To ensure correct use of these products, read the Instruction Manual prior to use.

Failure to follow all safeguards can result in fire, electric shock, or other accidents.

Specifications are subject to change without notice.

For the benefit of mankind and the earth, PATLITE is committed to developing environmentally friendly products.

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PATLITE Corporation

http://www.patlite.com  e-mail:overseas@patlite.co.jp

Explosion Protection & Harsh Environment

PATLITE offers state-of-the-art equipment for process and industrial automation for over 60 years. Our innovative and robust design, backed by a powerful commitment and years of knowledge, has made PATLITE the world’s best known manufacturer of the visual and audible signaling products. We are also dedicated to the development of products that are safe in harsh and explosive environments to demonstrate our strong commitment to serving the industry with unique and innovative solutions.

In order to identify the diversified needs of our customers, and respond quickly and satisfactorily to those needs, we have implemented the POP (Point of Production) System together with a lean-manufacturing cell-based assembly system (combination, single, and flexible assembly). These new systems allow us to handle any order rapidly from single items to customized item orders.

We’ve also reduced development time and production cost by having our own in-house machinery to design and manufacture metal moldings for making injection molded parts.

From designing to production, from raw material to the finished product, we also manage our quality control throughout the entire process. This is how we maintain our world class quality reputation for visual, audible signaling and networking information products.

### World-wide Sales, Marketing and After-sales Support Network

- **Factory**
- **Sales Subsidiary**

### From designing to production, quality control is managed throughout the process

- Design with 3-D CAD
- Machining Center
- Injection molding machines
- Manufacturing of metal molding parts
- Electrical discharge machine

### Wide-range of Innovative and World-class Quality Products

- **How an Explosion Occurs**
  - An explosion can only occur if there is a combination of the following three factors.
    - **Source of ignition**
    - **Oxygen**
    - **Combustible substances**
  - Combustible substances can exist in the form of gases, vapor, mist or dust. If one component is missing, no explosion will take place.

- **How to minimize an explosion**
  - The followings are protective measures to minimize the risk of an explosion.
    - Limit concentration to a safe level
    - Avoid combustible substances
    - Increase ventilation
    - Prevent the ignition
    - Restrict explosive effects to a negligible level

- **An explosive environment is categorized in three segments, Zone 0, Zone 1 and Zone 2, depending on the hazardous level of gases and vapors**

  - **Zone 0**
    - An area where an explosive atmosphere consisting of a mixture of air containing flammable substances in the form of gas, liquid, or vapor continuously present or is frequently present for a longer period of time.

  - **Zone 1**
    - An area where an explosive atmosphere consisting of a mixture of air containing flammable substances in the form of gas, liquid, or vapor can occasionally occur during normal operating conditions.

  - **Zone 2**
    - An area where an explosive atmosphere consisting of a mixture of air containing flammable substances in the form of gas, liquid, or vapor is not likely to occur under normal conditions. However, if it occurs, it will only be for short period of time.

### An explosive environment is categorized in three segments, Zone 0, Zone 1 and Zone 2, depending on the hazardous level of gases and vapors

- **Zone 2**
  - An area where an explosive atmosphere consisting of a mixture of air containing flammable substances in the form of gas, liquid, or vapor is not likely to occur under normal conditions. However, if it occurs, it will only be for short period of time.

- **How to minimize an explosion**
  - The followings are protective measures to minimize the risk of an explosion.
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    - Avoid combustible substances
    - Increase ventilation
    - Prevent the ignition
    - Restrict explosive effects to a negligible level

### Prerequisites for an explosion

- **Source of Ignition**
- **Oxygen**
- **Combustible Substances**

- **Explosion**
- **Zone 0**
  - An area where an explosive atmosphere consisting of a mixture of air containing flammable substances in the form of gas, liquid, or vapor continuously present or is frequently present for a longer period of time.

- **Zone 1**
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- **Zone 2**
  - An area where an explosive atmosphere consisting of a mixture of air containing flammable substances in the form of gas, liquid, or vapor is not likely to occur under normal conditions. However, if it occurs, it will only be for short period of time.
### Various Applications for Explosion-Safe and Harsh Environments

<table>
<thead>
<tr>
<th>Branch</th>
<th>Explosion Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Generation Companies</td>
<td>● Lump Coal Dust</td>
</tr>
<tr>
<td>Woodworking Industry</td>
<td>● Saw Dust</td>
</tr>
<tr>
<td></td>
<td>● Fine Wood Chips</td>
</tr>
<tr>
<td>Metal-work Operations</td>
<td>● Explosive Metal Dust</td>
</tr>
<tr>
<td></td>
<td>● Spark-ignitable Metal Dust</td>
</tr>
<tr>
<td>Food/Beverage Industry</td>
<td>● Ignitable Grain Dust</td>
</tr>
<tr>
<td></td>
<td>● Explosive Sugar Dust</td>
</tr>
<tr>
<td>Refinery Industry</td>
<td>● Hydrocarbons close to their flash-points</td>
</tr>
<tr>
<td></td>
<td>● Oil Processing Plants</td>
</tr>
<tr>
<td>Waste Disposal Companies</td>
<td>● Waste-water Treatment Gases</td>
</tr>
<tr>
<td>Landfills/Civil Engineering</td>
<td>● Flammable Landfill Gases</td>
</tr>
<tr>
<td></td>
<td>● Uncontrolled Gas Emissions</td>
</tr>
<tr>
<td></td>
<td>● Flammable Gas from poor ventilation sources</td>
</tr>
<tr>
<td>Pharmaceutical Industry</td>
<td>● Alcohol Solvents</td>
</tr>
<tr>
<td></td>
<td>● Materials explosive when mixed</td>
</tr>
<tr>
<td>Gas Suppliers</td>
<td>● Natural Gas Leakage</td>
</tr>
<tr>
<td></td>
<td>● Natural Gas Emissions</td>
</tr>
<tr>
<td>Paint-spraying Operations</td>
<td>● Overspray in Spray-paint Bays</td>
</tr>
<tr>
<td></td>
<td>● Solvent Vapor Emissions</td>
</tr>
<tr>
<td>Recycling Operations</td>
<td>● Unemptied flammable gas/liquid containers</td>
</tr>
<tr>
<td></td>
<td>● Biodegradable Material Emitting</td>
</tr>
<tr>
<td></td>
<td>● Explosive Gases</td>
</tr>
<tr>
<td>Chemical Industry</td>
<td>● Flammable Gases</td>
</tr>
<tr>
<td></td>
<td>● Flammable Liquids</td>
</tr>
<tr>
<td></td>
<td>● Flammable Solids</td>
</tr>
<tr>
<td>Agriculture</td>
<td>● Bio-gas Production Plants</td>
</tr>
<tr>
<td></td>
<td>● Bio-gas Located on Farms</td>
</tr>
</tbody>
</table>

### Classification of Hazardous Areas

#### Gases/Vapors

The tank is filled with flammable liquid. The inside of the tank is defined as zone 0, because the explosive gas/oxygen mixture is continuously present. Vapor may escape on occasion through the vent on the top of the tank, therefore the area around the vent is categorized as Zone 1.

#### Dust

At a mill with a feed hopper and filter: A product, which causes dust particles mixed with air to cause a flammable mixture, is loaded into a hopper. Inside the feed hopper and filter, it is categorized as Zone 20. While the product is being loaded, the mixture of dust and air causes a potentially explosive compound in the area where the product is loaded into the hopper, so the area outside the hopper is categorized as Zone 21. Around the hopper where a potential flammable atmosphere exists temporarily is categorized as Zone 22.
**Relationship of IEC, CENELEC, NEC 505 and NEC 500**

IEC: International Electrotechnical Commission  
CENELEC: European Committee for Electrotechnical Standardization  
NEC: National Electrical Code

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**Types of Protection**

According to EN Standard Series EN 60079, explosion protected electrical equipment can have various types of protection according to its construction. The table below for Gas and Dust shows an overview of the standardized protections and describes its basic principal, as well as its practical applications.

Select the suitable PATLITE explosion-safe and intrinsically-safe products according to the specific application and type of protection.

---

**Gas**

<table>
<thead>
<tr>
<th>Type of Protection</th>
<th>Marking</th>
<th>Diagram</th>
<th>Definition</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>General requirements</td>
<td>EN 60079-0</td>
<td>IEC 60079-0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flameproof Enclosure &quot;d&quot;</td>
<td>Ex d</td>
<td></td>
<td>Parts which can cause ignition while in a potentially explosive atmosphere are enclosed in an enclosure which can withstand the pressure to contain it when the explosive mixture ignites inside or is transported through the environment.</td>
<td></td>
</tr>
<tr>
<td>Increased Safety &quot;i&quot;</td>
<td>Ex ib</td>
<td></td>
<td>Preventive safety precautions are applied to prevent the possibility of explosion through ignition, the occurrence of which can ignite on exposed parts of the equipment that would not be ignited in conditions where ignition sources are not present.</td>
<td></td>
</tr>
<tr>
<td>Intrinsically Safe &quot;&quot;</td>
<td>Ex ia</td>
<td></td>
<td>Equipment used in an intrinsically safe environment where all sparks of internal heat source produced under normal operating conditions and specific fault conditions are not capable of causing ignition in a given explosive atmosphere.</td>
<td></td>
</tr>
<tr>
<td>Oil Immersion &quot;&quot;</td>
<td>Ex o</td>
<td></td>
<td>Electrical equipment or parts are immersed in a protection fluid such as oil, to prevent the ignition of a potentially explosive atmosphere which may be located over or outside the equipment.</td>
<td></td>
</tr>
<tr>
<td>Pressurized Enclosure &quot;p,&quot;</td>
<td>Ex p</td>
<td></td>
<td>Inside the enclosure, a positive internal pressure is related to the surrounding atmosphere is maintained with the supply of a constant flow of protective gas (when necessary) to drive off any combustible mixture.</td>
<td></td>
</tr>
<tr>
<td>Powder Filling &quot;q&quot;</td>
<td>Ex q</td>
<td></td>
<td>The casing of the electrical equipment is packed with the granular material to make it impossible for any electric arc created inside the casing under certain operating conditions to ignite the potentially explosive environment outside the casing. Ignition cannot be caused from flames or the raised temperature on the surface of the casing.</td>
<td></td>
</tr>
<tr>
<td>Encapsulated &quot;c,&quot;</td>
<td>Ex c</td>
<td></td>
<td>Parts which can cause ignition in a potentially explosive atmosphere by sparking or heating are enclosed in a compound to contain and isolate it from the ignitions of an explosive environment.</td>
<td></td>
</tr>
<tr>
<td>Type of Protection &quot;n,&quot;</td>
<td>Ex na, Ex nl</td>
<td></td>
<td>Electrical equipment cannot cause the ignition of a potentially explosive atmosphere (defined under abnormal operating conditions and during normal operation).</td>
<td></td>
</tr>
</tbody>
</table>

---

**Dust**

<table>
<thead>
<tr>
<th>Type of Protection</th>
<th>Marking</th>
<th>Diagram</th>
<th>Definition</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>General requirements</td>
<td>EN IEC 60079-0</td>
<td>IEC 60079-0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection by Enclosures &quot;t&quot;</td>
<td>Ex t</td>
<td></td>
<td>Dust incapable of igniting the enclosures at all or in the quantity is at a safe degree, which allows the ignitable equipment to be mounted inside. The surface temperature of the enclosure will not cause ignition to the surrounding explosive atmosphere.</td>
<td></td>
</tr>
<tr>
<td>Pressurized Enclosure &quot;pD&quot;</td>
<td>Ex pD</td>
<td></td>
<td>&quot;pD&quot; is Expansion B-B, C-C, D-D, E-E, F-F, G-G, or a complete enclosure, which contains a positive internal pressure of the protective gas (when necessary) to drive off any combustible mixture.</td>
<td></td>
</tr>
<tr>
<td>Intrinsically Safe &quot;&quot;</td>
<td>Ex ia</td>
<td></td>
<td>Equipment used in a potentially explosive environment where all sparks of internal heat source produced under normal operating conditions and specific fault conditions are not capable of causing ignition in a given explosive atmosphere.</td>
<td></td>
</tr>
<tr>
<td>Encapsulated &quot;n&quot;</td>
<td>Ex na</td>
<td></td>
<td>Parts which can cause ignition in a potentially explosive environment by sparking or heating are enclosed in a compound to contain and isolate it from the ignition of a layer of dust or cloud.</td>
<td></td>
</tr>
</tbody>
</table>
Maintenance Free LED Signal Lights

The EDLM and EDWM series LED signal lights are visual warning and status indicating lights for use in hazardous locations that require compliance with the ATEX Directive 94/9/EC (CENELEC standard) or NEC Article 505 certification.

The EDLM and EDWM series offer wide range of voltages and versatile mounting options to meet various applications. The following chart explains the comparison between the ATEX Directive 94/9/EC (CENELEC standard) and NEC Article 505 certification. To find the most suitable models, refer to page 9 and 10.

### Standard Markings

Markings for ATEX Directive (CENELEC Standard)

<table>
<thead>
<tr>
<th>Type of Protection</th>
<th>Category</th>
<th>Group</th>
<th>Temperature Code</th>
<th>Equipment Group</th>
<th>maximum Surface Temperature</th>
<th>Hazardous Area Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flameproof</td>
<td>II, IIa</td>
<td>A, B, C</td>
<td>T6, T5</td>
<td>IIa/IIb/IIc</td>
<td>100°C</td>
<td>Zone 3, Zone 22</td>
</tr>
<tr>
<td>Increased Safety</td>
<td>II, IIa</td>
<td>A, B, C</td>
<td>T6, T5</td>
<td>IIa/IIb/IIc</td>
<td>100°C</td>
<td>Zone 3, Zone 22</td>
</tr>
<tr>
<td>Type of Protection</td>
<td>Category</td>
<td>Group</td>
<td>Temperature Code</td>
<td>Equipment Group</td>
<td>maximum Surface Temperature</td>
<td>Hazardous Area Classification</td>
</tr>
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<td>Flameproof</td>
<td>II, IIa</td>
<td>A, B, C</td>
<td>T6, T5</td>
<td>IIa/IIb/IIc</td>
<td>100°C</td>
<td>Zone 3, Zone 22</td>
</tr>
<tr>
<td>Increased Safety</td>
<td>II, IIa</td>
<td>A, B, C</td>
<td>T6, T5</td>
<td>IIa/IIb/IIc</td>
<td>100°C</td>
<td>Zone 3, Zone 22</td>
</tr>
</tbody>
</table>

*These products are manufactured by PATLITE, converted and certified to explosion-safe by Artidor, and sold by PATLITE.

### Explosion-Safe Protection

#### Zone Classification

<table>
<thead>
<tr>
<th>Zone Classification</th>
<th>Hazardous Area Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone 0</td>
<td>Gas</td>
</tr>
<tr>
<td>Zone 1</td>
<td>Low Risk (Non-explosive)</td>
</tr>
<tr>
<td>Zone 2</td>
<td>High Risk (Explosive)</td>
</tr>
</tbody>
</table>

#### Equipment Group

<table>
<thead>
<tr>
<th>Equipment Group</th>
<th>Category - Protection Level</th>
<th>Type of Environment</th>
<th>Flammable Substances</th>
<th>Flammable Hazardous Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>I -exes</td>
<td>M1 - Very High Level Exposure</td>
<td>Constant Exposure</td>
<td>Methane</td>
<td>Zone 0</td>
</tr>
<tr>
<td></td>
<td>M2 - High Level Exposure</td>
<td>Constant Exposure</td>
<td>Methane</td>
<td>Zone 0</td>
</tr>
<tr>
<td></td>
<td>1 - Very High Level Exposure</td>
<td>Constant Exposure</td>
<td>Gas</td>
<td>Zone 2</td>
</tr>
<tr>
<td></td>
<td>2 - High Level Exposure</td>
<td>Constant Exposure</td>
<td>Vapors</td>
<td>Zone 2</td>
</tr>
<tr>
<td></td>
<td>3 - Normal Level</td>
<td>R, T, D</td>
<td>Dust</td>
<td>Zone 2</td>
</tr>
<tr>
<td></td>
<td>4 - Other Level</td>
<td>R, T, D</td>
<td>Dust</td>
<td>Zone 2</td>
</tr>
</tbody>
</table>

#### ATEX Directive (CENELEC)

**ATEX IEC Classification for Gases and Temperature Coding**

<table>
<thead>
<tr>
<th>Equipment Group</th>
<th>Category - Protection Level</th>
<th>Type of Environment</th>
<th>Flammable Substances</th>
<th>Flammable Hazardous Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>I -exes</td>
<td>M1 - Very High Level Exposure</td>
<td>Constant Exposure</td>
<td>Methane</td>
<td>Zone 0</td>
</tr>
<tr>
<td></td>
<td>M2 - High Level Exposure</td>
<td>Constant Exposure</td>
<td>Methane</td>
<td>Zone 0</td>
</tr>
<tr>
<td></td>
<td>1 - Very High Level Exposure</td>
<td>Constant Exposure</td>
<td>Gas</td>
<td>Zone 2</td>
</tr>
<tr>
<td></td>
<td>2 - High Level Exposure</td>
<td>Constant Exposure</td>
<td>Vapors</td>
<td>Zone 2</td>
</tr>
<tr>
<td></td>
<td>3 - Normal Level</td>
<td>R, T, D</td>
<td>Dust</td>
<td>Zone 2</td>
</tr>
</tbody>
</table>

M2 - High Level Exposure

- Methane
- Ethylene
- Propane

T1 (at 40°C)

- Acetone
- Ethanol
- Propane

T2 (at 80°C)

- Ethanol
- Propane
- Acetone

T3 (at 100°C)

- Ethanol
- Propane
- Acetone

T4 (at 120°C)

- Ethanol
- Propane
- Acetone

T5 (at 150°C)

- Ethanol
- Propane
- Acetone

T6 (at 180°C)

- Ethanol
- Propane
- Acetone

#### Markings

**ATEX/IEC Classification for Gases & Temperature Coding**

<table>
<thead>
<tr>
<th>Type of Environment</th>
<th>Flammable Substances</th>
<th>Flammable Hazardous Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas</td>
<td>Methane</td>
<td>Zone 0</td>
</tr>
<tr>
<td>Vapors</td>
<td>Ethylene</td>
<td>Zone 2</td>
</tr>
<tr>
<td>Dust</td>
<td>Acetone</td>
<td>Zone 2</td>
</tr>
</tbody>
</table>

#### LED Signal Towers

<table>
<thead>
<tr>
<th>Model Selection</th>
<th>Page</th>
<th>CENELEC Standard</th>
<th>Explosion Safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>AR-070 Series</td>
<td>11</td>
<td>EN 60079-0, EN 60079-15</td>
<td>T500°C Co IP65</td>
</tr>
<tr>
<td>AR-078 Series</td>
<td>12</td>
<td>EN 60079-0, EN 60079-15</td>
<td>T500°C Co IP65</td>
</tr>
</tbody>
</table>

#### Visual/Audible Signaling Products & LED Work Lights

A wide range of visual and audible signaling products, as well as super bright LED light bars, designed for use in hazardous locations that require the ATEX Directive 94/9/EC (CENELEC Standard). These unique and innovative models meet the criteria for Zone 2 (gas) and Zone 22 (dust) atmospheres.
**EDLM & EDWM SERIES**

**EXPLOSION-SAFE**

- **Descriptions**
  - The EDLM (3 tiered LED) and EDWM (5 tiered LED) models are innovative LED maintenance-free Explosion-safe Signal Towers. Their robust design, along with pressure and flame-proof housing, is ideal for use in potentially flammable and hazardous explosive environments, such as chemical, petrochemical, combustible dust, mineral/natural gas production; as well as for the food and beverage industries.

- **Features**
  - Housing: Aluminum alloy
  - Glass: Borosilicate glass
  - Terminals: Easy wire connection to the Signal Tower by opening the bottom
  - Mounting: Upright, Wall Mount, Vertical-mount, and Horizontal Mount
  - LED color: Different color configurations are possible to custom-design

- **EDLM & EDWM are covered by the specifications shown in the shaded areas below**

<table>
<thead>
<tr>
<th>Country</th>
<th>Area Classification</th>
<th>Classification of hazardous areas</th>
<th>Pattle Model EDLM, EDWM</th>
<th>Certification authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>ATEX Directive 94/9/EC</td>
<td>Zone 0, Zone 2, Zone 21, Zone 22</td>
<td>EDLM-302FEA, EDLM-312FEA</td>
<td>PBT (Germany)</td>
</tr>
<tr>
<td>North America</td>
<td>NEC Article 505</td>
<td>Zone 0, Zone 1, Zone 2, Zone 2</td>
<td>EDLM-302FEA</td>
<td>FM (USA)</td>
</tr>
</tbody>
</table>

- **Specifications**

- **Explosion-Proof Structure and Functions**
  - **ATEX Directive**
  - **FM Standard**

- **Indications**
  - **Continuous light**
  - **Flashing**
  - **Upper & Lower case**
  - **Casing main body**
  - **Material**
  - **Wire lead-in port**

- **Testing Authority**
  - PTB (Germany)
  - NEC Article 505
  - FM (USA)

- **Dimensions (EDLM, EDWM)**

- **Wiring Diagram**
  - **EDLM (3 color LED)**
  - **EDWM (5 color LED)**
**AR-070 SERIES EXPLOSION-SAFE**

**Explosion-safe Signal Light Ø40mm**

- **Description**
  - Explosion-safe Signal Light featuring an LED light that is versatile and energy-efficient. The vertical and horizontal cut lenses in combination with a double-reflection system enhances the LED light diffusion to create a unique, full and brilliant light. The lenses and main body are made of strong synthetic materials with characteristics to withstand harsh environments. The Signal Light can be ordered in any combination from 1 to 5 LED units with any color combination. In addition to its "continuous lighting" condition, the Signal Light can also be ordered with flashing/non-flashing functions, as well as with two super-loud alarm sounds with an 85dB (at 1m) output.

- **Features**
  - Explosion-safe for gas and dust
  - Suitable for Zone 2 and Zone 22
  - CE compliance in accordance to ATEX
  - Full and brilliant lumination
  - LED double reflection lighting system
  - Different lens colors available
  - 1 to 5 stack are available
  - 1/2" NPT adapter for pole mount available as an option
  - Available with "flashing/non-flashing" and two audible buzzer alarm sounds
  - Ingress protection of IP55
  - Wall-mount or 1/2" NPT mount

**Specifications**

- **Ambient Temperature:** -30 °C to +60 °C
- **Activation Time:** 100%
- **Ingress Protection:** IP65 to EN 60529
- **Material:** ABS towerbody, polyester glassfibre reinforced base
- **Rated Voltage:** AC/DC 24V
- **Acoustical Source:** Buzzer 85 dB (1m) with two different tones
- **Lighting Source:** Multiple LEDs with double reflection system
- **Color:** Red, Amber, Green, Blue, Clear/white

**How to Order**

- **Code:** AR-070-__
- **Voltage Code:** AC/DC 24V
- **No. of Stacks Code:** 1-5
- **Bracket Code:** Side mount bracket 1/2" NPT

**Dimensions**

- **Side Mount Bracket**
- **1/2" NPT Adapter Type**

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**AR-078 SERIES EXPLOSION-SAFE**

**Explosion-safe Signal Light Ø60mm**

- **Description**
  - Explosion-safe Signal Light featuring an LED light that is versatile and energy-efficient. The vertical and horizontal cut lenses in combination with a double-reflection system enhances the LED light diffusion to create a unique, full and brilliant light. The lenses and main body are made of strong synthetic materials with characteristics to withstand harsh environments. The Signal Light can be ordered in any combination from 1 to 5 LED units with any color combination. In addition to its "continuous lighting" condition, the Signal Light can also be ordered with flashing/non-flashing functions, as well as with two super-loud alarm sounds with an 90dB (at 1m) output.

- **Features**
  - Explosion-safe for gas and dust
  - Suitable for Zone 2 and Zone 22
  - CE compliance in accordance to ATEX
  - Full and brilliant lumination
  - LED double reflection lighting system
  - Different lens colors available
  - 1 to 5 stack are available
  - 3/4" NPT adapter for pole mount available as an option
  - Available with "flashing/non-flashing" and two audible buzzer alarm sounds
  - Ingress protection of IP55
  - Wall mount or 3/4" NPT mount

**Specifications**

- **Ambient Temperature:** -30 °C to +60 °C
- **Activation Time:** 100%
- **Ingress Protection:** IP65 to EN 60529
- **Material:** ABS towerbody, polyester glassfibre reinforced base
- **Rated Voltage:** AC/DC 24V
- **Acoustical Source:** Buzzer 90 dB (1m) with two different tones
- **Lighting Source:** Multiple LEDs with double reflection system

**How to Order**

- **Code:** AR-078-__
- **Voltage Code:** AC/DC 24V
- **No. of Stacks Code:** 1-5
- **Bracket Code:** Side mount bracket 3/4" NPT

**Dimensions**

- **Side Mount Bracket**
- **3/4" NPT Adapter Type**

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*From top to bottom: 1-AC type is available by special order.*
**LKEH-FE-EX, LKEH-FV-EX EXPLOSION-SAFE**

- **Zone 2, Zone 22**
- **CE**
- **II 3GD Ex nA IIC T4 Gc, Ex tc IIIC T85°C Dc IP65 94/9/EC (ATEX) CENELEC: EN 60079-0, EN 60079-15, EN 60079-31

**105dB(A)**

**MP3 Field Programmable Annunciator, Melody Horn**

- Explosion-safe for gas and dust
- Suitable for Zone 2 and Zone 22
- CE compliance in accordance to ATEX
- Super bright LED colors correspond to different voice, sounds, chimes and melodies.
- Voice alert messages of up to 63 seconds (64kbit/s) with 5 channels can be played back.
- 32 combinations of sounds, chimes and melodies are pre-recorded.
- 8 sounds can be played back by a bit input, and 32 sounds by binary input.
- Volume is adjustable from 0 to 105dB at 1 meter.
- Field programmable with MP3 by SD card for the model LKEH-FV-EX.
- Well visible with the super bright 100mm diameter LED from far distance.
- Robust design to withstand against 20G vibration.

- The body is made of Acrylonitrile-Butadiene-Styrene for weather resistance.
- Easy to control by only one common wire for both LED units and audible signals.
- NPN standard. PNP open collector type is also available on order.

**Sound Selection Charts**

- Pre-recorded on model LKEH-FE-EX.
- 8 sounds can be played back by a bit input, and 32 sounds by binary input.

**Height**

- Ø6 Ø70

**Model Voltage Range MP3 Power**

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage Range</th>
<th>MP3, Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>LKEH-FE-EX</td>
<td>DC 12 - 24V</td>
<td>14.2W</td>
</tr>
<tr>
<td>LKEH-FV-EX</td>
<td>DC 12 - 24V</td>
<td>14.2W</td>
</tr>
</tbody>
</table>

**How to Order**

**LKEH-302FVF-RYG-EX**

- **Color**
  - G: Green
  - Y: Amber
  - R: Red

**LKEH Wall Mount Model**

**Specifications**

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage Range</th>
<th>MP3, Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>LKEH-FE-EX</td>
<td>DC 12 - 24V</td>
<td>14.2W</td>
</tr>
<tr>
<td>LKEH-FW-EX</td>
<td>DC 12 - 24V</td>
<td>14.2W</td>
</tr>
<tr>
<td>LKEH-FV-EX</td>
<td>DC 12 - 24V</td>
<td>14.2W</td>
</tr>
</tbody>
</table>

**How to Order**

**EHV-EX**

- **Melody/Alarm Type**
  - G: Type G

- **Melody/Alarm Type**
  - G: Type G

**Specifications**

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage Range</th>
<th>Power Consumption</th>
<th>Rated Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>EHS-M1T</td>
<td>DC 12 - 24V</td>
<td>4W (DC24V)</td>
<td>40mA (max)</td>
</tr>
<tr>
<td>EHV-M1T</td>
<td>DC 12 - 24V</td>
<td>4W (DC24V)</td>
<td>40mA (max)</td>
</tr>
</tbody>
</table>

**Note 1:** The sound pressure level is based on measurements under controlled conditions (voice-synthesized 1 kHz sine wave played back from a distance of 1 meter), therefore the surrounding environmental conditions and message content will result in different values for the sound pressure level.

**Note 2:** Even when starting less or more units simultaneously, a lag will occur during message playback.

**Voice alert messages of up to 63 seconds (64kbit/s) with 5 channels can be played back.**

**Melodies & Chimes Horn:**

- **EHV-EX** offers a field-programmable MP3 function with a maximum of 220 sec. of recording time (@ 64kbps) and an adjustable volume up to 110dB (@ 1m).
- **Ideal for plant-wide notification, public address and process control.**
- **EHS-M1 and EHV-M1 Only.**
- **Robust, indoor and outdoor use with vibration resistance up to 4.5G.**
- **CE Compliance in accordance to ATEX**

**Explosion-Safe for gas and dust**

**Protection Rating of IP65.**

**Easy to control by only one common wire for both LED units and audible signals.**

**NPN standard. PNP open collector type is available.**
**Light Distribution Characteristics**

- 820lx brightness, equivalent to a 40W incandescent bulb
- 65,000 hours, or about 7 years of long service life (1)
- IP66G, IP67G, IP69K protection (2)
- DC24V (Polarized)
- IEC62471 Compliance (Photobiological Safety Standard)
- Daylight Color Temperature (6,500K) suitable for very detailed work

Sufficient illumination with only a 174mA current draw.

**Specifications**

- **Model**: CLN-24-CD-PT-EX
- **Rated Voltage**: DC 24V (Polarized)
- **Designation**: Explosion-safe for gas and dust
- **Suitable for Zone 2 and Zone 22
- **CE compliance in accordance to ATEX**
- **Protection Rating**: IP66G/IP67G (IEC60529)/IP69K (DIN40050 part 9)
- **Main Unit Material**: Body: Aluminum Alloy, Lens: Tempered Glass
- **Dimensions**: 22.2mm X (Width) 85mm X (Height) 128mm
- **Mass**: 80g
- **Luminous Intensity at Operating Ambient Temperature**: 820lx
- **Color Temperature**: 6500K
- **Illumination Area Size**: 1,500mm (810lx), 1,200mm (890lx), 900mm (945lx)
- **Total Amplitude**: 0.3mm
- **Rear Mount Hole**: 4-M6, Pitch: 45
- **Pan-bracket**: 4-M6, Pitch: 45
- **Housing**: Aluminum, Cover: Tempered glass
- **Life Span**: 60,000 hrs., or about 7 years of long service life (1)

**Options**

- **Model**: CLN-24-CD-PT-EX
- **Rated Voltage**: DC 24V (Polarized)
- **Designation**: Explosion-safe for gas and dust
- **Suitable for Zone 2 and Zone 22
- **CE compliance in accordance to ATEX**
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- **Pan-bracket**: 4-M6, Pitch: 45
- **Housing**: Aluminum, Cover: Tempered glass
- **Life Span**: 60,000 hrs., or about 7 years of long service life (1)

**How to Order**

- **Model**: CLN-24-CD-PT-EX
- **Rated Voltage**: DC 24V (Polarized)
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- **Pan-bracket**: 4-M6, Pitch: 45
- **Housing**: Aluminum, Cover: Tempered glass
- **Life Span**: 60,000 hrs., or about 7 years of long service life (1)
**LFH-EX EXPLOSION-SAFE**

**Indoor/Outdoor LED Warning Light**

- Explosion-safe for gas and dust
- Suitable for Zone 2 and Zone 22
- Dome colors: Red, Yellow, Blue
- Triple flash: 110 +/- 10 flash/minute
- Indoor/Outdoor use allows for the unit to be used in various environments such as factories, utilities, food and beverage, pharmaceutical, parking lots, and others.
- Vibration resistance of 90g/s² (90°) can withstand the mounting on to forklifts, construction, maintenance, and other industrial vehicles.
- IP66

**Dimensions**

<table>
<thead>
<tr>
<th>Color</th>
<th>Rated Voltage</th>
<th>Operating Voltage Range</th>
<th>Operating Ambient Temperature</th>
<th>Mounting Location</th>
<th>Vibration Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>R: Red</td>
<td>DC24V</td>
<td>AC 100V/120V/200V/240V</td>
<td>-22°F to +158°F (-30°C to +70°C)</td>
<td>Indoors and Outdoors</td>
<td>90 m/s²</td>
</tr>
<tr>
<td>Y: Yellow</td>
<td>MD: AC100-240V</td>
<td>AC 100V-240V</td>
<td>-4°F to +140°F (-20°C to +60°C)</td>
<td>Upright, Inverted, and Sideways (in a wet environment)</td>
<td>20 m/s²</td>
</tr>
<tr>
<td>B: Blue</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Specifications**

<table>
<thead>
<tr>
<th>Model</th>
<th>Rated Voltage</th>
<th>Color</th>
<th>Operating Ambient Temperature</th>
<th>Mounting Location</th>
<th>Vibration Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>LFH-24</td>
<td>DC 24V</td>
<td></td>
<td></td>
<td>Indoors and Outdoors</td>
<td>90 m/s²</td>
</tr>
<tr>
<td>LFH-M2</td>
<td>AC 120V/125V/150V</td>
<td></td>
<td></td>
<td>Upright, Inverted, and Sideways (in a wet environment)</td>
<td>20 m/s²</td>
</tr>
</tbody>
</table>

**How to Order**

```
Model: LFH-24-EX
Color: R: Red, Y: Yellow, B: Blue
Rated Voltage: DC 24V, AC 100V/120V/200V/240V
```

**Wiring**

- White/Power Wire
- Black/Power Wire
- Red/Power Wire
- Green/Power Wire
- Blue/Power Wire
- Yellow/Power Wire

**RES-A Heavy Duty Revolving Warning Light for Harsh Environment**

**Robust Heavy Duty Revolving Warning Light**

- φ224mm diameter.
- Integral Rotating Parabolic Reflector: For enhanced visibility from a distance.
- Installation: Indoors—upright, inverted, sideways; Outdoors—upright only.
- Main Body: Aluminum alloy die-cast with silver color baked finish.
- Dome: Acrylic resin covered with clear hard-glass, and metal guard.
- Available Colors: Red, Amber, Green and Blue.
- IP66
- The metal cable gland is an optional part. Needs special order.

**Dimensions**

<table>
<thead>
<tr>
<th>Model</th>
<th>Rated Voltage</th>
<th>Current</th>
<th>Rotations per Minute</th>
<th>Bulb Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>RES-12A</td>
<td>DC 12V</td>
<td>0.9A</td>
<td>0.5</td>
<td>12V10W 9</td>
</tr>
<tr>
<td>RES-24A</td>
<td>DC 24V</td>
<td>0.5A</td>
<td>1</td>
<td>24V10W 10</td>
</tr>
<tr>
<td>RES-48A</td>
<td>DC 48V</td>
<td>0.3A</td>
<td>1.5</td>
<td>48V10W 11</td>
</tr>
<tr>
<td>RES-100A</td>
<td>AC 100-110V</td>
<td>0.1A</td>
<td>1.5</td>
<td>100-110V 12</td>
</tr>
<tr>
<td>RES-120A</td>
<td>AC 115-120V</td>
<td>0.1A</td>
<td>1.5</td>
<td>115-120V 12</td>
</tr>
<tr>
<td>RES-220A</td>
<td>AC 200-220V</td>
<td>0.05A</td>
<td>1.5</td>
<td>200-220V 12</td>
</tr>
<tr>
<td>RES-240A</td>
<td>AC 230-240V</td>
<td>0.05A</td>
<td>1.5</td>
<td>230-240V 12</td>
</tr>
</tbody>
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**How to Order**

- Model: LFH-24-EX
- Color: R: Red, Y: Yellow, B: Blue
- Rated Voltage: DC 24V, AC 100V/120V/200V/240V

**Specifications**

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<td>DC 48V</td>
<td>0.3A</td>
<td>1.5</td>
<td>48V10W 11</td>
</tr>
<tr>
<td>RES-100A</td>
<td>AC 100-110V</td>
<td>0.1A</td>
<td>1.5</td>
<td>100-110V 12</td>
</tr>
<tr>
<td>RES-120A</td>
<td>AC 115-120V</td>
<td>0.1A</td>
<td>1.5</td>
<td>115-120V 12</td>
</tr>
<tr>
<td>RES-220A</td>
<td>AC 200-220V</td>
<td>0.05A</td>
<td>1.5</td>
<td>200-220V 12</td>
</tr>
<tr>
<td>RES-240A</td>
<td>AC 230-240V</td>
<td>0.05A</td>
<td>1.5</td>
<td>230-240V 12</td>
</tr>
</tbody>
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