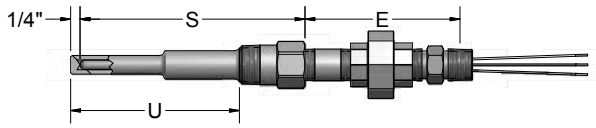
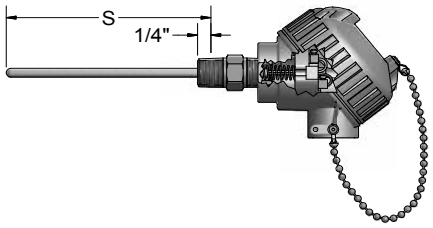
Sensors with Connection Heads

Configuration Code GP03
Spring-Loaded RTD/Thermowell Assemblies with General-Purpose Connection Heads

Spring-Loaded RTD/Thermowell Assemblies with General-Purpose Connection Heads are designed for use with various thermowell types. Complete assemblies can be ordered by selecting the RTD assembly below, the thermowell from the thermowell section of this catalog, and a temperature transmitter from the back of this section. Assemblies without a thermowell can be ordered by selecting the sensor assembly from this page and inserting the "S" length in table 2-0. These sensors are supplied with a 316 stainless steel sheath and are available in various tolerances and temperature ranges as noted in the tables below.





ORDER CODES

Example Order Number:

1-0	1-1	1-2		2-0		3-0		4-0	4-1	4-2	
R1T185L	48	3	-	Select Thermowell Part # or Insert 3 Digit Length Code	-	SL	-	8HN	31,	T	Select Type and Range from back of section

1-0 100 Ω Platinum RTD Elements α = 0.003 85 °C^{-1}

CODE		TOLERANCE[1]	TEMP. RANGE
SINGLE	*DUPLEX*		
R1T185L	R1T285L	Grade B	(-200 to 200) °C
R5T185L	R5T285L	(1/5) Class B	(-30 to 150) °C
RBF185L	RBF285L	Class B	(-50 to 200) °C
RAF185L	RAF285L	Class A	(-30 to 200) °C
R1T185H	R1T285H	Grade B	(-200 to 600) °C
RAT185H	RAT285H	Class A	(-100 to 450) °C

[1] Refer to RTD tolerance information in the General Information section for calculations to determine specific tolerance at temperature.

1-1 Sheath Diameters

CODE	DIAMETERS (inches) 316 SS
38	3/16
48	1/4

1-2 Element Connection

CODE	DESCRIPTION
2	2-wire element
3	3-wire element
4	4-wire element

2-0

Select thermowell part number from Thermowell Section, or specify 3 digit "S" length in inches if no thermowell is required.

3-0 Element Options

CODE	DESCRIPTION
SL[1]	Spring-loaded element
SC	Self-contained spring-loaded element
SN	Self-contained spring-loaded element with Buna-N oil seal 121°C [250°F] 100 PSI Max.
[1] Not available with option 35T, 36T, or 37T	

4-0 Head Mounting Fittings

CODE	DESCRIPTION	CODE	DESCRIPTION
STEEL FITTINGS		*316SS FITTINGS*	
6HN	1/2" x 1/2" NPT hex nipple 1" length	8HN	1/2" x 1/2" NPT hex nipple 1" length
6PN_	1/2" NPT pipe nipple (specify "E" length in inches)	8PN_	1/2" NPT pipe nipple (specify "E" length in inches)
6PU_ [1]	1/2" NPT union/nipple (specify "E" length in inches)	8PU_ [1]	1/2" NPT union/nipple (specify "E" length in inches)
[1] 4" Minimum length required			

4-1 Head and Sheath Terminations

CODE	DESCRIPTION
22	3" Individual fluoropolymer leads with terminal pins
31	Aluminum screw-cover head
34	Cast iron screw-cover head
35T142A	(4 to 20) mA HART® Field Transmitter with aluminum general-purpose housing
36T71-D10	(4 to 20) mA isolated programmable transmitter with digital display and general purpose aluminum housing with glass lid
36T72-D10	(4 to 20) mA isolated programmable HART® transmitter with digital display and general purpose aluminum housing with glass lid
36T82-D10	(4 to 20) mA dual input HART® transmitter with digital display and general-purpose aluminum housing with glass lid
49	Flip-top aluminum head
63	White polypropylene screw-cover head
91	316 L stainless steel screw-cover head

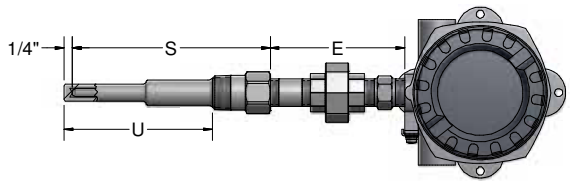
4-2 Options

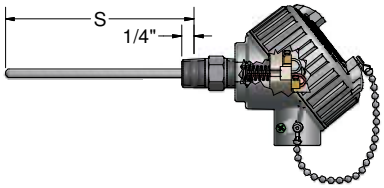
W[1]	Epoxy Coating
GS	Ground screw
I	Stainless tag
NB	1/2" NPT nylon conduit reducer bushing
SB	1/2" NPT conduit reducer bushing
T31	(4 to 20) mA head-mounted RTD transmitter
T71-00	(4 to 20) mA isolated programmable transmitter
T72-00	(4 to 20) mA isolated programmable HART® transmitter
T82-00	(4 to 20) mA dual input HART® head-mounted transmitter
See transmitter ordering information in back of section.	
[1] Available with option 31 only.	

HART® is a registered trademark of HART Communication Foundation.

Sensors with Connection Heads

Spring-Loaded RTD/Thermowell Assemblies with Explosion-Proof Connection Heads are designed for use with various thermowell types. Complete assemblies can be ordered by selecting the RTD assembly below, the thermowell from the thermowell section of this catalog, and a temperature transmitter from the back of this section. Assemblies without a thermowell can be ordered by selecting the sensor assembly from this page and inserting the "S" length in table 2-0. These sensors are supplied with a 316 stainless steel sheath and are available in various tolerances and temperature ranges as noted in the tables below.





ORDER CODES

Example Order Number:

1-0	1-1	1-2		2-0		3-0		4-0	4-1	4-2	
RBF185L	**48**	**3**	**-**	Select Thermowell Part # or Insert 3 Digit Length Code	**-**	**SL**	**-**	**8HN**	**93,**	**T**	Select Type and Range from back of section

1-0 100 Ω Platinum RTD Elements α = 0.003 85 °C^{-1}

CODE		TOLERANCE[1]	TEMP. RANGE
SINGLE	*DUPLEX*		
R1T185L	R1T285L	Grade B	(-200 to 200) °C
R5T185L	R5T285L	(1/5) Class B	(-30 to 150) °C
RBF185L	RBF285L	Class B	(-50 to 200) °C
RAF185L	RAF285L	Class A	(-30 to 200) °C
R1T185H	R1T285H	Grade B	(-200 to 600) °C
RAT185H	RAT285H	Class A	(-100 to 450) °C

[1] Refer to RTD tolerance information in the General Information section for calculations to determine specific tolerance at temperature.

1-1 Sheath Diameters

CODE	DIAMETERS (inches) 316 SS
38	3/16
48	1/4

1-2 Element Connection

CODE	DESCRIPTION
2	2-wire element
3	3-wire element
4	4-wire element

2-0

Select thermowell part number from Thermowell Section, or specify 3 digit "S" length in inches if no thermowell is required.

4-1 Head Terminations

CODE	DESCRIPTION
74	Dual conduit DIN form B aluminum explosion-proof/flame-proof head, NEC, IEC, Atex approved
75T142C	(4 to 20) mA HART® field transmitter with aluminum explosion-proof housing
93	Aluminum explosion-proof/flame-proof head, NEC, IEC, Atex approved
94	316L stainless steel explosion-proof/flame-proof head, NEC, IEC, Atex approved

4-2 Options

SB	1/2" NPT conduit reducer bushing
I	Stainless tag
T31	(4 to 20) mA head-mounted RTD transmitter
T71-00	(4 to 20) mA isolated programmable transmitter
T72-00	(4 to 20) mA isolated programmable HART® transmitter
T82-00	(4 to 20) mA dual input, isolated HART® head-mounted transmitter
See transmitter ordering information in back of section.	

4-0 Head Mounting Fittings

CODE	DESCRIPTION	CODE	DESCRIPTION
STEEL FITTINGS		*316SS FITTINGS*	
6HN	1/2" x 1/2" NPT hex nipple 1" length	8HN	1/2" x 1/2" NPT hex nipple 1" length
6PN_	1/2" NPT pipe nipple (specify "E" length in inches)	8PN_	1/2" NPT pipe nipple (specify "E" length in inches)
6XU_ [1]	1/2" NPT union/nipple (specify "E" length in inches)	8XU_ [1]	1/2" NPT union/nipple (specify "E" length in inches)
[1] 3 1/2" Minimum length required			

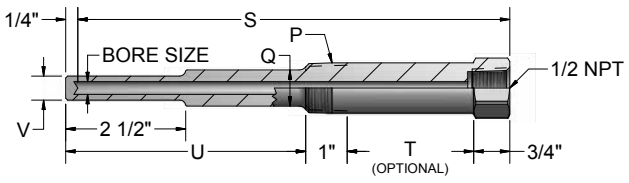
3-0 Element Options

CODE	DESCRIPTION
SL[1]	Spring-loaded element
SC	Self-contained spring-loaded element
SN	Self-contained spring-loaded element with Buna-N oil seal 121°C [250°F] 100 PSI Max.
[1] Not available with option 75T	

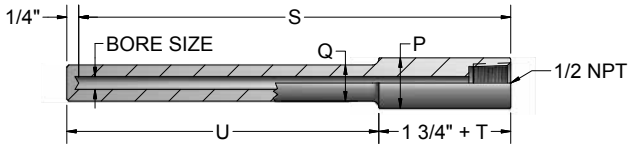
HART® is a registered trademark of HART Communication Foundation.

The drilled thermowells listed below are those most commonly found in process applications. Other types and styles are listed later in this section. The thermowells listed below are available as separate component wells and can be ordered by the code numbers listed below. They can also be ordered as a part of a complete sensor assembly. Consult factory for wells with different mounting threads, lengths, and materials.

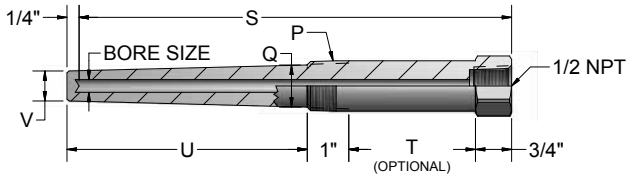
STANDARD-DUTY WELLS



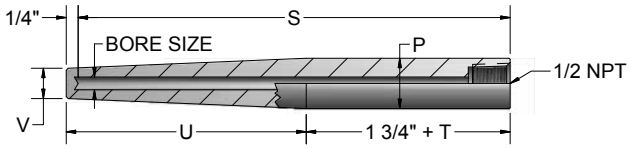
STRAIGHT-SHANK, SOCKET-WELD



HEAVY-DUTY WELLS



WELD-IN WELLS



ORDER CODES

Example Order Number:

1-0	1-1	1-2	1-3	1-4	1-5	1-6
S	**4**	**D**	**06**	**08**	**T2**	**S**

1-0 Well Type

CODE	DESCRIPTION
S	Standard-duty threaded (NPT)
H	Heavy-duty threaded (NPT)
SW	Straight-shank, socket-weld
WI	Weld-in

1-1 Bore Size

CODE	DESCRIPTION
4	0.260 Dia. Bore

1-2 Pipe Size "P"

CODE	DESCRIPTION
C	1/2" Pipe[1]
D	3/4" Pipe
E	1" Pipe
[1] Only available with well type S or H	

1-3 Length Dimensions (inches)

CODE	"S" DIMENSIONS	"U" DIMENSIONS	
		NO LAG	*WITH STANDARD LAG*
04	4	2(1/2)	N/A
06	6	4(1/2)	2(1/2)
09	9	7(1/2)	4(1/2)
12	12	10(1/2)	7(1/2)
15	15	13(1/2)	10(1/2)
18	18	16(1/2)	13(1/2)
24	24	22(1/2)	19(1/2)

1-4 Material

CODE	DESCRIPTION
08	316 stainless steel
09	304 stainless steel

1-5 Optional "T" Lag Dimension

CODE	DESCRIPTION
Leave blank if No Lag is required	
T2	2" Lag standard on 6" well
T3	3" Lag standard on 9, 12, 15, 18, 24" wells
T__	Special Lag specify "T" dimension in inches

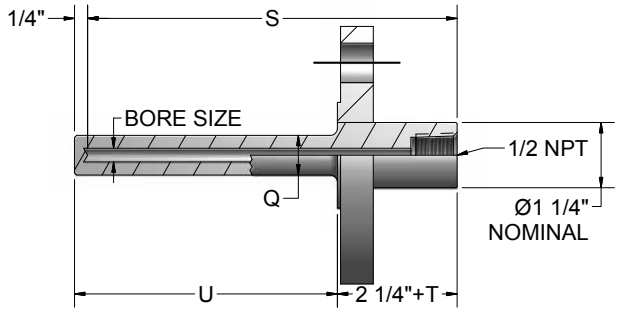
1-6 Well Options

CODE	DESCRIPTION
C8	316 stainless steel well cap and chain
C22	Brass well cap and chain
S	Customer specified part number marked on the thermowell - (10 digit maximum)

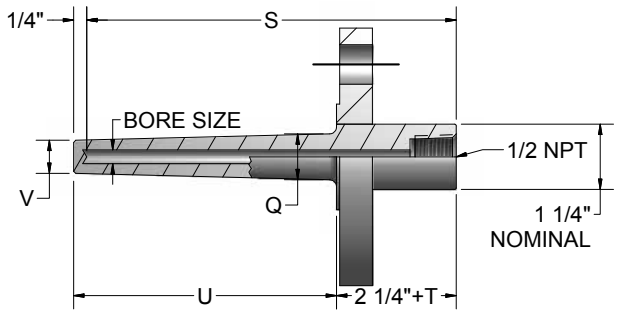
The flanged thermowells described on this page are those commonly found in most process applications. These wells are supplied as standard- or heavy-duty with raised-faced flanges. Other types and styles are listed later in this section. Consult factory for wells with different flange sides, lengths, and materials.

FLANGED THERMOWELLS

STANDARD-DUTY



HEAVY-DUTY



ORDER CODES

Example Order Number:

1-0	1-1	1-2	1-3	1-4	1-5	1-6	1-7	1-8
SF	4	15	R	3	12	08	T2	C8

1-0 Well Type

CODE	DESCRIPTION
SF	Standard-duty flanged
HF	Heavy-duty flanged

1-1 Bore Size

CODE	DESCRIPTION
4	0.260 Bore

1-2 Flange Size

CODE	DESCRIPTION
10	1"
15	1 1/2"
20	2"

1-3 Flange Type

CODE	DESCRIPTION
R	Raised face

1-4 Pressure Rating

CODE	DESCRIPTION
1	150 class
3	300 class

1-8 Well Options

CODE	DESCRIPTION
C8	316 stainless steel well cap and chain
C22	Brass well cap and chain
S	Customer specified part number marked on thermowell (10 digit maximum)

1-7 Optional "T" Lag Dimension

CODE	DESCRIPTION
Leave blank if no lag is required	
T__	Specify "T" dimension in inches

1-6 Well Material

CODE	DESCRIPTION
08	316 Stainless steel
09	304 Stainless steel

1-5 Well Length (inches)

CODE	DESCRIPTION	
	"S" DIMENSION	"U" DIMENSION
06	6	4
09	9	7
12	12	10
15	15	13
18	18	16
24	24	22

ORDER CODES

Example Order Number:

1-0		1-1		1-2	1-3	1-4		1-5	1-6		1-7
T31	-	D	-	3	85	U	-	S(0-200)	C	-	B

1-0 Transmitter Type

CODE	DESCRIPTION
T31	(4 to 20) mA programmable head-mounted RTD Transmitter
T71-00	(4 to 20) mA isolated programmable transmitter
T72-00	(4 to 20) mA isolated programmable HART® head-mounted transmitter
35T142A	(4 to 20) mA HART® Field Transmitter with general-purpose aluminum housing
36T71-D10	(4 to 20) mA isolated Programmable transmitter with digital display and general purpose aluminum housing with glass lid
36T72-D10	(4 to 20) mA isolated Programmable HART® transmitter with digital display and general purpose aluminum housing with glass lid
75T142C	(4 to 20) mA HART® Field Transmitter with explosion-proof aluminum housing FM/CSA/ XP Class I Div I Groups A,B,C,D; DIP Class II Div I Groups E,F,G; Class III; NI Class I Div II Groups A,B,C,D

1-1 Options (For 142 Series only)

CODE	DESCRIPTION
T	Solid cover
D	Glass cover with digital display
Leave blank if using T31, T71, or T72	

1-2 Input Type

CODE	DESCRIPTION
00[1]	Unconfigured
1	Thermocouple (TC)
2	RTD (2-wire)
3	RTD (3-wire)
4	RTD (4-wire)
[1] Default setting supplied as 4-wire Pt100 (0-100) °C	

1-3 Sensor Type

CODE	DESCRIPTION
J	Type J thermocouple
K	Type K thermocouple
T	Type T thermocouple
N	Type N thermocouple
E	Type E thermocouple
85	100 ohm platinum (α = 0.003 85 $^{\circ}C^{-1}$)
92	100 ohm platinum (α = 0.003 92 $^{\circ}C^{-1}$)
95	1000 ohm platinum (α = 0.003 85 $^{\circ}C^{-1}$)

1-4 Failure Mode

CODE	DESCRIPTION
U	Upscale Burnout ≥ 20.5 mA
D	Downscale Burnout ≤ 3.8 mA

1-5 Range

CODE	DESCRIPTION
S	(lower limit – upper limit)

1-6 Unit of Measure

CODE	DESCRIPTION
C	Celsius
F	Fahrenheit

1-7 Options

CODE	DESCRIPTION
B[1]	Bluetooth (APP) Configuration
[1] Only available with T72 Models	

For complete transmitter specifications see Transmitter Section.

HART® is a registered trademark of HART Communication Foundation.

ORDER CODES

Example Order Number:

1-0		1-1		1-2		1-3		1-4		1-5		1-6		1-7		1-8
36T82-D10	-	**33**	-	**85**	-	**85**	-	**E**	-	**U**	-	**S(0-200)**		**C**	-	**SIL**

1-0 Transmitter Type

CODE	DESCRIPTION
T82-00	(4 to 20) mA dual input, isolated HART® head-mounted Transmitter, no display (transmitter only)
36T82-D10	(4 to 20) mA dual input, isolated HART® Transmitter with digital display and general purpose screw-cover housing

1-1 Configuration Input

CODE	DESCRIPTION
00	Unconfigured
2I	Ch1: RTD 2-wire, Ch2: inactive
22	Ch1: RTD 2-wire, Ch2: RTD 2-wire
23	Ch1: RTD 2-wire, Ch2: RTD 3-wire
2T	Ch1: RTD 2-wire, Ch2: Thermocouple
3I	Ch1: RTD 3-wire, Ch2: inactive
32	Ch1: RTD 3-wire, Ch2: RTD 2-wire
33	Ch1: RTD 3-wire, Ch2: RTD 3-wire
3T	Ch1: RTD 3-wire, Ch2: Thermocouple
4I	Ch1: RTD 4-wire, Ch2: inactive
4T	Ch1: RTD 4-wire, Ch2: Thermocouple
TI	Ch1: Thermocouple, Ch2: inactive
TT	Ch1: Thermocouple, Ch2: Thermocouple

1-2 Sensor Input Channel 1

CODE	DESCRIPTION
J	Type J thermocouple
K	Type K thermocouple
T	Type T thermocouple
N	Type N thermocouple
E	Type E thermocouple
R	Type R thermocouple
S	Type S thermocouple
B	Type B thermocouple
85	100 ohm platinum (α = 0.003 85 $^{\circ}C^{-1}$)
55	500 ohm platinum (α = 0.003 85 $^{\circ}C^{-1}$)
95	1000 ohm platinum (α = 0.003 85 $^{\circ}C^{-1}$)

1-3 Sensor Input Channel 2

CODE	DESCRIPTION
00	No second channel
J	Type J thermocouple
K	Type K thermocouple
T	Type T thermocouple
N	Type N thermocouple
E	Type E thermocouple
R	Type R thermocouple
S	Type S thermocouple
B	Type B thermocouple
85	100 ohm platinum (α = 0.003 85 $^{\circ}C^{-1}$)
55	500 ohm platinum (α = 0.003 85 $^{\circ}C^{-1}$)
95	1000 ohm platinum (α = 0.003 85 $^{\circ}C^{-1}$)

1-4 Input Set-ups

CODE	DESCRIPTION
A	Process variable = Ch1; Ch2 = inactive
B	Process variable = Ch1; Secondary value = Ch2
C	Process variable = the difference between Ch1 and Ch2
D	Process variable = average of Ch1 and Ch2
E	Sensor backup; Process variable = Ch1 and Ch2

1-5 Failure Mode

CODE	DESCRIPTION
U	Upscale Burnout ≥ 23 mA
D	Downscale Burnout ≤ 3 mA

1-6 Range

CODE	DESCRIPTION
S	(lower limit – upper limit)

1-7 Unit of Measure

CODE	DESCRIPTION
C	Celsius
F	Fahrenheit

1-8 SIL Option

CODE	DESCRIPTION
SIL	Safety Integrity Level SIL2 and Supports SIL3

For complete transmitter specifications see Transmitter Section.

HART® is a registered trademark of HART Communication Foundation