IDEC

Emergency Stop Switches
(Unibody/Illuminated)
XA/XW 16mm and 22mm Series



Short Body E-stop compliant with ISO13850

Emergency stop switches to ensure safety and functionality

IDEC CORPORATION

COMPACT AND STANDARDS-COMPLIANT SAFETY DEVICES

Emergency stop (E-stop) switches are a fundamental safety element for all types of automation, but compact equipment sizes and increasing regulatory requirements are challenging designers to find better ways of incorporating E-stops.

The IDEC XA/XW short-body E-stops address this, featuring a minimal installation footprint and meeting the requirements of ISO 13850:2015 by illuminating the cap in red when the E-stop is functional (Active) to be used in an emergency situation, and turning white when the E-stop is not-functional (Inactive).

With additional safety and durability features, designers now have more choices to ensure standards-compliant safety in industrial applications.



Active (Illuminated in red) | Inactive (Non-illuminated)

• XA series (illuminated switch)/button color: white, illuminated color: red

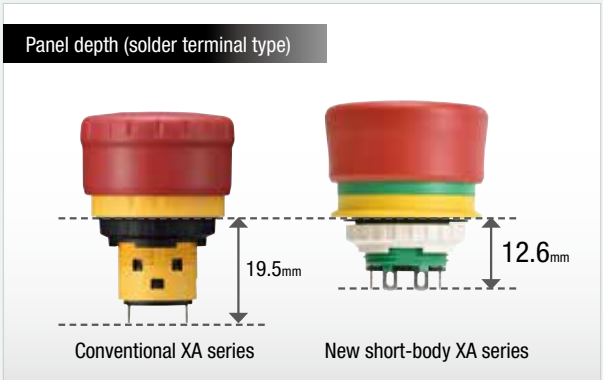
NEW Added: illuminated “low-voltage” (3 to 6V) type, suitable for use with circuit boards and battery power supplies.

FEATURES

Shortest depth in the IDEC X-Series lineup

Panel depth
- 12.6mm (solder terminal)
- 17.0mm (solder/tab #110 terminal)

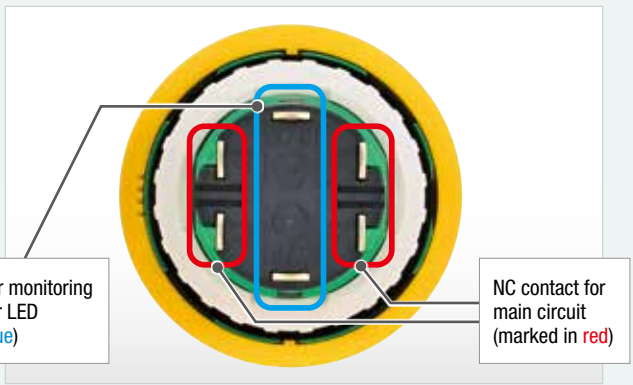
Designed with the shortest body among multiple generations of IDEC emergency stop switches, this E-stop helps users save space behind the panel for their application.



Unibody structure with 1NO-2NC contacts

Compact unibody structure with 3-terminal configuration suitable for a wide range of applications in limited space.

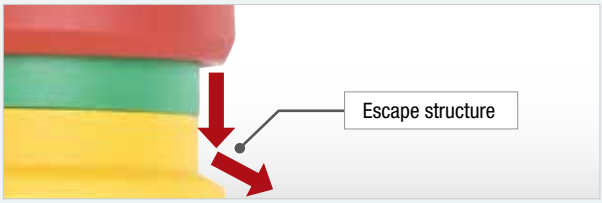
One contact (blue) can be used as a lamp terminal or as a NO contact for monitoring.

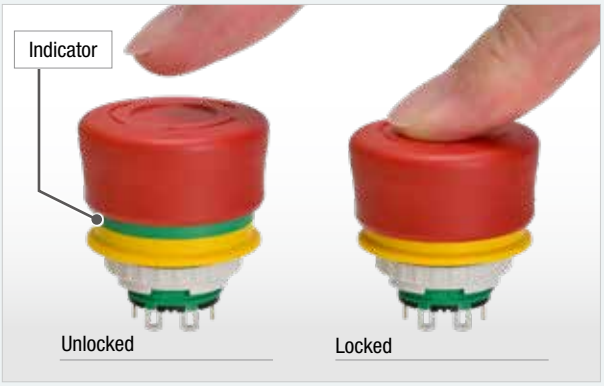


Status indicator and escape structure

The indicator (green area) visible from the side enables the user to check the operating status of the switch at a glance.

Also, an escape structure prevents foreign objects from being caught during operation, ensuring a smooth activation of the E-stop in an emergency situation.





Certified for outdoor use

XA/XW series E-stops are UL type 4X certified, making them the ideal E-stops for use in wet, windy, and snowy environments.*

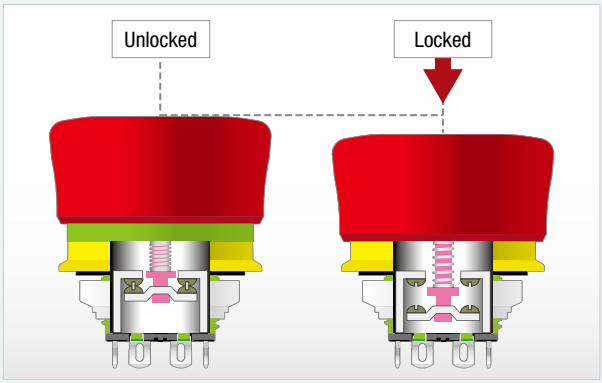
*Not certified for use in all outdoor environments.



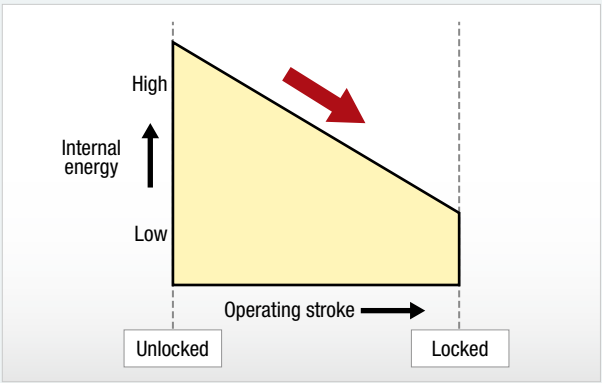
Safer E-stop with reverse energy structure

3rd generation (reverse energy structure)

The energy level of the new emergency stop switch



Main contacts (NC) are always inclined to turn off (safe)



Emergency stop function on portable operator control stations

With the growing advancements in technology, users have been demanding more convenient and efficient options such as using detachable cables that allow a single teaching pendant to be used with multiple robots or eliminating the need for wiring altogether. However, safety remains a crucial aspect that must be considered with utmost care. Therefore, the requirements for detachable and wireless operator control stations have been updated in this revision to ensure maximum safety and reliability.

ISO 13850: 2015

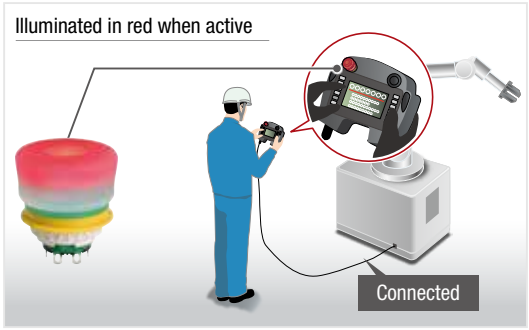
4.3.8.

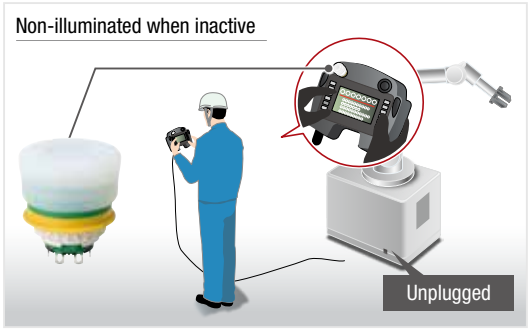
When emergency stop devices are installed on detachable or cableless operator control stations (e.g. pluggable portable teaching pendants), at least one emergency stop device shall be permanently available (e.g. in a fixed position) on the machine.

In addition, at least one of the following measures shall be applied to avoid confusion between active and inactive emergency stop devices:

— device colour changing through illumination of the active emergency stop device;
— automatic (self-actuating) covering of inactive emergency stop devices; where this is not practicable, manually-applied covering may be used, provided that the cover remains attached to the operator control stations;
— provision of proper storage for detached or cableless operator control stations.

The instructions for use of the machine shall state, which measure has been applied in order to avoid confusion between active or inactive emergency stop device(s). The correct operation of this measure shall be explained.





• Active/Inactive status does not indicate the button operation (lock/unlock) status of the emergency stop switch.

Intended actuation

Recommended actuators and nameplates

**To ensure quick and effective response in case of an emergency, it is crucial to optimize the operability and visibility of the emergency stop switch. The switch should be easily accessible and actuated with intent and without any hesitation.
Therefore, the following safety requirements are included.**

ISO 13850:2015

4.1.1.2

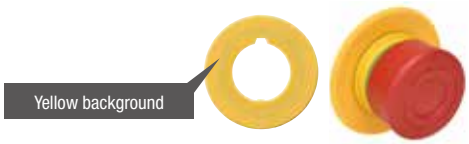
The emergency stop function must be available and operable at all times.

4.3.6

The actuator of the emergency stop device shall be coloured RED. As far as a background exists behind the actuator and as far as it is practicable, the background shall be coloured YELLOW.

4.3.7

Neither the actuator nor the background should be labelled with text or symbols.
When it is necessary to identify the direction of unlatching of the actuator (button) then this identification shall have the same or nearly the same colour as the actuator.



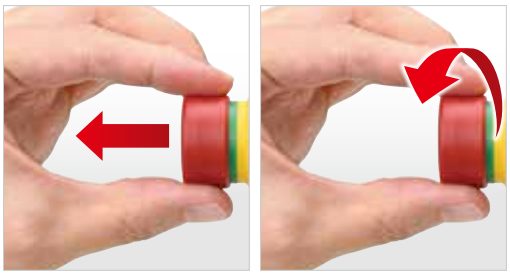


Intended resetting

Importance of human intention in resetting

In emergency situations, an emergency stop switch requires an intentional action to be triggered. As such, it is also essential to consider the intended action required to reset the emergency stop switch as part of the safety requirements.

Resetting the switch



Pull to reset | Turn to reset

ISO 13850:2015

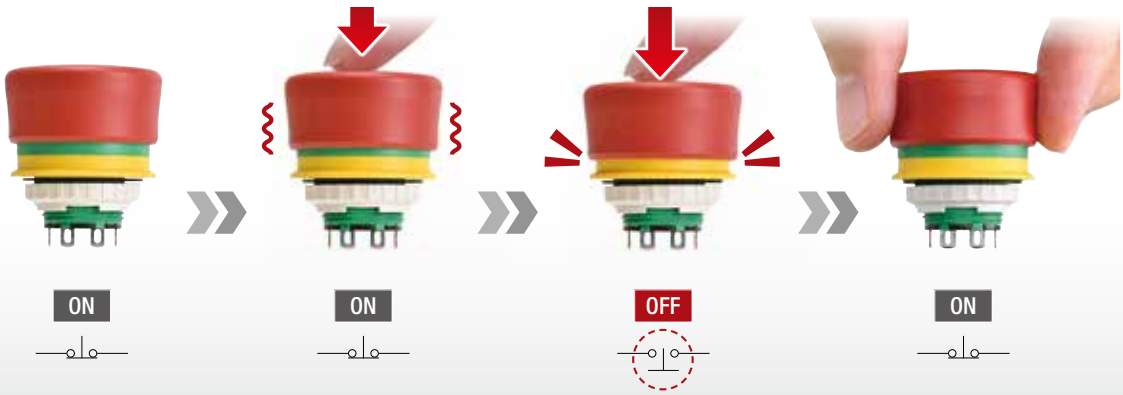
4.1.1.2

The emergency stop function shall be reset by intentional human action. Resetting of the emergency stop function shall be operated by disengagement of an emergency stop device.

Example (IDEC XA series)

The NC contact does not move until the emergency stop switch latches (locks), allowing OFF operation and resetting only by the intended operation.

▶ The safety lock feature allows only the intended reset to operate.



Emergency stop switches are vital safety components used across various industries to prevent accidents and ensure worker safety.

The new compact and short-body design XA/XW series offers a wider range of applications, making it a versatile and reliable solution for emergency stop needs.

Portable pendants and robot controllers

ROBOT



Low profile panels and small transport equipment

AGV/AMR



Outdoor facilities with high temperatures (Operating temperature up to +70ºC)*

QUICK CHARGER FOR EV



*Non-illuminated type only

Remote control box for use in environments exposed to rain

WIRELESS REMOTE CONTROL



ø16 XA / ø22 XW Series
Emergency stop switches (unibody/illuminated)

The new addition to the XA/XW series features a reverse energy structure with illuminated or 1NO-2NC contact types available. These have a compact and unibody design with a panel depth of 12.6mm.

- Product lineup includes an illuminated 24V type and an illuminated "low-voltage" (3 to 6V) type (for use with battery power supplies).
- Two reset operations (Pushlock pull or turn reset)
- Reverse energy structure
- Safety lock mechanism (IEC 60947-5-5: 6.2)
- Direct opening action mechanism (IEC 60947-5-5: 5.2, IEC 60947-5-1 annex K.)
- Protection degree IP65, IP67, (IEC 60529) and IP69K (ISO 20653)
- Indicator and escape structure



- See website for details on approvals and standards.

Contact ratings

Rated insulation voltage (Ui)			Non-illuminated	250V		
			Illuminated			
Rated current (Ith)			Non-illuminated	5A		
			Illuminated	3A		
Rated operating voltage (Ue)				30V	125V	250V
Rated operating current (*1)	Main contact	AC 50/60Hz	Resistive load (AC-12)	–	3A	1.5A
			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 contact	AC 50/60Hz	Resistive load (AC-12)	–	1.2A	0.6A
			Inductive load (AC-15)	–	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 on silver, crossbar contacts		

- Minimum applicable load (reference value) = 5V AC/DC, 1mA
  3V AC/DC, 5mA
  (Applicable range may vary with operating conditions and load types.)
- Operational current represents the classification by making and breaking current (IEC 60947-5-1)

*1) UL recognized ratings: Pilot Duty AC 1.5A / 250V
Pilot Duty DC 1A/30V
Maximum ambient air temperature 60˚C
TÜV / CCC certified ratings: AC-15 1.5A / 250V, DC-13 1A / 30V

Illumination rating

Illuminated 24V type

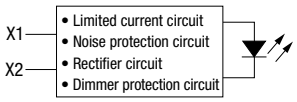
Rated voltage	Operating voltage	Rated current
24V AC/DC	24V AC/DC ±10%	Typ.10mA

Illuminated low-voltage (3 to 6V) type

Rated voltage	Operating voltage	Rated current
3 to 6V DC	3.0 to 6.0V DC	Typ.21mA

LED Internal Circuit

- LED lamp is not removable.



Bottom View

Non-illuminated	Illuminated 24V type	Illuminated low-voltage 3 to 6V type



Performance Specifications

Type		XA	XW
Applicable standards		IEC 60947-1, EN 60947-1, JIS C 8201-1 IEC 60947-5-1, EN 60947-5-1, JIS C 8201-5-1, IEC 60947-5-5 (*2), EN 60947-5-5 (*2), JIS C 8201-5-5 (*2), UL 60947-5-5(*2) , UL 991(*2), NFPA79 (*2), ISO 13850 (*3), UL 508, CSA C 22.2 No. 14, GB/T14048.5	
Standard operating conditions	Operating temperature	Non-illuminated:-25 to +70˚C (no freezing)	
		Illuminated: -25 to +55˚C (no freezing)	
	Operating humidity	30 to 85%RH (no condensation)	
	Storage temperature	Non-illuminated: -45 to +80˚C (no freezing)	
		Illuminated: -30 to +70˚C (no freezing)	
Operating force		Pushlock: 20N Pull reset:12N Turn reset: 0.2N·m	
Minimum force required for direct opening action		50N	
Minimum operator stroke required for direct opening action		3mm	
Maximum operator stroke		4.1mm	
Contact resistance		50mΩ max. (initial value)	
Insulation resistance		100MΩ min. (500V DC megger)	
Overvoltage category		II	
Impulse withstand voltage		2.5kV	
Degree of pollution		Panel front:3, Panel back: 2	

*2) Yellow/Gray button types are not subject to relevant standards and cannot be used as an emergency stop switch.
*3) Illuminated white button should be used with red illumination in accordance with ISO 13850.
*4) When using low-voltage type (3 to 6V DC type) illuminated parts at 3.0 to 3.2V DC, use them in the -5 to 55˚C range.

Type	XA	XW
Operation frequency	900 operations per hour	
LED life (*5)	60,000 hours (Ta = 25°C, 45%RH) (The total illumination life in which the illuminance maintains a minimum of 50% of the initial value.)	
Shock resistance	Operating extremes: 150m/s^2 Damage limits: 1000m/s^2	
Vibration resistance	Operating extremes: 10 to 500Hz, amplitude 0.35mm, acceleration 50 m/s^2 Damage limits: 10 to 500Hz, amplitude 0.35mm, acceleration 50m/s^2	
Durability	Mechanical:250,000 times min. Electrical: 100,000 times min. 250,000 times min. (24V AC/DC, 100mA)	
Degree of Protection (*6)	Panel front: IP65, IP67, IP69K, UL Type 4X	
Impact protection	Equivalent to IK06, 07 *No damages	
Short-circuit protection	250V/10A fuse (Type aM IEC 60269-1/IEC 60269-2)	
Conditional short-circuit current	100A	
Terminal style	Solder terminal, Solder/tab #110 terminal	
Recommended tightening torque of locking ring	0.8 to 0.9N·m	1.8 to 2N·m
Connectable wire	1.25mm^2 max. (AWG16 max.)	
Terminal soldering conditions	310 to 350°C, within 3 seconds	
Weight (approx.)	Approx. 15g	Approx. 17g

*5) This is not a guaranteed value. Actual LED life varies depending on operating environment and conditions. It is also subject to change without notice. Ta is the operating temperature of the product.
*6) The protective structure is based on the test conditions of IEC 60529, ISO 20653, and JIS C 0920. This is not guaranteed for all operating environments. The specification values for the protective structure are for products that have been installed.

Emergency Stop Switches

ø16 XA pushlock pull or turn reset switch (non-illuminated)

Quantity: 1

Shape	Part No.	Contact	Terminal style	Button color
	XA1E-BV3SG01∗	1NC	Solder terminal	Red Bright red
	XA1E-BV3SG01T∗		Solder/tab #110 terminal	
	XA1E-BV3SG02∗	2NC	Solder terminal	
	XA1E-BV3SG02T∗		Solder/tab #110 terminal	
	XA1E-BV3SG12∗	1NO-2NC	Solder terminal	
	XA1E-BV3SG12T∗		Solder/tab #110 terminal	

∗Color code: R (red), RH (bright red)

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

ø22 XW pushlock pull or turn reset switch (non-illuminated)

Quantity: 1

Shape	Part No.	Contact	Terminal style	Button color
	XW1E-BV3SG01∗	1NC	Solder terminal	Red Bright red
	XW1E-BV3SG01T∗		Solder/tab #110 terminal	
	XW1E-BV3SG02∗	2NC	Solder terminal	
	XW1E-BV3SG02T∗		Solder/tab #110 terminal	
	XW1E-BV3SG12∗	1NO-2NC	Solder terminal	
	XW1E-BV3SG12T∗		Solder/tab #110 terminal	

• ∗Color code: R (red), RH (bright red)

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

ø16 XA pushlock pull or turn reset switch (illuminated)

Quantity: 1

Shape	Part No.	Contact	Terminal style	Voltage	Button color	Illuminated color
	XA1E-LV3SG02Q4R	2NC	Solder terminal	24V	Red	Red
	XA1E-LV3SG02QBR			3.0 to 6.0V DC		
	XA1E-LV3SG02Q4TR		Solder/tab #110 terminal	24V		
	XA1E-LV3SG02QBTR			3.0 to 6.0V DC		
	XA1E-LV3SG02Q4WR		Solder terminal	24V	White	Red
	XA1E-LV3SG02QBWR			3.0 to 6.0V DC		
	XA1E-LV3SG02Q4TWR		Solder/tab #110 terminal	24V		
	XA1E-LV3SG02QBTWR			3.0 to 6.0V DC		

ø22 XW pushlock pull or turn reset switch (illuminated)

Quantity: 1

Shape	Part No.	Contact	Terminal style	Voltage	Button color	Illuminated color
	XW1E-LV3SG02Q4R	2NC	Solder terminal	24V	Red	Red
	XW1E-LV3SG02QBR			3.0 to 6.0V DC		
	XW1E-LV3SG02Q4TR		Solder/tab #110 terminal	24V		
	XW1E-LV3SG02QBTR			3.0 to 6.0V DC		
	XW1E-LV3SG02Q4WR		Solder terminal	24V	White	Red
	XW1E-LV3SG02QBWR			3.0 to 6.0V DC		
	XW1E-LV3SG02Q4TWR		Solder/tab #110 terminal	24V		
	XW1E-LV3SG02QBTWR			3.0 to 6.0V DC		

• When using the “button color: white” version, be sure to use the switch when it is illuminated (active).

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

Accessories

Name / Shape	Part No.	Specification	Quantity	Remarks
Locking ring wrench 	MT-001	Metal (brass, nickel plated)	1	For XA series. Used to tighten the locking ring when mounting the unit to the panel.
Locking ring 	XA9Z-LNW	Polyamide resin (White)	10	For XA series
Locking ring wrench 	MW9Z-T1	Metal (Brass)	1	For XW series. Used to tighten the locking ring when mounting the unit to the panel.
Locking ring 	XW9Z-LNW	Polyamide resin (White)	5	For XW series

Nameplates

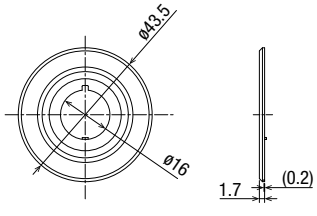
Package quantity: 1

Name	Legend	Part No.	Material	Plate Color	Legend Color	Remarks
Nameplate for XA1E	(blank)	HAAV-0	Polyamide	Yellow	Black	After installation, the degree of protection will be IP65, IP67.
	EMERGENCY STOP	HAAV-27				
Nameplate for XW1E	(blank)	HWAV-0-Y				After installation, the degree of protection will be IP65.
	EMERGENCY STOP	HWAV-27-Y				

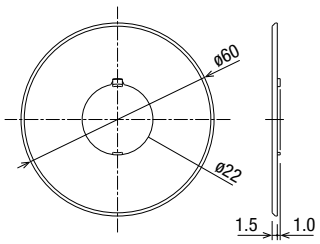
• Panel thickness when using the nameplate: 0.5 to 3 mm

Dimensions

All dimensions in mm.



• Panel thickness when using the nameplate: 0.5 to 3 mm



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

ø16 Switch Guards

Package quantity: 1

Shape	Part No.	SEMI S2	ISO 13850	Applicable Switches	Remarks
	XA9Z-KG1	○	○	XA1E-BV3 XA1E-LV3	• Material: Polyamide (PA6) • Degree of protection: IP65 (IEC 60529) • Please check the latest standards when selecting equipment.

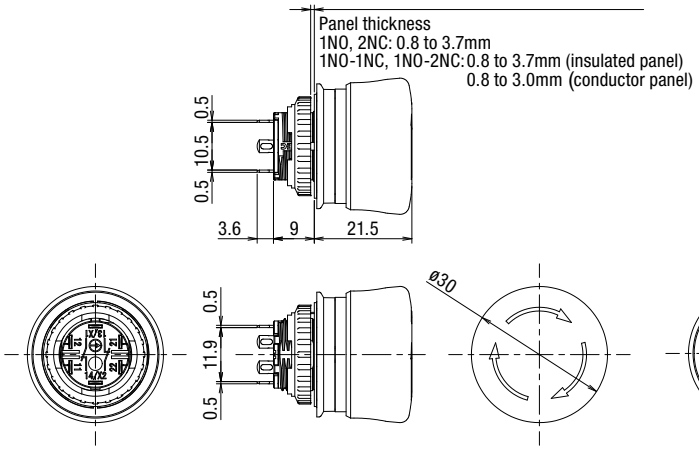
• The combination of IDEC's emergency stop switches and EMO switch guards are approved by TÜV Rheinland for compliance with SEMI S2 standard.

Dimensions

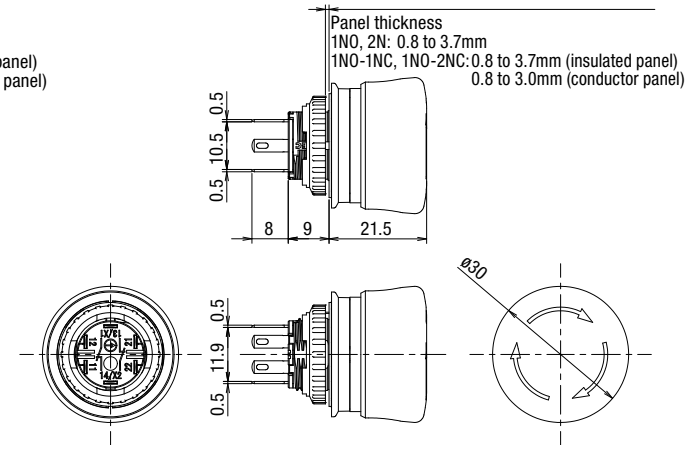
All dimensions in mm.

ø16 XA pushlock pull or turn reset switch (illuminated or non-illuminated)

Solder terminal

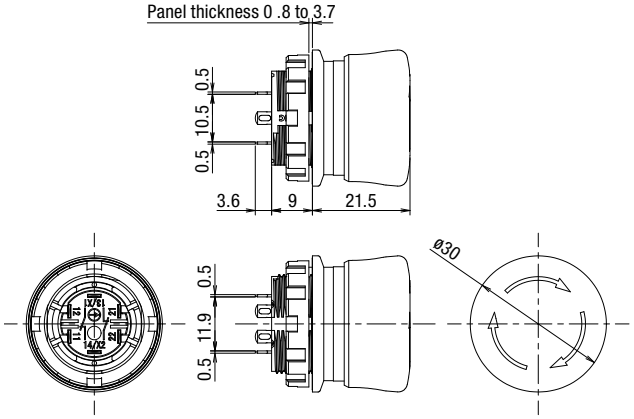


Solder/tab #110 terminal

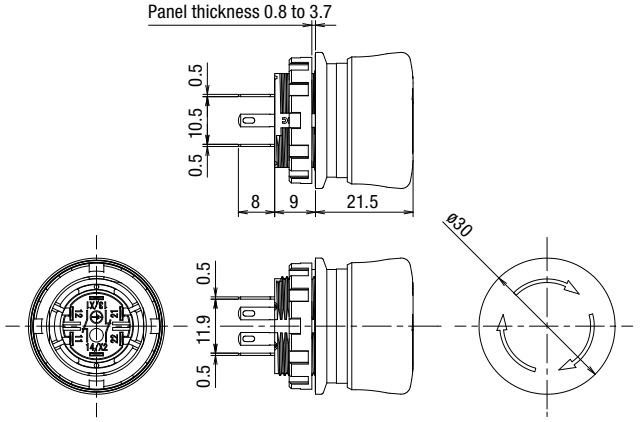


ø22 XW pushlock pull or turn reset switch (illuminated or non-illuminated)

Solder terminal



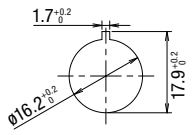
Solder/tab #110 terminal



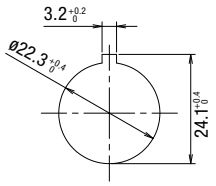
Panel cut-out

All dimensions in mm.

ø16 XA pushlock pull or turn reset switch (illuminated or non-illuminated)



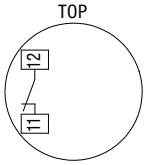
ø22 XW pushlock pull or turn reset switch (illuminated or non-illuminated)



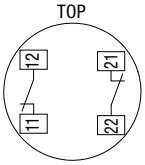
Terminal arrangement (BOTTOM VIEW)

Non-illuminated

1NC contact

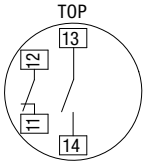


2NC contact

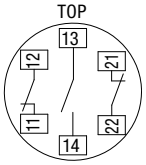


1NC: Terminals on left
2NC: Terminals on right

1NO-1NC contact



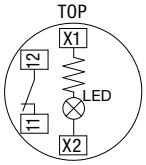
1NO-2NC contact



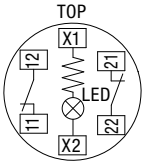
1NC: Terminals on left
2NC: Terminals on right

Illuminated

1NC contact



2NC contact



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

⚠ Safety Precautions

- Turn off the power to the product before starting installation, removal, wiring, maintenance, and inspection of the products. Failure to turn power off may cause electrical shock or fire.
- Use wires of the proper size to meet the voltage and current requirements. Incorrect wiring causes overheating, resulting in a possible fire hazard. Provide appropriate protection against electric shock. Failure to turn power off may cause electrical shock or fire.

Instructions

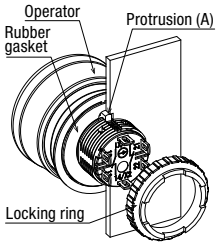
Panel mounting

Notes for panel mounting

Do not tighten with excessive force using tools such as pliers. Otherwise the locking ring may be damaged.

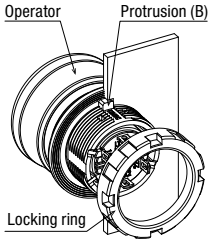
XA Series

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. Install the locking ring with the recommended tightening torque by aligning the protrusion A of the operator with the panel hole groove. Using the locking ring wrench MT-001, tighten the locking ring to a torque of 0.8 to 0.9N·m.



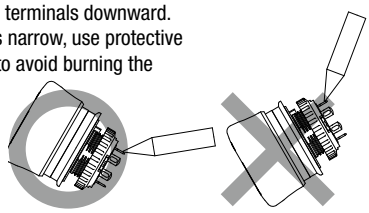
XW Series

Remove the locking ring from the operator and insert the operator from panel front into the panel hole. Install the locking ring with the recommended tightening torque by aligning the protrusion B of the operator with the panel hole groove. Using the locking ring wrench MW9Z-T1, tighten the locking ring to a torque of 1.8 to 2.0N·m.



Wiring (Notes for solder terminal)

1) The applicable wire size is 1.25mm2 maximum. The wires should be soldered through the holes in the terminals.
2) Solder the terminals using a soldering iron at 310 to 350°C for within 3 seconds. Do not use flow or dip soldering. (Sn-Ag-Cu type lead-free solder is recommended.) When soldering, make sure to solder as far away as possible from the plastic part of the switch body. Do not apply external force such as bending the terminals or pulling the wires. Check the operation using the actual load.
3) Use a non-corrosive rosin-based 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 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.



Wiring (solder/tab #110 terminal)

1) Use quick connect #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 Chatter/bounce

Contact chatter/bounce may occur when the main contact (NC contact) is reset by pulling or turning or when the monitor contact (NO contact) is pressed. Take countermeasures to prevent chatter/bounce. (Reference value: 20ms)
Also, do not apply external shock to the switch as chatter may occur.

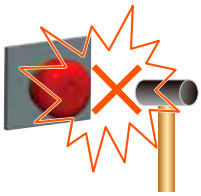
LED Illuminated Switches

- Illumination colors and illuminance may vary depending on the LED element and each product.
- An LED lamp is built into the contact block and cannot be replaced.

Notes

- Do not expose the switch to excessive shock and vibration, otherwise the switch may be deformed or damaged, causing malfunction or operation failure.
- Be sure to observe the operating ambient temperature. Ambient operating temperature is the temperature surrounding the product. Check the ambient temperature when using the product. Conditions exceeding the specifications may cause the internal temperature to rise, resulting in failure.
- Do not disassemble, repair, or modify the power supplies.
- The color of the button may vary on the production lot.
- The resin may discolor if left in a high temperature environment.
- Do not install in the following environment

(1) Where this product is exposed to high-pressure water. (Exceeding specifications equivalent to IEC 60529 protection classes IPX5, IPX7, and IPX9K)
(2) Where dust (locations exceeding the specifications equivalent to IEC 60529 protection class IP6X)
(3) Where safety and reliability may be impaired by corrosive, volatile, flammable or chemicals gases, etc.
(4) Where strong magnetic fields or strong electric fields are generated.
(5) Where flammable substances are generated or exist.
(6) Locations where condensation or icing may occur, such as inside freezers, air conditioner vents, etc. (When using the product in the above locations, take measures to prevent condensation or icing.)
(7) Where ozone, radiation, or ultraviolet rays may impair safety or reliability.



- When installing an emergency stop switch, be sure to conduct a risk assessment.
- If active and inactive emergency stop switches coexist in the working area, take measures according to ISO 13850 and the requirements of applicable equipment and machinery to avoid confusion between active and inactive states.

For customers using the “button color: white / illuminated color: red” combination

- This product is an emergency stop switch for detachable or wireless control stations.
- When the emergency stop function is active, be sure to only use the switch when it is illuminated (red).
- Do not turn on the illumination function while the emergency stop function is inactive. In addition, be sure that the illumination is not dimmed by leakage current or induced current.
- When using this emergency stop switch for detachable or wireless control stations, be sure to install at least one switch in an appropriate location on or near to the connected machinery.
- When conducting a risk assessment, consider scenarios where the illuminated part of the switch does not light up, or is not bright enough, due to loss of power supply or a failure in the LED circuit.
- Be sure that the colors when active (red) and inactive (white) can be clearly distinguished between in the actual use environment.

Be sure to read the instruction manual carefully before performing installation, wiring, or maintenance work.

For details on mounting, wiring, and maintenance, see the instruction manual from the URL below.
URL: https://product.idec.com/?product=XA1E-XW1E