



# Ø16mm X6 Series Emergency Stop Switches



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



Actual  
Size



If you have ever wondered...

*“Which emergency stop switch assures the highest level of safety?”*

→ Ask IDEC.

# ø16mm X6 Series

## Third-generation emergency stop switch with **Reverse Energy Structure**

Long committed to providing the highest level of safety, IDEC has developed the new X6 series unbody emergency stop switch. With IDEC’s original Reverse Energy Structure incorporated, the X6 series emergency stop switches provide the highest level of safety in a compact body.

Third-generation  
Reverse Energy  
Structure

**First\***

**Excellent safety**

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 unibody design eliminates the possibility of the contact bocks falling off the switch (details on page 3).

\* Based on IDEC research as of March 2010.

**New**

### Unparalleled design

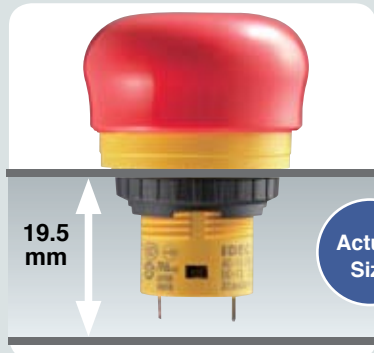
The smooth button is ideal for applications that require utmost cleanliness, such as food processing machines or semiconductor manufacturing equipment. Also suitable for applications requiring a sleek design of emergency stop switches, such as medical equipment.



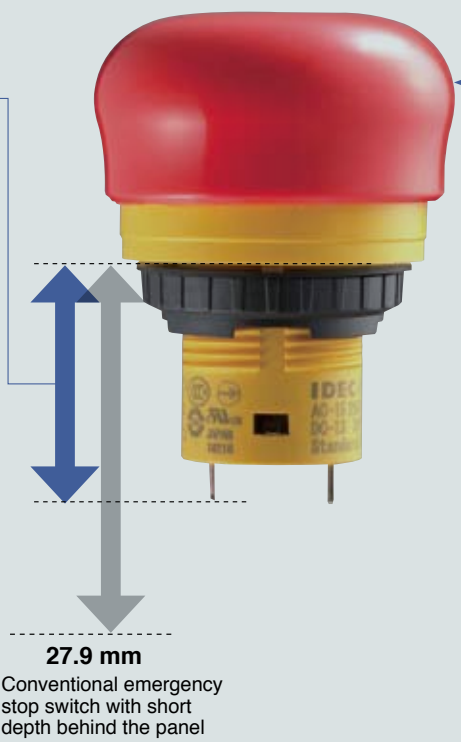
**Only 19.5 mm depth behind the panel**

**Smallest in its class**

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

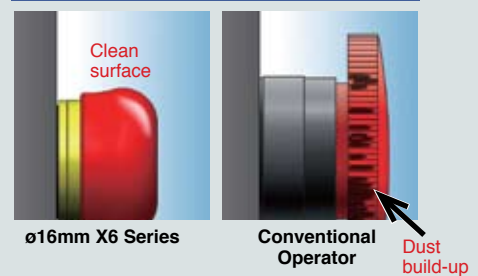


**Actual Size**



**Prevents dust build-up**

**Clean**



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

**Variety**

**Two ways to reset, two button sizes.**

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.



Pull to reset



Turn to reset

Third-generation  
Reverse Energy  
Structure

# Highest Safety

## IDEC's Unique Reverse Energy Structure

**Third Generation**

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

Satisfies the requirements of:

- ① ② ③

+

**IDEC's Unique Reverse Energy Structure**

**Second Generation**

Compliant with international safety standards.

Satisfies the requirements of:

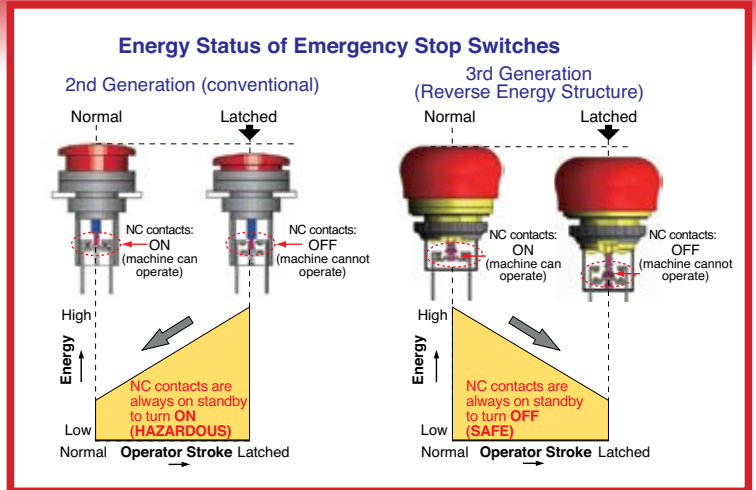
- ① ② ③

**First Generation**

Developed before the establishment of international safety standards.

Satisfies the requirements of:

- ① ②



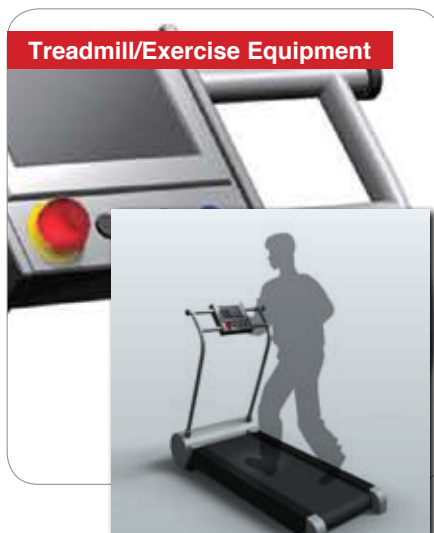
With X series emergency stop switches, the potential energy level of the latched status is lower than that of normal status. In the event the switch is damaged due to excessive shocks, the NC contacts will turn off, thus stopping the machine (patented design).

### International Safety Standards Requirements

- ① Red-colored, mushroom actuator, with yellow background. (IEC 60947-5-5; 4.2, ISO 13850; 4.4, IEC 60204-1; 10.7)
- ② Normally closed contacts with a direct opening action (IEC 60947-5-5; 5.2, IEC 60947-5-1; Annex K)
- ③ The emergency stop function shall be maintained by latching of the operator until reset manually (IEC 60947-5-5; 6.2, ISO 13850; 4.4)

## High functionality with sleek design

X6 series emergency stop switches for various applications



# ø16 X6 Series Emergency Stop Switches (unibody type)

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

- Two button sizes—ø30mm and ø40mm
- Two button colors—red for emergency stop switch and yellow for stop switch
- Two ways of resetting —pulling and turning.
- UL, c-UL recognized, EN compliant.
- Safety lock mechanism (IEC 60947-5-5; 6.2)
- Direct opening action (IEC 60947-5-5; 5.2, IEC 60947-5-1, Annex K)



### Standards

| Standard                          | Mark | Approval Organization/<br>File No.          |
|-----------------------------------|------|---|
| UL508<br>CSA C22.2 No.14          |      | UL/c-UL File No.E68961                      |
| EN60947-5-1<br>EN60947-5-5 (Note) |      | TÜV SÜD                                     |
|                                   |      | European Commission's Low Voltage Directive |

Note: Except for stop switch (yellow button)

### 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 rating: AC-15 0.75A/250V, DC-13 1A/30V

UL rating: Standard Duty AC 0.75A/250V  
Standard Duty DC 1A/30V

Manufacturer:

IDEC CORP. 1-7-31 Nishimiyahara, Yodogawa-Ku, Osaka 532-8550, Japan

EU Authorized Representative:

IDEC Elektrotechnik GmbH

Wendenstrasse 331, D-20537 Hamburg, Germany

DECLARATION OF CONFORMITY:

We, IDEC CORPORATION 7-31, Nishimiyahara 1-chome Yodogawa-ku, Osaka 532-8550, Japan declare under our sole responsibility that the product:

Description: Emergency stop switches

Model No.: X6

to which this declaration relates is in conformity with the EC Directive on the following standard(s) or other normative document(s). In case of alteration of the product, not agreed upon by us, this declaration will lose its validity.

Applicable EC Directive: Low Voltage Directive (2006/95/EC)  
Machinery Directive (2006/42/EC)

Applicable Standard(s): EN 60947-5-5

### Specifications





|  |  |
|--|--|
| Applicable Standards                                       | IEC 60947-5-1, EN 60947-5-1<br>IEC 60947-5-5 (Note), EN 60947-5-5 (Note)<br>JIS C8201-5-1, UL508, CSA C22.2 No.14  |
| 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<br>Pull to reset: 8.8N<br>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/s <sup>2</sup><br>Damage limits: 1000 m/s <sup>2</sup>   |
| Vibration Resistance                                       | Operation extremes: 10 to 500 Hz<br>amplitude 0.35 mm, acceleration 50 m/s <sup>2</sup><br>Damage limits: 10 to 500 Hz,<br>amplitude 0.35 mm, acceleration 50 m/s <sup>2</sup> |
| Mechanical Life  | 100,000 operations minimum   |
| Electrical Life  | 100,000 operations minimum   |
| Degree of Protection                                       | IP65 (IEC 60529)   |
| Short-circuit Protection                                   | 250V/10A fuse<br>(Type aM IEC 60269-1/IEC 60269-2)   |
| Conditional Short-circuit Current                          | 1000A  |
| Terminal Style   | Solder terminal  |
| Recommended Tightening Torque for Locking Ring             | 0.88 N·m   |
| Applicable Wire Size                                       | 1.25 mm <sup>2</sup> maximum   |
| Terminal Soldering Condition                               | 310 to 350°C, within 3 seconds   |
| Weight (approx.)   | ø30mm button: 13g<br>ø40mm button: 16g   |

Note: Except for stop switch (yellow button)

## Types

### Unmarked Type (Pushlock Pull/Turn Reset Switch)





Package quantity: 1

| Shape  | Main Contact (NC) | Ordering Type No.    |
|--|-------------------|----------------------|
| ø30mm Mushroom<br><br> | 1NC               | <b>AB6E-3BV01PRH</b> |
|  | 2NC               | <b>AB6E-3BV02PRH</b> |
| ø40mm Mushroom<br><br> | 1NC               | <b>AB6E-4BV01PRH</b> |
|  | 2NC               | <b>AB6E-4BV02PRH</b> |

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

### Arrow Marked Type (Pushlock Pull/Turn Reset Switch)



Package quantity: 1

| Shape  | Main Contact (NC) | Ordering Type No.    |
|--|-------------------|----------------------|
| ø30mm Mushroom<br><br>  | 1NC               | <b>AB6E-3BV01PRM</b> |
|  | 2NC               | <b>AB6E-3BV02PRM</b> |
| ø40mm Mushroom<br><br> | 1NC               | <b>AB6E-4BV01PRM</b> |
|  | 2NC               | <b>AB6E-4BV02PRM</b> |

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

### Stop Switch (Unmarked, Yellow Button, Solder Terminal Pushlock Pull/Turn Reset Switch)

Package quantity: 1

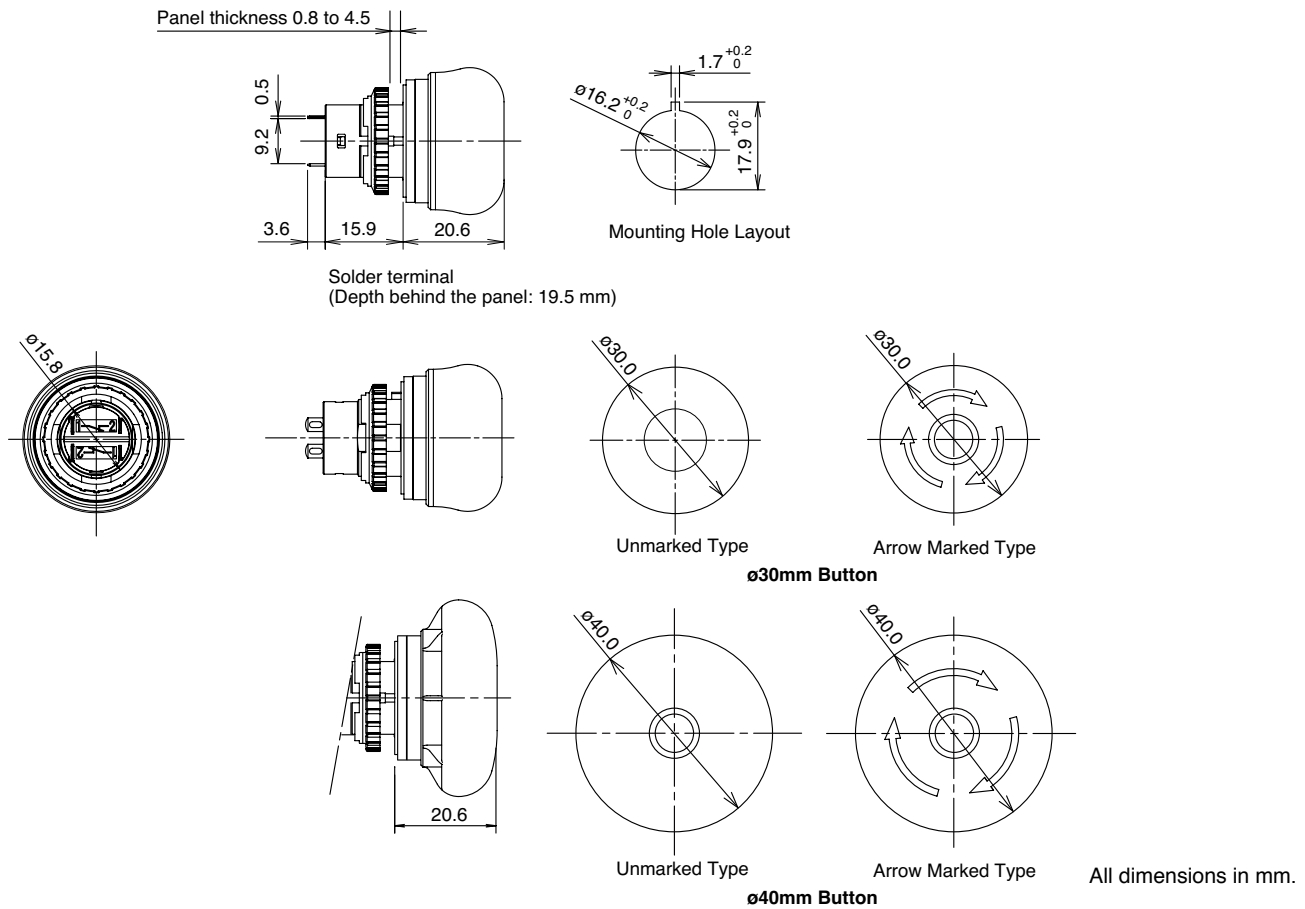
| Shape  | Operator     | Main Contact (NC) | Ordering Type No.   |
|--|--------------|-------------------|---------------------|
| ø30mm Mushroom<br><br> | ø30mm button | 1NC               | <b>AB6E-3BV01PY</b> |
|  |              | 2NC               | <b>AB6E-3BV02PY</b> |
|  | ø40mm button | 1NC               | <b>AB6E-4BV01PY</b> |
|  |              | 2NC               | <b>AB6E-4BV02PY</b> |

- Pushlock pull/turn reset switches are locked when pressed, and reset when pulled or turned clockwise.
- Do not use the stop switch as an emergency stop switch.

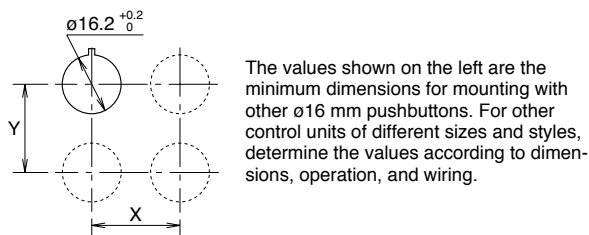


# ø16 X6 Series Emergency Stop switch (Unibody Type)

## Dimensions

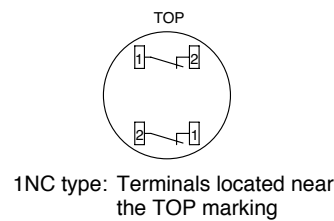


## Mounting Hole Layout





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

## Terminal Arrangement (Bottom View)



## Accessories

| Shape   | Material                       | Ordering Type No.  | Package Quantity | Remarks   |
|---|--------------------------------|--------------------|------------------|---|
|  | Metal<br>(nickel-plated brass) | <b>MT-001</b>      | 1                | <ul style="list-style-type: none"> <li>Used to tighten the locking ring when installing the X6 switch onto a panel.</li> <li>Recommended tightening torque: 0.88 N·m maximum</li> </ul> |
|  | Plastic                        | <b>XA9Z-LNPN10</b> | 10               | <ul style="list-style-type: none"> <li>Black</li> </ul>   |

# X6 Series Emergency Stop switch (Unibody Type) ø16

## Nameplate (for emergency stop switch)


Package quantity: 1

| Description      | Legend         | Ordering Type No. | Material  | Background Color | Legend Color |
|------------------|----------------|-------------------|-----------|------------------|--------------|
| For ø30mm Button | Blank          | <b>HAAV-0</b>     | Polyamide | Yellow           | Black        |
|                  | EMERGENCY STOP | <b>HAAV-27</b>    |           |                  |              |
| For ø40mm Button | Blank          | <b>HAAV4-0</b>    |           |                  |              |
|                  | EMERGENCY STOP | <b>HAAV4-27</b>   |           |                  |              |

• Cannot be used with switch guard.

## SEMI S2 Compliant Switch Guard

Package quantity: 1

| Shape   | Material        | Ordering Type No. | Remarks   |
|---|-----------------|-------------------|---|
|  | Polyamide (PA6) | <b>XA9Z-KG1</b>   | <ul style="list-style-type: none"> <li>• IP65 degree of protection</li> <li>• Color: yellow (Munsell 2.5Y8/10 or equivalent)</li> <li>• Cannot be used with nameplate.</li> </ul> |

**Note:**

Switch guards have been designed for applications in semiconductor manufacturing equipment only. Do not use the switch guards with emergency stop switches which are installed on other machines such as 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.

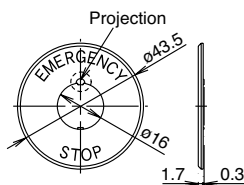
## White Nameplate (for stop switch)

Package quantity: 1

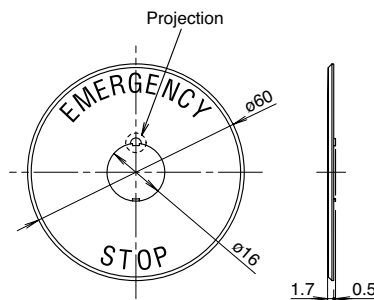
| Description      | Legend | Ordering Type No. | Material  | Background Color     |
|------------------|--------|-------------------|-----------|----------------------|
| For ø30mm Button | Blank  | <b>HAAV-0-W</b>   | Polyamide | White (Munsell N9.5) |
| For ø40mm Button |        | <b>HAAV4-0-W</b>  |           |                      |

## Dimensions

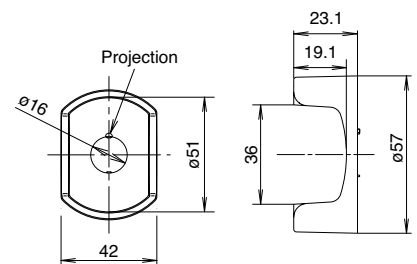
### • Nameplate for ø30mm Button HAAV-\*



### • Nameplate for ø40mm Button HAAV4-\*



### • Switch Guard XA9Z-KG1



- Remove the projection from the nameplate using pliers, otherwise the switch cannot be installed.
- Panel thickness when using a nameplate: 0.5 to 3 mm

- Remove the projection from the switch guard using pliers, otherwise the switch cannot be installed.
- Panel thickness when using a nameplate: 0.5 to 3 mm

# ø16 X6 Series Emergency Stop switch (Unibody Type)

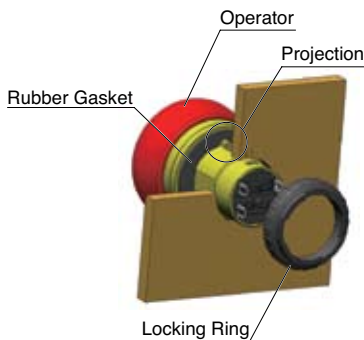
## ⚠ Safety Precautions

- 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.



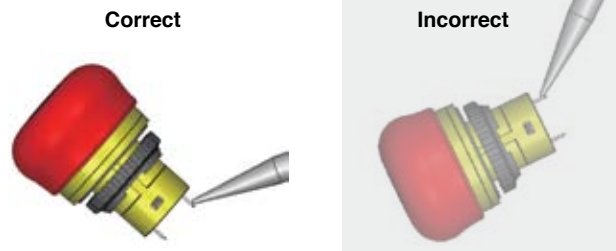
### • Notes for Panel Mounting

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<sup>2</sup> 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.



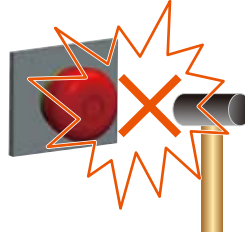
4. Because the terminal spacing is narrow, use protective tubes or heat shrinkable tubes to avoid burning the wire sheath or short circuit.
5. Apply force on the terminals in the vertical direction to the panel only, otherwise the terminals will be damaged.

### 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.



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



## IDEC CORPORATION

7-31, Nishi-Miyahara 1-Chome, Yodogawa-ku, Osaka 532-8550, Japan  
Tel: +81-6-6398-2571, Fax: +81-6-6392-9731  
E-mail: marketing@idec.co.jp

**IDEC CORPORATION (USA)**  
1175 Elko Drive, Sunnyvale, CA 94089-2209, USA  
Tel: +1-408-747-0550 / (800) 262-IDEC (4332)  
Fax: +1-408-744-9055 / (800) 635-6246  
E-mail: opencontact@idec.com

**IDEC CANADA LIMITED**  
3155 Pepper Mill Court, Unit 4, Mississauga, Ontario, L5L 4X7, Canada  
Tel: +1-905-890-8561, Toll Free: (888) 317-4332  
Fax: +1-905-890-8562  
E-mail: sales@ca.idec.com

**IDEC AUSTRALIA PTY. LTD.**  
2/3 Macro Court, Rowville, Victoria 3178, Australia  
Tel: +61-3-9763-3244, Toll Free: 1800-68-4332  
Fax: +61-3-9763-3255  
E-mail: sales@au.idec.com

**IDEC ELECTRONICS LIMITED**  
Unit 2, Beechwood, Chineham Business Park, Basingstoke, Hampshire RG24 8WA, UK  
Tel: +44-1256-321000, Fax: +44-1256-327755  
E-mail: sales@uk.idec.com

**IDEC ELEKTROTECHNIK GmbH**  
Wendenstrasse 331, 20537 Hamburg, Germany  
Tel: +49-40-25 30 54 - 0, Fax: +49-40-25 30 54 - 24  
E-mail: service@idec.de

**IDEC (SHANGHAI) CORPORATION**  
Room 608-609, 6F, Gangtai Plaza, No. 700, Yan'an East Road, Shanghai 200001, PRC  
Tel: +86-21-5353-1000, Fax: +86-21-5353-1263  
E-mail: idec@cn.idec.com

**IDEC (BEIJING) CORPORATION**  
Room 211B, Tower B, The Grand Pacific Building, 8A Guanghua Road, Chaoyang District, Beijing 100026, PRC  
Tel: +86-10-6581-6131, Fax: +86-10-6581-5119

**IDEC (SHENZHEN) CORPORATION**  
Unit AB-3B2, Tian Xiang Building, Tian'an Cyber Park, Fu Tian District, Shenzhen, Guang Dong 518040, PRC  
Tel: +86-755-8356-2977, Fax: +86-755-8356-2944

**IDEC IZUMI (H.K.) CO., LTD.**  
Units 11-15, Level 27, Tower 1, Millennium City 1, 388 Kwun Tong Road, Kwun Tong, Kowloon, Hong Kong  
Tel: +852-2803-8989, Fax: +852-2565-0171  
E-mail: info@hk.idec.com

**IDEC TAIWAN CORPORATION**  
8F-1, No. 79, Hsin Tai Wu Road, Sec. 1, Hsi-Chih, Taipei County, Taiwan  
Tel: +886-2-2698-3929, Fax: +886-2-2698-3931  
E-mail: service@tw.idec.com

**IDEC IZUMI ASIA PTE. LTD.**  
No. 31, Tannery Lane #05-01, HB Centre 2, Singapore 347788  
Tel: +65-6746-1155, Fax: +65-6844-5995  
E-mail: info@sg.idec.com