SureSite® Visual Liquid Level Indicators
...the safe alternative to cloudy, breakable sight glasses.

High Visibility—Brilliantly colored flags are easy to read, even at great
distances. The indicator is isolated from the measured media; therefore,
SureSite Indicators can be used where sight glasses are not even a
consideration.

Durability—Stainless steel, PVC, CPVC, PVDF, Hastelloy or other
exotic housings, whatever the media requirements, provide years of
maintenance-free service.

Environmentally Safe—Monitored liquid is contained inside a pressure-
tight housing.

Efficient—Continuous level indication without external power.

Electronic Control—Attach optional point level switches and/or
continuous level transmitters to extend capabilities beyond those of a
simple sight glass.

- Low Maintenance—No glass to break, durable housings
- OSHA Friendly—Accident incidence reduction
- Reduced Workload—Quick and easy viewing shortens monitoring chores
- EPA Friendly—Fewer seals and no glass protect against spillage
- Multi-Purpose—Not single purpose as with sightglasses; can replace
  simple tank gauging systems as a complete level gauge package

When Gems Sensors & Controls introduced SureSite® Liquid Level
Indicators almost 30 years ago, no one had seen anything like them...
sightglasses were the standard in liquid level indication. Well, we are
happy to say that since that time SureSite Indicators have retired more
sightglasses than we can count! Our success has spawned many
imitators, but there is still only one SureSite Indicator with its many
exclusive features, and more importantly there is no manufacturer so
uniquely capable as Gems to be your sensor supplier.

Fifty years of experience has taught us which technologies and
product characteristics will provide the most effective solutions to
your requirements. And our engineering resources have long been
helping customers solve their most challenging application problems.
So, there is a good chance we’ve already dealt with the design criteria
you are working on. If you don’t see materials or configurations in the
following pages to suit your needs, please give Gems a call for custom
application assistance.

Gems Serves the OEM and End User
Gems welcomes any size order...whether a single unit or 100 units or
more. Gems commitment is to meet your most stringent requirements
of price, delivery and quality.

Contents

<table>
<thead>
<tr>
<th>Specifying and Ordering</th>
<th>D-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alloy Versions</td>
<td></td>
</tr>
<tr>
<td>Miniature Size</td>
<td>D-4</td>
</tr>
<tr>
<td>Standard Size</td>
<td>D-7</td>
</tr>
<tr>
<td>High Performance SureSite</td>
<td>D-10</td>
</tr>
<tr>
<td>Engineered Plastic Version</td>
<td>D-10</td>
</tr>
<tr>
<td>Optional Transmitters</td>
<td>D-13</td>
</tr>
<tr>
<td>Optional Switch Modules</td>
<td>D-16</td>
</tr>
<tr>
<td>Optional Indicating Scale</td>
<td>D-18</td>
</tr>
</tbody>
</table>

SureSite® Visual Liquid Level Indicators
Simply the Most Versatile Liquid Level Monitoring System Available ... and Tough Enough For All Kinds of Applications!

Visual Indication
- Handles full vacuum to high pressure
- Highly visible from over 100 ft. (30m)
- Eliminates downtime
- Virtually maintenance free
- Custom configured units

Comprehensive Indication
- Pressures to 4200 PSI
- Externally mounted electronics
- Hi/Low alarms, Switch Points
- ANSI Flange/ASME Type
- Cenelec, FM, UL, CSA Approved

Cold Service Applications
- -200°F (-129°C)
- Frost proof lens
- Insulation (Cold Service)
- Magnified visibility

Hot Service Applications
- Process temps to 750°F (399°C)
- External electronics to 750°F (399°C)
- High temp insulation available

Oil/Water Applications
- Interface application
- Materials: Stainless Steel, engineered plastics
- Multiple process ports required
- Electronics for pump control
- Valves available
- Consult factory for details

Acid Applications
- Fluid compatible materials - Hastelloy C 276, PVDF, Alloy 20, Titanium
- Eliminate dangerous/costly leaks

Versatile Design
The SureSite Indicators described on the following pages represent only “basic designs.” An infinite variety of configurations can be derived, custom built to your exact dimensions and application specifications on existing or new tank designs.

Top mount units available. Contact factory for details.
SureSite Indicators Are Superior To Other Magnetic Type Indicators. Here’s Why:
It begins with a patented Flag Assembly and integrated Magnetic Guide

Many magnetic flag type indicators look the same, but look closer and you’ll see they are not made the same. SureSite® Indicators are unique. They incorporate a patented design and special features that provide the ultimate in performance and reliable operation.

- A permanent magnet, encapsulated into each flag, forms a secure magnetic interlock with adjacent flags. Proper alignment is assured, and is unaffected by shock, vibration, surges or rapid level changes.
- A Magnetic Guide (a SureSite exclusive) enables the use of a more powerful bar magnet in the float assembly. The guide is integrated into the flag channel, so regardless of positioning, the bar magnet within the float is always aligned for optimum performance and exactness.
- A powerful, permanent bar magnet lies in a horizontal position within the float. This preferred attitude directs the flux density of the magnetic field toward the flags. Flag rotation is positive and reliable.
- Float capability to handle liquid specific gravity range as low as 0.40.

SureSite® Indicators in the Process...
Many applications require high temperature/pressure capabilities, or strict adherence to industry standards such as
- ASME
- CENELEC
- CSA
- FM
- UL

Gems High Performance SureSite Indicators are manufactured to fill these requirements. See pages D-10 and D-11.

Operating Principle
As liquid level rises, a magnet-equipped float within the unit inverts the magnetic flags in the external indicator to “color-side-out.” The flags remain magnetically interlocked in a column until again inverted to “contrasting-side-out” by the float as liquid level falls. Liquid level is indicated by the junction of the “color” and “contrasting” portions of the column.

Ordering SureSite® Indicators

Order online or use our quick and easy OrderIt! Forms.

1. To specify this product, start by photocopying the appropriate OrderIt! PRODUCT CHECK LIST located on pages D-6, D-9, D-12, and D-15.

2. Next, using the product information supplied in this section, check off the boxes and fill in the blanks of the OrderIt! Check List to specify your desired product configuration. Accurate answers to each question will assure correct fit and function of your custom built product. Note: Use a separate Check List for each unique configuration.

3. To obtain a priced quotation, fax your completed OrderIt! Check List to Gems at 860-747-4244 or fax it to the Sales Partner nearest you. You can now configure and request quotes directly online at www.gemssensors.com. All of our Sales Partner locations, along with their fax numbers, are conveniently located on the Web at www.gemssensors.com.

4. To order your CUSTOM product, either place your order over the phone with one of our representatives, or use the OrderIt! method. Just photocopy the appropriate OrderIt! PRODUCT CHECK LIST (D-6, D-9, D-12, and/or D-15). Accurately complete all of the purchasing information that we’ll need to process your order and fax it. These forms will provide us with the shipping and billing information we need, along with any prices or delivery dates quoted.
Alloy Versions—Miniature Size

- Lengths to over 20 feet (6.1 meters)
- 316 Stainless Steel construction
- Pressures to 400 PSI (27 bar) – Temperature to 400°F (204°C)

Use these Mini SureSite Indicators where space is tight—they feature a diameter of only 1-1/4”! They can replace existing, antiquated sightglasses for excellent external, visual liquid level indication. Mini SureSite Indicators are ideal for use with clean, low viscosity liquids.

Typical Applications
- Pharmaceuticals
- Medical Equipment
- Food and Beverages
- Semiconductor Manufacturing
- Boilers

1. Mounting Configuration Types

<table>
<thead>
<tr>
<th>Type AM</th>
<th>Type BM</th>
<th>Type CM</th>
<th>Type DM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top and Bottom Process Connections</td>
<td>Side and Side Process Connections</td>
<td>Top and Side Process Connections</td>
<td>Side and Bottom Process Connections</td>
</tr>
</tbody>
</table>

L = Length of Visual Indication

Typical Lengths*

<table>
<thead>
<tr>
<th>Type</th>
<th>C to C = L + 7.72” (196 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type AM</td>
<td>C to C = L</td>
</tr>
<tr>
<td>Type BM</td>
<td>C to C = L + 3” (76 mm)</td>
</tr>
<tr>
<td>Type CM</td>
<td>C to C = L + 5” (127 mm)</td>
</tr>
</tbody>
</table>

Flag Material
- Plastic (300°F/148.9°C) or Aluminum (400°F/204°C)

Length of Indication (Uninterrupted)
- 240” (610 cm)

*Dimensions vary due to connections, material and specific gravity.

Note: Additional materials, floats, connections and manufacturing techniques are available to extend lengths and operational capabilities. Please contact Gems if the parameters above do not meet your requirements.

Miniature SureSite Performance

Gems configures Miniature SureSite Indicators, using various materials and fittings, to perform within the Pressure/Temperature parameters specified in the chart at right. Consult the factory with pressure/temperature requirements that fall outside the parameters shown here.

Note: SureSite Indicators are available for temperatures as low as -200°F (-129°C)
Connection Code Descriptions
Please provide all connections when completing the Order Kit Product Checklist (located on the following page).

Note: Before selecting your connections, consider incorporating your vent and drain requirements.

T & B (Top and Bottom)
- T/B 1. Welded cap
- T/B 2. Welded cap with FNPT
- T/B 3. Welded cap with MNPT
- T/B 7. Sanitary flange
- T/B 8. Sanitary flange with mating blind flange
- T/B 10. Standard fixed flange/mating blind flange
- T/B 11. Standard fixed flange/mating FNPT reducing flange
- T/B 12. Standard fixed flange/mating flange with MNPT nipple
- T/B 13. Standard fixed flange/mating flange with butt weld nipple
- T/B 18. Welded cap with butt weld nipple
- T/B 19. Welded cap with ANSI flange
- T/B 20. Standard fixed flange/mating reducing flange spool with ANSI flange

Sa & Sb (Sides)
- Sa 1. No connection
- Sa 2. MNPT nipple
- Sa 3. FNPT coupling
- Sa 4. ANSI flange
- Sa 5. Sanitary flange
- Sa 6. Butt weld nipple

Performance Notes:
1. As an option, either the Switch Modules or Transmitter can be used on a Miniature SureSite Indicator - Not Both.
2. Minimum specific gravity is 0.7.
3. Standard O-ring seal material is Viton®. Others available upon request.
4. Electropolished Outer Diameter (OD) and/or Inner Diameter (ID) housings available upon request.

Note: Gems recommends a removable top and/or bottom connection for float access.

Connection Codes and Materials background-shaded in this color are stacked by Gems. Select these connections where possible to obtain the most economical SureSite indicators with a prompt 3-day delivery.

3-Day Quik Configured
Available for up to 10 units
Built & Shipped in 3 Days!

Need it quick? Choose materials and components with the color shading for 3-Day manufacturing and shipping. See the Product Configurator section at www.gemssensors.com for further details.

Accessories – Pages D-16 to D-18
Make more of your SureSite® Indicator with the productivity-enhancing accessories found at the end of this section.

- **Indicating Scales**
  Add graduations to your flag indication.
- **Switch Modules**
  Control pumps, valves, alarms, etc. Mount externally on housing for infinite positioning.
- **Continuous Output Transmitters**
  Signal conditioned for compatibility with most electronic instruments to 300°F (149°C).
SureSite Indicators, Alloy Versions – Miniature Size

Process Conditions

This information is essential to the accurate and proper operation of your SureSite® Visual Level Indicators. Please complete fully and accurately.

1. Pressure: Operating _______ psig  Maximum _______ psig
2. Temperature: Operating _______ °F  Maximum _______ °F
3. Liquid Media:
4. Specific Gravity @ Operating Condition:
5. Viscosity: ____________ SSU
6. Application Location: □ Indoors □ Outdoors

Physical Configuration

1. Mounting Configuration Types:
   □ Type AM  □ Type BM  □ Type CM  □ Type DM

2. Connection Codes – Complete all 4 connection code lines. Check off NPT or Flange size where appropriate.
   ▼ Connection Code Number Goes Here. Connection Code Numbers and their descriptions are on Page D-5.

   Connection to Connection Dimension – C to C: _______ inches.

4. Flag Type
   Plastic flags available to 300°F (149°C).
   Aluminum flags only for temperatures to 750°F (399°C).
   □ Plastic (Orange and White)  □ Aluminum (Black and Silver)
   □ Non-Standard; Specify:__________________________________, consult factory.

5. O-Ring Material:
   □ Viton® (Standard)  □ Ethylene Propylene
   □ Other

Special Instructions (Materials, Connections, etc.)

Accessories (Pages D-16 to D-18)

1. Switch Modules (Single Point):
   □ SPST  □ SPDT  □ DPDT 120 VAC  □ DPDT 24 VDC
   □ Standard – 300°F  □ High Temperature
   □ Explosion Proof

2. Indicating Scales:
   □ Feet and Inches  □ Inches  □ Metric  □ Blank
   □ Custom Graduations; specify:__________________________

3. Continuous Transmitter:
   □ 0-5 VDC  □ 0-12 VDC  □ 4-20 mA
   □ J-Box: □ Standard  □ Explosion Proof

Please contact GEMS Sensors Inc. for any configuration or special requirements not covered on this form: 800-378-1600

Quote $__________  Date Quoted _______ / _______ / _______
Standard Alloy Versions – Standard Size

- Temperatures to 750°F (399°C)
- Pressures to 700 PSI (48 bar)

Rugged, welded construction makes these 2-1/2" (63.5 mm) diameter design, alloy SureSite Indicators dependable over a long service life indoors and out.

1. Mounting Configuration Types

To choose the best configuration for your application, focus on the process connections (connections where the liquid typically enters/leaves the SureSite).

<table>
<thead>
<tr>
<th>Type AA</th>
<th>Type BA</th>
<th>Type CA</th>
<th>Type DA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top and Bottom Process Connections</td>
<td>Side and Side Process Connections</td>
<td>Top and Side Process Connections</td>
<td>Side and Bottom Process Connections</td>
</tr>
</tbody>
</table>

\[
\text{C to C} = L + 10-1/4" (260.4 \text{ mm})
\]

\[
\text{C to C} = L + 3-3/4" (95.2 \text{ mm})
\]

\[
\text{C to C} = L + 6-1/2" (165.1 \text{ mm})
\]

Flag Material: Plastic (300°F/148.9°C) or Aluminum (750°F/399°C)

Length of Indication (Uninterrupted): 240° (610 cm)

Minimum Specific Gravity: 0.39

* Dimensions vary due to connections, material and specific gravity.

Note: Additional materials, floats, connections and manufacturing techniques are available to extend lengths and operational capabilities. Please contact GEMS Sensors if the parameters above do not meet your requirements.

2. Material

Housing and Float: 316 Stainless Steel

Pressure/Temperature performance parameters for alloy SureSite versions are specified in the chart at right. Please consult the factory with temperature/pressure requirements that fall outside the parameters shown here.

Stock Material (Best economy and delivery):

<table>
<thead>
<tr>
<th>Materials</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing</td>
<td>Float</td>
</tr>
<tr>
<td>316L Stainless Steel</td>
<td>316L Stainless Steel</td>
</tr>
<tr>
<td>Carpenter 20</td>
<td>Hastelloy C276</td>
</tr>
<tr>
<td>Hastelloy C276</td>
<td>Hastelloy C276</td>
</tr>
</tbody>
</table>

* Consult factory for pressure/temperature capabilities.

Note: SureSite Indicators are available for temperatures as low as -200°F (-129°C).

3. Connection Codes
(See complete descriptions below)

<table>
<thead>
<tr>
<th>Blind</th>
<th>NPT</th>
<th>Flange</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed</td>
<td>Removable</td>
<td>Fixed</td>
</tr>
<tr>
<td>T1</td>
<td>T2</td>
<td>T3</td>
</tr>
<tr>
<td>T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Connection Codes and Materials
background-shaded in this color are stocked by Gems. Select these connections where possible to obtain the most economical SureSite Indicators with a prompt 3-day delivery.

Connection Code Descriptions
Please provide all connections when completing the OrderIt! Product Check List (located on the following page).

Note: Before selecting your connections, consider incorporating your vent and drain requirements.

T & B (Top and Bottom)
T/B 1. Welded pipe cap
T/B 2. Standard fixed flange/blind mating flange
T/B 3. Welded pipe cap w/FNPT
T/B 4. Welded pipe cap w/MNPT nipple
T/B 5. Standard fixed flange/mating FNPT reducing flange
T/B 6. Standard fixed flange/mating MNPT nipple
T/B 7. Welded pipe cap with ANSI flange
T/B 8. Standard fixed flange/mating reducing flange spool

Sa & Sb Sides
S1. No connection
S2. MNPT nipple
S3. FNPT coupling
S4. ANSI flange

Top Mount Units
When it's not practical to access the side of a tank for liquid monitoring, look to SureSite Top Mount Indicators for the solution. Please consult with the factory for these specially configured indicators 1-800-378-1600.

3-Day Quick Configured
Available for up to 10 units
Built & Shipped in 3 Days!

Need it quick? Choose materials and components with the color shading for 3-Day manufacturing and shipping. See the Product Configurator section at www.gemssensors.com for further details.

Accessories – Pages D-16 to D-18
Make more of your SureSite® Indicator with the productivity-enhancing accessories found at the end of this section.

- Indicating Scales
  Add graduations to your flag indication.

- Switch Modules
  Control pumps, valves, alarms, etc. Mount externally on housing for infinite positioning.

- Continuous Output Transmitters
  Signal conditioned for compatibility with most electronic instruments to 500°F (149°C).
SureSite Indicators, Alloy Versions – Standard Size

Process Conditions
This information is essential to the accurate and proper operation of your SureSite® Visual Level Indicators. Please complete fully and accurately.

1. Pressure: Operating ______ psig  Maximum ______ psig
2. Temperature: Operating ______ °F  Maximum ______ °F
3. Liquid Media:

4. Specific Gravity @ Operating Condition:

5. Viscosity:

6. Application Location: □ Indoors  □ Outdoors

Physical Configuration
1. Mounting Configuration Types:
   □ Type AA  □ Type BA  □ Type CA  □ Type DA
2. Housing and Float Material
   □ Code 2  □ Code 3  □ Code 4
3. Connection Codes – Complete all 4 connection code lines. Check off NPT or Flange size where appropriate.

Top T

<table>
<thead>
<tr>
<th>Top T</th>
<th>NPT</th>
<th>Flange</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Side Sa

<table>
<thead>
<tr>
<th>Side Sa</th>
<th>NPT</th>
<th>Flange</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Side Sb

<table>
<thead>
<tr>
<th>Side Sb</th>
<th>NPT</th>
<th>Flange</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Bottom B

<table>
<thead>
<tr>
<th>Bottom B</th>
<th>NPT</th>
<th>Flange</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Length of Visual Indication – L: ______ inches (240°, Max.).
   Connection to Connection Dimension – C to C: ______ inches.

5. Flag Type
   Plastic flags available to 300°F (149°C).
   Aluminum flags only for temperatures to 750°F (399°C).
   □ Plastic (Orange and White)  □ Aluminum (Black and Silver)
   □ Non-Standard: Specify ______ consult factory.

Special Instructions (Materials, Connections, etc.)

Accessories (Pages D-16 to D-18)

1. Transmitters (Continuous Electrical Indication):
   □ Low Temperature – 300°F (149°C)  □ Explosion-Proof
   □ High Temperature – 750°F (399°C)

2. J-Box/Signal Conditioners Accessories:
   □ Terminal Strip  □ 4-20 mA Output
   □ 0-12 VDC Output  □ 0-5 VDC Output

3. Power Supply:
   □ 115 VAC (Input)/24 VDC (Output)  (Optional)
   □ 230 VAC (Input)/24 VDC (Output)

Please contact GEMS Sensors Inc. for any configuration or special requirements not covered on this form. 800-378-1600

Quote: __________  Date Quoted: __________/______/______
High Performance Versions – Standard Size

- Designed to meet the requirements of ASME B31.3 "normal" fluid service
- Temperatures to 750°F (399°C)
- Pressures to 4200 PSI (290 bar)

For your most demanding applications, these SureSite® Indicators feature ANSI flanges and fittings and construction to rigorous ASME standards. You can’t specify a better visual level indicator.

1. Mounting Configuration Types

To choose the best configuration for your application, focus on the process connections (connections where the liquid typically enters/leaves the SureSite).

<table>
<thead>
<tr>
<th>Type AA</th>
<th>Type BA</th>
<th>Type CA</th>
<th>Type DA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top and Bottom Process Connections</td>
<td>Side and Side Process Connections</td>
<td>Top and Side Process Connections</td>
<td>Side and Bottom Process Connections</td>
</tr>
</tbody>
</table>

L = Length of Visual Indication

<table>
<thead>
<tr>
<th>Typical Lengths*</th>
<th>C to C = L + 10-1/4&quot; (260.4 mm)</th>
<th>C to C = L</th>
<th>C to C = L + 3-3/4&quot; (95.2 mm)</th>
<th>C to C = L + 6-1/2&quot; (165.1 mm)</th>
</tr>
</thead>
</table>

Flag Material
Plastic (300°F/148.9°C) or Aluminum (750°F/399°C)

Length of Indication (Uninterrupted) 240° (610 cm)

Minimum Specific Gravity 0.39

† Dimensions vary due to connections, material and specific gravity.

2. Material

Select desired material from those tabulated below. Mark the Code Number on your Order! Check List. The pressure/temperature performance parameters are specified in the chart at right. Consult the factory with pressure/temperature requirements that fall outside the parameters shown here. These units are manufactured in Schedule 40, 80 or 160 pipe accordingly.

Stock Material (Best economy and delivery).

<table>
<thead>
<tr>
<th>Materials</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing</td>
<td>Float</td>
</tr>
<tr>
<td>316L Stainless Steel</td>
<td>600 psi –</td>
</tr>
<tr>
<td>316L Titanium (Ti-6Al-4V)</td>
<td>600 psi+</td>
</tr>
</tbody>
</table>

Note: Additional materials, floats, connections and manufacturing techniques are available to extend lengths and operational capabilities. Please contact Gems if the parameters above do not meet your requirements.

* Units requiring ASME certification must be specified at time of request.
3. Connection Codes

All connections comprised of ANSI fittings (See complete descriptions below)

<table>
<thead>
<tr>
<th>Blind</th>
<th>NPT</th>
<th>Flange</th>
<th>Weld</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fixed</td>
<td>Removable</td>
<td>Fixed</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>Fixed</td>
<td>T15</td>
<td>T16</td>
<td>T17</td>
</tr>
<tr>
<td></td>
<td>T20</td>
<td>T21</td>
<td>T22</td>
</tr>
<tr>
<td>Removable</td>
<td>Socket</td>
<td>Butt</td>
<td>Socket</td>
</tr>
<tr>
<td>T25</td>
<td>T26</td>
<td>T27</td>
<td>T28</td>
</tr>
</tbody>
</table>

TOP T
SIDE Sa
SIDE Sb
BOTTOM B

Note: Gems recommends a removable top and/or bottom connection for float access.

Connection Code Descriptions
Please provide all connections when completing the OrderIt! Product Check List.
Note: Before selecting your connections, consider incorporating your vent and drain requirements.

T & B (Top and Bottom)
T/B 15. ANSI welded pipe cap
T/B 16. ANSI fixed slip-on flange/blind mating flange
T/B 17. ANSI welded pipe cap with FNPT
T/B 19. ANSI welded pipe cap with MNPT nipple
T/B 20. ANSI fixed slip-on flange/mating FNPT reducing flange
T/B 22. ANSI fixed slip-on flange/mating flange w/MNPT nipple
T/B 23. ANSI welded pipe cap with ANSI flange
T/B 24. ANSI fixed slip-on flange/mating reducing ANSI flange spool
T/B 25. ANSI welded pipe cap with socketweld coupling
T/B 26. ANSI welded pipe cap with butt weld nipple
T/B 27. ANSI fixed slip-on flange/mating flange with socketweld coupling
T/B 28. ANSI fixed slip-on flange/mating flange with butt weld nipple
T/B 29. ANSI fixed weldneck flange/blind mating flange
T/B 30. ANSI fixed weldneck flange/mating FNPT reducing flange
T/B 32. ANSI fixed weldneck flange/mating flange w/MNPT nipple
T/B 33. ANSI fixed weldneck flange/mating reducing flange spool
T/B 34. ANSI fixed weldneck flange/mating flange with socketweld coupling
T/B 35. ANSI fixed weldneck flange/mating flange with butt weld nipple

Sa & Sb (Sides)
S1. No connection
S2. MNPT nipple
S3. FNPT coupling
S4. ANSI flange
S5. Weldneck flange
S6. Socketweld coupling
S7. Butt weld nipple

Accessories – Pages D-16 to D-18
Make more of your SureSite® Indicator with the productivity-enhancing accessories found at the end of this section.

- Indicating Scales
  Add graduations to your flag indication.

- Switch Modules
  Control pumps, valves, alarms, etc. Mount externally on housing for infinite positioning.

- Continuous Output Transmitters
  Signal conditioned for compatibility with most electronic instruments to 300°F (149°C).

### Product Check List

**Fax It! 860-747-4244**

**Photocopy This Form**
Use one form for each product type you are selecting.

This is a [ ] Request for a Quote
[ ] Order P.O. # 

**Quantity Needed**

Date Required / / 

Shipping Method: 

Partial(s) Accepted: [ ] Yes  [ ] No

[ ] Fax (______)

---

**SureSite Indicators, High Performance Versions**

**Process Conditions**
This information is essential to the accurate and proper operation of your SureSite® Visual Level Indicators. Please complete fully and accurately.

1. **Pressure:** Operating ______ psig  Maximum ______ psig
2. **Temperature:** Operating ______ °F  Maximum ______ °F
3. **Liquid Media:**

**Use this page for high performance units only.**

4. **Specific Gravity @ Operating Condition:**

5. **Viscosity:** ______ SSU

6. **Application Location:** [ ] Indoor  [ ] Outdoor

---

**Physical Configuration**

1. **Mounting Configuration Types:**
   [ ] Type AA  [ ] Type BA  [ ] Type CA  [ ] Type DA

2. **Housing and Float Material**
   - Housing: 316L/SS
   - Code 2 – 316L SS Float  [ ] Code 9 – Titanium Float

3. **Connection Codes**
   - ▶ Complete all 4 connection code lines. Check off NPT or Flange size where appropriate.
   - Connection Code Number Goes Here. **Connection Code Numbers and their descriptions are on Page D-11.**

<table>
<thead>
<tr>
<th>Top T</th>
<th>NPT or Weld</th>
<th>Flange</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ 1/2” □ 1” □ 1.5” □ Other</td>
<td>□ 1/2” □ 1” □ 2” □ Other</td>
<td></td>
</tr>
<tr>
<td>□ 150# (RF) □ 600# (RF) □ 900# (RF) □ Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Side Sa</th>
<th>NPT or Weld</th>
<th>Flange</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ 1/2” □ 1” □ 1.5” □ Other</td>
<td>□ 1/2” □ 1” □ 2” □ Other</td>
<td></td>
</tr>
<tr>
<td>□ 150# (RF) □ 600# (RF) □ 900# (RF) □ Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Side Sb</th>
<th>NPT or Weld</th>
<th>Flange</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ 1/2” □ 1” □ 1.5” □ Other</td>
<td>□ 1/2” □ 1” □ 2” □ Other</td>
<td></td>
</tr>
<tr>
<td>□ 150# (RF) □ 600# (RF) □ 900# (RF) □ Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bottom B</th>
<th>NPT or Weld</th>
<th>Flange</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ 1/2” □ 1” □ 1.5” □ Other</td>
<td>□ 1/2” □ 1” □ 2” □ Other</td>
<td></td>
</tr>
<tr>
<td>□ 150# (RF) □ 600# (RF) □ 900# (RF) □ Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. **Length of Visual Indication – L:** ______ inches (240°, Max).
   - Connection to Connection Dimension – C to C: ______ inches.

5. **Flag Type**
   - Plastic flags available to 300°F (149°C).
   - Specify aluminum flags for temperatures of 301°F to 750°F (149°C to 399°C).

   - [ ] Plastic (Orange and White)
   - [ ] Aluminum (Black and Silver)

   - [ ] Non-Standard; Specify: ____________________________ consult factory.

---

**Accessories (Pages D-16 to D-18)**

1. **Transmitters** (Continuous Electrical Indication):
   - [ ] Low Temperature – 300°F (149°C)
   - [ ] High Temperature – 750°F (399°C)

2. **J-Box/Signal Conditioners Accessories:**
   - [ ] Terminal Strip  □ 4-20 mA Output
   - [ ] 0-12 VDC Output  □ 0-5 VDC Output

3. **Power Supply**
   - (Optional)
   - □ 115 VAC (Input) /24 VDC (Output)
   - □ 230 VAC (Input) /24 VDC (Output)

Please contact Gems for any configuration or special requirements not covered on this form. 800-378-1600

**Quote:** $ _______  **Date Quoted:** / / 

---

**Gems Sensors & Controls**

Hi Perf SureSite / p3of3 / 9-MAy 16
Engineered Plastics Versions – Standard Size

- Temperatures to 280°F (139°C)
- Pressures to 150 PSI (10.3 Bar)
- Up to 19 feet (5.8 meters) of continuous visual indication

The 2” Schedule 80 pipe design is ideal for use on chemical storage tanks, or with almost any liquid where temperature and pressure requirements are moderate. All SureSite Indicators feature the same patented flag and guide assemblies used on our alloy versions, so you can be assured of excellent visibility and long-life reliability.

1. Mounting Configuration Types

To choose the best configuration for your application, focus on the process connections (connections where the liquid typically enters/leaves the SureSite).

<table>
<thead>
<tr>
<th>Type AP</th>
<th>Type BP</th>
<th>Type CP</th>
<th>Type DP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top and Bottom Process Connections</td>
<td>Side and Side Process Connections</td>
<td>Top and Side Process Connections</td>
<td>Side and Bottom Process Connections</td>
</tr>
<tr>
<td>C to C = L or 11” (279 mm)</td>
<td>C to C = L or 8” (203 mm)</td>
<td>C to C = L or 9.5” (241 mm)</td>
<td>C to C = L or 9.5” (241 mm)</td>
</tr>
<tr>
<td>Overall Length = C to C</td>
<td>Overall Length = C to C + 11” (279 mm)</td>
<td>Overall Length = C to C + 5-1/2” (140 mm)</td>
<td>Overall Length = C to C + 5-1/2” (140 mm)</td>
</tr>
</tbody>
</table>

Flag Indicator Material: Plastic

Length of Indication, Max.: 228” (579 cm)

*Dimensional data varies due to connections, material and specific gravity.

Note: Additional materials, floats, connections and manufacturing techniques are available to extend lengths and operational capabilities. Please contact Gems Sensors if the parameters above do not meet your requirements.

2. Material

Select desired material from those tabulated below. Mark the Code Number on your Order!
Check List. The pressure/temperature performance parameters are specified in the charts at right. Consult the factory with pressure/temperature requirements that fall outside the parameters shown here.

<table>
<thead>
<tr>
<th>Materials</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing &amp; Float</td>
<td></td>
</tr>
<tr>
<td>PVC</td>
<td>1</td>
</tr>
<tr>
<td>Clear PVC Housing/ PVC Float</td>
<td>1A*</td>
</tr>
<tr>
<td>CPVC</td>
<td>2</td>
</tr>
<tr>
<td>PVDF</td>
<td>4</td>
</tr>
</tbody>
</table>

* 2” Schedule 40 pipe

= Stock Material
(Best economy and delivery.)

Ordering is Easy! See Page D-15.
Easy online ordering too!

3. Connection Codes
(See complete descriptions below)

Connection Code Descriptions
Please provide all connections when completing the Order It! Product Check List.
Note: Before selecting your connections, consider incorporating your vent and drain requirements.

T & B (Top and Bottom)  
- T/B 1. Welded cap
- T/B 2. Threaded cap (PVC/CPVC only)
- T/B 3. Fixed flange/blind mating flange
- T/B 4. Welded coupling/NPT
- T/B 5. Welded coupling/MNPT
- T/B 6. Threaded union/MNPT
- T/B 7. Fixed flange/mating flange MNPT
- T/B 8. Fixed flange/mating flange/NPT
- T/B 9. Welded coupling flange
- T/B 10. Threaded union flange

Sa & Sb (Sides)
- S1 - Blind-No Connection
- S2 - MNPT nipple
- S3 - FNPT coupling
- S4 - ANSI flange

Accessories – Pages D-16 to D-18
Make more of your SureSite® Indicator with the productivity-enhancing accessories found at the end of this section.

- Indicating Scales
  Add graduations to your flag indication.

- Switch Modules
  Control pumps, valves, alarms, etc. Mount externally on housing for infinite positioning.

- Continuous Output Transmitters
  Signal conditioned for compatibility with most electronic instruments.
SureSite Indicators, Engineered Plastic Versions – Standard Size

Process Conditions
This information is essential to the accurate and proper operation of your SureSite® Visual Level Indicators. Please complete fully and accurately.

1. Pressure: Operating __________ psig Maximum __________ psig
2. Temperature: Operating ________ °F Maximum __________ °F
3. Liquid Media: __________
4. Specific Gravity @ Operating Condition: __________
5. Viscosity: __________ SSU
6. Application Location: □ Indoors □ Outdoors

Physical Configuration
1. Mounting Configuration Types:
   □ Type AP □ Type BP □ Type CP □ Type DP
2. Housing and Float Material:
   □ Code 1 □ Code 1A □ Code 2 □ Code 3 □ Code 4
3. Connection Codes – Complete all 4 connection code lines.
   Check off NPT or Flange size where appropriate.

4. Length of Visual Indication – L: __________ inches (228”, Max.).
   Connection to Connection Dimension – C to C: __________ inches.
5. Flag Type: Plastic (Orange and White)

Accessories (Pages D-16 to D-18)
1. Transmitters (Continuous Electrical Indication):
   □ Standard – 300°F (149°C) □ Explosion-Proof
2. J-Box/Signal Conditioners Accessories:
   □ Terminal Strip □ 4-20 mA Output □ 0-5 VDC Output
   □ 0-12 VDC Output
3. Power Supply: (Optional)
   □ 115 VAC (Input) /24 VDC (Output)
   □ 230 VAC (Input) /24 VDC (Output)
4. Switch Modules (Single Point): __________ Quantity (only if required)
   a. □ SPST □ SPDT □ DPDT 120 VAC □ DPDT 24 VDC
   b. □ Standard – 300°F (149°C) □ High Temperature
   □ Explosion Proof
5. Indicating Scales:
   □ Feet and Inches □ Inches □ Metric □ Blank
   □ Custom Graduations; specify: __________

Please contact Gems for any configuration or special requirements not covered on this form. 800-378-1600

Quote: __________ Date Quoted: __________/__/____

Continuous Electrical Output Transmitters for all SureSite Indicators

Broaden the SureSite Indicator’s capabilities; add one of these transmitters. You can have visual indication and a continuous electrical output too without additional tank penetrations. Use them to know what’s in your tank remotely, send the signal to your controller, schedule your next inventory.

These transmitters are compatible with the readout displays at the end of this Section (D-28 to D-30) or can interface directly to your equipment by specifying the appropriate output.

Select your transmitter preference on the SureSite Product Check List (pages D-6, D-9, D-12 and D-15).

<table>
<thead>
<tr>
<th>Low Temperature Transmitter</th>
<th>Explosion-Proof Transmitter</th>
<th>Explosion-Proof / High Temperature Transmitter</th>
</tr>
</thead>
<tbody>
<tr>
<td>+300°F (149°C)</td>
<td>+300°F (149°C)</td>
<td>+750°F (399°C)</td>
</tr>
<tr>
<td>Polysulfone</td>
<td>316 Stainless Steel</td>
<td></td>
</tr>
<tr>
<td>Cable</td>
<td>Junction Box (Metal/iron)</td>
<td></td>
</tr>
<tr>
<td>3/8” (9.5 mm)</td>
<td>3/8” (9.5 mm)</td>
<td></td>
</tr>
<tr>
<td>3/8” (9.5 mm)</td>
<td>3/8” (9.5 mm)</td>
<td></td>
</tr>
</tbody>
</table>

Compatible SureSite Types

Operating Temperature, Max.

Housing Materials

Output Termination

Transmitter Resolution

Accuracy

Signal Conditioned Modules

Gems offers a variety of electrical Junction Boxes with built-in Signal Conditioners to increase the versatility of SureSite Indicators. Voltage outputs available:

- 0-5VDC
- 0-10VDC
- 0-12 VDC

Current output available:

- 4-20mA (loop powered)

Electrical specifications and ordering information for these units are found on Page D-17. Junction boxes with terminal blocks are also on Page D-17.

Intrinsic Safety

Operation is intrinsically safe when transmitters are properly connected with a Gems, or other appropriate, zener barrier in Section L.
Signal Conditioning Modules, 0-5 VDC, 0-12 VDC and 4-20 mA Outputs

Provide signal conditioning as an integral part of the SureSite® Level Indicators

- Stem Mounted
- J-Box Enclosed
- Panel Mounted

Gems signal conditioners provide outputs for direct connection to a wide range of instrumentation. They are ideal for large, multi-tank complexes. Units with 4-20 mA outputs are particularly well suited for instrumentation control loops. No intermediate receiver is required.

Specifications (Not included in table below)

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
<td>+5°F to +160°F (-15°C to +71°C)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40°F to +212°F (-40°C to +100°C)</td>
</tr>
<tr>
<td>Output Temperature Coefficient</td>
<td>±0.00388%/°F (±0.007%/°C)</td>
</tr>
<tr>
<td>4-20 mA Types</td>
<td>To within ±1% of 16 mA</td>
</tr>
</tbody>
</table>

Excitation Required for Transmitters using 4-20 mA Signal Conditioners

The minimum excitation required for operation of transmitters with 4-20 mA, DC signal converters (See chart at right) can be determined for a given total loop resistance from the graph shown. (Total loop resistance = the sum of the DC termination resistance plus loop resistance.) For optimum operation, which is a function of source voltage (+V,) and total loop resistance, the source voltage value used should be above the minimum load line for the related loop resistance.

How To Order

Select Part Number based on Output Signal desired and SureSite Indicator being used.

<table>
<thead>
<tr>
<th>Electrical Termination Method</th>
<th>Output Signal</th>
<th>Input Voltage</th>
<th>Module Part Numbers For:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>SureSite</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Low Temperature</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>High Temperature</td>
</tr>
<tr>
<td>Junction Box</td>
<td>0-5 VDC</td>
<td>8-24 VDC</td>
<td>86155</td>
</tr>
<tr>
<td></td>
<td>0-12 VDC</td>
<td>15-30 VDC</td>
<td>85997</td>
</tr>
<tr>
<td></td>
<td>4-20 mA</td>
<td>10-40 VDC</td>
<td>86158</td>
</tr>
<tr>
<td>Panel Mount with Plug-in Base</td>
<td>4-20 mA</td>
<td>10-40 VDC</td>
<td>112300</td>
</tr>
</tbody>
</table>

Operating on 115 VAC or 230 VAC inputs to supply a regulated 24 VDC to the signal conditioned transmitter where external VDC power is not available. Maximum Load: 70 mA.
Switch Modules Provide High-, Low- or Intermediate-Level Alarms or Control Logic

- CSA Approved
- Includes Stainless Steel Mounting Clamp
- Polyurethane Housing
- Withstands Temperatures to 300°F (148.9°C)
- Connection: 1/4” FNPT

- Withstands Temperatures of 750°F (399°C)
- 316 Stainless Steel Construction
- 1/2” MNPT Conn.
- Includes Stainless Steel Mounting Clamp

- UL, CSA, FM Approved
- Withstands Temperatures of 750°F (399°C)
- J-Box Terminated
- Stainless Steel Construction
- Includes Stainless Steel Mounting Clamp

Switch Logic (All Models)

<table>
<thead>
<tr>
<th>Lead Wires Up</th>
<th>Switch closes on rising level and remains closed until opened by falling level.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead Wires Down</td>
<td>Switch opens on rising level and remains open until closed by falling level.</td>
</tr>
</tbody>
</table>

For Intrinsic Safety, these switch modules can be rendered intrinsically safe with the use of GEMS SAFE-PAK® and Zener Barriers. See Section I.

How To Order
Switch modules can be added to any SureSite Indicator at any time. Specify the Part Number and quantity of switches desired on Product Check List.

<table>
<thead>
<tr>
<th>Switch Type</th>
<th>Rating*</th>
<th>Part Numbers – Based on SureSite Version</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Alloy &amp; ASME</td>
</tr>
<tr>
<td>Standard</td>
<td>SPST</td>
<td>20VA</td>
</tr>
<tr>
<td>Hi-Temp</td>
<td>SPST</td>
<td>20VA</td>
</tr>
<tr>
<td></td>
<td>SPDT</td>
<td>20VA</td>
</tr>
<tr>
<td>Explosion-Proof</td>
<td>SPST</td>
<td>20VA</td>
</tr>
<tr>
<td></td>
<td>DPDT, 120 VAC</td>
<td>10A</td>
</tr>
<tr>
<td></td>
<td>DPDT, 24 VDC</td>
<td>10A</td>
</tr>
</tbody>
</table>

* See "Electrical Data" on Page X-5 for more information. # - Stock item

Indicating Scales

These optional stainless steel indicating scales provide a numerical readout of the liquid level in addition to the flag indication. They mount alongside the flag assembly for easy viewing.

- Available in 1.5” and 3” wide versions.
- Markings: Feet and Inches
  - Inches
  - Metric (Decimeter, centimeter, millimeter)
- Custom marked graduations such as gallons, liters or percentage available.

LED Transmitter Versions – Miniature Size

- LED indicators ideal in low or no ambient light
- Integral transmitter with choice of signal conditioned output
- Lengths to 10 feet (3 meters)
- Pressures to 400 PSI (27 bar) – Temperature to 300°F (149°C)

These Mini SureSite Indicators excel where zero and low ambient light make visual indicators difficult to read. These mini indicators feature all the benefits of a SureSite, like safe and durable stainless steel process fluid containment, while combining a continuous output transmitter with a bright LED channel.

The LED indicator assembly integrates a continuous level transmitter reducing overall footprint. A variety of signal conditioners provide the output you require. Forget the flashlights and squinting required to view antiquated sightglasses.

Typical Applications
- Pharmaceuticals
- Medical Equipment
- Food and Beverages
- Marine
- Rail
- Boilers

Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indication Length</td>
<td>5&quot; to 120&quot; (13 to 305 cm) in 0.5&quot; (13 mm) increments</td>
</tr>
<tr>
<td>Media</td>
<td>Waters, Coolants, Light Oils, Diesel, Hydraulics</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>Minimum 0.8 SG to 1.2 SG</td>
</tr>
<tr>
<td>Chamber Housing</td>
<td>316/316L Stainless Steel</td>
</tr>
<tr>
<td>Flange</td>
<td>316/316L Stainless Steel</td>
</tr>
<tr>
<td>Shroud</td>
<td>Polycarbonate</td>
</tr>
<tr>
<td>O-Ring (Wetted)</td>
<td>Viton®, unless otherwise specified</td>
</tr>
<tr>
<td>J-Box Enclosure</td>
<td>Die cast Aluminum</td>
</tr>
<tr>
<td>Reliability and Durability</td>
<td>Expected 10 year service life</td>
</tr>
<tr>
<td>Performance Resolution</td>
<td>3/8&quot; (9.5 mm)</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±1/2&quot; (13 mm)</td>
</tr>
<tr>
<td>Output Signal</td>
<td>4-20 mA to within ±3% of full scale</td>
</tr>
<tr>
<td>Temperature Ranges</td>
<td>-40°F to +300°F (-40°C to +149°C)</td>
</tr>
<tr>
<td>Process</td>
<td>-40°F to +160°F (-40°C to +71°C)</td>
</tr>
<tr>
<td>Ambient</td>
<td>Vacuum to 400 psig (27.6 bar)</td>
</tr>
<tr>
<td>Environmental</td>
<td>Enclosure NEMA 4X IP65 (Water Resistant)</td>
</tr>
<tr>
<td>Input Power</td>
<td>20 to 28VDC @100 mA, Consult Factory for other voltages</td>
</tr>
<tr>
<td>Outputs</td>
<td>4-20 mA continuous current loop (3 wire)</td>
</tr>
<tr>
<td></td>
<td>0-5 V continuous (3 wire)</td>
</tr>
<tr>
<td></td>
<td>0-10 V continuous (3 wire)</td>
</tr>
<tr>
<td>Mechanical Interface</td>
<td>Custom configured for tank (per mini SureSite offering); 1/2&quot; NPT to junction box</td>
</tr>
<tr>
<td>Mounting Orientation</td>
<td>AM-L, BM-L, CM-L, DM-L</td>
</tr>
<tr>
<td>Unit Positions</td>
<td>See Selection Guide; Step 2 for Codes</td>
</tr>
<tr>
<td>Shroud Position</td>
<td>Field Adjustment Null and Span/Factory Calibrated</td>
</tr>
</tbody>
</table>
1. Mounting Configuration Type
   Based on process connection locations.

<table>
<thead>
<tr>
<th>Type AM-L</th>
<th>Type BM-L</th>
<th>Type CM-L</th>
<th>Type DM-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top and Bottom Process Connections</td>
<td>Side and Side Process Connections</td>
<td>Top and Side Process Connections</td>
<td>Side and Bottom Process Connections</td>
</tr>
</tbody>
</table>

   L = Length of Visual Indication
   C1 to C0 = Length between process connections.* 
   Gems will aid in determining this value.

   Typical Lengths*
   C1 to C0 = L + 9.5” (241 mm) 
   C1 to C0 = L + 6” (152 mm)

   Length of Indication (Uninterrupted) 120° (305 cm), Maximum

   * Formula provided is for approximation only. Final dimensions will vary due to connections type, position, cable or junction box location, and specific gravity of process liquid. Gems will confirm final dimensions before manufacturing.

2. LED Transmitter Assembly Location
   Position relative to process connection location. All illustration views are from the top. Codes with ‘+’ indicate views when 3/4” side ports are used.

<p>| Transmitter Assembly Location Code |</p>
<table>
<thead>
<tr>
<th>A</th>
<th>A+</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>E+</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Image" /></td>
<td><img src="image2" alt="Image" /></td>
<td><img src="image3" alt="Image" /></td>
<td><img src="image4" alt="Image" /></td>
<td><img src="image5" alt="Image" /></td>
<td><img src="image6" alt="Image" /></td>
<td><img src="image7" alt="Image" /></td>
</tr>
</tbody>
</table>

   Approximate angle of view - 270°

3. J-Box Location
   Drawings are typical, and for reference only. Final, specific locations are determined at time of manufacture.

<table>
<thead>
<tr>
<th>J-Box Location Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Side Mount Below Bottom Port</td>
</tr>
</tbody>
</table>

   LED Assembly Cable Egress
   For J-Box Location 1, LED Transmitter Assembly cable will egress from the bottom of the assembly. 
   For J-Box Locations 2 and 3, the cable will egress from the top of the assembly.

   * Requires a Blind Fixed Top Connection. See Connection Code T1 in the chart on next page.
### 4. Connection Codes

(See complete descriptions below)

<table>
<thead>
<tr>
<th>Standard Connections</th>
<th>Sanitary Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Blind</strong></td>
<td><strong>NPT</strong></td>
</tr>
<tr>
<td>Fixed</td>
<td>Fixed</td>
</tr>
<tr>
<td>Removable</td>
<td>Removable</td>
</tr>
<tr>
<td><strong>Flange</strong></td>
<td><strong>Weld</strong></td>
</tr>
<tr>
<td>Fixed</td>
<td>Fixed</td>
</tr>
<tr>
<td>Removable</td>
<td>Removable</td>
</tr>
</tbody>
</table>

**Connection Code Descriptions**

Please provide all connections when completing the **Orderit!** Product Check List (located on the following page).

**Note:** Before selecting your connections, consider incorporating your vent and drain requirements.

**T & B (Top and Bottom)**

- **T/B 1.** Welded cap
- **T/B 2.** Welded cap with FNPT
- **T/B 3.** Welded cap with MNPT
- **T/B 7.** Sanitary flange
- **T/B 8.** Sanitary flange with mating blind flange
- **T/B 10.** Standard fixed flange/mating blind flange
- **T/B 11.** Standard fixed flange/mating FNPT reducing flange

**Sa & Sb (Sides)**

- **S1.** No connection
- **S2.** MNPT nipple
- **S3.** FNPT coupling
- **S4.** ANSI flange
- **S5.** Sanitary flange
- **S6.** Butt weld nipple

### 5. Signal Conditioner Assemblies

Gems signal conditioners provide outputs for direct connection to a wide range of instrumentation. They are ideal for large, multi-tank complexes. Units with 4-20 mA outputs are particularly well suited for instrumentation control loops. Consult LED SureSite Installation, Operation and Maintenance bulletin.
LED SureSite Indicator/Transmitter, Alloy Versions – Miniature Size LED Process Conditions

This information is essential to the accurate and proper operation of your SureSite® Visual Level Indicators. Please complete fully and accurately.

1. Pressure: Operating ______ psig Maximum ______ psig
2. Temperature: Operating ______ °F Maximum ______ °F
3. Liquid Media: __________________________
4. Specific Gravity @ Operating Condition: __________________________
5. Viscosity: __________ SSU
6. Application Location: □ Indoors □ Outdoors

Physical Configuration

1. Mounting Configuration Types:
   □ Type AM-L □ Type BM-L □ Type CM-L □ Type DM-L
   Length of Visual Indication – L ______ inches (120°, Max.)
   Connection to Connection – C to C: ______ inches (calculated)

2. LED Transmitter Assembly Location:
   1/2” Side Ports: □ A □ B □ C □ D □ E
   3/4” Side Ports: □ A+ □ C □ E+

3. J-Box Location:
   □ 1 □ 2 □ 3

4. Connection Codes – Complete all 4 connection code lines. Check off NPT or Flange size where appropriate.

<table>
<thead>
<tr>
<th>Top T</th>
<th>NPT or Weld</th>
<th>Flange</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ 1/2” □ 3/4” □ Other</td>
<td>□ 1/2” □ 3/4” □ 1” □ Other</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Side Sa</th>
<th>NPT or Weld</th>
<th>Flange</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ 1/2” □ 3/4” □ Other</td>
<td>□ 1/2” □ 3/4” □ 1” □ Other</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Side Sb</th>
<th>NPT or Weld</th>
<th>Flange</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ 1/2” □ 3/4” □ Other</td>
<td>□ 1/2” □ 3/4” □ 1” □ Other</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bottom B</th>
<th>NPT or Weld</th>
<th>Flange</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ 1/2” □ 3/4” □ Other</td>
<td>□ 1/2” □ 3/4” □ 1” □ Other</td>
<td></td>
</tr>
</tbody>
</table>

5. Supply/Conditioner:
   Supply Voltage: □ 5 VDC □ 12 VDC □ 24 VDC
   Output: □ 4-20mA □ 0-5 VDC □ 0-10 VDC

6. O-Ring Material:
   □ Viton® (Standard) □ Ethylene Propylene □ Other

Special Instructions (Materials, Connections, etc.)

________________________

Special Instructions (Materials, Connections, etc.)

________________________

Please contact GEMS Sensors Inc. for any configuration or special requirements not covered on this form. 800-378-1600

Quote $ _____________ Date Quoted / / 

DIPTAPE Visual Level Indicators –
Manually Operated

These manually-operated indicators are compact and completely self-contained. They need no electricity to provide continuous indication of liquid level in storage tanks and vessels. DIPTAPE Indicators are ideal for quick, periodic readouts that are accurate to 1/16 inch or 1 mm; especially in remote areas where power is unavailable, or undesirable. Only the float and stem contact the liquid, so the readout tape is always clean and readable.

Custom-configurable DIPTAPE Indicators described on the following pages are available in a broad range of materials and mounting types in lengths to six feet (1.8 m). For lengths six to ten feet, consult factory.

General Operating Principle
A magnet-equipped float moves with liquid level along the unit stem, inside the storage vessel. Level readout is obtained by simply removing the protective cap atop the unit and lifting the calibrated indicator (within the unit) until magnetic interlock with the float is felt. The indicator is held at this point and level is read where the calibration aligns with the top of the mounting. The indicator is then lowered back inside the unit for storage and is protected by the screw type cap when not in use.

Typical Application
Refillable, portable chemical tanks are monitored and exchanged when empty. DIPTAPE Indicators maintain a “closed” system on tanks or drums containing environmentally hazardous liquids and vapors. Plus, their rugged construction stands up to the rigors of transportation.

Contents

<table>
<thead>
<tr>
<th>Description</th>
<th>Page Start</th>
</tr>
</thead>
<tbody>
<tr>
<td>All-PVC Versions</td>
<td>D-24</td>
</tr>
<tr>
<td>Engineered Plastic Versions</td>
<td>D-25</td>
</tr>
<tr>
<td>Alloy Versions</td>
<td>D-26</td>
</tr>
</tbody>
</table>
All-PVC Versions Are Economical for Light Duty

- Temperatures to 140°F (60°C)
- Pressures to 15 PSI (1 bar) Max.

Ideal for chemical storage tanks, our all-PVC DIPTAPE Indicators provide one of your best values for liquid level monitoring. These light duty versions are recommended for use in calm liquids and ambient temperature and pressure levels. See Engineered Plastic versions on the next page for enhanced performance characteristics.

1. Mounting Types

<table>
<thead>
<tr>
<th>Type 3</th>
<th>Type 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>2” NPT</td>
<td>3”-150# ANSI Flange</td>
</tr>
</tbody>
</table>

“B” Dimension (Length Overall): Indicating Length +1-7/8” (47.6 mm)

<table>
<thead>
<tr>
<th>Stem, Float and Mounting Material</th>
<th>PVC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. Liquid Specific Gravity</td>
<td>0.65</td>
</tr>
<tr>
<td>Operating Temperatures</td>
<td>0°F to +140°F (-17.7°C to 60°C)</td>
</tr>
<tr>
<td>Operating Pressure, Max.</td>
<td>15 psi (1 bar)</td>
</tr>
<tr>
<td>Indicating Length*</td>
<td>6” to 72” (15.2 cm to 182.9 cm)</td>
</tr>
<tr>
<td>Std. Indication Markings</td>
<td>1/16” or 1 mm increments</td>
</tr>
</tbody>
</table>

*For longer lengths, please consult factory.

Ordering Is Easy
1. To specify DIPTAPE Level Indicators, start by photocopying the OrderIt! Product Check List located on Page D-27.
2. Use the product information in this section to make your selections on the Check List. Please use a separate Check List for each unique configuration.
3. Fax your completed OrderIt! Check List to Gems for a price quotation.
   Fax: 860-747-6244
Engineered Plastic Versions Offer Best Chemical Resistance

- Temperatures to 140°F (60°C)
- Pressures to 50 PSI (3.4 bar)

With a choice of three highly resistive, engineered plastic materials, large floats and 1/2 inch IPS stems, these DIPTAPE Indicators provide rugged durability in almost any chemical tank. For higher temperature and pressure capability, review the alloy versions on next page.

1. Mounting Types

"B" Dimension
(Length Overall):
Indicating Length + A + C

Note: Dimensions "A" and "C" are dependent on float selected. See Float Types below.

<table>
<thead>
<tr>
<th>Stem and Mounting Material</th>
<th>PVC, PVDF or Polypropylene</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicating Length*</td>
<td>6&quot; to 72&quot; (15.2 cm to 182.9 cm)</td>
</tr>
<tr>
<td>Std. Indication Markings</td>
<td>1/16&quot; or 1 mm increments</td>
</tr>
</tbody>
</table>

*For longer lengths, please consult factory.
**Dimensions listed below, under "Float Types."

2. Float Types

<table>
<thead>
<tr>
<th>Float Material</th>
<th>PVC</th>
<th>Polypropylene</th>
<th>PVDF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part Number</td>
<td>71741</td>
<td>73742</td>
<td>73740</td>
</tr>
<tr>
<td>Min. Liquid Specific Gravity</td>
<td>0.65</td>
<td>0.46</td>
<td>0.83</td>
</tr>
<tr>
<td>Operating Temperatures</td>
<td>+40°F to +140°F (+4.4°C to +60°C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Pressure, Max.</td>
<td>50 psi (3.4 bar)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;A&quot; Dimension (From Mounting Types)</td>
<td>1-3/4&quot; (44.4 mm)</td>
<td>1-3/8&quot; (34.9 mm)</td>
<td>2-3/16&quot; (56.6 mm)</td>
</tr>
<tr>
<td>&quot;C&quot; Dimension (From Mounting Types)</td>
<td>15/16&quot; (23.8 mm)</td>
<td>1-5/16&quot; (33.3 mm)</td>
<td>1/2&quot; (12.7 mm)</td>
</tr>
</tbody>
</table>
DIPTAPE™ Indicators – Alloy Versions

- Temperatures to 300°F (148°C)
- Pressures to 750 PSI (52 bar)

Rugged brass or stainless steel units are ideal for use in water and oils. Select these units for best temperature and pressure capabilities.

1. Mounting Types

“B” Dimension
(Length Overall):
Indicating Length + A + C

Note: Dimensions “C” and “A” are dependent on float selected. See Float Types below.

<table>
<thead>
<tr>
<th>Stem and Mounting Material</th>
<th>Brass or 316 Stainless Steel</th>
<th>316 Stainless Steel Stem with Carbon Steel or 316 Stainless Steel Flange</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicating Length**</td>
<td>6” to 72” (15.2 cm to 182.9 cm)</td>
<td></td>
</tr>
<tr>
<td>Std. Indication Markings</td>
<td>1/16” or 1 mm increments</td>
<td></td>
</tr>
</tbody>
</table>

* Dimensions listed below, under “Float Types.”
** For longer lengths, please contact factory.

2. Float Types

<table>
<thead>
<tr>
<th>Buna N*</th>
<th>Stainless Steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Float Part Number</td>
<td>73710</td>
</tr>
<tr>
<td>Min. Liquid Specific Gravity</td>
<td>0.45</td>
</tr>
<tr>
<td>Operating Temperatures</td>
<td>Oil: -40°F to +230°F (-40°C to +110°C)</td>
</tr>
<tr>
<td>Water: to 180°F (+32.2°C)</td>
<td></td>
</tr>
<tr>
<td>Operating Pressure, Max.</td>
<td>300 psi (21 bar) max. @ 77°F (25°C)</td>
</tr>
<tr>
<td>“A” Dimension (From Mounting Types)</td>
<td>1-1/4” (31.7 mm)</td>
</tr>
<tr>
<td>“C” Dimension (From Mounting Types)</td>
<td>11/16” (17.5 mm)</td>
</tr>
</tbody>
</table>

*Other Wiper Material: Hysol.
DIPTAPE Level Indicators

Application Environment Conditions

This information is essential to the accurate and proper operation of your Diptape Level Indicators. Please complete fully and accurately.

1. Liquid Media: __________________________

2. Pressure: Minimum _____ psig  Maximum _____ psig

3. Temperature: Minimum _____ °F  Maximum _____ °F

4. Specific Gravity: Minimum _____  Maximum _____

5. Viscosity: __________ SSU

6. Tank Material: __________________________

7. Tank Depth: ____________________________

1. Mounting Type:
   □ Type B  □ Type C
   □ Type 3  □ Type 4

2. Material:
   □ PVC   □ PVDF   □ Polypropylene
   □ Brass □ 316 Stainless Steel

   Flange - Alloy Version:
   □ 316 Stainless Steel □ Carbon Steel

3. Float Types:
   □ PVC   □ PVDF   □ Polypropylene
   □ Buna N □ 316 Stainless Steel

4. Stem Length (Length Overall) “B”

   Dimension B = ________________ inches
   Max. Indicating length 72”

   Other lengths, consult factory.

Please contact Gems for any configuration or special requirements not covered on this form: 800-378-1600

Quote: $ __________ Date Quoted: ___ / ___ / ___
GEMS Receivers Tell You What Your Sensors Already Know

GEMS Receivers house a numerical digital readout, and all of the calibration adjustments for a complete Continuous Level Indication system. Those receivers designed for the XM-Series transmitters also include a power supply for the transmitter.

Selector Guide

The Selector Guide below lists standard GEMS Receivers and the transmitter series with which they are normally configured. GEMS doesn’t stop, however, with the standard designs shown in this catalog. Our experienced engineering staff will custom design receivers to suit your application. Don’t hesitate to contact us about your special requirements.

<table>
<thead>
<tr>
<th>Receivers</th>
<th>Mounting*</th>
<th>Alarm</th>
<th>Operating Voltage</th>
<th>Compatible GEMS Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-Digit Level Cube Receivers</td>
<td>Wall or Transmitter</td>
<td>None</td>
<td>9V Battery, 9 VDC / 117 VAC, Solar</td>
<td>XM-Series (1/4” or 1/2” Resolution), and SureSite Transmitters</td>
</tr>
<tr>
<td>RE163000D</td>
<td>Panel or Wall</td>
<td>2 Alarm</td>
<td>90-120 VAC, 20-50 VDC</td>
<td>All Continuous Transmitters, SureSite Transmitters, Pressure Transmitters</td>
</tr>
</tbody>
</table>

*Mounting Definitions:
Wall: Mounted onto a surface; i.e., wall, bulkhead, deck, etc.
Panel: Mounted into, and approximately flush with, a surface through a cutout.
Transmitter: Mounted directly to the top of the transmitter.

3-Digit Level Cube Receivers

Digital Bargraph Receivers

These units feature a large 4-digit display and bright LED bargraph to visually clarify relative tank content level.
3-Digit Level Cube Receivers

For use with GEMS Transmitters and SureSite® Transmitters.

These compact, low-cost Level Cubes provide accurate, continuous 3-digit readout of liquid level. The indicating range and decimal point location on the display are quickly and easily selectable with the readout plainly visible.

3 Power Choices with NPT or Cable Mounted

<table>
<thead>
<tr>
<th></th>
<th>9-V Battery Powered</th>
<th>9 VDC/117 VAC Powered</th>
<th>Solar-Powered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part Numbers:</td>
<td>118600 — Cable Output</td>
<td>118520 — 1/2” NPT</td>
<td>Part Numbers:</td>
</tr>
<tr>
<td></td>
<td>118250 — 1/2” NPT</td>
<td>119270 — 1/2” NPT</td>
<td>Part Numbers:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>118610 — Cable Output</td>
<td>119260 — 1/2” NPT</td>
</tr>
</tbody>
</table>

Notes:
1. 9-V Alkaline Battery Powered Units: Two batteries (supplied) are snapped into terminals in Cube. On/Off switch available.
2. 9 VDC/117 VAC Powered Units: Power is supplied from AC adapter. A plug, Part Number 119218, is available for use where 7 VDC power is supplied by customer. These units are not watertight.
3. Solar-Powered Units: Sunlight or a flashlight beam directed on a solar cell in the front cover is all that’s needed to operate.

Specifications

- **Housing Material**: Polycarbonate, NEMA-4X, watertight*
- **Cable Distance from Transmitter**: 100 feet, Max.
- **Operating Temperature**: +23°F to 131°F (-5°C to +55°C)
- **Accuracy**: ± 2%

*Except for 9 VDC/117 VAC Powered Units which are not watertight.

How To Order – Standard Models

<table>
<thead>
<tr>
<th>Style</th>
<th>Mounting</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-V Battery</td>
<td>Cable Output</td>
<td>118600</td>
</tr>
<tr>
<td></td>
<td>1/2” NPT</td>
<td>119250</td>
</tr>
<tr>
<td>9 VDC / 117 VAC</td>
<td>Cable Output</td>
<td>118620</td>
</tr>
<tr>
<td></td>
<td>1/2” NPT</td>
<td>119270</td>
</tr>
<tr>
<td>Solar</td>
<td>Cable Output</td>
<td>118610</td>
</tr>
<tr>
<td></td>
<td>1/2” NPT</td>
<td>119260</td>
</tr>
</tbody>
</table>
Digital Bargraph Display Receivers - 163000 Series

Gems Digital Bargraph Receivers improve the way you are able to visualize the data being received from your liquid level transmitters. These new receivers display liquid level information in digital numerals in conjunction with a 0-100% LED bargraph readout. The numeric portion is a 1/2" 4-digit display that provides detailed quantification of tank contents, while the bright LED bargraph represents the tank contents as a bar length relative to the percentage of fluid volume within the tank.

If you have a non-linear tank, such as a sphere or a cylinder laying on its side, these receivers are a blessing. They can be calibrated easily so that the digital and bargraph displays will indicate accurate content information for “odd” shape tanks. See “Linearization” below.

In addition to the dual visual displays, the Gems Bargraph Receiver features two independent alarms with adjustable time delays, 10 amp auxiliary dry contacts and easy user set-up. The receiver is available in component form for mounting into custom enclosures or panels, or housed within a NEMA 4X enclosure.

2 Independent Alarms with adjustable time delays. Labels are supplied and user applied.

Example of units measured: Gallons, Liters, Pounds, etc. Labels are supplied and user applied.

Touch to acknowledge alarm activation.

Large 4 Digit Numerical Display.

LED Bargraph represents percentage of tank contents.

Calibration conveniently accessible from front of panel (access plate is supplied loose in a cloth bag along with labels).

**Linearization**

Certain tanks, like a sphere or a cylinder laying on its side, are considered “Non-Linear” in terms of volume versus tank height. In these cases this receiver may be linearized according to your tank parameters so that the correct volume is displayed. Any units may be displayed by the receiver. Gallons, inches, tons, cubic inches, liters and etc.

The receiver uses a scheme where 9 points or 8 straight lines are used to calculate the numbers to be displayed. These 8 lines approximate the curve of the non-linear tank.

**Examples of Non-Linear Display Values.**

1. Gallons in a spherical tank.
2. Gallons in a cylindrical tank laying down.
3. Pounds of liquid in a spherical tank.
4. Cubic meters in a conical shaped tank.
5. Gallons in a non-linear shaped tank.

**IMPORTANT:** Customer must supply a sounding table, capacity curve and/or tank drawing for linearization of the digital bar graph display receiver.

**Specification**

<table>
<thead>
<tr>
<th>Input Signal</th>
<th>4-20mA, Proportional Voltage*, Serial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy Over Given Range</td>
<td>± 1.0%</td>
</tr>
<tr>
<td>Operating Voltage</td>
<td>24VDC or 115VAC</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>32°F to 122°F (0°C to 50°C)</td>
</tr>
<tr>
<td>Alarm Contacts, Load</td>
<td>10Amp, Dry Contact</td>
</tr>
<tr>
<td>Digital Readout</td>
<td>0000 to 9999</td>
</tr>
</tbody>
</table>

* Proportional voltage as produced by the non-signal conditioned Gems Liquid Level Transmitters (Section H) and SureSite Transmitters (Section G).

Note: Customer alarms (High & Low) are set upon request.
Dimensions
Panel Mounting Receivers

NEMA 4X Enclosed Receivers

Typical Installation

How To Order - Standard
Select receiver type by Part Number based on Input Power and Input/Output Signals required.

<table>
<thead>
<tr>
<th>Input Power</th>
<th>Input/Output Signals</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transmitter*</td>
<td>None</td>
<td>170680-0100 170690-0100</td>
</tr>
<tr>
<td>Serial</td>
<td>None</td>
<td>170661-0100 170691-0100</td>
</tr>
<tr>
<td>Transmitter*</td>
<td>4-20mA</td>
<td>170682-0100 170692-0100</td>
</tr>
<tr>
<td>4-20mA</td>
<td>4-20mA</td>
<td>170683-0100 170693-0100</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>170664-0100 170694-0100</td>
</tr>
<tr>
<td>115 VAC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transmitter*</td>
<td>None</td>
<td>170685-0100 170695-0100</td>
</tr>
<tr>
<td>Serial</td>
<td>None</td>
<td>170666-0100 170696-0100</td>
</tr>
<tr>
<td>Transmitter*</td>
<td>4-20mA</td>
<td>170687-0100 170697-0100</td>
</tr>
<tr>
<td>4-20mA</td>
<td>4-20mA</td>
<td>170688-0100 170698-0100</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>170669-0100 170699-0100</td>
</tr>
</tbody>
</table>

* Proportional voltage as produced by the non-signal conditioned Gems Liquid Level Transmitters (Sections C) and SureSite Transmitters (Section D). When used in conjunction with RE-163000, no additional signal conditioning required.