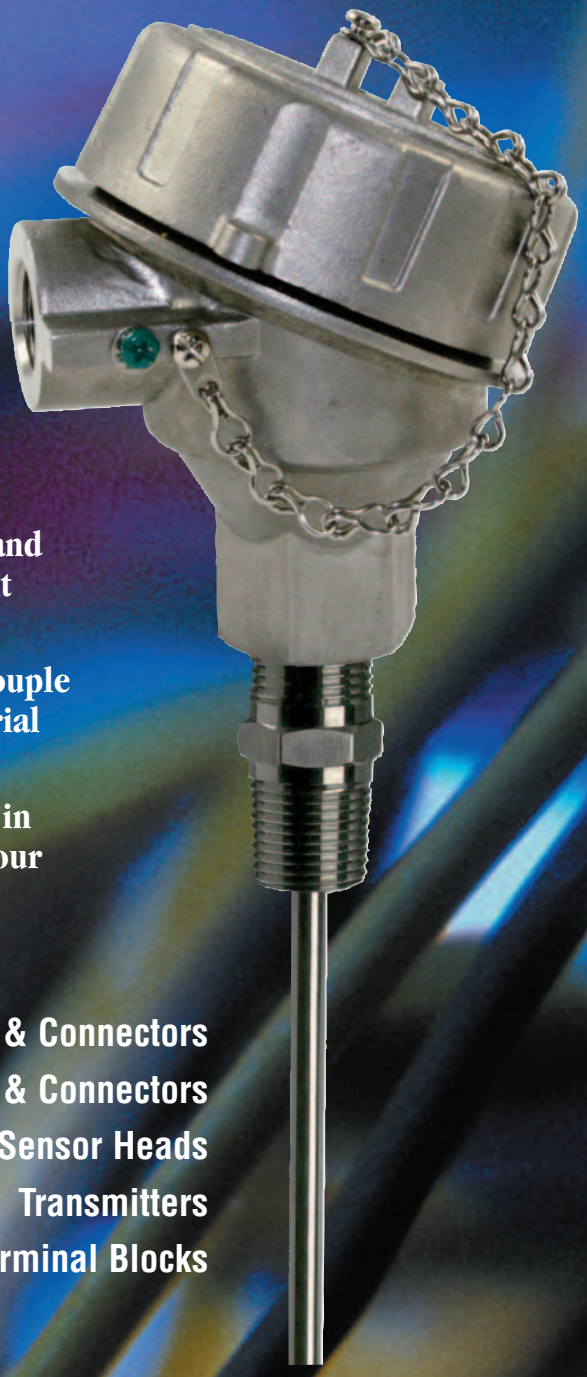
RTD & Thermocouple Industrial Sensor Assemblies



Temperature is one of the most crucial process variables measured in industrial applications.

Wahl Thermocouples and RTDs are precise temperature measuring sensors engineered to provide the highest quality and reliability.

Since 1953, Wahl's history of achievement and innovation in the temperature measurement field backs up this performance.

You can configure these RTD and Thermocouple systems and components to fit most industrial applications.

If you require a design solution not shown in these pages, call your Wahl Distributor or our factory.

NEW!

RTD Probes & Connectors
Thermocouple Probes & Connectors
Sensor Heads
Transmitters
Terminal Blocks

PALMER Wahl
INSTRUMENTATION GROUP

Continued Innovation Since 1836
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PW1260
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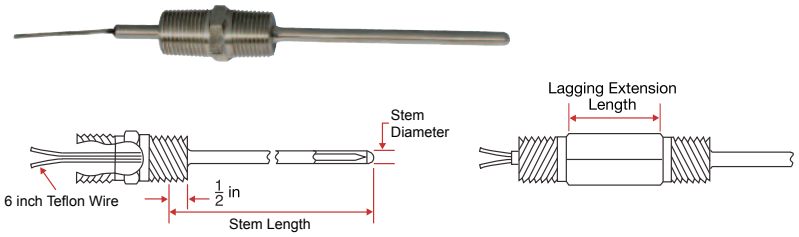
NEW! WR Series Industrial RTD Probes

WR1 Series 304SS Standard Welded Probe

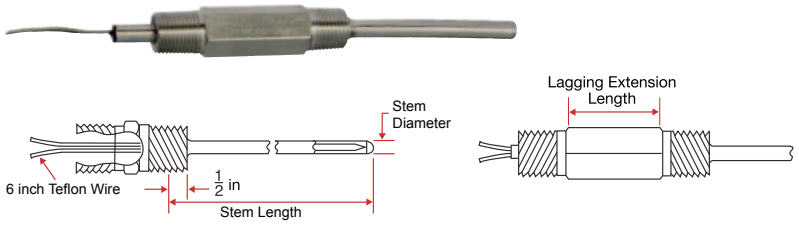


Constructed with 304SS fittings:
1/2" NPT x 1/2" NPT
1/2" NPT x 3/4" NPT

Available in:
Standard nipple (shown)
Lagging extension

Operating range of:
-50°F to 400°F, (-45°C to 204°C)

WR2 Series 316SS Standard Welded Probe

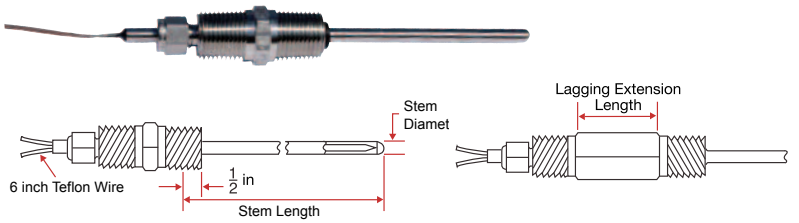


Constructed with 316SS fittings:
1/2" NPT x 1/2" NPT
1/2" NPT x 3/4" NPT

Available in:
Standard nipple
Lagging extension (shown)

Operating range of:
-50°F to 400°F, (-45°C to 204°C)

WR3 Series 304SS Compression Fitting Probe

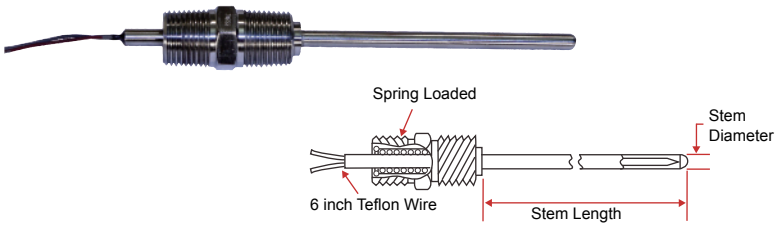


Constructed with 304SS compression fittings:
1/2" NPT x 1/2" NPT

Available in:
Standard nipple (shown)
Lagging extension

Operating range of:
-50°F to 400°F, (-45°C to 204°C)

WR4 Series 316SS Spring Loaded Probe

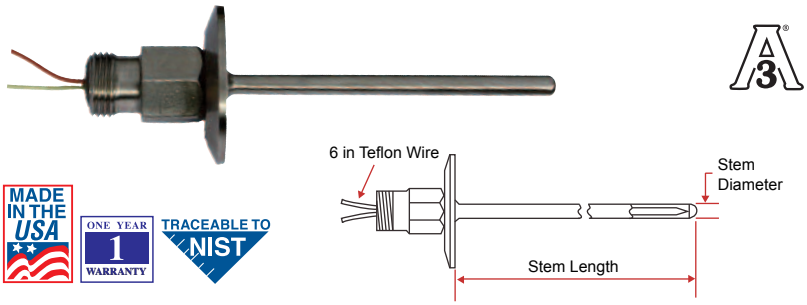


Constructed with 316SS spring-loaded fittings:
1/2" NPT x 1/2" NPT

Available in:
Standard nipple only

Operating range of:
-50°F to 400°F, (-45°C to 204°C)

WR5 Series 316SS Sanitary Probe



MADE IN THE USA
ONE YEAR 1 WARRANTY
TRACEABLE TO NIST

Constructed with 316SS Sanitary fitting:
3A Standard 74-03 certification for all process contact surfaces

Available in:
1.5", 2.0", 2.5" and 3" flange configurations

Operating range of:
-50°F to 400°F, (-45°C to 204°C)

WR Series Industrial RTD Probes Ordering Information

This example shows a standard 304SS nipple probe, 1/2" x 3/4" NPT process connection, Thin Film, Class B RTD, 1/4" diameter stem, 3 wire teflon configuration, 15-1/2" stem length, and connection head with terminal block.

Example of a typical RTD Probe part number configuration:

WR	1	B	2	1	3	1	5	B	1
Sensor		Process Connection	RTD Type	Stem Diameter	Wire Configuration	Stem Length			Accessories

WR [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]

1) RTD Sensors

1	Standard 304SS
2	Standard 316SS
3	Compression 304SS
4	Spring Loaded 316SS
5	Sanitary 316SS

2) Standard Process Connections

A	1/2" x 1/2" NPT, No Lagging Extension
B	1/2" x 3/4" NPT, No Lagging Extension
C	2" Lagging Extension, 1/2" x 1/2" NPT
D	4" Lagging Extension, 1/2" x 1/2" NPT
E	6" Lagging Extension, 1/2" x 1/2" NPT
F	2" Lagging Extension, 1/2" x 3/4" NPT
G	4" Lagging Extension, 1/2" x 3/4" NPT
H	6" Lagging Extension, 1/2" x 3/4" NPT

2) Compression Process Connections

J	1/2" x 1/2" NPT, Compression Fitting
C	2" Lagging Extension, 1/2" x 1/2" NPT
D	4" Lagging Extension, 1/2" x 1/2" NPT
E	6" Lagging Extension, 1/2" x 1/2" NPT

2) Spring Loaded Process Connections

K	1/2" x 1/2" NPT, Spring Loaded Fitting

2) Sanitary Process Connections

L	1-1/2" Flange
M	2" Flange
N	2-1/2" Flange
P	3" Flange

3) RTD Type

1	Thin Film, Class A
2	Thin Film, Class B
3	Wire Wound, Class A
4	Wire Wound, Class B

4) Stem Diameter

0	NA
1	1/4"
2	3/8" (not available on WR4)

5) Wire Configuration

2	2 - Wire Teflon
3	3 - Wire Teflon
4	4 - Wire Teflon

6) Stem Length

01X-72X 1" to 72"- 01X = 1 inch, 02X = 2 inch, etc.
For fractional lengths substitute X with:
A = 1/4", B = 1/2", C = 3/4"
Example: 13B = 13-1/2"

7) Accessories

0	No Head
1	Head with Terminal Block
2	Head with Transmitter

Wahl's WR Series of Industrial RTD probes use 100Ω platinum RTDs with .00385Ω/Ω/°C coefficient. All RTDs or Resistance Temperature Detectors are made from high purity platinum for precise temperature measurements and are available in Class A or Class B accuracy per DIN EN 60751.

All probes are available in 2, 3, or 4-wire configuration with a maximum operating range of -50°F to 400°F, (-45°C to 204°C).

Two types of RTDs are available:

Thin Film Type RTDs use a thin layer of platinum, deposited over a ceramic substrate, laser etched and protected with a fused glass coating. They should be chosen for high vibration and high shock applications. Thin Film sensors offer fast response at a lower cost.

Wire Wound Type RTDs use high-purity platinum wire, wound around a ceramic core and encapsulated in a glass coating.

Wire Wound elements provide a faster response when used in a cylindrical shank and have greater accuracy, particularly over wide temperature ranges.

Standard, compression, spring-loaded, and sanitary probe types are available.

For other configurations contact your Wahl Distributor

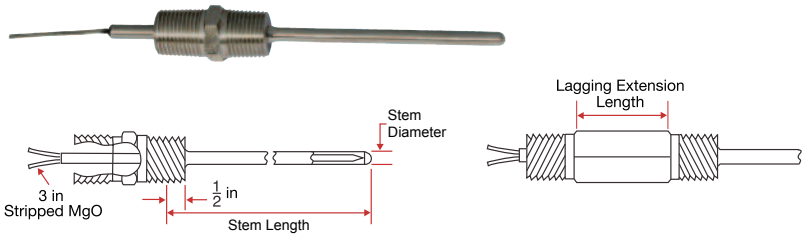
Choose an RTD sensor when higher accuracy and better stability are needed.

TRACEABLE TO NIST · ONE YEAR 1 WARRANTY · MADE IN THE USA

Calibration Services Available

NEW! WT Series Industrial Thermocouple Probes

WT1 Series 304SS Standard Welded Probe

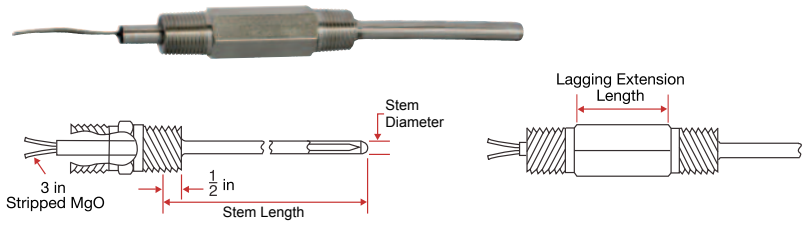


Constructed with 304SS fittings
1/2" NPT x 1/2" NPT
1/2" NPT x 3/4" NPT

Available in:
Type K, J or T calibrations
Standard nipple (shown)
Lagging extension

Magnesium Oxide (MgO) Cable and Special Limits of Error conductors

WT2 Series 316SS Standard Welded Probe

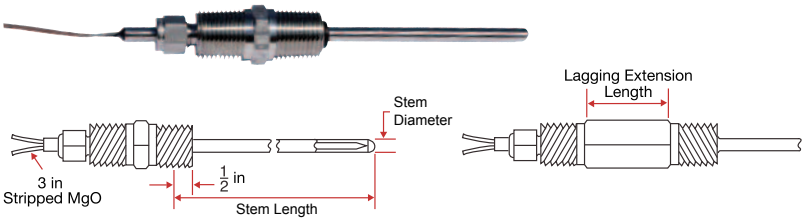


Constructed with 316SS fittings
1/2" NPT x 1/2" NPT
1/2" NPT x 3/4" NPT

Available in:
Type K, J or T calibrations
Standard nipple
Lagging extension (shown)

Magnesium Oxide (MgO) Cable and Special Limits of Error conductors

WT3 Series 304SS Compression Fitting Probe

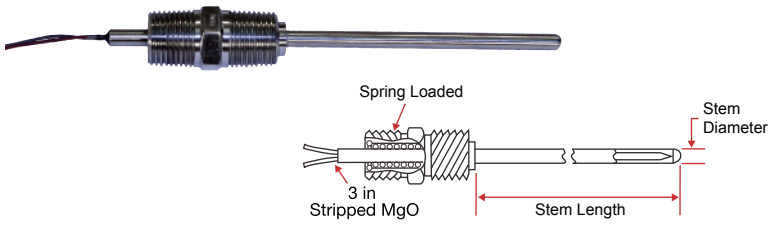


Constructed with 304SS compression fittings
1/2" NPT x 1/2" NPT

Available in:
Type K, J or T calibrations
Standard nipple (shown)
Lagging extensions are also available

Magnesium Oxide (MgO) Cable and Special Limits of Error conductors

WT4 Series 316SS Spring Loaded Probe

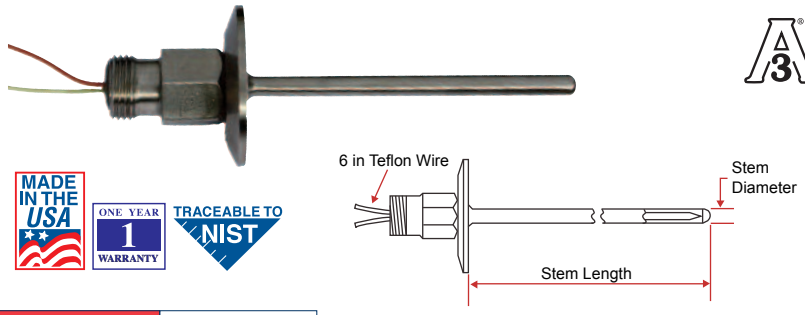


Constructed with 316SS spring-loaded fittings
1/2" NPT x 1/2" NPT

Available in:
Type K, J or T calibrations
Standard nipple (shown)

Magnesium Oxide (MgO) Cable and Special Limits of Error conductors

WT5 Series 316SS Sanitary Probe



MADE IN THE USA
ONE YEAR 1 WARRANTY
TRACEABLE TO NIST

Constructed with 316SS Sanitary fitting
3A Standard 74-03 certification for all process contact surfaces

Available in:
Type K, J or T calibrations
Maximum operating temperature is 400°F (204°C)

FEP insulated Special Limits of Error wire

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WT Series Industrial Thermocouple Probes Ordering Information

This example shows a probe with compression fitting,1/2" x 1/2" NPT process connection, Chromel - Alumel thermocouple, 1/8" diameter stem, grounded, 24" stem length and connection head with transmitter.

Example of a typical T/C Probe part number configuration:

WT	3	J	K	0	G	2	4	X	2
	Sensor	Process Connection	T/C Type	Stem Diameter	Stem Tip		Stem Length		Accessories

7) Accessories

- **0** No Head
- **1** Head with Terminal Block
- **2** Head with Transmitter

6) Stem Length

01X-72X 1" to 72"- 01X = 1 inch, 02X = 2 inch, etc.
For fractional lengths substitute X with:
A = 1/4", B = 1/2", C = 3/4"
Example: 13B = 13-1/2"

5) Stem Tip

- **G** Grounded
- **U** Ungrounded

4) Stem Diameter

- **0** 1/8" (not available on WT4)
- **1** 1/4"
- **2** 3/8" (not available on WT4)

3) Thermocouple Type / Range

- **J** Iron - Constantan
- **K** Chromel - Alumel
- **T** Copper - Constantan

1) Thermocouple Sensors

- **1** Standard 304SS
- **2** Standard 316SS
- **3** Compression 304SS
- **4** Spring Loaded 316SS
- **5** Sanitary 316SS

2) Standard Process Connections

- **A** 1/2" x 1/2" NPT, No Lagging Extension
- **B** 1/2" x 3/4" NPT, No Lagging Extension
- **C** 2" Lagging Extension, 1/2" x 1/2" NPT
- **D** 4" Lagging Extension, 1/2" x 1/2" NPT
- **E** 6" Lagging Extension, 1/2" x 1/2" NPT
- **F** 2" Lagging Extension, 1/2" x 3/4" NPT
- **G** 4" Lagging Extension, 1/2" x 3/4" NPT
- **H** 6" Lagging Extension, 1/2" x 3/4" NPT

2) Compression Process Connections

- **J** 1/2" x 1/2" NPT, Compression Fitting
- **C** 2" Lagging Extension, 1/2" x 1/2" NPT
- **D** 4" Lagging Extension, 1/2" x 1/2" NPT
- **E** 6" Lagging Extension, 1/2" x 1/2" NPT

2) Spring Loaded Process Connections

- **K** 1/2" x 1/2" NPT, Spring Loaded Fitting

2) Sanitary Process Connections

- **L** 1-1/2" Flange
- **M** 2" Flange
- **N** 2-1/2" Flange
- **P** 3" Flange

Wahl's WT Series of industrial Thermocouple probes are constructed using Special Limits of Error Cables for the highest accuracy measurements. WT1 through WT4 are constructed using stainless steel sheathed Magnesium Oxide (MgO) cable, while WT5 uses FEP insulated cables and 316 Stainless Steel tubing and flanges. All probes are available in Type J, K or T calibration and with grounded or ungrounded elements.

Grounded - thermocouple element is welded into the tip of the sheath.

Ungrounded - thermocouple element is electrically isolated from the sheath.

Probe Operating Temperatures:

WT1 - WT4 Series

Type J -40° to 750°C, or -40° to 1382°F
Type K -40° to 1000°C, or -40° to 1832°F
Type T -40° to 350°C, or -40° to 662°F

WT5 Series

Type J -40° to 204°C, or -40° to -400°F
Type K -40° to 204°C, or -40° to -400°F
Type T -40° to 204°C, or -40° to -400°F

Standard, compression, spring-loaded, and sanitary probe types are available.

For other configurations contact your Wahl Distributor

Choose a Thermocouple sensor when response time is critical.

TRACEABLE TO NIST · ONE YEAR 1 WARRANTY · MADE IN THE USA

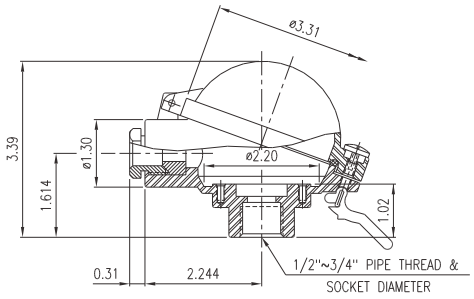
Calibration Services Available

NEW! General Purpose Connection Heads

Providing resistance to dust and moisture for temperature sensors is extremely important to your process. Designed for heavy industrial and process applications, **Wahl's New Industrial Connection Heads** come in a variety of choices to meet your specific needs. All our Connection Heads are compatible with our new Terminal Blocks or Transmitters, shown on page, 8. For additional connection heads contact your Wahl Distributor for information.

General Purpose: Aluminum - Flip Top Heads				
Model	**Type**	**Material**	**Process**	**Conduit**
12401-03	General Purpose	Aluminum	1/2" NPT	1/2" NPT
12401-19	General Purpose	Aluminum	1/2" NPT	3/4" NPT

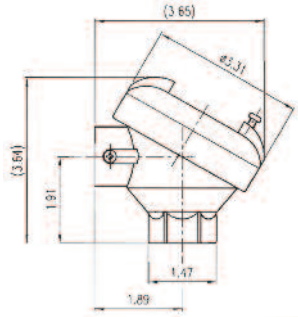
- Suitable for DIN size Transmitters
- Baked enamel silver paint and corrosive resistant hardware
- Rated IP68



12401-03 Aluminum, 1/2" Process x 1/2" Conduit

General Purpose: Aluminum - Screw Top Heads				
Model	**Type**	**Material**	**Process**	**Conduit**
12401-02	General Purpose	Aluminum	1/2" NPT	1/2" NPT
12401-10	General Purpose	Aluminum	1/2" NPT	3/4" NPT

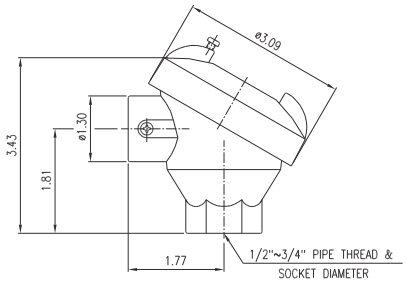
- Suitable DIN Transmitters & most Terminal Blocks
- Rated NEMA 4X & IP68
- Epoxy painted for NEMA protection, shiny, non-painted finish available



12401-10 Aluminum, 1/2" Process x 3/4" Conduit

General Purpose: Stainless Steel - Screw Top Heads				
Model	**Type**	**Material**	**Process**	**Conduit**
12401-09	General Purpose	316SS	1/2" NPT	3/4" NPT

- Suitable for DIN size Transmitters & Terminal most blocks
- Rated NEMA 4X



12401-09 316SS, 1/2" Process x 3/4" Conduit

ONE YEAR 1 WARRANTY

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Calibration Services Available

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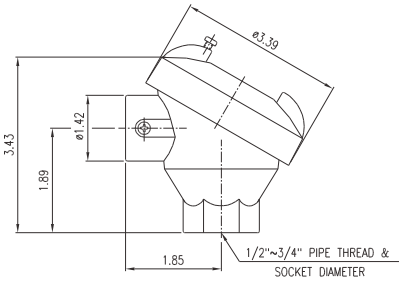
NEW! General Purpose Connection Heads

General Purpose: Cast Iron - Screw Top Heads				
Model	**Type**	**Material**	**Process**	**Conduit**
12401-08	General Purpose	Cast Iron	1/2" NPT	1/2" NPT
12401-11	General Purpose	Cast Iron	1/2" NPT	3/4" NPT

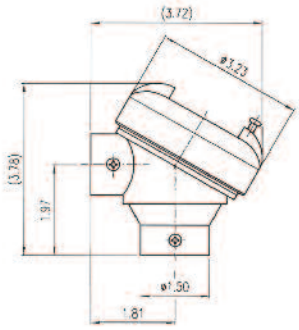
- Suitable for DIN size Terminal Blocks & Transmitters
- Rated NEMA 4X
- Painted in High Temperature Black Paint



12401-08 Cast Iron, 1/2" Process x 1/2" Conduit

General Purpose: Polypropylene - Screw Top Heads				
Model	**Type**	**Material**	**Process**	**Conduit**
12401-06	General Purpose	Polypropylene	1/2" NPT	3/4" NPT

- Suitable for DIN size Transmitters & most Terminal Blocks
- FDA Approved Polypropylene



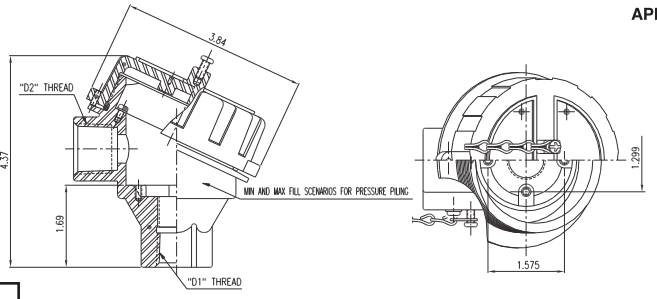
12401-06 Polypropylene, 3/4" Process x 3/4" Connection

Explosion Proof Connection Heads

Explosion Proof: 316SS & Cast Aluminum - Screw Top Heads				
Model	**Type**	**Material**	**Process**	**Conduit**
12401-13	Explosion Proof	316SS	1/2" NPT	1/2" NPT
12401-14	Explosion Proof	316SS	1/2" NPT	3/4" NPT
12401-16	Explosion Proof	Cast Aluminum	1/2" NPT	1/2" NPT
12401-17	Explosion Proof	Cast Aluminum	1/2" NPT	3/4" NPT

Explosion proof for Class 1, Division 1, Groups A, B, C and D; Dust-ignition proof for Class II, III Division 1, Groups E, F, and G, hazardous (classified) locations; indoor/outdoor.

- Suitable for 40mm and DIN size Terminal Blocks & Transmitters
- Supplied with Stainless Steel chain and screws
- 316SS: NEMA 4X
- Cast Aluminum: NEMA 4



12401-13 316SS, Explosion Proof

12401-16 Cast Aluminum, Explosion Proof

FM C US APPROVED

ONE YEAR 1 WARRANTY

Calibration Services Available

NEW! Temperature Transmitters

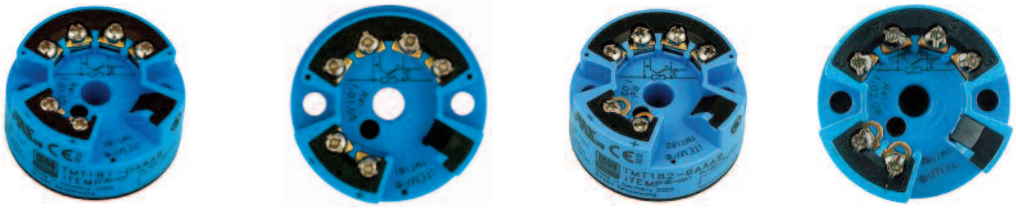
These Transmitters have been discontinued. Please see catalog supplement for current product information.

Universal Temperature Head Transmitters for RTD and Thermocouples, and for mounting in a connection head DIN Form B.

- Adjustable via PC, configuration kit shown below.
- High accuracy and wide ambient temperature range
- Fault signal on sensor break or short circuit
- NAMUR NE 43 compliant

ONE YEAR 1 WARRANTY

FM APPROVED



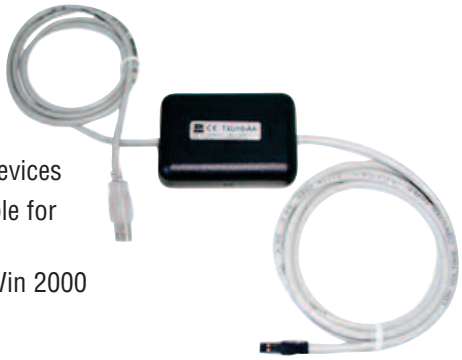
Model	12415-03	12415-07	12415-05	12415-06
Temperature Transmitter	PC-programmable		Protocol - HART	
Approval	Non-hazardous area	FM*	Non-hazardous area	FM*
Application	RTD, TC, Ohm, mV			
Wire	2-wire, 4-20mA, Galvanic Isolation			
Fault Reaction	NAMUR NE 43			
Mounting	Head Form B, DIN43729			
Configuration Sensor Type	Pt100, -200 to 850°C, min span 10K, IEC751 (a=0.00385)		Factory setup Pt100, 3-wire 0 to 100°C	
Configuration	Factory setup Pt100, 3-wire 0 to 100°C			
Options	Standard = DIN mounting set		US-M4 mounting screws	

To specify setup parameters when ordering a transmitter please contact Customer Service.

** FM Approval for Intrinsically Safe Class 1, Division 1 & 2, Groups A, B, C and D.*

12415-04 Configuration Kit for Universal Temperature Head Transmitters

- Used with PC Programmable devices
- Set-up program + interface cable for PC with USB port
- AA Adapter 4 pin plug + ReadWin 2000
- Factory configuration offered



Precision instruments from Wahl offer you the quality and reliability you rely on for your process!

For options not shown contact your Wahl Distributor

NEW! Terminal Blocks

Ceramic Terminal Heads
for RTD and Thermocouples Connection Heads.
Brass and nickel plated brass terminals can be used with any of our connection heads.

ONE YEAR 1 WARRANTY

12405-05
2 Position Ceramic Terminal Block

12405-01
4 Position Ceramic Terminal Block

12405-02
6 Position Ceramic Terminal Block

Calibration Services Available

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NEW! In-Head Temperature Transmitters

Temperature Transmitters

Universal Programmable 2-wire Transmitters

12415-08 • 12415-09 Universal Transmitters are universal, isolated 2-wire in-head transmitters for temperature and other measurement applications. They combine functionality and simple configuration. Useful error correction functions improve the accuracy.

- Fully universal, linearized and high-isolation
- Accepts RTD, T/C, mV and Ω
- Sensor error and system (sensor/transmitter) error correction for highest total accuracy
- Full access to all features while in operation
- NAMUR compliant - for output limits and fail currents
- User defined sensor break function
- Simplified loop check-up with calibration output
- Low sensor isolation detection
- IPRO or ConSoft Software, easy-to-use Windows configuration software - included with Configuration Kit, or free download from website. Call for details.

12415-08

12415-09*

FM APPROVED

FIVE YEAR 5 WARRANTY

Universal HART-Compatible 2-wire Transmitters

12415-10 • 12415-11 Universal Transmitters are universal 2-wire in-head transmitters and are fully HART-compatible, with communication via the HART protocol.

- Utilizes HART Protocol for remote configuration and monitoring
- Communicates with HART Communicator or PC via modem
- Fully universal, linearized and isolated
- Accepts RTD, T/C, mV and Ω input
- Sensor error correction
- Full access to all features while in operation
- User defined sensor break function
- Easy wiring, large center hole
- 50 point linearization – any sensor can be matched
- Low sensor isolation detection
- MEPRO, easy-to-use Windows configuration software - requires Hart modem or configurator

HART FIELD COMMUNICATIONS PROTOCOL

12415-10

12415-11**

FM APPROVED

FIVE YEAR 5 WARRANTY

Basic Programmable 2-wire Transmitter

12415-12 Basic Transmitter is a basic, programmable non-isolated, easy-to-use 2-wire in-head transmitter. The Low Profile housing has a height of only 18.5 mm / 0.72 inch. Configuration is made in seconds with the user friendly Windows software. No external power supply required for configuration. The transmitter is programmable for RTD's in 3- and 4-wire connection according to different standards as well as for 11 T/C types. Useful error correction functions improve the accuracy.

- Robust terminals with test connections
- Only 18.5 mm / 0.72 inch high
- Accepts RTD in 3- and 4-wire connection and 11 T/C types
- Sensor error and system (sensor/transmitter) error correction for highest total accuracy
- Temperature linear output
- Configuration without external power
- Easy-to-use Windows configuration software
- USB communication
- NAMUR compliant - for output limits and fail currents
- Rugged design tested for 10 g vibrations
- MiniPaq or ConSoft Software, easy-to-use Windows configuration software - included with Configuration Kit or free download from website. Call for details.

12415-12

FIVE YEAR 5 WARRANTY

For additional specifications, or to specify setup parameters when ordering a transmitter please contact Customer Service.

* FM Approval for Intrinsically Safe Class I; Division 1; Groups A, B, C and D, T4 Ta = 80°C

** FM Approval for Intrinsically Safe Class I,II,III; Division 1; Groups A, B, C and D, T4 Ta = 80°C

NEW! In-Head Temperature Transmitters

Programming Kit for Temperature Transmitters (excluding 12415-10 & 12415-11)

12415-13 Programming Kit is a complete kit for PC configuration of the transmitters above. The kit contains the INOR USB Interface, transmitter cables and ConSoft Software. User Instructions and Installation Guide included (on USB memory stick). Communication with the connected transmitter is established automatically, without any problems to match the PC communication port to the software.

- USB communication
- Automatic matching of communication ports
- Automatic transmitter identification for quick start up
- Diagnostic LED's on the USB Interface show the communication status
- Simple installation of configuration software and drivers for the USB Interface
- Free download from website. Call for details.

Specifications					
Model	**12415-08**	**12415-09**	**12415-10**	**12415-11**	**12415-12**
Temperature Transmitter	PC-Programmable		Protocol - HART		PC-Programmable
Approval	Non-hazardous area	FM, Class I; Div 1; Intrinsically Safe Group A, B, C, and D, T4 Ta = 80°C	Non-hazardous area	FM, Class I,II,III; Div 1; Intrinsically Safe Group A, B, C, and D, T4 Ta = 80°C	Non-hazardous area Non-grounded probes
Wire	2-wire, 1500V AC, 1 minute, Galvanic Isolation		2-wire, 1500V AC, 1 minute Galvanic Isolation		2-wire, Non-Isolated
Fault Reaction	NAMUR NE 43		User programmable		NAMUR NE 43
Mounting	Head Form B, DIN43729		Head Form B, DIN43729		Head Form B, DIN43729
Typical Accuracy	Typical ± 0.1% of input span		Typical ± 0.1% of input span		Typical ± 0.1% of input span
Options	Standard = DIN mounting set		Standard = DIN mounting set		Standard = DIN mounting set
Configuration Sensor Type					
RTD's	**8 RTD's:** Pt100, Pt1000, Ptx 10, Ni100, Ni1000, Ni120, Cu10 and D100		**6 RTD's:** Pt100, Pt1000, Ptx 10, Ni100, Ni1000, and D100		**9 RTD's:** Pt100 (3), Pt1000, Ni100, Ni1000, Ptx, Ni120, & Cu10
Resistance Input	0 to 2000 Ω		0 to 2000 Ω		Maximum Resistance: 25 Ω/wire
Thermocouples	**11 Thermocouples:** B, C, E, J, K, L, N, R, S, T, U		**11 Thermocouples:** B, C E, J, K,L, N, R, S, T, U		**11 Thermocouples:** B, C, E, J, K, L, N, R, S, T, U
Voltage Input	-10 to +500 MV		-10 to +500 MV		
Linearization	9 pt Custom Linearization		50 pt Custom Linearization		
Load Characteristics	Max Load @ 24 V DC 795 Ω -08 727 Ω -09		Max Load @ 24 V DC 608 Ω -10 521 Ω -11		Max Load @ 24 V DC 725 Ω

Specifications are subject to change without notice

ISO 9001:2008 CERTIFIED QUALITY MANAGEMENT SYSTEM

For additional specifications, or to specify setup parameters when ordering a transmitter please contact Customer Service.