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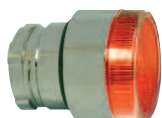
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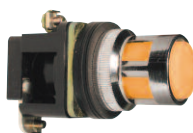
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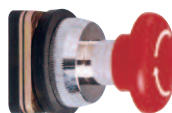
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# 22 and 30 mm Altech Metal Push Buttons



Part No. PBD

**Quality at a Competitive Price!**

# 22mm Metal Push Buttons

## Control and Signalling devices Ø 22.5mm

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

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

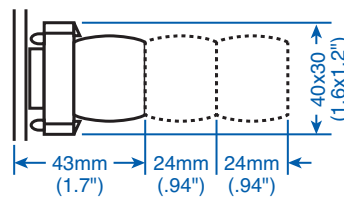
## Actuators

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

## Contact Elements

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

Multiple Switch Contact Assembly



## LED Illuminated Actuators and Pilot Lights

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

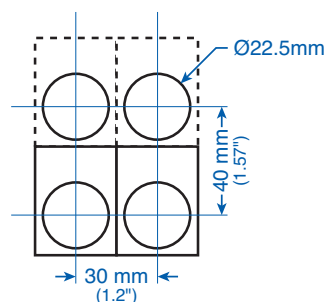
## Terminals

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

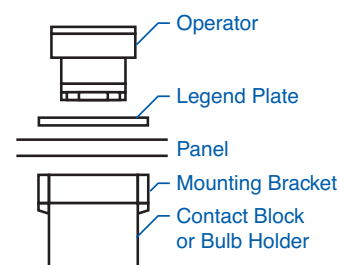
## Mounting

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

Panel Cutout with minimum space requirements



Sample Push Button Assembly



# 22mm Non-Illuminated Metal Operators



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

## Flush

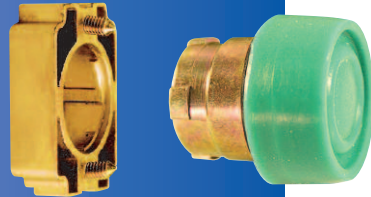
*Momentary  
with mounting bracket*



Color	Cat No.
<input type="checkbox"/> White	2AF1
<input 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

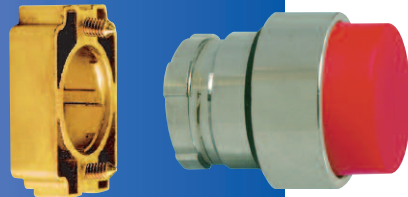
*Momentary  
with mounting bracket*



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*



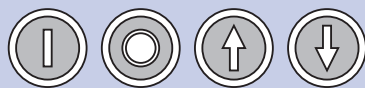
Color	Cat No.
<input type="checkbox"/> White	2AF1RH
<input checked="" type="checkbox"/> Black	2AF2RH
<input checked="" type="checkbox"/> Green	2AF3RH
<input checked="" type="checkbox"/> Red	2AF4RH
<input checked="" type="checkbox"/> Blue	2AF6RH
<input checked="" type="checkbox"/> Yellow	2AF8RH



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

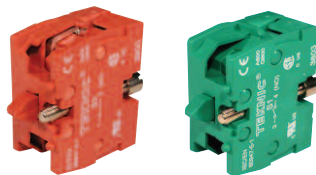


### Markings on Request



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

#### Base Mount\*

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

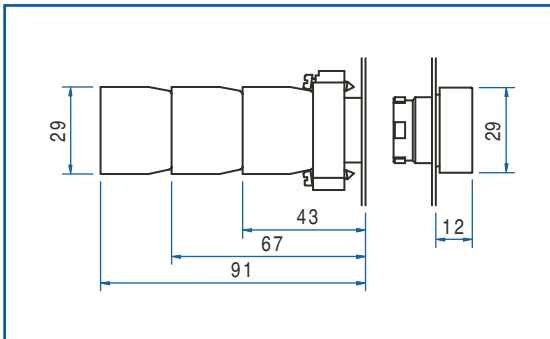
\* For use with non-illuminated operators in thermoplastic or aluminum enclosures listed on pages 30 and 36-37.

# 22mm Non-Illuminated Metal Operators

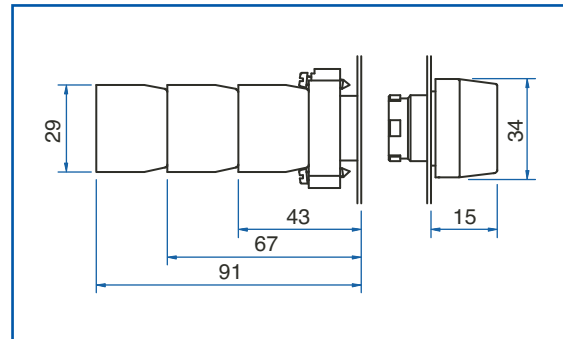
## Dimensional Drawings

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

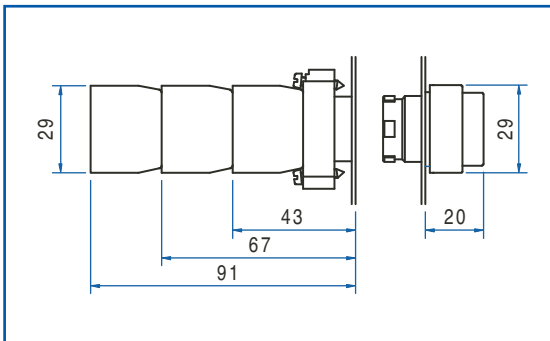
Non-Illuminated Flush



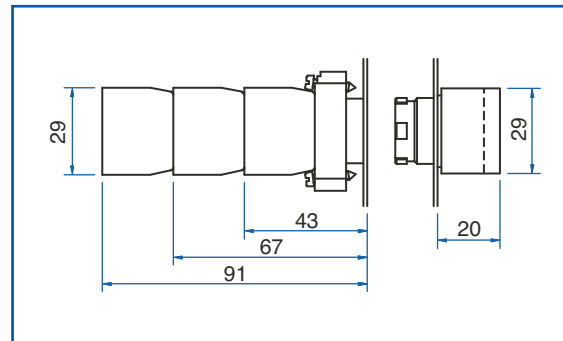
Non-Illuminated Booted



Non-Illuminated Projecting

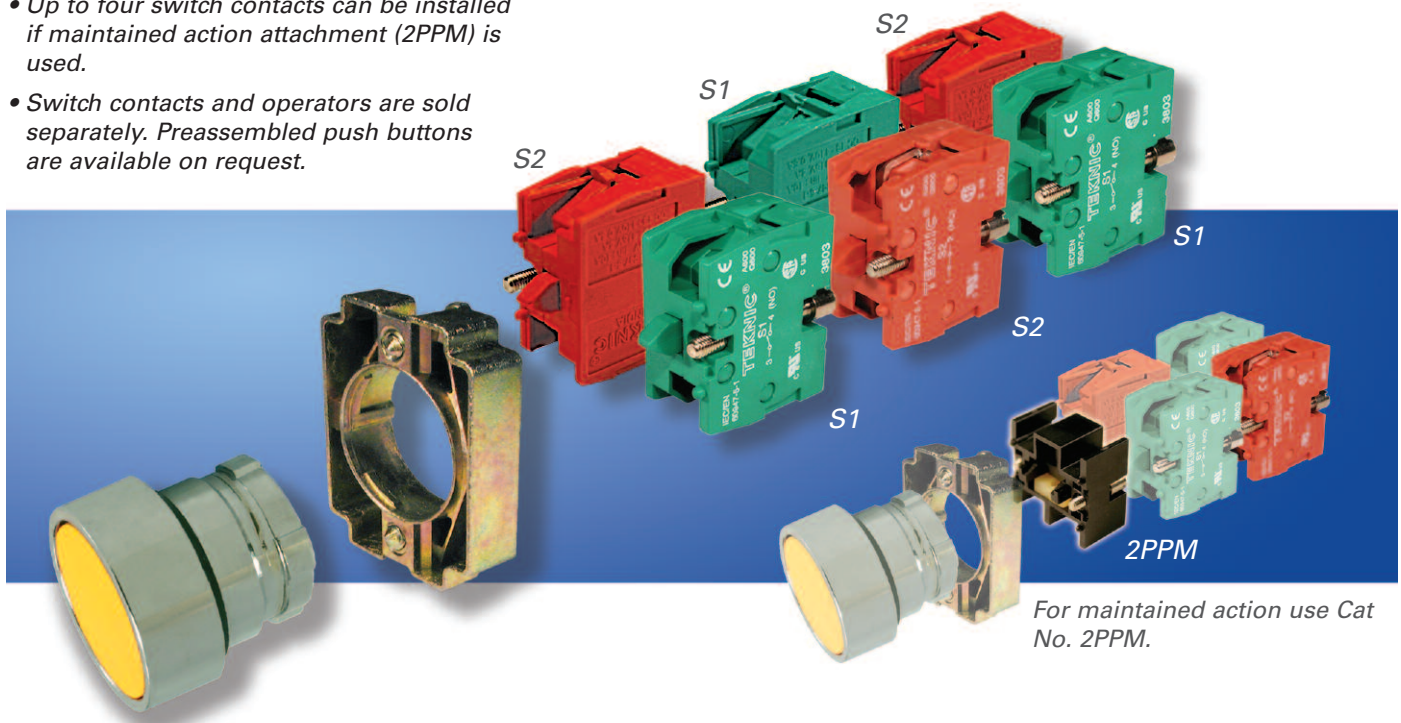


Non-Illuminated Recessed



## Exploded Assembly View

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



For maintained action use Cat No. 2PPM.

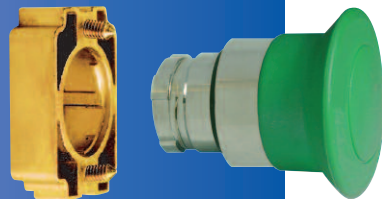
# 22mm Non-Illuminated Mushroom Metal Operators



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

## Mushroom

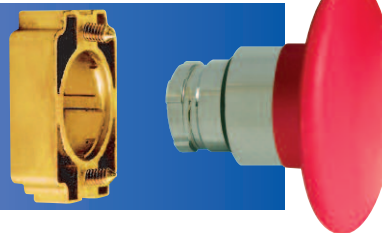
*Momentary  
with mounting bracket*



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

## Mushroom

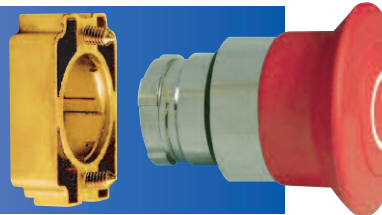
*Momentary Large  
with mounting bracket*



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

## Mushroom

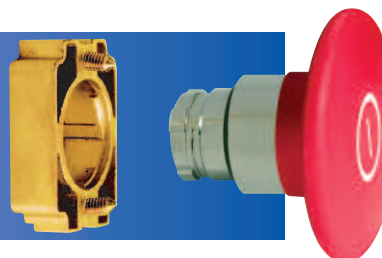
*Push-Pull  
with mounting bracket*



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

## Mushroom

*Push-Pull Large  
with mounting bracket*



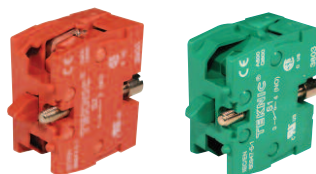
Color	Description	Cat No.
☐ White	60mm, Head	2AMPPJ1
■ Black	60mm, Head	2AMPPJ2
■ Green	60mm, Head	2AMPPJ3
■ Red	60mm, Head	2AMPPJ4
■ Blue	60mm, Head	2AMPPJ6
■ Yellow	60mm, Head	2AMPPJ8

### Markings on Request



### Switch Contacts

*(sold separately)*



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

#### Panel Mount

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

#### Base Mount\*

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

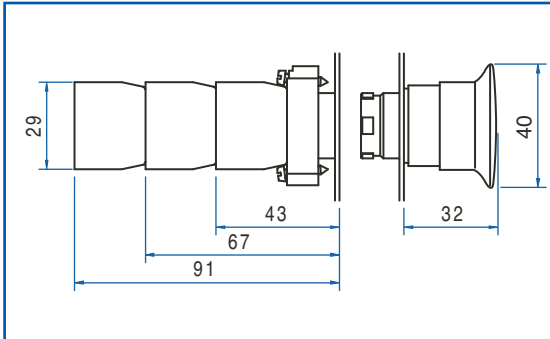
\* For use with non-illuminated operators in thermoplastic or aluminum enclosures listed on pages 30 and 36-37.

# 22mm Non-Illuminated Mushroom Metal Operators

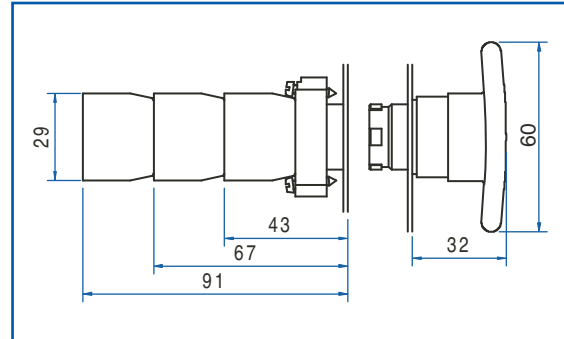
## Dimensional Drawings

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

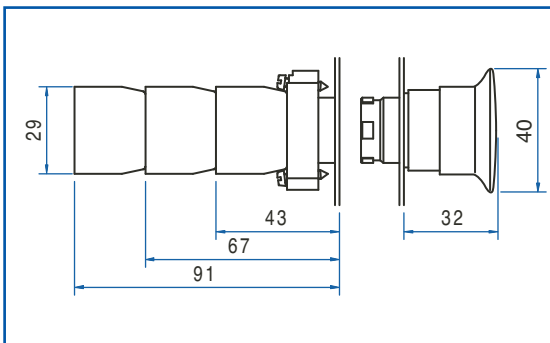
Mushroom Momentary



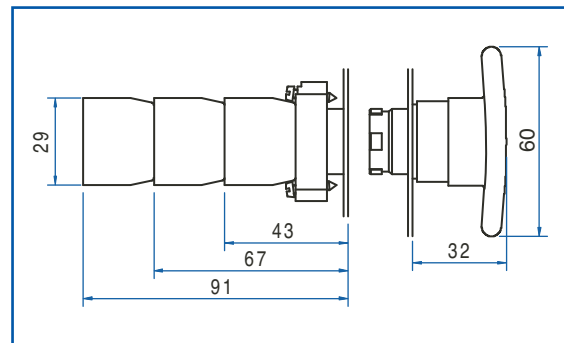
Mushroom Momentary Large



Mushroom Push-Pull

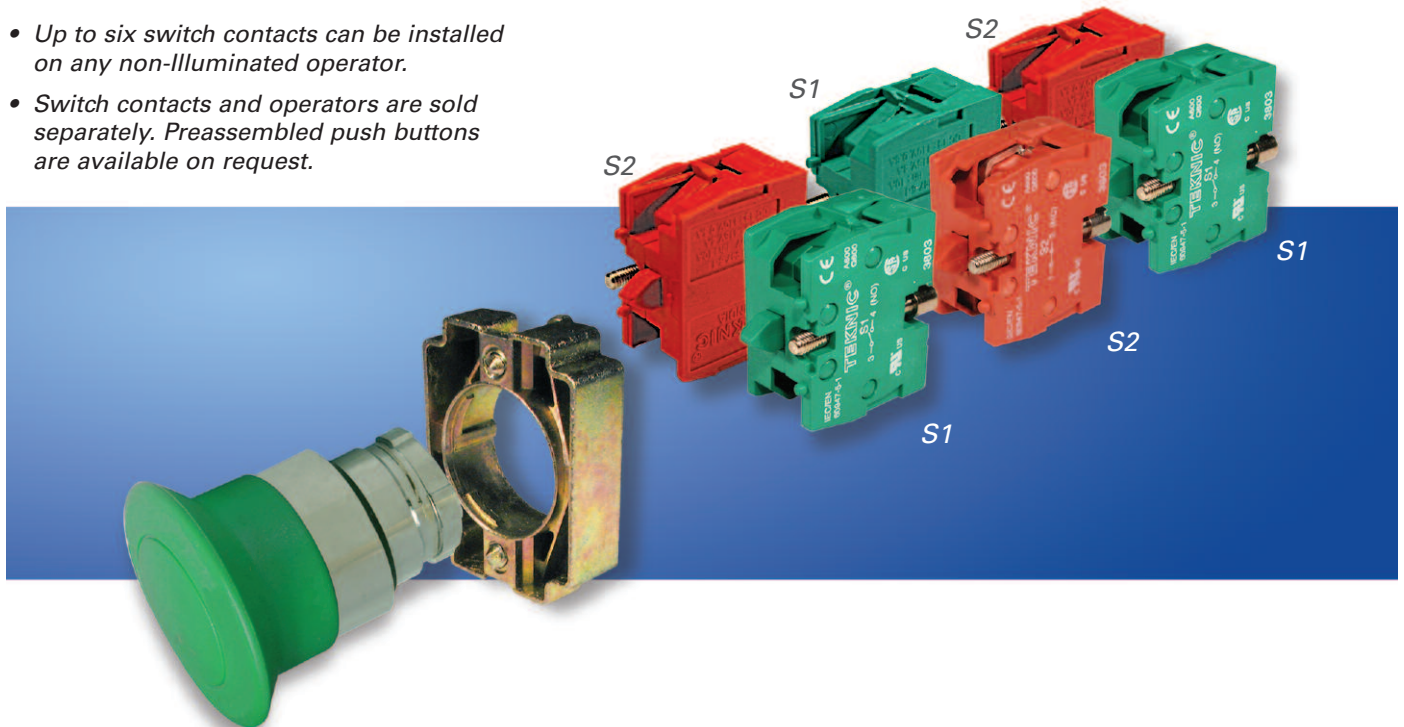


Mushroom Push-Pull Large



## Exploded Assembly View

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

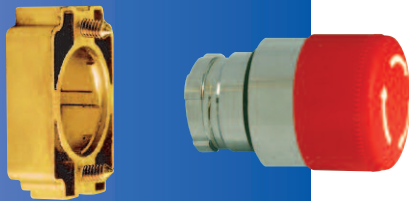


# 22mm Non-Illuminated Mushroom Metal Operators



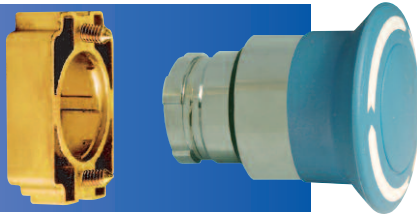
Certified for  
**NEMA Type 4X**  
12 environment.

## Mushroom Push-Turn Small with mounting bracket



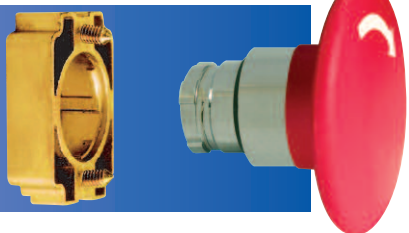
Color	Description	Cat No.
□ White	30 mm, Head	2AMLS1
■ Black	30 mm, Head	2AMLS2
■ Green	30 mm, Head	2AMLS3
■ Red	30 mm, Head	2AMLS4
■ Blue	30 mm, Head	2AMLS6
■ Yellow	30 mm, Head	2AMLS8

## 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

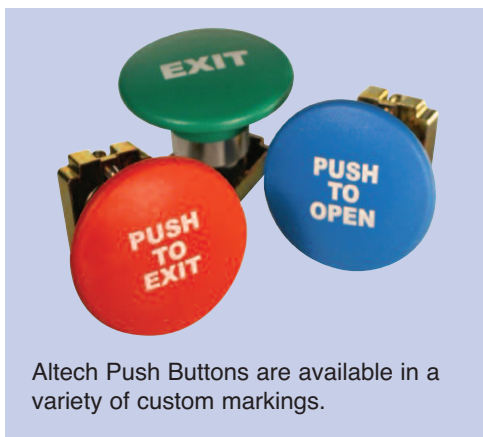
All keys are "keyed alike". Different keys are available on request.



**Replacement Key**

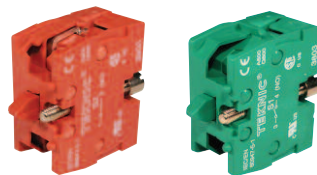
**2KY455**

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

#### Base Mount\*

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

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

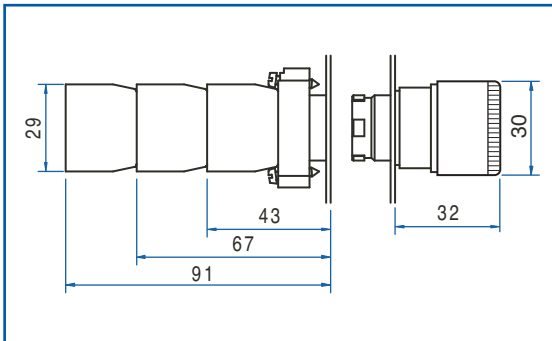


# 22mm Non-Illuminated Mushroom Metal Operators

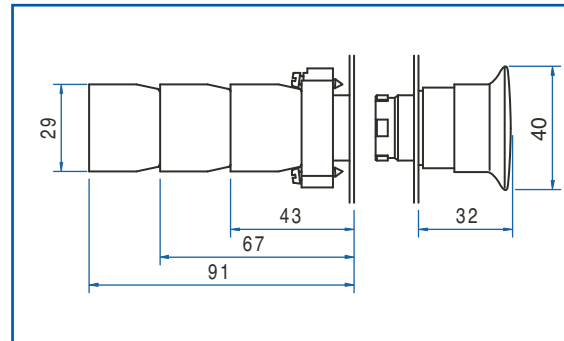
## Dimensional Drawings

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

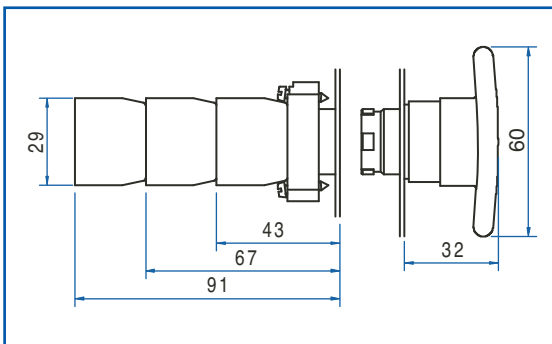
Mushroom Push-Turn Small



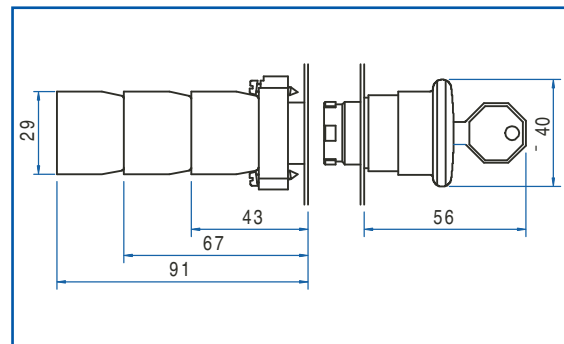
Mushroom Push-Turn



Mushroom Push-Turn Large

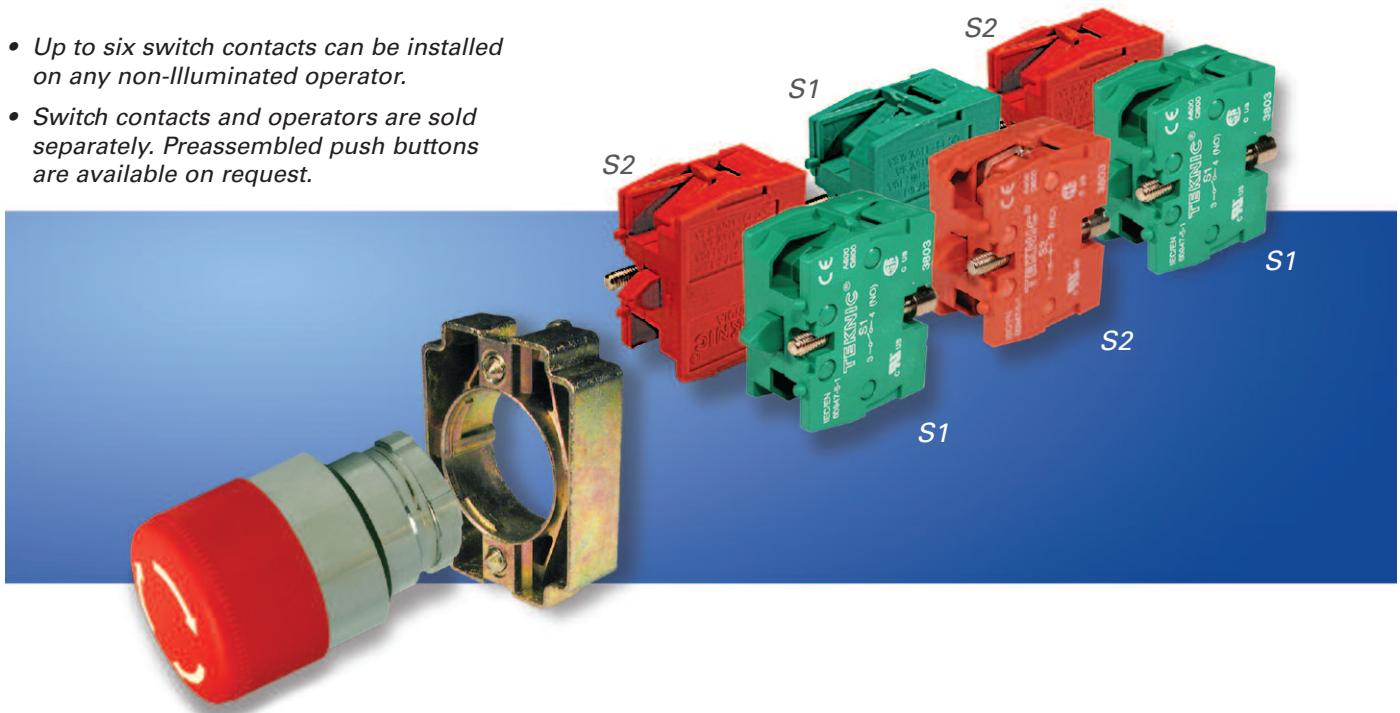


Mushroom with Key Release



## Exploded Assembly View

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



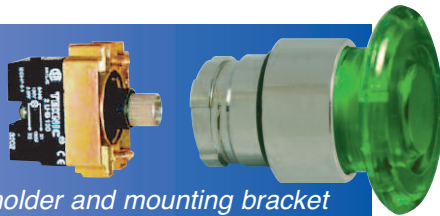
# 22mm LED Illuminated Mushroom Metal Operators



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

## Mushroom Illuminated Momentary

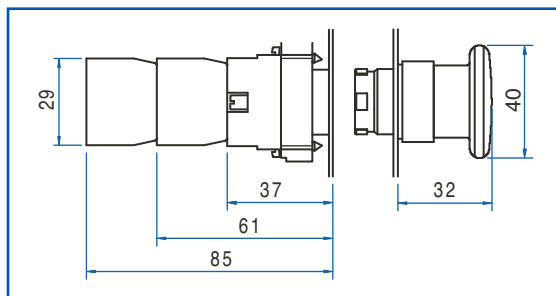
with LED bulb, bulb holder and mounting bracket



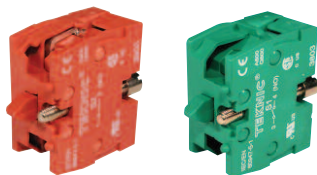
### Dimensional Drawings

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

Illuminated Mushroom Momentary



### Switch Contacts (sold separately)



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

#### Panel Mount

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

#### Base Mount\*

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

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

### Color Description Cat No.

#### 12V AC/DC

<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

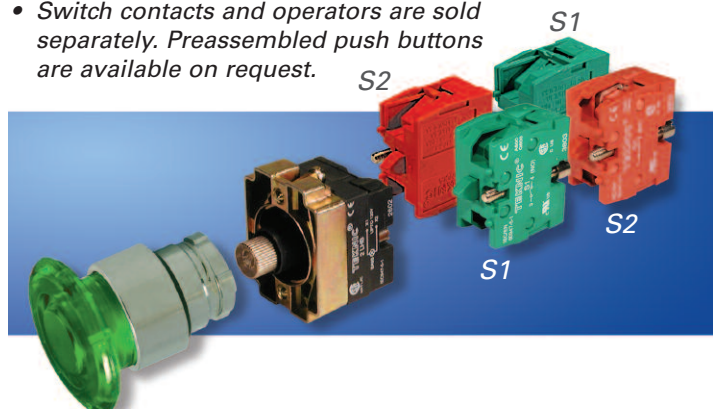
#### 230V AC\*

<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.



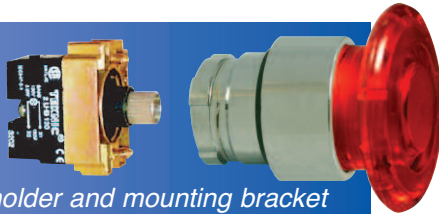
# 22mm LED Illuminated Mushroom Metal Operators



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

## Mushroom Illuminated Push-Pull

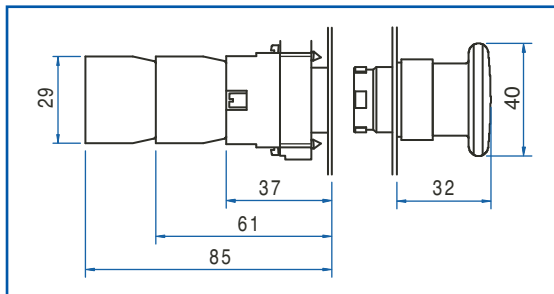
with LED bulb, bulb holder and mounting bracket



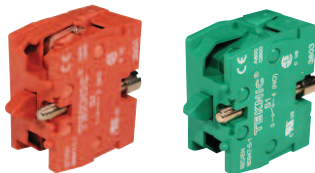
### Dimensional Drawings

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

#### Base Mount\*

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

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

Color	Description	Cat No.
-------	-------------	---------

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

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

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

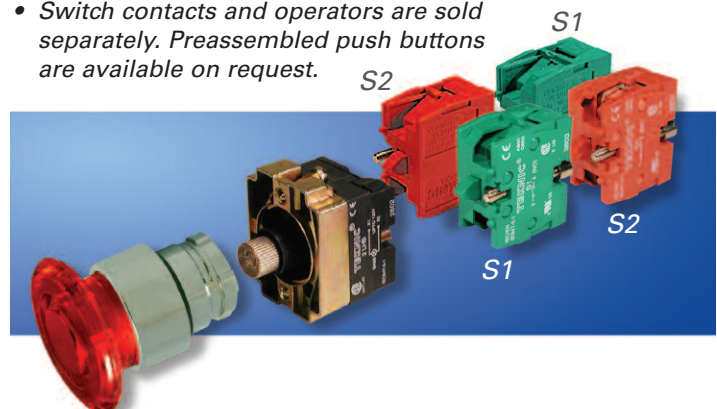
110V AC*		
<input type="checkbox"/>	White	40mm Head, 110VAC* 2ALMPP1LB-110
<input type="checkbox"/>	Green	40mm Head, 110VAC* 2ALMPP3LB-110
<input type="checkbox"/>	Red	40mm Head, 110VAC* 2ALMPP4LB-110
<input type="checkbox"/>	Amber	40mm Head, 110VAC* 2ALMPP5LB-110
<input type="checkbox"/>	Blue	40mm Head,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

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

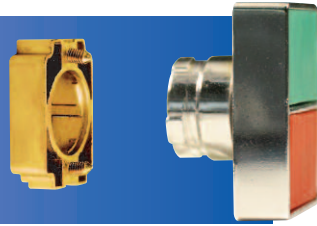


# 22mm Twin Touch Metal Non-Illuminated Operators



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

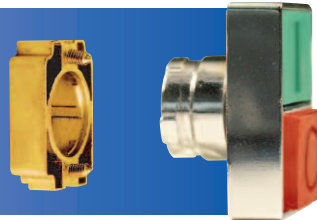
## Twin Touch/ Not Marked *with mounting bracket*



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.

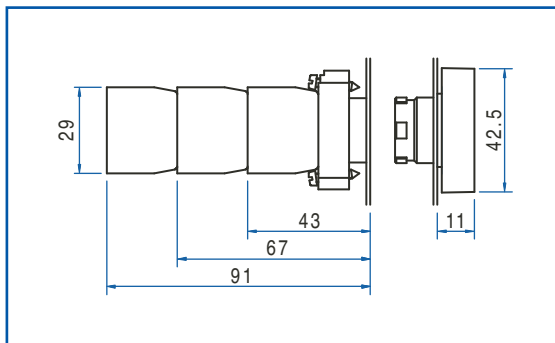
Color	Description	Cat No.
	GREEN-RED Flush	2ATF3-F4-IO
	YELLOW-BLACK Flush	2ATF8-F2-IO
	BLACK-WHITE* Flush	2ATF2-F1-IO
	GREEN-RED Green Flush, Red Projecting	2ATF3-P4-IO
	YELLOW-BLACK Yellow Flush, Black Projecting	2ATF8-P2-IO
	WHITE-BLACK* White Flush, Black Projecting	2ATF1-P2-IO

\*Comply with vision impaired requirements.

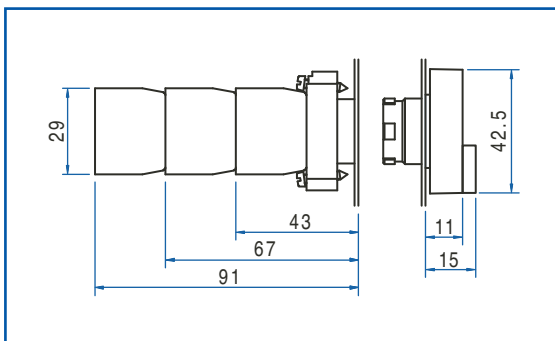
## Dimensional Drawings

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

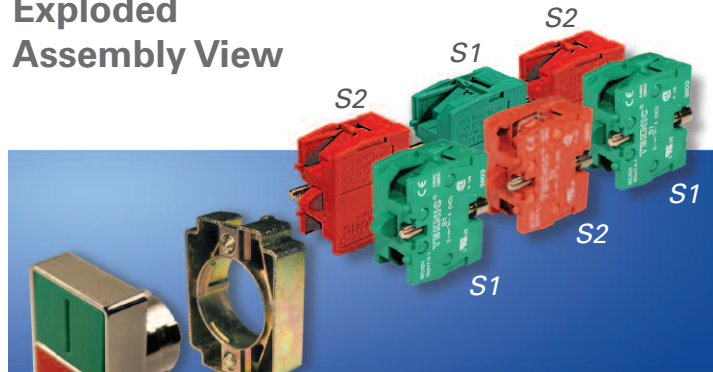
Twin Touch/ Flush



Twin Touch/ Flush/ Projecting

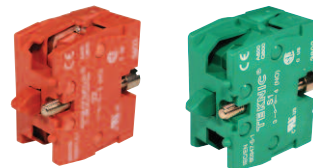


## Exploded Assembly View



- 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.

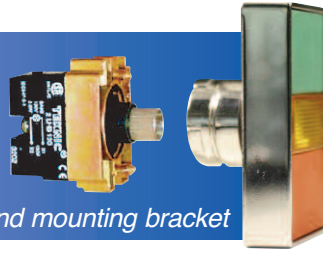
# 22mm Twin Touch Metal LED Illuminated Operators



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

## Illuminated Center Twin Touch/ Not Marked

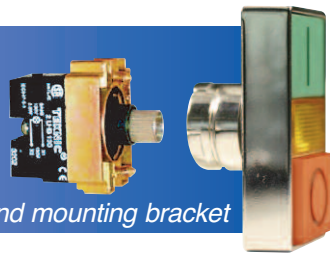
with LED bulb, bulb holder and mounting bracket



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

## Illuminated Center Twin Touch/ I-O Marked

with LED bulb, bulb holder and mounting bracket

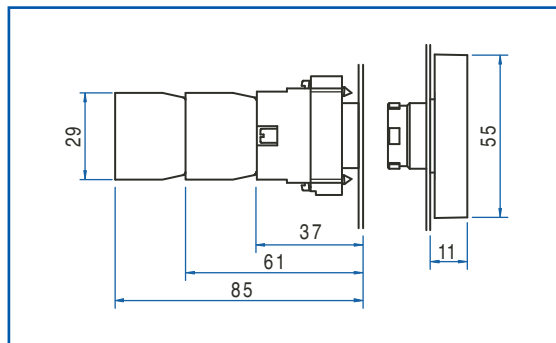


Arrows marking available upon request.  
Other lense colors available upon request.

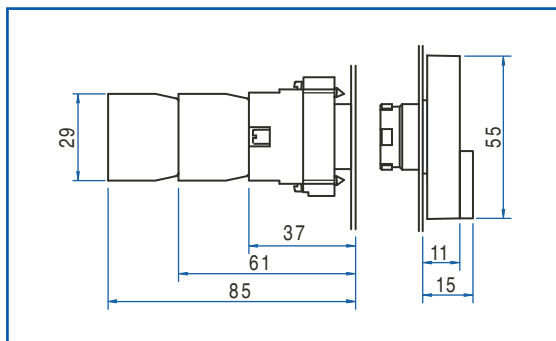
## Dimensional Drawings

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

Illuminated Twin Touch/ Flush



Illuminated Twin Touch/ Flush/ Projecting



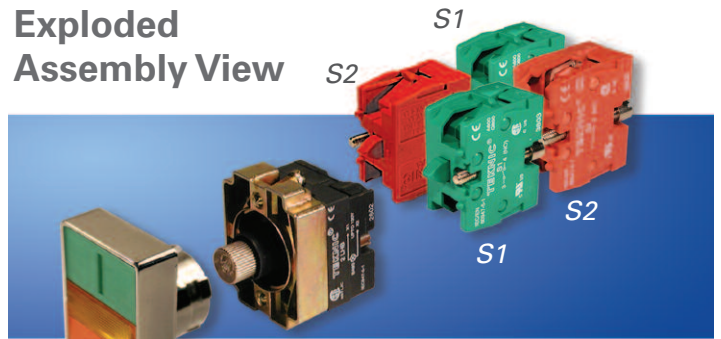
Color	Description	Cat No.
<b>GREEN-RED, Flush, Illuminated Center</b>		
Green/Red	Amber 12VAC/DC	2ATL5LB F3F4-012
Green/Red	Amber 24VAC/DC	2ATL5LB F3F4-024
Green/Red	Amber 48VAC/DC	2ATL5LB F3F4-048
Green/Red	Amber 110VAC**	2ATL5LB F3F4-110
Green/Red	Amber 230VAC**	2ATL5LB F3F4-230
<b>GREEN-RED, Green Flush/ Red Projecting, Illuminated center</b>		
Green/Red	Amber 12VAC/DC	2ATL5LB F3P4-012
Green/Red	Amber 24VAC/DC	2ATL5LB F3P4-024
Green/Red	Amber 48VAC/DC	2ATL5LB F3P4-048
Green/Red	Amber 110VAC**	2ATL5LB F3P4-110
Green/Red	Amber 230VAC**	2ATL5LB F3P4-230

Color	Description	Cat No.
<b>GREEN-RED, Flush, Illuminated Center</b>		
Green/Red	Amber 12VAC/DC	2ATL5LB F3F4-IO-012
Green/Red	Amber 24VAC/DC	2ATL5LB F3F4-IO-024
Green/Red	Amber 48VAC/DC	2ATL5LB F3F4-IO-048
Green/Red	Amber 110VAC**	2ATL5LB F3F4-IO-110
Green/Red	Amber 230VAC**	2ATL5LB F3F4-IO-230
<b>GREEN-RED, Green Flush/ Red Projecting, Illuminated Center</b>		
Green/Red	Amber 12VAC/DC	2ATL5LB F3P4-IO-012
Green/Red	Amber 24VAC/DC	2ATL5LB F3P4-IO-024
Green/Red	Amber 48VAC/DC	2ATL5LB F3P4-IO-048
Green/Red	Amber 110VAC**	2ATL5LB F3P4-IO-110
Green/Red	Amber 230VAC**	2ATL5LB F3P4-IO-230
<b>WHITE-BLACK*, Flush, Illuminated Center</b>		
White/Black	Amber 12VAC/DC	2ATL5LB F2F1-IO-012
White/Black	Amber 24VAC/DC	2ATL5LB F2F1-IO-024
White/Black	Amber 48VAC/DC	2ATL5LB F2F1-IO-048
White/Black	Amber 110VAC**	2ATL5LB F2F1-IO-110
White/Black	Amber 230VAC**	2ATL5LB F2F1-IO-230

\* Comply with vision impaired requirements.

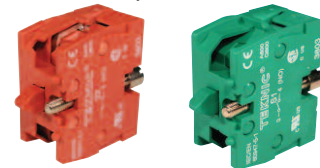
\*\* 110V DC and 230V DC version is available on request.

## 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	<b>S1</b>	<b>S5</b>
Normally Closed Silver	<b>S2</b>	<b>S6</b>
Normally Open Gold plated	<b>S3</b>	<b>S7</b>
Normally Closed Gold plated	<b>S4</b>	<b>S8</b>

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

# 22mm Non-Illuminated Metal 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

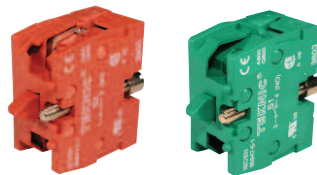
(sold separately)



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

### Base Mount\*

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

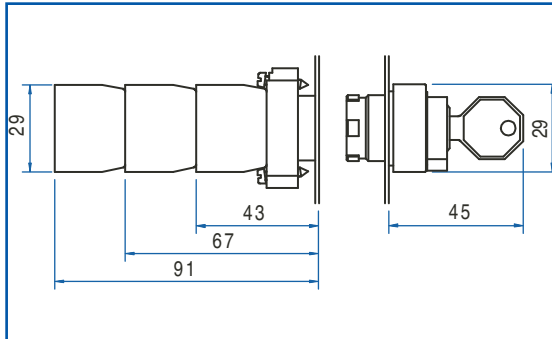
\* For use with non-illuminated operators in thermoplastic or aluminum enclosures listed on pages 30 and 36-37.

# 22mm Non-Illuminated Metal Selector Switch Operators

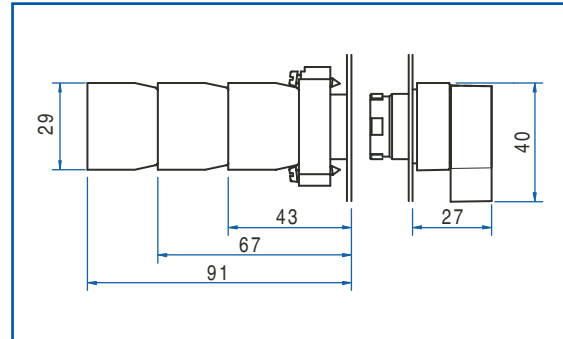
## Dimensional Drawings

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

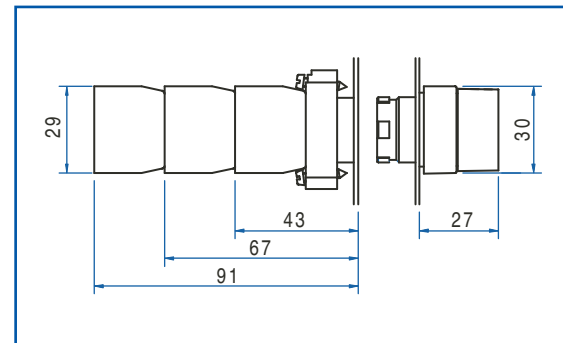
Key Selector



Extended Selector



Selector



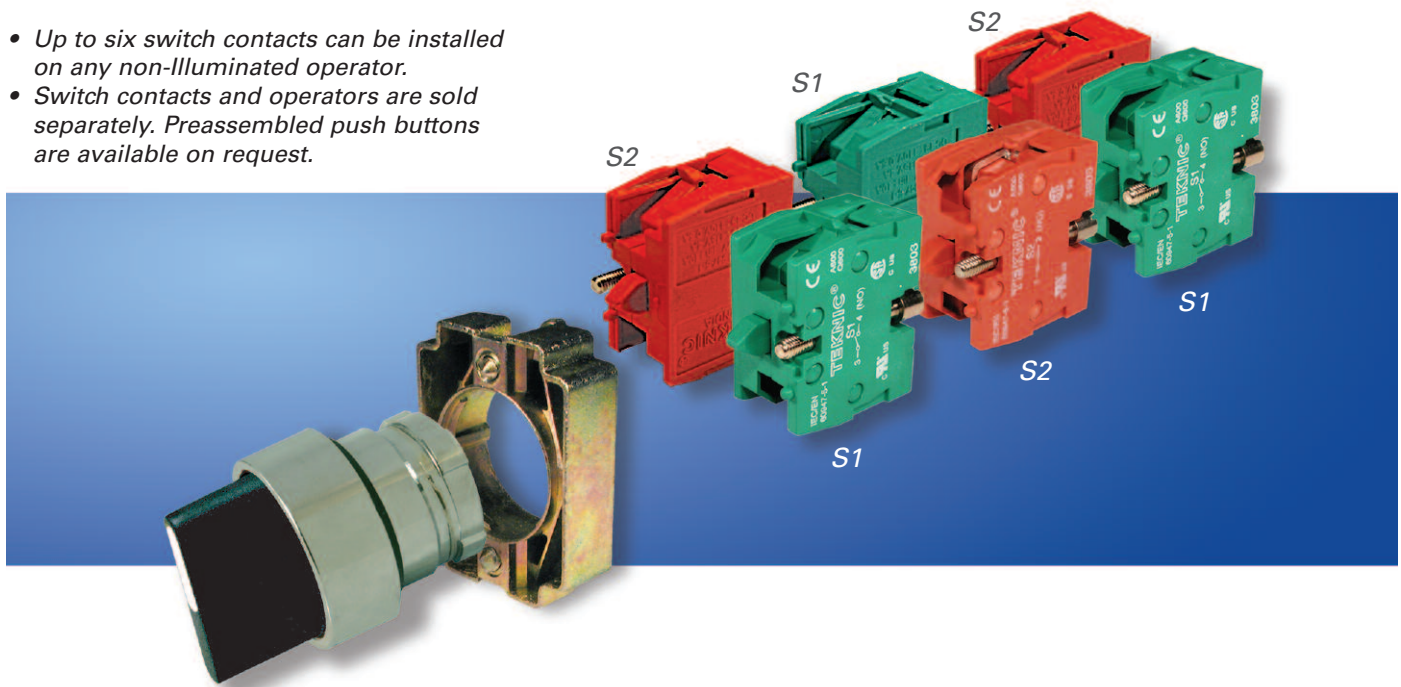
3 POSITION  
SELECTOR SWITCH  
CONTACT BLOCK GUIDE

			CONTACTOR BLOCK GUIDE
⊗	⊙	⊙	1 NO (left)
⊙	⊗	⊙	2 NC in series (side x side)
⊙	⊙	⊗	1 NO (right)
⊗	⊗	⊙	1 NC (right)
⊙	⊗	⊗	1 NC (left)
⊗	⊙	⊗	2 NO in parallel (side x side)

(Left or right as seen from front of operator)

## Exploded Assembly View

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



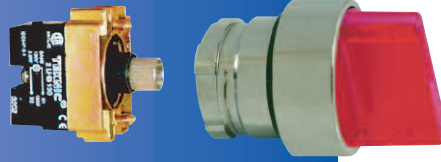
# 22mm LED Illuminated Metal Selector Switch Operators



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

## Selector

with bulb holder,  
LED bulb and  
mounting bracket



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

### XXX = Voltage Codes

012	=	12VAC/DC
024	=	24VAC/DC
048	=	48VAC/DC
110	=	110VAC
110D	=	110VDC
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






# 22mm LED Illuminated Metal Selector Switch Operators

## Dimensional Drawings

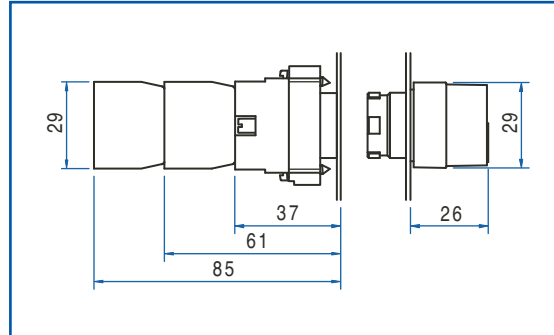
All dimensions shown in millimeters.  
To convert to inches multiply by 0.03937

3 POSITION  
SELECTOR SWITCH  
CONTACT BLOCK GUIDE

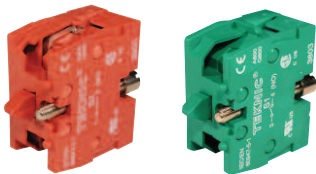
			CONTACTOR BLOCK GUIDE
x	o	o	1 NO (left)
o	x	o	2 NC in series (side x side)
o	o	x	1 NO (right)
x	x	o	1 NC (right)
o	x	x	1 NC (left)
x	o	x	2 NO in parallel (side x side)

(Left or right as seen from front of operator)

Illuminated Selector



## Switch Contacts (sold separately)



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

### Panel Mount

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

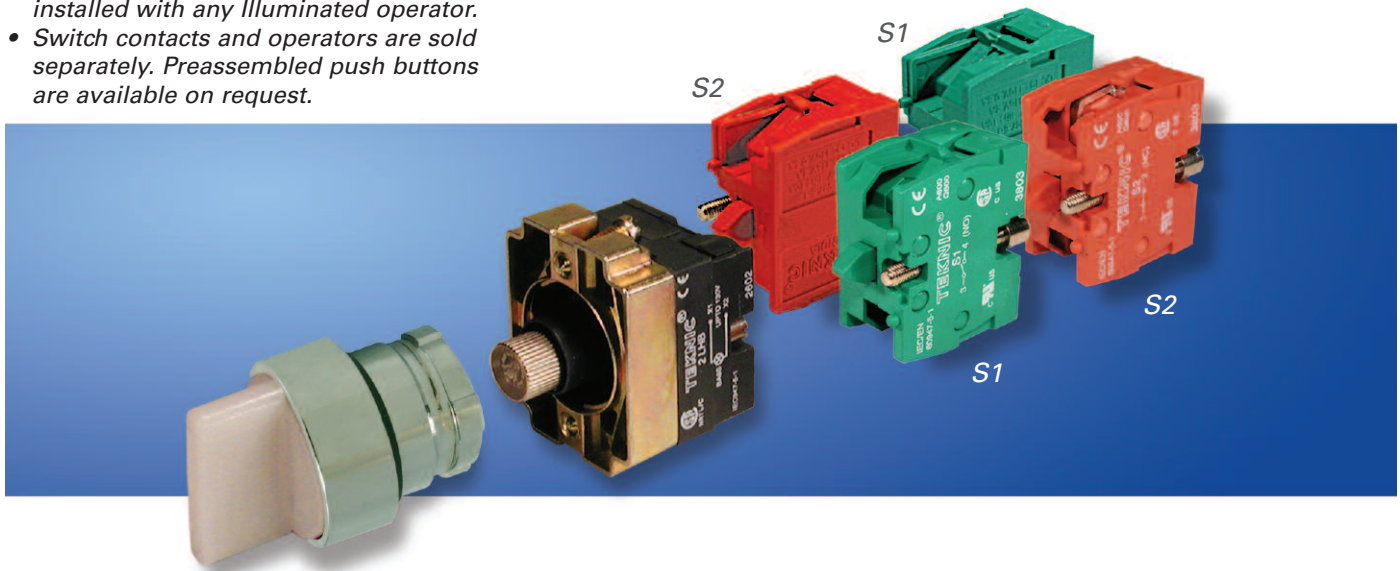
### Base Mount\*

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

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

## Exploded Assembly View

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



# 22mm LED Illuminated Metal Projecting Operators



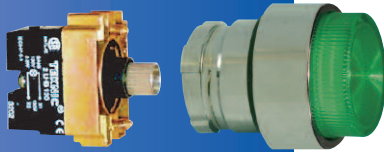
UL US  
E225660



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

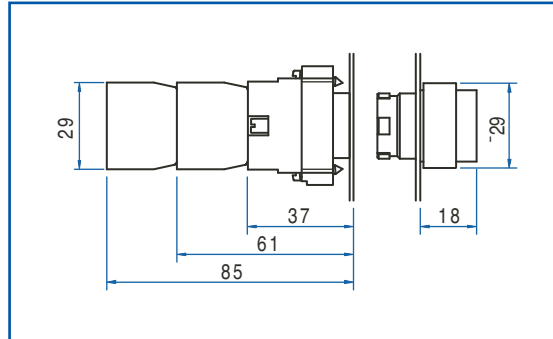
<input type="checkbox"/>	White	230V DC 2ALP1LB-230D
<input checked="" type="checkbox"/>	Green	230V DC 2ALP3LB-230D
<input checked="" type="checkbox"/>	Red	230V DC 2ALP4LB-230D
<input checked="" type="checkbox"/>	Amber	230V DC 2ALP5LB-230D
<input checked="" type="checkbox"/>	Blue	230V DC 2ALP6LB-230D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

# 22mm LED Illuminated Metal Projecting Operators

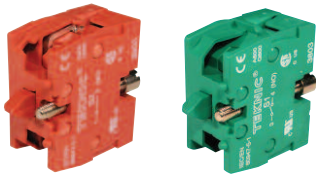
## Dimensional Drawings

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

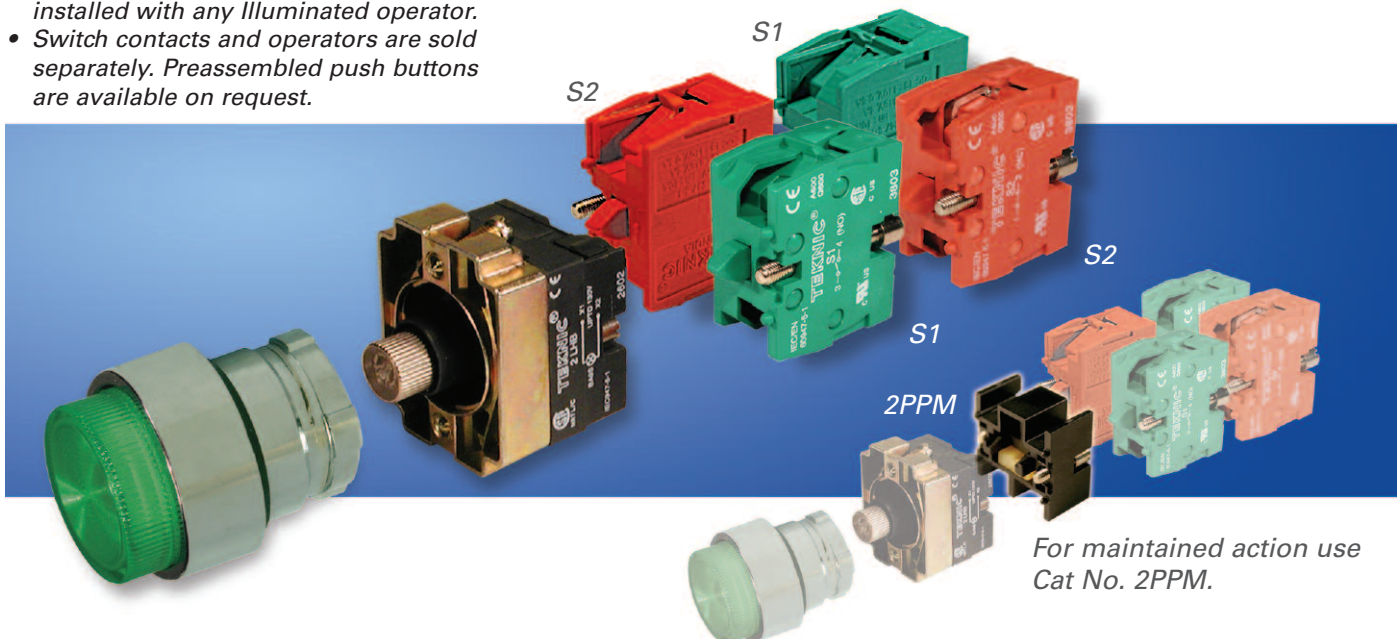
### Base Mount\*

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

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

## Exploded Assembly View

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



For maintained action use  
Cat No. 2PPM.

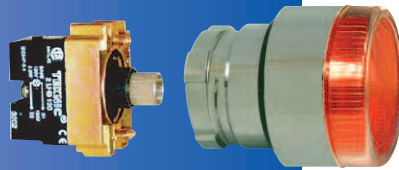
# 22mm LED Illuminated Metal Flush Operators



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

## Flush Momentary

with bulb, bulb holder and mounting bracket



**SAMPLE ASSEMBLY**



Replacement bulbs available.  
See page 39.

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

### 12V AC/DC

<input type="checkbox"/>	White	12V AC/DC	2ALF1LB-012
<input checked="" type="checkbox"/>	Green	12V AC/DC	2ALF3LB-012
<input 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

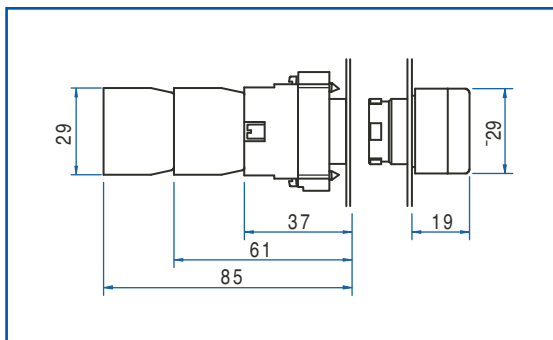
<input type="checkbox"/>	White	230V DC	2ALF1LB-230D
<input checked="" type="checkbox"/>	Green	230V DC	2ALF3LB-230D
<input checked="" type="checkbox"/>	Red	230V DC	2ALF4LB-230D
<input checked="" type="checkbox"/>	Amber	230V DC	2ALF5LB-230D
<input checked="" type="checkbox"/>	Blue	230V DC	2ALF6LB-230D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

# 22mm LED Illuminated Metal Flush Operators

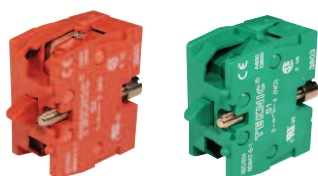
## Dimensional Drawings

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**

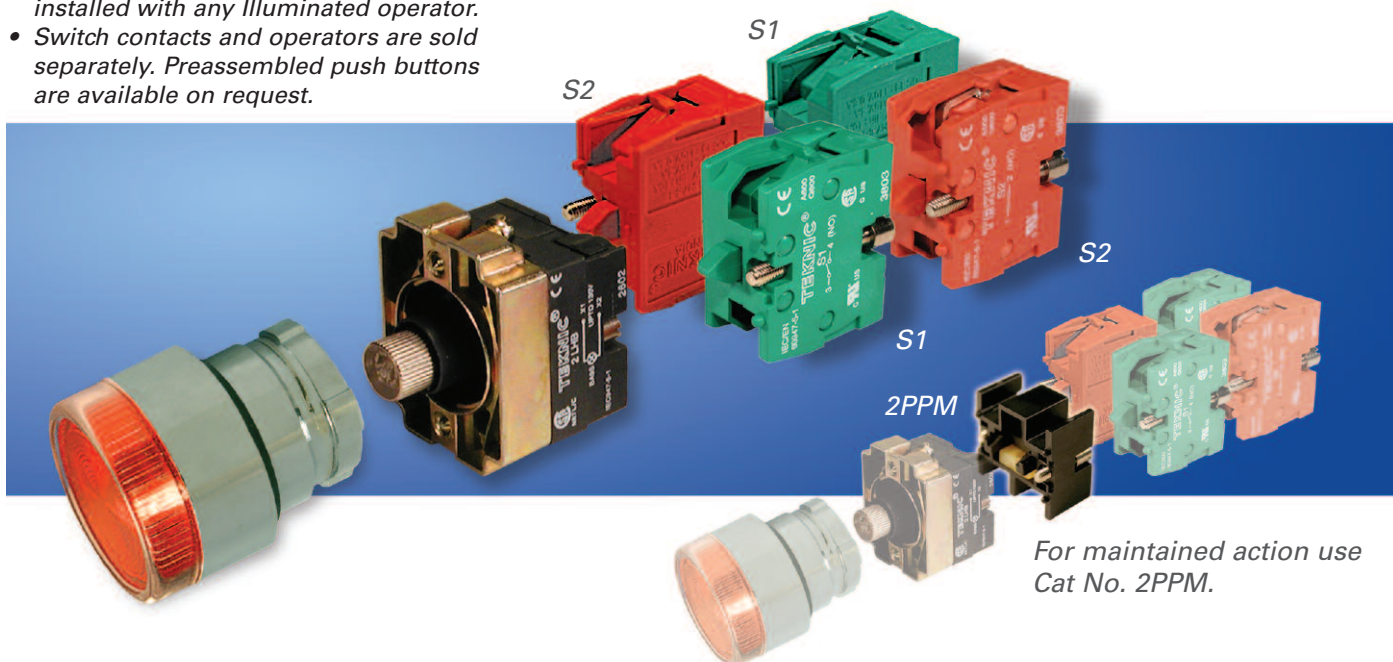
### Base Mount\*

- 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 action use Cat No. 2PPM.

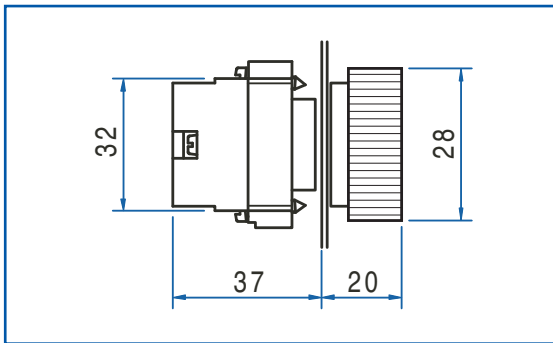
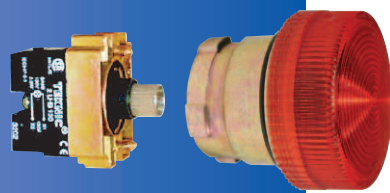
# 22mm LED Metal Pilot Lights



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 <sup>2</sup> ) maximum 2x16 AWG (2 x 1.5 mm <sup>2</sup> ) or 14 AWG (2.5 mm <sup>2</sup> )
Terminal marking:	1-2 for NC, 3-4 for NO
Short circuit protection:	10A cartridge fuse HRC type, rated for resistive loads
Mechanical life:	1 million operations

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

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

# Economy Non-Illuminated Plastic Push Buttons



## Momentary



## Maintained



Color	Description & Function	Cat No.
-------	------------------------	---------

### Momentary

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

### Maintained

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



# Economy Non-Illuminated Plastic Push Buttons Specifications

## A. Mechanical Characteristics

Contact Operation	NO/NC Slow Break
Operating Travel	Changing NC status = 2mm 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

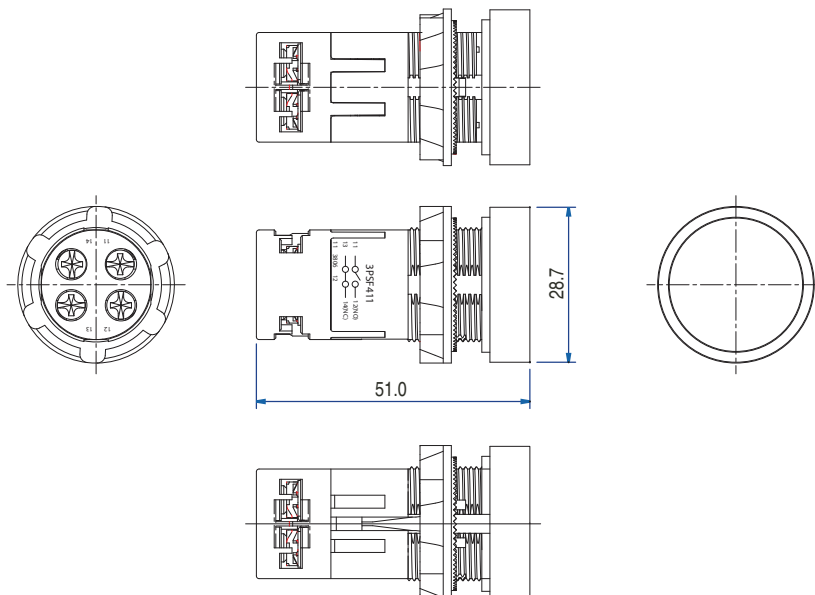
Push Button, Spring Return	1 Million Operations
Push-Push Type	100,000 Operations
Applicable Standard	UL508; IS13947-5-1; CSA 22.2
Degree of Protection	IP65 (as per IS 13947)
Temperature Range	-25° to +85°C (-13°F to 180°F)

## C. Electrical Characteristics

Rating	<p><i>For AC:</i> C300= 120V, make current 15A &amp; 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 <sup>2</sup> ; 1 X 0.5mm <sup>2</sup> (min); 1 X 2.5mm <sup>2</sup> (max)
Contact Material	<ul style="list-style-type: none"> <li>• Moving contact = Phosphor Bronze</li> <li>• Fixed Contact = Brass silver plated 2 microns</li> </ul>
Short Circuit Protection	4A fuse
Dielectric Test	2.5KV
Rated insulation Resistance	500M ohm
Rated Thermal Current	2.5A

## Dimensional Drawings

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



# Unibody LED Indicator Plastic Pilot Lights



## Pilot Lights with integral LED



Color	Description	Cat No.
	White Lens/Yellow LED 12V AC/DC	3PLBR1L-012
	White Lens/Yellow LED 24V AC/DC	3PLBR1L-024
	White Lens/Yellow LED 48V AC/DC	3PLBR1L-048
	White Lens/Yellow LED 110V AC*	3PLBR1L-110
	White Lens/Yellow LED 230V AC*	3PLBR1L-230
	White Lens/White LED 12V AC/DC	3PLBR1LS-012
	White Lens/White LED 24V AC/DC	3PLBR1LS-024
	White Lens/White LED 48V AC/DC	3PLBR1LS-048
	White Lens/White LED 110V AC*	3PLBR1LS-110
	White Lens/White LED 230V AC*	3PLBR1LS-230
	Green Lens/Green LED 12V AC/DC	3PLBR3L-012
	Green Lens/Green LED 24V AC/DC	3PLBR3L-024
	Green Lens/Green LED 48V AC/DC	3PLBR3L-048
	Green Lens/Green LED 110V AC*	3PLBR3L-110
	Green Lens/Green LED 230V AC*	3PLBR3L-230
	Red Lens/Red LED 12V AC/DC	3PLBR4L-012
	Red Lens/Red LED 24V AC/DC	3PLBR4L-024
	Red Lens/Red LED 48V AC/DC	3PLBR4L-048
	Red Lens/Red LED 110V AC*	3PLBR4L-110
	Red Lens/Red LED 230V AC*	3PLBR4L-230
	Amber Lens/Amber LED 12V AC/DC	3PLBR5L-012
	Amber Lens/Amber LED 24V AC/DC	3PLBR5L-024
	Amber Lens/Amber LED 48V AC/DC	3PLBR5L-048
	Amber Lens/Amber LED 110V AC*	3PLBR5L-110
	Amber Lens/Amber LED 230V AC*	3PLBR5L-230
	Blue Lens/Blue LED 12V AC/DC	3PLBR6L-012
	Blue Lens/Blue LED 24V AC/DC	3PLBR6L-024
	Blue Lens/Blue LED 48V AC/DC	3PLBR6L-048
	Blue Lens/Blue LED 110V AC*	3PLBR6L-110
	Blue Lens/Blue LED 230V AC*	3PLBR6L-230
	Clear Lens/Yellow LED 12V AC/DC	3PLBR7L-012
	Clear Lens/Yellow LED 24V AC/DC	3PLBR7L-024
	Clear Lens/Yellow LED 48V AC/DC	3PLBR7L-048
	Clear Lens/Yellow LED 110V AC*	3PLBR7L-110
	Clear Lens/Yellow LED 230V AC*	3PLBR7L-230
	Clear Lens/White LED 12V AC/DC	3PLBR7LS-012
	Clear Lens/White LED 24V AC/DC	3PLBR7LS-024
	Clear Lens/White LED 48V AC/DC	3PLBR7LS-048
	Clear Lens/White LED 110V AC*	3PLBR7LS-110
	Clear Lens/White LED 230V AC*	3PLBR7LS-230
	Yellow Lens/Yellow LED 12V AC/DC	3PLBR8L-012
	Yellow Lens/Yellow LED 24V AC/DC	3PLBR8L-024
	Yellow Lens/Yellow LED 48V AC/DC	3PLBR8L-048
	Yellow Lens/Yellow LED 110V AC*	3PLBR8L-110
	Yellow Lens/Yellow LED 230V AC*	3PLBR8L-230

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

# Unibody LED Indicator Plastic Pilot Lights Specifications

## A. Mechanical Characteristics

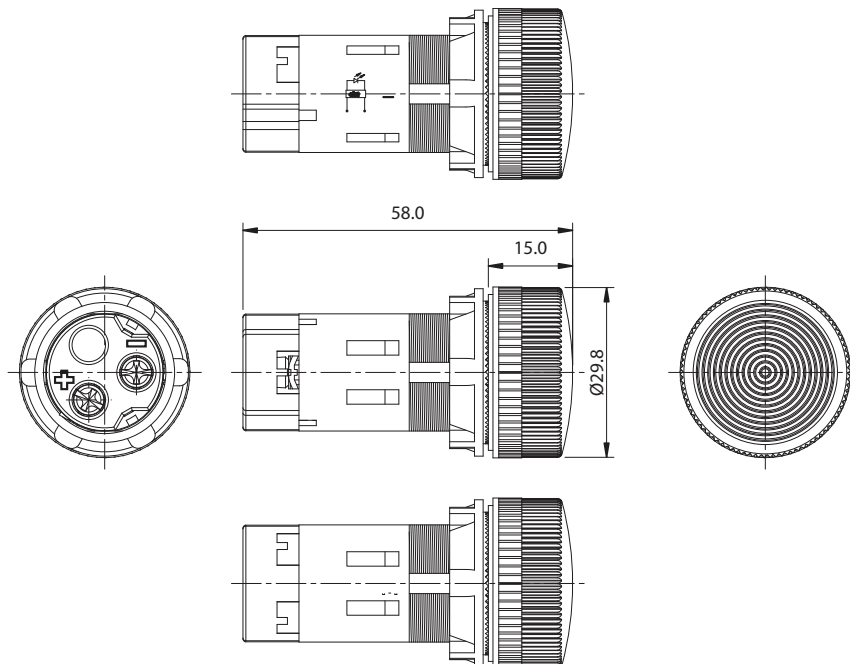
Applicable Standard	UL508 IEC 60947 CSA 22.2
Degree of Protection	IP65 as per IEC 60947,
Temperature Range	-25° to +70°C (-13 to +158°F)
Contact material	Phosphor bronze for LED, PCB contact brass (tin plated)
Corrosion protection	All metallic parts are electroplated for corrosion protection
Terminal 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 <sup>2</sup> 1 X 0.5mm <sup>2</sup> (min) 1 X 2.5mm <sup>2</sup> (max)
Dielectric Test	2.5KV
Rated insulation Resistance	500M ohm at 1000VDC
Polarity protection	Polarity protection is only in case of DC supply lamps
Low voltage protection	20V for 110V AC & 110V DC 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

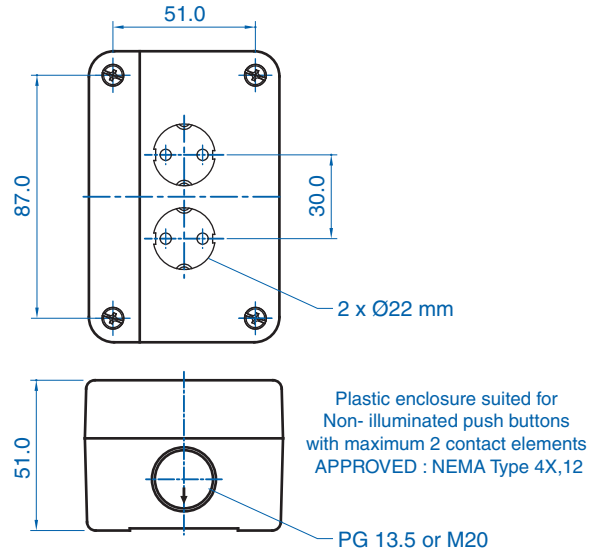
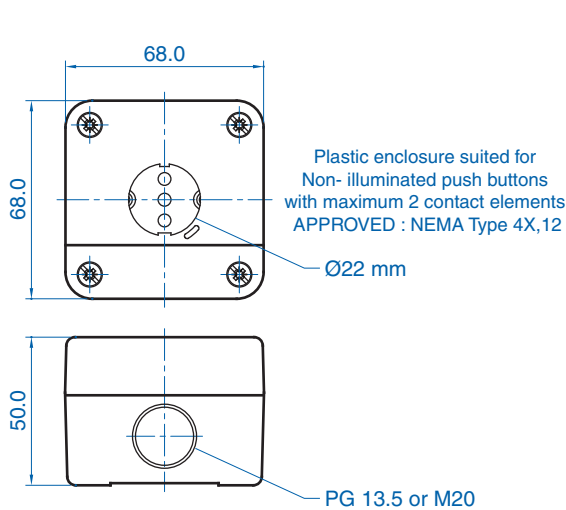


Certified for  
**NEMA Type 4X**  
12 environment.



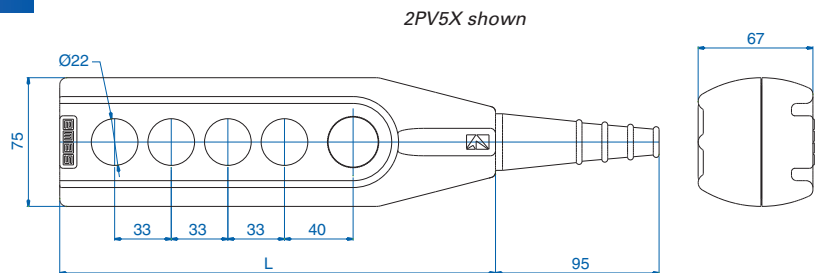
## Base Mount Enclosures

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



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

## Control Boxes



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

Contact Elements and Seal	
Cat. No.	Description
S1	Normally open
S2	Normally closed
3PRG1*	Rubber gasket*

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

## 22mm Thermoplastic Enclosure & Control Box Accessories



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

### Flush

*Momentary*

*with mounting bracket*



### Mushroom

*Momentary/Maintained*  
*with mounting bracket*



### Projecting

*with mounting bracket*



### Selector Switch

*with mounting bracket*



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

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

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

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



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



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



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



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

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



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

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



**Transparent Silicone Rubber Boot for Flush Actuators**

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

### Switch Contacts



#### Panel Mount

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

#### Base Mount

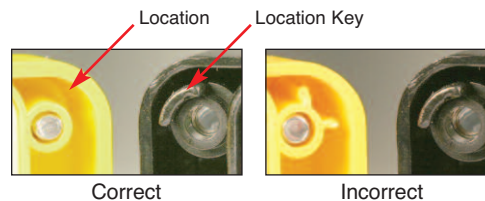
Normally Open Silver **S5**  
Normally Closed Silver **S6**  
Normally Open Gold plated **S7**  
Normally Closed Gold plated **S8**

# 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

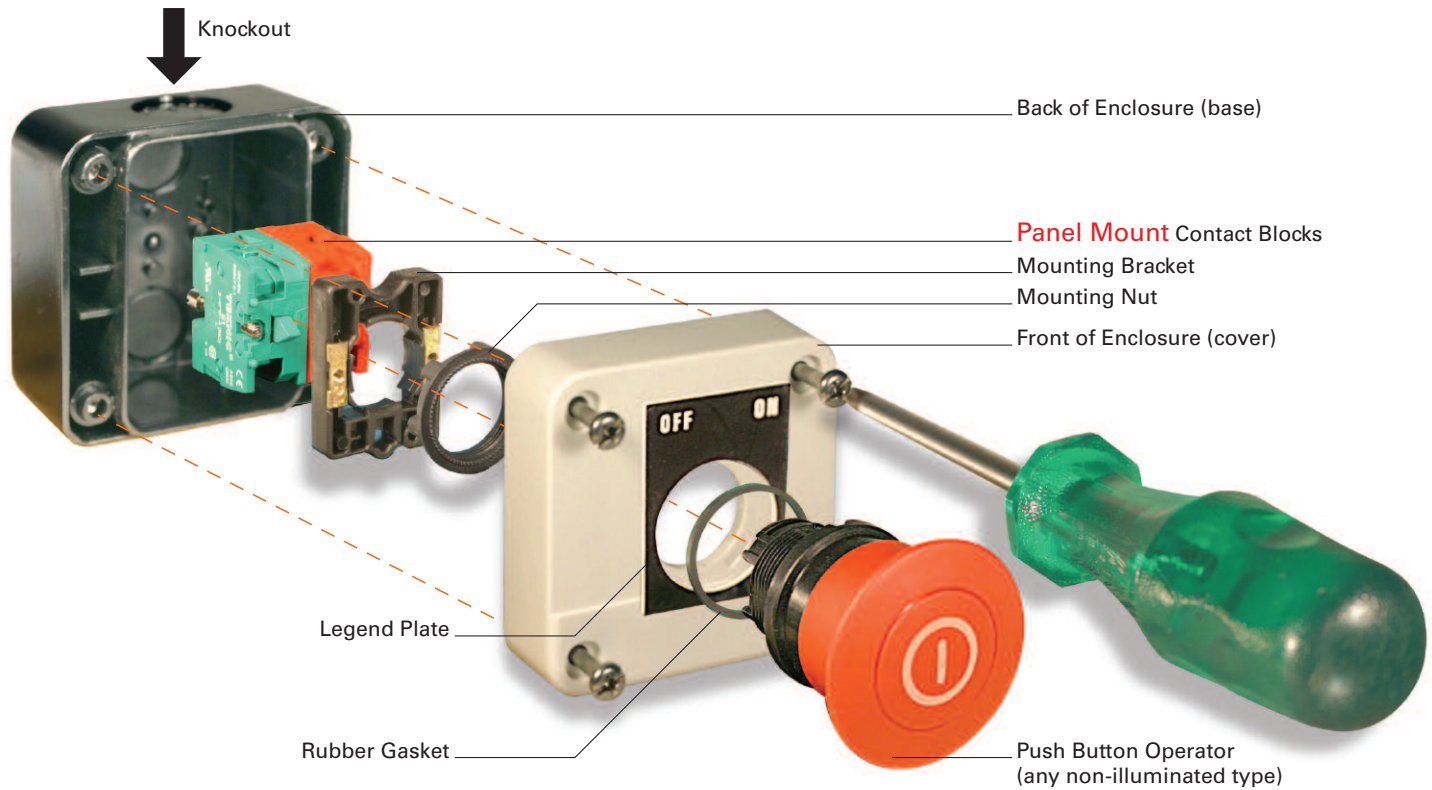
The unit may only be assembled and installed by individuals who are familiar with the installation instructions and the current regulations for health and safety at work and accident prevention. Ensure local regulations compliances are met.

## CAUTION

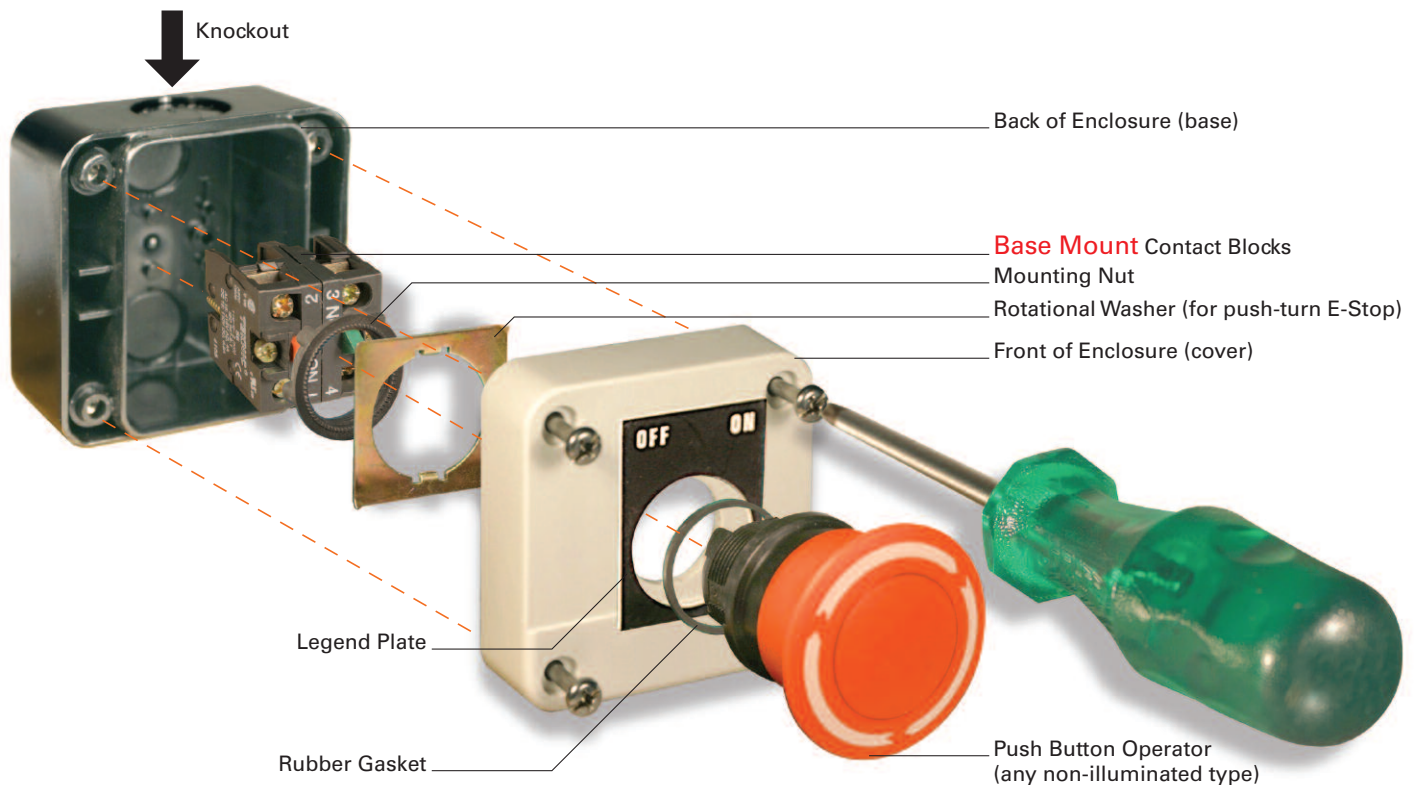
1. Non-metallic enclosures do not provide grounding connections.  
Use grounding jumper wires.
2. The conduit hubs are to be connected to the conduit before being connected to the enclosure.
3. To maintain the environmental rating of this enclosure, install only UL listed or UL recognized conduit hubs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



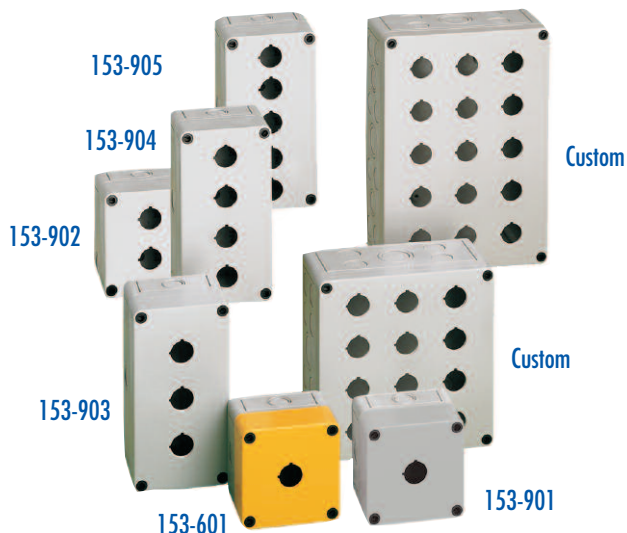
# 22mm Polycarbonate Enclosures

## 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

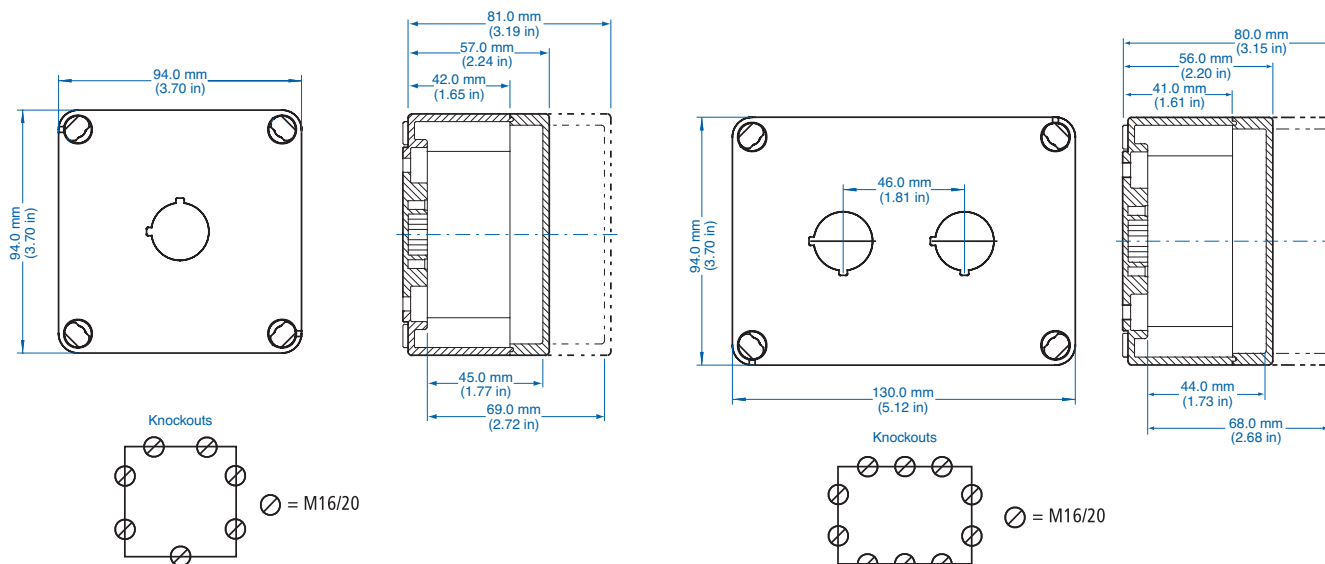
\*IP66 when suitable installation devices are used.



### Ordering Information

### Dimensions mm (in)

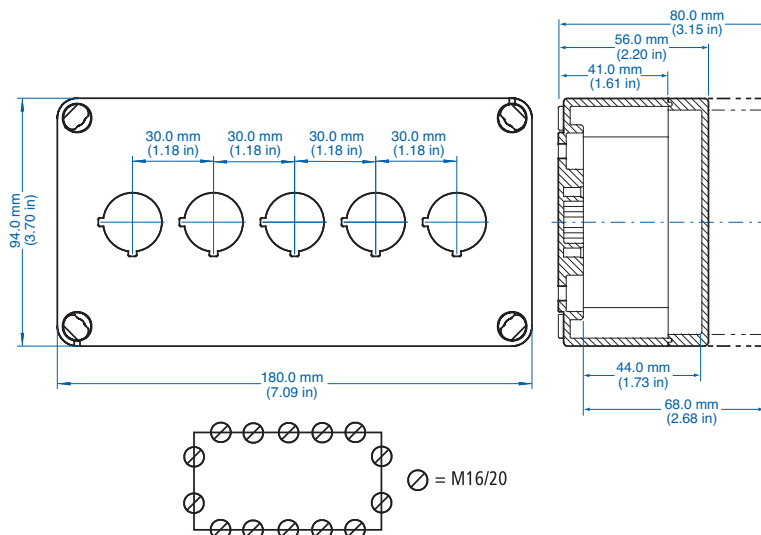
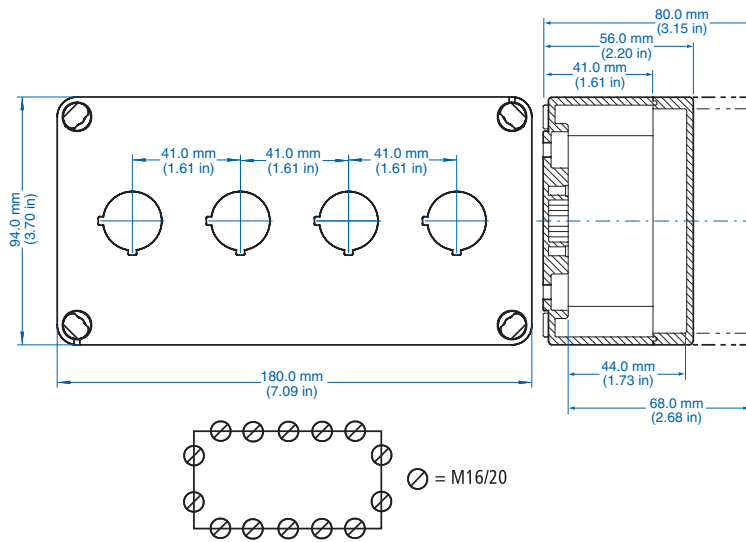
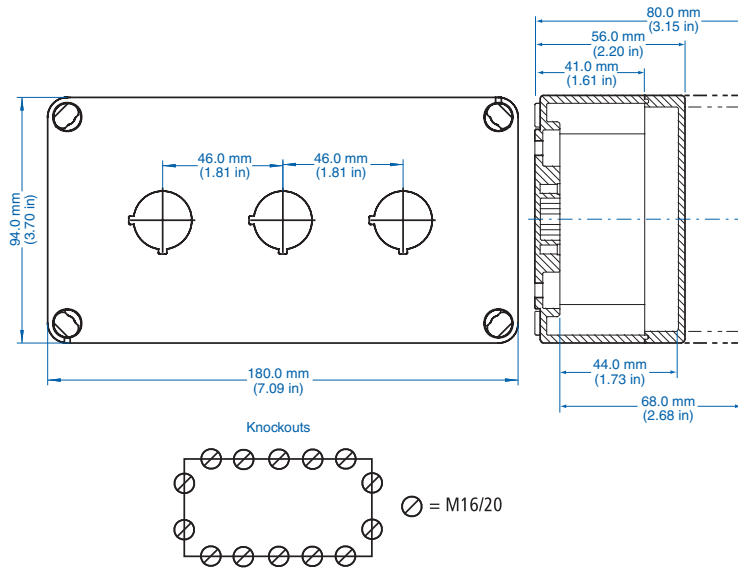
	Cat. No.	Length	Width	Height	Std. Pk.
One hole enclosure	153-901	94 mm (3.70 in)	94 mm (3.70 in)	81 mm (3.19 in)	1
One hole enclosure (Yellow cover)	153-601	94 mm (3.70 in)	94 mm (3.70 in)	81 mm (3.19 in)	1
Two hole enclosure	153-902	130 mm (5.12 in)	94 mm (3.70 in)	81 mm (3.19 in)	1
Three hole enclosure	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



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



# 22mm Polycarbonate Enclosures



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

# 22mm Aluminum Enclosures



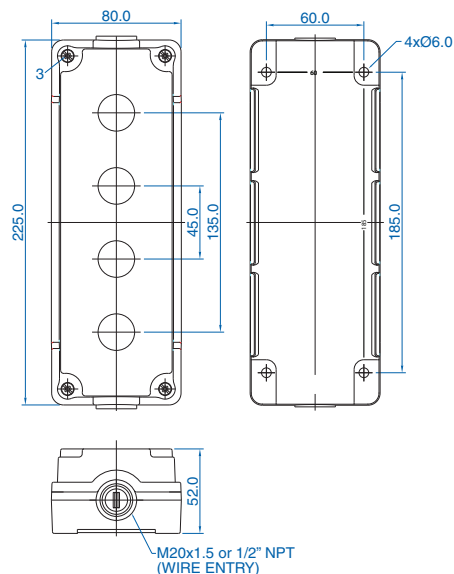
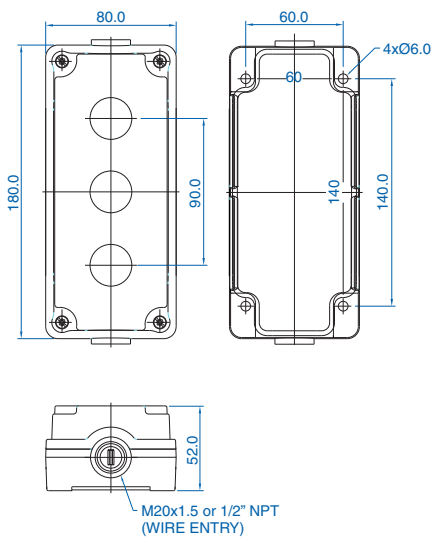
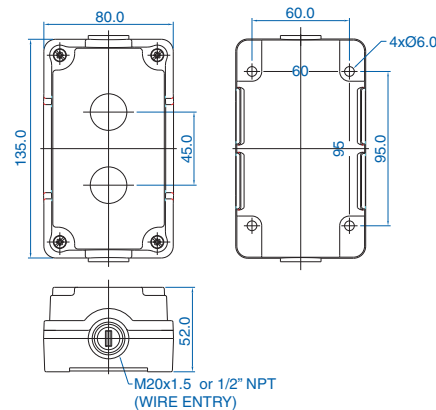
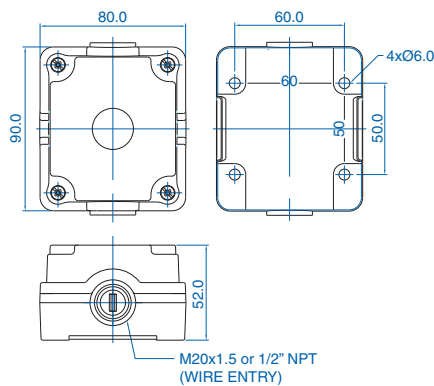
Certified for  
**NEMA Type 4X**  
12 environment.

## Aluminum Pressure Die Cast

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



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



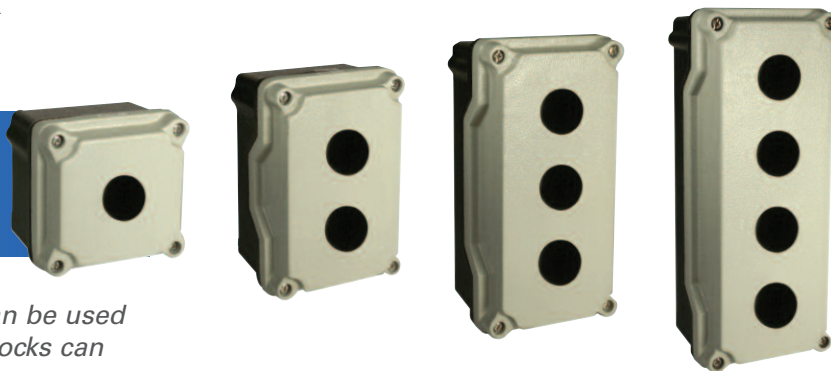
All dimensions shown in millimeters.  
To convert to inches multiply by 0.03937

# 22mm Aluminum Enclosures



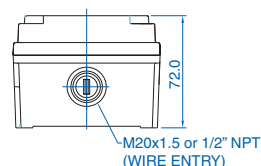
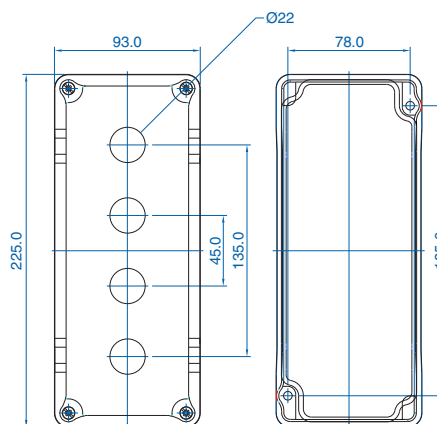
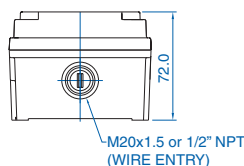
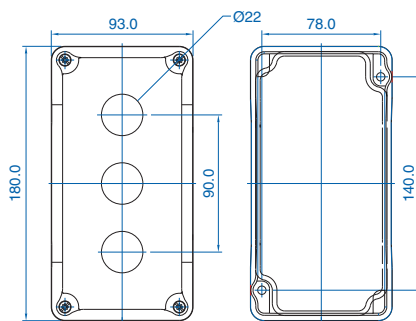
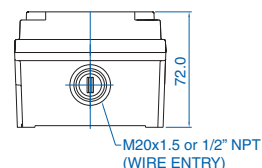
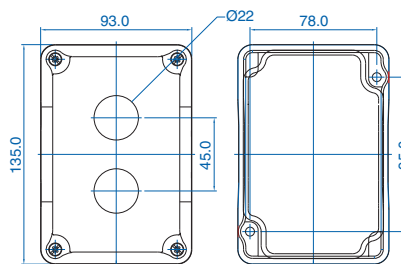
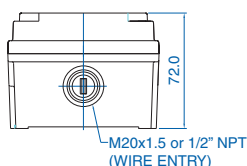
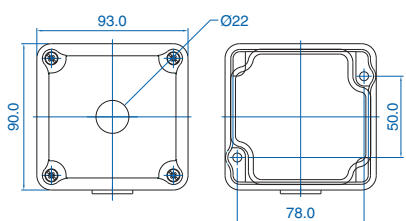
Certified for  
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12 environment.

## Aluminum Gravity Die Cast



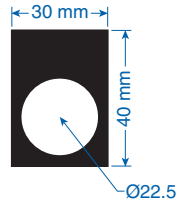
For panel mount contact blocks and illuminated operators. 2 contact blocks can be used with an illuminated operator. 4 contact blocks can be used with any non-illuminated operator.

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

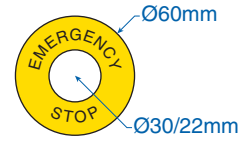


All dimensions shown in millimeters.  
To convert to inches multiply by 0.03937

# 22mm Push Button Accessories



**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.*

## 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	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



### Lenses for Pilot Lights with LED

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

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

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

### Boots for Booted Actuators

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

### Lenses for Pilot Lights with Filament Bulb

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

### Lenses for Illuminated Actuators with Filament Bulb

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

## Replacement Bulbs



### Filament Bulbs

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

### LED Bulbs

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

### LED Bulbs

Color	Voltage	Cat No.	Color	Voltage	Cat No.
<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
<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
<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



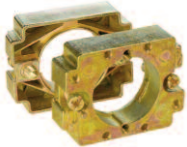
**Transparent Silicone Rubber Boot for Flush Actuators**  
Color: Clear  
Cat. No. 2BT7 (for non-illuminated)  
2ALBT7 (for illuminated)



**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. 2BKKT (*Thin Bracket for Base Mount Enclosures*)



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



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



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



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



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



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



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

# 22mm Push Button Switch Contacts

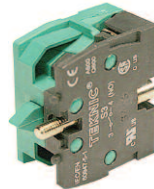
## Panel Mount Types



**S1**  
Normally  
Open  
Silver



**S2**  
Normally  
Closed  
Silver

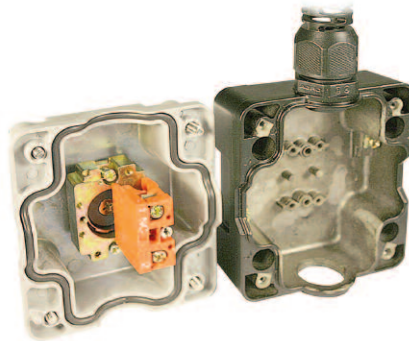


**S3**  
Normally  
Open  
Gold plated

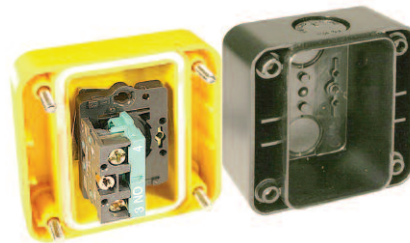


**S4**  
Normally  
Closed  
Gold plated

*Mounting Examples:*

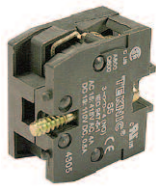


Cast Aluminum Enclosure  
with panel mount contacts  
and metal operator

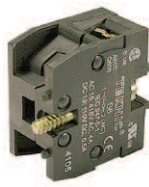


Plastic Enclosure  
with panel mount contacts  
and plastic operator

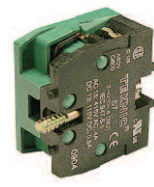
## Base Mount Types



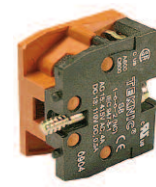
**S5\***  
Normally  
Open  
Silver



**S6\***  
Normally  
Closed  
Silver

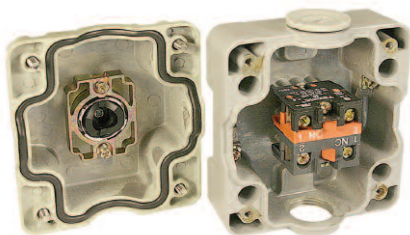


**S7\***  
Normally  
Open  
Gold plated



**S8\***  
Normally  
Closed  
Gold plated

*Mounting Examples:*



Cast Aluminum Enclosure  
with base mount contacts  
and metal operator



Plastic Enclosure  
with base mount contacts  
and metal operator



Plastic Enclosure  
with base mount contacts  
and plastic operator

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

## Pre-assembled or Ready to Assemble Control Stations



### Solutions for your applications

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



### High performance and Extensive range

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

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

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





## Pre-assembled or Ready to Assemble Control Stations



### Application specific solutions

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

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



### Safety and reliability

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

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

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

### Save Time

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

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



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2.01E+16	36	2ALF4LB-024	22	2ALMPP4LB-110	13	2AML1	10
2.01E+16	37	2ALF4LB-048	22	2ALMPP4LB-230	13	2AML2	10
2.01E+16	36	2ALF4LB-110	22	2ALMPP5LB-012	13	2AML3	10
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1004C13	53	2ALF4LB-230D	22	2ALMPP5LB-110	13	2AML6	10
1004G13	53	2ALF5LB-012	22	2ALMPP5LB-230	13	2AML8	10
1005A13	53	2ALF5LB-024	22	2ALMPP6LB-012	13	2AMLJ1	10
1006C13	53	2ALF5LB-048	22	2ALMPP6LB-024	13	2AMLJ2	10
1006G13	53	2ALF5LB-110	22	2ALMPP6LB-048	13	2AMLJ3	10
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153-601/L	34	2ALF5LB-230	22	2ALMPP6LB-230	13	2AMLJ6	10
153-901	34	2ALF5LB-230D	22	2ALMPP7LB-012	13	2AMLJ8	10
153-901/L	34	2ALF6LB-012	22	2ALMPP7LB-024	13	2AMLKB1	10
153-902	34	2ALF6LB-024	22	2ALMPP7LB-048	13	2AMLKB2	10
153-902/1H	34	2ALF6LB-048	22	2ALMPP7LB-110	13	2AMLKB3	10
153-902/L	34	2ALF6LB-110	22	2ALMPP7LB-230	13	2AMLKB4	10
153-903	34	2ALF6LB-110D	22	2ALMPP8LB-012	13	2AMLKB6	10
153-903/L	34	2ALF6LB-230	22	2ALMPP8LB-024	13	2AMLKB8	10
153-904	34	2ALF6LB-230D	22	2ALMPP8LB-048	13	2AMLS1	10
153-904/L	34	2ALF7LB-012	22	2ALMPP8LB-110	13	2AMLS2	10
153-905	34	2ALF7LB-024	22	2ALMPP8LB-230	13	2AMLS3	10
153-905/L	34	2ALF7LB-048	22	2ALP1LB-012	20	2AMLS4	10
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2005G13	37	2ALF7LB-110D	22	2ALP1LB-048	20	2AMLS6	10
2006C13	36	2ALF7LB-230	22	2ALP1LB-110D	20	2AMLS8	10
2008G13	36	2ALF7LB-230D	22	2ALP1LB-230	20	2AMPP1	8
2009A13	37	2ALF8LB-012	22	2ALP1LB-230D	20	2AMPP2	8
2009G13	37	2ALF8LB-024	22	2ALP3LB-012	20	2AMPP3	8
2010G13	36	2ALF8LB-048	22	2ALP3LB-024	20	2AMPP4	8
2011C13	37	2ALF8LB-110	22	2ALP3LB-048	20	2AMPP4	31
2014C13	36	2ALF8LB-110D	22	2ALP3LB-110	20	2AMPP6	8
2015A13	36	2ALF8LB-230	22	2ALP3LB-110D	20	2AMPP8	8
2015C13	37	2ALF8LB-230D	22	2ALP3LB-230	20	2AMPPJ1	8
2016A13	37	2ALM1LB-012	12	2ALP3LB-230D	20	2AMPPJ2	8
2AB1	6	2ALM1LB-024	12	2ALP4LB-012	20	2AMPPJ3	8
2AB2	6	2ALM1LB-048	12	2ALP4LB-024	20	2AMPPJ4	8
2AB3	6	2ALM1LB-110	12	2ALP4LB-048	20	2AMPPJ6	8
2AB4	6	2ALM1LB-230	12	2ALP4LB-110	20	2AMPPJ8	8
2AB6	6	2ALM3LB-012	12	2ALP4LB-110D	20	2AP1	6
2AB8	6	2ALM3LB-024	12	2ALP4LB-230	20	2AP2	6
2ADP	40	2ALM3LB-048	12	2ALP4LB-230D	20	2AP3	6
2AF1	6	2ALM3LB-110	12	2ALP5LB-012	20	2AP4	6
2AF1RH	6	2ALM3LB-230	12	2ALP5LB-024	20	2AP6	6
2AF2	6	2ALM4LB-012	12	2ALP5LB-048	20	2AP8	6
2AF2RH	6	2ALM4LB-024	12	2ALP5LB-110	20	2AS2-1	16
2AF3	6	2ALM4LB-048	12	2ALP5LB-110D	20	2AS2-2	16
2AF3RH	6	2ALM4LB-110	12	2ALP5LB-230	20	2AS2-3	16
2AF4	6	2ALM4LB-230	12	2ALP5LB-230D	20	2AS2-4	16
2AF4RH	6	2ALM5LB-012	12	2ALP6LB-012	20	2AS2-5	16
2AF6	6	2ALM5LB-024	12	2ALP6LB-024	20	2AS2-6	16
2AF6RH	6	2ALM5LB-048	12	2ALP6LB-048	20	2AS2E-1	16
2AF8	6	2ALM5LB-110	12	2ALP6LB-110	20	2AS2E-2	16
2AF8RH	6	2ALM5LB-230	12	2ALP6LB-110D	20	2AS2E-3	16
2AK2-01	16	2ALM6LB-012	12	2ALP6LB-230	20	2AS2E-4	16
2AK2-02	16	2ALM6LB-024	12	2ALP6LB-230D	20	2AS2E-5	16
2AK2-03	16	2ALM6LB-048	12	2ALP7LB-012	20	2AS2E-6	16
2AK2-04	16	2ALM6LB-110	12	2ALP7LB-024	20	2ASL1LB-1-012	18
2AK2-05	16	2ALM6LB-230	12	2ALP7LB-048	20	2ASL1LB-1-024	18
2AK2-06	16	2ALM7LB-012	12	2ALP7LB-110	20	2ASL1LB-1-048	18
2AK2-07	16	2ALM7LB-024	12	2ALP7LB-110D	20	2ASL1LB-1-110	18
2AK2-08	16	2ALM7LB-048	12	2ALP7LB-230	20	2ASL1LB-1-110D	18
2AK2-09	16	2ALM7LB-110	12	2ALP7LB-230D	20	2ASL1LB-1-230	18
2AK2-10	16	2ALM7LB-230	12	2ALP8LB-012	20	2ASL1LB-1-230D	18
2AK2-11	16	2ALM8LB-012	12	2ALP8LB-024	20	2ASL1LB-2-012	18
2ALBT7	31	2ALM8LB-024	12	2ALP8LB-048	20	2ASL1LB-2-024	18
2ALBT7	40	2ALM8LB-048	12	2ALP8LB-110	20	2ASL1LB-2-048	18
2ALF1LB-012	22	2ALM8LB-110	12	2ALP8LB-110D	20	2ASL1LB-2-110	18
2ALF1LB-024	22	2ALM8LB-230	12	2ALP8LB-230	20	2ASL1LB-2-110D	18
2ALF1LB-048	22	2ALMPP1LB-012	13	2ALP8LB-230D	20	2ASL1LB-2-230	18
2ALF1LB-110	22	2ALMPP1LB-024	13	2AM1	8	2ASL1LB-2-230D	18
2ALF1LB-110D	22	2ALMPP1LB-048	13	2AM2	8	2ASL1LB-3-012	18
2ALF1LB-230	22	2ALMPP1LB-110	13	2AM3	8	2ASL1LB-3-024	18
2ALF1LB-230D	22	2ALMPP1LB-230	13	2AM4	8	2ASL1LB-3-048	18
2ALF3LB-012	22	2ALMPP3LB-012	13	2AM6	8	2ASL1LB-3-110	18
2ALF3LB-024	22	2ALMPP3LB-024	13	2AM8	8	2ASL1LB-3-110D	18
2ALF3LB-048	22	2ALMPP3LB-048	13	2AMJ1	8	2ASL1LB-3-230	18
2ALF3LB-110	22	2ALMPP3LB-110	13	2AMJ2	8	2ASL1LB-3-230D	18
2ALF3LB-110D	22	2ALMPP3LB-230	13	2AMJ3	8	2ASL1LB-4-012	18
2ALF3LB-230	22	2ALMPP4LB-012	13	2AMJ4	8	2ASL1LB-4-024	18

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2ASL1LB-5-048	18	2ASL4LB-5-012	18	2ASL6LB-4-230	18	2ASL8LB-4-110	18
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2ASL1LB-5-110D	18	2ASL4LB-5-048	18	2ASL6LB-5-012	18	2ASL8LB-4-230	18
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ALF8LB-048	46	MCB154110D	54	P2AS2-3	31	S7	41
ALF8LB-110	46	MCB15412	54	P2AS2-4	31	S8	41
ALF8LB-230	46	MCB154230	54	P2BRK	31	SC25	55
ALP101	55	MCB154230D	54	P2MN	31	SC25	55
AM1	50	MCB15424	54	PAM	55	SC45	55
AM2	50	MCB15448	54	PAP	55	SC45	55
AM3	50	MCB155110	54	PLB1-024	52	SC65	55
AM4	50	MCB155110D	54	PLB1-048	52	SC65	55
AM6	50	MCB15512	54	PLB1-110	52	SC90	55
AM8	50	MCB155230	54	PLB1-230	52	SC90	55
AMKB2	50	MCB155230D	54	PLB1LB-024	52		
AMKB4	50	MCB15524	54	PLB1LB-048	52		
AML2	50	MCB15548	54	PLB1LB-110	52		
AML4	50	MCB156110	54	PLB1LB-230	52		
AMLKB2	50	MCB156110D	54	PLB3-024	52		
AMLKB4	50	MCB15612	54	PLB3-048	52		
AP1	44	MCB156230	54	PLB3-110	52		
AP2	44	MCB156230D	54	PLB3-230	52		
AP3	44	MCB15624	54	PLB3LB-024	52		
AP4	44	MCB15648	54	PLB3LB-048	52		
AP6	44	MCB158110	54	PLB3LB-110	52		
AP8	44	MCB158110D	54	PLB3LB-230	52		

Commonly used metric and other useful conversions

<b>Length</b>		
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
<b>Torque</b>		
Newtonmeter [Nm]	x0.738	=lb-ft
lb-ft	x1.356	=Nm
lb-in	x0.113	=Nm
oz-in	x0.0071	=Nm
<b>Power</b>		
kilowatt [kW]	x1.341	=hp
hp	x0.7457	=kW
<b>Moment of Inertia (WR<sup>2</sup>)</b>		
lb-ft <sup>2</sup>	x0.042	=kgm <sup>2</sup>
kilogrammeter <sup>2</sup> [kgm <sup>2</sup> ]	23.720	=lb-ft <sup>2</sup>
<b>Weight Mass and Force</b>		
Newton [N]	x0.02248	=pounds
kilogram [kg]	x2.205	=pounds
pound [lb]	x4.448	=N
pound [lb]	x0.4536	=kg

Metric Cross-Sectional Areas <sup>1</sup>		American Wire Gauge		Metric Cross-Sections Areas <sup>a</sup>		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 <sup>2</sup>	mm <sup>2</sup>		mm <sup>2</sup>	mm <sup>2</sup>		mm <sup>2</sup>	mm <sup>2</sup>
0.50	0.519	20 AWG	25.0	21.15	4 AWG		
0.75	0.653	19	35.0	26.67	3		
	0.823	18		33.63	2		
				42.41	1		
1.5	1.04	17	50.0	53.48	1/0		
	1.31	16		67.43	2/0		
2.5	1.65	15	70.0	85.03	3/0		
	2.08	14	95.0				
	2.62	13		107.20	4/0		
4.0	3.31	12	120.0	126.64	250 MCM		
	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			400.0	380.00	750		
	10.55	7	500.0	506.71	1000		
	13.30	6	625.0				
16.0	16.77	5					

<sup>a</sup>As 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°)



## Стандарт Электрон Связь

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