



Approved for measuring temperatures in hazardous locations

Digi-Stem® DST500-FM Digital RTD Thermometer System

The Wahl Digi-Stem® DST500-FM is a Digital RTD Thermometer System with Factory Mutual approval for measuring temperatures in hazardous areas where the risk for explosion exists. This model is intrinsically safe, limiting the energy available to below the energy required to cause combustion of material or gas, even in fault conditions.

The DST500-FM Thermometer System offers high-precision temperature measurement technology with a system accuracy of up to $\pm 0.5\%$ of reading.¹

Adjustable display sample rate extends battery life up to 10 years when set at 10 second sample rate with optional DSTCAL Software.

Features:

- Large 1" Digit LCD Display, readable from 30 Feet. Resolution 0.1°F/°C.
- User Selectable Scale °F or °C.
- Tamper resistant with DSTCAL, our user friendly single point calibration software (sold separately), to set the sample and display rates.
- Ambient operation from -40° to 158°F (-40° to 70°C).
- PC Board has over-current and reverse battery protection.
- Hazardous Location approval by FM in US and Canada.

Approved for:

IS/CL I, II, III/ DIV 1 / GP ABCDEFG / T4A Ta= 70°C; Type 4X

CL I, II, III/ DIV 2 / GP ABCDEFG / T4A Ta= 70°C; Type 4X

CLASS 1 - GASES

CLASS 2 - DUSTS

CLASS 3 - FIBERS

DIV 1 - FLAMMABLE MATERIAL PRESENT CONTINUOUSLY OR INTERMITTENTLY

DIV 2 - FLAMMABLE MATERIAL PRESENT ABNORMALLY

GROUP A - ACETYLENE

GROUP B - HYDROGEN

GROUP C- ETHYLENE

GROUP D - PROPANE

GROUP E - METAL DUST

GROUP F - COAL DUST

GROUP G - GRAIN DUST

Additional Features:

- Vibration - MIL STD 202G. NEMA-4X Stainless Steel Housing.
- Powered by a FM Approved C cell sized Lithium Metal Battery.²
- Two years nominal battery life at default update rate.³
- Optional 90° elbow allows Back, Left or Right Angle configuration.

¹ See System Accuracy on the Specification table for details.

² Unit must be used with Tadiran model TL-2200, our catalog # DSA3060, 3.6V C Cell Sized Lithium Thionyl Chloride Battery.

³ Default update rate is 2 seconds unless otherwise specified at time of order. Adjustable from 0.25 seconds to 10 seconds in 0.25 second intervals with optional DSTCAL Software.

Digi-Stem® is a registered trademark of Palmer Wahl Instruments, Inc.

Specifications subject to change without notice. Go to www.palmerwahl.com for most current information.



DST500-FM Meter with Polycarbonate H-Frame



DST500-FM Applications

Explosive Dust:

Grain Storage Silos
Grain Processing Plants
Explosive Powder Production

Coal Mining:

Methane Gas & Coal Dust

Manufacturing:

Ammunition Plants

Storage Tanks:

Aircraft Fuel at Airports
Fuel Distribution Centers
Volatile Chemical Storage
Petrochemical Plants

Transmission Lines:

Oil & Gasoline Pumping



Digi-Stem DST500-FM Series Specifications

CASE STYLE	Stainless Steel Case Polycarbonate H Frame/Window	DST500-FM
	Model Feature	FM Approval
PROBES	Probe Type / Sensor	Pt100 Class A 4-wire RTD Sensor in 316 Stainless Steel or Inconel 600, Thin Film or Wire Wound. R0 = 100 Ω , Alpha = .00385 $\Omega/\Omega/^{\circ}\text{C}$
METER SPECIFICATIONS	Meter Range / Scale	-328° to 1472°F (-200° to 800°C) / User Selectable for °F or °C
	Meter Accuracy	$\pm 0.1^{\circ}\text{F}/^{\circ}\text{C}$, over 1 year period (@ Tamb = 23°C $\pm 5^{\circ}\text{C}$)
	System Accuracy	°C Temp < 300°C = $\pm 0.15 + 0.2\%$ of reading, Temp > 300°C = $\pm 0.25 + 0.5\%$ of reading; °F Temp < 572°F = $\pm 0.27 + 0.2\%$ (reading -32), Temp > 572°F = $\pm 0.45 + 0.5\%$ (reading -32)
	Ambient Operating Environment	-40° to 158°F (-40° to 70°C)
	Relative Humidity	10% to 100% RH non-condensing
	Ambient Temperature Coefficient	Maximum of 0.003°/°C over Ambient Operating Temperature Range From 23°C $\pm 5^{\circ}\text{C}$
	Vibration	Vibration - MIL STD 202G
	Meter Battery	1 - C size, Lithium Thionyl Chloride, 3.6V, #DSA3060 (Tadiran #TL-2200)
	Battery Life	4 years nominal at 2 second update interval
	FM Approved for Hazardous Locations	IS/CL I, II, III / DIV 1 / GP ABCDEFG; T4A Ta = 70°C; Type 4X CL I, II, III / DIV 2 / GP ABCDEFG; T4A Ta = 70°C; Type 4X
DISPLAY SPECIFICATIONS	Display	1.0 inch 4-digit LCD display, readable from 30 Feet
	Display Icons	°F and °C, Low Battery, Error Warnings
	Display Resolution	0.1°F/°C; 1°F above 999.9°F
	Sample / Display Update Rate	2 seconds standard, adjustable in .25 second intervals from .25 to 10 seconds ²
ENCLOSURE	Protection	NEMA 4X
	Enclosure Dimensions / Weight	5.3" W x 4.3" H x 2.7" D (135 x 109 x 69 mm) / Weight: 2.0 lbs. (1kg)

¹ Unit must be used with Tadiran model TL-2200, our catalog # DSA3060, 3.6V C Cell Sized Lithium Thionyl Chloride Battery.
² Default update rate is 2 seconds unless otherwise specified at time of order. Adjustable from 0.25 seconds to 10 seconds in 0.25 second intervals with optional DSTCAL Software.

Optional DSTCAL Software allows the following functions for the DST500-FM Series:

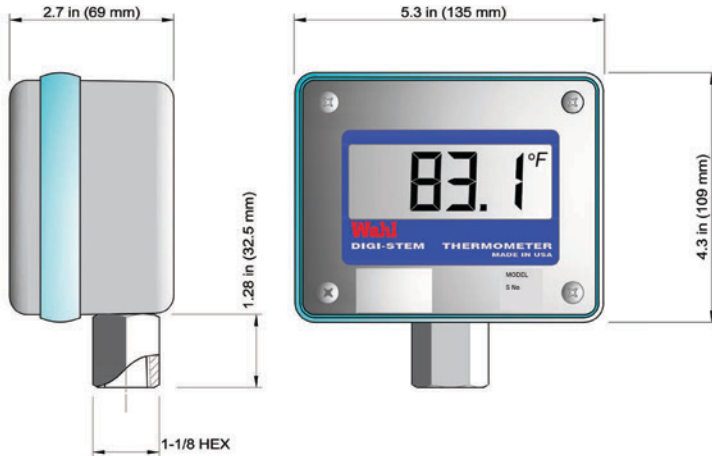
- Set Sample/Display Rate - Optimizes sample rate to match your process speed and maximize battery life.
- Tamper Resistance - DSTCAL software is required for all temperature adjustments, providing added security.
- Probe R0 - Improves System Accuracy by entering the probes actual R0 value.
- Meter Calibration - Calibrates the resistance measurement electronics by use of known fixed resistances.
- System Calibration - Automatically measures/programs the R0 value for connected probe by placing it into an ice bath.

Digi-Stem's are designed
and built to order in our
Asheville, NC factory.

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Digi-Stem DST500-FM Series Dimensional Drawings

DST500-FM Case dimensions. Probe configuration will determine overall dimensions depending on customer specifications.

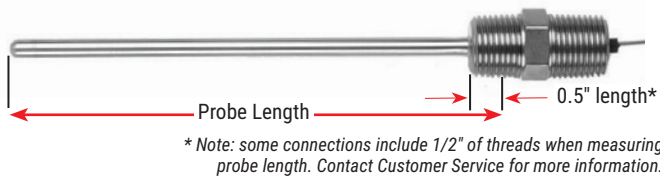


DST500-FM Stainless Case with Polycarbonate H-Frame and Window

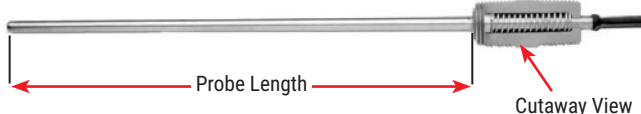
Digi-Stem DST500-FM Series Process Connection Options and Stem Length Measurement

Process Connection Code 01, (1/2") or Code 02, (3/4") NPT:

- **Welded Probe***: Sealed for immersion in fluids, for use in thermowells, sanitary, and high-pressure applications.



- **Spring Loaded Probe**: Maintains a positive force against the bottom of thermowells; not for direct immersion in fluids; assembly is not sealed. Allows approximately 1 inch of travel. Requires Thermowell.

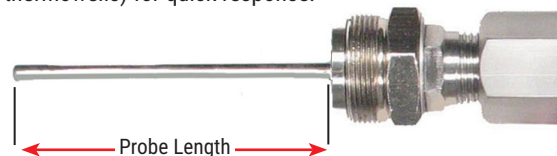


Process Connection Code 07, 1-1/4" -18 Swivel Nut Fitting: (Code 08, 1/2" NPSM Swivel Nut Fitting also available, measure probe length in the same manner.)

- **Tapered Bulb** - Direct replacement for existing MIG's. Must be used with a Thermowell.

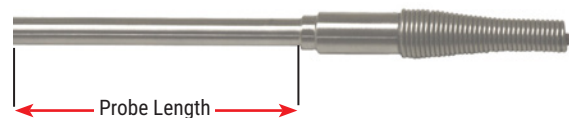


- **1/4" Diameter Stem** - for use with union connections (no thermowells) for quick response.



Process Connection (Code 09) Transition Fitting:

Unthreaded transition fitting for hand held operation, or use in open vessels with no thread.



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April
2025

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Digi-Stem DST500-FM Meter and Rigid Probe Order Guide

Step 1 - Select Digi-Stem DST500-FM Series RTD Meter	
Model	Select Digi-Stem RTD Meter
DST500-FM	Digi-Stem RTD Meter, FM, LCD, Battery Powered Display, "C" Battery Included, -328° to 1472°F (-200° to 800°C) (NIST purchased separately)
Code	Step 2 - Select Probe Type and Configuration
DST5M	DST500-FM Series RTD Probe
Code	Select Process Connection For Rigid Probe (Select One)
01	1/2" NPT Fitting
02	3/4" NPT Fitting
07	1-1/4" x 18 NEF2 Swivel Nut Fitting
08	1/2" NPSM Swivel Nut Fitting (Consult Customer Service when ordering for proper fit of thermowell)
Code	Select Mounting Type (Remote Probes available on page following optional accessories)
B	Rigid (Bottom Connected) For Back, Left or Right Side Mount specify Code B, add #13146X - 90° Elbow.*
Code	Select Stem Type (Select One)
2	Welded
3	Spring Loaded. Process Connection Codes "01" & "02" only. Stem Diameter Code "1" only. Requires Thermowell.
Code	Select Stem Material / Operating Temperature / Conductor/ Sensor Type (Select One)
1	316 SS / -70°C to +400°C / Ni / Thin Film
2	316 SS / -70°C to +400°C / Cu / Thin Film
3	Inconel 600 / -70°C to +400°C / Ni / Thin Film
4	Inconel 600 / -70°C to +400°C / Cu / Thin Film
5	316 SS / -196°C to +600°C / Ni / Wire Wound
6	Inconel 600 / -196°C to +600°C / Ni / Wire Wound
7	316 SS / -196°C to +800°C / Ni / Wire Wound
8	Inconel 600 / -196°C to +800°C / Ni / Wire Wound
Code	Select Stem Diameter (Select One) (Note: Other size heat transfer block available)
1	1/4" Diameter
2	3/8" Diameter (with crimp on 3" Length heat transfer block, see note above)
4	1/2" Diameter (with crimp on 3" Length heat transfer block, see note above)
Code	Specify Stem Length (Specify exact length desired)
0001X-3150X	1" to 3150" Length in inches - 0001X = 1 inch, 0002X = 2 inch, 0003X = 3 inch, etc. For fractional lengths substitute X with: A = 1/4", B = 1/2", C = 3/4", Example: 03B = 3-1/2".
	Stem Material/Construction Codes 1, 2, 5 & 7, _____ inches @
	Stem Material/Construction Codes 3, 4, 6 & 8, _____ inches @

DST500-FM
METER Final
Part Number

PROBE Final Part Number

DST5M								-FM
Probe Type	Process Connection	Mounting Type	Stem Type	Stem Material	Stem Diameter	Stem Length		
Rigid Probe								



DSA3060 - Lithium Thionyl Chloride "C" Battery, 3.6V. For FM meters ONLY. NOT FOR INTERNATIONAL SHIPMENTS.



13146X - 90° elbow for rigid stem models allows for multiple angle installations. Specify X: Back (B), Left (L) or Right Side (R) Mount.

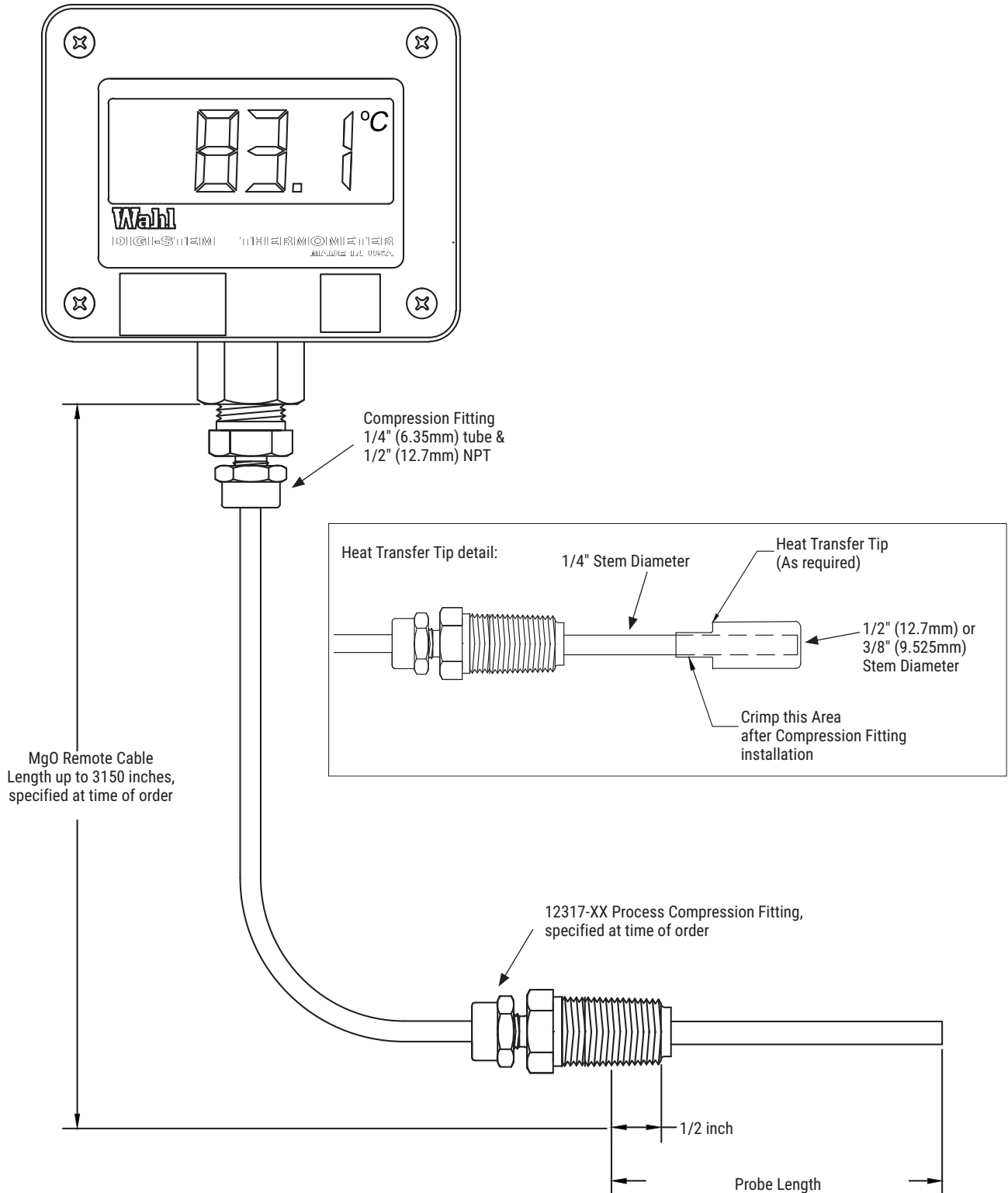
WAHL DST500-FM OPTIONAL ACCESSORIES ORDER GUIDE

Step 3 - Select DST500 Series Software and Accessories	
DSTCAL	DST500 Series Calibration Software Kit (includes USB Cable, DST/USB Interface Module, Serial Interface Cable)
13500-04	DST500 Series Fixed Probe Calibration Cable
DST500 Series Meter Accessories and NIST Traceable Certificate of Conformance	
DSA3060	Spare Lithium Thionyl "C" Battery, (Tadiran #TL-2200) for FM meters ONLY. NOT FOR INTERNATIONAL SHIPMENTS.
13146X	90 Degree Elbow for Rigid Stem models, Specify X: Back Connection (B), Left (L) or Right Side (R) Mount
	NIST Traceable Certificate of Conformance at: 32°F, 220°F, 350°F (with Firmware Upgrades included if applicable)
	User Specified Calibration Points available

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Digi-Stem DST500-FM Series Remote Probe Detail Drawing

DST500-FM with Remote Probe. Probe configuration will determine overall dimensions depending on customer specifications.



See CSW-022 (Internal Palmer Wahl document) for detailed ordering instructions for Remote Cable process end compression fittings. Order Compressions fittings as a separate line item.



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Digi-Stem DST500-FM Meter and Remote Probe Order Guide

Step 1 - Select Digi-Stem DST500-FM Series RTD Meter	
Model	Select Digi-Stem RTD Meter
DST500-FM	Digi-Stem RTD Meter, FM, LCD, Battery Powered Display, "C" Battery Included, -328° to 1472°F (-200° to 800°C) (NIST purchased separately)
Code	Step 2 - Select Probe Type and Configuration
DST5M	DST500-FM Series RTD Probe
Code	Select Process Connection for Remote Probe
09	Unthreaded Transition Fitting (For using MgO as Remote Cable ONLY. See CSW-022 (Internal document) and note below). Includes 1/2" NPT Compression Fitting for joining the cable to the DST housing.
Code	Select Mounting Type (Remote Probes are not currently available)
B	Rigid (Bottom Connected) For Back, Left or Right Side Mount specify Code B, add #13146X - 90° Elbow.*
Code	Select Stem Type (Select One)
2	Welded
Code	Select Stem Material / Operating Temperature / Conductor/ Sensor Type (Select One)
1	316 SS / -70°C to +400°C / Ni / Thin Film
2	316 SS / -70°C to +400°C / Cu / Thin Film
3	Inconel 600 / -70°C to +400°C / Ni / Thin Film
4	Inconel 600 / -70°C to +400°C / Cu / Thin Film
5	316 SS / -196°C to +600°C / Ni / Wire Wound
6	Inconel 600 / -196°C to +600°C / Ni / Wire Wound
7	316 SS / -196°C to +800°C / Ni / Wire Wound
8	Inconel 600 / -196°C to +800°C / Ni / Wire Wound
Code	Select Stem Diameter (Select One) (Note: Other size heat transfer blocks available)
1	1/4" Diameter
2	3/8" Diameter (with crimp on 3" Length heat transfer block, see note above)
4	1/2" Diameter (with crimp on 3" Length heat transfer block, see note above)
Codes 2 and 4 require two compression fittings, one at each end, before crimping the heat transfer block to the probe tip. The end user will need to place the compression fittings and tighten them down.	
Code	Specify Stem Length Plus Cable Length (Specify exact length desired - See Note Below)
0001X-3150X	1" to 3150" Length in inches - 0001X = 1 inch, 0002X = 2 inch, 0003X = 3 inch, etc. For fractional lengths substitute X with: A = 1/4", B = 1/2", C = 3/4", Example: 03B = 3-1/2".
	Stem Material/Construction Codes 1, 2, 5 & 7, _____ inches @
	Stem Material/Construction Codes 3, 4, 6 & 8, _____ inches @
Add desired Stem/Probe length in inches plus desired Cable length in inches plus 1 inch Example 12" probe + 10 ft cable - 12 + 120 (10 ft) + 1 = 133. Stem Code: 01333X	

DST500-FM
METER Final Part Number

DST5M	09	B					-FM
Probe Type	Process Connection	Mounting Type	Stem Type	Stem Material	Stem Diameter	Stem Length + Cable Length	
Remote Probe							

REMOTE PROBE Final Part Number

DST5M	09	B					-FM
Probe Type	Process Connection	Mounting Type	Stem Type	Stem Material	Stem Diameter	Stem Length + Cable Length	
Remote Probe							

WAHL DST500-FM OPTIONAL ACCESSORIES ORDER GUIDE

Step 3 - Select DST500 Series Software and Accessories	
DSTCAL	DST500 Series Calibration Software Kit (includes USB Cable, DST/USB Interface Module, Serial Interface Cable)
13500-04	DST500 Series Fixed Probe Calibration Cable
DST500 Series Meter Accessories and NIST Traceable Certificate of Conformance	
DSA3060	Spare Lithium Thionyl "C" Battery, (Tadiran #TL-2200) for FM meters ONLY. NOT FOR INTERNATIONAL SHIPMENTS.
13146X	90 Degree Elbow for Rigid Stem models, Specify X: Back Connection (B), Left (L) or Right Side (R) Mount
	NIST Traceable Certificate of Conformance at: 32°F, 220°F, 350°F (with Firmware Upgrades included if applicable)
	User Specified Calibration Points available

DST500-FM REMOTE COMPRESSION FITTINGS

Step 3 - Select Process Compression Fitting	
Code	Process Compression Fitting
12317-02	1/2" NPT Compression Fitting
12317-03	3/4" NPT Compression Fitting
12317-06	1/8" NPT Compression Fitting
12317-07	1/4" NPT Compression Fitting

Configure DST500-FM Meter as desired and enter Remote Process Compression Fitting as a separate line item.

Note: See CSW-022 (Internal Palmer Wahl document) for detailed ordering instructions for Remote Cable process end compression fittings. Order Compressions Fittings as a separate line item.

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