

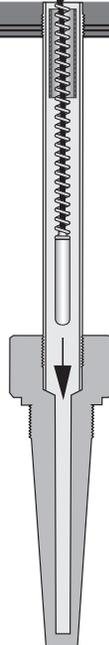
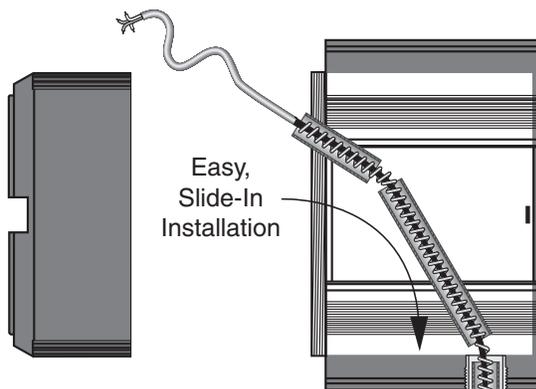


In both new and retrofit applications, the WORM® Flexible Sensors for Thermowell Temperature Assemblies replace restrictive straight sensor probes with a universal sensor strategy that will save you time and money.

**Unique Flexible Design Installs in Minutes**

With straight sensors, you have to remove the connection head, and sometimes thermowell assembly components, to get the sensor into the thermowell. The WORM bends right through the top or face of the enclosure. It slides through the enclosure's conduit port, and into (or out of) the thermowell without having to remove the enclosure or any assembly components (Figure 1).

*Figure 1. The WORM lets you replace a sensor without removing the enclosure or disassembling the thermowell.*



**Features**

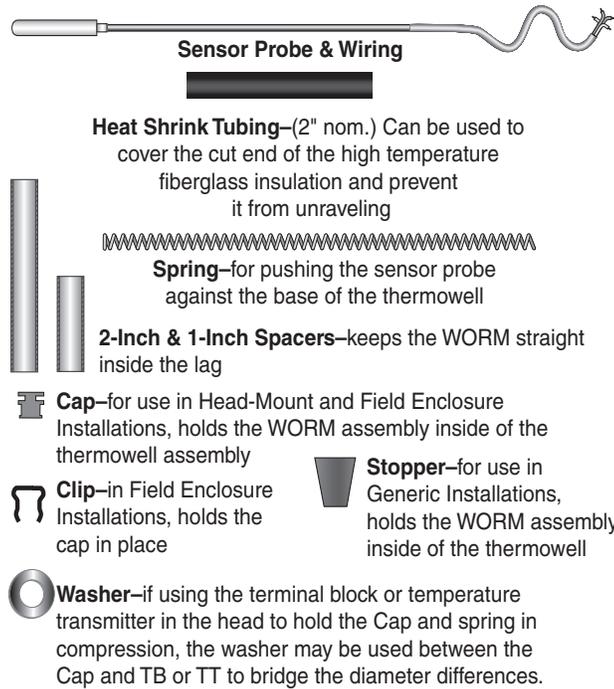
- **Universal, trims to thermowell length.** There's no need to stock an expensive array of different sensor lengths. With a quick measurement and a simple trim-to-length, the WORM handles nearly every thermowell assembly.
- **Ideal for hockey-puck, connection head and dual-sided enclosures.** The innovative WORM provides cost and time advantages for all types of temperature transmitter enclosures.
- **Popular RTD and thermocouples.** Standard sensor types include 100 and 1000 ohm platinum, nickel and copper RTDs; plus J-, K-, T-, E- type thermocouples.
- **Faster response time.** The WORM delivers step response times 13% faster than standard sensors.

## Flexible Sensor Kits for Thermowell Temperature Assemblies

### Installs in Minutes

Each of the three installation options uses different parts from the installation kit; expect to have parts left over after installation. Read through all steps for the enclosure type prior to beginning installation.

Figure 2. The WORM Kit Components

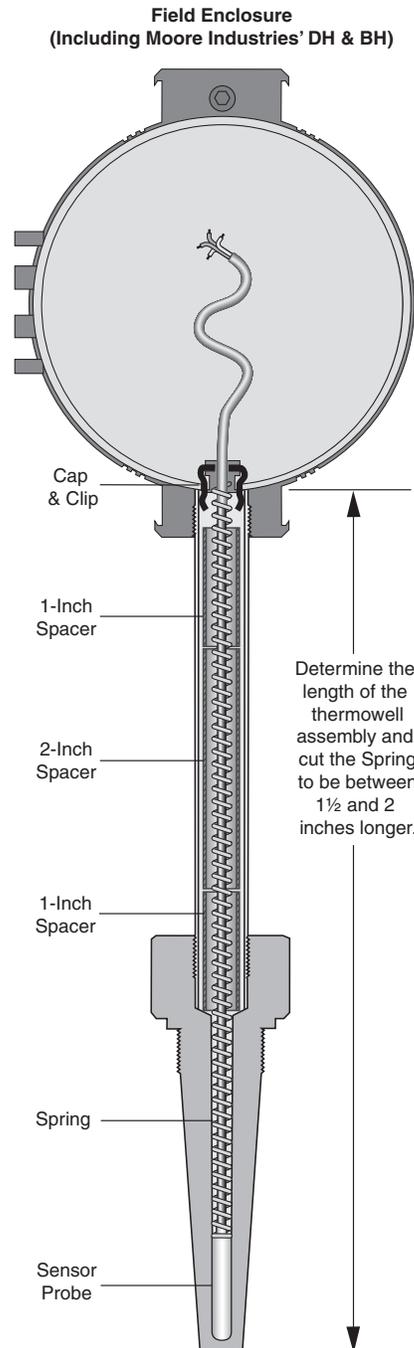


### Field Enclosure Installation (Including Moore Industries' DH & BH enclosures)

**Installation Components Available:** Sensor Probe, Spring, Cap, Clip, and Spacer(s).

1. Determine the length of the thermowell assembly (see the illustration to the right). Cut the WORM Spring to be between 1½ and 2 inches **longer** than the length of the assembly (this is necessary so that the Spring's compression securely holds the sensor probe to the bottom of the thermowell).
2. Ensuring that the uncut portion of the Spring faces down towards the Sensor Probe, slide the Spring over the sensor wires and onto the end of the Sensor Probe.
3. Snap the Clip onto the Cap. Then slide the Cap/Clip combination over the sensor wires onto the top of the Spring.
4. Remove the instrument from the enclosure (if necessary). Insert the WORM sensor into the thermowell. Slide the appropriate length(s) and number of Spacers to keep the WORM Spring straight inside the thermowell assembly lag (Spacers may not be required).

5. Using pliers, grasp the Cap/Clip combination by the niche at the top of the Cap, and insert it into the enclosure's sensor entry port to compress the WORM Spring into the thermowell. Reinstall the instrument into the enclosure. Connect the sensor wires.

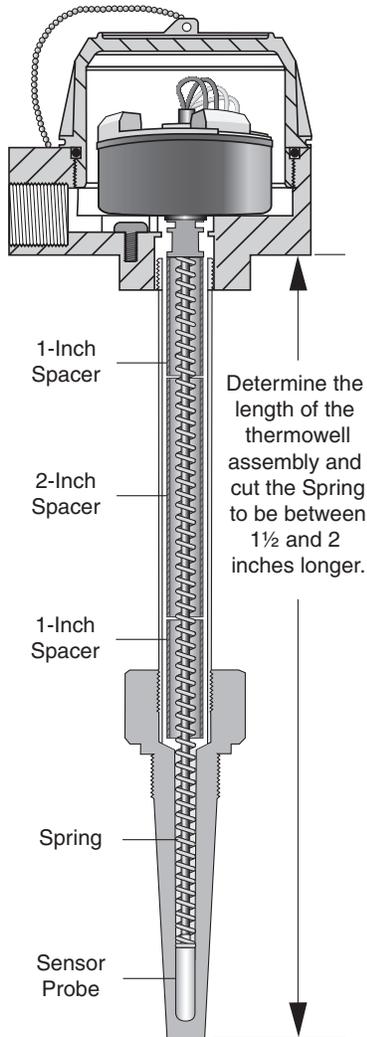


## Flexible Sensor Kits for Thermowell Temperature Assemblies

### Head-Mount Enclosure Installation (Including Moore Industries' LH enclosure)

Installation Components Required: Sensor Probe, Spring, Cap and Spacer(s).

1. Determine the length of the thermowell assembly (see the illustration to the left). Cut the WORM Spring to be between 1½ and 2 inches longer than the length of the assembly (this is necessary so that the Spring's compression securely holds the Sensor Probe to the bottom of the thermowell).



2. Ensuring that the uncut portion of the Spring faces down towards the Sensor Probe, slide the Spring over the sensor wires and onto the end of the Sensor Probe.

3. Slide the Cap and washer over the sensor wires onto the top of the Spring.

4. Remove the instrument from the enclosure. Insert the WORM sensor into the thermowell. Slide the appropriate length(s) and number of Spacers to keep the WORM Spring straight inside the thermowell assembly lag (Spacers may not be required).

5. Reinstall the instrument into the enclosure, compressing the WORM Spring into the thermowell with the bottom of the instrument. Connect the sensor wires.

### Generic Enclosure Installation

Installation Components Required: Sensor Probe, Spring, Stopper and Spacer(s).

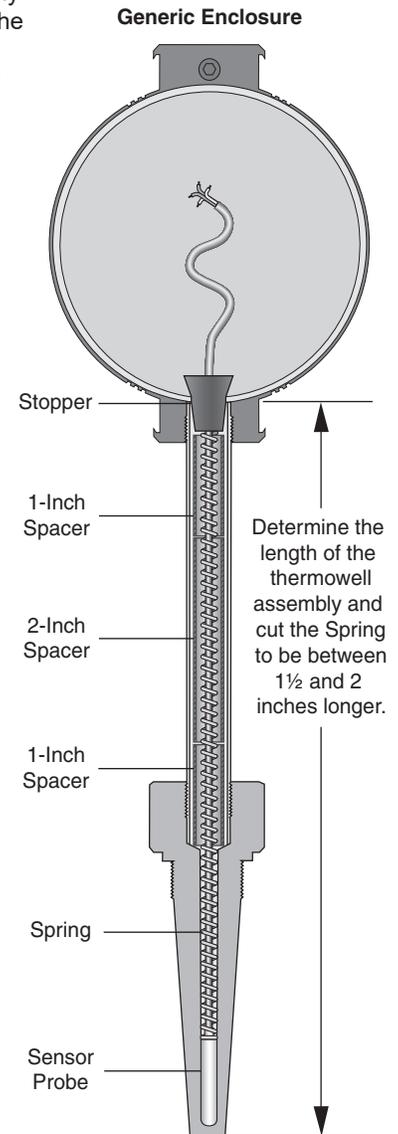
1. Determine the length of the thermowell assembly (see the illustration to the right). Cut the WORM Spring to be between 1 and 1½ and 2 inches longer than the length of the assembly (this is necessary so that the Spring's compression securely holds the Sensor Probe to the bottom of the thermowell).

2. Ensuring that the uncut portion of the Spring faces down towards the Sensor Probe, slide the Spring over the sensor wires and onto the end of the Sensor Probe.

3. Remove the instrument from the enclosure (if necessary). Insert the WORM sensor into the thermowell. Slide the appropriate length(s) and number of Spacers to keep the WORM Spring straight inside the thermowell assembly lag (Spacers may not be required).

4. Slide the Stopper over the sensor wires onto the top of the Spring. Push the Stopper firmly into the thermowell entry port to compress the WORM Spring into the thermowell.

5. Reinstall the instrument into the enclosure. Connect the sensor wires.





# Flexible Sensor Kits for Thermowell Temperature Assemblies

## Select one from each category to order a Sensor Kit:

### The WORM Sensor Kit

- SEN1** Sensor Kit includes One Complete "the WORM" Sensor Assembly plus Spare Assembly Parts
- SEN3** Sensor Kit includes Three Complete "the WORM" Sensor Assemblies plus Spare Assembly Parts
- SEN10** CAN of WORMS: Sensor Kit includes Ten Complete "the WORM" Sensor Assemblies plus Spare Assembly Parts

### Jacket and Spring Length (See Page 2 to Determine Total Sensor Insertion Length)

- JL24** 24-Inch Wire Jacket and Spring Length plus 6-8" lead wires (specify for total sensor insertion lengths of 22-inches and under)
- JL36** 36-Inch Wire Jacket and Spring Length plus 6-8" lead wires (specify for total sensor insertion lengths of 34-inches and under)

### Sensor Sheath Diameter

- D25** Appropriate for 0.25-inch and 6mm diameter applications

### Sensor Sheath Material

- S316** Stainless Steel 316; specify for measurements up to 760°C (1400°F)

### Sensor Type (see Sensor Specifications on next page; consult factory for special WORM sensors)

#### RTD SENSORS:

- WSPT14** Standard Platinum RTD; 4-Wire; 100 ohm (450°F maximum)
- WS2PT14** Standard Platinum RTD; 4-Wire; 100 ohm (Dual Sensor, (450°F maximum)
- WSPT104** Standard Platinum RTD; 4-Wire; 1000 ohm (450°F maximum)
- WHPT14** High Temperature Platinum RTD; 4-Wire; 100 ohm (800°F maximum)
- WH2PT13** High Temperature Platinum RTD; 3-Wire; 100 ohm (Dual Sensor, 800°F maximum)
- WH2PT103** High Temperature Platinum RTD; 3-wire; 1000 ohm (Dual Sensor, 800°F maximum)
- WHPT104** High Temperature Platinum RTD; 4-Wire; 1000 ohm (800°F maximum)
- WSN4** Nickel RTD; 4-Wire; 120 ohm (450°F maximum)
- WSCU4** Copper RTD; 4-Wire; 10 ohm (450°F maximum)

#### THERMOCOUPLE SENSORS:

- WSTC?G** Standard, Replace ? with J, K, T or E Thermocouple, Grounded (450°F maximum)
- WS2TC?G** Standard, Replace ? with J, K, T or E Thermocouple, Grounded (Dual Sensor, 450°F maximum)
- WSTC?U** Standard, Replace ? with J, K, T or E Thermocouple, Ungrounded (450°F maximum)
- WS2TC?U** Standard, Replace ? with J, K, T or E Thermocouple, Ungrounded (Dual Sensor, 450°F maximum)
- WHTC?G** High Temperature, Replace ? with J, K, T or E Thermocouple, Grounded
- WH2TC?G** High Temperature, Replace ? with J, K, T or E Thermocouple, Grounded (Dual Sensor)
- WHTC?U** High Temperature, Replace ? with J, K, T or E Thermocouple, Ungrounded
- WH2TC?U** High Temperature, Replace ? with J, K, T or E Thermocouple, Ungrounded (Dual Sensor)

### Assembly Options (not required)

- WW** Wire Wound Option for Temperatures Below -10°F (RTDs only)
- .04** 1/3 DIN High-Accuracy RTD Sensor (.04%)  
(Available on any PLATINUM RTD Sensor Types Only)
- .06** Class "A" High-Accuracy RTD Sensor (.06%)  
(Available on PLATINUM RTD Sensor Types Only)
- 10G** 10G Low-Intensity Vibration Sensor (See Sensor Specifications)
- 30G** 30G High-Intensity Vibration Sensor (See Sensor Specifications)

### The WORM Sensor Kit

[SEN]

#### IMPORTANT NOTE

Specify Standard Temperature WS\* WORM sensors for measurements up to 232°C (450°F).

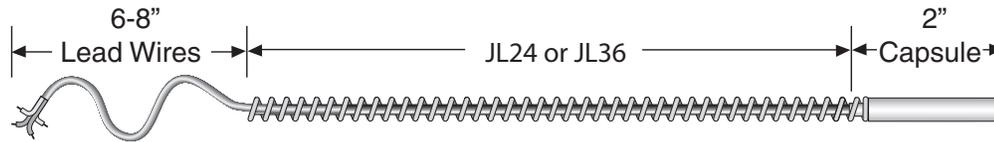
Specify High Temperature WHPT\* WORM sensors for measurements up to 427°C (800°F).

Specify High Temperature WHTC\* WORM Sensors for high temperature measurements, see specific TC specifications on next page.

SEN3 / JL36 / D25 / S316 / -WSPT14 -.06 [SEN]

Model Number Example

## Flexible Sensor Kits for Thermowell Temperature Assemblies



### Sensor Specifications

#### Lead Wires:

Standard (WS) Sensors: Teflon insulated, hermetically sealed for measurements up to 232°C (450°F).

High Temperature (WH) Sensors: Braided fiberglass for measurements ranging from 232°C (450°F) up to 427°C (800°F).

**Wire Size:** Wire gauges range from 20 to 28 depending on the element type.

**Accuracy: RTD:** ±0.12% at 0°C. Consult with factory for thermocouple tolerances.

**Stability: RTD:** 0.2°C after 10,000 hrs. at maximum temperature (1 year, 51 days, 16 hrs. continuous).

#### Response Time (typical to reach a 63.2% temperature change):

RTD: <5 seconds; Grounded Thermocouples 2.0 sec.;

Ungrounded Thermocouples 4.5 sec.

#### Vibration Options:

10G: provides protection for sensors that are exposed to higher than normal vibration levels.

30G: sensor is encapsulated in a waterproof epoxy to endure extreme vibration levels and full water immersion.

**Spring:** 302 stainless steel.

T/C IDENTIFICATION		
Type	Wire Color	
	+	-
J	White	Red
K	Yellow	Red
E	Purple	Red
T	Blue	Red

### Accessories

Part Number	Description
231-849-00	<b>Spare Parts Kit includes three each:</b> Spare Spring; Clip; Cap; 1" Spacer; 2" Spacer; stopper; washer; heat shrink tubing
802-179-24	Combination Pliers/Wire Stripper facilitates installation of the WORM components and sensor connection

### Temperature Ranges for WORM Elements

Type		Temperature Range	$\alpha$	Accuracy*
RTDs	Platinum	0 - 800°F (-18 - 427°C)	0.00385	±0.12% at 0°C
	Nickel	0 - 400°F (-18 - 204°C)	0.00672	
	Copper	0 - 400°F (-18 - 204°C)	0.00427	
Wire Wound (-WW) RTD	Platinum	For temperatures below -10°F (-23°C)	0.00385	±0.12% at 0°C
	Nickel	-100 - 400°F (-73 - 204°C)	0.00672	
	Copper	-50 - 400°F (-45 - 204°C)	0.00427	
Thermocouple	J	-200 - 1400°F (-129 - 760°C)		2.2°C or .75% of reading, whichever is greater
	K	-200 - 2000°F (-129 - 1093°C)		2.2°C or .75% of reading, whichever is greater
	T	-200 - 750°F (-129 - 399°C)		1.0°C or .75% of reading, whichever is greater
	E	-200 - 1400°F (-129 - 760°C)		1.7°C or .5% of reading, whichever is greater

\* See options -.04 and -.06 for higher accuracy RTD WORM sensors

# Smart HART® Product Solutions

## STZ Functional Safety Dual Input Smart HART® Temperature Transmitter



Part of Moore Industries' FS Functional Safety Series, the SIL 2 and SIL 3 capable STZ Functional Safety Dual Input Smart HART® Temperature Transmitters for your SIS (Safety Instrumented System) configures quickly and easily to accept a single or dual input from a wide array of sensors and analog devices located in hazardous and nonhazardous areas.

### Features:

- exida® certified to IEC 61508:2010
- Comprehensive FMEDA certified safety data
- Associated IS Input option
- Dual sensor input
- HART 7 compliant & HART Access Control
- 20-bit input resolution delivers exceptional digital accuracy
- HART & DTM Programmable
- Device Intelligence
- Resistance and Potentiometer Devices
- Direct Millivolt sources
- Accepts 14 RTD types, 9 thermocouple types

## THZ<sup>3</sup> & TDZ<sup>3</sup> Dual Input Smart HART® Temperature Transmitter



Moore Industries' Dual Input Smart HART® Temperature Transmitters configure quickly and easily to accept a direct signal input from a wide array of sensors and analog devices located in hazardous and non-hazardous areas.

### Features:

- Dual sensor input for Backup and Failover Protection
- Device Intelligence
- Associated IS Input option
- HART 7 compliant
- Input-to-output analog accuracy of up to  $\pm 0.014^{\circ}\text{C}$  ( $\pm 0.025^{\circ}\text{F}$ )
- 20-bit input resolution delivers exceptional digital accuracy
- HART & DTM Programmable
- Standard integral display on the model TDZ3 shows real-time process status
- Advanced RFI/EMI protection and ambient temperature compensation



United States • info@miinet.com  
Tel: (818) 894-7111 • FAX: (818) 891-2816  
Australia • sales@mooreind.com.au  
Tel: (02) 8536-7200 • FAX: (02) 9525-7296

*Demand Moore Reliability*

[www.miinet.com](http://www.miinet.com)

BeNeLux • info@mooreind.eu  
Tel: 03/448.10.18 • FAX: 03/440.17.97

China • sales@mooreind.sh.cn  
Tel: 86-21-62491499 • FAX: 86-21-62490635  
United Kingdom • sales@mooreind.com  
Tel: 01293 514488 • FAX: 01293 536852