

# GAPS & HAPS SERIES

000843

Issue 2

## Aerospace Proximity Sensors

### DESCRIPTION

Honeywell has over 30 years' experience designing and delivering accurate and reliable proximity sensors that are currently used in a variety of military and commercial aircraft.

Honeywell has two new platforms of proximity sensors: **General Aerospace Proximity Sensors (GAPS)** and **Harsh Aerospace Proximity Sensors (HAPS)**, formerly known as the IHM Series. Both platforms incorporate Honeywell's patented Internal Health Monitoring functionality, however the products have some technical differences that allow them to be used in various aerospace applications. GAPS can be used in less harsh areas of application with some differences of electrical and environmental characteristics when compared to HAPS. Whilst, HAPS Aerospace Proximity Sensors are configurable, non-contact, hermetically sealed devices designed to sense the presence or absence of a target in harsh-duty aircraft applications.

The GAPS and HAPS platforms provide on/off outputs and can be configured with an optional health monitoring output to the host system. The sensing mechanism is based on the familiar Eddy Current Killed Oscillator (ECKO) principles; however, Honeywell has designed and implemented the patented FAVCO (Fixed Amplitude Variable Current Oscillator) technology which enables the Honeywell sensors to have the health monitoring (IHM) features. See Figure 5 to compare the ECKO and FAVCO technologies. The GAPS and HAPS Series helps to reduce downtime and maintenance costs due to a unique circuit that can detect any internal failures and display a fault output instead of a false positive or false negative. For the customer, this delivers the best performance with a lower overall cost over the life of the aircraft.

### FEATURES

- Industry-leading indirect lightning and dielectric ruggedness: Meets the increased requirements of today's composite aircraft and most challenging applications including landing gear, thrust reversers, and flight controls
- Enhanced vibration ruggedness: Capable of withstanding extremely high vibration applications
- Environmentally rugged: Fully hermetic packages provide long-term reliability in very harsh environments by eliminating the potential for contamination of the sensor from the application environment. In addition, Honeywell has developed an innovative method to environmentally seal wire-lead (pigtail) configurations
- Internal Health Monitoring Capability: Optional third output state to indicate the health of the sensor (whether it is healthy or failed). Reduces maintenance time, reduces delayed flights, and lowers overall maintenance cost across the life of the aircraft
- Non-contact design: Utilizes non-contact technology to sense the presence or absence of a target regardless of the dirty, harsh environment in which it is placed, eliminating mechanical failure mechanisms, reducing wear, minimizing downtime, increasing durability, and increasing reliability



### VALUE TO CUSTOMERS

- Enhanced vibration and EMI specifications help to increase revenue (flight hours) and reduce cost to serve (system maintenance)
- Hermetic sealing helps increase revenue (flight hours), reduce cost to serve (maintenance), & reduce cost of goods (spares)
- Platform approach helps to increase revenue and reduce cost to serve
- Health monitoring helps to increase revenue, reduce cost to serve, and reduce cost of goods
- Supplier stability helps to reduce cost to serve (troubleshoot with original supplier)
- Current install base helps to reduce cost to serve (proven performance and MTBF)

### PORTFOLIO



Honeywell's GAPS and HAPS Series is part of a comprehensive line of aerospace sensors, switches, and value-added solutions.

To view Honeywell's complete product offering, click here.

**Honeywell**

# AEROSPACE PROXIMITY SENSORS, GAPS & HAPS SERIES



## GAPS | GENERAL Aerospace Proximity Sensor

## HAPS | HARSH Application Proximity Sensor

|                         |                  |                          |                           |                         |                           |                   |                 |                  |
|-------------------------|------------------|--------------------------|---------------------------|-------------------------|---------------------------|-------------------|-----------------|------------------|
|                         |                  |                          |                           |                         |                           |                   |                 |                  |
| Landing Gear<br>GAPS    | Doors<br>GAPS    | Hydraulics<br>GAPS       | Primary Surface<br>GAPS   | Rear Stabilizer<br>GAPS | Gen Actuators<br>GAPS     | TRAS<br>HAPS      | Valves<br>HAPS  | Engine<br>HAPS   |
|                         |                  |                          |                           |                         |                           |                   |                 |                  |
| Ground Vehicles<br>GAPS | Airframe<br>GAPS | Rotary Actuators<br>GAPS | Evacuation Slides<br>GAPS | Cargo Storage<br>GAPS   | Turbine Speed/ACM<br>GAPS | Actuators<br>HAPS | Nacelle<br>HAPS | Canopies<br>HAPS |

## GAPS

### DIFFERENTIATORS

## HAPS

|   |  |  |
|---|--|--|
| 500,000   | MTBF > FLIGHT HOURS                        | 500,000  |
|   | <b>MECHANICAL CHARACTERISTICS</b>          |  |
| 115°C   | OPERATING TEMPERATURE                      | 115°C  |
| 20 G  | VIBRATION                                  | 90 G   |
| 20 G  | OPERATING SHOCK                            | 20 G   |
|   | <b>ELECTRICAL CHARACTERISTICS</b>          |  |
| 150 mA Level W  | RADIO FREQUENCY CONDUCTED SUSCEPTIBILITY   | 300 mA Level Y   |
| 100 V/m CAT F   | RADIO FREQUENCY RADIATED SUSCEPTIBILITY    | 200 V/m CAT G  |
| Level 3   | LIGHTNING INDUCED TRANSIENT SUSCEPTIBILITY | Level 3  |
| Current loop output with Internal Health Monitoring (IHM)<br>NPN open collector output<br>max. load current 20 mA | OUTPUT TYPE                                | Current loop output with Internal Health Monitoring (IHM)<br>NPN open collector output<br>max. load current 250 mA |
| 1000 Vdc/750 Vac  | DIELECTRIC/IR                              | 1000 Vdc/750 Vac   |

# AEROSPACE PROXIMITY SENSORS, GAPS & HAPS SERIES

**TABLE 1. GAPS SERIES AND HAPS SERIES PERFORMANCE SPECIFICATIONS**

| CHARACTERISTIC                     | PARAMETER  |   |
|------------------------------------|--|---|
| Mechanical Characteristics         | GAPS   | HAPS  |
| <b>Weight</b>                      | Less than 60 grams (inline variants);<br>85 grams (right-angle variants)   | 60 g to 150 g   |
| <b>Sealing</b>                     | Hermetically sealed  | Hermetically sealed,<br>pigtail versions environmentally sealed   |
| <b>Connector/leads</b>             | D38999/25YA98PN<br>D38999/25YA98PA<br>EN2997Y10803MN   | <ul style="list-style-type: none"> <li>• D38999/25YA98PN</li> <li>• EN2997Y10803MN</li> <li>• M83723/90Y10056</li> <li>• M83723/90Y10058</li> <li>• D38999/25YA98PA</li> <li>• M83723/90Y1005N</li> <li>• M83723/90Y10057</li> <li>• Pigtail</li> </ul> |
| <b>Form factor</b>                 | <ul style="list-style-type: none"> <li>• Inline, cylindrical, threaded</li> <li>• Right angle, cylindrical, threaded</li> <li>• Inline, cylindrical, flanged</li> <li>• Right angle, cylindrical, flanged</li> </ul> | <ul style="list-style-type: none"> <li>• Inline, cylindrical, threaded</li> <li>• Right angle, cylindrical, threaded</li> <li>• Inline, cylindrical, flanged</li> <li>• Right angle, cylindrical, flanged</li> </ul>                                    |
| <b>Sensing distance</b>            | 3,5 mm max.  | 4 mm max.   |
| <b>Sensing face</b>                | Inconel®   | Inconel®  |
| <b>Outer body material</b>         | Stainless steel  | Stainless steel   |
| <b>Sensor head diameter</b>        | 13,5 mm [0.53 in]  | 13,5 mm [0.53 in]   |
| <b>Sensor length</b>               | 55 mm [2.17 in] max.   | various; 60 mm [2.36 in] max.   |
| <b>Target (typical)</b>            | SS 17-4PH rectangular target with dimensions<br>25 mm x 18 mm x 3 mm [0.98 in x 0.71 in x 0.12 in]   | SS 17-4PH rectangular target with dimensions<br>25 mm x 18 mm x 3 mm [0.98 in x 0.71 in x 0.12 in]  |
| <b>MTBF</b>                        | 500,000 flight hours   | 500,000 flight hours  |
| Electrical Characteristics         | GAPS   | HAPS  |
| <b>Supply voltage</b>              | 12 Vdc to 32 Vdc (input)   | 12 Vdc to 32 Vdc (input)  |
| <b>Supply current</b>              | <10 mA   | <10 mA  |
| <b>Operating temperature range</b> | -55°C to 115°C [-67°F to 239°F]  | -55°C to 115°C [-67°F to 239°F]   |
| <b>Storage temperature range</b>   | -65°C to 115°C [-85°F to 239°F]  | -65°C to 115°C [-85°F to 239°F]   |
| <b>Target response time</b>        | 5 ms   | 5 ms  |
| <b>Power on delay time</b>         | <1 second  | <1 second   |
| <b>Bonding resistance</b>          | < 2.5 mΩ   | <2.5 mΩ   |
| <b>Dielectric strength</b>         | 1000 Vdc/750 Vac for 1 minute  | 1000 Vdc/750 Vac for 1 minute   |
| <b>Insulation resistance</b>       | 200 MΩ min. at 50 Vdc  | 200 MΩ min. at 50 Vdc   |
| Sensing Characteristics            | GAPS   | HAPS  |
| <b>Ga/Gd</b>                       | see Figure 3   | see Figure 3  |
| <b>Target material</b>             | 17-4 PH stainless steel heat treated to condition<br>H1025   | 17-4 PH stainless steel heat treated to condition<br>H1025  |
| <b>Target dimension</b>            | Rectangular target of 25 mm x 18 mm x 3 mm   | Rectangular target of 25 mm x 18 mm x 3 mm  |

# AEROSPACE PROXIMITY SENSORS, GAPS & HAPS SERIES

| TABLE 2. GAPS SERIES AND HAPS SERIES PERFORMANCE SPECIFICATIONS |   |   |
|---|---|---|
| CHARACTERISTIC  | PARAMETER   |   |
| Environmental Characteristics                                   | GAPS  | HAPS  |
| Temperature and altitude  | RTCA/DO-160G – Section 4, Category D3                     | RTCA/DO-160G – Section 4, Category D3                     |
| Temperature variation   | RTCA/DO-160G – Section 5, Category S2                     | RTCA/DO-160G – Section 5, Category S2                     |
| Humidity  | RTCA/DO-160G – Section 6, Category C                      | RTCA/DO-160G – Section 6, Category C                      |
| Operational shock and crash safety                              | RTCA/DO-160G – Section 7, Category B                      | RTCA/DO-160G – Section 7, Category B                      |
| Vibration   | RTCA/DO-160G – Section 8, Category R (Curve E, E1, and W) | RTCA/DO-160G – Section 8, Category R (Curve E, E1, and W) |
| Explosion safety  | RTCA/DO-160G – Section 9 Category H                       | RTCA/DO-160G – Section 9 Category E & H                   |
| Water proofness   | RTCA/DO-160G – Section 10, Category R                     | RTCA/DO-160G – Section 10, Category R                     |
| Fire proofness  | CPR option (Case Pressure Relief Port) (GAPS only)        | Standard  |
| Fluid susceptibility  | RTCA/DO-160G – Section 11, Category F                     | RTCA/DO-160G – Section 11, Category F                     |
| Sand and dust   | RTCA/DO-160G – Section 12, Category D                     | RTCA/DO-160G – Section 12, Category D                     |
| Fungus resistance   | RTCA/DO-160G – Section 13, Category F                     | RTCA/DO-160G – Section 13, Category F                     |
| Salt spray  | RTCA/DO-160G – Section 14, Category T                     | RTCA/DO-160G – Section 14, Category T                     |
| Magnetic effects  | RTCA/DO-160G – Section 15, Category A                     | RTCA/DO-160G – Section 15, Category A                     |
| Power input   | RTCA/DO-160G – Section 16, Category A                     | RTCA/DO-160G – Section 16, Category A                     |
| Voltage spike   | RTCA/DO-160G – Section 17, Category A                     | RTCA/DO-160G – Section 17, Category A                     |
| Audio frequency conducted susceptibility                        | RTCA/DO-160G – Section 18, Category Z                     | RTCA/DO-160G – Section 18, Category Z                     |
| Induced signal susceptibility                                   | RTCA/DO-160G – Section 19, Category CWE                   | RTCA/DO-160G – Section 19, Category CWE                   |
| Radio frequency radiated susceptibility                         | RTCA/DO-160G – Section 20, Category F                     | RTCA/DO-160G – Section 20, Category G                     |
| Radio frequency conducted susceptibility                        | RTCA/DO-160G – Section 20, Category W                     | RTCA/DO-160G – Section 20, Category Y                     |
| Radio frequency emission  | RTCA/DO-160G – Section 21, Category M                     | RTCA/DO-160G – Section 21, Category M                     |
| Lightning induced transient susceptibility                      | RTCA/DO-160G – Section 22, Category B3K3L3                | RTCA/DO-160G – Section 22, Category B3K3L3                |
| Icing   | RTCA/DO-160G – Section 24, Category A                     | RTCA/DO-160G – Section 24, Category A                     |
| Electrostatic discharge   | RTCA/DO-160G – Section 25, Category A                     | RTCA/DO-160G – Section 25, Category A                     |

# AEROSPACE PROXIMITY SENSORS, GAPS & HAPS SERIES

**FIGURE 1. GAPS PRODUCT NOMENCLATURE**

| Series  | Form Factor                                | Range Ga/Gd mm [in]               | Electrical Output Type                                   | Termination                | Reserved | Hardware               | Reserved for customization |
|---|--|-----------------------------------|--|----------------------------|----------|------------------------|----------------------------|
| <b>LG</b> Series<br>General<br>Aerospace<br>Proximity<br>Sensor | <b>CT</b> Inline, cylindrical threaded     | <b>A</b> 1.75/2.75 [0.069/0.108]  | <b>3C</b> 3-wire, open collector output normally open    | <b>A</b> D38999/25YA98PN   | <b>0</b> | <b>N</b> No hardware   |                            |
|   | <b>RT</b> Right angle cylindrical threaded | <b>B</b> 2.00/3.00 [0.078/0.118]  | <b>3A</b> 3-wire, current sink output*                   | <b>B</b> D38999/25YA98PA   |          | <b>1</b> With hardware |                            |
|   | <b>CF</b> Inline, cylindrical flanged*     | <b>C</b> 2.25/3.25 [0.088/0.128]  | <b>3B</b> 3-wire, open collector output normally closed* | <b>C</b> EN2997Y10803MN*   |          |                        |                            |
|   | <b>RF</b> Right angle cylindrical flanged* | <b>D</b> 2.50/3.50 [0.098/0.138]  |  | <b>D</b> Custom connector* |          |                        |                            |
|   |  | <b>E</b> 2.75/3.75 [0.108/0.148]* |  |                            |          |                        |                            |
|   |  | <b>F</b> 3.00/4.00 [0.118/0.157]* |  |                            |          |                        |                            |
|   |  | <b>Z</b> Custom*                  |  |                            |          |                        |                            |

\*Note: These grayed-out options with blue code letters are non-qualified listings (not released as production listings in Honeywell's system for ordering). These listings will be qualified upon customer request. A project needs to be raised to qualify these listings based on customer request and related documents to be revised (PRS, QTP, etc.).

**FIGURE 2. HAPS SERIES PRODUCT NOMENCLATURE**

| Series   | Form Factor                                | Range Ga/Gd mm [in]              | Electrical Output Type                                  | Termination                    | Pigtail Length               | Hardware  | Reserved |
|--|--|----------------------------------|---|--------------------------------|------------------------------|---|----------|
| <b>HAPS</b> Series<br>One-Piece<br>(Active)<br>Proximity<br>Sensor | <b>CT</b> Inline, cylindrical threaded     | <b>A</b> 1.75/2.75 [0.069/0.108] | <b>3A</b> 3-wire, current sink output Near/Fault/Far    | <b>A</b> D38999/25YA98PN       | <b>N</b> Not applicable      | <b>N</b> No hardware  |          |
|  | <b>RT</b> Right angle cylindrical threaded | <b>B</b> 2.00/3.00 [0.078/0.118] | <b>3B</b> 3-wire, open collector output normally closed | <b>B</b> D38999/25YA98PA       | <b>A</b> 30.84 cm [12.0 in]  | <b>1</b> Washer MS25081C6 (1 nos.)<br>Hex nut MS21340-05 (2 nos.) |          |
|  | <b>CF</b> Inline, cylindrical flanged      | <b>C</b> 2.25/3.25 [0.088/0.128] | <b>3C</b> 3-wire, open collector output normally open   | <b>C</b> EN2997Y10803MN        | <b>B</b> 60.96 cm [24.0 in]  |   |          |
|  | <b>RF</b> Right angle cylindrical flanged  | <b>D</b> 2.50/3.50 [0.098/0.138] |   | <b>H</b> Pigtail (flying lead) | <b>C</b> 91.44 cm [36.0 in]  |   |          |
|  |  | <b>E</b> 2.75/3.75 [0.108/0.147] |   | <b>D</b> M83723/90Y1005N*      | <b>D</b> 121.92 cm [48.0 in] |   |          |
|  |  | <b>F</b> 3.00/4.00 [0.118/0.157] |   | <b>E</b> M83723/90Y10056*      | <b>E</b> 152.40 cm [60.0 in] |   |          |
|  |  |                                  |   | <b>F</b> M83723/90Y10057*      | <b>F</b> 182.88 cm [72.0 in] |   |          |
|  |  |                                  | <b>G</b> M83723/90Y10058*                               | <b>G</b> 213.36 cm [84.0 in]   |                              |   |          |

\*Note: These grayed-out options are non-qualified listings (not released as production listings in the ordering system). These listings will be qualified based on customer request. Contact Honeywell for further information on the grayed-out customization options.

# AEROSPACE PROXIMITY SENSORS, GAPS & HAPS SERIES

**TABLE 3. GAPS SERIES INTERFACE DETAILS**

| SUPPLY VOLTAGE   | SUPPLY CURRENT | OUTPUT TYPE                      | OUTPUT CONDITION   | CONNECTOR       | CATALOG LISTING | PIN CONFIGURATION   |
|------------------|----------------|----------------------------------|--|-----------------|-----------------|---|
| 12 Vdc to 32 Vdc | 10 mA max.     | Current sink                     | <b>Target near:</b> $4\text{ mA} \leq I_o \leq 6\text{ mA}$<br><b>Target far:</b> $12\text{ mA} \leq I_o \leq 16\text{ mA}$<br><b>Internal fault:</b><br>$9\text{ mA} \leq I_o \leq 11\text{ mA}$ or $I_o < 1\text{ mA}$ | D38999/25YA98PN | LGXXD3AAX-000   | Pin A: Supply excitation<br>Pin B: Supply return<br>Pin C: Output |
|                  |                |                                  |  | D38999/25YA98PA | LGXXD3ABX-000   | Pin A: Supply excitation<br>Pin B: Supply return<br>Pin C: Output |
|                  |                |                                  |  | EN2997Y10803MN  | LGXXD3ACX-000   | Pin 1: Supply excitation<br>Pin 2: Supply return<br>Pin 3: Output |
| 12 Vdc to 32 Vdc | 10 mA max.     | Open collector (normally closed) | <b>Target near:</b> Switch open, $I_o < 100\ \mu\text{A}$<br><b>Target far:</b> Switch close, $V_o < 1\text{ V}$ @ 20 mA of $I_o$  | D38999/25YA98PN | LGXXD3BAX-000   | Pin A: Supply excitation<br>Pin B: Supply return<br>Pin C: Output |
|                  |                |                                  |  | D38999/25YA98PA | LGXXD3BBX-000   | Pin A: Supply excitation<br>Pin B: Supply return<br>Pin C: Output |
|                  |                |                                  |  | EN2997Y10803MN  | LGXXD3BCX-000   | Pin 1: Supply excitation<br>Pin 2: Supply return<br>Pin 3: Output |
| 12 Vdc to 32 Vdc | 10 mA max.     | Open collector (normally open)   | <b>Target near:</b> Switch close, $V_o < 1\text{ V}$ @ 20 mA of $I_o$<br><b>Target far:</b> Switch open, $I_o < 100\ \mu\text{A}$  | D38999/25YA98PN | LGXXD3CAX-000   | Pin A: Supply excitation<br>Pin B: Supply return<br>Pin C: Output |
|                  |                |                                  |  | D38999/25YA98PA | LGXXD3CBX-000   | Pin A: Supply excitation<br>Pin B: Supply return<br>Pin C: Output |
|                  |                |                                  |  | EN2997Y10803MN  | LGXXD3CCX-000   | Pin 1: Supply excitation<br>Pin 2: Supply return<br>Pin 3: Output |

# AEROSPACE PROXIMITY SENSORS, GAPS & HAPS SERIES

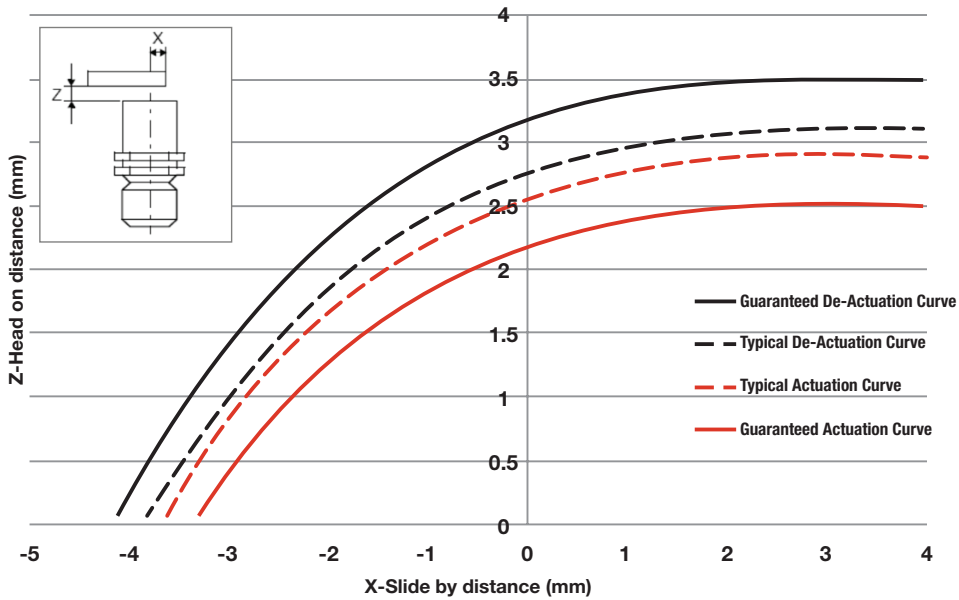
**TABLE 4. HAPS SERIES INTERFACE DETAILS**

| SUPPLY VOLTAGE        | SUPPLY CURRENT | OUTPUT TYPE   | OUTPUT CONDITION   | CONNECTOR       | CATALOG LISTING | PIN/WIRE CONFIGURATION  |
|-----------------------|----------------|---|--|-----------------|-----------------|---|
| 12 Vdc to 32 Vdc      | 10 mA max.     | Current sink  | <b>Target near:</b> $4\text{ mA} \leq I_o \leq 6\text{ mA}$<br><b>Target far:</b> $12\text{ mA} \leq I_o \leq 16\text{ mA}$<br><b>Internal fault:</b><br>$9\text{ mA} \leq I_o \leq 11\text{ mA}$ or $I_o < 1\text{ mA}$ | D38999/25YA98PN | 1PXXX3AANX-000  | Pin A: Supply excitation<br>Pin B: Supply return<br>Pin C: Output   |
|                       |                |   |  | D38999/25YA98PA | 1PXXX3ABNX-000  |   |
|                       |                |   |  | EN2997Y10803MN  | 1PXXX3ACNX-000  | Pin 1: Supply excitation<br>Pin 2: Output<br>Pin 3: Supply return   |
|                       |                |   |  | M83723/90Y1005N | 1PXXX3ADNX-000  | Pin 1: Supply excitation<br>Pin 2: Output<br>Pin 3: Supply return<br>Pin 4: No connection<br>Pin 5: No connection |
|                       |                |   |  | M83723/90Y10056 | 1PXXX3AENX-000  |   |
|                       |                |   |  | M83723/90Y10057 | 1PXXX3AFNX-000  |   |
|                       |                |   |  | M83723/90Y10058 | 1PXXX3AGNX-000  |   |
| Pigtail (Flying Lead) | 1PXXX3AHXX-000 | White wire (orange stripes): Supply excitation<br>White wire (blue stripes): Output<br>White wire (no stripes): Supply return |  |                 |                 |   |
| 12 Vdc to 32 Vdc      | 10 mA max.     | Open collector (normally closed)  | <b>Target near:</b> Switch open, $I_o < 50\text{ }\mu\text{A}$<br><b>Target far:</b> Switch close, $V_o < 1\text{ V}$ @ 20 mA of $I_o$   | D38999/25YA98PN | 1PXXX3AANX-000  | Pin A: Supply excitation<br>Pin B: Output<br>Pin C: Supply return   |
|                       |                |   |  | D38999/25YA98PA | 1PXXX3ABNX-000  |   |
|                       |                |   |  | EN2997Y10803MN  | 1PXXX3ACNX-000  | Pin 1: Supply excitation<br>Pin 2: Output<br>Pin 3: Supply return   |
|                       |                |   |  | M83723/90Y1005N | 1PXXX3ADNX-000  | Pin 1: Supply excitation<br>Pin 2: Output<br>Pin 3: Supply return<br>Pin 4: No connection<br>Pin 5: No connection |
|                       |                |   |  | M83723/90Y10056 | 1PXXX3AENX-000  |   |
|                       |                |   |  | M83723/90Y10057 | 1PXXX3AFNX-000  |   |
|                       |                |   |  | M83723/90Y10058 | 1PXXX3AGNX-000  |   |
| Pigtail (Flying Lead) | 1PXXX3AHXX-000 | White wire (orange stripes): Supply excitation<br>White wire (blue stripes): Output<br>White wire (no stripes): Supply return |  |                 |                 |   |
| 12 Vdc to 32 Vdc      | 10 mA max.     | Open collector (normally open)  | <b>Target near:</b> Switch close, $V_o < 1\text{ V}$ @ 20 mA of $I_o$<br><b>Target far:</b> Switch open, $I_o < 50\text{ }\mu\text{A}$   | D38999/25YA98PN | 1PXXX3AANX-000  | Pin A: Supply excitation<br>Pin B: Output<br>Pin C: Supply return   |
|                       |                |   |  | D38999/25YA98PA | 1PXXX3ABNX-000  |   |
|                       |                |   |  | EN2997Y10803MN  | 1PXXX3ACNX-000  | Pin 1: Supply excitation<br>Pin 2: Output<br>Pin 3: Supply Return   |
|                       |                |   |  | M83723/90Y1005N | 1PXXX3ADNX-000  | Pin 1: Supply excitation<br>Pin 2: Output<br>Pin 3: Supply return<br>Pin 4: No connection<br>Pin 5: No connection |
|                       |                |   |  | M83723/90Y10056 | 1PXXX3AENX-000  |   |
|                       |                |   |  | M83723/90Y10057 | 1PXXX3AFNX-000  |   |
|                       |                |   |  | M83723/90Y10058 | 1PXXX3AGNX-000  |   |
| Pigtail (Flying Lead) | 1PXXX3AHXX-000 | White wire (orange stripes): Supply excitation<br>White wire (blue stripes): Output<br>White wire (no stripes): Supply return |  |                 |                 |   |

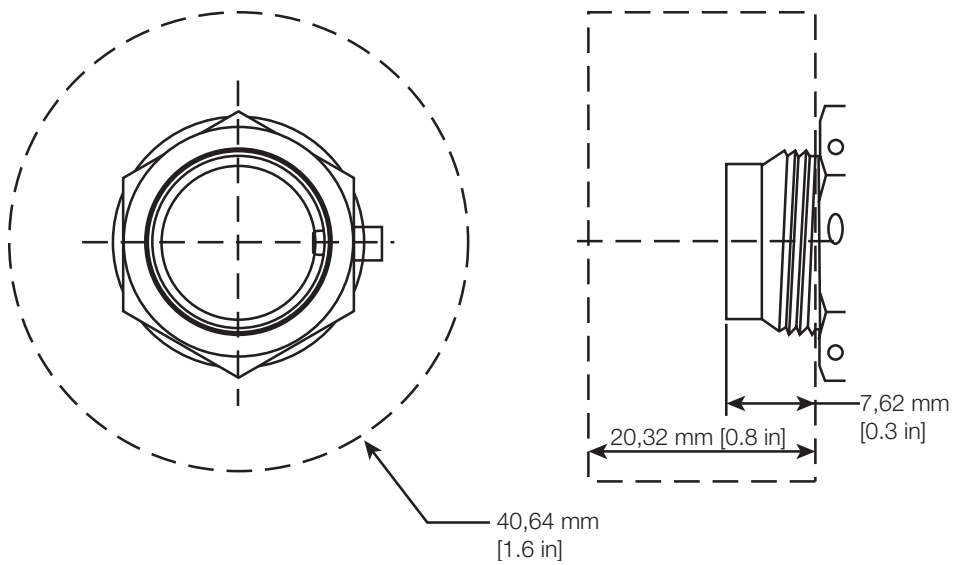
# AEROSPACE PROXIMITY SENSORS, GAPS & HAPS SERIES

**FIGURE 3. SLIDE-BY CURVES**

Proximity Sensor Actuation and De-Actuation Curves



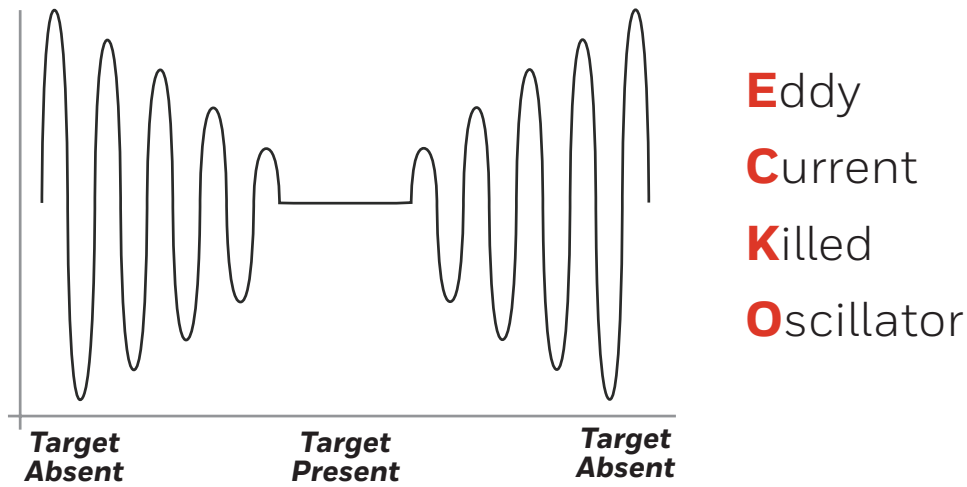
**FIGURE 4. KEEP OUT ZONE MAP**



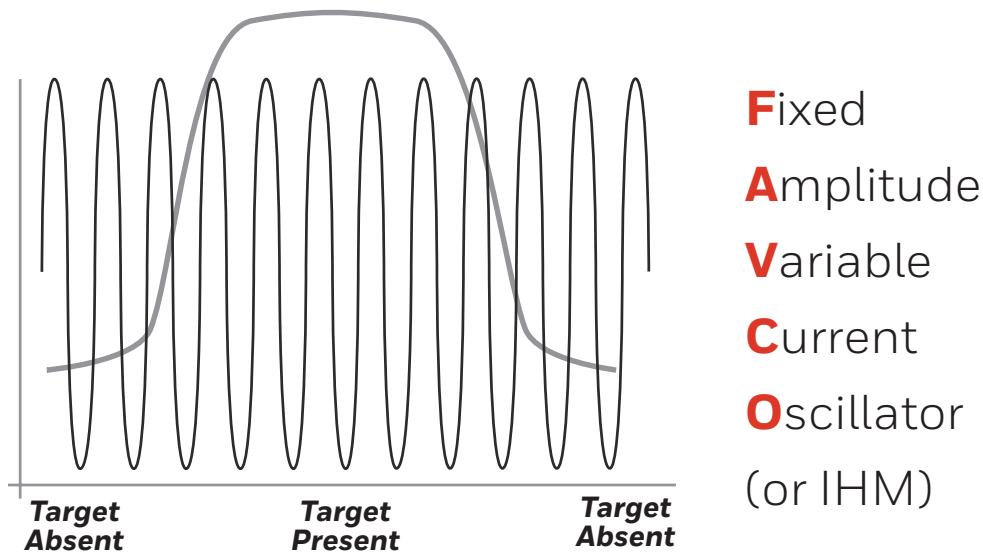


# AEROSPACE PROXIMITY SENSORS, GAPS & HAPS SERIES

FIGURE 5. ECKO VS. FAVCO TECHNOLOGY



Eddy currents within the target cause a load on the sensor decreasing the amplitude of the oscillator, monitored by a trigger switching the output state **on** or **off**.

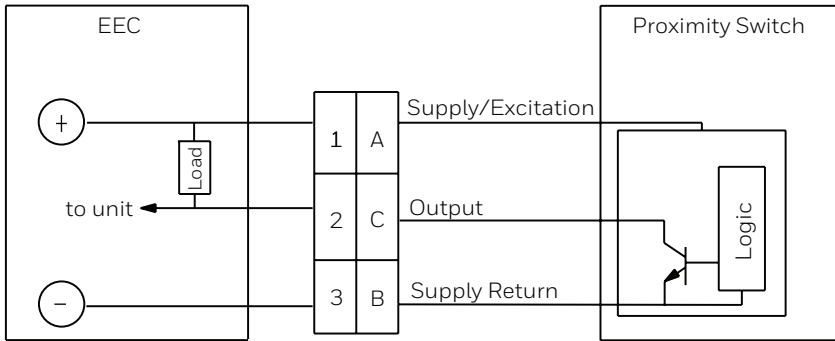


Energy measured to maintain the oscillation when a load on the sensor is applied caused by the eddy currents of the target.

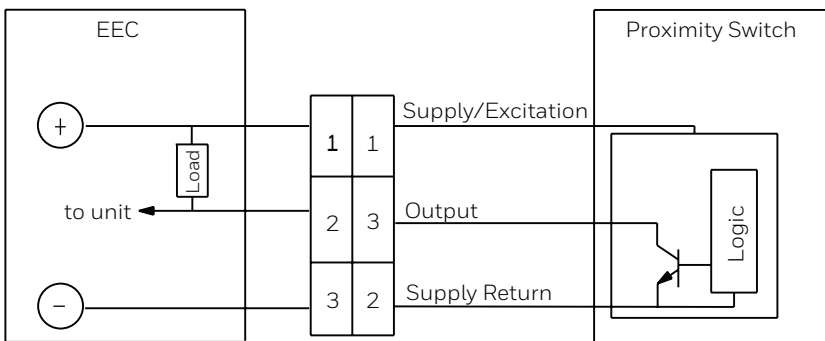
# AEROSPACE PROXIMITY SENSORS, GAPS & HAPS SERIES

## GAPS WIRING DIAGRAMS

**FIGURE 6. GAPS SERIES D38999/25YA98PN CONNECTOR**

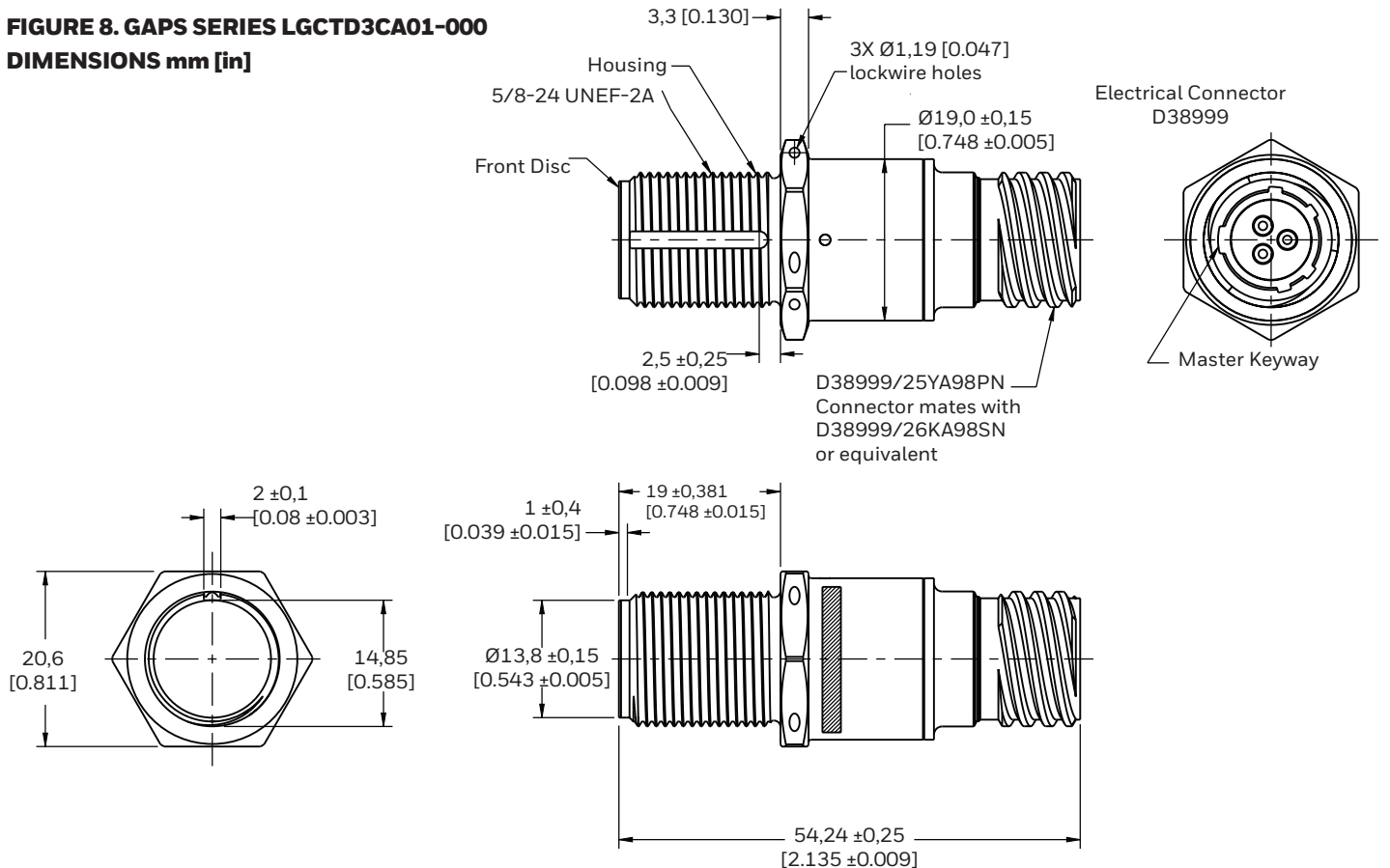


**FIGURE 7. GAPS SERIES EN2997Y10803MN CONNECTOR**



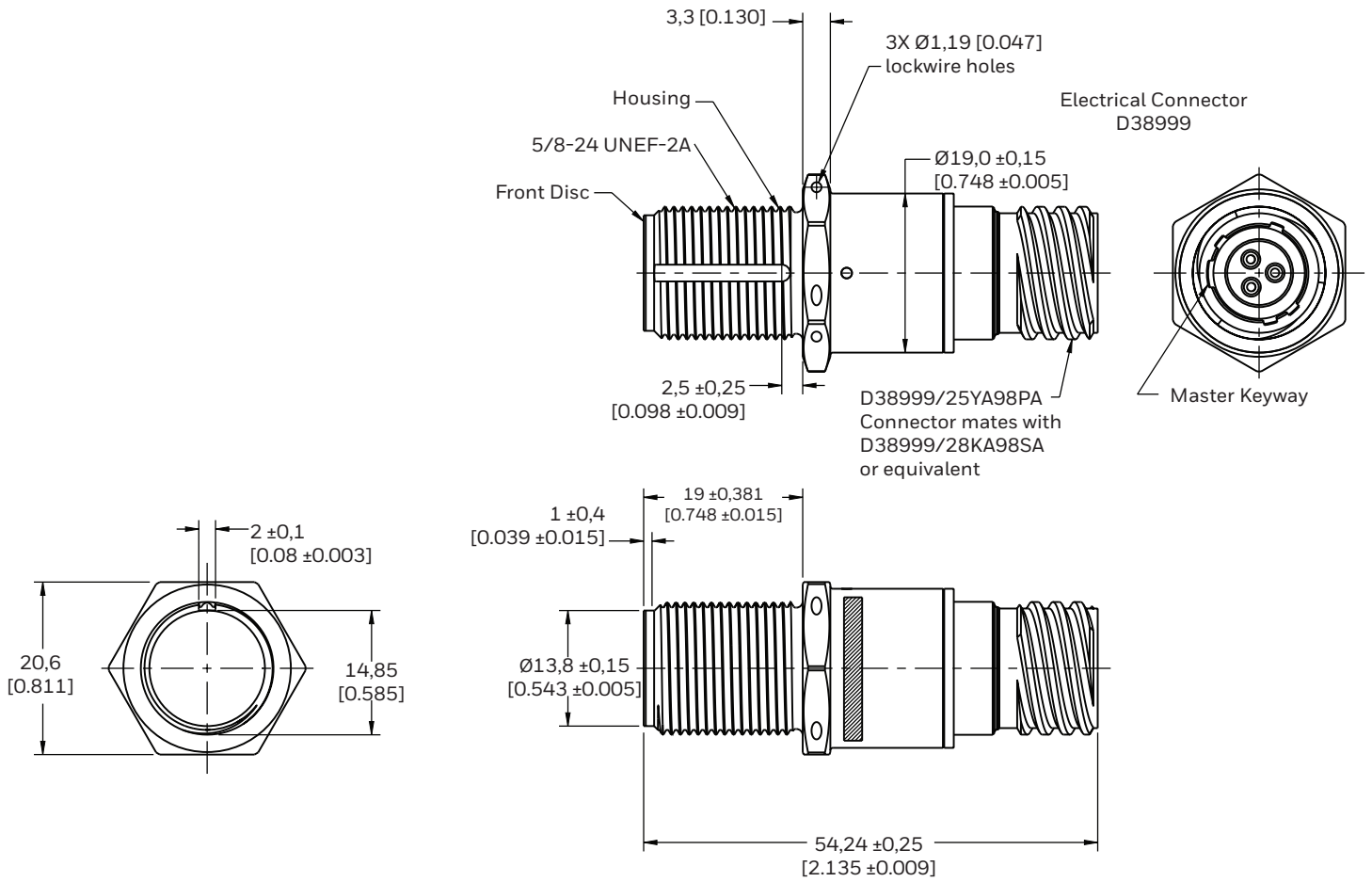
## PRODUCT DIMENSIONS

**FIGURE 8. GAPS SERIES LGCTD3CA01-000 DIMENSIONS mm [in]**



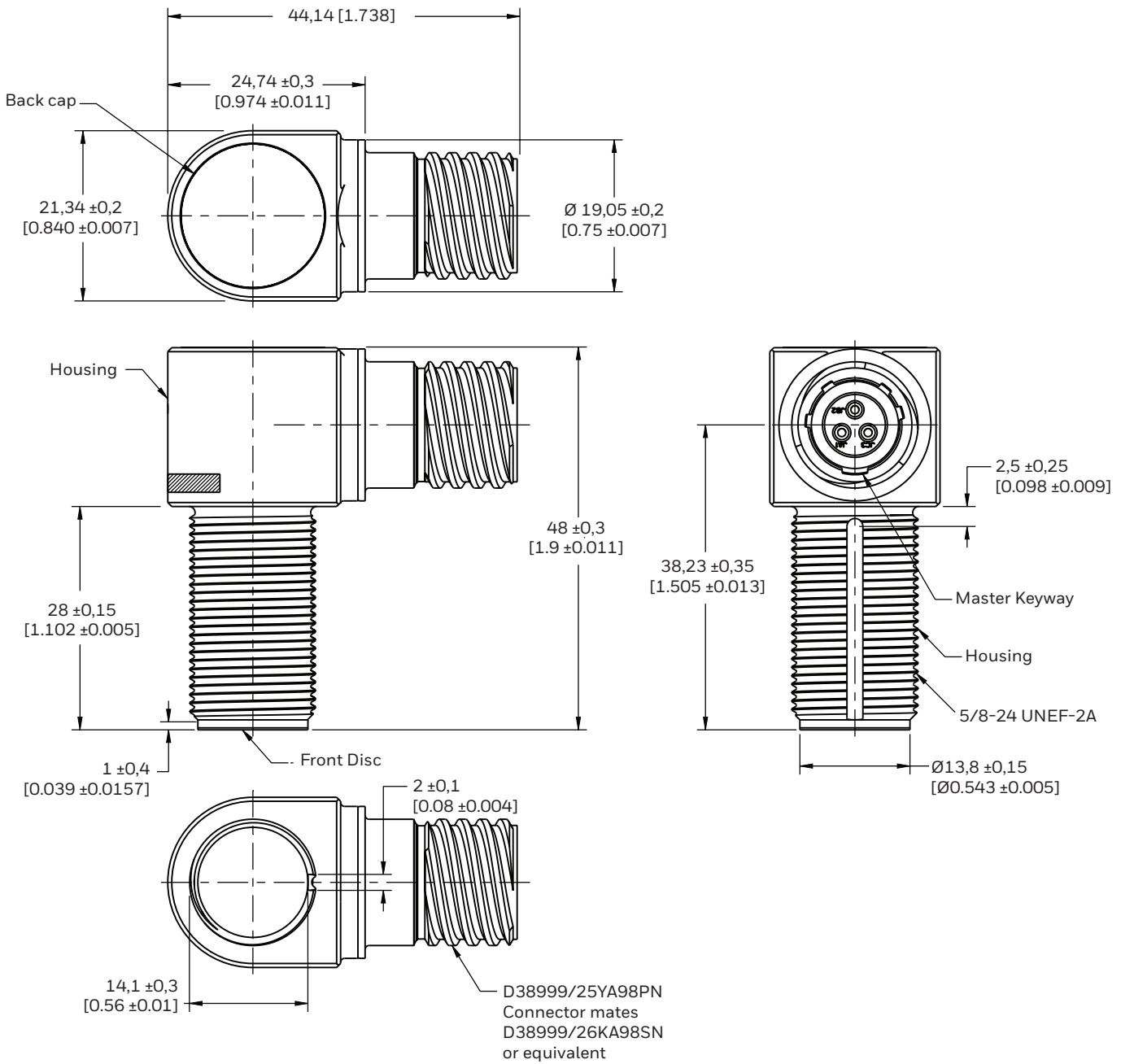
# AEROSPACE PROXIMITY SENSORS, GAPS & HAPS SERIES

**FIGURE 9. GAPS SERIES LGCTD3CB01-000 DIMENSIONS mm [in]**



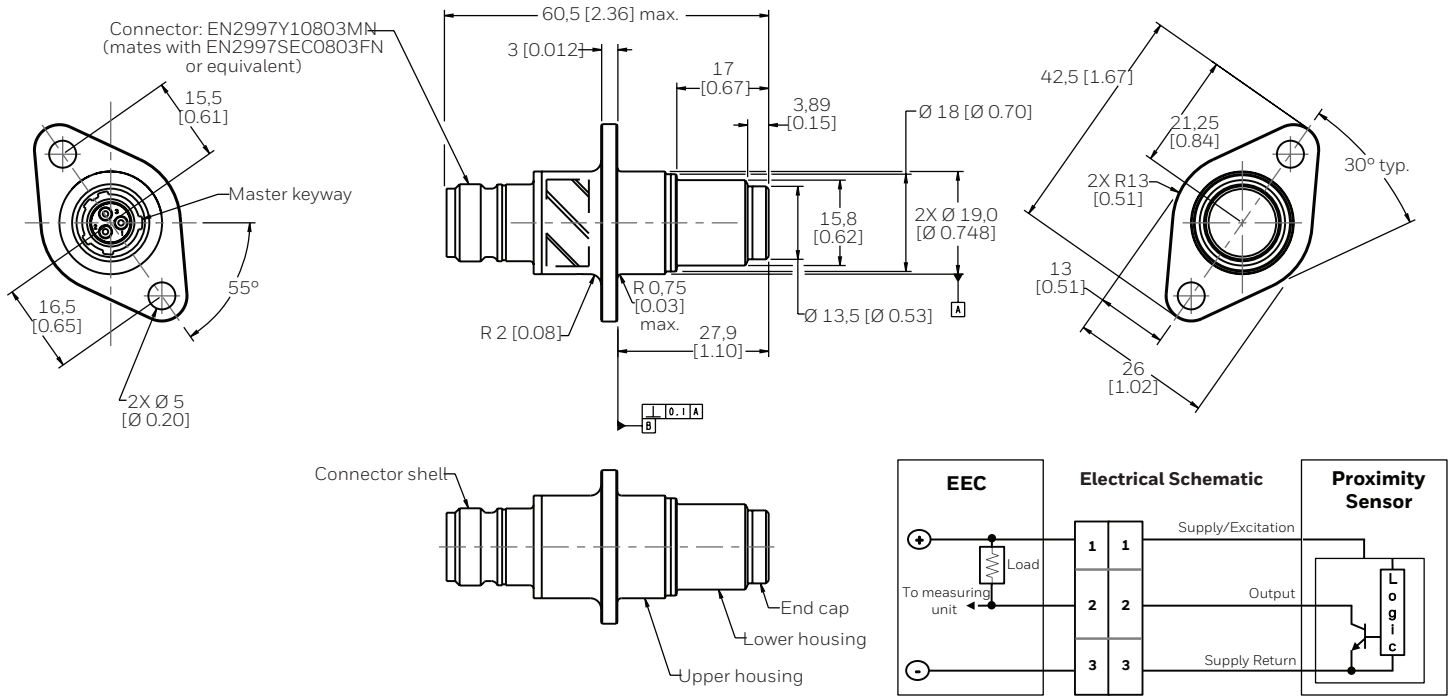
# AEROSPACE PROXIMITY SENSORS, GAPS & HAPS SERIES

**FIGURE 10. GAPS SERIES LGRTD3CA01-000 DIMENSIONS mm [in]**

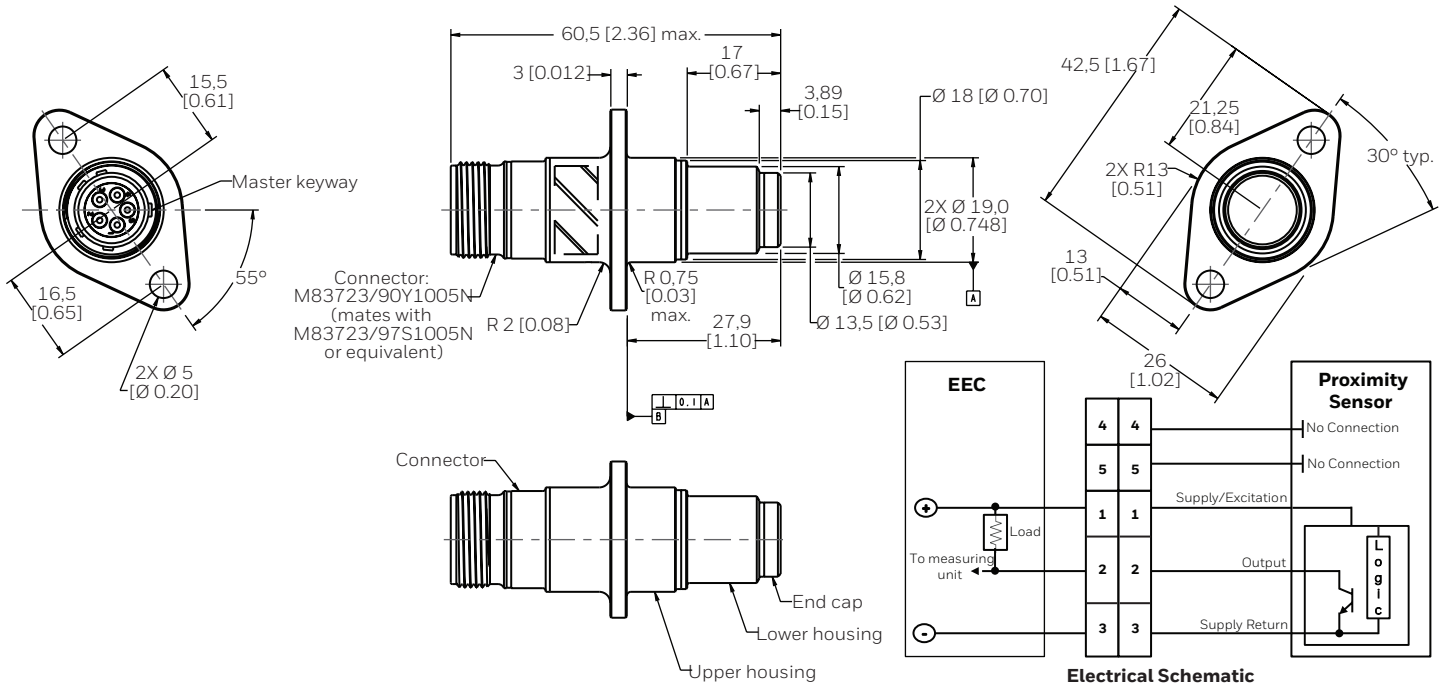


# AEROSPACE PROXIMITY SENSORS, GAPS & HAPS SERIES

**FIGURE 11. HAPS SERIES: CYLINDRICAL, FLANGED HOUSING WITH EN2997Y10803MN CONNECTOR mm [in]**

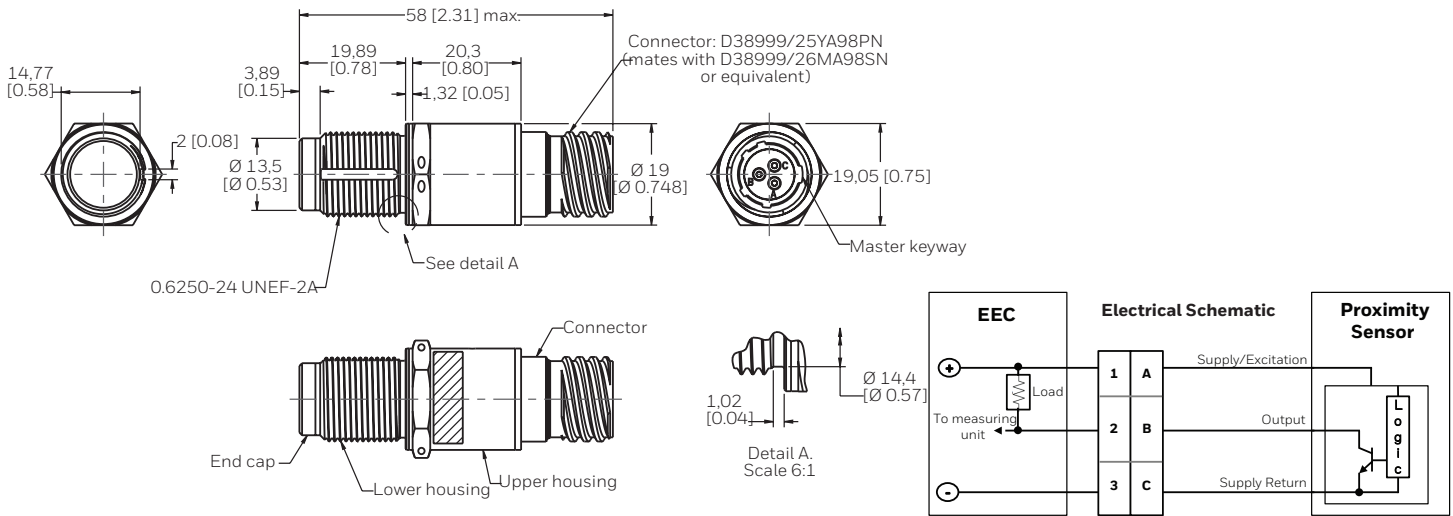


**FIGURE 12. HAPS SERIES: CYLINDRICAL, FLANGED HOUSING WITH M83723/90Y1005N CONNECTOR mm [in]**

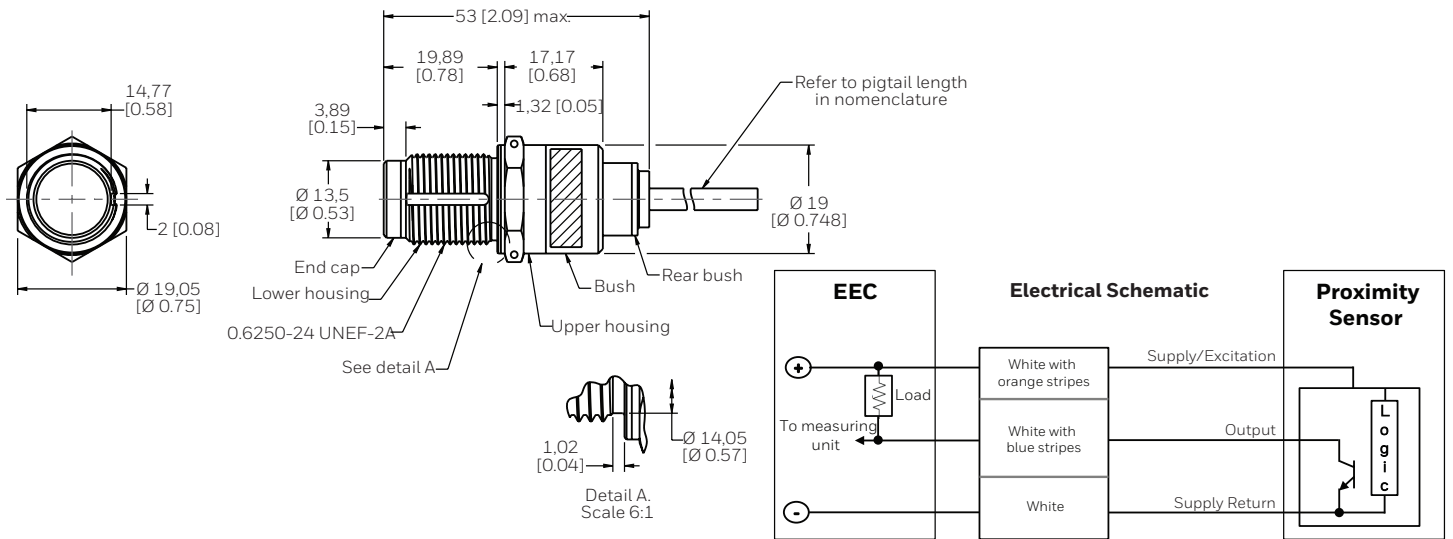


# AEROSPACE PROXIMITY SENSORS, GAPS & HAPS SERIES

**FIGURE 13. HAPS SERIES: CYLINDRICAL HOUSING WITH D38999/25YA98PN CONNECTOR mm [in]**

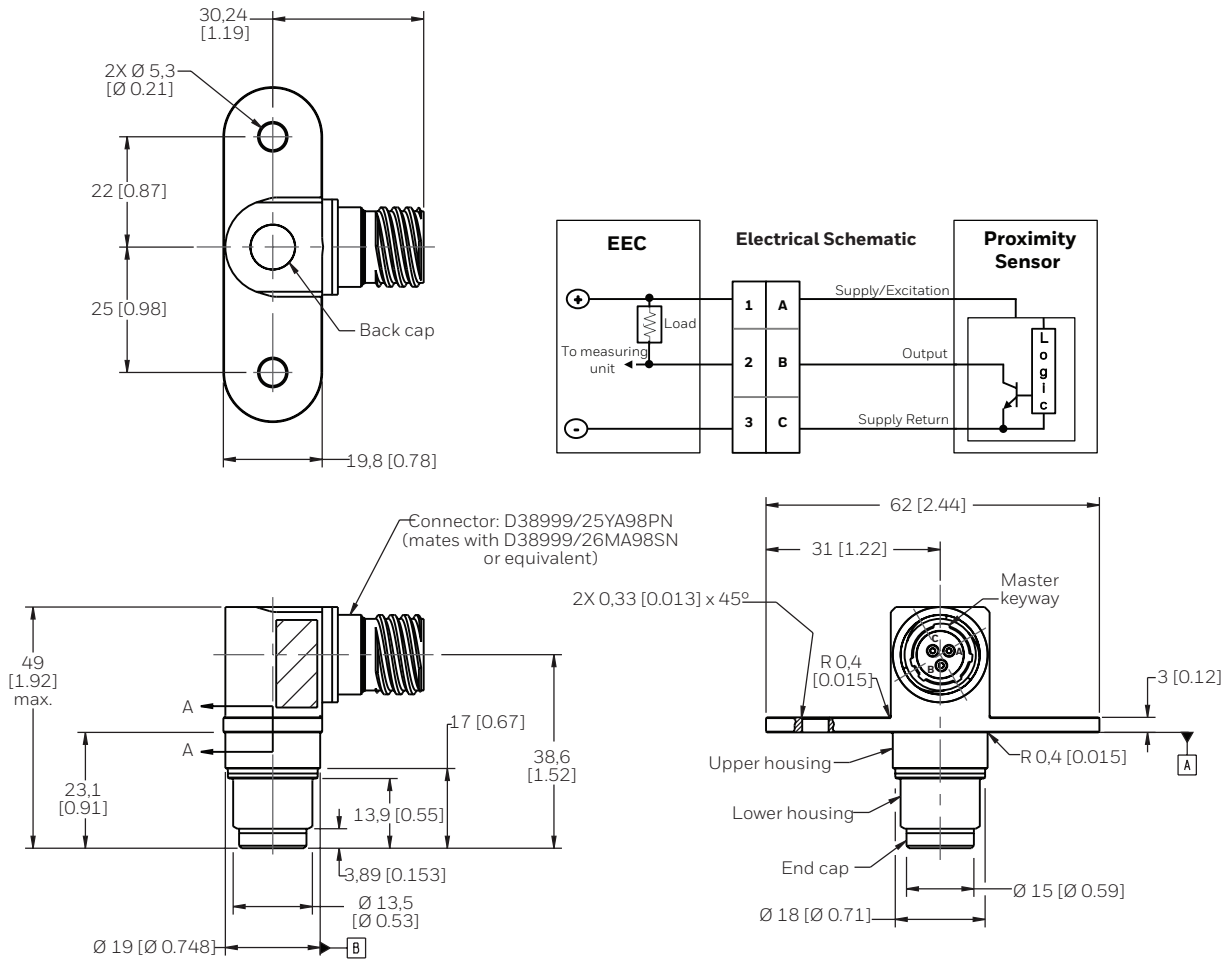


**FIGURE 14. HAPS SERIES: CYLINDRICAL HOUSING WITH PIGTAIL CONNECTION mm [in]**

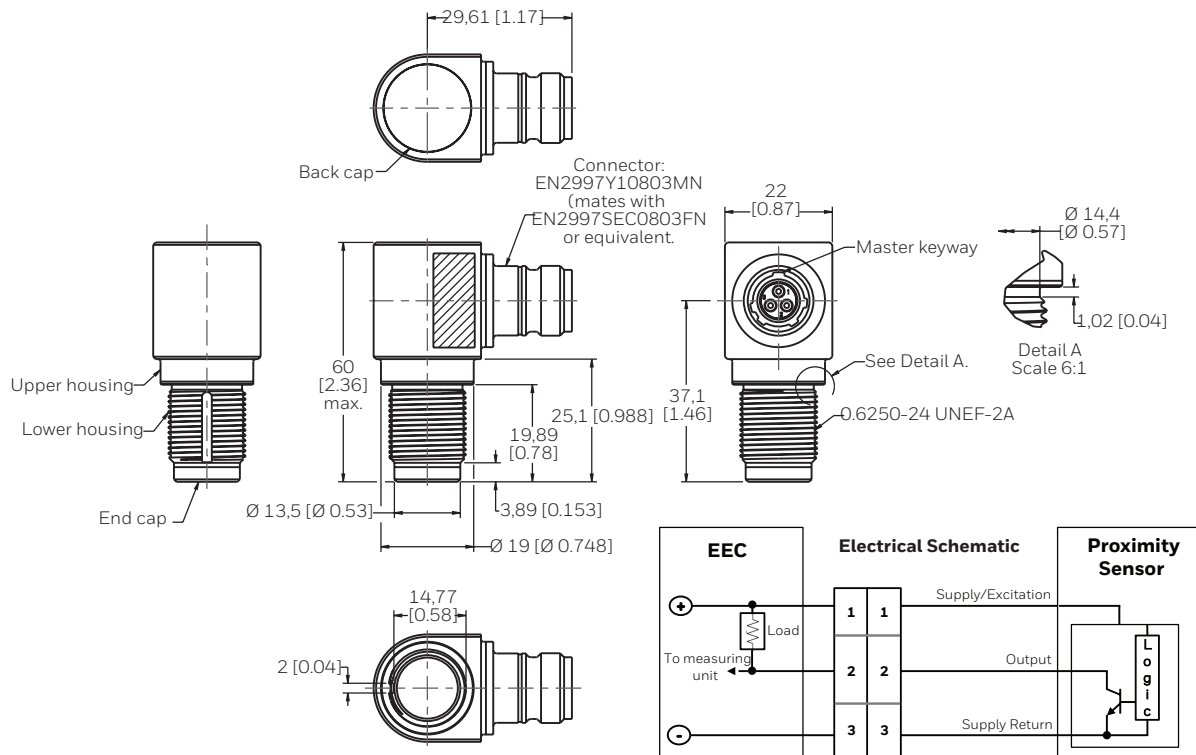


# AEROSPACE PROXIMITY SENSORS, GAPS & HAPS SERIES

**FIGURE 15. HAPS SERIES: RIGHT ANGLE, FLANGED HOUSING WITH D38999/25YA98PN CONNECTOR mm [in]**

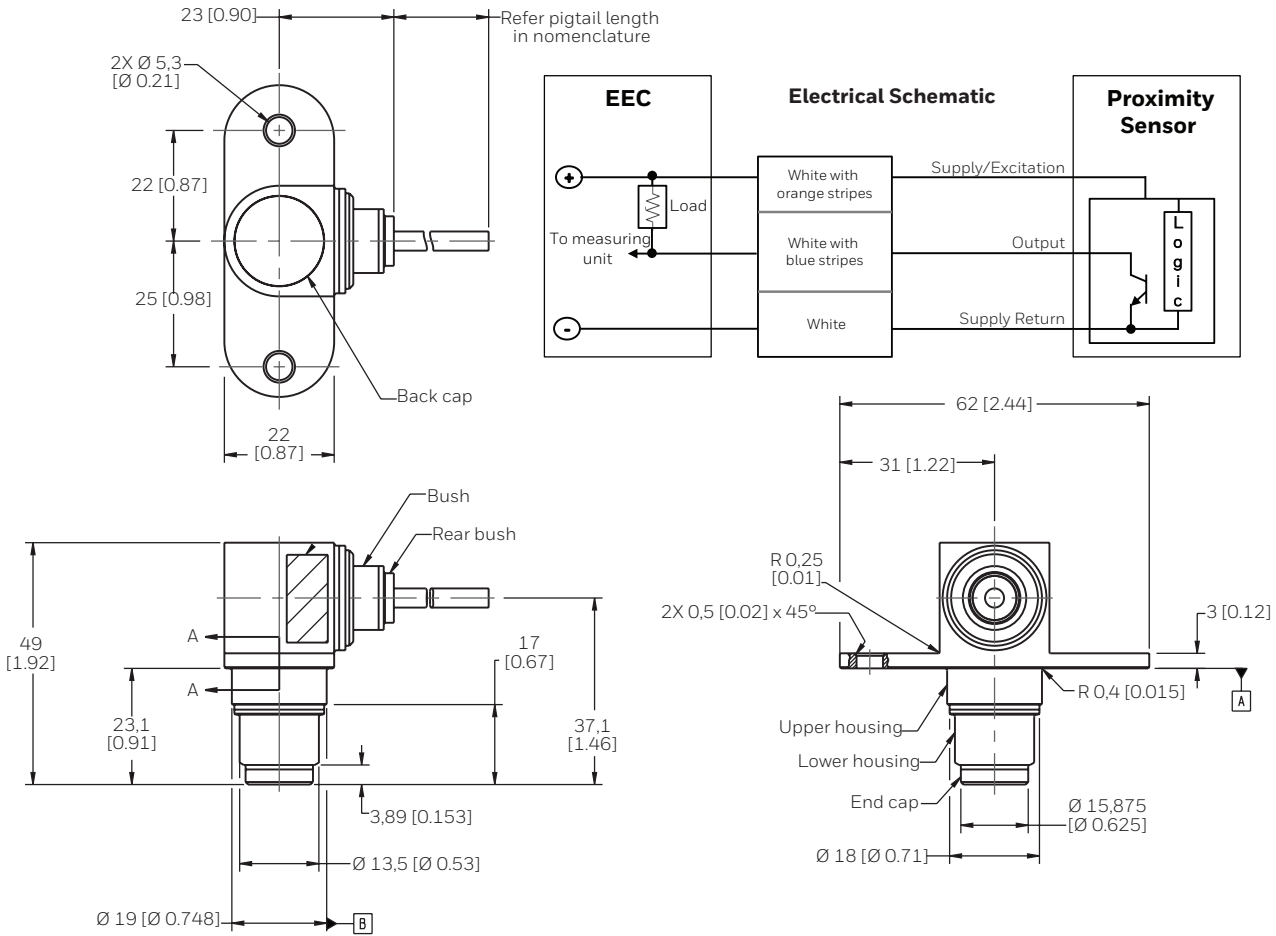


**FIGURE 16. HAPS SERIES: RIGHT ANGLE WITH EN2997Y10803MN CONNECTOR mm [in]**



# AEROSPACE PROXIMITY SENSORS, GAPS & HAPS SERIES

**FIGURE 17. HAPS SERIES: RIGHT ANGLE, FLANGED HOUSING WITH PIGTAIL CONNECTION mm [in]**



**FIGURE 18. HAPS SERIES: RIGHT ANGLE WITH M83723/90Y1005N CONNECTOR mm [in]**

