# Non-sparking Embedment Sensors

ATEX
II 3G Ex nA IIC u

## Overview

- Non-sparking embedment sensors for monitoring the temperature of thrust bearings
- Four case styles offer a variety of installation options
- Certified for use in Zone 2, Group IIC hazardous areas

## Specifications

**Temperature range:** -50 to 200°C (-58 to 392°F), reducing to 125°C (257°F) when elastomer filled cable is ordered.

**Case:** Tin plated copper alloy.

**Babbitt tip:** Factory applied babbitt tip, available on case style A, B, and short style B, reduces the danger of overheating the sensor when installed in babbitt layer.

**Leads:**
RTD: stranded copper with PTFE insulation.
Stainless steel braid, FEP over PTFE and FEP over stainless steel braid with elastomer fill are optional.
Thermocouple: stranded, PTFE insulated, twisted pairs.
Stainless steel braid, FEP over PTFE and FEP over stainless steel braid with elastomer fill are optional.

**Leadwire size (AWG):**

| RTD | | | | | |
|---|---|---|---|---|---|
| Case style | Number of leads | | | | |
| | 2 | 3 | 4 | 6 | 8 |
| A | 24 | 24 | 24 | 24 | |
| B | 24 | 24 | 28 | 28 | 28 |
| C | 24 | 26 | 30 | 30 | |
| Short B | 24 | 26 | 28 | 30 | |
| Thermocouple | | | | | |
| All cases | 24 | | 24 | | |

**Time constant:** 3.0 seconds (case style A), typical in moving water.

**Insulation resistance:** 10 megohms minimum at 100 VDC, leads to case.

## Specification and order options:

### RTD non-sparking embedment sensors

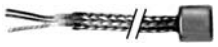
| S102617PD | Model number from next page |
|---|---|
| 3 | Number of leads per sensing element (2, 3 or 4):<br>CA or PD elements not available with 2 leads<br>4 leads available on all single elements and dual S102618 and S102662 only |
| F | Covering over leadwires:<br>T = PTFE insulated leads only<br>S = Stainless steel overbraid with PTFE insulated leads<br>F = FEP over PTFE insulated leads<br>E = FEP over stainless steel braid with elastomer fill and PTFE Insulated leads (max. fill length 240") |
| 48 | Lead length in inches |
| (Stop here for case style C or D; no installation variable) | |
| B0 | Optional Installation/Accessory option:<br>B0 = No babbitt metal or accessories<br>B1 = Babbitt metal applied<br>AC1 = Supplied with AC171 spring and AC172 series ring (case style B only)<br>AC2 = Supplied with AC171 spring and AC1038 ring (case style B only)<br>AC3 = Supplied with AC171 spring and AC915-1 ring (case style B only) |
| S102617PD3F48B0 = Sample part number | |

### Thermocouple non-sparking embedment sensors

| TC102621E | Model number from next page |
|---|---|
| U | Junction grounding:<br>G = Grounded<br>U = Ungrounded |
| 48 | Lead length in inches |
| F | Covering over leadwires:<br>T = PTFE insulated leads only<br>S = Stainless steel overbraid with PTFE insulated leads<br>F = FEP over PTFE insulated leads<br>E = FEP over stainless steel braid with elastomer fill and PTFE Insulated leads (max. fill length 240") |
| (Stop here for case style C or D; no installation variable) | |
| B0 | Optional Installation/Accessory option:<br>B0 = No babbitt metal or accessories<br>B1 = Babbitt metal applied<br>AC1 = Supplied with AC171 spring and AC172 series ring (case style B only)<br>AC2 = Supplied with AC171 spring and AC1038 ring (case style B only)<br>AC3 = Supplied with AC171 spring and AC915-1 ring (case style B only) |
| TC102621EU48FB0 = Sample part number | |

*Specifications subject to change*

| RTD Element | TCR Ω/Ω/°C | Case style A<br>Case L: 0.250" (6.4 mm)<br>Case Ø: 0.275" (7.0 mm)<br>  | | Case style B<br>Case L: 0.250" (6.4 mm)<br>Case Ø: 0.188" (4.8 mm)<br>Flange Ø: 0.250" (6.4 mm)<br>  | | Case style C<br>Case L: 0.300" (7.6 mm)<br>Case Ø: 0.125" (3.2 mm)<br>  | | Short case style B<br>Case L: .188" (4.8 mm)<br>Case Ø: .188" (4.8 mm)<br>Flange Ø: 0.250" (6.4 mm)<br>  | |
|---|---|---|---|---|---|---|---|---|---|
| | | Single | Dual | Single | Dual | Single | Dual | Single | Dual |
| Platinum, 100 Ω ±0.36% at 0°C | .00392 | S102617PA | S102617PAPA | S102618PA | S102618PAPA | S102619PA | S102619PAPA | S102662PA | S102662PAPA |
| Platinum, 100 Ω ±0.12% at 0°C (Meets EN60751, Class B) | .00385 | S102617PD | S102617PDPD | S102618PD | S102618PDPD | S102619PD | S102619PDPD | S102662PD | S102662PDPD |
| Platinum, 100 Ω ±0.36% at 0°C | .00385 | S102617PE | S102617PEPE | S102618PE | S102618PEPE | S102619PE | S102619PEPE | S102662PE | S102662PEPE |
| Platinum, 1000 Ω ±0.12% at 0°C | .00385 | S102617PF | S102617PFPF | S102618PF | S102618PFPF | S102619PF | S102619PFPF | S102662PF | S102662PFPF |
| Copper, 10 Ω ±0.2% at 25°C | .00427 | S102617CA | S102617CACA | S102618CA | | S102619CA | | S102662CA | |
| Nickel, 120 Ω ±0.5% at 0°C | .00672 | S102617NA | S102617NANA | S102618NA | S102618NANA | S102619NA | | S102662NA | S102662NANA |

| Thermocouple Junction Type | Case style A<br>Case L: 0.250" (6.4 mm)<br>Case Ø: 0.275" (7.0 mm)<br>  | | Case style B<br>Case L: 0.250" (6.4 mm)<br>Case Ø: 0.188" (4.8 mm)<br>Flange Ø: 0.250" (6.4 mm)<br>  | | Case style C<br>Case L: 0.300" (7.6 mm)<br>Case Ø: 0.125" (3.2 mm)<br>  | | Short case style B<br>Case L: .188" (4.8 mm)<br>Case Ø: .188" (4.8 mm)<br>Flange Ø: 0.250" (6.4 mm)<br>  | |
|---|---|---|---|---|---|---|---|---|
| | Single | Dual | Single | Dual | Single | Dual | Single | Dual |
| E = Chromel-Constantan | TC102620E | TC102620EE | TC102621E | TC102621EE | TC102622E | TC102622EE | TC102663E | TC102663EE |
| J = Iron-Constantan | TC102620J | TC102620JJ | TC102621J | TC102621JJ | TC102622J | TC102622JJ | TC102663J | TC102663JJ |
| K = Chromel-Alumel | TC102620K | TC102620KK | TC102621K | TC102621KK | TC102622K | TC102622KK | TC102663K | TC102663KK |
| T = Copper-Constantan | TC102620T | TC102620TT | TC102621T | TC102621TT | TC102622T | TC102622TT | TC102663T | TC102663TT |

## *STOP OIL SEEPAGE!*

***Feedthroughs*** provide an oil tight seal where a cable exits a machine housing. The stainless steel tube is epoxy filled and each wire is sealed to the individual conductor. This prevents wicking of oil inside the wires as well as leakage around the wire insulation. Pressure rating to 25 psi (1.7 bar.) See page 4-11 for details.

***Leadwire and cable seal*** models FG1015, FG3015 and FG4015 seal RTD or thermocouple leadwires where they exit oil-filled bearing housings of rotating equipment. Both versions include a grommet that provides the seal and allows adjustment of the wire or cable position. See page 4-12 for details.

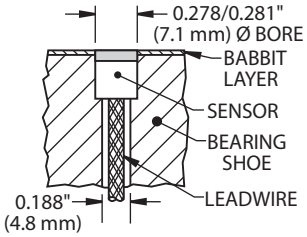
***Elastomer rubber-filled cable*** has elastomer fill between the wires, stainless steel braid, and outer jacket. This fill can extend along the entire length of the cable, or a specified portion. The outside of the cable can be sealed with an FG1015, FG3015 and FG4015 fitting. See Leadwire Covering Options on Miniature Sensors on pages 7-2 to 7-10.

Minco Application Aid #27 provides more information on the problems of oil seepage and various solutions. Download AA#27 at **www.minco.com**

*Specifications subject to change*

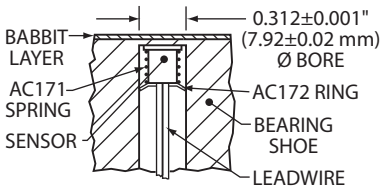
# Installation and Accessories

## Case style A



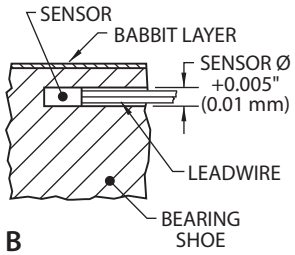

Install case style A sensor just below the babbitt layer, then puddle the babbitt metal over the sensor tip and smooth. Read Engineering Instruction #164 and Engineering Instruction #167 for complete details.

## Case style B




The "top hat" flange shape allows spring loading with the AC171 spring and AC172 or AC915 retaining ring (order separately). Choose the economical AC172 style for lowest cost. The AC915 style allows removal and reinstallation. Slide the spring and ring over the leads, insert the sensor tip into a milled hole, and push down on the retaining ring to compress the spring and secure the sensor. Read Engineering Instruction #180 and Engineering Instruction #181.

## Case styles C and D




Pot with epoxy inside small bearing shoes. Locate near the babbitt face for best readings. Read Engineering Instruction #184.

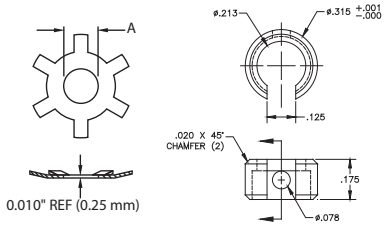
## AC171 spring for case style B

Stainless steel. Outside diameter 0.240" (6.1 mm). Compressed length 0.22" (5.6 mm). To be used in conjunction with AC172 or AC915 for spring loading case style B

## Feedthroughs

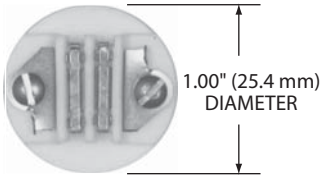
Feedthroughs provide an oil tight seal where a cable exits a machine housing. The stainless steel tube is epoxy filled and each wire is sealed to the individual conductor. This prevents wicking of oil inside the wires as well as leakage around the wire insulation. Pressure rating to 25 psi (1.7 bar).
See page 4-12 for more information.

## AC172 and AC915 retaining ring for case style B



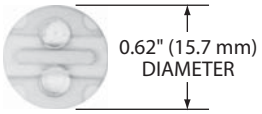

| Model | "A" diameter | Hole I.D. |
|---|---|---|
| AC172 | sized to fit leadwires | 0.312" (7.92 mm) |
| AC172-3 | 0.175" (4.45 mm) | 0.375" (9.53 mm) |
| AC915-1 | 0.213" (5.4 mm) | 0.312" (7.92 mm) |

## AC190 terminal block



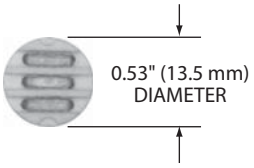

Two tin-plated brass terminals. PTFE body. Meets MIL-T-17600. For instructions, read Installation Instruction #107.

## AC191 terminal block




Two tin-plated brass terminals. PTFE body. Meets MIL-T-17600. Read Installation Instruction #121 for instructions.

## AC192 terminal block

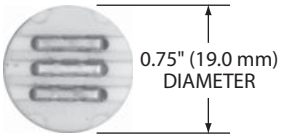



Three tin-plated brass terminals. Glass-filled PTFE body.

## AC195 terminal block

Same as AC192 except polyamide-imide body for radiation resistance to $10^9$ rads.

## AC197 terminal block




Three tin-plated brass terminals. Glass-filled PTFE body.

## AC196 terminal block

Same as AC197 except polyamide-imide body for radiation resistance to $10^9$ rads.

*Specifications subject to change*