

# Ø30mm XN Series Emergency Stop Switches



IDEC CORPORATION

# High level of function and safety

## ø30mm XN Series Emergency Stop Switches

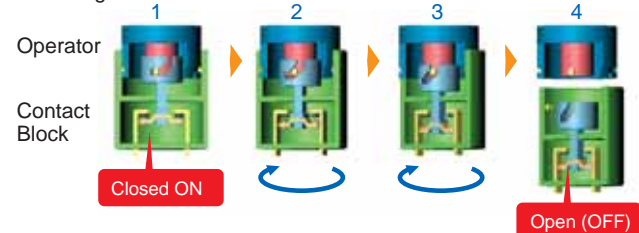
IDEC's new ø30mm XN series emergency stop switches with Safe Break Action and Safety Potential Structure ensure the highest level of safety and functionality.

### Safe Break Action

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

**World's First**

Detaching the Contact Block



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

### Direct Opening Action

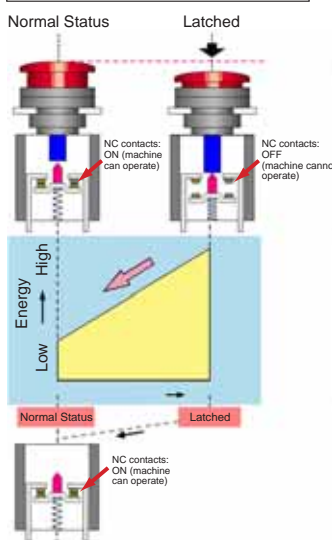
Achievement of contact separation (of a contact element) of the switch actuator through non-resilient members (for example not dependent upon springs)  
(IEC 60947-5-5; 5.2, IEC 60947-5-1; Annex K)

### Safety Lock Mechanism

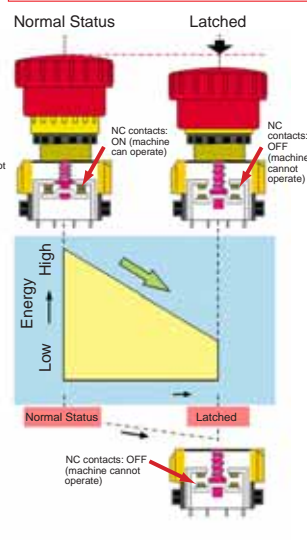
The emergency stop signal shall be maintained until the emergency stop device is reset (disengaged). (IEC 60947-5-5; 6.2)

### Safety Potential Structure

#### 2nd-generation



#### 3rd-generation (Safety Potential Structure)



With the XN emergency stop switches, the potential energy level of the latched status is lower than that of the normal status. In the event the contact block is damaged due to excessive shocks, the NC contacts will turn off, thus leading to safety by stopping the machine.

## Push-to-lock, Pull/Turn-to-Reset in 3 Shapes

### Flush Bezel and Plastic Bezel

Flush Bezel Type



Resetting is possible by either pulling or turning the button, allowing for easy operation.

Flush bezel type extends out only 21 mm from the front of the panel.



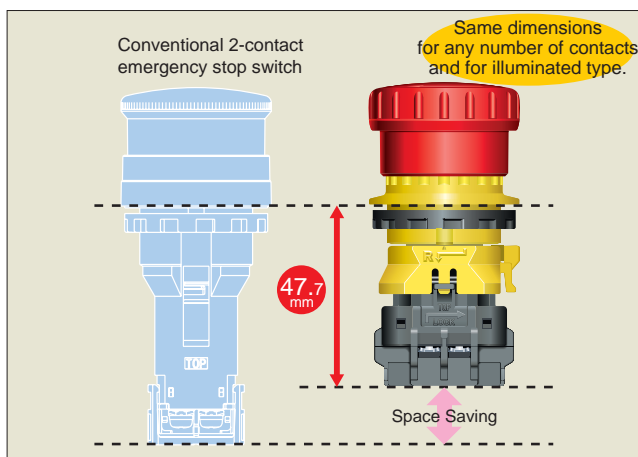
Plastic Bezel  
Jumbo Mushroom (ø60)



Plastic Bezel  
Mushroom (ø40)



Plastic bezel type with four contacts is only 47.7 mm deep behind the panel.



# New Resetting Concept — Padlockable Emergency Stop Switches



Using hasps makes it possible to install a maximum of 20 padlocks (1,500g maximum in total). Padlocks and hasps are not supplied by IDEC with the XN series emergency stop switches and must be ordered separately.

## Padlockable Emergency Stop Switches



### Safety Concept

OSHA (Occupational Safety & Health Administration, U.S. Department of Labor) requires that where the unexpected energization or start-up of the machine or equipment or release of stored energy could cause injury to operators, the machine or equipment is stopped, isolated from all potentially hazardous energy sources and locked out before employees perform any servicing or maintenance.

ISO 12100-2: 2003 also requires that risks be reduced to the lowest allowable level by taking protective measures in order of inherently safe design, safeguarding, and complementary protective measures. Locking out the energy isolation devices is one of complementary protective measures.

Inspired by the lockout concept, IDEC's XN series emergency stop switches have been developed to prevent unauthorized reset of the latched emergency stop switches.

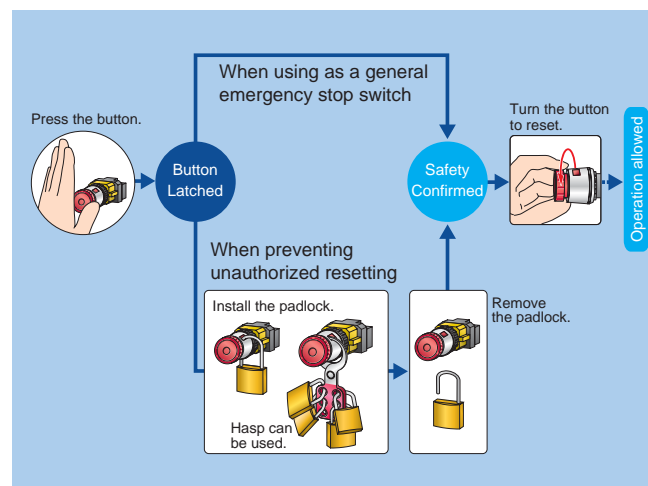
Note:

OSHA 29CFR 1910.147 – The control of hazardous energy (lockout/tagout)  
ANSI Z244.1-2003 Control of Hazardous Energy - Lockout/Tagout and Alternative Methods

The padlocks used on XN series emergency stop switches are **NOT** lockout devices.

### New Resetting Concept

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



#### Notes:





- The XN series emergency stop switch is an additional protective measure.
  - Padlockable safety switches for door guards are also available from IDEC.
  - Perform a risk assessment before using the XN series emergency stop switches.
  - Operators must observe the rules in the work place in order to ensure safety by using emergency stop switches.
- Residual risk such as failure to install padlocks on the emergency stop switches must be taken into consideration.







## Plastic Bezel Type

### • Non-illuminated Emergency Stop Switch

Appearance	NC Main Contact	NO Monitor Contact	Type No.		Operator 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 Type No.
- Only solid wires can be used on the IP20 fingersafe terminal type.

### • Illuminated Emergency Stop Switch

Appearance	Illumination Type	Rated Voltage	NC Main Contact	NO Monitor Contact	Type 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 type.

### • Illuminated Push-ON Emergency Stop Switch






Appearance	Illumination Type	Rated Voltage	NC Main Contact	NO Monitor Contact	Type 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 type is illuminated when the operator is latched, and turns off when reset.
- Only solid wires can be used on the IP20 fingersafe terminal type.

# ø30 XN Series Emergency Stop Switches






## Flush Bezel Type

### • Non-illuminated Emergency Stop Switch

Appearance	NC Main Contact	NO Monitor Contact	Type No.		Operator Color Code
			IP20 Fingersafe Terminal	w/Terminal Cover	
<div>ø40mm Mushroom</div>  <div>     </div>	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 Type No.
- Only solid wires can be used on the IP20 fingersafe terminal type.

### • Illuminated Emergency Stop Switch

Appearance	Illumination Type	Rated Voltage	NC Main Contact	NO Monitor Contact	Type No.		Operator Color
					IP20 Fingersafe Terminal	w/Terminal Cover	
<div>ø40mm Mushroom</div>  <div>     </div>	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 type.






### • Illuminated Push-ON Emergency Stop Switch

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

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






## Padlockable Type

### • Non-illuminated Emergency Stop Switch

Appearance	NC Main Contact	NO Monitor Contact	Type 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 type.
- Padlocks and hasps are not supplied with the emergency stop switches and must be ordered separately. See page 10.

### • Illuminated Emergency Stop Switch

Appearance	Illumination Type	Rated Voltage	NC Main Contact	NO Monitor Contact	Type 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 type.
- Padlocks and hasps are not supplied with the emergency stop switches and must be ordered separately. See page 10.

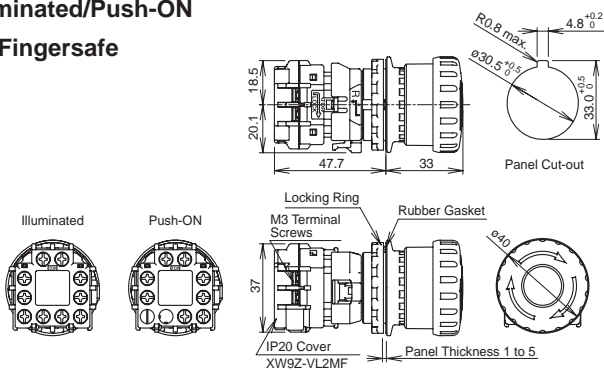
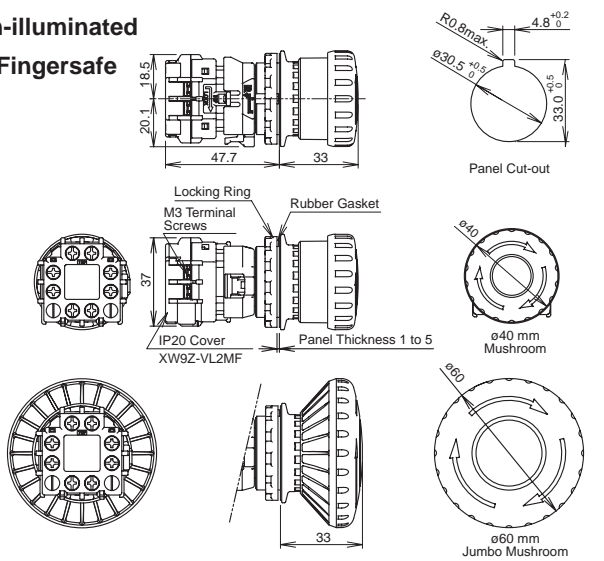
### • LED Push-ON Emergency Stop Switch

Appearance	Illumination Type	Rated Voltage	NC Main Contact	NO Monitor Contact	Type 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	—	
			2NC	1NO	XN4E-TL412Q4MFR	XN4E-TL412Q4MR	

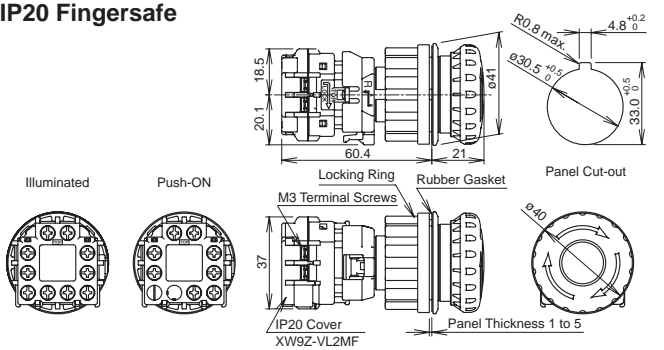
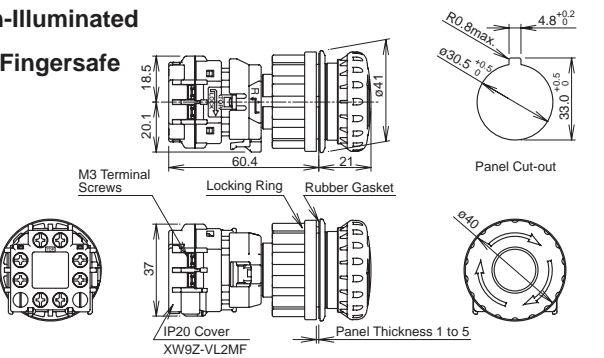
- Push-ON type is illuminated when the operator is latched, and turns off when reset.
- Only solid wires can be used on the IP20 fingersafe terminal type.
- Padlocks and hasps are not supplied with the emergency stop switches and must be ordered separately. See page 10.

# XN Series Emergency Stop Switches

## IP20 Fingersafe



## IP20 Fingersafe



All dimensions in mm.

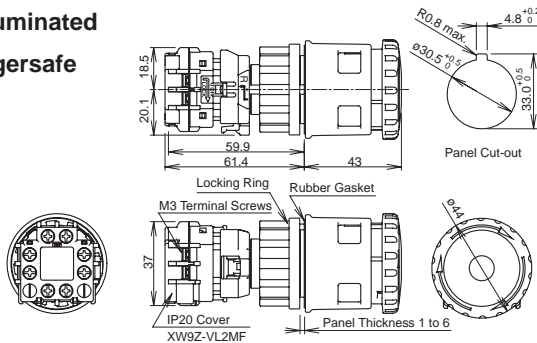


## Dimensions

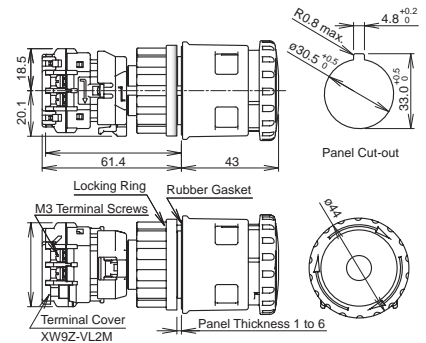
### Padlockable Type

#### • Non-illuminated

#### IP20 Fingersafe

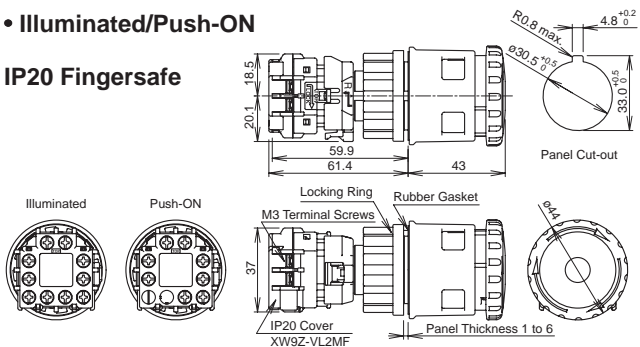


#### w/Terminal Cover

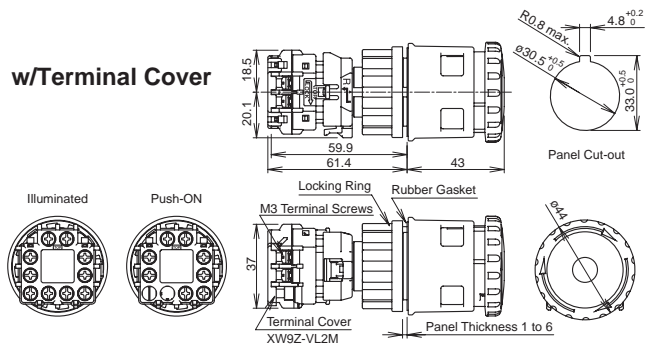


#### • Illuminated/Push-ON

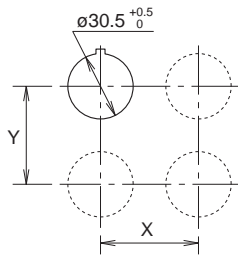
#### IP20 Fingersafe



#### w/Terminal Cover



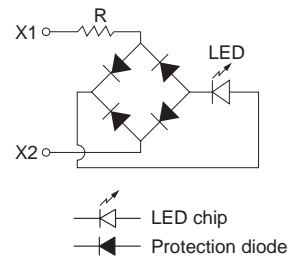
## Mounting Hole Layout



	X	Y
Plastic Bezel Type	70 mm minimum	
Flush Bezel Type		

- 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 type, determine the values according to the size and number of padlocks and hasp.

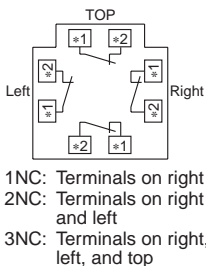
## LED Unit Internal Circuit



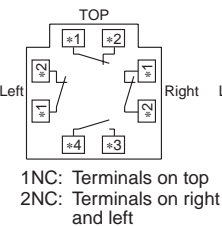
## Terminal Arrangement (Bottom View)

### Non-illuminated

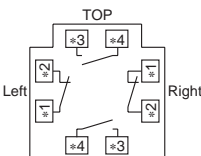
#### • NC main contacts only



#### • With 1NO monitor contact

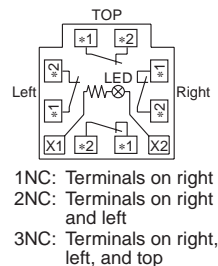


#### • With 2NO monitor contacts

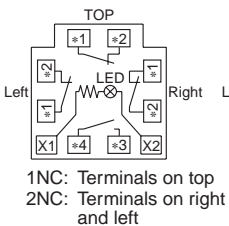


### Illuminated

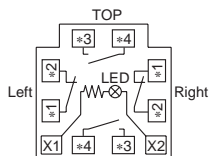
#### • NC main contacts only



#### • With 1NO monitor contact

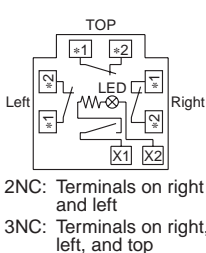


#### • With 2NO monitor contacts

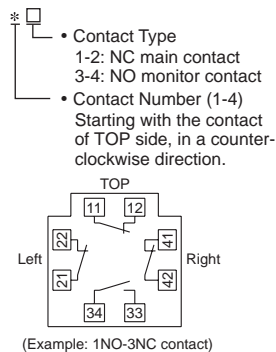
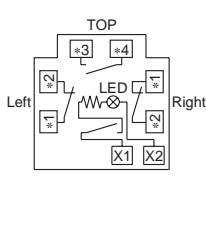


### Push-ON

#### • NC main contacts only

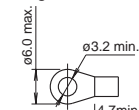


#### • With 1NO monitor contact

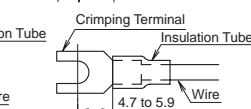
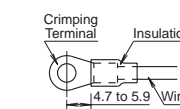
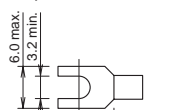


## Applicable Crimping Terminal

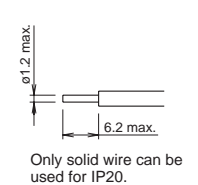
### Ring Terminal



### Spade Terminal



## Solid Wire




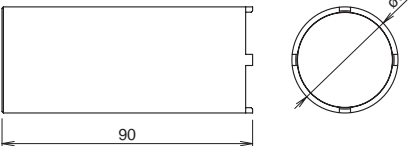

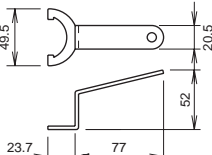


- Be sure to install an insulating tube on the crimping terminal.

All dimensions in mm.

Ø30


## Accessories and Replacement Parts

Name & Appearance	Material	Type No.	Ordering Type No.	Package Quantity	Remarks
Terminal Cover 	PPE	XW9Z-VL2M	XW9Z-VL2MPN02	2	<ul style="list-style-type: none"> <li>• Black</li> </ul>
IP20 Fingersafe Terminal Cover 	Polyamide	XW9Z-VL2MF	XW9Z-VL2MFPN02	2	<ul style="list-style-type: none"> <li>• Black</li> <li>• Used to change terminal cover type to IP20 fingersafe terminal type.</li> <li>• Only solid wires can be used. Once installed, IP20 terminal cover cannot be removed.</li> </ul>
Ring Wrench 	Metal	XN9Z-T1	XN9Z-T1	1	<ul style="list-style-type: none"> <li>• Used to tighten the locking ring when installing the XN emergency stop switch onto a panel.</li> </ul> 
Ring Wrench 	Metal	TWST-T1	TWST-T1	1	<ul style="list-style-type: none"> <li>• Used to tighten the locking ring when installing the XN emergency stop switch onto a panel.</li> <li>• Tighten to a torque of 2.0 to 2.5 N·m.</li> </ul> 

Note:

- 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

Description & Appearance	Type No.	Package Quantity	Legend	Material	Plate Color	Legend Color	Mounting Panel Thickness
	HNAV-0	1	(blank)	Polyamide	Yellow (Munsell 2.5Y 8/10 or equivalent)	Black	XN4E-□L4: 1.0 to 4.5 mm
	HNAV-27		EMERGENCY STOP				XN□E-□V4: 1.0 to 3.5 mm

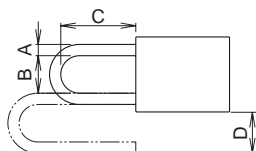
## Padlock and Hasp

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 as shown on page 3, 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 Hasps

Manufacturer	Type No.
PANDUIT CORP.	PSL-HD3 PSL-1A
Master Lock	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.

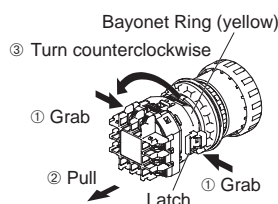
Padlocks and hasps are available from the following manufacturers.

Manufacturer	URL
PANDUIT CORP.	<a href="http://www.panduit.com/">http://www.panduit.com/</a>
Master Lock® Company LLC	<a href="http://www.masterlock.com/">http://www.masterlock.com/</a>

## 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.

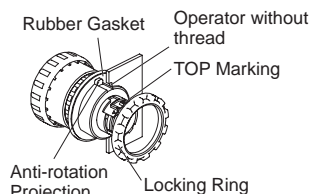


#### Notes for removing the contact block

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 pushbuttons. 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.



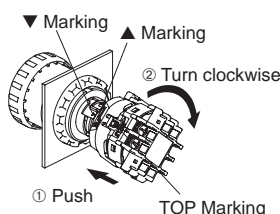
#### When using a nameplate

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.



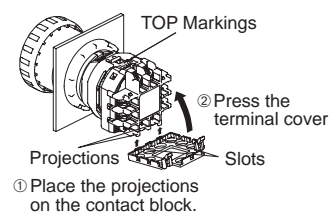
#### Notes for installing the contact block

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.

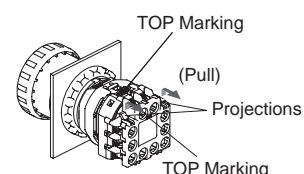
### Installing & Removing Terminal Covers

#### • 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.

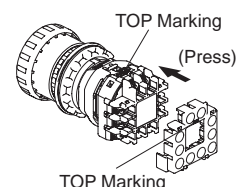


To remove the terminal cover, pull out the two latches on the top side of the terminal cover. Do not exert excessive force to the latches, otherwise the latches may break.



#### 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.

# ø30 XN Series Emergency Stop Switches



## Safety Precautions

- Turn off power to the XN series emergency stop switch before installation, removal, wiring, maintenance, and inspection of the switches. Failure to turn power off may cause electrical shock or fire hazard.
- Use wires of the proper size to meet the voltage and current requirements, and tighten the M3 terminal screws to the recommended tightening torque of 0.6 to 1.0 N·m. If improper wire is used or the screw is tightened loosely, the switch may heat during operation, causing fire hazard. Also, provide proper protection for electric shocks.

## ø16mm XA / ø22mm XW Series Emergency Stop Switches

### ø16mm XA Series

The world's first ø16mm, 4-contact emergency stop switch—only 27.9 mm deep behind the panel.

- Contact: Main 1NC to 4NC, Monitor 1NO
- Rated Operating Current: Main contacts  
AC: 250V, 3A (resistive load)  
DC: 250V, 0.2A (resistive load)  
Monitor contacts  
AC: 250V, 0.6A (resistive load)  
DC: 250V, 0.2A (resistive load)
- Illumination Ratings: 24V AC/DC, 11 mA



### ø22mm XW Series

The world's shortest ø22mm, 4-contact emergency stop switch—only 48.7 mm deep behind the panel.

- Contact: Main 1NC to 4NC, Monitor 1NO to 2NO
- Rated Operating Current: Main contacts  
AC: 250V, 3A (resistive load)  
DC: 250V, 0.2A (resistive load)  
Monitor contacts  
AC: 250V, 0.6A (resistive load)  
DC: 250V, 0.2A (resistive load)
- Illumination Ratings: 24V AC/DC, 15 mA



Specifications and other descriptions in this catalog are subject to change without notice.



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