YARWAY LED ILLUMINATOR SYSTEM FOR COLOR-PORT GAUGES
INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

Before installation, these instructions must be carefully read and understood.

1 SAFETY INFORMATION

IMPORTANT
It is the user’s responsibility to ensure that all connections and wiring comply with all applicable codes, specifications, sales contracts or public laws.

IMPORTANT
The sales order lists the required operating voltage. Operation at a voltage other than specified will cause equipment damage.

The Color-Port gauge operates at the boiler saturation temperature. High surface temperatures can be expected where this equipment connects to the gauge.

WARNING
Do not touch until the unit has cooled.

The Color-Port gauge must be adequately supported to hold the combined weight of LED illuminator, level display and hood (if applicable). Shut-off LED illuminator before doing any maintenance or repairs.

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2 INTRODUCTION

Yarway LED illuminators are designed to be mounted readily to the Yarway Color-Port gauge, as well as most competitive color-port gauges. All illuminators are complete with a color screen containing two strips of glass - one red and one green. Due to the difference in the index of refraction of light through water and steam, only the corresponding color is seen: green for water, red for steam.

Yarway LED illuminators are available in lengths from 5 ports to 26 ports.

2.1 System description

Yarway LED illuminators comprise five main components. Use the exploded parts diagrams in Section 13 as additional reference material.

- **Illuminator** - light source. It is composed of an anodized, rigid, extruded aluminum that protects the PC boards.
- **Bracket** - used to mount illuminator to Color-Port gauge. The brackets can be moved up and down along the extruded body making assembly and disassembly quick and easy.
- **Power supply** - provides intrinsically safe power to the LED illuminator. Power supply is mounted inside an explosion proof enclosure that is mounted to the illuminator body.
- **Cordset** - used to connect the power supply to the illuminator. The cordset consists of a straight female connector and a straight male connector.
- **Level display** - focuses the light from the LED illuminator to show the level.

2.2 Accessories

- Level display hood and hooded mirror - enhance the images for outdoor installations or redirect the image for viewing below the gauge.

3 AVAILABLE MODELS

Yarway LED illuminators are made to fit/cover the whole length of the Color-Port gauge. One power supply is required per 26 ports (208 LEDs). On average an LED will give the user 100,000 hours of use compared to 1000 hours for a standard light bulb.

3.1 Power Requirements & Specifications

- **Input:** 115/230 VAC ±10%, 50/60 Hz
- **Power consumption:** up to 400 mA max at 115/230 VAC
- **Max distance from power supply to LED illuminator:** 200 ft. (consult Emerson if longer distance is required)
- **Ambient temperature range for general location:** -40°F to 158°F (-40°C to 70°C)
- **Ambient temperature range for hazardous location:** -40°F < ta < +140°F (-40°C < ta < +60°C)
- **Ingress protection:** IP66
- **Max altitude:** 6,561 ft.
- **Electrical connection size:** ¾” FNPT for US and Canada M20 for ATEX and IECEx
  - Unit must be wired with 14 AWG wire minimum, with a maximum wire length of 1000 feet.
  - An external switch or circuit-breaker and external overcurrent protection is recommended to be installed near the unit.
  - Unit can be use indoors and outdoors.
  - maximum relative humidity 80% for temperatures up to 88°F (31°C) decreasing linearly to 50% relative humidity at 104°F (40°C).

3.2 Approvals

- **General location**
  - UL61010-1/CSA C22.2 No. 61010-1
- **Explosion-proof with intrinsically safe output**
  - MET Certified for US and Canada Class I Division 1 Groups A*, B, C, D T4
    - only for Mounting Option 2
  - ATEX Approved
    - Ex II 2G (Power Supply)
    - Ex II 1G (Illuminator)
  - IECEx Approved
    - Ex d [ia Ga IIC] IIC T4 Gb (Power Supply)
    - Ex ia IIC T4 Ga (Illuminator)

When installed in accordance with Emerson Control Drawings:
- For Division Locations - 18WL4-009 (Figure 6A)
- For ATEX/IECEx - 18WR6-009 (Figure 6B)

WARNING
Do not tamper with Yarway’s power supply or its components.
TABLE 1 - MODEL STRUCTURE

<table>
<thead>
<tr>
<th>Example:</th>
<th>ILCP</th>
<th>25</th>
<th>05</th>
<th>1</th>
<th>0</th>
<th>5</th>
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<tbody>
<tr>
<td>Illuminator model</td>
<td><strong>ILCP</strong> Illuminator LED Color Port</td>
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</tr>
<tr>
<td>Port spacing</td>
<td>25</td>
<td>2.5” pitch</td>
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</tr>
<tr>
<td></td>
<td>28</td>
<td>2.875” pitch</td>
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<tr>
<td>Number of ports (05 – 26)</td>
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<td>Input voltage</td>
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<tr>
<td></td>
<td>2</td>
<td>230 VAC 50/60 Hz [M20 inlet]</td>
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<tr>
<td></td>
<td>3</td>
<td>115 VAC 50/60 Hz [M20 inlet]</td>
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<tr>
<td></td>
<td>4</td>
<td>230 VAC 50/60 Hz [¾ NPT inlet]</td>
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<td>Application location</td>
<td>G</td>
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<td>Z</td>
<td>Zone locations [ATEX and IECEx]</td>
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<td>Installation configuration</td>
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<td>C</td>
<td>Chain connection (staggered gauges)</td>
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<td>Remote mount power supply</td>
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<tr>
<td></td>
<td>A</td>
<td>Chain connection (staggered gauges) and remote mount power supply</td>
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<table>
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<tr>
<td>8</td>
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<td>9</td>
</tr>
</tbody>
</table>
4 INSTALLATION

5.3 Installation of unit to gauge

Become familiar with the illuminator components before proceeding with installation. Refer to the exploded parts drawing in Section 13, Figures 1 and 2. As well as Figure 5A for general locations, Figure 5B for division locations, and Figure 5C for ATEX/IECEx when performing the following installation instructions.

To assemble the illuminator and level display to a Color-Port style gauge, follow the steps below:

1. Mount level display to gauge by inserting mounting slots to the hex screws on the body of the gauge.
2. Attach the mounting brackets (73A) to the illuminator body (11) using the screws (100) and the slider brackets (73) provided. Leave two slider brackets in the middle-lower half of the illuminator for the power supply.
3. Align the mounting brackets with the mark on the back of the illuminator’s body.
4. Firmly tighten down the screws (100) to secure mounting brackets (73A) to illuminator body.
5. Mount LED illuminator to gauge by inserting mounting brackets to the hex screws on the body of the gauge.
6. Make sure that the LED clusters are aligned with the ports.
7. Firmly tighten down the hex screws on the gauge body to hold the illuminator and the level display to the gauge.
8. Open the cover of the power supply enclosure and make sure the AC input voltage selector switch in the power supply matches the input voltage provided to the unit (115 VAC or 230 VAC).
9. After voltage selector switch is selecting the correct input voltage, connect/plug in the AC wires to Terminal Block 1.
10. Fully close the cover of the enclosure by hand tightening it.
11. Mount power supply to the illuminator body using the last two slider brackets you set aside from step 2.
12. Connect the power supply to the LED illuminator using the cordset provided.

IMPORTANT FOR HAZARDOUS LOCATION ONLY

• A flame path seal-off shall be installed within 18 in. of enclosure. see Figure 5B for Division Locations.
• A flame path seal-off shall be installed directly to threaded entry of enclosure. see or Figure 5C for ATEX/IECEx.
• The LED Illuminator contains material composition capable of igniting the explosive atmosphere due to physical impact or friction. Installation shall provide inherent protection from potential impacts risks by means of installation location, guards and/or barriers.
5.4 Electrical installation

**WARNING**
DO NOT proceed with electrical installation unless the illuminator has been mounted to the gauge according to instructions in Section 5.3. Only qualified electricians who have read and understood local and national electrical codes should connect the illuminator to an electrical source. Failure to follow any of these instructions may result in death, severe personal injury, property damage or damage to the illuminator and gauge.

The electrical installation should be performed by a qualified electrician and comply with applicable codes (U.S. - refer to National Electrical Code NFPA current edition; Canada - refer to Electrical Code CSA C22) or other regulations as applicable. The conduit must run in such a manner that it is not supported by or does not serve as a support for the illuminator. The unit must be grounded before it is operated.

6 OPERATION

Check that all installation procedures have been completed. Use only qualified, experienced personnel who are familiar with illuminators and thoroughly understand the implications of all the instructions. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

7 MAINTENANCE

The user must create maintenance schedules, safety manuals and inspection details for each specific installation of an illuminator.

7.1 Preventative maintenance
On all installations the following items should be evaluated regularly by the user for purposes of maintenance:
1. Protective glass/colored glass, for signs of dirt build up, scratches or breakage
2. Mounting bracket for signs of loosening

The user must determine an appropriate maintenance schedule necessary for his or her specific application, upon evaluation of their own operating experience. Realistic maintenance schedules can only be determined with full knowledge of the services and application situation involved.

7.2 Maintenance procedures

Cleaning the protective glass/colored glass - wash with a non-abrasive soap or detergent and water using a soft, grit-free cloth or sponge. When cleaning grease and oil from the protective glass/colored glass, use a chemical compatible with silicone rubber only and a soft, grit-free cloth. DO NOT use solvents such as acetone, benzene, carbon tetrachloride, dry cleaning fluid or lacquer thinners since they will attack the surface of the protective glass/colored glass and or the gaskets. After the surface has been cleaned and rinsed of foreign particles, it may be dried with a clean, soft, damp chamois or grit-free cloth.

**IMPORTANT**
DO NOT use hard, rough cloths on the edge of protective glass/colored glass because they can scratch the surface. The scratches will result in reduced light output from the illuminator.

7.3 Troubleshooting

Internal or external corrosion - could be an indication of a harsh service environment. An investigation should be carried out immediately to determine the cause of the problem. It is the user’s responsibility to choose a material of construction compatible with both the contained fluid and the surrounding atmosphere.

All LEDs off - could be an indication of power failure. Check the power supply and connections.

**IMPORTANT**
Contact the manufacturer if any part needs to be replaced.

7.4 Allowable modifications
The LED illuminator or level display are not to be modified in any way. Any modification will void warranty and could result in equipment damage or serious personal injury.
YARWAY LED ILLUMINATOR SYSTEM FOR COLOR-PORT GAUGES
INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

8 REMOVAL - DISASSEMBLY - REASSEMBLY

8.1 Disassembly
Refer to the exploded parts drawing in Section 13, Figures 1 and 2, for additional reference during disassembly of the illuminator.

1. Disconnect the electrical power source from the illuminator.
2. Loosen hex screws on the gauge body (do not remove).
3. Remove LED illuminator by moving up and away from gauge.
4. Remove level display by moving up and away from gauge.

8.2 Reassembly
Refer to the exploded parts drawing in Section 13, Figures 1 and 2, for additional reference during reassembly of the illuminator.

1. Mount level display to gauge by inserting mounting slots to the hex screws on the body of the gauge.
2. Mount LED illuminator to gauge by inserting mounting brackets to the hex screws on the body of the gauge.
3. Make sure that the LED clusters are aligned with the ports.
4. Firmly tighten down the hex screws on the gauge body to hold the illuminator and the level display to the gauge.
5. Connect electrical power source to the illuminator.

9 PACKAGING, STORAGE AND TRANSPORTATION

9.1 Packaging
The LED illuminator and level display contain fragile components and must be handled with care. These units must be packed to prevent damage during transportation. If damage to the colored glass or lens should occur during shipment contact the factory.

9.2 Storage
The LED illuminator and level display can be stored outside. These units are not affected by temperature or humidity.

9.3 Transportation
Since these components contain fragile parts, care should be taken to ensure that the units arrive undamaged. After unpacking units, each unit should be inspected and any damaged parts should be replaced before assembly and installation.

10 DISPOSAL AT END OF USEFUL LIFE

Yarway illuminators’ metal and polymers should be recycled whenever possible. Refer to the order and applicable technical data sheets for materials of construction.

11 WARRANTY

See sales order acknowledgements for terms and conditions of sale.

12 TELEPHONE ASSISTANCE

If you are having difficulty with your illuminator, notify your local Yarway distributor. You may also contact the factory direct at (956) 430-2500 and ask for an applications engineer. So that we may assist you more effectively, please have as much of the following information as possible when you call:

- Model #
- Name of the company from whom you purchased your illuminator
- Invoice # and date
- Operating temperatures
- A brief description of the problem
- Troubleshooting procedures that failed

If attempts to solve your problem fail, you may be requested to return your illuminator to the factory for intensive testing. You must obtain a Return Authorization (RA) number from Emerson prior to returning anything. Failure to do so will result in the unit being returned to you, without being tested, freight collect. To obtain an R.A. number, the following information (in addition to that above) is needed:

- Reason for return
- Person to contact at your company
- 'Ship-to’ address

There is a minimum charge for evaluation of non-warranty units. You will be contacted before any repairs are initiated should the cost exceed the minimum charge. If you return a unit under warranty, but it is not defective, the minimum charge will apply.
YARWAY LED ILLUMINATOR SYSTEM FOR COLOR-PORT GAUGES
INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

13 EXPLODED PARTS DIAGRAMS

FIGURE 1
Exploded parts diagram

PARTS LIST
<table>
<thead>
<tr>
<th>Ref #</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Body LED illuminator</td>
</tr>
<tr>
<td>73</td>
<td>Slider bracket</td>
</tr>
<tr>
<td>73A</td>
<td>Mounting bracket</td>
</tr>
<tr>
<td>100</td>
<td>Screw</td>
</tr>
<tr>
<td>100A</td>
<td>Screw</td>
</tr>
<tr>
<td>214</td>
<td>Cordset</td>
</tr>
<tr>
<td>297</td>
<td>Enclosure</td>
</tr>
</tbody>
</table>

FIGURE 2
Installation of LED illuminator and level display to Color-Port gauge

PARTS LIST
<table>
<thead>
<tr>
<th>Ref #</th>
<th>Item</th>
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<tbody>
<tr>
<td>83</td>
<td>Color-Port gauge</td>
</tr>
<tr>
<td>100</td>
<td>Hex screw</td>
</tr>
<tr>
<td>100A</td>
<td>Screw</td>
</tr>
<tr>
<td>164</td>
<td>Adjustment plate</td>
</tr>
<tr>
<td>253</td>
<td>Level display</td>
</tr>
<tr>
<td>269</td>
<td>LED illuminator</td>
</tr>
</tbody>
</table>

FIGURE 3
Red/green colored glass orientation

LED illuminator
Green glass
Gauge wide side
Level display
Red glass
Gauge narrow side

IMPORTANT NOTICE, READ FIRST

ALL PENTAIR VALVES AND CONTROLS PRODUCTION STANDARDS ARE APPLICABLE
HARLINGEN, TX. USA 78550

Pentair Valves & Controls
DO NOT SCALE PRINT

SIZE DWG. NO.

DE1205710
APR 6/4/2015

APPROACHment APPR 1 1 SHEET

DIMENSIONS IN [ ] ARE IN MILLIMETERS.
DIMENSIONS ARE IN INCHES.
IMPLIED 90 ° ANGLES = ± 1/2 °; OTHER ANGLES = ±5°
HUNDREDTHS = ± ; THOUSANDS = ±

UNLESS OTHERWISE SPECIFIED:

Title
 CHK

YARWAY LED ILLUMINATOR SYSTEM FOR COLOR-PORT GAUGES
INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

PARTS LIST
<table>
<thead>
<tr>
<th>Ref #</th>
<th>Item</th>
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<tr>
<td>11</td>
<td>Body LED illuminator</td>
</tr>
<tr>
<td>73</td>
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</tr>
<tr>
<td>73A</td>
<td>Mounting bracket</td>
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<tr>
<td>100</td>
<td>Screw</td>
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<tr>
<td>100A</td>
<td>Screw</td>
</tr>
<tr>
<td>214</td>
<td>Cordset</td>
</tr>
<tr>
<td>297</td>
<td>Enclosure</td>
</tr>
</tbody>
</table>

FIGURE 1
Exploded parts diagram

PARTS LIST
<table>
<thead>
<tr>
<th>Ref #</th>
<th>Item</th>
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</thead>
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<td>Screw</td>
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<td>Screw</td>
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<tr>
<td>214</td>
<td>Cordset</td>
</tr>
<tr>
<td>297</td>
<td>Enclosure</td>
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FIGURE 2
Installation of LED illuminator and level display to Color-Port gauge

PARTS LIST
<table>
<thead>
<tr>
<th>Ref #</th>
<th>Item</th>
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<td>Screw</td>
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<td>Adjustment plate</td>
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<tr>
<td>253</td>
<td>Level display</td>
</tr>
<tr>
<td>269</td>
<td>LED illuminator</td>
</tr>
</tbody>
</table>

FIGURE 3
Red/green colored glass orientation

LED illuminator
Green glass
Gauge wide side
Level display
Red glass
Gauge narrow side
IMPORTANT NOTICE, READ FIRST

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES.

IMPLIED 90° ANGLES = ± 1/2°; OTHER ANGLES = ±5° HUNDREDTHS = ±; THOUSANDTHS = ±

YARWAY LED ILLUMINATOR SYSTEM FOR COLOR-PORT GAUGES
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FIGURE 6A
Control drawing for division locations
HAZARDOUS AREA
CLASS I DIV 1 GROUPS B, C, D T4
FLAME PROOF MOUNTING
INTEGRAL SEAL-OFF
A FLAME PATH SEAL-OFF SHALL BE INSTALLED WITHIN 18 IN. OF ENCLOSURE
INTRINSIC SAFETY MOUNTING
INTEGRAL SEAL-OFF
I.S. LED ILLUMINATOR
EXTRA CLASSIC DUAL LEADERS
Vout
I.S. SIGNAL
R < 1Ω
NOTE: Equipment supplying intrinsic system must not produce more than 125/250 Vmax.
Loop wire distance not to exceed 200 ft. using Clead = 60pF/ft. Llead = μH/ft.
Barrier ground shall be connected to a grounding electrode by redundant, 12 AWG or larger insulated conductors.
The installation must be in accordance with National Electric Code, NFPA 70, Articles 504 and 505, and ANSI/ISA-RP12.06.01.

NOTES: Equipment supplying intrinsic system must not produce more than 125/250 Vmax.
Loop wire distance not to exceed 200 ft. using Clead = 60pF/ft. Llead = μH/ft.
Consult Emerson if longer distance needed.
The installation must be in accordance with Canadian Electric Code CSA C22.1 Part 1, Appendix F.
The installation must be in accordance with National Electric Code, NFPA 70, Articles 504 and 505, and ANSI/ISA-RP12.06.01.

FIGURE 6B
Control drawing for ATEX/IECEx
HAZARDOUS AREA
Zone 1
FLAME PROOF MOUNTING
INTEGRAL SEAL-OFF
A SUITABLY CERTIFIED FLAME PATH SEAL-OFF SHALL BE INSTALLED DIRECTLY TO THREADED ENTRY OF ENCLOSURE
INTRINSIC SAFETY MOUNTING
INTEGRAL SEAL-OFF
I.S. LED ILLUMINATOR
EXTRA CLASSIC DUAL LEADERS
Vout
I.S. SIGNAL
R < 1Ω
NOTE: Equipment supplying intrinsic system must not produce more than 125/250 Vmax.
Loop wire distance not to exceed 200 ft. using Clead = 60pF/ft. Llead = μH/ft.
Consult Emerson if longer distance needed.
The installation must be in accordance with National Electric Code, NFPA 70, Articles 504 and 505, and ANSI/ISA-RP12.06.01.
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