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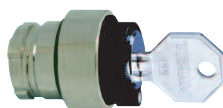
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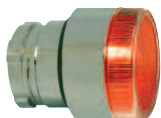
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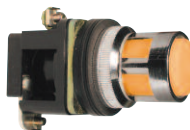
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## 22 and 30 mm Altech Metal Push Buttons



Part No. PBD

**Quality at a Competitive Price!**

# 22mm Metal Push Buttons

## Control and Signalling devices Ø 22.5mm

This range of Ø 22.5mm push buttons, selector switches, illuminated switches, illuminated selector switches and pilot lights have been designed to provide the following features:

- Economy of space
- Self-wiping contacts
- Safe operation
- Simple to mount (screw driver is all that is required)
- Fixing method unaffected by excessive vibration-unit does not loosen
- Protection against electric shock (unit grounded)
- Aesthetically pleasing
- Heavy-duty construction
- Shrouded terminals
- Flame resistant materials
- Use of LEDs for long life and minimum maintenance

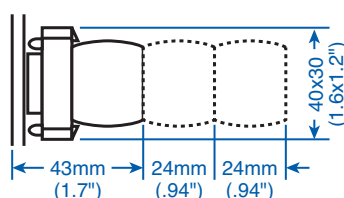
## Actuators

The circular actuators have chrome plated metal bezels, and are interchangeable with different contact elements. Custom colors and finishes (black, silver satin, etc.) are available.

## Contact Elements

The contact elements are double break and have self-wiping contacts. The elements are interchangeable and can be stacked without additional hardware. 1 to 6 elements (NO or NC) can be used with non-illuminated actuators, whereas, 1 to 4 elements (NO or NC) can be used for illuminated actuators. Gold plated NO and NC contact elements for low voltage, low current switching circuits < 25 mA, are available.

Multiple Switch Contact Assembly



## LED Illuminated Actuators and Pilot Lights

LED illuminated actuators & pilot lights are supplied with LED in bayonet cap suitable for operating at various voltages. LED bulbs with bayonet cap are constructed in the standard BA9S design.

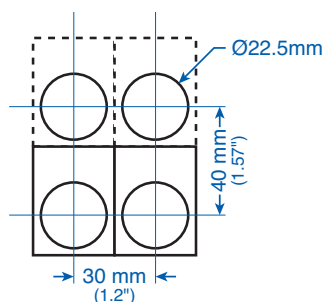
## Terminals

Contact elements and pilot lights are designed to have shrouded terminals with combination flat/phillips screws.

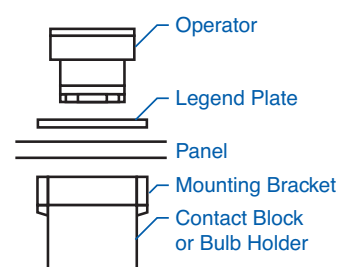
## Mounting

These Ø 22.5 control devices can be mounted in any position in panels of 1 to 6 mm (.039 - .236 in.) thickness. We recommend minimum fixing centers of 30 x 40mm (1.2 x 1.57 inches). However, the dimensions and configuration should be decided on the basis of the application. The actuators and the lens assemblies lock on to the holding bracket using a bayonet type of fixing which enables a simple and fast assembly. The complete assembly is locked into position on the panel by two M4 pointed screws on the bracket, tightened equally from the rear. The screws should be tightened to such an extent as to pierce through the paint on the panel from inside. These screws also ensure the grounding of the unit.

Panel Cutout with minimum space requirements



Sample Push Button Assembly



# 22mm Non-Illuminated Metal Operators



Certified for  
**NEMA Type 4X**  
12 environment.

## Flush

*Momentary  
with mounting bracket*



### Color

### Cat No.

|                                 |      |
|---------------------------------|------|
| <input type="checkbox"/> White  | 2AF1 |
| <input type="checkbox"/> Black  | 2AF2 |
| <input type="checkbox"/> Green  | 2AF3 |
| <input type="checkbox"/> Red    | 2AF4 |
| <input type="checkbox"/> Blue   | 2AF6 |
| <input type="checkbox"/> Yellow | 2AF8 |

## Booted

*Momentary  
with mounting bracket*



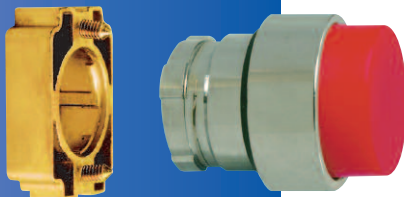
### Color

### Cat No.

|                                 |      |
|---------------------------------|------|
| <input type="checkbox"/> White  | 2AB1 |
| <input type="checkbox"/> Black  | 2AB2 |
| <input type="checkbox"/> Green  | 2AB3 |
| <input type="checkbox"/> Red    | 2AB4 |
| <input type="checkbox"/> Blue   | 2AB6 |
| <input type="checkbox"/> Yellow | 2AB8 |

## Projecting

*Momentary  
with mounting bracket*



### Color

### Cat No.

|                                 |      |
|---------------------------------|------|
| <input type="checkbox"/> White  | 2AP1 |
| <input type="checkbox"/> Black  | 2AP2 |
| <input type="checkbox"/> Green  | 2AP3 |
| <input type="checkbox"/> Red    | 2AP4 |
| <input type="checkbox"/> Blue   | 2AP6 |
| <input type="checkbox"/> Yellow | 2AP8 |

## Recessed

*Momentary  
with mounting bracket*



### Color

### Cat No.

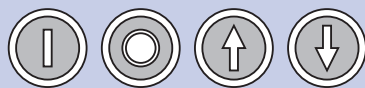
|                                 |        |
|---------------------------------|--------|
| <input type="checkbox"/> White  | 2AF1RH |
| <input type="checkbox"/> Black  | 2AF2RH |
| <input type="checkbox"/> Green  | 2AF3RH |
| <input type="checkbox"/> Red    | 2AF4RH |
| <input type="checkbox"/> Blue   | 2AF6RH |
| <input type="checkbox"/> Yellow | 2AF8RH |



All above operators available with remote attachment.  
Standard length is 50mm (2 in.), other lengths available  
upon request. Contact Altech for Part Number.

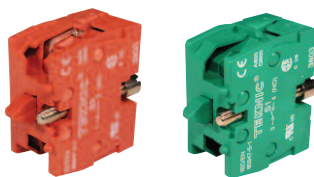


## Markings on Request



Altech Push Buttons are available in a variety of markings, including molded arrows. Please contact Altech for further information and part numbers.

## Switch Contacts (sold separately)



- Heavy-duty contact blocks with mounting screws. Blocks can be stacked 2 blocks across by 3 blocks deep for a total of 6 circuits.
- Contact blocks are available with silver contacts or gold plated contacts
- Self-wiping contacts

### Panel Mount

|                             |           |
|-----------------------------|-----------|
| Normally Open Silver        | <b>S1</b> |
| Normally Closed Silver      | <b>S2</b> |
| Normally Open Gold Plated   | <b>S3</b> |
| Normally Closed Gold Plated | <b>S4</b> |

### Base Mount\*

|                             |           |
|-----------------------------|-----------|
| Normally Open Silver        | <b>S5</b> |
| Normally Closed Silver      | <b>S6</b> |
| Normally Open Gold Plated   | <b>S7</b> |
| Normally Closed Gold Plated | <b>S8</b> |

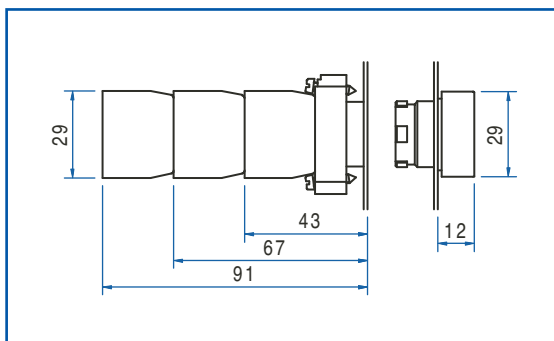
\* For use with non-illuminated operators in thermoplastic or aluminum enclosures listed on pages 30 and 36-37.

# 22mm Non-Illuminated Metal Operators

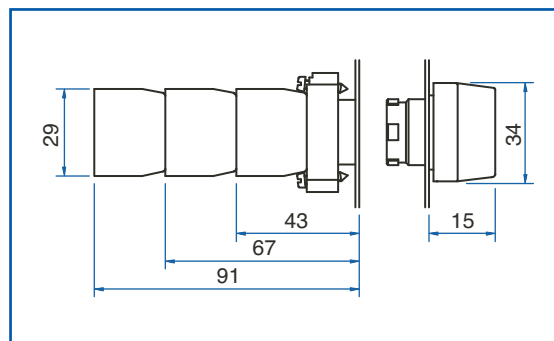
## Dimensional Drawings

All dimensions shown in millimeters.  
To convert to inches multiply by 0.03937

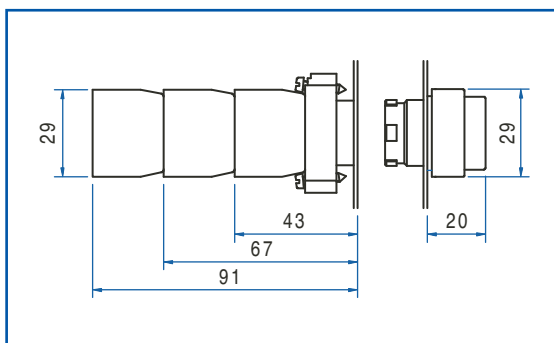
Non-Illuminated Flush



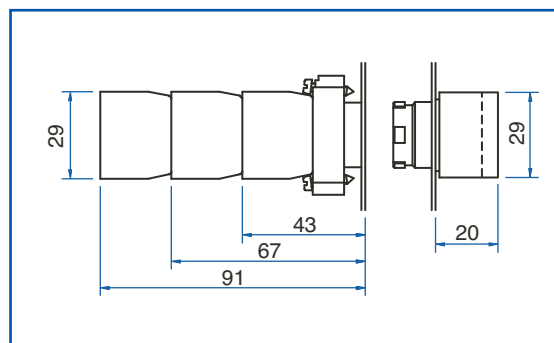
Non-Illuminated Booted



Non-Illuminated Projecting

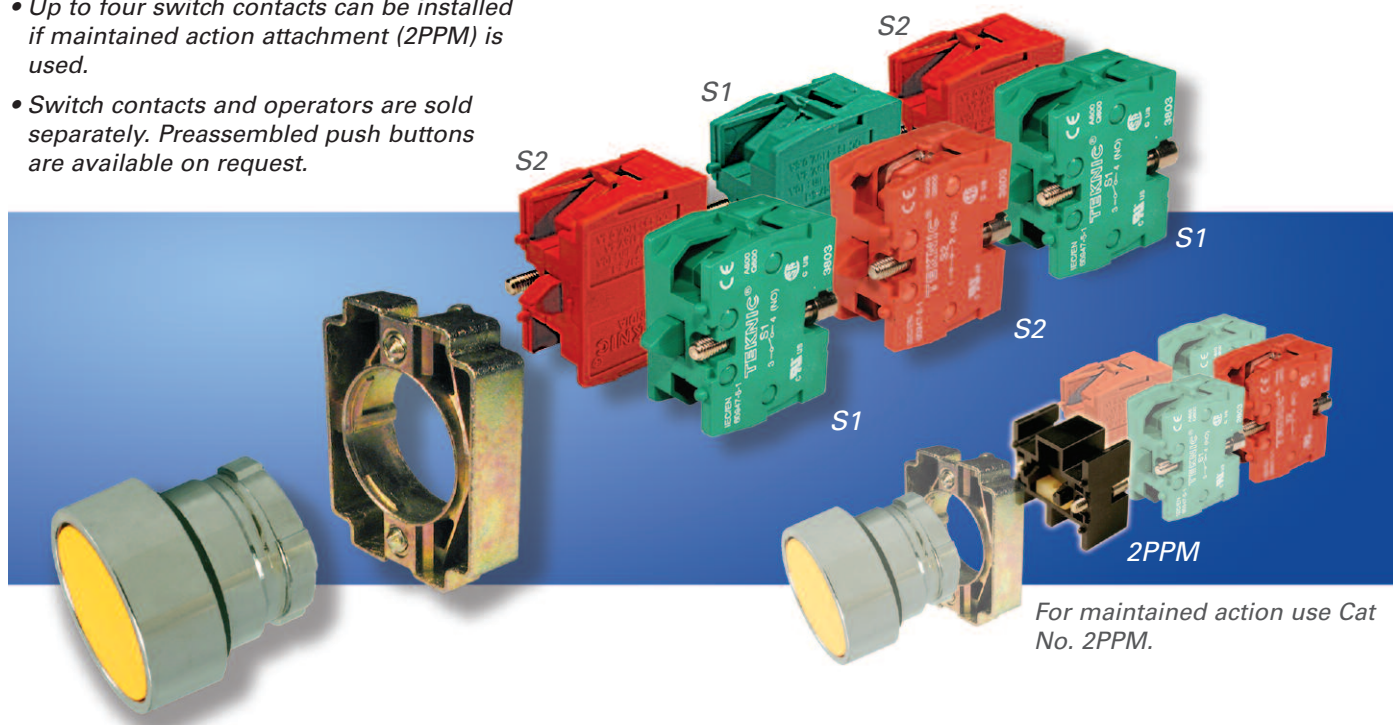


Non-Illuminated Recessed



## Exploded Assembly View

- Up to six switch contacts can be installed on any non-illuminated operator.
- Up to four switch contacts can be installed if maintained action attachment (2PPM) is used.
- Switch contacts and operators are sold separately. Preassembled push buttons are available on request.



For maintained action use Cat No. 2PPM.

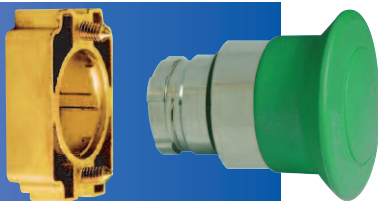
# 22mm Non-Illuminated Mushroom Metal Operators



Certified for  
**NEMA Type 4X**  
12 environment.

## Mushroom

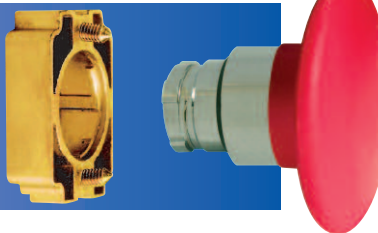
*Momentary  
with mounting bracket*



| Color    | Description | Cat No. |
|----------|-------------|---------|
| □ White  | 40mm, Head  | 2AM1    |
| ■ Black  | 40mm, Head  | 2AM2    |
| ■ Green  | 40mm, Head  | 2AM3    |
| ■ Red    | 40mm, Head  | 2AM4    |
| ■ Blue   | 40mm, Head  | 2AM6    |
| ■ Yellow | 40mm, Head  | 2AM8    |

## Mushroom

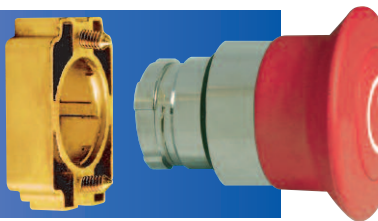
*Momentary Large  
with mounting bracket*



| Color    | Description | Cat No. |
|----------|-------------|---------|
| □ White  | 60mm, Head  | 2AMJ1   |
| ■ Black  | 60mm, Head  | 2AMJ2   |
| ■ Green  | 60mm, Head  | 2AMJ3   |
| ■ Red    | 60mm, Head  | 2AMJ4   |
| ■ Blue   | 60mm, Head  | 2AMJ6   |
| ■ Yellow | 60mm, Head  | 2AMJ8   |

## Mushroom

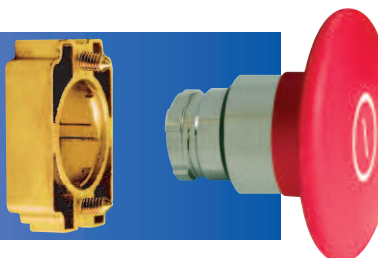
*Push-Pull  
with mounting bracket*



| Color    | Description | Cat No. |
|----------|-------------|---------|
| □ White  | 40mm, Head  | 2AMPP1  |
| ■ Black  | 40mm, Head  | 2AMPP2  |
| ■ Green  | 40mm, Head  | 2AMPP3  |
| ■ Red    | 40mm, Head  | 2AMPP4  |
| ■ Blue   | 40mm, Head  | 2AMPP6  |
| ■ Yellow | 40mm, Head  | 2AMPP8  |

## Mushroom

*Push-Pull Large  
with mounting bracket*



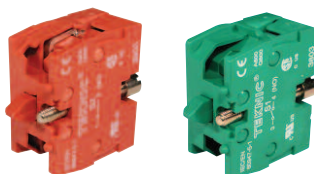
| Color    | Description | Cat No. |
|----------|-------------|---------|
| □ White  | 60mm, Head  | 2AMPPJ1 |
| ■ Black  | 60mm, Head  | 2AMPPJ2 |
| ■ Green  | 60mm, Head  | 2AMPPJ3 |
| ■ Red    | 60mm, Head  | 2AMPPJ4 |
| ■ Blue   | 60mm, Head  | 2AMPPJ6 |
| ■ Yellow | 60mm, Head  | 2AMPPJ8 |

## Markings on Request



## Switch Contacts

(sold separately)



- Heavy-duty contact blocks with mounting screws. Blocks can be stacked 2 blocks across by 3 blocks deep for a total of 6 circuits.
- Contact blocks are available with silver contacts or gold plated contacts
- Self-wiping contacts

### Panel Mount

|                             |           |
|-----------------------------|-----------|
| Normally Open Silver        | <b>S1</b> |
| Normally Closed Silver      | <b>S2</b> |
| Normally Open Gold Plated   | <b>S3</b> |
| Normally Closed Gold Plated | <b>S4</b> |

### Base Mount\*

|                             |           |
|-----------------------------|-----------|
| Normally Open Silver        | <b>S5</b> |
| Normally Closed Silver      | <b>S6</b> |
| Normally Open Gold Plated   | <b>S7</b> |
| Normally Closed Gold Plated | <b>S8</b> |

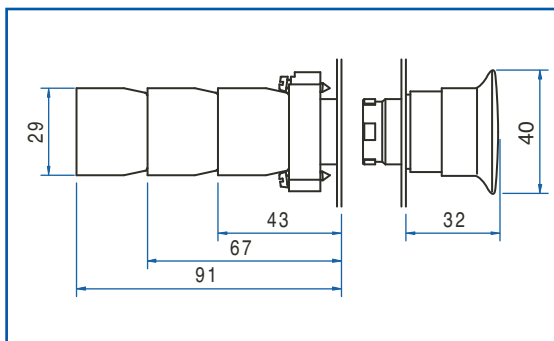
\* For use with non-illuminated operators in thermoplastic or aluminum enclosures listed on pages 30 and 36-37.

# 22mm Non-Illuminated Mushroom Metal Operators

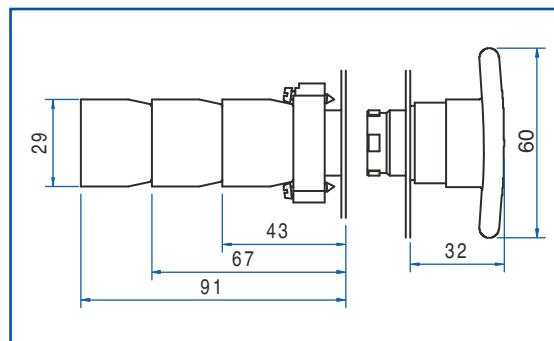
## Dimensional Drawings

All dimensions shown in millimeters.  
To convert to inches multiply by 0.03937

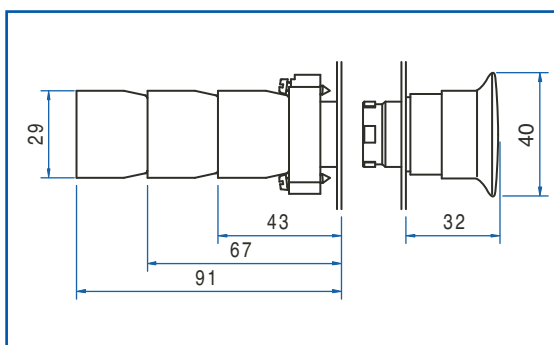
Mushroom Momentary



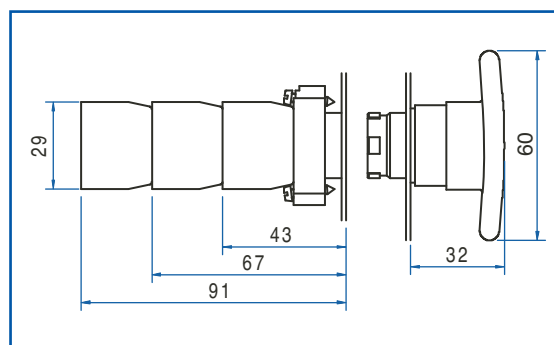
Mushroom Momentary Large



Mushroom Push-Pull

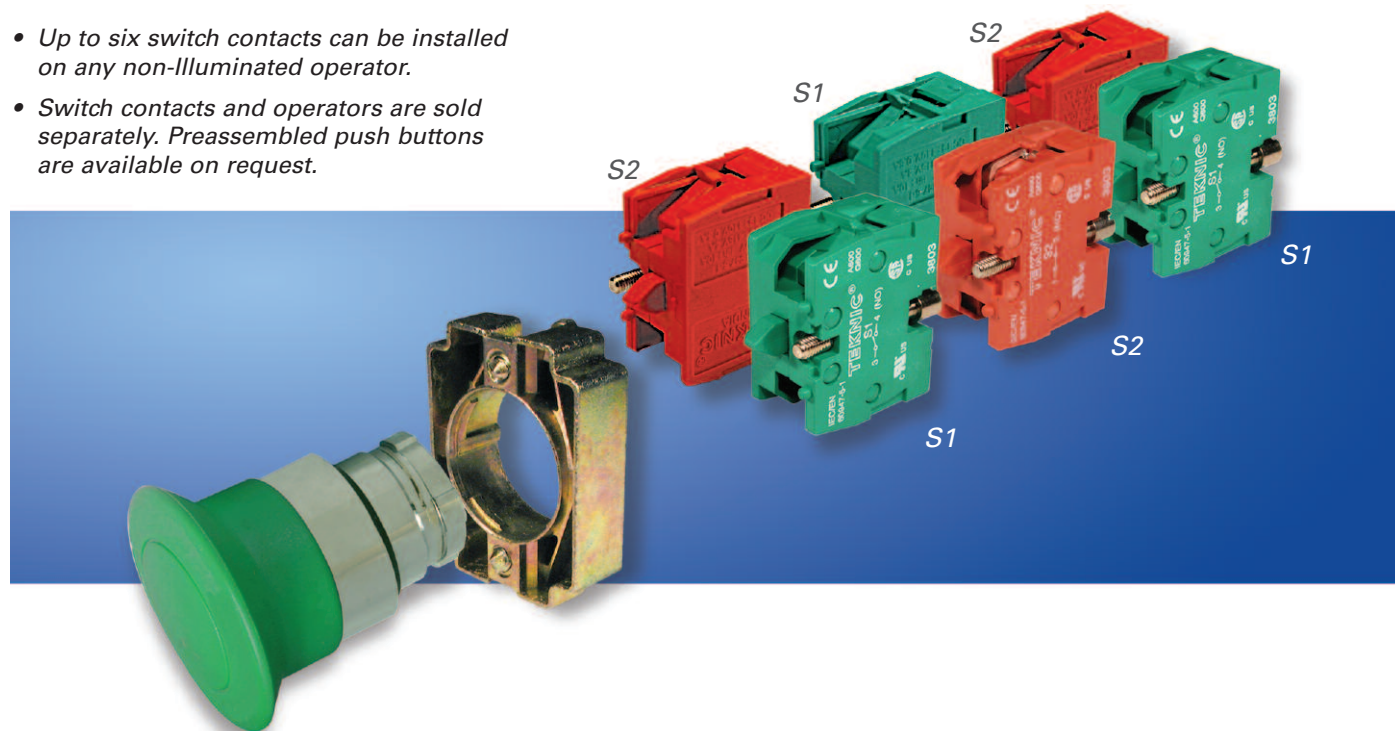


Mushroom Push-Pull Large



## Exploded Assembly View

- Up to six switch contacts can be installed on any non-illuminated operator.
- Switch contacts and operators are sold separately. Preassembled push buttons are available on request.



# 22mm Non-Illuminated Mushroom Metal Operators



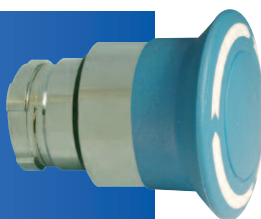
Certified for  
**NEMA Type 4X**  
12 environment.

## Mushroom Push-Turn Small with mounting bracket



| Color                                      | Description | Cat No. |
|--------------------------------------------|-------------|---------|
| <input type="checkbox"/> White             | 30 mm, Head | 2AMLS1  |
| <input checked="" type="checkbox"/> Black  | 30 mm, Head | 2AMLS2  |
| <input checked="" type="checkbox"/> Green  | 30 mm, Head | 2AMLS3  |
| <input checked="" type="checkbox"/> Red    | 30 mm, Head | 2AMLS4  |
| <input checked="" type="checkbox"/> Blue   | 30 mm, Head | 2AMLS6  |
| <input checked="" type="checkbox"/> Yellow | 30 mm, Head | 2AMLS8  |

## Mushroom Push-Turn with mounting bracket



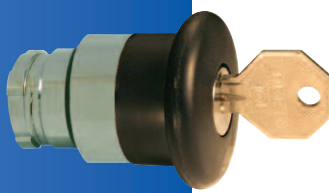
| Color                                      | Description | Cat No. |
|--------------------------------------------|-------------|---------|
| <input type="checkbox"/> White             | 40mm, Head  | 2AML1   |
| <input checked="" type="checkbox"/> Black  | 40mm, Head  | 2AML2   |
| <input checked="" type="checkbox"/> Green  | 40mm, Head  | 2AML3   |
| <input checked="" type="checkbox"/> Red    | 40mm, Head  | 2AML4   |
| <input checked="" type="checkbox"/> Blue   | 40mm, Head  | 2AML6   |
| <input checked="" type="checkbox"/> Yellow | 40mm, Head  | 2AML8   |

## Mushroom Push-Turn Large with mounting bracket



| Color                                      | Description | Cat No. |
|--------------------------------------------|-------------|---------|
| <input type="checkbox"/> White             | 60mm, Head  | 2AMLJ1  |
| <input checked="" type="checkbox"/> Black  | 60mm, Head  | 2AMLJ2  |
| <input checked="" type="checkbox"/> Green  | 60mm, Head  | 2AMLJ3  |
| <input checked="" type="checkbox"/> Red    | 60mm, Head  | 2AMLJ4  |
| <input checked="" type="checkbox"/> Blue   | 60mm, Head  | 2AMLJ6  |
| <input checked="" type="checkbox"/> Yellow | 60mm, Head  | 2AMLJ8  |

## Mushroom with Key Release with mounting bracket



| Color                                      | Description | Cat No. |
|--------------------------------------------|-------------|---------|
| <input type="checkbox"/> White             | 40mm, Head  | 2AMLKB1 |
| <input checked="" type="checkbox"/> Black  | 40mm, Head  | 2AMLKB2 |
| <input checked="" type="checkbox"/> Green  | 40mm, Head  | 2AMLKB3 |
| <input checked="" type="checkbox"/> Red    | 40mm, Head  | 2AMLKB4 |
| <input checked="" type="checkbox"/> Blue   | 40mm, Head  | 2AMLKB6 |
| <input checked="" type="checkbox"/> Yellow | 40mm, Head  | 2AMLKB8 |

All keys are "keyed alike". Different keys are available on request.



**Replacement Key**

**2KY455**

## Markings on Request



## Switch Contacts (sold separately)



- Heavy-duty contact blocks with mounting screws. Blocks can be stacked 2 blocks across by 3 blocks deep for a total of 6 circuits.
- Contact blocks are available with silver contacts or gold plated contacts
- Self-wiping contacts

### Panel Mount

|                             |           |
|-----------------------------|-----------|
| Normally Open Silver        | <b>S1</b> |
| Normally Closed Silver      | <b>S2</b> |
| Normally Open Gold Plated   | <b>S3</b> |
| Normally Closed Gold Plated | <b>S4</b> |

### Base Mount\*

|                             |           |
|-----------------------------|-----------|
| Normally Open Silver        | <b>S5</b> |
| Normally Closed Silver      | <b>S6</b> |
| Normally Open Gold Plated   | <b>S7</b> |
| Normally Closed Gold Plated | <b>S8</b> |

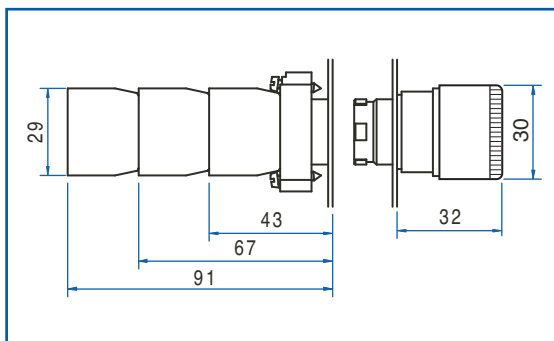
\* For use with non-illuminated operators in thermoplastic or aluminum enclosures listed on pages 30 and 36-37.

# 22mm Non-Illuminated Mushroom Metal Operators

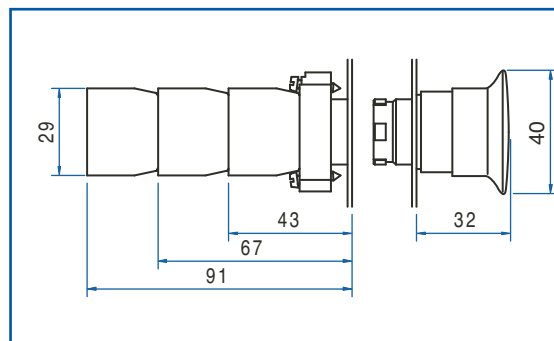
## Dimensional Drawings

All dimensions shown in millimeters.  
To convert to inches multiply by 0.03937

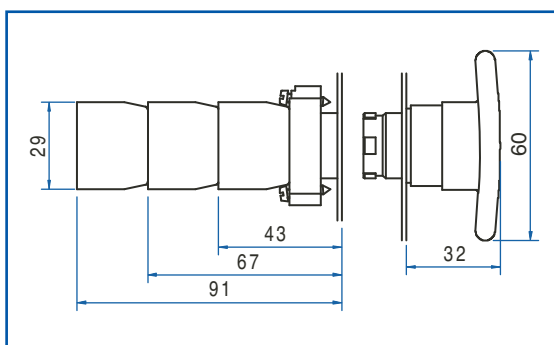
Mushroom Push-Turn Small



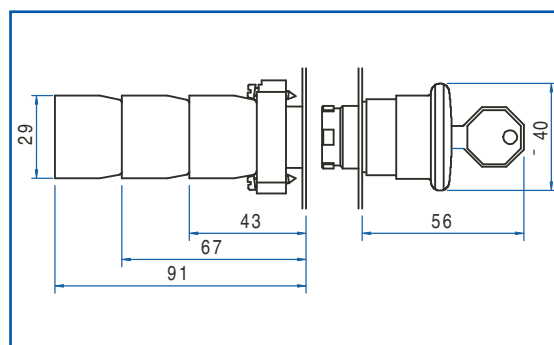
Mushroom Push-Turn



Mushroom Push-Turn Large

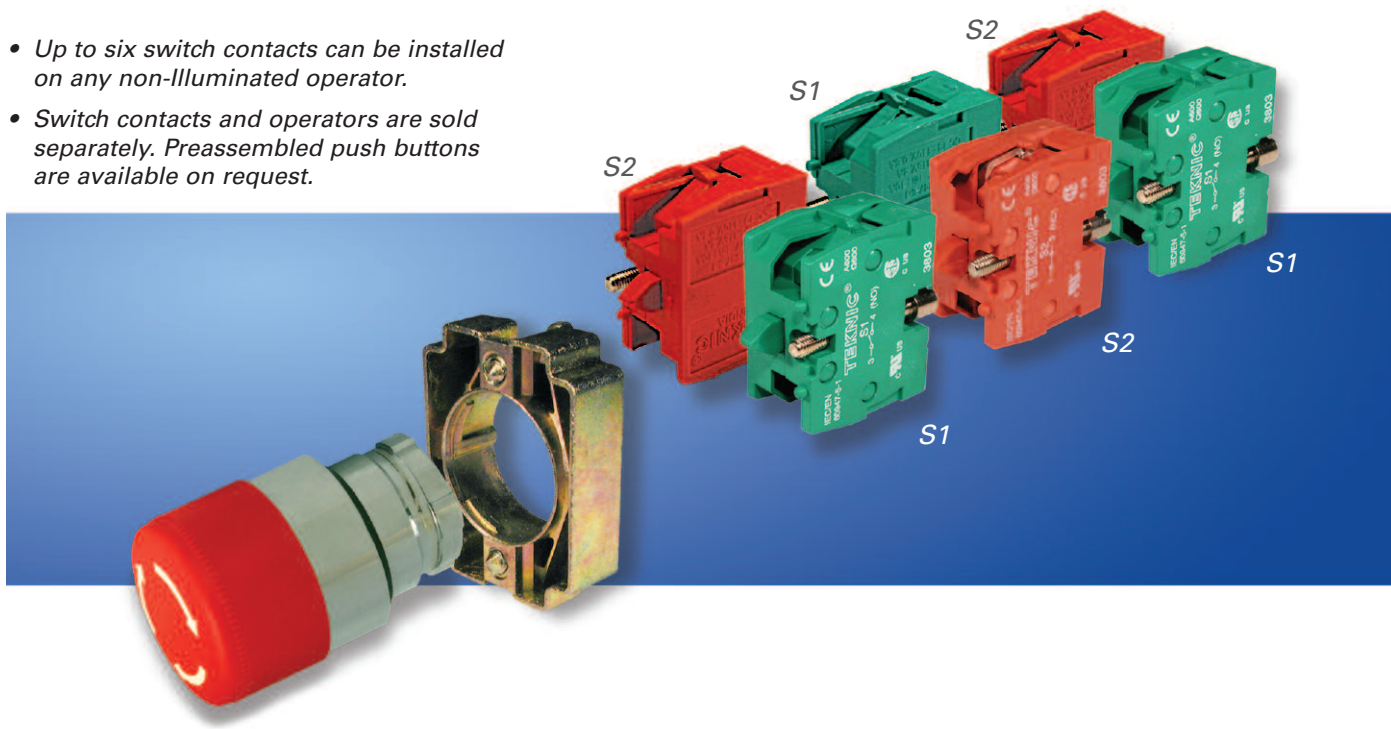


Mushroom with Key Release



## Exploded Assembly View

- Up to six switch contacts can be installed on any non-illuminated operator.
- Switch contacts and operators are sold separately. Preassembled push buttons are available on request.



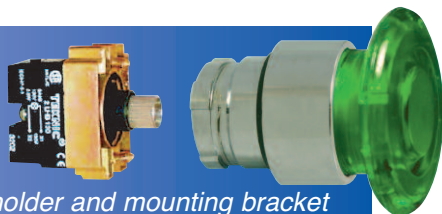
# 22mm LED Illuminated Mushroom Metal Operators



Certified for  
**NEMA Type 4X**  
12 environment.

## Mushroom Illuminated Momentary

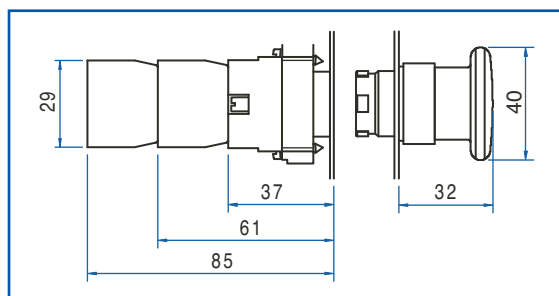
with LED bulb, bulb holder and mounting bracket



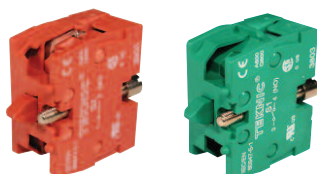
### Dimensional Drawings

All dimensions shown in millimeters.  
To convert to inches multiply by 0.03937

Illuminated Mushroom Momentary



### Switch Contacts (sold separately)



- Heavy-duty contact blocks with mounting screws. Blocks can be stacked 2 blocks across by 3 blocks deep for a total of 6 circuits.
- Contact blocks are available with silver contacts or gold plated contacts
- Self-wiping contacts

#### Panel Mount

|                             |           |
|-----------------------------|-----------|
| Normally Open Silver        | <b>S1</b> |
| Normally Closed Silver      | <b>S2</b> |
| Normally Open Gold Plated   | <b>S3</b> |
| Normally Closed Gold Plated | <b>S4</b> |

#### Base Mount\*

|                             |           |
|-----------------------------|-----------|
| Normally Open Silver        | <b>S5</b> |
| Normally Closed Silver      | <b>S6</b> |
| Normally Open Gold Plated   | <b>S7</b> |
| Normally Closed Gold Plated | <b>S8</b> |

\* For use with non-illuminated operators in thermoplastic or aluminum enclosures listed on pages 30 and 36-37.

### Color Description Cat No.

#### 12V AC/DC

|        |                     |             |
|--------|---------------------|-------------|
| White  | 40mm Head, 12VAC/DC | 2ALM1LB-012 |
| Green  | 40mm Head, 12VAC/DC | 2ALM3LB-012 |
| Red    | 40mm Head, 12VAC/DC | 2ALM4LB-012 |
| Amber  | 40mm Head, 12VAC/DC | 2ALM5LB-012 |
| Blue   | 40mm Head, 12VAC/DC | 2ALM6LB-012 |
| Clear  | 40mm Head, 12VAC/DC | 2ALM7LB-012 |
| Yellow | 40mm Head, 12VAC/DC | 2ALM8LB-012 |

#### 24V AC/DC

|        |                     |             |
|--------|---------------------|-------------|
| White  | 40mm Head, 24VAC/DC | 2ALM1LB-024 |
| Green  | 40mm Head, 24VAC/DC | 2ALM3LB-024 |
| Red    | 40mm Head, 24VAC/DC | 2ALM4LB-024 |
| Amber  | 40mm Head, 24VAC/DC | 2ALM5LB-024 |
| Blue   | 40mm Head, 24VAC/DC | 2ALM6LB-024 |
| Clear  | 40mm Head, 24VAC/DC | 2ALM7LB-024 |
| Yellow | 40mm Head, 24VAC/DC | 2ALM8LB-024 |

#### 48V AC/DC

|        |                     |             |
|--------|---------------------|-------------|
| White  | 40mm Head, 48VAC/DC | 2ALM1LB-048 |
| Green  | 40mm Head, 48VAC/DC | 2ALM3LB-048 |
| Red    | 40mm Head, 48VAC/DC | 2ALM4LB-048 |
| Amber  | 40mm Head, 48VAC/DC | 2ALM5LB-048 |
| Blue   | 40mm Head, 48VAC/DC | 2ALM6LB-048 |
| Clear  | 40mm Head, 48VAC/DC | 2ALM7LB-048 |
| Yellow | 40mm Head, 48VAC/DC | 2ALM8LB-048 |

#### 110V AC\*

|        |                    |             |
|--------|--------------------|-------------|
| White  | 40mm Head, 110VAC* | 2ALM1LB-110 |
| Green  | 40mm Head, 110VAC* | 2ALM3LB-110 |
| Red    | 40mm Head, 110VAC* | 2ALM4LB-110 |
| Amber  | 40mm Head, 110VAC* | 2ALM5LB-110 |
| Blue   | 40mm Head, 110VAC* | 2ALM6LB-110 |
| Clear  | 40mm Head, 110VAC* | 2ALM7LB-110 |
| Yellow | 40mm Head, 110VAC* | 2ALM8LB-110 |

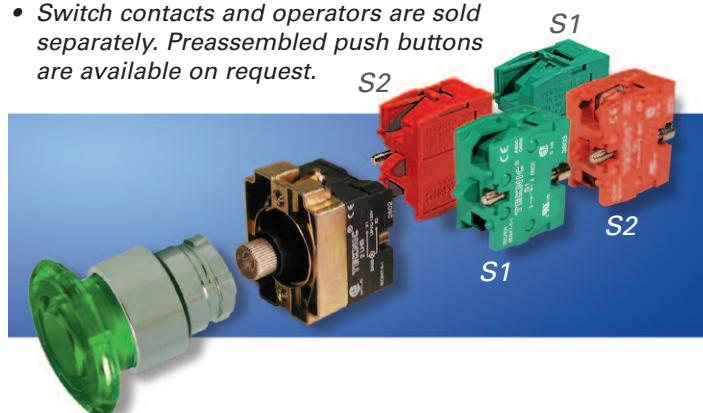
#### 230V AC\*

|        |                    |             |
|--------|--------------------|-------------|
| White  | 40mm Head, 230VAC* | 2ALM1LB-230 |
| Green  | 40mm Head, 230VAC* | 2ALM3LB-230 |
| Red    | 40mm Head, 230VAC* | 2ALM4LB-230 |
| Amber  | 40mm Head, 230VAC* | 2ALM5LB-230 |
| Blue   | 40mm Head, 230VAC* | 2ALM6LB-230 |
| Clear  | 40mm Head, 230VAC* | 2ALM7LB-230 |
| Yellow | 40mm Head, 230VAC* | 2ALM8LB-230 |

\*110V DC and 230V DC version is available on request.

### Exploded Assembly View

- Up to four switch contacts can be installed with any illuminated operators.
- Switch contacts and operators are sold separately. Preassembled push buttons are available on request.



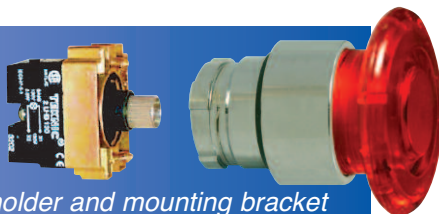
# 22mm LED Illuminated Mushroom Metal Operators



Certified for  
**NEMA Type 4X**  
12 environment.

## Mushroom Illuminated Push-Pull

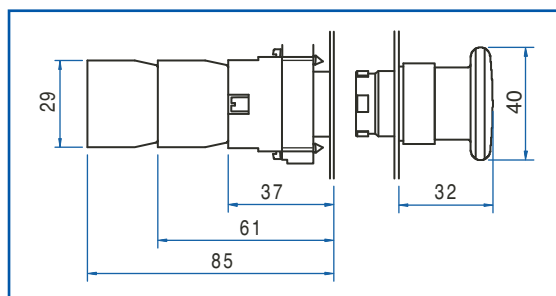
with LED bulb, bulb holder and mounting bracket



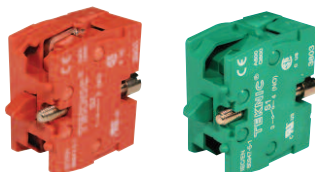
## Dimensional Drawings

All dimensions shown in millimeters.  
To convert to inches multiply by 0.03937

Illuminated Mushroom Push-Pull



## Switch Contacts (sold separately)



- Heavy-duty contact blocks with mounting screws. Blocks can be stacked 2 blocks across by 3 blocks deep for a total of 6 circuits.
- Contact blocks are available with silver contacts or gold plated contacts
- Self-wiping contacts

### Panel Mount

|                             |           |
|-----------------------------|-----------|
| Normally Open Silver        | <b>S1</b> |
| Normally Closed Silver      | <b>S2</b> |
| Normally Open Gold Plated   | <b>S3</b> |
| Normally Closed Gold Plated | <b>S4</b> |

### Base Mount\*

|                             |           |
|-----------------------------|-----------|
| Normally Open Silver        | <b>S5</b> |
| Normally Closed Silver      | <b>S6</b> |
| Normally Open Gold Plated   | <b>S7</b> |
| Normally Closed Gold Plated | <b>S8</b> |

\* For use with non-illuminated operators in thermoplastic or aluminum enclosures listed on pages 30 and 36-37.

## Color Description Cat No.

### 12V AC/DC

|        |                     |               |
|--------|---------------------|---------------|
| White  | 40mm Head, 12VAC/DC | 2ALMPP1LB-012 |
| Green  | 40mm Head, 12VAC/DC | 2ALMPP3LB-012 |
| Red    | 40mm Head, 12VAC/DC | 2ALMPP4LB-012 |
| Amber  | 40mm Head, 12VAC/DC | 2ALMPP5LB-012 |
| Blue   | 40mm Head, 12VAC/DC | 2ALMPP6LB-012 |
| Clear  | 40mm Head, 12VAC/DC | 2ALMPP7LB-012 |
| Yellow | 40mm Head, 12VAC/DC | 2ALMPP8LB-012 |

### 24V AC/DC

|        |                     |               |
|--------|---------------------|---------------|
| White  | 40mm Head, 24VAC/DC | 2ALMPP1LB-024 |
| Green  | 40mm Head, 24VAC/DC | 2ALMPP3LB-024 |
| Red    | 40mm Head, 24VAC/DC | 2ALMPP4LB-024 |
| Amber  | 40mm Head, 24VAC/DC | 2ALMPP5LB-024 |
| Blue   | 40mm Head, 24VAC/DC | 2ALMPP6LB-024 |
| Clear  | 40mm Head, 24VAC/DC | 2ALMPP7LB-024 |
| Yellow | 40mm Head, 24VAC/DC | 2ALMPP8LB-024 |

### 48V AC/DC

|        |                     |               |
|--------|---------------------|---------------|
| White  | 40mm Head, 48VAC/DC | 2ALMPP1LB-048 |
| Green  | 40mm Head, 48VAC/DC | 2ALMPP3LB-048 |
| Red    | 40mm Head, 48VAC/DC | 2ALMPP4LB-048 |
| Amber  | 40mm Head, 48VAC/DC | 2ALMPP5LB-048 |
| Blue   | 40mm Head, 48VAC/DC | 2ALMPP6LB-048 |
| Clear  | 40mm Head, 48VAC/DC | 2ALMPP7LB-048 |
| Yellow | 40mm Head, 48VAC/DC | 2ALMPP8LB-048 |

### 110V AC\*

|        |                    |               |
|--------|--------------------|---------------|
| White  | 40mm Head, 110VAC* | 2ALMPP1LB-110 |
| Green  | 40mm Head, 110VAC* | 2ALMPP3LB-110 |
| Red    | 40mm Head, 110VAC* | 2ALMPP4LB-110 |
| Amber  | 40mm Head, 110VAC* | 2ALMPP5LB-110 |
| Blue   | 40mm Head, 110VAC* | 2ALMPP6LB-110 |
| Clear  | 40mm Head, 110VAC* | 2ALMPP7LB-110 |
| Yellow | 40mm Head, 110VAC* | 2ALMPP8LB-110 |

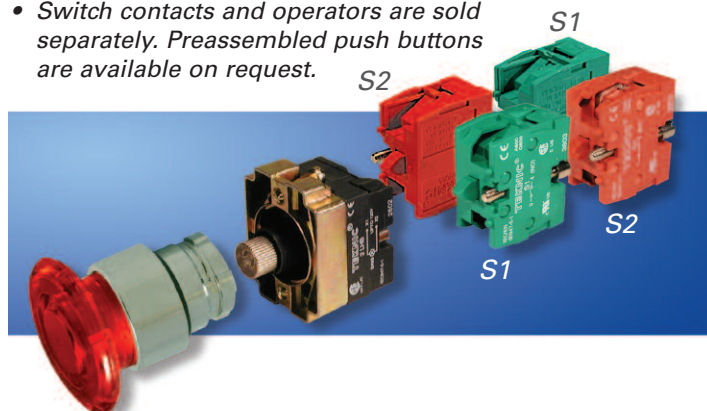
### 230V AC\*

|        |                    |               |
|--------|--------------------|---------------|
| White  | 40mm Head, 230VAC* | 2ALMPP1LB-230 |
| Green  | 40mm Head, 230VAC* | 2ALMPP3LB-230 |
| Red    | 40mm Head, 230VAC* | 2ALMPP4LB-230 |
| Amber  | 40mm Head, 230VAC* | 2ALMPP5LB-230 |
| Blue   | 40mm Head, 230VAC* | 2ALMPP6LB-230 |
| Clear  | 40mm Head, 230VAC* | 2ALMPP7LB-230 |
| Yellow | 40mm Head, 230VAC* | 2ALMPP8LB-230 |

\*110V DC and 230V DC version is available on request.

## Exploded Assembly View

- Up to four switch contacts can be installed with any illuminated operators.
- Switch contacts and operators are sold separately. Preassembled push buttons are available on request.



# 22mm Twin Touch Metal Non-Illuminated Operators



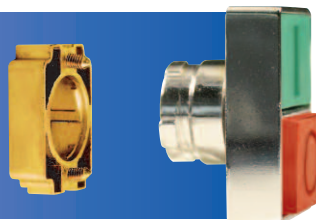
Certified for  
**NEMA Type 4X**  
12 environment.

## Twin Touch/ Not Marked with mounting bracket



Arrows marking available upon request.

## Twin Touch I-O Marked with mounting bracket



Arrows marking available upon request.

| Color | Description                                 | Cat No.  |
|-------|---------------------------------------------|----------|
|       | GREEN-RED Flush                             | 2ATF3-F4 |
|       | YELLOW-BLACK Flush                          | 2ATF8-F2 |
|       | BLACK-WHITE Flush                           | 2ATF2-F1 |
|       | GREEN-RED Green Flush, Red Projecting       | 2ATF3-P4 |
|       | YELLOW-BLACK Yellow Flush, Black Projecting | 2ATF8-P2 |
|       | WHITE-BLACK White Flush, Black Projecting   | 2ATF1-P2 |

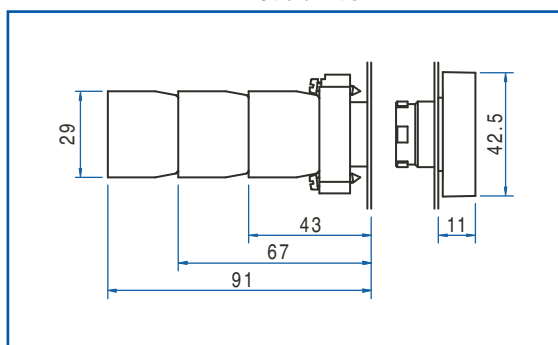
| Color | Description                                 | Cat No.     |
|-------|---------------------------------------------|-------------|
|       | GREEN-RED Flush                             | 2ATF3-F4-IO |
|       | YELLOW-BLACK Flush                          | 2ATF8-F2-IO |
|       | BLACK-WHITE* Flush                          | 2ATF2-F1-IO |
|       | GREEN-RED Green Flush, Red Projecting       | 2ATF3-P4-IO |
|       | YELLOW-BLACK Yellow Flush, Black Projecting | 2ATF8-P2-IO |
|       | WHITE-BLACK* White Flush, Black Projecting  | 2ATF1-P2-IO |

\*Comply with vision impaired requirements.

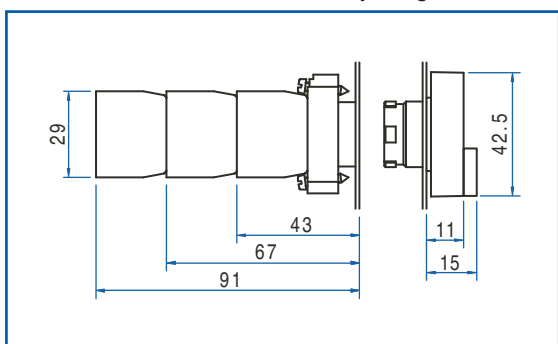
## Dimensional Drawings

All dimensions shown in millimeters.  
To convert to inches multiply by 0.03937

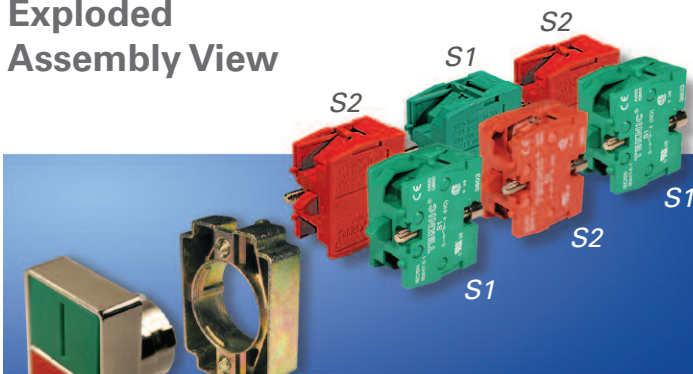
Twin Touch/ Flush



Twin Touch/ Flush/ Projecting

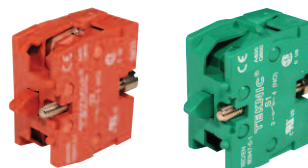


## Exploded Assembly View



- Up to four switch contacts can be installed with any illuminated operators.
- Switch contacts and operators are sold separately. Preassembled push buttons are available on request.

## Switch Contacts (sold separately)



- Heavy-duty contact blocks with mounting screws. Blocks can be stacked 2 blocks across by 3 blocks deep for a total of 6 circuits.
- Contact blocks are available with silver contacts or gold plated contacts
- Self-wiping contacts

|                             | Panel Mount<br>Cat No. | Base Mount*<br>Cat No. |
|-----------------------------|------------------------|------------------------|
| Normally Open Silver        | S1                     | S5                     |
| Normally Closed Silver      | S2                     | S6                     |
| Normally Open Gold plated   | S3                     | S7                     |
| Normally Closed Gold plated | S4                     | S8                     |

\*For use with non-illuminated operators in thermoplastic or aluminum enclosures listed on pages 30 and 36-37.

# 22mm Twin Touch Metal LED Illuminated Operators

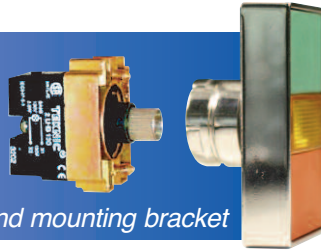


Certified for  
**NEMA Type 4X**  
12 environment.

## Illuminated Center Twin Touch/ Not Marked

with LED bulb, bulb holder and mounting bracket

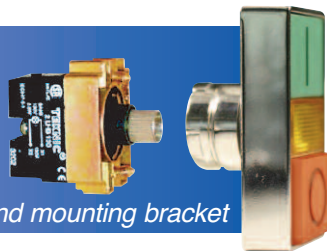
Arrows marking available upon request.  
Other lense colors available upon request.



## Illuminated Center Twin Touch/ I-O Marked

with LED bulb, bulb holder and mounting bracket

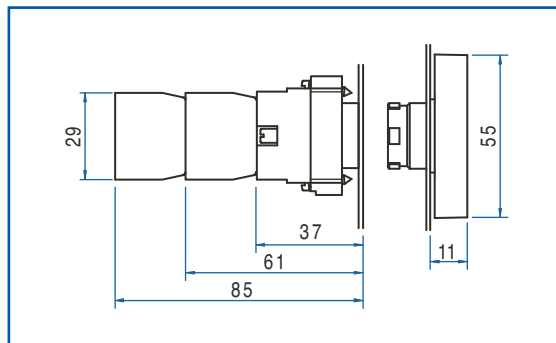
Arrows marking available upon request.  
Other lense colors available upon request.



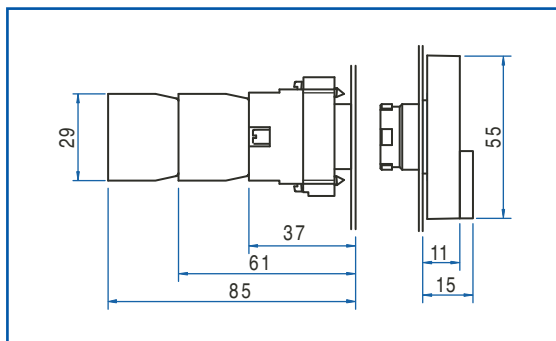
## Dimensional Drawings

All dimensions shown in millimeters.  
To convert to inches multiply by 0.03937

Illuminated Twin Touch/ Flush



Illuminated Twin Touch/ Flush/ Projecting



## Color Description Cat No.

### GREEN-RED, Flush, Illuminated Center

|       |          |                  |
|-------|----------|------------------|
| Amber | 12VAC/DC | 2ATL5LB F3F4-012 |
| Amber | 24VAC/DC | 2ATL5LB F3F4-024 |
| Amber | 48VAC/DC | 2ATL5LB F3F4-048 |
| Amber | 110VAC** | 2ATL5LB F3F4-110 |
| Amber | 230VAC** | 2ATL5LB F3F4-230 |

### GREEN-RED, Green Flush/ Red Projecting, Illuminated center

|       |          |                  |
|-------|----------|------------------|
| Amber | 12VAC/DC | 2ATL5LB F3P4-012 |
| Amber | 24VAC/DC | 2ATL5LB F3P4-024 |
| Amber | 48VAC/DC | 2ATL5LB F3P4-048 |
| Amber | 110VAC** | 2ATL5LB F3P4-110 |
| Amber | 230VAC** | 2ATL5LB F3P4-230 |

## Color Description Cat No.

### GREEN-RED, Flush, Illuminated Center

|       |          |                     |
|-------|----------|---------------------|
| Amber | 12VAC/DC | 2ATL5LB F3F4-IO-012 |
| Amber | 24VAC/DC | 2ATL5LB F3F4-IO-024 |
| Amber | 48VAC/DC | 2ATL5LB F3F4-IO-048 |
| Amber | 110VAC** | 2ATL5LB F3F4-IO-110 |
| Amber | 230VAC** | 2ATL5LB F3F4-IO-230 |

### GREEN-RED, Green Flush/ Red Projecting, Illuminated Center

|       |          |                     |
|-------|----------|---------------------|
| Amber | 12VAC/DC | 2ATL5LB F3P4-IO-012 |
| Amber | 24VAC/DC | 2ATL5LB F3P4-IO-024 |
| Amber | 48VAC/DC | 2ATL5LB F3P4-IO-048 |
| Amber | 110VAC** | 2ATL5LB F3P4-IO-110 |
| Amber | 230VAC** | 2ATL5LB F3P4-IO-230 |

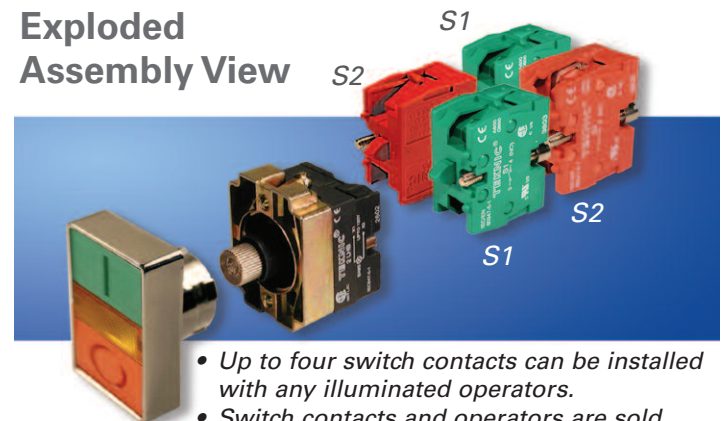
### WHITE-BLACK\*, Flush, Illuminated Center

|       |          |                     |
|-------|----------|---------------------|
| Amber | 12VAC/DC | 2ATL5LB F2F1-IO-012 |
| Amber | 24VAC/DC | 2ATL5LB F2F1-IO-024 |
| Amber | 48VAC/DC | 2ATL5LB F2F1-IO-048 |
| Amber | 110VAC** | 2ATL5LB F2F1-IO-110 |
| Amber | 230VAC** | 2ATL5LB F2F1-IO-230 |

\* Comply with vision impaired requirements.

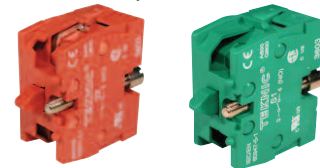
\*\* 110V DC and 230V DC version is available on request.

## Exploded Assembly View



- Up to four switch contacts can be installed with any illuminated operators.
- Switch contacts and operators are sold separately. Preassembled push buttons are available on request.

## Switch Contacts (sold separately)



|                             | Panel Mount<br>Cat No. | Base Mount*<br>Cat No. |
|-----------------------------|------------------------|------------------------|
| Normally Open Silver        | S1                     | S5                     |
| Normally Closed Silver      | S2                     | S6                     |
| Normally Open Gold plated   | S3                     | S7                     |
| Normally Closed Gold plated | S4                     | S8                     |

\* For use with non-illuminated operators in thermoplastic or aluminum enclosures listed on pages 30 and 36-37.

# 22mm Non-Illuminated Metal Selector Switch Operators



Certified for  
**NEMA Type 4X**  
12 environment.

## Key Selector

with mounting bracket



Other key combinations and colors are available on request.  
All keys are "keyed alike". Different keys are available on request.

### Color Description Key Removal Cat No.

|         |  |               |            |         |
|---------|--|---------------|------------|---------|
| ■ Black |  | Maintained    | Left/Right | 2AK2-01 |
| ■ Black |  | Maintained    | Left       | 2AK2-02 |
| ■ Black |  | Maintained    | Right      | 2AK2-03 |
| ■ Black |  | Spring Return | Left       | 2AK2-04 |
| ■ Black |  | Maintained    | Left/Right | 2AK2-05 |
| ■ Black |  | Maintained    | All        | 2AK2-06 |
| ■ Black |  | Maintained    | Center     | 2AK2-07 |
| ■ Black |  | Spring Return | Center     | 2AK2-08 |
| ■ Black |  | Spring Return | Center     | 2AK2-09 |
| ■ Black |  | Spring Return | Center     | 2AK2-10 |
| ■ Black |  | Maintained    | Left       | 2AK2-11 |



Replacement Key

2KY455

## Selector

with mounting bracket



Other colors are available on request.

### Color Description Cat No.

|         |  |               |        |
|---------|--|---------------|--------|
| ■ Black |  | Maintained    | 2AS2-1 |
| ■ Black |  | Spring Return | 2AS2-2 |
| ■ Black |  | Maintained    | 2AS2-3 |
| ■ Black |  | Spring Return | 2AS2-4 |
| ■ Black |  | Spring Return | 2AS2-5 |
| ■ Black |  | Spring Return | 2AS2-6 |

## Extended Selector

with mounting bracket



Other colors are available on request.

### Color Description Cat No.

|         |  |               |         |
|---------|--|---------------|---------|
| ■ Black |  | Maintained    | 2AS2E-1 |
| ■ Black |  | Spring Return | 2AS2E-2 |
| ■ Black |  | Maintained    | 2AS2E-3 |
| ■ Black |  | Spring Return | 2AS2E-4 |
| ■ Black |  | Spring Return | 2AS2E-5 |
| ■ Black |  | Spring Return | 2AS2E-6 |

## Switch Contacts

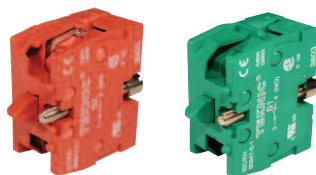
(sold separately)



### Markings on Request



Altech Push Buttons are available in a variety of markings, including molded arrows. Please contact Altech for further information and part numbers.



- Heavy-duty contact blocks with mounting screws. Blocks can be stacked 2 blocks across by 3 blocks deep for a total of 6 circuits.
- Contact blocks are available with silver contacts or gold plated contacts
- Self-wiping contacts

### Panel Mount

|                             |    |
|-----------------------------|----|
| Normally Open Silver        | S1 |
| Normally Closed Silver      | S2 |
| Normally Open Gold Plated   | S3 |
| Normally Closed Gold Plated | S4 |

### Base Mount\*

|                             |    |
|-----------------------------|----|
| Normally Open Silver        | S5 |
| Normally Closed Silver      | S6 |
| Normally Open Gold Plated   | S7 |
| Normally Closed Gold Plated | S8 |

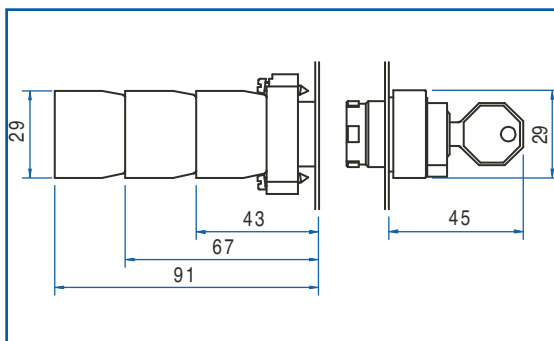
\* For use with non-illuminated operators in thermoplastic or aluminum enclosures listed on pages 30 and 36-37.

# 22mm Non-Illuminated Metal Selector Switch Operators

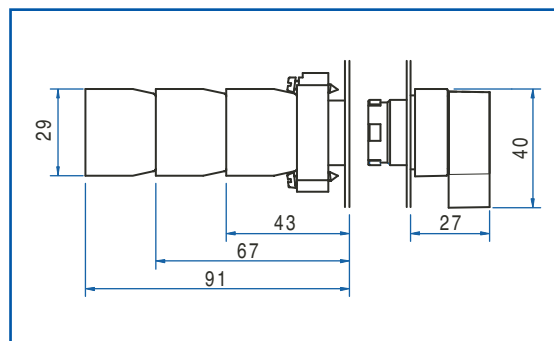
## Dimensional Drawings

All dimensions shown in millimeters.  
To convert to inches multiply by 0.03937

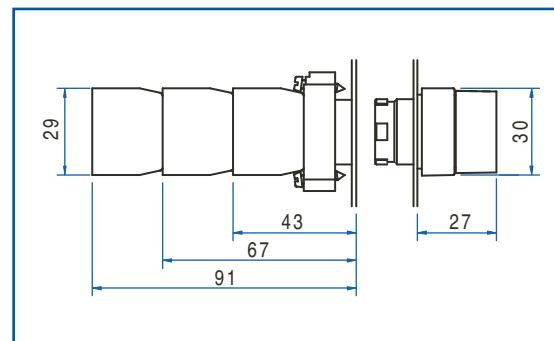
Key Selector



Extended Selector



Selector



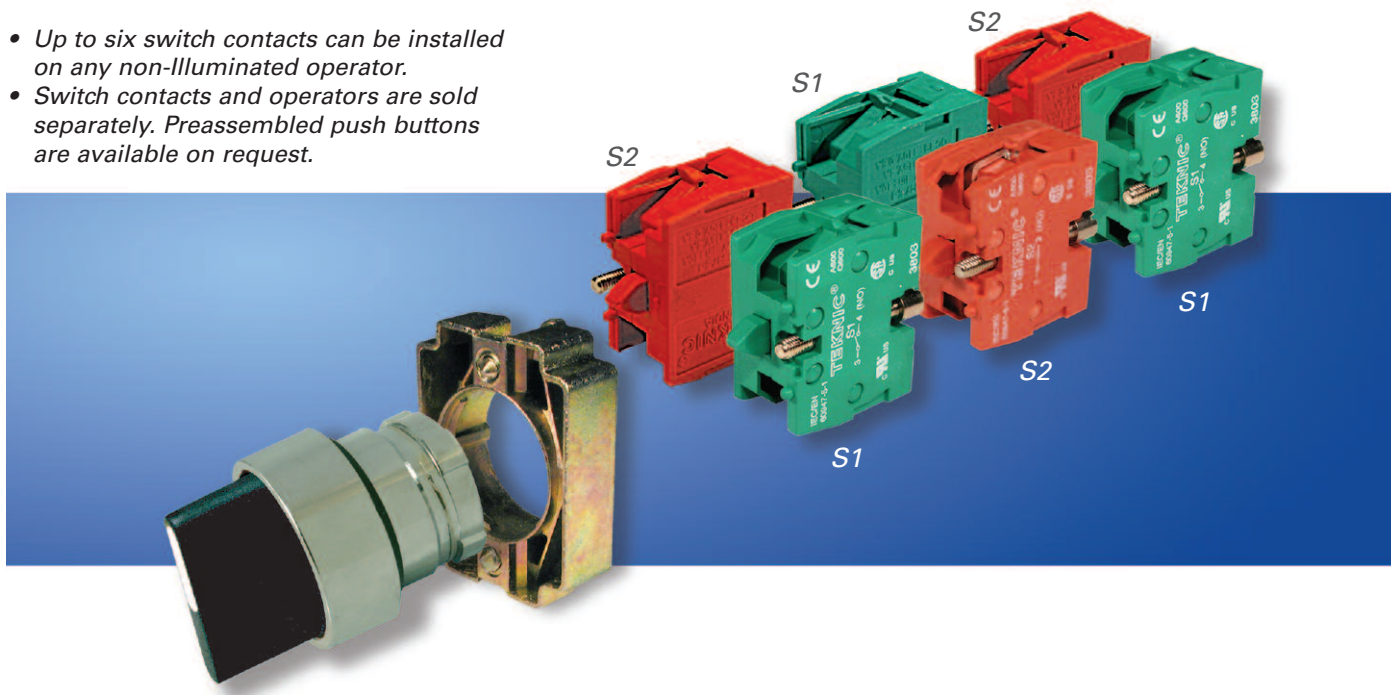
3 POSITION  
SELECTOR SWITCH  
CONTACT BLOCK GUIDE

| ⤴ | ⤵ | ⤴ | CONTACTOR BLOCK GUIDE          |
|---|---|---|--------------------------------|
| × | ○ | ○ | 1 NO (left)                    |
| ○ | × | ○ | 2 NC in series (side x side)   |
| ○ | ○ | × | 1 NO (right)                   |
| × | × | ○ | 1 NC (right)                   |
| ○ | × | × | 1 NC (left)                    |
| × | ○ | × | 2 NO in parallel (side x side) |

(Left or right as seen from front of operator)

## Exploded Assembly View

- Up to six switch contacts can be installed on any non-illuminated operator.
- Switch contacts and operators are sold separately. Preassembled push buttons are available on request.



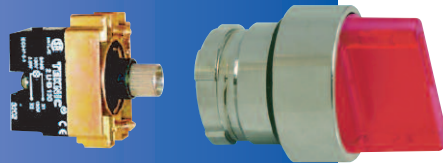
# 22mm LED Illuminated Metal Selector Switch Operators



Certified for  
**NEMA Type 4X**  
12 environment.

## Selector

with bulb holder,  
LED bulb and  
mounting bracket



Other combinations and colors available upon request.  
Please contact Altech for further information and part numbers.

### XXX = Voltage Codes

|             |   |          |
|-------------|---|----------|
| <b>012</b>  | = | 12VAC/DC |
| <b>024</b>  | = | 24VAC/DC |
| <b>048</b>  | = | 48VAC/DC |
| <b>110</b>  | = | 110VAC   |
| <b>110D</b> | = | 110VDC   |
| <b>230</b>  | = | 230VAC   |
| <b>230D</b> | = | 230VDC   |

**SAMPLE  
ASSEMBLY**



Push button assemblies are available  
in a variety of custom configurations.



Replacement  
bulbs available.  
See page 39.

### Color

### Function

### Cat No.

#### 2 Position

|                          |        |  |            |               |
|--------------------------|--------|--|------------|---------------|
| <input type="checkbox"/> | White  |  | Maintained | 2ASL1LB-1-XXX |
| <input type="checkbox"/> | Green  |  | Maintained | 2ASL3LB-1-XXX |
| <input type="checkbox"/> | Red    |  | Maintained | 2ASL4LB-1-XXX |
| <input type="checkbox"/> | Amber  |  | Maintained | 2ASL5LB-1-XXX |
| <input type="checkbox"/> | Blue   |  | Maintained | 2ASL6LB-1-XXX |
| <input type="checkbox"/> | Clear  |  | Maintained | 2ASL7LB-1-XXX |
| <input type="checkbox"/> | Yellow |  | Maintained | 2ASL8LB-1-XXX |

#### 2 Position

|                          |        |  |               |               |
|--------------------------|--------|--|---------------|---------------|
| <input type="checkbox"/> | White  |  | Spring Return | 2ASL1LB-2-XXX |
| <input type="checkbox"/> | Green  |  | Spring Return | 2ASL3LB-2-XXX |
| <input type="checkbox"/> | Red    |  | Spring Return | 2ASL4LB-2-XXX |
| <input type="checkbox"/> | Amber  |  | Spring Return | 2ASL5LB-2-XXX |
| <input type="checkbox"/> | Blue   |  | Spring Return | 2ASL6LB-2-XXX |
| <input type="checkbox"/> | Clear  |  | Spring Return | 2ASL7LB-2-XXX |
| <input type="checkbox"/> | Yellow |  | Spring Return | 2ASL8LB-2-XXX |

#### 3 Position

|                          |        |  |            |               |
|--------------------------|--------|--|------------|---------------|
| <input type="checkbox"/> | White  |  | Maintained | 2ASL1LB-3-XXX |
| <input type="checkbox"/> | Green  |  | Maintained | 2ASL3LB-3-XXX |
| <input type="checkbox"/> | Red    |  | Maintained | 2ASL4LB-3-XXX |
| <input type="checkbox"/> | Amber  |  | Maintained | 2ASL5LB-3-XXX |
| <input type="checkbox"/> | Blue   |  | Maintained | 2ASL6LB-3-XXX |
| <input type="checkbox"/> | Clear  |  | Maintained | 2ASL7LB-3-XXX |
| <input type="checkbox"/> | Yellow |  | Maintained | 2ASL8LB-3-XXX |

#### 3 Position, spring return from left and right

|                          |        |  |               |               |
|--------------------------|--------|--|---------------|---------------|
| <input type="checkbox"/> | White  |  | Spring Return | 2ASL1LB-4-XXX |
| <input type="checkbox"/> | Green  |  | Spring Return | 2ASL3LB-4-XXX |
| <input type="checkbox"/> | Red    |  | Spring Return | 2ASL4LB-4-XXX |
| <input type="checkbox"/> | Amber  |  | Spring Return | 2ASL5LB-4-XXX |
| <input type="checkbox"/> | Blue   |  | Spring Return | 2ASL6LB-4-XXX |
| <input type="checkbox"/> | Clear  |  | Spring Return | 2ASL7LB-4-XXX |
| <input type="checkbox"/> | Yellow |  | Spring Return | 2ASL8LB-4-XXX |

#### 3 Position, spring return from right

|                          |        |  |               |               |
|--------------------------|--------|--|---------------|---------------|
| <input type="checkbox"/> | White  |  | Spring Return | 2ASL1LB-5-XXX |
| <input type="checkbox"/> | Green  |  | Spring Return | 2ASL3LB-5-XXX |
| <input type="checkbox"/> | Red    |  | Spring Return | 2ASL4LB-5-XXX |
| <input type="checkbox"/> | Amber  |  | Spring Return | 2ASL5LB-5-XXX |
| <input type="checkbox"/> | Blue   |  | Spring Return | 2ASL6LB-5-XXX |
| <input type="checkbox"/> | Clear  |  | Spring Return | 2ASL7LB-5-XXX |
| <input type="checkbox"/> | Yellow |  | Spring Return | 2ASL8LB-5-XXX |

#### 3 Position, spring return from left

|                          |        |  |               |               |
|--------------------------|--------|--|---------------|---------------|
| <input type="checkbox"/> | White  |  | Spring Return | 2ASL1LB-6-XXX |
| <input type="checkbox"/> | Green  |  | Spring Return | 2ASL3LB-6-XXX |
| <input type="checkbox"/> | Red    |  | Spring Return | 2ASL4LB-6-XXX |
| <input type="checkbox"/> | Amber  |  | Spring Return | 2ASL5LB-6-XXX |
| <input type="checkbox"/> | Blue   |  | Spring Return | 2ASL6LB-6-XXX |
| <input type="checkbox"/> | Clear  |  | Spring Return | 2ASL7LB-6-XXX |
| <input type="checkbox"/> | Yellow |  | Spring Return | 2ASL8LB-6-XXX |

# 22mm LED Illuminated Metal Selector Switch Operators

## Dimensional Drawings

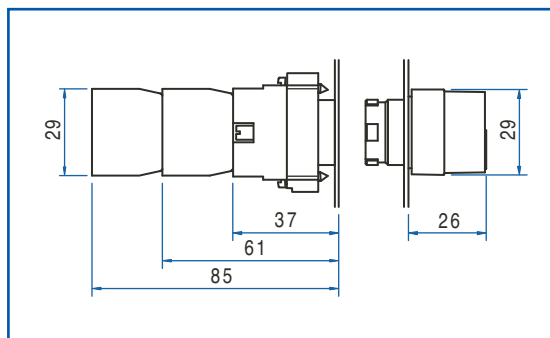
All dimensions shown in millimeters.  
To convert to inches multiply by 0.03937

3 POSITION  
SELECTOR SWITCH  
CONTACT BLOCK GUIDE

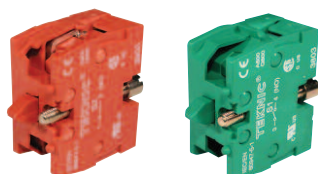
|  |  |  | CONTACTOR BLOCK GUIDE          |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------|
| x                                                                                 | o                                                                                 | o                                                                                 | 1 NO (left)                    |
| o                                                                                 | x                                                                                 | o                                                                                 | 2 NC in series (side x side)   |
| o                                                                                 | o                                                                                 | x                                                                                 | 1 NO (right)                   |
| x                                                                                 | x                                                                                 | o                                                                                 | 1 NC (right)                   |
| o                                                                                 | x                                                                                 | x                                                                                 | 1 NC (left)                    |
| x                                                                                 | o                                                                                 | x                                                                                 | 2 NO in parallel (side x side) |

(Left or right as seen from front of operator)

Illuminated Selector



## Switch Contacts (sold separately)



- Heavy-duty contact blocks with mounting screws. Blocks can be stacked 2 blocks across by 3 blocks deep for a total of 6 circuits.
- Contact blocks are available with silver contacts or gold plated contacts
- Self-wiping contacts

## Panel Mount

|                             |           |
|-----------------------------|-----------|
| Normally Open Silver        | <b>S1</b> |
| Normally Closed Silver      | <b>S2</b> |
| Normally Open Gold Plated   | <b>S3</b> |
| Normally Closed Gold Plated | <b>S4</b> |

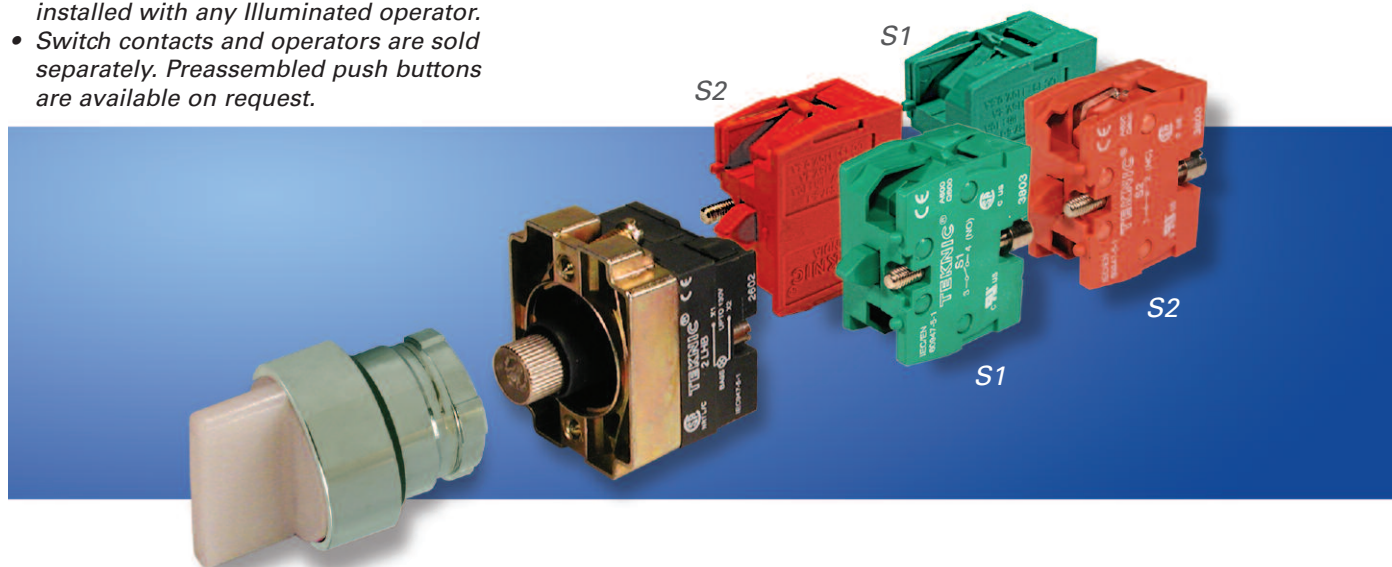
## Base Mount\*

|                             |           |
|-----------------------------|-----------|
| Normally Open Silver        | <b>S5</b> |
| Normally Closed Silver      | <b>S6</b> |
| Normally Open Gold Plated   | <b>S7</b> |
| Normally Closed Gold Plated | <b>S8</b> |

\* For use with non-illuminated operators in thermoplastic or aluminum enclosures listed on pages 30 and 36-37.

## Exploded Assembly View

- Up to four switch contacts can be installed with any Illuminated operator.
- Switch contacts and operators are sold separately. Preassembled push buttons are available on request.



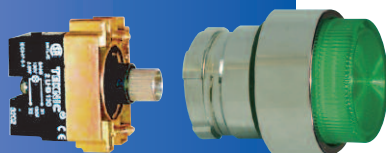
# 22mm LED Illuminated Metal Projecting Operators



Certified for  
**NEMA Type 4X**  
12 environment.

## Projecting Momentary

with bulb, bulb holder  
and mounting bracket



**SAMPLE  
ASSEMBLY**



Replacement bulbs  
available.  
See page 39.

### Color 12V AC/DC

### Voltage

### Cat No.

|                                            |           |             |
|--------------------------------------------|-----------|-------------|
| <input type="checkbox"/> White             | 12V AC/DC | 2ALP1LB-012 |
| <input checked="" type="checkbox"/> Green  | 12V AC/DC | 2ALP3LB-012 |
| <input checked="" type="checkbox"/> Red    | 12V AC/DC | 2ALP4LB-012 |
| <input checked="" type="checkbox"/> Amber  | 12V AC/DC | 2ALP5LB-012 |
| <input checked="" type="checkbox"/> Blue   | 12V AC/DC | 2ALP6LB-012 |
| <input type="checkbox"/> Clear             | 12V AC/DC | 2ALP7LB-012 |
| <input checked="" type="checkbox"/> Yellow | 12V AC/DC | 2ALP8LB-012 |

### 24V AC/DC

|                                            |           |             |
|--------------------------------------------|-----------|-------------|
| <input type="checkbox"/> White             | 24V AC/DC | 2ALP1LB-024 |
| <input checked="" type="checkbox"/> Green  | 24V AC/DC | 2ALP3LB-024 |
| <input checked="" type="checkbox"/> Red    | 24V AC/DC | 2ALP4LB-024 |
| <input checked="" type="checkbox"/> Amber  | 24V AC/DC | 2ALP5LB-024 |
| <input checked="" type="checkbox"/> Blue   | 24V AC/DC | 2ALP6LB-024 |
| <input type="checkbox"/> Clear             | 24V AC/DC | 2ALP7LB-024 |
| <input checked="" type="checkbox"/> Yellow | 24V AC/DC | 2ALP8LB-024 |

### 48V AC/DC

|                                            |           |             |
|--------------------------------------------|-----------|-------------|
| <input type="checkbox"/> White             | 48V AC/DC | 2ALP1LB-048 |
| <input checked="" type="checkbox"/> Green  | 48V AC/DC | 2ALP3LB-048 |
| <input checked="" type="checkbox"/> Red    | 48V AC/DC | 2ALP4LB-048 |
| <input checked="" type="checkbox"/> Amber  | 48V AC/DC | 2ALP5LB-048 |
| <input checked="" type="checkbox"/> Blue   | 48V AC/DC | 2ALP6LB-048 |
| <input type="checkbox"/> Clear             | 48V AC/DC | 2ALP7LB-048 |
| <input checked="" type="checkbox"/> Yellow | 48V AC/DC | 2ALP8LB-048 |

### 110V AC

|                                            |         |             |
|--------------------------------------------|---------|-------------|
| <input type="checkbox"/> White             | 110V AC | 2ALP1LB-110 |
| <input checked="" type="checkbox"/> Green  | 110V AC | 2ALP3LB-110 |
| <input checked="" type="checkbox"/> Red    | 110V AC | 2ALP4LB-110 |
| <input checked="" type="checkbox"/> Amber  | 110V AC | 2ALP5LB-110 |
| <input checked="" type="checkbox"/> Blue   | 110V AC | 2ALP6LB-110 |
| <input type="checkbox"/> Clear             | 110V AC | 2ALP7LB-110 |
| <input checked="" type="checkbox"/> Yellow | 110V AC | 2ALP8LB-110 |

### 110V DC

|                                            |         |              |
|--------------------------------------------|---------|--------------|
| <input type="checkbox"/> White             | 110V DC | 2ALP1LB-110D |
| <input checked="" type="checkbox"/> Green  | 110V DC | 2ALP3LB-110D |
| <input checked="" type="checkbox"/> Red    | 110V DC | 2ALP4LB-110D |
| <input checked="" type="checkbox"/> Amber  | 110V DC | 2ALP5LB-110D |
| <input checked="" type="checkbox"/> Blue   | 110V DC | 2ALP6LB-110D |
| <input type="checkbox"/> Clear             | 110V DC | 2ALP7LB-110D |
| <input checked="" type="checkbox"/> Yellow | 110V DC | 2ALP8LB-110D |

### 230V AC

|                                            |         |             |
|--------------------------------------------|---------|-------------|
| <input type="checkbox"/> White             | 230V AC | 2ALP1LB-230 |
| <input checked="" type="checkbox"/> Green  | 230V AC | 2ALP3LB-230 |
| <input checked="" type="checkbox"/> Red    | 230V AC | 2ALP4LB-230 |
| <input checked="" type="checkbox"/> Amber  | 230V AC | 2ALP5LB-230 |
| <input checked="" type="checkbox"/> Blue   | 230V AC | 2ALP6LB-230 |
| <input type="checkbox"/> Clear             | 230V AC | 2ALP7LB-230 |
| <input checked="" type="checkbox"/> Yellow | 230V AC | 2ALP8LB-230 |

### 230V DC

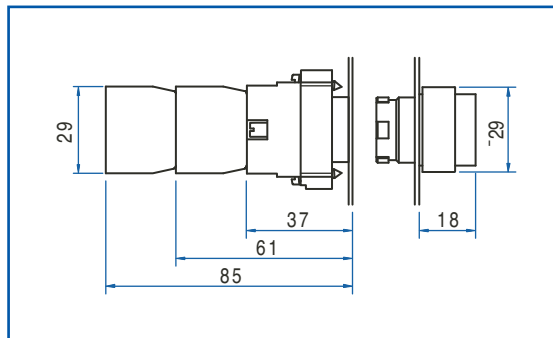
|                                            |         |              |
|--------------------------------------------|---------|--------------|
| <input type="checkbox"/> White             | 230V DC | 2ALP1LB-230D |
| <input checked="" type="checkbox"/> Green  | 230V DC | 2ALP3LB-230D |
| <input checked="" type="checkbox"/> Red    | 230V DC | 2ALP4LB-230D |
| <input checked="" type="checkbox"/> Amber  | 230V DC | 2ALP5LB-230D |
| <input checked="" type="checkbox"/> Blue   | 230V DC | 2ALP6LB-230D |
| <input type="checkbox"/> Clear             | 230V DC | 2ALP7LB-230D |
| <input checked="" type="checkbox"/> Yellow | 230V DC | 2ALP8LB-230D |

## 22mm LED Illuminated Metal Projecting Operators

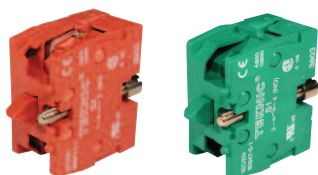
### Dimensional Drawings

All dimensions shown in millimeters.  
To convert to inches multiply by 0.03937

Projecting Momentary



### Switch Contacts (sold separately)



- Heavy-duty contact blocks with mounting screws. Blocks can be stacked 2 blocks across by 3 blocks deep for a total of 6 circuits.
- Contact blocks are available with silver contacts or gold plated contacts
- Self-wiping contacts

### Panel Mount

|                             |           |
|-----------------------------|-----------|
| Normally Open Silver        | <b>S1</b> |
| Normally Closed Silver      | <b>S2</b> |
| Normally Open Gold Plated   | <b>S3</b> |
| Normally Closed Gold Plated | <b>S4</b> |

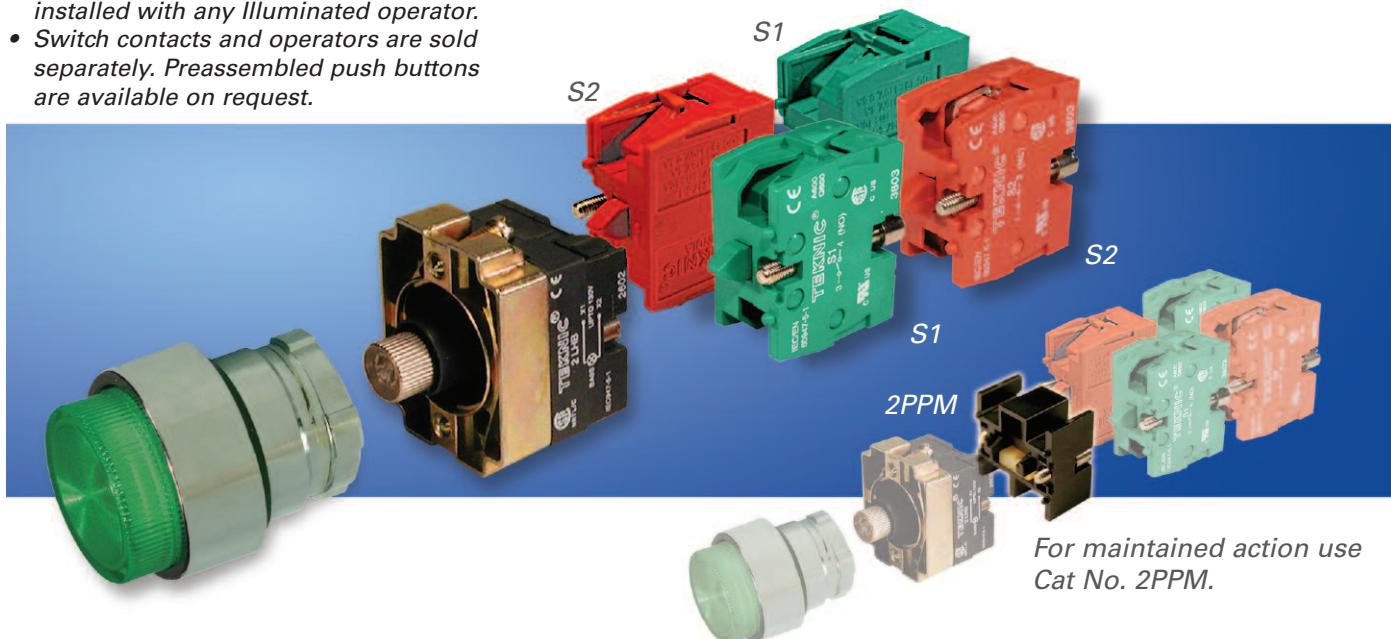
### Base Mount\*

|                             |           |
|-----------------------------|-----------|
| Normally Open Silver        | <b>S5</b> |
| Normally Closed Silver      | <b>S6</b> |
| Normally Open Gold Plated   | <b>S7</b> |
| Normally Closed Gold Plated | <b>S8</b> |

\* For use with non-illuminated operators in thermoplastic or aluminum enclosures listed on pages 30 and 36-37.

### Exploded Assembly View

- Up to four switch contacts can be installed with any illuminated operator.
- Switch contacts and operators are sold separately. Preassembled push buttons are available on request.



For maintained action use  
Cat No. 2PPM.

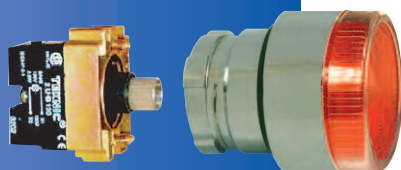
# 22mm LED Illuminated Metal Flush Operators



Certified for  
**NEMA Type 4X**  
12 environment.

## Flush Momentary

with bulb, bulb holder  
and mounting bracket



**SAMPLE  
ASSEMBLY**



Replacement bulbs  
available.  
See page 39.

### Color Voltage Cat No.

#### 12V AC/DC

|                                     |        |           |             |
|-------------------------------------|--------|-----------|-------------|
| <input type="checkbox"/>            | White  | 12V AC/DC | 2ALF1LB-012 |
| <input checked="" type="checkbox"/> | Green  | 12V AC/DC | 2ALF3LB-012 |
| <input type="checkbox"/>            | Red    | 12V AC/DC | 2ALF4LB-012 |
| <input type="checkbox"/>            | Amber  | 12V AC/DC | 2ALF5LB-012 |
| <input type="checkbox"/>            | Blue   | 12V AC/DC | 2ALF6LB-012 |
| <input type="checkbox"/>            | Clear  | 12V AC/DC | 2ALF7LB-012 |
| <input type="checkbox"/>            | Yellow | 12V AC/DC | 2ALF8LB-012 |

#### 24V AC/DC

|                                     |        |           |             |
|-------------------------------------|--------|-----------|-------------|
| <input type="checkbox"/>            | White  | 24V AC/DC | 2ALF1LB-024 |
| <input checked="" type="checkbox"/> | Green  | 24V AC/DC | 2ALF3LB-024 |
| <input type="checkbox"/>            | Red    | 24V AC/DC | 2ALF4LB-024 |
| <input type="checkbox"/>            | Amber  | 24V AC/DC | 2ALF5LB-024 |
| <input type="checkbox"/>            | Blue   | 24V AC/DC | 2ALF6LB-024 |
| <input type="checkbox"/>            | Clear  | 24V AC/DC | 2ALF7LB-024 |
| <input type="checkbox"/>            | Yellow | 24V AC/DC | 2ALF8LB-024 |

#### 48V AC/DC

|                                     |        |           |             |
|-------------------------------------|--------|-----------|-------------|
| <input type="checkbox"/>            | White  | 48V AC/DC | 2ALF1LB-048 |
| <input checked="" type="checkbox"/> | Green  | 48V AC/DC | 2ALF3LB-048 |
| <input type="checkbox"/>            | Red    | 48V AC/DC | 2ALF4LB-048 |
| <input type="checkbox"/>            | Amber  | 48V AC/DC | 2ALF5LB-048 |
| <input type="checkbox"/>            | Blue   | 48V AC/DC | 2ALF6LB-048 |
| <input type="checkbox"/>            | Clear  | 48V AC/DC | 2ALF7LB-048 |
| <input type="checkbox"/>            | Yellow | 48V AC/DC | 2ALF8LB-048 |

#### 110V AC

|                                     |        |         |             |
|-------------------------------------|--------|---------|-------------|
| <input type="checkbox"/>            | White  | 110V AC | 2ALF1LB-110 |
| <input checked="" type="checkbox"/> | Green  | 110V AC | 2ALF3LB-110 |
| <input type="checkbox"/>            | Red    | 110V AC | 2ALF4LB-110 |
| <input type="checkbox"/>            | Amber  | 110V AC | 2ALF5LB-110 |
| <input type="checkbox"/>            | Blue   | 110V AC | 2ALF6LB-110 |
| <input type="checkbox"/>            | Clear  | 110V AC | 2ALF7LB-110 |
| <input type="checkbox"/>            | Yellow | 110V AC | 2ALF8LB-110 |

#### 110V DC

|                                     |        |         |              |
|-------------------------------------|--------|---------|--------------|
| <input type="checkbox"/>            | White  | 110V DC | 2ALF1LB-110D |
| <input checked="" type="checkbox"/> | Green  | 110V DC | 2ALF3LB-110D |
| <input type="checkbox"/>            | Red    | 110V DC | 2ALF4LB-110D |
| <input type="checkbox"/>            | Amber  | 110V DC | 2ALF5LB-110D |
| <input type="checkbox"/>            | Blue   | 110V DC | 2ALF6LB-110D |
| <input type="checkbox"/>            | Clear  | 110V DC | 2ALF7LB-110D |
| <input type="checkbox"/>            | Yellow | 110V DC | 2ALF8LB-110D |

#### 230V AC

|                                     |        |         |             |
|-------------------------------------|--------|---------|-------------|
| <input type="checkbox"/>            | White  | 230V AC | 2ALF1LB-230 |
| <input checked="" type="checkbox"/> | Green  | 230V AC | 2ALF3LB-230 |
| <input type="checkbox"/>            | Red    | 230V AC | 2ALF4LB-230 |
| <input type="checkbox"/>            | Amber  | 230V AC | 2ALF5LB-230 |
| <input type="checkbox"/>            | Blue   | 230V AC | 2ALF6LB-230 |
| <input type="checkbox"/>            | Clear  | 230V AC | 2ALF7LB-230 |
| <input type="checkbox"/>            | Yellow | 230V AC | 2ALF8LB-230 |

#### 230V DC

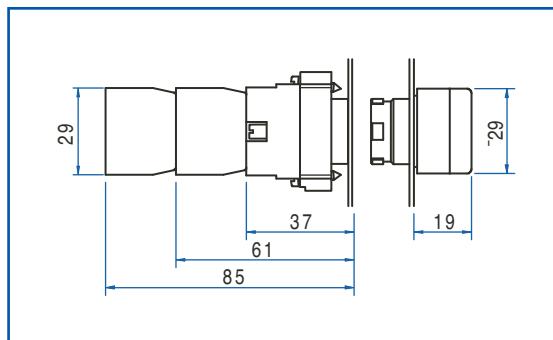
|                                     |        |         |              |
|-------------------------------------|--------|---------|--------------|
| <input type="checkbox"/>            | White  | 230V DC | 2ALF1LB-230D |
| <input checked="" type="checkbox"/> | Green  | 230V DC | 2ALF3LB-230D |
| <input type="checkbox"/>            | Red    | 230V DC | 2ALF4LB-230D |
| <input type="checkbox"/>            | Amber  | 230V DC | 2ALF5LB-230D |
| <input type="checkbox"/>            | Blue   | 230V DC | 2ALF6LB-230D |
| <input type="checkbox"/>            | Clear  | 230V DC | 2ALF7LB-230D |
| <input type="checkbox"/>            | Yellow | 230V DC | 2ALF8LB-230D |

# 22mm LED Illuminated Metal Flush Operators

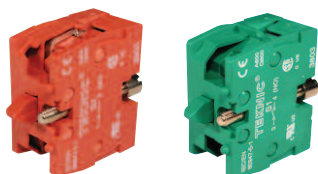
## Dimensional Drawings

All dimensions shown in millimeters.  
To convert to inches multiply by 0.03937

Flush Momentary



## Switch Contacts (sold separately)



- Heavy-duty contact blocks with mounting screws. Blocks can be stacked 2 blocks across by 3 blocks deep for a total of 6 circuits.
- Contact blocks are available with silver contacts or gold plated contacts
- Self-wiping contacts

## Panel Mount

|                             |           |
|-----------------------------|-----------|
| Normally Open Silver        | <b>S1</b> |
| Normally Closed Silver      | <b>S2</b> |
| Normally Open Gold Plated   | <b>S3</b> |
| Normally Closed Gold Plated | <b>S4</b> |

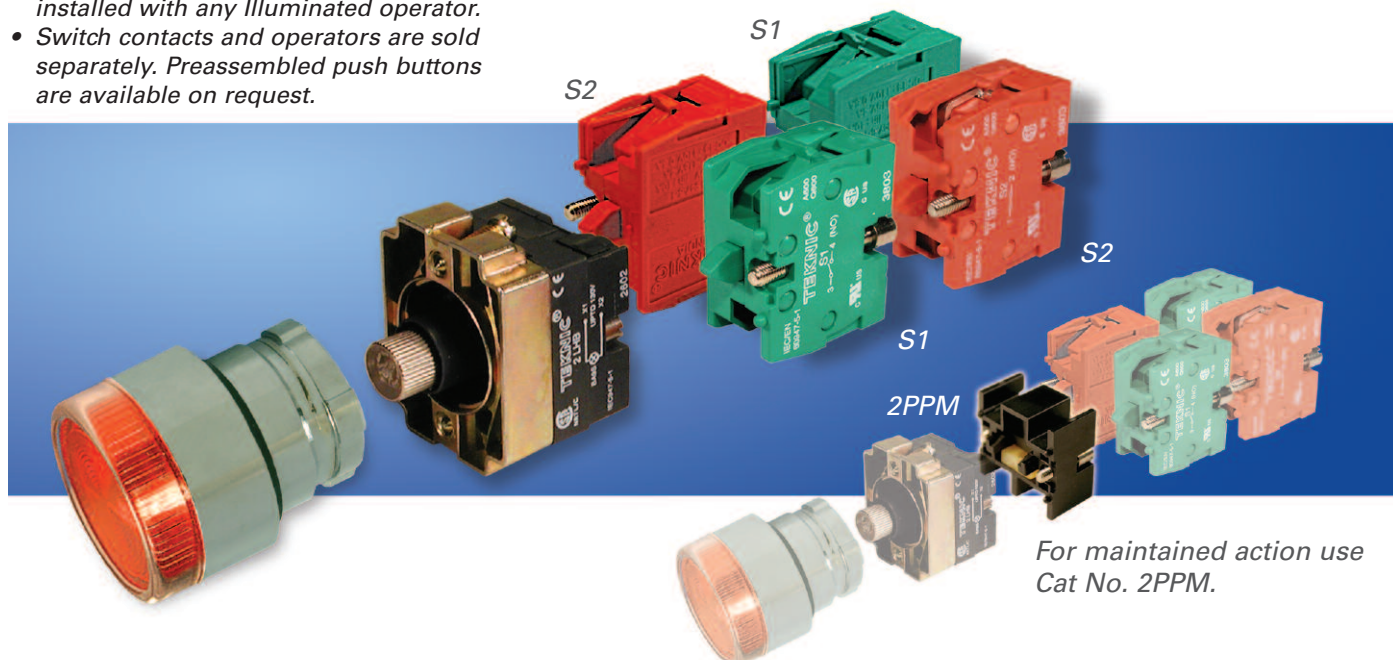
## Base Mount\*

|                             |           |
|-----------------------------|-----------|
| Normally Open Silver        | <b>S5</b> |
| Normally Closed Silver      | <b>S6</b> |
| Normally Open Gold Plated   | <b>S7</b> |
| Normally Closed Gold Plated | <b>S8</b> |

\* For use with non-illuminated operators in thermoplastic or aluminum enclosures listed on pages 30 and 36-37.

## Exploded Assembly View

- Up to four switch contacts can be installed with any Illuminated operator.
- Switch contacts and operators are sold separately. Preassembled push buttons are available on request.



For maintained action use  
Cat No. 2PPM.

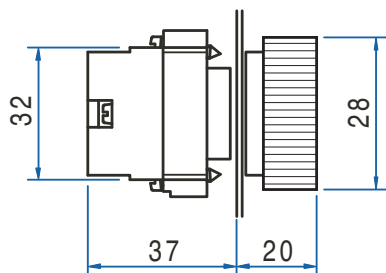
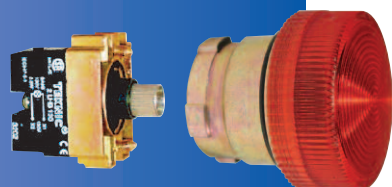
# 22mm LED Metal Pilot Lights



Certified for  
**NEMA Type 4X**  
12 environment.

## Pilot Light

with bulb, bulb holder  
and mounting bracket



Replacement bulbs  
available.  
See page 39.

### Color 12V AC/DC

### Voltage

### Cat No.

|                                     |        |           |             |
|-------------------------------------|--------|-----------|-------------|
| <input type="checkbox"/>            | White  | 12V AC/DC | 2PLB1LB-012 |
| <input checked="" type="checkbox"/> | Green  | 12V AC/DC | 2PLB3LB-012 |
| <input checked="" type="checkbox"/> | Red    | 12V AC/DC | 2PLB4LB-012 |
| <input checked="" type="checkbox"/> | Amber  | 12V AC/DC | 2PLB5LB-012 |
| <input checked="" type="checkbox"/> | Blue   | 12V AC/DC | 2PLB6LB-012 |
| <input type="checkbox"/>            | Clear  | 12V AC/DC | 2PLB7LB-012 |
| <input checked="" type="checkbox"/> | Yellow | 12V AC/DC | 2PLB8LB-012 |

### 24V AC/DC

|                                     |        |           |             |
|-------------------------------------|--------|-----------|-------------|
| <input type="checkbox"/>            | White  | 24V AC/DC | 2PLB1LB-024 |
| <input checked="" type="checkbox"/> | Green  | 24V AC/DC | 2PLB3LB-024 |
| <input checked="" type="checkbox"/> | Red    | 24V AC/DC | 2PLB4LB-024 |
| <input checked="" type="checkbox"/> | Amber  | 24V AC/DC | 2PLB5LB-024 |
| <input checked="" type="checkbox"/> | Blue   | 24V AC/DC | 2PLB6LB-024 |
| <input type="checkbox"/>            | Clear  | 24V AC/DC | 2PLB7LB-024 |
| <input checked="" type="checkbox"/> | Yellow | 24V AC/DC | 2PLB8LB-024 |

### 48V AC/DC

|                                     |        |           |             |
|-------------------------------------|--------|-----------|-------------|
| <input type="checkbox"/>            | White  | 48V AC/DC | 2PLB1LB-048 |
| <input checked="" type="checkbox"/> | Green  | 48V AC/DC | 2PLB3LB-048 |
| <input checked="" type="checkbox"/> | Red    | 48V AC/DC | 2PLB4LB-048 |
| <input checked="" type="checkbox"/> | Amber  | 48V AC/DC | 2PLB5LB-048 |
| <input checked="" type="checkbox"/> | Blue   | 48V AC/DC | 2PLB6LB-048 |
| <input type="checkbox"/>            | Clear  | 48V AC/DC | 2PLB7LB-048 |
| <input checked="" type="checkbox"/> | Yellow | 48V AC/DC | 2PLB8LB-048 |

### 110V AC

|                                     |        |         |             |
|-------------------------------------|--------|---------|-------------|
| <input type="checkbox"/>            | White  | 110V AC | 2PLB1LB-110 |
| <input checked="" type="checkbox"/> | Green  | 110V AC | 2PLB3LB-110 |
| <input checked="" type="checkbox"/> | Red    | 110V AC | 2PLB4LB-110 |
| <input checked="" type="checkbox"/> | Amber  | 110V AC | 2PLB5LB-110 |
| <input checked="" type="checkbox"/> | Blue   | 110V AC | 2PLB6LB-110 |
| <input type="checkbox"/>            | Clear  | 110V AC | 2PLB7LB-110 |
| <input checked="" type="checkbox"/> | Yellow | 110V AC | 2PLB8LB-110 |

### 110V DC

|                                     |        |         |              |
|-------------------------------------|--------|---------|--------------|
| <input type="checkbox"/>            | White  | 110V DC | 2PLB1LB-110D |
| <input checked="" type="checkbox"/> | Green  | 110V DC | 2PLB3LB-110D |
| <input checked="" type="checkbox"/> | Red    | 110V DC | 2PLB4LB-110D |
| <input checked="" type="checkbox"/> | Amber  | 110V DC | 2PLB5LB-110D |
| <input checked="" type="checkbox"/> | Blue   | 110V DC | 2PLB6LB-110D |
| <input type="checkbox"/>            | Clear  | 110V DC | 2PLB7LB-110D |
| <input checked="" type="checkbox"/> | Yellow | 110V DC | 2PLB8LB-110D |

### 230V AC

|                                     |        |         |             |
|-------------------------------------|--------|---------|-------------|
| <input type="checkbox"/>            | White  | 230V AC | 2PLB1LB-230 |
| <input checked="" type="checkbox"/> | Green  | 230V AC | 2PLB3LB-230 |
| <input checked="" type="checkbox"/> | Red    | 230V AC | 2PLB4LB-230 |
| <input checked="" type="checkbox"/> | Amber  | 230V AC | 2PLB5LB-230 |
| <input checked="" type="checkbox"/> | Blue   | 230V AC | 2PLB6LB-230 |
| <input type="checkbox"/>            | Clear  | 230V AC | 2PLB7LB-230 |
| <input checked="" type="checkbox"/> | Yellow | 230V AC | 2PLB8LB-230 |

### 230V DC

|                                     |        |         |              |
|-------------------------------------|--------|---------|--------------|
| <input type="checkbox"/>            | White  | 230V DC | 2PLB1LB-230D |
| <input checked="" type="checkbox"/> | Green  | 230V DC | 2PLB3LB-230D |
| <input checked="" type="checkbox"/> | Red    | 230V DC | 2PLB4LB-230D |
| <input checked="" type="checkbox"/> | Amber  | 230V DC | 2PLB5LB-230D |
| <input checked="" type="checkbox"/> | Blue   | 230V DC | 2PLB6LB-230D |
| <input type="checkbox"/>            | Clear  | 230V DC | 2PLB7LB-230D |
| <input checked="" type="checkbox"/> | Yellow | 230V DC | 2PLB8LB-230D |

## 22mm Specifications

### Electrical and Mechanical Characteristics

|                       |                                                                                                                                |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Standard conformity:  | IEC 60947-5-1                                                                                                                  |
| Approvals:            | VDE0660<br>CSA - C22.2 No. 14-95<br>UL508<br>IEC 947 - 5 (1) 1990, IS 13947<br>ASTA UK certified as per IEC 947 - 5 - (1) 1990 |
| Degree of protection: | IP 65 as per IEC 529<br>NEMA Type 4X, 12 as per UL50                                                                           |
| Temperature Range:    | - 25°C to + 70°C (-13°F to +158°F)                                                                                             |

### Contact Block

|                            |                                                                                                                       |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Rated voltage:             | 600V AC /DC                                                                                                           |
| Rated current:             | 10A AC / 2.5A DC                                                                                                      |
| Contact operation:         | self-wiping, slow break NO or NC                                                                                      |
| UL508 rating (pilot duty): |                                                                                                                       |
| CSA - C22.2 No. 14-95:     | A600: 10A; 600V AC<br>Q600: 2.5A; 600V DC                                                                             |
| Make and break capacity    |                                                                                                                       |
| IEC 947 - 5 - (1) 1990:    | AC 15 4A, 415V AC<br>DC 13 0.5A, 110V DC                                                                              |
| Terminal capacity:         | minimum 20 AWG (0.5 mm <sup>2</sup> )<br>maximum 2x16 AWG (2 x 1.5 mm <sup>2</sup> ) or 14 AWG (2.5 mm <sup>2</sup> ) |
| Terminal marking:          | 1-2 for NC, 3-4 for NO                                                                                                |
| Short circuit protection:  | 10A cartridge fuse HRC type, rated for resistive loads                                                                |
| Mechanical life:           | 1 million operations                                                                                                  |

### Modules for Pilot Lights & Illuminated Switches with LED Bulbs

|                                                                       |                                                                                                                         |
|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Current consumption (applicable to all colors)                        |                                                                                                                         |
| 24 VAC/DC, 100 VAC & 240 VAC:                                         | max. 20 mA                                                                                                              |
| 110 VDC:                                                              | max. 15 mA                                                                                                              |
| 220 VDC:                                                              | max. 10 mA                                                                                                              |
| Service life (at nominal voltage and at ambient temperature of 25°C): | 100,000 hours                                                                                                           |
| Voltage limits (nominal voltage):                                     | <20% of rated voltage>                                                                                                  |
| Short circuit protection:                                             | on specific request                                                                                                     |
| Terminal capacity:                                                    | min. 1 x 0.5 mm <sup>2</sup> (20 AWG), max. 2 x 1.5 mm <sup>2</sup> (2x16 AWG)<br>or 1 x 2.5 mm <sup>2</sup> (1x14 AWG) |

# Economy Non-Illuminated Plastic Push Buttons



## Momentary



## Maintained



### Color Description & Function Cat No.

#### Momentary

|        |                          |         |
|--------|--------------------------|---------|
| White  | Flush, 1NO Contact       | 3PSF110 |
| Black  | Flush, 1NO Contact       | 3PSF210 |
| Green  | Flush, 1NO Contact       | 3PSF310 |
| Red    | Flush, 1NO Contact       | 3PSF410 |
| Blue   | Flush, 1NO Contact       | 3PSF610 |
| Yellow | Flush, 1NO Contact       | 3PSF810 |
| White  | Flush, 1NC Contact       | 3PSF101 |
| Black  | Flush, 1NC Contact       | 3PSF201 |
| Green  | Flush, 1NC Contact       | 3PSF301 |
| Red    | Flush, 1NC Contact       | 3PSF401 |
| Blue   | Flush, 1NC Contact       | 3PSF601 |
| Yellow | Flush, 1NC Contact       | 3PSF801 |
| White  | Flush, 1NO + 1NC Contact | 3PSF111 |
| Black  | Flush, 1NO + 1NC Contact | 3PSF211 |
| Green  | Flush, 1NO + 1NC Contact | 3PSF311 |
| Red    | Flush, 1NO + 1NC Contact | 3PSF411 |
| Blue   | Flush, 1NO + 1NC Contact | 3PSF611 |
| Yellow | Flush, 1NO + 1NC Contact | 3PSF811 |
| White  | Flush, 2NO Contact       | 3PSF120 |
| Black  | Flush, 2NO Contact       | 3PSF220 |
| Green  | Flush, 2NO Contact       | 3PSF320 |
| Red    | Flush, 2NO Contact       | 3PSF420 |
| Blue   | Flush, 2NO Contact       | 3PSF620 |
| Yellow | Flush, 2NO Contact       | 3PSF820 |
| White  | Flush, 2NC Contact       | 3PSF102 |
| Black  | Flush, 2NC Contact       | 3PSF202 |
| Green  | Flush, 2NC Contact       | 3PSF302 |
| Red    | Flush, 2NC Contact       | 3PSF402 |
| Blue   | Flush, 2NC Contact       | 3PSF602 |
| Yellow | Flush, 2NC Contact       | 3PSF802 |

#### Maintained

|        |                            |           |
|--------|----------------------------|-----------|
| White  | Flush, 1NO Push-Push       | 3PSFPP110 |
| Black  | Flush, 1NO Push-Push       | 3PSFPP210 |
| Green  | Flush, 1NO Push-Push       | 3PSFPP310 |
| Red    | Flush, 1NO Push-Push       | 3PSFPP410 |
| Blue   | Flush, 1NO Push-Push       | 3PSFPP610 |
| Yellow | Flush, 1NO Push-Push       | 3PSFPP810 |
| White  | Flush, 1NC Push-Push       | 3PSFPP101 |
| Black  | Flush, 1NC Push-Push       | 3PSFPP201 |
| Green  | Flush, 1NC Push-Push       | 3PSFPP301 |
| Red    | Flush, 1NC Push-Push       | 3PSFPP401 |
| Blue   | Flush, 1NC Push-Push       | 3PSFPP601 |
| Yellow | Flush, 1NC Push-Push       | 3PSFPP801 |
| White  | Flush, 1NO + 1NC Push-Push | 3PSFPP111 |
| Black  | Flush, 1NO + 1NC Push-Push | 3PSFPP211 |
| Green  | Flush, 1NO + 1NC Push-Push | 3PSFPP311 |
| Red    | Flush, 1NO + 1NC Push-Push | 3PSFPP411 |
| Blue   | Flush, 1NO + 1NC Push-Push | 3PSFPP611 |
| Yellow | Flush, 1NO + 1NC Push-Push | 3PSFPP811 |
| White  | Flush, 2NO Push-Push       | 3PSPP120  |
| Black  | Flush, 2NO Push-Push       | 3PSPP220  |
| Green  | Flush, 2NO Push-Push       | 3PSPP320  |
| Red    | Flush, 2NO Push-Push       | 3PSPP420  |
| Blue   | Flush, 2NO Push-Push       | 3PSPP620  |
| Yellow | Flush, 2NO Push-Push       | 3PSPP820  |
| White  | Flush, 2NC Push-Push       | 3PSPP102  |
| Black  | Flush, 2NC Push-Push       | 3PSPP202  |
| Green  | Flush, 2NC Push-Push       | 3PSPP302  |
| Red    | Flush, 2NC Push-Push       | 3PSPP402  |
| Blue   | Flush, 2NC Push-Push       | 3PSPP602  |
| Yellow | Flush, 2NC Push-Push       | 3PSPP802  |

# Economy Non-Illuminated Plastic Push Buttons Specifications

## A. Mechanical Characteristics

|                                 |                                                                                                                                                                                            |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Contact Operation               | NO/NC Slow Break                                                                                                                                                                           |
| Operating Travel                | Changing NC status = 2mm<br>Changing NO status = 2mm<br>Total travel = 3.5mm                                                                                                               |
| Operating Force for 3PSF Series | Changing NC status = 4.22mm<br>Changing NO status = 5.60mm<br>Travel required to change NC status = 0.65mm<br>Travel required to change NO status = 1.65 to 1.98mm<br>Total travel = 3.8mm |
| Contact Configurations          | 1NO; 1NO + 1NC; 2NC                                                                                                                                                                        |
| Terminal Torque                 | 0.5Nm / 4.5lbs. in.                                                                                                                                                                        |

## B. Mechanical Durability

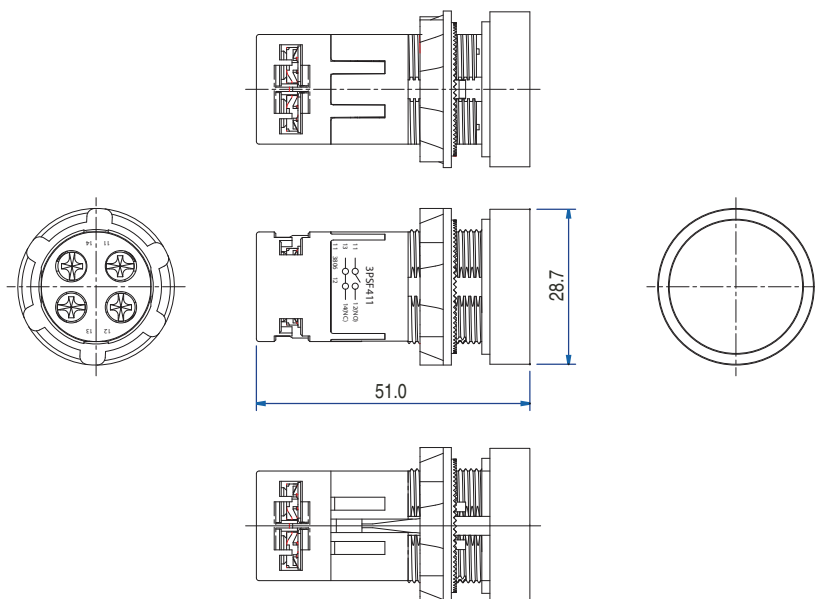
|                            |                                |
|----------------------------|--------------------------------|
| Push Button, Spring Return | 1 Million Operations           |
| Push-Push Type             | 100,000 Operations             |
| Applicable Standard        | UL508; IS13947-5-1; CSA 22.2   |
| Degree of Protection       | IP65 (as per IS 13947)         |
| Temperature Range          | -25° to +85°C (-13°F to 180°F) |

## C. Electrical Characteristics

|                              |                                                                                                                                                                            |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rating                       | For AC:<br>C300= 120V, make current 15A & break current 1.5A<br>(thermal current=2.5A)<br><br>For DC:<br>R300= 125V, make or break current 0.22A<br>(thermal current=1.0A) |
| Terminal Capacity for wiring | 2 X 1.5mm <sup>2</sup> ; 1 X 0.5mm <sup>2</sup> (min); 1 X 2.5mm <sup>2</sup> (max)                                                                                        |
| Contact Material             | • Moving contact = Phosphor Bronze<br>• Fixed Contact = Brass silver plated 2 microns                                                                                      |
| Short Circuit Protection     | 4A fuse                                                                                                                                                                    |
| Dielectric Test              | 2.5KV                                                                                                                                                                      |
| Rated insulation Resistance  | 500M ohm                                                                                                                                                                   |
| Rated Thermal Current        | 2.5A                                                                                                                                                                       |

## Dimensional Drawings

All dimensions shown in millimeters.  
To convert to inches multiply by 0.03937



# Unibody LED Indicator Plastic Pilot Lights



## Pilot Lights with integral LED



### Color

### Description

### Cat No.

|  |                       |           |             |
|--|-----------------------|-----------|-------------|
|  | White Lens/Yellow LED | 12V AC/DC | 3PLBR1L-012 |
|  | White Lens/Yellow LED | 24V AC/DC | 3PLBR1L-024 |
|  | White Lens/Yellow LED | 48V AC/DC | 3PLBR1L-048 |
|  | White Lens/Yellow LED | 110V AC*  | 3PLBR1L-110 |
|  | White Lens/Yellow LED | 230V AC*  | 3PLBR1L-230 |

|  |                      |           |              |
|--|----------------------|-----------|--------------|
|  | White Lens/White LED | 12V AC/DC | 3PLBR1LS-012 |
|  | White Lens/White LED | 24V AC/DC | 3PLBR1LS-024 |
|  | White Lens/White LED | 48V AC/DC | 3PLBR1LS-048 |
|  | White Lens/White LED | 110V AC*  | 3PLBR1LS-110 |
|  | White Lens/White LED | 230V AC*  | 3PLBR1LS-230 |

|  |                      |           |             |
|--|----------------------|-----------|-------------|
|  | Green Lens/Green LED | 12V AC/DC | 3PLBR3L-012 |
|  | Green Lens/Green LED | 24V AC/DC | 3PLBR3L-024 |
|  | Green Lens/Green LED | 48V AC/DC | 3PLBR3L-048 |
|  | Green Lens/Green LED | 110V AC*  | 3PLBR3L-110 |
|  | Green Lens/Green LED | 230V AC*  | 3PLBR3L-230 |

|  |                  |           |             |
|--|------------------|-----------|-------------|
|  | Red Lens/Red LED | 12V AC/DC | 3PLBR4L-012 |
|  | Red Lens/Red LED | 24V AC/DC | 3PLBR4L-024 |
|  | Red Lens/Red LED | 48V AC/DC | 3PLBR4L-048 |
|  | Red Lens/Red LED | 110V AC*  | 3PLBR4L-110 |
|  | Red Lens/Red LED | 230V AC*  | 3PLBR4L-230 |

|  |                      |           |             |
|--|----------------------|-----------|-------------|
|  | Amber Lens/Amber LED | 12V AC/DC | 3PLBR5L-012 |
|  | Amber Lens/Amber LED | 24V AC/DC | 3PLBR5L-024 |
|  | Amber Lens/Amber LED | 48V AC/DC | 3PLBR5L-048 |
|  | Amber Lens/Amber LED | 110V AC*  | 3PLBR5L-110 |
|  | Amber Lens/Amber LED | 230V AC*  | 3PLBR5L-230 |

|  |                    |           |             |
|--|--------------------|-----------|-------------|
|  | Blue Lens/Blue LED | 12V AC/DC | 3PLBR6L-012 |
|  | Blue Lens/Blue LED | 24V AC/DC | 3PLBR6L-024 |
|  | Blue Lens/Blue LED | 48V AC/DC | 3PLBR6L-048 |
|  | Blue Lens/Blue LED | 110V AC*  | 3PLBR6L-110 |
|  | Blue Lens/Blue LED | 230V AC*  | 3PLBR6L-230 |

|  |                       |           |             |
|--|-----------------------|-----------|-------------|
|  | Clear Lens/Yellow LED | 12V AC/DC | 3PLBR7L-012 |
|  | Clear Lens/Yellow LED | 24V AC/DC | 3PLBR7L-024 |
|  | Clear Lens/Yellow LED | 48V AC/DC | 3PLBR7L-048 |
|  | Clear Lens/Yellow LED | 110V AC*  | 3PLBR7L-110 |
|  | Clear Lens/Yellow LED | 230V AC*  | 3PLBR7L-230 |

|  |                      |           |              |
|--|----------------------|-----------|--------------|
|  | Clear Lens/White LED | 12V AC/DC | 3PLBR7LS-012 |
|  | Clear Lens/White LED | 24V AC/DC | 3PLBR7LS-024 |
|  | Clear Lens/White LED | 48V AC/DC | 3PLBR7LS-048 |
|  | Clear Lens/White LED | 110V AC*  | 3PLBR7LS-110 |
|  | Clear Lens/White LED | 230V AC*  | 3PLBR7LS-230 |

|  |                        |           |             |
|--|------------------------|-----------|-------------|
|  | Yellow Lens/Yellow LED | 12V AC/DC | 3PLBR8L-012 |
|  | Yellow Lens/Yellow LED | 24V AC/DC | 3PLBR8L-024 |
|  | Yellow Lens/Yellow LED | 48V AC/DC | 3PLBR8L-048 |
|  | Yellow Lens/Yellow LED | 110V AC*  | 3PLBR8L-110 |
|  | Yellow Lens/Yellow LED | 230V AC*  | 3PLBR8L-230 |

\*110V DC and 230V DC version is available on request.

# Unibody LED Indicator Plastic Pilot Lights Specifications

## A. Mechanical Characteristics

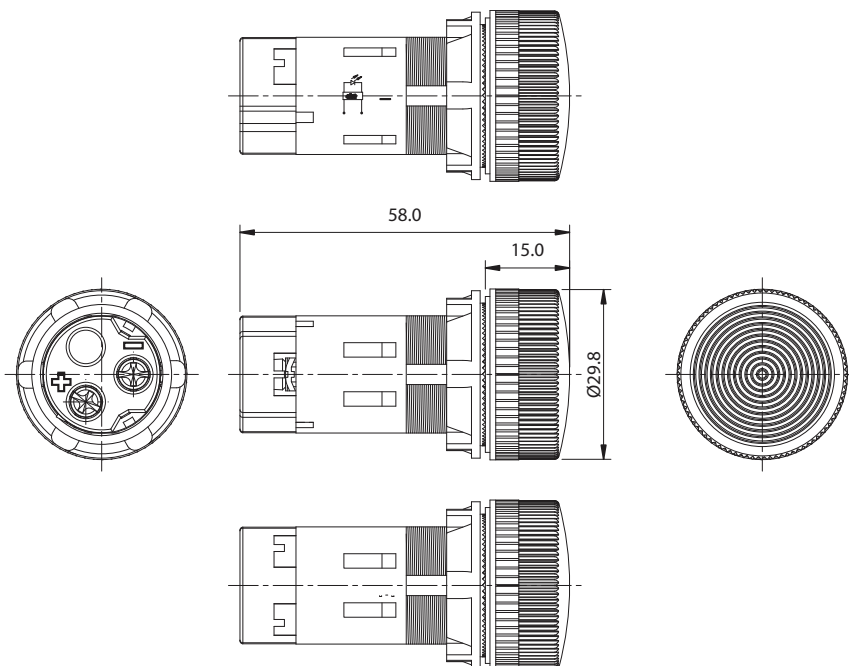
|                         |                                                               |
|-------------------------|---------------------------------------------------------------|
| Applicable Standard     | UL508<br>IEC 60947<br>CSA 22.2                                |
| Degree of Protection    | IP65 as per IEC 60947,                                        |
| Temperature Range       | -25° to +70°C (-13 to +158°F)                                 |
| Contact material        | Phosphor bronze for LED, PCB contact brass (tin plated)       |
| Corrosion protection    | All metallic parts are electroplated for corrosion protection |
| Terminal Torque         | 0.5 Nm (4.5 lbs. / in.)                                       |
| Viewing Angle           | More than 100°                                                |
| Optical Axial intensity | More than 100 mcd for all colors                              |

## B. Electrical Characteristics

|                             |                                                                                                            |
|-----------------------------|------------------------------------------------------------------------------------------------------------|
| Rating                      | Rated 6V AC/DC to 240V AC and 220V DC, 2W max. (Integral LEDs)                                             |
| Terminal Capacity           | Screw connection<br>2 X 1.5mm <sup>2</sup><br>1 X 0.5mm <sup>2</sup> (min)<br>1 X 2.5mm <sup>2</sup> (max) |
| Dielectric Test             | 2.5KV                                                                                                      |
| Rated insulation Resistance | 500M ohm at 1000VDC                                                                                        |
| Polarity protection         | Polarity protection is only in case of DC supply lamps                                                     |
| Low voltage protection      | 20V for 110V AC & 110V DC<br>40V for 240V AC & 220V DC<br>(i.e. approx. 20% of Rated Voltage)              |
| Current Consumption         | Max. 20mA for AC circuits<br>Max. 15mA for DC circuits                                                     |

## Dimensional Drawings

All dimensions shown in millimeters.  
To convert to inches multiply by 0.03937



## 22mm Thermoplastic Enclosures

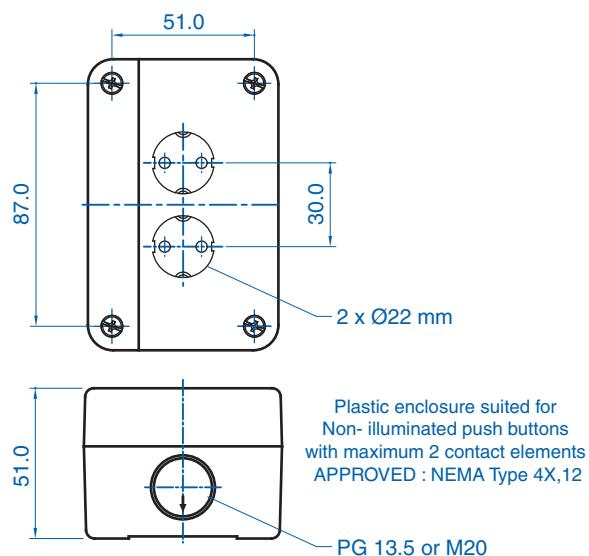
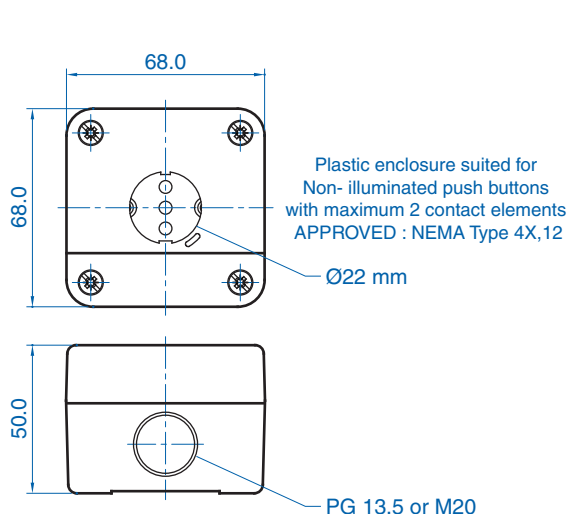


Certified for  
**NEMA Type 4X**  
12 environment.



### Base Mount Enclosures

| Cat. No.   | Operator Capacity | Color Top/ Bottom | Construction  | Dimensions LxWxH mm* | Cable Entry Size | No. of Knockouts | Mounting Hole Dia. |
|------------|-------------------|-------------------|---------------|----------------------|------------------|------------------|--------------------|
| 3-001-Q-11 | 1                 | White/ Black      | Thermoplastic | 51 x 68 x 68         | 2 x 21mm         | 2                | 2 x 4mm            |
| 4-001-Q-10 | 1                 | Yellow/ Black     | Thermoplastic | 51 x 68 x 68         | 2 x 21mm         | 2                | 2 x 4mm            |
| 3-001-R-11 | 2                 | White/ Black      | Thermoplastic | 51 x 68 x 104        | 2 x 21mm         | 2                | 2 x 4mm            |
| 4-001-R-10 | 2                 | Yellow/ Black     | Thermoplastic | 51 x 68 x 104        | 2 x 21mm         | 2                | 2 x 4mm            |
| 4003E11    | 3                 | White/ Black      | Thermoplastic | 51 x 68 x 153        | 2 x 21mm         | 2                | 2 x 4mm            |
| 4003G11    | 4                 | White/ Black      | Thermoplastic | 51 x 68 x 193        | 2 x 21mm         | 2                | 2 x 4mm            |
| 4003S11    | 5                 | White/ Black      | Thermoplastic | 51 x 68 x 233        | 2 x 21mm         | 2                | 2 x 4mm            |
| 4003I11    | 6                 | White/ Black      | Thermoplastic | 51 x 68 x 278        | 2 x 21mm         | 2                | 2 x 4mm            |

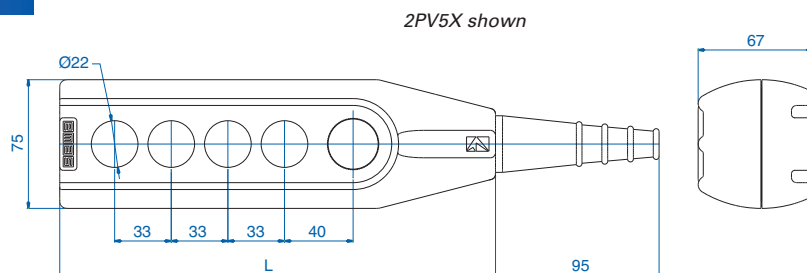


**Ambient Temperature:** -25°C to 70°C (-13°F to 158°F)

### Control Boxes



| Cat. No. | Operator Capacity | Dimensions* LxWxH mm |
|----------|-------------------|----------------------|
| 2PV2X    | 2                 | 188x75x67            |
| 2PV3X    | 3                 | 188x75x67            |
| 2PV4X    | 4                 | 221x75x67            |
| 2PV5X    | 5                 | 254x75x67            |
| 2PV6X    | 6                 | 287x75x67            |
| 2PV7X    | 7                 | 320x75x67            |
| 2PV8X    | 8                 | 353x75x67            |
| 2PV9X    | 9                 | 386x75x67            |



Contact Elements and Seal

| Cat. No. | Description     |
|----------|-----------------|
| S1       | Normally open   |
| S2       | Normally closed |
| 3PRG1*   | Rubber gasket*  |

\* To achieve IP65 rating for control boxes, this rubber gasket must be used.

## 22mm Thermoplastic Enclosure & Control Box Accessories



Certified for  
**NEMA Type 4X**  
12 environment.

### Flush

*Momentary*

*with mounting bracket*



### Mushroom

*Momentary/Maintained*  
*with mounting bracket*



### Projecting

*with mounting bracket*



### Selector Switch

*with mounting bracket*



| Color  | Function  | Marking                 | Cat No.   |
|--------|-----------|-------------------------|-----------|
| White  | Momentary | None                    | P2AF1     |
| White  | Momentary | Black arrow, up/down    | P2AF1WA0  |
| White  | Momentary | Black arrow, left/right | P2AF1WA90 |
| Black  | Momentary | None                    | P2AF2     |
| Black  | Momentary | White arrow, up/down    | P2AF2WA0  |
| Black  | Momentary | White arrow, left/right | P2AF2WA90 |
| Green  | Momentary | None                    | P2AF3     |
| Red    | Momentary | None                    | P2AF4     |
| Blue   | Momentary | None                    | P2AF6     |
| Yellow | Momentary | None                    | P2AF8     |

|     |                |      |         |
|-----|----------------|------|---------|
| Red | 40mm Momentary | None | P2AM4   |
| Red | 40mm Push-Turn | ⦿    | P2AML4  |
| Red | 30mm Push-Turn | ⦿    | P2AMLS4 |
| Red | 40mm Push-Pull | ⦿    | P2AMPP4 |

|        |            |      |       |
|--------|------------|------|-------|
| Black  | Projecting | None | P2AP2 |
| Green  | Projecting | None | P2AP3 |
| Red    | Projecting | None | P2AP4 |
| Blue   | Projecting | None | P2AP6 |
| Yellow | Projecting | None | P2AP8 |

|       |                         |      |         |
|-------|-------------------------|------|---------|
| Black | Maintained / 2 position | None | P2AS2-1 |
| Black | Maintained / 3 position | None | P2AS2-3 |
| Black | Momentary / 3 position  | None | P2AS2-4 |



**Mounting Bracket  
for plastic operators**  
Cat. No. P2BRK



**Rotational Washer  
for push-turn E-stop plastic operator**  
Cat. No. 2RLW



**Mounting Nut  
for plastic operators**  
Cat. No. P2MN



**Large Rubber Gasket**  
Cat. No. 3PRG1

*Note: Used for Push Buttons that begin in a 3P part number. Also used for control boxes with any type of operator in place of small rubber gasket (2PRG1) to achieve a IP65 rating.*



**Small Rubber Gasket**  
Cat. No. 2PRG1

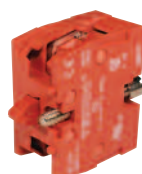
*Note: Used for Push Buttons that begin in a 2P or P2 part number as a standard gasket.*



**Transparent Silicone Rubber Boot  
for Flush Actuators**

Color: Clear  
Cat. No. 2BT7 (for non-illuminated)  
2ALBT7 (for illuminated)

## Switch Contacts



### Panel Mount

|                             |           |
|-----------------------------|-----------|
| Normally Open Silver        | <b>S1</b> |
| Normally Closed Silver      | <b>S2</b> |
| Normally Open Gold plated   | <b>S3</b> |
| Normally Closed Gold plated | <b>S4</b> |

### Base Mount

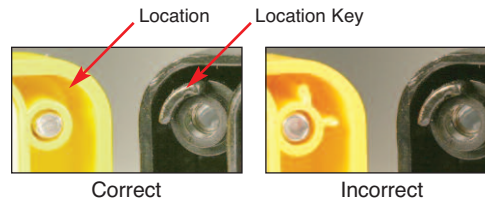
|                             |           |
|-----------------------------|-----------|
| Normally Open Silver        | <b>S5</b> |
| Normally Closed Silver      | <b>S6</b> |
| Normally Open Gold plated   | <b>S7</b> |
| Normally Closed Gold plated | <b>S8</b> |

# 22mm Thermoplastic Enclosure Installation Instructions

## Installation

The enclosure may be installed vertically or horizontally.

1. Unscrew the top half of the enclosure. Some enclosures are supplied with detached cover.
2. Place the bottom half to the desired mounting location using two M4 or 8/32" screws.
3. When wiring is complete, install the top half of the enclosure making sure the location key is in it's proper location (see below).



## Intended Use

The unit is a two part non-metallic enclosure with a gasket. Metal and/or Plastic series non-illuminated push buttons & pilot lights can be installed in these enclosures. For illuminated push buttons consider the plastic enclosures on pages 34-35 or GDC (gravity die cast) aluminum enclosures on page 37.

Features:

1. Protection type IP65 in accordance with IEC 60947.
2. Protection type 4X, 12 in accordance with UL50.

## Preparing for Operation

1. To insert cable, knockout one of the pre-stamped opening.  
For IP65 protection you must use a M20 or PG13 liquid tight strain relief.
2. Install the push button or pilot light in the actuator mounting hole.

## Safety Regulations

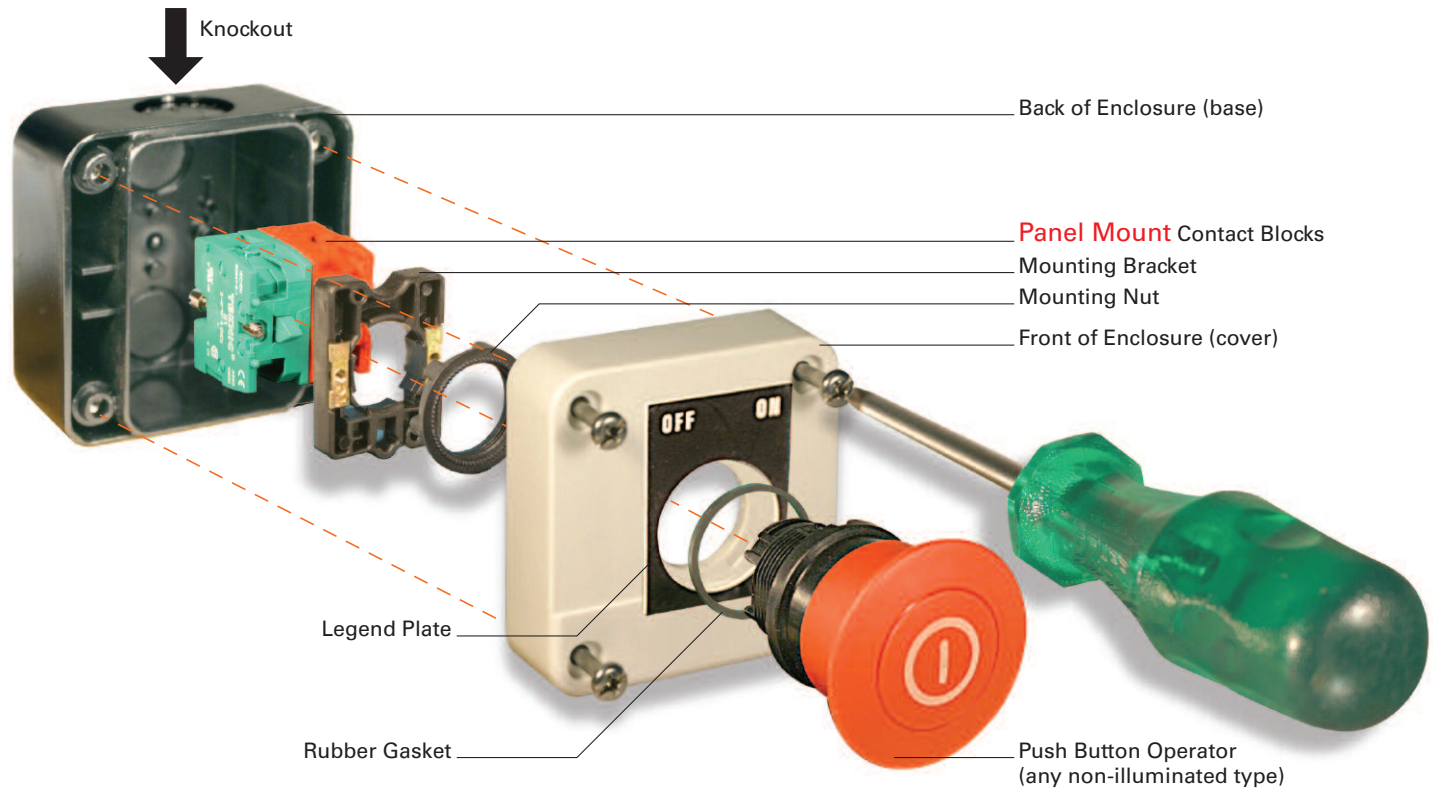
The unit may only be assembled and installed by individuals who are familiar with the installation instructions and the current regulations for health and safety at work and accident prevention. Ensure local regulations compliances are met.

## CAUTION

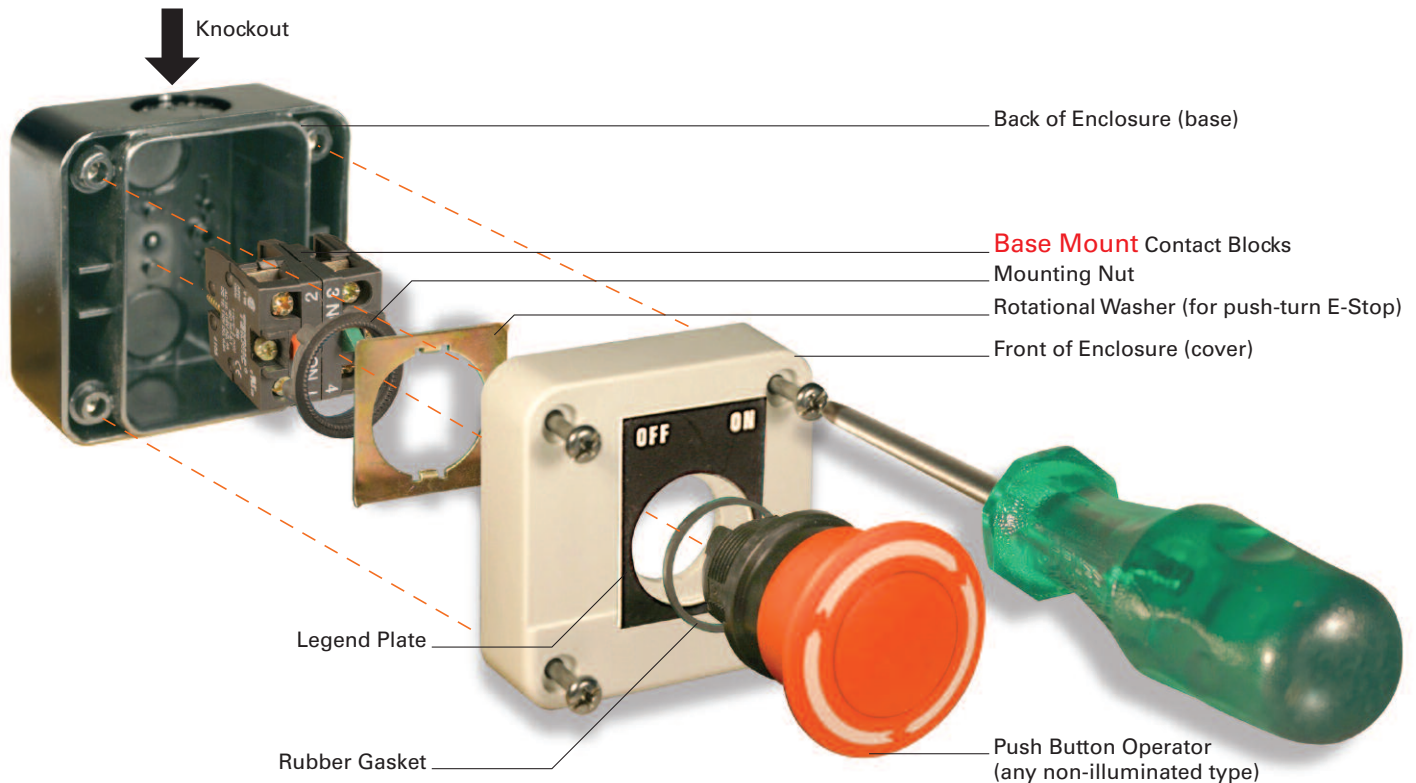
1. Non-metallic enclosures do not provide grounding connections.  
Use grounding jumper wires.
2. The conduit hubs are to be connected to the conduit before being connected to the enclosure.
3. To maintain the environmental rating of this enclosure, install only UL listed or UL recognized conduit hubs or control devices with the same environmental ratings as the enclosure, in compliance with the installation instructions of the device.

## 22mm Thermoplastic Enclosures Assembly Instructions

### Panel Mount Contact Block Installation



### Base Mount Contact Block Installation



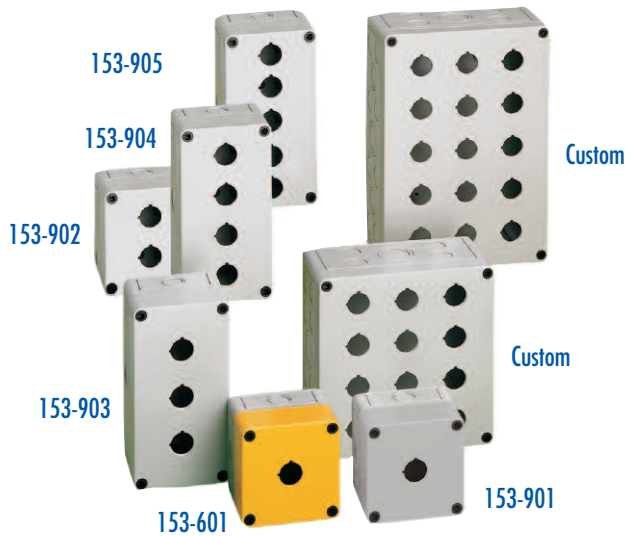
# 22mm Polycarbonate Enclosures

## Polycarbonate Enclosures

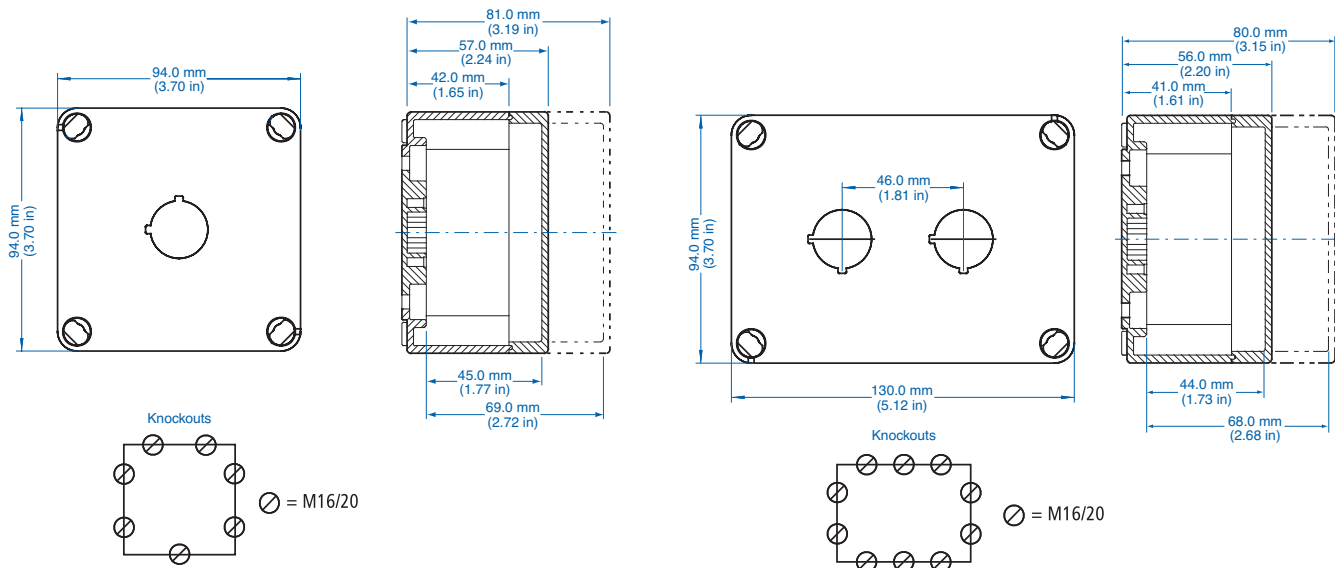
### Standard Features

- Protection Level: IP66\* (Nema 4x)
- Technical: M16/20 Knockout Sidewalls  
22.5 mm Diameter Push Button Holes
- Enclosure Material: Polycarbonate
- Temperature Range: -35°C to 120°C (-31°F to 248°F)
- Gasket Material: Polyurethane
- Color: Light Gray
- Accessories: See section below

\*IP66 when suitable installation devices are used.

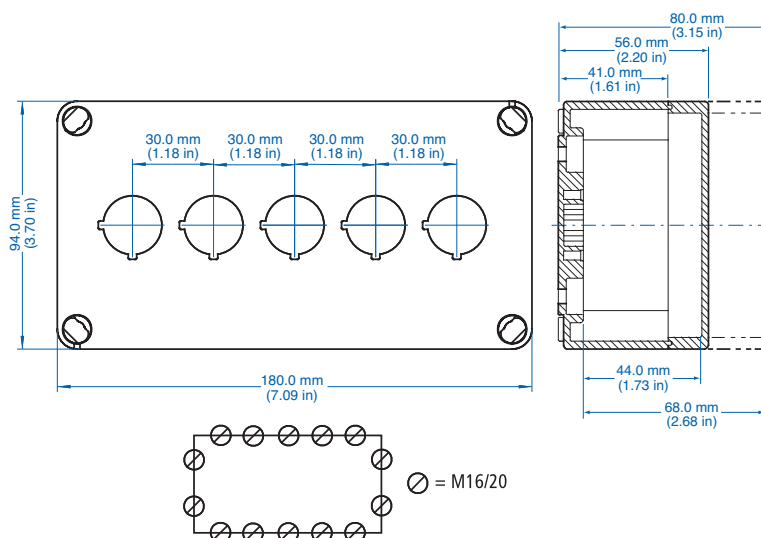
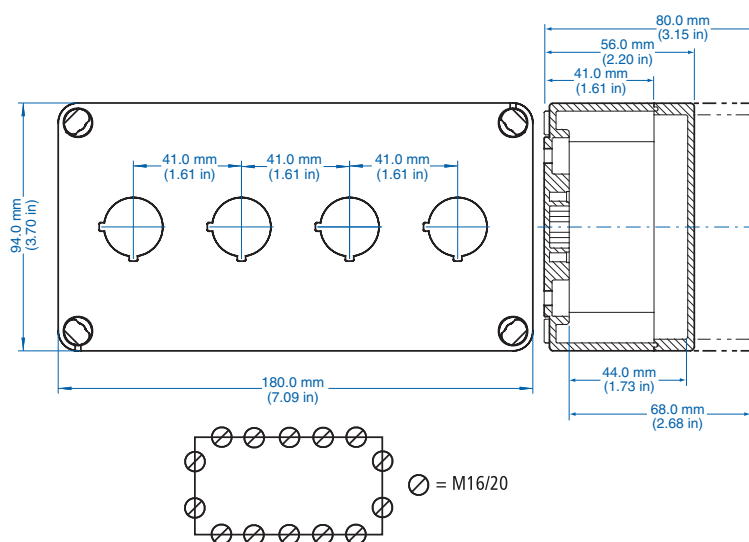
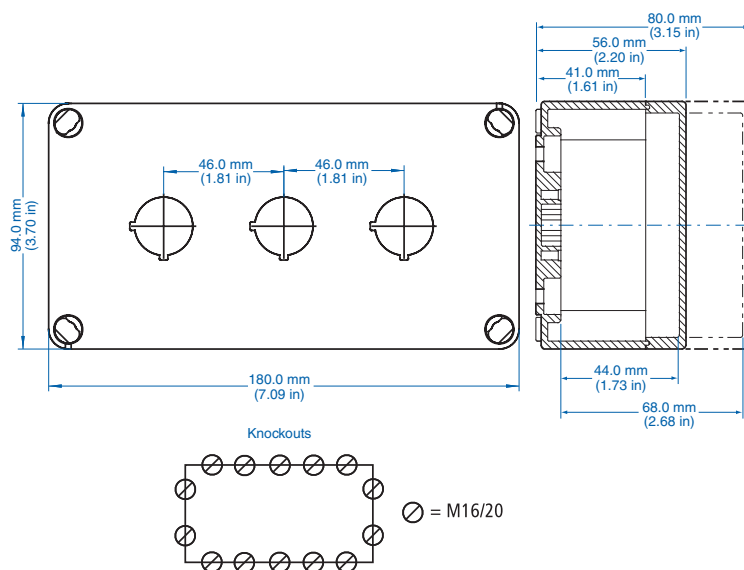


| Ordering Information              | Dimensions mm (in)                        |                  |                 |                 | Std. Pk. |
|-----------------------------------|-------------------------------------------|------------------|-----------------|-----------------|----------|
|                                   | Cat. No.                                  | Length           | Width           | Height          |          |
| One hole enclosure                | 153-901                                   | 94 mm (3.70 in)  | 94 mm (3.70 in) | 81 mm (3.19 in) | 1        |
| One hole enclosure (Yellow cover) | 153-601                                   | 94 mm (3.70 in)  | 94 mm (3.70 in) | 81 mm (3.19 in) | 1        |
| Two hole enclosure                | 153-902                                   | 130 mm (5.12 in) | 94 mm (3.70 in) | 81 mm (3.19 in) | 1        |
| Three hole enclosure              | 153-903                                   | 180 mm (7.09 in) | 94 mm (3.70 in) | 81 mm (3.19 in) | 1        |
| Four hole enclosure               | 153-904                                   | 180 mm (7.09 in) | 94 mm (3.70 in) | 81 mm (3.19 in) | 1        |
| Five hole enclosure               | 153-905                                   | 180 mm (7.09 in) | 94 mm (3.70 in) | 81 mm (3.19 in) | 1        |
| One hole enclosure                | 153-901/L                                 | 94 mm (3.70 in)  | 94 mm (3.70 in) | 57 mm (2.24 in) | 1        |
| One hole enclosure (Yellow cover) | 153-601/L                                 | 94 mm (3.70 in)  | 94 mm (3.70 in) | 57 mm (2.24 in) | 1        |
| Two hole enclosure                | 153-902/L                                 | 130 mm (5.12 in) | 94 mm (3.70 in) | 57 mm (2.24 in) | 1        |
| Three hole enclosure              | 153-903/L                                 | 180 mm (7.09 in) | 94 mm (3.70 in) | 57 mm (2.24 in) | 1        |
| Four hole enclosure               | 153-904/L                                 | 180 mm (7.09 in) | 94 mm (3.70 in) | 57 mm (2.24 in) | 1        |
| Five hole enclosure               | 153-905/L                                 | 180 mm (7.09 in) | 94 mm (3.70 in) | 57 mm (2.24 in) | 1        |
| One hole enclosure (extra space)  | 153-902/1H                                | 130 mm (5.12 in) | 94 mm (3.70 in) | 57 mm (2.24 in) | 1        |
| 5308 959                          | M20 Cord Grip, 5-12mm Cable Dia., Lt Gray |                  |                 |                 | 1        |
| 7211 981                          | M20 Locknut, Lt. Gray, PA                 |                  |                 |                 | 1        |



All dimensions shown in millimeters.  
To convert to inches multiply by 0.03937

# 22mm Polycarbonate Enclosures



All dimensions shown in millimeters.  
To convert to inches multiply by 0.03937

# 22mm Aluminum Enclosures

**UL**  
C US  
E225660



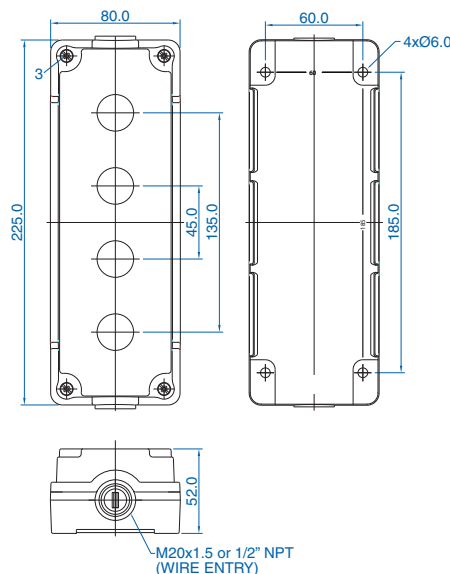
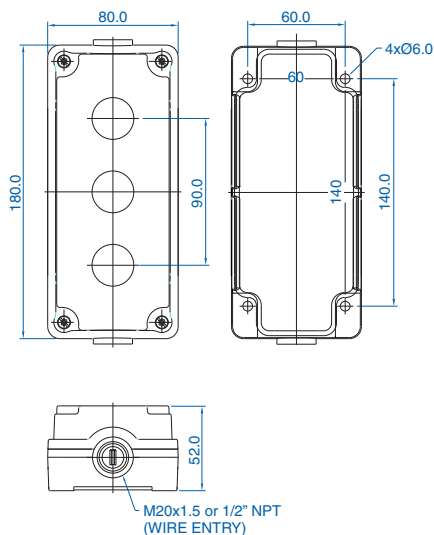
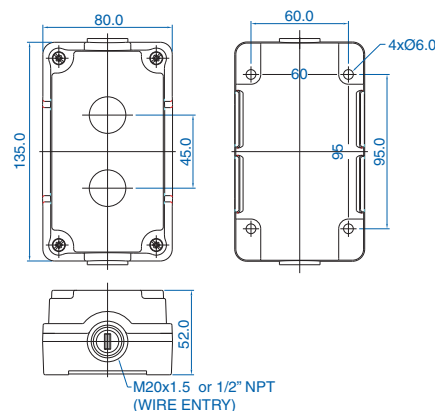
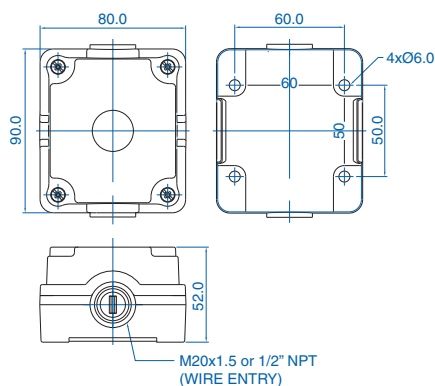
Certified for  
**NEMA Type 4X**  
12 environment.

## Aluminum Pressure Die Cast

For base mount contact blocks and non-illuminated operators. 2 contact blocks maximum per operator.



| Cat. No. | Operator Capacity | Color Top/ Bottom            | Construction | Dimensions LxWxH mm (in.)   | Cable Entry Thread Size | Mounting Hole Dia. |
|----------|-------------------|------------------------------|--------------|-----------------------------|-------------------------|--------------------|
| 2005A13  | 1                 | Black/Pebble Gray (RAL 7032) | PDC Aluminum | 80x90x52 (3.15x3.54x2.05)   | 2xM20                   | 4 x 6mm            |
| 2006C13  | 2                 | Black/Pebble Gray (RAL 7032) | PDC Aluminum | 80x135x52 (3.15x5.32x2.05)  | 2xM20                   | 4 x 6mm            |
| 2007E13  | 3                 | Black/Pebble Gray (RAL 7032) | PDC Aluminum | 80x180x52 (3.15x7.09x2.05)  | 2xM20                   | 4 x 6mm            |
| 2010G13  | 4                 | Black/Pebble Gray (RAL 7032) | PDC Aluminum | 80x225x52 (3.15x8.86x2.05)  | 2xM20                   | 4 x 6mm            |
| 2015A13  | 1                 | Black/Pebble Gray (RAL 7032) | PDC Aluminum | 80 x 90x52 (3.15x3.54x2.05) | 2x1/2"-14 NPT           | 4 x 6mm            |
| 2014C13  | 2                 | Black/Pebble Gray (RAL 7032) | PDC Aluminum | 80x135x52 (3.15x5.32x2.05)  | 2x1/2"-14 NPT           | 4 x 6mm            |
| 2012E13  | 3                 | Black/Pebble Gray (RAL 7032) | PDC Aluminum | 80x180x52 (3.15x7.09x2.05)  | 2x1/2"-14 NPT           | 4 x 6mm            |
| 2008G13  | 4                 | Black/Pebble Gray (RAL 7032) | PDC Aluminum | 80x225x52 (3.15x8.86x2.05)  | 2x1/2"-14 NPT           | 4 x 6mm            |



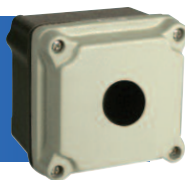
All dimensions shown in millimeters.  
To convert to inches multiply by 0.03937

# 22mm Aluminum Enclosures



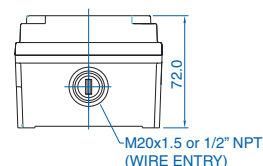
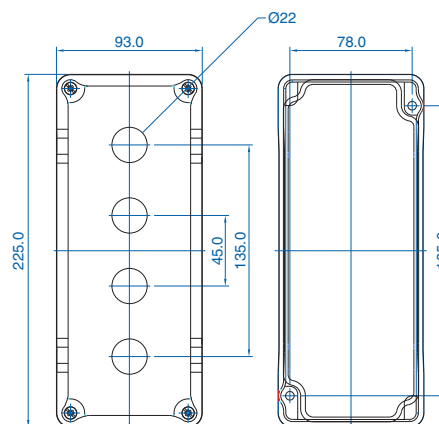
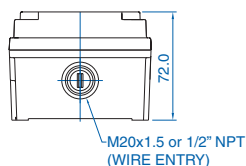
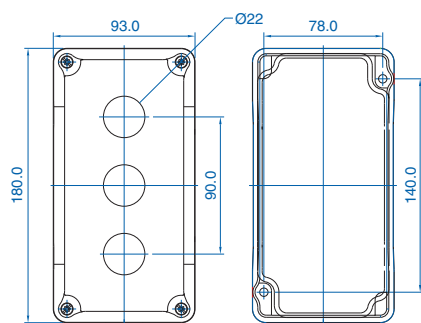
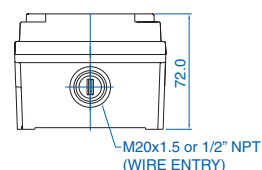
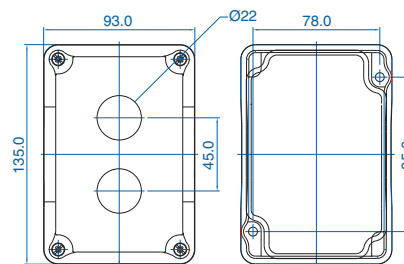
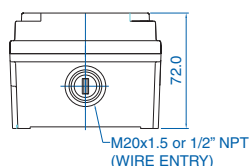
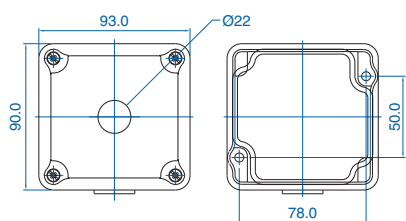
Certified for  
**NEMA Type 4X**  
12 environment.

## Aluminum Gravity Die Cast



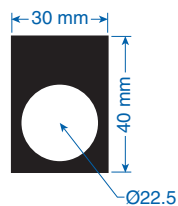
For panel mount contact blocks and illuminated operators. 2 contact blocks can be used with an illuminated operator. 4 contact blocks can be used with any non-illuminated operator.

| Cat. No. | Operator Capacity | Color Top/ Bottom            | Construction | Dimensions LxWxH mm (in.)   | Cable Entry Thread Size | Mounting Hole Dia. |
|----------|-------------------|------------------------------|--------------|-----------------------------|-------------------------|--------------------|
| 2009A13  | 1                 | Black/Pebble Gray (RAL 7032) | GDC Aluminum | 93x90x72 (3.66x3.54x2.83)   | 2xM20                   | 2 X 6mm            |
| 2011C13  | 2                 | Black/Pebble Gray (RAL 7032) | GDC Aluminum | 93x135x72 (3.66x5.32x2.83)  | 2xM20                   | 2 X 6mm            |
| 2009E13  | 3                 | Black/Pebble Gray (RAL 7032) | GDC Aluminum | 93x180x72 (3.66x7.09x2.83)  | 2xM20                   | 2 X 6mm            |
| 2005G13  | 4                 | Black/Pebble Gray (RAL 7032) | GDC Aluminum | 93x225x72 (3.66x8.86x2.83)  | 2xM20                   | 2 X 6mm            |
| 2016A13  | 1                 | Black/Pebble Gray (RAL 7032) | GDC Aluminum | 93 x 90x72 (3.66x3.54x2.83) | 2x1/2"-14 NPT           | 2 X 6mm            |
| 2015C13  | 2                 | Black/Pebble Gray (RAL 7032) | GDC Aluminum | 93x135x72 (3.66x5.32x2.83)  | 2x1/2"-14 NPT           | 2 X 6mm            |
| 2013E13  | 3                 | Black/Pebble Gray (RAL 7032) | GDC Aluminum | 93x180x72 (3.66x7.09x2.83)  | 2x1/2"-14 NPT           | 2 X 6mm            |
| 2009G13  | 4                 | Black/Pebble Gray (RAL 7032) | GDC Aluminum | 93x225x72 (3.66x8.86x2.83)  | 2x1/2"-14 NPT           | 2 X 6mm            |



All dimensions shown in millimeters.  
To convert to inches multiply by 0.03937

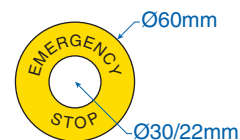
# 22mm Push Button Accessories



Metal legend plates are engraved on both sides, one side in horizontal and the other side in a vertical orientation.



**EMERGENCY STOP**  
LP41 / 2LP41 (only)  
Legend plate Ø 60mm  
yellow with black text.  
*Not to be used with  
thermoplastic enclosures.*



## English

| Title                  | Cat No. |
|------------------------|---------|
| AUTO                   | 2LP09   |
| AUTO HAND              | 2LP32   |
| AUTO - MAN             | 2LP43   |
| B PHASE                | 2LP27   |
| Blank Aluminum         | 2LP40   |
| BOTTOM HEAT            | 2LP101  |
| CLEAR                  | 2LP51   |
| CLOSE                  | 2LP08   |
| CLUTCH ON/OFF          | 2LP73   |
| Cycle Stop             | 2LP55   |
| DOWN                   | 2LP06   |
| EMERGENCY STOP         | 2LP41   |
| Emergency Stop (black) | 2LP56   |
| Emergency Stop (red)   | 2LP66   |
| FAST                   | 2LP12   |
| FAULT                  | 2LP107  |
| FILM FEED              | 2LP105  |
| FOR-OFF-REV            | 2LP42   |
| FORWARD                | 2LP03   |
| FWD - REV              | 2LP47   |
| HAND                   | 2LP10   |
| HAND O AUTO            | 2LP36   |
| HOLD                   | 2LP50   |
| I II                   | 2LP34   |
| I O II                 | 2LP39   |
| INCH                   | 2LP14   |
| INFEED                 | 2LP72   |
| INFEED ON/OFF          | 2LP71   |
| JOG                    | 2LP69   |
| JOG - RUN              | 2LP45   |
| KNIFE CYCLE            | 2LP106  |
| LEFT                   | 2LP18   |
| LOCAL                  | 2LP21   |
| LOCAL REMOTE           | 2LP33   |
| MAN O AUTO             | 2LP36   |
| O I                    | 2LP35   |
| OFF                    | 2LP16   |

| Title                        | Cat No. |
|------------------------------|---------|
| OFF - ON                     | 2LP46   |
| ON                           | 2LP15   |
| ON OFF                       | 2LP30   |
| OPEN                         | 2LP07   |
| OVER                         | 2LP74   |
| OXY - ATM - AUTO             | 2LP58   |
| OXY - AUTO - ATM             | 2LP57   |
| POSITION , A B               | 2LP48   |
| POWER ON                     | 2LP20   |
| PUSHER CYCLE                 | 2LP104  |
| R PHASE                      | 2LP25   |
| RAISE - LOWER                | 2LP44   |
| READY                        | 2LP49   |
| REMOTE                       | 2LP22   |
| RESET                        | 2LP13   |
| RESET/MANUAL/AUTO            | 2LP103  |
| REV FWD                      | 2LP31   |
| REV - OFF - FWD              | 2LP59   |
| REVERSE                      | 2LP04   |
| RIGHT                        | 2LP17   |
| RUN                          | 2LP24   |
| SHEAR                        | 2LP70   |
| SIDE HEAT                    | 2LP102  |
| SLOW                         | 2LP11   |
| SLOW OFF FAST                | 2LP37   |
| START                        | 2LP01   |
| START STOP                   | 2LP28   |
| STOP                         | 2LP02   |
| TEST                         | 2LP23   |
| TRIP                         | 2LP19   |
| UNDERLOAD                    | 2LP108  |
| UP                           | 2LP05   |
| UP DOWN                      | 2LP29   |
| UP OFF DOWN                  | 2LP38   |
| Y PHASE                      | 2LP26   |
| Temporary for Custom Imprint | 2LPXX   |

## Spanish

| Title              | Cat No. |
|--------------------|---------|
| ABAJO              | 2LP06SP |
| ABRIR              | 2LP07SP |
| ADELANTE           | 2LP03SP |
| ADELANTE ATRAS     | 2LP31SP |
| ARRANQUE           | 2LP01SP |
| ARRANQUE PARO      | 2LP28SP |
| ARRIBA             | 2LP05SP |
| ARRIBA ABAJO       | 2LP29SP |
| ARRIBA FUERA ABAJO | 2LP38SP |
| ATRAS              | 2LP04SP |
| AUTO MAN           | 2LP32SP |
| CERRAR             | 2LP08SP |
| DENTRO             | 2LP15SP |
| DERECHO            | 2LP17SP |

| Title              | Cat No. |
|--------------------|---------|
| ENCENDIDO          | 2LP20SP |
| ENCENDIDO APAGADO  | 2LP30SP |
| FALLA              | 2LP19SP |
| FUERA              | 2LP16SP |
| IZQUIERDA          | 2LP18SP |
| LENTO              | 2LP14SP |
| LENTO FUERA RAPIDO | 2LP37SP |
| LOCAL REMOTO       | 2LP33SP |
| MAN O AUTO         | 2LP36SP |
| MANUAL             | 2LP10SP |
| PARO               | 2LP02SP |
| PARO DE EMERGENCIA | 2LP41SP |
| RAPIDO             | 2LP12SP |
| REARME             | 2LP13SP |

## 22mm Push Button Accessories



### Lenses for Pilot Lights with LED

| Color                                      | Cat No. |
|--------------------------------------------|---------|
| <input type="checkbox"/> White             | 2PLL1L  |
| <input checked="" type="checkbox"/> Green  | 2PLL3L  |
| <input checked="" type="checkbox"/> Red    | 2PLL4L  |
| <input checked="" type="checkbox"/> Amber  | 2PLL5L  |
| <input checked="" type="checkbox"/> Blue   | 2PLL6L  |
| <input checked="" type="checkbox"/> Clear  | 2PLL7L  |
| <input checked="" type="checkbox"/> Yellow | 2PLL8L  |

### Lenses for Illuminated Actuators with LED (flush/projecting)

| Color                                      | Cat No. |
|--------------------------------------------|---------|
| <input type="checkbox"/> White             | 2LAL1L  |
| <input checked="" type="checkbox"/> Green  | 2LAL3L  |
| <input checked="" type="checkbox"/> Red    | 2LAL4L  |
| <input checked="" type="checkbox"/> Amber  | 2LAL5L  |
| <input checked="" type="checkbox"/> Blue   | 2LAL6L  |
| <input checked="" type="checkbox"/> Clear  | 2LAL7L  |
| <input checked="" type="checkbox"/> Yellow | 2LAL8L  |

### Boots for Booted Actuators

| Color                                      | Cat No. |
|--------------------------------------------|---------|
| <input type="checkbox"/> White             | 2BT1    |
| <input checked="" type="checkbox"/> Black  | 2BT2    |
| <input checked="" type="checkbox"/> Green  | 2BT3    |
| <input checked="" type="checkbox"/> Red    | 2BT4    |
| <input checked="" type="checkbox"/> Blue   | 2BT6    |
| <input checked="" type="checkbox"/> Clear  | 2BT7    |
| <input checked="" type="checkbox"/> Yellow | 2BT8    |

### Lenses for Pilot Lights with Filament Bulb

| Color                                      | Cat No. |
|--------------------------------------------|---------|
| <input type="checkbox"/> White             | 2PLL1   |
| <input checked="" type="checkbox"/> Green  | 2PLL3   |
| <input checked="" type="checkbox"/> Red    | 2PLL4   |
| <input checked="" type="checkbox"/> Amber  | 2PLL5   |
| <input checked="" type="checkbox"/> Blue   | 2PLL6   |
| <input checked="" type="checkbox"/> Clear  | 2PLL7   |
| <input checked="" type="checkbox"/> Yellow | 2PLL8   |

### Lenses for Illuminated Actuators with Filament Bulb

| Color                                      | Cat No. |
|--------------------------------------------|---------|
| <input type="checkbox"/> White             | 2LAL1   |
| <input checked="" type="checkbox"/> Green  | 2LAL3   |
| <input checked="" type="checkbox"/> Red    | 2LAL4   |
| <input checked="" type="checkbox"/> Amber  | 2LAL5   |
| <input checked="" type="checkbox"/> Blue   | 2LAL6   |
| <input checked="" type="checkbox"/> Clear  | 2LAL7   |
| <input checked="" type="checkbox"/> Yellow | 2LAL8   |

## Replacement Bulbs



### Filament Bulbs

| Color                          | Voltage    | Cat No. |
|--------------------------------|------------|---------|
| <input type="checkbox"/> Clear | 12V AC/DC  | BA9S12  |
| <input type="checkbox"/> Clear | 24V AC/DC  | BA9S24  |
| <input type="checkbox"/> Clear | 48V AC/DC  | BA9S48  |
| <input type="checkbox"/> Clear | 110V AC/DC | BA9S110 |
| <input type="checkbox"/> Clear | 230V AC/DC | BA9S220 |

### LED Bulbs

| Color                                      | Voltage   | Cat No. |
|--------------------------------------------|-----------|---------|
| <input type="checkbox"/> White             | 12V AC/DC | MCB9112 |
| <input checked="" type="checkbox"/> Green  | 12V AC/DC | MCB9312 |
| <input checked="" type="checkbox"/> Red    | 12V AC/DC | MCB9412 |
| <input checked="" type="checkbox"/> Amber  | 12V AC/DC | MCB9512 |
| <input checked="" type="checkbox"/> Blue   | 12V AC/DC | MCB9612 |
| <input checked="" type="checkbox"/> Yellow | 12V AC/DC | MCB9812 |

### LED Bulbs

| Color                                      | Voltage | Cat No.  |
|--------------------------------------------|---------|----------|
| <input type="checkbox"/> White             | 110V AC | MCB91110 |
| <input checked="" type="checkbox"/> Green  | 110V AC | MCB93110 |
| <input checked="" type="checkbox"/> Red    | 110V AC | MCB94110 |
| <input checked="" type="checkbox"/> Amber  | 110V AC | MCB95110 |
| <input checked="" type="checkbox"/> Blue   | 110V AC | MCB96110 |
| <input checked="" type="checkbox"/> Yellow | 110V AC | MCB98110 |

| Color                                      | Voltage | Cat No.   |
|--------------------------------------------|---------|-----------|
| <input type="checkbox"/> White             | 110V DC | MCB91110D |
| <input checked="" type="checkbox"/> Green  | 110V DC | MCB93110D |
| <input checked="" type="checkbox"/> Red    | 110V DC | MCB94110D |
| <input checked="" type="checkbox"/> Amber  | 110V DC | MCB95110D |
| <input checked="" type="checkbox"/> Blue   | 110V DC | MCB96110D |
| <input checked="" type="checkbox"/> Yellow | 110V DC | MCB98110D |

| Color                                      | Voltage   | Cat No. |
|--------------------------------------------|-----------|---------|
| <input type="checkbox"/> White             | 24V AC/DC | MCB9124 |
| <input checked="" type="checkbox"/> Green  | 24V AC/DC | MCB9324 |
| <input checked="" type="checkbox"/> Red    | 24V AC/DC | MCB9424 |
| <input checked="" type="checkbox"/> Amber  | 24V AC/DC | MCB9524 |
| <input checked="" type="checkbox"/> Blue   | 24V AC/DC | MCB9624 |
| <input checked="" type="checkbox"/> Yellow | 24V AC/DC | MCB9824 |

| Color                                      | Voltage | Cat No.  |
|--------------------------------------------|---------|----------|
| <input type="checkbox"/> White             | 230V AC | MCB91230 |
| <input checked="" type="checkbox"/> Green  | 230V AC | MCB93230 |
| <input checked="" type="checkbox"/> Red    | 230V AC | MCB94230 |
| <input checked="" type="checkbox"/> Amber  | 230V AC | MCB95230 |
| <input checked="" type="checkbox"/> Blue   | 230V AC | MCB96230 |
| <input checked="" type="checkbox"/> Yellow | 230V AC | MCB98230 |

| Color                                      | Voltage | Cat No.   |
|--------------------------------------------|---------|-----------|
| <input type="checkbox"/> White             | 230V DC | MCB91230D |
| <input checked="" type="checkbox"/> Green  | 230V DC | MCB93230D |
| <input checked="" type="checkbox"/> Red    | 230V DC | MCB94230D |
| <input checked="" type="checkbox"/> Amber  | 230V DC | MCB95230D |
| <input checked="" type="checkbox"/> Blue   | 230V DC | MCB96230D |
| <input checked="" type="checkbox"/> Yellow | 230V DC | MCB98230D |

| Color                                      | Voltage   | Cat No. |
|--------------------------------------------|-----------|---------|
| <input type="checkbox"/> White             | 48V AC/DC | MCB9148 |
| <input checked="" type="checkbox"/> Green  | 48V AC/DC | MCB9348 |
| <input checked="" type="checkbox"/> Red    | 48V AC/DC | MCB9448 |
| <input checked="" type="checkbox"/> Amber  | 48V AC/DC | MCB9548 |
| <input checked="" type="checkbox"/> Blue   | 48V AC/DC | MCB9648 |
| <input checked="" type="checkbox"/> Yellow | 48V AC/DC | MCB9848 |

## Maximum Power Consumption:

| LED            |                      |          | FILAMENT BULBS       |           |
|----------------|----------------------|----------|----------------------|-----------|
| Supply Voltage | Power (max) in Watts | Current  | Power (max) in Watts | Current   |
| 12V            | 0.5W                 | max 20mA | 2W                   | max 166mA |
| 24V            | 0.5W                 | max 20mA | 2W                   | max 85mA  |
| 48V            | 0.5W                 | max 20mA | 2W                   | max 45mA  |
| 110V           | 0.5W                 | max 15mA | 2.6W                 | max 20mA  |
| 240V           | 1W                   | max 10mA | 2.6W                 | max 20mA  |

These bulbs are available in various colors and Voltages. A filament bulb can be directly replaced with these LED based bulbs without having to change any other expensive part of your existing lamps.

These bulbs use high brightness LED chips which last for more than 100,000 hours and consume very little power. Heat generated by LED based bulbs is negligible hence no damage to the body of the lamp or any operator in case of Illuminated push buttons.

These bulbs can be used to replace 12V AC/DC, 24V AC/DC, 48V AC/DC, 110V AC or DC and 240V AC or DC circuits directly. LED color indication is given on the bulb for easy identification.

Conforming Standards: UL508, CSA 22.2, IEC 60947-5-1

## 22mm Push Button Accessories



**Push Push mechanism for converting spring return actuator into maintained**  
Cat. No. 2PPM



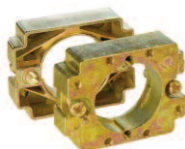
**Transparent Silicone Rubber Boot for Flush Actuators**  
Color: Clear  
Cat. No. 2BT7 (for non-illuminated)  
2ALBT7 (for illuminated)



**Adapter for installing a Ø22.5 device in Ø 30.5 cutout**  
Cat. No. 2ADP (with washer)  
ADW (washer only)



**Rubber Boot for Twin Actuators**  
Color: Clear  
Cat. No. 2ATBT7 (Non-Illuminated)  
2ATLBT7 (illuminated)



**Mounting Bracket**  
Cat. No. 2BRK  
Cat. No. 2BKKT (*Thin Bracket for Base Mount Enclosures*)



**Blanking plug for 22.5 mm holes**  
Color: Black  
Cat. No. 2BP2  
**Blanking plug for M20 (20mm) or NPT 1/2" holes**  
Color: Gray  
Cat. No. M20  
Cat. No. NPT1/2



**Padlock**  
For mushroom actuator: Cat. No. 2PAM  
For projecting actuator: Cat. No. 2PAP



**Bulb Extractor**  
Cat. No. 2BA9SE



**E-Stop Shroud**  
Plastic protector: Cat. No. 2ESS1  
Plastic protector (UL): Cat. No. 2ESS1-UL



**Bulb Holder for Illuminated Push Buttons**  
Cat. No. 2LHB



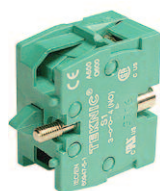
**Replacement Keys**  
For all 22mm operators with keys  
Cat. No. 2KY455



**Rubber Gasket**  
Cat. No. 2PRG1

## 22mm Push Button Switch Contacts

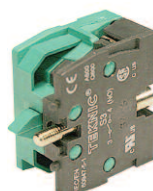
### Panel Mount Types



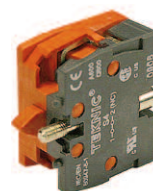
**S1**  
Normally  
Open  
Silver



**S2**  
Normally  
Closed  
Silver

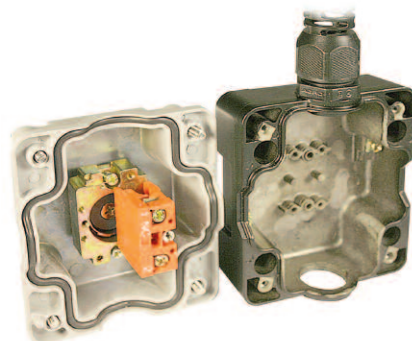


**S3**  
Normally  
Open  
Gold plated

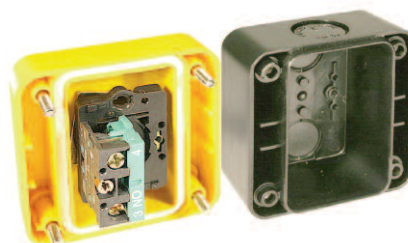


**S4**  
Normally  
Closed  
Gold plated

*Mounting Examples:*

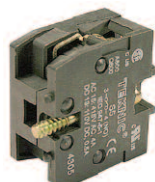


Cast Aluminum Enclosure  
with panel mount contacts  
and metal operator

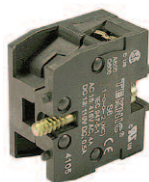


Plastic Enclosure  
with panel mount contacts  
and plastic operator

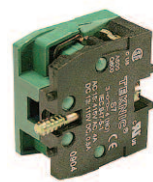
### Base Mount Types



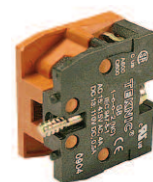
**S5\***  
Normally  
Open  
Silver



**S6\***  
Normally  
Closed  
Silver

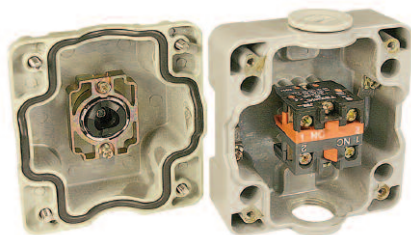


**S7\***  
Normally  
Open  
Gold plated

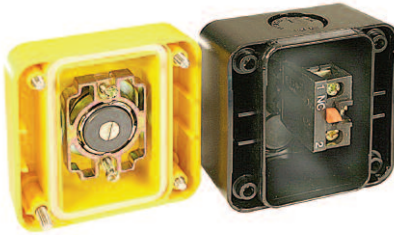


**S8\***  
Normally  
Closed  
Gold plated

*Mounting Examples:*



Cast Aluminum Enclosure  
with base mount contacts  
and metal operator



Plastic Enclosure  
with base mount contacts  
and metal operator



Plastic Enclosure  
with base mount contacts  
and plastic operator

\* For use with non-illuminated operators in thermoplastic or aluminum enclosures listed on page 30 and 36.

## Pre-assembled or Ready to Assemble Control Stations



### Solutions for your applications

Backed by technical and industrial experience, we offer preassembled ready to install or assembled to order control stations. Altech offers several ranges of control stations. From a cost effective plastic enclosure assembled with 22 mm push buttons to a heavy duty cast aluminum enclosure assembled with 22 or 30mm push buttons, you will find the one that fits your application.



### High performance and Extensive range

**Our basic plastic or Pressure Die Cast aluminum (PDC)** enclosures are available with contact blocks mounted on the bracket behind the 22 mm operator or in the rear (base) of the enclosure (*see page 41*). Altech can assemble the control station to the customer specifications or it can be ordered unassembled. These enclosures are easy to assemble by using any Non-Illuminated operator with a maximum of 2 contacts per operator.

**Our plastic** enclosures on pages 34-35 can be customized to meet the customer's most demanding applications. These enclosures can be equipped with any 22 mm illuminated or Non-Illuminated operators. Use up to 2 contact blocks with the illuminated operators or up to 4 contact blocks with the Non-illuminated operators.

**Our Gravity Die Cast aluminum (GDC)** enclosures have an excellent resistance to mechanical shock and vibration. They can be equipped with any illuminated or Non-Illuminated operators. Use up to 2 contact blocks with the illuminated 22mm operators or up to 4 contact blocks with the Non-illuminated 22mm operators. This enclosure can be modified to accept any Non-illuminated 30mm operator or pilot light as well.



## Pre-assembled or Ready to Assemble Control Stations



### Application specific solutions

These products are suitable for a wide variety of applications. They have an excellent resistance to corrosion and cleaning agents. They are tolerant of high pressure cleaning without leakage. These enclosures combined with our push buttons offer an excellent price/performance ratio.

Our staff has the ability to take your requirements and rapidly turn them into a solution. We use the latest CAD system in our process. Prototypes are available for most application specific requirements.



### Safety and reliability

The majority of the enclosures meet all industrial application requirements from the most common to the most extreme.

They have international certifications such as UL, CE, etc. They conform to IEC standards, have a IP65 rating and NEMA Type 4X protection.

*Metal legend plates are engraved on both sides, one side in horizontal and the other side in a vertical orientation.*

### Save Time

Our control stations save you time, simplify and speed up your installation while maintaining the high quality and appearance of your equipment.

Mounting is easy, the only tool you need is a screwdriver.



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| ALF7LB-024  | 46   | MCB15148   | 54   | P2AF6      | 31   | PLL7       | 55   |
| ALF7LB-048  | 46   | MCB153110  | 54   | P2AF7      | 31   | PLL8       | 55   |
| ALF7LB-110  | 46   | MCB153110D | 54   | P2AM4      | 31   | PLL8       | 55   |
| ALF7LB-230  | 46   | MCB15312   | 54   | P2AP2      | 31   | S1         | 41   |
| ALF8-024    | 46   | MCB153230  | 54   | P2AP3      | 31   | S2         | 41   |
| ALF8-048    | 46   | MCB153230D | 54   | P2AP4      | 31   | S3         | 41   |
| ALF8-110    | 46   | MCB15324   | 54   | P2AP6      | 31   | S4         | 41   |
| ALF8-230    | 46   | MCB15348   | 54   | P2AP8      | 31   | S5         | 41   |
| ALF8LB-024  | 46   | MCB154110  | 54   | P2AS2-1    | 31   | S6         | 41   |
| ALF8LB-048  | 46   | MCB154110D | 54   | P2AS2-3    | 31   | S7         | 41   |
| ALF8LB-110  | 46   | MCB15412   | 54   | P2AS2-4    | 31   | S8         | 41   |
| ALF8LB-230  | 46   | MCB154230  | 54   | P2BRK      | 31   | SC25       | 55   |
| ALP101      | 55   | MCB154230D | 54   | P2MN       | 31   | SC25       | 55   |
| AM1         | 50   | MCB15424   | 54   | PAM        | 55   | SC45       | 55   |
| AM2         | 50   | MCB15448   | 54   | PAP        | 55   | SC45       | 55   |
| AM3         | 50   | MCB155110  | 54   | PLB1-024   | 52   | SC65       | 55   |
| AM4         | 50   | MCB155110D | 54   | PLB1-048   | 52   | SC65       | 55   |
| AM6         | 50   | MCB15512   | 54   | PLB1-110   | 52   | SC90       | 55   |
| AM8         | 50   | MCB155230  | 54   | PLB1-230   | 52   | SC90       | 55   |
| AMKB2       | 50   | MCB155230D | 54   | PLB1LB-024 | 52   |            |      |
| AMKB4       | 50   | MCB15524   | 54   | PLB1LB-048 | 52   |            |      |
| AML2        | 50   | MCB15548   | 54   | PLB1LB-110 | 52   |            |      |
| AML4        | 50   | MCB156110  | 54   | PLB1LB-230 | 52   |            |      |
| AMLKB2      | 50   | MCB156110D | 54   | PLB3-024   | 52   |            |      |
| AMLKB4      | 50   | MCB15612   | 54   | PLB3-048   | 52   |            |      |
| AP1         | 44   | MCB156230  | 54   | PLB3-110   | 52   |            |      |
| AP2         | 44   | MCB156230D | 54   | PLB3-230   | 52   |            |      |
| AP3         | 44   | MCB15624   | 54   | PLB3LB-024 | 52   |            |      |
| AP4         | 44   | MCB15648   | 54   | PLB3LB-048 | 52   |            |      |
| AP6         | 44   | MCB158110  | 54   | PLB3LB-110 | 52   |            |      |
| AP8         | 44   | MCB158110D | 54   | PLB3LB-230 | 52   |            |      |

## Commonly used metric and other useful conversions

|                                                                                                                                                                                   |  |  |                                                            |  |  |                                                                                                                                                                       |  |  |                                                                                                                                               |  |  |                                                  |  |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|------------------------------------------------------------|--|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|-----------------------------------------------------------------------------------------------------------------------------------------------|--|--|--------------------------------------------------|--|--|
| <b>Length</b><br>inch [in.] x25.4 =millimeters<br>millimeters [mm] x0.03937 =inches<br>meters [m] x3.281 =feet<br>miles [mi] x1.609 =kilometers<br>kilometers [km] x0.6214 =miles |  |  | <b>Metric Cross-Sectional Areas<sup>1</sup></b>            |  |  | <b>American Wire Gauge</b>                                                                                                                                            |  |  | <b>Metric Cross-Sections Areas<sup>a</sup></b>                                                                                                |  |  | <b>American Wire Gauge</b>                       |  |  |
| <b>Torque</b><br>Newtonmeter [Nm] x0.738 =lb-ft<br>lb-ft x1.356 =Nm<br>lb-in x0.113 =Nm<br>oz-in x0.0071 =Nm                                                                      |  |  | <b>Power</b><br>kilowatt [kW] x1.341 =hp<br>hp x0.7457 =kW |  |  | <b>Moment of Inertia (WR<sup>2</sup>)</b><br>lb-ft <sup>2</sup> x0.042 =kgm <sup>2</sup><br>kilogrammeter <sup>2</sup> 23.720 =lb-ft <sup>2</sup> [kgm <sup>2</sup> ] |  |  | <b>Weight Mass and Force</b><br>Newton [N] x0.02248 =pounds<br>kilogram [kg] x2.205 =pounds<br>pound [lb] x4.448 =N<br>pound [lb] x0.4536 =kg |  |  |                                                  |  |  |
| <b>Cross-Sectional Area</b><br>mm <sup>2</sup>                                                                                                                                    |  |  | <b>Equivalent Metric Area</b><br>mm <sup>2</sup>           |  |  | <b>AWG or MCM</b>                                                                                                                                                     |  |  | <b>Cross-Sectional Area</b><br>mm <sup>2</sup>                                                                                                |  |  | <b>Equivalent Metric Area</b><br>mm <sup>2</sup> |  |  |
| 0.50                                                                                                                                                                              |  |  | 0.519                                                      |  |  | 20 AWG                                                                                                                                                                |  |  | 25.0                                                                                                                                          |  |  | 21.15                                            |  |  |
| 0.75                                                                                                                                                                              |  |  | 0.653                                                      |  |  | 19                                                                                                                                                                    |  |  | 35.0                                                                                                                                          |  |  | 26.67                                            |  |  |
|                                                                                                                                                                                   |  |  | 0.823                                                      |  |  | 18                                                                                                                                                                    |  |  |                                                                                                                                               |  |  | 33.63                                            |  |  |
|                                                                                                                                                                                   |  |  |                                                            |  |  |                                                                                                                                                                       |  |  |                                                                                                                                               |  |  | 42.41                                            |  |  |
|                                                                                                                                                                                   |  |  |                                                            |  |  |                                                                                                                                                                       |  |  | 50.0                                                                                                                                          |  |  | 53.48                                            |  |  |
| 1.5                                                                                                                                                                               |  |  | 1.04                                                       |  |  | 17                                                                                                                                                                    |  |  | 70.0                                                                                                                                          |  |  | 67.43                                            |  |  |
|                                                                                                                                                                                   |  |  | 1.31                                                       |  |  | 16                                                                                                                                                                    |  |  |                                                                                                                                               |  |  | 85.03                                            |  |  |
|                                                                                                                                                                                   |  |  |                                                            |  |  |                                                                                                                                                                       |  |  | 95.0                                                                                                                                          |  |  |                                                  |  |  |
| 2.5                                                                                                                                                                               |  |  | 1.65                                                       |  |  | 15                                                                                                                                                                    |  |  |                                                                                                                                               |  |  |                                                  |  |  |
|                                                                                                                                                                                   |  |  | 2.08                                                       |  |  | 14                                                                                                                                                                    |  |  |                                                                                                                                               |  |  |                                                  |  |  |
|                                                                                                                                                                                   |  |  |                                                            |  |  |                                                                                                                                                                       |  |  |                                                                                                                                               |  |  |                                                  |  |  |
|                                                                                                                                                                                   |  |  | 2.62                                                       |  |  | 13                                                                                                                                                                    |  |  |                                                                                                                                               |  |  |                                                  |  |  |
|                                                                                                                                                                                   |  |  |                                                            |  |  |                                                                                                                                                                       |  |  | 120.0                                                                                                                                         |  |  | 107.20                                           |  |  |
| 4.0                                                                                                                                                                               |  |  | 3.31                                                       |  |  | 12                                                                                                                                                                    |  |  | 150.0                                                                                                                                         |  |  | 126.64                                           |  |  |
|                                                                                                                                                                                   |  |  | 4.17                                                       |  |  | 11                                                                                                                                                                    |  |  |                                                                                                                                               |  |  | 152.00                                           |  |  |
|                                                                                                                                                                                   |  |  | 5.26                                                       |  |  | 10                                                                                                                                                                    |  |  | 185.0                                                                                                                                         |  |  | 177.35                                           |  |  |
|                                                                                                                                                                                   |  |  |                                                            |  |  |                                                                                                                                                                       |  |  | 240.0                                                                                                                                         |  |  | 202.71                                           |  |  |
| 6.0                                                                                                                                                                               |  |  | 6.63                                                       |  |  | 9                                                                                                                                                                     |  |  |                                                                                                                                               |  |  | 253.35                                           |  |  |
|                                                                                                                                                                                   |  |  | 8.37                                                       |  |  | 8                                                                                                                                                                     |  |  | 300.0                                                                                                                                         |  |  |                                                  |  |  |
|                                                                                                                                                                                   |  |  |                                                            |  |  |                                                                                                                                                                       |  |  | 400.0                                                                                                                                         |  |  | 380.00                                           |  |  |
| 10.0                                                                                                                                                                              |  |  | 10.55                                                      |  |  | 7                                                                                                                                                                     |  |  | 500.0                                                                                                                                         |  |  | 506.71                                           |  |  |
|                                                                                                                                                                                   |  |  | 13.30                                                      |  |  | 6                                                                                                                                                                     |  |  |                                                                                                                                               |  |  |                                                  |  |  |
| 16.0                                                                                                                                                                              |  |  | 16.77                                                      |  |  | 5                                                                                                                                                                     |  |  | 625.0                                                                                                                                         |  |  |                                                  |  |  |

As per IEC Publ. 228



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Электрон  
Связь**

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