B-985-1(3)

INSTRUCTION SHEET

Control Box
FB Series

Confirm that the delivered product is what you have ordered. Read this instruction sheet to make sure of correct operation. Make sure that the instruction sheet is kept by the end user.

⚠ Safety Precations

・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.

1 Type

< Without control unit > FB□□□-□□□□

- Box size (Length)
  - 1：76 mm
  - 2：140 mm
  - 3：200 mm
- mounting hole (diameter)
  - T：Without hole
  - W：With hole (ϕ22 mm)
- Types (With control unit mounting hole)
  - Blank：Standard type (Control unit mounting hole in box cover)
  - R ：Contact cover type (Control unit mounting hole in box base)
- No. of rows
  - 0：No hole
  - 1：1
- No. of control unit mounting holes
  - 0：No hole
  - 1：1
  - 2：2
  - 3：3
  - 4：4
  - 5：5
- Control unit mounting hole centers
  - 0：No hole
  - 1：50 mm
  - 2：30 mm
  - 3：36 mm
- Box cover color
  - Y：Yellow
  - Z：Light beige

< With control unit >
・1 hole

FB1W- □ -□□

- Type No. with control unit
- Box cover color
  - Y：Yellow
  - Z：Light beige
- Types of accessories
  - 0 ：None
  - 1 to (undefined)：Separate designation (Refer to the catalog)

・2 to 5 holes

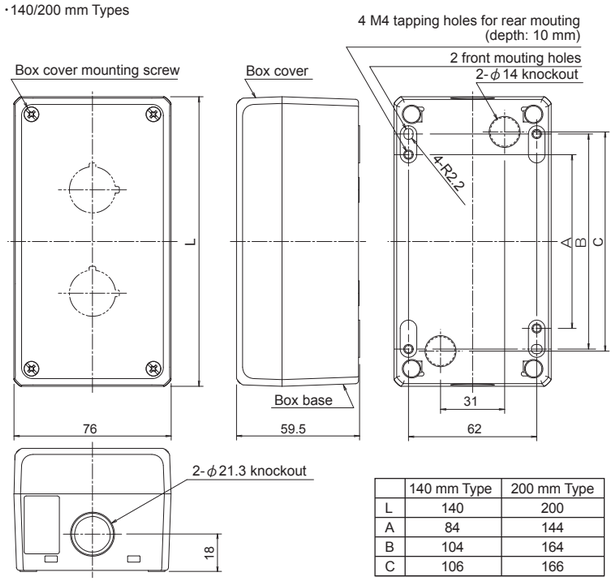
FB□□-□□□Z-A□□□□□

- Type No. without control unit
- Types of control units
  - A (Five digits)：Separate designation (Refer to the catalog)

Example：FB3W-311Z-A03010

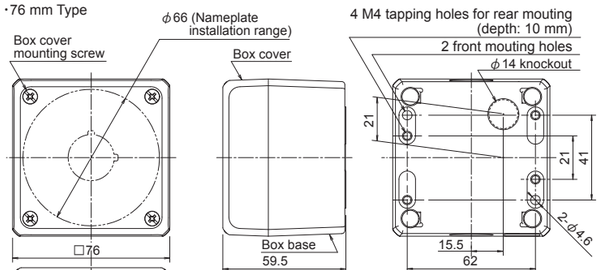
2 Dimensions

< Dimensions >
・140/200 mm Types

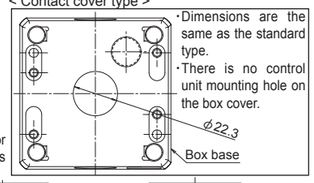


	140 mm Type	200 mm Type
L	140	200
A	84	144
B	104	164
C	106	166

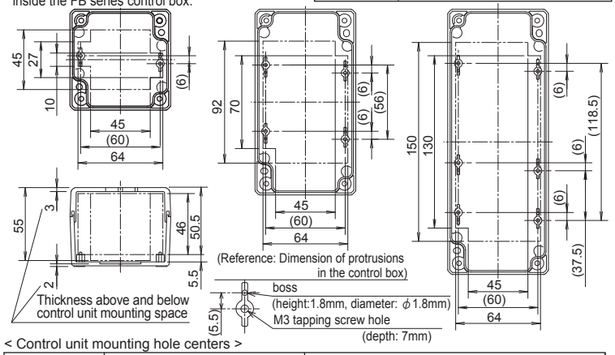
・76 mm Type



< Contact cover type >



< Control unit mounting space >
・The inside dimensions show the available space for mounting control units, excluding the protrusions inside the FB series control box.

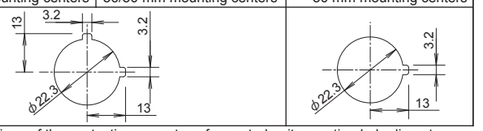


< Control unit mounting hole centers >

76 mm Type	140 mm Type		200 mm Type		
	2 holes	3 holes	3 holes	4 holes	5 holes
	50	30 30	50 50	36 36 36	30 30 30 30

< Control unit mounting hole diameter >

76 mm Type	140 mm Type	200 mm Type	140/200 mm Type
	50 mm mounting centers	36/50 mm mounting centers	30 mm mounting centers



*Refer to the dimensions of the contacting cover type for control unit mounting hole diameter.

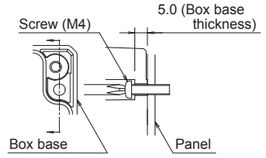
3 Specifictions

Applicable Standards	IEC/EN60529 UL50, UL508 CSA C22.2 No.94, CSA C22.2 No.14	
Standard Operating Conditions	Operating Temperature	-25 to +60ºC (no freezing)
	Relative Humidity	45 to 85%RH (no condensation)
	Storage Temperature	-40 to +80ºC (no freezing)
	Pollution Degree	3
Degree of Protection	IP65 (When applicable Auxilliary Devices are installed)	
	NEMA TYPE 4X (When applicable NEMA TYPE 4X Auxilliary Devices are installed) NEMA TYPE 1 (When applicable NEMA TYPE 4X Auxilliary Devices are not installed)	
Electric Shock Protection	Class II (When applicable control unit is installed)	
Material	Box Cover, Box Base：Polycarbonate	
	Box cover mounting screw：Stainless steel	
Applicable Control Unit	HW/TW/XW series control unit and accessories (IDEC)	
Weight (approx.)	76 mm Type	125g (FB1W-111Y only)
	140 mm Type	184g (FB2W-211Z only)
	200 mm Type	243g (FB3W-311Z only)

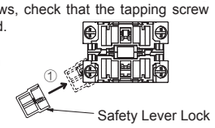
・The above specifications are for the FB series control box only. For details on control units, refer to the specifications of each control unit.
・Install control units or accessories in consideration of the mounting centers, depth, and thickness (3 mm) of the FB series control box. For selector switches, the mounting angle of the operator is limited for 30 mm and 36 mm mounting hole center type control boxes.
・The XW screw terminal type control units can be installed in one-hole type or 50 mm mounting hole centers type by wiring one crimping terminal to each terminal.
・Damages caused by using control units other than those specified by IDEC are excluded from any warranty.
・The contact cover type (Type: FB1WR) is not UL and c-UL listed.
・FB series control box without hole type (Type: FB□T) is not UL and c-UL listed.

4 Mounting

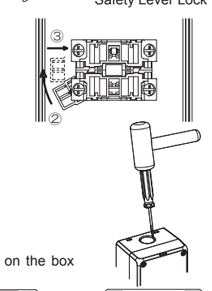
< Panel Mounting >
1. Installing the FB series control box from the front
・Use two M4 screws.
(Recommended tightening torque: 1.4 to 2.0 N·m)
・Determine the screw length in consideration of the box base and panel thickness.
*Mounting screws are not supplied with the FB series control box. Use M4 mounting screws.



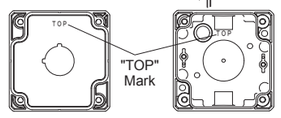
2. Installing the FB series control box from the back
・When installing from the back, insert M4 tapping screws into holes for the tapping screws on the back of the box base (depth: 8 to 10 mm, tapping screw hole diameter: ϕ3.7 mm)
[Recommended tightening torque: 1.3±0.1N·m (M4-P-TITE (Nitto Seiko))]
*Mounting screws are not supplied with the FB series control box. Use M4 tapping screws. [Recommended screws: M4-P-TITE (Nitto Seiko)]
*The value of the recommended tightening torque has been confirmed with a M4 tapping screw [P-TITE screw (Nitto Seiko)]. When using other screws, check that the tapping screw hole is not damaged and the screw can be securely tightened.
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 the safety lever lock for HW series control units (HW9Z-LS, yellow) >
・When installing the HW series control units in the direction shown at right, install the unit with the safety lever in the unlocked position, lock the lever and push in the safety lever lock.



< 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.



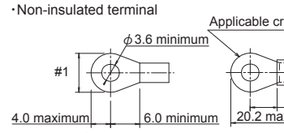
< Installing the box cover and box base >
・Attach the box cover to the box base so that the TOP mark on the box cover and box base are in the same direction.
・Use box cover mounting screws to attach the box cover to the box base. (Recommended tightening torque: 1.3±0.1 N·m)
*Make sure that the box cover and the box base are attached in the correct direction. Otherwise, the FB series control box may be damaged.



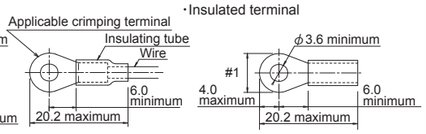
< Installation using tapping screw hole inside the control box >
*When using M3 tapping hole screws inside the control box, make sure to install the devices in consideration of the insulation distance and temperature rise. Damages caused by using devices other than those specified by IDEC are excluded from any warranty. Control boxes installed with devices using tapping screw holes will not be UL and c-UL listed.
・M3 tapping screw hole (depth: 6 to 7 mm, tapping screw hole diameter: ϕ2.7 mm)
[Recommended tightening torque: 0.9±0.1N·m (M3-P-TITE (Nitto Seiko))]

5 Wiring

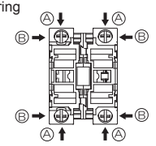
< Applicable Wire >
・Determine the wire size in consideration of the control unit and cable thickness of the cable gland.
< Applicable crimping terminal >
1. HW/TW series
・Non-insulated terminal



・Insulated terminal

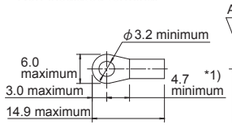


・Directions for wiring

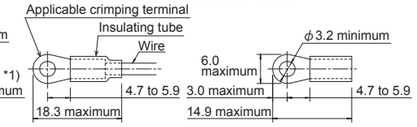


・#1 dimensions
Direction of A：8.0 maximum
Direction of B：6.6 maximum

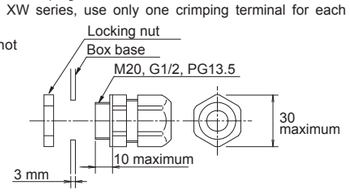
2. XW Series (Screw terminal type)
・Non-insulated terminal



・Insulated terminal



*1) When spade terminal is used, the dimension is 4.7 to 5.9 mm.
*Be sure to install an insulating tube on the crimping terminal.
*When using crimping terminal for the XW series, use only one crimping terminal for each terminal.
*Make sure that the wiring does not contact the FB series control box.
< Applicable Cable Gland >
・Use cable glands with waterproof characteristics (IP65, NEMA TYPE 4X) which can be mounted on a panel thickness of 3 mm or more.



1. When using plastic cable gland and multi-core cable

Gland port size	Plastic cable gland
M20	5311 1220［Skintop-ST-M］, Applicable gasket：GPM20 (LAPP, Germany)
G1/2	5380 6030［Skintop-ST-PF］, Applicable gasket：GP 050 (LAPP, Germany)
PG13.5	5301 5030［Skintop-ST］, Applicable gasket：GP13.5 (LAPP, Germany)

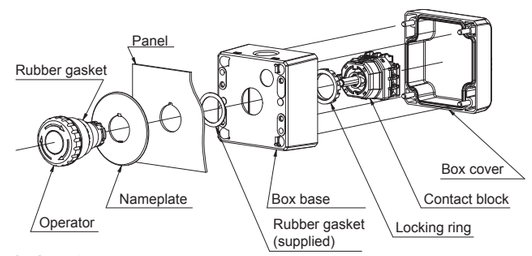
2. Locking nut for installing cable gland
(The locking nut for installing cable gland is not supplied. Order separately.)

Gland port size	Locking Nut Type (Made of plastic)
M20	HW9Z-NM20PN05 (IDEC)
G1/2	HW9Z-GPN05 (IDEC)
PG13.5	HW9Z-PG135PN05 (IDEC)

*The degree of protection of the cable gland examples described above is not NEMA TYPE 4X.
*Only UL approved cable glands are described.
・When using the FB control box in North America, be sure to use UL approved plastic cable glands.
・Tighten cable glands to a torque of 3.0±0.3N·m.
*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 FB series control box, use the ϕ14 knockout on the back of the control box. A cable gland cannot be installed to the ϕ14 knockout.

6 Contact Cover Type

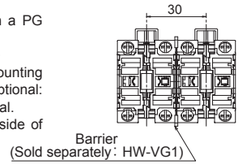
1. Specifications (Applicable model) and Wiring
・Same as the standard control boxes.
2. Installation (When installing XW series control units to the FB1WR-111Z control box)
・Remove the contact block and the locking ring from the operator and check that the rubber gasket is in place. Insert the operator from panel front into the panel hole. Attach the rubber gasket and the box base to the operator unit (Place the rubber gasket between the panel and the box base) and tighten the locking ring using locking ring wrench MW9Z-T1.
(Recommended tightening torque: 2.0 N·m)
・Attach the contact block to the operator. After wiring, attach the box cover to the box base using four box cover mounting screws.
(Recommended tightening torque: 1.3±0.1 N·m)
・Use a nameplate if necessary.
・Determine the panel thickness by excluding the thickness of the box base (2.0 mm) and accessories (if used) from the maximum panel thickness for the control unit.



3. Notes for Operation
・Do not expose the cable to excessive force, otherwise failure or damage may be caused. When mounting strength is needed, insert M4 tapping screws from the front of the panel. (Screw tightening depth: 8 to 10 mm / Tapping screw hole: ϕ3.7 mm)
・Determine the mounting hole centers referring to the dimensions of the contact cover type.

7 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, FB series control box, and control units may be damaged.
・Because the FB series control box is not provided with a PG terminal, a bonding circuit cannot be interconnected.
< Installation of control units on 30 mm mounting centers >
・When mounting HW/TW series control units on 30 mm mounting centers (close mounting), make sure to use a barrier (optional: HW-VG1) to secure the insulation properties of the terminal. The barriers (HW-VG1) can be easily pressed into the side of the contact block.



< Operation >
・Avoid any contact with oil or coolants. Otherwise, the control box may be damaged.
・Use FB series control box indoors. (TYPE 4X Indoor Use Only)

8 Accessories

Mounting bracket：FB9Z-PK1
DIN rail adapter：FB9Z-PK3
・For installation, refer to each instruction sheet.

9 Precations for Disposal

・Dispose of the FB series control box as an industrial waste.

IDEC CORPORATION
http://www.idec.com

2009.3