax**		
	M01	1.0570	400 °C	- not for version with flange	
	M11	1.0425, P265GH	450 °C	- not for version with flange	
•	M02	1.7715	575 °C	- not for version with flange	
•	M03	1.4541	600 °C		
	M04	1.4571	500 °C		
	M05	1.4903	620 °C		
	M06	Titan grade 2	- specific thermowell version consult with supplier		
	M07	Tantal 99%	- specific thermowell version consult with supplier		
	M08	Monel 400	- specific thermowell version consult with supplier		
	M09	Hastelloy C-22	- specific thermowell version consult with supplier		
	M10	Nickel 200/201	- specific thermowell version consult with supplier		
	M99	Other	- specific thermowell version consult with supplier		
	Code	**OPTIONAL ACCESSORIES** **Process connection with flange Z2 [1)]**			
	P64	Flange DN 40/PN 160 according to EN 1092-1			
	P67	Flange DN 40/PN 250 according to EN 1092-1			
	P84	Flange 1.5", 2500 lbs according to ANSI B 16.5			
	P99	Other	- customer requirements consult with supplier		
	Code	**Accessories**			
•	BZS	Stainless steel tag (70x15 mm) with description according to order			
•	PPZ	Product description according to customer requirements			
	UZ	Stainless steel plug, dimension according to thermowell inner thread, including coupling chain			
•	Q1	Material certificate according to EN 10204, 3.1			
•	TZI	Pressure test of thermowell by inside over-pressure			
	TZE	Pressure test of thermowell by outside over-pressure (consult with supplier)			
•	PZ	Penetration test of thermowell welds			
	KY	Degreasing version for oxygen			
	VY	Strength calculation of thermowell (frequency, pressure stress)			- see configuration sheet No. 0993
Example of order: WT70 D 33 Z01 L170 M03					

• ... Ex stock version [1)]… See dimensional drawings [2)]… Dimensions are valid only for conical thermowells with flange.

	Type	Description	
•	NV	Welded on piece for thermowells WT70 D	
	Code	**Inner diameter of welded-on piece [mm]**	**Length / outer diameter D [mm] [1)]**
	D18	18G7	40 / 39
•	D24	24G7	40 / 49
•	D26	26G7	40 / 49
	D99	Other	
	Code	**Version**	
•	P	Straight	
	S	Oblique 45°	
	J	Other (specify angle in the order)	
	Code	**Material**	
	M01	1.0570	
	M11	1.0425, P265GH	
•	M02	1.7715	
•	M03	1.4541	
	M04	1.4571	
	M05	1.4903	
	M99	Other	
	Code	**OPTIONAL ACCESSORIES** **Accessories**	
•	PPZ	Product description according to customer requirements	
•	Q1	Material certificate according to EN 10204, 3.1	
Example of order: NV D26 P M03			

• ... Ex stock version [1)] … Other length of the welded on piece specify in brackets of ordering code.

	Type	Description			
•	NT70	Extension piece for temperature sensors			
	Code	**Version of extension piece** **Diameter D**	**Material**	**Max. temperature**	
	D14	14x2.5 mm	1.4541	600 °C	
•	D20	20x3 mm	1.4541	600 °C	
	D99	Other			
	Code	**Length of extension piece M [mm]**			
	M060	60			
•	M090	90			
•	M150	150			
	M200	200			
	M240	240			
	M . . .	Other (fill in length of extension piece in mm)			
	Code	**Inner thread Z**	**Length L1 [mm]**		
•	Z01	M20x1.5	18		
	Z02	M18x1.5	16		
	Z03	M16x1.5	14		
	Z04	M14x1.5	12		
	Z05	G1/2”	18		
	Z06	G1/4”	16		
	Z07	1/2” NPT	19		
	Z99	Other			
	Code	**Process connection P**	**Length L2 [mm]**	**Diameter d [mm]**	
	P1	Outer thread M14x1.5	12	7	- only for D14
	P2	Outer thread M18x1.5	12	9	- only for D14
•	P3	Outer thread M20x1.5	15	9	
	P5	Outer thread G1/2”	15	9	
	P7	Outer thread 1/2” NPT	8	9	
	P9	Other			
	Code	**OPTIONAL ACCESSORIES** **Accessories**			
	BZS	Stainless steel tag (70x15 mm) with description according to order			
	PPZ	Product description according to customer requirements			
	UZ	Stainless steel plug, dimension according to thermowell inner thread, including coupling chain			
	Q1	Material certificate according to EN 10204, 3.1			
	TZI	Pressure test of thermowell by inside over-pressure			
	Example of order: NT70 D20 M90 Z01 P3				

• ... Ex stock version