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ISO 9001:2008 CERTIFICATE



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New Products and Promotions

Serving the Automation & Control Industry Since 1984

Circuit Protection



Connectors



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Altech Corp.®

Serving the Automation & Control Industry since 1984



Quality Endorsed Company



22 & 30mm Push Buttons & Control Stations

Altech Corporation
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 Flemington, NJ 08822-6000
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 www.altechcorp.com



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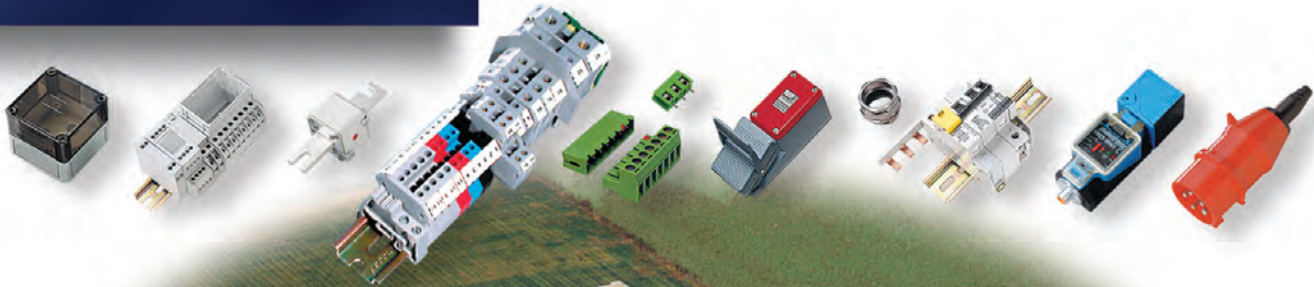
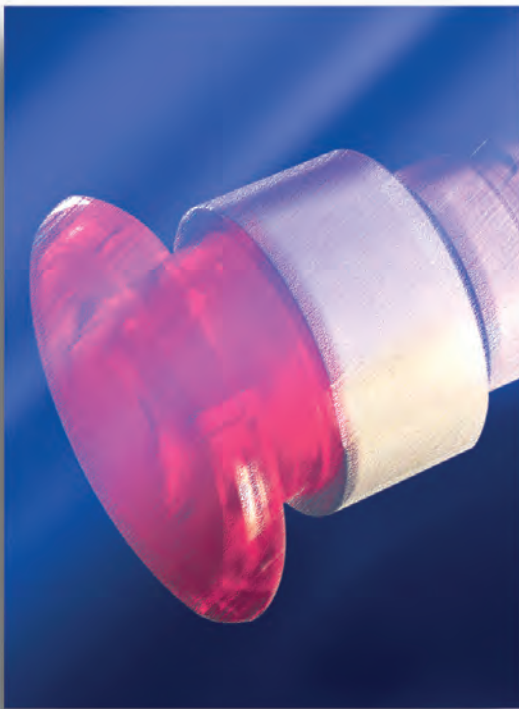
Altech Corporation

Since 1984, Altech Corporation has grown to become a leading supplier of automation and industrial control components. Headquartered in Flemington, NJ, Altech has an experienced staff of engineering, manufacturing and sales personnel to provide the highest quality products with superior service. This is the Altech Commitment!

Altech 22 and 30mm Push Buttons offer ideal cost-effective solutions for control circuits utilizing both direct and remote management applications. Ease of assembly has been engineered into the design; the only tool necessary for installation is a screwdriver.

- LED Indicating Devices
- Pilot Lights
- Push Button Stations
- Push Button Enclosures
- UL Recognized
- Custom Push Button Assemblies
- All Very Competitively Priced

Our well trained technical experts welcome the opportunity to answer your technical questions and provide solutions to your automation and control needs. Give us a call or visit www.altechcorp.com.



Quality Commitment

Altech's control components meet diverse national and international standards such as UL, NEC, CSA, IEC, VDE and more. Altech provides superior customer service and delivery through Total Quality Management and Continuous Process Improvement.

Altech is ISO 9001 approved. We perform these services with honesty and integrity and are committed to achieve these goals.

Table of Contents

22mm Push Buttons

| | |
|---|--|
| | Introduction - 4-5 |
|  | 22mm Non-Illuminated Metal Operators 6-7 |
|  | 22mm Non-Illuminated Mushroom Metal Operators 8-11 |
|  | 22mm LED Illuminated Mushroom Metal Operators 12-13 |
|  | 22mm Twin Touch Non-Illuminated and LED Illuminated Metal Operators 14-15 |
|  | 22mm Non-Illuminated Metal Selector Switch Operators 16-17 |
|  | 22mm LED Illuminated Metal Selector Switches 18-19 |
|  | 22mm LED Illuminated Projecting Metal Operator 20-21 |
|  | 22mm LED Illuminated Flush Metal Operators 22-23 |
|  | 22mm LED Metal Pilot Lights 24 |
| | 22mm Specifications - 25 |
|  | Economy Non-Illuminated Plastic Push Buttons 26-27 |
|  | Unibody LED Illuminated Plastic Pilot Lights 28-29 |



22mm Plastic Enclosures, Control Boxes & Installation Instructions 30-35



22mm Aluminum Enclosures 36-37

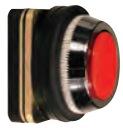
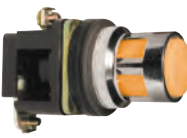

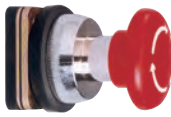





22mm Push Button Accessories & Switch Contacts 38-41



Pre-assembled or Ready to Assemble Control Stations 42-43

30mm Metal Push Buttons

| | |
|--|---|
| | Introduction - 44 |
|  | 30mm Non-Illuminated Metal Operators 44-45 |
|  | 30mm LED Illuminated Metal Operators 46-47 |
|  | 30mm Non-Illuminated Metal Selector Switches 48-49 |
|  | 30mm Non-Illuminated Mushroom Metal Operators 50-51 |
|  | 30mm Metal Pilot Lights 52 |
|  | 30mm Aluminum Enclosures 53 |
|  | 30mm Push Button Accessories, Contact Blocks & Technical Notes 54-56 |
| | Index - 57-60 |
| | Terms and Conditions - 62 |

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

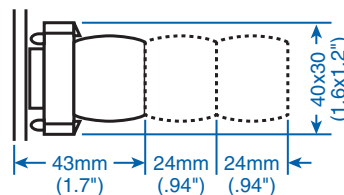
Actuators

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.

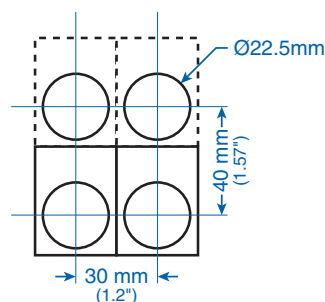
Terminals

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

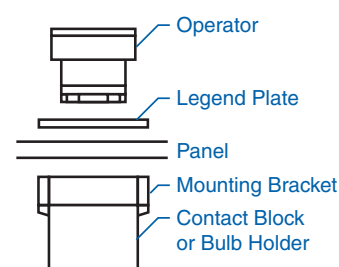
Mounting

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



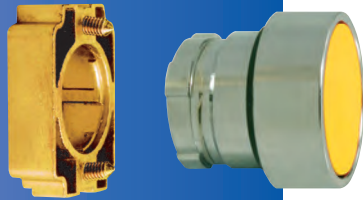
22mm Non-Illuminated Metal Operators



Certified for
NEMA Type 4X
12 environment.

Flush

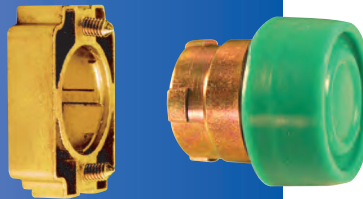
*Momentary
with mounting bracket*



| Color | Cat No. |
|--|---------|
| <input type="checkbox"/> White | 2AF1 |
| <input checked="" type="checkbox"/> Black | 2AF2 |
| <input checked="" type="checkbox"/> Green | 2AF3 |
| <input checked="" type="checkbox"/> Red | 2AF4 |
| <input checked="" type="checkbox"/> Blue | 2AF6 |
| <input checked="" type="checkbox"/> Yellow | 2AF8 |

Booted

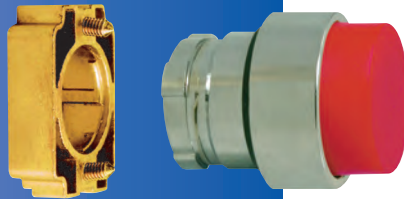
*Momentary
with mounting bracket*



| Color | Cat No. |
|--|---------|
| <input type="checkbox"/> White | 2AB1 |
| <input checked="" type="checkbox"/> Black | 2AB2 |
| <input checked="" type="checkbox"/> Green | 2AB3 |
| <input checked="" type="checkbox"/> Red | 2AB4 |
| <input checked="" type="checkbox"/> Blue | 2AB6 |
| <input checked="" type="checkbox"/> Yellow | 2AB8 |

Projecting

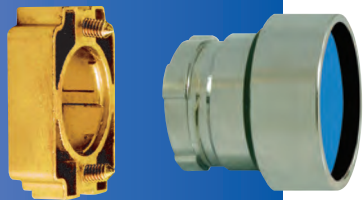
*Momentary
with mounting bracket*



| Color | Cat No. |
|--|---------|
| <input type="checkbox"/> White | 2AP1 |
| <input checked="" type="checkbox"/> Black | 2AP2 |
| <input checked="" type="checkbox"/> Green | 2AP3 |
| <input checked="" type="checkbox"/> Red | 2AP4 |
| <input checked="" type="checkbox"/> Blue | 2AP6 |
| <input checked="" type="checkbox"/> Yellow | 2AP8 |

Recessed

*Momentary
with mounting bracket*



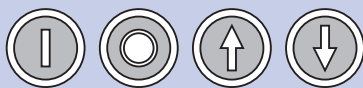
| Color | Cat No. |
|--|---------|
| <input type="checkbox"/> White | 2AF1RH |
| <input checked="" type="checkbox"/> Black | 2AF2RH |
| <input checked="" type="checkbox"/> Green | 2AF3RH |
| <input checked="" type="checkbox"/> Red | 2AF4RH |
| <input checked="" type="checkbox"/> Blue | 2AF6RH |
| <input checked="" 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.

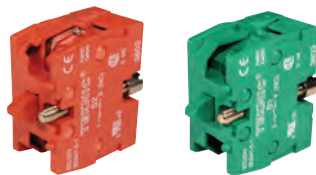


Markings on Request



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

Base Mount*

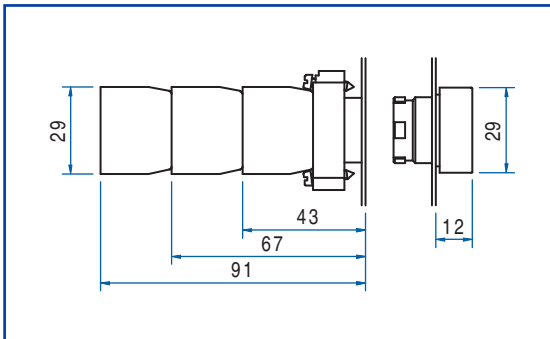
| | |
|-----------------------------|-----------|
| Normally Open Silver | S5 |
| Normally Closed Silver | S6 |
| Normally Open Gold Plated | S7 |
| Normally Closed Gold Plated | S8 |

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

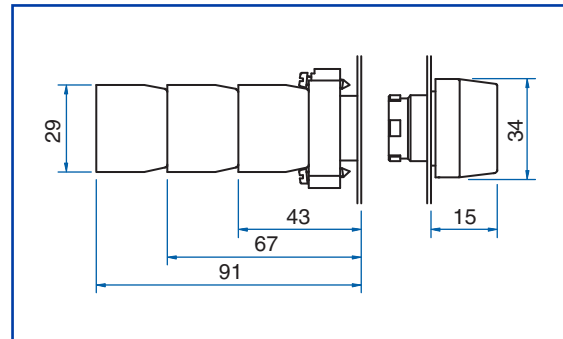
Dimensional Drawings

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

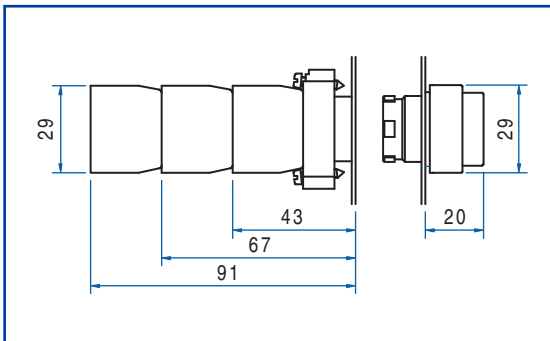
Non-Illuminated Flush



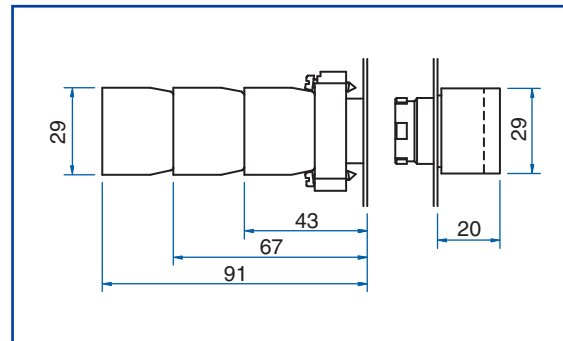
Non-Illuminated Booted



Non-Illuminated Projecting

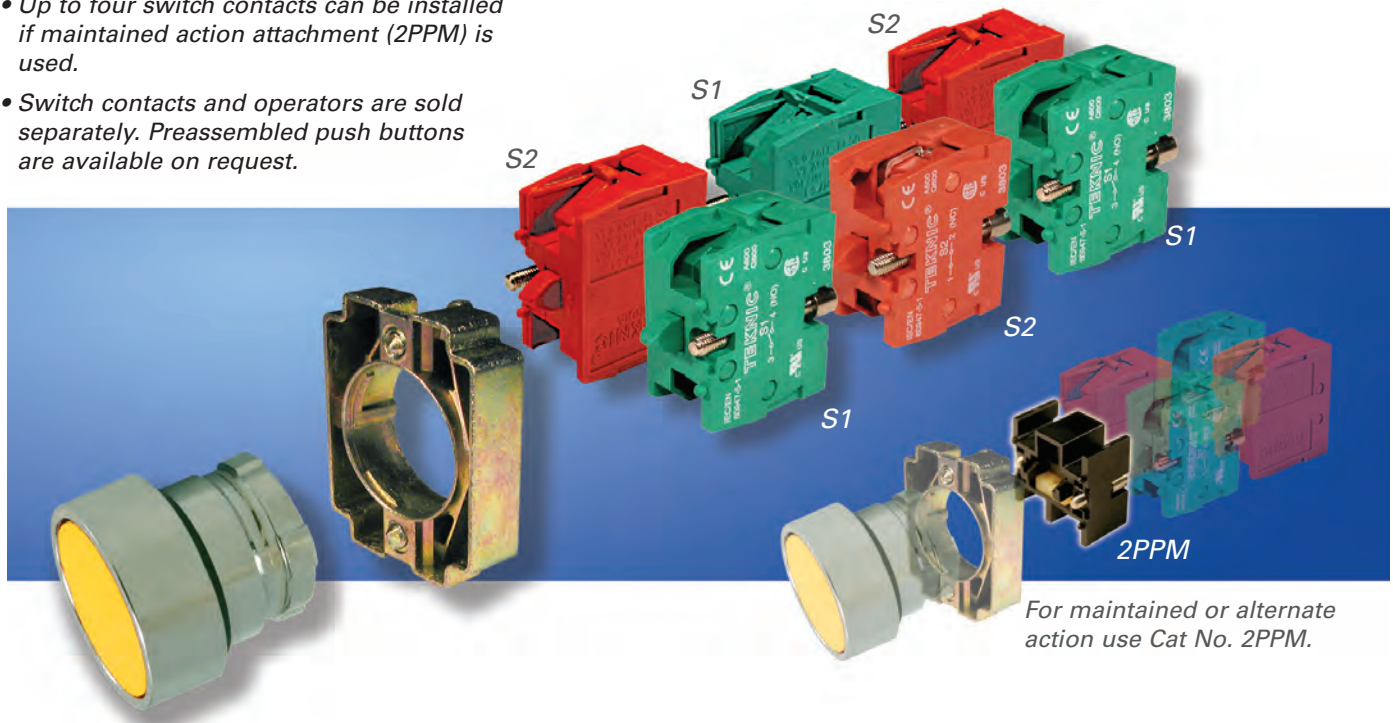


Non-Illuminated Recessed



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 or alternate action use Cat No. 2PPM.

22mm Non-Illuminated Mushroom Metal Operators



Certified for
NEMA Type 4X
12 environment.

Mushroom

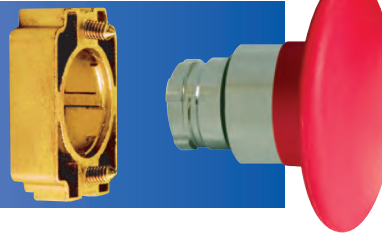
*Momentary
with mounting bracket*



| 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

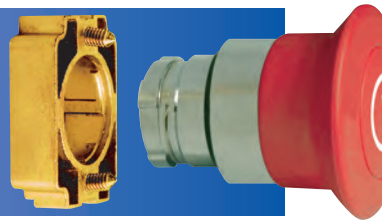
*Momentary Large
with mounting bracket*



| 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

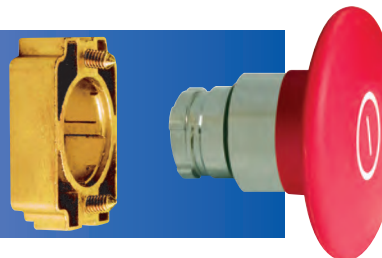
*Push-Pull
with mounting bracket*



| 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 |

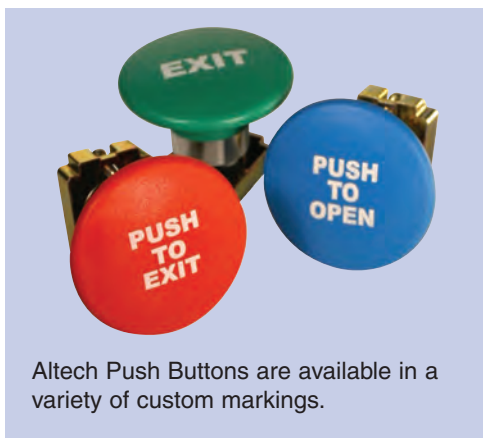
Mushroom

*Push-Pull Large
with mounting bracket*



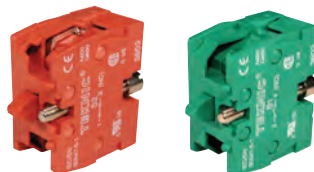
| Color | Description | Cat No. |
|----------|-------------|---------|
| □ White | 60mm, Head | 2AMPPJ1 |
| ■ Black | 60mm, Head | 2AMPPJ2 |
| ■ Green | 60mm, Head | 2AMPPJ3 |
| ■ Red | 60mm, Head | 2AMPPJ4 |
| ■ Blue | 60mm, Head | 2AMPPJ6 |
| ■ Yellow | 60mm, Head | 2AMPPJ8 |

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

Base Mount*

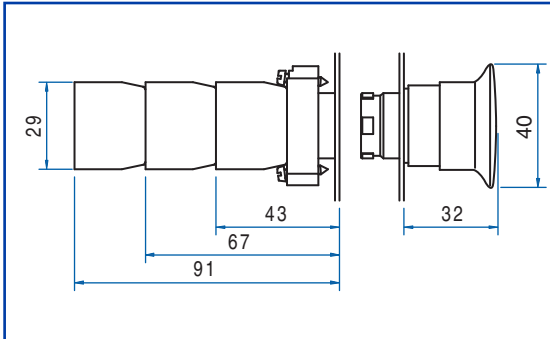
| | |
|-----------------------------|-----------|
| Normally Open Silver | S5 |
| Normally Closed Silver | S6 |
| Normally Open Gold Plated | S7 |
| Normally Closed Gold Plated | S8 |

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

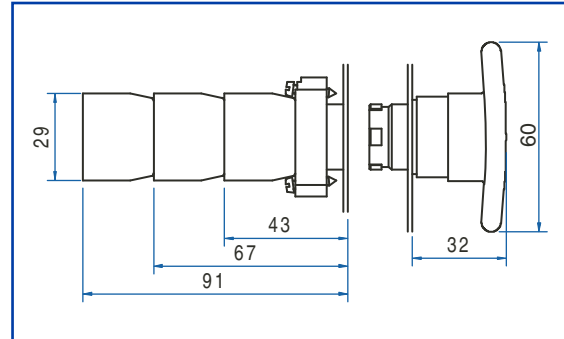
Dimensional Drawings

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

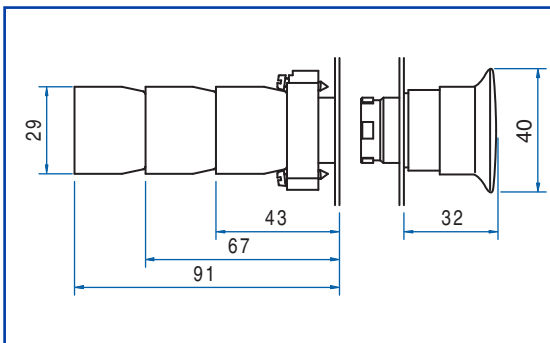
Mushroom Momentary



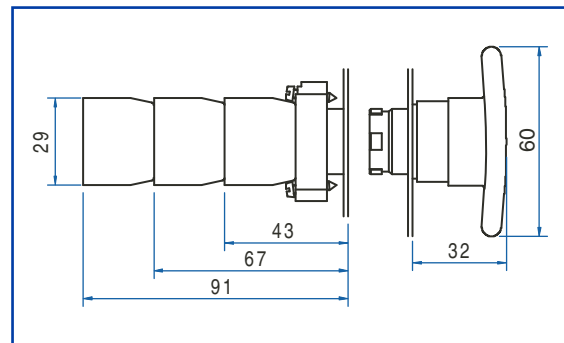
Mushroom Momentary Large



Mushroom Push-Pull

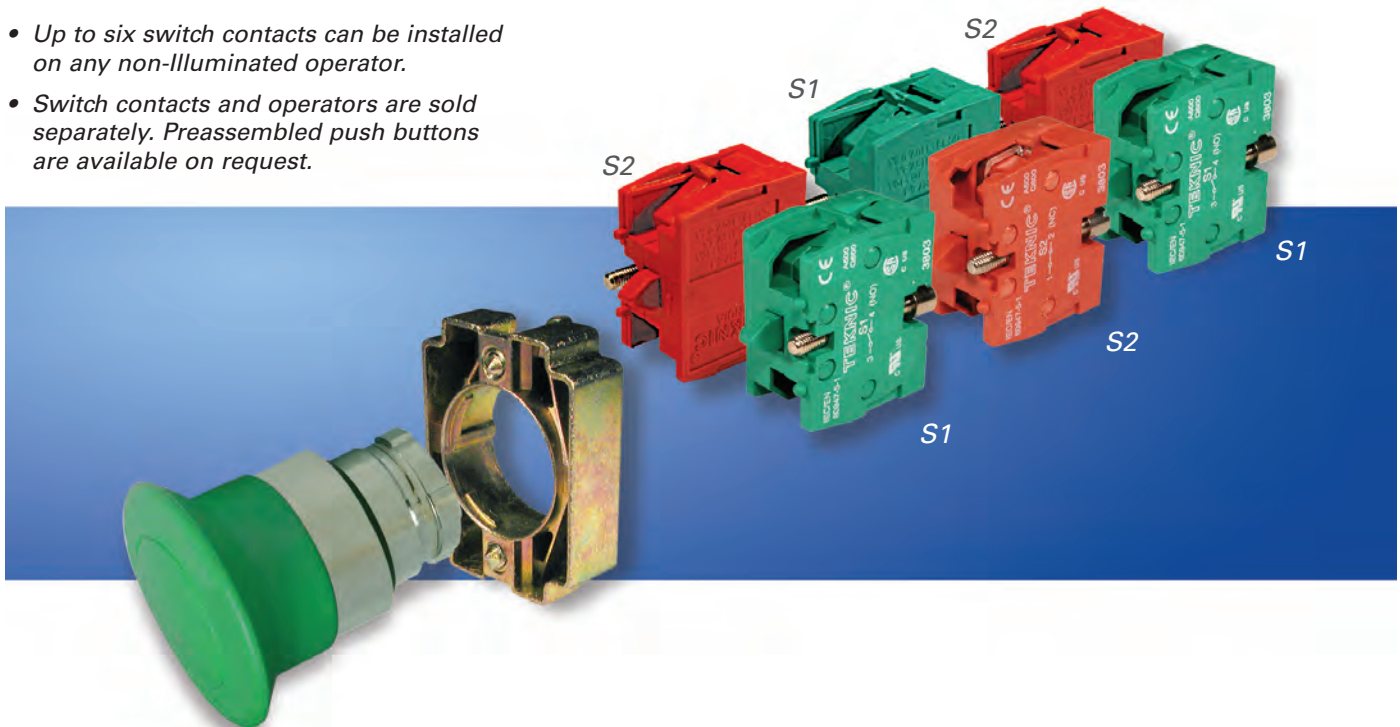


Mushroom Push-Pull Large



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.

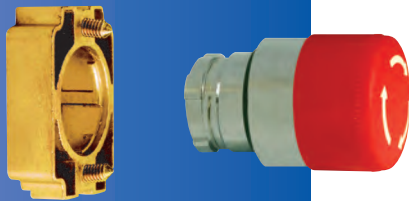


22mm Non-Illuminated Mushroom Metal Operators



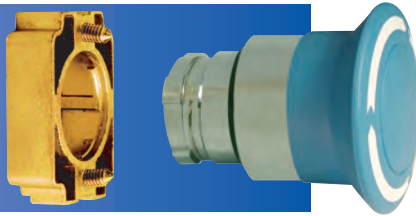
Certified for
NEMA Type 4X
12 environment.

Mushroom
Push-Turn Small
with mounting bracket



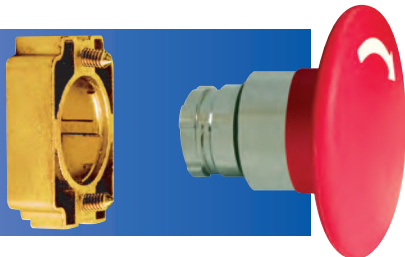
| Color | Description | Cat No. |
|----------|-------------|---------|
| □ White | 30 mm, Head | 2AMLS1 |
| ■ Black | 30 mm, Head | 2AMLS2 |
| ■ Green | 30 mm, Head | 2AMLS3 |
| ■ Red | 30 mm, Head | 2AMLS4 |
| ■ Blue | 30 mm, Head | 2AMLS6 |
| ■ Yellow | 30 mm, Head | 2AMLS8 |

Mushroom
Push-Turn
with mounting bracket



| Color | Description | Cat No. |
|----------|-------------|---------|
| □ White | 40mm, Head | 2AML1 |
| ■ Black | 40mm, Head | 2AML2 |
| ■ Green | 40mm, Head | 2AML3 |
| ■ Red | 40mm, Head | 2AML4 |
| ■ Blue | 40mm, Head | 2AML6 |
| ■ Yellow | 40mm, Head | 2AML8 |

Mushroom
Push-Turn Large
with mounting bracket



| Color | Description | Cat No. |
|----------|-------------|---------|
| □ White | 60mm, Head | 2AMLJ1 |
| ■ Black | 60mm, Head | 2AMLJ2 |
| ■ Green | 60mm, Head | 2AMLJ3 |
| ■ Red | 60mm, Head | 2AMLJ4 |
| ■ Blue | 60mm, Head | 2AMLJ6 |
| ■ Yellow | 60mm, Head | 2AMLJ8 |

Mushroom
with Key Release
with mounting bracket



| Color | Description | Cat No. |
|----------|-------------|---------|
| □ White | 40mm, Head | 2AMLKB1 |
| ■ Black | 40mm, Head | 2AMLKB2 |
| ■ Green | 40mm, Head | 2AMLKB3 |
| ■ Red | 40mm, Head | 2AMLKB4 |
| ■ Blue | 40mm, Head | 2AMLKB6 |
| ■ Yellow | 40mm, Head | 2AMLKB8 |

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



Replacement Key

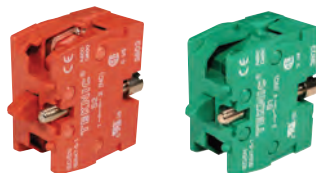
2KY455

Markings on Request



Altech Push Buttons are available in a variety of custom markings.

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

Base Mount*

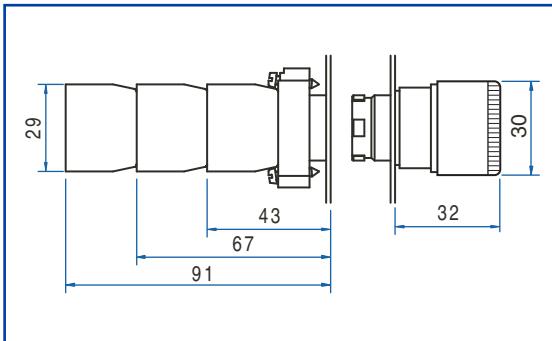
| | |
|-----------------------------|-----------|
| Normally Open Silver | S5 |
| Normally Closed Silver | S6 |
| Normally Open Gold Plated | S7 |
| Normally Closed Gold Plated | S8 |

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

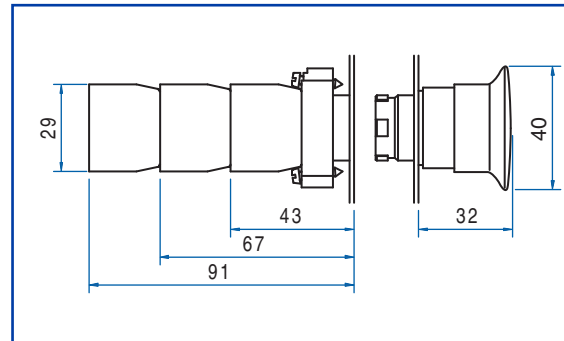
Dimensional Drawings

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

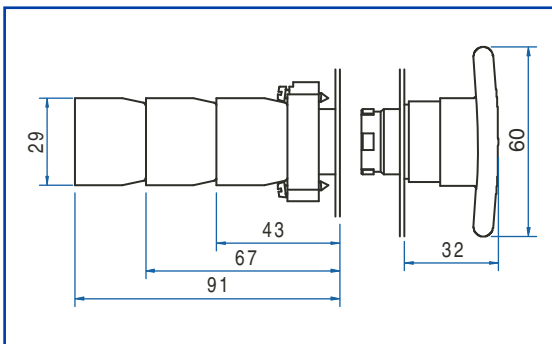
Mushroom Push-Turn Small



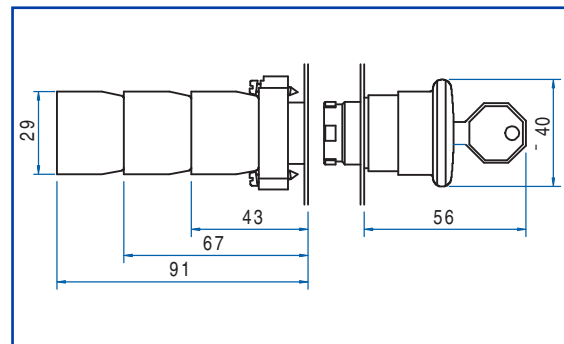
Mushroom Push-Turn



Mushroom Push-Turn Large

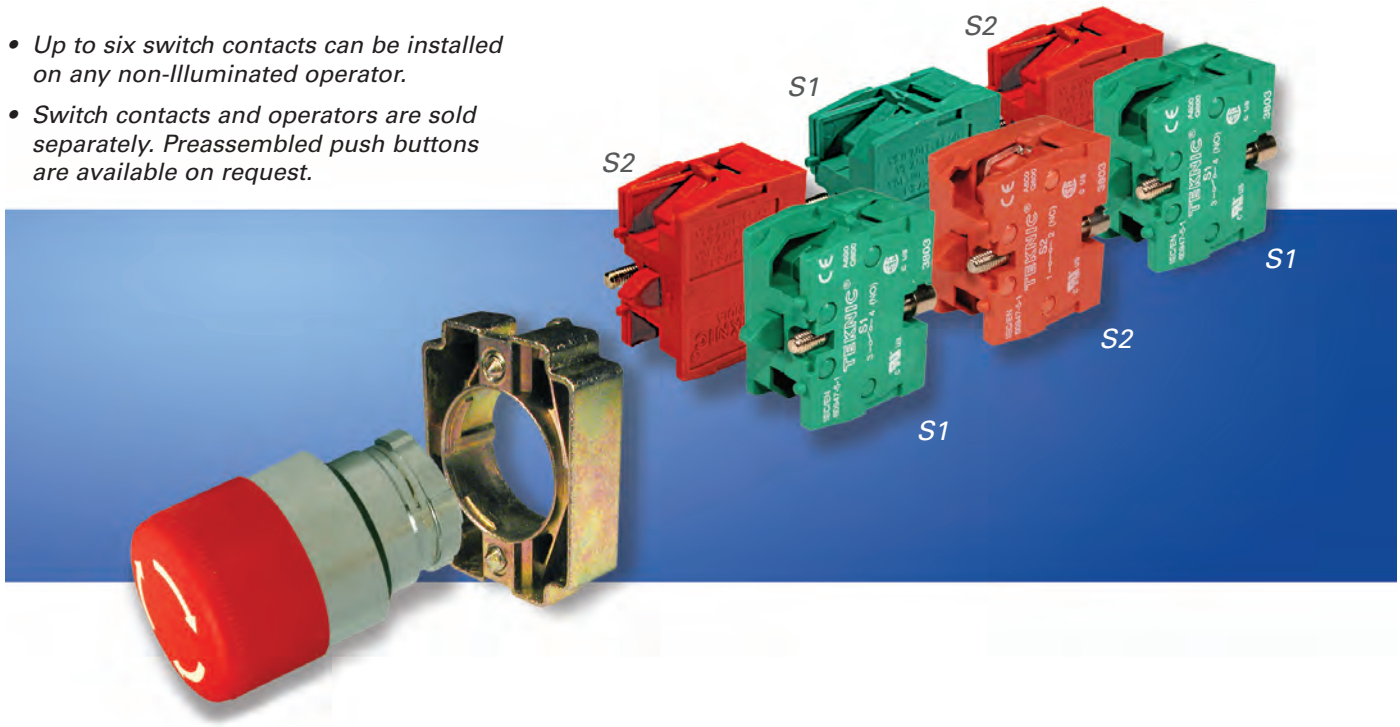


Mushroom with Key Release



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.



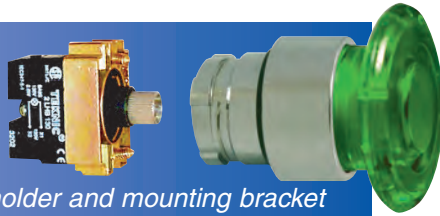
22mm LED Illuminated Mushroom Metal Operators



Certified for
NEMA Type 4X
12 environment.

Mushroom Illuminated Momentary

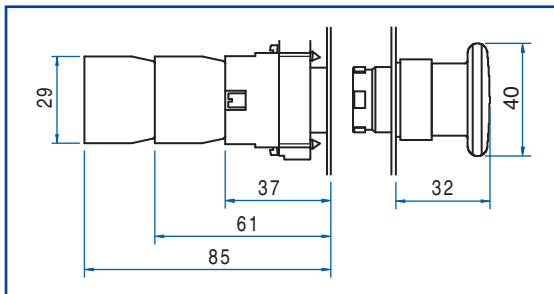
with LED bulb, bulb holder and mounting bracket



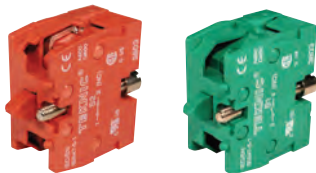
Dimensional Drawings

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 | 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.

Color Description Cat No.

12V AC/DC

| | | | |
|--------------------------|--------|---------------------|-------------|
| <input type="checkbox"/> | White | 40mm Head, 12VAC/DC | 2ALM1LB-012 |
| <input type="checkbox"/> | Green | 40mm Head, 12VAC/DC | 2ALM3LB-012 |
| <input type="checkbox"/> | Red | 40mm Head, 12VAC/DC | 2ALM4LB-012 |
| <input type="checkbox"/> | Amber | 40mm Head, 12VAC/DC | 2ALM5LB-012 |
| <input type="checkbox"/> | Blue | 40mm Head, 12VAC/DC | 2ALM6LB-012 |
| <input type="checkbox"/> | Clear | 40mm Head, 12VAC/DC | 2ALM7LB-012 |
| <input type="checkbox"/> | Yellow | 40mm Head, 12VAC/DC | 2ALM8LB-012 |

24V AC/DC

| | | | |
|--------------------------|--------|---------------------|-------------|
| <input type="checkbox"/> | White | 40mm Head, 24VAC/DC | 2ALM1LB-024 |
| <input type="checkbox"/> | Green | 40mm Head, 24VAC/DC | 2ALM3LB-024 |
| <input type="checkbox"/> | Red | 40mm Head, 24VAC/DC | 2ALM4LB-024 |
| <input type="checkbox"/> | Amber | 40mm Head, 24VAC/DC | 2ALM5LB-024 |
| <input type="checkbox"/> | Blue | 40mm Head, 24VAC/DC | 2ALM6LB-024 |
| <input type="checkbox"/> | Clear | 40mm Head, 24VAC/DC | 2ALM7LB-024 |
| <input type="checkbox"/> | Yellow | 40mm Head, 24VAC/DC | 2ALM8LB-024 |

48V AC/DC

| | | | |
|--------------------------|--------|---------------------|-------------|
| <input type="checkbox"/> | White | 40mm Head, 48VAC/DC | 2ALM1LB-048 |
| <input type="checkbox"/> | Green | 40mm Head, 48VAC/DC | 2ALM3LB-048 |
| <input type="checkbox"/> | Red | 40mm Head, 48VAC/DC | 2ALM4LB-048 |
| <input type="checkbox"/> | Amber | 40mm Head, 48VAC/DC | 2ALM5LB-048 |
| <input type="checkbox"/> | Blue | 40mm Head, 48VAC/DC | 2ALM6LB-048 |
| <input type="checkbox"/> | Clear | 40mm Head, 48VAC/DC | 2ALM7LB-048 |
| <input type="checkbox"/> | Yellow | 40mm Head, 48VAC/DC | 2ALM8LB-048 |

110V AC*

| | | | |
|--------------------------|--------|--------------------|-------------|
| <input type="checkbox"/> | White | 40mm Head, 110VAC* | 2ALM1LB-110 |
| <input type="checkbox"/> | Green | 40mm Head, 110VAC* | 2ALM3LB-110 |
| <input type="checkbox"/> | Red | 40mm Head, 110VAC* | 2ALM4LB-110 |
| <input type="checkbox"/> | Amber | 40mm Head, 110VAC* | 2ALM5LB-110 |
| <input type="checkbox"/> | Blue | 40mm Head, 110VAC* | 2ALM6LB-110 |
| <input type="checkbox"/> | Clear | 40mm Head, 110VAC* | 2ALM7LB-110 |
| <input type="checkbox"/> | Yellow | 40mm Head, 110VAC* | 2ALM8LB-110 |

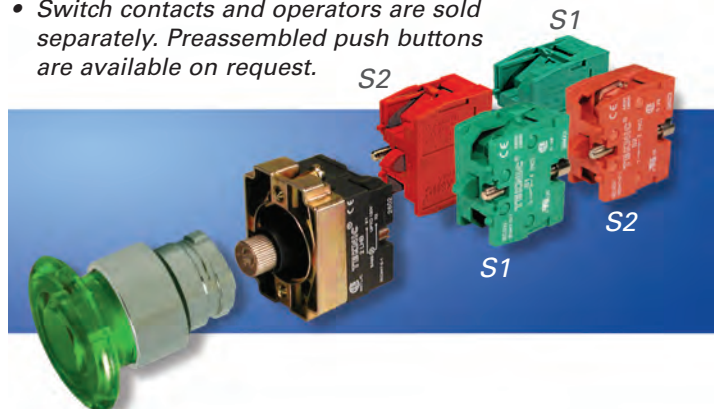
230V AC*

| | | | |
|--------------------------|--------|--------------------|-------------|
| <input type="checkbox"/> | White | 40mm Head, 230VAC* | 2ALM1LB-230 |
| <input type="checkbox"/> | Green | 40mm Head, 230VAC* | 2ALM3LB-230 |
| <input type="checkbox"/> | Red | 40mm Head, 230VAC* | 2ALM4LB-230 |
| <input type="checkbox"/> | Amber | 40mm Head, 230VAC* | 2ALM5LB-230 |
| <input type="checkbox"/> | Blue | 40mm Head, 230VAC* | 2ALM6LB-230 |
| <input type="checkbox"/> | Clear | 40mm Head, 230VAC* | 2ALM7LB-230 |
| <input type="checkbox"/> | 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.



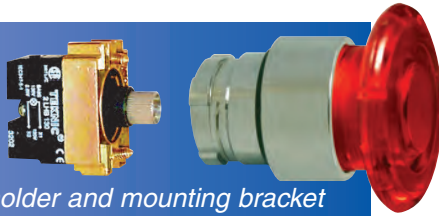
22mm LED Illuminated Mushroom Metal Operators



Certified for
NEMA Type 4X
12 environment.

Mushroom Illuminated Push-Pull

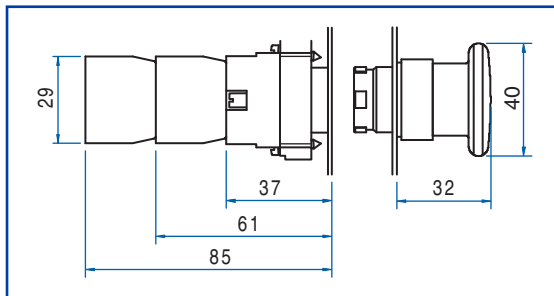
with LED bulb, bulb holder and mounting bracket



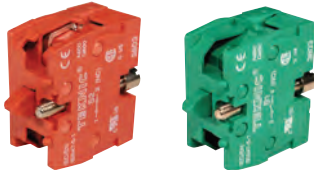
Dimensional Drawings

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 | 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.

Color Description Cat No.

12V AC/DC

| | | | |
|-------------------------------------|--------|---------------------|---------------|
| <input type="checkbox"/> | White | 40mm Head, 12VAC/DC | 2ALMPP1LB-012 |
| <input checked="" type="checkbox"/> | Green | 40mm Head, 12VAC/DC | 2ALMPP3LB-012 |
| <input checked="" type="checkbox"/> | Red | 40mm Head, 12VAC/DC | 2ALMPP4LB-012 |
| <input checked="" type="checkbox"/> | Amber | 40mm Head, 12VAC/DC | 2ALMPP5LB-012 |
| <input checked="" type="checkbox"/> | Blue | 40mm Head, 12VAC/DC | 2ALMPP6LB-012 |
| <input type="checkbox"/> | Clear | 40mm Head, 12VAC/DC | 2ALMPP7LB-012 |
| <input checked="" type="checkbox"/> | Yellow | 40mm Head, 12VAC/DC | 2ALMPP8LB-012 |

24V AC/DC

| | | | |
|-------------------------------------|--------|---------------------|---------------|
| <input type="checkbox"/> | White | 40mm Head, 24VAC/DC | 2ALMPP1LB-024 |
| <input checked="" type="checkbox"/> | Green | 40mm Head, 24VAC/DC | 2ALMPP3LB-024 |
| <input checked="" type="checkbox"/> | Red | 40mm Head, 24VAC/DC | 2ALMPP4LB-024 |
| <input checked="" type="checkbox"/> | Amber | 40mm Head, 24VAC/DC | 2ALMPP5LB-024 |
| <input checked="" type="checkbox"/> | Blue | 40mm Head, 24VAC/DC | 2ALMPP6LB-024 |
| <input type="checkbox"/> | Clear | 40mm Head, 24VAC/DC | 2ALMPP7LB-024 |
| <input checked="" type="checkbox"/> | Yellow | 40mm Head, 24VAC/DC | 2ALMPP8LB-024 |

48V AC/DC

| | | | |
|-------------------------------------|--------|---------------------|---------------|
| <input type="checkbox"/> | White | 40mm Head, 48VAC/DC | 2ALMPP1LB-048 |
| <input checked="" type="checkbox"/> | Green | 40mm Head, 48VAC/DC | 2ALMPP3LB-048 |
| <input checked="" type="checkbox"/> | Red | 40mm Head, 48VAC/DC | 2ALMPP4LB-048 |
| <input checked="" type="checkbox"/> | Amber | 40mm Head, 48VAC/DC | 2ALMPP5LB-048 |
| <input checked="" type="checkbox"/> | Blue | 40mm Head, 48VAC/DC | 2ALMPP6LB-048 |
| <input type="checkbox"/> | Clear | 40mm Head, 48VAC/DC | 2ALMPP7LB-048 |
| <input checked="" type="checkbox"/> | Yellow | 40mm Head, 48VAC/DC | 2ALMPP8LB-048 |

110V AC*

| | | | |
|-------------------------------------|--------|--------------------|---------------|
| <input type="checkbox"/> | White | 40mm Head, 110VAC* | 2ALMPP1LB-110 |
| <input checked="" type="checkbox"/> | Green | 40mm Head, 110VAC* | 2ALMPP3LB-110 |
| <input checked="" type="checkbox"/> | Red | 40mm Head, 110VAC* | 2ALMPP4LB-110 |
| <input checked="" type="checkbox"/> | Amber | 40mm Head, 110VAC* | 2ALMPP5LB-110 |
| <input checked="" type="checkbox"/> | Blue | 40mm Head, 110VAC* | 2ALMPP6LB-110 |
| <input type="checkbox"/> | Clear | 40mm Head, 110VAC* | 2ALMPP7LB-110 |
| <input checked="" type="checkbox"/> | Yellow | 40mm Head, 110VAC* | 2ALMPP8LB-110 |

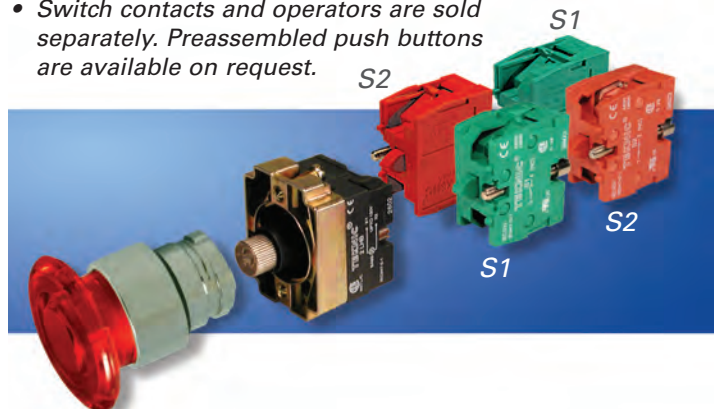
230V AC*

| | | | |
|-------------------------------------|--------|--------------------|---------------|
| <input type="checkbox"/> | White | 40mm Head, 230VAC* | 2ALMPP1LB-230 |
| <input checked="" type="checkbox"/> | Green | 40mm Head, 230VAC* | 2ALMPP3LB-230 |
| <input checked="" type="checkbox"/> | Red | 40mm Head, 230VAC* | 2ALMPP4LB-230 |
| <input checked="" type="checkbox"/> | Amber | 40mm Head, 230VAC* | 2ALMPP5LB-230 |
| <input checked="" type="checkbox"/> | Blue | 40mm Head, 230VAC* | 2ALMPP6LB-230 |
| <input type="checkbox"/> | Clear | 40mm Head, 230VAC* | 2ALMPP7LB-230 |
| <input checked="" type="checkbox"/> | 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



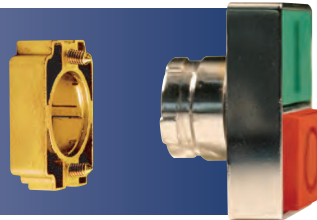
Twin Touch/ Not Marked *with mounting bracket*



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 |

Twin Touch I-O Marked *with mounting bracket*



Arrows marking available upon request.

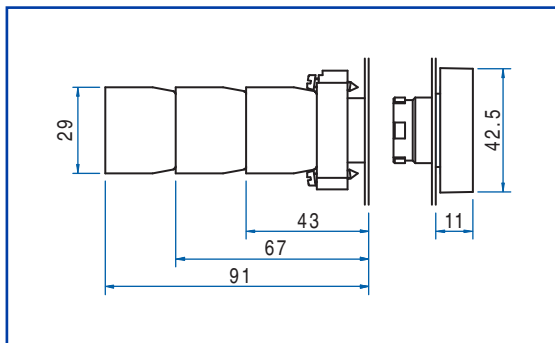
| Color | Description | Cat No. |
|-------|---|-------------|
| | GREEN-RED Flush | 2ATF3-F4-IO |
| | YELLOW-BLACK Flush | 2ATF8-F2-IO |
| | BLACK-WHITE* Flush | 2ATF2-F1-IO |
| | GREEN-RED Green Flush, Red Projecting | 2ATF3-P4-IO |
| | YELLOW-BLACK Yellow Flush, Black Projecting | 2ATF8-P2-IO |
| |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

*Comply with vision impaired requirements.

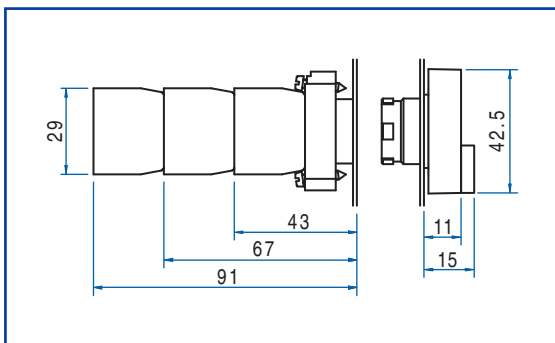
Dimensional Drawings

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

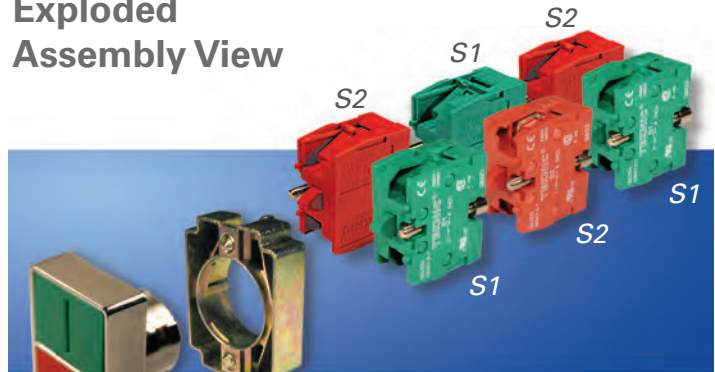
Twin Touch/ Flush



Twin Touch/ Flush/ Projecting

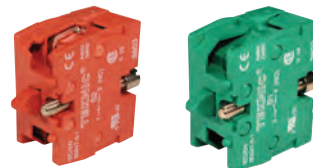


Exploded Assembly View



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

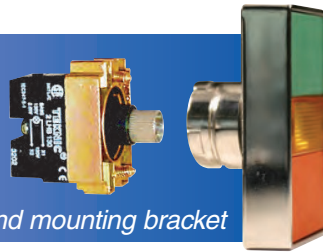
*For use with non-illuminated operators in thermoplastic or aluminum enclosures listed on pages 30 and 36-37.

22mm Twin Touch Metal LED Illuminated Operators



Illuminated Center Twin Touch/ Not Marked

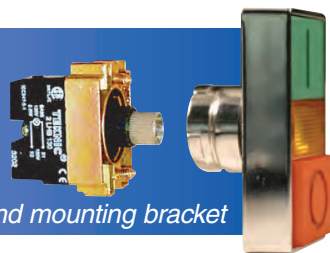
with LED bulb, bulb holder and mounting bracket



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

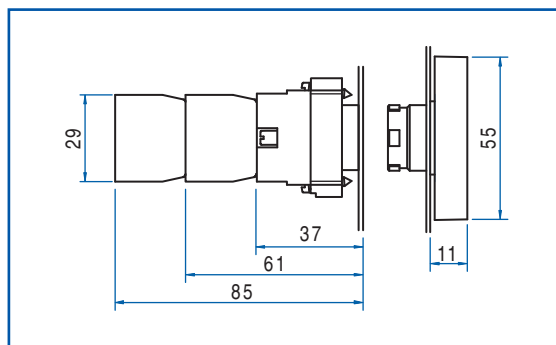


Arrows marking available upon request.
Other lense colors available upon request.

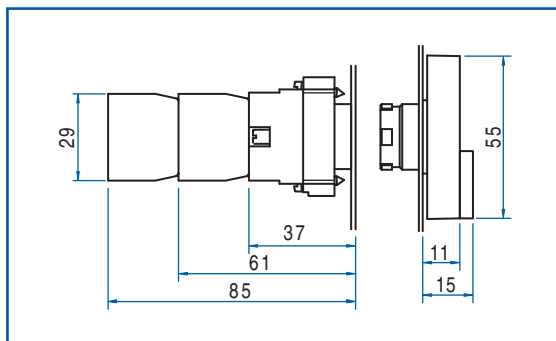
Dimensional Drawings

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 |

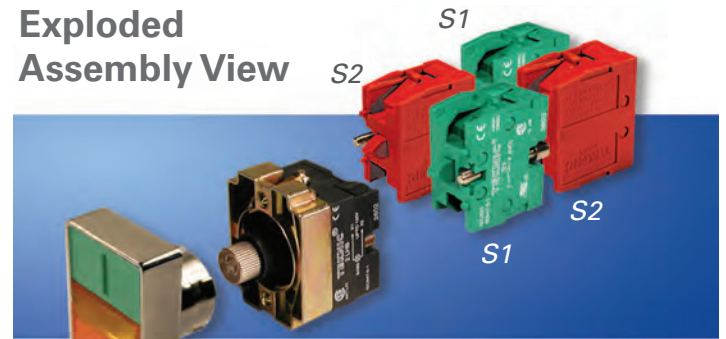
WHITE-BLACK*, Flush, Illuminated Center

| | | | |
|--|-------|----------|---------------------|
| | 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.

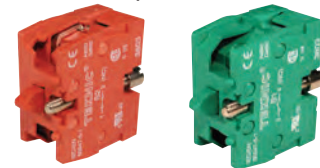
** 110V DC and 230V DC version is available on request.

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 Cat No. | Base Mount* 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

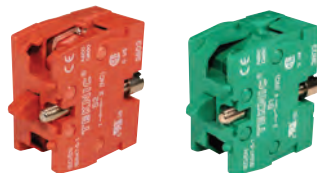
(sold separately)



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*

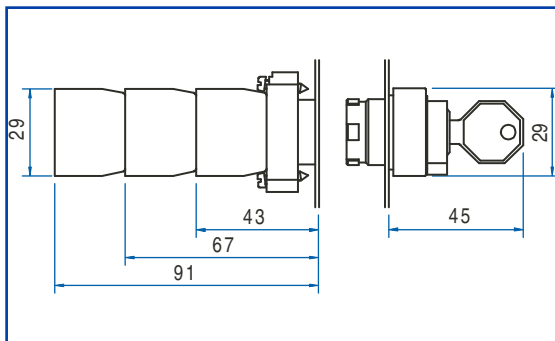
| | |
|-----------------------------|-----------|
| Normally Open Silver | S5 |
| Normally Closed Silver | S6 |
| Normally Open Gold Plated | S7 |
| Normally Closed Gold Plated | S8 |

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

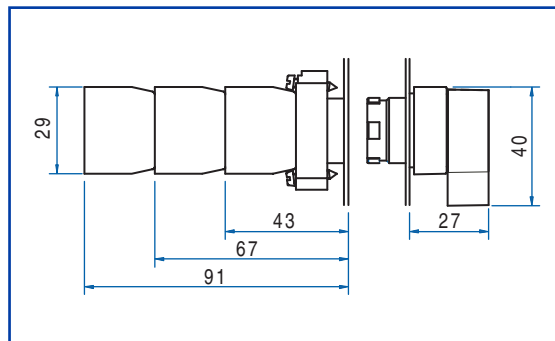
Dimensional Drawings

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

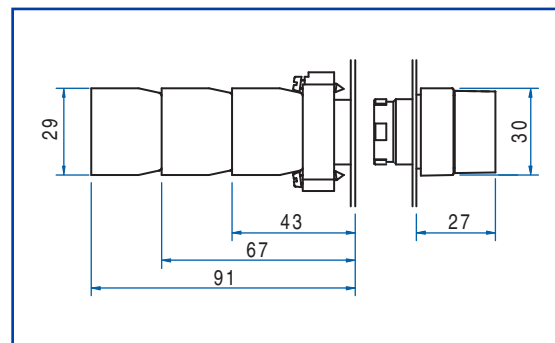
Key Selector



Extended Selector



Selector



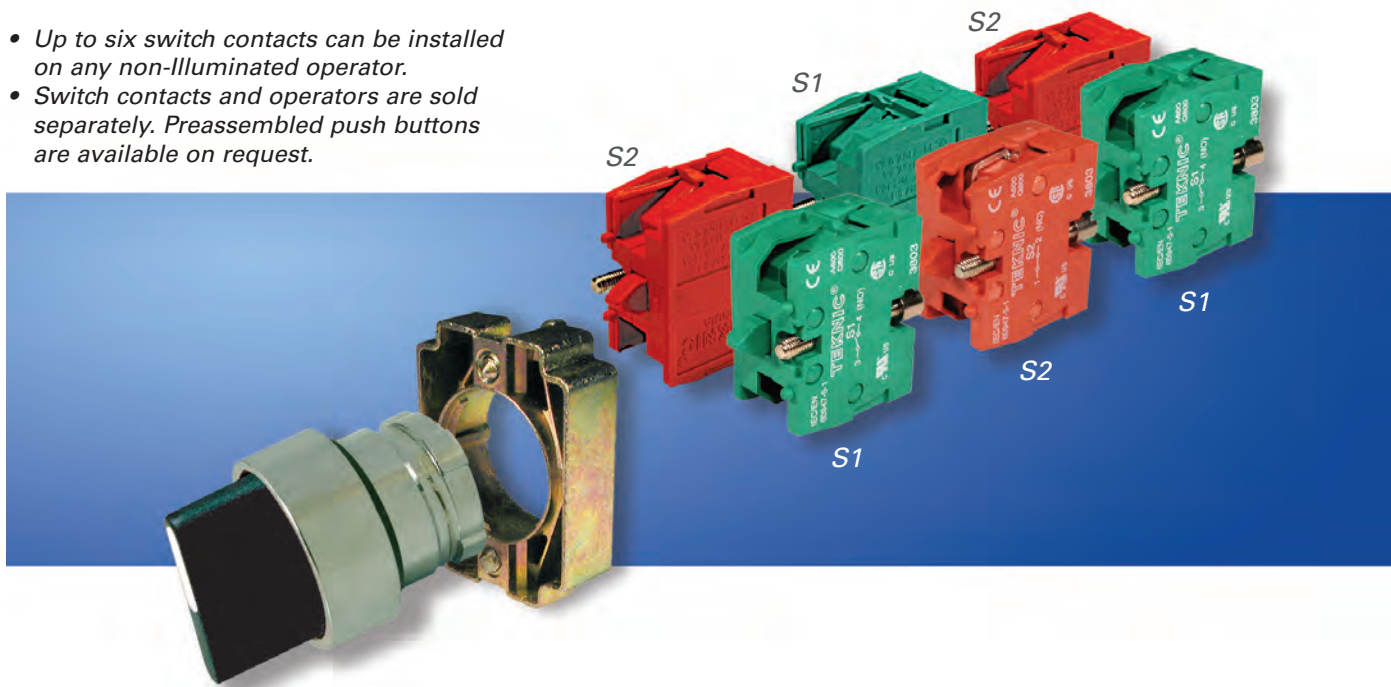
3 POSITION
SELECTOR SWITCH
CONTACT BLOCK GUIDE

| | | | 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.



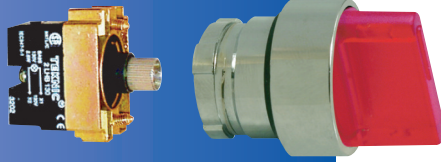
22mm LED Illuminated Metal Selector Switch Operators



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

| | | |
|------|---|-----------|
| 012 | = | 12VAC/DC |
| 024 | = | 24VAC/DC |
| 048 | = | 48VAC/DC |
| 110 | = | 110VAC/DC |
| 230 | = | 230VAC |
| 230D | = | 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 |

Dimensional Drawings

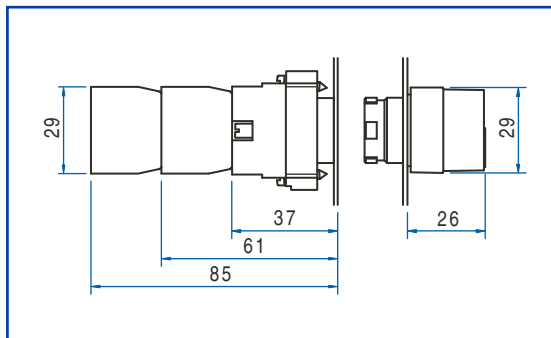
All dimensions shown in millimeters.
To convert to inches multiply by 0.03937

3 POSITION SELECTOR SWITCH CONTACT BLOCK GUIDE

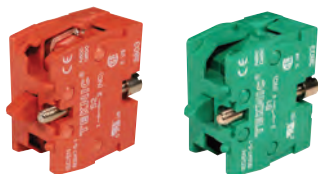
| | | | CONTACTOR BLOCK GUIDE |
|---|---|---|--------------------------------|
| x | o | o | 1 NO (left) |
| o | x | o | 2 NC in series (side x side) |
| o | o | x | 1 NO (right) |
| x | x | o | 1 NC (right) |
| o | x | x | 1 NC (left) |
| x | o | x | 2 NO in parallel (side x side) |

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

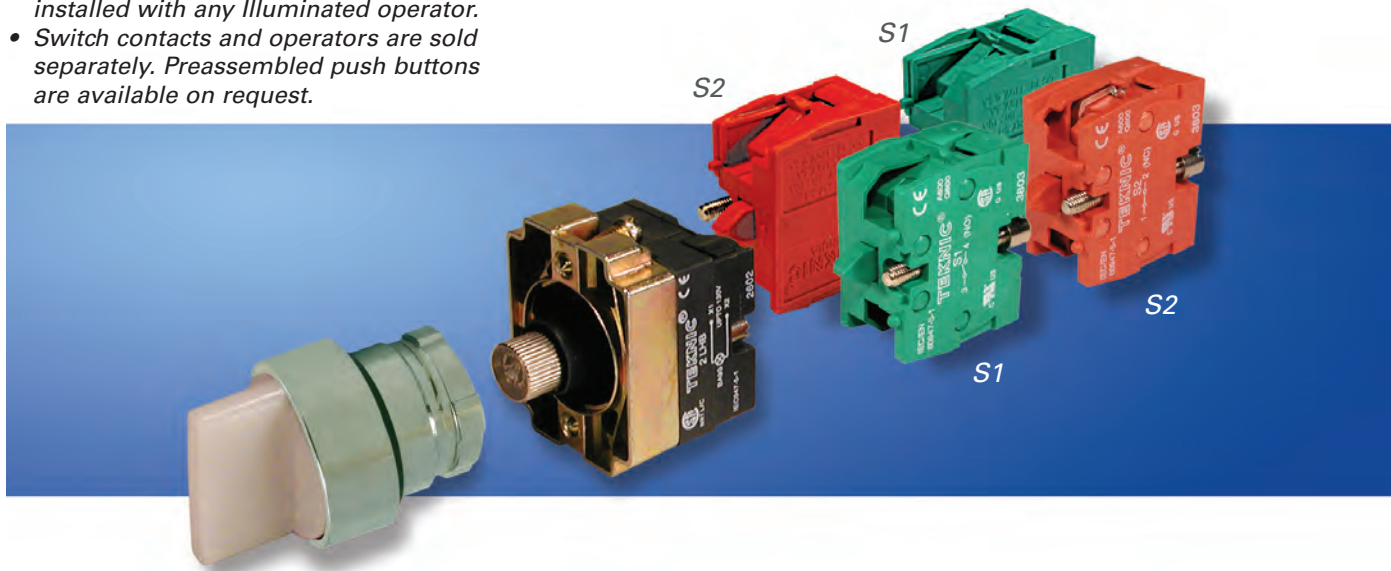
Base Mount*

| | |
|-----------------------------|-----------|
| 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.

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.



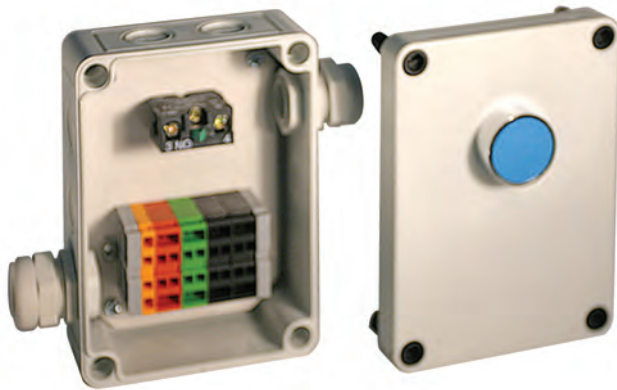
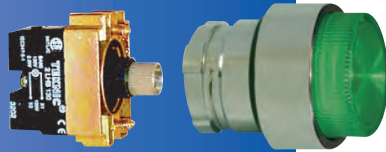
22mm LED Illuminated Metal Projecting Operators



Certified for
NEMA Type 4X
12 environment.

Projecting Momentary

with bulb, bulb holder
and mounting bracket



**SAMPLE
ASSEMBLY**



Replacement bulbs
available.
See page 39.

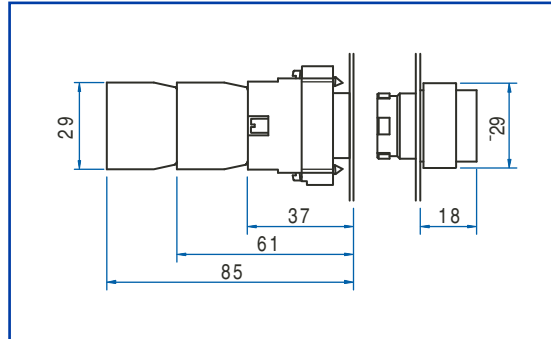
| Color | Voltage | Cat No. |
|--|-----------|--------------|
| 12V AC/DC | | |
| <input type="checkbox"/> White | 12V AC/DC | 2ALP1LB-012 |
| <input checked="" type="checkbox"/> Green | 12V AC/DC | 2ALP3LB-012 |
| <input checked="" type="checkbox"/> Red | 12V AC/DC | 2ALP4LB-012 |
| <input checked="" 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

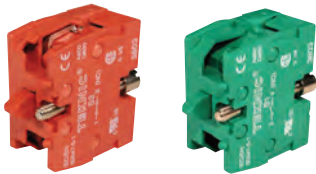
Dimensional Drawings

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

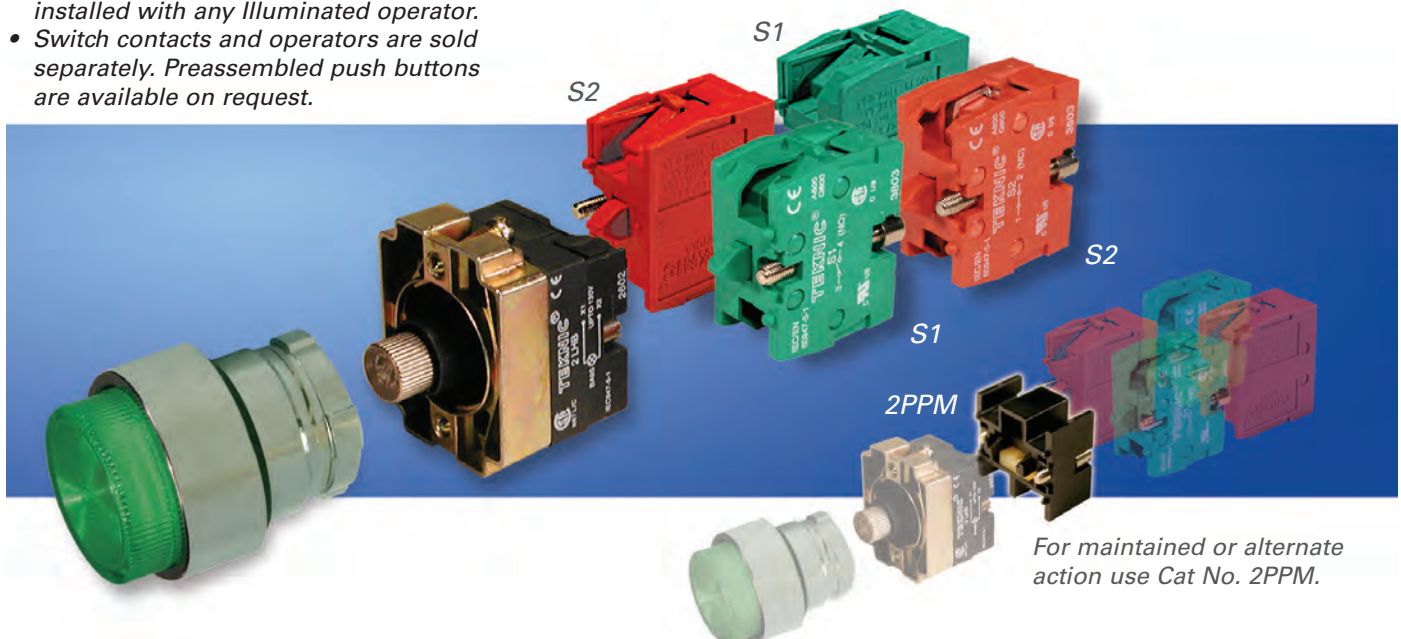
Base Mount*

| | |
|-----------------------------|-----------|
| 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.

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 or alternate action use Cat No. 2PPM.

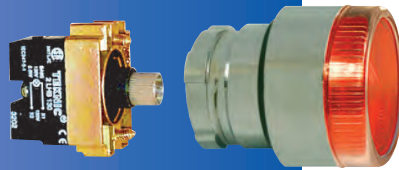
22mm LED Illuminated Metal Flush Operators



Certified for
NEMA Type 4X
12 environment.

Flush Momentary

with bulb, bulb holder and mounting bracket



SAMPLE ASSEMBLY



For installation of a metal operator in the plastic enclosure a Cat No. ADW washer is required.



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 checked="" type="checkbox"/> | Red | 12V AC/DC | 2ALF4LB-012 |
| <input checked="" type="checkbox"/> | Amber | 12V AC/DC | 2ALF5LB-012 |
| <input checked="" type="checkbox"/> | Blue | 12V AC/DC | 2ALF6LB-012 |
| <input type="checkbox"/> | Clear | 12V AC/DC | 2ALF7LB-012 |
| <input checked="" 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 checked="" type="checkbox"/> | Red | 24V AC/DC | 2ALF4LB-024 |
| <input checked="" type="checkbox"/> | Amber | 24V AC/DC | 2ALF5LB-024 |
| <input checked="" type="checkbox"/> | Blue | 24V AC/DC | 2ALF6LB-024 |
| <input type="checkbox"/> | Clear | 24V AC/DC | 2ALF7LB-024 |
| <input checked="" 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 checked="" type="checkbox"/> | Red | 48V AC/DC | 2ALF4LB-048 |
| <input checked="" type="checkbox"/> | Amber | 48V AC/DC | 2ALF5LB-048 |
| <input checked="" type="checkbox"/> | Blue | 48V AC/DC | 2ALF6LB-048 |
| <input type="checkbox"/> | Clear | 48V AC/DC | 2ALF7LB-048 |
| <input checked="" 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 checked="" type="checkbox"/> | Red | 110V AC | 2ALF4LB-110 |
| <input checked="" type="checkbox"/> | Amber | 110V AC | 2ALF5LB-110 |
| <input checked="" type="checkbox"/> | Blue | 110V AC | 2ALF6LB-110 |
| <input type="checkbox"/> | Clear | 110V AC | 2ALF7LB-110 |
| <input checked="" 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 checked="" type="checkbox"/> | Red | 110V DC | 2ALF4LB-110D |
| <input checked="" type="checkbox"/> | Amber | 110V DC | 2ALF5LB-110D |
| <input checked="" type="checkbox"/> | Blue | 110V DC | 2ALF6LB-110D |
| <input type="checkbox"/> | Clear | 110V DC | 2ALF7LB-110D |
| <input checked="" 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 checked="" type="checkbox"/> | Red | 230V AC | 2ALF4LB-230 |
| <input checked="" type="checkbox"/> | Amber | 230V AC | 2ALF5LB-230 |
| <input checked="" type="checkbox"/> | Blue | 230V AC | 2ALF6LB-230 |
| <input type="checkbox"/> | Clear | 230V AC | 2ALF7LB-230 |
| <input checked="" type="checkbox"/> | Yellow | 230V AC | 2ALF8LB-230 |

230V DC

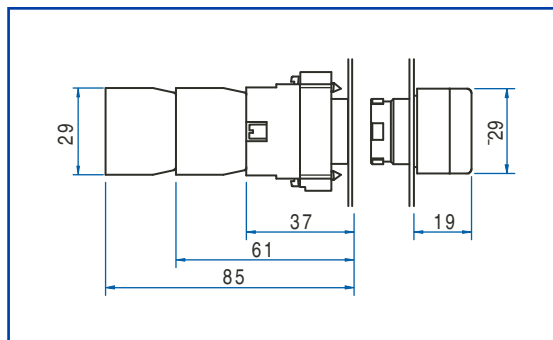
| | | | |
|-------------------------------------|--------|---------|--------------|
| <input type="checkbox"/> | White | 230V DC | 2ALF1LB-230D |
| <input checked="" type="checkbox"/> | Green | 230V DC | 2ALF3LB-230D |
| <input checked="" type="checkbox"/> | Red | 230V DC | 2ALF4LB-230D |
| <input checked=""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

22mm LED Illuminated Metal Flush Operators

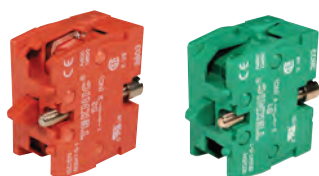
Dimensional Drawings

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

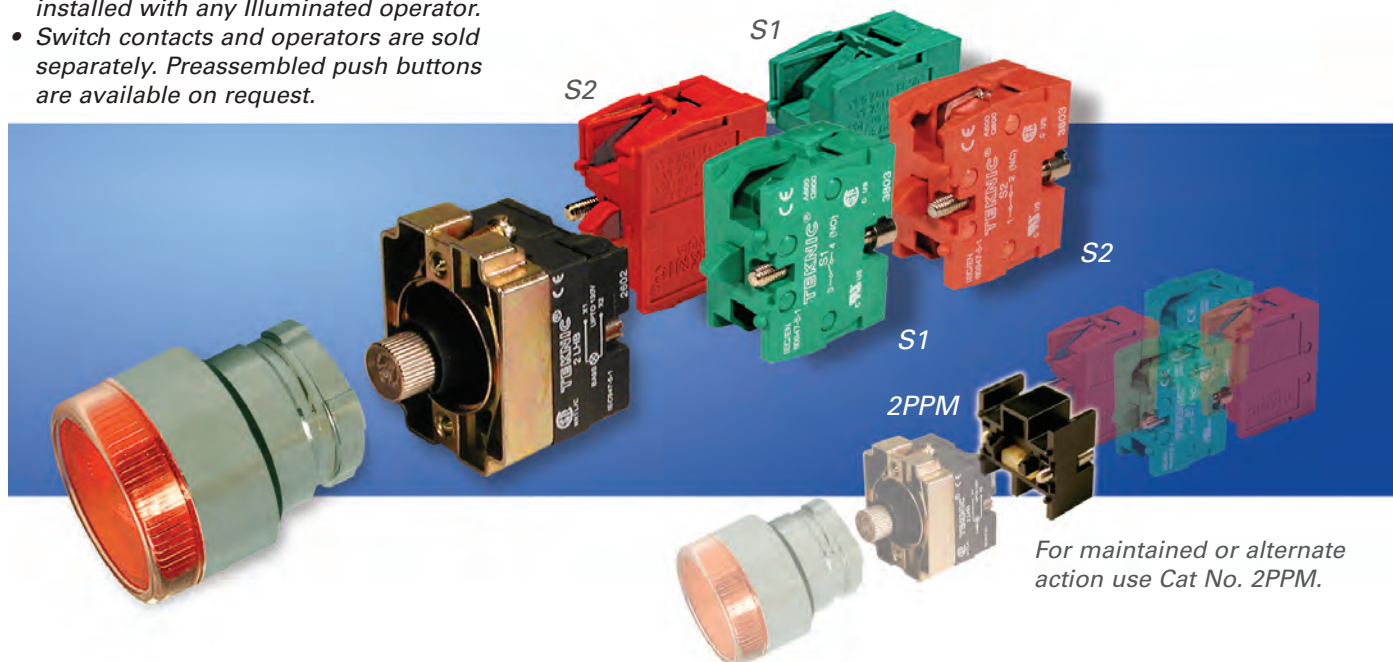
Base Mount*

| | |
|-----------------------------|-----------|
| 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.

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 or alternate action use Cat No. 2PPM.

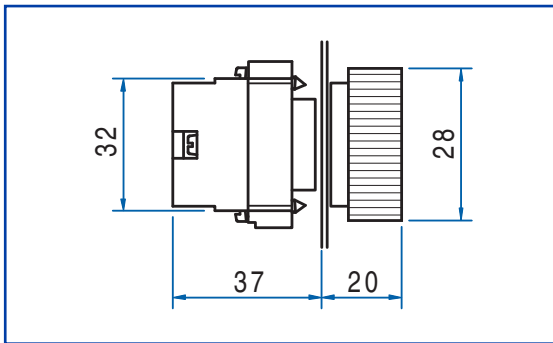
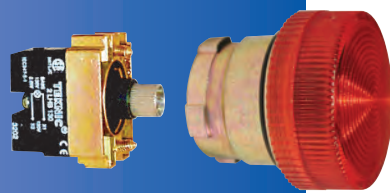
22mm LED Metal Pilot Lights



Certified for
NEMA Type 4X
12 environment.

Pilot Light

with bulb, bulb holder and mounting bracket



Replacement bulbs available.
See page 39.

| Color | Voltage | Cat No. |
|-------|---------|---------|
|-------|---------|---------|

| 12V AC/DC | | |
|-----------|-----------|-------------|
| White | 12V AC/DC | 2PLB1LB-012 |
| Green | 12V AC/DC | 2PLB3LB-012 |
| Red | 12V AC/DC | 2PLB4LB-012 |
| Amber | 12V AC/DC | 2PLB5LB-012 |
| Blue | 12V AC/DC | 2PLB6LB-012 |
| Clear | 12V AC/DC | 2PLB7LB-012 |
| Yellow | 12V AC/DC | 2PLB8LB-012 |

| 24V AC/DC | | |
|-----------|-----------|-------------|
| White | 24V AC/DC | 2PLB1LB-024 |
| Green | 24V AC/DC | 2PLB3LB-024 |
| Red | 24V AC/DC | 2PLB4LB-024 |
| Amber | 24V AC/DC | 2PLB5LB-024 |
| Blue | 24V AC/DC | 2PLB6LB-024 |
| Clear | 24V AC/DC | 2PLB7LB-024 |
| Yellow | 24V AC/DC | 2PLB8LB-024 |

| 48V AC/DC | | |
|-----------|-----------|-------------|
| White | 48V AC/DC | 2PLB1LB-048 |
| Green | 48V AC/DC | 2PLB3LB-048 |
| Red | 48V AC/DC | 2PLB4LB-048 |
| Amber | 48V AC/DC | 2PLB5LB-048 |
| Blue | 48V AC/DC | 2PLB6LB-048 |
| Clear | 48V AC/DC | 2PLB7LB-048 |
| Yellow | 48V AC/DC | 2PLB8LB-048 |

| 110V AC | | |
|---------|---------|-------------|
| White | 110V AC | 2PLB1LB-110 |
| Green | 110V AC | 2PLB3LB-110 |
| Red | 110V AC | 2PLB4LB-110 |
| Amber | 110V AC | 2PLB5LB-110 |
| Blue | 110V AC | 2PLB6LB-110 |
| Clear | 110V AC | 2PLB7LB-110 |
| Yellow | 110V AC | 2PLB8LB-110 |

| 110V DC | | |
|---------|---------|--------------|
| White | 110V DC | 2PLB1LB-110D |
| Green | 110V DC | 2PLB3LB-110D |
| Red | 110V DC | 2PLB4LB-110D |
| Amber | 110V DC | 2PLB5LB-110D |
| Blue | 110V DC | 2PLB6LB-110D |
| Clear | 110V DC | 2PLB7LB-110D |
| Yellow | 110V DC | 2PLB8LB-110D |

| 230V AC | | |
|---------|---------|-------------|
| White | 230V AC | 2PLB1LB-230 |
| Green | 230V AC | 2PLB3LB-230 |
| Red | 230V AC | 2PLB4LB-230 |
| Amber | 230V AC | 2PLB5LB-230 |
| Blue | 230V AC | 2PLB6LB-230 |
| Clear | 230V AC | 2PLB7LB-230 |
| Yellow | 230V AC | 2PLB8LB-230 |

| 230V DC | | |
|---------|---------|--------------|
| White | 230V DC | 2PLB1LB-230D |
| Green | 230V DC | 2PLB3LB-230D |
| Red | 230V DC | 2PLB4LB-230D |
| Amber | 230V DC | 2PLB5LB-230D |
| Blue | 230V DC | 2PLB6LB-230D |
| Clear | 230V DC | 2PLB7LB-230D |
| Yellow | 230V DC | 2PLB8LB-230D |

22mm Specifications

Electrical and Mechanical Characteristics

| | |
|-----------------------|--|
| Standard conformity: | IEC 60947-5-1 |
| Approvals: | VDE0660 CSA - C22.2 No. 14-95 UL508 IEC 947 - 5 (1) 1990, IS 13947 ASTA UK certified as per IEC 947 - 5 - (1) 1990 |
| Degree of protection: | IP 65 as per IEC 529 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 Q600: 2.5A; 600V DC |
| Make and break capacity | |
| IEC 947 - 5 - (1) 1990: | AC 15 4A, 415V AC DC 13 0.5A, 110V DC |
| Terminal capacity: | minimum 20 AWG (0.5 mm ²) maximum 2x16 AWG (2 x 1.5 mm ²) or 14 AWG (2.5 mm ²) |
| 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 ² (20 AWG), max. 2 x 1.5 mm ² (2x16 AWG) or 1 x 2.5 mm ² (1x14 AWG) |

Torque Specifications

| | |
|---------------------------------|------------------------|
| Mounting bracket screws | 1.2 Nm (10.8 lbs. in.) |
| Contact block to bracket screws | 0.5 Nm (4.5 lbs. in.) |
| Terminal screws (wiring) | 0.8 Nm (7.2 lbs. in.) |

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

B. Mechanical Durability

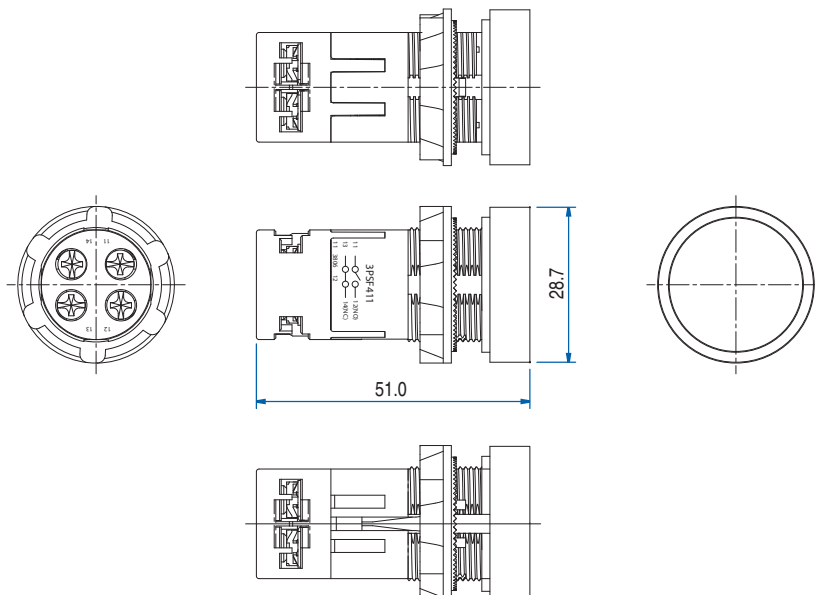
| | |
|----------------------------|--------------------------------|
| Push Button, Spring Return | 1 Million Operations |
| Push-Push Type | 100,000 Operations |
| Applicable Standard | UL508; IS13947-5-1; CSA 22.2 |
| Degree of Protection | IP65 (as per IS 13947) |
| Temperature Range | -25° to +85°C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

C. Electrical Characteristics

| | |
|------------------------------|---|
| Rating | <p><i>For AC:</i> C300= 120V, make current 15A & break current 1.5A (thermal current=2.5A)</p> <p><i>For DC:</i> R300= 125V, make or break current 0.22A (thermal current=1.0A)</p> |
| Terminal Capacity for wiring | 2 X 1.5mm ² ; 1 X 0.5mm ² (min); 1 X 2.5mm ² (max) |
| Contact Material | <ul style="list-style-type: none"> • Moving contact = Phosphor Bronze • 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

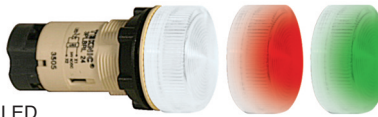
All dimensions shown in millimeters.
To convert to inches multiply by 0.03937



Unibody LED Indicator Plastic Pilot Lights



Pilot Lights with integral LED



Multi color LED pilot light
Clear Lens / Red / Green 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 |
| | Green Lens/Green LED 24-230V AC/DC | 3PLBR3LU |
| | 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 |
| | Red Lens/Red LED 24-230V AC/DC | 3PLBR4LU |
| | Clear Lens /Red/Green LED 12V AC/DC | 3PLBR34L-012 |
| | Clear Lens /Red/Green LED 24V AC/DC | 3PLBR34L-024 |
| | Clear Lens /Red/Green LED 48V AC/DC | 3PLBR34L-048 |
| | Clear Lens /Red/Green LED 110V AC* | 3PLBR34L-110 |
| | Clear Lens /Red/Green LED 230V AC* | 3PLBR34L-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

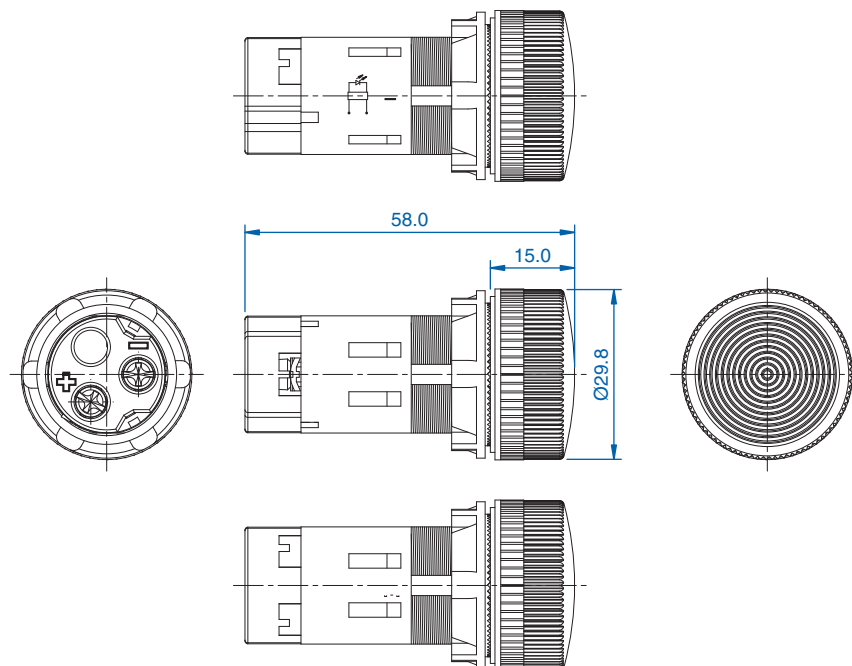
| | |
|-------------------------|---|
| Applicable Standard | UL508 IEC 60947 CSA 22.2 |
| Degree of Protection | IP65 as per IEC 60947, |
| Temperature Range | -25° to +70°C (-13 to +158°F) |
| Contact material | Phosphor bronze for LED, PCB contact brass (tin plated) |
| Corrosion protection | All 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 2 X 1.5mm ² 1 X 0.5mm ² (min) 1 X 2.5mm ² (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 40V for 240V AC & 220V DC (i.e. approx. 20% of Rated Voltage) |
| Current Consumption | Max. 20mA for AC circuits Max. 15mA for DC circuits |

Dimensional Drawings

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



22mm Thermoplastic Enclosures

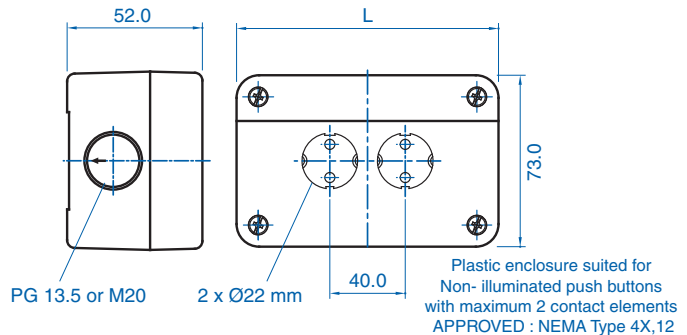
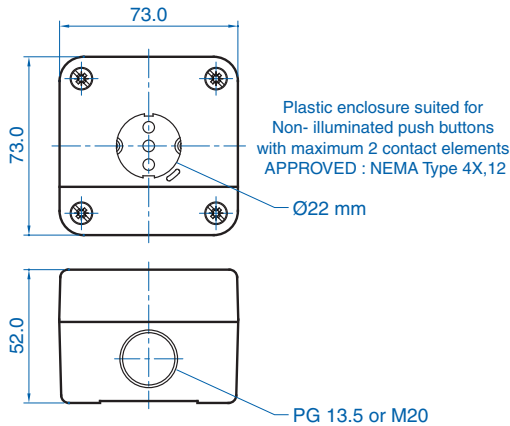


Certified for
NEMA Type 4X
12 environment.



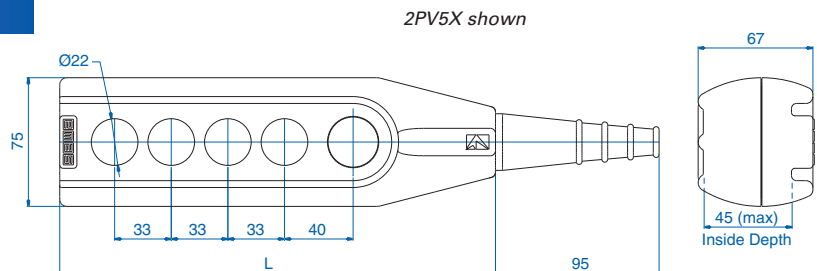
Base Mount Enclosures

| Cat. No. | Operator Capacity | Material | Long Description | Dimensions L x W x H | Cable Entry Knockouts | Mounting Hole Size |
|----------|-------------------|----------------|-------------------------|----------------------|-----------------------|--------------------|
| 4003A11 | 1 | Thermo Plastic | White Top/Black Bottom | 73 X 73 X 52 | 2 x M20 | (4) - 4.4x6.4 |
| 4003C11 | 2 | Thermo Plastic | White Top/Black Bottom | 113 X 73 X 52 | 2 x M20 | (4) - 4.4x6.4 |
| 4003E11 | 3 | Thermo Plastic | White Top/Black Bottom | 153 X 73X 52 | 2 x M20 | (4) - 4.4x6.4 |
| 4003G11 | 4 | Thermo Plastic | White Top/Black Bottom | 193 X 73 X 52 | 2 x M20 | (4) - 4.4x6.4 |
| 4003S11 | 5 | Thermo Plastic | White Top/Black Bottom | 233 X 73 X 52 | 2 x M20 | (4) - 4.4x6.4 |
| 4003I11 | 6 | Thermo Plastic | White Top/Black Bottom | 273 X 73 X 52 | 2 x M20 | (4) - 4.4x6.4 |
| 4004A10 | 1 | Thermo Plastic | Yellow Top/Black Bottom | 73 X 73 X 52 | 2 x M20 | (4) - 4.4x6.4 |
| 4004C10 | 2 | Thermo Plastic | Yellow Top/Black Bottom | 113 X 73 X 52 | 2 x M20 | (4) - 4.4x6.4 |
| 4004E10 | 3 | Thermo Plastic | Yellow Top/Black Bottom | 153 X 73X 52 | 2 x M20 | (4) - 4.4x6.4 |
| 4004G10 | 4 | Thermo Plastic | Yellow Top/Black Bottom | 193 X 73 X 52 | 2 x M20 | (4) - 4.4x6.4 |
| 4004S10 | 5 | Thermo Plastic | Yellow Top/Black Bottom | 233 X 73 X 52 | 2 x M20 | (4) - 4.4x6.4 |
| 4004I10 | 6 | Thermo Plastic | Yellow Top/Black Bottom | 273 X 73 X 52 | 2 x M20 | (4) - 4.4x6.4 |



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.

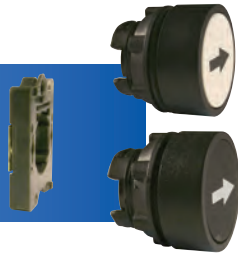
22mm Thermoplastic Enclosure & Control Box Accessories



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* |

* Only for 22mm Thermoplastic Enclosures.



**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 **S1**
Normally Closed Silver **S2**
Normally Open Gold plated **S3**
Normally Closed Gold plated **S4**

Base Mount

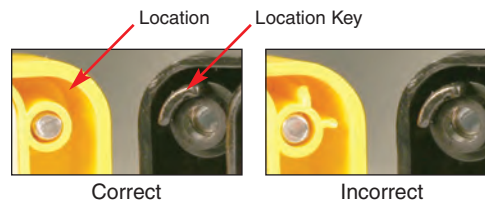
Normally Open Silver **S5**
Normally Closed Silver **S6**
Normally Open Gold plated **S7**
Normally Closed Gold plated **S8**

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

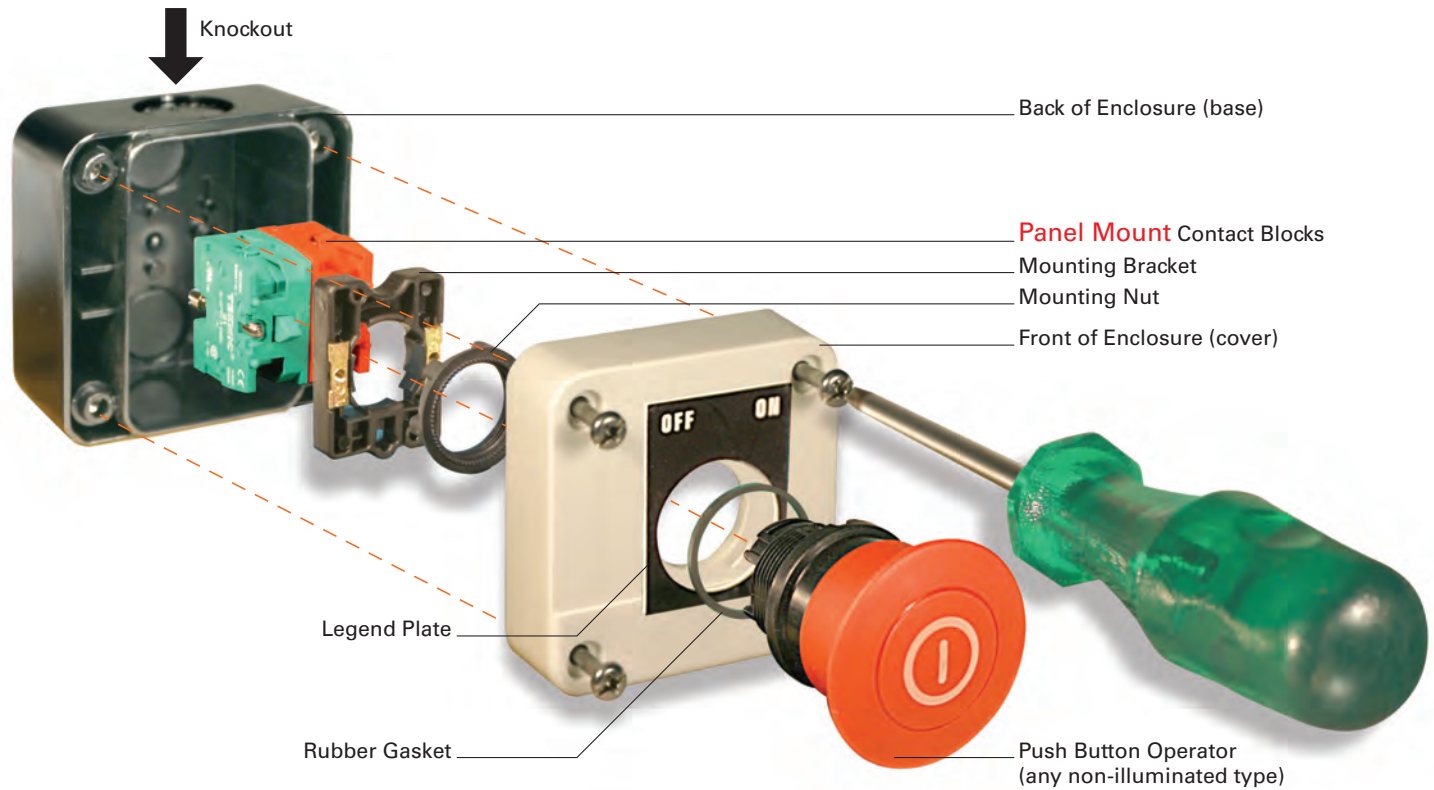
The unit may only be assembled and installed by individuals who are familiar with the installation instructions and the current regulations for health and safety at work and accident prevention. Ensure local regulations compliances are met.

CAUTION

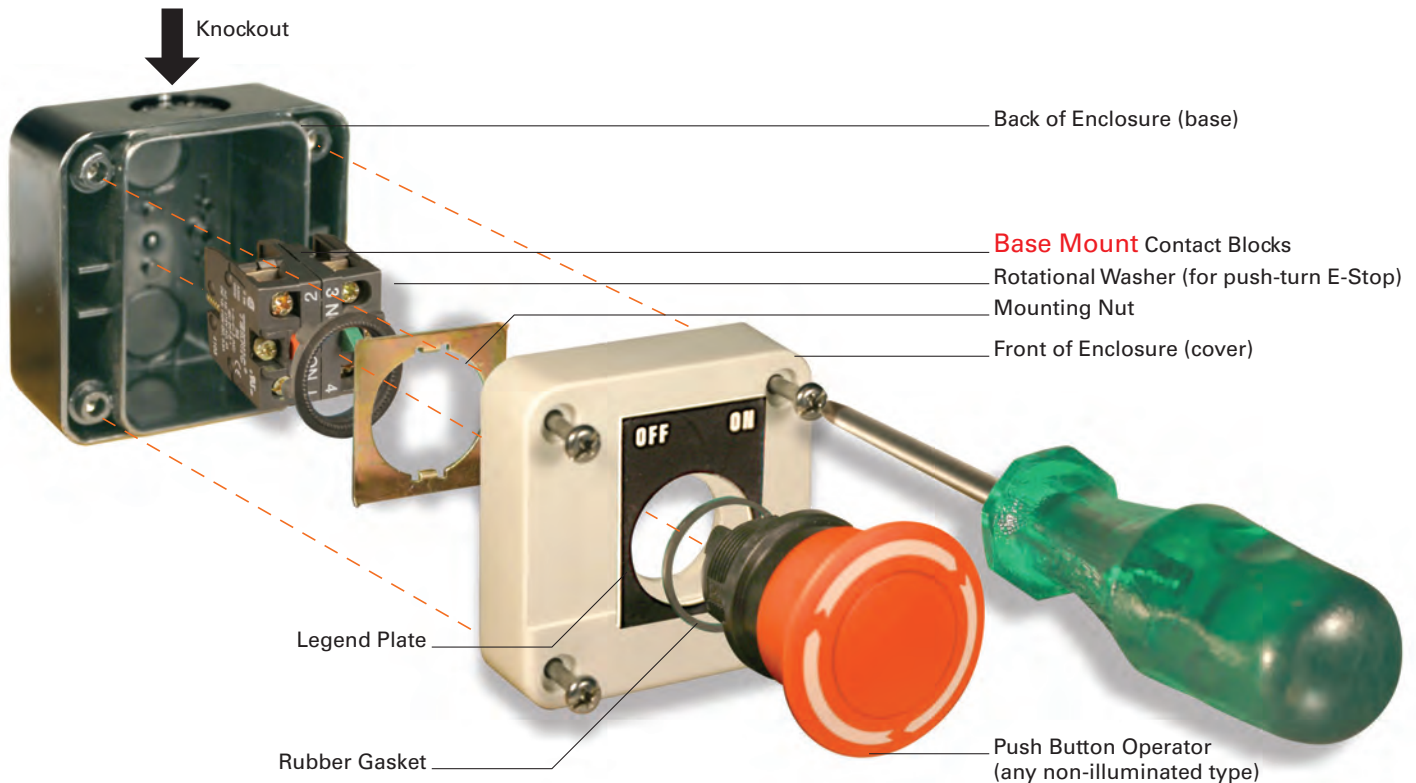
1. Non-metallic enclosures do not provide grounding connections.
Use grounding jumper wires.
2. The conduit hubs are to be connected to the conduit before being connected to the enclosure.
3. To maintain the environmental rating of this enclosure, install only UL listed or UL recognized conduit hubs 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



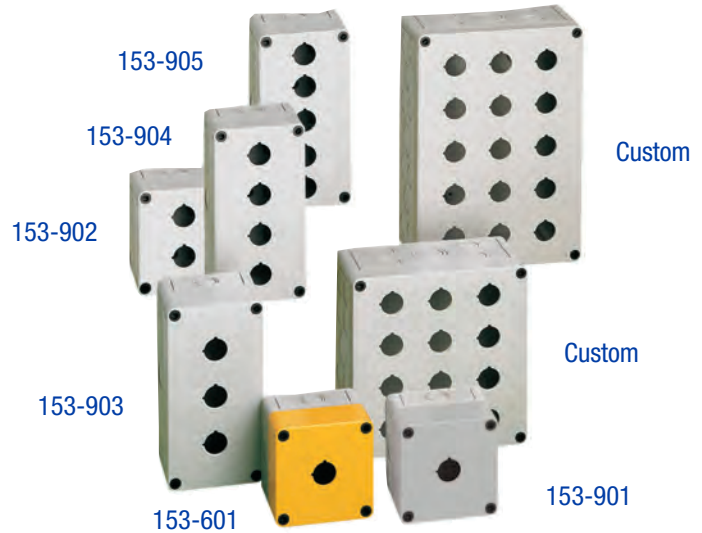
22mm Polycarbonate Enclosures

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

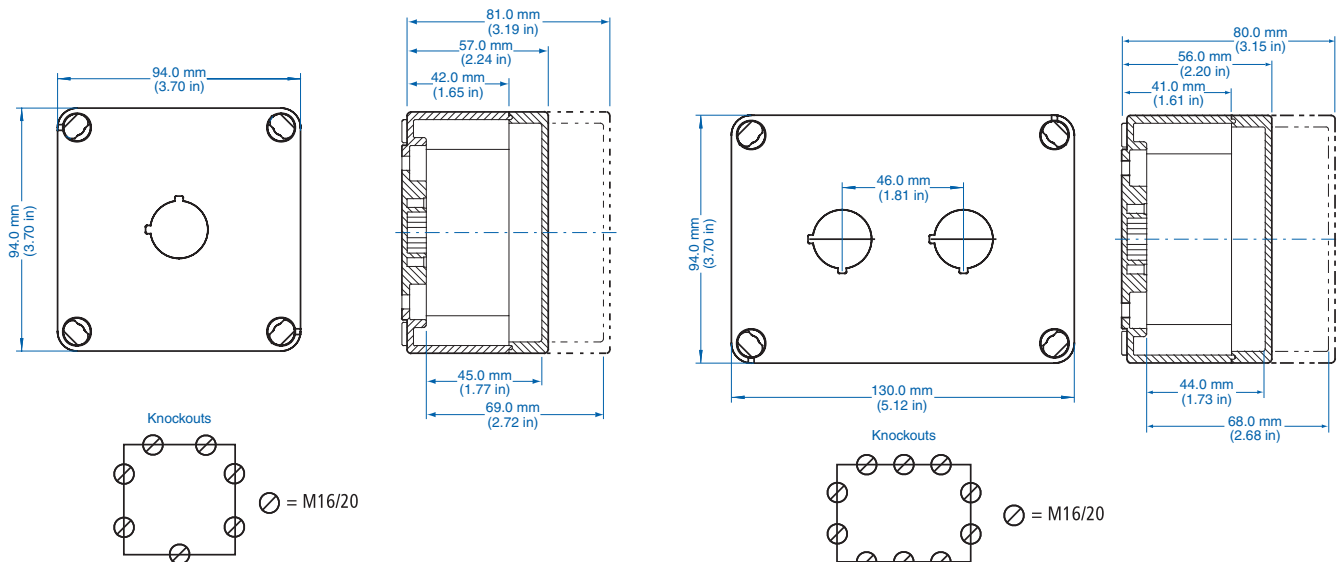
*IP66 when suitable installation devices are used.



Ordering Information

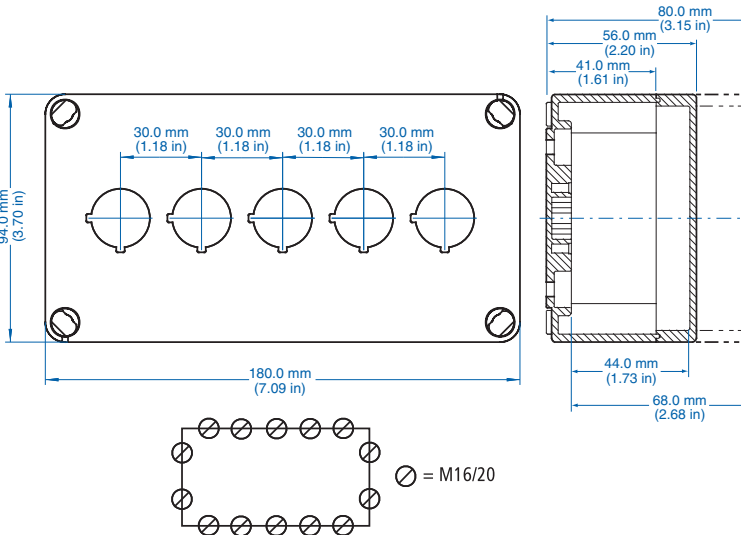
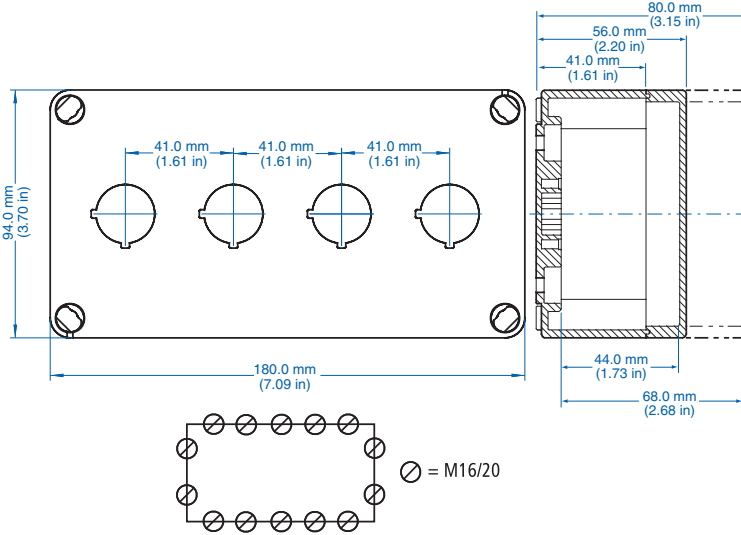
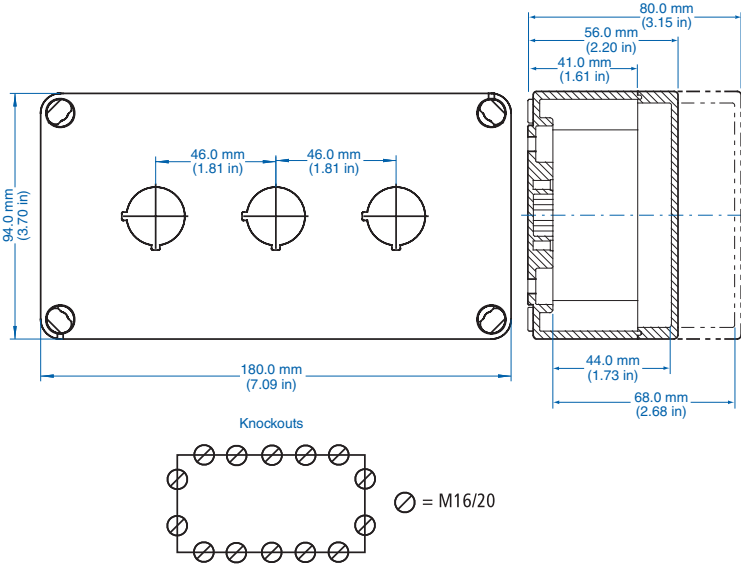
Dimensions mm (in)

| | Cat. No. | Length | Width | Height | Std. Pk. |
|-----------------------------------|---|------------------|-----------------|-----------------|----------|
| 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 |
| 5308 949 | M20 Cord Grip, 5-12mm Cable Dia., Black | | | | 1 |
| 7211 976 | M20 Locknut, Black, 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

Aluminum Enclosures for 22mm Operators



Certified for
NEMA Type 4X
12 environment.



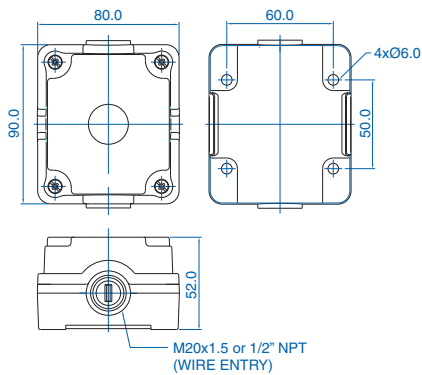
Aluminum (52mm Height) Pressure Die Cast

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

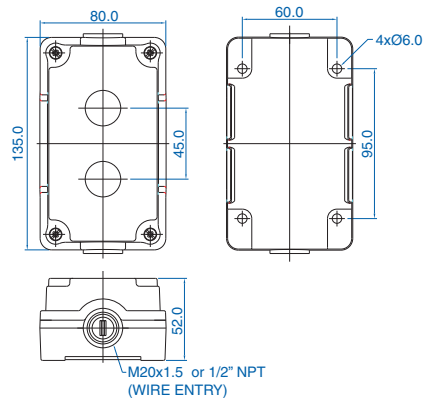
| Operator Capacity | Cat. No. Black base/ Grey Cover* | Color Black base/ Yellow Cover | Material Construction | Dimensions LxWxH mm (in.) | Cable Entry Thread Size | Mounting Hole Dia. |
|-------------------|--|--------------------------------------|--------------------------|------------------------------|----------------------------|-----------------------|
| 1 | 2005A13 | 2048A10 | PDC Aluminum | 80x90x52 (3.15x3.54x2.05) | 2xM20 | 4 x 6mm |
| 2 | 2006C13 | 2050C10 | PDC Aluminum | 80x135x52 (3.15x5.32x2.05) | 2xM20 | 4 x 6mm |
| 3 | 2007E13 | 2032E10 | PDC Aluminum | 80x180x52 (3.15x7.09x2.05) | 2xM20 | 4 x 6mm |
| 4 | 2010G13 | 2020G10 | PDC Aluminum | 80x225x52 (3.15x8.86x2.05) | 2xM20 | 4 x 6mm |
| 1 | 2015A13 | 2049A10 | PDC Aluminum | 80 x 90x52 (3.15x3.54x2.05) | 2x1/2"-14 NPT | 4 x 6mm |
| 2 | 2014C13 | 2051C10 | PDC Aluminum | 80x135x52 (3.15x5.32x2.05) | 2x1/2"-14 NPT | 4 x 6mm |
| 3 | 2012E13 | 2033E10 | PDC Aluminum | 80x180x52 (3.15x7.09x2.05) | 2x1/2"-14 NPT | 4 x 6mm |
| 4 | 2008G13 | 2019G10 | PDC Aluminum | 80x225x52 (3.15x8.86x2.05) | 2x1/2"-14 NPT | 4 x 6mm |

*Color code RAL 7032, Pebble Gray. Other colors available upon request.

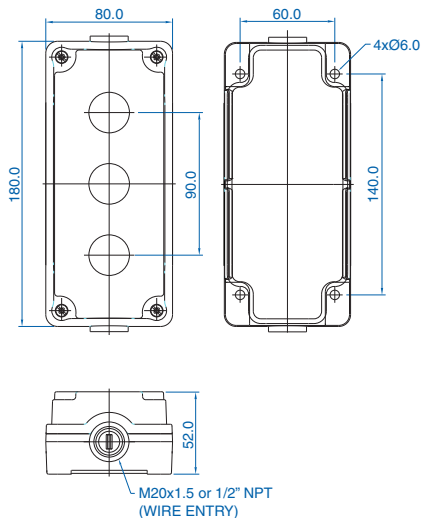
1 - Operator Capacity



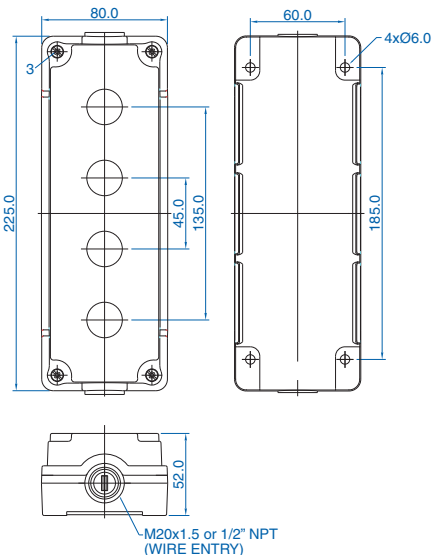
2 - Operator Capacity



3 - Operator Capacity



4 - Operator Capacity



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

Aluminum Enclosures for 22mm Operators



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12 environment.



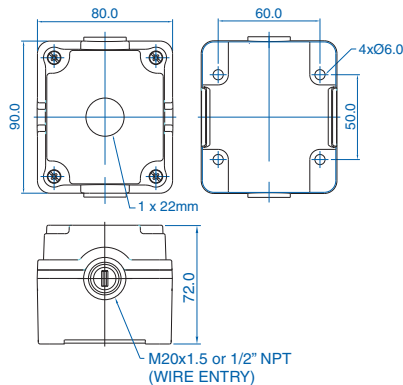
Aluminum (72mm Height) Pressure Die Cast

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.

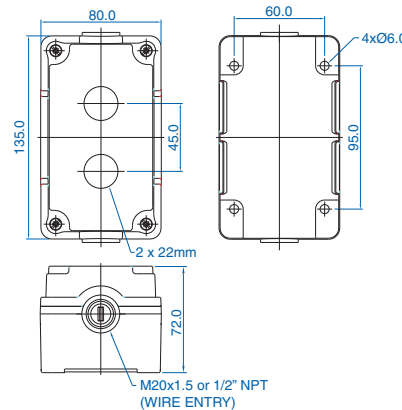
| Operator Capacity | Cat. No. Black base/ Grey cover* | Color Black base/ Grey cover* | Material Construction | Dimensions LxWxH mm (in.) | Cable Entry Thread Size | Mounting Hole Dia. |
|-------------------|----------------------------------|-------------------------------|-----------------------|----------------------------|-------------------------|--------------------|
| 1 | 7009A13 | 7021A10 | PDC Aluminum, EH | 80x90x72 (3.15x3.54x2.83) | 2xM20 | 4 X 6mm |
| 2 | 7006C13 | 7015C10 | PDC Aluminum, EH | 80x135x72 (3.15x5.32x2.83) | 2xM20 | 4 X 6mm |
| 3 | 7004E13 | 7016E10 | PDC Aluminum, EH | 80x180x72 (3.15x7.09x2.83) | 2xM20 | 4 X 6mm |
| 4 | 7004G13 | 7008G10 | PDC Aluminum, EH | 80x225x72 (3.15x8.86x2.83) | 2xM20 | 4 X 6mm |
| 1 | 7010A13 | 7022A10 | PDC Aluminum, EH | 80x90x72 (3.15x3.54x2.83) | 2x1/2"-14 NPT | 4 X 6mm |
| 2 | 7007C13 | 7016C10 | PDC Aluminum, EH | 80x135x72 (3.15x5.32x2.83) | 2x1/2"-14 NPT | 4 X 6mm |
| 3 | 7005E13 | 7017E10 | PDC Aluminum, EH | 80x180x72 (3.15x7.09x2.83) | 2x1/2"-14 NPT | 4 X 6mm |
| 4 | 7005G13 | 7009G10 | PDC Aluminum, EH | 80x225x72 (3.15x8.86x2.83) | 2x1/2"-14 NPT | 4 X 6mm |

*Color code RAL 7032, Pebble Gray. Other colors available upon request.

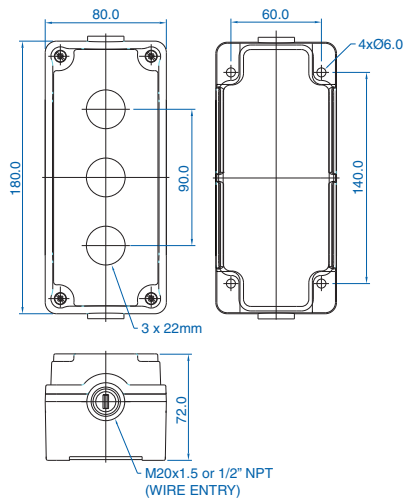
1 - Operator Capacity



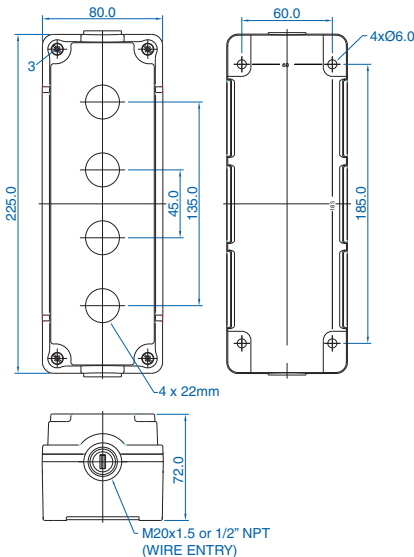
2 - Operator Capacity



3 - Operator Capacity

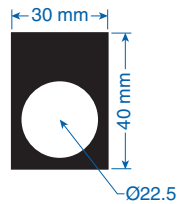


4 - Operator Capacity

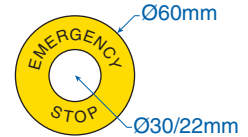


All dimensions shown in millimeters. To convert to inches multiply by 0.03937

22mm Push Button Accessories



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



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

Please visit altechcorp.com/pb for other available legend plates.

English

| Title | Cat No. | Title | Cat No. |
|------------------------|---------|------------------------------|---------|
| AUTO | 2LP09 | OFF - ON | 2LP46 |
| AUTO HAND | 2LP32 | ON | 2LP15 |
| AUTO - MAN | 2LP43 | ON OFF | 2LP30 |
| B PHASE | 2LP27 | OPEN | 2LP07 |
| Blank Aluminum | 2LP40 | OVER | 2LP74 |
| BOTTOM HEAT | 2LP101 | OXY - ATM - AUTO | 2LP58 |
| CLEAR | 2LP51 | OXY - AUTO - ATM | 2LP57 |
| CLOSE | 2LP08 | POSITION , A B | 2LP48 |
| CLUTCH ON/OFF | 2LP73 | POWER ON | 2LP20 |
| Cycle Stop | 2LP55 | PUSHER CYCLE | 2LP104 |
| DOWN | 2LP06 | R PHASE | 2LP25 |
| EMERGENCY STOP | 2LP41 | RAISE - LOWER | 2LP44 |
| Emergency Stop (black) | 2LP56 | READY | 2LP49 |
| Emergency Stop (red) | 2LP66 | REMOTE | 2LP22 |
| FAST | 2LP12 | RESET | 2LP13 |
| FAULT | 2LP107 | RESET/MANUAL/AUTO | 2LP103 |
| FILM FEED | 2LP105 | REV FWD | 2LP31 |
| FOR-OFF-REV | 2LP42 | REV - OFF - FWD | 2LP59 |
| FORWARD | 2LP03 | REVERSE | 2LP04 |
| FWD - REV | 2LP47 | RIGHT | 2LP17 |
| HAND | 2LP10 | RUN | 2LP24 |
| HAND O AUTO | 2LP36 | SHEAR | 2LP70 |
| HOLD | 2LP50 | SIDE HEAT | 2LP102 |
| I II | 2LP34 | SLOW | 2LP11 |
| I O II | 2LP39 | SLOW OFF FAST | 2LP37 |
| INCH | 2LP14 | START | 2LP01 |
| INFEED | 2LP72 | START STOP | 2LP28 |
| INFEED ON/OFF | 2LP71 | STOP (red) | 2LP02 |
| JOG | 2LP69 | TEST | 2LP23 |
| JOG - RUN | 2LP45 | TRIP | 2LP19 |
| KNIFE CYCLE | 2LP106 | UNDERLOAD | 2LP108 |
| LEFT | 2LP18 | UP | 2LP05 |
| LOCAL | 2LP21 | UP DOWN | 2LP29 |
| LOCAL REMOTE | 2LP33 | UP OFF DOWN | 2LP38 |
| MAN O AUTO | 2LP36 | Y PHASE | 2LP26 |
| O I | 2LP35 | | |
| OFF | 2LP16 | Temporary for Custom Imprint | 2LPXX |

Spanish

| Title | Cat No. | Title | Cat No. |
|--------------------|---------|--------------------|---------|
| ABAJO | 2LP06SP | ENCENDIDO | 2LP20SP |
| ABRIR | 2LP07SP | ENCENDIDO APAGADO | 2LP30SP |
| ADELANTE | 2LP03SP | FALLA | 2LP19SP |
| ADELANTE ATRAS | 2LP31SP | FUERA | 2LP16SP |
| ARRANQUE | 2LP01SP | IZQUIERDA | 2LP18SP |
| ARRANQUE PARO | 2LP28SP | LENTO | 2LP14SP |
| ARRIBA | 2LP05SP | LENTO FUERA RAPIDO | 2LP37SP |
| ARRIBA ABAJO | 2LP29SP | LOCAL REMOTO | 2LP33SP |
| ARRIBA FUERA ABAJO | 2LP38SP | MAN O AUTO | 2LP36SP |
| ATRAS | 2LP04SP | MANUAL | 2LP10SP |
| AUTO MAN | 2LP32SP | PARO | 2LP02SP |
| CERRAR | 2LP08SP | PARO DE EMERGENCIA | 2LP41SP |
| DENTRO | 2LP15SP | RAPIDO | 2LP12SP |
| DERECHO | 2LP17SP | REARME | 2LP13SP |

22mm Push Button Accessories



Replacement Lens for Illuminated Mushroom Operators

| Color | Cat No. |
|--|---------|
| <input type="checkbox"/> White | 2ALM1L |
| <input checked="" type="checkbox"/> Green | 2ALM3L |
| <input checked="" type="checkbox"/> Red | 2ALM4L |
| <input checked="" type="checkbox"/> Amber | 2ALM5L |
| <input checked="" type="checkbox"/> Blue | 2ALM6L |
| <input type="checkbox"/> Clear | 2ALM7L |
| <input checked="" type="checkbox"/> Yellow | 2ALM8L |

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 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 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 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 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 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. | Color | Voltage | Cat No. |
|--|-----------|-----------|--|-----------|-----------|
| 110V AC | | | | | |
| <input type="checkbox"/> White | 110V AC | MCB91110 | <input type="checkbox"/> White | 230V AC | MCB91230 |
| <input checked="" type="checkbox"/> Green | 110V AC | MCB93110 | <input checked="" type="checkbox"/> Green | 230V AC | MCB93230 |
| <input checked="" type="checkbox"/> Red | 110V AC | MCB94110 | <input checked="" type="checkbox"/> Red | 230V AC | MCB94230 |
| <input checked="" type="checkbox"/> Amber | 110V AC | MCB95110 | <input checked="" type="checkbox"/> Amber | 230V AC | MCB95230 |
| <input checked="" type="checkbox"/> Blue | 110V AC | MCB96110 | <input checked="" type="checkbox"/> Blue | 230V AC | MCB96230 |
| <input checked="" type="checkbox"/> Yellow | 110V AC | MCB98110 | <input checked="" type="checkbox"/> Yellow | 230V AC | MCB98230 |
| 110V DC | | | | | |
| <input type="checkbox"/> White | 110V DC | MCB91110D | <input type="checkbox"/> White | 230V DC | MCB91230D |
| <input checked="" type="checkbox"/> Green | 110V DC | MCB93110D | <input checked="" type="checkbox"/> Green | 230V DC | MCB93230D |
| <input checked="" type="checkbox"/> Red | 110V DC | MCB94110D | <input checked="" type="checkbox"/> Red | 230V DC | MCB94230D |
| <input checked="" type="checkbox"/> Amber | 110V DC | MCB95110D | <input checked="" type="checkbox"/> Amber | 230V DC | MCB95230D |
| <input checked="" type="checkbox"/> Blue | 110V DC | MCB96110D | <input checked="" type="checkbox"/> Blue | 230V DC | MCB96230D |
| <input checked="" type="checkbox"/> Yellow | 110V DC | MCB98110D | <input checked="" type="checkbox"/> Yellow | 230V DC | MCB98230D |
| 24V AC/DC | | | | | |
| <input type="checkbox"/> White | 24V AC/DC | MCB9124 | <input type="checkbox"/> White | 48V AC/DC | MCB9148 |
| <input checked="" type="checkbox"/> Green | 24V AC/DC | MCB9324 | <input checked="" type="checkbox"/> Green | 48V AC/DC | MCB9348 |
| <input checked="" type="checkbox"/> Red | 24V AC/DC | MCB9424 | <input checked="" type="checkbox"/> Red | 48V AC/DC | MCB9448 |
| <input checked="" type="checkbox"/> Amber | 24V AC/DC | MCB9524 | <input checked="" type="checkbox"/> Amber | 48V AC/DC | MCB9548 |
| <input checked="" type="checkbox"/> Blue | 24V AC/DC | MCB9624 | <input checked="" type="checkbox"/> Blue | 48V AC/DC | MCB9648 |
| <input checked="" type="checkbox"/> Yellow | 24V AC/DC | MCB9824 | <input checked="" type="checkbox"/> Yellow | 48V AC/DC | MCB9848 |

Maximum Power Consumption:

| Supply Voltage | LED | | FILAMENT BULBS | |
|----------------|----------------------|----------|----------------------|-----------|
| | 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. 2BRKT (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



Plastic Cover
Cat. No. 2PAM7



Rubber Gasket
Cat. No. 2PRG1



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



Rubber Boot for Contact Elements
Cat. No. 2SEBT2

22mm Push Button Switch Contacts

Panel Mount Types



S1
Normally
Open
Silver



S2
Normally
Closed
Silver

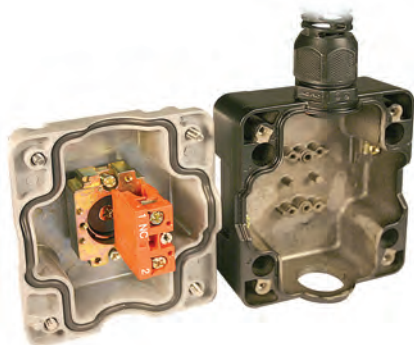


S3
Normally
Open
Gold plated

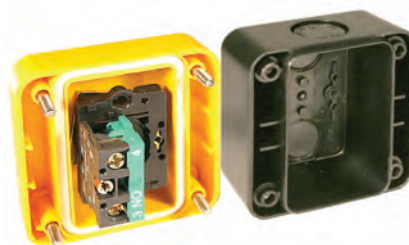


S4
Normally
Closed
Gold plated

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

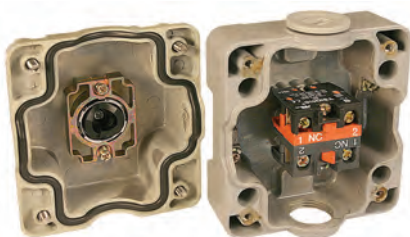


S7*
Normally
Open
Gold plated



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.



Sample Part No. 44.2R.-156

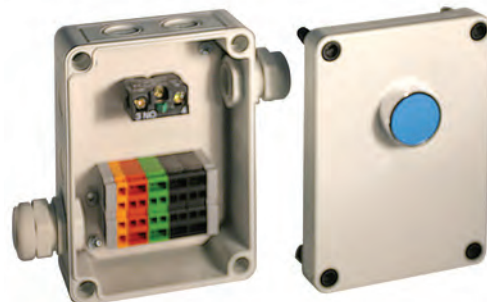


High performance and Extensive range

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.



Sample Part No. 44-200T



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.



30mm Metal Push Buttons

The Altech 30mm Push Button line include a complete selection of push buttons, pilot lights and selector switches and accessories. All properly assembled devices are UL and CE Recognized and they certified for NEMA type 4X applications. An internal seal provides watertight integrity and all components are corrosion resistant materials.

Our contact blocks are color coded for an easy assembly and identification (Red=S11, Yellow=S12). Illuminated or Non-Illuminated push buttons in various colors are available for quick delivery.

Selector Switches are available in a 2 or 3 position styles with and option for momentary or maintained function. The pilot lights are full voltage and LED and filament bubs are interchangeable.

Cast aluminum control stations are available to your specifications.

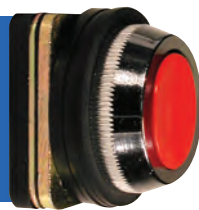
These Ø 30 control devices can be mounted in any position in panels of 1 to 6 mm (.039 - .236 in.) thickness.

30mm Non-Illuminated Metal Operators



Certified for
NEMA Type 4X
12 environment.

Flush Non-Illuminated Momentary



| Color | Function | Cat No. |
|----------|-----------|---------|
| □ White | Momentary | AF1 |
| ■ Black | Momentary | AF2 |
| ■ Green | Momentary | AF3 |
| ■ Red | Momentary | AF4 |
| ■ Blue | Momentary | AF6 |
| ■ Yellow | Momentary | AF8 |

Booted Momentary



| Color | Function | Cat No. |
|----------|-----------|---------|
| □ White | Momentary | AB1 |
| ■ Black | Momentary | AB2 |
| ■ Green | Momentary | AB3 |
| ■ Red | Momentary | AB4 |
| ■ Blue | Momentary | AB6 |
| ■ Yellow | Momentary | AB8 |

Projecting Momentary



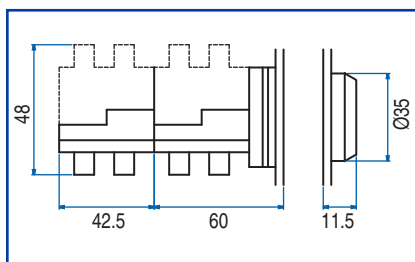
| Color | Function | Cat No. |
|----------|-----------|---------|
| □ White | Momentary | AP1 |
| ■ Black | Momentary | AP2 |
| ■ Green | Momentary | AP3 |
| ■ Red | Momentary | AP4 |
| ■ Blue | Momentary | AP6 |
| ■ Yellow | Momentary | AP8 |

30mm Non-Illuminated Metal Operators

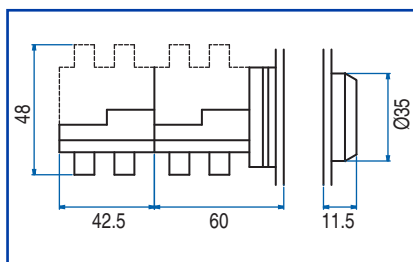
Dimensional Drawings

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

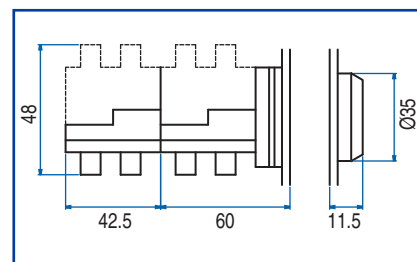
Flush Momentary



Booted Momentary



Projecting Momentary



Contact Elements

Description

1 Normally Open + 1 Normally Closed
Silver Contacts

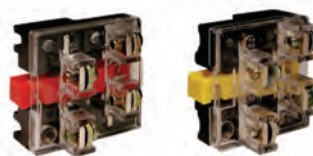
Cat. No.

S11

2 Normally Open + 2 Normally Closed
Silver Contacts

S11 + S12

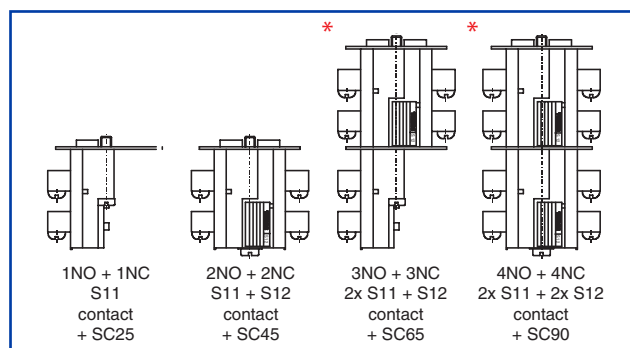
For additional contacts, see diagram at right.



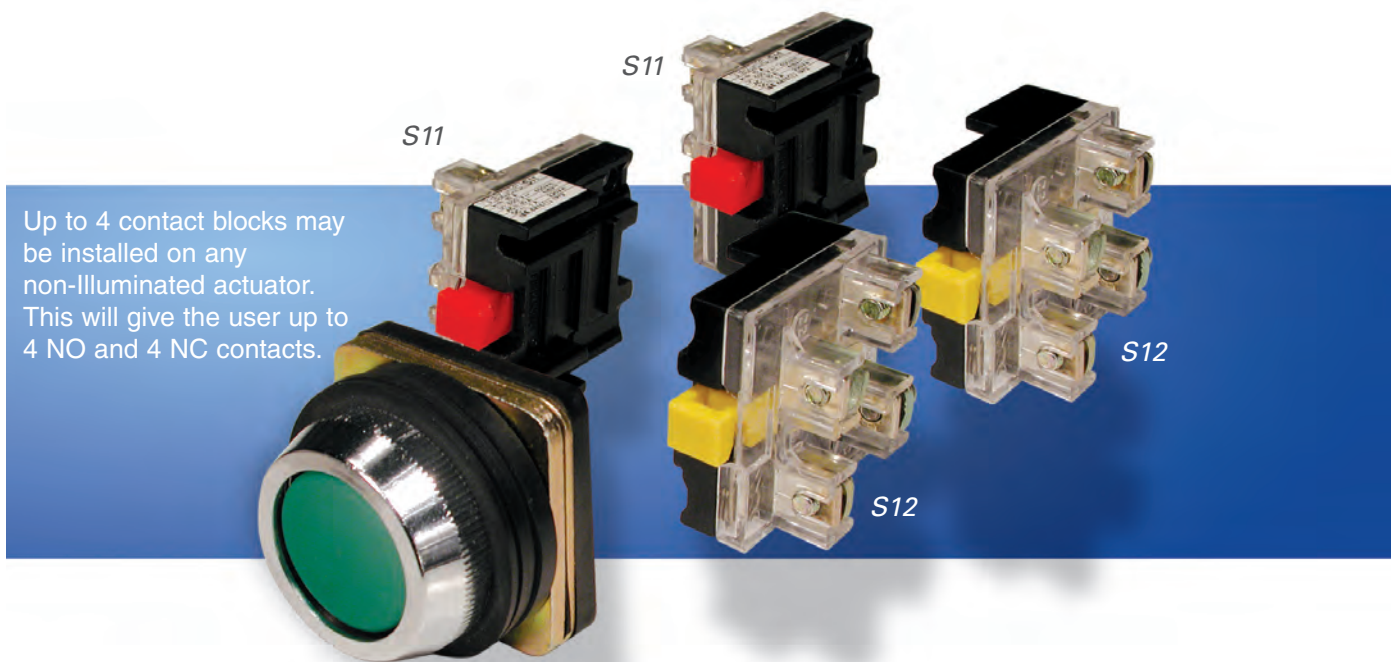
Contact Installation Screws

| Type | Dimensions | Used with |
|------|------------|-----------------|
| SC25 | M4 x 25 mm | S11 |
| SC45 | M4 x 45 mm | S11 + S12 |
| SC65 | M4 x 65 mm | 2x S11 + S12 |
| SC90 | M4 x 90 mm | 2x S11 + 2x S12 |

* When using more than two contact blocks, additional screws must be purchased separately (SC65 and SC90).



Exploded Assembly View



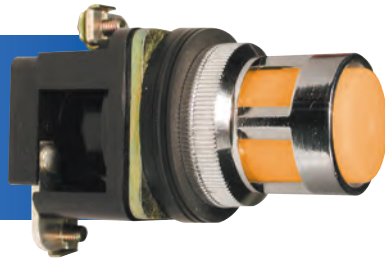
Up to 4 contact blocks may be installed on any non-illuminated actuator. This will give the user up to 4 NO and 4 NC contacts.

30mm Illuminated Metal Operators



Certified for
NEMA Type 4X
12 environment.

Flush Illuminated Momentary



Note:
All LED illuminated actuators and pilot lights at a specified voltage will operate on AC and DC.
Except for 110V and 230V specify AC or DC type.



Replacement bulbs
available.
See page 54.



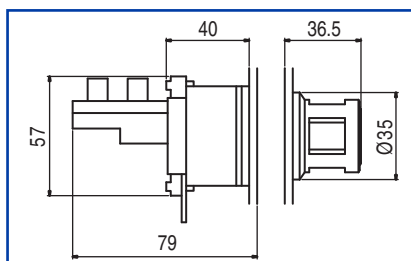
| Color | Voltage | Cat No. |
|--|------------|------------|
| 24V AC/DC (filament bulb) | | |
| <input type="checkbox"/> White | 24V AC/DC | ALF1-024 |
| <input checked="" type="checkbox"/> Green | 24V AC/DC | ALF3-024 |
| <input checked="" type="checkbox"/> Red | 24V AC/DC | ALF4-024 |
| <input checked="" type="checkbox"/> Amber | 24V AC/DC | ALF5-024 |
| <input checked="" type="checkbox"/> Blue | 24V AC/DC | ALF6-024 |
| <input type="checkbox"/> Clear | 24V AC/DC | ALF7-024 |
| <input checked="" type="checkbox"/> Yellow | 24V AC/DC | ALF8-024 |
| 48V AC/DC (filament bulb) | | |
| <input type="checkbox"/> White | 48V AC/DC | ALF1-048 |
| <input checked="" type="checkbox"/> Green | 48V AC/DC | ALF3-048 |
| <input checked="" type="checkbox"/> Red | 48V AC/DC | ALF4-048 |
| <input checked="" type="checkbox"/> Amber | 48V AC/DC | ALF5-048 |
| <input checked="" type="checkbox"/> Blue | 48V AC/DC | ALF6-048 |
| <input type="checkbox"/> Clear | 48V AC/DC | ALF7-048 |
| <input checked="" type="checkbox"/> Yellow | 48V AC/DC | ALF8-048 |
| 110V AC/DC (filament bulb) | | |
| <input type="checkbox"/> White | 110V AC/DC | ALF1-110 |
| <input checked="" type="checkbox"/> Green | 110V AC/DC | ALF3-110 |
| <input checked="" type="checkbox"/> Red | 110V AC/DC | ALF4-110 |
| <input checked="" type="checkbox"/> Amber | 110V AC/DC | ALF5-110 |
| <input checked="" type="checkbox"/> Blue | 110V AC/DC | ALF6-110 |
| <input type="checkbox"/> Clear | 110V AC/DC | ALF7-110 |
| <input checked="" type="checkbox"/> Yellow | 110V AC/DC | ALF8-110 |
| 230V AC (filament bulb) | | |
| <input type="checkbox"/> White | 230V AC | ALF1-230 |
| <input checked="" type="checkbox"/> Green | 230V AC | ALF3-230 |
| <input checked="" type="checkbox"/> Red | 230V AC | ALF4-230 |
| <input checked="" type="checkbox"/> Amber | 230V AC | ALF5-230 |
| <input checked="" type="checkbox"/> Blue | 230V AC | ALF6-230 |
| <input type="checkbox"/> Clear | 230V AC | ALF7-230 |
| <input checked="" type="checkbox"/> Yellow | 230V AC | ALF8-230 |
| <i>230V DC version is available on request.</i> | | |
| 24V AC/DC (LED bulb) | | |
| <input type="checkbox"/> White | 24V AC/DC | ALF1LB-024 |
| <input checked="" type="checkbox"/> Green | 24V AC/DC | ALF3LB-024 |
| <input checked="" type="checkbox"/> Red | 24V AC/DC | ALF4LB-024 |
| <input checked="" type="checkbox"/> Amber | 24V AC/DC | ALF5LB-024 |
| <input checked="" type="checkbox"/> Blue | 24V AC/DC | ALF6LB-024 |
| <input type="checkbox"/> Clear | 24V AC/DC | ALF7LB-024 |
| <input checked="" type="checkbox"/> Yellow | 24V AC/DC | ALF8LB-024 |
| 48V AC/DC (LED bulb) | | |
| <input type="checkbox"/> White | 48V AC/DC | ALF1LB-048 |
| <input checked="" type="checkbox"/> Green | 48V AC/DC | ALF3LB-048 |
| <input checked="" type="checkbox"/> Red | 48V AC/DC | ALF4LB-048 |
| <input checked="" type="checkbox"/> Amber | 48V AC/DC | ALF5LB-048 |
| <input checked="" type="checkbox"/> Blue | 48V AC/DC | ALF6LB-048 |
| <input type="checkbox"/> Clear | 48V AC/DC | ALF7LB-048 |
| <input checked="" type="checkbox"/> Yellow | 48V AC/DC | ALF8LB-048 |
| 110V AC/DC (LED bulb) | | |
| <input type="checkbox"/> White | 110V AC | ALF1LB-110 |
| <input checked="" type="checkbox"/> Green | 110V AC | ALF3LB-110 |
| <input checked="" type="checkbox"/> Red | 110V AC | ALF4LB-110 |
| <input checked="" type="checkbox"/> Amber | 110V AC | ALF5LB-110 |
| <input checked="" type="checkbox"/> Blue | 110V AC | ALF6LB-110 |
| <input type="checkbox"/> Clear | 110V AC | ALF7LB-110 |
| <input checked="" type="checkbox"/> Yellow | 110V AC | ALF8LB-110 |
| 230V AC* (LED bulb) | | |
| <input type="checkbox"/> White | 230V AC* | ALF1LB-230 |
| <input checked="" type="checkbox"/> Green | 230V AC* | ALF3LB-230 |
| <input checked="" type="checkbox"/> Red | 230V AC* | ALF4LB-230 |
| <input checked="" type="checkbox"/> Amber | 230V AC* | ALF5LB-230 |
| <input checked="" type="checkbox"/> Blue | 230V AC* | ALF6LB-230 |
| <input type="checkbox"/> Clear | 230V AC* | ALF7LB-230 |
| <input checked="" type="checkbox"/> Yellow | 230V AC* | ALF8LB-230 |
| <i>*230V DC version is available on request.</i> | | |

30mm Illuminated Metal Operators

Dimensional Drawings

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

Flush Illuminated Momentary



Contact Elements

Description

1 Normally Open + 1 Normally Closed
Silver Contacts

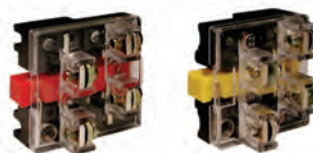
Cat. No.

S11

2 Normally Open + 2 Normally Closed
Silver Contacts

S11 + S12

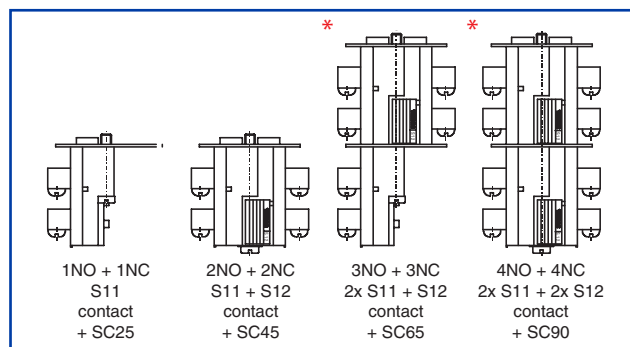
For additional contacts, see diagram at right.



Contact Installation Screws

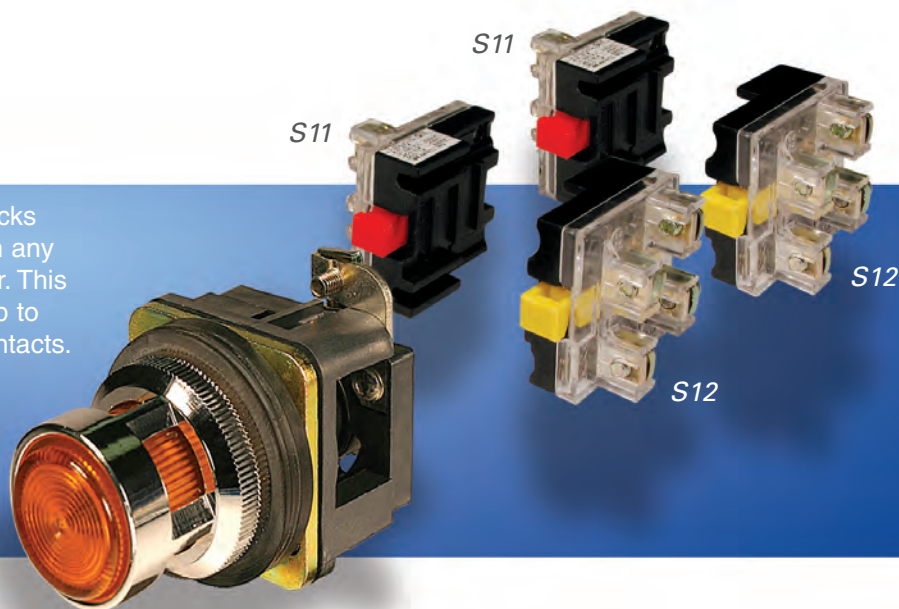
| Type | Dimensions | Used with |
|------|------------|-----------------|
| SC25 | M4 x 25 mm | S11 |
| SC45 | M4 x 45 mm | S11 + S12 |
| SC65 | M4 x 65 mm | 2x S11 + S12 |
| SC90 | M4 x 90 mm | 2x S11 + 2x S12 |

* When using more than two contact blocks, additional screws must be purchased separately (SC65 and SC90).



Exploded Assembly View

Up to 4 contact blocks may be installed on any Illuminated actuator. This will give the user up to 2 NO and 2 NC contacts.



30mm Selector Switch Metal Operators



Certified for
NEMA Type 4X
12 environment.

Selector Maintained & Momentary



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

Color

Cat No.

2 Position Maintained

| | |
|---------|--------|
| ■ Black | AS2-2P |
|---------|--------|

3 Position Maintained

| | |
|---------|--------|
| ■ Black | AS2-3P |
|---------|--------|

2 Position Momentary

| | |
|---------|----------|
| ■ Black | AS2-2PSR |
|---------|----------|

Key Selector Switch

Keyed Alike



To be used for applications where single or multiple operators are used, but the same key configurations are required. Standard key selector switches have the same key configuration (Cat. No. KY30).

Function

Key Removal

Cat No.

2 Position

| | | | |
|------------|---|------------|-----------|
| Maintained | ∩ | Left/Right | AK2-2PB |
| Momentary | ∩ | Left | AK2-2POSR |
| Maintained | ∩ | Right | AK2-2PI |
| Maintained | ∩ | Left | AK2-2PO |

3 Position

| | | | |
|------------|---|------------|---------|
| Maintained | ∩ | Left/Right | AK2-3PB |
| Maintained | ∩ | Center | AK2-3PC |



Replacement Key

KY30

Key Selector Switch

Keyed Differently



To be used for applications where multiple operators are used, but different key configurations are required. Each cat. no. have different key configurations.

Function

Key Removal

Cat No.

2 Position

| | | | |
|------------|---|------|-------------|
| Maintained | ∩ | Left | AK2-2PO-KD |
| Momentary | ∩ | Left | AK2-2PO-KD1 |
| Maintained | ∩ | Left | AK2-2PO-KD2 |
| Maintained | ∩ | Left | AK2-2PO-KD4 |
| Maintained | ∩ | Left | AK2-2PO-KD5 |

3 Position

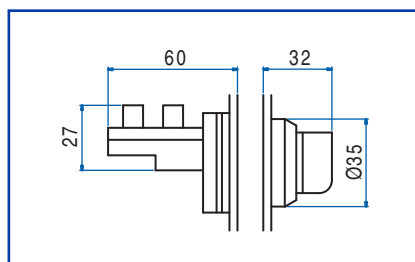
| | | | |
|------------|---|--------|-------------|
| Maintained | ∩ | Center | AK2-3PC-KD |
| Maintained | ∩ | Center | AK2-3PC-KD1 |
| Maintained | ∩ | Center | AK2-3PC-KD2 |
| Maintained | ∩ | Center | AK2-3PC-KD3 |

30mm Selector Switch Metal Operators

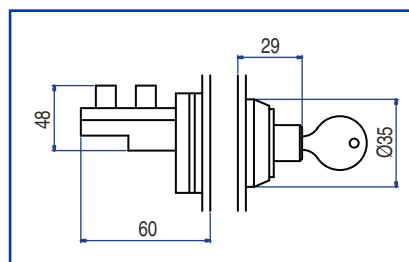
Dimensional Drawings

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

Flush Maintained and Momentary



Key Selector



Contact Elements

Description

1 Normally Open + 1 Normally Closed
Silver Contacts

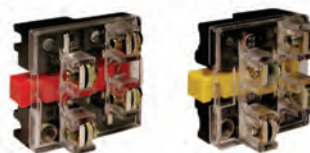
Cat. No.

S11

2 Normally Open + 2 Normally Closed
Silver Contacts

S11 + S12

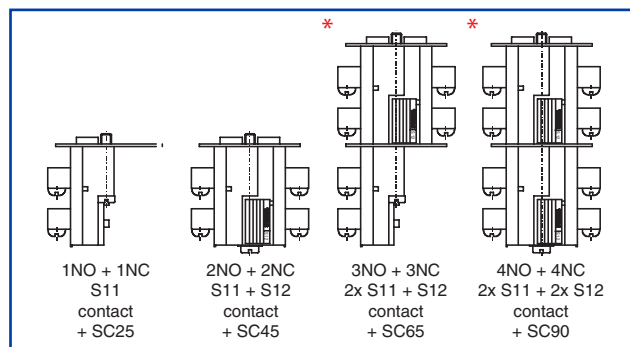
For additional contacts, see diagram at right.



Contact Installation Screws

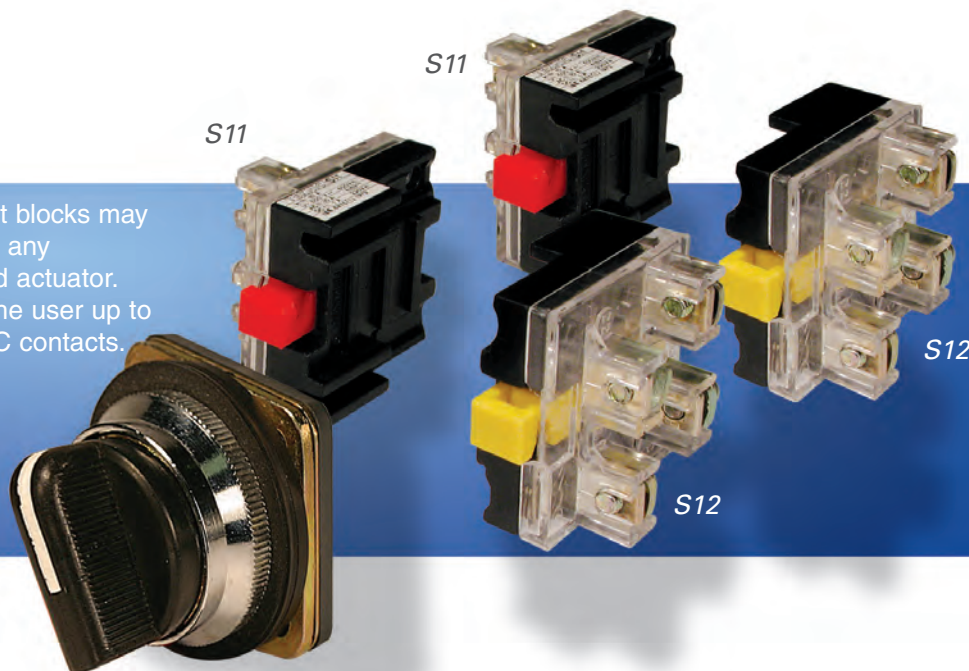
| Type | Dimensions | Used with |
|------|------------|-----------------|
| SC25 | M4 x 25 mm | S11 |
| SC45 | M4 x 45 mm | S11 + S12 |
| SC65 | M4 x 65 mm | 2x S11 + S12 |
| SC90 | M4 x 90 mm | 2x S11 + 2x S12 |

* When using more than two contact blocks, additional screws must be purchased separately (SC65 and SC90).



Exploded Assembly View

Up to 4 contact blocks may be installed on any non-illuminated actuator. This will give the user up to 4 NO and 4 NC contacts.



30mm Non-Illuminated Metal Operators



Certified for
NEMA Type 4X
12 environment.

Mushroom with Key



All keys are “keyed alike”. Different keys are available on request.
Other colors are available on request.

| Color | Function | Cat No. |
|-------|----------|---------|
|-------|----------|---------|

Press to Lock, Key to Release

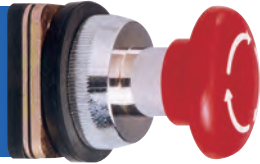
| | | |
|---------|------------|--------|
| ■ Black | Maintained | AMLKB2 |
| ■ Red | Maintained | AMLKB4 |

Key to Lock, Key to Release

| | | |
|---------|------------|-------|
| ■ Black | Maintained | AMKB2 |
| ■ Red | Maintained | AMKB4 |

Mushroom with Indicating Arrows

(Press to lock, turn to release.)



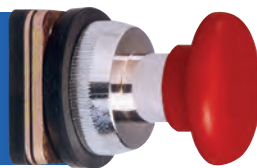
Other colors are available on request.

| Color | Function | Cat No. |
|-------|----------|---------|
|-------|----------|---------|

Press to Lock, Turn to Release

| | | |
|---------|------------|------|
| ■ Black | Maintained | AML2 |
| ■ Red | Maintained | AML4 |

Mushroom Momentary



| Color | Function | Cat No. |
|-------|----------|---------|
|-------|----------|---------|

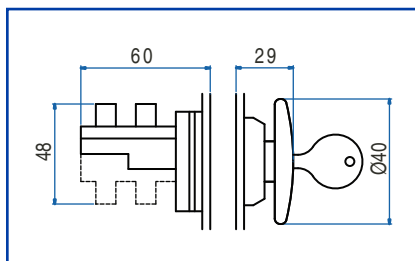
| | | |
|----------|-----------|-----|
| □ White | Momentary | AM1 |
| ■ Black | Momentary | AM2 |
| ■ Green | Momentary | AM3 |
| ■ Red | Momentary | AM4 |
| ■ Blue | Momentary | AM6 |
| ■ Yellow | Momentary | AM8 |

30mm Non-Illuminated Metal Operators

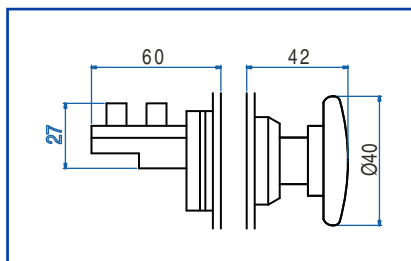
Dimensional Drawings

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

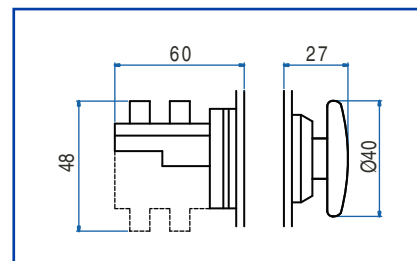
Mushroom with Key



Mushroom with Indicating Arrows



Mushroom Momentary



Contact Elements

Description

1 Normally Open + 1 Normally Closed
Silver Contacts

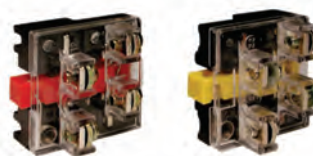
Cat. No.

S11

2 Normally Open + 2 Normally Closed
Silver Contacts

S11 + S12

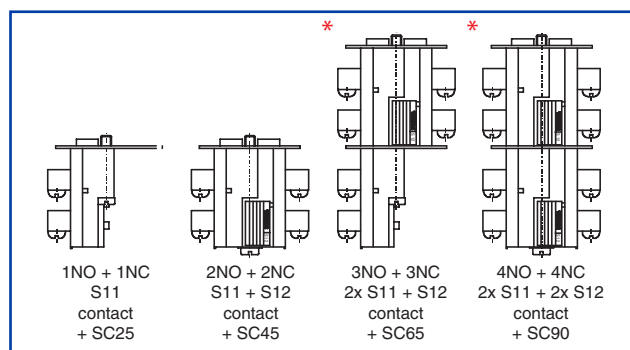
For additional contacts, see diagram at right.



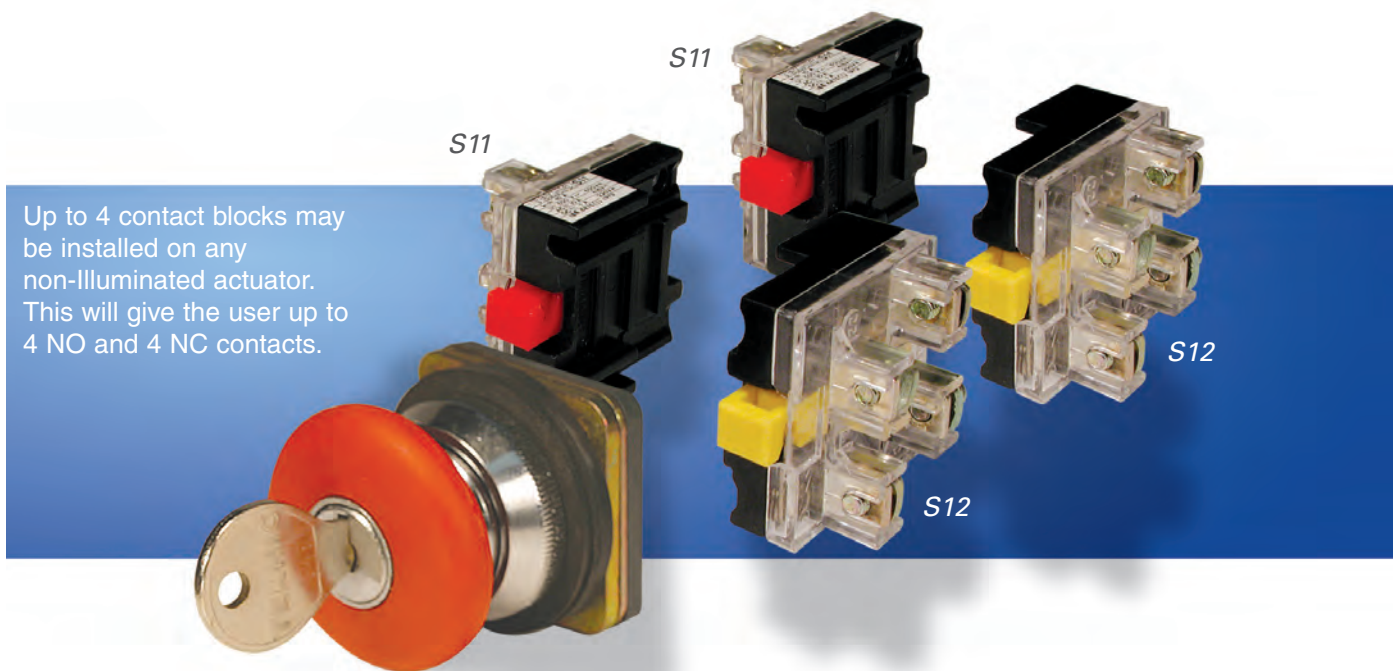
Contact Installation Screws

| Type | Dimensions | Used with |
|------|------------|-----------------|
| SC25 | M4 x 25 mm | S11 |
| SC45 | M4 x 45 mm | S11 + S12 |
| SC65 | M4 x 65 mm | 2x S11 + S12 |
| SC90 | M4 x 90 mm | 2x S11 + 2x S12 |

* When using more than two contact blocks, additional screws must be purchased separately (SC65 and SC90).



Exploded Assembly View



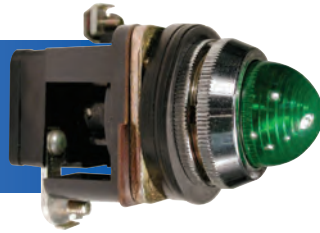
Up to 4 contact blocks may be installed on any non-illuminated actuator. This will give the user up to 4 NO and 4 NC contacts.

30mm Metal Pilot Lights



Certified for
NEMA Type 4X
12 environment.

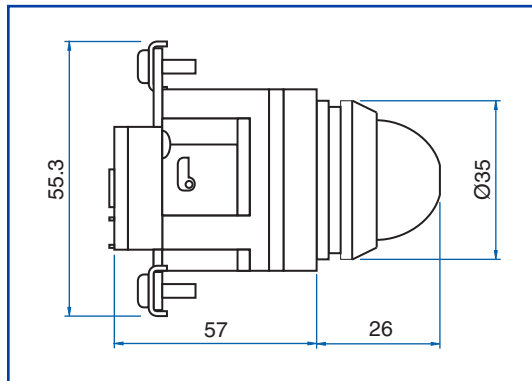
Pilot Light



Note:
All LED pilot lights and illuminated actuators at a specified voltage will operate on AC and DC.
Except for 110 and 230V specify AC or DC type.

Dimensional Drawings

Pilot Light



Replacement bulbs
available.
See page 54.



Filament Bulb

| Color | Voltage | Cat No. |
|-----------------------------------|------------|----------|
| 24V AC/DC (filament bulb) | | |
| White | 24V AC/DC | PLB1-024 |
| Green | 24V AC/DC | PLB3-024 |
| Red | 24V AC/DC | PLB4-024 |
| Amber | 24V AC/DC | PLB5-024 |
| Blue | 24V AC/DC | PLB6-024 |
| Clear | 24V AC/DC | PLB7-024 |
| Yellow | 24V AC/DC | PLB8-024 |
| 48V AC/DC (filament bulb) | | |
| White | 48V AC/DC | PLB1-048 |
| Green | 48V AC/DC | PLB3-048 |
| Red | 48V AC/DC | PLB4-048 |
| Amber | 48V AC/DC | PLB5-048 |
| Blue | 48V AC/DC | PLB6-048 |
| Clear | 48V AC/DC | PLB7-048 |
| Yellow | 48V AC/DC | PLB8-048 |
| 110V AC/DC (filament bulb) | | |
| White | 110V AC/DC | PLB1-110 |
| Green | 110V AC/DC | PLB3-110 |
| Red | 110V AC/DC | PLB4-110 |
| Amber | 110V AC/DC | PLB5-110 |
| Blue | 110V AC/DC | PLB6-110 |
| Clear | 110V AC/DC | PLB7-110 |
| Yellow | 110V AC/DC | PLB8-110 |
| 230V AC/DC (filament bulb) | | |
| White | 230V AC/DC | PLB1-230 |
| Green | 230V AC/DC | PLB3-230 |
| Red | 230V AC/DC | PLB4-230 |
| Amber | 230V AC/DC | PLB5-230 |
| Blue | 230V AC/DC | PLB6-230 |
| Clear | 230V AC/DC | PLB7-230 |
| Yellow | 230V AC/DC | PLB8-230 |

LED Bulb

| Color | Voltage | Cat No. |
|------------------------------|-----------|------------|
| 24V AC/DC (LED bulb) | | |
| White | 24V AC/DC | PLB1LB-024 |
| Green | 24V AC/DC | PLB3LB-024 |
| Red | 24V AC/DC | PLB4LB-024 |
| Amber | 24V AC/DC | PLB5LB-024 |
| Blue | 24V AC/DC | PLB6LB-024 |
| Clear | 24V AC/DC | PLB7LB-024 |
| Yellow | 24V AC/DC | PLB8LB-024 |
| 48V AC/DC (LED bulb) | | |
| White | 48V AC/DC | PLB1LB-048 |
| Green | 48V AC/DC | PLB3LB-048 |
| Red | 48V AC/DC | PLB4LB-048 |
| Amber | 48V AC/DC | PLB5LB-048 |
| Blue | 48V AC/DC | PLB6LB-048 |
| Clear | 48V AC/DC | PLB7LB-048 |
| Yellow | 48V AC/DC | PLB8LB-048 |
| 110V AC/DC (LED bulb) | | |
| White | 110V AC | PLB1LB-110 |
| Green | 110V AC | PLB3LB-110 |
| Red | 110V AC | PLB4LB-110 |
| Amber | 110V AC | PLB5LB-110 |
| Blue | 110V AC | PLB6LB-110 |
| Clear | 110V AC | PLB7LB-110 |
| Yellow | 110V AC | PLB8LB-110 |
| 230V AC* (LED bulb) | | |
| White | 230V AC* | PLB1LB-230 |
| Green | 230V AC* | PLB3LB-230 |
| Red | 230V AC* | PLB4LB-230 |
| Amber | 230V AC* | PLB5LB-230 |
| Blue | 230V AC* | PLB6LB-230 |
| Clear | 230V AC* | PLB7LB-230 |
| Yellow | 230V AC* | PLB8LB-230 |

*230V DC version is available on request.

Aluminum Enclosures for 30mm Operators



Certified for
NEMA Type 4X
12 environment.

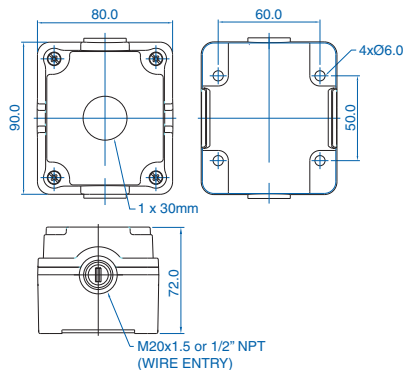


Aluminum (72mm Height)
Pressure Die Cast

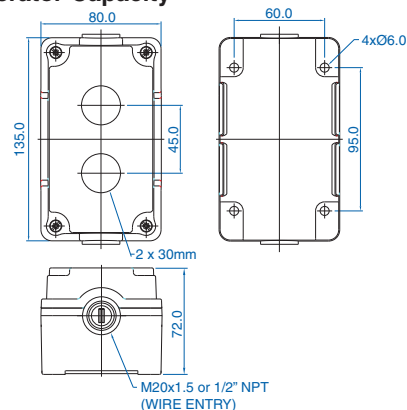
| Operator Capacity | Cat. No. Black base/ Grey Cover* | Color Black base/ Yellow Cover | Material Construction | Dimensions LxWxH mm (in.) | Cable Entry Thread Size | Mounting Hole Dia. |
|-------------------|--|--------------------------------------|--------------------------|------------------------------|----------------------------|-----------------------|
| 1 | 7011A13 | 7023A10 | PDC Aluminum, EH | 80x90x72 (3.15x3.54x2.83) | 2xM20 | 4 X 6mm |
| 2 | 7008C13 | 7017C10 | PDC Aluminum, EH | 80x135x72 (3.15x5.32x2.83) | 2xM20 | 4 X 6mm |
| 3 | 7006E13 | 7018E10 | PDC Aluminum, EH | 80x180x72 (3.15x7.09x2.83) | 2xM20 | 4 X 6mm |
| 4 | 7006G13 | 7010G10 | PDC Aluminum, EH | 80x225x72 (3.15x8.86x2.83) | 2xM20 | 4 X 6mm |
| 1 | 7012A13 | 7024A10 | PDC Aluminum, EH | 80x90x72 (3.15x3.54x2.83) | 2x1/2"-14 NPT | 4 X 6mm |
| 2 | 7009C13 | 7018C10 | PDC Aluminum, EH | 80x135x72 (3.15x5.32x2.83) | 2x1/2"-14 NPT | 4 X 6mm |
| 3 | 7007E13 | 7019E10 | PDC Aluminum, EH | 80x180x72 (3.15x7.09x2.83) | 2x1/2"-14 NPT | 4 X 6mm |
| 4 | 7007G13 | 7011G10 | PDC Aluminum, EH | 80x225x72 (3.15x8.86x2.83) | 2x1/2"-14 NPT | 4 X 6mm |

*Color code RAL 7032, Pebble Gray. Other colors available upon request.

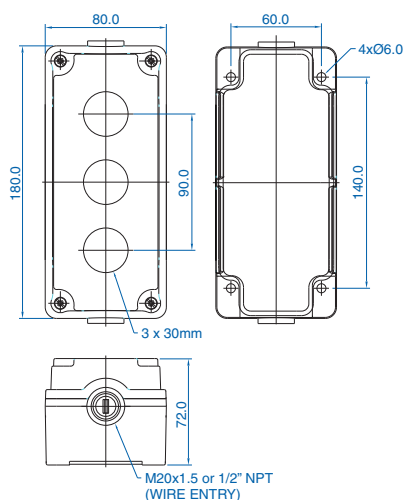
1 - Operator Capacity



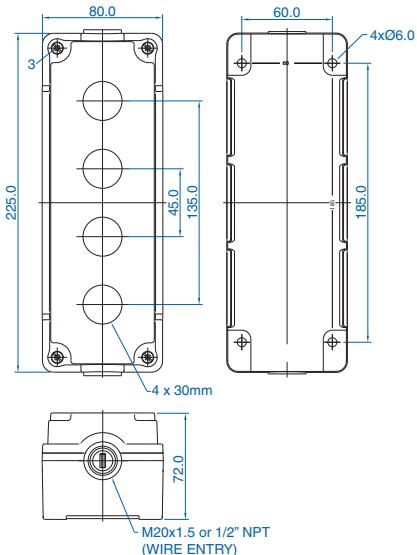
2 - Operator Capacity



3 - Operator Capacity



4 - Operator Capacity



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

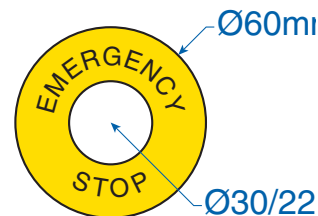
30mm Push Button Accessories



Metal legend plates are engraved in horizontal and vertical orientations, one per side.



EMERGENCY STOP
LP41
Legend plate Ø 60mm
yellow with black text.



| Title | Cat No. | Title | Cat No. |
|----------------|---------|------------|---------|
| AUTO | LP09 | OVER | LP74 |
| CLOSE | LP08 | POWER ON | LP20 |
| DOWN | LP07 | RESET | LP13 |
| EMERGENCY STOP | LP41 | REVERSE | LP04 |
| FAST | LP12 | RIGHT | LP17 |
| HAND | LP10 | RUN | LP24 |
| HAND, O, AUTO | LP36 | SLOW | LP11 |
| INCH | LP14 | START | LP01 |
| LEFT | LP18 | STOP (red) | LP02 |
| OFF | LP16 | TRIP | LP19 |
| ON | LP15 | UNDER LOAD | LP108 |
| OPEN | LP07 | | |

Replacement Bulbs



Filament Bulbs

| Color | Voltage | Cat No. |
|--------------------------------|------------|----------|
| <input type="checkbox"/> Clear | 12V AC/DC | BA15D12 |
| <input type="checkbox"/> Clear | 24V AC/DC | BA15D24 |
| <input type="checkbox"/> Clear | 48V AC/DC | BA15D48 |
| <input type="checkbox"/> Clear | 110V AC/DC | BA15D110 |
| <input type="checkbox"/> Clear | 230V AC/DC | BA15D220 |

LED Bulbs

| Color | Voltage | Cat No. |
|--|-----------|----------|
| <input type="checkbox"/> White | 12V AC/DC | MCB15112 |
| <input checked="" type="checkbox"/> Green | 12V AC/DC | MCB15312 |
| <input checked="" type="checkbox"/> Red | 12V AC/DC | MCB15412 |
| <input checked="" type="checkbox"/> Amber | 12V AC/DC | MCB15512 |
| <input checked="" type="checkbox"/> Blue | 12V AC/DC | MCB15612 |
| <input checked="" type="checkbox"/> Yellow | 12V AC/DC | MCB15812 |

LED Bulbs

| Color | Voltage | Cat No. | Color | Voltage | Cat No. |
|--|-----------|------------|--|-----------|------------|
| <input type="checkbox"/> White | 110V AC | MCB151110 | <input type="checkbox"/> White | 230V AC | MCB151230 |
| <input checked="" type="checkbox"/> Green | 110V AC | MCB153110 | <input checked="" type="checkbox"/> Green | 230V AC | MCB153230 |
| <input checked="" type="checkbox"/> Red | 110V AC | MCB154110 | <input checked="" type="checkbox"/> Red | 230V AC | MCB154230 |
| <input checked="" type="checkbox"/> Amber | 110V AC | MCB155110 | <input checked="" type="checkbox"/> Amber | 230V AC | MCB155230 |
| <input checked="" type="checkbox"/> Blue | 110V AC | MCB156110 | <input checked="" type="checkbox"/> Blue | 230V AC | MCB156230 |
| <input checked="" type="checkbox"/> Yellow | 110V AC | MCB158110 | <input checked="" type="checkbox"/> Yellow | 230V AC | MCB158230 |
| <input type="checkbox"/> White | 110V DC | MCB151110D | <input type="checkbox"/> White | 230V DC | MCB151230D |
| <input checked="" type="checkbox"/> Green | 110V DC | MCB153110D | <input checked="" type="checkbox"/> Green | 230V DC | MCB153230D |
| <input checked="" type="checkbox"/> Red | 110V DC | MCB154110D | <input checked="" type="checkbox"/> Red | 230V DC | MCB154230D |
| <input checked="" type="checkbox"/> Amber | 110V DC | MCB155110D | <input checked="" type="checkbox"/> Amber | 230V DC | MCB155230D |
| <input checked="" type="checkbox"/> Blue | 110V DC | MCB156110D | <input checked="" type="checkbox"/> Blue | 230V DC | MCB156230D |
| <input checked="" type="checkbox"/> Yellow | 110V DC | MCB158110D | <input checked="" type="checkbox"/> Yellow | 230V DC | MCB158230D |
| <input type="checkbox"/> White | 24V AC/DC | MCB15124 | <input type="checkbox"/> White | 48V AC/DC | MCB15148 |
| <input checked="" type="checkbox"/> Green | 24V AC/DC | MCB15324 | <input checked="" type="checkbox"/> Green | 48V AC/DC | MCB15348 |
| <input checked="" type="checkbox"/> Red | 24V AC/DC | MCB15424 | <input checked="" type="checkbox"/> Red | 48V AC/DC | MCB15448 |
| <input checked="" type="checkbox"/> Amber | 24V AC/DC | MCB15524 | <input checked="" type="checkbox"/> Amber | 48V AC/DC | MCB15548 |
| <input checked="" type="checkbox"/> Blue | 24V AC/DC | MCB15624 | <input checked="" type="checkbox"/> Blue | 48V AC/DC | MCB15648 |
| <input checked="" type="checkbox"/> Yellow | 24V AC/DC | MCB15824 | <input checked="" type="checkbox"/> Yellow | 48V AC/DC | MCB15848 |

Maximum Power Consumption:

| Supply Voltage | LED | | FILAMENT BULBS | |
|----------------|----------------------|----------|----------------------|-----------|
| | 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 | 5W | max 105mA |
| 110V | 0.5W | max 20mA | 5W | max 45mA |
| 240V | 1W | max 20mA | 6W | max 25mA |

These bulbs are available in various colors and voltages. LED based bulbs are a direct replacement for filament bulbs and do not require having to change any other components in your existing operator or pilot light.

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, therefore no damage to the body of the lamp or any operator in case of illuminated push buttons occurs.

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.

30mm Push Button Accessories

Please visit altechcorp.com/pb for other available legend plates.

Lenses and Replacement Boots

Lenses for pilot lights



| | Color | Cat No. | Cat No. w/ bushing |
|-------------------------------------|--------|---------|--------------------|
| <input type="checkbox"/> | White | PLL1 | — |
| <input checked="" type="checkbox"/> | Green | PLL3 | PLLA3 |
| <input checked="" type="checkbox"/> | Red | PLL4 | PLLA4 |
| <input checked="" type="checkbox"/> | Amber | PLL5 | — |
| <input checked="" type="checkbox"/> | Blue | PLL6 | — |
| <input type="checkbox"/> | Clear | PLL7 | — |
| <input checked="" type="checkbox"/> | Yellow | PLL8 | — |

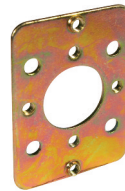
Lenses for illuminated actuators

| | Color | Cat No. |
|-------------------------------------|--------|---------|
| <input type="checkbox"/> | White | ALL1 |
| <input checked="" type="checkbox"/> | Green | ALL3 |
| <input checked="" type="checkbox"/> | Red | ALL4 |
| <input checked="" type="checkbox"/> | Amber | ALL5 |
| <input checked="" type="checkbox"/> | Blue | ALL6 |
| <input type="checkbox"/> | Clear | ALL7 |
| <input checked="" type="checkbox"/> | Yellow | ALL8 |



Padlock

For mushroom actuator: Cat. No. PAM
For projecting actuator: Cat. No. PAP



Actuator Lock Plate

Cat. No.: ALP101

Rubber Boots for Booted Actuators



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



1.2mm Actuator Rubber Washer

Cat. No.: ARW1.2

3.2mm Actuator Rubber Washer

Cat. No.: ARW3.2



Replacement Key

Cat. No.: KY30



Bulb Extractor

Cat. No.: 2BA9SE

Contact Block Installation Screws



| Cat #. | Dimensions | Used With |
|--------|------------|-----------------------------|
| SC25 | M4 x 25 mm | S11 only |
| SC45 | M4 x 45 mm | S11 + S12 (2NO + 2NC) |
| SC65 | M4 x 65 mm | 2 x S11 + S12 (3NO + 3NC) |
| SC90 | M4 x 90 mm | 2 x S11 + 2 x S12 (4NO+4NC) |

Contact Elements

Description

1 Normally Open + 1 Normally Closed
Silver Contacts

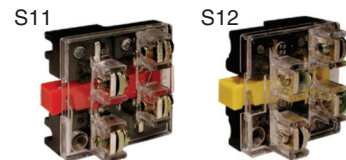
Cat. No.

S11

2 Normally Open + 2 Normally Closed
Silver Contacts

S11 + S12

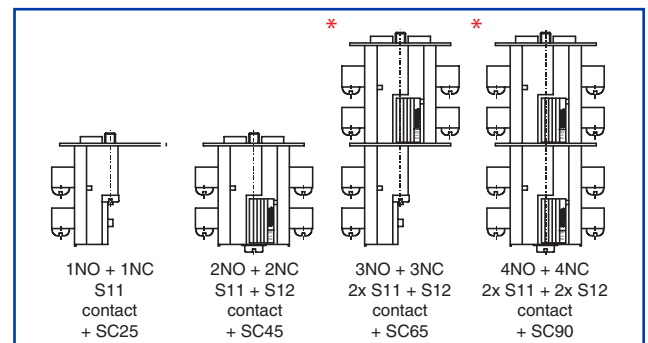
For additional contacts, see diagram at right.



Contact Installation Screws

| Type | Dimensions | Used with |
|------|------------|-----------------|
| SC25 | M4 x 25 mm | S11 |
| SC45 | M4 x 45 mm | S11 + S12 |
| SC65 | M4 x 65 mm | 2x S11 + S12 |
| SC90 | M4 x 90 mm | 2x S11 + 2x S12 |

* When using more than two contact blocks, additional screws must be purchased separately (SC45 and SC90).



30mm Technical Notes

Characteristics

Environment

| | | |
|-----------------------|---|--|
| Temperature Range | -25°C to +70°C (-13°F to +158°F) | |
| Degree of protection: | IEC 529 UL50 | IP65 NEMA Type 4X, 12 |
| Mechanical Life | All push buttons except maintained mushroom maintained mushroom | 1 million of cycles 0.3 million of cycles |

Mechanical Characteristics of contact elements

| | | |
|--------------------------|---|--|
| Contact Operation | NO+NC | Double break, self-wiping |
| Rated Insulation Voltage | 500 V AC | |
| Operating Travel | Push buttons | Changing NC state 2.4mm Changing NO state 4.3mm Travel 8.7mm |
| Terminal Capacity | Wiring | 2x1.5 sq.mm (2x16 AWG) or 1x2.5 sq.mm (14 AWG) |
| Contact Material | Bimetal (Cu/Ag) | Standard single element |
| Short Circuit Protection | 10A HRC fuse | |
| Rated Make Break | UL508, AC: A600; 600V, 1.2A DC: Q600; 600V, 0.1A | standard block with screw clamp terminals 415V AC, 4A standard block with screw clamp terminals 220V AC, 0.5A |
| Dielectric Strength | Push Buttons, Pilot Lights | 2500V for 1 minute |

| Cat. No. | Page | Cat. No. | Page | Cat. No. | Page | Cat. No. | Page |
|--------------|------|---------------|------|---------------|------|----------------|------|
| 1.01E+16 | 53 | 2ALF3LB-230D | 22 | 2ALMPP1LB-230 | 13 | 2AM4 | 8 |
| 1.01E+16 | 53 | 2ALF4LB-012 | 22 | 2ALMPP3LB-012 | 13 | 2AM6 | 8 |
| 2.01E+16 | 36 | 2ALF4LB-024 | 22 | 2ALMPP3LB-024 | 13 | 2AM8 | 8 |
| 2.01E+16 | 37 | 2ALF4LB-048 | 22 | 2ALMPP3LB-048 | 13 | 2AMJ1 | 8 |
| 2.01E+16 | 36 | 2ALF4LB-110 | 22 | 2ALMPP3LB-110 | 13 | 2AMJ2 | 8 |
| 2.01E+16 | 37 | 2ALF4LB-110D | 22 | 2ALMPP3LB-230 | 13 | 2AMJ3 | 8 |
| 1003A13 | 53 | 2ALF4LB-230 | 22 | 2ALMPP4LB-012 | 13 | 2AMJ4 | 8 |
| 1004C13 | 53 | 2ALF4LB-230D | 22 | 2ALMPP4LB-024 | 13 | 2AMJ6 | 8 |
| 1004G13 | 53 | 2ALF5LB-012 | 22 | 2ALMPP4LB-048 | 13 | 2AMJ8 | 8 |
| 1005A13 | 53 | 2ALF5LB-024 | 22 | 2ALMPP4LB-110 | 13 | 2AML1 | 10 |
| 1006C13 | 53 | 2ALF5LB-048 | 22 | 2ALMPP4LB-230 | 13 | 2AML2 | 10 |
| 1006G13 | 53 | 2ALF5LB-110 | 22 | 2ALMPP5LB-012 | 13 | 2AML3 | 10 |
| 153-601 | 34 | 2ALF5LB-110D | 22 | 2ALMPP5LB-024 | 13 | 2AML4 | 10 |
| 153-601/L | 34 | 2ALF5LB-230 | 22 | 2ALMPP5LB-048 | 13 | 2AML4 | 31 |
| 153-901 | 34 | 2ALF5LB-230D | 22 | 2ALMPP5LB-110 | 13 | 2AML6 | 10 |
| 153-901/L | 34 | 2ALF6LB-012 | 22 | 2ALMPP5LB-230 | 13 | 2AML8 | 10 |
| 153-902 | 34 | 2ALF6LB-024 | 22 | 2ALMPP6LB-012 | 13 | 2AMLJ1 | 10 |
| 153-902/1H | 34 | 2ALF6LB-048 | 22 | 2ALMPP6LB-024 | 13 | 2AMLJ2 | 10 |
| 153-902/L | 34 | 2ALF6LB-110 | 22 | 2ALMPP6LB-048 | 13 | 2AMLJ3 | 10 |
| 153-903 | 34 | 2ALF6LB-110D | 22 | 2ALMPP6LB-110 | 13 | 2AMLJ4 | 10 |
| 153-903/L | 34 | 2ALF6LB-230 | 22 | 2ALMPP6LB-230 | 13 | 2AMLJ6 | 10 |
| 153-904 | 34 | 2ALF6LB-230D | 22 | 2ALMPP7LB-012 | 13 | 2AMLJ8 | 10 |
| 153-904/L | 34 | 2ALF7LB-012 | 22 | 2ALMPP7LB-024 | 13 | 2AMLKB1 | 10 |
| 153-905 | 34 | 2ALF7LB-024 | 22 | 2ALMPP7LB-048 | 13 | 2AMLKB2 | 10 |
| 153-905/L | 34 | 2ALF7LB-048 | 22 | 2ALMPP7LB-110 | 13 | 2AMLKB3 | 10 |
| 2005A13 | 36 | 2ALF7LB-110 | 22 | 2ALMPP7LB-230 | 13 | 2AMLKB4 | 10 |
| 2005G13 | 37 | 2ALF7LB-110D | 22 | 2ALMPP8LB-012 | 13 | 2AMLKB6 | 10 |
| 2006C13 | 36 | 2ALF7LB-230 | 22 | 2ALMPP8LB-024 | 13 | 2AMLKB8 | 10 |
| 2008G13 | 36 | 2ALF7LB-230D | 22 | 2ALMPP8LB-048 | 13 | 2AMLS1 | 10 |
| 2009A13 | 37 | 2ALF8LB-012 | 22 | 2ALMPP8LB-110 | 13 | 2AMLS2 | 10 |
| 2009G13 | 37 | 2ALF8LB-024 | 22 | 2ALMPP8LB-230 | 13 | 2AMLS3 | 10 |
| 2010G13 | 36 | 2ALF8LB-048 | 22 | 2ALP1LB-012 | 20 | 2AMLS4 | 10 |
| 2011C13 | 37 | 2ALF8LB-110 | 22 | 2ALP1LB-024 | 20 | 2AMLS4 | 31 |
| 2014C13 | 36 | 2ALF8LB-110D | 22 | 2ALP1LB-048 | 20 | 2AMLS6 | 10 |
| 2015A13 | 36 | 2ALF8LB-230 | 22 | 2ALP1LB-110D | 20 | 2AMLS8 | 10 |
| 2015C13 | 37 | 2ALF8LB-230D | 22 | 2ALP1LB-230 | 20 | 2AMPP1 | 8 |
| 2016A13 | 37 | 2ALM1L | 39 | 2ALP1LB-230D | 20 | 2AMPP2 | 8 |
| 2AB1 | 6 | 2ALM3L | 39 | 2ALP3LB-012 | 20 | 2AMPP3 | 8 |
| 2AB2 | 6 | 2ALM4L | 39 | 2ALP3LB-024 | 20 | 2AMPP4 | 8 |
| 2AB3 | 6 | 2ALM5L | 39 | 2ALP3LB-048 | 20 | 2AMPP4 | 31 |
| 2AB4 | 6 | 2ALM6L | 39 | 2ALP3LB-110 | 20 | 2AMPP6 | 8 |
| 2AB6 | 6 | 2ALM7L | 39 | 2ALP3LB-110D | 20 | 2AMPP8 | 8 |
| 2AB8 | 6 | 2ALM8L | 39 | 2ALP3LB-230 | 20 | 2AMPPJ1 | 8 |
| 2ADP | 40 | 2ALM1LB-012 | 12 | 2ALP3LB-230D | 20 | 2AMPPJ2 | 8 |
| 2AF1 | 6 | 2ALM1LB-024 | 12 | 2ALP4LB-012 | 20 | 2AMPPJ3 | 8 |
| 2AF1RH | 6 | 2ALM1LB-048 | 12 | 2ALP4LB-024 | 20 | 2AMPPJ4 | 8 |
| 2AF2 | 6 | 2ALM1LB-110 | 12 | 2ALP4LB-048 | 20 | 2AMPPJ6 | 8 |
| 2AF2RH | 6 | 2ALM1LB-230 | 12 | 2ALP4LB-110 | 20 | 2AMPPJ8 | 8 |
| 2AF3 | 6 | 2ALM3LB-012 | 12 | 2ALP4LB-110D | 20 | 2AP1 | 6 |
| 2AF3RH | 6 | 2ALM3LB-024 | 12 | 2ALP4LB-230 | 20 | 2AP2 | 6 |
| 2AF4 | 6 | 2ALM3LB-048 | 12 | 2ALP4LB-230D | 20 | 2AP3 | 6 |
| 2AF4RH | 6 | 2ALM3LB-110 | 12 | 2ALP5LB-012 | 20 | 2AP4 | 6 |
| 2AF6 | 6 | 2ALM3LB-230 | 12 | 2ALP5LB-024 | 20 | 2AP6 | 6 |
| 2AF6RH | 6 | 2ALM4LB-012 | 12 | 2ALP5LB-048 | 20 | 2AP8 | 6 |
| 2AF8 | 6 | 2ALM4LB-024 | 12 | 2ALP5LB-110 | 20 | 2AS2-1 | 16 |
| 2AF8RH | 6 | 2ALM4LB-048 | 12 | 2ALP5LB-110D | 20 | 2AS2-2 | 16 |
| 2AK2-01 | 16 | 2ALM4LB-110 | 12 | 2ALP5LB-230 | 20 | 2AS2-3 | 16 |
| 2AK2-02 | 16 | 2ALM4LB-230 | 12 | 2ALP5LB-230D | 20 | 2AS2-4 | 16 |
| 2AK2-03 | 16 | 2ALM5LB-012 | 12 | 2ALP6LB-012 | 20 | 2AS2-5 | 16 |
| 2AK2-04 | 16 | 2ALM5LB-024 | 12 | 2ALP6LB-024 | 20 | 2AS2-6 | 16 |
| 2AK2-05 | 16 | 2ALM5LB-048 | 12 | 2ALP6LB-048 | 20 | 2AS2E-1 | 16 |
| 2AK2-06 | 16 | 2ALM5LB-110 | 12 | 2ALP6LB-110 | 20 | 2AS2E-2 | 16 |
| 2AK2-07 | 16 | 2ALM5LB-230 | 12 | 2ALP6LB-110D | 20 | 2AS2E-3 | 16 |
| 2AK2-08 | 16 | 2ALM6LB-012 | 12 | 2ALP6LB-230 | 20 | 2AS2E-4 | 16 |
| 2AK2-09 | 16 | 2ALM6LB-024 | 12 | 2ALP6LB-230D | 20 | 2AS2E-5 | 16 |
| 2AK2-10 | 16 | 2ALM6LB-048 | 12 | 2ALP7LB-012 | 20 | 2AS2E-6 | 16 |
| 2AK2-11 | 16 | 2ALM6LB-110 | 12 | 2ALP7LB-024 | 20 | 2ASL1LB-1-012 | 18 |
| 2ALBT7 | 31 | 2ALM6LB-230 | 12 | 2ALP7LB-048 | 20 | 2ASL1LB-1-024 | 18 |
| 2ALBT7 | 40 | 2ALM7LB-012 | 12 | 2ALP7LB-110 | 20 | 2ASL1LB-1-048 | 18 |
| 2ALF1LB-012 | 22 | 2ALM7LB-024 | 12 | 2ALP7LB-110D | 20 | 2ASL1LB-1-110 | 18 |
| 2ALF1LB-024 | 22 | 2ALM7LB-048 | 12 | 2ALP7LB-230 | 20 | 2ASL1LB-1-110D | 18 |
| 2ALF1LB-048 | 22 | 2ALM7LB-110 | 12 | 2ALP7LB-230D | 20 | 2ASL1LB-1-230 | 18 |
| 2ALF1LB-110 | 22 | 2ALM7LB-230 | 12 | 2ALP8LB-012 | 20 | 2ASL1LB-1-230D | 18 |
| 2ALF1LB-110D | 22 | 2ALM8LB-012 | 12 | 2ALP8LB-024 | 20 | 2ASL1LB-2-012 | 18 |
| 2ALF1LB-230 | 22 | 2ALM8LB-024 | 12 | 2ALP8LB-048 | 20 | 2ASL1LB-2-024 | 18 |
| 2ALF1LB-230D | 22 | 2ALM8LB-048 | 12 | 2ALP8LB-110 | 20 | 2ASL1LB-2-048 | 18 |
| 2ALF3LB-012 | 22 | 2ALM8LB-110 | 12 | 2ALP8LB-110D | 20 | 2ASL1LB-2-110 | 18 |
| 2ALF3LB-024 | 22 | 2ALM8LB-230 | 12 | 2ALP8LB-230 | 20 | 2ASL1LB-2-110D | 18 |
| 2ALF3LB-048 | 22 | 2ALMPP1LB-012 | 13 | 2ALP8LB-230D | 20 | 2ASL1LB-2-230 | 18 |
| 2ALF3LB-110 | 22 | 2ALMPP1LB-024 | 13 | 2AM1 | 8 | 2ASL1LB-2-230D | 18 |
| 2ALF3LB-110D | 22 | 2ALMPP1LB-048 | 13 | 2AM2 | 8 | 2ASL1LB-3-012 | 18 |
| 2ALF3LB-230 | 22 | 2ALMPP1LB-110 | 13 | 2AM3 | 8 | 2ASL1LB-3-024 | 18 |

Index

| Cat. No. | Page | Cat. No. | Page | Cat. No. | Page | Cat. No. | Page |
|----------------|------|----------------|------|----------------|------|---------------------|------|
| 2ASL1LB-3-048 | 18 | 2ASL4LB-3-012 | 18 | 2ASL6LB-2-230 | 18 | 2ASL8LB-2-110 | 18 |
| 2ASL1LB-3-110 | 18 | 2ASL4LB-3-024 | 18 | 2ASL6LB-2-230D | 18 | 2ASL8LB-2-110D | 18 |
| 2ASL1LB-3-110D | 18 | 2ASL4LB-3-048 | 18 | 2ASL6LB-3-012 | 18 | 2ASL8LB-2-230 | 18 |
| 2ASL1LB-3-230 | 18 | 2ASL4LB-3-110 | 18 | 2ASL6LB-3-024 | 18 | 2ASL8LB-2-230D | 18 |
| 2ASL1LB-3-230D | 18 | 2ASL4LB-3-110D | 18 | 2ASL6LB-3-048 | 18 | 2ASL8LB-3-012 | 18 |
| 2ASL1LB-4-012 | 18 | 2ASL4LB-3-230 | 18 | 2ASL6LB-3-110 | 18 | 2ASL8LB-3-024 | 18 |
| 2ASL1LB-4-024 | 18 | 2ASL4LB-3-230D | 18 | 2ASL6LB-3-110D | 18 | 2ASL8LB-3-048 | 18 |
| 2ASL1LB-4-048 | 18 | 2ASL4LB-4-012 | 18 | 2ASL6LB-3-230 | 18 | 2ASL8LB-3-110 | 18 |
| 2ASL1LB-4-110 | 18 | 2ASL4LB-4-024 | 18 | 2ASL6LB-3-230D | 18 | 2ASL8LB-3-110D | 18 |
| 2ASL1LB-4-110D | 18 | 2ASL4LB-4-048 | 18 | 2ASL6LB-4-012 | 18 | 2ASL8LB-3-230 | 18 |
| 2ASL1LB-4-230 | 18 | 2ASL4LB-4-110 | 18 | 2ASL6LB-4-024 | 18 | 2ASL8LB-3-230D | 18 |
| 2ASL1LB-4-230D | 18 | 2ASL4LB-4-110D | 18 | 2ASL6LB-4-048 | 18 | 2ASL8LB-4-012 | 18 |
| 2ASL1LB-5-012 | 18 | 2ASL4LB-4-230 | 18 | 2ASL6LB-4-110 | 18 | 2ASL8LB-4-024 | 18 |
| 2ASL1LB-5-024 | 18 | 2ASL4LB-4-230D | 18 | 2ASL6LB-4-110D | 18 | 2ASL8LB-4-048 | 18 |
| 2ASL1LB-5-048 | 18 | 2ASL4LB-5-012 | 18 | 2ASL6LB-4-230 | 18 | 2ASL8LB-4-110 | 18 |
| 2ASL1LB-5-110 | 18 | 2ASL4LB-5-024 | 18 | 2ASL6LB-4-230D | 18 | 2ASL8LB-4-110D | 18 |
| 2ASL1LB-5-110D | 18 | 2ASL4LB-5-048 | 18 | 2ASL6LB-5-012 | 18 | 2ASL8LB-4-230 | 18 |
| 2ASL1LB-5-230 | 18 | 2ASL4LB-5-110 | 18 | 2ASL6LB-5-024 | 18 | 2ASL8LB-4-230D | 18 |
| 2ASL1LB-5-230D | 18 | 2ASL4LB-5-110D | 18 | 2ASL6LB-5-048 | 18 | 2ASL8LB-5-012 | 18 |
| 2ASL1LB-6-012 | 18 | 2ASL4LB-5-230 | 18 | 2ASL6LB-5-110 | 18 | 2ASL8LB-5-024 | 18 |
| 2ASL1LB-6-024 | 18 | 2ASL4LB-5-230D | 18 | 2ASL6LB-5-110D | 18 | 2ASL8LB-5-048 | 18 |
| 2ASL1LB-6-048 | 18 | 2ASL4LB-6-012 | 18 | 2ASL6LB-5-230 | 18 | 2ASL8LB-5-110 | 18 |
| 2ASL1LB-6-110 | 18 | 2ASL4LB-6-024 | 18 | 2ASL6LB-5-230D | 18 | 2ASL8LB-5-110D | 18 |
| 2ASL1LB-6-110D | 18 | 2ASL4LB-6-048 | 18 | 2ASL6LB-6-012 | 18 | 2ASL8LB-5-230 | 18 |
| 2ASL1LB-6-230 | 18 | 2ASL4LB-6-110 | 18 | 2ASL6LB-6-024 | 18 | 2ASL8LB-5-230D | 18 |
| 2ASL1LB-6-230D | 18 | 2ASL4LB-6-110D | 18 | 2ASL6LB-6-048 | 18 | 2ASL8LB-6-012 | 18 |
| 2ASL3LB-1-012 | 18 | 2ASL4LB-6-230 | 18 | 2ASL6LB-6-110 | 18 | 2ASL8LB-6-024 | 18 |
| 2ASL3LB-1-024 | 18 | 2ASL4LB-6-230D | 18 | 2ASL6LB-6-110D | 18 | 2ASL8LB-6-048 | 18 |
| 2ASL3LB-1-048 | 18 | 2ASL5LB-1-012 | 18 | 2ASL6LB-6-230 | 18 | 2ASL8LB-6-110 | 18 |
| 2ASL3LB-1-110 | 18 | 2ASL5LB-1-024 | 18 | 2ASL6LB-6-230D | 18 | 2ASL8LB-6-110D | 18 |
| 2ASL3LB-1-110D | 18 | 2ASL5LB-1-048 | 18 | 2ASL7LB-1-012 | 18 | 2ASL8LB-6-230 | 18 |
| 2ASL3LB-1-230 | 18 | 2ASL5LB-1-110 | 18 | 2ASL7LB-1-024 | 18 | 2ASL8LB-6-230D | 18 |
| 2ASL3LB-1-230D | 18 | 2ASL5LB-1-110D | 18 | 2ASL7LB-1-048 | 18 | 2ATBT7 | 40 |
| 2ASL3LB-2-012 | 18 | 2ASL5LB-1-230 | 18 | 2ASL7LB-1-110 | 18 | 2ATF1-P2 | 14 |
| 2ASL3LB-2-024 | 18 | 2ASL5LB-1-230D | 18 | 2ASL7LB-1-110D | 18 | 2ATF1-P2-IO | 14 |
| 2ASL3LB-2-048 | 18 | 2ASL5LB-2-012 | 18 | 2ASL7LB-1-230 | 18 | 2ATF2-F1 | 14 |
| 2ASL3LB-2-110 | 18 | 2ASL5LB-2-024 | 18 | 2ASL7LB-1-230D | 18 | 2ATF2-F1-IO | 14 |
| 2ASL3LB-2-110D | 18 | 2ASL5LB-2-048 | 18 | 2ASL7LB-2-012 | 18 | 2ATF3-F4 | 14 |
| 2ASL3LB-2-230 | 18 | 2ASL5LB-2-110 | 18 | 2ASL7LB-2-024 | 18 | 2ATF3-F4-IO | 14 |
| 2ASL3LB-2-230D | 18 | 2ASL5LB-2-110D | 18 | 2ASL7LB-2-048 | 18 | 2ATF3-P4 | 14 |
| 2ASL3LB-3-012 | 18 | 2ASL5LB-2-230 | 18 | 2ASL7LB-2-110 | 18 | 2ATF3-P4-IO | 14 |
| 2ASL3LB-3-024 | 18 | 2ASL5LB-2-230D | 18 | 2ASL7LB-2-110D | 18 | 2ATF8-F2 | 14 |
| 2ASL3LB-3-048 | 18 | 2ASL5LB-3-012 | 18 | 2ASL7LB-2-230 | 18 | 2ATF8-F2-IO | 14 |
| 2ASL3LB-3-110 | 18 | 2ASL5LB-3-024 | 18 | 2ASL7LB-2-230D | 18 | 2ATF8-P2 | 14 |
| 2ASL3LB-3-110D | 18 | 2ASL5LB-3-048 | 18 | 2ASL7LB-3-012 | 18 | 2ATF8-P2-IO | 14 |
| 2ASL3LB-3-230 | 18 | 2ASL5LB-3-110 | 18 | 2ASL7LB-3-024 | 18 | 2ATL5LB F2F1-IO-012 | 15 |
| 2ASL3LB-3-230D | 18 | 2ASL5LB-3-110D | 18 | 2ASL7LB-3-048 | 18 | 2ATL5LB F2F1-IO-024 | 15 |
| 2ASL3LB-4-012 | 18 | 2ASL5LB-3-230 | 18 | 2ASL7LB-3-110 | 18 | 2ATL5LB F2F1-IO-048 | 15 |
| 2ASL3LB-4-024 | 18 | 2ASL5LB-3-230D | 18 | 2ASL7LB-3-110D | 18 | 2ATL5LB F2F1-IO-110 | 15 |
| 2ASL3LB-4-048 | 18 | 2ASL5LB-4-012 | 18 | 2ASL7LB-3-230 | 18 | 2ATL5LB F2F1-IO-230 | 15 |
| 2ASL3LB-4-110 | 18 | 2ASL5LB-4-024 | 18 | 2ASL7LB-3-230D | 18 | 2ATL5LB F3F4-012 | 15 |
| 2ASL3LB-4-110D | 18 | 2ASL5LB-4-048 | 18 | 2ASL7LB-4-012 | 18 | 2ATL5LB F3F4-024 | 15 |
| 2ASL3LB-4-230 | 18 | 2ASL5LB-4-110 | 18 | 2ASL7LB-4-024 | 18 | 2ATL5LB F3F4-048 | 15 |
| 2ASL3LB-4-230D | 18 | 2ASL5LB-4-110D | 18 | 2ASL7LB-4-048 | 18 | 2ATL5LB F3F4-110 | 15 |
| 2ASL3LB-5-012 | 18 | 2ASL5LB-4-230 | 18 | 2ASL7LB-4-110 | 18 | 2ATL5LB F3F4-230 | 15 |
| 2ASL3LB-5-024 | 18 | 2ASL5LB-4-230D | 18 | 2ASL7LB-4-110D | 18 | 2ATL5LB F3F4-IO-012 | 15 |
| 2ASL3LB-5-048 | 18 | 2ASL5LB-5-012 | 18 | 2ASL7LB-4-230 | 18 | 2ATL5LB F3F4-IO-024 | 15 |
| 2ASL3LB-5-110 | 18 | 2ASL5LB-5-024 | 18 | 2ASL7LB-4-230D | 18 | 2ATL5LB F3F4-IO-048 | 15 |
| 2ASL3LB-5-110D | 18 | 2ASL5LB-5-048 | 18 | 2ASL7LB-5-012 | 18 | 2ATL5LB F3F4-IO-110 | 15 |
| 2ASL3LB-5-230 | 18 | 2ASL5LB-5-110 | 18 | 2ASL7LB-5-024 | 18 | 2ATL5LB F3F4-IO-230 | 15 |
| 2ASL3LB-5-230D | 18 | 2ASL5LB-5-110D | 18 | 2ASL7LB-5-048 | 18 | 2ATL5LB F3P4-012 | 15 |
| 2ASL3LB-6-012 | 18 | 2ASL5LB-5-230 | 18 | 2ASL7LB-5-110 | 18 | 2ATL5LB F3P4-024 | 15 |
| 2ASL3LB-6-024 | 18 | 2ASL5LB-5-230D | 18 | 2ASL7LB-5-110D | 18 | 2ATL5LB F3P4-048 | 15 |
| 2ASL3LB-6-048 | 18 | 2ASL5LB-6-012 | 18 | 2ASL7LB-5-230 | 18 | 2ATL5LB F3P4-110 | 15 |
| 2ASL3LB-6-110 | 18 | 2ASL5LB-6-024 | 18 | 2ASL7LB-5-230D | 18 | 2ATL5LB F3P4-230 | 15 |
| 2ASL3LB-6-110D | 18 | 2ASL5LB-6-048 | 18 | 2ASL7LB-6-012 | 18 | 2ATL5LB F3P4-IO-012 | 15 |
| 2ASL3LB-6-230 | 18 | 2ASL5LB-6-110 | 18 | 2ASL7LB-6-024 | 18 | 2ATL5LB F3P4-IO-024 | 15 |
| 2ASL3LB-6-230D | 18 | 2ASL5LB-6-110D | 18 | 2ASL7LB-6-048 | 18 | 2ATL5LB F3P4-IO-048 | 15 |
| 2ASL4LB-1-012 | 18 | 2ASL5LB-6-230 | 18 | 2ASL7LB-6-110 | 18 | 2ATL5LB F3P4-IO-110 | 15 |
| 2ASL4LB-1-024 | 18 | 2ASL5LB-6-230D | 18 | 2ASL7LB-6-110D | 18 | 2ATL5LB F3P4-IO-230 | 15 |
| 2ASL4LB-1-048 | 18 | 2ASL6LB-1-012 | 18 | 2ASL7LB-6-230 | 18 | 2ATLBT7 | 40 |
| 2ASL4LB-1-110 | 18 | 2ASL6LB-1-024 | 18 | 2ASL7LB-6-230D | 18 | 2BA9SE | 40 |
| 2ASL4LB-1-110D | 18 | 2ASL6LB-1-048 | 18 | 2ASL8LB-1-012 | 18 | 2BA9SE | 55 |
| 2ASL4LB-1-230 | 18 | 2ASL6LB-1-110 | 18 | 2ASL8LB-1-024 | 18 | 2BP2 | 40 |
| 2ASL4LB-1-230D | 18 | 2ASL6LB-1-110D | 18 | 2ASL8LB-1-048 | 18 | 2BRK | 40 |
| 2ASL4LB-2-012 | 18 | 2ASL6LB-1-230 | 18 | 2ASL8LB-1-110 | 18 | 2BRKT | 40 |
| 2ASL4LB-2-024 | 18 | 2ASL6LB-1-230D | 18 | 2ASL8LB-1-110D | 18 | 2BT1 | 39 |
| 2ASL4LB-2-048 | 18 | 2ASL6LB-2-012 | 18 | 2ASL8LB-1-230 | 18 | 2BT2 | 39 |
| 2ASL4LB-2-110 | 18 | 2ASL6LB-2-024 | 18 | 2ASL8LB-1-230D | 18 | 2BT3 | 39 |
| 2ASL4LB-2-110D | 18 | 2ASL6LB-2-048 | 18 | 2ASL8LB-2-012 | 18 | 2BT4 | 39 |
| 2ASL4LB-2-230 | 18 | 2ASL6LB-2-110 | 18 | 2ASL8LB-2-024 | 18 | 2BT6 | 39 |
| 2ASL4LB-2-230D | 18 | 2ASL6LB-2-110D | 18 | 2ASL8LB-2-048 | 18 | 2BT7 | 31 |

| Cat. No. | Page | Cat. No. | Page | Cat. No. | Page | Cat. No. | Page |
|----------|------|--------------|------|--------------|------|-------------|------|
| 2BT7 | .39 | 2LP30SP | .38 | 2PLB7LB-024 | .24 | 3PLBR8L-012 | .28 |
| 2BT7 | .40 | 2LP31 | .38 | 2PLB7LB-048 | .24 | 3PLBR8L-024 | .28 |
| 2BT8 | .39 | 2LP31SP | .38 | 2PLB7LB-110 | .24 | 3PLBR8L-048 | .28 |
| 2ESS1 | .40 | 2LP32 | .38 | 2PLB7LB-110D | .24 | 3PLBR8L-110 | .28 |
| 2ESS1-UL | .40 | 2LP32SP | .38 | 2PLB7LB-230 | .24 | 3PLBR8L-230 | .28 |
| 2KY30 | .48 | 2LP33 | .38 | 2PLB7LB-230D | .24 | 3PRG1 | .31 |
| 2KY455 | .10 | 2LP33SP | .38 | 2PLB8LB-012 | .24 | 3PSF101 | .26 |
| 2KY455 | .16 | 2LP34 | .38 | 2PLB8LB-024 | .24 | 3PSF102 | .26 |
| 2KY455 | .40 | 2LP35 | .38 | 2PLB8LB-048 | .24 | 3PSF110 | .26 |
| 2LAL1 | .39 | 2LP36 | .38 | 2PLB8LB-110 | .24 | 3PSF111 | .26 |
| 2LAL1L | .39 | 2LP36 | .38 | 2PLB8LB-110D | .24 | 3PSF120 | .26 |
| 2LAL3 | .39 | 2LP36SP | .38 | 2PLB8LB-230 | .24 | 3PSF201 | .26 |
| 2LAL3L | .39 | 2LP37 | .38 | 2PLB8LB-230D | .24 | 3PSF202 | .26 |
| 2LAL4 | .39 | 2LP37SP | .38 | 2PLL1 | .39 | 3PSF210 | .26 |
| 2LAL4L | .39 | 2LP38 | .38 | 2PLL1L | .39 | 3PSF211 | .26 |
| 2LAL5 | .39 | 2LP38SP | .38 | 2PLL3 | .39 | 3PSF220 | .26 |
| 2LAL5L | .39 | 2LP39 | .38 | 2PLL3L | .39 | 3PSF301 | .26 |
| 2LAL6 | .39 | 2LP40 | .38 | 2PLL4 | .39 | 3PSF302 | .26 |
| 2LAL6L | .39 | 2LP41 | .38 | 2PLL4L | .39 | 3PSF310 | .26 |
| 2LAL7 | .39 | 2LP41SP | .38 | 2PLL5 | .39 | 3PSF311 | .26 |
| 2LAL7L | .39 | 2LP42 | .38 | 2PLL5L | .39 | 3PSF320 | .26 |
| 2LAL8 | .39 | 2LP43 | .38 | 2PLL6 | .39 | 3PSF401 | .26 |
| 2LAL8L | .39 | 2LP44 | .38 | 2PLL6L | .39 | 3PSF402 | .26 |
| 2LHB | .40 | 2LP45 | .38 | 2PLL7 | .39 | 3PSF410 | .26 |
| 2LP01 | .38 | 2LP46 | .38 | 2PLL7L | .39 | 3PSF411 | .26 |
| 2LP01SP | .38 | 2LP47 | .38 | 2PLL8 | .39 | 3PSF420 | .26 |
| 2LP02 | .38 | 2LP48 | .38 | 2PLL8L | .39 | 3PSF601 | .26 |
| 2LP02SP | .38 | 2LP49 | .38 | 2PPM | .40 | 3PSF602 | .26 |
| 2LP03 | .38 | 2LP50 | .38 | 2PRG1 | .31 | 3PSF610 | .26 |
| 2LP03SP | .38 | 2LP51 | .38 | 2PRG1 | .40 | 3PSF611 | .26 |
| 2LP04 | .38 | 2LP55 | .38 | 2PV2X | .30 | 3PSF620 | .26 |
| 2LP04SP | .38 | 2LP56 | .38 | 2PV3X | .30 | 3PSF801 | .26 |
| 2LP05 | .38 | 2LP57 | .38 | 2PV4X | .30 | 3PSF802 | .26 |
| 2LP05SP | .38 | 2LP58 | .38 | 2PV5X | .30 | 3PSF810 | .26 |
| 2LP06 | .38 | 2LP59 | .38 | 2PV6X | .30 | 3PSF811 | .26 |
| 2LP06SP | .38 | 2LP66 | .38 | 2PV7X | .30 | 3PSF820 | .26 |
| 2LP07 | .38 | 2LP69 | .38 | 2PV8X | .30 | 3PSFPP101 | .26 |
| 2LP07SP | .38 | 2LP70 | .38 | 2PV9X | .30 | 3PSFPP110 | .26 |
| 2LP08 | .38 | 2LP71 | .38 | 2RLW | .31 | 3PSFPP111 | .26 |
| 2LP08SP | .38 | 2LP72 | .38 | 2SEBT2 | .40 | 3PSFPP201 | .26 |
| 2LP09 | .38 | 2LP73 | .38 | 3-001-Q-11 | .30 | 3PSFPP210 | .26 |
| 2LP10 | .38 | 2LP74 | .38 | 3-001-R-11 | .30 | 3PSFPP211 | .26 |
| 2LP101 | .38 | 2LPXX | .38 | 3PLBR1L-012 | .28 | 3PSFPP301 | .26 |
| 2LP102 | .38 | 2PAM | .40 | 3PLBR1L-024 | .28 | 3PSFPP310 | .26 |
| 2LP103 | .38 | 2PAM7 | .40 | 3PLBR1L-048 | .28 | 3PSFPP311 | .26 |
| 2LP104 | .38 | 2PAP | .40 | 3PLBR1L-110 | .28 | 3PSFPP401 | .26 |
| 2LP105 | .38 | 2PLB1LB-012 | .24 | 3PLBR1L-230 | .28 | 3PSFPP410 | .26 |
| 2LP106 | .38 | 2PLB1LB-024 | .24 | 3PLBR1LS-012 | .28 | 3PSFPP411 | .26 |
| 2LP107 | .38 | 2PLB1LB-048 | .24 | 3PLBR1LS-024 | .28 | 3PSFPP601 | .26 |
| 2LP108 | .38 | 2PLB1LB-110 | .24 | 3PLBR1LS-048 | .28 | 3PSFPP610 | .26 |
| 2LP10SP | .38 | 2PLB1LB-110D | .24 | 3PLBR1LS-110 | .28 | 3PSFPP611 | .26 |
| 2LP11 | .38 | 2PLB1LB-230 | .24 | 3PLBR1LS-230 | .28 | 3PSFPP801 | .26 |
| 2LP12 | .38 | 2PLB1LB-230D | .24 | 3PLBR3L-012 | .28 | 3PSFPP810 | .26 |
| 2LP12SP | .38 | 2PLB3LB-012 | .24 | 3PLBR3L-024 | .28 | 3PSFPP811 | .26 |
| 2LP13 | .38 | 2PLB3LB-024 | .24 | 3PLBR3L-048 | .28 | 3PSPP102 | .26 |
| 2LP13SP | .38 | 2PLB3LB-048 | .24 | 3PLBR3L-110 | .28 | 3PSPP120 | .26 |
| 2LP14 | .38 | 2PLB3LB-110 | .24 | 3PLBR3L-230 | .28 | 3PSPP202 | .26 |
| 2LP14SP | .38 | 2PLB3LB-110D | .24 | 3PLBR4L-012 | .28 | 3PSPP220 | .26 |
| 2LP15 | .38 | 2PLB3LB-230 | .24 | 3PLBR4L-024 | .28 | 3PSPP302 | .26 |
| 2LP15SP | .38 | 2PLB3LB-230D | .24 | 3PLBR4L-048 | .28 | 3PSPP320 | .26 |
| 2LP16 | .38 | 2PLB4LB-012 | .24 | 3PLBR4L-110 | .28 | 3PSPP402 | .26 |
| 2LP16SP | .38 | 2PLB4LB-024 | .24 | 3PLBR4L-230 | .28 | 3PSPP420 | .26 |
| 2LP17 | .38 | 2PLB4LB-048 | .24 | 3PLBR5L-012 | .28 | 3PSPP602 | .26 |
| 2LP17SP | .38 | 2PLB4LB-110 | .24 | 3PLBR5L-024 | .28 | 3PSPP620 | .26 |
| 2LP18 | .38 | 2PLB4LB-110D | .24 | 3PLBR5L-048 | .28 | 3PSPP802 | .26 |
| 2LP18SP | .38 | 2PLB4LB-230 | .24 | 3PLBR5L-110 | .28 | 3PSPP820 | .26 |
| 2LP19 | .38 | 2PLB4LB-230D | .24 | 3PLBR5L-230 | .28 | 4-001-Q-10 | .30 |
| 2LP19SP | .38 | 2PLB5LB-012 | .24 | 3PLBR6L-012 | .28 | 4-001-R-10 | .30 |
| 2LP20 | .38 | 2PLB5LB-024 | .24 | 3PLBR6L-024 | .28 | 5308 959 | .34 |
| 2LP20SP | .38 | 2PLB5LB-048 | .24 | 3PLBR6L-048 | .28 | 7211 981 | .34 |
| 2LP21 | .38 | 2PLB5LB-110 | .24 | 3PLBR6L-110 | .28 | AB1 | .44 |
| 2LP22 | .38 | 2PLB5LB-110D | .24 | 3PLBR6L-230 | .28 | AB2 | .44 |
| 2LP23 | .38 | 2PLB5LB-230 | .24 | 3PLBR7L-012 | .28 | AB3 | .44 |
| 2LP24 | .38 | 2PLB5LB-230D | .24 | 3PLBR7L-024 | .28 | AB4 | .44 |
| 2LP25 | .38 | 2PLB6LB-012 | .24 | 3PLBR7L-048 | .28 | AB6 | .44 |
| 2LP26 | .38 | 2PLB6LB-024 | .24 | 3PLBR7L-110 | .28 | AB8 | .44 |
| 2LP27 | .38 | 2PLB6LB-048 | .24 | 3PLBR7L-230 | .28 | ADW | .40 |
| 2LP28 | .38 | 2PLB6LB-110 | .24 | 3PLBR7LS-012 | .28 | AF1 | .44 |
| 2LP28SP | .38 | 2PLB6LB-110D | .24 | 3PLBR7LS-024 | .28 | AF2 | .44 |
| 2LP29 | .38 | 2PLB6LB-230 | .24 | 3PLBR7LS-048 | .28 | AF3 | .44 |
| 2LP29SP | .38 | 2PLB6LB-230D | .24 | 3PLBR7LS-110 | .28 | AF4 | .44 |
| 2LP30 | .38 | 2PLB7LB-012 | .24 | 3PLBR7LS-230 | .28 | AF6 | .44 |

Index

| Cat. No. | Page | Cat. No. | Page | Cat. No. | Page | Cat. No. | Page |
|-------------|------|------------|------|------------|------|------------|------|
| AF8 | 44 | AML4 | 50 | MCB156110 | 54 | PLB1LB-230 | 52 |
| AK2-2PB | 48 | AMLKB2 | 50 | MCB156110D | 54 | PLB3-024 | 52 |
| AK2-2PI | 48 | AMLKB4 | 50 | MCB15612 | 54 | PLB3-048 | 52 |
| AK2-2PO | 48 | AP1 | 44 | MCB156230 | 54 | PLB3-110 | 52 |
| AK2-2PO-KD | 48 | AP2 | 44 | MCB156230D | 54 | PLB3-230 | 52 |
| AK2-2PO-KD1 | 48 | AP3 | 44 | MCB15624 | 54 | PLB3LB-024 | 52 |
| AK2-2PO-KD2 | 48 | AP4 | 44 | MCB15648 | 54 | PLB3LB-048 | 52 |
| AK2-2PO-KD4 | 48 | AP6 | 44 | MCB158110 | 54 | PLB3LB-110 | 52 |
| AK2-2PO-KD5 | 48 | AP8 | 44 | MCB158110D | 54 | PLB3LB-230 | 52 |
| AK2-2POS | 48 | ARW1.2 | 55 | MCB15812 | 54 | PLB4-024 | 52 |
| AK2-3PB | 48 | AS2-2P | 48 | MCB158230 | 54 | PLB4-048 | 52 |
| AK2-3PC | 48 | AS2-2PSR | 48 | MCB158230D | 54 | PLB4-110 | 52 |
| AK2-3PC-KD | 48 | AS2-3P | 48 | MCB15824 | 54 | PLB4-230 | 52 |
| AK2-3PC-KD1 | 48 | BA15D110 | 54 | MCB15848 | 54 | PLB4LB-024 | 52 |
| AK2-3PC-KD2 | 48 | BA15D12 | 54 | MCB91110 | 39 | PLB4LB-048 | 52 |
| AK2-3PC-KD3 | 48 | BA15D220 | 54 | MCB91110D | 39 | PLB4LB-110 | 52 |
| ALF1-024 | 46 | BA15D24 | 54 | MCB9112 | 39 | PLB4LB-230 | 52 |
| ALF1-048 | 46 | BA15D48 | 54 | MCB91230 | 39 | PLB5-024 | 52 |
| ALF1-110 | 46 | BA9SD110 | 39 | MCB91230D | 39 | PLB5-048 | 52 |
| ALF1-230 | 46 | BA9SD12 | 39 | MCB9124 | 39 | PLB5-110 | 52 |
| ALF1LB-024 | 46 | BA9SD220 | 39 | MCB9148 | 39 | PLB5-230 | 52 |
| ALF1LB-048 | 46 | BA9SD24 | 39 | MCB93110 | 39 | PLB5LB-024 | 52 |
| ALF1LB-110 | 46 | BA9SD48 | 39 | MCB93110D | 39 | PLB5LB-048 | 52 |
| ALF1LB-230 | 46 | BT1 | 55 | MCB94110 | 39 | PLB5LB-110 | 52 |
| ALF3-024 | 46 | BT2 | 55 | MCB94110D | 39 | PLB5LB-230 | 52 |
| ALF3-048 | 46 | BT3 | 55 | MCB9412 | 39 | PLB6-024 | 52 |
| ALF3-110 | 46 | BT4 | 55 | MCB94230 | 39 | PLB6-048 | 52 |
| ALF3-230 | 46 | BT6 | 55 | MCB94230D | 39 | PLB6-110 | 52 |
| ALF3LB-024 | 46 | BT8 | 55 | MCB9424 | 39 | PLB6-230 | 52 |
| ALF3LB-048 | 46 | KY30 | 55 | MCB9448 | 39 | PLB6LB-024 | 52 |
| ALF3LB-110 | 46 | LP01 | 54 | MCB95110 | 39 | PLB6LB-048 | 52 |
| ALF3LB-230 | 46 | LP02 | 54 | MCB95110D | 39 | PLB6LB-110 | 52 |
| ALF4-024 | 46 | LP04 | 54 | MCB9512 | 39 | PLB6LB-230 | 52 |
| ALF4-048 | 46 | LP07 | 54 | MCB95230 | 39 | PLB7-024 | 52 |
| ALF4-110 | 46 | LP07 | 54 | MCB95230D | 39 | PLB7-048 | 52 |
| ALF4-230 | 46 | LP08 | 54 | MCB9524 | 39 | PLB7-110 | 52 |
| ALF4LB-024 | 46 | LP09 | 54 | MCB9548 | 39 | PLB7-230 | 52 |
| ALF4LB-048 | 46 | LP10 | 54 | MCB96110 | 39 | PLB7LB-024 | 52 |
| ALF4LB-110 | 46 | LP108 | 54 | MCB96110D | 39 | PLB7LB-048 | 52 |
| ALF4LB-230 | 46 | LP11 | 54 | MCB9612 | 39 | PLB7LB-110 | 52 |
| ALF5-024 | 46 | LP12 | 54 | MCB96230 | 39 | PLB7LB-230 | 52 |
| ALF5-048 | 46 | LP13 | 54 | MCB96230D | 39 | PLB8-024 | 52 |
| ALF5-110 | 46 | LP14 | 54 | MCB9624 | 39 | PLB8-048 | 52 |
| ALF5-230 | 46 | LP15 | 54 | MCB9648 | 39 | PLB8-110 | 52 |
| ALF5LB-024 | 46 | LP16 | 54 | MCB98110 | 39 | PLB8-230 | 52 |
| ALF5LB-048 | 46 | LP17 | 54 | MCB98110D | 39 | PLB8LB-024 | 52 |
| ALF5LB-110 | 46 | LP18 | 54 | MCB9812 | 39 | PLB8LB-048 | 52 |
| ALF5LB-230 | 46 | LP19 | 54 | MCB98230 | 39 | PLB8LB-110 | 52 |
| ALF6-024 | 46 | LP20 | 54 | MCB98230D | 39 | PLB8LB-230 | 52 |
| ALF6-048 | 46 | LP24 | 54 | MCB9824 | 39 | PLL1 | 55 |
| ALF6-110 | 46 | LP36 | 54 | MCB9848 | 39 | PLL1 | 55 |
| ALF6-230 | 46 | LP41 | 54 | NPT1/2 | 40 | PLL3 | 55 |
| ALF6LB-024 | 46 | LP74 | 54 | P2AF1 | 31 | PLL3 | 55 |
| ALF6LB-048 | 46 | M20 | 40 | P2AF1WA0 | 31 | PLL4 | 55 |
| ALF6LB-110 | 46 | MCB15110 | 54 | P2AF1WA90 | 31 | PLL4 | 55 |
| ALF6LB-230 | 46 | MCB15110D | 54 | P2AF2 | 31 | PLL5 | 55 |
| ALF7-024 | 46 | MCB15112 | 54 | P2AF2WA0 | 31 | PLL5 | 55 |
| ALF7-048 | 46 | MCB151230 | 54 | P2AF2WA90 | 31 | PLL6 | 55 |
| ALF7-110 | 46 | MCB151230D | 54 | P2AF3 | 31 | PLL6 | 55 |
| ALF7-230 | 46 | MCB15124 | 54 | P2AF4 | 31 | PLL7 | 55 |
| 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 | | |

Commonly used metric and other useful conversions

| | | |
|--|----------|---------------------|
| Length | | |
| inch [in.] | x25.4 | =millimeters |
| millimeters [mm] | x0.03937 | =inches |
| meters [m] | x3.281 | =feet |
| miles [mi] | x1.609 | =kilometers |
| kilometers [km] | x0.6214 | =miles |
| Torque | | |
| Newtonmeter [Nm] | x0.738 | =lb-ft |
| lb-ft | x1.356 | =Nm |
| lb-in | x0.113 | =Nm |
| oz-in | x0.0071 | =Nm |
| Power | | |
| kilowatt [kW] | x1.341 | =hp |
| hp | x0.7457 | =kW |
| Moment of Inertia (WR²) | | |
| lb-ft ² | x0.042 | =kgm ² |
| kilogrammeter ² [kgm ²] | 23.720 | =lb-ft ² |
| Weight Mass and Force | | |
| Newton [N] | x0.02248 | =pounds |
| kilogram [kg] | x2.205 | =pounds |
| pound [lb] | x4.448 | =N |
| pound [lb] | x0.4536 | =kg |

| Metric Cross-Sectional Areas ¹ | | American Wire Gauge | | Metric Cross-Sections Areas ^a | | American Wire Gauge | |
|---|------------------------|---------------------|----------------------|--|------------|----------------------|------------------------|
| Cross-Sectional Area | Equivalent Metric Area | AWG or MCM | Cross-Sectional Area | Equivalent Metric Area | AWG or MCM | Cross-Sectional Area | Equivalent Metric Area |
| mm ² | mm ² | | mm ² | mm ² | | mm ² | mm ² |
| 0.50 | 0.519 | 20 AWG | 25.0 | 21.15 | 4 AWG | | |
| 0.75 | 0.653 | 19 | 26.67 | 26.67 | 3 | | |
| | 0.823 | 18 | 35.0 | 33.63 | 2 | | |
| | | | | 42.41 | 1 | | |
| | | | 50.0 | 53.48 | 1/0 | | |
| 1.5 | 1.65 | 15 | 70.0 | 67.43 | 2/0 | | |
| 2.5 | 2.08 | 14 | 95.0 | 85.03 | 3/0 | | |
| | 2.62 | 13 | | 107.20 | 4/0 | | |
| | 3.31 | 12 | 120.0 | 126.64 | 250 MCM | | |
| 4.0 | 4.17 | 11 | 150.0 | 152.00 | 300 | | |
| | 5.26 | 10 | 185.0 | 177.35 | 350 | | |
| 6.0 | 6.63 | 9 | 240.0 | 202.71 | 400 | | |
| | 8.37 | 8 | 300.0 | 253.35 | 500 | | |
| 10.0 | 10.55 | 7 | 400.0 | 380.00 | 750 | | |
| | 13.30 | 6 | 500.0 | 506.71 | 1000 | | |
| 16.0 | 16.77 | 5 | 625.0 | | | | |

^aAs per IEC Publ. 228

| DEGREES CELCIUS VERSUS DEGREES FAHRENHEIT | | | | | | | | | | | | | |
|---|--------|-----|------|----|------|----|-------|----|-------|-----|-------|-----|-------|
| °C | °F | °C | °F | °C | °F | °C | °F | °C | °F | °C | °F | °C | °F |
| -80 | -112.0 | -20 | -4.0 | 5 | 41.0 | 30 | 86.0 | 55 | 131.0 | 80 | 176.0 | 105 | 221.0 |
| -70 | -94.0 | -19 | -2.2 | 6 | 42.8 | 31 | 87.8 | 56 | 132.8 | 81 | 177.8 | 106 | 222.8 |
| -60 | -65.0 | -18 | -0.4 | 7 | 44.6 | 32 | 89.6 | 57 | 134.6 | 82 | 179.6 | 107 | 224.6 |
| -50 | -58 | -17 | +1.4 | 8 | 46.4 | 33 | 91.4 | 58 | 136.4 | 83 | 181.4 | 108 | 226.4 |
| -45 | -49.1 | -16 | 3.2 | 9 | 48.2 | 34 | 93.2 | 59 | 138.2 | 84 | 183.2 | 109 | 228.2 |
| -40 | -40.0 | -15 | 5.0 | 10 | 50.0 | 35 | 95.0 | 60 | 140.0 | 85 | 185.0 | 110 | 230.0 |
| -39 | -38.2 | -14 | 6.8 | 11 | 51.8 | 36 | 96.8 | 61 | 141.8 | 86 | 186.8 | 111 | 231.8 |
| -38 | -36.4 | -13 | 8.6 | 12 | 53.6 | 37 | 98.6 | 62 | 143.6 | 87 | 188.6 | 112 | 233.6 |
| -37 | -34.6 | -12 | 10.4 | 13 | 55.4 | 38 | 100.4 | 63 | 145.4 | 88 | 189.4 | 113 | 235.4 |
| -36 | 32.8 | -11 | 12.2 | 14 | 57.2 | 39 | 102.2 | 64 | 147.2 | 89 | 192.2 | 114 | 237.2 |
| -35 | -31.0 | -10 | 14.0 | 15 | 59.0 | 40 | 104.0 | 65 | 149.0 | 90 | 194.0 | 115 | 239.0 |
| -34 | 29.2 | -9 | 15.8 | 16 | 60.8 | 41 | 105.8 | 66 | 150.8 | 91 | 195.8 | 116 | 240.8 |
| -33 | -27.4 | -8 | 17.6 | 17 | 62.6 | 42 | 107.6 | 67 | 152.6 | 92 | 197.6 | 117 | 242.6 |
| -32 | -25.6 | -7 | 19.4 | 18 | 64.4 | 43 | 109.4 | 68 | 154.4 | 93 | 199.4 | 118 | 244.4 |
| -31 | -23.8 | -6 | 21.2 | 19 | 66.2 | 44 | 111.2 | 69 | 156.2 | 94 | 201.2 | 119 | 246.2 |
| -30 | -22.0 | -5 | 23.0 | 20 | 68.0 | 45 | 113.0 | 70 | 158.0 | 95 | 203.0 | 120 | 248.0 |
| -29 | -22.0 | -4 | 24.8 | 21 | 69.8 | 46 | 114.8 | 71 | 159.8 | 96 | 204.8 | 121 | 249.8 |
| -28 | -18.4 | -3 | 26.6 | 22 | 71.6 | 47 | 116.8 | 72 | 161.6 | 97 | 206.6 | 122 | 251.6 |
| -27 | -16.6 | -2 | 28.4 | 23 | 73.4 | 48 | 118.4 | 73 | 163.4 | 98 | 208.4 | 123 | 253.4 |
| -26 | -14.8 | -1 | 30.2 | 24 | 75.2 | 49 | 120.2 | 74 | 165.2 | 99 | 210.2 | 124 | 255.2 |
| -25 | -13.0 | 0 | 32.0 | 25 | 77.0 | 50 | 122.0 | 75 | 167.0 | 100 | 212.0 | 125 | 257.0 |
| -24 | -11.2 | 1 | 33.8 | 26 | 78.8 | 51 | 123.8 | 76 | 168.8 | 101 | 213.8 | 126 | 258.8 |
| -23 | -9.4 | 2 | 35.6 | 27 | 80.6 | 52 | 125.6 | 77 | 170.6 | 102 | 215.6 | 127 | 260.6 |
| -22 | -7.6 | 3 | 37.4 | 28 | 82.4 | 53 | 127.4 | 78 | 172.4 | 103 | 217.4 | 128 | 262.4 |
| -21 | -5.8 | 4 | 39.2 | 29 | 84.2 | 54 | 129.2 | 79 | 174.2 | 104 | 219.2 | 129 | 264.2 |

Conversion Formula °F = 9/5°C + 32° °C = 5/9(°F-32°)

Terms and Conditions

TITLE - Title to the products of ALTECH shall remain with ALTECH until payment is made in full by Customer. Such reservation of title is for the purpose of securing the purchase price and shall not relieve Customer of the duty to inspect the products upon receipt, to notify ALTECH of any deficiencies or defects, and to exercise due care in the use, installation, operation, and maintenance of the products when on the premise of the Customer or under the control of the Customer. Notwithstanding any reservation of title by ALTECH, risk of loss shall pass to customer at any time of shipment.

SHIPMENT AND DELIVERY - All orders for destination in the mainland United States (less Hawaii, Alaska and non-continental United States possessions) will be shipped F.O.B. Flemington, N.J. All destination, shipping and other charges shall be paid by the Customer in accordance with ALTECH's then current shipping and billing practices.

Delivery dates given in the acceptance of any order are approximate. ALTECH shall not be liable for delays in delivery or in performance due to causes beyond its reasonable control including acts of God, acts of Customer, acts of civil or military authority, fires, strikes or other labor disturbances, war, riot or delays in transportation. In the event of such delay, the date of delivery or performance shall be extended for a period equal to the time lost by reason of the delay.

PRICE - PRICES in any ALTECH publication are subject to change without prior notification. Catalog prices are based on prices published in the current price list. All written quotations are valid for thirty (30) days from the date of quotation. Customer shall pay all sales, use, excise or similar taxes whenever ALTECH must itself pay and/or collect such tax from Customer arising out of the sale.

PAYMENT - Customer agrees to make payment within thirty (30) days of date of the invoice from ALTECH. Customer agrees to pay a late payment charge of one and one-half percent (1.5% per month, or the maximum late payment charge permitted by applicable law, whichever is less, on any unpaid amount for each calendar month (or fraction thereof) that such payment is in default. Orders amounting to less than \$100.00 will be billed at \$100.00 plus freight. Full carton purchases are required. In the event of referral to an attorney for collection, reasonable attorney's fees for collection of the overdue amount shall be paid by Customer. In the event payment is not received within 30 days from the date of invoice, any discount shall be cancelled and the full list price will be due.

LIMITED WARRANTY - ALTECH warrants to Customer that the equipment purchases shall be free from defects in material and workmanship under normal use and service for a period of one year from shipment.

Written notice as an explanation of the circumstances of any claim that the equipment has proved defective in material or workmanship shall be given promptly by the Customer to ALTECH.

ALTECH will not be liable for any misuse, improper operations, improper installation, improper maintenance, alteration, modification, accident or unusual degradation of the equipment or parts due to an unsuitable installation environment.

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Customer's sole and exclusive remedy in the event of breach of warranty, as set forth herein, is expressly limited to (1) the correction of the defect by adjustment, repair, modification, or replacement, or (2) issuance of a credit or refund of the purchase price for the defective equipment at ALTECH's election and sole expense.

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LIMITATION OF LIABILITY - IN NO EVENT, SHALL ALTECH BE LIABLE FOR LOSS OF PROFITS, INDIRECT, SPECIAL, CONSEQUENTIAL OR OTHER SIMILAR DAMAGES ARISING OUT OF ANY BREACH OF THIS AGREEMENT OR OBLIGATIONS UNDER THE AGREEMENT.

ALTECH SHALL NOT BE LIABLE FOR ANY DAMAGES CAUSED BY DELAY IN SHIPMENT, INSTALLATION OR FURNISHING OF EQUIPMENT OR SERVICES UNDER THIS AGREEMENT.

No action arising out of any claimed breach of this Agreement may be brought by either party more than two (2) years after the cause of action has accrued.

PATENT INDEMNITY - ALTECH shall defend or settle any suit or proceeding brought against Customer based on a claim that any equipment made to ALTECH design and furnished hereunder constitutes an infringement of any existing United States patent, provided (ALTECH) is notified promptly in writing and is given complete authorization and information required for the defense, and ALTECH shall pay all damages and costs awarded against Customer, but shall not be responsible for any costs, expense or compromise incurred or made by Customer without ALTECH's prior written consent. If any equipment is in ALTECH's opinion likely to or does become the subject of a claim for patent infringement, ALTECH may at its option and expense procure for Customer the right to continue using the device, modify it to become non-infringing, but in the event ALTECH is not reasonably able to modify, substitute, or otherwise procure for Customer the right to continue using it, ALTECH will remove such equipment and refund to Customer the amount paid in excess of a reasonable rental for past use.

ALTECH shall not be liable for any infringement or claim based upon use of the equipment in combination with other equipment not supplied by ALTECH or with modifications made by Customer.

The foregoing states the entire liability of ALTECH to Customer arising from patent infringement.

SELLER'S REMEDIES - Should Customer fail to make any payment within ten (10) days of its due date, or fail to perform any other of the Customer's obligation hereunder upon thirty (30) days written notice, or should Customer be or become insolvent or be a party to any bankruptcy receivership proceeding prior to full payment of all amounts payable hereunder, ALTECH may: (a) with or without demand or notice to customer declare the entire amount unpaid immediately due and payable; (b) enter upon the premises where the equipment may be found and remove it (Customer shall assemble the equipment and make it available to ALTECH at a place reasonably convenient to both parties and shall permit and assist ALTECH in effecting the retaking and removal of the equipment); and (c) sell any or all the equipment as permitted under applicable law, applying the proceeds of the sale to payment of the expenses of retaking, repairing and selling the equipment, reasonable attorney fees and to the satisfaction of all indebtedness then due and unpaid under this Agreement. Any surplus shall be paid to Customer and any deficiency shall be paid to ALTECH by Customer.

The remedies provided herein shall be cumulative and in addition to all other remedies provided by law or equity or under the Uniform Commercial Code.

GOVERNING LAW - This agreement will be governed by the Laws of the State of New Jersey.

GENERAL - This Agreement shall only become effective and binding when either (a) it has been accepted and executed by an authorized representative of ALTECH, or (b) the equipment has been shipped to Customer, with or without acceptance in writing hereon. Notice of acceptance is hereby waived by Customer. Customer hereby acknowledges receipt of a true and complete copy hereof.

No addition to or modification of any of the Terms and Conditions of Sale as they appear herein shall be binding upon ALTECH unless signed in writing by duly authorized representative of ALTECH in Flemington, N.J.

Typographical and clerical errors in quotations, orders and acknowledgments are subject to correction.

This Agreement is not assignable without the prior written consent of ALTECH. Any attempt to assign any of the rights, duties or obligations of this Agreement without such consent is void.

If any provision or provisions of this Agreement shall be held to be invalid, illegal or unenforceable, the validity, legality and enforceability, of the remaining provisions shall not in any way be affected or impaired thereby.

ALTECH is not responsible for failure to fulfill its obligation under this Agreement due to causes beyond its control, or except as agreed herein.

THE CUSTOMER ACKNOWLEDGES THAT HE HAS READ THE AGREEMENT, UNDERSTANDS IT, AND AGREES TO BE BOUND BY ITS TERMS AND CONDITIONS. FURTHERMORE, THE CUSTOMER AGREES THAT IT IS THE COMPLETE AND EXCLUSIVE STATEMENT OF THE AGREEMENT BETWEEN THE PARTIES, WHICH SUPERSEDES ALL PROPOSALS OR PRIOR AGREEMENTS, ORAL OR WRITTEN, EXPRESSED OR IMPLIED, AND ALL OTHER COMMUNICATIONS BETWEEN THE PARTIES RELATING TO THE SUBJECT MATTER OF THIS AGREEMENT.

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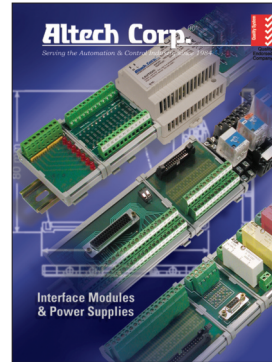
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