North American Sensors Corp.
Pressure Switches Inc.

Products that make sense
Mission Statement

It is the mission of North American Sensors Corporation to manufacture innovative products for all industries. Our hope is that these products will continually create a benchmark of quality and customer satisfaction. Through these self imposed standards, we will continually strive to surpass industry expectations concerning product and personal performance. All of these pursuits will be conducted with the ultimate goal of becoming the industry leader in sensor manufacturing and technology.

Manufacturer’s Warranty

North American Sensors Corporation warrants its products to be free from defects in material and workmanship when subjected to normal use and service for a period of one year from the date of purchase. This warranty is applicable only to product components that are stationary and not subject to normal wear. This warranty does not apply to products that have been subjected to electrical or chemical damage due to improper use, accident, negligence or abuse. Electrical damage to solid state components, relays, reed switches or other components will not be covered. Also excluded are products that have been modified or altered, or have electrical cables that have been cut during installation. If anyone other than authorized personnel of NASC attempts to repair the device, this warranty is null and void.

NASC is responsible under this warranty for the repair or replacement of the defective product or components as deemed necessary upon inspection by NASC service personnel. NASC assumes no responsibility for consequential damages to personal or real property, or for injury to any person.

This warranty supersedes all warranties expressed or implied. The suitability of NASC products for a particular application and the implied warranty of merchantability is excluded from warranty coverage. This warranty may not be expanded or altered other than in writing by an officer of NASC.

Defective products must be shipped to NASC prepaid and insured to the address below within 30 days of the original malfunction. All returned goods must be labelled with a Return Goods Authorization number obtained from NASC customer service. Also include the part number, serial number, name and contact number of someone capable of answering questions regarding the use, operation and liquid contamination of the product, a return shipping address and a description of the problem. All returns will be handled as quickly as possible and the preceding information will help to expedite the return or replacement of the product.
NASC's bilge switches are designed to be installed in ships bilges, tanks and industrial sumps, where it would be bolted to an adjoining structure. Custom configurations are available upon request. Specifications regarding this model may change without notice.

**BLG 100/25SSS-X***

Standard Features:
- Clear polycarbonate Slosh Shield
- 316SS Stem, Float and Brackets
- 25 VA Form C Hermetically Sealed Reed Switch
- 4C 18AWG PVC Jacketed Cable
- Water Tight Seal
- Made in the USA

**BLG 150/25SSS-X***

Standard Features:
- Manual Lift/Test Mechanism

**BLG 225/25SSS-X***

Standard Features:
- 316SS Slosh Shield
- 316SS Stem, Float and Brackets
- 25 VA Form C Hermetically Sealed Reed Switch
- 4C 18AWG PVC Jacketed Cable
- Water Tight Seal
- Manual Lift/Test Mechanism
- Made in the USA

**-X Options**
- STO Cable 16AWG 4C
- Custom Lengths of Cable

*All switches can also be supplied with 100VA form ‘C’ hermetically sealed reed switch.

**Note:**
The actuation point will vary depending on the temperature and the specific gravity of the individual liquid being detected.

---

**Max Temp** | 250F
---|---
**Max PSIG** | 120
**Float SG** | 0.68
**Watt Rating** | 25 AC/DC
**Max Volts** | 120 AC/DC

North American Sensors Corp.
Quality Pressure, Level, and Temperature Solutions

Bilge/Sump Level Switches
BLG Series

23400 HWY 435 • Abita Springs, LA 70420 • Ph: (800) 259-6874 • Fax: (985) 893-0807 • sales@mepinc.com • www.northamericansensors.com
NASC’s ABS Type approved bilge switch is designed to be installed in ships bilges, tanks and industrial sumps, where it would be bolted to an adjoining structure. Custom configurations are available upon request. Specifications regarding this model may change without notice. The BLG250/25SSS switch is the only ABS type approved bilge level switch manufactured in the US.

**BLG 250/25SSS**

**Standard Features:**
- 316SS Slosh Shield
- 316SS Stem, Float and Brackets
- 25 VA Form C Hermetically Sealed Reed Switch
- ABS Approved Cable, 6 ft. Standard
- Watertight Seal
- Manual Lift/Test Mechanism
- ABS Type Approved
- Made in the USA

*All switches can also be supplied with 100VA form ‘C’ hermetically sealed reed switch.

Note: The actuation point will vary depending on the temperature and the specific gravity of the individual liquid being detected.

For a more rugged design, our BLG 250/25SSS-B has a double bracketing system and the slosh shield is Tig welded to the brackets and stem.
NASC’s line of brass bottle switches are designed to be installed externally to ship tanks and industrial tanks. It may also be bolted to an adjoining structure. Custom configurations are available upon request. Specifications regarding this model may change without notice.

**BTL100/25BBS**

**BTL 100/25BBN**

### Standard Features:
- All Brass Bottle
- Brass Pipe Plug and Stem
- 316SS Float or Buna Float
- External Mounting Tab
- 18AWG PVC Jacketed 4C Wire
- Hermetically Sealed SPDT Reed Switch
- Made in the USA

### Wiring Logic

<table>
<thead>
<tr>
<th>Switch Rated SPDT 25VA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red - N.O.</td>
</tr>
<tr>
<td>Black - N.C.</td>
</tr>
<tr>
<td>White - Common</td>
</tr>
<tr>
<td>Green - Ground</td>
</tr>
</tbody>
</table>

**BTL100/25BBS** or **BTL100/BBN** can be supplied with a 100VA from 'C' hermetically sealed reed switch.

**Note:**
The actuation point will vary depending on the temperature and the specific gravity of the individual liquid to be detected.

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**BTL 150/25BBS**

**BTL 150/25BBN**

### Standard Features:
- All Brass Bottle
- Brass Pipe Plug and Stem
- 316SS Float or Buna Float
- External Mounting Tab
- 18AWG PVC Jacketed 4C Wire
- Hermetically Sealed SPDT Reed Switch
- 316SS Lift/Test Mechanism and Rod Wiper
- ABS Type Approved

### Example of an external bottle switch used as high - low level alarms in a tank gauging application

<table>
<thead>
<tr>
<th>Max Temp</th>
<th>175F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max PSIG</td>
<td>50</td>
</tr>
<tr>
<td>316SS Float SG</td>
<td>0.64</td>
</tr>
<tr>
<td>Buna Float SG</td>
<td>0.48</td>
</tr>
<tr>
<td>Watt Rating*</td>
<td>AC/DC</td>
</tr>
</tbody>
</table>

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NASC’s line of stainless steel bottle switches are designed to be installed externally to ship tanks and industrial tanks. It may also be bolted to an adjoining structure. Custom configurations are available upon request. Specifications regarding this model may change without notice.

BTL 400/25SSS

<table>
<thead>
<tr>
<th>Max Temp</th>
<th>175F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max PSIG</td>
<td>50</td>
</tr>
<tr>
<td>316SS Float SG</td>
<td>0.60 - 0.69</td>
</tr>
<tr>
<td>Watt Rating*</td>
<td>AC/DC</td>
</tr>
</tbody>
</table>

Standard Features:
- All 316 Stainless Steel
- Body
- Stem & Connections
- 316SS Float or Buna Float
- External Mounting Tab
- Interchangeable Parts for Easy Maintenance
- 20 AWG PVC Jacketed 4C Wire
- Hermetically Sealed SPDT Reed Switch
- Made in the USA

BTL 450/25SSS

BTL 450/25SSN

BTL400/25SSS is available with a 100VA from ‘C’ hermetically sealed reed switch.

Note:
The actuation point will vary depending on the temperature and the specific gravity of the individual liquid be detected.
North American Sensors Corp.
Quality Pressure, Level, and Temperature Solutions

Bottle Switches (External Mount Level Switches)

BTL Series

Nasc’s line of stainless steel bottle switches are designed to be installed external to marine and industrial tanks to provide a level alarm. It may also be bolted to an adjoining structure for remote mounting. Custom configurations are available upon request. Specifications regarding this model may change without notice.

BTL 500/10SSN

Standard Features:
• 316 Stainless Steel Body
• 316 Stainless Steel Stem & Connections
• Buna Float
• Interchangeable Parts for Easy Maintenance
• 3 # 22 AWG PVC Jacketed Wire
• Hermetically Sealed SPST Reed Switch
• Made in the USA

Wiring Logic

<table>
<thead>
<tr>
<th>Switch Rated SPST 10VA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black - N.C. **</td>
</tr>
<tr>
<td>White - Common</td>
</tr>
<tr>
<td>Green - Ground</td>
</tr>
</tbody>
</table>

Example of a low and high level alarm on a level gauge.

<table>
<thead>
<tr>
<th>Max Temp</th>
<th>175F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max PSIG</td>
<td>50</td>
</tr>
<tr>
<td>*Buna Float SG</td>
<td>0.45</td>
</tr>
<tr>
<td>Watt Rating*</td>
<td>25</td>
</tr>
<tr>
<td>AC/DC</td>
<td></td>
</tr>
</tbody>
</table>

*Stainless steel float available. BTL500/SSS

**N.O. available upon request

Note:
The actuation point will vary depending on the temperature and the specific gravity of the individual liquid be detected.

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NASC’s SLS300 is a side mount level switch & actuates at the location it is mounted. Designed to be used in tanks where the top of the tank is inaccessible. We offer this switch with either a 25VA or 100VA reed switch. Specifications regarding this model may change without notice. Consult factory for custom configurations.

**Standard Features:**
- Precision machined body
- 22 AWG PVC jacketed 4C wire
- 316SS Float
- Delrin Magnet Holders
- Hermetically Sealed SPDT Reed Switch
- Made in the USA

**Options Available:**
- Mounting: 1" - 3" MNPT or 1" - 4" Flanged.

**Note:**
1. The actuation point will vary depending on the temperature and the specific gravity of the individual liquid being detected.
2. This product is to be used with an approved NEMA 4X terminal box that is connected to the electrical side of the switch.

**SLS300/25SS/4SS**

**SLS300/25SSS**

**Wiring Logic**
- Switch Rated SPDT 25VA
- Red - N.O.
- Blue - N.C.
- White - Common
- Green - Ground

**Max Temp**
- 300F

**Max PSIG**
- 150

**316SS Float SG**
- 0.7

**Watt Rating**
- 25 AC/DC

SLS300/25SSS can be supplied with a 100VA from ‘C’ hermetically sealed reed switch.

*Inquire about our SLS300 with a lift test mechanism.*
North American Sensors Corp.
Quality Pressure, Level, and Temperature Solutions

Side Mount Level Switches

NASC’s SLS300T is a side mount level switch & actuates at the location it is mounted. Designed to be used in tanks where the top of the tank is inaccessible. We offer this switch with either a 25VA or 100VA reed switch. Specifications regarding this model may change without notice. Consult factory for custom configurations.

Options Available:
Mounting: 1” - 3” MNPT or 1” - 4” Flanged.

Note:
1. The actuation point will vary depending on the temperature and the specific gravity of the individual liquid being detected.
2. This product is to be used with an approved NEMA 4X terminal box that is connected to the electrical side of the switch.

Wiring Logic
Switch Rated SPDT 25VA
Red - N.O.
Blue - N.C.
White - Common
Green - Ground

SLS300T/25SSS can be supplied with a 100VA from ‘C’ hermetically sealed reed switch.

Standard Features:
• Precision machined body
• 22 AWG PVC jacketed 4C wire
• 316SS Float
• Delrin Magnet Holders
• Hemetically Sealed SPDT Reed Switch
• Made in the USA
• Manual Lift/Test Mechanism

<table>
<thead>
<tr>
<th>Max Temp</th>
<th>300F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max PSIG</td>
<td>50</td>
</tr>
<tr>
<td>316SS</td>
<td>0.7</td>
</tr>
<tr>
<td>Float SG</td>
<td></td>
</tr>
<tr>
<td>Watt</td>
<td>25</td>
</tr>
<tr>
<td>Rating*</td>
<td>AC/DC</td>
</tr>
</tbody>
</table>

23400 HWY 435 • Abita Springs, LA 70420 • Ph: (800) 259-6874 • Fax: (985) 893-0807 • sales@mepinc.com • www.northamericansensors.com
NASC's SLS90 is designed to interface between two different liquids (i.e., oil & water). The 0.95 specific gravity float enables this unique design to sense when heavier liquids collect in the bottom of storage tanks. Custom configurations are available, consult the factory for more information. Specifications regarding this model may change without notice.

### Standard Features:
- All 316 Stainless Steel
- 1/2” .065 Wall Tubing Stem
- 2” Hex Head Pipe Plug
- 316SS Float
- 18 AWG/4C Foil Shielded Cable
- Hermetically Sealed SPDT Reed Switch

### Wiring Logic
- Red - N.O.
- Black - N.C.
- White - Common
- Green - Ground

Flange connections from 3” and above available.

**SLS90/25SSS** can be supplied with a 100VA from 'C’ hermetically sealed reed switch.

### Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Temp</td>
<td>250°F</td>
</tr>
<tr>
<td>Max PSIG</td>
<td>150</td>
</tr>
<tr>
<td>316SS Float SG</td>
<td>0.95</td>
</tr>
<tr>
<td>Watt Rating*</td>
<td>AC/DC</td>
</tr>
</tbody>
</table>

**Note:**
1. The actuation point will vary depending on the temperature and the specific gravity of the individual liquid being detected.
2. This product is to be used with an approved NEMA 4X terminal box that is connected to the electrical side of the switch.
Custom Level Switch Ordering Form

Please fill in all boxes below. A part number will be generated from your selections.

**Product P/N:**

Example P/N: MLS-S50-T1000-SSW-NLT-C50/W18-505-(IL=20”, L1=18”, L2=4”)/O-25-C

**Sensor Type:**
- **MLS** = Multi-Level Switch
- **CLS** = Single-Level Switch
- **GMLS** = Guarded Multi-Level Switch
- **GCLS** = Guarded Single-Level Switch

**Material of Construction:**
- **M** = Brass
- **S** = Stainless Steel
- **P** = PVC
- **PP** = Polypropylene

**Series (Stem Type):**
- **25** = Ø1/4" Piping
- **50** = Ø1/2" Tubing
- **70** = Ø3/4" Tubing
- **100** = Ø1" Tubing

**Material of Construction:**
- **Threaded Connection**
  - **T1000** = 1" MNPT
  - **T1250** = 1-1/4" MNPT
  - **T1500** = 1-1/2" MNPT
  - **T2000** = 2" MNPT
  - **T3000** = 3" MNPT

**Flanged Connection**
- **R** = Raised Face
- **F** = Flat Face
- **CS** = Carbon Steel
- **SS** = Stainless Steel
- **F1** = 1"
- **F2** = 2"
- **F3** = 3"
- **F4** = 4"
- **F5** = 5"
- **F6** = 6"

**Float Protection:**
- **SSW** = S.S. Stilling Well
- **PSW** = PCV Stilling Well
- **NFP** = No Float Protection

**Electrical Connection:**
- **C50** = 1/2" MNPT
- **C55** = 1/2" FNPT
- **C70** = 3/4" MNPT

**Terminal Heads (optional):**
- **PSCT** = Plastic
- **SSCT** = Stainless Steel
- **ASCT** = Aluminum

**Number of Switch-points:**
- **IL** = Overall length of unit in inches (bottom of switch mount to end of stem) in inches
- **L1** = switch point 1 at _______ in
- **L2** = switch point 2 at _______ in
- **L3** = switch point 3 at _______ in
- **L4** = switch point 4 at _______ in
- **L5** = switch point 5 at _______ in
- **L6** = switch point 6 at _______ in

**Switching Position:**
- **O** = Switch open in dry position
- **C** = Switch closed in dry position
- **D** = SPDT

**Switch ID #:**
- **25** = 25VA
- **100** = 100VA

**Common Leads:**
- **S** = Each switch has an independent common.
- **C** = Each switch has a shared common

For more information on custom level switches, please call 1-800-259-6874 or send an email to sales@mepinc.com.
The model DS150 ‘dipstick’ gauge is a mechanical-magnetic level gauge that is designed for high level indicating applications where a non-electrical gauge is required. This gauge works by lifting the internal stick, which has a magnet housing on the bottom, that interlocks with the magnet inside the float. Stick is assembled in different colored (red, yellow, and green) sections. The integral rain cap on top of stick is PVC. Custom configurations are available, consult the factory for more information. Specifications regarding this model may change without notice.

**Standard Features:**
- 316SS or Carbon Steel Flange (8” Standard)
- 1” 316SS Stem/Housing
- Segmented Anodized Aluminum Stick/Indicator
- 316SS 7” Float
- Made in the USA

**Model Code (Example):** DS150/L39-M8FSS-F7SS-1SS
Specify DS150/L(Length in inches)/M(Mounting type)
Series 1 Pressure Switch

Key Features

- Field Adjustable
- High, Low, Differential & Vacuum Pressure Switch options available
- All Anodized Aluminum Construction
- 316SS Pressure Ports Available
- All Markings Laser Engraved into body for long lasting durability and visibility
- Multiple Electrical Connections Available
- 11amp UL recognized micro switch standard, gold plated contacts and 5amp micro switch also available
- UL & cUL Approved
- NEMA 4, 4x, 13

Operating Specifications

Adjustment Range: See Table Below for Options
Circuit Form: SPDT
Electrical Ratings: 11A (RES/IND) - 1/4 HP @125 OR 250VAC 5A RES, 3A IND @ 28VDC .5A RES @ 28VDC Optional: 100mA @125VAC, 0.25A @ 6VDC
Pressure Connection: See Ordering Chart Adjacent
Temperature Range: -30°F to 160°F (-34°C to 71°C)
Diaphragm Material: See Ordering Chart Adjacent
Electrical Connection: See Ordering Chart Adjacent
Multi-Conductor: UL 22464, CSA TI 18AWG PVC insulated per UL
Cycle Life: Model 1A, 1C, 1G, 1Z 1H for moderate to low cycling, Model 1P for high cycling applications

How to Order

(Example: Part Number 1G10N1.43)

1 G 10 N1 .43

Range
01  2 - 15 psi
03  5 - 75 psi
43  15 - 200 psi
53  50 - 450 psi
62  50 - 1750 psi
71+ 100 - 1800 psi
72+ 200 - 2500 psi
73+ 350 - 3250 psi
83** 400 - 4000 psi
84** 500 - 5000 psi

Diaphragm
N1 Nitrile Polyamide
F1 Viton Polyamide
F2 Viton Stainless Steel
F6** Viton Polyamide
N9* Nitrile SST Piston Teflon

Electrical Connection
10 18" Free leads
11 DIN 43650/IP65
42 Terminal Strip for Wiring

Pressure Connection
A AL 1/2"-14 NPT
C 316SS 1/4"-18 NPT
D 316SS 1/4"-18 NPT
H+* 316SS 1/8"-18 NPT
P+ AL 1/4"-18 NPT
Z 316SS/1/2"-14 NPT

Options:
(Example: Part Number 1G10N1.43.5)
.5 5A Micro Switch
* Available only for model 1P (Piston Pressure Switch)
** Available only for model 1H (S.S. Piston Pressure Switch)

Wiring Diagram

DIN43650

18" Free leads
BLUE = N.O.
RED = N.C.
BROWN = COM
GREEN = GRD

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Series 1 Pressure Switch

Low Pressure Switch

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Adj. Range</th>
<th>Deadband</th>
<th>Proof Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1G10N1.12</td>
<td>0.36 - 3.61 psi</td>
<td>0.018 - 0.108 psi</td>
<td>250 psi</td>
</tr>
<tr>
<td>1G10N1.14</td>
<td>2 - 16 psi</td>
<td>0.072 - 0.25 psi</td>
<td>250 psi</td>
</tr>
<tr>
<td></td>
<td>(10” - 100” WC)</td>
<td>(0.5” - 3” WC)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(55” - 443” WC)</td>
<td>(2” - 7” WC)</td>
<td></td>
</tr>
</tbody>
</table>

Terminal Strip

<table>
<thead>
<tr>
<th>Part Number</th>
<th>1X42XX,XX</th>
</tr>
</thead>
</table>

Anodized aluminum terminal strip is for wiring a 1/2-14 FNPT conduit fitting. This option is available for any pressure ranges including the differential, vacuum, and high pressure switches.

How to Order

(Example: Part Number 1G10N1.43)

1  G  10  N1  •  43

Options:

- Available only for model 1P (Piston Pressure Switch)
- Available only for model 1H (S.S. Piston Pressure Switch)
Series 1 Pressure Switch

**Differential Pressure Switch**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>1DXXF1.02</th>
<th>1DXXF1.04</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adj. Range</td>
<td>2 - 20 psi</td>
<td>5 - 95 psi</td>
</tr>
<tr>
<td>Max System</td>
<td>400 psi</td>
<td>400 psi</td>
</tr>
<tr>
<td>Proof Hi/Lo</td>
<td>1000 psi</td>
<td>1000 psi</td>
</tr>
<tr>
<td>Proof Lo/Hi</td>
<td>1000 psi</td>
<td>1000 psi</td>
</tr>
<tr>
<td>Pressure Port</td>
<td>AL 1/4-18 FNPT</td>
<td>AL 1/4-18 FNPT</td>
</tr>
</tbody>
</table>

**Also available in 316SS 1/4-18 FNPT process fittings (P/N: 1DXXXX.XX)**

**Vacuum Switch**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>1VXXN9.91</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacuum Range</td>
<td>1 - 28 inHg</td>
</tr>
<tr>
<td>Deadband</td>
<td>0.75- 1.50 inHg</td>
</tr>
<tr>
<td>Proof Test</td>
<td>300 psi</td>
</tr>
<tr>
<td>Pressure Port</td>
<td>AL 1/8-27 FNPT</td>
</tr>
</tbody>
</table>

**Electrical Connection**

10 - 18” Free leads 11 - DIN 43650/IP65

**Operating Specifications**

- **Adjustment Range:** See Table on Page 1 for Options
- **Circuit Form:** SPDT
- **Electrical Ratings:** 11A (RES/IND) - 1/4 HP @125 OR 250VAC, 5A RES, 3A IND @ 28VDC, .5A RES @ 28VDC
- **Optional:** 000mA @125VAC, 0.25A @ 6VDC
- **Pressure Connection:** See Ordering Chart on Page 1 for Options
- **Temperature Range:** -30°F to 160°F (-34°C to 71°C)
- **Diaphragm Material:** See Ordering Chart on Page 1 for Options
- **Electrical Connection:** See Ordering Chart on Page 1 for Options
- **Multi-Conductor Cable:** UL 22464, CSA TL 18AWG PVC insulated per UL 1007, secured with a nylon liquid tight connector
- **Cycle Life:** Model 1A, 1C, 1G, 1Z 1H for moderate to low cycling, Model 1P for high cycling applications

**Key Features**

- Field Adjustable
- High, Low, Differential & Vacuum Pressure Switch options available
- All Anodized Aluminum Construction
- 316SS Pressure Ports Available
- All Markings Laser Engraved into body for long lasting durability and visibility
- Multiple Electrical Connections Available
- 11amp UL recognized micro switch standard, gold plated contacts and 5amp micro switch also available
- UL & cUL Approved
- NEMA 4, 4x, 13
Series 2 Pressure Switch

Key Features
- Field Adjustable
- Compact Design
- All Anodized Aluminum Construction
- 316SS Pressure Ports Available
- All Markings Laser Engraved into body for long lasting durability and visibility
- Multiple Electric Connections Available
- 11amp UL recognized micro switch standard, gold plated contacts and 5amp micro switch also available
- UL & cUL Approved
- NEMA 4, 4x, 13

How to Order
(Example: Part Number 2G11N1.63)

<table>
<thead>
<tr>
<th>Range ID</th>
<th>Model</th>
<th>Range ID</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>.01</td>
<td>2A</td>
<td>2 - 20</td>
<td>0.138 - 1.38</td>
</tr>
<tr>
<td>.03</td>
<td>2C</td>
<td>5 - 95</td>
<td>0.34 - 6.55</td>
</tr>
<tr>
<td>.43</td>
<td>2G</td>
<td>15 - 200</td>
<td>1.03 - 13.79</td>
</tr>
<tr>
<td>.53</td>
<td>2G</td>
<td>50 - 450</td>
<td>3.45 - 31.03</td>
</tr>
<tr>
<td>.62</td>
<td>2G</td>
<td>50 - 1000</td>
<td>3.45 - 68.95</td>
</tr>
<tr>
<td>.63</td>
<td>2G</td>
<td>100 - 1750</td>
<td>6.89 - 120.66</td>
</tr>
<tr>
<td>.71</td>
<td>2P</td>
<td>100 - 1800</td>
<td>6.89 - 124.11</td>
</tr>
<tr>
<td>.72</td>
<td>2P</td>
<td>200 - 2500</td>
<td>13.79 - 172.37</td>
</tr>
<tr>
<td>.73</td>
<td>2P</td>
<td>350 - 3250</td>
<td>24.13 - 443.09</td>
</tr>
<tr>
<td>.74</td>
<td>2P</td>
<td>400 - 4500</td>
<td>27.58 - 1010.27</td>
</tr>
</tbody>
</table>

Operating Specifications

### Adjustment Range
See Table Below for Options

### Circuit Form
11A (RES/IND) - 1/4 HP @125 OR 250VAC
5A RES, 3A IND @ 28VDC
.5A RES @ 28VDC

Optional: 100mA @125VAC, 0.25A @ 6VDC

### Electrical Connections
See Ordering Chart Adjacent for Options

### Pressure Connection
See Ordering Chart Adjacent for Options

### Temperature Range
See Ordering Chart Adjacent for Options

### Diaphragm Material
See Ordering Chart Adjacent for Options

### Electrical Connection
See Ordering Chart Adjacent for Options

### Multi-Conductor Cable
UL 22464, CSA TL 18AWG PVC insulated per UL 1007, secured with a nylon liquid tight connector

### Cycle Life
Model 2A, 2C, 2G, 2Z for moderate to low cycling
Model 2P for high cycling applications

### Options:
(Example: Part Number 2G11N1.63 B)

- **1** MS33649-4 Pressure Fitting
- **2** Gold Contact Switch
- **5** 5A Micro Switch
- **B** Base bracket for mounting

*Available only for model 2P (Piston Pressure Switch)*

### Wiring Diagram

- DIN 43650
- PIN 1 = N.O.
- PIN 2 = N.C.
- PIN 3 = C/O

Blue = N.O.
Red = N.C.
Brown = C/O
Green = G/R
Series 6 Pressure Switch

**Key Features**
- Explosion Proof, Rated for Hazardous Areas
- Field Adjustable
- Low Pressure Switch Available
- All precision machined Anodized aluminum Construction
- 316SS Pressure Ports Available
- All Markings Laser Engraved into body for long lasting durability and visibility
- 11amp UL recognized micro switch standard, gold plated contacts and 5amp micro switch also available
- UL Approved
- NEMA 4, 4x, 7, 9

**Operating Specifications**

<table>
<thead>
<tr>
<th>Adjustment Range</th>
<th>Circuit Form</th>
<th>Electrical Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>See Table Below for Options</td>
<td>SPDT (12), DPDT (33)</td>
<td>11A (RES/IND) - 1/4 HP @125/250VAC 5A RES @ 30VDC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pressure Connection</th>
<th>See Ordering Chart Adjacent for Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature Range</td>
<td>-30°F to 160°F (-34°C to 71°C)</td>
</tr>
<tr>
<td>Diaphragm Material</td>
<td>See Ordering Chart Adjacent for Options</td>
</tr>
<tr>
<td>Electrical Connection</td>
<td>See Ordering Chart Adjacent for Options</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>Range ID</th>
<th>Switch Adjustment Range</th>
<th>Dead Band Approx.</th>
<th>Max System</th>
<th>Proof Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>6A 6Z</td>
<td>.01</td>
<td>2 - 15 psi</td>
<td>0.138 - 1.03</td>
<td>0.2 - 4 psi</td>
<td>0.014 - 0.275</td>
</tr>
<tr>
<td>6C 6G</td>
<td>.03</td>
<td>5 - 75 psi</td>
<td>0.34 - 5.17</td>
<td>0.5 - 8 psi</td>
<td>0.034 - 0.551</td>
</tr>
<tr>
<td>6C 6G</td>
<td>.43</td>
<td>15 - 200 psi</td>
<td>1.03 - 13.79</td>
<td>2 - 18 psi</td>
<td>0.138 - 1.24</td>
</tr>
<tr>
<td>6C 6G</td>
<td>.53</td>
<td>50 - 450 psi</td>
<td>3.45 - 31.03</td>
<td>5 - 33 psi</td>
<td>0.345 - 2.27</td>
</tr>
<tr>
<td>6P</td>
<td>.62</td>
<td>50 - 1000 psi</td>
<td>6.89 - 120.66</td>
<td>15 - 110 psi</td>
<td>1.03 - 7.58</td>
</tr>
<tr>
<td>6H</td>
<td>.64</td>
<td>200 - 2500 psi</td>
<td>13.79 - 172.37</td>
<td>20 - 175 psi</td>
<td>1.38 - 12.06</td>
</tr>
<tr>
<td>6P</td>
<td>.73</td>
<td>350 - 3250 psi</td>
<td>24.13 - 224.09</td>
<td>50 - 400 psi</td>
<td>3.45 - 27.58</td>
</tr>
<tr>
<td>6H</td>
<td>.83</td>
<td>400 - 4000 psi</td>
<td>27.58 - 275.29</td>
<td>75 - 500 psi</td>
<td>5.17 - 34.74</td>
</tr>
<tr>
<td>6H</td>
<td>.84</td>
<td>500 - 5000 psi</td>
<td>34.47 - 344.74</td>
<td>75 - 500 psi</td>
<td>5.17 - 34.74</td>
</tr>
</tbody>
</table>

**Low Pressure Switch**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Adj. Range</th>
<th>Deadband</th>
<th>Proof Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>6G12N1.12</td>
<td>0.36 - 3.61 psi (10&quot; - 100&quot; WC)</td>
<td>0.027 - 0.144 psi (0.75&quot; - 4&quot; WC)</td>
<td>250 psi</td>
</tr>
<tr>
<td>6G12N1.14</td>
<td>0.36 - 3.61 psi (10&quot; - 100&quot; WC)</td>
<td>0.027 - 0.144 psi (0.75&quot; - 4&quot; WC)</td>
<td>250 psi</td>
</tr>
</tbody>
</table>

**Diaphragm**
- N1: Nitrile Polyamide
- F1: Viton Polyamide
- F2: Viton Stainless Steel
- F6: Viton Polyamide
- N9: Nitrile SST Piston Teflon

**Electrical Connection**
- 12: SPDT (Silver)
- 33: DPDT (Silver)

**Pressure Connection**
- A: AL 1/2"-14 NPT
- B: 316SS 1/4"-18 NPT
- D: AL 1/4"-18 NPT
- G: AL 1/4"-18 NPT
- H: 316SS 1/4"-18 NPT
- P: AL 1/4"-18 NPT
- Z: 316SS 1/2"-14 NPT

* Available only for model 6P (Piston Pressure Switch)
** Available only for model 6H (High Pressure Switch)

* Listed by: Underwriters Laboratories Inc. (File No. E123884) Suitable for Class I, Groups A, B, C, D; Class II, Groups E, F, G.

**Wiring Diagram**
Series 6 Pressure Switch

**Dimensional Specifications**

- **Diaphragm**
  - N1: Nitrile Polyamide
  - F1: Viton Polyamide
  - F2: Viton Stainless Steel
  - F6**: Viton Polyamide
  - N9*: Nitrile SST Piston Teflon

- **Electrical Connection**
  - 12: SPDT (Silver)
  - 33: DPDT (Silver)

- **Pressure Connection**
  - A: AL 1/2"-14 NPT
  - C: 316SS 1/4"-18 NPT
  - D: AL 1/4"-18 NPT
  - G: AL 1/4"-18 NPT
  - H**: 316SS 1/4"-18 NPT
  - P*: AL 1/4"-18 NPT
  - Z: 316SS 1/4"-18 NPT

**How to Order**

(Example: Part Number 6G12F1.03)

- **Range**
  - 01: 2 - 15 psi
  - 03: 5 - 75 psi
  - 43: 15 - 200 psi
  - 53: 50 - 450 psi
  - 62: 50 - 1000 psi
  - 63: 100 - 1750 psi
  - 64: 200 - 2500 psi
  - 73*: 350 - 3250 psi
  - 83**: 400 - 4000 psi
  - 84**: 500 - 5000 psi

**Diaphragm**
- N1: Nitrile Polyamide
- F1: Viton Polyamide
- F2: Viton Stainless Steel
- F6**: Viton Polyamide
- N9*: Nitrile SST Piston Teflon

**Electrical Connection**
- 12: SPDT (Silver)
- 33: DPDT (Silver)

**Pressure Connection**
- A: AL 1/2"-14 NPT
- C: 316SS 1/4"-18 NPT
- D: AL 1/4"-18 NPT
- G: AL 1/4"-18 NPT
- H**: 316SS 1/4"-18 NPT
- P*: AL 1/4"-18 NPT
- Z: 316SS 1/4"-18 NPT

* Available only for model 6P (Piston Pressure Switch)
** Available only for model 6H (High Pressure Switch)
Series 575 Pressure Transmitter

Two wire 4-20mA output transmitters offering superb chemical and corrosion resistance. Gauge or Absolute pressure is detected using a four active arm strain gauge bridge sensor, fuse to a high-purity ceramic diaphragm. Ranges from 100mbar to 600 bar or scaled to customers requirements.

Key Features
- All Stainless Steel Housing
- Rugged Construction
- Wide Pressure Ranges Available
- 4 - 20mA Output
- Excellent Linearity
- Long Term Stability
- Wide Temperature Range
- Excellent Corrosion Resistance
- Units can be factory scaled
- ABS Type Approved

Operating Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wetted Materials</td>
<td>316L S.S., Alumina ceramic &amp; Viton</td>
</tr>
<tr>
<td>Standard Ranges</td>
<td>See Ordering Chart for Options</td>
</tr>
<tr>
<td>Safe over-range pressure</td>
<td>1.5 x rated range</td>
</tr>
<tr>
<td>Burst Pressure</td>
<td>3 x rated range minimum</td>
</tr>
<tr>
<td>Output—span</td>
<td>16mA +/- 1% span</td>
</tr>
<tr>
<td>Output—zero</td>
<td>4mA +/- 1% span</td>
</tr>
<tr>
<td>Non-linearity, hysteresis &amp;</td>
<td>0.25% of span (best fit straight</td>
</tr>
<tr>
<td>Repeatability</td>
<td>line)</td>
</tr>
<tr>
<td>Compensated</td>
<td>-0 to +80 deg C</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>-20 to +125 deg C</td>
</tr>
<tr>
<td>Thermal zero shift</td>
<td>+/- 0.04% span per deg C</td>
</tr>
<tr>
<td>Thermal Span</td>
<td>+/- 0.015% reading per deg C</td>
</tr>
<tr>
<td>Long Term Stability</td>
<td>0.1% per 12 month typical</td>
</tr>
<tr>
<td>Supply</td>
<td>10 to 32VDC</td>
</tr>
<tr>
<td>Loop Resistance</td>
<td>1.1kΩ max @ 32VDC supply</td>
</tr>
</tbody>
</table>

23400 HWY 435 • Abita Springs, LA 70420 • Ph: (800) 259-6874 • Fax: (985) 893-0807 • sales@mepinc.com • www.northamericansensors.com
Series 575 Pressure Transmitter

Dimensional Specifications

Wiring Diagram

DIN43650
PIN 1 = -/BLUE
PIN 3 = +/RED
FLAT PIN: TO CASE

Power Supply

Zero Pot adjust
Span Pot adjust

Cable Outlet

Accuracy Class
A: NL&H < ± 0.1%/span BFSL
B: NL&H < ± 0.15%/span BFSL
C: NL&H < ± 0.25%/span BFSL

How to Order
(Example: Part Number PTR575G/T7/20B/Q/C/V/300)

Process Connection
T1 Submersible (flat diaphragm)
T2 1/4” BSP w/ Delrin Nose Cone
T7 1/2” NPT (male)
T29 3/4” BSP (flat diaphragm)
T40 1/4” NPT (female)
T41 1/4” NPT (male)
T42 1/4” BSP (male)
T43 1/4” BSP (female)
T44 1/2” BSP (female)
T45 1/2” BSP (male)

Range
10B 10bar
0.1B 0.1 bar
0.4B 0.4 bar
1B 1 bar
2B 2 bar
3B 3 bar
5B 5 bar
10B 100 bar
20B 200 bar
40B 400 bar
50B 500 bar

Cable Outlet
C IP65 crimped cable & length (ft.)
D IP65 mini DIN40050 plug & socket
H IP65 DIN43650 plug & socket
I IP68 glanded cable & length (ft.)
Q Cable outlet DIN43650 w/4-20mA adjustable pots

O-ring Material
V Viton
E EPDM
H HNBR
K Kalrez

* PTR575A (Atmospheric, Zero offset ranges available.)
Series 525 Pressure Transmitter

Two wire 4-20mA output transmitters offering superb chemical and corrosion resistance. Gauge or Absolute pressure is detected using a four active arm strain gauge bridge sensor, fuse to a high-purity ceramic diaphragm. Ranges from 100mbar to 50 bar or scaled to customers requirements. Standard cable length is 10’, custom cable lengths available.

---

**Operating Specifications**

<table>
<thead>
<tr>
<th>Wetted Materials</th>
<th>316L S.S., Alumina ceramic &amp; Viton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Ranges</td>
<td>See Ordering Chart for Options</td>
</tr>
<tr>
<td>Safe over-range pressure</td>
<td>1.5 x rated range</td>
</tr>
<tr>
<td>Burst Pressure</td>
<td>3 x rated range minimum</td>
</tr>
<tr>
<td>Output—span</td>
<td>16mA +/- 1%span</td>
</tr>
<tr>
<td>Output—zero</td>
<td>4mA +/- 1%span</td>
</tr>
<tr>
<td>Non-linearity, hysteresis &amp; Repeatability</td>
<td>0.25% of span (best fit straight line)</td>
</tr>
<tr>
<td>Compensated</td>
<td>-0 to +80 deg C (32 to 176F)</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>-20 to +125 deg C (-4 - 257F)</td>
</tr>
<tr>
<td>Thermal zero shift</td>
<td>+/- 0.04% span per deg C</td>
</tr>
<tr>
<td>Thermal Span</td>
<td>+/- 0.015% reading per deg C</td>
</tr>
<tr>
<td>Long Term Stability</td>
<td>0.1% per 12 month typical</td>
</tr>
<tr>
<td>Supply</td>
<td>10 to 32VDC</td>
</tr>
<tr>
<td>Loop Resistance</td>
<td>1.1kΩ max @ 32VDC supply</td>
</tr>
</tbody>
</table>

---

**Key Features**

- All Stainless Steel Housing
- Rugged Construction
- Wide Pressure Ranges Available
- 4 - 20mA Output
- Excellent Linearity
- Long Term Stability
- Wide Temperature Range
- Excellent Corrosion Resistance
- Units can be factory scaled
- ABS Type Approved
**Series 525 Pressure Transmitter**

### Dimensional Specifications

Cable (OD .25" +/- .05)

**Process Connection**
- T1: Submersible (flange diaphragm)
- T2: 1/4" BSP w/ Delrin Nose Cone
- T7: 1/2" NPT (male)
- T29: 3/4" BSP (flange diaphragm)
- T40: 1/4" NPT (female)
- T41: 1/4" NPT (male)
- T42: 1/4" BSP (male)
- T43: 1/4" BSP (female)
- T44: 1/2" BSP (female)
- T45: 1/2" BSP (male)

### How to Order

(Example: Part Number PTR525G/T7/20B/I30/C/V/300)

**Accuracy Class**
- A: NL&H ≤ ± 0.1%/span BFSL
- B: NL&H ≤ ± 0.15%/span BFSL
- C: NL&H ≤ ± 0.25%/span BFSL

**O-ring Material**
- V: Viton
- E: EPDM
- H: HNBR
- K: Kalrez

**Wiring Diagram**

- POWER SUPPLY
  - + SUP
  - - SUP
- METER
  - - SIG
  - + SIG
- CABLE
  - Red
  - Blue
  - White
- To Case

**Series 525 (Atmospheric, Zero offset ranges available.)**

INTRINSICALLY SAFE PRESSURE TRANSDUCER
EEx ia IIC T4 (Tambient max = +90°C) Sira 02ATEX2386X
Type: PTR525

**Serial No:**
- Ui = 28V
- Ci = 60nF
- Pi = 0.84W
- li = 120mA
- Li = 0

---

North American Sensors Corp.
Quality Pressure, Level, and Temperature Solutions

Level/Pressure Transmitters

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Series 150 Pressure Transmitter

The PTR150 is a compact & robust transmitter, providing pressure measurement in the range of 1 to 200 bar. All ranges are available in gauge or absolute format to suit customer requirements. An all laser welded stainless steel construction ensures media isolation. The product is designed to meet the tough environmental conditions experienced by modern day applications.

Key Features

- Compact and rugged construction
- Cost effective
- 1% total error band (-40°C to 105°C)
- High immunity to EMC: 100V/m
- 5V supply: 0.5 to 4.5V ratiometric output
- 8 to 30V supply: 4-20mA or 1 to 5V output
- Packard, M12 or Mini DIN connectors

Operating Specifications

Output Type | 0.5 to 4.5V | 4-20mA | 1 - 5V
--- | --- | --- | ---
Non-linearity, Hysteresis & Repeatability | 5 bar - 200 bar | V0.5% FS | <1.00% FS
| <5 bar | | |
Thermal Error | 5 bar - 200 bar | V0.5% FS | <1.00% FS
| <5 bar | | |
Stability | | | <0.25% / Year
Operating Temperature | | | -40°C to +105°C
Proof Pressure | | | 3 x FS
Burst Pressure (absolute) | | | Lesser of 10 x FS or 100 bar
Burst Pressure (gauge) | | | 5 x FS

Wetted Materials

304L & 316L SS, Al₂O₃

Pressure/Temperature Cycles

>1.8*10⁷ Cycles (50Hz at 80MHz to 100MHz
>105°C, 0.5hr soak at temp)

Vibration

144 hours (10 to 50Hz, 3g sinusoidal, 3 axes)

EMC Compatibility

100 V/m (80MHz to 1 GHz)

Humidity

250 hours (85°C and 90% to 95% RH)

Weight

<100g

How to Order

(Example: Part Number PTR150G/T41/20B/MD/MA/300psi)

<table>
<thead>
<tr>
<th>Pressure Datum</th>
<th>G Gauge</th>
<th>A Absolute</th>
<th>S Sealed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Connection</td>
<td>T40 1/4” NPT (female)</td>
<td>T41 1/4” NPT (male)</td>
<td>T42 1/4” BSP (male)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Range</th>
<th>10B 10bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1B</td>
<td>0.1 bar</td>
</tr>
<tr>
<td>0.4B</td>
<td>0.4 bar</td>
</tr>
<tr>
<td>1B</td>
<td>1 bar</td>
</tr>
<tr>
<td>2B</td>
<td>2 bar</td>
</tr>
<tr>
<td>3B</td>
<td>3 bar</td>
</tr>
<tr>
<td>5B</td>
<td>5 bar</td>
</tr>
<tr>
<td>10B</td>
<td>10 bar</td>
</tr>
<tr>
<td>20B</td>
<td>20 bar</td>
</tr>
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<td>50B</td>
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<tr>
<td>200B</td>
<td>200 bar</td>
</tr>
<tr>
<td>400B</td>
<td>400 bar</td>
</tr>
<tr>
<td>500B</td>
<td>500 bar</td>
</tr>
</tbody>
</table>

Electrical Connection

P Packard Metripak
MD DIN40050
M12 4 pin
16 150mm Integral Harness
122 300mm Integral Harness
175 1800mm Integral Harness

Output Type

45 0.5-4.5V (5V Excitation)
9V 1.5V (8 to 30V Excitation)
mA 4-20mA (8 to 30V Excitation)

Output current

0.45mA Max (Sink of Source)
0.45mA Max (Sink of Source)

Response Time

<1mS
<1mS
<1mS

Reverse Polarity Protection

N/A
Yes
Yes

Wiring Diagram

DIN43650
PIN 1 = -/BLUE
PIN 3 = +/RED
FLAT PIN: TO CASE

* Other process connections available
ICT 1000 Level/Pressure Transmitter

NASC has drawn upon thirty years of global marine application experience, to develop a smart dual mode MODBUS and analogue pressure transmitter that offers you the highest possible standards in terms of performance, versatility, functionality and reliability. The ICT 1000 pressure transmitter's advanced capacitive measurement cell is manufactured in robust and durable ceramic, and our careful design of the sensor means the diaphragm is fully supported and protected against overload and shock conditions. The ICT 1000 transmitter body is manufactured from 316SS and employs a carefully engineered Kalrez seal assembly to provide a fully submersible (IP68) construction capable of withstanding the toughest operating conditions for many years. The ICT has a powerful on-board micro-controller to precisely monitor the pressure related output of the capacitive cell. Ambient temperature is also monitored to provide a fully compensated measurement output. The transmitter is certified according to ATEX regulations for installation in a hazardous area and approved by many major classifications societies as suitable for use in marine applications.

Key Features

- Constructed and type approved specifically for pressure measurement in marine applications
- Simple to install, robust and reliable
- Wide range of process and electrical connections
- Ceramic measuring cell ensures high accuracy, long term stability and a wide measuring range
- Gauge, Absolute and Compound calibration options
- Dual-mode operation provides outputs as 4-20mA and RS485 MODBUS
- Smart micro-controller operation allows remote programming and diagnostics via RS485 modem

Digital and analogue operation

The ICT 1000 is capable, depending on option, of operating as both an analogue 4-20mA hydrostatic level transmitter and communicating directly to the host system using the RS485 MODBUS protocol. The integral temperature measurement is also available as an output variable in digital mode.

Smart Programming

The ICT 1000 is a smart pressure transmitter capable of being remotely programmed for measurement range, functionality and diagnostics by the user via RS485 serial modem and NASC supplied software configuration tool.

Part of the TankView Product family

Including the RFM series of field mount connection and barrier modules and TankView software, display and control modules. These comprise a simple to install but scalable solution for marine level measurement and supervision systems for ballast, cargo, service and bunker fuel oil tanks.

Save money and Time

When installing for multi-point applications ICT 1000 digital mode enables significant cost and weight savings for cable runs to individual transmitters by utilizing an RS485 communication with NASC RFM series modules.
## Operating Specifications

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Power Supply Digital Only Mode</th>
<th>Power Supply Including Analogue Mode</th>
<th>Accuracy: Level (at 20°C and 1 bar)</th>
<th>Long Term Stability</th>
<th>Accuracy: Temperature</th>
<th>Temperature Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8 - 30 Vdc</td>
<td>12 - 30 Vdc</td>
<td>±0.1% FS (Digital mode only)</td>
<td>1°C/Year</td>
<td>±1°C (Measurement available in digital mode only)</td>
<td>±0.025% FS per 1°C (Over calibration range of 0-60°C Other temperature ranges on request)</td>
</tr>
<tr>
<td>Measuring Cell Pressure Overload Ratings</td>
<td></td>
<td></td>
<td>Range (Bar)</td>
<td>Proof Pressure (Bar)</td>
<td>Burst Pressure (Bar)</td>
<td>Range (Bar)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.20</td>
<td>1.4</td>
<td>2.7</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.35</td>
<td>1.5</td>
<td>3</td>
<td>0.35</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>6</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10</td>
<td>30</td>
<td>50</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>20</td>
<td>60</td>
<td>100</td>
<td>20</td>
</tr>
</tbody>
</table>

Analogue Output: 4-20mA 2 wire loop powered  
Digital Output: RS485 MODBUS 2 wire half duplex  
Sensing Element: Ceramic (96% Al₂O₃) measuring cell  
Construction: 316SS with Kalrez seal and LSHF PET-E sheathed cable  
Operating Temperature: -20°C to +80°C  
IP Rating: IP68 (suitable for continuous immersion)  
Intrinsic Safety: Ex ia LLC T4  

## Dimensional Specifications

![Dimensional Specifications Diagram]
### ICT Series

#### Level/Pressure Transmitters

**Model Code 7 Position Construction (ex: 1050 / S / C / S1 / 6 / F / 7.5)**

<table>
<thead>
<tr>
<th>Position</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1: Output</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1040</td>
<td>Digital output only</td>
</tr>
<tr>
<td></td>
<td>1050</td>
<td>Analogue output only</td>
</tr>
<tr>
<td></td>
<td>1060</td>
<td>Analogue and Digital outputs</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>Absolute measurement, otherwise leave blank</td>
</tr>
<tr>
<td><strong>2: Approvals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>Safe area installation</td>
</tr>
<tr>
<td></td>
<td>I</td>
<td>Hazardous area installation (ATEX intrinsic safety (IS) approval)</td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>Hazardous area installation (IECEx intrinsic safety (IS) approval)</td>
</tr>
<tr>
<td><strong>3: Transmitter Maximum Pressure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>2m H2O (200 mbar)</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>3.5 H2O (350 mbar)</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>10m H2O (1 bar)</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>20m H2O (2 bar)</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>50m H2O (5 bar)</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>100m H2O (10 bar)</td>
</tr>
<tr>
<td></td>
<td>G</td>
<td>200m H2O (20 bar)</td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>Custom range on request (specify X meters H2O)</td>
</tr>
<tr>
<td><strong>4: Process Connection</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A1</td>
<td>Basic submersible sensor 1/2&quot; BSP female with removable nosecone</td>
</tr>
<tr>
<td></td>
<td>A2 X</td>
<td>Basic submersible sensor with drain wire adaptor (Specify length X meters)</td>
</tr>
<tr>
<td></td>
<td>A3</td>
<td>Pole adaptor fitting threaded 1/2&quot; BSP female</td>
</tr>
<tr>
<td></td>
<td>A4</td>
<td>Free standing</td>
</tr>
<tr>
<td></td>
<td>A5</td>
<td>Free standing with pole adaptor fitting threaded 1/2&quot; BSP female</td>
</tr>
<tr>
<td></td>
<td>A6</td>
<td>DN25 PN16 flange mounting</td>
</tr>
<tr>
<td></td>
<td>A7</td>
<td>DN40 PN16 flange mounting</td>
</tr>
<tr>
<td></td>
<td>A8</td>
<td>DN50 PN16 flange mounting</td>
</tr>
<tr>
<td></td>
<td>A9</td>
<td>1&quot; ANSI 150lb flange mounting to BS1560</td>
</tr>
<tr>
<td></td>
<td>AA</td>
<td>1-1/2&quot; ANSI 150lb flange to BS1560</td>
</tr>
<tr>
<td></td>
<td>AB</td>
<td>2&quot; ANSI 150lb flange to BS1560</td>
</tr>
<tr>
<td></td>
<td>AE</td>
<td>Pole adaptor fitting 2&quot; x 1-1/4&quot; OD for compression adaptor</td>
</tr>
<tr>
<td></td>
<td>AJ</td>
<td>JIS 25A 5K flange mounting</td>
</tr>
<tr>
<td></td>
<td>AK</td>
<td>JIS 40A 5K flange mounting</td>
</tr>
<tr>
<td></td>
<td>AL</td>
<td>JIS 40A 10K flange mounting</td>
</tr>
<tr>
<td></td>
<td>AM</td>
<td>JIS 50A 5K flange mounting</td>
</tr>
<tr>
<td></td>
<td>AN</td>
<td>JIS 50A 10K flange mounting</td>
</tr>
<tr>
<td></td>
<td>S1</td>
<td>Tank fixing clamp</td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>Custom fixing on request</td>
</tr>
<tr>
<td><strong>5: Cable</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Standard 3m cable length</td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>Custom cable length on request (specify length in X meters)</td>
</tr>
<tr>
<td></td>
<td>TH</td>
<td>316 stainless steel terminal housing (not possible with ATEX approval)</td>
</tr>
<tr>
<td><strong>6: Configuration</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>Not configured</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>Factory configured (specify details)</td>
</tr>
<tr>
<td><strong>7: Range</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>Transmitter 4-20 mA configured range in X meters H2O</td>
</tr>
</tbody>
</table>
Hammer Union Pressure Transmitter

This is a 4-20mA output Hammer-Lug Union pressure transmitter. It is ATEX certified for use in Hazardous areas, IP68 rated and is EMC compliant to CE standards. It is available in the 1502 and 2202 union. The option of secondary containment for users that may experience high velocity pressure spikes is available upon request please contact us if you require this additional feature.

Key Features

• Ranges to 15,000psi (1000 bar)
• 0.25% accuracy
• 4-20mA two wire output
• IS - ATEX certified
• Full RF/EMC immunity compliance
• Sour service standard - Materials comply with NACE MR-DI-75 Revision 03
• Fused ceramic technology
• Shock and vibration tested

Applications

• Drilling instrumentation
• Mud logging systems
• MWD surface sensing
• Wellhead monitoring
• BOP control systems
• Subsea control systems
• Production testing
• Process systems
• Well Cementing

Input Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Range</td>
<td>0 - 15,000psi (1000bar)</td>
</tr>
<tr>
<td>Over Pressure</td>
<td>x1.5 of calibration pressure</td>
</tr>
<tr>
<td>Burst Pressure</td>
<td>x2.5 for 15,000 psi (1000 bar) range, &gt; x3 on all other ranges</td>
</tr>
<tr>
<td>Reverse Polarity Protection</td>
<td>Yes</td>
</tr>
<tr>
<td>Electrical Excitation</td>
<td>12 to 28Vdc</td>
</tr>
<tr>
<td>Pressure Media</td>
<td>Fluids compatible with Duplex Stainless Steel UNS 32205/UNS31803 (SAF2205) to EN 1.4462, Ceramic (AL2O3), Inconel X750 and Perfluoroelastomer</td>
</tr>
</tbody>
</table>

Output Specifications (@ Ambient Temperature)

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Span</td>
<td>16 mA</td>
</tr>
<tr>
<td>Residual Unbalance</td>
<td>4mA</td>
</tr>
<tr>
<td>Zero Setting Error</td>
<td>± 1%/Span</td>
</tr>
<tr>
<td>Span Set</td>
<td>±1%</td>
</tr>
<tr>
<td>Lead Driving</td>
<td>800 ohm @ 28Vdc supply</td>
</tr>
<tr>
<td>Long Term Stability</td>
<td>±0.1%/Span</td>
</tr>
<tr>
<td>Non-linearity</td>
<td>See NLH</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>See NLH</td>
</tr>
<tr>
<td>Repeatability</td>
<td>See NLH</td>
</tr>
<tr>
<td>Combined NLH (+repeat)</td>
<td>≤±0.25%/Span BFSL</td>
</tr>
</tbody>
</table>

Dimensional Specifications

Manufactured for NASC by RM&C

23400 HWY 435 • Abita Springs, LA 70420 • Ph: (800) 259-6874 • Fax: (985) 893-0807 • sales@mepinc.com • www.northamericansensors.com
Hammer Union Pressure Transmitter

Environmental Performance

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
<td>-22°F to +194°F</td>
</tr>
<tr>
<td>Compensated Temperature</td>
<td>14°F to +194°F</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-22°F to 212°F</td>
</tr>
<tr>
<td>Process Temperature</td>
<td>194°F max</td>
</tr>
<tr>
<td>Thermal Zero Shift (TZS)</td>
<td>±0.01%/Span/°F typical</td>
</tr>
<tr>
<td>Thermal Span Shift (TSS)</td>
<td>±0.01%/°F typical</td>
</tr>
<tr>
<td>IP Rating</td>
<td>68</td>
</tr>
</tbody>
</table>

Physical Characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Port</td>
<td>1502 Male sub hammer Lug Union Units are directly compatible with WECO® 2”-1502 and 2202</td>
</tr>
<tr>
<td>Materials of Construction</td>
<td>Duplex Stainless Steel UNS 32205/UNS31803 (SAF2205) to EN 1.4462</td>
</tr>
<tr>
<td>Method of Installation</td>
<td>Hammer Lug Union</td>
</tr>
<tr>
<td>Electrical Connection</td>
<td>500Vac</td>
</tr>
<tr>
<td>Electrical Connection</td>
<td>6-Pin connector to MIL-C-24682 (10-6 POL)</td>
</tr>
</tbody>
</table>

Intrinsic Safety

EEx ia IIC T4 (max temperature = 194°F)

EMC

Compliant to latest EMC standards.

Model Code Logic

W/ 9 / 420 / 8 / X / X / XXXXP

<table>
<thead>
<tr>
<th>Position</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Pressure Ref.</td>
<td>W</td>
<td>Hammer Union Pressure Transmitter</td>
</tr>
<tr>
<td>2: Series</td>
<td>9</td>
<td>Basic submersible sensor with drain wire adaptor</td>
</tr>
<tr>
<td>3: Output</td>
<td>420</td>
<td>4-20mA</td>
</tr>
<tr>
<td>4: Pressure Port</td>
<td>8</td>
<td>2” Hammer Union Male-Sub</td>
</tr>
<tr>
<td>5: Secondary</td>
<td>0</td>
<td>None</td>
</tr>
<tr>
<td>6: Electrical</td>
<td>0</td>
<td>MIL C 24682</td>
</tr>
<tr>
<td>7: Pressure Range (psi)</td>
<td>350P</td>
<td>0-5,000 PSI</td>
</tr>
<tr>
<td></td>
<td>400P</td>
<td>0-6,000 PSI</td>
</tr>
<tr>
<td></td>
<td>700P</td>
<td>0-10,000 PSI</td>
</tr>
<tr>
<td></td>
<td>1000P</td>
<td>0-15,000 PSI</td>
</tr>
</tbody>
</table>
Hydrostatic Level Transmitter

460 Hydrostatic Level Transmitter

With thousands of marine liquid level transmitters installed on all classes of ships, from military vessels to tankers, the design of the Series 460 marine level transmitter draws on NASC’s comprehensive marine application experience. Fully compliant with the latest IEC and marine industry standards, the Series 460 rugged construction provides reliable and accurate monitoring of liquids in the harsh environments of shipboard tanks. The Measuring principle of pressure in the Series 460 hydrostatic level transmitter is a diaphragm and L.V.D.T. sensor with power and signal linearization via a remote mounted transmitter. This combines excellent responsiveness and long term stability. The liquid level transmitter has the sensitivity needed to accurately measure shallow tanks but will resist a five times nominal range overload without damage. The all welded level sensor is manufactured from high grade alloys specifically selected for their stability and corrosion resistance. A wide choice of fittings and the remotely mounted amplifier maximizes installation flexibility and serviceability. The Series 460 is maintenance free and contains no active electronic components. A factory sealed cable is supplied with a heavy-duty outer sheath of cross linked polymers, suitable for continuous immersion in sea water, fuels and hydrocarbons. An optional performance cable permits use of the sensor with extreme temperatures limits of -50°C to -148°C.

Key Features

• Designed and constructed specifically for marine applications with relevant industry body and type application and approvals.
• Full range of connections and sensor mounting options for side-of-tank or IP68 submersible installation.
• Compatible with all common marine liquids and cargo applications: seawater, fuel and lubricating oil, bilge water etc.
• Wide span with a high measurement accuracy, long term stability and exceptional pressure overload resistance.
• Remote transmitter provides ease of access for routine calibrations checks.
• Robust construction gives reliable operation and low maintenance cost.

Specifications

<table>
<thead>
<tr>
<th>Calibrated Spans</th>
<th>From 0 - 300 H₂O to 0 - 50m H₂O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range Adjustment</td>
<td>3:1 turndown of normal range</td>
</tr>
<tr>
<td>Zero Adjustment</td>
<td>± 10% of calibrated span</td>
</tr>
<tr>
<td>Overload</td>
<td>Minimum of 50 meters or 5x nominal range</td>
</tr>
<tr>
<td>Nominal Ranges</td>
<td>1, 2, 4, 8, 16, 32 and 50 meters H₂O</td>
</tr>
<tr>
<td>Signal Output</td>
<td>4-20mA DC2 wire</td>
</tr>
<tr>
<td>Power Supply</td>
<td>12- 35 DC</td>
</tr>
<tr>
<td>Maximum Load</td>
<td>1000 ohms at 30V</td>
</tr>
<tr>
<td>Diaphragms</td>
<td>Hastelloy C276</td>
</tr>
<tr>
<td>Sensor Cable</td>
<td>Heavy duty TPE vented</td>
</tr>
<tr>
<td>Sensors Operating Temperature</td>
<td>-40°C to 105°C (-40°C to +55°C for IS models)</td>
</tr>
<tr>
<td>Electronics Housing</td>
<td>IP65 GRP (NEMA 4) with internal RFI screen (IP67 optional)</td>
</tr>
<tr>
<td>Electronics Operating Temperature</td>
<td>-40°C to +55°C</td>
</tr>
<tr>
<td>Accuracy</td>
<td>Better than ± 0.25% FRO</td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td>Less than 0.02@ per °C shift zero and range</td>
</tr>
<tr>
<td>Sensor Body</td>
<td>316L stainless steel</td>
</tr>
</tbody>
</table>
# Hydrostatic Level Transmitter

## Model Code Logic

<table>
<thead>
<tr>
<th>Position</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Transmitter</td>
<td>460</td>
<td>Sensor with RT168 remote transmitter 4-20mA output</td>
</tr>
<tr>
<td>2: Process Connection</td>
<td>F47</td>
<td>Basic submersible sensor with drain wire adaptor</td>
</tr>
<tr>
<td></td>
<td>F17</td>
<td>DN40 PN16 flanged mounting</td>
</tr>
<tr>
<td></td>
<td>F18</td>
<td>DN50 PN16 flanged mounting</td>
</tr>
<tr>
<td></td>
<td>F15</td>
<td>Welded pole assembly</td>
</tr>
<tr>
<td></td>
<td>F16</td>
<td>3/4” BSP female running nut NRV plunger</td>
</tr>
<tr>
<td></td>
<td>F19</td>
<td>Fixing clamp @ 1/2” BSP female pole adaptor</td>
</tr>
<tr>
<td>3: Transmitter</td>
<td>H1</td>
<td>1m H2O</td>
</tr>
<tr>
<td>maximum pressure</td>
<td>H2</td>
<td>2m H2O</td>
</tr>
<tr>
<td></td>
<td>H4</td>
<td>4m H2O</td>
</tr>
<tr>
<td></td>
<td>H8</td>
<td>8m H2O</td>
</tr>
<tr>
<td></td>
<td>H16</td>
<td>16m H2O</td>
</tr>
<tr>
<td></td>
<td>H32</td>
<td>32m H2O</td>
</tr>
<tr>
<td></td>
<td>H50</td>
<td>50m H2O</td>
</tr>
<tr>
<td>4: Cable</td>
<td>P</td>
<td>Standard 3m cable length</td>
</tr>
<tr>
<td>5: Cable Length</td>
<td>X</td>
<td>Custom cable length on request (specify length X meters)</td>
</tr>
<tr>
<td>6: Range</td>
<td>DW X</td>
<td>Transmitter 4-20mA configured range in X m H2O</td>
</tr>
<tr>
<td>7: Remote Electronics</td>
<td>9</td>
<td>PG9 cable gland for signal cable (standard)</td>
</tr>
<tr>
<td></td>
<td>M16</td>
<td>M16 cable gland for signal cable (optional)</td>
</tr>
<tr>
<td>8: Approvals</td>
<td>IS</td>
<td>Hazardous area installation (ATEX IS approved)</td>
</tr>
<tr>
<td></td>
<td>NA</td>
<td>Safe area installation</td>
</tr>
</tbody>
</table>

## Dimensional Specifications

![Diagram of Hydrostatic Level Transmitter](image)

---

23400 HWY 435 • Abita Springs, LA 70420 • Ph: (800) 259-6874 • Fax: (985) 893-0807 • sales@mepinc.com • [www.northamericansensors.com](http://www.northamericansensors.com)
290 Density Transmitter

NASC has designed and developed the Series 290 as a density transmitter specifically for use in the onshore and offshore oil and gas market. It is the first fluid density transmitter that is fully submersible for use on drilling mud, slurry, cement and completion fluids. This density transmitter is rugged yet accurate, providing reliable measurement in the mixing or holding tanks and return sumps. The Series 290 transmitter measures density as a function of differential pressure. Each unit has two pressure sensitive diaphragms mechanically separated by a fixed distance on a mounting pole. The distance between the transmitter's two diaphragms provides a value of the liquids specific gravity. The diaphragms are protected by enclosure cages to prevent damage from the mechanical impact or debris. These are easily removable for cleaning. The density measurement is made online in real time and is fully compensated for changes in fluid temperature.

Key Features

- Density transmitter for drilling mud, slurry, cement and completion fluids.
- Designed to be installed in mixing recirculation and storage tanks.
- Simple and flexible pole mounting installation from the top of the tank.
- Remote transmitter suitable for installation in hazardous area.
- Robust and reliable construction for arduous duty and extended service.
- Sensors protected by stainless steel cage easily removed for cleaning.
- Temperature compensated measurement with low thermal sensitivity.
- 2 Wire 4-20mA output signal calibrated to suit the application.

Specifications

- Construction: Body assembly 316L Stainless steel with diaphragms Hastelloy C276.
- Mounting: Submersed in tank.
- Measuring range (Factory calibration)
  - 6.67 to 20 pounds / US Gallon
  - 0.8 to 2.4 SG / 0.8 to 2.4 kg/l
- Customer specific calibration within this range on request.
- Minimum density measurement:
  - 6.25 Pounds / US Gallons
  - 0.75 SG / 0.75 kg/l
- Sensor capillary fill fluid: Silicon oil
- Operating temperature -10° to 80° C
- Hazardous area rating (option) EEx ia IIIC T6

Amplifier Module

- Construction: Wall mount GRP enclosure
- Enclosure rating: IP65 (IP67 option) / NEMA 4X
- Power supply: 12 to 35 Vdc
- Signal output: 4 to 20mA dc. 2 wire

Performance

- Accuracy ±0.25% of set span
- Temperature coefficient: ±0.02% set span / °C
Density Transmitter

Dimensional Specifications

= Pole Adaptor Threaded 3/4" NPT Female
= Sensor Cable
= Separation Distance 305mm (12")
= 668mm Approx (26")
= 250mm (10")
= 102mm (4")
= 114mm (4.5")
= Optional Location Pocket (Customer Supply)
= Removable Diaphragm Protection Cage Assembly (Remove for Cleaning or Calibration Purposes only)

Sensor Input PG9 Cable Gland
4 to 20mA Output Signal Cable Gland.
PG9 or Optional M16/M20 as Required
Mounting Holes 178 x 45mm

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NASC’s Scanrad is a high accuracy pulse radar transmitter intended for tank level measurement for typical application for Shipboard duties on: barges, chemical carriers & product carriers. It is also suitable for general industrial application. The compact design is offered with both DN50 and DN80 flanged mounting options. Inbuilt diagnostic software enables the user to map an installation to filter out echoes from In-tank obstacles to ensure accurate measurement.

**Key Features**

- Compact design
- Marine certified
- 4 - 20mA / HART / RS485 outputs
- Measurement range up to 88 Feet
- Liquids and solids measurement
- Accuracy +/- 1/8in
- Power up self-test diagnostics
- Automatic false echo suppression
- Certified I.S.

**Specifications**

- Measuring interval: ~1 second
- Adjustment time: ~1 second
- Process Temperature: -40 to +300°F
- Storage Temperature: -40 to +212°F
- Microwave frequency: Pulse 26GHz
- Pressure: 40MPa Maximum
- Relative Humidity: <95%
- I.S. Approval: II 1G Ex ia T6...T3 Ga
- Protection Class: IP67
- Weight: Approx. 15lbs (DN80 Flange)
- 3dB Beam Angle: DN80 Flange 18°
- Resolution of mA: 1.6μA
- Power (2 wire HART): 21.6~26.4VDC
- Power Consumption: Max 22.5mA

**Materials**

- Housing: 316L SS Mo 2.8
- Enclosure: 316L SS Mo 2.8
- Flange: 316L SS Mo 2.8
- Process seal: PTFE

**Process Connection**

- Standard: DN80
- Option: DN50 (refer for availability)

**Electrical Connection**

- Cable conduit: M20 x 1.5

**Dimensional Specifications**

**Model Code Logic**

<table>
<thead>
<tr>
<th>5000 Scanrad Radar Level Transmitter</th>
</tr>
</thead>
<tbody>
<tr>
<td>5000</td>
</tr>
<tr>
<td>50</td>
</tr>
<tr>
<td>80</td>
</tr>
<tr>
<td>A</td>
</tr>
<tr>
<td>I</td>
</tr>
<tr>
<td>4H</td>
</tr>
<tr>
<td>RS</td>
</tr>
</tbody>
</table>
These RTDs are specifically designed for use in two different process temperature ranges and they provide accurate and repeatable temperature measurement through a range of -328° to 1112°F (-200° to 600°C). Low range wire wound RTDs -328° to 400°F (-200° to 204°C) and low range thin film RTDs -40° to 400°F (-40° to 204°C) are constructed using silver plated copper internal leads, teflon, and other suitable wire insulations with potting compounds to resist moisture penetration. High range RTDs -328° to 1112°F (-200° to 600°C) are constructed with nickel internal leads inside swaged MgO insulated cable to allow higher temperature measurements at the RTD element and to provide higher temperature lead protection along the sheath.

1) RTD type (low temp/high temp, accuracy and element type)
2) Sheath diameter
3) Element connection (2, 3 or 4 wire)
4) Sheath length (insertion length)
5) Fittings/no fittings/sheath bend options
6) Electrical connections and terminations
7) Wire type and terminations

View our detailed literature online on how to order, email or call for customer support. Custom built assemblies with non-standard specifications are available upon request.

Sensing element materials and temperature limits:
- Platinum: -450°F to 1200°F
- Nickel: -150°F to 600°F
- Copper: -100°F to 300°F
- Nickel/Iron: 32°F to 400°F

*Please call for complete model code and description.*
The millivolt potential that is created in the thermocouple conductors differs depending on the materials used. Some materials make better thermocouples than others because the millivolt potentials created by these materials are more repeatable and well established. These thermocouples have been given specific type designations such as Type E, J, K, N, T, B, R and S. The type of T/C used also depends on temperature monitored and environment.

As a general rule, industrial thermocouples can be made to withstand higher temperatures and come in a wider variety of thermocouple types. MgO thermocouples are flexible and have a wider selection of measurement junction configurations.

An MgO thermocouple consists of a thermocouple element encased in a metal sheath and hard-packed with magnesium oxide mineral insulation. Thermocouple sheaths are fully annealed and can be formed into different configurations (minimum bend radius is twice the outer diameter of the sheath). The measuring junction can also be sealed from the environment, reducing the potential for contamination issues.

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### How to Order
(see order form on line, email or call for application assistance)

1. Type of thermocouple (J, K, T, etc.) and single or duplex element
2. Sheath diameter
3. Sheath material
4. Measuring junction (grounded, ungrounded, etc.)
5. Fittings/no fittings/sheath bends
6. Sheath terminations
7. Electrical transitions
8. Lead wire materials, transitions and length

<table>
<thead>
<tr>
<th>Type</th>
<th>Application Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>Recommended for continuously oxidizing or inert atmospheres. Sub-zero limits of error not established. Highest thermoelectric output of the common thermocouple types.</td>
</tr>
<tr>
<td>J</td>
<td>Suitable for vacuum, reducing or inert atmospheres, oxidizing atmospheres with reduced life. Iron oxidizes rapidly above 1000°F so only heavy gauge wire is recommended for high temperature.</td>
</tr>
<tr>
<td>K</td>
<td>Recommended for continuous oxidizing or neutral atmospheres. Mostly used above 1000°F (538°C). Subject to failure if exposed to sulfur. Preferential oxidation of chromium in positive leg at certain low oxygen concentrations causes “green rot” and large negative calibration drifts most serious in the 1500 - 1900°F (816 - 1038°C) range.</td>
</tr>
<tr>
<td>N</td>
<td>Can be used in applications where Type K elements have shorter life and stability problems due to oxidation and the development of “green rot”.</td>
</tr>
<tr>
<td>T</td>
<td>Usable in oxidizing, reducing, or inert atmospheres as well as vacuum. Not subject to corrosion in moist atmospheres.</td>
</tr>
<tr>
<td>R &amp; S</td>
<td>Recommended for high temperature. Must be protected in a non-metallic protection tube and ceramic insulators. Type R is used in industry, Type S in the laboratory</td>
</tr>
<tr>
<td>B</td>
<td>Same as R &amp; S but has a lower output. Also, has a higher maximum temperature and less susceptible to grain growth.</td>
</tr>
</tbody>
</table>

*Please call for complete model code and description.*
<table>
<thead>
<tr>
<th>Type</th>
<th>Materials</th>
<th>Temperature Range</th>
<th>Limits Of Error</th>
<th>Temperature Range</th>
<th>Limits Of Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td>Iron/Constantan</td>
<td>32 to 559F (0 to 293C)</td>
<td>4F (2.2C)</td>
<td>32 to 527F (0 to 275C)</td>
<td>2F (1.1C)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>550 to 1400F (293 to 760C)</td>
<td>0.75%</td>
<td>527 to 1400F (275 to 760C)</td>
<td>0.40%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-328 to -166F (-200 to -110C)</td>
<td>2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>Chromel/Alumel</td>
<td>-166 to 32F (-110 to 0C)</td>
<td>4F (2.2C)</td>
<td>32 to 527F (0 to 275C)</td>
<td>2F (1.1C)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>32 to 559F (0 to 293C)</td>
<td>4F (2.2C)</td>
<td>527 to 2282F (275 to 1250C)</td>
<td>0.40%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>559 to 2282F (293 to 1250C)</td>
<td>0.75%</td>
<td>257 to 662F (125 to 350C)</td>
<td>0.40%</td>
</tr>
<tr>
<td>T</td>
<td>Copper/Constantan</td>
<td>-328 to -89F (-200 to -67C)</td>
<td>1.50%</td>
<td>32 to 527F (0 to 275C)</td>
<td>0.9F (0.05C)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-89 To 32F (-67 to 0C)</td>
<td>1.8F (1C)</td>
<td>257 to 662F (125 to 350C)</td>
<td>0.40%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>32 to 271F (0 to 133C)</td>
<td>1.8F (1C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>271 to 662F (133 to 350C)</td>
<td>0.75%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Chromel/Constantan</td>
<td>-328 to -89F (-200 To -67C)</td>
<td>1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-274 to 32F (-170 to 0C)</td>
<td>3.1F (1.7C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>32 to 644F (0 to 340C)</td>
<td>3.1F (1.7C)</td>
<td>32 to 257F (0 to 125C)</td>
<td>0.9F (0.05C)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>644 to 1652F (340 to 900C)</td>
<td>0.50%</td>
<td>482 to 1652F (250 to 900C)</td>
<td>0.40%</td>
</tr>
<tr>
<td>N</td>
<td>Nicrosil/Nisil</td>
<td>32 to 559F (0 to 293C)</td>
<td>4F (2.2C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>559 to 2300F (293 to 1260C)</td>
<td>0.75%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>Platinum/Platinum- 13% Rhodium</td>
<td>32 to 1112F (0 to 600C)</td>
<td>2.7F (1.5C)</td>
<td>32 to 1112F (0 to 600C)</td>
<td>1.1F (0.6C)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1112F to 2642F (600 to 1450C)</td>
<td>0.25%</td>
<td>112F to 2642F (600 to 1450C)</td>
<td>0.10%</td>
</tr>
<tr>
<td>S</td>
<td>Platinum/Platinum-10% Rhodium</td>
<td>32 to 1112F (0 to 600C)</td>
<td>2.7F (1.5C)</td>
<td>32 to 1112F (0 to 600C)</td>
<td>1.1F (0.6C)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1112F to 2642F (600 to 1450C)</td>
<td>0.25%</td>
<td>112F to 2642F (600 to 1450C)</td>
<td>0.10%</td>
</tr>
<tr>
<td>B</td>
<td>Platinum/Platinum-30% Rhodium</td>
<td>1472 to 3092F (800 to 1700C)</td>
<td>0.50%</td>
<td>1472 to 3092F (800 to 1700C)</td>
<td></td>
</tr>
</tbody>
</table>
A thermowell acts as a barrier between a process medium and the sensing element of a temperature measuring device. It protects against corrosive process media, as well as media contained under pressure or flowing at a high velocity. A thermowell also allows the sensing element to be removed from the application while maintaining a closed system.

Our thermowells are available in 316S.S. and 304S.S.. Other materials available upon request.

**How to Order**

1) Process connection: Flanged, threaded, limited space, socket-weld or weld-in type.
2) Style: Stepped, straight, tapered, lag, lag straight or lag tapered.
3) Bore(inches): .260, .375, .385, .390, .515, .702 or special.
4) Material: Brass, C.S., 304 S.S., 316 S.S., Monel, titanium, hastelloy C, etc.
5) Stem length (inches): L or U dimension

View our detailed literature on line on how to order, email or call for customer support.