Emergency Stop Switches

ø16

ø22

X6 (Unibody)
Third-generation emergency stop switch with Reverse Energy Structure. Smallest in its class.
D-007

XA (Unibody)
Small, unibody emergency stop switches suitable for equipment with small mounting space.
D-015

XW
22mm, 4-contact emergency stop switch.
D-026

HW
Unique safety mechanism.
D-038

YW
22mm emergency stop switches.
D-044

XA with removable contact block
The industry's first 16mm, 4-contact emergency stop switch.
D-017

XW (Mechanical Indicator)
High level of safety with Safe Break Action. Mechanical indicator on the operator body shows the contact.
D-032

XA (Round Form)
Round shaped buttons.
D-021

ø30

SEMI

Stop Switches

XN
30mm, 4-contact emergency stop switch. Padlockable and flush bezel are available.
D-051

EU2B
Hazardous location Switches
D-065

SEMI
SEMI Emergency OFF (EMO) Switches
D-069

Stop Switches
Wide variety with yellow button, white guard and nameplate
D-076

Compare and select the right product for you.

Selection Guide

D-005

Solutions with IDEC products

Industry Solutions
Safety Solutions

P.23 P.33 P.35
P.43 P.47

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Third-generation Safety

Long Commited to providing the

IDEC's original "Safe Break Action" and "Reverse Energy Structure"ensure the safety of operator and system, when the switch is damaged due to excessive shocks.

Third Generation

Compliant with international safety standards. Even more consideration has been taken into account on operator safety.

Satisfies the requirements of:

①Red-colored, mushroom actuator, with yellow background
②Direct opening action
③Safety lock mechanism

IDEC's Unique

- Reverse Energy Structure
- Safe Break Action

Second Generation

Compliant with international safety standards.

Satisfies the requirements of:

①Red-colored, mushroom actuator, with yellow background
②Direct opening action
③Safety lock mechanism

First Generation

Developed before the establishment of international safety standards.

Satisfies the requirements of:

①Red-colored, mushroom actuator, with yellow background
②Direct opening action

International Safety Standards Requirements

①Red-colored, mushroom actuator, with yellow background (IEC 60947-5-5; 4.2, ISO 13850; 4.4, IEC 60204-1; 10.7)

②Normally closed contacts with a direct opening action (IEC 60947-5-5; 5.2, IEC 60947-5-1; Annex K)

③The emergency stop function shall be maintained by latching of the operator until reset manually (IEC 60947-5-5; 6.2, ISO 13850; 4.4)

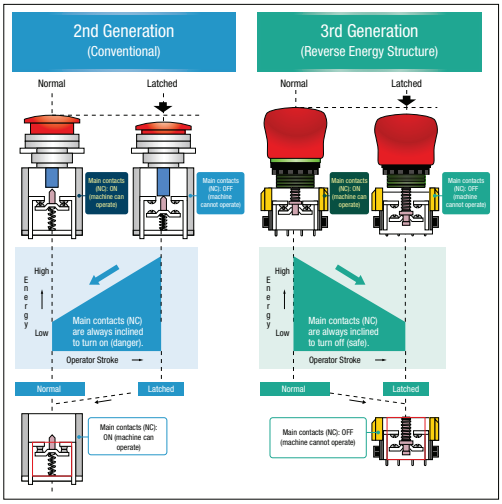
Highest Level of Safety

Third Generation Emergency Stop Switches

IDEC's Unique Safety Technology

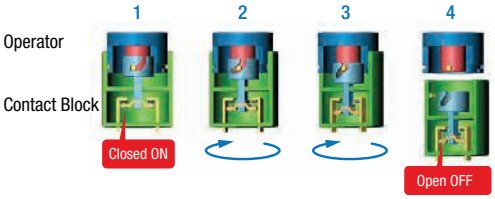
Reverse Energy Structure

With X series emergency stop switches, the potential energy level of the latched status is lower than that of normal status. In the event the switch is damaged due to excessive shocks, the NC contacts will turn off, thus stopping the machine (patented design).



Safe Break Action

When the contact block is detached from the operator, the NC contact opens (OFF).



When the contact block is detached from the operator, the cam directly opens the NC main contacts (contacts are off). (Patented)

Resetting

X series can be reset easily either by pulling or turning. Safet and easy-to-use.


Pull Reset


Turn Reset

International Safety Standards

Direct Opening Action

All normally closed contact elements of an emergency stop devices shall have a direct opening action (positive opening action), according to annex K of IEC 60947-5-1.
(IEC 60947-5-5; 5.2)

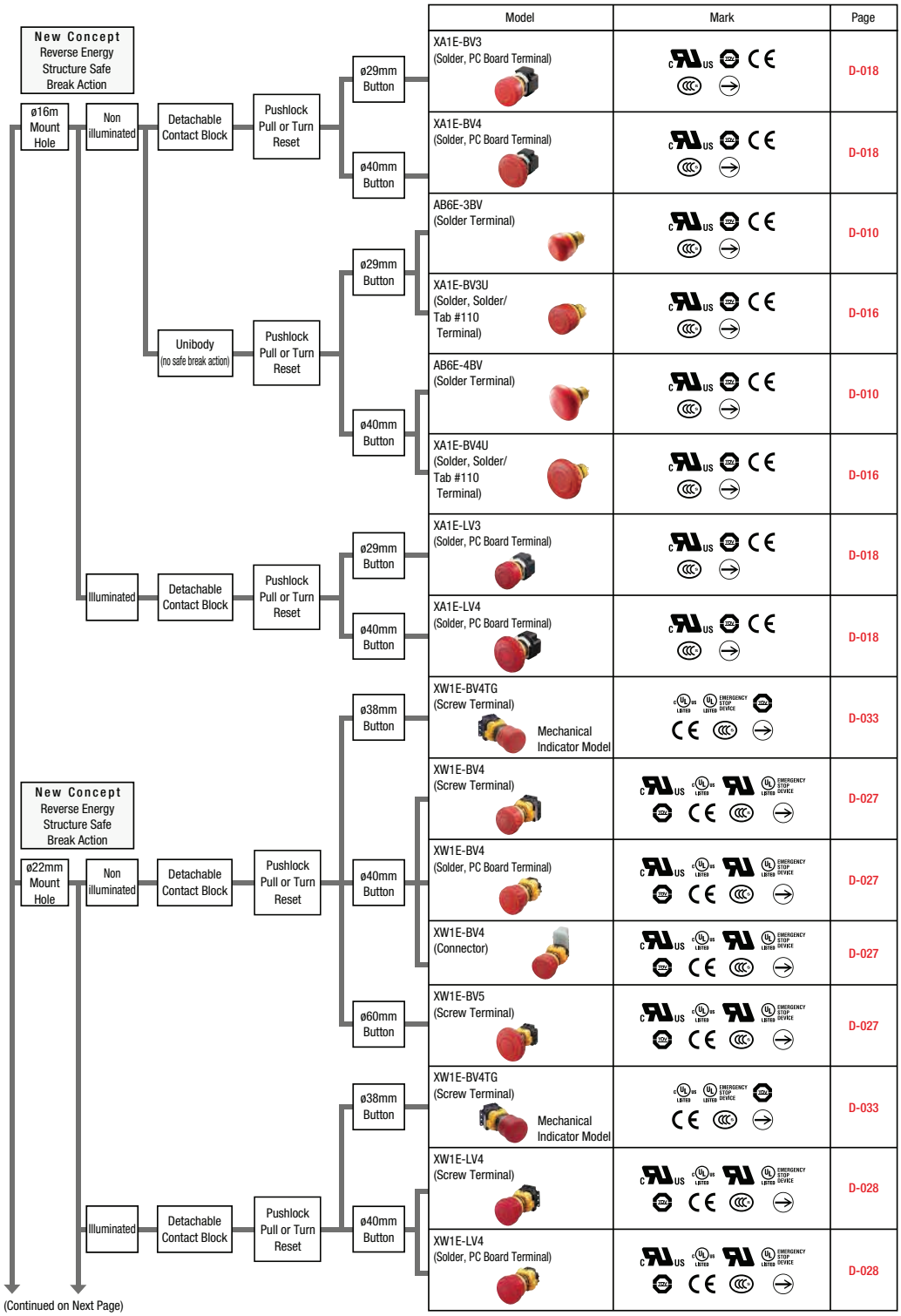
Safety Lock Mechanism

The emergency stop signal shall be maintained until the emergency stop device is reset (disengaged).
(IEC 60947-5-5; 6.2)

Complies to international safety standards

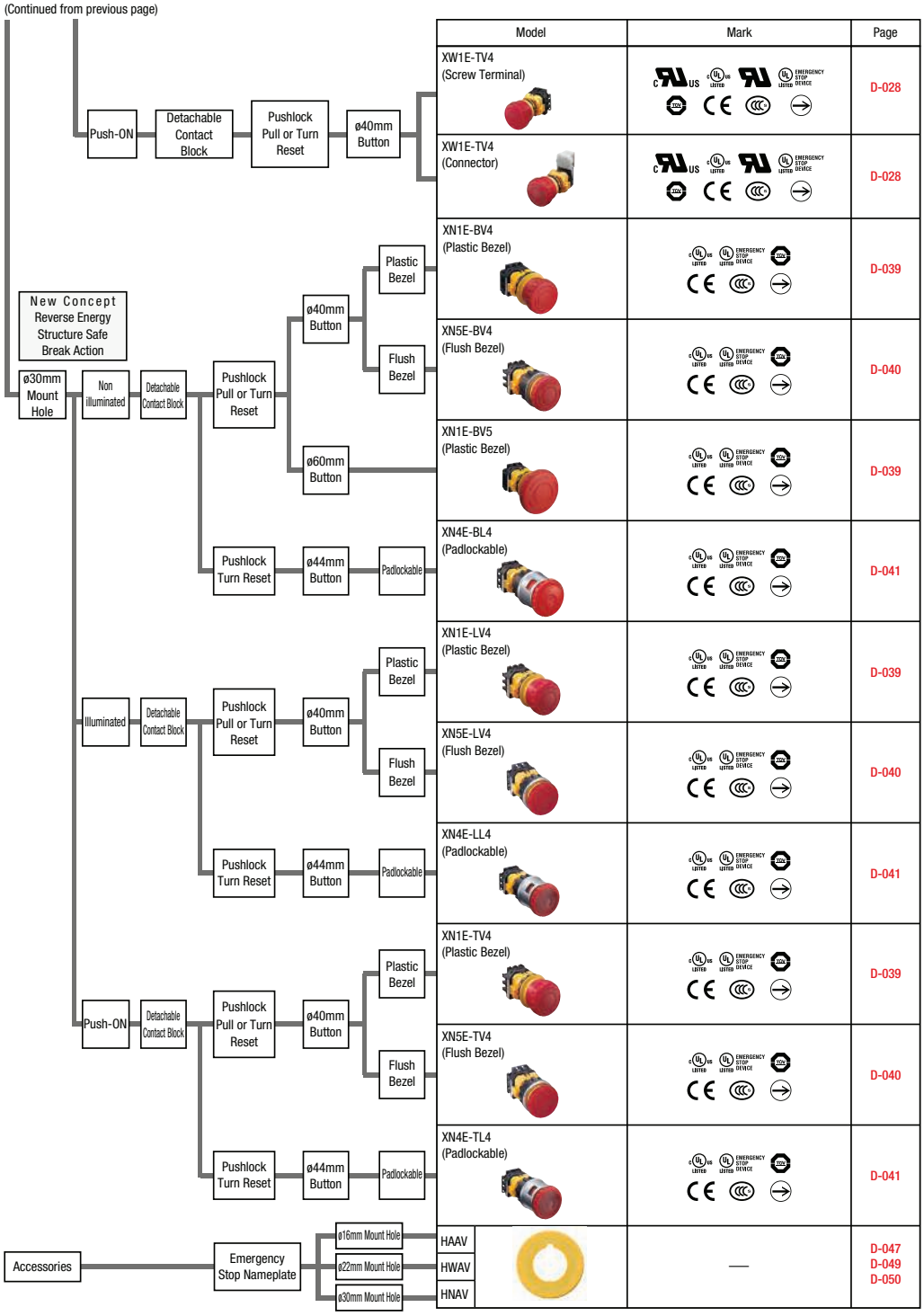
UL508, CSAC22.2No.14, IEC60947-5-5, UL991, NFPA79, EN60947-5-1, EN60947-5-5, GB14048.5

Emergency Stop Switches Selection Guide



Model	Mark	Page
XA1E-BV3 (Solder, PC Board Terminal)		D-018
XA1E-BV4 (Solder, PC Board Terminal)		D-018
AB6E-3BV (Solder Terminal)		D-010
XA1E-BV3U (Solder, Solder/ Tab #110 Terminal)		D-016
AB6E-4BV (Solder Terminal)		D-010
XA1E-BV4U (Solder, Solder/ Tab #110 Terminal)		D-016
XA1E-LV3 (Solder, PC Board Terminal)		D-018
XA1E-LV4 (Solder, PC Board Terminal)		D-018
XW1E-BV4TG (Screw Terminal) Mechanical Indicator Model		D-033
XW1E-BV4 (Screw Terminal)		D-027
XW1E-BV4 (Solder, PC Board Terminal)		D-027
XW1E-BV4 (Connector)		D-027
XW1E-BV5 (Screw Terminal)		D-027
XW1E-BV4TG (Screw Terminal) Mechanical Indicator Model		D-033
XW1E-LV4 (Screw Terminal)		D-028
XW1E-LV4 (Solder, PC Board Terminal)		D-028

(Continued from previous page)

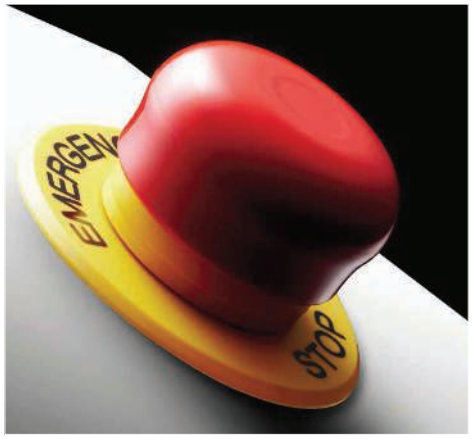


Emergency Stop Switches

X6 Series

Excellent safety and design.
The shortest depth behind the panel in its class.

• See website for details on approvals and standards.



ø16 X6 Series Emergency Stop Switches (Unibody)

Excellent safety

Third-generation Reverse Energy Structure

IDEC's unique Reverse Energy Structure, achieved as a result of in-depth failure analysis of emergency stop switches, has resulted in this innovative emergency stop switch.
X6 series emergency stop switches provide the highest level of safety, because the uni-body design eliminates the possibility of the contact bocks falling off the switch

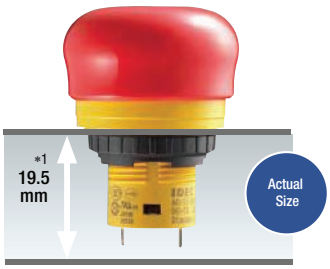
Unparalleled design

The smooth button is ideal for applications that require utmost cleanliness, such as food processing machines or semiconductor manufacturing equipment. Also suitable for applications requiring a sleek design of emergency stop switches, such as medical equipment.

ø30 mm Button Unmarked | ø30 mm Button Arrow Marked | ø40 mm Button Unmarked | ø40 mm Button Arrow Marked

Only 19.5 mm depth behind the panel

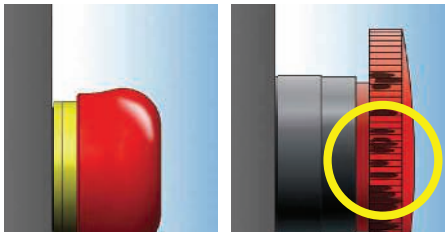
The short depth behind the panel reduces the required mounting space.
Depth: 30% reduction
Volume: 70% reduction
(Compared with conventional emergency stop switches)
Thus equipment and control panels can be made much smaller.



*1: Solder terminal.
Solder/tab terminal: 23.9mm

Prevents dust build-up

The smooth and ridge-less button surface prevents dust built-up, and is also easy to clean.

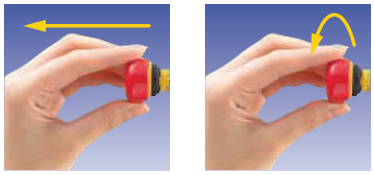


ø16mm X6 Series | Conventional Operator

Two ways to reset,two button sizes,two wiring methods.

The X6 emergency stop switch can be reset either by pulling or turning. The button is available in ø30 mm and ø40 mm sizes.
In addition to a red button, a yellow button is also available as a stop switch. Solder terminals and solder/tab terminals are available.

Two ways to reset



Pull to reset | Turn to reset

Two connection methods

Solder Terminal | Solder/Tab Terminal #110

ø16 X6 Series Emergency Stop Switches (Unibody)

Third-generation emergency stop switch with Reverse Energy Structure
Smallest in its class

- Two button sizes—ø30mm and ø40mm
- Two ways of resetting —pulling and turning.
- Safety lock mechanism (IEC 60947-5-5; 6.2)
- Direct opening action (IEC 60947-5-5; 5.2, IEC 60947-5-1, Annex K)
- Degree of protection: IP65 (IEC60529)

Standards and Specifications

Contact Ratings

Rated Insulation Voltage (Ui)				250V		
Rated Thermal Current (Ith)				5A		
Rated Operating Voltage (Ue)				30V	125V	250V
Rated Operating Current (Note)	Main Contacts	AC 50/60 Hz	Resistive Load (AC-12)	–	5A	3A
			Inductive Load (AC-15)	–	1.5A	0.75A
		DC	Resistive Load (DC-12)	2A	0.4A	0.2A
			Inductive Load (DC-13)	1A	0.22A	0.1A

- Minimum applicable load: 5V AC/DC, 1 mA (reference value)
  (May vary depending on the operating conditions and load)
- Operational current represents the classification by making and breaking currents (IEC 60947-5-1).

Note:
TÜV/CCC rating: AC-15 0.75A/250V, DC-13 1A/30V
UL rating: Standard Duty AC 0.75A/250V
Standard Duty DC 1A/30V

Specifications

Applicable Standards	IEC 60947-5-1, EN 60947-5-1 IEC 60947-5-5 (Note), EN 60947-5-5 (Note) JIS C8201-5-1, JIS C8201-5-5, UL508 CSA C22.2 No.14, GB14048.5
Operating Temperature	–25 to +60°C (no freezing)
Operating Humidity	45 to 85% RH (no condensation)
Storage Temperature	–45 to +80°C (no freezing)
Operating Force	Push to lock: 10.5N Pull to reset: 8.8N Turn to reset: 0.17 N·m
Minimum Force Required for Direct Opening Action	40N
Minimum Operator Stroke Required for Direct Opening Action	4.5 mm
Maximum Operator Stroke	4.5 mm
Contact Resistance	50 mΩ maximum (initial value)
Insulation Resistance	100 MΩ minimum (500V DC megger)
Overvoltage Category	II
Impulse Withstand Voltage	2.5 kV
Pollution Degree	3
Operation Frequency	900 operations/hour
Shock Resistance	Operation extremes: 150 m/s² Damage limits: 1000 m/s²
Vibration Resistance	Operation extremes: 10 to 500 Hz amplitude 0.35 mm, acceleration 50 m/s² Damage limits: 10 to 500 Hz, amplitude 0.35 mm, acceleration 50 m/s²
Mechanical Life	100,000 operations minimum
Electrical Life	100,000 operations minimum
Degree of Protection	IP65 (IEC 60529)
Short-circuit Protection	250V/10A fuse (Type aM IEC 60269-1/IEC 60269-2)
Conditional Short-circuit Current	1000A
Terminal Style	Solder terminal, Solder/tab terminal #110
Recommended Tightening Torque for Locking Ring	0.88 N·m
Applicable Wire Size	1.25 mm² maximum (AWG16 maximum)
Terminal Soldering Condition	310 to 350°C, within 3 seconds
Weight (approx.)	ø30mm button: 13g ø40mm button: 16g

Pushlock Pull/Turn Reset Switch (Solder Terminal)

Unmarked

Pushlock Pull/Turn Reset Switch

Package quantity: 1

Shape	Main Contact (NC)	Part No.	
		Solder Terminal	Solder/tab Terminal #110
ø30mm Mushroom 	1NC	AB6E-3BV01PRH	AB6E-3BV01PTRH
	2NC	AB6E-3BV02PRH	AB6E-3BV02PTRH
ø40mm Mushroom 	1NC	AB6E-4BV01PRH	AB6E-4BV01PTRH
	2NC	AB6E-4BV02PRH	AB6E-4BV02PTRH

• Pushlock pull/turn reset switches are locked when pressed, and reset when pulled or turned clockwise.

Arrow Marked

Pushlock Pull/Turn Reset Switch

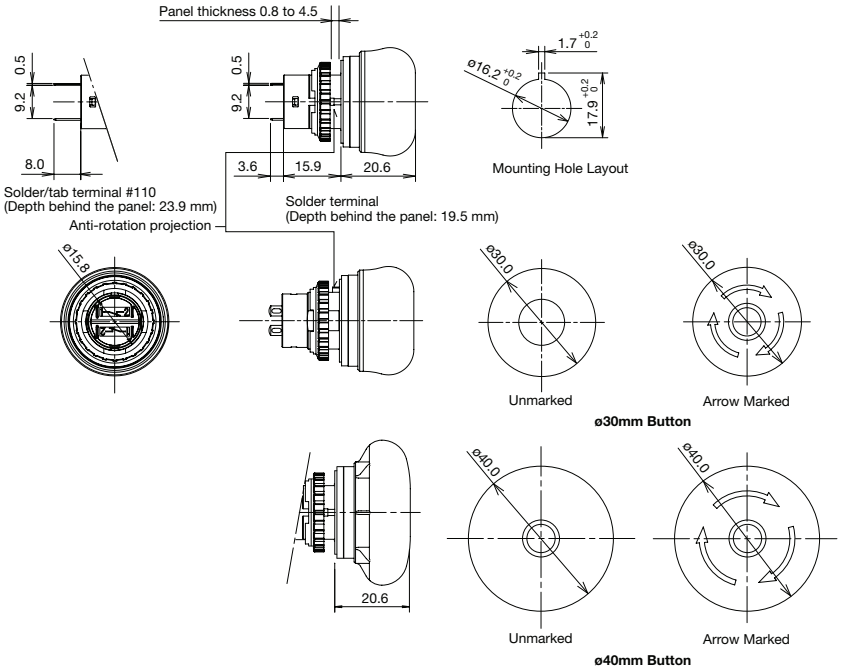
Package quantity: 1

Shape	Main Contact (NC)	Part No.	
		Solder Terminal	Solder/tab Terminal #110
ø30mm Mushroom 	1NC	AB6E-3BV01PRM	AB6E-3BV01PTRM
	2NC	AB6E-3BV02PRM	AB6E-3BV02PTRM
ø40mm Mushroom 	1NC	AB6E-4BV01PRM	AB6E-4BV01PTRM
	2NC	AB6E-4BV02PRM	AB6E-4BV02PTRM

• Pushlock pull/turn reset switches are locked when pressed, and reset when pulled or turned clockwise.

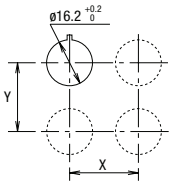
ø16 X6 Series Emergency Stop Switches (Unibody)

Dimensions



All dimensions in mm.

Mounting Hole Layout

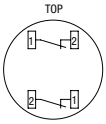


The values shown on the left are the minimum dimensions for mounting with other ø16 mm pushbuttons. For other control units of different sizes and styles, determine the values according to dimensions, operation, and wiring.

	X	Y
ø30 mm Button	40 mm min.	40mm min.
ø40 mm Button	50 mm min.	50mm min.

• See D-047 for accessories and replacement parts.

Terminal Arrangement (Bottom View)



1NC: Terminals located near the TOP marking

X6
XA
XW
XN
SEMI

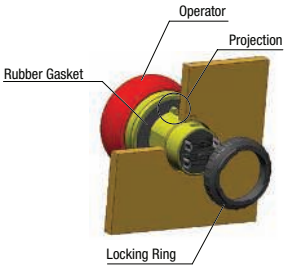
⚠ Safety Precautions

- Turn off power to the X6 series units before installation, removal, wiring, maintenance, and inspection. Failure to turn power off may cause electrical shocks or fire hazard.
- For wiring, use wires of proper size to meet the voltage and current requirements and solder properly. Improper soldering may cause overheating and create fire hazards.

Instructions

Panel Mounting

Remove the locking ring from the operator and check that the rubber gasket is in place. Insert the operator from panel front into the panel hole. Face the side with the projection upward, and tighten the locking ring using the locking ring wrench MT-001.



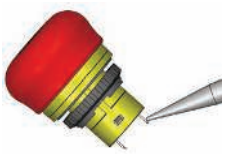
Notes for Panel Mounting

Using the locking ring wrench MT-001, tighten the locking ring to a torque of 0.88 N·m. Do not use pliers. Do not apply excessive force, otherwise the locking ring will become damaged.

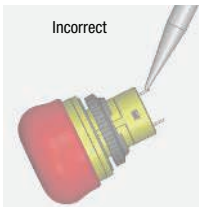
Wiring

1. Applicable wire size is 1.25 mm^2 maximum.
2. Solder the terminals using a soldering iron at 310 to 350°C for 3 seconds maximum. Do not use flow or dip soldering. SnAgCu type lead-free solder is recommended. Make sure that the soldering iron touches the terminals only, not plastic parts. Do not apply external force such as bending the terminals or applying tensile force on the wires.
3. Use a non-corrosive rosin flux. To prevent the flux from entering the switch while soldering, face the terminals downward.

Correct



Incorrect



4. Because the terminal spacing is narrow, use protective tubes or heat shrinkable tubes to avoid burning the wire sheath or short circuit.
5. Apply force on the terminals in the vertical direction to the panel only, otherwise the terminals will be damaged.

Notes for Solder/tab terminal #110

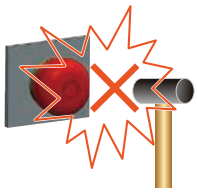
1. Use quick connect of #110 and 0.5mm tab thickness.
2. To prevent short-circuit between different poles, use protective tubes or heat shrink tubes.
3. Apply force on the terminals in the vertical direction to the panel only, otherwise the terminals will be damaged.

Contact Bounce

When the button is reset by pulling or turning, the NC contacts will bounce. When designing a control circuit, take the contact bounce time into consideration (reference value: 20 ms).

Handling

Do not expose the switch to excessive shock and vibrations, otherwise the switch may be deformed or damaged, causing malfunction or operation failure.



Emergency Stop Switches

X Series

High level of safety with Safe Break Action and Reverse Energy Structure.

• See website for details on approvals and standards.

Series		Type	Features
ø16 XA Series		Unibody	Small, unibody emergency stop switches. Only 19.5mm behind panel.
		With Removable Contact	ø16 mm, 4-contact Emergency Stop Switch. Round form types also available.
ø22 XW Series		Standard Bezel	Four different terminal styles. Can be used on FB series control stations.
		Mechanincal Indicator	Mechanical indicator on the operator body shows the contact status - green when NC contacts are closed - reducing maintenance work.
ø30 XN Series		Plastic Bezel	ø60mm jumbo mushroom, and LED push-on models available.
		Flush Bezel	Stylish design. Projects only 21mm from the panel.
		Padlockable	Padlockable models can be locked using padlocks when latched. Prevents unauthorized resetting.

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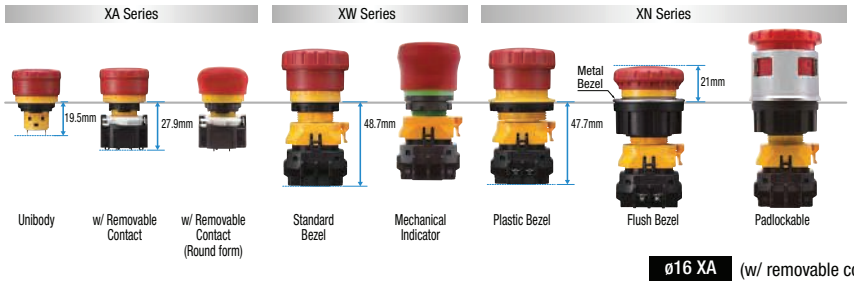
Saves space



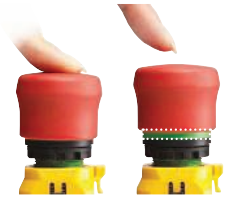
ø16 XA (w/ removable contact block)

Prevents dust build-up

The round form button design is ideal for use on consumer equipment.
The smooth and ridge-less button surface prevents dust build-up, and is also to clean

ø22 XW (Mechanical Indicator)

Normal/latched status can be checked from a distance with the mechanical indicator function.



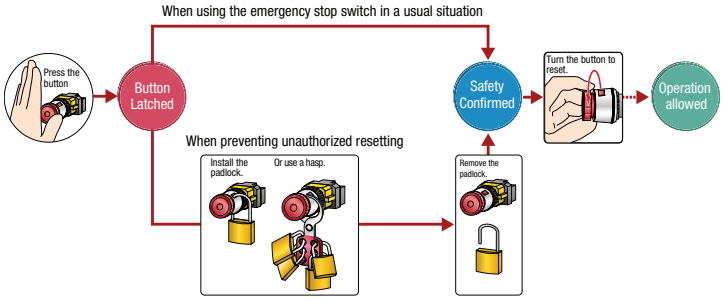
The mechanical indicator on the operator body shows the normal/latched status (green: normal).
Reduces maintenance work and improves operation efficiency.

ø30 XN (Padlockable)

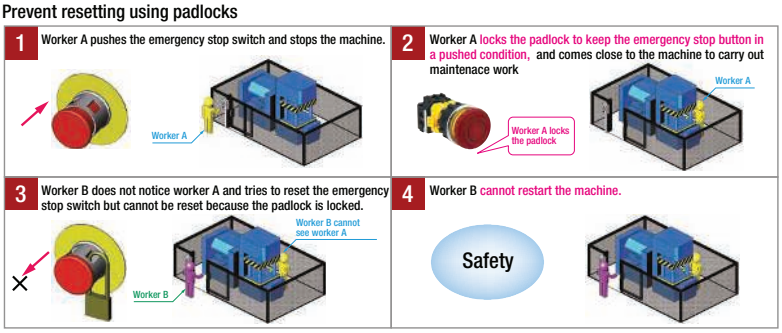
Prevents unauthorized resetting using padlocks

The padlockable emergency stop switches are push-to-lock, turn/pull-to-reset emergency stop switches. Installing the padlock(s) on latched emergency stop switches prevents unauthorized resetting.

Multiple padlocks can be installed by using a hasp



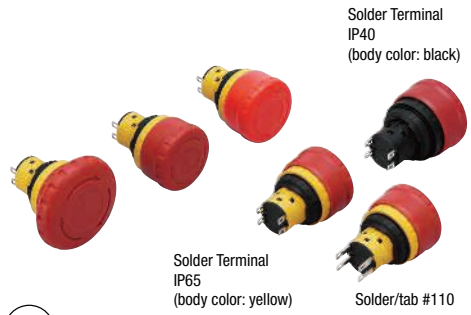
Prevent resetting using padlocks



ø16 XA Series Emergency Stop Switches (Unibody)

Small, unibody emergency stop switches suitable for equipment with small mounting space. Requires only ø16mm × 19.5mm for installation.

- ø29mm and ø40mm mushroom operators
- Degree of protection IP65 and IP40 (IEC 60529)
- Dark red (Munsell 5R4/12) and bright red (Munsell 7.5R4.5/14) colors for operators of emergency stop switches.
- Silver with gold contacts.
- Push-to-lock, pull or turn-to-reset operator
- Safety lock mechanism (IEC 60947-5-5, 6.2)
- Direct opening action mechanism (IEC 60947-5-5, 5.2, IEC60947-5-1, Annex K)



Standards and Specifications

Contact Ratings

Rated Insulation Voltage (Ui)			250V		
Thermal Current (Ith)			5A		
Rated Operating Voltage (Ue)			30V	125V	250V
Rated Operating Current	AC 50/60Hz	Resistive Load (AC-12)	—	5A	3A
		Inductive Load (AC-15)	—	3A	1.5A
	DC	Resistive Load (DC-12)	2A	0.4A	0.2A
		Inductive Load (DC-13)	1A	0.22A	0.1A

- Minimum applicable load: 5V AC/DC, 1 mA (reference value) (May vary depending on the operating conditions and load.)
- The rated operating currents are measured at resistive/inductive loads as specified in IEC 60947-5-1.

Specifications

Applicable Standards	IEC 60947-5-1, EN 60947-5-1 IEC 60947-5-5, EN 60947-5-5 JIS C8201-5-1, UL508, CSA C22.2 No.14 GB14048.5
Operating Temperature	–25 to +60°C (no freezing)
Storage Temperature	–45 to +80°C (no freezing)
Operating Humidity	45 to 85% RH (no condensation)
Operating Force	Push-to-lock: 10.5N Pull to reset: 10N Turn to reset: 0.16 N·m
Minimum Force Required for Direct Opening Action	40N
Minimum Operator Stroke Required for Direct Opening Action	4.0 mm
Maximum Operator Stroke	4.5 mm
Contact Resistance	50 mΩ maximum (initial value)
Insulation Resistance	100 MΩ minimum (500V DC megger)
Overvoltage Category	II
Impulse Withstand Voltage	2.5 kV
Pollution Degree	3
Operating Frequency	900 operations/hour
Shock Resistance	Operating extremes: 150 m/s² Damage limits: 1000 m/s²
Vibration Resistance	Operating extremes: 10 to 500 Hz, amplitude 0.35mm, acceleration 50 m/s² Damage limits: 10 to 500 Hz, amplitude 0.35 mm, acceleration 50 m/s²
Durability	Mechanical: 250,000 Electrical: 100,000 250,000 (24V AC/DC, 100mA)
Degree of Protection	IP65, IP40 (IEC 60529)
Short-circuit Protection	250V/10A fuse (Type aM IEC 60269-1/IEC 60269-2)
Conditional Short-circuit Current	1000A
Terminal Style	Solder terminal, Solder/tab #110 terminal
Recommended Tightening Torque for Locking Ring	0.88 N·m
Applicable Wire Size	1.25 mm² maximum (AWG16 maximum)
Terminal Soldering Condition	310 to 350°C, within 3 seconds
Weight (approx.)	ø29mm mushroom: 14g ø40mm mushroom: 17g

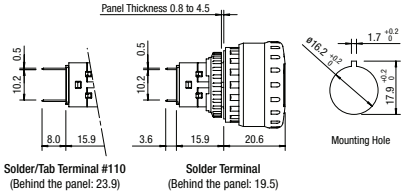
Pushlock Pull/Turn Reset (Solder Terminal)

XA Series

Shape	Contact	Part No. IP40 (contact part: black)	Part No. IP65 (contact part: yellow)	① Operator Color Code
ø29mm Mushroom 	1NC	XA1E-BV3U01K①	XA1E-BV3U01①	R: red RH: bright red
	2NC	XA1E-BV3U02K①	XA1E-BV3U02①	
ø40mm Mushroom 	1NC	XA1E-BV4U01K①	XA1E-BV4U01①	
	2NC	XA1E-BV4U02K①	XA1E-BV4U02①	

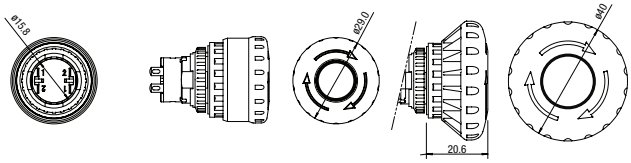
• Solder/tab #110 terminal is also available. Specify "T" before ① in the Ordering No.
XA1E-BV3U02KR → XA1E-BV3U02KTR

Dimensions



Solder/Tab Terminal #110 (Behind the panel: 23.9)

Solder Terminal (Behind the panel: 19.5)



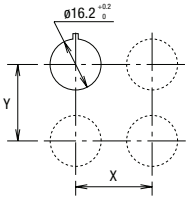
ø29 mm Mushroom **ø40 mm Mushroom**

All dimensions in mm.

Terminal Arrangement (Bottom View)

1NC: Termimals on top

Mounting Hole Layout



• The values shown on the left are the minimum dimensions for mounting with other ø16 mm pushbuttons. For other control units of different sizes and styles, determine the values according to the dimensions, operation, and wiring.

	X	Y
ø29mm Mushroom	40 mm minimum	
ø40mm Mushroom	50 mm minimum	

ø16 XA Series Emergency Stop Switches (w/Removable Contact Block)

Compact size - only 27.9 mm deep behind the panel. Reliable "Safe break action."

- The depth behind the panel is only 27.9 mm for 1 to 4 contacts, both on illuminated and non-illuminated.
- IDEC's original "Safe break action" ensures that the contacts open when the contact block is detached from the operator.
- 1 to 4NC main contacts and 1NO monitor contact
- Push-to-lock, Pull or Turn-to-reset operator
- Direct opening action mechanism (IEC 60947-5-5, 5.2, IEC60947-5-1, Annex K)
- Safety lock mechanism (IEC 60947-5-5, 6.2)
- Degree of protection IP65 (IEC 60529)
- Silver with gold contacts.
- Two operator sizes: ø29 and ø40 mm
- Dark red (Munsell 5R4/12) or bright red (Munsell 7.5R4.5/14) colors are available for the operator of non-illuminated emergency stop switches.

Standards and Specifications

Contact Ratings

NC main contacts (black) /NO monitor contact (blue)

Rated Insulation Voltage (Ui)				300V (illuminated part: 60V)		
Rated Thermal Current (Ith)				5A		
Rated Operating Voltage (Ue)				30V	125V	250V
Rated Operating Current	Main Contacts	AC 50/60 Hz	Resistive Load (AC-12)	–	3A	3A
			Inductive Load (AC-15)	–	1.5A	1.5A
		DC	Resistive Load (DC-12)	2A	0.4A	0.2A
			Inductive Load (DC-13)	1A	0.22A	0.1A
	Monitor Contacts	AC 50/60 Hz	Resistive Load (AC-12)	–	1.2A	0.6A
			Inductive Load (AC-14)	–	0.6A	0.3A
		DC	Resistive Load (DC-12)	2A	0.4A	0.2A
			Inductive Load (DC-13)	1A	0.22A	0.1A

- Minimum applicable load: 5V AC/DC, 1 mA (reference value) (Operating area may vary according to the operating conditions and load types.)
- The rated operating currents are measured at resistive/inductive load types specified in IEC 60947-5-1.

Illumination Ratings

Rated Voltage	Operating Voltage	Rated Current
24V AC/DC	24V AC/DC ±10%	11 mA

Specifications

Applicable Standards	IEC60947-5-1, EN60947-5-1 IEC60947-5-5, EN60947-5-5, JIS C8201-5-1, UL991, NFPA79, UL508, CSA C22.2 No.14, GB14048.5
Operating Temperature	–25 to +60°C (no freezing) Illuminated: –25 to +55°C (no freezing)
Storage Temperature	–45 to +80°C
Operating Humidity	45 to 85% RH (no condensation)
Operating Force	Push to lock: 10.5N Pull to reset: 10N Turn to reset: 0.16 N·m
Minimum Force Required for Direct Opening Action	60N
Minimum Operator Stroke Required for Direct Opening Action	4.0 mm
Maximum Operator Stroke	4.5 mm
Contact Resistance	50 mΩ maximum (initial value)
Insulation Resistance	100 MΩ minimum (500V DC megger)
Overvoltage Category	II
Impulse Withstand Voltage	2.5 kV
Pollution Degree	3 (inside LED unit: 2)
Operation Frequency	900 operations/hour
Shock Resistance	Operating extremes: 150 m/s² Damage limits: 1000 m/s²
Vibration Resistance	Operating extremes: 10 to 500 Hz, amplitude 0.35 mm acceleration 50 m/s² Damage limits: 10 to 500 Hz, amplitude 0.35 mm acceleration 50 m/s²
Mechanical Life	250,000 operations minimum
Electrical Life	100,000 operations min 250,000 operations min (24V AC/DC, 100 mA)
Degree of Protection	IP65 (IEC60529)
Short-circuit Protection	250V/10A fuse (Type aM, IEC60269-1/IEC60269-2)
Conditional Short-circuit Current	1000A
Terminal Style	Solder terminal, PC board terminal
Recommended Tightening Torque for Locking Ring	0.88 N·m
Connectable Wire	1.25 mm² maximum (AWG16 maximum)
Soldering Conditions	310 to 350°C, 3 seconds maximum
Weight	ø29 mm: 23g, ø40 mm: 28g

Pushlock Pull/Turn Reset (Solder Terminal/PC Board Terminal)

Non-illuminated

Shape	NC Main Contact	NO Monitor Contact	Part No.		Operator Color Code
			Solder Terminal	PC Board Terminal	
ø29mm Mushroom 	1NC	—	XA1E-BV301①	XA1E-BV301V①	R: Dark red RH: Bright red
	2NC	—	XA1E-BV302①	XA1E-BV302V①	
	3NC	—	XA1E-BV303①	XA1E-BV303V①	
	4NC	—	XA1E-BV304①	XA1E-BV304V①	
	1NC	1NO	XA1E-BV311①	XA1E-BV311V①	
	2NC	1NO	XA1E-BV312①	XA1E-BV312V①	
	3NC	1NO	XA1E-BV313①	XA1E-BV313V①	
ø40mm Mushroom 	1NC	—	XA1E-BV401①	XA1E-BV401V①	
	2NC	—	XA1E-BV402①	XA1E-BV402V①	
	3NC	—	XA1E-BV403①	XA1E-BV403V①	
	4NC	—	XA1E-BV404①	XA1E-BV404V①	
	1NC	1NO	XA1E-BV411①	XA1E-BV411V①	
	2NC	1NO	XA1E-BV412①	XA1E-BV412V①	
	3NC	1NO	XA1E-BV413①	XA1E-BV413V①	

- Specify a color code in place of ① in the Part No.
- Pushlock pull/turn reset switches are locked when pressed, and reset when pulled or turned clockwise.
- Terminal cover (XA9Z-VL2) is ordered separately.
- For EMO Switches, see D-052.

Illuminated

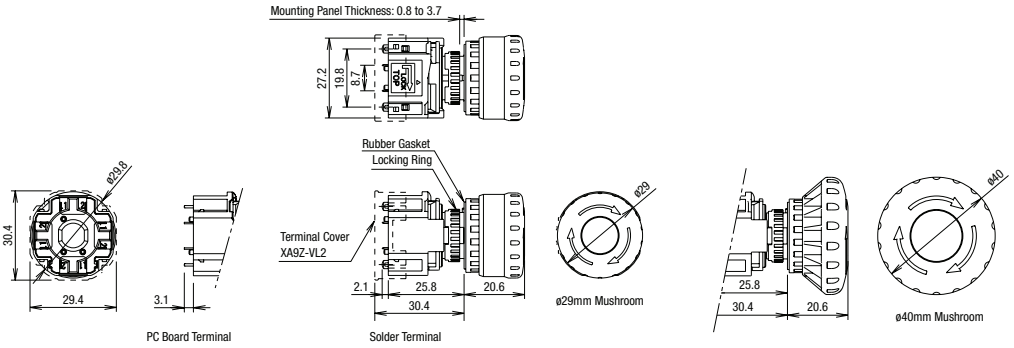
Shape	NC Main Contact	NO Monitor Contact	Part No.		Operator Color
			Solder Terminal	PC Board Terminal	
ø29mm Mushroom 	1NC	—	XA1E-LV301Q4R	XA1E-LV301Q4VR	Dark red only
	2NC	—	XA1E-LV302Q4R	XA1E-LV302Q4VR	
	3NC	—	XA1E-LV303Q4R	XA1E-LV303Q4VR	
	4NC	—	XA1E-LV304Q4R	XA1E-LV304Q4VR	
	1NC	1NO	XA1E-LV311Q4R	XA1E-LV311Q4VR	
	2NC	1NO	XA1E-LV312Q4R	XA1E-LV312Q4VR	
	3NC	1NO	XA1E-LV313Q4R	XA1E-LV313Q4VR	
ø40mm Mushroom 	1NC	—	XA1E-LV401Q4R	XA1E-LV401Q4VR	
	2NC	—	XA1E-LV402Q4R	XA1E-LV402Q4VR	
	3NC	—	XA1E-LV403Q4R	XA1E-LV403Q4VR	
	4NC	—	XA1E-LV404Q4R	XA1E-LV404Q4VR	
	1NC	1NO	XA1E-LV411Q4R	XA1E-LV411Q4VR	
	2NC	1NO	XA1E-LV412Q4R	XA1E-LV412Q4VR	
	3NC	1NO	XA1E-LV413Q4R	XA1E-LV413Q4VR	

- Pushlock pull/turn reset switches are locked when pressed, and reset when pulled or turned clockwise.
- Terminal cover (XA9Z-VL2) is ordered separately.

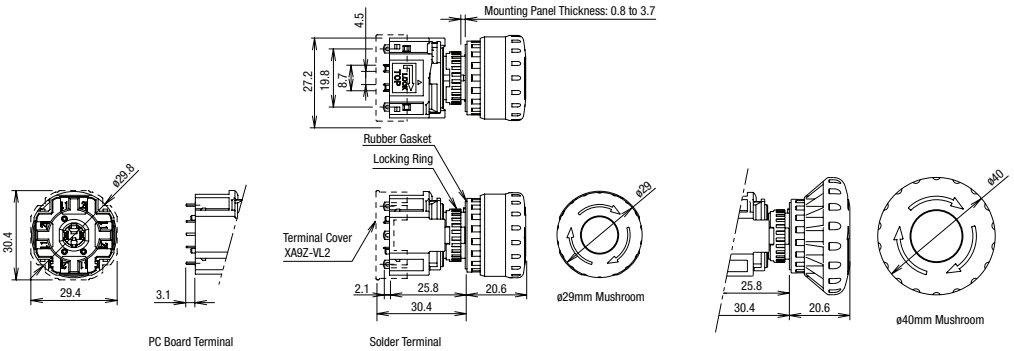
ø16 XA Series Emergency Stop Switches (w/Removable Contact Block)

Dimensions

Non-illuminated

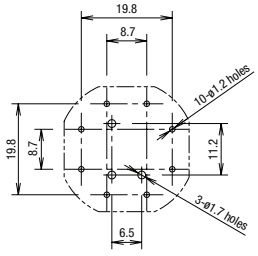


Illuminated

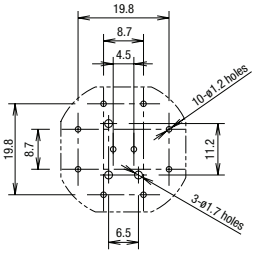


PC Board Layout (Bottom View)

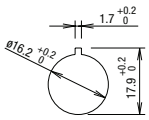
Non-Illuminated



Illuminated

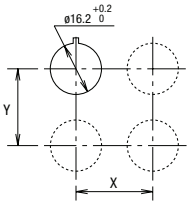


Panel Cut-out



All dimensions in mm.

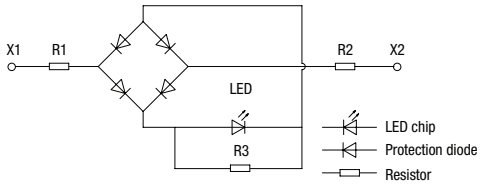
Mounting Hole Layout



	X	Y
ø29mm Mushroom	40 mm minimum	
ø40mm Mushroom	50 mm minimum	

- The values shown above are the minimum dimensions for mounting with other ø16 mm pushbuttons. For other control units of different sizes and styles, determine the values according to the dimensions, operation, and wiring convenience.

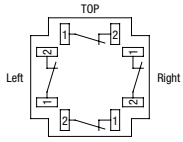
LED Unit Internal Circuit



Terminal Arrangement (Bottom View)

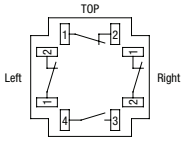
Non-illuminated

NC main contacts (black) only
NC main contacts (black): Terminals 1-2



1NC: Terminals on right
2NC: Terminals on right and left
3NC: Terminals on right, left, and top

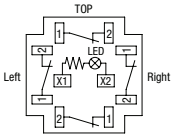
With NO monitor contacts (blue)
NC main contacts (black): Terminals 1-2
NO monitor contacts (blue): Terminals 3-4



1NC: Terminals on top
2NC: Terminals on right and left

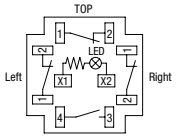
Illuminated

NC main contacts only (black)
NC main contacts(black): Terminals 1-2



1NC: Terminals on right
2NC: Terminals on right and left
3NC: Terminals on right, left, and top

With NO monitor contacts (blue)
NC main contacts (black): Terminals 1-2
NO monitor contacts (blue): Terminals 3-4

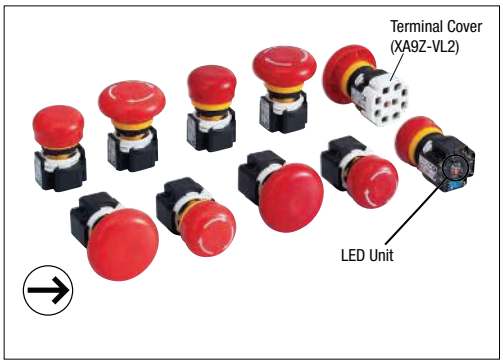


1NC: Terminals on top
2NC: Terminals on right and left

ø16 XA Series Emergency Stop Switches Round Form (w/Removable Contact Blocks)

Smooth Round Form Buttons

- IDEC's unique Reverse Energy Structure
- Depth behind the panel: 27.9mm
- Arrow marked and unmarked buttons.
- The smooth button is ideal for applications that require utmost cleanliness.Prevents dust built-up, and is also easy to clean.
- Two reset operations - pushlock pull or turn reset.
- Silver with gold contacts.
- Direct opening action (IEC60947-5-5:5.2, IEC60947-5-1, Annex K)
- Safety lock mechanism (IEC60947-5-5:6.2)
- Degree of protection IP65 (IEC60529)



Standards and Specifications

Contact Ratings

NC main contacts (black) /NO monitor contact (blue)

Rated Insulation Voltage (Ui)				300V (illuminated part: 60V)		
Rated Thermal Current (Ith)				5A		
Rated Operating Voltage (Ue)				30V	125V	250V
Rated Operating Current	Main Contacts	AC 50/60 Hz	Resistive Load (AC-12)	–	3A	3A
			Inductive Load (AC-15)	–	1.5A	1.5A
		DC	Resistive Load (DC-12)	2A	0.4A	0.2A
			Inductive Load (DC-13)	1A	0.22A	0.1A
	Monitor Contacts	AC 50/60 Hz	Resistive Load (AC-12)	–	1.2A	0.6A
			Inductive Load (AC-14)	–	0.6A	0.3A
		DC	Resistive Load (DC-12)	2A	0.4A	0.2A
			Inductive Load (DC-13)	1A	0.22A	0.1A

- Minimum applicable load: 5V AC/DC, 1 mA (reference value) (Operating area may vary according to the operating conditions and load types.)
- The rated operating currents are measured at resistive/inductive load types specified in IEC 60947-5-1.

Illumination Ratings

Rated Voltage	Operating Voltage	Rated Current
24V AC/DC	24V AC/DC ±10%	11 mA

Specifications

Applicable Standards	IEC60947-5-1, EN60947-5-1 IEC60947-5-5, EN60947-5-5, JIS C8201-5-1, UL991, NFPA79, UL508, CSA C22.2 No.14, GB14048.5
Operating Temperature	–25 to +60°C (no freezing) Illuminated: –25 to +55°C (no freezing)
Storage Temperature	–45 to +80°C
Operating Humidity	45 to 85% RH (no condensation)
Operating Force	Push to lock: 10.5N Pull to reset: 10N Turn to reset: 0.16 N·m
Minimum Force Required for Direct Opening Action	60N
Minimum Operator Stroke Required for Direct Opening Action	4.0 mm
Maximum Operator Stroke	4.5 mm
Contact Resistance	50 mΩ maximum (initial value)
Insulation Resistance	100 MΩ minimum (500V DC megger)
Overvoltage Category	II
Impulse Withstand Voltage	2.5 kV
Pollution Degree	3 (inside LED unit: 2)
Operation Frequency	900 operations/hour
Shock Resistance	Operating extremes: 150 m/s² Damage limits: 1000 m/s²
Vibration Resistance	Operating extremes: 10 to 500 Hz, amplitude 0.35 mm, acceleration 50 m/s² Damage limits: 10 to 500 Hz, amplitude 0.35 mm, acceleration 50 m/s²
Mechanical Life	250,000 operations minimum
Electrical Life	100,000 operations min 250,000 operations min (24V AC/DC, 100 mA)
Degree of Protection	IP65 (IEC60529)
Short-circuit Protection	250V/10A fuse (Type aM, IEC60269-1/IEC60269-2)
Conditional Short-circuit Current	1000A
Terminal Style	Solder terminal, PC board terminal
Recommended Tightening Torque for Locking Ring	0.88 N·m
Connectable Wire	1.25 mm² maximum (AWG16 maximum)
Soldering Conditions	310 to 350°C, 3 seconds maximum
Weight	ø30 mm: 23g, ø40 mm: 28g

Pushlock Pull/Turn Reset (Solder Terminal)

Non-illuminated

Shape	NC Main Contact	NO Monitor Contact	Part No. (Ordering Part No.)	
			Unmarked	Arrow Marked
ø30 Mushroom 	3NC	–	XA1E-BV3T03RH	XA1E-BV3T03RM
	4NC	–	XA1E-BV3T04RH	XA1E-BV3T04RM
	1NC	1NO	XA1E-BV3T11RH	XA1E-BV3T11RM
	2NC	1NO	XA1E-BV3T12RH	XA1E-BV3T12RM
	3NC	1NO	XA1E-BV3T13RH	XA1E-BV3T13RM
ø40 Mushroom 	3NC	–	XA1E-BV4T03RH	XA1E-BV4T03RM
	4NC	–	XA1E-BV4T04RH	XA1E-BV4T04RM
	1NC	1NO	XA1E-BV4T11RH	XA1E-BV4T11RM
	2NC	1NO	XA1E-BV4T12RH	XA1E-BV4T12RM
	3NC	1NO	XA1E-BV4T13RH	XA1E-BV4T13RM

- Pushlock pull/turn reset switches are locked when pressed, and reset when pulled or turned clockwise.
- 1NC and 2NC contacts also available.
- Terminal cover (XA9Z-VL2) is ordered separately.
- For PC board terminals, add "V" in front of "R" in the part number.
  Example: **XA1E-BV3T03RH** => **XA1E-BV3T03VRH**

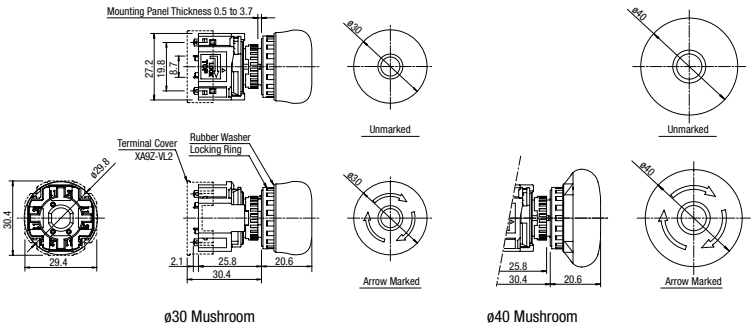
Illuminated

Shape	NC Main Contact	NO Monitor Contact	Part No. (Ordering Part No.)	
			Unmarked	Arrow Marked
ø30 Mushroom 	1NC	–	XA1E-LV3T01Q4R	XA1E-LV3T01Q4RM
	2NC	–	XA1E-LV3T02Q4R	XA1E-LV3T02Q4RM
	3NC	–	XA1E-LV3T03Q4R	XA1E-LV3T03Q4RM
	4NC	–	XA1E-LV3T04Q4R	XA1E-LV3T04Q4RM
	1NC	1NO	XA1E-LV3T11Q4R	XA1E-LV3T11Q4RM
	2NC	1NO	XA1E-LV3T12Q4R	XA1E-LV3T12Q4RM
	3NC	1NO	XA1E-LV3T13Q4R	XA1E-LV3T13Q4RM
ø40 Mushroom 	1NC	–	XA1E-LV4T01Q4R	XA1E-LV4T01Q4RM
	2NC	–	XA1E-LV4T02Q4R	XA1E-LV4T02Q4RM
	3NC	–	XA1E-LV4T03Q4R	XA1E-LV4T03Q4RM
	4NC	–	XA1E-LV4T04Q4R	XA1E-LV4T04Q4RM
	1NC	1NO	XA1E-LV4T11Q4R	XA1E-LV4T11Q4RM
	2NC	1NO	XA1E-LV4T12Q4R	XA1E-LV4T12Q4RM
	3NC	1NO	XA1E-LV4T13Q4R	XA1E-LV4T13Q4RM

- Pushlock pull/turn reset switches are locked when pressed, and reset when pulled or turned clockwise.
- Terminal cover (XA9Z-VL2) is ordered separately.
- For PC board terminals, add "V" in front of "R" in the part number.
  Example: **XA1E-LV3T01Q4R** => **XA1E-LV3T01Q4VR**

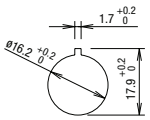
ø16 XA Series Emergency Stop Switches Round Form (w/Removable Contact Blocks)

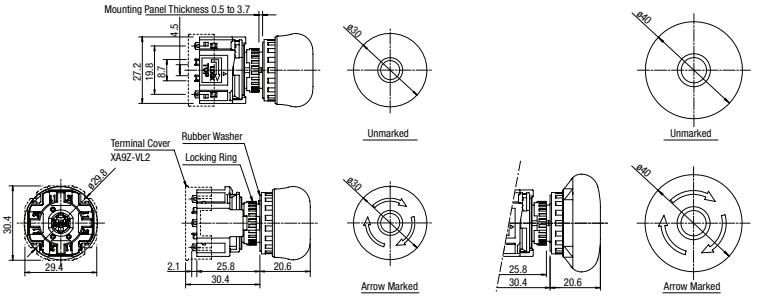
Dimensions



ø30 Mushroom ø40 Mushroom

Panel Cut-out



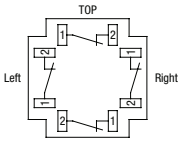


ø30 Mushroom ø40 Mushroom

Terminal Arrangement (Bottom View)

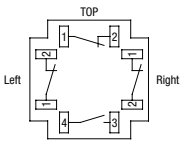
Non-illuminated

NC main contacts (black) only
NC main contacts (black): Terminals 1-2



1NC: Terminals on right
2NC: Terminals on right and left
3NC: Terminals on right, left, and top

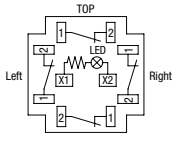
With NO monitor contacts (blue)
NC main contacts (black): Terminals 1-2
NO monitor contacts (blue): Terminals 3-4



1NC: Terminals on top
2NC: Terminals on right and left

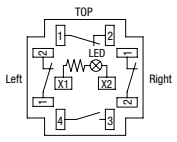
Illuminated

NC main contacts only (black)
NC main contacts(black): Terminals 1-2



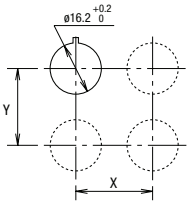
1NC: Terminals on right
2NC: Terminals on right and left
3NC: Terminals on right, left, and top

With NO monitor contacts (blue)
NC main contacts (black): Terminals 1-2
NO monitor contacts (blue):Terminals 3-4



1NC: Terminals on top
2NC: Terminals on right and left

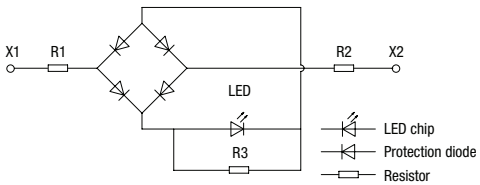
Mounting Hole Layout



	X	Y
ø29mm Mushroom	40 mm minimum	
ø40mm Mushroom	50 mm minimum	

- The values shown above are the minimum dimensions for mounting with other ø16 mm pushbuttons. For other control units of different sizes and styles, determine the values according to the dimensions, operation, and wiring convenience.

LED Unit Internal Circuit



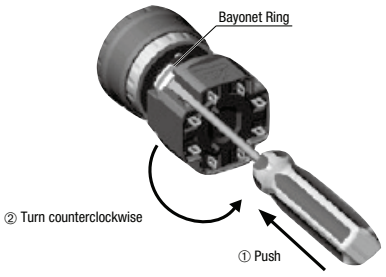
⚠ Safety Precautions

- Turn off power to the XA series emergency stop switch before starting installation, removal, wiring, maintenance, and inspection of the relays. Failure to turn power off may cause electrical shock or fire hazard.
- Use the LED unit removal tool when replacing the LED unit to avoid burn on your hands.
- Use wires of the proper size to meet the voltage and current requirements, and solder the wires correctly. If soldering is incomplete, the wire may heat during operation, causing fire hazard.

Instructions

Removing the Contact Block

First unlock the operator button. While pushing up the white bayonet ring, using a small screwdriver (width: 2.5 to 3 mm) if necessary, turn the contact block counterclockwise and pull out. **Do not exert excessive force when using a screwdriver, otherwise the bayonet ring may be damaged.**

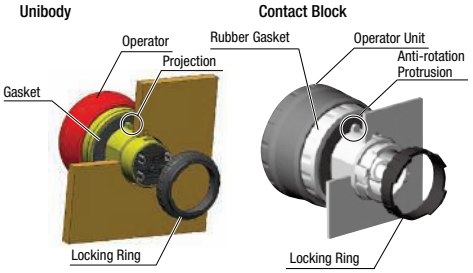


Notes for Removing the Contact Block

1. When the contact block is removed, the monitor contact (NO contact) is closed.
2. While removing the contact block, do not exert excessive force, otherwise the switch may be damaged.

Panel Mounting

Remove the locking ring from the operator and check that the rubber gasket is in place. Insert the operator from panel front into the panel hole. Face the side with the anti-rotation protrusion on the operator upward, and tighten the locking ring.

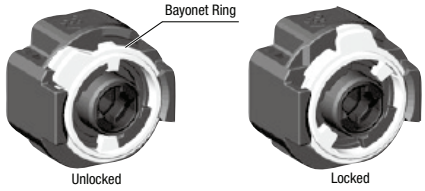


Notes for Panel Mounting

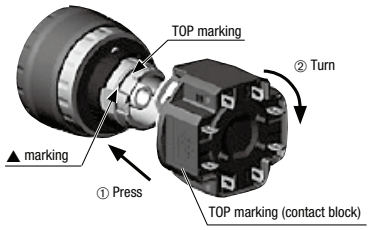
To mount the XA emergency stop switches onto a panel, tighten the locking ring to a tightening torque of 0.88 N·m maximum using ring wrench MT-001. Do not use pliers. Do not exert excessive force, otherwise the locking ring may be damaged.

Installing the Contact Block

First turn the bayonet ring to the unlocked position.



Align the small ▲ marking on the edge of the operator base with the TOP marking on the contact block. Press the contact block onto the operator and turn the contact block clockwise until the bayonet ring clicks.

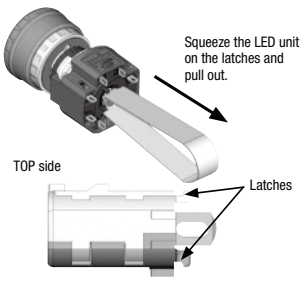


Notes for Installing the Contact Block

Check that the contact block is securely installed on the operator. When the emergency stop switch is properly assembled, the bayonet ring is in place as shown below.

Removing the LED Unit (Contact Block)

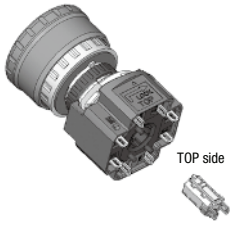
Pull out the LED unit while squeezing the latches on the LED unit using the LED unit removal tool (MT-101).



ø16 XA Series Emergency Stop Switches

Installing the LED Unit (with Removable Contact Block)

Align the to of the LED unit with the TOP marking on the contact block. Push the LED unit into the contact block.



Wiring

1. The applicable wire size is 1.25 mm^2 maximum.
2. Solder the terminal at a temperature of 310 to 350°C within 3 seconds using a soldering iron. Sn-Ag-Cu type is recommended when using lead-free solder. When soldering, do not touch the enabling switch with the soldering iron. Also ensure that no tensile force is applied to the terminal. Do not bend the terminal or apply excessive force to the terminal.
3. Use a non-corrosive rosin flux. To prevent the flux from entering the switch while soldering, face the terminals downward.
4. Because the terminal spacing is narrow, use protective tubes or heat shrinkable tubes to avoid burning of wire coating or short circuit.

Solder/Tab Terminal #110

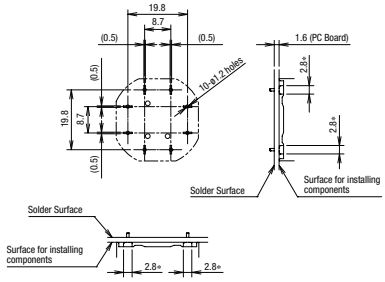
1. Use #110 receptacles for 0.5mm-thick tabs.
2. Because the terminal spacing is narrow, use protective tubes or heat shrinkable tubes of 0.5mm minimum in thickness.
3. Do not apply force on the terminals in the direction other than vertical to the mounting panel, otherwise the terminals will be damaged.

PC Board Terminal

1. When mounting a contact block on a PC board, provide sufficient rotating space for the PC board when installing and removing the contact block.
2. When mounting an XA emergency stop switch on a PC board, make sure that the operator is securely installed.

About PC Board and Circuit Design

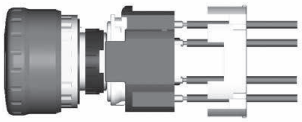
1. Use PC boards made of glass epoxy copper-clad laminated sheets of 1.6 mm in thickness, with double-sided through hole.
2. PC boards and circuits must withstand rated voltage and current, including the instantaneous current and voltage at switching.
3. The minimum applicable load is 5V AC/DC, 1 mA. This value may vary according to the operating environment and load.
4. Within the 2.8∗ mm areas shown in the figure below, terminals touch the PC board, resulting in possible short circuit on the printed circuit. When designing a PC board pattern, take this possibility into consideration.



Installing Insulation Terminal Cover

To install the terminal cover (XA9Z-VL2), align the TOP marking on the terminal cover with TOP marking on the contact block, and press the terminal cover toward the contact block.

Note: For wiring, insert the wires into the holes in the terminal cover before soldering.

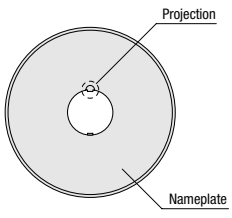


Contact Bounce

When the button is reset by pulling or turning, the NC main contacts will bounce. When pressing the button, the NO monitor contacts will bounce. When designing a control circuit, take the contact bounce time into consideration (reference value: 20 ms).

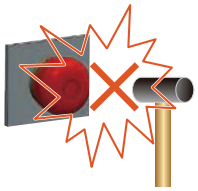
Nameplate

When anti-rotation is not required, remove the projection from the nameplate using pliers.



Handling

Do not expose the switch to excessive shock and vibration, otherwise the switch may be deformed or damaged, causing malfunction or operation failure.



ø22 XW Series Emergency Stop Switches

ø22 mm, 4-contact Emergency Stop Switch. Compact size—only 37.1 mm deep behind the panel (screw terminal style 48.7 mm with terminal cover). Reliable "Safe break action."

- The depth behind the panel is only 37.1 mm for 1 to 4 contacts (screw terminal style 48.7 mm with terminal cover).
- The same depth behind the panel for illuminated and non-illuminated switches.
- IDEC's original "Safe break action" ensures that the contacts open when the contact block is detached from the operator.
- 1 to 4NC main contacts and 1 or 2NO monitor contact
- Push-to-lock, Pull or Turn-to-reset operator
- Direct opening action mechanism (IEC60947-5-5, 5.2, IEC60947-5-1, Annex K)
- Safety lock mechanism (IEC60947-5-5, 6.2)
- Degree of protection IP65, IP67 (IEC60529)
- Durable, silver with gold contacts.
- Screw terminal style is finger-safe (IP20).
- Two operator sizes: ø40 and ø60 mm
- Dark red (Munsell 5R4/12) or bright red (Munsell 7.5R4.5/14) colors are available for the non-illuminated operator.
- Push-ON illumination available (operator size: ø60)
- Connector style available to reduce wiring time and wiring mistakes.

Standards and Specifications

Contact Ratings

(NC main contacts/NO monitor contact)

Rated Insulation Voltage (Ui)			Screw Terminal	250V		
			Solder Terminal	300V		
			PC Board Terminal			
			Connector	125V		
Rated Thermal Current (Ith)				5A (connector style: 2.5A)		
Rated Operating Voltage (Ue)				30V	125V	250V (Note 3)
Rated Operating Current	Main Contacts	AC 50/60 Hz	Resistive Load (AC-12)	–	5A (Note 1)	3A
			Inductive Load (AC-15)	–	3A (Note 2)	1.5A
		DC	Resistive Load (DC-12)	2A	0.4A	0.2A
			Inductive Load (DC-13)	1A	0.22A	0.1A
	Monitor Contacts	AC 50/60 Hz	Resistive Load (AC-12)	–	1.2A	0.6A
			Inductive Load (AC-14)	–	0.6A	0.3A
		DC	Resistive Load (DC-12)	2A	0.4A	0.2A
			Inductive Load (DC-13)	1A	0.22A	0.1A

- Minimum applicable load: 5V AC/DC, 1 mA (reference value) (Operating area depends on the operating conditions and load types.)
- The rated operating currents are measured at resistive/inductive load types specified in JIS C8201-5-1.

Note 1: Solder terminal/PC board terminal: 3A, Connector: 2.5A

Note 2: Solder terminal/PC board terminal: 1.5A

Note 3: Except for connector style.

Illumination Ratings

Rated Voltage	Operating Voltage	Rated Current
24V AC/DC	24V AC/DC ±10%	15 mA

Note: An LED lamp is built into the contact block and cannot be replaced.

Specifications

Applicable Standards	IEC60947-5-1, EN60947-5-1 IEC60947-5-5 (Note), EN60947-5-5 JIS C8201-5-1, UL508, UL991, NFPA79, CSA C22.2 No. 14, GB14048.5
Operating Temperature	Non-illuminated: –25 to +60°C (no freezing) LED illuminated: –25 to +55°C (no freezing)
Storage Temperature	–45 to +80°C
Operating Humidity	45 to 85% RH (no condensation)
Operating Force	Push to lock: 32N Pull to reset: 21N Turn to reset: 0.27 N·m
Minimum Force Required for Direct Opening Action	80N
Minimum Operator Stroke Required for Direct Opening Action	4.0 mm
Maximum Operator Stroke	4.5 mm
Contact Resistance	50 mΩ maximum (initial value) Connector style: 30 mΩ (Note)
Insulation Resistance	100 MΩ minimum (500V DC megger)
Overvoltage Category	II
Impulse Withstand Voltage	2.5 kV
Pollution Degree	3 (connector style: 2)
Operation Frequency	900 operations/hour
Shock Resistance	Operating extremes: 150 m/s² Damage limits: 1000 m/s²
Vibration Resistance	Operating extremes: 10 to 500 Hz, amplitude 0.35 mm, acceleration 50 m/s² Damage limits: 10 to 500 Hz, amplitude 0.35 mm, acceleration 50 m/s²
Mechanical Life	250,000 operations minimum
Electrical Life	100,000 operations minimum 250,000 operations minimum (24V AC/DC, 100 mA)
Degree of Protection	Panel front: IP65, IP67 (IEC 60529) Terminal Protection: IP20 (screw terminal, when using XW9Z-VL2MF)
Short-circuit Protection	250V/10A fuse (Type aM, IEC60269-1/IEC60269-2)
Conditional Short-circuit Current	1000A
Terminal Style	Solder terminal, PC board terminal, M3 screw terminal, Connector
Recommended Tightening Torque for Locking Ring	2.0 N·m
Connectable Wire	Screw terminal: 0.75 to 1.25 mm² (AWG18 to 16) Solder terminal / PC board terminal: 1.25 mm² maximum (AWG16 maximum) Connector style: 0.3 to 0.85 mm² (AWG22 to 18)
Soldering Conditions	310 to 350°C, 3 seconds maximum
Recommended Tightening Torque for Terminal Screw	0.6 to 1.0 N·m
Weight	ø40 mm: 72g ø60 mm: 81g

Note: When connecting the applicable connector to a 1m wire of 0.3 mm² (AWG22).

ø22 XW Series Emergency Stop Switches

XW Series Emergency Stop Switches

Non-illuminated Pushlock Pull / Turn Reset (Screw Terminal)

Shape	NC Main Contact	NO Monitor Contact	Part No.		①Operator Color Code
			IP20	w/Terminal Cover	
ø40mm Mushroom 	1NC	—	XW1E-BV401MF①	XW1E-BV401M①	R: Dark red RH: Bright red
	2NC	—	XW1E-BV402MF①	XW1E-BV402M①	
	3NC	—	XW1E-BV403MF①	XW1E-BV403M①	
	4NC	—	XW1E-BV404MF①	XW1E-BV404M①	
	1NC	1NO	XW1E-BV411MF①	XW1E-BV411M①	
	2NC	1NO	XW1E-BV412MF①	XW1E-BV412M①	
	3NC	1NO	XW1E-BV413MF①	XW1E-BV413M①	
	2NC	2NO	XW1E-BV422MF①	XW1E-BV422M①	
ø60mm Mushroom 	1NC	—	XW1E-BV501MF①	XW1E-BV501M①	
	2NC	—	XW1E-BV502MF①	XW1E-BV502M①	
	3NC	—	XW1E-BV503MF①	XW1E-BV503M①	
	4NC	—	XW1E-BV504MF①	XW1E-BV504M①	
	1NC	1NO	XW1E-BV511MF①	XW1E-BV511M①	
	2NC	1NO	XW1E-BV512MF①	XW1E-BV512M①	
	3NC	1NO	XW1E-BV513MF①	XW1E-BV513M①	
	2NC	2NO	XW1E-BV522MF①	XW1E-BV522M①	

- Specify a color code in place of ① in the Part No.
- IP20 types can be connected to solid wires only.
- For EMO Switches, see D-052.

Non-illuminated Pushlock Pull/Turn Reset (Solder Terminal/PC Board Terminal)

Shape	NC Main Contact	NO Monitor Contact	Part No.		①Operator Color Code
			Solder Terminal	PC Board Terminal	
ø40mm Mushroom 	1NC	—	XW1E-BV401①	XW1E-BV401V①	R: Dark red RH: Bright red
	2NC	—	XW1E-BV402①	XW1E-BV402V①	
	3NC	—	XW1E-BV403①	XW1E-BV403V①	
	4NC	—	XW1E-BV404①	XW1E-BV404V①	
	1NC	1NO	XW1E-BV411①	XW1E-BV411V①	
	2NC	1NO	XW1E-BV412①	XW1E-BV412V①	
	3NC	1NO	XW1E-BV413①	XW1E-BV413V①	
	2NC	2NO	XW1E-BV422①	—	

- Specify a color code in place of ① in the Part No.
- Terminal cover (XA9Z-VL2) is ordered separately.

Pushlock Pull/Turn Reset (Connector)

Shape	NC Main Contact	NO Monitor Contact	Part No.	①Operator Color Code
ø40mm Mushroom 	3NC	—	XW1E-BV403V①-BC	R: Dark red RH: Bright red

- Specify a color code in place of ① in the Part No.
- See D-036 for applicable connectors.

XW Series Emergency Stop Switches

LED Illuminated Pushlock Pull/Turn Reset (Screw Terminal)

Shape	Illumination	Rated Voltage	NC Main Contact	NO Monitor Contact	Part No.	
					IP20	w/Terminal Cover
ø40mm Mushroom 	LED	24V AC/DC	1NC	—	XW1E-LV401Q4MFR	XW1E-LV401Q4MR
			2NC	—	XW1E-LV402Q4MFR	XW1E-LV402Q4MR
			3NC	—	XW1E-LV403Q4MFR	XW1E-LV403Q4MR
			4NC	—	XW1E-LV404Q4MFR	XW1E-LV404Q4MR
			1NC	1NO	XW1E-LV411Q4MFR	XW1E-LV411Q4MR
			2NC	1NO	XW1E-LV412Q4MFR	XW1E-LV412Q4MR
			3NC	1NO	XW1E-LV413Q4MFR	XW1E-LV413Q4MR
			2NC	2NO	XW1E-LV422Q4MFR	XW1E-LV422Q4MR

- The operator color is red only.
- IP20 types can be connected to solid wires only.

LED Illuminated Pushlock Pull/Turn Reset (Solder Terminal/PC Board Terminal)

Shape	Illumination	Rated Voltage	NC Main Contact	NO Monitor Contact	Part No.	
					Solder Terminal	PC Board Terminal
ø40mm Mushroom 	LED	24V AC/DC	1NC	—	XW1E-LV401Q4R	XW1E-LV401Q4VR
			2NC	—	XW1E-LV402Q4R	XW1E-LV402Q4VR
			3NC	—	XW1E-LV403Q4R	XW1E-LV403Q4VR
			4NC	—	XW1E-LV404Q4R	XW1E-LV404Q4VR
			1NC	1NO	XW1E-LV411Q4R	XW1E-LV411Q4VR
			2NC	1NO	XW1E-LV412Q4R	XW1E-LV412Q4VR
			3NC	1NO	XW1E-LV413Q4R	XW1E-LV413Q4VR
			2NC	2NO	XW1E-LV422Q4R	—

- The operator color is red only.
- Terminal cover (XA9Z-VL2) is ordered separately.

Push-ON LED Illuminated Pushlock Pull/Turn Reset (Screw Terminal)

Shape	Illumination	Rated Voltage	NC Main Contact	NO Monitor Contact	Part No.	
					IP20	w/Terminal Cover
ø40mm Mushroom 	LED	24V AC/DC	3NC	—	XW1E-TV403Q4MFR	XW1E-TV403Q4MR
			2NC	1NO	XW1E-TV412Q4MFR	XW1E-TV412Q4MR

- The operator color is red only.
- Push-ON is illuminated when the operator is latched, and turns off when reset.
- IP20 types can be connected to solid wires only.

Push-ON LED Illuminated Pushlock Pull/Turn Reset (Connector)

Shape	Illumination	Rated Voltage	NC Main Contact	NO Monitor Contact	Part No.
ø40mm Mushroom 	LED	24V AC/DC	3NC	—	XW1E-TV403Q4VR-BC

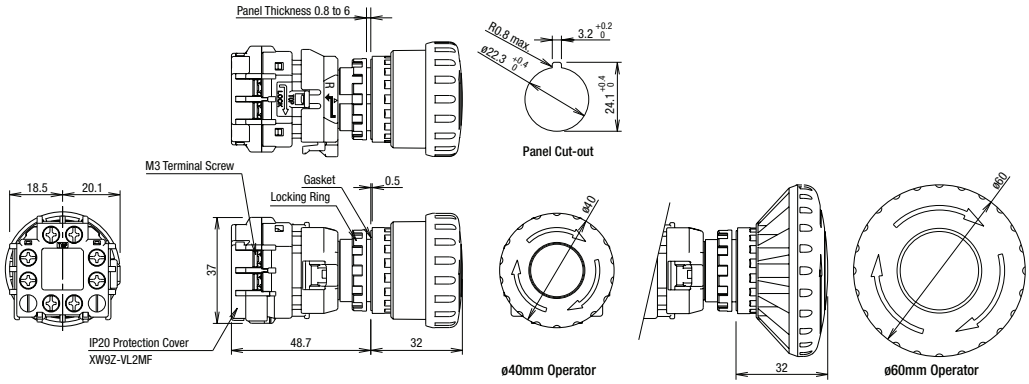
- The operator color is red only.
- Push-ON is illuminated when the operator is latched, and turns off when reset.

See D-036 for applicable connectors.

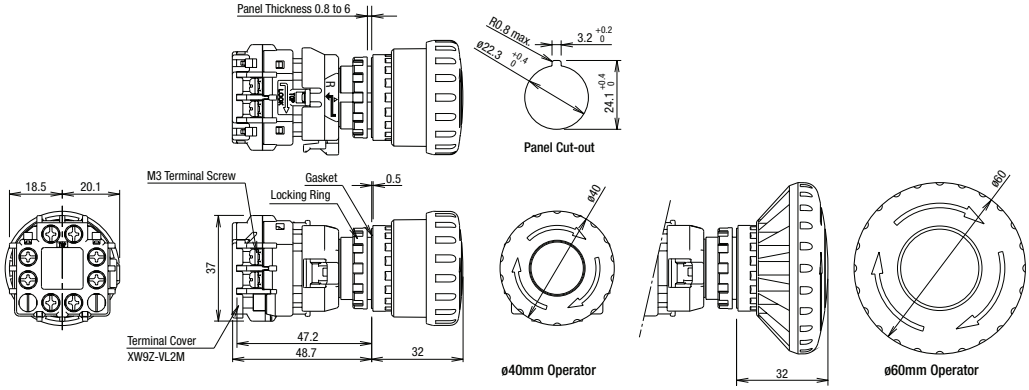
ø22 XW Series Emergency Stop Switches

Dimensions (Non-Illuminated)

Screw Terminal (IP20)

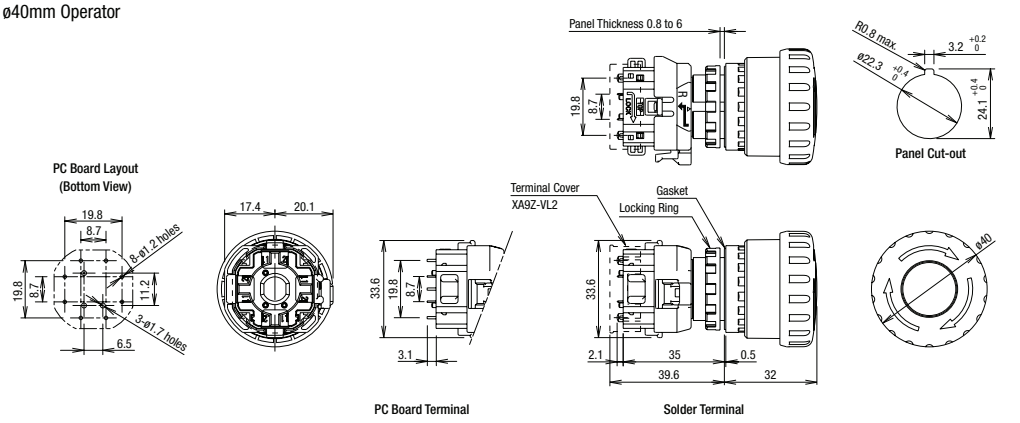


Screw Terminal (w/terminal cover)



Solder Terminal and PC Board Terminal

ø40mm Operator

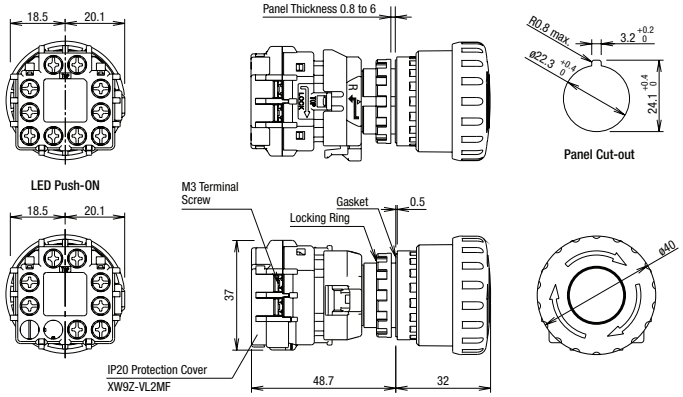


All dimensions in mm.

Dimensions (Illuminated)

Screw Terminal (IP20) LED Illuminated

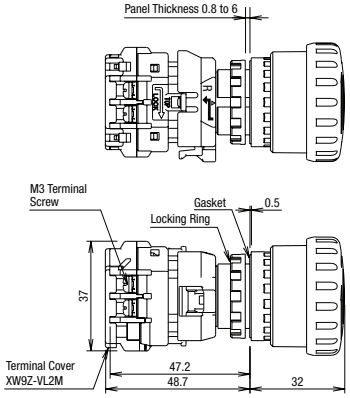
ø40mm Operator



Screw Terminal (w/terminal cover)

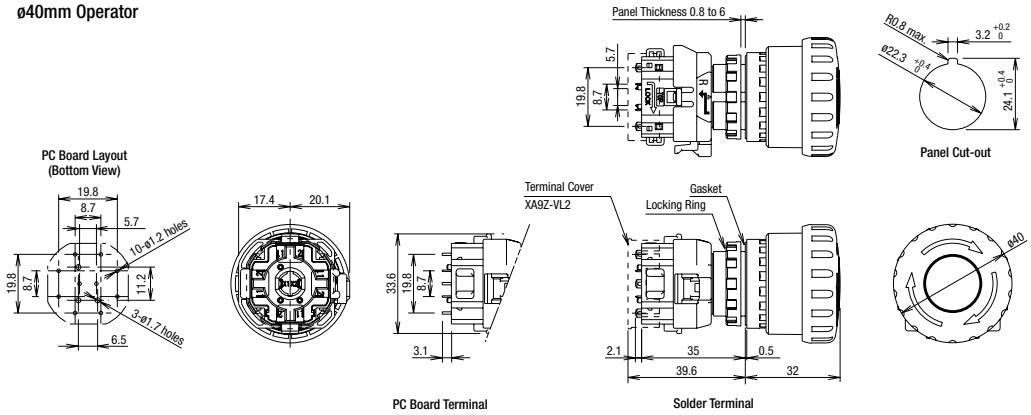
LED Illuminated

ø40mm Operator



Solder Terminal and PC Board Terminal LED Illuminated

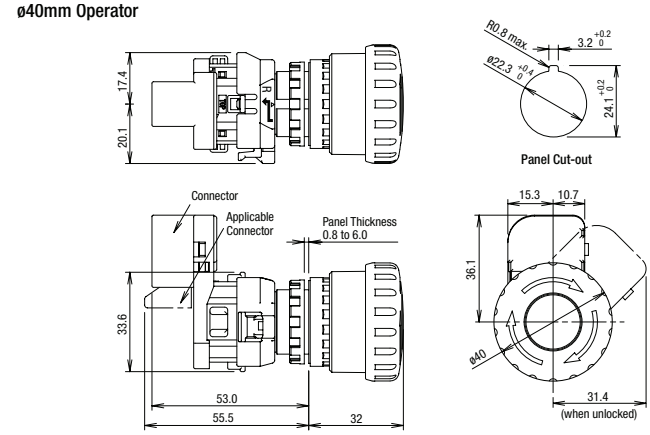
ø40mm Operator



Dimensions (Connector Style)

Non-illuminated / LED Push-ON

ø40mm Operator

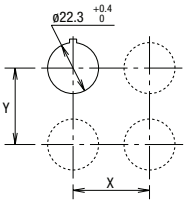


For applicable connectors, see D-036.

All dimensions in mm.

ø22 XW Series Emergency Stop Switches

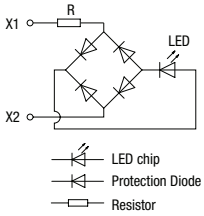
Mounting Hole Layout



	X	Y
Screw Terminal	70 mm minimum	
Solder/PC Board Terminal	50 mm minimum	
Connector Style	50 mm minimum	70 mm minimum

• The values shown above are the minimum dimensions for mounting with other ø22mm pushbuttons. For other control units of different sizes and styles, determine the values according to the dimensions, operation, and wiring convenience.

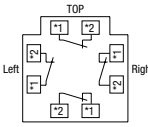
LED Internal Circuit



Terminal Arrangement (Bottom View)

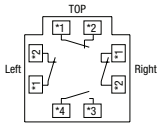
Screw Terminal Non-illuminated

NC main contacts only
NC main contacts
Terminals 1-2



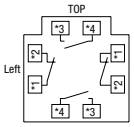
1NC: Terminals on right
2NC: Terminals on right and left
3NC: Terminals on right, left, and top

With 1NO monitor contacts
NC main contacts:
Terminals 1-2
NO monitor contacts:
Terminals 3-4



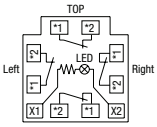
1NC: Terminals on top
2NC: Terminals on right and left

With 2NO monitor contacts
NC main contacts:
Terminals 1-2
NO monitor contacts:
Terminals 3-4



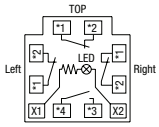
Screw Terminal Illuminated

NC main contacts only
NC main contacts:
Terminals 1-2



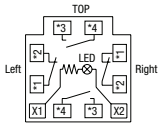
1NC: Terminals on right
2NC: Terminals on right and left
3NC: Terminals on right, left, and top

With 1NO monitor contacts
NC main contacts
Terminals 1-2
NO monitor contacts:
Terminals 3-4



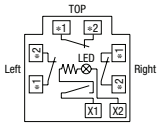
1NC: Terminals on top
2NC: Terminals on right and left

With 2NO monitor contacts
NC main contacts:
Terminals 1-2
NO monitor contacts:
Terminals 3-4

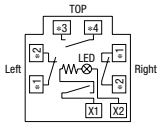


Screw Terminal Illuminated Push-ON

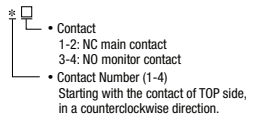
NC main contacts only
NC main contacts:
Terminals 1-2



With 1NO monitor contacts
NC main contacts:
Terminals 1-2
NO monitor contacts:
Terminals 3-4



Terminal Marking Development

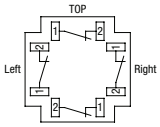


(Example: 1NO-3NC contact)

• On solder terminal and PC board terminal, the contact block is marked with contact codes (NC main contact 1-2: black, NO monitor contact 3-4: blue).

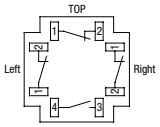
Solder Terminal / PC Board Terminal Non-illuminated

NC main contacts only
NC main contacts:
Terminals 1-2



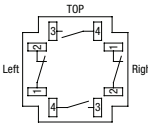
1NC: Terminals on right
2NC: Terminals on right and left
3NC: Terminals on right, left, and top

With 1NO monitor contacts
NC main contacts:
Terminals 1-2
NO monitor contacts:
Terminals 3-4



1NC: Terminals on top
2NC: Terminals on right and left

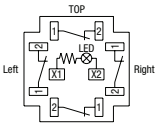
With 2NO monitor contacts
NC main contacts:
Terminals 1-2
NO monitor contacts:
Terminals 3-4



Solder Terminal only

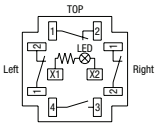
Solder Terminal / PC Board Terminal Illuminated

NC main contacts only
NC main contacts:
Terminals 1-2



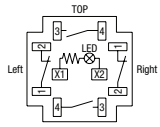
1NC: Terminals on right
2NC: Terminals on right and left
3NC: Terminals on right, left, and top

With 1NO monitor contacts
NC main contacts:
Terminals 1-2
NO monitor contacts:
Terminals 3-4



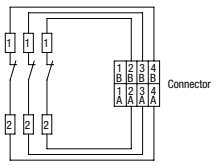
1NC: Terminals on top
2NC: Terminals on right and left

With 2NO monitor contacts
NC main contacts:
Terminals 1-2
NO monitor contacts:
Terminals 3-4

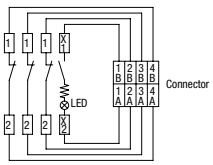


Solder Terminal only

Connector Style Non-illuminated



Connector Style Push-ON



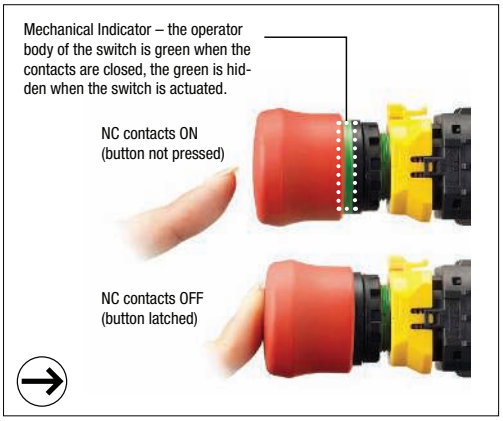
For applicable connectors, see D-036.

All dimensions in mm.

ø22 XW Series Emergency Stop Switches (Mechanical Indicator)

High level of safety with Safe Break Action. Mechanical indicator on the operator body shows the contact status - green when NC contacts are closed - reducing the maintenance work.

- IDEC's original "Safe Break Action" and "Reverse Energy Structure" ensure the safety of operator and system, when the switch is damaged due to excessive shocks.
- The mechanical indicator on the operator body shows the normal/latched status (green: normal). Reduces maintenance work and improves operation efficiency.
- Illuminated model also available (same size as non-illuminated)
- The depth behind the panel is only 46.4 mm (w/terminal cover).
- 1 to 4NC main contacts and 1 or 2NO monitor contact
- Push-to-lock, Pull or Turn-to-reset operator
- Direct opening action mechanism (IEC 60947-5-5, 5.2, IEC 60947-5-1, Annex K)
- Safety lock mechanism (IEC 60947-5-5, 6.2)
- Degree of protection: IP65 (IEC 60529)
- Durable, silver with gold contacts.
- Finger-safe structure (IP20)
- UL NISD category



Standards and Specifications

Contact Ratings

(NC main contacts/NO monitor contact)

Rated Insulation Voltage (Ui)			Screw Terminal	250V		
Rated Thermal Current (Ith)				5A		
Rated Operating Voltage (Ue)				30V	125V	250V
Rated Operating Current	Main Contacts	AC 50/60 Hz	Resistive Load (AC-12)	–	5A	3A
			Inductive Load (AC-15)	–	3A	1.5A
		DC	Resistive Load (DC-12)	2A	0.4A	0.2A
			Inductive Load (DC-13)	1A	0.22A	0.1A
	Monitor Contacts	AC 50/60 Hz	Resistive Load (AC-12)	–	1.2A	0.6A
			Inductive Load (AC-14)	–	0.6A	0.3A
		DC	Resistive Load (DC-12)	2A	0.4A	0.2A
			Inductive Load (DC-13)	1A	0.22A	0.1A

- Minimum applicable load: 5V AC/DC, 1 mA (reference value) (Operating area depends on the operating conditions and load types.)
- The rated operating currents are measured at resistive/inductive load types specified in JIS C8201-5-1.

Illumination Ratings

Rated Voltage	Operating Voltage	Rated Current
24V AC/DC	24V AC/DC ±10%	15 mA

Note: An LED lamp is built into the contact block and cannot be replaced.

Specifications

Applicable Standards	IEC60947-5-5, EN60947-5-5 JIS C8201-5-1, UL508, UL991, NFPA79, EN418 CSA C22.2 No. 14, GB14048.5
Operating Temperature	Non-illuminated: –25 to +60°C (no freezing) LED illuminated: –25 to +55°C (no freezing)
Storage Temperature	–45 to +80°C (no freezing)
Operating Humidity	45 to 85% RH (no condensation)
Operating Force	Push to lock: 32N Pull to reset: 21N Turn to reset: 0.27 N·m
Minimum Force Required for Direct Opening Action	80N
Minimum Operator Stroke Required for Direct Opening Action	4.0 mm
Maximum Operator Stroke	4.5 mm
Contact Resistance	50 mΩ maximum (initial value)
Insulation Resistance	100 MΩ minimum (500V DC megger)
Overvoltage Category	II
Impulse Withstand Voltage	2.5 kV
Pollution Degree	3
Operation Frequency	900 operations/hour
Shock Resistance	Operating extremes: 150 m/s² Damage limits: 1000 m/s²
Vibration Resistance	Operating extremes:10 to 500 Hz, amplitude 0.35 mm, acceleration 50 m/s² Damage limits: 10 to 500 Hz, amplitude 0.35 mm, acceleration 50 m/s²
Mechanical Life	250,000 operations minimum
Electrical Life	100,000 operations minimum 250,000 operations minimum (24V AC/DC, 100 mA)
Degree of Protection	Panel front: IP65 (IEC 60529) Terminal Protection: IP20 (screw terminal, when using XW9Z-VL2MF)
Short-circuit Protection	250V/10A fuse (Type aM, IEC60269-1/IEC60269-2)
Conditional Short-circuit Current	1000A
Terminal Style	M3 screw terminal
Recommended Tightening Torque for Locking Ring	2.0 N·m
Connectable Wire	0.75 to 1.25 mm² (AWG18 to 16)
Recommended Tightening Torque for Terminal Screw	0.6 to 1.0 N·m

ø22 XW Series Emergency Stop Switches (Mechanical Indicator)

Non-illuminated Pushlock Pull/Turn Reset (Screw Terminal)

Package quantity: 1

Shape	NC Main Contact	NO Monitor Contact	Part No.		Button Color Code
			IP20	w/Terminal Cover	
ø38 mushroom with mechanical indicator 	1NC	—	XW1E-BV4TG01MFR	XW1E-BV4TG01MR	R (red)
	2NC	—	XW1E-BV4TG02MFR	XW1E-BV4TG02MR	
	3NC	—	XW1E-BV4TG03MFR	XW1E-BV4TG03MR	
	4NC	—	XW1E-BV4TG04MFR	XW1E-BV4TG04MR	
	1NC	1NO	XW1E-BV4TG11MFR	XW1E-BV4TG11MR	
	2NC	1NO	XW1E-BV4TG12MFR	XW1E-BV4TG12MR	
	3NC	1NO	XW1E-BV4TG13MFR	XW1E-BV4TG13MR	
	2NC	2NO	XW1E-BV4TG22MFR	XW1E-BV4TG22MR	

- Pushlock pull/turn reset switches are locked when pressed, and reset when pulled or turned clockwise.
- IP20 types can be connected to solid wires only.

Illuminated Pushlock Pull/Turn Reset (Screw Terminal)

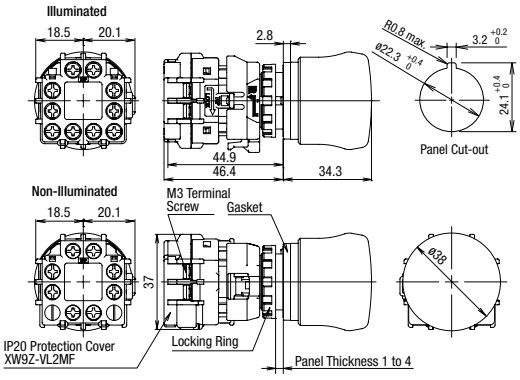
Package quantity: 1

Shape	Illumination	Rated Voltage	NC Main Contact	NO Monitor Contact	Part No.		Button Color Code
					IP20	w/Terminal Cover	
ø38 mushroom with mechanical indicator 	LED	24V AC/DC	1NC	—	XW1E-LV4TG01Q4MFR	XW1E-LV4TG01Q4MR	R (red)
			2NC	—	XW1E-LV4TG02Q4MFR	XW1E-LV4TG02Q4MR	
			3NC	—	XW1E-LV4TG03Q4MFR	XW1E-LV4TG03Q4MR	
			4NC	—	XW1E-LV4TG04Q4MFR	XW1E-LV4TG04Q4MR	
			1NC	1NO	XW1E-LV4TG11Q4MFR	XW1E-LV4TG11Q4MR	
			2NC	1NO	XW1E-LV4TG12Q4MFR	XW1E-LV4TG12Q4MR	
			3NC	1NO	XW1E-LV4TG13Q4MFR	XW1E-LV4TG13Q4MR	
			2NC	2NO	XW1E-LV4TG22Q4MFR	XW1E-LV4TG22Q4MR	

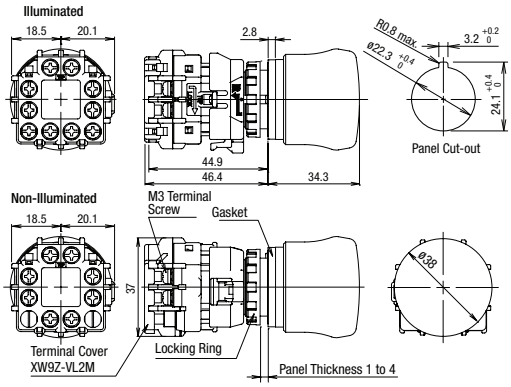
- Pushlock pull/turn reset switches are locked when pressed, and reset when pulled or turned clockwise.
- IP20 types can be connected to solid wires only.
- LED lamp is not removable.

Dimensions

Screw Terminal (IP20)

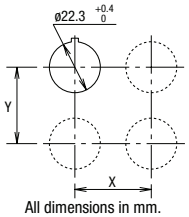


Screw Terminal (w/terminal cover)



All dimensions in mm.

Mounting Hole Layout

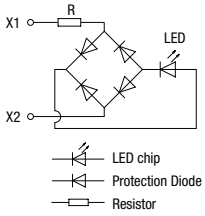


All dimensions in mm.

	X	Y
Screw Terminal	70 mm minimum	

- The values shown above are the minimum dimensions for mounting with other ø22mm emergency stop switches. For other emergency stop switches of different sizes and styles, determine the values according to the dimensions, operation, and wiring convenience.

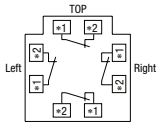
LED Internal Circuit



Terminal Arrangement (Bottom View)

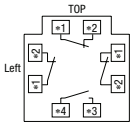
Screw Terminal Non-illuminated

NC main contacts only
NC main contacts: Terminals 1-2



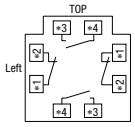
1NC: Terminals on right
2NC: Terminals on right and left
3NC: Terminals on right, left, and top

With 1NO monitor contacts
NC main contacts: Terminals 1-2
NO monitor contacts: Terminals 3-4



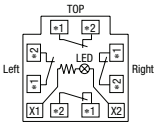
1NC: Terminals on top
2NC: Terminals on right and left

With 2NO monitor contacts
NC main contacts: Terminals 1-2
NO monitor contacts: Terminals 3-4



Screw Terminal Illuminated

NC main contacts only
NC main contacts: Terminals 1-2



1NC: Terminals on right
2NC: Terminals on right and left
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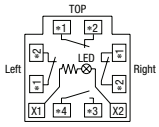
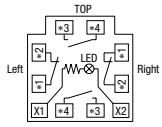
With 1NO monitor contacts
NC main contacts: Terminals 1-2
NO monitor contacts: Terminals 3-4



1NC: Terminals on top
2NC: Terminals on right and left

With 2NO monitor contacts
NC main contacts: Terminals 1-2
NO monitor contacts: Terminals 3-4



ø22 XW Series Emergency Stop Switches

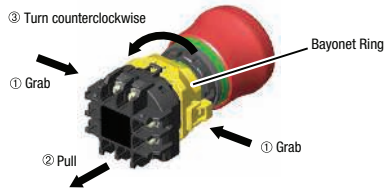
⚠ Safety Precautions

- Turn off power to the XW series emergency stop switch before starting installation, removal, wiring, maintenance, and inspection of the relays. Failure to turn power off may cause electrical shock or fire hazard.
- For wiring, use wires of the proper size to meet the voltage and current requirements. Tighten the M3 terminal screw to a tightening torque of 0.6 to 1.0 N·m. Failure to tighten the terminal screws may cause overheating and fire.

Instructions

Removing the Contact Block

First unlock the operator button. Grab the bayonet ring ① and pull back the bayonet ring until the latch pin clicks ②, then turn the contact block counterclockwise and pull out ③.

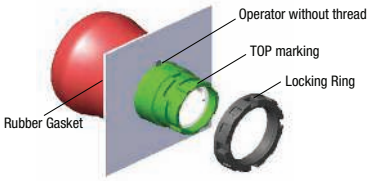


Notes for removing the contact block

1. When the contact block is removed, the monitor contact (NO contact) is closed.
2. While removing the contact block, do not exert excessive force, otherwise the switch may be damaged.
3. An LED lamp is built into the contact block for illuminated push-buttons. When removing the contact block, pull the contact block straight to prevent damage to the LED lamp. If excessive force is exerted, the LED lamp may be damaged and fail to light.

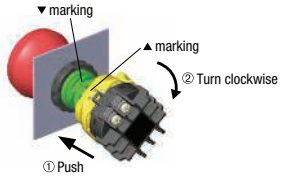
Panel Mounting

Remove the locking ring from the operator. Insert the operator from panel front into the panel hole. Face the side without thread on the operator with TOP marking upward, and tighten the locking ring using ring wrench MW9Z-T1 to a torque of 2.0 N·m maximum.



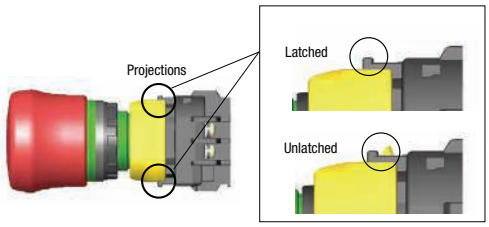
Installing the Contact Block

First unlock the operator button. Align the small ▼ marking on the edge of the operator with the small ▲ marking on the yellow bayonet ring. Hold the contact block, not the bayonet ring. Press the contact block onto the operator and turn the contact block clockwise until the bayonet ring clicks.



Notes for installing the contact block

Make sure that the bayonet ring is in the locked position. Check that the two projections on the bayonet ring are securely in place.



Wiring

Solder Terminal

1. The applicable wire size is 1.25 mm² maximum.
2. Solder the terminal at a temperature of 310 to 350°C within 3 seconds using a soldering iron. Sn-Ag-Cu type is recommended when using lead-free solder. When soldering, do not touch the enabling switch with the soldering iron. Also ensure that no tensile force is applied to the terminal. Do not bend the terminal or apply excessive force to the terminal.
3. Use a non-corrosive rosin flux.
4. Because the terminal spacing is narrow, use protective tubes or heat shrinkable tubes to avoid burning of wire coating or short circuit.

PC Board Terminal

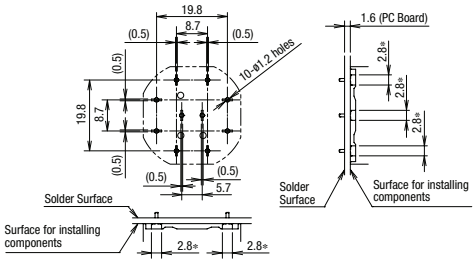
1. When mounting a contact block on a PC board, provide sufficient rotating space for the PC board when installing and removing the contact block.
2. When mounting an XW emergency stop switch on a PC board, make sure that the operator is securely installed.
3. Do not solder by flow soldering. Otherwise, damage may be caused.

APEM
Switches & Pilot Lights
Control Boxes
Emergency Stop Switches
Enabling Switches
Safety Products
Explosion Proof
Terminal Blocks
Relays & Sockets
Circuit Protectors
Power Supplies
LED Illumination
Controllers
Operator Interfaces
Sensors
AUTO-ID
X6
XA
XW
XN
SEMI

Instructions

About PC Board and Circuit Design

1. Use PC boards made of glass epoxy copper-clad laminated sheets of 1.6 mm in thickness, with double-sided through hole.
2. PC boards and circuits must withstand rated voltage and current, including the instantaneous current and voltage at switching.
3. The minimum applicable load is 5V AC/DC, 1 mA. This value may vary according to the operating environment and load.
4. Within the 2.8∗ mm areas shown in the figure below, terminals touch the PC board, resulting in possible short circuit on the printed circuit. When designing a PC board pattern, take this possibility into consideration.



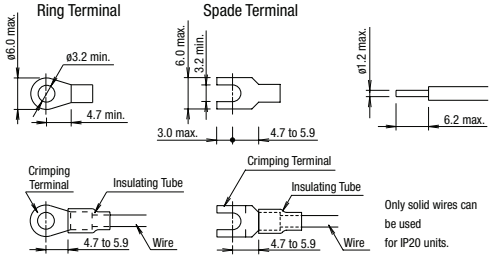
Screw Terminal

Applicable Crimping Terminals

Solid Wire

Ring Terminal

Spade Terminal



1. Wire thickness: 0.75 to 1.25 mm^2 (AWG18 to 16)

• Be sure to install an insulating tube on the crimping terminal.

2. Tighten the M3 terminal screw to a tightening torque of 0.6 to 1.0 N·m.

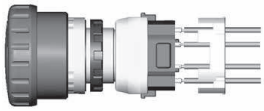
Connector

1. Connector shape
   - Tyco Electronics, D-2000 series
     Part No. 1376009-1 (tab header, board mount)
2. Applicable connectors (to be supplied by user)
   - Tyco Electronics, D-2000 series
     Part No. 1-1318119-4 (receptacle housing)
   - Tyco Electronics, D-2000 series
     Part No. 1318107-1 (receptacle contact)
3. To prepare correct receptacles for the connector, read the instruction sheet and catalog of Tyco Electronics and understand the installation and wiring method.
4. Fasten the cable so that the connector is not pulled. Otherwise the switch may be deformed and damaged, causing malfunction or operation failure.

Installing & Removing Terminal Covers

XA9Z-VL2 (Terminal Cover for Solder Terminals)

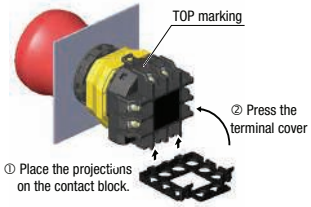
To install the terminal cover, align the TOP marking on the terminal cover with TOP marking on the contact block, and press the terminal cover toward the contact block.



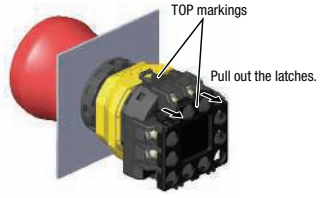
Note: For wiring, insert the wires into the holes in the terminal cover before soldering.

XW9Z-VL2M (Terminal Cover for Screw Terminals)

To install the terminal cover, align the TOP marking on the terminal cover with the TOP marking on the contact block. Place the two projections on the bottom side of the contact block into the slots in the terminal cover. Press the terminal cover toward the contact block.

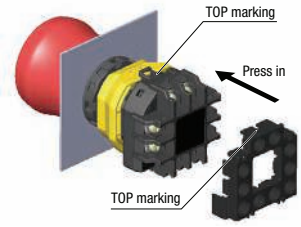


To remove the terminal cover, pull out the two latches on the top side of the terminal cover. Do not exert excessive force to the latches, otherwise the latches may break.



XW9Z-VL2MF (IP20 Protection Terminal Cover)

To install the IP20 protection cover, align the TOP marking on the cover with the TOP marking on the contact block, and press the cover toward the contact block.



Notes:

1. Once installed, the XW9Z-VL2MF cannot be removed.
2. The XW9Z-VL2MF cannot be installed after wiring.
3. With the XW9Z-VL2MF installed, crimping terminals cannot be used. Use solid wires.
4. Make sure that the XW9Z-VL2MF is securely installed. IP20 cannot be achieved when installed loosely, and electric shocks may occur.

Instructions

Contact Bounce

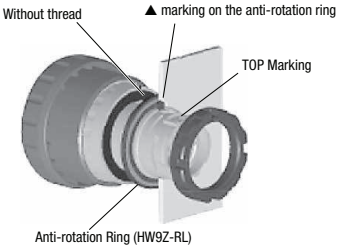
When the button is reset by pulling or turning, the NC main contacts will bounce. When pressing the button, the NO monitor contacts will bounce.
When designing a control circuit, take the contact bounce time into consideration (reference value: 20 ms).

LED Illuminated Switches

An LED lamp is built into the contact block and cannot be replaced.

Installing the Anti-rotation Ring HW9Z-RL

Align the side without thread on the operator with TOP marking, the small ▲ marking on the anti-rotation ring, and the recess on the mounting panel.

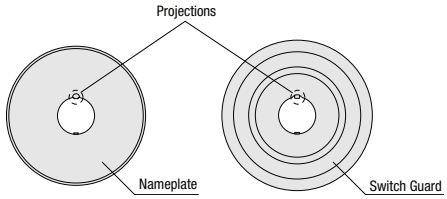


Installing the Nameplate

Align the side without thread on the operator with TOP marking, the projection on the nameplate, and the recess on the mounting panel.

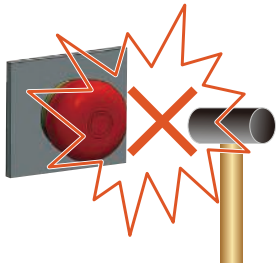
Nameplate or Switch Guard

When anti-rotation is not required, remove the projection from the nameplate or switch guard using pliers.



Handling

Do not expose the switch to excessive shocks and vibrations, otherwise the switch may be deformed or damaged, causing malfunction or operation failure.



ø22 HW Series Emergency Stop Switches

Emergency Stop Switches (w/Removable Contact Block) Specifications

Standards

Applicable Standards	Mark	File No. or Organization
UL508	UL LISTED	UL Listing File No. E68961
CSA C22.2 No. 14	SP	File No. LR92374
EN60947-5-5	TÜV	TÜV Rheinland
	CE	EU Low Voltage Directive
GB14048.5	CCC	CCC No.2005103050145656

Contact Ratings

Contact Block	Rated Insulation Voltage	600V
	Rated Thermal Current	10A
	Contact Ratings by Utilization Category IEC 60947-5-1	AC-15 (A600) DC-13

Characteristics

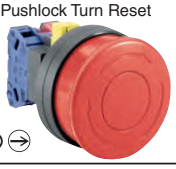
Contact Ratings by Utilization Category

Operational Voltage			24V	48V	50V	110V	220V	440V
Operational Current	AC 50/60 Hz	AC-12 Control of resistive loads and solid state loads	10A	—	10A	10A	6A	2A
		AC-15 Control of electromagnetic loads (> 72 VA)	10A	—	7A	5A	3A	1A
	DC	DC-12 Control of resistive loads and solid state loads	8A	4A	—	2.2A	1.1A	—
		DC-13 Control of electromagnets	4A	2A	—	1.1A	0.6A	—

Specifications

Operating Temperature	–25 to +60°C (no freezing)
Storage Temperature	–40 to +80°C
Operating Humidity	45 to 85% RH (no condensation)
Operating Force	50N
Minimum Force Required for Direct Opening Action	5.5 mm
Maximum Operator Stroke	10 mm
Contact Resistance	50 mΩ maximum (initial value)
Insulation Resistance	100 MΩ minimum (500V DC megger)
Dielectric Strength	Between live and dead metal parts Between terminals of different poles Between terminals of the same pole 2,500V AC, 1 minute
Vibration Resistance	Damage limits: 30 Hz, amplitude 1.5 mm Operating extremes: 5 to 55 Hz, amplitude 0.5 mm
Shock Resistance	Damage limits: 1000 m/s² Operating extremes: 100 m/s²
Operating Frequency	900 operations/h
Life	Mechanical: 500,000 operations minimum (push-pull: 250,000 operations) Electrical: 500,000 operations minimum (push-pull: 250,000 operations) (at 900 operations/h, duty ratio 40%)
Degree of Protection	IP65 (IEC 60529)
Terminal Style	M3.5 screw
Weight	76g (HW1B-V322) 99g (HW1B-X422R) 54g (HW1B-Y202) 79g (HW1B-V422R-EMO)

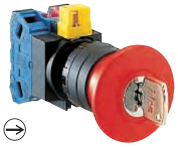
Pushlock Turn Reset Switches (with Removable Contact Block)

Shape	Contact	Part No.	Button Color
ø29mm Mushroom Pushlock Turn Reset HW1B-V3 	1NC	**HW1B-V301①**	Specify a button color code in place of ① in the Part No. R: red Y: yellow
	1NO-1NC	**HW1B-V311①**	
	2NC	**HW1B-V302①**	
	2NO-2NC	**HW1B-V322①**	
ø40mm Mushroom Pushlock Turn Reset HW1B-V4 	1NC	**HW1B-V401①**	
	1NO-1NC	**HW1B-V411①**	
	2NC	**HW1B-V402①**	
	2NO-2NC	**HW1B-V422①**	
ø60mm Mushroom Pushlock Turn Reset HW1B-V5 	1NC	**HW1B-V501①**	
	1NO-1NC	**HW1B-V5⑥1①**	
	2NC	**HW1B-V502①**	
	2NO-2NC	**HW1B-V522①**	

- Yellow buttons cannot be used as emergency stop switches in compliance with EN standards.
- When pressed, the button is held depressed. The button is released by turning clockwise.
- Pushlock turn reset switches with one or three contact blocks contain a dummy block.
- Safety lever lock HW9Z-LS is supplied with the switch.
- Other contact arrangements and gold-plated silver contacts are also available. See page 35.

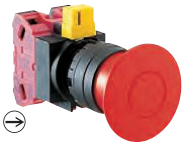
HW Series Emergency Stop Switches ø22

Pushlock Key Reset Switches (with Removable Contact Block)

Shape	Contact	Part No.	Button Color
ø40mm Mushroom Pushlock Key Reset HW1B-X4 	1NC	**HW1B-X401R**	Red only
	1NO-1NC	**HW1B-X411R**	
	2NC	**HW1B-X402R**	
	2NO-2NC	**HW1B-X422R**	

- When pressed, the button is held depressed. The button is released by turning the key clockwise.
- Pushlock key reset switches with one or three contact blocks contain a dummy block.
- Two identical keys and safety lever lock HW9Z-LS are supplied with the switch.
- Safety lever lock HW9Z-LS is supplied with the switch.
- Other contact arrangements and gold-plated silver contacts are also available. See Part No. Development.

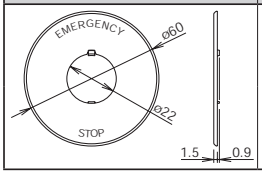
Push-Pull Switches (with Removable Contact Block)

Shape	Contact	Part No.	Button Color
ø40mm Mushroom Push-Pull (2-position) HW1B-Y2 	1NC	**HW1B-Y201①**	Specify a button color code in place of ① in the Part No. R: red Y: yellow
	1NO-1NC	**HW1B-Y211①**	
	2NC	**HW1B-Y202①**	

- The button is maintained at either pulled or depressed position.
- Push-pull switches are available with one or two contact blocks.
- Push-pull switches with one contact block contain a dummy block.
- Safety lever lock HW9Z-LS is supplied with the switch.

Accessory

Nameplate (for ø22 Emergency Stop Switches)

Shape	Name	Part No.	Legend	Package Quantity	Remarks
	Nameplate for Emergency Stop Switch (See page 36 for panel cut-out.)	**HWAV-0-Y**	(blank)	1	Background: Yellow Legend: Black Applicable panel thickness: 0.8 to 4.5 mm Material: Polyamide Not applicable for ø60 mm mushroom buttons. Legend "EMERGENCY STOP" is indicated outside a ø44mm circle.
		HWAV-27-Y	EMERGENCY STOP		

- EMERGENCY OFF and white nameplates (blank) also available. See page 61 and 64 for details.

Part No. Development

Emergency Stop Switches (w/Removable Contact Block)

For emergency stop purposes, these switches must contain at least one NC contact block.

HW1B-V4 11 R -MAU

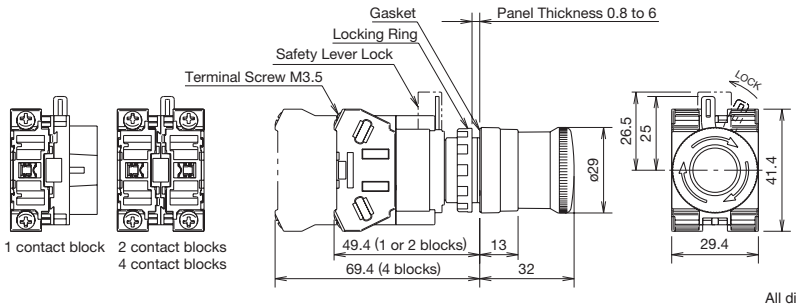
- Optional contact
  - MAU: Gold-plated silver contact
- Button/lens color code
- Contact arrangement code
  - 01: 1NC
  - 02: 2NC
  - 12: 1NO-2NC
  - 31: 3NO-1NC
  - 13: 1NO-3NC
  - 11: 1NO-1NC
  - 21: 2NO-1NC
  - 03: 3NC
  - 22: 2NO-2NC
  - 04: 4NC

Note: Push-pull HW1B-Y2 can have a maximum of two contact blocks.

ø22 HW Series Emergency Stop Switches

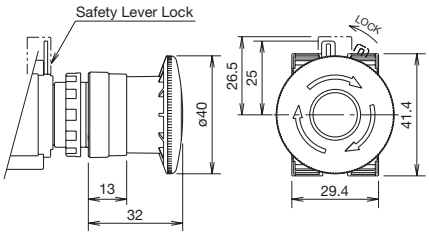
Dimensions

ø29mm Pushlock Turn Reset
HW1B-V3

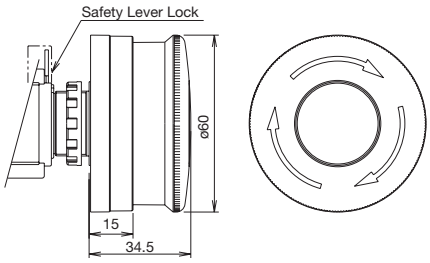


All dimensions in mm.

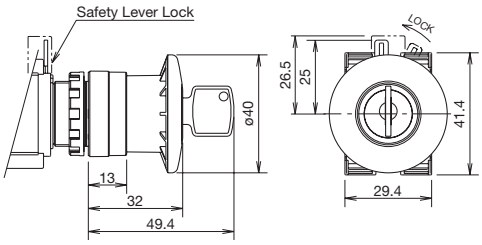
ø40mm Pushlock Turn Reset
HW1B-V4



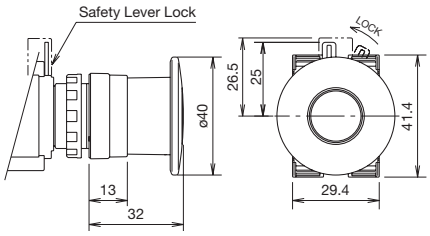
ø60mm Pushlock Turn Reset
HW1B-V5



ø40mm Pushlock Key Reset
HW1B-X4

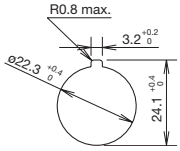


ø40mm Push-Pull
HW1B-Y2



All dimensions in mm.

Panel Cut-Out



The minimum mounting centers shown below are applicable to emergency stop switches with one layer of contact blocks (two contact blocks). When two layers of contact blocks are mounted, determine the minimum mounting centers in consideration of convenience for wiring.

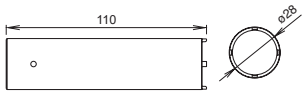
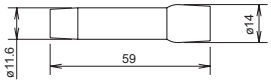
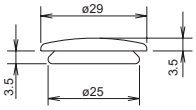
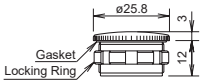
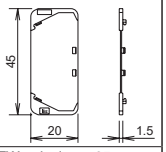
Minimum Mounting Centers for Emergency Stop Switches

Unit	Vertical Spacing	Horizontal Spacing
HW1B-V3 HW1B-V4 HW1B-X4 HW1B-Y2	50 mm minimum	50 mm minimum
HW1B-V5	60 mm minimum	60 mm minimum

Note: When using the safety lever lock, determine the vertical spacing in consideration of convenience for installing and removing the safety lever lock. Recommended vertical spacing: 100 mm

HW Series Emergency Stop Switches ø22

Accessories

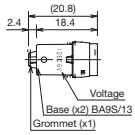
Shape	Material	Part No.	Ordering No.	Package Quantity	Description & Dimensions (mm)
Locking Ring Wrench 	Metal (weight: approx. 150g)	MW9Z-T1	MW9Z-T1	1	• Used to tighten the locking ring when installing the HW switch onto a panel. • Tighten the locking ring to a torque of 2.0 N·m. 
Lamp Holder Tool 	Rubber	OR-55	OR-55	1	• Used to install and remove the LED lamps. 
Rubber Mounting Hole Plug 	Rubber (black)	OB-31	OB-31PN05	5	• Used to plug the unused ø22.2mm mounting holes. 
Metallic Mounting Hole Plug 	Diecast Metal (locking ring: plastic)	LW9Z-BM	LW9Z-BM	1	• Used to plug the unused ø22.2mm mounting holes. • Tighten the locking ring to a torque of 1.2 N·m. • IP66 • Mounting panel thickness: 0.8 to 6 mm 
Barrier 	Plastic	HW-VG1	HW-VG1PN10	10	• Used to prevent contact between adjacent lead wires when units are mounted closely. Barriers should always be used in close mounting. 
Ring Adapter 	Rubber	HW9Z-A25	HW9Z-A25PN05	5	• Used to install the HW/TW units into ø25 mounting holes. • IP65 • Cannot be used with anti-rotation ring and nameplate. • Mounting panel thickness: 1.2 to 6.0 mm
Ring Adapter 	Adapter: Plastic Washer: Metal	HW9Z-A30	HW9Z-A30PN02	2	• Used to install the HW units into ø30 mounting holes (except for HW1E and HW1B-M5/V5). • IP65 • Cannot be used with anti-rotation ring, nameplate, full-shroud illuminated pushbuttons, pushbutton selectors, and mono-lever switches. • Mounting panel thickness: 1.6 to 4.0 mm
Ring Adapter 	Adapter: Rubber Washer: Metal	HW9Z-A30E	HW9Z-A30EPN02	2	• Used to install the HW1E units into ø30 mounting holes. • IP65 • Cannot be used with anti-rotation ring and nameplate. • Mounting panel thickness: 1.6 to 3.8 mm

ø22 HW Series Emergency Stop Switches

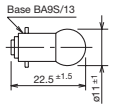
Maintenance Parts

Shape	Material	Part No.	Ordering No.	Package Quantity	Description & Dimensions (mm)
Safety Lever Lock 	Plastic	**HW9Z-LS**	**HW9Z-LSPN10**	10	• Yellow • 1 piece included as standard
Locking Ring 	Polyamide	**HW9Z-LN**	**HW9Z-LNPN05**	5	• Black
Gasket 	Nitryl rubber	**HW9Z-WM**	**HW9Z-WMPN10**	10	
Spare Key 	Metal Brass, nickel-plated	**HW9Z-SK-231**	**HW9Z-SK-231PN02**	2	• For pushlock key reset switches

LED Lamps (LSTD)

Shape	Rated Operating Voltage	Current Draw AC	Current Draw DC	Part No.	Ordering No.	Package Quantity	Base	Dimensions (mm)
	6V AC/DC	17 mA (A, R, W, Y) 8 mA (G, PW, S)	14 mA (A, R, W, Y) 5.5 mA (G, PW, S)	**LSTD-6R**	**LSTD-6R**	1	BA9S/13	
					LSTD-6RPN10	10		
	12V AC/DC	11 mA	10 mA	**LSTD-1R**	**LSTD-1R**	1		
					LSTD-1RPN10	10		
	24V AC/DC	11 mA	10 mA	**LSTD-2R**	**LSTD-2R**	1		
					LSTD-2RPN10	10		

Incandescent Lamps (LS)

Shape	Rated Operating Voltage	Lamp Ratings	Part No.	Package Quantity	Dimensions (mm)
	6V AC/DC	1W (6.3V)	**LS-6**	1	
	12V AC/DC	1W (18V)	**LS-8**		
	18V AC/DC	1W (24V)	**LS-2**		
	24V AC/DC	1W (30V)	**LS-3**		

HW Series Emergency Stop Switches ø22

⚠ Safety Precautions

- Turn off the power to the HW series control units before starting installation, removal, wiring, maintenance, and inspection of the products. Failure to turn power off may cause electrical shocks or fire hazard.
- To avoid a burn on your hand, use the lamp holder tool when replacing lamps.
- For wiring, use wires of a proper size to meet the voltage and current requirements. Tighten the M3.5 terminal screws to a tightening torque of 1.0 to 1.3 N·m. Failure to tighten terminal screws may cause overheat and fire.

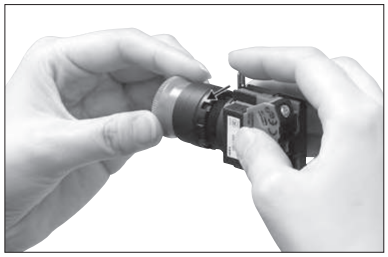
Instructions

Panel Mounting

Remove the contact block from the operator (for transformer pilot lights, remove the transformer from the illumination unit). Remove the locking ring from the operator. Insert the operator into the panel cut-out from the front, tighten the locking ring from the back, then install the contact block to the operator.

Removing and Installing the Contact Block

1. To remove the operator from the contact block, turn the locking lever in the direction of the arrow shown below. Then the operator can be pulled out.
2. To reinstall, place the TOP markings on the operator and the contact block mounting adapter in the same direction, and insert the operator into the contact block mounting adapter. Then turn the locking lever in the opposite direction.



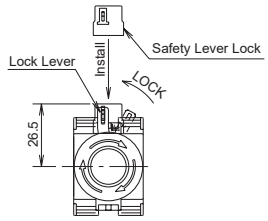
Notes for Panel Mounting

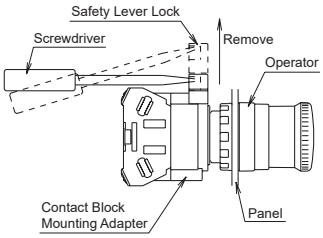
When mounting the operator onto a panel, use the optional locking ring wrench (MW9Z-T1) to tighten the locking ring. Tightening torque must not exceed 2.0 N·m. Do not use pliers. Excessive tightening will damage the locking ring.

Safety Lever Lock

IDEC strongly recommends using the safety lever lock (HW9Z-LS, yellow) to prevent heavy vibration or maintenance personnel from unlocking contacts.

1. HW series can be mounted vertically with a minimum spacing of 50 mm (70 mm for mono-lever switches) but spacing should be determined to ensure easy operation.
2. Mount the control unit onto the panel, lock the lever, and strongly push in the safety lever lock to install.
3. When the spacing is narrower than the recommended value, with the lever unlocked, mount the safety lever lock and insert the contact unit to the operator. Then, lock the lever and strongly push in the safety lever lock to install.
4. To remove the safety lever lock, insert a flat screwdriver into the safety lever lock and push upwards.





ø22 YW Series Emergency Stop Switches

Emergency Stop Switches Specifications

Standards

Applicable Standards	Mark	File No. or Organization
UL508 CSA C22.2 No.14	c UL us LISTED	UL/c-UL Listed File No.E68961
EN60947-5-5	TÜV	TÜV SÜD
	CE	EU Low Voltage Directive
GB14048.5	CCC	CCC No. 2006010305196875

Specifications

Operating temperature	–20 to +55°C (no freezing)
Operating humidity	45 to 85% RH (no condensation)
Storage temperature	–45 to +80°C (no freezing)
Storage humidity	95% RH maximum
Degree of Protection	From panel front: IP65 (IEC 60529) Terminal: IP20 (IEC 60529)
Insulation Resistance	100 MΩ
Dielectric Strength	Contact block: 2,500V, 1 minute Pilot light: 2,000V, 1 minute
Vibration Resistance	Operating extremes / Damage limits: 10 to 500 Hz, amplitude 0.35 mm, acceleration 50 m/s²
Shock Resistance	Operating extremes: 150 m/s² (15G) Damage limits: 1,000 m/s² (100G)
Mechanical Life (minimum operations)	250,000 (single contact block)
Electrical Life (minimum operations)	100,000 (single contact block)

Contact Ratings (Contact Block)

Rated Insulation Voltage		600V			
Rated Thermal Current		10A			
Operating Voltage		24V	120V	240V	380V
AC 50/60 Hz	Resistive Load (AC-12)	10A	10A	6A	2A
	Inductive Load (AC-15)	10A	6A	3A	1.9A
DC	Resistive Load (DC-12)	8A	2.2A	1.1A	–
	Inductive Load (DC-13)	4A	1.1A	0.55A	–

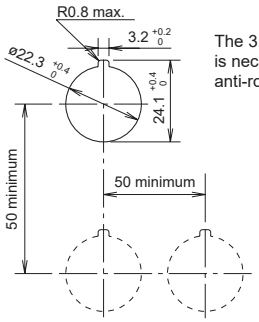
LED Lamp Ratings

Part No.	Rated Voltage	Rated Current
LSED-6R	6V AC/DC	10 mA
LSED-1R	12V AC/DC	14 mA
LSED-2R	24V AC/DC	14 mA
LSED-HR	110/120V AC/DC	5.5 mA
LSED-M3R	230/240V AC/DC	2.7 mA

Incandescent Lamp Ratings

Part No.	Rated Voltage	Ratings
LS-T6	6V AC/DC	6.3V 1W
LS-T8	12V AC/DC	18V 1W
LS-T3	24V AC/DC	30V 1W

Mounting Hole Layout



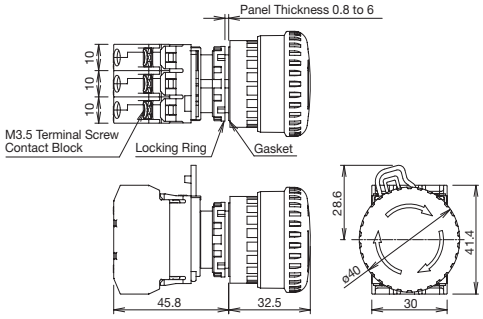
The 3.2-mm-wide key recess is necessary when the anti-rotation ring is used.

YW Series Emergency Stop Switches ø22

Pushlock Pull/Turn Reset

Style	Contact	Part No.	Button Color Code
ø40mm Mushroom 	1NC	YW1B-V4E01R	Red only
	2NC	YW1B-V4E02R	
	3NC	YW1B-V4E03R	
	1NO-1NC	YW1B-V4E11R	
	1NO-2NC	YW1B-V4E12R	
	2NO-1NC	YW1B-V4E21R	

Dimensions



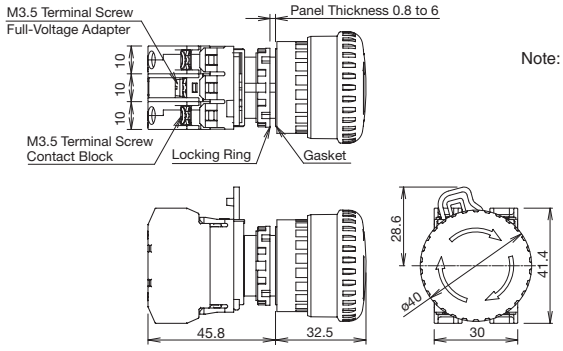
Note: When pressed, the button is locked in the depressed position, and is reset when either pulled or turned clockwise.

LED/Incandescent Illuminated Pushlock Pull/Turn Reset

Style	Lamp	Contacts	Part No.	③ Operating Voltage Code	Lens Color Code
ø40mm Mushroom 	Without Lamp	1NC	YW1L-V4E01Q0R	0 (without lamp) 250V AC/DC max.	Red only
		2NC	YW1L-V4E02Q0R		
		1NO-1NC	YW1L-V4E11Q0R		
	LED	1NC	YW1L-V4E01Q③R	2 (6V AC/DC) 3 (12V AC/DC) 4 (24V AC/DC) H (110/120V AC/DC) M3 (230/240V AC/DC)	
		2NC	YW1L-V4E02Q③R		
		1NO-1NC	YW1L-V4E11Q③R		
	Incandescent	1NC	YW1L-V4E01Q③R	5 (6V AC/DC) 6 (12V AC/DC) 7 (24V AC/DC)	
		2NC	YW1L-V4E02Q③R		
		1NO-1NC	YW1L-V4E11Q③R		

Note: Specify an operating voltage code in place of ③ in the Part No.

Dimensions

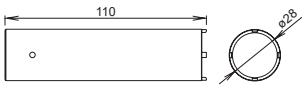
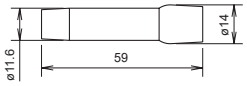
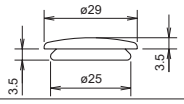
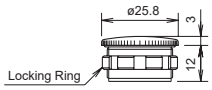
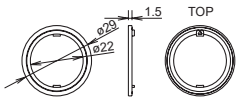
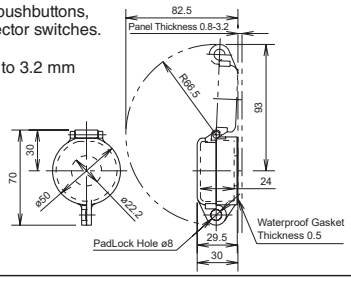


Note: When pressed, the button is locked in the depressed position, and is reset when either pulled or turned clockwise.

All dimensions in mm.

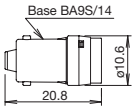
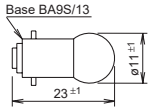
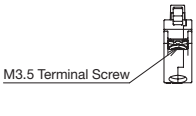
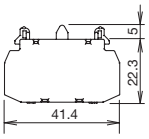
ø22 YW Series Emergency Stop Switches

Accessories

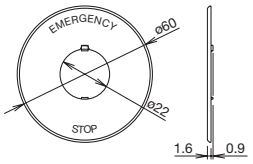
Name & Shape	Part No.	Description & Dimensions (mm)	Package Quantity
Locking Ring Wrench 	**MW9Z-T1**	Metallic tool used to tighten the plastic locking ring when installing the YW series control unit on a panel. 	1
Lamp Holder Tool 	**OR-55**	Made of rubber. Used for replacing lamps. 	1
Rubber Mounting Hole Plug 	**OB-31PN05**	Used for plugging unused mounting holes in the panel. Color: Black 	5
Metallic Mounting Hole Plug 	**LW9Z-BM**	Used for plugging unused mounting holes in the panel. Weight: Approx. 18g 	1
Anti-Rotation Ring 	**HW9Z-RLPN10**	Prevents rotation of switches in panel. Mainly used with selector switches when no nameplate is used. With waterproof gasket (IP65). Made of plastic (black). Applicable panel thickness: 1.2 to 4.5 mm 	10
Padlock Cover 	**HW9Z-KL1**	Plastic hinged cover to protect pushbuttons, illuminated pushbuttons, or selector switches. Degree of protection: IP65. Applicable panel thickness: 0.8 to 3.2 mm 	1

YW Series Emergency Stop Switches ø22

Maintenance Parts

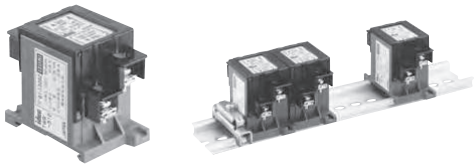
Name & Shape	Part No.	Description & Dimensions (mm)			Package Quantity
LED Lamp 	**LSED-6R**	6V AC/DC			1
	LSED-1R	12V AC/DC			
	LSED-2R	24V AC/DC			
	LSED-HR	110/120V AC/DC			
	LSED-M3R	230/240V AC/DC			
Incandescent Lamp 	**LS-T6P**	6.3V, 1W	One pack contains 100 incandescent lamps.		100
	LS-T8P	18V, 1W			
	LS-T3P	30V, 1W			
Single Contact Block 	**YW-E10P**	Color: blue Contact: 1NO			10
	YW-E01P	Color: reddish purple Contact: 1NC			

Nameplate (for ø22 Emergency Stop Switches)

Description	Legend	Material	Part No.	Ordering No.	Package Quantity	Dimensions (mm)
HWAV	Blank	Plastic (yellow) 1.5 mm thick	**HWAV-0-Y**	**HWAV-0-Y**	1	 • Legend "Emergency Stop" is indicated outside a ø44mm circle.
	EMERGENCY STOP		**HWAV-27-Y**	**HWAV-27-Y**	1	

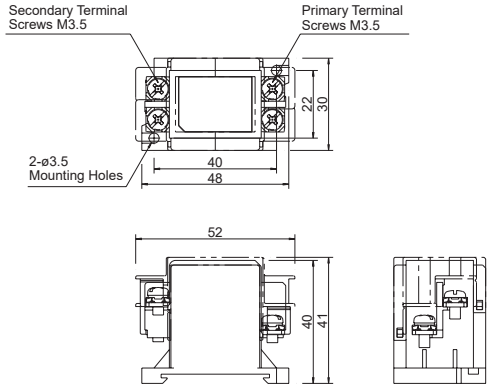
ø22 YW Series Emergency Stop Switches

Din Rail Mount Transformer



Primary Voltage (50/60 Hz)	Part No.	Applicable Lamp Rating
110V AC	**TWR516**	One full voltage illuminated unit containing LED lamp LSED-6 (6V AC/DC) or incandescent lamp LS-T6 (6.3V)
115V AC	**TWR5116**	
120V AC	**TWR5126**	
220V AC	**TWR526**	
230V AC	**TWR5236**	
240V AC	**TWR5246**	
380V AC	**TWR5386**	
440V AC	**TWR546**	
480V AC	**TWR5486**	

Dimensions (mm)



Note: Finger-safe terminal cover is supplied with the transformer.

Safety Precautions

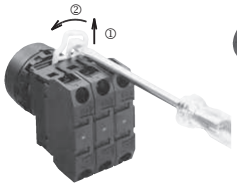
- Turn off the power to the YW series control units before starting installation, removal, wiring, maintenance, and inspection of the products. Failure to turn power off may cause electrical shocks or fire hazard.
- To avoid burning your hand, use the lamp holder tool when replacing lamps.
- For wiring, use wires of a proper size to meet the voltage and current requirements. Tighten the M3.5 terminal screws to a tightening torque of 1.0 to 1.3 N·m. Failure to tighten the terminal screws may cause overheating and fire.

YW Series Emergency Stop Switches ø22

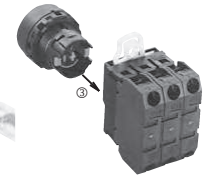
Instructions

Panel Mounting

- Remove the contact block from the operator. Remove the locking ring from the operator. Insert the operator into the panel cut-out from the front, tighten the locking ring from the back, then install the contact block to the operator.



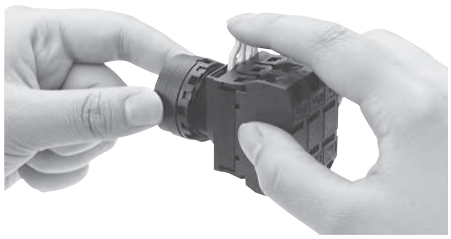
① Pull up the locking lever.
② Turn the lever to the left.



③ Pull out the contact block.

Removing and Installing the Contact Block

1. To remove the operator from the contact block, pull up the locking lever and turn it to the left. Then the operator can be pulled out.
2. To reinstall, place the TOP marking on the operator and the idec marking on the contact block mounting adapter in the same direction, and insert the operator into the contact block mounting adapter. Then turn the locking lever to the right.



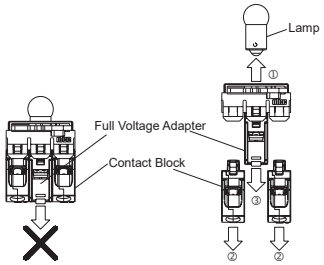
Notes for Panel Mounting

Use the optional locking ring wrench (MW9Z-T1) to mount the operator onto a panel. Tightening torque must not exceed 2.0 N·m. Do not use pliers. Excessive tightening will damage the locking ring.

Removing Contact Blocks and Full Voltage Adapter

Insert a flat screwdriver between the latch and contact block mounting adapter, and disengage the latch.

Make sure to remove the lamp and contact blocks before removing the full voltage adapter.

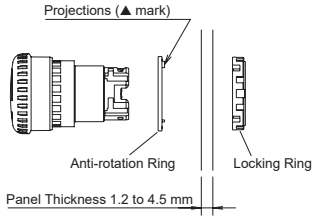


ø22 YW Series Emergency Stop Switches

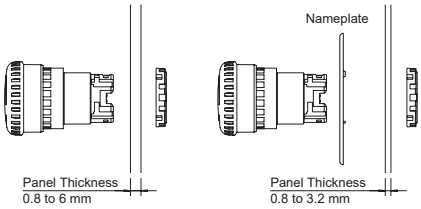
Instructions

Tightening Torque for Terminal Screws
Tighten terminal screws to a torque between 1.0 and 1.3 N·m.

Anti-rotation Ring and Mounting Panel
Turn the TOP marking on the operator and the ▲ mark on the anti-rotation ring to the recess on the mounting panel.



Mounting Panel Thickness
The mounting panel must be 0.8 to 6.0 mm in thickness. When optional accessories are added, the applicable panel thickness changes as shown below.



Contact Bounce
When the button is reset by pulling or turning, the NC main contacts will bounce. When pressing the button, the NO monitor contacts will bounce.
When designing a control circuit, take the contact bounce time into consideration (reference value: 20 ms).

Nameplate
When anti-rotation is not required, remove the projection from the nameplate using pliers.

Handling
Do not expose the switch to excessive shock and vibration, otherwise the switch may be deformed or damaged, causing malfunction or operation failure.

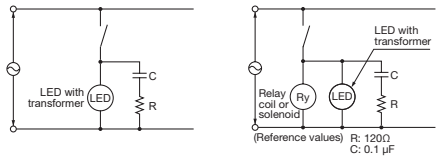
LED Illumination
LED lamps consist of semiconductors. If the applied voltage exceeds the rated voltage,
LED elements deteriorate due to overheat, resulting in significant decrease in luminance, hue change, or failure of lighting. Also, if extraneous noise, transient voltage, or transient current is applied to the circuit, similar effects will be caused. When using LED lamps, observe the following instructions.

Rated Voltage
The LED illuminated units are rated at 6V, 12V, 24V, 110V, or 230/240V AC/DC, and can be used within ±10% the rated voltage of either AC or DC, except the 230/240V AC/DC can be used on 250V AC/DC maximum.

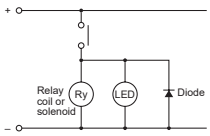
DC Power
1. Switching power supply
   Regulated voltage from switching power supply is best suited. Make sure to use within the rated voltage of the LED lamp.
2. Rechargeable battery
   Note that the battery voltage may exceed the rated voltage of the LED lamp while the battery is being charged and immediately after the charging is complete. Be sure to use the LED lamp on a voltage of ±10% the rated voltage, except the 230/240V AC/DC on 250V AC/DC maximum.
3. Full-wave rectification
   Since the LED lamp is AC/DC compatible, a diode bridge for recti fication is not necessary. If the LED lamp is used on a full-wave rectification current through a diode bridge, the rectifier diodes wil reduce the voltage, resulting in lower luminance.
4. Single-phase half-wave rectification
   This is not suitable for the power source of LED lamps. Use constant-voltage DC power.

Noise
LED elements deteriorate due to extraneous noise, resulting in significant decrease in luminance, hue change, or failure of lighting. When such effects are anticipated, take a protection measure shown below, such as RC elements or a surge absorber.

[Protection Example 1] For AC circuit

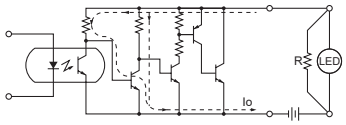


[Protection Example 2] For DC circuit



Countermeasures against Dim Lighting
1. Leakage currents through the transistors or a contact protection circuit may cause the LED lamp to illuminate dimly even when the output is off.
2. When the LED lamp is illuminated by a transistor output, take the following measure.

[Circuit Example]
Connect shunt resistor R in parallel with the LED lamp.



Io: Leakage current when the output is off
R: Shunt resistor

Ordering Information
- When ordering, specify the Part No. and quantity.
- Replacement contact blocks are supplied in a package containing 10 pieces.

ø30 XN Series Emergency Stop Switches

ø30 mm, 4-contact Emergency Stop Switch. Padlockable and flush bezel are available.

- Padlockable, flush bezel, ø60mm jumbo mushroom, illuminated, LED push-on are available.
- IDEC's original "Safe break action" and reverse energy structure ensure the highest level of safety.
- Safety lock mechanism (IEC 60947-5-5, 6.2)
- Direct opening action mechanism (IEC 60947-5-5, 5.2, IEC60947-5-1, Annex K)
- Short depth behind the panel – only 47.7 mm for 4-contact, illuminated (flush bezel: 60.4 mm, padlockable: 61.4 mm)
- Padlockable can be locked using padlocks when latched (main contact: OFF). The rugged aluminum diecast shroud allows for installing a maximum of 20 padlocks using a hasp (total weight: 1500g maximum).
- Silver with gold contacts.
- Red (Munsell 5R4/12) or bright red (Munsell 7.5R4.5/14) colors are available.

Standards and Specifications

Contact Ratings

NC main contacts/NO monitor contacts

Rated Insulation Voltage (Ui)				250V		
Rated Thermal Current (Ith)				5A		
Rated Operating Voltage (Ue)				30V	125V	250V
Rated Operating Current	Main Contacts	AC 50/60 Hz	Resistive Load (AC-12)	–	5A	3A
			Inductive Load (AC-15)	–	3A	1.5A
		DC	Resistive Load (DC-12)	2A	0.4A	0.2A
			Inductive Load (DC-13)	1A	0.22A	0.1A
	Monitor Contacts	AC 50/60 Hz	Resistive Load (AC-12)	–	1.2A	0.6A
			Inductive Load (AC-14)	–	0.6A	0.3A
		DC	Resistive Load (DC-12)	2A	0.4A	0.2A
			Inductive Load (DC-13)	1A	0.22A	0.1A
Contact Material				Gold-plated Silver		

- Minimum applicable load: 5V AC/DC, 1 mA (reference value) (May vary depending on the operating conditions and load types.)
- The rated operating currents are measured at resistive/inductive load types specified in IEC 60947-5-1.

Illumination Ratings (LED)

Rated Voltage	Operating Voltage	Rated Current
24V AC/DC	24V AC/DC ±10%	15 mA

Note: An LED lamp is built into the contact block and cannot be replaced.

Specifications

Applicable Standards	IEC60947-5-1, EN60947-5-1 IEC60947-5-5, EN60947-5-5 JIS C8201-5-1, UL508, UL991, NFPA79 CSA C22.2 No. 14, GB14048.5
Operating Temperature	Non-illuminated: –25 to +60°C (no freezing) Illuminated: –25 to +55°C (no freezing)
Storage Temperature	–45 to +80°C
Operating Humidity	45 to 85% RH (no condensation)
Minimum Force Required for Direct Opening Action	80N
Minimum Operator Stroke Required for Direct Opening Action	4.0 mm
Maximum Operator Stroke	4.5 mm
Contact Resistance	50 mΩ maximum (initial value)
Insulation Resistance	100 MΩ minimum (500V DC megger)
Overvoltage Category	II
Impulse Withstand Voltage	2.5 kV
Pollution Degree	3
Operating Frequency	900 operations/hour
Shock Resistance	Operating extremes: 150 m/s² Damage limits: 1000 m/s²
Vibration Resistance	Operating extremes: 10 to 500 Hz, amplitude 0.35 mm, acceleration 50 m/s² Damage limits: 10 to 500 Hz, amplitude 0.35 mm, acceleration 50 m/s²
Durability (at 900 operations/h, on-duration 40%)	Mechanical: 250,000 operations minimum Electrical: 100,000 operations minimum 250,000 operations minimum (24V AC/DC, 100 mA)
Degree of Protection	Operator: IP65 (IEC60529) Terminal: IP20 (when XW9Z-VL2MF is installed)
Short-circuit Protection	250V/10A fuse (Type aM, IEC60269-1/IEC60269-2)
Conditional Short-circuit Current	1000A
Terminal Style	M3 screw terminal
Recommended Tightening Torque for Terminal Screw	0.6 to 1.0 N·m
Recommended Tightening Torque for Locking Ring	2.5 N·m
Applicable Wire Size	0.75 to 1.25 mm² (AWG18 to 16)
Total Weight of a Hasp and Padlocks	1500g maximum (padlockable)
Reinforced Insulation (IEC 60664-1)	Between live part and metal bezel (flush bezel, padlockable)
Weight	83g (XN1E-LV404Q4MR) 93g (XN1E-BV504MR) 89g (XN5E-LV404Q4MR) 120g (XN4E-LL404Q4MR)

ø30 XN Series Emergency Stop Switches

XN Series Emergency Stop Switches

Plastic Bezel

Non-illuminated Pushlock Pull/Turn Reset (Screw Terminal)

Shape	NC Main Contact	NO Monitor Contact	Part No.		①Operator Color Code
			IP20 Fingersafe Terminal	w/Terminal Cover	
ø40mm Mushroom 	1NC	—	XN1E-BV401MF①	XN1E-BV401M①	R: Red RH: Bright red
	2NC	—	XN1E-BV402MF①	XN1E-BV402M①	
	3NC	—	XN1E-BV403MF①	XN1E-BV403M①	
	4NC	—	XN1E-BV404MF①	XN1E-BV404M①	
	1NC	1NO	XN1E-BV411MF①	XN1E-BV411M①	
	2NC	1NO	XN1E-BV412MF①	XN1E-BV412M①	
	3NC	1NO	XN1E-BV413MF①	XN1E-BV413M①	
	2NC	2NO	XN1E-BV422MF①	XN1E-BV422M①	
ø60mm Jumbo Mushroom 	1NC	—	XN1E-BV501MF①	XN1E-BV501M①	
	2NC	—	XN1E-BV502MF①	XN1E-BV502M①	
	3NC	—	XN1E-BV503MF①	XN1E-BV503M①	
	4NC	—	XN1E-BV504MF①	XN1E-BV504M①	
	1NC	1NO	XN1E-BV511MF①	XN1E-BV511M①	
	2NC	1NO	XN1E-BV512MF①	XN1E-BV512M①	
	3NC	1NO	XN1E-BV513MF①	XN1E-BV513M①	
	2NC	2NO	XN1E-BV522MF①	XN1E-BV522M①	

- Specify a color code in place of ① in the Part No.
- Only solid wires can be used on the IP20 fingersafe terminal switches.

Illuminated Pushlock Pull/Turn Reset (Screw Terminal)

Shape	Illumination	Rated Voltage	NC Main Contact	NO Monitor Contact	Part No.		Operator Color
					IP20 Fingersafe Terminal	w/Terminal Cover	
ø40mm Mushroom 	LED	24V AC/DC	1NC	—	XN1E-LV401Q4MFR	XN1E-LV401Q4MR	Red only
			2NC	—	XN1E-LV402Q4MFR	XN1E-LV402Q4MR	
			3NC	—	XN1E-LV403Q4MFR	XN1E-LV403Q4MR	
			4NC	—	XN1E-LV404Q4MFR	XN1E-LV404Q4MR	
			1NC	1NO	XN1E-LV411Q4MFR	XN1E-LV411Q4MR	
			2NC	1NO	XN1E-LV412Q4MFR	XN1E-LV412Q4MR	
			3NC	1NO	XN1E-LV413Q4MFR	XN1E-LV413Q4MR	
			2NC	2NO	XN1E-LV422Q4MFR	XN1E-LV422Q4MR	

- Only solid wires can be used on the IP20 fingersafe terminal switches.

Illuminated Push-ON Pushlock Pull/Turn Reset (Screw Terminal)

Shape	Illumination	Rated Voltage	NC Main Contact	NO Monitor Contact	Part No.		Operator Color
					IP20 Fingersafe Terminal	w/Terminal Cover	
ø40mm Mushroom 	LED	24V AC/DC	2NC	—	XN1E-TV402Q4MFR	XN1E-TV402Q4MR	Red only
			3NC	—	XN1E-TV403Q4MFR	XN1E-TV403Q4MR	
			2NC	1NO	XN1E-TV412Q4MFR	XN1E-TV412Q4MR	

- Push-ON is illuminated when the operator is latched, and turns off when reset.
- Only solid wires can be used on the IP20 fingersafe terminal switches.

Flush Bezel

Non-illuminated Pushlock Pull/Turn Reset (Screw Terminal)

Shape	NC Main Contact	NO Monitor Contact	Part No.		Operator Color Code
			IP20 Fingersafe Terminal	w/Terminal Cover	
ø40mm Mushroom 	1NC	—	XN5E-BV401MF①	XN5E-BV401M①	R: Red RH: Bright red
	2NC	—	XN5E-BV402MF①	XN5E-BV402M①	
	3NC	—	XN5E-BV403MF①	XN5E-BV403M①	
	4NC	—	XN5E-BV404MF①	XN5E-BV404M①	
	1NC	1NO	XN5E-BV411MF①	XN5E-BV411M①	
	2NC	1NO	XN5E-BV412MF①	XN5E-BV412M①	
	3NC	1NO	XN5E-BV413MF①	XN5E-BV413M①	
	2NC	2NO	XN5E-BV422MF①	XN5E-BV422M①	

- Specify a color code in place of ① in the Part No.
- Only solid wires can be used on the IP20 fingersafe terminal switches.

Illuminated Pushlock Pull/Turn Reset (Screw Terminal)

Shape	Illumination	Rated Voltage	NC Main Contact	NO Monitor Contact	Part No.		Operator Color
					IP20 Fingersafe Terminal	w/Terminal Cover	
ø40mm Mushroom 	LED	24V AC/DC	1NC	—	XN5E-LV401Q4MFR	XN5E-LV401Q4MR	Red only
			2NC	—	XN5E-LV402Q4MFR	XN5E-LV402Q4MR	
			3NC	—	XN5E-LV403Q4MFR	XN5E-LV403Q4MR	
			4NC	—	XN5E-LV404Q4MFR	XN5E-LV404Q4MR	
			1NC	1NO	XN5E-LV411Q4MFR	XN5E-LV411Q4MR	
			2NC	1NO	XN5E-LV412Q4MFR	XN5E-LV412Q4MR	
			3NC	1NO	XN5E-LV413Q4MFR	XN5E-LV413Q4MR	
			2NC	2NO	XN5E-LV422Q4MFR	XN5E-LV422Q4MR	

- Only solid wires can be used on the IP20 fingersafe terminal switches.

Illuminated Push-ON Pushlock Pull/Turn Reset (Screw Terminal)

Shape	Illumination	Rated Voltage	NC Main Contact	NO Monitor Contact	Part No.		Operator Color
					IP20 Fingersafe Terminal	w/Terminal Cover	
ø40mm Mushroom 	LED	24V AC/DC	2NC	—	XN5E-TV402Q4MFR	XN5E-TV402Q4MR	Red only
			3NC	—	XN5E-TV403Q4MFR	XN5E-TV403Q4MR	
			2NC	1NO	XN5E-TV412Q4MFR	XN5E-TV412Q4MR	

- Push-ON is illuminated when the operator is latched, and turns off when reset.
- Only solid wires can be used on the IP20 fingersafe terminal switches.

ø30 XN Series Emergency Stop Switches

XN Series Emergency Stop Switches

Padlockable

Non-illuminated Pushlock Turn Reset (Padlockable) (Screw Terminal)

Shape	NC Main Contact	NO Monitor Contact	Part No.		Operator Color
			IP20 Fingersafe Terminal	w/Terminal Cover	
ø44mm Mushroom 	1NC	—	XN4E-BL401MFRH	XN4E-BL401MRH	Bright red only
	2NC	—	XN4E-BL402MFRH	XN4E-BL402MRH	
	3NC	—	XN4E-BL403MFRH	XN4E-BL403MRH	
	4NC	—	XN4E-BL404MFRH	XN4E-BL404MRH	
	1NC	1NO	XN4E-BL411MFRH	XN4E-BL411MRH	
	2NC	1NO	XN4E-BL412MFRH	XN4E-BL412MRH	
	3NC	1NO	XN4E-BL413MFRH	XN4E-BL413MRH	
	2NC	2NO	XN4E-BL422MFRH	XN4E-BL422MRH	

- Only solid wires can be used on the IP20 fingersafe terminal switches.
- Padlocks and hasps are not supplied with the emergency stop switches and must be ordered separately. See D-050.

Illuminated Pushlock Turn Reset (Padlockable) (Screw Terminal)

Shape	Illumination	Rated Voltage	NC Main Contact	NO Monitor Contact	Part No.		Operator Color
					IP20 Fingersafe Terminal	w/Terminal Cover	
ø44mm Mushroom 	LED	24V AC/DC	1NC	—	XN4E-LL401Q4MFR	XN4E-LL401Q4MR	Red only
			2NC	—	XN4E-LL402Q4MFR	XN4E-LL402Q4MR	
			3NC	—	XN4E-LL403Q4MFR	XN4E-LL403Q4MR	
			4NC	—	XN4E-LL404Q4MFR	XN4E-LL404Q4MR	
			1NC	1NO	XN4E-LL411Q4MFR	XN4E-LL411Q4MR	
			2NC	1NO	XN4E-LL412Q4MFR	XN4E-LL412Q4MR	
			3NC	1NO	XN4E-LL413Q4MFR	XN4E-LL413Q4MR	
			2NC	2NO	XN4E-LL422Q4MFR	XN4E-LL422Q4MR	

- Only solid wires can be used on the IP20 fingersafe terminal switches.
- Padlocks and hasps are not supplied with the emergency stop switches and must be ordered separately. See D-050.

LED Push-ON Pushlock Turn Reset (Padlockable) (Screw Terminal)

Shape	Illumination	Rated Voltage	NC Main Contact	NO Monitor Contact	Part No.		Operator Color
					IP20 Fingersafe Terminal	w/Terminal Cover	
ø44mm Mushroom 	LED	24V AC/DC	2NC	—	XN4E-TL402Q4MFR	XN4E-TL402Q4MR	Red only
			3NC	—	XN4E-TL403Q4MFR	XN4E-TL403Q4MR	
			2NC	1NO	XN4E-TL412Q4MFR	XN4E-TL412Q4MR	

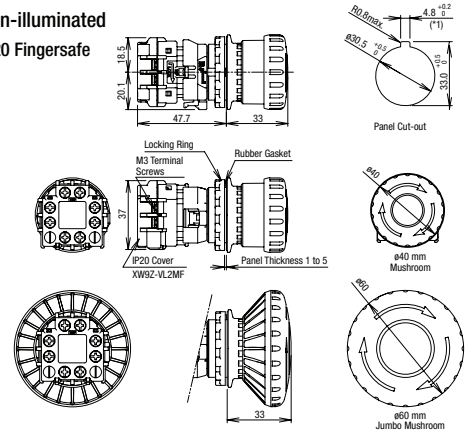
- Push-ON is illuminated when the operator is latched, and turns off when reset.
- Only solid wires can be used on the IP20 fingersafe terminal switches.
- Padlocks and hasps are not supplied with the emergency stop switches and must be ordered separately. See D-050.

Dimensions

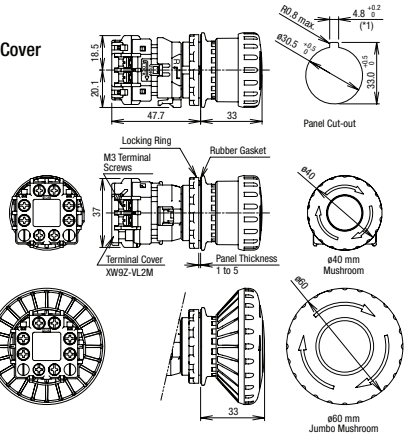
Plastic Bezel

Non-illuminated

IP20 Fingersafe

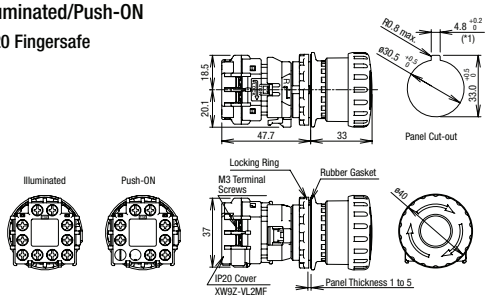


w/Terminal Cover

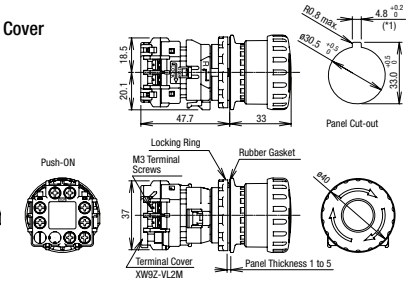


Illuminated/Push-ON

IP20 Fingersafe



w/Terminal Cover



*1) Make sure that the panel cut-out is as shown in the drawing as the operator has a projection for anti-rotation.

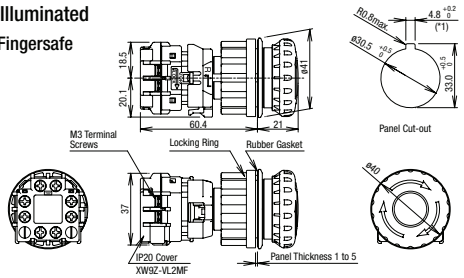
ø30 XN Series Emergency Stop Switches

Dimensions

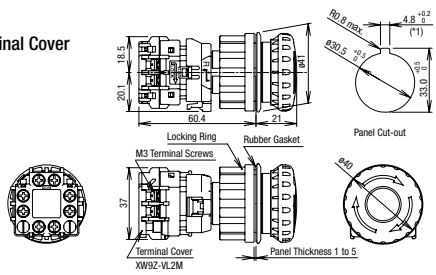
Flush Bezel

Non-Illuminated

IP20 Fingersafe

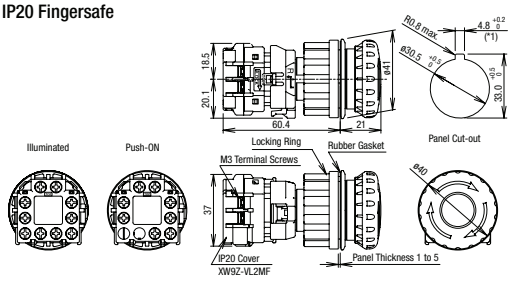


w/Terminal Cover

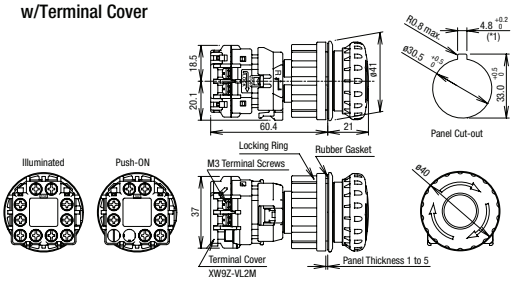


Illuminated/Push-ON

IP20 Fingersafe



w/Terminal Cover



All dimensions in mm.

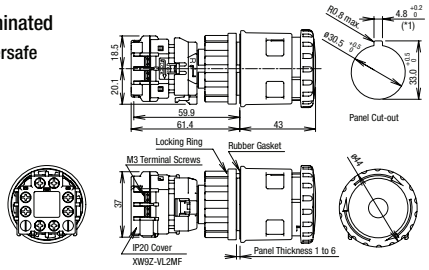
*1) Make sure that the panel cut-out is as shown in the drawing as the operator has a projection for anti-rotation.

Dimensions

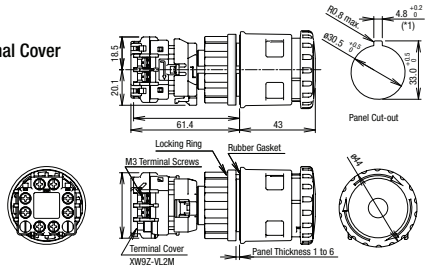
Padlockable

Non-Illuminated

IP20 Fingersafe

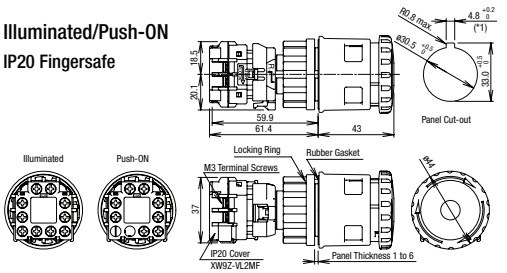


w/Terminal Cover

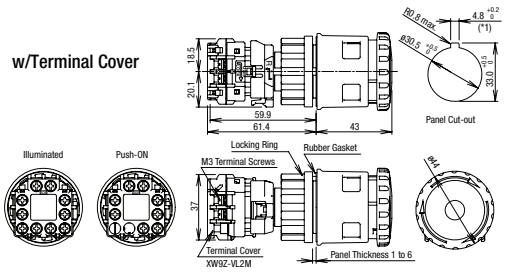


Illuminated/Push-ON

IP20 Fingersafe

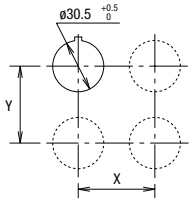


w/Terminal Cover



*1) Make sure that the panel cut-out is as shown in the drawing as the operator has a projection for anti-rotation.

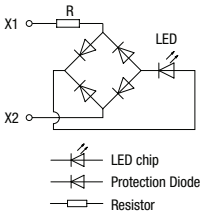
Mounting Hole Layout



	X	Y
Plastic Bezel	70 mm minimum	
Flush Bezel		

- The values shown above are the minimum dimensions for mounting with other ø30 mm pushbuttons. For other control units of different sizes and styles, determine the values according to the dimensions, operation, and wiring convenience.
- For padlockable, determine the values according to the size and number of padlocks and hasp.

LED Unit Internal Circuit



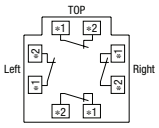
ø30 XN Series Emergency Stop Switches

Terminal Arrangement

Terminal Arrangement (Bottom View)

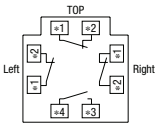
Non-illuminated

NC main contacts only



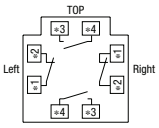
1NC: Terminals on right
2NC: Terminals on right and left
3NC: Terminals on right, left, and top

With 1NO monitor contact



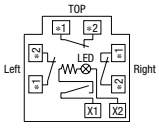
1NC: Terminals on top
2NC: Terminals on right and left

With 2NO monitor contacts



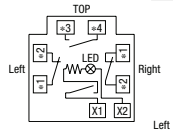
Push-ON

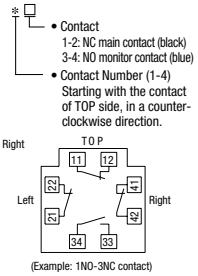
NC main contacts only



2NC: Terminals on right and left
3NC: Terminals on right, left, and top

With 1NO monitor contact

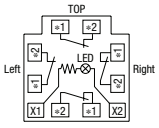




(Example: 1NO-3NC contact)

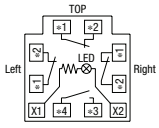
Illuminated

NC main contacts only



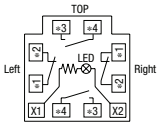
1NC: Terminals on right
2NC: Terminals on right and left
3NC: Terminals on right, left, and top

With 1NO monitor contact



1NC: Terminals on top
2NC: Terminals on right and left

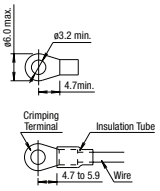
With 2NO monitor contacts



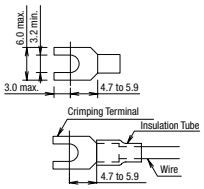
• See D-050 for accessories and replacement parts.

Applicable Crimping Terminal

Ring Terminal

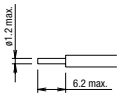


Spade Terminal



• Be sure to install an insulating tube on the crimping terminal.

Solid Wire



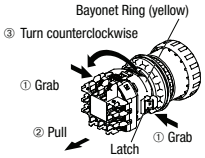
• Only solid wire can be used for IP20.

All dimensions in mm.

Operating Instructions

Removing the Contact Block

First unlock the operator button.
Grab the yellow bayonet ring ① and pull back the bayonet ring until the latch pin clicks ②, then turn the contact block counterclockwise and pull out ③.

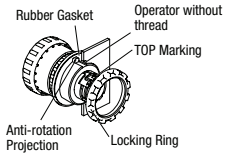


Notes for removing the contact block

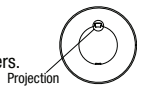
1. Do not attempt to remove the contact block while the operator is latched, otherwise the switch may be damaged.
2. When the contact block is removed, the monitor contact (NO contact) is closed.
3. While removing the contact block, do not use excessive force, otherwise the switch may be damaged.
4. An LED lamp is built into the contact block for illuminated push-buttons. When removing the contact block, pull the contact block straight to prevent damage to the LED lamp. If excessive force is used, the LED lamp may be damaged and fail to light.

Panel Mounting

Remove the locking ring from the operator and check that the rubber gasket is in place. Insert the operator from panel front into the panel hole. Face the side without thread on the operator with TOP marking upward, and tighten the locking ring using ring wrench XN9Z-T1 or TWST-T1 to a torque of 2.5 N·m maximum.

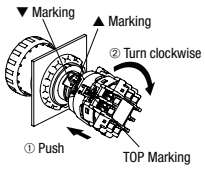


When using a nameplate
When using a nameplate HNAV-□, break the projection from the nameplate using pliers.



Installing the Contact Block

First unlock the operator button.
Align the small ▼ marking on the edge of the operator with the small ▲ marking on the yellow bayonet ring. Hold the contact block, not the bayonet ring. Press the contact block onto the operator and turn the contact block clockwise until the bayonet ring clicks.



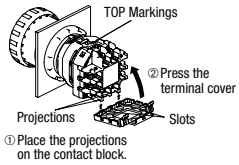
Notes for installing the contact block

1. Do not attempt to install the contact block when the operator is latched, otherwise the switch may be damaged.
2. Make sure that the bayonet ring is in the locked position.

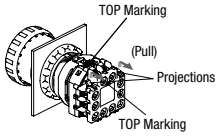
Installing & Removing Terminal Covers

XW9Z-VL2M

To install the terminal cover, align the TOP marking on the terminal cover with the TOP marking on the contact block. Place the two projections on the bottom side of the contact block into the slots in the terminal cover. Press the terminal cover toward the contact block.

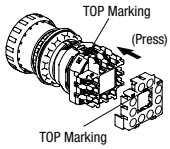


To remove the terminal cover, pull out the two latches on the top side of the terminal cover. Do not exert excessive force to the latches, otherwise the latches may break.



IP20 Fingersafe Terminal Cover XW9Z-VL2MF

To install the IP20 fingersafe terminal cover, align the TOP marking on the cover with the TOP marking on the contact block, and press the cover toward the contact block.



Notes:
1. Once installed, the XW9Z-VL2MF cannot be removed.
2. With the XW9Z-VL2MF installed, crimping terminals cannot be used. Use solid wires.
3. The XW9Z-VL2MF cannot be installed after wiring.
4. Make sure that the XW9Z-VL2MF is securely installed. IP20 cannot be achieved when installed loosely, and electric shocks may occur.

Notes for Operation

When using the XN emergency stop switches in safety-related part of a control system, observe safety standards and regulations of the relevant country or region. Also be sure to perform a risk assessment before operation.

Wiring

Tighten the M3 terminal screws to a torque of 0.6 to 1.0 N·m.

Contact Bounce

When the button is reset by pulling or turning, the NC main contacts will bounce. When pressing the button, the NO monitor contacts will bounce.
When designing a control circuit, take the contact bounce time into consideration (reference value: 20 ms).

LED Illuminated Switches

An LED lamp is built into the contact block and cannot be replaced.

Handling

Do not expose the switch to excessive shocks and vibrations, for example by operating the switch with tools. Otherwise the switch may be deformed or damaged, causing malfunction or operation failure.

ø16 X6/XA Series Emergency Stop Switches Accessories

Accessories and Replacement Parts (ø16 X6/XA Series Emergency Stop Switches)

Package quantity: 1

Description & Shape	Material	Part No.	Ordering No.	Package Quantity	Remarks
Ring Wrench 	Metal (nickel-plated brass)	MT-001	MT-001	1	• Used to tighten the locking ring when installing the XA emergency stop switch onto a panel.
Locking Ring 	Polyamide	XA9Z-LN	XA9Z-LNPN10	10	• Black
Terminal Cover 	PBT	XA9Z-VL2	XA9Z-VL2PN02	2	• White • Used for solder terminals. • Also applicable to the XW series.
LED Unit 	For Solder Terminal	XA9Z-LED2R	XA9Z-LED2R	1	• Replacement LED unit for illuminated (for XA series only).
	For PC Board Terminal	XA9Z-LED2VR	XA9Z-LED2VR		
LED Unit Removal Tool 	Stainless Steel	MT-101	MT-101		• Used for removing the LED unit.

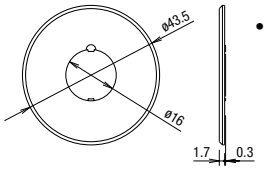
Nameplates (for ø16 X6/XA Emergency Stop Switches)

Package quantity: 1

Description	Legend	Part No.	Material	Plate Color	Legend Color
For ø30mm Operator	(blank)	HAAV-0	Polyamide	Yellow	Black
	EMERGENCY STOP	HAAV-27			
For ø40mm Operator	(blank)	HAAV4-0			
	EMERGENCY STOP	HAAV4-27			

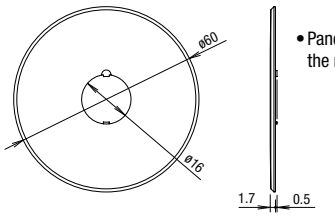
• Cannot be used with a switchguard.

For ø30mm Operator



• Panel thickness when using the nameplate: 0.5 to 2 mm

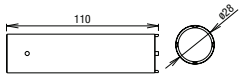
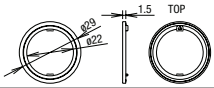
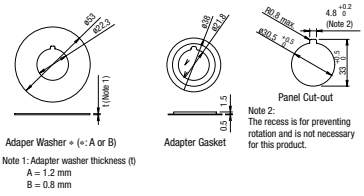
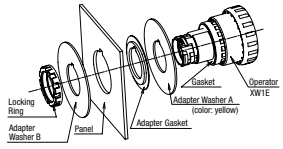
For ø40mm Operator



• Panel thickness when using the nameplate: 0.5 to 2 mm

All dimensions in mm.

Accessories (ø22 XW Series Emergency Stop Switches)

Description & Shape	Material	Part No.	Ordering No.	Package Quantity	Remarks
Ring Wrench 	Metal (nickel-plated brass) (weight: approx. 150g)	MW9Z-T1	MW9Z-T1	1	• Used to tighten the locking ring when installing the XW emergency stop switch onto a panel. 
Anti-rotation Ring 	Ring: Polyamide Gasket: Nitryl rubber	HW9Z-RL	HW9Z-RLPN10	10	• The anti-rotation ring is used for preventing the operator from turning. 
Terminal Cover 	PBT	XA9Z-VL2	XA9Z-VL2PN02	2	• White • Used for solder terminals.
Terminal Cover 	PPE	XW9Z-VL2M	XW9Z-VL2MPN02	2	• Black • Used for screw terminals. • Attached to IP20 protection cover units.
IP20 Protection Cover 	Polyamide	XW9Z-VL2MF	XW9Z-VL2MFPN02	2	• Black • Used on terminals for IP20 finger protection. • Only solid wires can be used. • The IP20 protection cover cannot be removed once installed.
Ring Adapter 	Rubber on metal base	XW9Z-A30E	XW9Z-A30EPN02	2	• Yellow panel surface • Used for installing XW1E emergency stop switches in ø30mm mounting hole. • Can be used for XW1E emergency stop switches only. • IP65 protection. • Cannot be used with nameplates. Panel thickness when mounted: 0.8 to 3.0 mm  Adaper Washer ∘ (∘: A or B) Note 1: Adapter washer thickness (t) A = 1.2 mm B = 0.8 mm Adapter Gasket • Panel Mounting 

Notes:
- XW emergency stop switches of screw terminal are provided with a terminal cover.
- All dimensions in mm.

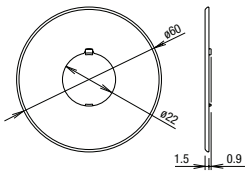
ø22 XW Series Emergency Stop Switches Accessories

Nameplate (for ø22 Emergency Stop Switches)

Description	Legend	Part No.	Ordering No.	Package Quantity	Material	Plate Color	Legend Color
For ø40mm Operator	(blank)	HWAV-0-Y	HWAV-0-Y	1	Polyamide	Yellow	Black
	EMERGENCY STOP	HWAV-27-Y	HWAV-27-Y				
For ø60mm Operator	(blank)	HWAV5-0	HWAV5-0		PBT		
	EMERGENCY STOP	HWAV5-27	HWAV5-27				
	EMERGENCY STOP	HWAV5F-27	HWAV5F-27PN10	10	PET film sticker		

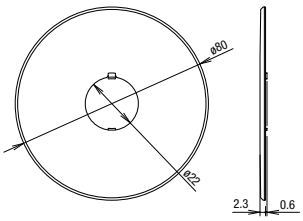
Dimensions

For ø40mm Operator



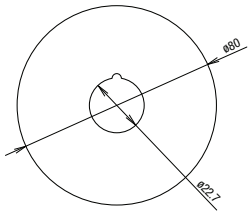
• Panel thickness when using the nameplate: 0.8 to 4.5 mm

For ø60mm Operator



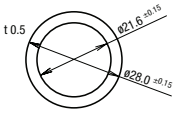
• Panel thickness when using the nameplate: 0.8 to 4 mm

Sticker Nameplate for ø60mm Operator

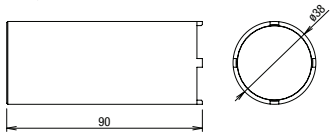
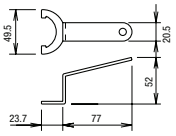


All dimensions in mm.

Maintenance Parts (for ø22 Emergency Stop Switches)

Description & Shape	Material	Part No.	Ordering No.	Package Quantity	Dimensions (mm)
Locking Ring  ø28.4 H5 M22 P1	Polyamide (black)	HW9Z-LN	HW9Z-LNPN05	5	• Cannot be used on XW Series (mechanical indicator)
Washer 	Nityl rubber	HW9Z-WM	HW9Z-WMPN10	10	
Locking Ring  ø27.8 t=5.0	Polyamide	CW9Z-LN	CW9Z-LNPN05	5	• For use on XW Series (mechanical indicator) only.

Accessories and Replacement Parts (for ø30 XN Series Emergency Stop Switches)

Name & Shape	Material	Part No.	Ordering No.	Package Quantity	Remarks
Terminal Cover 	PPE	XW9Z-VL2M	XW9Z-VL2MPN02	2	• Black • Used for screw terminals. • Attached to IP20 protection cover units.
IP20 Fingersafe Terminal Cover 	Polyamide	XW9Z-VL2MF	XW9Z-VL2MFPN02	2	• Black • Used to change terminal cover to IP20 fingersafe terminal. • Only solid wires can be used. Once installed, IP20 terminal cover cannot be removed.
Ring Wrench 	Brass	XN9Z-T1	XN9Z-T1	1	• Used to tighten the locking ring when installing the XN emergency stop switch onto a panel. 
Ring Wrench 	Steel Trivalent chromate plating	TWST-T1	TWST-T1	1	• Used to tighten the locking ring when installing the XN emergency stop switch onto a panel. 

- The XN series emergency stop switches are supplied with either terminal cover or IP20 fingersafe terminal cover.
- Padlocks and hasps are not supplied and must be ordered separately.

Nameplates (for ø30 Emergency Stop Switches)

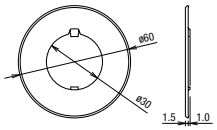
Description & Shape	Legend	Part No.	Package Quantity	Dimensions (mm)
	(blank)	HNAV-0	1	Polyamide Mounting panel thickness XN4E-☐L4: 1.0 to 4.5 mm XN☐E-☐V4: 1.0 to3.5 mm 
	EMERGENCY STOP	HNAV-27		

Plate color: Yellow (Munsell 2.5Y 8/10 or equivalent), Legend: Black

Padlock and Hasp

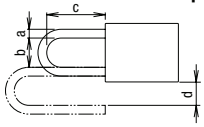
Padlocks and hasps of the following specifications can be used with padlockable emergency stop switches.

Padlock Size

a	b	c	d
7 mm maximum	19 mm minimum	39 mm minimum	15 mm minimum (Note)

Note: When the padlock is installed from the side of the bezel, dimension d requires a minimum of 6 mm. When the padlock is installed from the front of the button, dimension d requires a minimum of 15 mm.

Recommended Hasp



Maker	Part No.
PANDUIT CORP.	PSL-HD3 PSL-1A
Master Lock® Company LLC	420, 421

Use only padlocks or hasps that satisfy the specifications shown on the left. The maximum total weight for padlocks and hasps is 1500g. Make sure that the total weight does not exceed 1500g, otherwise the XN emergency stop switch may be damaged.
Make sure that locking and unlocking of the padlock and hasp do not interfere with other devices.
Padlocks and hasps are available from the following manufacturers.

Manufacturer	URL
PANDUIT CORP.	http://www.panduit.com/
Master Lock® Company LLC	http://www.masterlock.com/

XA/XW Series Emergency Stop Switches Switchguard

Emergency Stop Guard for Machinery (Protective Shroud)

If the safety requirements of ISO15380:2015 4.3.2 or 4.5 is satisfied, the switchguard can be used safely by combining IDEC's switchguard and emergency stop switch, which is approved by TÜV Rheinland in ISO13850:2015 to be used as protective shroud with emergency stop switch.

In the past, use of a switchguard (term: protective shroud) on devices such as a machine tool or food processing machines was not permitted under ISO/IEC. However, in the latest revision, the use of a protective shroud is permitted with conditions. This is because the "Prevention of unintended actuation of an emergency stop device" was added as a safety requirement and the definition of a protective shroud is as below.

> **ISO13850:2015 3.7 protective shroud (protective shroud)**
> mechanincal measure provided to reduce the possibility of unintended actuation of an emergency stop device.

Productive shroud can be used under the following conditions:

> **ISO13850:2015 4.5 Prevention of unintended acuation of an emergency stop device**
> The emergency stop device shall be designed to avoid unintended actuation.
> The actuation of the emergency stop device shall not be impaired.
> To prevent unintended actuation of the emergency stop device some precautions can be taken, e.g.:
> – locate the emergency stop device away from foreseeable heavily trafficked areas,
> – select the type of emergency stop device,
> – select appropriate size or shape of the emergency stop device, or
> – mount the emergency stop device within a recessed surface of the surrounding control panel.
> The use of a protective shroud around the emergency stop device should be avoided, except when necessary to prevent unintended actuation and other measures are not practicable.
> For emergency stop devices intended to be acutated by the hand the measures against unintended actuation shall not impede or hinder actuation with the palm of the hand, from any foreseeable position of the machine operator and others who could need to actuate them.

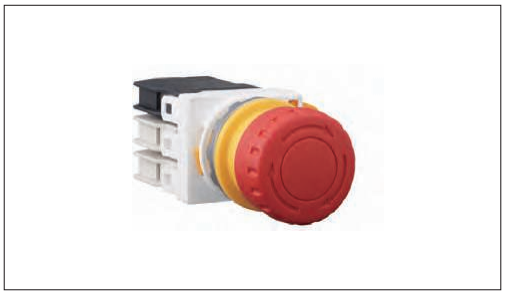
For details on protective shroud, see D-055.

ø30 EU2B Series Hazardous location Switches

ø30 mm, up to 3 contacts for application in hazardous locations with explosive gases such as oil and gas, petrochemical, painting and more.

Complying with IECEx and ATEX Directives, UL for hazardous environments, new 30mm EU2B Hazardous Location Switches provide increased safety for your applications.

- Zone 1/Zone 21, Division 2
- Applicable in explosive gas atmospheres (Ex de IIC T6 Gb)
- Applicable in explosive dust atmospheres (Ex tb IIIC Db IP65)
- UL Type 4X rated
- Up to 3 contact blocks
- Exposed and finger-safe (IP20) screw terminals available



Standards compliance

IECEx	Ex de IIC Gb Ex tb IIIC Db
ATEX	Ex II2G Ex de IIC Gb Ex II2D Ex tb IIIC Db IP65
UL	Class I, Zone 1, AEx de IIC T6 Gb Class I, Div 2, Groups A, B, C and D
c-UL	Class I, Zone 1, Ex de IIC T6 Gb Class I, Div 2, Groups A, B, C and D

Certificate numbers

IECEx	PTB 15.0006u PTB 15.0007u
ATEX	PTB 08 ATEX 1053 U PTB 08 ATEX 1003 U
UL/cUL	E347230

Specifications

General Specifications

Applicable Standards	EN60947-5-5 TÜV SÜD / EU Low Voltage Directive	
Degree of Protection	IP65 (IEC60529), Type 4X	
Insulation Resistance	100 MΩ minimum (500V DC megger)	
Operating Temperature	–20 to +50°C (no freezing)	
Operating Humidity	45 to 85% (no condensation)	
Altitude	2,000m Maximum	
Pollution Degree	3	
Shock Resistance	Operating Extremes	150-m/s² (without Meter)
	Damage Limits	1000-m/s²
Vibration Resistance	Operating Extremes	5 to 500-Hz, amplitude 0.35-mm, acceleration 50-m/s² (without Meter)
	Damage Limits	5 to 500-Hz, amplitude 0.35-mm, acceleration 50-m/s²
Rated Insulation Voltage	600 V	
Contact Resistance	50 mΩ maximum (initial value)	
Impulse Withstand Voltage (Uimp)	6kV	
Insulation Resistance	100MΩ minimum (500V DC megger)	
Short-Circuit Protection	250V/10A fuse (Type aM IEC60269-1/IEC60269-2)	
Conditional Short-Circuit Current	1,000A	
Mechanical life	50,000 operations minimum	
Electrical Life	50,000 (switching frequency 900 operations/h)	
Minimum Operator Stroke Required for Direct Opening Action	7.0mm	
Maximum Operator Stroke	9.0mm	

Contact Rating

Rated Insulation Voltage (Ui)			600V			
Rated Thermal Current (Ith)			10A*			
Rated Operating Voltage (Ue)			24V	120V	240V	500V
Rated Operating Current (Ie)	AC 50/60Hz	Resistive Load (AC12)	10A*	10A*	6A	2.8A
		Inductive Load (AC15)	10A*	6A	3A	1.4A
	DC	Resistive Load (DC12)	8A	2.2A	1.1A	—
		Inductive Load (DC13)	4A	1.1A	0.55A	—

Note: Up to 2 contacts (per control unit): 10A , 3 contacts (per control unit): 9A
Minimum applicable load: 3V AC/DC, 5mA
Applicable operating locations may vary according to operating conditions and load types.

Contact Rating Code Designation	Thermal Continuous Test Current Amperes	Maximum current, Amperes								Maximum Volt-Amperes	
		120 Volt		240 Volt		480 Volt		600 Volt		600 Volt	
		Make	Break	Make	Break	Make	Break	Make	Break	Make	Break
A600	10	60	6.00	30	3.00	15	1.5	12	1.2	7200	720

Hazardous location Switches

Part Numbers

Part Number	Operator	Contact Arrangement	Weight (Approx.)	Button Color
EU2B-YBV301•R	ø40 Mushroom	1NC	96g	R : Red
EU2B-YBV311•R		1NO-1NC	120g	
EU2B-YBV302•R		2NC		
EU2B-YBV312•R		1NO-2NC	144g	
EU2B-YBV303•R		3NC		

Specify a terminal style in place of • in the part number: F (Finger-safe terminal), C (Exposed screw terminal)

Part Number Structure

EU2B - YBV3 11 F R

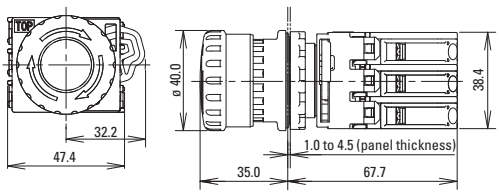
- Operator (style / function): BV3:40mm mushroom/push, pull or twist release
- Contact arrangement: 01:1NC, 11:1NO-1NC, 02:2NC, 03:3NC, 12:1NO-2NC
- Button color: R:Red
- Terminals: F : Finger-safe terminal (IP20), C:Exposed screw terminal

Dimensions

All dimensions in mm

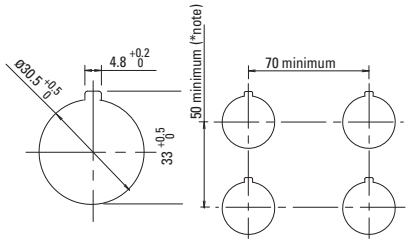
Emergency Stop Switches

Shown with finger-safe contacts



Mounting Hole Dimensions

Panel thickness: 1.0 to 4.5 mm.



*Note: The meter can be mounted on the top mounting holes of a standard 50mm mounting centers. The meter can be mounted on any mounting hole with a 70mm or larger mounting center.

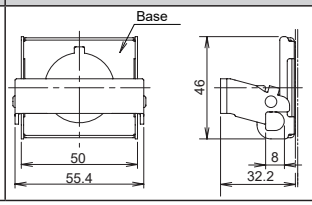
Accessories

All dimensions in mm

Emergency Stop Switch Padlock Cover

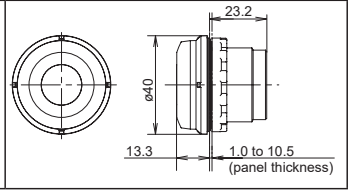
Used with EU2B-YBV emergency stop switch to maintain the switch in the latched status.

Coating: yellow
Material: Stainless Steel

Appearance	Part Number	Dimensions
	EU9Z-PCE	

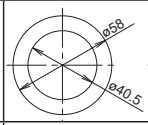
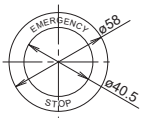
Mounting Hole Plug

Used to plug unused mounting holes (ø30.5) on the mounting panel.

Appearance	Part Number	Dimensions / Usage
	EU9Z-BP	

Emergency Stop Switch Nameplate Stickers

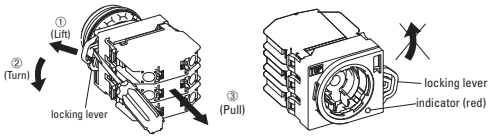
Material: yellow vinyl
Legend: black

Appearance	Legend	Part Number	Dimensions
	Blank	EU9Z-NVS0	
	Emergency Stop	EU9Z-NVS27	

Removing and Installing the Contact Unit / Lamp Unit

To remove the contact unit or the lamp unit from the operator, pull the protruding yellow part of the locking lever outwards as shown in the figure below using a screwdriver, and turn it to the left. The contact unit or lamp unit can be removed.

When the contact unit is removed from the emergency stop switch operator, the NO contact closes and the NC contact opens.
Do not turn the locking lever when the contact unit is removed from the operator (the red indicator is protruding out. See the figure below) or the switch can be damaged.

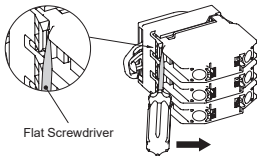


Panel mounting for the operator, lens unit and meter

Remove the locking ring from the operator and check that the rubber gasket is in place. Insert the operator from the panel front into the panel hole. Place the projection on the operator with TOP marking upward and the recess on the mounting panel in the same direction. (The meter has no projection.) Tighten the locking ring using ring wrench XN9Z-T1 to a torque of 2.5 Nm. When using a nameplate or padlocking cover, install it between the operator and panel. Make sure that the groove of the namplate or padlocking cover and the projection on the TOP marking of the operator are in the same direction.
Note: The locking ring for emergency stop switches and meter is metallic.

Removing the Contact Block

To remove the contact block, insert a flat screwdriver under the latch of the contact block adaptor and disengage the latch as shown in the figure below.



Installing the Contact block

When installing the contact block after maintenance or wiring, make sure that the contact configuration is correct. Installing the contact block in the incorrect position or incomplete installation may cause malfunction of the switch.
Remove the contact block from the operator before installing the contact block to the contact block adaptor. Also make sure that the contact block is correctly installed to the contact block adaptor before attaching the operator. Do not install the contact block adaptor with the operator attached. Otherwise, malfunction may result.

Accessories : Padlock Cover

The following padlocks and hasps can be used.

	(Padlock Size)
Emergency Stop Switch	ø5.5 to 7.0 mm

Recommended Hasp

Manufacturer	Part No.
Panduit	PSL-1, PSL-1A, PSL-1.5, PSL-1.5A, PSL-HD1
Master Lock	420, 421

Padlock and hasp are available in various shapes and sizes. Make sure that they do not interfere with the control units.
Note: Not supplied by IDEC.
Keep the total weight of padlock and hasp under 1500g max, otherwise the switch may malfunction or result in failure. No vibration should be applied when padlock or hasp are installed. When padlock or hasp are disfigured, stop usage immediately.
Ensure that no shock or electric sparks are generated.
When using the plate lock padlock cover with the extended pushbutton, the switch contact may turn on/off when the cover is being installed. Ensure to provide functional safety measure to prevent unexpected startup.
When using the padlock cover on the safety-related part of the control system, observe safety standards and regulations of the relevant country or region. Also be sure to perform risk assessment before operation.

Hazardous location Switches

Operating Instructions

Maintenance and Inspection

EU2B switches should be installed in an appropriate control box.

Maintenance and Inspection Method

Perform daily or periodical maintenance and inspection for items such as damage and temperature rise of the EU2B switches listed in the Maintenance and Inspection table below.

Maintenance and Inspection

Inspection Items	Inspection Method	Inspections	Measures
Enclosure base	Visual	No rusting No damages	Cleaning Rust-resistant treatment
Tightening bolt, screws	Visual, tactile	No loosening No rusting	Tightening Cleaning
Packings	Visual	No cracks No apparent deformation	Replacement
Connecting parts	Visual, tactile	No loosening of screws No dirt on insulation materials	Tightening Cleaning
Temperature rise	Thermometer, tactile	Surface temperature 80ºC max.	Investigate the cause

Disposal

Observe laws and regulations set by each country concerning refuse disposal.

Safety Precautions

Use EU2B switches that are applicable for use in hazardous areas (potentially explosive atmosphere where explosive gas or vapor may exist), otherwise explosion or fire hazard may result.

- EU2B switches can be installed only in zones 1 and 2. Do not use in zone 0.
- Turn power off to the EU2B switches before installation, removal, wiring, or maintenance, otherwise explosion, fire hazard, or electric shock may result.
- Do not disassemble, repair, or modify, otherwise damage or accident may result.
- Do not use damaged EU2B switches, otherwise damage or accident may result.
- When connecting external devices, make sure that each cable is connected to the correct terminal, otherwise electric shock, fire hazard, or explosion may result.
- Use wires of a proper size to meet voltage and current requirements. Incorrect wiring may cause abnormal temperature rise and lead to fire hazard and explosion.
- Connect the grounding terminal to a proper ground, otherwise electric shock, fire hazard, or explosion may result.
- Operate the EU2B switches at the rated current and voltage specified in this catalog, otherwise short-circuiting, fire hazard, or explosion may result.
- Stop operation immediately if abnormal operation occurs. Otherwise, a secondary accident may occur.

SEMI EMO Switches

SEMI Emergency Off (EMO) Switches

ø16mm XA Series EMO Switches (Solder Terminal) (Pushlock Turn Reset Switch)

Package Quantity: 1

Shape	NC Main Contact	NO Monitor Contact	Part No.
ø40mm Mushroom 	1NC	—	XA1E-BV401RH-EMO
	2NC	—	XA1E-BV402RH-EMO
	3NC	—	XA1E-BV403RH-EMO
	4NC	—	XA1E-BV404RH-EMO
	1NC	1NO	XA1E-BV411RH-EMO
	2NC	1NO	XA1E-BV412RH-EMO
	3NC	1NO	XA1E-BV413RH-EMO

- Button color is bright red (RH).
- For detailed specifications and instructions, see website.

ø22mm XW Series EMO Switch (Pushlock Turn Reset Switch)

Package Quantity: 1

Shape	NC Main Contact	NO Monitor Contact	Part No.	
			IP20 Fingersafe Terminal	w/Terminal Cover
ø40mm Mushroom 	1NC	—	XW1E-BV401MFRH-EMO	XW1E-BV401MRH-EMO
	2NC	—	XW1E-BV402MFRH-EMO	XW1E-BV402MRH-EMO
	3NC	—	XW1E-BV403MFRH-EMO	XW1E-BV403MRH-EMO
	4NC	—	XW1E-BV404MFRH-EMO	XW1E-BV404MRH-EMO
	1NC	1NO	XW1E-BV411MFRH-EMO	XW1E-BV411MRH-EMO
	2NC	1NO	XW1E-BV412MFRH-EMO	XW1E-BV412MRH-EMO
	3NC	1NO	XW1E-BV413MFRH-EMO	XW1E-BV413MRH-EMO
	2NC	2NO	XW1E-BV422MFRH-EMO	XW1E-BV422MRH-EMO

- Button color is bright red (RH).
- For detailed specifications and instructions, see website.

ø22mm HW Series EMO Switches (Screw Terminal) (Pushlock Turn Reset Switch)

Package Quantity: 1

Shape	Contact Arrangement	Part No.	Button Color
ø40mm Mushroom 	1NC	HW1B-V401R-EMO	Red only
	1NO-1NC	HW1B-V411R-EMO	
	2NC	HW1B-V402R-EMO	
	2NO-2NC	HW1B-V422R-EMO	

- For detailed specifications and instructions, see website

FB Series Control Stations

ø22mm HW Series EMO Switch

Package Quantity: 1

Illumination	Shape	NC Main Contact	NO Monitor Contact	Part No.	
				Without SEMI Switch Guard	With SEMI Switch Guard
Non-Illuminated	HW Series EMO Switch (Pushlock Turn Reset) 	1NC	—	FB1W-HW1B-V401R-EMO-Y0	FB1W-HW1B-V401R-EMO-Y☐
		2NC	—	FB1W-HW1B-V402R-EMO-Y0	FB1W-HW1B-V402R-EMO-Y☐
		1NC	1NO	FB1W-HW1B-V411R-EMO-Y0	FB1W-HW1B-V411R-EMO-Y☐

ø22mm XW Series EMO Switch

Package Quantity: 1

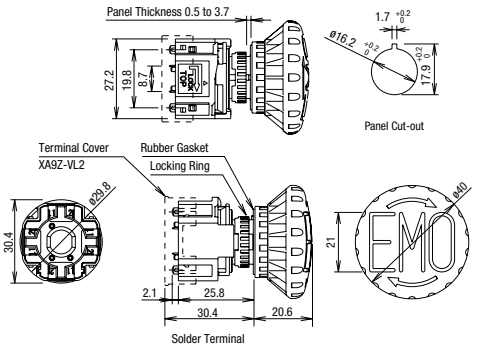
Illumination	Shape	NC Main Contact	NO Monitor Contact	Part No.	
				Without SEMI Switch Guard	With SEMI Switch Guard
Non-illuminated	ø22mm XW Series Emergency Stop Switch Pulhlock Pull/Turn Reset 	1NC	—	FB1W-XW1E-BV401MRH-EMO-Y0	FB1W-XW1E-BV401MRH-EMO-Y☐
		2NC	—	FB1W-XW1E-BV402MRH-EMO-Y0	FB1W-XW1E-BV402MRH-EMO-Y☐
		3NC	—	FB1W-XW1E-BV403MRH-EMO-Y0	FB1W-XW1E-BV403MRH-EMO-Y☐
		4NC	—	FB1W-XW1E-BV404MRH-EMO-Y0	FB1W-XW1E-BV404MRH-EMO-Y☐
		1NC	1NO	FB1W-XW1E-BV411MRH-EMO-Y0	FB1W-XW1E-BV411MRH-EMO-Y☐
		2NC	1NO	FB1W-XW1E-BV412MRH-EMO-Y0	FB1W-XW1E-BV412MRH-EMO-Y☐
		3NC	1NO	FB1W-XW1E-BV413MRH-EMO-Y0	FB1W-XW1E-BV413MRH-EMO-Y☐
		2NC	2NO	FB1W-XW1E-BV422MRH-EMO-Y0	FB1W-XW1E-BV422MRH-EMO-Y☐

Note: Insert a code of SEMI switch guard in place of ☐ in Part No. (2: HW9Z-KG3, 3: HW9Z-KG4)
HW9Z-KG3 and HW9Z-KG4 are compliant with SEMI S2. See D-055 for details.

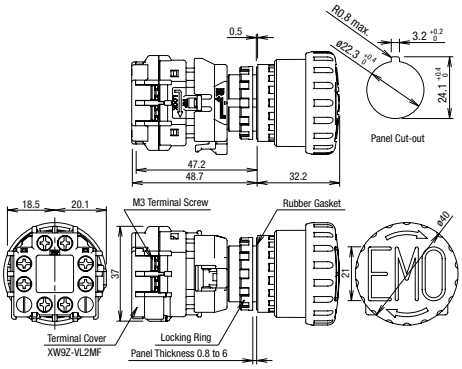
SEMI EMO Switch Guards

Dimensions

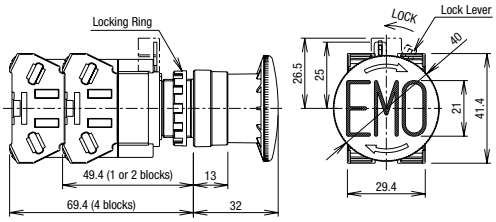
ø16mm XA Series EMO Switches



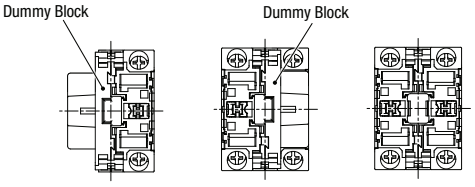
ø22mm XW Series EMO Switches



ø22mm HW Series EMO Switches



Bottom View



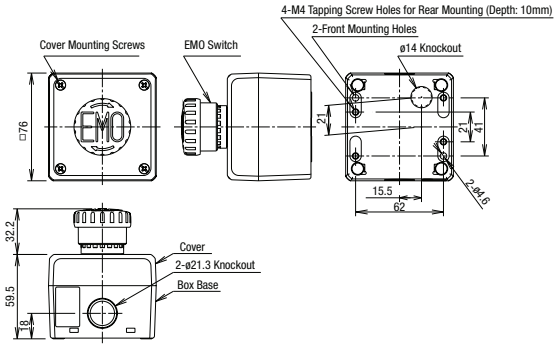
- For 1NC contact, the contact block will mount on the opposite side.
- See B-227 for wiring.
- Integrated terminal cover

Recommended Tightening Torque Number of Wlres

Unit	Wire		Number of Wires	Recommended Tightening Torque (N·m)	Terminal Screw
HW-U Contact Block	Crimping Terminal		2	1.0 to 1.3	M3.5
	Solid Wire	ø0.5 to 1.6mm (AWG14 to 22)	2	1.0 to 1.3	
		ø1.7 to 2.0mm (AWG12)	1	1.2 to 1.3	
	Stranded Wire	0.3 to 2.0mm² (AWG14 to 22)	2	1.0 to 1.3	
		2.1 to 3.5mm² (AWG12)	1	1.2 to 1.3	

FB Series Control Box

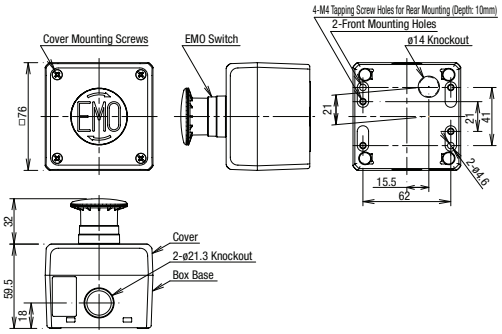
ø22mm XW Series EMO Switches



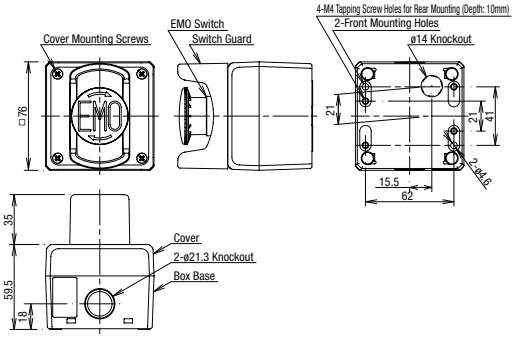
All dimensions in mm.

FB Series Control Box

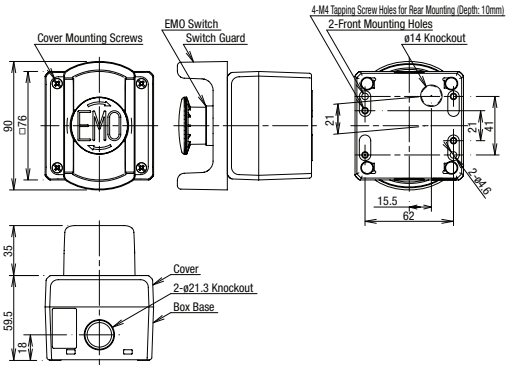
ø22mm HW Series EMO Switches



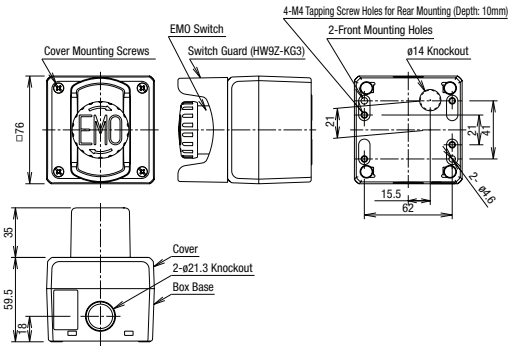
ø22mm HW Series EMO Switches + SEMI Switch Guard (HW9Z-KG3)



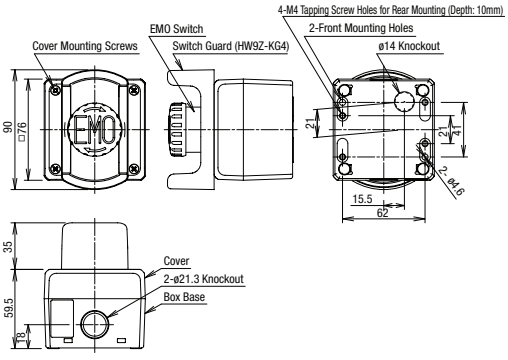
ø22mm HW Series EMO Switches + SEMI Switch Guard (HW9Z-KG4)



ø22mm XW Series EMO Switches + SEMI Switch Guard (HW9Z-KG3)



ø22mm XW Series EMO Switches + SEMI Switch Guard (HW9Z-KG4)



SEMI EMO Switch Guards

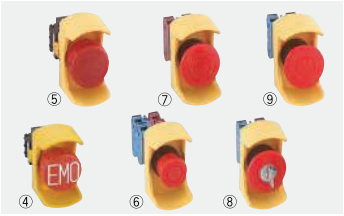
The combination of IDEC's EMO switch guards and emergency stop switches are approved by TÜV Rheinland for compliance with SEMI S2 standards.

SEMI S2-compliant Combinations

EMO Switch Guard	Applicable Emergency Stop Switches
XA9Z-KG1	XA1E-BV4****-EMO (①), XA1E-BV3 (②), XA1E-LV3 (③), XA1E-BV4 (③), XA1E-LV4 (③)
HW9Z-KG3	XW1E-BV4****-EMO (④), XW1E-BV4 (⑤), XW1E-LV4 (⑤), XW1E-TV4 (⑤), HW1B-V3 (⑥), HW1B-V4 (⑦),HW1B-X4 (⑧), HW1B-Y2 (⑨)
HW9Z-KG4	XW1E-BV4****-EMO (⑩), XW1E-BV4 (⑪), XW1E-LV4 (⑪), XW1E-TV4 (⑪), XW1E-BV5 (⑫) HW1B-V3 (⑬), HW1B-V4 (⑭), HW1E (⑮), HW1B-X4 (⑯), HW1B-Y2 (⑰)
HW9Z-KG5	XW1E-BV4****-EMO (⑱), XW1E-BV4 (⑲), XW1E-LV4 (⑲), XW1E-TV4 (⑲), XW1E-BV5 (⑳), HW1B-V3 (㉑),HW1B-V4 (㉒), HW1E (㉓), HW1B-X4 (㉔), HW1B-Y2 (㉕)

XA9Z-KG1

HW9Z-KG3



HW9Z-KG4

HW9Z-KG5

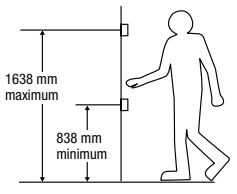
Note:
EMO switch guards have been designed for applications in semiconductor manufacturing equipment only. Do not use EMO switch guards with emergency stop switches which are installed on machine tools or food processing machines. (Machinery Directive of the European Commission and IEC 60204-1 require that emergency stop switches be installed in a readily accessible area, and the usage of switch guards is not permitted.)

About SEMI

SEMI is an international industry association whose member companies produce materials, equipment, and related technology for manufacturing semiconductor, flat panel display (FPD), and micro-electromechanical systems (MEMS) products. The SEMI safety guideline was published for the semiconductor industry and it is observed with the same importance as standards.
SEMI S2-0706, 12.1 describes as follows; "The equipment should have an 'emergency off' (EMO) circuit. The EMO actuator (e.g., button), when activated, should place the equipment into a safe shutdown condition, without generating any additional hazard to personnel or the facility."
Because the semiconductor environment involves solvents and chemicals in many cases, some of which are toxic, interrupting the power source may cause secondary accidents. SEMI safety guideline requires the installation of an emergency off switch which disconnects only the part responsible for the hazardous situation, and maintains the functions of safety-related devices (e.g., smoke detectors, gas/water leak detectors, pressure measurement devices, etc.).
Emergency off buttons should be located or guarded to minimize accidental activation (SEMI S2-0706, 12.5.1). The emergency off button should be red and mushroom shaped. A yellow background for the EMO should be provided (SEMI S2-0706, 12.3).

- Location of EMO switches on semiconductor manufacturing equipment
  Acceptance criteria: controls should not be located above 1638 mm (64.5 in.) or below 838 mm (33 in.) (SEMI S8-0705, 9.1.2).
- No operation or regularly scheduled maintenance location should require more than 3 m (10 feet) travel to an EMO button (S2-0706, 12.5.2).

EMO button ◄— (3 m maximum) —► Operator ◄— (3 m maximum) —► EMO button



SEMI S2 Compliant Switch Guards

Switch Guards

Package Quantity: 1

Series	Description & Shape	SEMI S2	ISO 13850	Part No.	Applicable Switches (*1)	Remarks
ø16mm XA Series	ø16 mm EMO Switch Guard 	○	○	XA9Z-KG1	XA1E-BV3 XA1E-BV4 XA1E-LV3 XA1E-LV4	• SEMI S2 compliant (The combination of IDEC's emergency stop switches and EMO switch guards are approved by TÜV Rheinland for compliance with SEMI S2 standard.) • ISO 13850 compliant.
ø22mm HW/XW Series	ø22 mm EMO Switch Guard 	○	—	HW9Z-KG1	XW1E-BV4 XW1E-LV4 XW1E-TV4 HW1B-V3 HW1B-V4 HW1B-X4 HW1B-Y2 HW1E-BV4 HW1E-LV4	• SEMI S2-0703, 12.5.1 compliant. • Widely used switch guard in many applications.
	ø22 mm EMO Switch Guard 	○	—	HW9Z-KG2	XW1E-BV4 XW1E-LV4 XW1E-TV4 HW1B-V3 HW1B-V4 HW1B-X4 HW1B-Y2 HW1E-BV4 HW1E-LV4	• SEMI S2-0703, 12.5.1 compliant. • SEMATECH Application Guide for SEMI S2-93, 12.4. compliant. • The round shape is effective to prevent inadvertent operation from any direction.
	ø22 mm EMO Switch Guard 	○	○	HW9Z-KG3	XW1E-BV4 XW1E-LV4 XW1E-TV4 HW1B-V3 HW1B-V4 HW1B-X4 HW1B-Y2	• SEMI S2 compliant (The combination of IDEC's emergency stop switches and EMO switch guards are approved by TÜV Rheinland for compliance with SEMI S2 standard.) • ISO 13850 compliant. • The smallest switch guard for ø22 series switches. • Can be installed on FB control boxes.
	ø22 mm EMO Switch Guard 	○	○	HW9Z-KG4	XW1E-BV4 XW1E-BV5 XW1E-LV4 XW1E-TV4 HW1B-V3 HW1B-V4 HW1B-X4 HW1B-Y2 HW1E-BV4 HW1E-LV4	• SEMI S2 compliant (The combination of IDEC's emergency stop switches and EMO switch guards are approved by TÜV Rheinland for compliance with SEMI S2 standard.) • ISO 13850 compliant. • SEMATECH Application Guide for SEMI S2-93, 12.4. compliant. • Narrower than HW9ZKG5. Saves more space. • Can be installed on FB control boxes. • Available in white.
	ø22 mm EMO Switch Guard 	○	○	HW9Z-KG5	XW1E-BV4 XW1E-LV4 XW1E-TV4 XW1E-BV5 HW1B-V3 HW1B-V4 HW1B-X4 HW1B-Y2 HW1E-BV4 HW1E-LV4	• SEMI S2 compliant (The combination of IDEC's emergency stop switches and EMO switch guards are approved by TÜV Rheinland for compliance with SEMI S2 standard.) • ISO 13850 compliant. • SEMATECH Application Guide for SEMI S2-93, 12.4. compliant. • A nameplate can be installed. • Available in white. 

• Material: polyamide (PA6), degree of protection: IP65 (IEC 60529)

*1) For details on applicable emergency stop switches, see D-052.

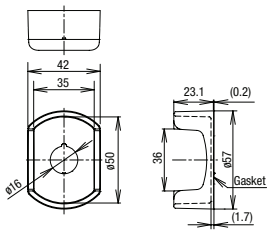
SEMI EMO Switch Guards

SEMI S2 Compliant Switch Guards

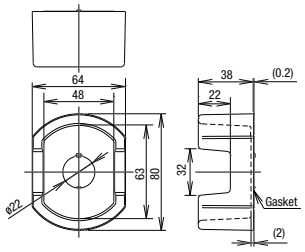
Dimensions

All dimensions in mm.

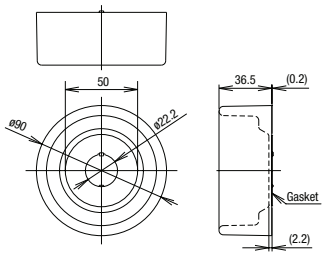
XA9Z-KG1



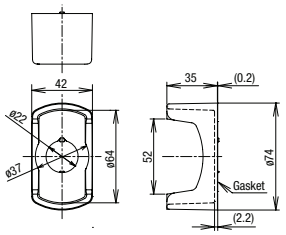
HW9Z-KG1



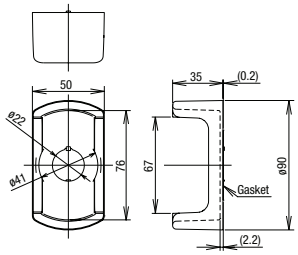
HW9Z-KG2



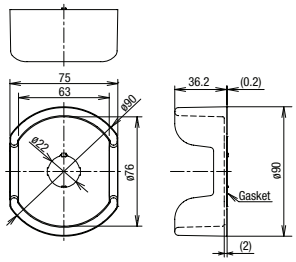
HW9Z-KG3



HW9Z-KG4



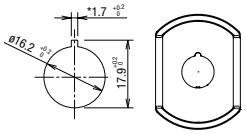
HW9Z-KG5



- Panel thickness: 1.2 to 4.0 mm
  (1.2 to 2.6 mm when using an HWAV nameplate)

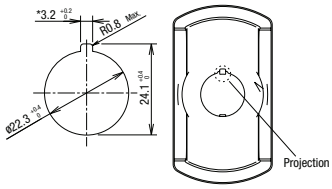
Panel Cut-out

ø16mm



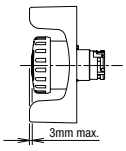
The * $1.7^{+0.2}_{0}$ recess is for preventing rotation and not necessary when anti-rotation is not used.

ø22mm



The * $3.2^{+0.2}_{0}$ recess is for preventing rotation and not necessary when anti-rotation is not used.

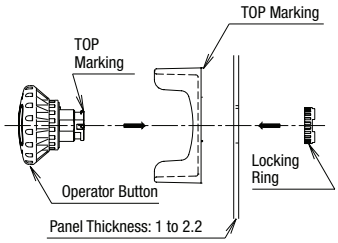
- When anti-rotation is not required or when the panel cut-out does not have anti-rotation recess, remove the projection using pliers.



Note: The height of the applicable switch and guard will be 3 mm or less as shown in the diagram on the right.

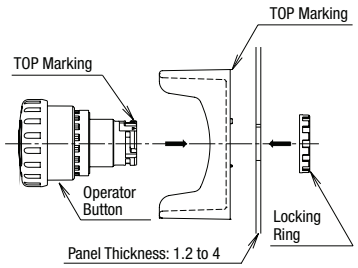
Installation

ø16 mm



To tighten the locking ring, use locking ring wrench MT-100 and tighten to a torque of 0.88 N·m.

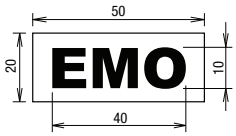
ø22 mm



To tighten the locking ring, use locking ring wrench MW9Z-T1 and tighten to a torque of 2.0 N·m.

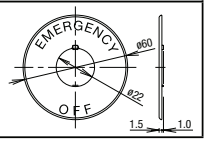
EMO Sticker

Part No.: HW9Z-EMO-NPP
Color: Yellow (red legend)Package
Quantity: 10



Nameplate (for ø22 mm Emergency Stop Switches)

Name	Legend	Part No.	Remarks
For ø40mm Mushroom	EMERGENCY OFF	HWAV-74-Y	• Nameplate color: yellow • Legend color: black



Stop Switches

Wider variety with yellow button, white guard and nameplate

According to SEMI S26-0308 Environmental, Health, and Safety Guideline for FPD Manufacturing Systems published in March 2008, the combination of a red button and yellow background cannot be used for switches that have only local or partial shut down functions. IDEC's yellow button switch, white switch guard, and nameplate can satisfy the requirement.

Stop Switches

ø16mm X6 series Stop Switch Pushlock Pull or Turn Reset Unibody (Solder Terminal)

Package quantity: 1

Description & Shape	Operator	NC Main Contact	Part No.
(Photo: ø30mm Mushroom) 	ø30mm	1NC	AB6E-3BV01PY
		2NC	AB6E-3BV02PY
	ø40mm	1NC	AB6E-4BV01PY
		2NC	AB6E-4BV02PY

- Pushlock pull or turn reset is locked when pressed, and reset when pulled or turned clockwise.
- Do not use yellow stop switches as emergency stop switches.
- See page 8 for specifications and instructions.

ø16mm XA series Stop Switch Pushlock Pull or Turn Reset Unibody (Solder Terminal)

Package quantity: 1

Description & Shape	Operator	NC Main Terminal	Part No.	
			IP40	IP65
(Photo: ø29mm Mushroom) 	ø29mm	1NC	XA1E-BV3U01K①	XA1E-BV3U01①
		2NC	XA1E-BV3U02K①	XA1E-BV3U02①
	ø40mm	1NC	XA1E-BV4U01K①	XA1E-BV4U01①
		2NC	XA1E-BV4U02K①	XA1E-BV4U02①

- Specify button color code Y (yellow) or N (gray) in place of ① in the Part No.
- Pushlock pull or turn reset is locked when pressed, and reset when pulled or turned clockwise.
- Solder/tab 110 terminal is available. To order, insert "T" before the Y in the Part No. Example: XA1E-BV3U02KY→XA1E-BV3U02KTY
- See page 13 for specifications and instructions.

ø16mm XA series Stop Switch Pushlock Pull or Turn Reset with Removable Contact Block

Package quantity: 1

Description & Shape	NC Main Contact	NO Monitor Contact	Part No.	
			Solder Terminal	PCB Terminal
ø29mm Mushroom 	1NC	—	XA1E-BV301①	XA1E-BV301V①
	2NC	—	XA1E-BV302①	XA1E-BV302V①
	3NC	—	XA1E-BV303①	XA1E-BV303V①
	4NC	—	XA1E-BV304①	XA1E-BV304V①
	1NC	1NO	XA1E-BV311①	XA1E-BV311V①
	2NC	1NO	XA1E-BV312①	XA1E-BV312V①
	3NC	1NO	XA1E-BV313①	XA1E-BV313V①
ø40mm Mushroom 	1NC	—	XA1E-BV401Y	XA1E-BV401VY
	2NC	—	XA1E-BV402Y	XA1E-BV402VY
	3NC	—	XA1E-BV403Y	XA1E-BV403VY
	4NC	—	XA1E-BV404Y	XA1E-BV404VY
	1NC	1NO	XA1E-BV411Y	XA1E-BV411VY
	2NC	1NO	XA1E-BV412Y	XA1E-BV412VY
	3NC	1NO	XA1E-BV413Y	XA1E-BV413VY

- Specify button color code Y (yellow) or N (gray) in place of ① in the Part No.
- Pushlock pull or turn reset is locked when pressed, and reset when pulled or turned clockwise.
- Terminal cover (XA9Z-VL2) is not supplied and must be ordered separately.
- See page 15 for specifications and instructions.

Stop Switches

ø22mm XW series Stop Switches Pushlock Pull / Turn Reset (Screw Terminal)

Package quantity: 1

Description & Shape	Main Contact	Monitor Contact	Part No.	
			IP20 Terminal	w/Terminal Cover
ø40mm Mushroom 	1NC	—	**XW1E-BV401MFY**	**XW1E-BV401MY**
	2NC	—	**XW1E-BV402MFY**	**XW1E-BV402MY**
	3NC	—	**XW1E-BV403MFY**	**XW1E-BV403MY**
	4NC	—	**XW1E-BV404MFY**	**XW1E-BV404MY**
	1NC	1NO	**XW1E-BV411MFY**	**XW1E-BV411MY**
	2NC	1NO	**XW1E-BV412MFY**	**XW1E-BV412MY**
	3NC	1NO	**XW1E-BV413MFY**	**XW1E-BV413MY**
	2NC	2NO	**XW1E-BV422MFY**	**XW1E-BV422MY**

- Pushlock, pull or turn reset is locked when pressed, and reset when pulled or turned clockwise.
- Specify IP20 terminal or terminal cover with the Part No.
- IP20 terminal type can be connected using solid wires only.
- See page 21 for specifications and instructions.

ø22mm HW series Stop Switches

Package quantity: 1

Description & Shape	Contact Configuration	Part No.		
		ø29mm Mushroom	ø40mm Mushroom	ø60mm Jumbo Mushroom
Pushlock Turn Reset (Photo: ø29mm Mushroom) 	1NC	**HW1B-V301Y**	**HW1B-V401Y**	**HW1B-V501Y**
	1NO-1NC	**HW1B-V311Y**	**HW1B-V411Y**	**HW1B-V511Y**
	2NC	**HW1B-V302Y**	**HW1B-V402Y**	**HW1B-V502Y**
	2NO-2NC	**HW1B-V322Y**	**HW1B-V422Y**	**HW1B-V522Y**
Push-Pull ø40mm Mushroom (2-position) 	1NC	—	**HW1B-Y201Y**	—
	1NO-1NC	—	**HW1B-Y211Y**	—
	2NC	—	**HW1B-Y202Y**	—

- Pushlock turn reset is locked when pressed, and reset when turned clockwise.
- Push-pull is a 2-position switch which is maintained in both pressed and reset (pull) positions.
- See page 32 for specifications and instructions.

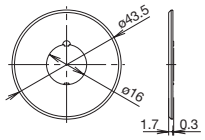
Stop Switches

Nameplates (White)

Shape	Description	Part No.	Material	Plate Color	Legend
For ø16mm Series 	For ø29mm Mushroom	**HAAV-0-W**	Polyamide	White (Munsell N9.5)	Blank
	For ø49mm Mushroom	**HAAV4-0-W**			
For ø22mm Series 	For ø40mm Mushroom	**HWAV-0-W**			
	For ø60mm Mushroom	**HWAV5-0-W**			

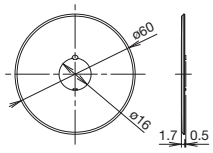
Dimensions

For ø16mm Series (Nameplate for ø29mm Mushroom)



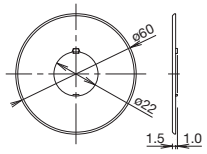
Panel thickness: 0.5 to 2 mm when using a nameplate

(Nameplate for ø40mm Mushroom)



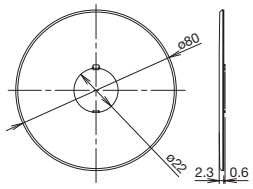
Panel thickness: 0.5 to 2 mm when using a nameplate

For ø22mm Series (Nameplate for ø40mm Mushroom)



Panel thickness: 0.8 to 4.5 mm when using a nameplate

(Nameplate for ø60mm Mushroom)



Panel thickness: 0.8 to 4 mm when using a nameplate

Switch Guard (White)

Description & Shape	Part No.	Remarks
For ø22mm HW/XW Series 	**HW9Z-KG4-W**	• Inside diameter ø76mm • Space-saving, 50 mm-wide.
For ø22mm HW/XW Series 	**HW9Z-KG5-W**	• Inside diameter ø76mm

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