

Rosemount[™] 114C Thermowells



- Wide variety of industry standard process connections including flanged, threaded, welded, and Van Stone.
- Large selection of thermowell materials to ensure proper process compatibility from stainless steel to exotic materials such as duplex and alloy C-276.
- Additional thermowell options and certificates available.

Rosemount 114C Thermowell

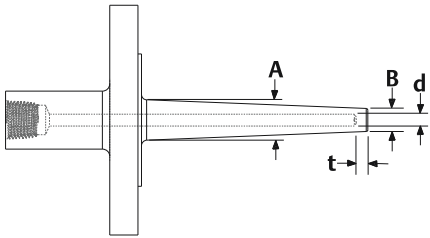
Product overview

Temperature sensors are rarely inserted directly into an industrial process. They are installed into a thermowell to isolate them from the potentially damaging process conditions of flow-induced stresses, high pressure, and corrosive chemical effects. Thermowells are closed-end metal tubes or barstock installed into the process vessel or piping and become an integral pressure-tight part of the process vessel or pipe. They permit the sensor to be quickly and easily removed from the process for calibration or replacement without requiring a process shutdown and possible drainage of the pipe or vessel.

The Rosemount 114C Thermowell is made from solid barstock to ensure strength and integrity. The Rosemount 114C was designed to accommodate a host of industry standard configurations, but has the flexibility to adapt to special configurations for different types of applications.

Flexible design modifiers accommodate many process requirements

- Different sizes of root (A), tip (B), and bore (d) diameters
- Different tip (t) thickness as required
- Numerous combinations for various industrial applications
- Meet ASME PTC 19.3 TW standard with flexible design



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Perform thermowell calculations using Rosemount's Thermowell Design Accelerator



Save design time and resources

- Performs automatic re-calculations of failed tags
- Performs batch calculations of 500 plus thermowells

Solutions for difficult applications

- Suggests alternate technologies if a calculation fails, such as Rosemount X-well Technology or Twisted Square

Assurance of quality and compliance

- Ensure design meets latest ASME PTC 19.3 TW standards
- Efficiently guides you to the best product for your application

Easy-to-use, intuitive user experience

- Automated troubleshooting assistance
- Generates Emerson thermowell and sensor models

Wide range of protection tube options and certificates for any application

- Options for special testing requirements, such as External Hydrostatic Pressure Test (Q5) and Dye Penetration Test (Q73)
- Material Certification option (Q8) to ensure material traceability.

Experience global consistency and local support from numerous worldwide Emerson manufacturing sites

- World-class manufacturing provides globally consistent product from every factory and the capacity to fulfill the needs of any project, large or small.
- Experienced Instrumentation Consultants help select the right product for any temperature application and offer advice on best installation practices.
- An extensive global network of Emerson service and support personnel can be on-site when and where they are needed.



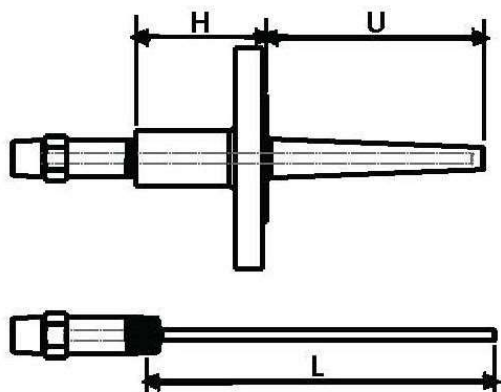
Explore the benefits of a Complete Point Solution™ from Emerson

- An “Assemble Sensor to Specific Transmitter” and “Assemble Sensor to Specific Protection Tube” option enables Emerson to provide a Complete Point Solution for measuring temperature, delivering an installation-ready transmitter, sensor, and protection tube assembly.
- Emerson has a complete portfolio of single-point and multi-input temperature measurement solutions, allowing effective measurement and process control with reliable Rosemount products.

Selection guide

Ensure the sensor fits the thermowell

Rosemount 114C Head length (H) + Immersion length (U) = Rosemount 214C Sensor insertion length (L).



Basic selection guide

Selecting the proper thermowell for an application is an important activity as it impacts plant safety and measurement efficiency. Thermowells are considered a wetted part; they physically become part of the pressure retaining system.

The four major factors to consider when selecting a thermowell for an application are described below:

Thermowell length

There is no standard formula to determine thermowell immersion length. However, there are a few common practices that the process industry follows along with good engineering judgment. Ideally, the thermowell tip should be located near the centerline in turbulent flow conditions, because this represents the most accurate process temperature.

To ensure optimal performance, a general guideline for immersion length into a pipe is as follows:

- 10× the thermowell root diameter for air or gas
- 5× the thermowell root diameter for liquids

Another guideline is at least one-third the way into the pipe for any measurement. The American Petroleum Institute (API) has a specific recommendation of using an immersion length of the sensing element plus 2-in. (50 mm).

Mounting configuration

Consider how the thermowell is mounted on the pipe or tank. The process designer typically specifies what mating connection will be used and the thermowell selected should match that connection. Temperature, pressure, and material are usually taken into consideration to ensure the process connection will be adequate for the application. Welded, threaded, flanged, and Van Stone are standard mounting configuration options.

Thermowell stem profile

Factors to be considered when selecting a stem style include the process pressure, required response speed of the measurement, drag force of the fluid flow on the well, and the wake frequency. The stem or shank is the part of a thermowell inserted into the process piping or vessel. Straight, stepped, and tapered stem styles are available. Each profile has its advantages depending on the need and situation.

Thermowell material

Rosemount Thermowells are supplied in most materials required for industrial applications. Standard materials are 316/316L Stainless Steel, 304/304L Stainless Steel, and A105 Carbon Steel. For corrosive environments, special

materials such as Alloy C-276 and Alloy 600 are also available. See the ordering table for a complete listing of standard materials. Contact your local Emerson representative for additional material availability.

Specifications and options

See the Specifications and options section for more details on each configuration. Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See the **Material selection** section for more information.

Optimizing lead time

The starred offerings (★) represent the most common options and should be selected for the fastest delivery times. The non-starred offerings are subject to additional delivery lead time.

Online product configuration

Many products are configurable online using our Product Configurator. Select the **Configure** button or visit our [website](#) to start. With this tool's built-in logic and continuous validation, you can configure your products more quickly and accurately.

[CONFIGURE >](#)[VIEW PRODUCT >](#)

Rosemount 114C Threaded Thermowell



Threaded thermowell overview

Threaded thermowells are threaded into a process pipe or tank, allowing for easy installation and removal when necessary. While this is a common mounting method, it has a lower pressure rating than the flange mounting option.

Figure 1: Standard Offering–Threaded

Model				Units	Immersion length (U)				Mounting style	Process connection		Stem style	Thermowell material		Head length (H)			Instrument connection threads	Options
1	1	4	C	X	X	X	X	X	T	X	X	X	X	X	X	X	X	X	XX, XXX, XX
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	

(5) Units	
English (E)	
Metric (M)	

(10) Mounting style	
Threaded (T)	

(13) Stem style	
1	Straight stem
2	Tapered stem
3	Stepped stem

(16-18) Head length (H)	
XXX	1.75- to 11.25-in. (E) Example: 1.75-in. = 017, 10-in. = 100
XXX	40 to 225mm (M) Example: 40 mm = 040, 225 mm = 225

Common options	
Q5	External pressure test
Q35	NACE certification
R21	Thermowell calculation
Q8	Material certification

(6-9) Immersion length (U)	
XXXX	1- to 42-in. (E) Example: 2-in. = 0020, 42-in. = 0420
XXXX	25 to 1165 mm (M) Example: 25 mm = 0025, 1165 mm = 1165

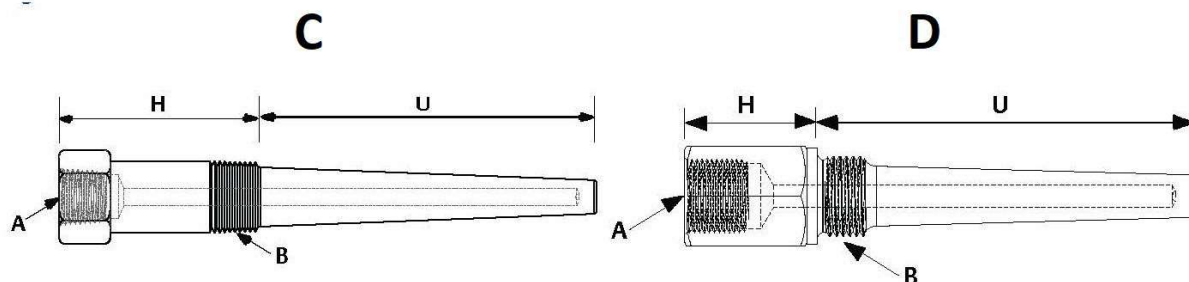
(11-12) Process connections	
AA	½-14 NPT
AB	¾-14 NPT
AC	1-11.5 NPT
DA	M20 x 1.5p
DB	M24 x 1.5p
DE	½-in. BSPF (G½)

(14-15) Thermowell material	
SC	316/316L SST
SF	304/304L SST
CS	Carbon steel

(19) Instrument connection	
A	½-14 NPT
B	½-14 NPSM
D	M18 x 1.5p
E	M20 x 1.5p
F	M24 x 1.5p

The common options shown in Figure 1 represent a partial offering; reference the figure below for a full list of available options.

Figure 2: Threaded Thermowell Components



- A. Instrument connection
- B. Process connection
- C. Tapered threads
- D. Parallel threads
- H. Head length
- U. Immersion length

Note

Wetted surface includes engaged threads and immersion length (U).

Threaded ordering information

Figure 3: Model Number Ordering Example

Model				Units	Immersion length (U)				Mounting style	Process connection		Stem style	Thermowell material		Head length (H)			Instrument connection	Options
1	1	4	C	E	0	0	6	0	T	A	A	1	S	C	0	5	0	A	WR5, Q76...
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	XXXXX

The numbers below the model number ordering example correlate to the character place numbers in the second column of the ordering table.

Optimizing lead time

The starred offerings (★) represent the most common options and should be selected for the fastest delivery times. The non-starred offerings are subject to additional delivery lead time.

Required model components

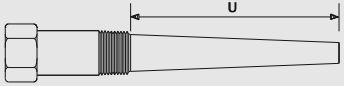
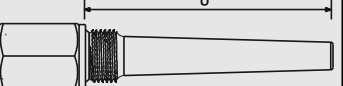
Model

Place #s 1-4		Description		Ref. page
★	114C	Barstock temperature thermowell	Made with a standard bore diameter of 0.26-in. (6.6 mm) and tip wall thickness of 0.25-in. (6.4 mm)	N/A

Dimension units

Place # 5		Description	Details	Ref. page
★	E	English units (in.)	Specifies whether length units will be in inches (.in) or millimeters (mm)	page 76
★	M	Metric units (mm)		page 76

Immersion length (U)

Place #s 6-9		Description	Tapered threads	Parallel threads	Ref. page
					
★	xxxx	xxx.x-in., 1.00 to 100-in. in ¼-in. increments (when ordered with dimension units code E) Example of a 6.25-in. length where the second decimal is dropped off: 0062			page 76
★	xxxx	xxxx mm, 25 to 2500 mm in 5 mm increments (when ordered with dimension units code M) Example of a 50 mm length: 0050			page 76

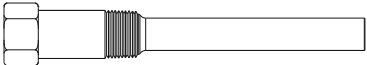
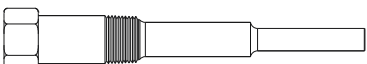
Mounting style

Place # 10		Description	Ref. page
★	T	Threaded	N/A

Process connection

Places # 11-12		Description	Thread type	Ref. page
★	AA	½-14 NPT	Tapered threads	N/A
★	AB	¾-14 NPT	Tapered threads	N/A
★	AC	1-11.5 NPT	Tapered threads	N/A
★	AD	1½-11.5 NPT	Tapered threads	N/A
★	AE	½-in. BSPT	Tapered threads	N/A
★	AF	¾-in. BSPT	Tapered threads	N/A
★	AG	1-in. BSPT	Tapered threads	N/A
★	DA	M20 × 1.5p	Parallel threads	N/A
★	DB	M24 × 1.5p	Parallel threads	N/A
★	DC	M27 × 2p	Parallel threads	N/A
	DD	M33 × 2p	Parallel threads	N/A
★	DE	½-in. BSPF (G½)	Parallel threads	N/A
★	DF	¾-in. BSPF (G¾)	Parallel threads	N/A
★	DG	1-in. BSPF (G1)	Parallel threads	N/A

Stem style

Place # 13		Description	Details	Image	Ref. page
★	1	Straight	Minimum immersion length 1-in. (25 mm) - Tapered threads 1.75-in. (45 mm) - Parallel threads		page 77
★	2	Tapered	Minimum immersion length 1-in. (25 mm) - Tapered threads 1.75-in. (45 mm) - Parallel threads		page 77
★	3	Stepped	Minimum immersion length 3-in. (75 mm) - Tapered threads 3.75-in. (95 mm) - Parallel threads		page 77

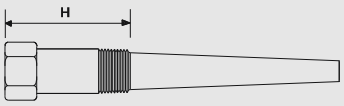
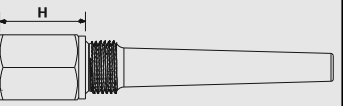
Thermowell material

Place # 14-15		Description	Details	Ref. page
★	SC	316/316L dual rated		page 78

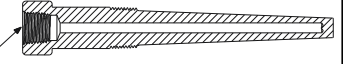
Place # 14-15		Description	Details	Ref. page
	SD	316/316L dual rated (NORSOK)	Must order the Q8 Material Certificate to get NORSOK documentation	page 78
★	SF	304/304L dual rated		page 78
★	CS	Carbon steel (A-105)		page 78
	MO	Molybdenum		page 78
	SG	316Ti SST		page 78
	SL	310 SST		page 78
	SM	321 SST		page 78
	SN	321H SST		page 78
	SR	904L SST		page 78
	SP	347 SST		page 78
	AB	Alloy B3		page 78
	AC	Alloy C-276		page 78
	AG	Alloy 20		page 78
	AH	Alloy 400		page 78
	AK	Alloy 600		page 78
	AM	Alloy 601		page 78
	AN	Alloy 625		page 78
	AP	Alloy 800		page 78
	AQ	Alloy 800H/HT		page 78
	AR	Alloy 825		page 78
	AU	Alloy C-20		page 78
	AS	Alloy F44 Mo6		page 78
	CA	Chrome-Moly Grade B-11/F-11 Class II		page 78
	CB	Chrome-Moly Grade B-22/ F-22 Class III		page 78

Place # 14-15		Description	Details	Ref. page
	CC	Chrome-Moly Grade F-91		page 78
	NK	Nickel 200		page 78
	TT	Titanium Grade 2		page 78
	DS	Super duplex SST		page 78
	DT	Super duplex SST - NORSOK	Must order the Q8 Material Certificate to get NORSOK documentation	page 78
	DU	Duplex 2205		page 78
	DV	Duplex 2205 - NORSOK	Must order the Q8 Material Certificate to get NORSOK documentation	page 78

Head length (H)

Place #s 16-18		Description	Tapered threads	Parallel threads	Ref. page
					
★	xxx	xx.x-in., 1.75 to 11.25-in. in ¼-in. increments (when ordered with dimension units code E) Example of a 6.25-in. length where the second decimal is dropped off: 062 (default head length = 1.75-in.)			page 81
★	xxx	xxx mm, 40 to 225 mm in 5 mm increments (when ordered with dimension units code M) Example of a 50 mm length: 050 (default head length = 45 mm)			page 81

Instrument connection

Place # 19		Description	Details	Image	Ref. page
★	A	½-14 NPT	Female threads		page 83
★	B	½-14 NPSM			page 83
	C	¾-14 NPT			page 83
	D	M18 × 1.5p			page 83
	E	M20 × 1.5p			page 83
	F	M24 × 1.5p			page 83
	G	G ½-in. (BSPF)			page 83

Place # 19		Description	Details	Image	Ref. page
	H	G ¾-in. (BSPF)			page 83
	J	M27 × 2p			page 83
	K	M14 × 1.5p			page 83

Additional options

Sensor/thermowell assemble to options

Code		Description	Details	Ref. page
★	XT	Hand tight assembly of sensor and thermowell	Ensures sensor is threaded into thermowell but only hand tightened	page 83
★	XW	Process-ready assembly of sensor and thermowell	Ensures sensor is threaded into thermowell and torqued for process-ready installation	page 83

Extended product warranty

Code		Description	Details	Ref. pages
★	WR3	3-year limited warranty	This warranty option extends manufacturer's warranty to three or five years for manufacturer related defects	page 83
★	WR5	5-year limited warranty		page 83

Thermowell calculation

Code		Description	Details	Ref. page
★	R21	Thermowell calculation	Set of calculations to ensure thermowells are safe in certain process conditions	page 84

NACE certification

Code		Description	Details	Ref. page
★	Q35	NACE approval	Meets MR0175/ISO 15156 and MR0103 requirements	page 84

PMI testing

Code		Description	Details	Ref. page
	Q76	PMI testing	Verifies chemical composition of material	page 85

Material certification

Code		Description	Details	Ref. page
★	Q8	Material certification	Certificate for material conformance and traceability in accordance with EN 10204 type 3.1	page 85

Material test

Code		Description	Details	Ref. page
	M01	Low temperature Charpy Test	Measures the low temperature ductility of the material	page 86
	M02	Ultrasonic examination of thermowell material	Examination of steel forgings for flaws and inclusions	page 86

Surface finish

Code		Description	Details	Ref. page
	Q16	Certification	Certificate showing measured surface finish values	page 86
	R14	Finish < Ra 0.3 µm (12 µin)	Improves surface roughness of thermowell	page 86

Electropolish

Code		Description	Details	Ref. page
	R20	Electropolish	Improve smoothness and surface quality	page 87

Hydrostatic external pressure test

Code		Description	Details	Ref. page
★	Q5	Standard external pressure test	Verifies structural quality and checks for leaks at thermowell process connection and stem	page 88
★	Q9	Extended external pressure test	Same as standard external pressure test but tested twice as long	page 89

Hydrostatic internal pressure test

Code		Description	Details	Ref. page
★	Q85	Standard internal pressure test	Verify internal structural integrity of thermowell	page 89
★	Q86	Extended internal pressure test	Same as standard internal pressure test but tested twice as long	page 89

Canadian registration number

Code		Description	Details	Ref. page
	Q17	Canadian Registration Number	Canadian approvals for all provinces (Approved materials in reference section)	page 90

Dye penetration test

Code		Description	Details	Ref. page
★	Q73	Dye penetration test	Checks quality of material	page 90

Material certification**Wall thickness test**

Code		Description	Details	Ref. page
★	Q83	Ultrasonic test	Checks the bore concentricity of the thermowell	page 91
★	Q84	Radiography (X-ray) test	Checks the bore concentricity of the thermowell	

Special cleaning

Code		Description	Details	Ref. page
	Q6	Special cleaning	Oxygen enriched environment cleaning per ASTM G93	page 91

Thermowell markings

Code		Description	Details	Ref. page
	R40	Test markings on thermowell	External marking of the thermowell for specific tests (see reference page for list of tests)	page 92

Spherical tip

Code		Description	Details	Ref. page
	R60	Spherical tip	Changes the flat tip to spherical	page 93

Plug and chain

Code		Description	Details	Ref. page
	R06	Stainless steel	Protects thermowell threads when sensor is not installed	page 94
	R23	Brass	Protects thermowell threads when sensor is not installed	page 94

Thermowell stem coating

Code		Description	Details	Ref. page
	R63	Alloy 6 stem coating	An alloy-based coating over the thermowell stem to prevent or slow down wear due to process media in erosive applications.	page 93

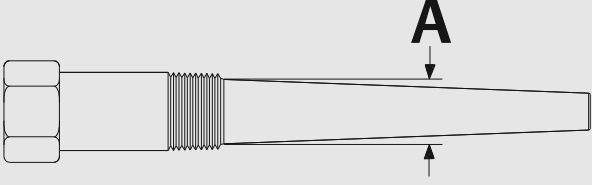
Vent hole

Code		Description	Details	Ref. page
	R11	Vent hole	Allows for the venting of a thermowell and for indication that thermowell structural integrity has been compromised	page 94

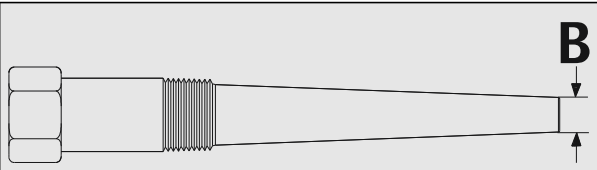
Thermowells with wrench flats

Code		Description	Details	Ref. Page
	R37	Thermowells with wrench flats	Converts the two wrench flats to hex wrench flats; only applies to exotic materials	page 103

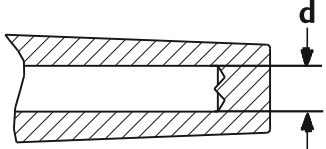
Root diameter (A)

Code		Description		Ref. Page
	Axxx	x.xx-in., 0.36 to 3.15-in. in 0.01-in. increments (when ordered with dimension units code E) Examples: Code A040 = 0.4-in., Code A315 = 3.15-in.		page 103
	Axxx	xx.xx mm, 10 to 80 mm in 0.5 mm increments (when ordered with dimension units code M) Examples: Code A100 = 10.0 mm, Code A755 = 75.5 mm		page 103

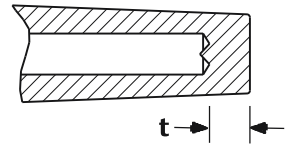
Tip diameter (B)

Code		Description		Ref. page
	Bxxx	x.xx-in., 0.36 to 1.83-in. in 0.01-in. increments (when ordered with dimension units code E) Examples: Code B040 = 0.4-in., Code B180 = 1.80-in.		page 104
	Bxxx	xx.xx mm, 10 to 46 mm in 0.5-mm. increments (when ordered with dimension units code M) Examples: Code B100 = 10.0 mm, Code B455 = 45.5 mm		page 104

Non-standard bore diameter (d)

Code		Description	Details	Image	Ref. page
	D01	0.276-in./7.0 mm	Default = 0.26-in. (6.6 mm)		page 105
	D03	0.138-in./3.5 mm			page 105
	D04	0.386-in./9.8 mm			page 105
	D05	0.354-in./9.0 mm			page 105
	D06	0.433-in./11.0 mm			page 105

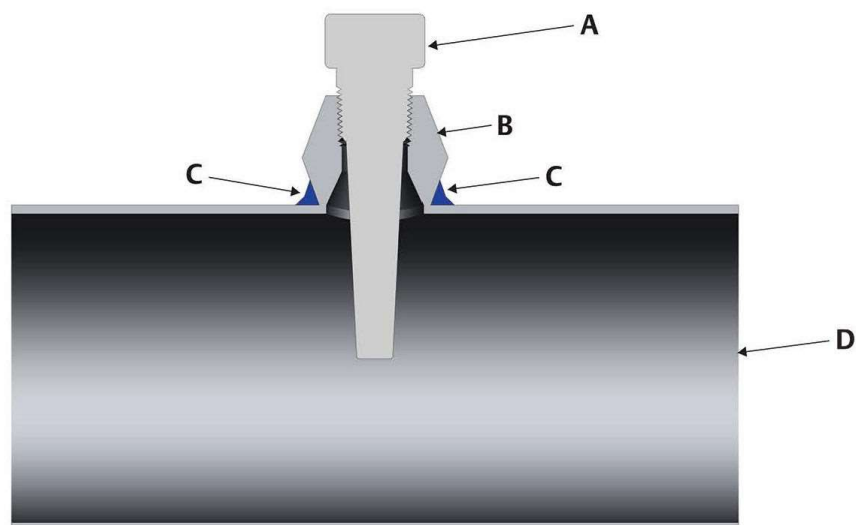
Non-standard tip thickness (t)

Code		Description	Details	Image	Ref. page
	T01	0.197-in./5.0 mm	Default = 0.25-in. (6.4 mm)		page 105
	T02	0.236-in./6.0 mm			page 105

Threaded installation

Threaded thermowells are screwed into the process using a threaded fitting or directly into a tapped pipe if there is sufficient wall thickness. Tapered threads will deform to each other to create a seal. Thread sealant and appropriate torque should be applied to reduce risk of leaks.

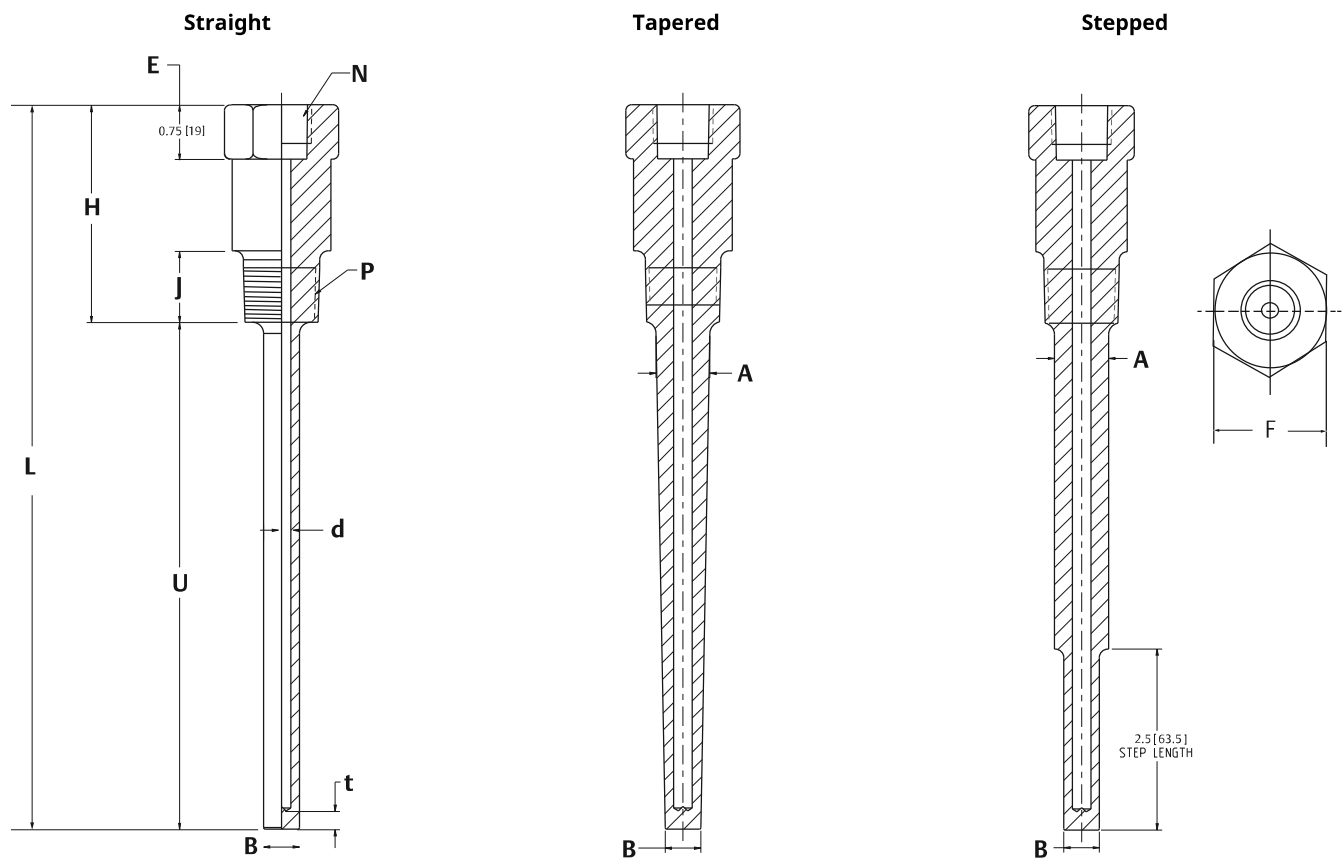
Figure 4: Installation Components



- A. Thermowell
- B. Threaded fitting
- C. Weld
- D. Process

Threaded thermowell drawings

Figure 5: Thread Mount Thermowell Drawings (Tapered Thread)



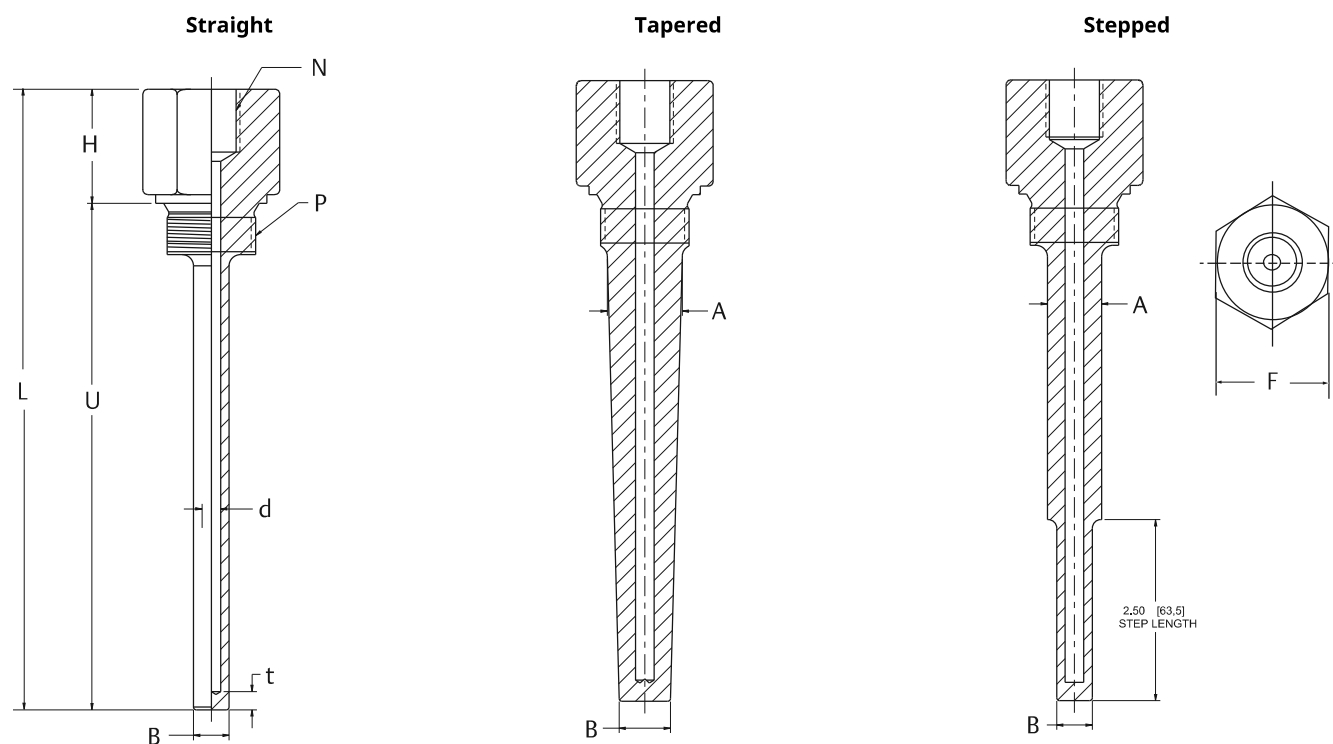
- A. Root diameter
- B. Tip diameter
- E. Wrench allowance
- H. Head length
- J. Thread allowance
- L. Total length ($U + H$)
- N. Instrument connection
- P. Process connection
- U. Immersion length
- d. Bore diameter
- t. Tip thickness

Table 1: Thread Mount Thermowells (Tapered Thread)

Dimensions are in inches (millimeter)

Code	Code T, threaded mounting style	Hex size "F"		Wrench flat size "G"		Root diameter stepped stem	Root diameter tapered stem	Tip diameter tapered stem	Root diameter straight stem	Thread specification
	Process connection "P"	Metric units (code M)	English units (code E)	Metric units (code M)	English units (code E)					
AA	½-14 NPT	1.18 (30)	1½ (28.6)	1.18 (30)	1½ (28.6)	0.67 (17)	0.67 (17)	0.50 (12.7)	0.669 (17)	NPT per SAE-AS 71051 (reference PS-71)
AB	¾-14 NPT	1.18 (30)	1½ (28.6)	1.18 (30)	1½ (28.6)	0.75 (19)	0.89 (22.5)	0.63 (16)	0.71 (18)	
AC	1-11.5 NPT	1.42 (36)	1 3/8 (34.9)	1.34 (34)	1¼ (31.8)	0.85 (21.5)	1.04 (26.5)	0.71 (18)	0.71 (18)	
AD	1½-11.5 NPT	1.97 (50)	2 (50.8)	1.89 (48)	1¾ (44.5)	0.85 (21.5)	1.04 (26.5)	0.71 (18)	0.71 (18)	
AE	½-in. BSPT	1.18 (30)	1½ (28.6)	1.18 (30)	1½ (28.6)	0.67 (17)	0.67 (17)	0.50 (12.7)	0.669 (17)	THD per ISO 7/1 (BS 21)
AF	¾-in. BSPT	1.18 (30)	1½ (28.6)	1.18 (30)	1½ (28.6)	0.75 (19)	0.89 (22.5)	0.63 (16)	0.71 (18)	
AG	1-in. BSPT	1.42 (36)	1 3/8 (34.9)	1.34 (34)	1¼ (31.8)	0.85 (21.5)	1.04 (26.5)	0.71 (18)	0.71 (18)	

Figure 6: Thread Mount Thermowell Drawings (Parallel Thread)



- A. Root diameter
- B. Tip diameter
- F. Hex size
- H. Head length
- L. Total length (U + H)
- N. Instrument connection
- P. Process connection
- U. Immersion length
- d. Bore diameter
- t. Tip thickness

Table 2: Thread Mount Thermowells (Parallel Thread)

Dimensions are in inches (millimeter)

Code	Code T, threaded mounting style	Hex size "F"	Wrench flat size "G"	Root diameter stepped stem	Root diameter tapered stem	Tip diameter tapered stem and straight stem	Thread specification
	Process connection "P"						
DA	M20 × 1.5	1.18 (30)	1.18 (30)	0.67 (17)	0.67 (17)	0.5 (12.7)	Thread per BS3643
DB	M24 × 1.5	1.18 (30)	1.18 (30)	0.75 (19)	0.75 (19)	0.5 (12.7)	
DC	M27 × 2	1.26 or 1.42 (32 or 36)	1.34 (34)	0.75 (19)	0.75 (19)	0.5 (12.7)	
DD	M33 × 2	1.61 (41)	1.58 (40)	0.85 (21.5)	1.04 (26.5)	0.71 (18)	
DE	½-in. BSPF (G½)	1.06 (27)	1.18 (30)	0.67 (17)	0.67 (17)	0.5 (12.7)	Thread per ISO 228/1 (BS 2779)
DF	¾-in. BSPF (G¾)	1.26 (32)	1.34 (34)	0.75 (19)	0.75 (19)	0.5 (12.7)	
DG	1-in. BSPF (G1)	1.61 (41)	1.58 (40)	0.85 (21.5)	1.04 (26.5)	0.71 (18)	

Note

Hex size will be different depending on units selected (english and metric). Wrench flats are used on exotic materials instead of hex flats. For hex flats on exotic materials, select option R37. Additional root and tip diameters available.

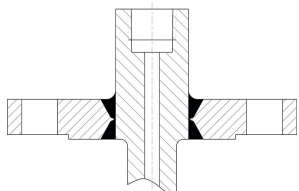
Rosemount 114C Flanged Thermowells



Flanged thermowell overview

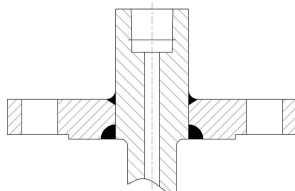
All Rosemount flanged thermowells are manufactured in accordance with ANSI B16.5. The flange to stem weld is in accordance to ASME Section IX. There is also full traceability with material certifications available on request. Rosemount flanged thermowells are available in two manufacturing configurations: full and partial penetration welds.

Full penetration weld (F)



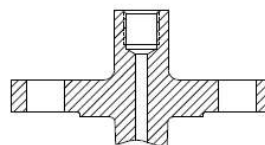
- Stronger weld joint per ASME PTC 19.3 TW
- Used for heavy duty applications
- Emerson recommended option

Partial penetration weld (P)



- Adequate for most process applications
- Weld withstands same pressure and temperature rating as flange
- Lower cost than full penetration weld

Forged, no welds (G)

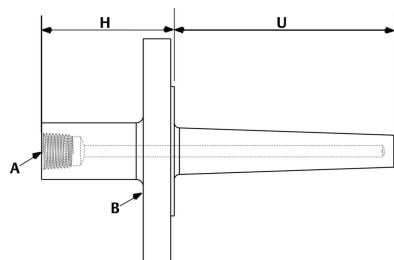


- Highest fatigue resistance per ASME PTC 19.3 TW
- Eliminates weld qualifications and failures
- Used in extreme process applications

Figure 7: Standard Offering–Flanged

Model	Units	Immersion length (U)	Mounting style	Process connection	Stem style	Thermowell material	Head length (H)	Instrument connection threads	Options
1 1 4 C	X	X X X X	X	X X	X	X X	X X X	X	XX, XXX, XX
1 2 3 4	5	6 7 8 9	10	11 12	13	14 15	16 17 18	19	
(5) Units English (E) Metric (M)		(10) Mounting style F Full penetration weld P Partial penetration weld G Forged, no welds		(13) Stem style 1 Straight stem 2 Tapered stem 3 Stepped stem		(16-18) Head length (H) XXX 2.25-in to 11.25-in (E) E.g: 2.25-in=022, 10-in=100 XXX 40 mm to 225 mm (M) E.g: 40 mm=040, 225 mm=225		Common options Q5 External pressure test Q35 NACE certification R21 Wake frequency calculation Q8 Material certification Q73 Dye penetration test	
(6-9) Immersion length (U) XXXX 1-in to 42-in (E) E.g: 0.5-in=0005, 42-in=0420 XXXX 25 mm to 1165 mm (M) E.g: 25 mm=0025, 1165 mm=1165		(11-12) Process connections AA 1-in. Class 150 AB 1½-in. Class 150 AC 2-in. Class 150 AH 1-in. Class 300 AJ 1½-in. Class 300 AK 2-in. Class 300		(14-15) Thermowell material SC 316/316L SST SF 304/304L SST CS Carbon steel		(19) Instrument connection A ½-14 NPT B ½-14 NPSM D M18 x 1.5p E M20 x 1.5p F M24 x 1.5p			

The common options shown in Figure 7 represent a partial offering; reference the [Flanged ordering information](#) for a full list of available options.

Figure 8: Flanged Thermowell Components

A. Instrument connection

B. Process connection

H. Head length

U. Immersion length

Note

Wetted surface includes flange face and immersion length (U).

Flanged ordering information

Figure 9: Model Number Ordering Example

Model				Units	Immersion length (U)				Mounting style	Process connection		Stem style	Thermowell material		Head length (H)			Instrument connection	Options
1	1	4	C	E	0	1	5	0	F	A	C	1	S	C	0	5	0	A	WR5, Q76...
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	XXXXX

The numbers below the model number ordering example correlate to the character place numbers in the second column of the ordering table.

Optimizing lead time

The starred offerings (★) represent the most common options and should be selected for the fastest delivery times. The non-starred offerings are subject to additional delivery lead time.

Required model components

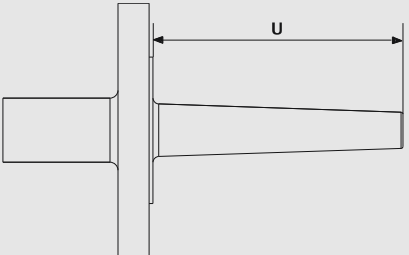
Model

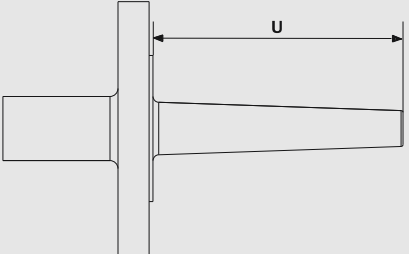
Place # 1-4		Description	Details	Ref. page
★	114C	Barstock temperature thermowell	Made with a standard bore diameter of 0.26-in. (6.6 mm) and tip wall thickness of 0.25-in. (6.4 mm). Default ASME flange facing is raised face with spiral serrations. Default EN 1092-1 flange facing is raised face Type B1.	N/A

Dimension units

Place # 5		Description	Details	Ref. page
★	E	English units (in.)	Specifies whether length units will be in inches (.in) or millimeters (mm)	page 76
★	M	Metric units (mm)		page 76

Immersion length (U)

Place # 6-9		Description		Ref. page
★	xxxx	xxx.x-in., 1.00 to 100-in. in ¼-in. increments (when ordered with dimension units code E) Example of a 6.25-in. length where the second decimal is dropped off: 0062		page 76

Place # 6-9		Description		Ref. page
★	xxxx	xxxx mm, 25 to 2500 mm in 5 mm increments (when ordered with dimension units code M) Example of a 50 mm length: 0050		page 76

Mounting style

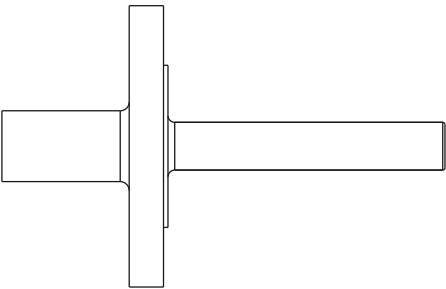
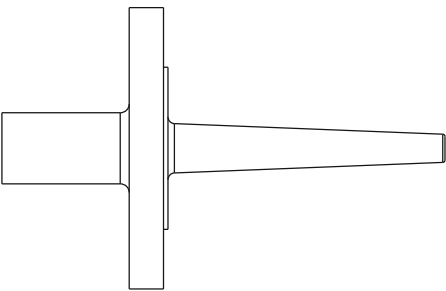
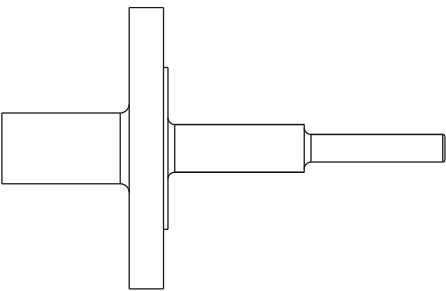
Place # 10		Description	Details	Ref. page
★	P	Flange, partial penetration weld	Weld refers to welding of the flange to thermowell stem	N/A
★	F	Flange, full penetration weld		N/A
★	G	Flange, forged	Single piece forging, no welds	N/A

Process connection

Place # 11-12		Partial weld (P)	Full penetration weld (F)	Forged, no welds (G)	Ref. page
★	AA	1-in. Class 150	1-in. Class 150	1-in. Class 150	N/A
★	AB	1½-in. Class 150	1½-in. Class 150	1½-in. Class 150	N/A
★	AC	2-in. Class 150	2-in. Class 150	2-in. Class 150	N/A
★	AD	3-in. Class 150	3-in. Class 150	3-in. Class 150	N/A
★	AE	4-in. Class 150	4-in. Class 150	4-in. Class 150	N/A
★	AF	6-in. Class 150	6-in. Class 150	6-in. Class 150	N/A
★	AG	¾-in. Class 300	¾-in. Class 300	¾-in. Class 300	N/A
★	AH	1-in. Class 300	1-in. Class 300	1-in. Class 300	N/A
★	AJ	1½-in. Class 300	1½-in. Class 300	1½-in. Class 300	N/A
★	AK	2-in. Class 300	2-in. Class 300	2-in. Class 300	N/A
	AL	1-in. Class 400/600	1-in. Class 400/600	1-in. Class 400/600	N/A
	AM	1½-in. Class 400/600	1½-in. Class 400/600	1½-in. Class 400/600	N/A
	AN	2-in. Class 400/600	2-in. Class 400/600	2-in. Class 400/600	N/A
	AP	N/A	1-in. Class 900/1500	1-in. Class 900/1500	N/A
	AQ	N/A	1½-in. Class 900/1500	1½-in. Class 900/1500	N/A
	AR	N/A	2-in. Class 900/1500	2-in. Class 900/1500	N/A
	AS	N/A	1-in. Class 2500	1-in. Class 2500	N/A
	AT	N/A	1½-in. Class 2500	1½-in. Class 2500	N/A
	AU	N/A	2-in. Class 2500	2-in. Class 2500	N/A
	AV	3-in. Class 300	3-in. Class 300	3-in. Class 300	N/A

Place # 11-12		Partial weld (P)	Full penetration weld (F)	Forged, no welds (G)	Ref. page
	AW	3-in. Class 400/600	3-in. Class 400/600	3-in. Class 400/600	N/A
	AX	N/A	3-in. Class 900	3-in. Class 900	N/A
	AY	N/A	3-in. Class 1500	3-in. Class 1500	N/A
	AZ	N/A	3-in Class 2500	3-in Class 2500	N/A
	FA	DN 20/PN 2.5/6	DN 20/PN 2.5/6	DN 20/PN 2.5/6	N/A
	FE	DN 20/PN 10/16/25/40	DN 20/PN 10/16/25/40	DN 20/PN 10/16/25/40	N/A
	FG	DN 20/PN 63/100	DN 20/PN 63/100	DN 20/PN 63/100	N/A
	GA	DN 25/PN 2.5/6	DN 25/PN 2.5/6	DN 25/PN 2.5/6	N/A
	GE	DN 25/PN 10/16/25/40	DN 25/PN 10/16/25/40	DN 25/PN 10/16/25/40	N/A
	GG	DN 25 PN 63/100	DN 25/PN 63/100	DN 25/PN 63/100	N/A
	JA	DN 40/PN 2.5/6	DN 40/PN 2.5/6	DN 40/PN 2.5/6	N/A
	JE	DN 40/PN 10/16/25/40	DN 40/PN 10/16/25/40	DN 40/PN 10/16/25/40	N/A
	JG	DN 40/PN 63/100	DN 40/PN 63/100	DN 40/PN 63/100	N/A
	KA	DN 50/PN 2.5/6	DN 50/PN 2.5/6	DN 50/PN 2.5/6	N/A
	KC	DN 50/PN 10/16	DN 50/PN 10/16	DN 50/PN 10/16	N/A
	KE	DN 50/PN 25/40	DN 50/PN 25/40	DN 50/PN 25/40	N/A
	KF	DN 50/PN 63	DN 50/PN 63	DN 50/PN 63	N/A
	KG	DN 50/PN 100	DN 50/PN 100	DN 50/PN 100	N/A
	LA	DN 65/PN 2.5/6	DN 65/PN 2.5/6	DN 65/PN 2.5/6	N/A
	LC	DN 65/PN 10/16	DN 65/PN 10/16	DN 65/PN 10/16	N/A
	LE	DN 65/PN 24/40	DN 65/PN 24/40	DN 65/PN 24/40	N/A
	LF	DN 65/PN 63	DN 65/PN 63	DN 65/PN 63	N/A
	LG	DN 65/PN 100	DN 65/PN 100	DN 65/PN 100	N/A
	MA	DN 80/PN 2.5/6	DN 80/PN 2.5/6	DN 80/PN 2.5/6	N/A
	MC	DN 80/PN 10/16	DN 80/PN 10/16	DN 80/PN 10/16	N/A
	ME	DN 80/PN 25/40	DN 80/PN 25/40	DN 80/PN 25/40	N/A
	MF	DN 80/PN 63	DN 80/PN 63	DN 80/PN 63	N/A
	MG	DN 80/PN 100	DN 80/PN 100	DN 80/PN 100	N/A
	NA	DN 100/PN 2.5/6	DN 100/PN 2.5/6	DN 100/PN 2.5/6	N/A
	NC	DN 100/PN 10/16	DN 100/PN 10/16	DN 100/PN 10/16	N/A
	NE	DN 100/PN 25/40	DN 100/PN 25/40	DN 100/PN 25/40	N/A
	NF	DN 100/PN 63	DN 100/PN 63	DN 100/PN 63	N/A
	NG	DN 100/PN 100	DN 100/PN 100	DN 100/PN 100	N/A

Stem style

Place # 13		Description	Details	Image	Ref. page
★	1	Straight	Minimum immersion length = 1-in. (25 mm)		page 77
★	2	Tapered	Minimum immersion length = 1-in. (25 mm)		page 77
★	3	Stepped	Minimum immersion length = 3-in. (75 mm)		page 77

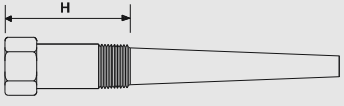
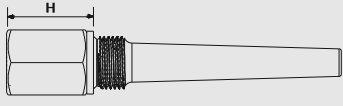
Thermowell material

Place # 14-15		Description	Details	Ref. page
★	SC	316/316L dual rated		page 78
	SD	316/316L dual rated (NORSOK)	Must order the Q8 Material Certificate to get NORSOK documentation	page 78
★	SF	304/304L dual rated		page 78
★	CS	Carbon steel (A-105)		page 78
	SG	316Ti SST		page 78
	SH	316/316L SST with tantalum sheath	Only available as a straight stem profile with a 0.75 diameter thus requires option A075 for English units	page 78

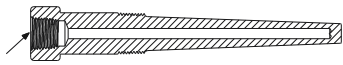
Place # 14-15		Description	Details	Ref. page
	SJ	316/316L SST with PFA coating	Recommended for non-stick applications	page 78
	SK	304/304L SST with PTFE coating	Recommended for non-stick applications	page 78
	SL	310 SST		page 78
	SM	321 SST		page 78
	SN	321H SST		page 78
	SR	904L SST		page 78
	SP	347 SST		page 78
	AB	Alloy B3		page 78
	AC	Alloy C-276		page 78
	AD	Alloy C-4 (with 304/304L SST flange)	Not available with G (Fully forged) mounting style	page 78
	AE	Alloy C-22 (with 304/304L SST flange)	Not available with G (Fully forged) mounting style	page 78
	AF	Alloy C-22 (with 316/316L SST flange)	Not available with G (Fully forged) mounting style	page 78
	AG	Alloy 20		page 78
	AH	Alloy 400		page 78
	AK	Alloy 600		page 78
	AL	Alloy 600 (with 304/304L SST flange)	Not available with G (Fully forged) mounting style	page 78
	AM	Alloy 601		page 78
	AN	Alloy 625		page 78
	AP	Alloy 800		page 78
	AQ	Alloy 800H/HT		page 78
	AR	Alloy 825		page 78
	AU	Alloy C-20		page 78
	AS	Alloy F44 Mo6		page 78

Place # 14-15		Description	Details	Ref. page
	CA	Chrome-Moly Grade B-11/F-11 Class II		page 78
	CB	Chrome-Moly Grade B-22/ F-22 Class III		page 78
	CC	Chrome-Moly Grade F-91		page 78
	NK	Nickel 200		page 78
	TT	Titanium Grade 2		page 78
	DS	Super duplex SST		page 78
	DT	Super duplex – NORSOK	Must order the Q8 Material Certificate to get NORSOK documentation	page 78
	DU	Duplex 2205		page 78
	DV	Duplex 2205 – NORSOK	Must order the Q8 Material Certificate to get NORSOK documentation	page 78

Head length (H)

Place #s 16-18		Description	Tapered threads 	Parallel threads 	Ref. page
★	xxx	xx.x-in., 1.75 to 11.25-in. in ¼-in. increments (when ordered with dimension units code E)			page 81
		Example of a 6.25-in. length where the second decimal is dropped off: 062 (default head length = 1.75-in.)			
★	xxx	xxx mm, 40 to 225 mm in 5 mm increments (when ordered with dimension units code M)			page 81
		Example of a 50 mm length: 050 (default head length = 45 mm)			

Instrument connection

Place # 19		Description	Details	Image	Ref. page
★	A	½-14 NPT	Female threads		page 83
★	B	½-14 NPSM			page 83
	C	¾-14 NPT			page 83
	D	M18 × 1.5p			page 83
	E	M20 × 1.5p			page 83

Place # 19		Description	Details	Image	Ref. page
	F	M24 × 1.5p			page 83
	G	G ½-in. (BSPF)			page 83
	H	G ¾-in. (BSPF)			page 83
	J	M27 × 2p			page 83
	K	M14 × 1.5p			page 83

Additional options

Sensor/thermowell assemble to options

Code		Description	Details	Ref. page
★	XT	Hand tight assembly of sensor and thermowell	Ensures sensor is threaded into thermowell but only hand tightened	page 83
★	XW	Process-ready assembly of sensor and thermowell	Ensures sensor is threaded into thermowell and torqued for process-ready installation	page 83

Extended product warranty

Code		Description	Details	Ref. pages
★	WR3	3-year limited warranty	This warranty option extends manufacturer's warranty to three or five years for manufacturer related defects	page 83
★	WR5	5-year limited warranty		page 83

Thermowell calculation

Note

If your chosen mounting style is flange with full penetration weld (F) then you must choose dye penetration option (Q73) to meet the ASME PTC 19.3 TW standard requirements.

Code		Description	Details	Ref. page
★	R21	Thermowell calculation	Set of calculations to ensure thermowells are safe in certain process conditions	page 84

NACE certification

Code		Description	Details	Ref. page
★	Q35	NACE approval	Meets MR0175/ISO 15156 and MR0103 requirements	page 84

PMI testing

Code		Description	Details	Ref. page
	Q76	PMI testing	Verifies chemical composition of material	page 85

Material certification

Code		Description	Details	Ref. page
★	Q8	Material certification	Certificate for material conformance and traceability in accordance with EN 10204 type 3.1	page 85

Material test

Code		Description	Details	Ref. page
	M01	Low temperature Charpy Test	Measures the low temperature ductility of the material	page 86
	M02	Ultrasonic examination of thermowell material	Examination of steel forgings for flaws and inclusions	page 86

Surface finish

Code		Description	Details	Ref. page
	Q16	Certification	Certificate showing measured surface finish values	page 86
	R14	Finish < Ra 0.3 µm (12 µin)	Improves surface roughness of thermowell	page 86

Electropolish

Code		Description	Details	Ref. page
	R20	Electropolish	Improve smoothness and surface quality	page 87

Hydrostatic external pressure test

Code		Description	Details	Ref. page
★	Q5	Standard external pressure test	Verifies structural quality and checks for leaks at thermowell process connection and stem	page 88
★	Q9	Extended external pressure test	Same as standard external pressure test but tested twice as long	page 89

Hydrostatic internal pressure test

Code		Description	Details	Ref. page
★	Q85	Standard internal pressure test	Verify internal structural integrity of thermowell	page 89
★	Q86	Extended internal pressure test	Same as standard internal pressure test but tested twice as long	page 89

Canadian registration number

Code		Description	Details	Ref. page
	Q17	Canadian Registration Number	Canadian approvals for all provinces (Approved materials in reference section)	page 90

Dye penetration test

Code		Description	Details	Ref. page
★	Q73	Dye penetration test	Checks quality of material	page 90

Material certification**Wall thickness test**

Code		Description	Details	Ref. page
★	Q83	Ultrasonic test	Checks the bore concentricity of the thermowell	page 91
★	Q84	Radiography (X-ray) test	Checks the bore concentricity of the thermowell	

Special cleaning

Code		Description	Details	Ref. page
	Q6	Special cleaning	Oxygen enriched environment cleaning per ASTM G93	page 91

Thermowell markings

Code		Description	Details	Ref. page
	R40	Test markings on thermowell	External marking of the thermowell for specific tests (see reference page for list of tests)	page 92

Phased array test

Code		Description	Details	Ref. page
	Q80	Phased array test	Verifies the quality of full penetration flange welds using ultrasonic technology	page 93

X-ray/radiograph Test

Code		Description	Details	Ref. page
	Q81	X-ray/radiograph	Verifies quality of full penetration flange welds	page 93

Flange welding documentation

Code		Description	Details	Ref. page
	Q66	Procedure Qualification Records (PQR)	A record of a test weld performed and tested rigorously to ensure that the procedure will produce good weld.	page 92
	Q67	Welder Performance Qualifications (WPQ)	A test certificate that shows whether a welder possesses the necessary experience and knowledge to perform the specifications of a particular weld procedure.	page 93
	Q68	Welding Procedure Specifications (WPS)	A formal written document that describes and provides direction to a welder or welding operator for making sound and quality production welds per code requirement.	page 93

Plug and chain

Code		Description	Details	Ref. page
	R06	Stainless steel	Protects thermowell threads when sensor is not installed	page 94
	R23	Brass	Protects thermowell threads when sensor is not installed	page 94

Spherical tip

Code		Description	Details	Ref. page
	R60	Spherical tip	Changes the flat tip to spherical	page 93

Thermowell stem coating

Code		Description	Details	Ref. page
	R63	Alloy 6 stem coating	An alloy-based coating over the thermowell stem to prevent or slow down wear due to process media in erosive applications.	page 93

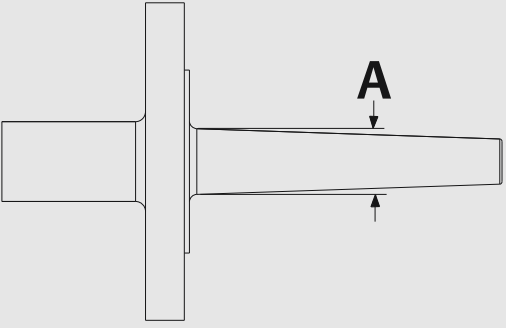
Vent hole

Code		Description	Details	Ref. page
	R11	Vent hole	Allows for the venting of a thermowell and for indication that thermowell structural integrity has been compromised	page 94

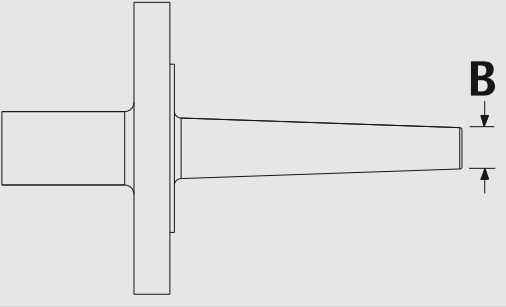
Flange face

Code		Description	Details	Ref. page
	R09	Concentric serrations	Concentric serrations in the flange face per ASME B16.5	page 94
	R10	Flat	Flat flange face per ASME B16.5 or EN 1092-1 facing Type A	page 96
	R15	Raised face, Type B2	Raised face per EN 1092-1 facing Type B2	page 97
	R16	RTJ	Ring type joint flange face per ASME B16.5	page 97
	R18	Groove, Type D	Groove, Type D per EN 1092-1	page 99
	R19	Tongue, Type C	Tongue, Type C per EN 1092-1	page 100
	R24	Spigot, Type E	Spigot, Type E per EN 1092-1	page 101
	R25	Recess, Type F	Recess, Type F per EN 1092-1	page 102

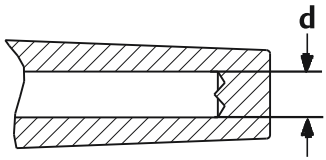
Root diameter (A)

Code		Description		Ref. page
	Axxx	x.xx-in., 0.36 to 3.15-in. in 0.01-in. increments (when ordered with dimension units code E) Examples: Code A040 = 0.4-in., Code A315 = 3.15-in.		page 103
	Axxx	xx.xx mm, 10 to 80 mm in 0.5 mm increments (when ordered with dimension units code M) Examples: Code A100 = 10.0 mm, Code A755 = 75.5 mm		page 103

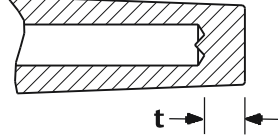
Tip diameter (B)

Code		Description		Ref. page
	Bxxx	x.xx-in., 0.36 to 1.83-in. in 0.01-in. increments (when ordered with dimension units code E) Examples: Code B040 = 0.4-in, Code B180 = 1.80-in.		page 104
	Bxxx	xx.x mm, 10 to 46 mm in 0.5 mm. increments (when ordered with dimension units code M) Examples: Code B100 = 10.0 mm, Code B455 = 45.5 mm		page 104

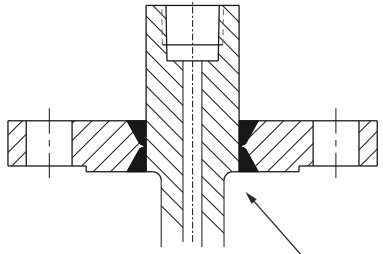
Non-standard bore diameter (d)

Code		Description	Details	Image	Ref. page
	D01	0.276-in./7.0 mm	Default = 0.26-in. (6.6 mm)		page 105
	D03	0.138-in./3.5 mm			page 105
	D04	0.386-in./9.8 mm			page 105
	D05	0.354-in./9.0 mm			page 105
	D06	0.433-in./11.0 mm			page 105

Non-standard tip thickness (t)

Code		Description	Details	Image	Ref. page
	T01	0.197-in./5.0 mm	Default = 0.25-in. (6.4 mm)		page 105
	T02	0.236-in./6.0 mm			page 105

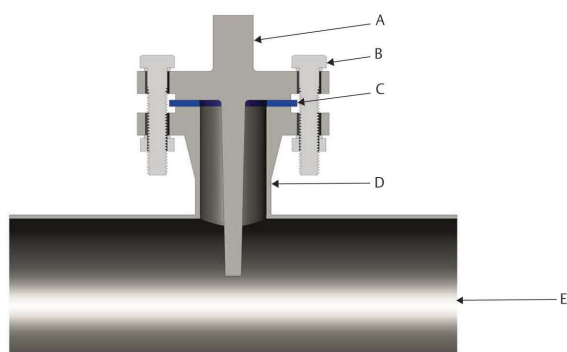
Fillet radius (e)

Code		Description	Details	Image	Ref. page
	E01	0.039-in./1 mm	Standard = 0.157-in. (4 mm)		page 106
	E02	0.079-in./ 2 mm			
	E03	0.118-in./3 mm			
	E05	0.197-in./5 mm			
	E06	0.236-in./6 mm			

Flanged installation

Flanged thermowells are bolted to a mating flange which protrudes from the process. It is important to select appropriate gasket for the process conditions, to provide a seal between the flange faces. The Rosemount 114C Thermowells come standard with a raised face and spiral serrations designed per the ASME B16.5 standard. These should be installed with an inside bolt circle (IBC) gasket/ring gasket, which extends to and is centered by the bolts. Other flange face options are available.

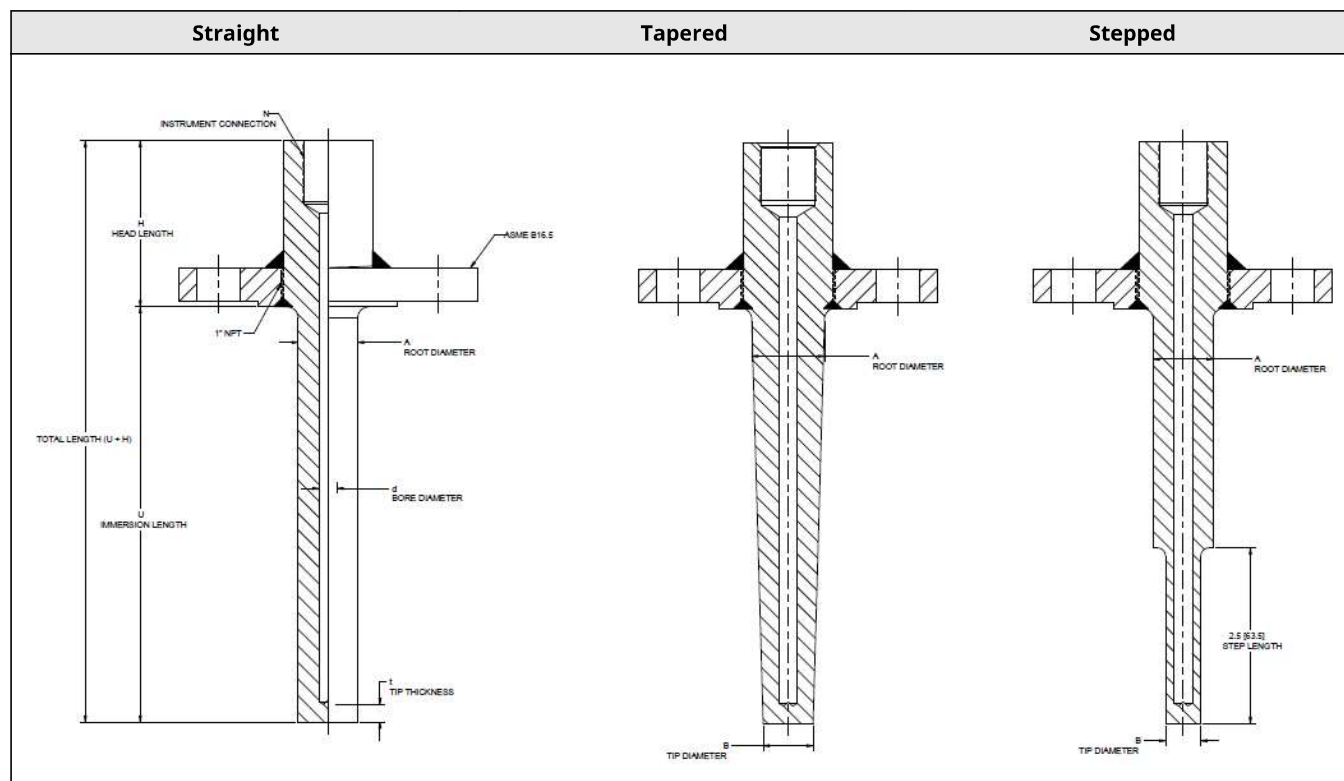
Figure 10: Installation Components



- A. Thermowell
- B. Bolt/washers
- C. Ring gasket
- D. Nozzle and mating flange
- E. Process

Flanged thermowell drawings

Figure 11: Flange Mounted Thermowell Drawings Total length = U+H.



- A. Root diameter
- B. Tip diameter
- C. ASME B16.5 lap flange
- E. Total length (U + H)
- H. Head length
- N. Instrument connection
- U. Immersion length
- d. Bore diameter
- t. Tip thickness

Note

Dimensions are millimeters (inches).

Table 3: Flange Mounted Thermowells

Code	Process connection			Root diameter stepped stem	Root diameter tapered stem	Tip diameter tapered stem	Tip diameter straight stem	Flanges per specification
	Code P, flanged, partial penetration weld	Code F, flanged, full penetration weld	Code G, flanged, forged/no welds					
AA	1-in. Class 150	1-in. Class 150	1-in. Class 150	.748 (19)	.886 (22.5)	.630 (16)	.748 (19)	ASME B16.5

Table 3: Flange Mounted Thermowells *(continued)*

Code	Process connection			Root diameter stepped stem	Root diameter tapered stem	Tip diameter tapered stem	Tip diameter straight stem	Flanges per specification
	Code P, flanged, partial penetration weld	Code F, flanged, full penetration weld	Code G, flanged, forged/no welds					
AB	1½-in. Class 150	1½-in. Class 150	1½-in. Class 150	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
AC	2-in. Class 150	2-in. Class 150	2-in. Class 150	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
AD	3-in. Class 150	3-in. Class 150	3-in. Class 150	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
AE	4-in. Class 150	4-in. Class 150	4-in. Class 150	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
AF	6-in. Class 150	6-in. Class 150	6-in. Class 150	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
AG	¾-in. Class 150	¾-in. Class 150	¾-in. Class 150	.669 (17)	.669 (17)	.496 (12.5)	.669 (17)	
AH	1-in. Class 300	1-in. Class 300	1-in. Class 300	.748 (19)	.886 (22.5)	.630 (16)	.748 (19)	
AJ	1½-in. Class 300	1½-in. Class 300	1½-in. Class 300	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
AK	2-in. Class 300	2-in. Class 300	2-in. Class 300	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
AL	1-in. Class 400/600	1-in. Class 400/600	1-in. Class 400/600	.748 (19)	.886 (22.5)	.630 (16)	.748 (19)	
AM	1½-in. Class 400/600	1½-in. Class 400/600	1½-in. Class 400/600	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
AN	2-in. Class 400/600	2-in. Class 400/600	2-in. Class 400/600	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
AP	N/A	1½-in. Class 900/1500	1½-in. Class 900/1500	.748 (19)	.886 (22.5)	.630 (16)	.748 (19)	
AQ	N/A	1½-in. Class 900/1500	1½-in. Class 900/1500	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
AR	N/A	2-in. Class 900/1500	2-in. Class 900/1500	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
AT	N/A	1½-in. Class 2500	1½-in. Class 2500	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
AU	N/A	2-in. Class 2500	2-in. Class 2500	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
AV	3-in. Class 300	3-in. Class 300	3-in. Class 300	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
AX	N/A	3-in. Class 900	N/A	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
AY	N/A	3-in. Class 1500	N/A	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
AZ	N/A	3-in. Class 2500	N/A	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	

Table 3: Flange Mounted Thermowells (continued)

Code	Process connection			Root diameter stepped stem	Root diameter tapered stem	Tip diameter tapered stem	Tip diameter straight stem	Flanges per specification
	Code P, flanged, partial penetration weld	Code F, flanged, full penetration weld	Code G, flanged, forged/no welds					
FA	DN 20/PN 2.5/6	DN 20/PN 2.5/6	.669 (17)	.669 (17)	.669 (17)	.669 (17)	.669 (17)	EN 1092-1
FE	DN 20/PN 10/16/25/40	DN 20/PN 10/16/25/40	DN 20/PN 10/16/25/40	.669 (17)	.669 (17)	.669 (17)	.669 (17)	
FG	DN 20/PN 63/100	DN 20/PN 63/100	DN 20/PN 63/100	.669 (17)	.669 (17)	.669 (17)	.669 (17)	
GA	DN 2.5 PN 2.5/6	DN 2.5 PN 2.5/6	DN 2.5 PN 2.5/6	.748 (19)	.748 (19)	.500 (12.7)	.748 (19)	
GE	DN 2.5 PN 10/16/25/40	DN 2.5 PN 10/16/25/40	DN 2.5 PN 10/16/25/40	.748 (19)	.748 (19)	.500 (12.7)	.748 (19)	
GG	DN 2.5 PN63/100	DN 2.5 PN63/100	DN 2.5 PN63/100	.748 (19)	.748 (19)	.500 (12.7)	.748 (19)	
JA	DN 40 / PN 2.5/6	DN 40 / PN 2.5/6	DN 40 / PN 2.5/6	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
JE	DN 40 / PN 10/16/25/40	DN 40 / PN 10/16/25/40	DN 40 / PN 10/16/25/40	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
JG	DN 40 / PN 63/100	DN 40 / PN 63/100	DN 40 / PN 63/100	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
JH	DN 40 / PN 160	DN 40 / PN 160	DN 40 / PN 160	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
JJ	DN 50/PN 250	DN 50/PN 250	DN 50/PN 250	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
JK	DN 50/PN 320	DN 50/PN 320	DN 50/PN 320	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
JL	DN 50/PN 400	DN 50/PN 400	DN 50/PN 400	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
KA	DN 50/PN 2.5/6	DN 50/PN 2.5/6	DN 50/PN 2.5/6	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
KC	DN 50/PN 10/16	DN 50/PN 10/16	DN 50/PN 10/16	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
KE	DN 50/PN 25/40	DN 50/PN 25/40	DN 50/PN 25/40	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
KF	DN 50/PN 63	DN 50/PN 63	DN 50/PN 63	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
KG	DN 50/PN 100	DN 50/PN 100	DN 50/PN 100	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
LA	DN 65 / PN 2.5/6	DN 65 / PN 2.5/6	DN 65 / PN 2.5/6	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	EN 1092-1
LC	DN 65 / PN 10/16	DN 65 / PN 10/16	DN 65 / PN 10/16	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
LE	DN 65 / PN 24/40	DN 65 / PN 24/40	DN 65 / PN 24/40	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
LF	DN 65 / PN 63	DN 65 / PN 63	DN 65 / PN 63	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	

Table 3: Flange Mounted Thermowells *(continued)*

Code	Process connection			Root diameter stepped stem	Root diameter tapered stem	Tip diameter tapered stem	Tip diameter straight stem	Flanges per specification
	Code P, flanged, partial penetration weld	Code F, flanged, full penetration weld	Code G, flanged, forged/no welds					
LG	DN 65 / PN 100	DN 65 / PN 100	DN 65 / PN 100	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
MA	DN 80/ PN 2.5/6	DN 80/ PN 2.5/6	DN 80/ PN 2.5/6	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
MC	DN 80/ PN 10/16	DN 80/ PN 10/16	DN 80/ PN 10/16	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
ME	DN 80/ PN 25/40	DN 80/ PN 25/40	DN 80/ PN 25/40	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
MF	DN 80/ PN 63	DN 80/ PN 63	DN 80/ PN 63	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
MG	DN 80/ PN 100	DN 80/ PN 100	DN 80/ PN 100	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
NA	DN 100/ PN 2.5/6	DN 100/ PN 2.5/6	DN 100/ PN 2.5/6	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
NC	DN 100/ PN 10/16	DN 100/ PN 10/16	DN 100/ PN 10/16	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
NE	DN 100 / PN 63	DN 100 / PN 63	DN 100 / PN 63	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
NF	DN 100/PN 63	DN 100/PN 63	DN 100/PN 63	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	
NG	DN 100/PN 100	DN 100/PN 100	DN 100/PN 100	.846 (21.5)	1.043 (26.5)	.709 (18)	.846 (21.5)	