

# Hydrastep and Hydratect Water/Steam Monitoring Systems

- *High clarity electronic gauging system for steam drums with options of local and remote indication*
- *4–20mA output proportional to drum level*
- *High reliability, low water level shutdown system*
- *Superior quality electrodes manufactured for long life and reliability*
- *Each system custom designed for your application to ensure minimum installation costs*
- *“Sole gauge” and ASME compliance with International approvals*
- *Hydratect for use as a Turbine Water Ingress Protection (TWIP) system*



# Hydrastep and Hydratect

## Hydrastep



Hydrastep Control Unit

A Hydrastep electronic steam/water gauging system comprises:-

- Control unit (see Table 1)
- Water column (see Table 2)
- Electrodes and electrode cables (see Table 4)
- Remote display (optional – see Table 6)

Hydrastep capabilities include:

- Replacement of hard-to-read gauge glasses with a highly visual indication of drum level. Multiple remote displays up to 3280 ft. (1000 m) away from drum
- 4–20mA signal for re-transmission
- Up to 16 trip/alarm relays for low water warning and boiler shut down
- No single fault will disable the system. Fault indication is on all displays
- Dual power supplies and continuous monitoring of electrodes and wiring provide high levels of reliability

### Additional Information

Accessories: page 4  
 Specification: page 6  
 Dimensions: page 8

TABLE 1. Hydrastep Control Unit Ordering Information

★The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.  
 The Expanded offering is subject to additional delivery lead time.

| Model                                   | Product Description                                |                 |
|---|--|-----------------|
| 2468                                    | Hydrastep Control Unit                             |                 |
| <b>Power Supply Input Boards</b>        |  |                 |
| <b>Standard</b>                         |  | <b>Standard</b> |
| CA                                      | 16 point EGS, single power supply (ac mains)       | ★               |
| CB                                      | 32 point EGS, dual power supplies (2 x ac mains)   | ★               |
| CC                                      | 16 point EGS, single power supply (24 Vdc)         | ★               |
| CD                                      | 32 point EGS, dual power supplies (2 x 24 Vdc)     | ★               |
| CE                                      | 32 point EGS, dual power supplies (1 x ac, 1 x dc) | ★               |
| <b>Optional Output Boards</b>           |  |                 |
| <b>Standard</b>                         |  | <b>Standard</b> |
| AD                                      | No output boards                                   | ★               |
| BD                                      | 1 Relay output board (4 relays)                    | ★               |
| CD                                      | 2 Relay output boards (8 relays)                   | ★               |
| DD                                      | 4 Relay output boards (16 relays)                  | ★               |
| <b>Expanded</b>                         |  |                 |
| ED                                      | 1 Relay output board with time delay (4 relays)    |                 |
| FD                                      | 2 Relay output boards with time delay (8 relays)   |                 |
| GD                                      | 4 Relay output boards with time delay (16 relays)  |                 |
| HD                                      | 1 Opto isolated output board (4 outputs)           |                 |
| JD                                      | 2 Opto isolated output boards (8 outputs)          |                 |
| KD                                      | 4 Opto isolated output boards (16 outputs)         |                 |
| <b>Typical Model Number: 2468 CB CD</b> |  |                 |

## Product Data Sheet

BP2468, Rev CA  
June 2010

# Hydrastep and Hydratect

**TABLE 2. Water Column Ordering Information**

★The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.  
The Expanded offering is subject to additional delivery lead time.

| Model   | Product Description   |                 |
|---|---|-----------------|
| <b>Standard</b>   |   | <b>Standard</b> |
| 120   | Low Pressure (up to 1740psi / 120 bar) Water Column (Schedule 80 Process Connections) – See Table 3     | ★               |
| 210   | High Pressure (up to 3045 psi / 210 bar) Water Column (Schedule 160 Process Connections) – See Table 3  | ★               |
| <b>Expanded</b>   |   |                 |
| 300 <sup>(1)</sup>  | Super Critical (up to 4350 psi / 300 bar) Water Column (Schedule XXS Process Connections) – See Table 3 |                 |
| <b>In-line Design</b>   |   |                 |
| <b>Standard</b>   |   | <b>Standard</b> |
| L <sup>(2)</sup>  | In-line design (top-and-bottom process connections)   | ★               |
| No Code <sup>(2)(3)</sup>   | Side-arm design (side-and-side process connections with hanger)   | ★               |
| <b>Distance Between Top and Bottom Tappings</b>   |   |                 |
| <b>Standard</b>   |   | <b>Standard</b> |
| TTTT <sup>(4)</sup>   | TTTT = Distance between top and bottom tappings (mm or inches)  | ★               |
| <b>Site Range</b>   |   |                 |
| <b>Standard</b>   |   | <b>Standard</b> |
| SSSS <sup>(5)</sup>   | SSSS = Distance between top and bottom electrodes (mm or inches)  | ★               |
| <b>Number Of Electrodes</b>   |   |                 |
| <b>Standard</b>   |   | <b>Standard</b> |
| 8   | Eight electrode ports   | ★               |
| 10  | Ten electrode ports   | ★               |
| 12  | Twelve electrode ports  | ★               |
| 14  | Fourteen electrode ports  | ★               |
| 16  | Sixteen electrode ports   | ★               |
| 18  | Eighteen electrode ports  | ★               |
| 20  | Twenty electrode ports  | ★               |
| 22  | Twenty two electrode ports  | ★               |
| 24  | Twenty four electrode ports   | ★               |
| 26  | Twenty six electrode ports  | ★               |
| 28  | Twenty eight electrode ports  | ★               |
| 30  | Thirty electrode ports  | ★               |
| 32  | Thirty two electrode ports  | ★               |
| <b>Typical Model Numbers: 120-1250-900-24 (Low Pressure Water Column, Side-and-side, 1250 mm Process Connection Centers)</b><br><b>210-L-43-37-16 (High Pressure Water Column, Top-and-bottom, 37 in. Process Connection Centers)</b> |   |                 |

(1) Available to special order only.

(2) Specify the process connection size (25, 32, 38, or 50 mm) on the column design sheet, which is available from your local sales office.

(3) Water column with hanger design has side arm/side-and-side process connections. Specify the drain connection size (20 or 25 mm) on the column design sheet, which is available from your local sales office.

(4) Maximum tap-to-tap distance is 138 in. (3500 mm).

(5) Refer to water column design sheet available from your local sales office.

**TABLE 3. Water Column Selection Data**

| Parameter                   | LP Rectangular Section           | HP Series 3   | HP Super 3  |
|-----------------------------|----------------------------------|---|---|
| Design Pressure             | 1740 psi (120 bar)               | 3045 psi (210 bar)  | 4350 psi (300 bar)  |
| Test Pressure               | 2610 psi (180 bar)               | 4567 psi (315 bar)  | 6525 psi (450 bar)  |
| Design Temp.                | 650 °F (343 °C)                  | 698 °F (370 °C)   | 1040 °F (560 °C)  |
| Design Code <sup>(1)</sup>  | ASME B31.1 Power Piping          | ASME B31.1 Power Piping   | ASME B31.1 Power Piping   |
| Maximum Length              | 138 in. (3500 mm)                | 138 in. (3500 mm)   | 138 in. (3500 mm)   |
| Materials of Construction   | Carbon Steel ASTM A105/A106 GR B | Carbon Steel ASTM A105/A106 GR B body with SA 479 – 316N electrode mounts | Stainless steel ASTM A312/A182 F316 with SA 479 – 316N electrode mounts |
| Protective Covers           | 18 SWG (17 AWG) Stainless steel  | 18 SWG (17 AWG) Stainless steel   | 18 SWG (17 AWG) Stainless steel   |
| Gross Weight <sup>(2)</sup> | 26.5 lb (12 kg)                  | 37.5 lb (17 kg)   | 37.5 lb (17 kg)   |
| Electrode Types             | 459600602 or 459600802           | 246781ZA, 246782AC, or 246784AA   | 246785A   |

(1) Manufactured and tested in accordance with ASME Boiler and Pressure Vessel Code: Section 1.

(2) Typical for (610 mm / 24 in.) steam/water range, 12 port, with electrodes and covers.

# Hydrastep and Hydratect

**TABLE 4. Electrodes And Electrode Cables Ordering Information**

★The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.  
The Expanded offering is subject to additional delivery lead time.

| Model  | Product Description  |                 |
|--|--|-----------------|
| <b>Standard</b>  |  | <b>Standard</b> |
| 459600602  | Low pressure (LP) electrode – Zirconia insulator (see Table 5 for electrode data)                            | ★               |
| 459600802  | Low pressure (LP) electrode – PTFE insulator (see Table 5 for electrode data)                                | ★               |
| 246781ZA   | High pressure (HP) electrode – Series III, Zirconia insulator (see Table 5 for electrode data)               | ★               |
| 246782AC   | High pressure (HP) electrode – Series III, PTFE insulator (see Table 5 for electrode data)                   | ★               |
| 246784AA   | High pressure (HP) electrode – Series III, Zirconia insulator, PTFE coated (see Table 5 for electrode data)  | ★               |
| 246785A  | Super critical electrode – Series III, ZTA Insulator (see Table 5 for electrode data), 1 in. (25 mm) fitting | ★               |
| 24680204A  | 18-core electrode cable – 10 ft. (3 m). <i>One cable is required for every multiple of eight electrodes</i>  | ★               |
| 24680205A  | 18-core electrode cable – 33 ft. (10 m). <i>One cable is required for every multiple of eight electrodes</i> | ★               |
| 24680206A  | 18-core electrode cable – 60 ft. (18 m). <i>One cable is required for every multiple of eight electrodes</i> | ★               |
| 24680207A  | 18-core electrode cable – 98 ft. (30 m). <i>One cable is required for every multiple of eight electrodes</i> | ★               |
| <b>Note:</b> Do not mix electrode types. See Table 5 for further Hydrastep electrode data. |  |                 |

**TABLE 5. Hydrastep Electrodes Selection Data**

| Part Number | Style                | Material            | Max Pressure<br>PSI (Bar) | Max Temperature<br>°F (°C) | ph<br>Range |
|-------------|----------------------|---------------------|---------------------------|----------------------------|-------------|
| 459600802   | Threaded (LP column) | PTFE                | 725 (50)                  | 500 (260)                  | 7 to 13.5   |
| 459600602   | Threaded (LP column) | Zirconia            | 1740 (120)                | 698 (370)                  | 7 to 11     |
| 247682AC    | Union (HP column)    | PTFE                | 725 (50)                  | 500 (260)                  | 7 to 13.5   |
| 2467 84AA   | Union (HP column)    | Ceramic PTFE coated | 4350 (300)                | 500 (260)                  | 7 to 13.5   |
| 246781ZA    | Union (HP column)    | Zirconia            | 3045 (210)                | 698 (370)                  | 7 to 11     |

**TABLE 6. Hydrastep Accessories Ordering Information**

★The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.  
The Expanded offering is subject to additional delivery lead time.

| Model           | Product Description   |                 |
|-----------------|---|-----------------|
| <b>Standard</b> |   | <b>Standard</b> |
| 24683C          | 32 point remote display, large panel mount  | ★               |
| 24683D          | 32 point remote display, IP65 wall mount (Type NEMA 4)                                  | ★               |
| 480121230       | Armoured cable, 5-pair shielded (order per ft. or m). Maximum length is 820 ft. (250 m) | ★               |
| <b>Expanded</b> |   |                 |
| 24683BB         | 32 point remote display, DIN panel mount  |                 |

## Product Data Sheet

BP2468, Rev CA  
June 2010

# Hydrastep and Hydratect

## Hydratect



Hydratect Control Unit

### Additional Information

Specification: page 7  
Dimensions: page 9

A Hydratect steam/water detection system comprises:-

- Control unit (see Table 7)
- Two electrodes, two electrode cables, two inserts, and two covers (see Table 8)
- Manifold (see Table 8 note), if user is not mounting electrodes in own manifold or pipework

Hydratect capabilities include:

- Fault tolerance and continuous monitoring ensure a high reliability water ingress protection system
- Trips are fully validated by the twin electrode configuration before action is taken
- Can be supplied with a factory manufactured manifold or as components for local mounting in existing pipework or condensate pots

TABLE 7. Hydratect Ordering Information

★The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.  
The Expanded offering is subject to additional delivery lead time.

| Model                                | Product Description  |                 |
|--------------------------------------|--|-----------------|
| 2462                                 | Hydratect Electronic Level Switch                                      |                 |
| <b>Power Supply And Input Boards</b> |  |                 |
| <b>Standard</b>                      |  | <b>Standard</b> |
| A                                    | 2 point level switch, ac mains, single pole single throw relay outputs | ★               |
| E                                    | 2 point level switch, ac mains, two pole changeover relay outputs      | ★               |
| <b>Expanded</b>                      |  |                 |
| C                                    | 2 point level switch, 24 Vdc, single pole single throw relay outputs   |                 |
| <b>Typical Model Number: 2462 A</b>  |  |                 |

TABLE 8. Shrouded Insert, Cover, Electrode, and Cable Ordering Information

★The Standard offering represents the most common models and options. These options should be selected for best delivery.  
The Expanded offering is subject to additional delivery lead time.

| Model  | Product Description  |                 |
|--|--|-----------------|
| <b>Standard</b>  |  | <b>Standard</b> |
| 24673540B  | Series III Insert, stainless steel (300 bar, 560 °C) <sup>(1)</sup> – one insert for each electrode                | ★               |
| 24673547B  | Series III Insert PTFE Electrode (50 bar 260 °C) <sup>(1)</sup> – one insert for each electrode                    | ★               |
| 24670118A  | Series III cover – one cover for each electrode  | ★               |
| 246785Z <sup>(2)</sup>   | Hydratect electrode – Series III, Zirconia insulator (see Table 9), 1 in. (25 mm) fitting – one electrode per port | ★               |
| 246785A <sup>(2)</sup>   | Hydratect electrode – Series III, ZTA insulator (see Table 9), 1 in. (25 mm) fitting – one electrode per port      | ★               |
| 246785P <sup>(2)</sup>   | Hydratect electrode – Series III, PTFE insulator (see Table 9), 1 in. (25 mm) fitting – one electrode per port     | ★               |
| 24620204A  | 4-core electrode cable – 10 ft. (3 m) – one cable per electrode  | ★               |
| 24620205A  | 4-core electrode cable – 33 ft. (10 m) – one cable per electrode   | ★               |
| 24620206A  | 4-core electrode cable – 60 ft. (18 m) – one cable per electrode   | ★               |
| 24620207A  | 4-core electrode cable – 98 ft. (30 m) – one cable per electrode   | ★               |
| <b>Note:</b> Manifolds (up to 4 ports) available for in-line/side-arm applications to special order – ask a local sales office for a manifold design sheet |  |                 |

(1) Minimum pipe I/D for installation of insert is 1.65 in. (42 mm).

(2) See Table 9 for Hydratect electrode selection data. Do not mix electrode types.

TABLE 9. Hydratect Electrode Selection Data

| Part Number | Style                  | Material | Max Pressure<br>PSI (Bar) | Max Temperature<br>°F (°C) | ph<br>Range |
|-------------|------------------------|----------|---------------------------|----------------------------|-------------|
| 246785Z     | Union Hydratect insert | Zirconia | 3045 (210)                | 698 (370)                  | 7 to 11     |
| 246785A     | Union Hydratect insert | ZTA      | 4350 (300)                | 1040 (560)                 | 7 to 11     |
| 246785P     | Union Hydratect insert | PTFE     | 725 (50)                  | 500 (260)                  | 7 to 13.5   |

## Hydrastep and Hydratect

## Specifications

## HYDRASTEPE SPECIFICATION

| General   |   |   |   |
|---|---|---|---|
| Product   | Hydrastep electronic steam/water gauging system   |   |   |
| Electrode Channels  | 8 to 32, in pairs. See Table 5 on page 4 for Hydrastep electrode specifications   |   |   |
| Water/Steam Threshold   | 0.6 $\mu\text{S}/\text{cm}$ in clean water (up to 106 $\mu\text{S}/\text{cm}$ ); 1.6 $\mu\text{S}/\text{cm}$ in dirty water (up to 300 $\mu\text{S}/\text{cm}$ )<br>Models for highly contaminated water, up to 1600 $\mu\text{S}/\text{cm}$ , available to special order   |   |   |
| Display And Fault Indication  |   |   |   |
| Integral Display  | Red/green bar graph, 32 LED segments. Display blanking from the bottom with less than 32 electrodes in use. Channel fault indication by flashing display segment. General fault indication by amber LED   |   |   |
| Remote Display  | Indication same as Integral Display<br>Powered from main unit (1 display only).<br>Local power 20 to 54 Vdc, 240 mA required for additional remote displays   |   |   |
| Electrical  |   |   |   |
| Power Supply  | Power supply (ac): 94 to 130 V or 187 to 256V, 48Hz to 65 Hz, 60 VA max.<br>Power supply (dc): 20 to 40V negative ground or isolated  |   |   |
| Analog Output   | Signal is proportional to the water level<br>Range: 0–20mA or 4–20mA, forward or reverse<br>Accuracy: $\pm 0.2$ mA<br>Drive capability 600 ohms at nominal supply voltage, or 500 ohms at minimum supply voltage  |   |   |
| Relay Outputs (Optional)  | Maximum of 4 can be fitted for alarm indication<br><br><table border="0" style="width: 100%;"> <tr> <td style="vertical-align: top; width: 50%;"> <b>Relay Board:</b><br/>           Four independent change-over relays<br/>           Relay contact rating (ac powered):<br/> <i>Maximum voltage of 250 Vac</i><br/> <i>Maximum current of 8A</i><br/> <i>Maximum switching power: 1500VA</i><br/>           Relay contact rating (dc powered):<br/> <i>Maximum voltage of 125 Vdc</i><br/> <i>Maximum current of 8A</i><br/> <i>Maximum switching power:</i><br/> <i>40 W &lt; 30 V, 65 W &lt; 60 V, 25 W &lt; 125 V</i><br/>           Type N safety:<br/> <i>5A at 12Vdc, 100mA at 30Vdc, 20mA at 125Vdc</i> </td> <td style="vertical-align: top; width: 50%;"> <b>Delayed Relay Board</b><br/> <i>(Specification as per Relay Board)</i><br/>           Delay range: 0 to 25s <math>\pm 1</math>s<br/><br/> <b>Opto-coupled Board</b><br/>           Solid state relays: Four independent outputs<br/>           Rating: 30 Vdc, 1A<br/>           Maximum voltage drop: 1.1 V @ 1A<br/>           Maximum leakage current: 1 mA @ 30 Vdc         </td> </tr> </table> | <b>Relay Board:</b><br>Four independent change-over relays<br>Relay contact rating (ac powered):<br><i>Maximum voltage of 250 Vac</i><br><i>Maximum current of 8A</i><br><i>Maximum switching power: 1500VA</i><br>Relay contact rating (dc powered):<br><i>Maximum voltage of 125 Vdc</i><br><i>Maximum current of 8A</i><br><i>Maximum switching power:</i><br><i>40 W &lt; 30 V, 65 W &lt; 60 V, 25 W &lt; 125 V</i><br>Type N safety:<br><i>5A at 12Vdc, 100mA at 30Vdc, 20mA at 125Vdc</i> | <b>Delayed Relay Board</b><br><i>(Specification as per Relay Board)</i><br>Delay range: 0 to 25s $\pm 1$ s<br><br><b>Opto-coupled Board</b><br>Solid state relays: Four independent outputs<br>Rating: 30 Vdc, 1A<br>Maximum voltage drop: 1.1 V @ 1A<br>Maximum leakage current: 1 mA @ 30 Vdc |
| <b>Relay Board:</b><br>Four independent change-over relays<br>Relay contact rating (ac powered):<br><i>Maximum voltage of 250 Vac</i><br><i>Maximum current of 8A</i><br><i>Maximum switching power: 1500VA</i><br>Relay contact rating (dc powered):<br><i>Maximum voltage of 125 Vdc</i><br><i>Maximum current of 8A</i><br><i>Maximum switching power:</i><br><i>40 W &lt; 30 V, 65 W &lt; 60 V, 25 W &lt; 125 V</i><br>Type N safety:<br><i>5A at 12Vdc, 100mA at 30Vdc, 20mA at 125Vdc</i> | <b>Delayed Relay Board</b><br><i>(Specification as per Relay Board)</i><br>Delay range: 0 to 25s $\pm 1$ s<br><br><b>Opto-coupled Board</b><br>Solid state relays: Four independent outputs<br>Rating: 30 Vdc, 1A<br>Maximum voltage drop: 1.1 V @ 1A<br>Maximum leakage current: 1 mA @ 30 Vdc   |   |   |
| Remote Display Output   | Drive to remote displays (maximum 6 units). 3280 ft. (1000 m) maximum distance  |   |   |
| Opto-isolated Fault Output  | Detects fault in electrode connection (open circuit and short-circuit to ground)  |   |   |
| Mechanical  |   |   |   |
| Weight  | 26.4 lb (12 kg)   |   |   |
| Control Unit Enclosure  | Brushed stainless steel, wall mounting (four point), IP65 / NEMA4X<br>16.7 in. high x 12.8 in. wide x 6.4 in. deep (425 mm x 325 mm x 163 mm)   |   |   |
| Remote Display Unit Enclosure   | 2468 3BB (Case style: DIN Panel Mount)<br><i>Dimensions: 5.67 in. x 2.38 in. x 7.87 in. deep (144 mm x 72 mm x 200mm)</i><br><i>Panel cutout: 5.41 in. x 2.60 in. (137.5mm x 66mm)</i><br>2468 3C (Case style: Large Panel Mount)<br><i>Dimensions: 7.56 in. x 3.78 in. x 8.23 in. deep (192mm x 96mm x 209mm)</i><br><i>Panel cutout: 7.32 in. x 3.62 in. (186mm x 92mm)</i><br>2468 3D (Case style: Rugged enclosure, NEMA 4X (IP65))<br><i>Dimensions: 11.89 in. x 7.32 in. x 6.89 in. deep (302mm x 186mm x 175mm)</i>  |   |   |
| Environment   |   |   |   |
| Operating Temperature   | –4 to 158 °F (–20 to 70 °C)   |   |   |
| Operating Pressure  | See Table 3 on page 3 for the Hydrastep water column specifications   |   |   |
| Relative Humidity   | Up to 100%  |   |   |

## Product Data Sheet

BP2468, Rev CA  
June 2010

# Hydrastep and Hydratect

| Hydrastep Approvals           |   |
|-------------------------------|---|
| LVD                           | EN 61010-1  |
| ATEX                          | II3 G EEx nA IIC, T4 (-20 °C < ta < +70 °C)   |
| CSA                           | (Canada) Ex nA [nL] nL IIC T4, (USA) Class 1 Zone 2, AEx nA IIC with relay output connected only to energy limited circuits |
| Electromagnetic Compatibility | EN 61326-1:2006   |
| Pressure Equipment Directive  | Safety accessory  |

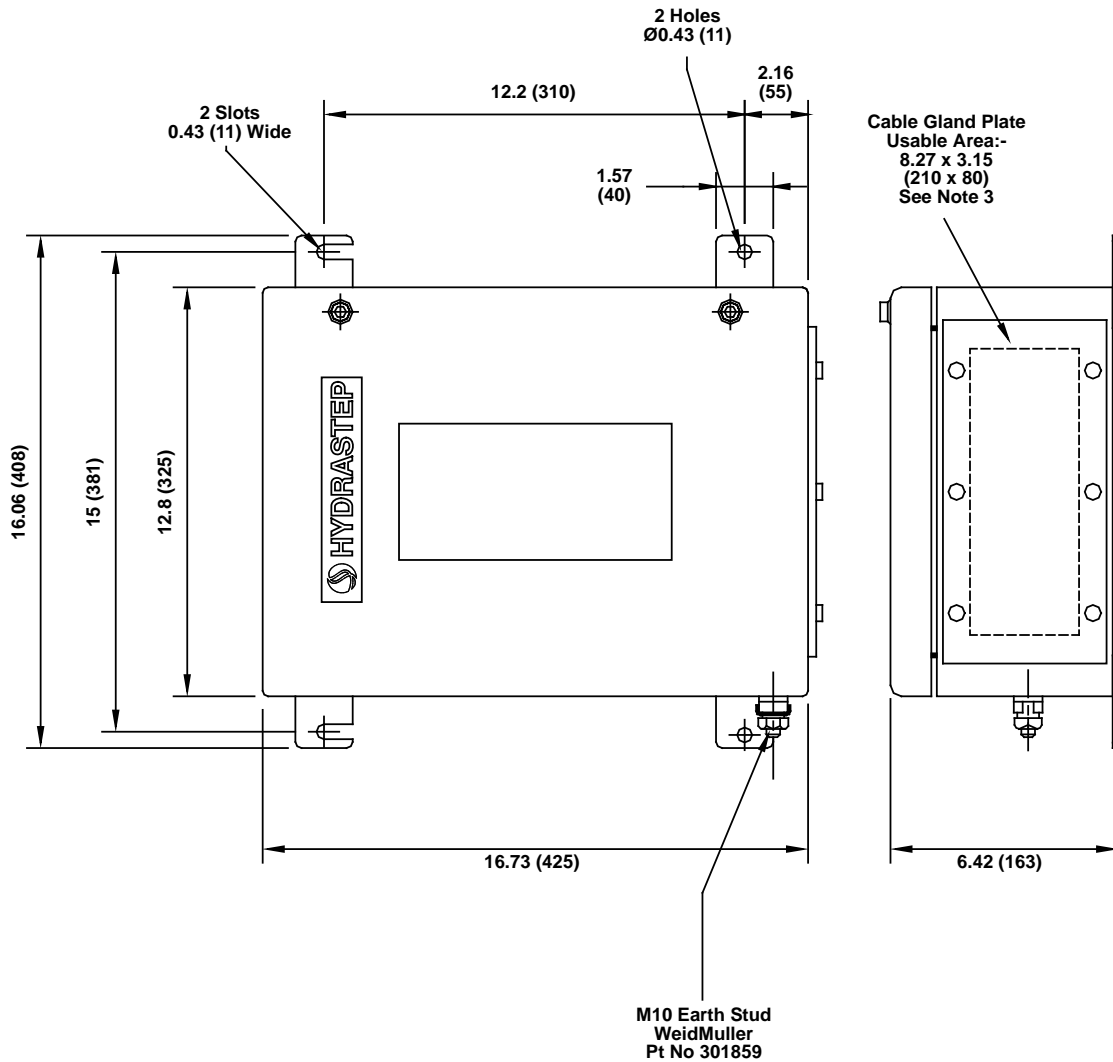
## HYDRATECT SPECIFICATION

| General                                  |  |
|--|--|
| Product                                  | Hydratect steam/water detection system   |
| Electrode Channels                       | 2 (See Table 9 on page 5 for Hydrastep electrode specifications)   |
| Water/Steam Threshold                    | 0,6 µS/cm (normal) or 1,6 µS/cm (alternate) depending on water purity  |
| Display                                  |  |
| Integral Display                         | One Red LED for indication of steam<br>One Green LED for indication of water<br>One Amber LED for indication of fault  |
| Electrical                               |  |
| Power Supply                             | Power supply (ac):<br>94 to 130 V or 187 to 256 V, 48 Hz to 65 Hz, 2 x 10 VA maximum<br>Power supply (dc):<br>20 to 60 V, 2 x 200 mA maximum, +ve or -ve ground  |
| Status Relay Output<br>(One Per Channel) | Water normal: Energized in water<br>Steam normal: Energized in steam<br>Separate normally open and normally closed contacts: <ul style="list-style-type: none"> <li>• Maximum voltage: 250 Vac, 125 Vdc</li> <li>• Maximum current: 8 A</li> <li>• Maximum Switching Power (ac): 1500 VA</li> <li>• Maximum Switching Power (dc): 240 W &lt; 30 V, 65 W &lt; 60 V, 25 W &lt; 125 V</li> </ul>  |
| Opto-isolated Fault Output               | Detects fault in electrode connection (open circuit and short-circuit to ground)<br>Output rating "off": 30 Vdc max, leakage <1 mA<br>Output rating "on": 1 A dc, voltage <1.1 V @ 1 A   |
| Fault Relay Output<br>(One Per Channel)  | Energized during normal operation (fail-safe).<br><i>Specification as status relay output above</i>  |
| Mechanical                               |  |
| Enclosure                                | Stainless steel, grade 304, wall mounting (two point)<br>Finish - natural<br>IP65 / NEMA4X<br>7.5 in. x 7.5 in. x 3.5 in. (190 mm x 190 mm x 90 mm)  |
| Weight                                   | 6.2 lb (2.8 kg)  |
| Environment                              |  |
| Operating Temperature                    | -4 to 158 °F (-20 to 70 °C)  |
| Operating Pressure                       | Manifolds are available with 1 to 4 electrode ports. Various materials depending on required pressure and temperature rating. Design sheets are available on request.<br><br>A selection of electrode types are available for pressures up to 4350 psi (300 bar) at 1040 °F (560 °C): <ul style="list-style-type: none"> <li>• The low pressure type, up to 1740 psi (120 bar) has a threaded style fitting (metaflex gasket seal).<br/>Choice of PTFE or ceramic insulator</li> <li>• The high pressure type, up to 4350 psi (300 bar), uses a union fitting (metal-to-metal seal).<br/>Choice of insulators</li> </ul> |
| Relative Humidity                        | Up to 100%   |

## Dimensional Drawings

### Hydrastep Enclosure

Note: Dimensions are in inches (mm)



**NOTES:**

1. Weight: 12 kg
2. IP Rating: IP65 / NEMA4X
3. Material Thickness Between Cable Gland Holes Must Be 9 mm Minimum.
4. Enclosure: Brushed Stainless Steel



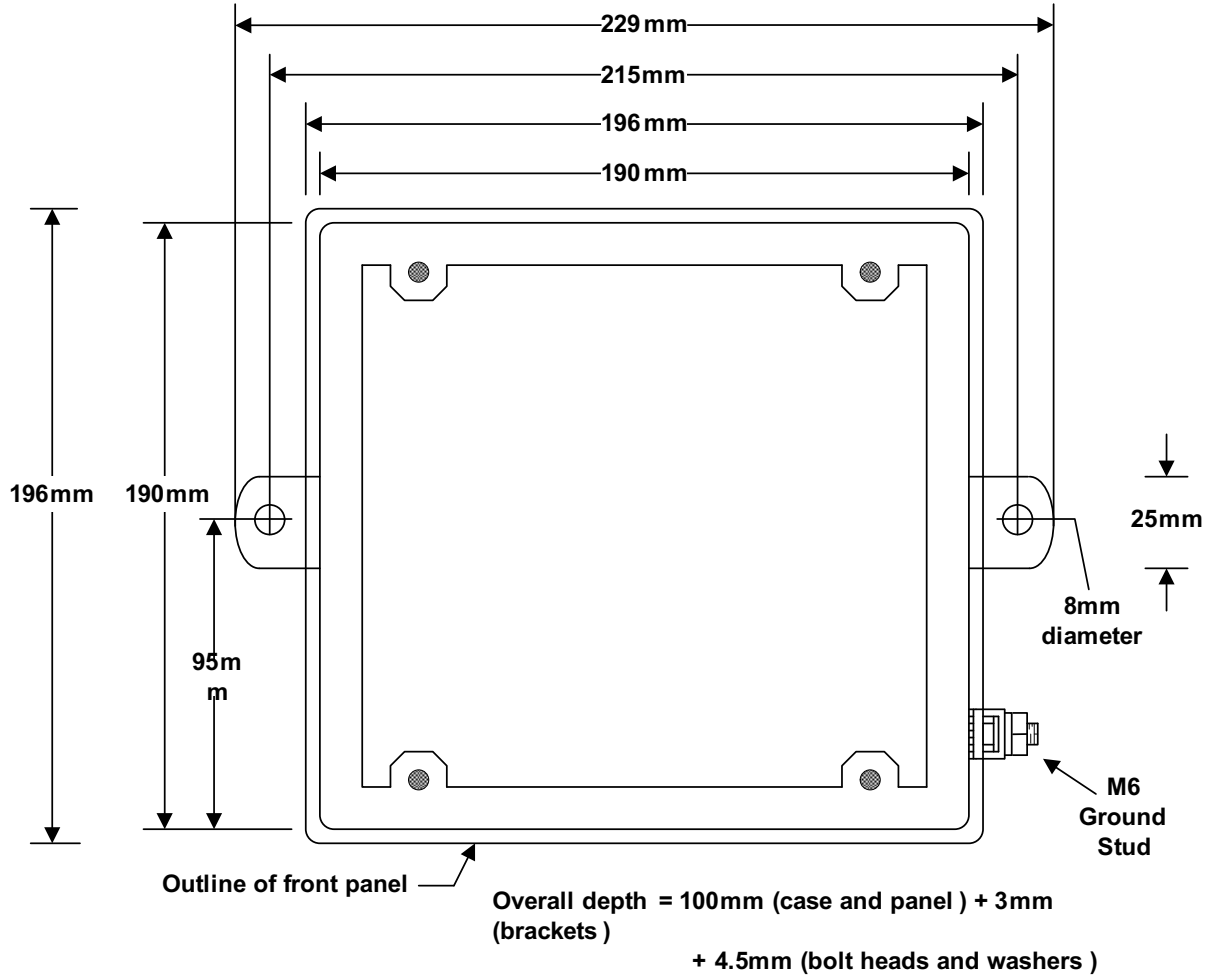
# Product Data Sheet

BP2468, Rev CA  
June 2010

# Hydrastep and Hydratect

## Hydratect Enclosure

Note: Dimensions are in mm



# Hydrastep and Hydratect

---

**Product Data Sheet**

BP2468, Rev CA  
June 2010

Hydrastep and Hydratect

---

## Mobrey Level Solutions

Emerson provides a wide range of Mobrey products for level measurement applications.

### POINT LEVEL DETECTION

#### Vibrating Fork Liquid Level Switches

For high and low alarms, overflow protection, pump control, including wide pressure and temperature requirements, and hygienic applications. Flexible mounting. Immune to changing process conditions and suitable for most liquids.

- Mobrey Mini-Squing (Compact)
- Mobrey Squing 2 (Full-featured)

#### Ultrasonic Gap Sensor Liquid Level Switches

For use in non-hazardous industrial processes to detect high or low liquid levels and liquid interface. Immune to changing density, and wide dielectric and pH variations. Suitable for use in most clean and non-aerated liquids, with options for sludges and slurries.

#### Float and Displacer Liquid Level Switches

Mobrey electromechanical float and displacer level switches are ideal for alarm and pump control duties, especially in critical applications or hazardous areas.

- Mobrey Horizontal Level Switches
- Mobrey Vertical Level Switches

Chambers are available for external mounting of these level switches on process vessels.

#### Dry Products Level Switches

For high and low level alarms. Including threaded mounting connections, extended lengths, high temperature capability, and multiple detection techniques. Suitable for a wide variety of powders, granules, and free flowing solids with wide variations in bulk densities.

- Mobrey VLS Series – Vibrating Rod Level Switch
- Mobrey PLS Series – Paddle Level Switch
- Mobrey CLS Series – Capacitance Level Switch

### CONTINUOUS MEASUREMENT

#### Ultrasonic Continuous Level Transmitters and Controllers

Top mounted, non-contacting for simple tank and open-air process level measurements. Unaffected by fluid properties such as density, viscosity, dirty coating, and corrosiveness. Intrinsically Safe versions are available for operating in hazardous areas.

- Mobrey MSP Series Ultrasonic Level and Flow Transmitters
- Mobrey MCU900 Series Universal Controllers

#### Ultrasonic Sludge Density Blanket Monitoring and Control

Ultrasonic in-line pipe or tank mounted sensors for sludge density measurement and control, and top mounted ultrasonic sensors for continuous measurement of sludge blanket level in Industrial and Municipal effluent treatment processes.

- Mobrey MSM400 – Sludge Density Monitor
- Mobrey MSL600 – Sludge Blanket Level Monitor

#### Displacer Continuous Level Measurement

Top mounted in a vessel or externally mounted in a vertical chamber. For use in hazardous areas.

- Mobrey MLT100 – Displacer Level Transmitter

#### Hydrostatic Continuous Level Transmitter

For level measurements in non-pressurized tanks where in-tank problems such as foaming, vapor layers, and temperature gradients prohibit the use of other instrumentation.

- Mobrey 9700 Series hydrostatic electronic level transmitters

### SPECIALIZED CONDUCTIVITY

#### Conductivity Water and Steam Interface Monitoring

Steam/water interface level gauges using specialized, high performance conductivity probes in external columns and manifolds, ideal for steam plants where reliable and redundant indication of boiler water level and turbine protection is critical.

- Hydratec 2462 – Water/Steam detection Systems
- Hydrastep 2468 – Water/Steam Monitoring Systems

*In the interest of development and improvement Delta Mobrey Ltd, reserves the right to amend, without notice, details contained in this publication. No legal liability will be accepted by Delta Mobrey Ltd for any errors, omissions or amendments.*

#### Delta Mobrey Limited

Riverside Business Park, Dogflud Way, Farnham, Surrey GU9 7SS, UK.

T+44 (0)1252 729140 F+44 (0)1252 729168 E [sales@delta-mobrey.com](mailto:sales@delta-mobrey.com) W [www.delta-mobrey.com](http://www.delta-mobrey.com)



ISO9001  
FM00720