FB Series Plastic Enclosures

IP65 lightweight plastic enclosures for installing control units.

- ø22mm control units can be installed.
- Blank front enclosures, without mounting holes, are also available.
- Blank front enclosures can also be used as junction boxes to mount terminal blocks.
- Yellow cover version for emergency stop switches is also available.
- Front panel mounting, rear panel mounting, hook mounting, and frame mounting options are available.
- UL/c-UL listed.

Applicable Standards	Mark	Certification Organization / File No.
UL508 UL50 CSA C22.2 No. 14 CSA C22.2 No. 94	CUL US	UL-c-UL listed File No. E68961 (with mounting hole)

• Contact cover box (Model: FB1BR) is not UL or c-UL listed.

- Enclosures without mounting hole is not UL or c-UL listed.
- (Enclosures less than 1,639 cm³ is not approved by UL50, 2:8.)

Enclosure

Size	No. of Mounting Holes	Mounting Hole Description	Cover Color	Part No.
	0	Without mounting hole	Light beige	FB1T-000Z
76mm	1	ø22mm	Yellow	FB1W-111Y
	1	ø22mm		FB1W-111Z
	0	Without mounting hole		FB2T-000Z
140mm	2	ø22mm, mounting centers 50mm		FB2W-211Z
	3	ø22mm, mounting centers 30mm		FB2W-312Z
	0	Without mounting hole	Light beige	FB3T-000Z
3		ø22mm, mounting centers 50mm		FB3W-311Z
200mm	4	ø22mm, mounting centers 36mm		FB3W-413Z
	5	ø22mm, mounting centers 30mm		FB3W-512Z

Specifications (Note 1)

Applicable Standards	IEC/EN60529 UL508 UL50 CSA C22.2 No. 14 CSA C22.2 No. 94
Standard Operating Conditions	Ambient temperature: -25 to +60°C (no freezing) Relative humidity: 45 to 85%RH (no condensation) Storage temperature: -40 to +80°C (no freezing) Degree of pollution: 3
Degree of Protection	IP65 (when IP65 control units are installed) NEMA Type 4X Indoor Use Only (when Type 4X control units are installed)
Electric Shock Protection	Class II (when class II control units are installed)
Material	Cover/base: Polycarbonate Cover mounting screws: Stainless steel
Applicable Control Units	IDEC's HW/TW/XW series control units and accessories (Note 2) (Note 3)
Weight (approx.)	76mm: 125g (FB1W-111Z) 140mm: 184g (FB2W-211Z) 200mm: 243g (FB3W-311Z)

Note 1: The above specifications are for enclosures. For control units, refer to the specifications of each control unit.

- Note 2: Choose control units and accessories which match the mounting hole centers, effective depth behind the cover, and the thickness of the cover where control units are installed (3 mm). Note that enclosures with 30mm or 36mm mounting hole centers may limit the knob orientation of selector switches, because the contact blocks can be mounted in one direction only on these mounting centers.
- Note 3: An XW series emergency stop switch of screw terminal type can be installed on an enclosure with one mounting hole or mounting holes of 50mm mounting centers, by connecting one clamping terminal to one terminal pole.



Contact Cover Box

Size	No. of Mounting Holes	Mounting Hole Description	Cover Color	Part No.
76mm	1	ø22mm hole in the base	Light beige	FB1WR-111Z

Cover does not have a control unit mounting hole.
For operating instructions, see page 1539.

Accessories

Description	Part No.	Ordering No.	Package Quantity
Mounting Bracket	FB9Z-PK1	FB9Z-PK1	1
DIN Rail Adapter	FB9Z-PK3	FB9Z-PK3PN02	2

For the dimensions and operating instructions, see pages 1542 and 1543.
Connectors and nuts are supplied by users.

Parts Description



Flush Silhouette

> Switches & Pilot Lights

Display Lights

LED Illumination Units

Display Units

Safety Products

Terminal Blocks

Comm. Terminals

AS-Interface

Relays & Timers

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Sockets
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Circuit
Protectors
```

Power Supplies

PLCs & SmartRelay

Interfaces

Operator

Sensors

Control Stations

Explosion Protection

References

Dimensions



Control Unit Mounting Hole Centers

		FB2 FB3				
Model	FB1	2 mounting holes	3 mounting holes	3 mounting holes	4 mounting holes	5 mounting holes
Shape	\bigcirc					20 20 20 20 20 20 20 20 20

FB Series Plastic Enclosure

With ø22mm XW Series EMO Switches



FB Series Plastic Enclosure

With ø22mm XW Series EMO Switches 3 + 4-M4 tapping holes fo rear mounting SEMI Switch Guard (HW9Z-KG4)





Mounting Hole Dimensions



Note: For contact cover boxes, see page 1537.

FB Series Plastic Enclosure

All dimensions in mm.

With Ø22mm XW Series EMO Switches + 4-M4 tapping holes fo rear mounting (Depth: 10mm)



Internal Dimensions



Choose an enclosure in consideration of control unit's depth behind the panel and the mounting centers of the adjacent control units.

Flush Silhouette

Switches &

Pilot Lights

Display

Lights

LED

Illumination Units

Display Units

FB Series Plastic Enclosures

Applicable Accessories

Series		Description
	Nameplate:	HWAM, HWAQ, HWAS, HWAV-*
	Marking plate for name	eplate: HWNP-*
	Anti-rotation ring:	HW9Z-RL
HW Series	EMO switch guard:	HW9Z-KG3, HW9Z-KG4
	Switch guard:	HW9Z-K1, HW9Z-K11
	Pushbutton clear boot:	OC-31, OC-32
	Padlock cover:	HW9Z-KL1
XW Series	Nameplate:	HWAV-*
Emergency	EMO switch guard:	HW9Z-KG3, HW9Z-KG4
Stop Switches	Anti-rotation ring:	HW9Z-RL
	Nameplate:	NWA-*, NWAQ-*, NWAS-0, NWAL-0, NWAQL-0, NWAV-*
	Anti-rotation ring:	OGL-31
TW Series	Metal protector:	OLW-C
Control Units	Pushbutton clear boot:	OC-31, OC-32
	Button cover:	OCW-10*, OCW-11*
	Padlock cover:	HW9Z-KL1, HS9Z-PC22

Note: Confirm the specifications of enclosure, control units, and accessories before choosing accessories, referring to separate catalogs.

Applicable DIN Rail

Description	Material	Part No.
	Aluminum	BAA1000
DIN Rall	Steel	BAP1000
Mounting Clip	Steel	BNL6

Note: Use DIN rail adapters FB9Z-PK3 when installing a DIN rail in the enclosure. See page 1542.

Applicable Terminal Block / Transformer

Series / Part No.			
Terminal Disal	BN-W Series: BN10W, BN15MW, BN15LW, BN30W		
тепліпаї Бюск	BA Series:	BA111T, BA211T, BA311T	
Separate Mounting Transformer	TWR5**		

Note: Install the terminal blocks and separate mounting transformers on a DIN rail using two DIN rail adapters (FB9Z-PK3). Choose the types and quantity of terminal blocks, transformers, mounting clips, and enclosures carefully taking the specifications into consideration. The separate mounting transformer can be installed on a DIN rail adapter directly.

Instructions

Installation

Panel Mounting

- 1. Installing the FB series from the front
- Using two M4 screws, install the base onto the panel. Recommended tightening torque: 1.4 to 2.0 N·m



- \ast Determine the screw length in consideration of the base and panel thickness.
- * Mounting screws are not supplied with the FB series. Use M4 mounting screws.
- 2. Installing the FB series from the rear
- Insert four M4 tapped screws into holes for tapping screws on the back of the base (depth: 8 to 10 mm, tapping screw hole diameter: ø3.7 mm), and fasten the screws to a tightening torque of 1.3±0.1 N·m (Nitto Seiko M4-P-TITE).
- * Mounting screws are not supplied with the FB series. Use M4 tapping screws (recommended screws: Nikko Seiko M4-P-TITE).
- The value of the recommended tightening torque has been confirmed with a M4 tapping screw (Nitto Seiko M4-P-TITE).
 When using other screws, check that the tapping screw hole is not damaged and the screw can be securely tightened.
- 3. Installation using mounting bracket FB9Z-PK1
- Refer to installation instructions on page 1541.

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 below, install the safety lever lock with the lever in the unlocked position, lock the lever, and push in the safety lever lock.





Safety Lever Lock

Installing the 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 make a cable gland hole, be careful not to damage the internal contact block.
- * Note that cracks or burrs on the cable gland hole wil degrade the waterproof characteristics.

Explosion Protection

References



Terminal

Blocks

Comm.

Terminals

AS-Interface

Sockets

Relays &

Timers

Circuit Protectors

Power Supplies

PLCs & SmartRelay

Operator Interfaces

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Control Stations

Instructions

Installing the Cover and Base

- Attach the cover to the base so that the TOP mark on the cover and base are in the same direction.
- Use cover mounting screws to attach the cover to the base. (Recommended tightening torque: 1.3±0.1 N·m)



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

Installation using tapping screw hole inside the enclosure

- When using M3 tapping hole screws inside the enclosure, make sue 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. Ensures installed with devices using tapping screw holes will not be UL or c-UL listed.
- M3 tapping screw hole (depth: 6 to 7mm, tapping screw hole diameter ø2.7m)
- Recommended tightening torque: 0.9 ±0.1 N·m, M3-P-TITE (Nikko Seiko)

Applicable Crimping Terminal HW/TW Series





Insulated Terminal





W dimensions

Direction of A: 8.0 maximum Direction of B: 6.6 maximum

XW Series (Screw Terminal)

Non-insulated Terminal

6.0 max. 3.0 max. 14.9 max.

Insulated Terminal





- * When a 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 terminals
- for the XW series, use only one crimping terminal for each terminal.
- * Make sure that the wiring does not contact the enclosure.

Applicable Cable Gland

 Use cable glands with waterproof characteristics (IP65, TYPE 4X) which can be mounted on a panel thickness of 3 mm or more.



All dimensions in mm.

* Cable gland and Locking nuts are not attached.

1. When using plastic cable gland, metal cable gland and multicore 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 the cable gland

Gland Port Size	Locking Nut Part No. (made of plastic)	
M20	HW9Z-NM20 (IDEC)	
G1/2	HW9Z-G (IDEC)	
PG13.5	HW9Z-PG135 (IDEC)	

- The degree of protection of the cable gland examples described above is not NEMA TYPE 4X.
- When using the FB plastic enclosures in North America, be sure to use UL approved plastic cable glands.
- Tighten cable glands to a torque of 3.0±0.3 N·m.
- * Insufficient tightening of the cable gland may degrade the waterproof characteristics.
- \ast 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, use the ø14 knockout on the back of the enclosure. A cable gland cannot be installed to the ø14 knockout.

FB Series Plastic Enclosures

Flush Silhouette

FΒ

Switches & Pilot Lights

Display Lights

LED Illumination Units

Products

Comm Terminals

AS-Interface

Relays & Timers

Sockets

Circuit Protectors

Power Supplies

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Explosion Protection

References

- frame.
 - * The value of the recommended tightening torque for M6 screws has been confirmed with a hexagon socket head screw. When other screws are used and tightened to a smaller torque, make sure that the screws do not become loose after mounting.



- Do not expose the FB series to excessive force, otherwise failure or damage may be caused.
- · Make sure that the mounting strength is secured in consideration of the operation of control unit.

Instructions

Notes

Applicable Wire Size

· Determine the wire size in consideration of the applicable wire for control units and the applicable diameter of cables.

Wirina

- · Avoid foreign objects such as dust, liquid, and oil from entering the switch while connecting a conduit or wiring.
- Do not twist or pull the cable of flexible conduit with excessive force. Otherwise, the wire, FB series, and control units may be damaged.

Barrier

(optional, HW-VG1)

· Because the FB series is not provided with a PG terminal, bonding circuits cannot be interconnected.

Installation of control units on 30mm centers

 When mounting HW/TW series control units on 30mm 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 enclosure may be damaged.
- Use the FB series for INDOOR applications only.

Contact Cover Box

Specifications, applicable units, and wiring

• Same as the standard enclosures.

Installing XW series control units to the FB1WR-111Z contact cover

- · 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 base to the operator unit (place the rubber gasket between the panel and the 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 cover to the base using four 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 base (2.0 mm) and accessories (if used) from the maximum panel thickness for the control unit.



- · 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 10mm tapping screw hole: ø3.7mm)
- · Determine the mounting hole centers referring to the dimensions of the contact cover box on page 1538.

Mounting Bracket

Hook Mounting

- Attach the FB9Z-PK1 mounting bracket on the FB series with the supplied screws (two M4 tapping screws). Recommended tightening torque: 1.3±0.1 N·m
- Do not tighten the FB9Z-PK1 onto the FB series with excessive force. The tapping screw hole may be damaged and may not securely hold the enclosure.
- When using the FB9Z-PK1 as hook mounting brackets, make sure that vibrations or shocks do not cause the enclosure to fall off, and that the control unit operates properly.
- Make sure that the mounting strength is secured.



Frame Mounting

 The FB9Z-PK1 can be used as frame mounting brackets by attaching two FB9Z-PK1 as shown below.

Four M4 Tapping Screw Holes



 Attach the FB9Z-PK1 on the FB series with the supplied screws (two M4 tapping screws).

Recommended tightening torque: 1.3±0.1 N·m.

- Do not tighten the FB9Z-PK1 onto the FB series with excessive force. The tapping screw hole may be damaged and may not securely hold the enclosure.
- Using two M6 screws, fasten the FB9Z-PK1 securely on the

Recommended tightening torque: 5.0±0.3 N·m





Safety

Display Units

Terminal Blocks

Dimensions

FB9Z-PK1



Hook Mounting





	FB Series Enclosure		
	FB1	FB2	FB3
L	76	140	200
А	19	18.5	18.5
в	12.5	12	12

Frame Mounting



	FB Series Enclosure			
	FB1	FB2	FB3	
L	76	140	200	
С	93	156	216	
D	114	177	237	

All dimensions in mm.

DIN Rail Adapter

Installing the FB9Z-PK3 DIN Rail Adapter

- To attach the FB9Z-PK3 on the FB series, position the positioning hole of the FB9Z-PK3 with the positioning boss in the enclosure using four M3 tapping screws (supplied) as shown in the figure below. Recommended tightening torque: 0.9±0.1 N·m
- Do not tighten the FB9Z-PK3 onto the FB series with excessive force. The tapping screw hole may be damaged and may not securely hold the enclosure.

Installing the DIN Rail

- To attach a DIN rail, use plain washers and spring washers on two M5 screws and tighten firmly.
- Recommended tightening torque: 2.0±0.1 N·m
- DIN rail mounting screw (M5) Screw length: (spring washer thickness + plain washer thickness + DIN rail thickness) + 3 to 5 mm



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FB Series Plastic Enclosures

- M5 screws, spring washers, and plain washers are not supplied.
- The length of DIN rail must be within the effective internal dimensions.
- Do not tighten the M5 screw onto the FB9Z-PK3 with excessive force. The screw hole may be damaged and may not securely hold the FB9Z-PK3.



- Mounting Control Units on DIN Rail
- · Refer to each instruction sheet.

Installing the Separate Mounting Transformer

• After attaching the FB9Z-PK3 on the FB series, attach the separate mounting transformer on the FB9Z-PK3, using plain washers and spring washers on two M3 screws as shown in the figure below. Recommended tightening torque: 0.5 to 0.8 N·m



- Separate mounting transformer mounting screw (M3) Screw Length: (Spring washer thickness) + (Plain washer thickness) + 7 to 10 mm
- M3 screws, spring washers, and plain washers are not supplied.
- · Do not tighten the screw with excessive force. The screw hole and the separate mounting transformer may be damaged.



FB9Z-PK3 Dimensions



Inside Dimensions of **FB Series Enclosure**



Other Precautions













FB Series Enclosure

☆ See internal dimensions on page 1538.

FB3

112.5

37.5

All dimensions in mm.

FB2

50

Relays & Timers

Sockets Circuit

Protectors

Power Supplies

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Operator Interfaces

Sensors

Control Stations

· Rated current of terminal blocks depends on operating conditions such as wire type, number of bundle wires, and ambient temperature. Check the specifications of terminal blocks carefully, and use terminal blocks within the specification values. Otherwise

Α

в

- electric shock or fire hazard may be caused. · FB series is rated as Class II protection against electric shock (no reliance on installation protective measures, according to IEC 61140). When using a blank front enclosure as a junction box and grounding is necessary, provide appropriate grounding, for example installing a grounding terminal block inside the enclosure.
- For wiring, refer to the instructions of the FB series enclosures and control units used.

References

Explosion

Protection