

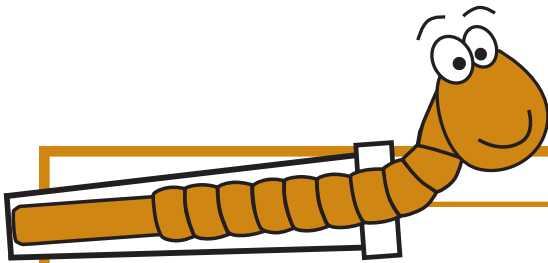
Технические характеристики на гибкие температурные датчики Moore Industries WORM

По вопросам продаж и поддержки обращайтесь:

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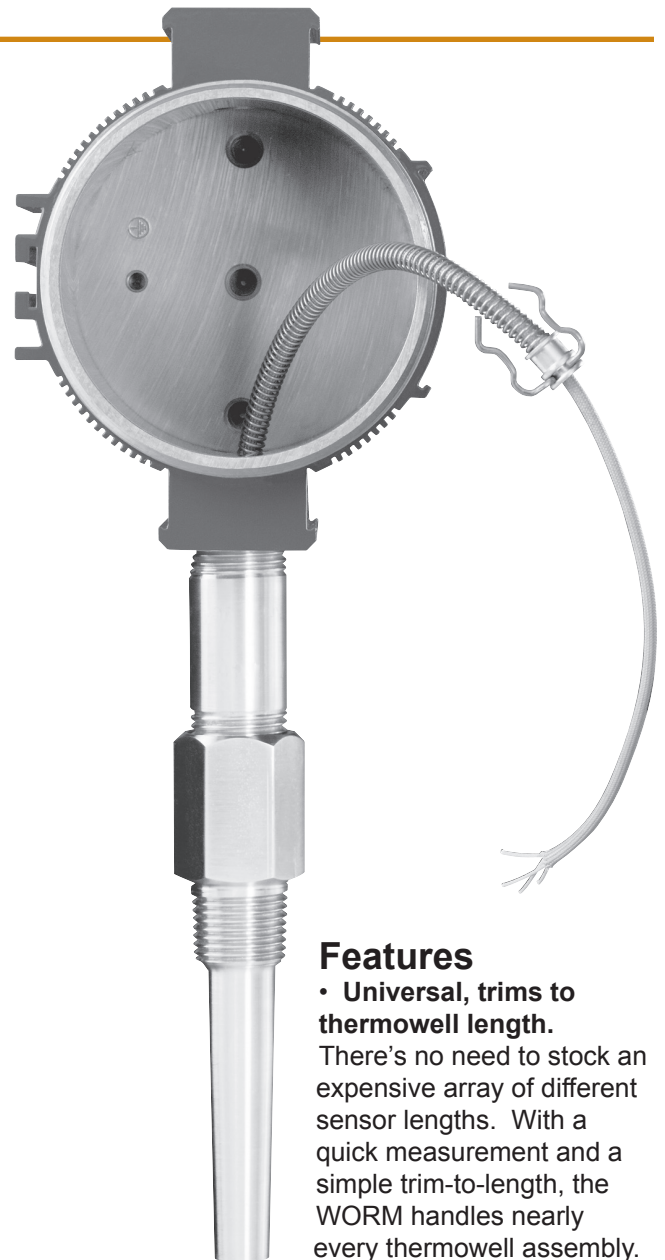
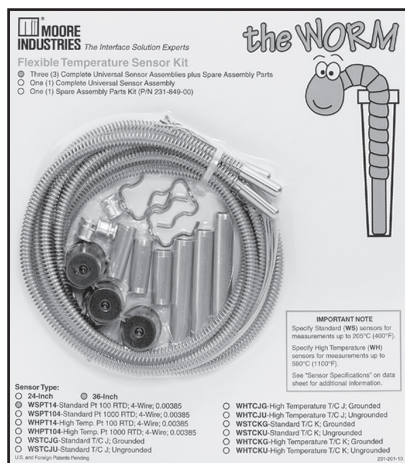
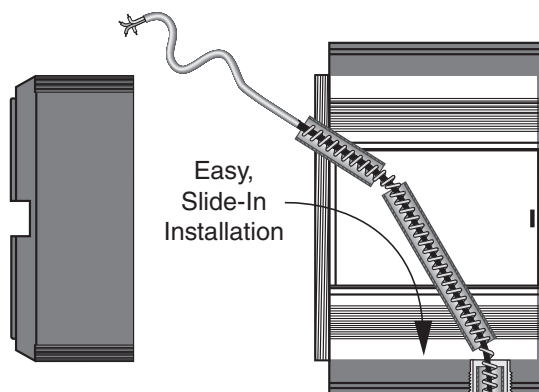


In both new and retrofit applications, the WORM® Flexible Sensors for Thermowell Temperature Assemblies replace restrictive straight sensor probes with a universal sensor strategy that will save you time and money.

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.

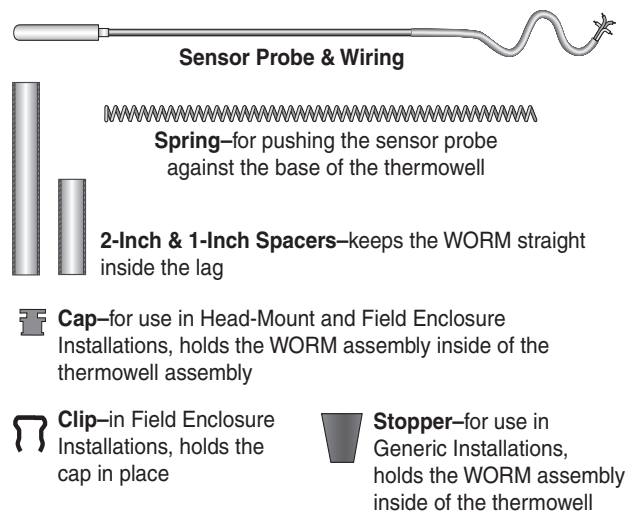
- **Faster response time.** The WORM delivers step response times 13% faster than standard sensors.

Flexible Sensors 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.

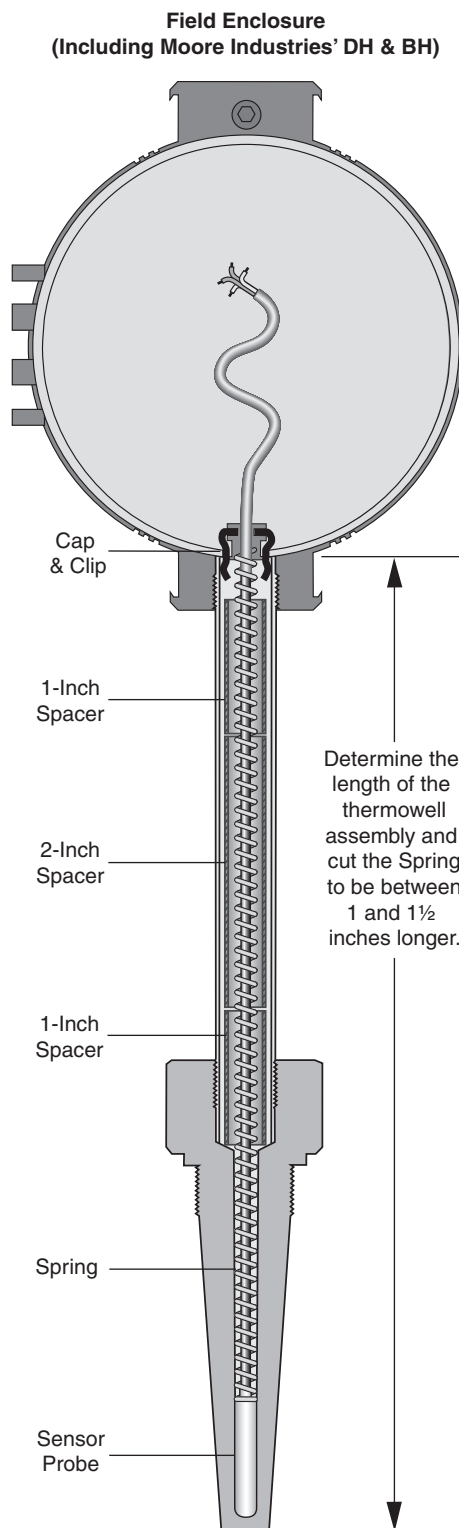
Figure 2. The WORM Kit Components



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

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

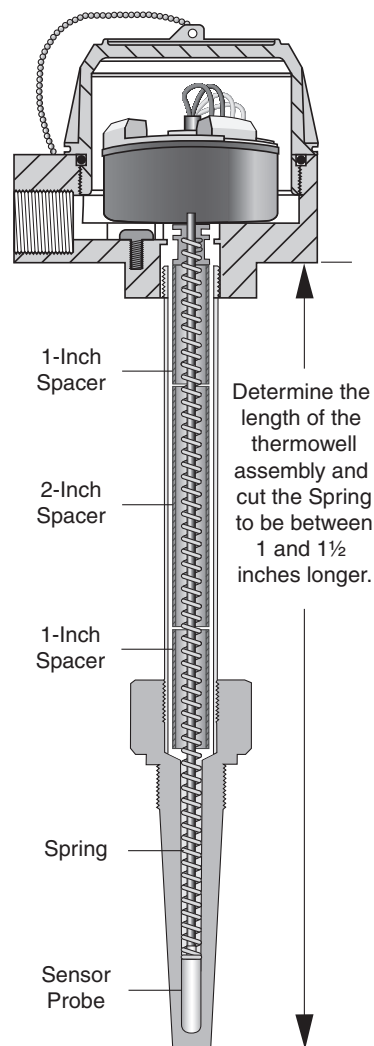
1. Determine the length of the thermowell assembly (see the illustration to the right). Cut the WORM Spring to be between 1 and 1½ inches **longer** than the length of the assembly (this is necessary so that the Spring's compression securely holds the sensor probe to the bottom of the thermowell).
2.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



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 1 and 1½ 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 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).

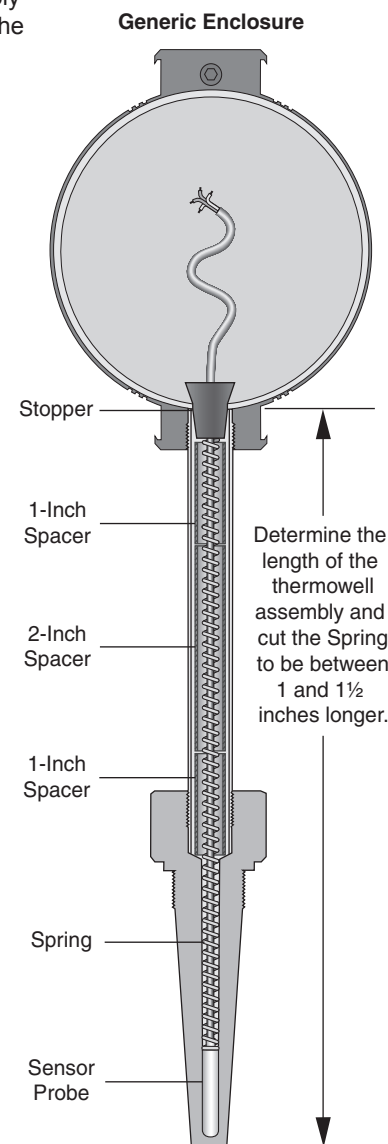
1. Determine the length of the thermowell assembly (see the illustration to the right). Cut the WORM Spring to be between 1 and 1½ inches **longer** than the length of the assembly (this is necessary so that the Spring's compression securely holds the Sensor Probe to the bottom of the thermowell).

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 Sensors for Thermowell Temperature Assemblies

Select one from each category to order a Sensor Kit:

The WORM Sensor Kit

- SEN3** Sensor Kit includes Three Complete "the WORM" Sensor Assemblies plus Spare Assembly Parts
SEN1 Sensor Kit includes One Complete "the WORM" Sensor Assembly plus Spare Assembly Parts
SEN Sensor Only; with Wire Jacket and No Spring

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

- CL24** 24-Inch Wire Jacket and Spring Length plus 6-8" lead wires (specify for total sensor insertion lengths of 22-inches and under)
CL36 36-Inch Wire Jacket and Spring Length plus 6-8" lead wires (specify for total sensor insertion lengths of 34-inches and under)
CL? Special Wire Jacket and Spring Length plus 6-8" lead wires - Replace "?" with length up to 120" (Specify in 0.25-inch increments)

Sensor Sheath Diameter

- D25** Appropriate for 0.25-inch and 6mm diameter applications
D18 0.18-inch diameter applications for single elements (WS); for (WH), consult the factory

Sensor Sheath Material

- S316** Stainless Steel 316; specify for measurements up to 760°C (1400°F)
INC Inconel (WHTCKG or WHTCKU sensor types only) up to 1,093°C (2,000°F) only

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)
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)
-ETR Extended Temperature Required Above +800°F to 1000°F (RTDs Only)
-.04 1/3 DIN High-Accuracy RTD Sensor (.04%)
(Available on any WSPT104/WHPT104 RTD Sensor Types Only)
-.06 Class "A" High-Accuracy RTD Sensor (.06%)
(Available on any WS, WH, PT14 AND PT104 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).

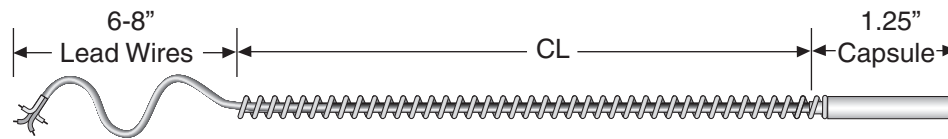
Specify High Temperature WHTC* WORM Sensors for measurements up to 760°C (1400°F).

For temperatures up to 1093°C (2000°F), specify WHTCKG or WHTCKU with a CL2 Sheath Length and Inconel Material.

SEN3 / CL36 / D25 / S316 / WSPT14 - .06 [SEN]

Model Number Example

Flexible Sensors for Thermowell Temperature Assemblies



*Capsule length varies slightly for wire-wound option

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).

Inconel (INC) sheathed sensors: special fiberglass insulation withstands temperatures up to 1,093°C (2,000°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. Withstands continuous temperatures up to 1093°C (2000°F).

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	Spare Parts Kit includes one each: Spare Spring; Clip; Cap; 1" Spacer; 2" Spacer
802-179-24	Combination Pliers/Wire Stripper facilitates installation of the WORM components and sensor connection

Temperature Ranges for WORM Elements

Type		Temperature Range	Accuracy*
RTDs	Platinum	0 - 800°F (-18 - 427°C)	±0.12% at 0°C
	Nickel	0 - 400°F (-18 - 204°C)	
	Copper	0 - 400°F (-18 - 204°C)	
Wire Wound (-WW) RTD	Platinum	For temperatures below -10°F (-23°C)	±0.12% at 0°C
	Nickel	-100 - 400°F (-73 - 204°C)	
	Copper	-50 - 400°F (-45 - 204°C)	
RTDs Extended Temperature Ranges (-ETR) RTD	Platinum	For temperatures above 800°F - 1000°F (427°C - 538°C)	±0.12% at 0°C
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

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