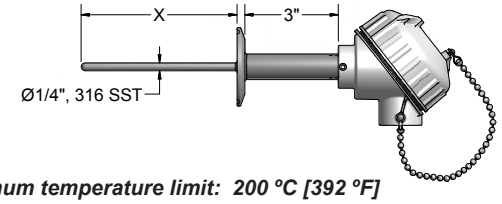
Configuration Code FD02

CIP Sanitary-Connected RTDs

General-purpose CIP sanitary-connected RTD temperature sensors are used in food, dairy, beverage, pharmaceutical, and chemical processing applications where sensor corrosion and product contamination are critical factors. The sanitary caps listed are those most commonly used in such processes. Sanitary caps are welded to the sheath and to a heavier support tube, all made of stainless steel, and then ground and polished to a finish that exceeds the No. 4 minimum finish required by the **3-A Sanitary Standard 74 -** . Assemblies are supplied with a surface finish that meets or exceeds 32µin R_a. Surface finishes of 15µin R_a or better are available upon request. The process contact surfaces are free of pits, crevices, and pockets thus preventing corrosion and bacteria growth. The 3-wire constructed sensor assembly consists of a high-accuracy platinum element sealed inside a 316 stainless steel sheath, and is provided with a white FDA compliant polypropylene connection head. The complete assembly provides excellent washdown protection. It is recommended that once customer connections are made, the connecting terminals be further protected by applying a coating of moisture-proof sealant over the connections.

74-



Maximum temperature limit: 200 ºC [392 ºF]

ORDER CODES

Example Order Number: **R5T185L48 3 - 04 - CIP - 2 - 5 - 63, T** Select Type and Range from back of Section

1-0 1-1 1-2 2 3 4

1-0 Pt100 (α = 0.003 85 ºC^{-1}) RTD Assemblies

CODE	TOLERANCE[1]
SINGLE	
RAF185L48	Class A
R1T185L48	Grade B
R3T185L48	Class AA
R5T185L48	(1/5) Class B
DUPLEX	
RAF285L48	Class A
R1T285L48	Grade B
R3T285L48	Class AA
R5T285L48	(1/5) Class B
[1] Refer to RTD tolerance information in the General Information section for calculations to determine specific tolerance at temperature.	
Thermocouple Assemblies	
For CIP thermocouple assemblies use T/C types J, K, T, or E and options G for grounded junction or U for ungrounded junction as per example. EXAMPLE: TP48G-04 - CIP - 2 - 5 - 63	

1-1 Element Connection

CODE	DESCRIPTION
3	3-Wire Element
4 [1]	4-Wire Element
[1] Not Available in Duplex	

1-2 Immersion Length "X"

Specify "X" length in inches using 2 digits, plus any fractional length desired
Examples: 04 = 4", 05(1/2) = 5.5"

2 Sanitary Cap Size

CODE	TUBE O.D. (inches)	CODE	TUBE O.D. (inches)
1	1(1/2)	4	3
2	2	5	4
3	2 (1/2)	Z	Other (specify)

4 Terminations

CODE	DESCRIPTION
91	316L stainless steel screw-cover head
63	White polypropylene screw-cover head
31,W	Aluminum screw-cover head with white epoxy coating
35T-642A	(4 to 20) mA HART® Field Transmitter with aluminum general-purpose housing
36T82-D10	(4 to 20) mA dual input HART® transmitter with digital display and general-purpose aluminum housing with glass lid
37T-662A	(4 to 20) mA HART® Field Transmitter with general-purpose dual cavity aluminum housing
22 (06)	6" individual fluoropolymer leads with terminal pins
02	1/2" O.D., 2 1/4" long extension leadwire transition (requires table 4 & 5 selections from RTD section)
Head Options	
T-440	(4 to 20) mA head-mounted RTD transmitter
T-441	(4 to 20) mA isolated head-mounted transmitter
T-442	(4 to 20) mA isolated HART® head-mounted transmitter
T82-00	(4 to 20) mA dual input HART® head-mounted transmitter
I	Stainless steel tags
HS	Wire seal security screws
See transmitter ordering information in back of section.	

3 Sanitary Cap Style

CODE	DESCRIPTION
2	16A cap - Bevel Seat with13-H Nut[1] 304SS
5	16 AMP cap - Tri-Clamp® 316SS
7	16AI-14I cap[2] 304SS
8	Other (describe)
[1] Must be manually cleaned [2] Not 3-A authorized	

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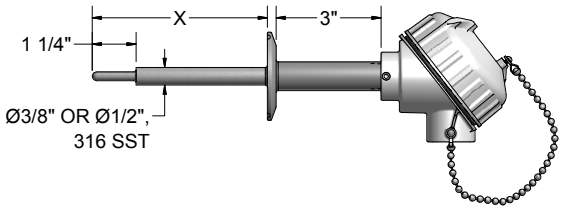
Configuration Code FD02

CIP Sanitary Reduced-Tip RTDs

General-purpose reduced-tip CIP sanitary-connected RTD temperature sensors are used in food, dairy, beverage, pharmaceutical, and chemical processing applications where sensor corrosion and product contamination are critical factors. The reduced tip construction provides strength along the major sheath length, and faster temperature response times at the reduced tip. The reduced tip sizes listed below are the most common constructions. For other configurations please consult the factory. The sanitary caps listed are those most commonly used in such processes. The sanitary caps are welded to the sheath and to a heavier support tube, all made of stainless steel, and then ground and polished to a finish that exceeds the No. 4 minimum finish required by the **3-A Sanitary Standard 74 -** . Assemblies are supplied with a surface finish that meets or exceeds 32µin R_a. Surface finishes of 15µin R_a or better are available upon request. The process contact surfaces are free of pits, crevices, and pockets thus preventing corrosion and bacteria growth. The 3-wire constructed sensor assembly consists of a high-accuracy platinum element sealed inside a 316 stainless steel sheath, and is provided with a white FDA compliant polypropylene connection head. The complete assembly provides excellent washdown protection. It is recommended that once customer connections are made, the connecting terminals be further protected by applying a coating of moisture-proof sealant over the connections.

74-



Maximum temperature limit: 200 °C [392 °F]

ORDER CODES

Example Order Number: **R5T185L68R38 3 - 04 - CIP - 2 - 5 - 63, I**

(1-0 = R5T185L68R38; 1-1 = 3; 1-2 = 04; CIP; 2 = 2; 3 = 5; 4 = 63, I)

1-0 Pt100 (α = 0.003 85 °C^{-1}) RTD Assemblies

CODE		TOLERANCE[1]	NORMAL SHEATH DIA. OD (in)	TIP DIAMETER OD (in)
SINGLE	*DUPLEX*			
RAF185L88R48	RAF285L88R48	Class A	1/2	1/4
RAF185L68R38	RAF285L68R38	Class A	3/8	3/16
R1T185L88R48	R1T285L88R48	Grade B	1/2	1/4
R1T185L68R38	R1T285L68R38	Grade B	3/8	3/16
R3T185L88R48	R3T285L88R48	Class AA	1/2	1/4
R3T185L68R38	R3T285L68R38	Class AA	3/8	3/16
R5T185L88R48	R5T285L88R48	(1/5) Class B	1/2	1/4
R5T185L68R38	R5T285L68R38	(1/5) Class B	3/8	3/16
[1] Refer to RTD tolerance information in the General Information section for calculations to determine specific tolerance at temperature.				
Thermocouple Assemblies				
For CIP thermocouple assemblies use T/C types J, K, T, or E and options G for grounded junction or U for ungrounded junction as per example. EXAMPLE: TP68R38G-04 - CIP - 2 - 5 - 63				

1-1 Element Connection

CODE	DESCRIPTION
3	3-Wire Element
4 [1]	4-Wire Element
[1] Not Available in Duplex	

1-2 Immersion Length "X"

Specify "X" length in inches using 2 digits, plus any fractional length desired. Examples: 04 = 4", 05(1/2) = 5.5"

2 Sanitary Cap Size

CODE	TUBE O.D. (inches)	CODE	TUBE O.D. (inches)
1	1(1/2)	4	3
2	2	5	4
3	2 (1/2)	Z	Other (specify)

4 Terminations

CODE	DESCRIPTION
91	316L stainless steel screw-cover head
63	White polypropylene screw-cover head
31,W	Aluminum screw-cover head with white epoxy coating
35T-642A	(4 to 20) mA HART® Field Transmitter with aluminum general-purpose housing
36T82-D10	(4 to 20) mA dual input HART® transmitter with digital display and general-purpose aluminum housing with glass lid
37T-662A	(4 to 20) mA HART® Field Transmitter with general-purpose aluminum housing
22 (06)	6" individual fluoropolymer leads with terminal pins
02	1/2" O.D., 2 1/4" long extension leadwire transition (requires table 5 & 6 selections from RTD section)
Head Options	
T-440	(4 to 20) mA head-mounted RTD transmitter
T-441	(4 to 20) mA isolated head-mounted transmitter
T-442	(4 to 20) mA isolated HART® head-mounted transmitter
T82-00	(4 to 20) mA dual input HART® head-mounted transmitter
I	Stainless steel tags
HS	Wire seal security screws

3 Sanitary Cap Style

CODE	DESCRIPTION
2	16A cap - bevel seat with13-H nut[1] 304SS
5	16 AMP cap - Tri-Clamp® 316SS
7	16AI-14I cap[2] 304SS
8	Other (describe)
[1] Must be manually cleaned [2] Not 3-A authorized	

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Food, Dairy & Pharmaceutical

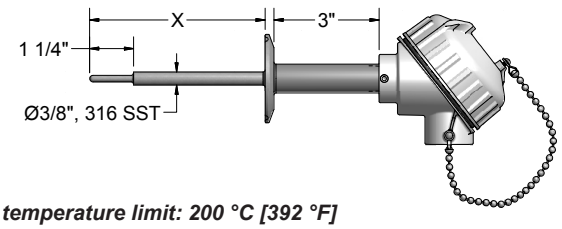
Configuration Code FD02

Fast Temperature Response RTDs with CIP Fittings

The sensors listed below are sanitary-connected RTD temperature sensor assemblies designed to meet the stringent requirements of HTST pasteurization systems. HTST requirements are described in the Grade "A" Milk Pasteurization Ordinance. The sensors listed on this page have response times below four seconds and come standard in accuracies at 100 ºC [212 ºF] ± 0.5 ºC. The below listed assemblies are available in a variety of sanitary connections. All wetted parts are ground and polished to a finish that exceeds the No. 4 minimum finish required by the 3-A Sanitary Standards for Sensors and Sensor Fittings and Connections used on Milk and Milk Product Equipment Standard **74-** . Assemblies are supplied with a surface finish that meets or exceeds 32µin R_a. Surface finishes of 15µin R_a or better are available upon request. The three-wire constructed sensor assembly consists of a high accuracy platinum element sealed inside a 316 stainless steel sheath and a white FDA compliant polypropylene connection head. The complete assembly provides excellent wash down protection. It is recommended that once customer connections are made, the connecting terminals be further protected by applying a coating of moisture-proof sealant over the connections.

3-A®

74-



Maximum temperature limit: 200 °C [392 °F]
Pasteurization Test Response Time: 2 to 3 seconds typical

ORDER CODES

Example Order Number:

1-0	1-1		1-2			2		3		4
R5T185L68R38	3	-	04	-	HTST	-	2	-	5	-	63

1-0 Pt100 (α = 0.003 85 ºC^{-1}) RTD Assemblies

CODE		TOLERANCE[1]
SINGLE	*DUPLEX*	
R3T185L68R38	R3T285L68R38	Class AA
R5T185L68R38	R5T285L68R38	(1/5) Class B
[1] Refer to RTD tolerance information in the General Information section for calculations to determine specific tolerance at temperature.		

1-1 Element Connection

CODE	DESCRIPTION
3	3-Wire Element
4 [1]	4-Wire Element
[1] Not Available in Duplex	

1-2 Immersion Length "X"

Specify "X" length in inches using 2 digits,
plus any fractional length desired.
2" minimum length is required.
Examples: 04 = 4", 05(1/2) = 5.5"

2 Sanitary Cap Size

CODE	TUBE O.D. (inches)	CODE	TUBE O.D. (inches)
1	1(1/2)	4	3
2	2	5	4
3	2 (1/2)	Z	Other (specify)

3 Sanitary Cap Style

CODE	DESCRIPTION
2	16A cap - bevel seat with13-H nut[1] 304SS
5	16 AMP cap - Tri-Clamp® 316SS
7	16AI-14I cap[2] 304SS
8	Other (describe)
[1] Must be manually cleaned [2] Not 3-A authorized	

4 Terminations

CODE	DESCRIPTION
91	316L stainless steel screw-cover head
63	White polypropylene screw-cover head
31,W	Aluminum screw-cover head with white epoxy coating
35T-642A	(4 to 20) mA HART® Field Transmitter with aluminum general-purpose housing
36T82-D10	(4 to 20) mA dual input HART® transmitter with digital display and general-purpose aluminum housing with glass lid
37T-662A	(4 to 20) mA HART® Field Transmitter with general-purpose aluminum housing
22 (06)	6" individual fluoropolymer leads with terminal pins
02	1/2" O.D., 2 1/4" long extension leadwire transition (requires table 5 & 6 selections from RTD section)
Head Options	
T-440	(4 to 20) mA head-mounted RTD transmitter
T-441	(4 to 20) mA isolated head-mounted transmitter
T-442	(4 to 20) mA isolated HART® head-mounted transmitter
T82-00	(4 to 20) mA dual input HART® head-mounted transmitter
I	Stainless steel tags
HS	Wire seal security screws

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ORDER CODES

Example Order Number:

1-0		1-1		1-2	1-3	1-4		1-5		1-6
440	-		-	3	85	U	-	S(0-200)		C

1-0 Transmitter Type

CODE	DESCRIPTION
440[1]	(4 to 20) mA programmable head-mounted RTD Transmitter
441	(4 to 20) mA programmable head-mounted universal Transmitter
442	(4 to 20) mA HART® programmable head-mounted universal Transmitter
35T-642A	(4 to 20) mA HART® Field Transmitter with general-purpose aluminum housing
75T-642C	(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] Only available with 2- or 3-wire input connection and Pt100 sensor type	

1-1 Options (For 642 Series only)

CODE	DESCRIPTION
T	Solid cover
D	Glass cover with digital display
Leave blank if using 440, 441, or 442	

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 3-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 $^{\circ}C^{-1}$)

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

For complete transmitter specifications see Transmitter Section.

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ORDER CODES

Example Order Number:

1-0		1-1		1-2		1-3		1-4		1-5		1-6		1-7	1-8
37T-662A	-	D	-	33	-	85	-	85	-	A	-	U	-	S(0-200)	C

1-0 Transmitter Type

CODE	DESCRIPTION
37T-662A	(4 to 20) mA HART® Field Transmitter, single or dual input, with general-purpose dual cavity aluminum housing
77T-662C	(4 to 20) mA HART® Field Transmitter with dual-cavity explosion-proof aluminum housing FM/CSA XP Class I Div I Groups B,C,D; DIP Class II Div I Groups E,F,G; Class III; NI Class I Div II Groups B,C,D
T82-00	(4 to 20) mA dual input, isolated HART® head-mounted Transmitter
36T82	(4 to 20) mA dual input HART® Transmitter and general-purpose aluminum housing
76T82	(4 to 20) mA dual input HART® programmable Transmitter with digital display and explosion-proof aluminum housing, FM/CSA,NI,IS,XP,DIP Class I Div I and Div II, Groups A,B,C,D

1-1 Housing Cover Options

CODE	DESCRIPTION
T	Solid cover for 662 series
D	Glass cover with digital display for 662 series
D10	Glass cover with digital display for 36T82 and 76T82 series

1-2 Configuration Input

CODE	DESCRIPTION
00	T82 Unconfigured
01	662 Single input, unconfigured
02	662 Dual input, 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

1-8 Unit of Measure

CODE	DESCRIPTION
C	Celsius
F	Fahrenheit

1-7 Range

CODE	DESCRIPTION
S	(lower limit – upper limit)

1-6 Failure Mode

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

1-5 Input Set-ups

CODE	DESCRIPTION
0	One Input (662 only)
A	Process Variable = Ch1; CH2 = inactive
B	Process variable = CH1; secondary variable = Ch2 (T82 Only)
C	Process variable = the difference between CH1 and Ch2
D	Process variable = the average between CH1 and Ch2
E	Sensor backup; Process variable= Ch1 and Ch2

1-4 Sensor Input Channel 2

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 ºC^{-1})
00	No second channel

1-3 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
85	100 ohm platinum (α = 0.003 85 ºC^{-1})

For complete transmitter specifications see Transmitter Section.

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