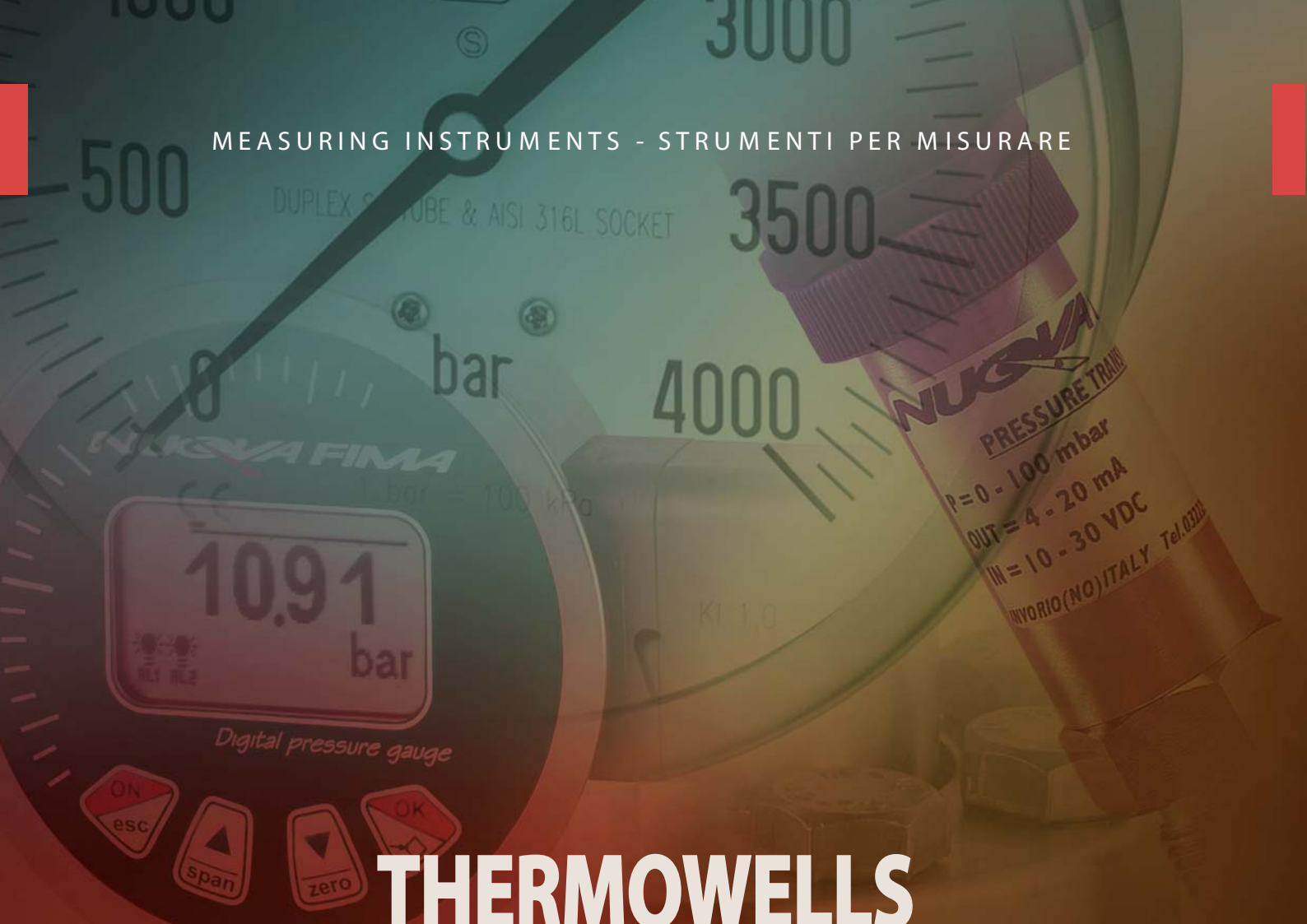


MEASURING INSTRUMENTS - STRUMENTI PER MISURARE

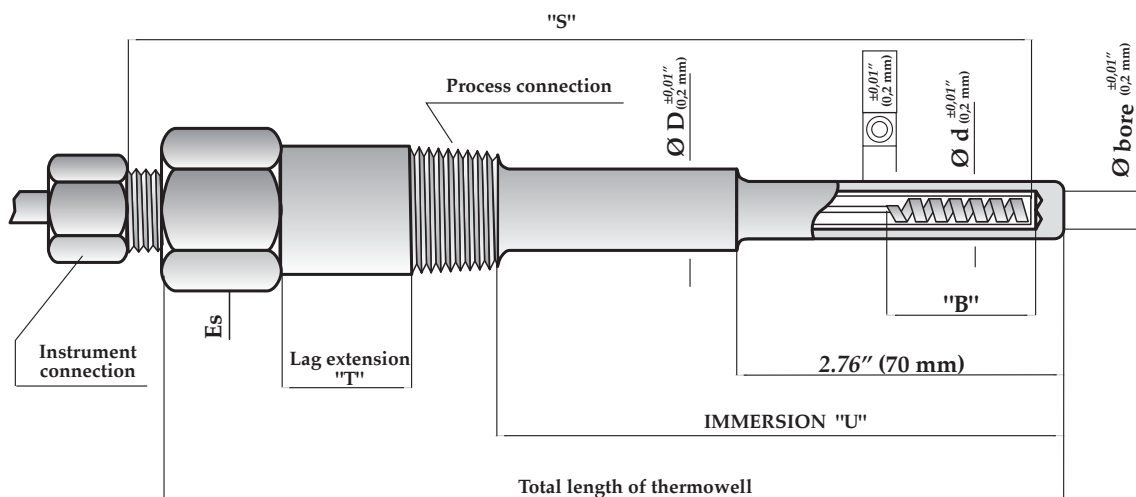


THERMOWELLS

NUOVA FIMA



Thermowells are used to protect bulbs from the effects of corrosion and process fluid flow, due to the high speed at which the process fluid flows, and to enable the thermometer to be interchanged, recalibrated, or replaced, without disturbing the process.



DEFINITION

Immersion "U"

This is the part of the thermowell extending from the underside of the process connection (threaded or flanged) to the tip of the shank that is inserted into the process fluid. The length varies from a minimum of 2.76" (70 mm) to a maximum of 196" (5000 mm) and is sized to suit the length of the sensitive part of thermometer bulbs and the section of the process pipe.

Lag extension "T"

This is the part of the well between the upper tip of the process connection (threaded or flanged) to the lower edge of the hexagon, and it is used to space the body of the temperature instrument, or the electrical connections in the case of thermocouples and thermal resistors, away from the process pipe.

Shank style

The shank is the portion of the thermowell that is inserted into the process, and its shape depends on the characteristics of the process fluid. A tapered shank style, for example, is the most suitable for applications with vapour at high temperature and speed, because it is particularly resistant to the effects of vibrations produced by the speed of the process fluid.

"S" dimension

This dimension related to the temperature sensors, rather than the thermowells. However, it is essential for obtaining a perfect coupling between the two. The "S" dimension can be calculated as follows: total length of the thermowell minus 10 mm.

Sensitive portion "B"

This is another dimension of the temperature sensors and not of the thermowells. When a temperature sensor is connected to a thermowell the sensitive part of the bulb must be located within the "U" immersion area.

GUIDE TO CHOOSING A THERMOWELL

MATERIALS

The choice of materials is generally based upon considerations of resistance to corrosion by the process fluid. Mirror polishing of the part that is immersed in the process confers maximal corrosion-resistance to the thermowell. In addition to the standard materials detailed on the following pages, rod-machined thermowells can also be constructed from MONEL 400, Hastelloy C276, Alloy 825, Alloy 625, Duplex SAF 2205, and Duplex SAF 2507. For special corrosion-resistance requirements, some thermowells may also be coated in PTFE.

PROCESS CONNECTIONS

The threads on thermowell connectors conform to the ASME B1.20.1 standards for NPT threads, and to DIN 3852 form A for Gas threads (UNI 338-BSP). Flanged thermowells have special threaded connectors which are welded to flanges that conform to the ANSI B16.5 or DIN-UNI standards. In these thermowells, the mechanical strength is assured by the threaded connection between the flange and thermowell, while the weld merely acts as a seal.

IMMERSION DEPTH "U"

For optimal measurement accuracy of the temperature sensing element (thermometer or thermistor), it is essential that the sensitive portion of the element be located entirely within the immersion depth.

Process fluid speed

When a thermowell is inserted into a process at a specific fluid speed it creates a turbulent wake (Von Karman Trail), which will have a particular frequency determined by the diameter of the thermowell and the speed of the process fluid. It is important for the thermowell dimensions to be chosen so that the frequency of the Karman wake is less than the resonant frequency of the thermowell. If these frequencies should coincide, the resulting vibrations will cause the destruction of the thermowell.

The maximum speeds and admissible lengths for the W50-60 range and W74-75-93 model thermowells at a temperature of 400 °C are shown alongside (the graph must be taken as a guide and does not replace checking, which must be carried out in depth).

Pressure temperature relation

The maximum permitted working pressure varies as a function of thermocouple wall thickness and temperature. In the pages that follow, graphs are provided that show the maximum operating pressures for thermowells made of AISI 304 or AISI 316, without taking the process fluid speed into consideration.

Checking conformity

The thermowells chosen can be checked by out Technical Department, in accordance with ASME PTC 19.3. This will

Therefore, when selecting a thermowell it is essential to know the exact length of the sensitive portion of the temperature instrument. On bimetallic thermometers and those filled with inert gases and liquid, the sensitive portions vary depending on the measuring range. Refer to catalogue data sheets TB and TG which list the respective dimensions.

THERMOWELL BORE

Different installations require a variety of different instruments for the measurement of temperature. The use of standard bore diameters facilitates interchangeability of the temperature sensors. The thermowells in this catalogue come in the following bore diameters:

Ø 0.28" (7 mm) bore

For bimetallic thermometers (BT) with Ø 0.24" (6 mm) or Ø 0.26" (6,5 mm) (1/4") bulb diameter. For thermocouples or thermistors.

Ø 0.39" (10 mm) bore

For bimetallic thermometers (BT) with Ø 0.31" (8 mm) or Ø 0.38" (9,6 mm) bulb diameter. For inert gas thermometers with Ø 0.31" (8 mm) and Ø 0.38" (9,6 mm) bulb diameter.

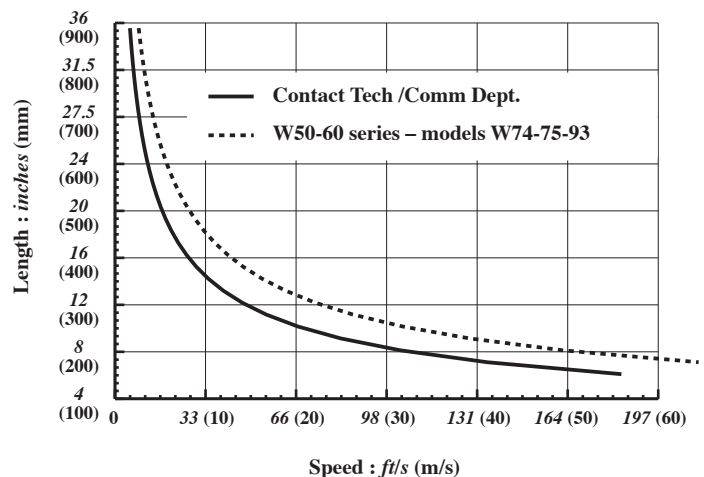
Ø 0.47" (12 mm) bore.

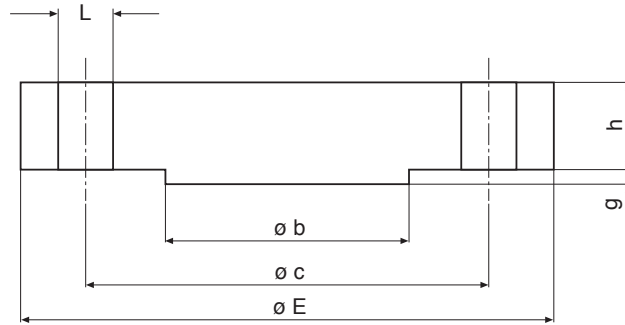
For inert gas thermometers with Ø 0.45" (11,5 mm) bulb diameter.

result in a certificate being issued that states that the thermowell has been checked for conformity in relation to the plant's operating conditions.

When this service is required, the following must be provided:

- Exact thermowell immersion dimensions (bore Ø, point and connections);
- thermowell material;
- pressure, temperature, speed and density of process fluid.





FLANGED CONNECTIONS TO ASME STANDARDS: DIMENSIONS

dimensions : inches

DN	Class-psi (1)	Cod.	E	b	h	g	c	L	N (2)
3/4"	150	5AA	3.88	1.69	0.96	0.06	2.75	0.63	0.16
3/4"	300	5BA	4.63	1.69	1.14	0.06	3.25	0.75	0.16
3/4"	600	5DA	4.63	1.69	1.14	0.25	3.25	0.75	0.16
3/4"	900	5EA	5.12	1.69	1.22	0.25	3.25	0.87	0.16
3/4"	1500	5FA	5.12	1.69	1.22	0.25	3.25	0.87	0.16
1"	150	6AA	4.25	2	0.96	0.06	3.13	0.63	0.16
1"	300	6BA	4.88	2	1.2	0.06	3.50	0.75	0.16
1"	600	6DA	4.88	2	1.2	0.25	3.50	0.75	0.16
1"	900	6EA	5.87	2	1.38	0.25	4	1.02	0.16
1"	1500	6FA	5.87	2	1.38	0.25	4	1.02	0.16
1 1/2"	150	AAA	5	2.87	0.93	0.06	3.87	0.63	0.16
1 1/2"	300	ABA	6.12	2.87	1.28	0.06	4.5	0.87	0.16
1 1/2"	600	ADA	6.12	2.87	1.28	0.25	4.5	0.87	0.16
1 1/2"	900	AEA	7.01	2.87	1.46	0.25	4.37	1.14	0.16
1 1/2"	1500	AFA	7.01	2.87	1.46	0.25	4.37	1.14	0.16
2"	150	BAA	6	3.63	0.96	0.06	4.75	0.75	0.16
2"	300	BBA	6.5	3.63	1	0.06	5	0.75	0.32
2"	600	BDA	6.5	3.63	1	0.25	5	0.75	0.32
2"	900	BEA	8.5	3.63	1.5	0.25	6.5	1	0.32
2"	1500	BFA	8.5	3.63	1.5	0.25	6.5	1	0.32

FLANGED CONNECTIONS TO UNI-DIN STANDARDS: DIMENSIONS

dimensions : mm

DN	NP-bar (1)	Cod.	E	b	h	g	c	L	N (2)
20	6	PO0	90	50	12	2	65	11	4
20	10...16	PQ0	105	58	14	2	75	14	4
20	25...40	PS0	105	58	16	2	75	14	4
20	100	PU0	130	58	20	2	90	18	4
25	6	QO0	100	60	12	2	75	11	4
25	10...16	QO0	115	68	14	2	85	14	4
25	25...40	QS0	115	68	16	2	85	14	4
25	100	QU0	140	65	22	2	100	18	4
40	6	SO0	130	80	11	3	100	14	4
40	10...16	SQ0	150	88	13	3	110	18	4
40	25...40	SS0	150	88	15	3	110	18	4
40	100	SU0	170	85	23	3	125	22	4
50	6	TO0	140	90	11	3	110	14	4
50	10...16	TQ0	165	102	15	3	125	18	4
50	25...40	TS0	165	102	17	3	125	18	4
50	100	TU0	195	95	25	3	145	27	4

- 1) The pressure applied must not exceed 1,5 times the NP for a 20U30AC flange and 1 times the NP for a 340 AC flange.
- 2) NA boring right through.

TOLERANCE AND MACHINING CHARACTERISTICS

OUTSIDE DIAMETER:
±0,01" (0,2 mm)

BORE DIAMETER:
±0,01" (0,2 mm)

BORE CONCENTRICITY:
10% of the thermowell wall thickness.

BASE THICKNESS:
±0,04" (1 mm)

LENGTHS:
±0,04" (1 mm)

IMMERSION FINISH (for bar-stock thermowells):

Ra 3,2Hm; Rz 12,5 Hm; 125 AARH standard finish
Ra 0,8 Hm; Rz 3,2 Hm; 32 AARH for polished finish – to be indicated in order

WELDING

All welds carried out on stainless steel thermowells are done in inert gas atmospheres, with or without the addition of material. Flanged thermowells with full penetration welds are available upon request.

MARKING

The threaded thermowells have the following markings on the hexagon or round bar:

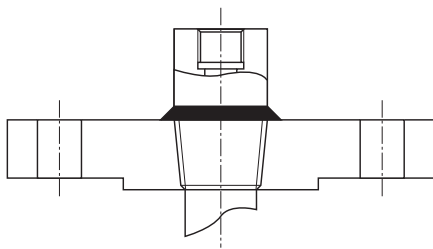
Material – Immersion – Client's Logo
E.G. AISI 316 - U=125 - TW 1256

The flange of flanged thermowells have the following markings:

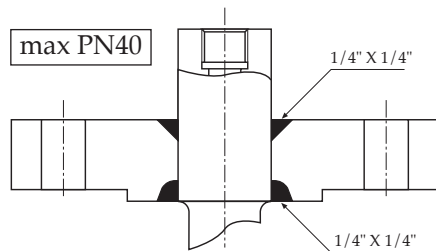
Flange rating – Material – Immersion – Client's Logo
E.G. 1" 150 RF 125AARH - ASTM A 105 - U=250 - TW1256

If the thermowell is made of material that differs from that of the flange, the material will also be marked on the thermowell.

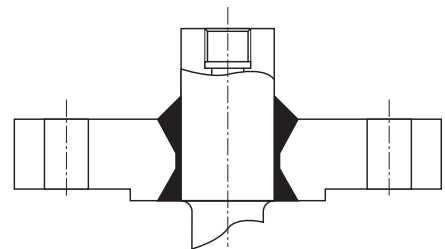
Standard welding



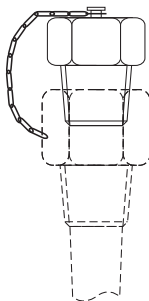
Double welding



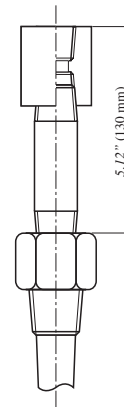
Full penetration welding



Cap and chain



Nipple + 5.12" (130 mm) hose



**built-up thermowells, straight shank
with threaded connection,
NP25**

W10, W20 serie



Thermowells are used to protect the measuring instrument from corrosion, high pressure or high fluid velocity and to allow the measuring instrument removal for recalibration or replacement without affecting the process system. The w10-W20 serie includes thermowells with threaded process connection. These thermowells are suitable for low / medium work intensity.

9 - Thermowells

Nominal pressure: 360 psi @ 752°F (25 bar @ 400°C).

Process fluid temperature: -328...+752°F (-200...+400 °C), for std materials.

Total length: 196" max (5000 mm).

Insertion hole: **100** - $\varnothing 0,39$ " (10 mm); **120** - $\varnothing 0,47$ " (12 mm)

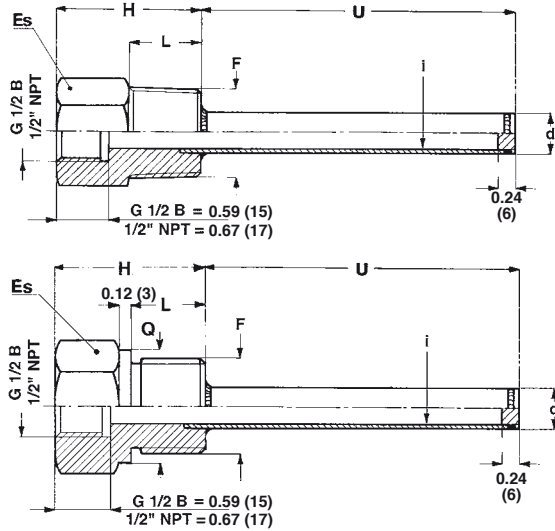
Materials :

insertion, AISI 316 (**Cod. 4**), AISI 316L (**Cod. 5**) st.st. seamless tube;
thread, AISI 316, AISI 316L st.st. bar-stock.

OPTIONS

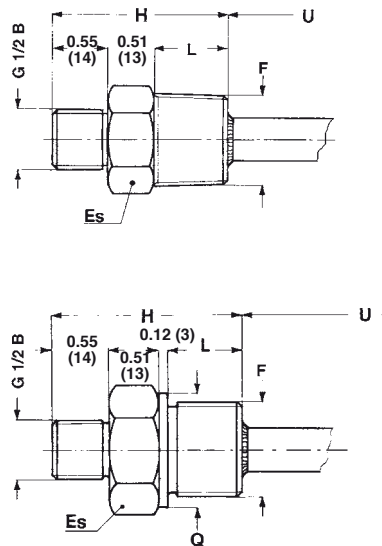
E30 - NACE MR0103/MR0175 - ISO15156-3 certificate
P02 - Oxygen service
TC1 - Plug and chain (1)

(1) Drawings and details in the "Thermowells information" sheet.



Mod.	Es.	F	i	d	H	L	Q
W11	0.94 (24)	43M	0.39 (10)	0.47 (12)	1.65 (42)	0.67 (17)	-
		1/2" NPT	0.47 (12)	0.55 (14)			
W12	1.06 (27)	53M	0.39 (10)	0.47 (12)	1.69 (43)	0.71 (18)	-
		3/4" NPT	0.47 (12)	0.55 (14)			
W13	1.42 (36)	41M	0.39 (10)	0.47 (12)	1.42 (36)	0.55 (14)	1.02 (26)
		G 1/2 B	0.47 (12)	0.55 (14)			
W13	1.26 (32)	63M	0.39 (10)	0.47 (12)	1.81 (46)	0.83 (21)	-
		1" NPT	0.47 (12)	0.55 (14)			
W14	1.61 (41)	51M	0.39 (10)	0.47 (12)	1.50 (38)	0.63 (16)	1.25 (31,7)
		G 3/4 B	0.47 (12)	0.55 (14)			
W14	1.61 (41)	61M	0.39 (10)	0.47 (12)	1.57 (40)	0.71 (18)	1.54 (39)
		G 1 B	0.47 (12)	0.55 (14)			

dimensions : inches (mm)



Mod.	Es.	F	i	d	H	L	Q
W21	0.87 (22)	43M	0.39 (10)	0.47 (12)	1.73 (44)	0.67 (17)	-
		1/2" NPT	0.47 (12)	0.55 (14)			
W22	1.06 (27)	53M	0.39 (10)	0.47 (12)	1.77 (45)	0.71 (18)	-
		3/4" NPT	0.47 (12)	0.55 (14)			
W23	1.42 (36)	41M	0.39 (10)	0.47 (12)	1.61 (41)	0.55 (14)	1.02 (26)
		G 1/2 B	0.47 (12)	0.55 (14)			
W23	1.26 (32)	63M	0.39 (10)	0.47 (12)	1.89 (48)	0.83 (21)	-
		1" NPT	0.47 (12)	0.55 (14)			
W24	1.61 (41)	51M	0.39 (10)	0.47 (12)	1.69 (43)	0.63 (16)	1.25 (31,7)
		G 3/4 B	0.47 (12)	0.55 (14)			
W24	1.61 (41)	61M	0.39 (10)	0.47 (12)	1.77 (45)	0.71 (18)	1.54 (39)
		G 1 B	0.47 (12)	0.55 (14)			

dimensions : inches (mm)

"HOW TO ORDER" SEQUENCE

Section / Model / Material / Instrument connection / Process connection / Insertion hole / Insertion length / Extension length / Options

9	W11	4	41F - G 1/2	41M	100	E30...TC1
	W12	5	43F - 1/2 NPT	51M	120	
	W13		41M - G 1/2 B	61M		
	W14			43M		
	W21			53M		
	W22			63M		
	W23					
	W24					

built-up thermowells, straight shank, with flanged connection, NP 6...25

W82



Thermowells are used to protect the measuring instrument from corrosion, high pressure or high fluid velocity and to allow the measuring instrument removal for recalibration or replacement without affecting the process system. The W82 serie includes bar-stock thermowells with flanged process connection. These thermowells are suitable for low / medium work intensity.

9.W82 - Standard Model

Nominal pressure: as flange rating, 360 psi @ 752°F max (25 bar @ 400°C).

Process fluid temperature: -328...+752°F (-200...+400°C), for std materials.

Total length: 196" max (5000 mm).

Insertion hole: 100 - $\varnothing 0,39$ " (10 mm); 120 - $\varnothing 0,47$ " (12 mm)

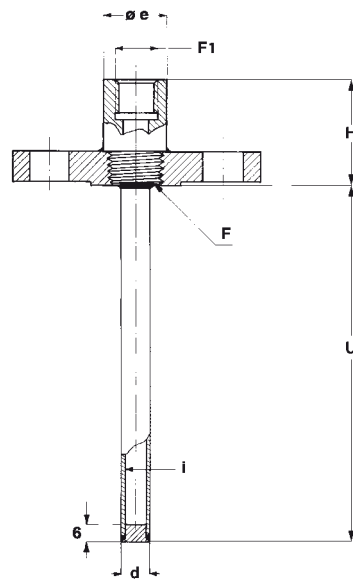
Process connection: plain flanges as per UNI-DIN or ASME B16.5; dimensions and finishing as defined in "Thermowell information" sheet.

Materials: AISI 316 (Cod. 4) or AISI 316L (Cod. 5) st.st tube and thread; ASTM A 105 (Cod. 3), AISI 316 (Cod. 4) st.st flange.

OPTIONS

P02 - Oxygen service
E30 - NACE MR0103/MR0175 - ISO15156-3 certificate
TC1 - Plug and chain (1)
NIP - Nipple with coupling (1)
P04 - Dye penetrant test (1)

(1) Drawings and details in the "Thermowells information" sheet.



F1
41F - G 1/2
43F - 1/2-14 NPT
53F - 3/4-14 NPT

dimensions : inches (mm)

Standard (1)	DN		F	e	H	i	d		
ASME B16.5	1/2"	Class 150...300	1/2" NPT	1.18 (30)	1.57 (40)	0.39 (10)	0.47 (12)		
	3/4"		1/2" NPT						
	1"		3/4" NPT						
	1" 1/2		1" NPT	1.38 (35)				0.47 (12)	0.55 (14)
	2"		1" NPT						
DIN-UNI	15	NP 6...25 bar	1/2" NPT	1.18 (30)	1.57 (40)	0.39 (10)	0.47 (12)		
	20		1/2" NPT						
	25		3/4" NPT						
	32		1" NPT	1.38 (35)				0.47 (12)	0.55 (14)
	40		1" NPT						
	50		1" NPT						

(1) flange dimensions are shown on introductory data-sheet "Introduction to thermowells"

"HOW TO ORDER" SEQUENCE

Section	Model	Material	Flange / material	Instrument connection	Process connection	Insertion hole	Insertion length	Extension length	Options
9	W82	4	3	41F	6AA	100			P02...P04
		5	4	43F		120			
				53F					

bar-stock thermowells, stepped shank, with threaded connection, NP100

W30, W40 serie



Thermowells are used to protect the measuring instrument from corrosion, high pressure or high fluid velocity and to allow the measuring instrument removal for recalibration or replacement without affecting the process system. The W30-W40 serie includes bar-stocked thermowells with a threaded process connection and they are suitable for heavy work conditions. These thermowells have a stepped-shank immersion length for a better process temperature measuring sensibility.

9 - Thermowells

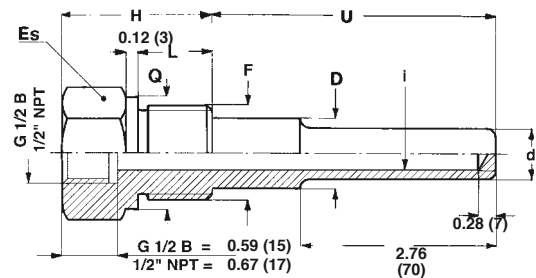
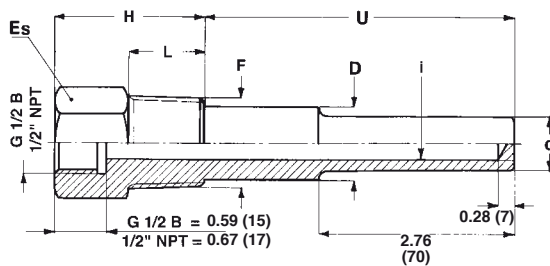
Nominal pressure: 1450 psi @ 752°F (100 bar @ 400°C).

Process fluid temperature: -328...+1112°F (-200...+600°C), for std materials.

Total length: 40" max (1000 mm).

Materials: AISI 316 (Cod. 4), AISI 316L (Cod. 5) st.st. bar-stock.

Special materials: Monel 400, Hastelloy C276, Alloy 825, Alloy 625, Duplex SAF 2205, Duplex SAF 2507 bar-stock.

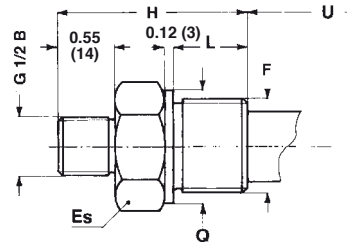
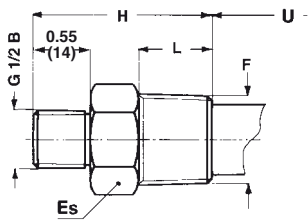


dimensions : inches (mm)

Mod.	Es.	F	i	D	d	H	L	Q
W31	0.94 (24) ⁽¹⁾	43M 1/2" NPT	0.28-0.31-0.35 (7 - 8 - 9)	0.71 (18)	0.59 (15)	1.81 (46)	0.79 (20)	-
			0.39-0.47 (10 - 12)		0.71 (18)			
W32	1.06 (27) ⁽¹⁾	53M 3/4" NPT	0.28-0.31-0.35 (7 - 8 - 9)	0.71 (18)	0.59 (15)	1.81 (46)	0.79 (20)	-
			0.39-0.47 (10 - 12)	0.83 (21)	0.71 (18)			
W33	1.42 (36) ⁽²⁾	41M G 1/2 B	0.28-0.31-0.35 (7 - 8 - 9)	0.71 (18)	0.59 (15)	1.81 (46)	0.79 (20)	1.02 (26)
			0.39-0.47 (10 - 12)		0.71 (18)			
W33	1.42 (36) ⁽²⁾	63M 1" NPT	0.28-0.31-0.35 (7 - 8 - 9)	0.83 (21)	0.59 (15)	2.01 (51)	0.98 (25)	-
			0.39-0.47 (10 - 12)	0.98 (25)	0.71 (18)			
W34	1.61 (41)	51M G 3/4 B	0.28-0.31-0.35 (7 - 8 - 9)	0.71 (18)	0.59 (15)	1.81 (46)	0.79 (20)	1.25 (31,7)
			0.39-0.47 (10 - 12)	0.83 (21)	0.71 (18)			
W34	1.61 (41)	61M G 1 B	0.28-0.31-0.35 (7 - 8 - 9)	0.83 (21)	0.59 (15)	2.01 (51)	0.79 (20)	1.54 (39)
			0.39-0.47 (10 - 12)	0.98 (25)	0.71 (18)			

(1) For insertion length > 16" (400 mm) and/or special material : round bar stock \varnothing 1.18 (30mm) with 0.94" (24 mm) key.

(2) For insertion length > 28" (700 mm) and/or special material : round bar stock \varnothing 1.38 (35mm) with 1.06" (27 mm) key.



dimensions : inches (mm)

Mod.	Es.	F	i	D	d	H	L	Q
W41	0.94 (24) ⁽¹⁾	43M 1/2" NPT	0.28-0.31-0.35 (7 - 8 - 9)	0.71 (18)	0.59 (15)	2.24 (57)	0.79 (20)	-
			0.39-0.47 (10 - 12)		0.69 (18)			
W42	1.06 (27) ⁽¹⁾	53M 3/4" NPT	0.28-0.31-0.35 (7 - 8 - 9)	0.71 (18)	0.59 (15)	2.24 (57)	0.79 (20)	-
			0.39-0.47 (10 - 12)	0.83 (21)	0.71 (18)			
W43	1.42 (36) ⁽²⁾	41M G 1/2 B	0.28-0.31-0.35 (7 - 8 - 9)	0.71 (18)	0.59 (15)	2.24 (57)	0.79 (20)	1.02 (26)
			0.39-0.47 (10 - 12)		0.71 (18)			
W43	1.42 (36) ⁽²⁾	63M 1" NPT	0.28-0.31-0.35 (7 - 8 - 9)	0.83 (21)	0.59 (15)	2.44 (62)	0.98 (25)	-
			0.39-0.47 (10 - 12)	0.98 (25)	0.71 (18)			
W44	1.61 (41)	51M G 3/4 B	0.28-0.31-0.35 (7 - 8 - 9)	0.71 (18)	0.59 (15)	2.24 (57)	0.79 (20)	1.25 (31,7)
			0.39-0.47 (10 - 12)	0.83 (21)	0.71 (18)			
W44	1.61 (41)	61M G 1 B	0.28-0.31-0.35 (7 - 8 - 9)	0.83 (21)	0.59 (15)	2.44 (62)	0.79 (20)	1.54 (39)
			0.39-0.47 (10 - 12)	0.98 (25)	0.71 (18)			

(1) For insertion length > 16" (400 mm) and/or special material : round bar stock ø 1.18 (30mm) with 0.94" (24 mm) key.

(2) For insertion length > 28" (700 mm) and/or special material : round bar stock ø 1.38 (35mm) with 1.06" (27 mm) key.

OPTIONS

P02 - Oxygen service
E30 - NACE MR0103 - MR0175 (ISO15156) certificate
TC1 - Plug and chain (1)
NIP - Nipple with coupling (1)

(1) Drawings and details in the "Thermowells information" sheet.

i
070 - ø 0.28 (7)
080 - ø 0.31 (8)
090 - ø 0.35 (9)
100 - ø 0.39 (10)
120 - ø 0.47 (12)

"HOW TO ORDER" SEQUENCE

Section	Model	Material	Instrument connection	Process connection	Insertion hole	Insertion length	Extension length	Options
9	W31	4	41F - G 1/2	41M	070			P02...NIP
	W32	5	43M - 1/2 NPT	51M	080			
	W33		41M - G 1/2 B	61M	090			
	W34			43M	100			
	W41			53M	120			
	W42			63M				
	W43							
	W44							

bar-stock thermowells, stepped shank, with flanged connection, NP 6...100

W92



Thermowells are used to protect the measuring instrument from corrosion, high pressure or high fluid velocity and to allow the measuring instrument removal for recalibration or replacement without affecting the process system. The W92 serie includes bar-stock thermowells with flanged process connection and they are suitable for heavy work conditions. These thermowells have a stepped-shank immersion length for a better process temperature measuring sensibility.

9.W92 - Standard Model

Nominal pressure: as flange rating, 1450 psi @ 752°F max (100 bar @ 400°C).

Process fluid temperature: -328...+1112°F (-200...+600°C), for std materials.

Total length: max 40" (1000 mm).

Process connection: plain flanges as per UNI-DIN or ASME B16.5; dimensions and finishing as defined in "Thermowell information" sheet.

Materials:

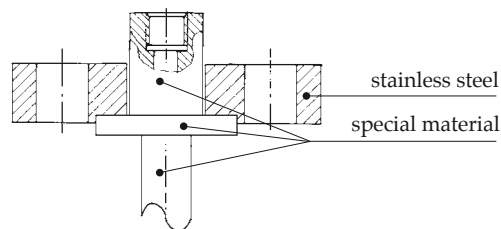
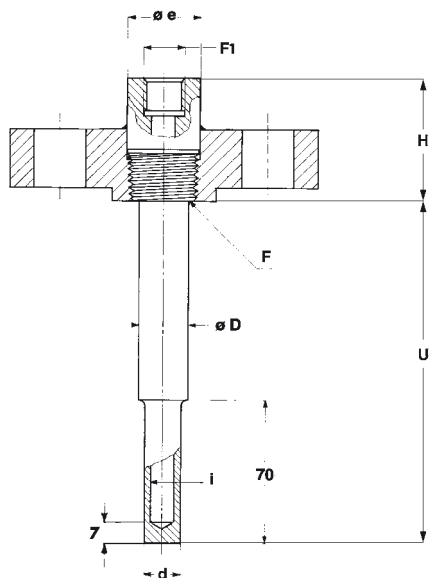
AISI 316 (Cod. 4) or AISI 316L (Cod. 5) st.st. bar-stock;
ASTM A 105 (Cod. 3), AISI 316 (Cod. 4) st.st. flange.

Special materials : Monel 400, Hastelloy C276, Alloy 825, Alloy 625, Duplex SAF 2205, Duplex SAF 2507 flange and bar-stock (the flange is also available made by stainless steel, with wetted parts made by special material)

OPTIONS

P02 - Oxygen service
E30 - NACE MR0103/MR0175 - ISO 15156-3 certificate
TC1 - Plug and chain (1)
NIP - Nipple with coupling (1)
Double welding (1)
FUL - "full penetration" welding (1)
P04 - Dye penetrant test (1)
CVK - ASME PTC 19.3 TW calculation (1)

(1) Drawings and details in the "Thermowells information" sheet.



Version with stainless steel flange, but wetted parts made by special material

F1
41F - G 1/2
43F - 1/2-14 NPT
53F - 3/4-14 NPT

i
070 - \varnothing 0.28 (7)
080 - \varnothing 0.31 (8)
090 - \varnothing 0.35 (9)
100 - \varnothing 0.39 (10)
120 - \varnothing 0.47 (12)

dimensions : inches (mm)

Standard	DN		F	e	H	i	D	d
ASME B16.5	3/4"	Class 150...1500	1/2" NPT	1.18 (30)	2.36 (60)	0.28-0.31-0.35 (7 - 8 - 9)	0.69 (17,5)	0.59 (15)
						0.39-0.47 (10 - 12)	0.71 (18)	0.71 (18)
	1"		3/4" NPT	1.18 (30)	2.36 (60)	0.28-0.31-0.35 (7 - 8 - 9)	0.71 (18)	0.59 (15)
						0.39-0.47 (10 - 12)	0.83 (21)	0.71 (18)
	1 1/2 2"		1" NPT	1.38 (35)	2.36 (60)	0.28-0.31-0.35 (7 - 8 - 9)	0.83 (21)	0.59 (15)
						0.39-0.47 (10 - 12)	0.98 (25)	0.71 (18)
EN 1092	20	NP 6...100	1/2" NPT	1.18 (30)	2.36 (60)	0.28-0.31-0.35 (7 - 8 - 9)	0.69 (17,5)	0.59 (15)
						0.39-0.47 (10 - 12)	0.71 (18)	0.71 (18)
	25		3/4" NPT	1.18 (30)	2.36 (60)	0.28-0.31-0.35 (7 - 8 - 9)	0.71 (18)	0.59 (15)
						0.39-0.47 (10 - 12)	0.83 (21)	0.71 (18)
	32, 40, 50		1" NPT	1.38 (35)	2.36 (60)	0.28-0.31-0.35 (7 - 8 - 9)	0.83 (21)	0.59 (15)
						0.39-0.47 (10 - 12)	0.98 (25)	0.71 (18)

"HOW TO ORDER" SEQUENCE

Section	Model	Material	Flange / material	Instrument / connection	Process / connection	Insertion hole / Insertion length	Extension / length	Options
9	W92	4	3	41F	6AA	070		P02...P04
		5	4	43F		080		
				53F		090		
						100		
						120		

bar-stock thermowells, weld-in connection, NP 100...250

W70 serie



Thermowells are used to protect the measuring instrument from corrosion, high pressure or high fluid velocity and to allow the measuring instrument removal for recalibration or replacement without affecting the process system. The W72-W73 serie includes bar stock thermowells with weld-in socket process connection and they are suitable for heavy work conditions. These thermowells are suitable for low / medium work intensity. These thermowells have a stepped-shank immersion length for a better process temperature measuring sensibility. The W75-W75 serie includes bar stock thermowells with weld-in socket process connection and they are suitable for heavy work conditions. These thermowells have a conic immersion length.

9 - Thermowells

Nominal pressure:

stepped shank : 11450 psi @ 752°F (100 bar @ 400°C);

tapered shank : 3600 psi @ 752°F (250 bar @ 400°C).

Process fluid temperature: -328...+1112°F (-200...+600°C), for std materials.

Total length: max 40" (1000 mm).

Materials : AISI 316 (Cod. 4), AISI 316L (Cod. 5) st.st. bar-stock.

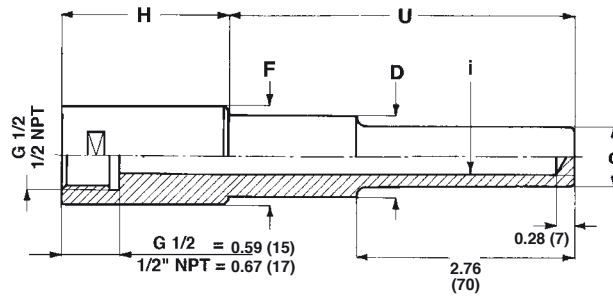
Special materials : Monel 400, Hastelloy C276, Alloy 825, Alloy 625, Duplex SAF 2205, Duplex SAF 2507 bar-stock.

OPTIONS

P02 - Oxygen service
E30 - NACE MR0103 - MR0175 (ISO15156) certificate
TC1 - Plug and chain (1)
NIP - Nipple with coupling (1)
CVK - Von Karman Trail calculation (1) (2)

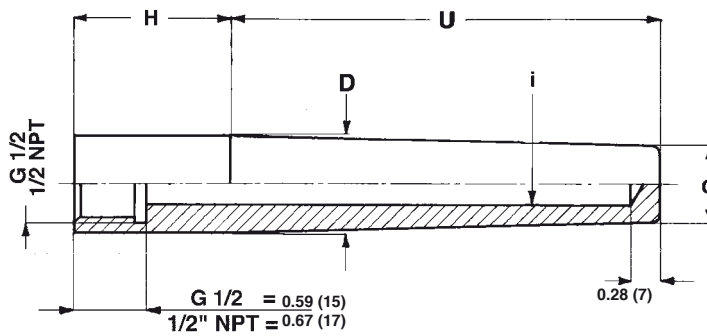
(1) Drawings and details in the "Thermowells information" sheet.

(2) Available for tapered shank only .



Mod.	DN	F	i	D	d	H
W72	3/4"	1.06 (26,9)	0.28-0.31-0.35 (7 - 8 -9)	0.75 (19)	0.59 (15)	1.81 (46)
			0.39-0.47 (10 - 12)	0.75 (19)	0.71 (18)	
W73	1"	1.31 (33,4)	0.28-0.31-0.35 (7 - 8 -9)	0.87 (22)	0.59 (15)	2.01 (51)
			0.39-0.47 (10 - 12)	0.87 (22)	0.71 (18)	

dimensions : inches (mm)



Mod.	DN	i	D	d	H
W74	1"	0.28-0.31-0.35 (7 - 8 -9)	1.31 (33,4)	0.71 (18)	2.01 (51)
		0.39-0.47 (10 - 12)		0.83 (21)	
W75	1"1/4	0.28-0.31-0.35 (7 - 8 -9)	1.66 (42,16)	0.71 (18)	2.01 (51)
		0.39-0.47 (10 - 12)		0.83 (21)	

dimensions : inches (mm)

i
070 - ø 0.28 (7)
080 - ø 0.31 (8)
090 - ø 0.35 (9)
100 - ø 0.39 (10)
120 - ø 0.47 (12)

"HOW TO ORDER" SEQUENCE

Section / Model / Material / Instrument connection / Process connection / Insertion hole / Insertion length / Extension length / Options

9	W72	4	41F - G 1/2	700	070	P02...CVK
	W73	5	43M - 1/2 NPT		080	
	W74				090	
	W75				100	
					120	

bar-stock thermowells, tapered shank, with threaded connection, NP250

W50, W60 serie



Thermowells are used to protect the measuring instrument from corrosion, high pressure or high fluid velocity and to allow the measuring instrument removal for recalibration or replacement without affecting the process system. The W50-W60 serie includes bar-stocked thermowells with a threaded process connection and they are suitable for heavy work conditions. These thermowells have a conic immersion length.

9 - Thermowells

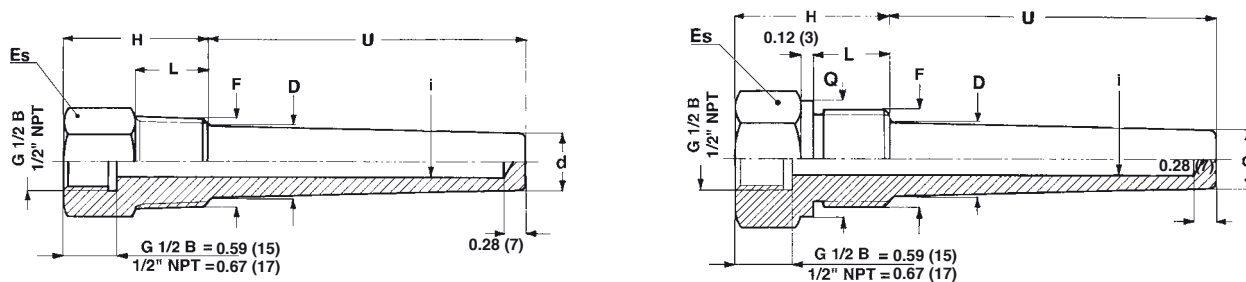
Nominal pressure: 3600 psi @ 752°F (250 bar @ 400°C).

Process fluid temperature: -328...+1112°F (-200...+600°C), for std materials.

Total length: 40" max (1000 mm).

Materials : AISI 316 (Cod. 4), AISI 316L (Cod. 5) st.st. bar-stock.

Special materials : Monel 400, Hastelloy C276, Alloy 825, Alloy 625, Duplex SAF 2205, Duplex SAF 2507 bar-stock.

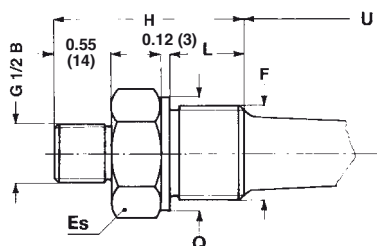
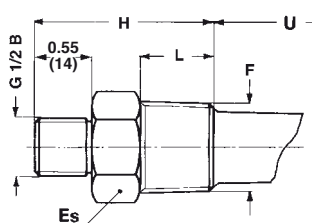


dimensions : inches (mm)

Mod.	Es.	F	i	D	d	H	L	Q
W52	1.06 (27) ⁽¹⁾	53M 3/4" NPT	0.28-0.31-0.35 (7 - 8 - 9)	0.91 (23)	0.71 (18)	1.81 (46)	0.79 (20)	-
			0.39-0.47 (10 - 12)		0.83 (21)			
W53	1.42 (36) ⁽²⁾	63M 1" NPT	0.28-0.31-0.35 (7 - 8 - 9)	1.14 (29)	0.71 (18)	2.01 (51)	0.98 (25)	-
			0.39-0.47 (10 - 12)		0.83 (21)			
W54	1.61 (41)	51M G 3/4 B	0.28-0.31-0.35 (7 - 8 - 9)	0.91 (23)	0.71 (18)	1.81 (46)	0.79 (20)	1.25 (31,7)
			0.39-0.47 (10 - 12)		0.83 (21)			
W54	1.61 (41)	61M G 1 B	0.28-0.31-0.35 (7 - 8 - 9)	1.14 (29)	0.71 (18)	2.01 (51)	0.98 (25)	1.54 (39)
			0.39-0.47 (10 - 12)		0.83 (21)			

(1) For insertion length > 16" (400 mm) and/or special material : round bar stock ø 1.18 (30mm) with 0.94" (24 mm) key.

(2) For insertion length > 28" (700 mm) and/or special material : round bar stock ø 1.38 (35mm) with 1.06" (27 mm) key.



dimensions : inches (mm)

Mod.	Es.	F	i	D	d	H	L	Q
W62	1.06 (27) ⁽¹⁾	53M 3/4" NPT	0.28-0.31-0.35 (7 - 8 -9)	0.91 (23)	0.71 (18)	2.24 (57)	0.79 (20)	-
			0.39-0.47 (10 - 12)		0.83 (21)			
W63	1.42 (36) ⁽²⁾	63M 1" NPT	0.28-0.31-0.35 (7 - 8 -9)	1.14 (29)	0.71 (18)	2.44 (62)	0.98 (25)	-
			0.39-0.47 (10 - 12)		0.83 (21)			
W64	1.61 (41)	51M G 3/4 B	0.28-0.31-0.35 (7 - 8 -9)	0.91 (23)	0.71 (18)	2.24 (57)	0.79 (20)	1.25 (31,7)
			0.39-0.47 (10 - 12)		0.83 (21)			
W64	1.61 (41)	61M G 1 B	0.28-0.31-0.35 (7 - 8 -9)	1.14 (29)	0.71 (18)	2.44 (62)	0.98 (25)	1.54 (39)
			0.39-0.47 (10 - 12)		0.83 (21)			

(1) For insertion length > 16" (400 mm) and/or special material : round bar stock $\varnothing 1.18$ (30mm) with 0.94" (24 mm) key.

(2) For insertion length > 28" (700 mm) and/or special material : round bar stock $\varnothing 1.38$ (35mm) with 1.06" (27 mm) key.

OPTIONS

P02 - Oxygen service
E30 - NACE MR0103 - MR0175 (ISO15156) certificate
TC1 - Plug and chain (1)
NIP - Nipple with coupling (1)
CVK - ASME PTC 19.3 TW calculation

i
070 - $\varnothing 0.28$ (7)
080 - $\varnothing 0.31$ (8)
090 - $\varnothing 0.35$ (9)
100 - $\varnothing 0.39$ (10)
120 - $\varnothing 0.47$ (12)

(1) Drawings and details in the "Thermowells information" sheet.

"HOW TO ORDER" SEQUENCE

Section	Model	Material	Instrument connection	Process connection	Insertion hole	Insertion length	Extension length	Options
9	W52	4	41F - G 1/2	51M	070			P02...CVK
	W53	5	43M - 1/2 NPT	61M	080			
	W54		41M - G 1/2 B	53M	090			
	W62			63M	100			
	W63				120			
	W64							
	W64							

bar-stock thermowells, tapered shank with flanged connection, NP 6...250

W93



Thermowells are used to protect the measuring instrument from corrosion, high pressure or high fluid velocity and to allow the measuring instrument removal for recalibration or replacement without affecting the process system. The W93 serie includes bar-stock thermowells with flanged process connection and they are suitable for heavy work conditions. These thermowells have a conic immersion length.

9.W93 - Standard Model

Nominal pressure: as flange rating, 2900 psi @ 752°F max (250 bar @ 400°C).

Process fluid temperature: -328...+1112°F (-200...+600°C), for std materials.

Total length: max 40" (1000 mm).

Process connection: plain flanges as per DIN-UNI or ASME B16.5; dimensions and finishing as defined in "Thermowell information" sheet.

Materials:

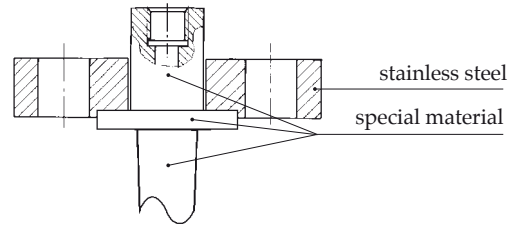
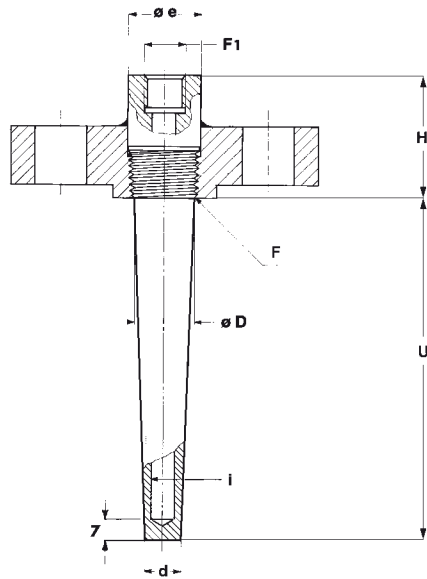
AISI 316 (Cod. 4) or AISI 316L (Cod. 5) st.st. bar-stock;
ASTM A 105 (Cod. 3), AISI 316 (Cod. 4) st.st flange.

Special materials : Monel 400, Hastelloy C276, Alloy 825, Alloy 625, Duplex SAF 2205, Duplex SAF 2507 flange and bar-stock (the flange is also available made by stainless steel, with wetted parts made by special material)

OPTIONS

P02 - Oxygen service
E30 - NACE MR0103/MR0175 - ISO 15156-3 certificate
TC1 - Plug and chain (1)
NIP - Nipple with coupling (1)
Double welding (1)
FUL - "full penetration" welding (1)
P04 - Dye penetrant test (1)
CVK - ASME PTC 19.3 TW calculation (1)

(1) Drawings and details in the "Thermowells information" sheet.



Version with stainless steel flange,
but wetted parts made by special
material

F1
41F - G 1/2
43F - 1/2-14 NPT
53F - 3/4-14 NPT

i
070 - \varnothing 0.28 (7)
080 - \varnothing 0.31 (8)
090 - \varnothing 0.35 (9)
100 - \varnothing 0.39 (10)
120 - \varnothing 0.47 (12)

dimensions : inches (mm)

Standard (1)	DN		F	e	H	i	D	d
ASME B16.5	1"	Class 150...1500	3/4" NPT	1.18 (30)	2.36 (60)	0.28-0.31-0.35 (7 - 8 - 9)	0.91 (23)	0.71 (18)
						0.39-0.47 (10 - 12)	0.91 (23)	0.83 (21)
	1" 1/2 2"		1" NPT	1.38 (35)	2.36 (60)	0.28-0.31-0.35 (7 - 8 - 9)	1.14 (29)	0.71 (18)
						0.39-0.47 (10 - 12)	1.14 (29)	0.83 (21)
DIN-UNI	25	NP 6...100	3/4" NPT	1.18 (30)	2.36 (60)	0.28-0.31-0.35 (7 - 8 - 9)	0.91 (23)	0.71 (18)
						0.39-0.47 (10 - 12)	0.91 (23)	0.83 (21)
	32, 40, 50		1" NPT	1.38 (35)	2.36 (60)	0.28-0.31-0.35 (7 - 8 - 9)	1.14 (29)	0.71 (18)
						0.39-0.47 (10 - 12)	1.14 (29)	0.83 (21)

(1) flange dimensions are shown on introductory data-sheet "Introduction to thermowells"

"HOW TO ORDER" SEQUENCE

Section	Model	Material	Flange / material	Instrument / connection	Process / connection	Insertion hole / length	Insertion / length	Extension / length	Options
9	W93	4	3	41F	6AA	070			P02...CVK
		5	4	43F		080			
				53F		090			
						100			
						120			



NUOVA FIMA S.p.A.
P.O. BOX 58 Via Cesare Battisti, 59
28045 Inverio (NO) Italy
Tel. +39 0322.253200
Fax +39 0322.253232
info@nuovafima.com
www.nuovafima.com