

## **SAFETY NOTE**

- Turn off the power to the control unit before starting installation, removal, wiring, and maintenance. Failure to turn power off may cause electric shocks or fire hazard.
- Use wires of a proper size to meet voltage and current requirements. Tighten the terminal screws to recommended tightening torque. Improper wires and loose terminals during operation will cause overheating and fire hazard. Provide a proper protection against electric shocks. Failure to turn power off may cause electric shock or fire hazard.

## Mounting

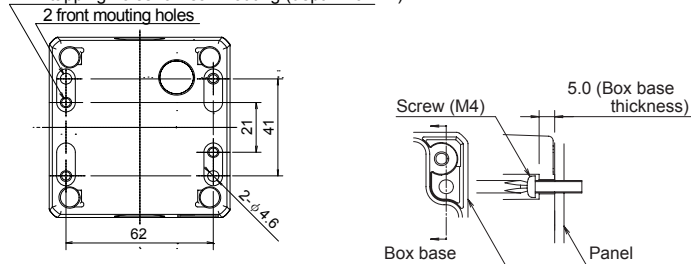
### Panel Mounting

#### 1. Installing the FB series control box from the front

- Use two M4 screws. (Recommended tightening torque: 1.4 to 2.0 Nm)
- Determine the screw length in consideration of the box base and panel thickness.

The cable is connected to the emergency stop switch on the box cover side with a removable connector. To separate the box base and box cover completely, remove the connector. This connector is equipped with a lock to prevent disconnection. Pull the connector while pressing the locking knob.

#### 4 M4 tapping holes for rear mouting (depth: 10 mm)



#### 2. Installing the FB series control box from the back

When installing from the back, insert M4 tapping screws into holes for the tapping screws on the back of the box base (depth: 8 to 10 mm, tapping screw hole diameter: Ø3.7 mm) [Recommended tightening torque: 1.3±0.1Nm.

#### 3. Installation using accessories (FB9Z-PK1)

When using accessories for installation, refer to each instruction sheet.

#### Installing and removing the control unit

Refer to installation instructions for each control unit.

#### Installing a cable gland

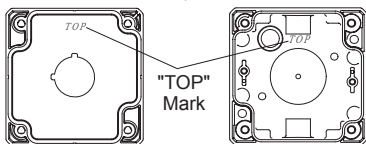
Break a desired knockout to mount a cable gland using a hammer and a screwdriver, and install the cable gland. When breaking the knockout to open a cable gland hole, be careful not to damage the internal contact block. Note that cracks or burrs on the cable gland hole will degrade the waterproof characteristics.

#### Installing the box cover and box base

Attach the box cover to the box base so that the TOP mark on the box cover and box base are in the same direction.

Use box cover mounting screws to attach the box cover to the box base. (Recommended tightening torque: 1.3±0.1 Nm)

Make sure that the box cover and the box base are attached in the correct direction. Otherwise, the ES-FB series control box may be damaged.



## Addressing

### M12 connector type

The address setting device with an „M12 AS-i line connector,“ enabling direct connection of the M12 connector. The address can be set from this state.

### Pin Assign

- 1 AS-Interface +
  - 2 Not used
  - 3 AS-Interface -
  - 4 Not used
- 

## Wiring

### M12 connector type

Connect one end of the special cable with M12 connector cable for ES-FB -XW that is sold separately and the other connector to AS-Interface flat cable.

### Applicable Wire

Determine the wire size in consideration of the control unit and cable thickness of the cable gland.

### When using plastic cable gland and multi-core cable

Gland port size	Plastic cable gland
M20	5311 1220 (Skintop-ST-M), Applicable gasketGPM20 (LAPP, Germany)
G1/2	5380 6030 (Skintop-ST-PF), Applicable gasketGP 050 (LAPP, Germany)
PG13.5	5301 5030 (Skintop-ST), Applicable gasketGP13.5 (LAPP, Germany)

### Locking nut for installing cable gland

(The locking nut for installing cable gland is not supplied. Order separately.) Only UL approved cable glands are described.

When using the ES-FB control box in North America, be sure to use UL approved plastic cable glands.

Tighten cable glands to a torque of 3.0±0.3Nm.

Insufficient tightening of the cable gland may degrade the waterproof characteristics.

Electric shock protection Class II is maintained only when a plastic cable gland is used.

Determine the cable gland for a multi-core cable according to the outside diameter of the cable sheath.

When wiring from the back of ES-FB series control box, use the Ø14 knockout on the back of the control box. A cable gland cannot be installed to the Ø14 knockout.

## Function

ES-XN/XW series emergency stop switches feature a slave connection to the safety bus AS-Interface Safety at Work. The position monitoring of the safety guard is carried out with two positively driven contacts.

When the button is in normal position it transmits a switch-specific, unique safety code sequence with 8x4 bits via the AS-Interface. This code sequence is evaluated by an AS-Interface safety monitor. The first positively driven NC contact is represented by the AS-Interface input bits D0 and D1, while the second positively driven NC contact is represented by D2 and D3.

The switch-specific safety code sequence is transmitted via the AS-Interface input bits D0 to D3 when the safety guard is closed.

When the button is pushed, the values 0, 0, 0, 0 are transmitted in every bus cycle by D0 to D3. The emergency stop switch must be configured correspondingly in the AS-Interface safety monitor (refer to the operating instructions of the AS-Interface safety monitor used).

## Notes for Operation

### Wiring

- Avoid foreign objects such as dust, liquid, and oil from entering the switch while wiring.
- Do not twist or pull the cable or cable gland with excessive force. Otherwise, the wire, ES-FB series control box, and control units may be damaged.
- Because the ES-FB series control box is not provided with a PG terminal, a bonding circuit cannot be interconnected.

### Operation

- Avoid any contact with oil or coolants. Otherwise, the control box may be damaged.
- Use ES-FB-series control box indoors.

## Specifications

Applicable Standards	IEC/EN60529 UL50, UL508 CSA C22.2 No.94, CSA C22.2 No.14	
Standard Operating Conditions	Operating Temperature	-25 to +60°C (no freezing)
	Relative Humidity	45 to 85 *RH (no condensation)
	Storage Temperature	-40 to +80°C (no freezing)
	Pollution Degree	3
Degree of Protection	IP65	
Electric Shock Protection	Class II	
Material	Box Cover, Box Base: Polycarbonate	
	Box cover mounting screw: Stainless steel	
Applicable Control Unit	ES-XW series control unit and accessories	
Weight (approx.)	125g	

<b>Environment</b>	
Operating temperature	Non-illuminated: -25 to 55°C (no freezing) Illuminated: -25 to 50°C (no freezing)
Storage temperature	-40 to 70°C (no freezing)
Operating humidity	45 to 85% RH (no condensation)
Pollution degree	3 <sup>1)</sup>
<b>Structural specifications</b>	
Protection grade	IP65
Weight	Ø 40 M12 sensor connector type: 195g Ø 60 M12 sensor connector type: 205g Ø 40 AS-Interface piercing type : 235g Ø 60 AS-Interface piercing type : 245g
Connector	M12 connector
Compatible cable	M12 connector cable for ES-FB

1) For  $\text{U}$  and  $\text{U}$  = pollution degree is 2.

## Dimensions

