

EJ5C Terminal Boxes (Increased Safety Construction)

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

Safety Precautions

In this instruction manual, safety precautions are categorized by Warning and Caution:

WARNING

Warning indicates that improper operation may cause severe personal injury or death.

CAUTION

Caution indicates that inattention might cause personal injury or damage to equipment.

WARNING

(General requirements)

- Use EJ5C terminal boxes that are applicable for use in hazardous areas, otherwise explosion or fire hazard may result. (Hazardous area: potentially explosive atmosphere where explosive gas or vapor may exist) EJ5C terminal boxes are ATEX certified products. EJ5C cannot be used in Japan.

- EJ5C terminal boxes can be installed only in zones 1 and 2. Do not use in zone 0.
- Turn power off to the EJ5C terminal box before installation, removal, wiring, maintenance, or inspection, otherwise explosion, fire hazard, or electric shock may result.
- Special expertise is required to transport, install, wire, operate, maintain, and inspect the EJ5C terminal box. People without such expertise must not use the EJ5C terminal box, otherwise damage or accident may result.

- Do not disassemble, repair, or modify, otherwise damage or accident may result.
- Do not use a damaged the EJ5C terminal box, otherwise damage or accident may result.

(Wiring)

- When connecting with external devices, make sure that each cable is connected to the correct terminal, otherwise electric shock, fire hazard, or explosion may result.

- Use wires of a proper size to meet voltage and current requirements. Incorrect wiring may cause abnormal temperature rise and lead to fire hazard and explosion.

(Installation)

- The grounding terminal must be installed, otherwise electric shock, fire hazard, or explosion may result.

- Do not sit on or hang from the EJ5C terminal box, otherwise damage, personal injury, or accident may result.

(Operation)

- Do not open the cover of the EJ5C terminal box during operation, otherwise electric shock, fire hazard, or explosion may result.

- Operate the EJ5C terminal box under the rated current and voltage specified in this instruction manual, otherwise short-circuiting, fire hazard, or explosion may result.

(Maintenance and inspection)

- When Maintenance and inspection of the EJ5C terminal box, make sure that potentially explosive atmosphere of explosive gas or vapor does not exist in the vicinity, otherwise explosion may result. Do not touch the terminal carelessly. Otherwise, electric shock may result.

CAUTION

(General requirements)

- Do not place any obstacles in front of the nameplate.
- Do not remove the nameplate.

- When opening the cover for wiring, maintenance or inspection, make sure that substances such as dust, concrete powder, or metal powder do not enter inside the box, otherwise contact failure or insulation failure may result.

(Transportation)

- Be careful not to drop or topple the EJ5C terminal box during transportation.

(Unpacking)

- Be sure to open the carton the right way up, otherwise damage or personal injury may result.

- Check that the product is what you have ordered. Using an incorrect model might result in malfunction or accident.

(Operation)

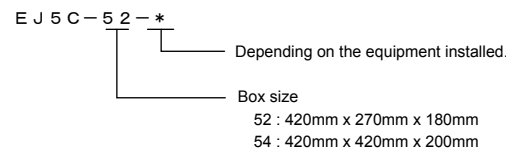
- Stop operation immediately if abnormal operation occurs. Otherwise, a secondary accident may occur.

(Maintenance and inspection)

- The surface temperature of the EJ5C terminal box may become extremely high during operation. Before maintenance or inspection of the EJ5C terminal box, be sure to wear gloves to prevent burn on your hand.

1 Product Structure

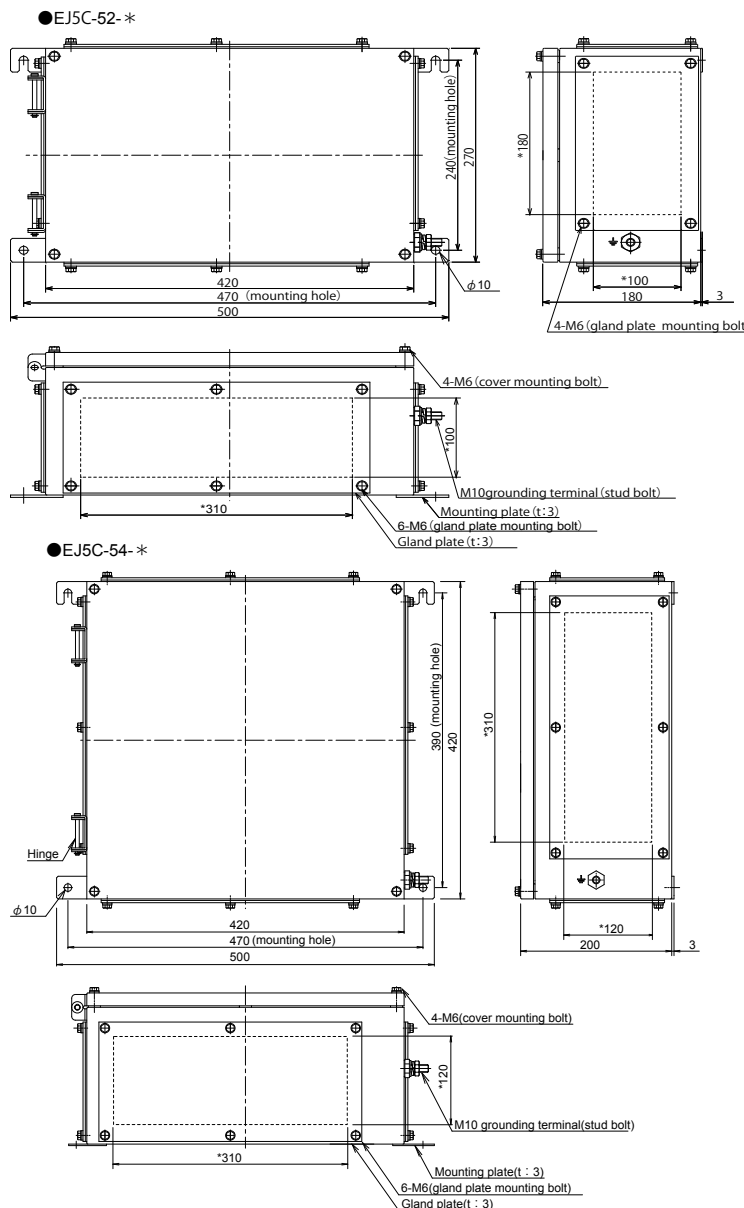
(1) Type number



(2) Description of parts and dimensions

1) Dimensions

- Below are examples of mounting of the gland plate.
- Dimensions marked with * show the surface area range of the fitting that can be mounted.



(3) Attachments
 1) Attachments for all models ... 1 each
 Instruction manual (Japanese / English)
 2) Attachments for HPN type cable lead-in fitting Hexagon wrench Hex 2 ... 1 pc

2 Product Specifications

(1) Specifications

Applicable standards	IEC/EN60079-0, IEC/EN60079-7, IEC/EN60079-31
Group and category	Ex II 2GD
Explosion protection	Ex e IIC T6 Gb, Ex tb IIIC T80°C Db IP65
Certificate number	TÜV 12 ATEX 7190X
Degree of protection	IP65 (IEC/EN 60529)
Box material	Stainless steel 316L (body, cover)
Rated insulation voltage	600V (depends on the installed devices) (Terminal block WDU2.5: 550V)
Dielectric strength	2500V AC, 1min (depends on the installed devices)
Insulation resistance	100MΩ minimum (500V DC megger)
Operating temperature	-20 to +50°C (no freezing)
Operating humidity	45 to 85% RH (no condensation)
Altitude	2000m maximum

(Note) When using the EJ5C terminal box, the allowable temperature rise of the cable and conduit wiring lead in the box must be taken into consideration.

• Applicable terminal block: WDU2.5(N), SAK2.5*, ZDU2.5/UT2.5, UK2.5N, ST2.5
 Protective conductor: WPE2.5(N), EK2.5N, ZPE2.5/UT2.5-PE, ST2.5-PE, USLKG2.5N (Weidmuller/Phoenix)

(2) Limitation of the operating current

The allowable current value (reference) when applying current evenly to all circuits of the maximum number of circuits. (*1)

	Number of Terminal	
	30	60
Allowable operating current (reference)(*1)	8.8A	6.2A
Maximum dissipated power	50W	50W
A number of wires per bundle	10(wires)	20(wires)

• EJ5C-54-*

	Number of Terminal			
	30	60	90	120
Allowable operating current (reference)(*1)	9A	7A	5.5A	4A
Maximum dissipated power	60W	70W	70W	50W
A number of wires per bundle	10(wires)	20(wires)	30(wires)	40(wires)

3 Unpacking

Check that the product is what you ordered, and that there are no damages on parts. Contact your sales representative if any parts are missing or damaged.

4 Notes on Operation

(1) Installation location

1) Do not install the EJ5C terminal box in an environment higher than IP65 protection degree.

2) Ambient temperature: -20 to +50°C

If the terminal box is exposed to direct sunlight and the surface temperature may rise above 50°C, provide a shroud to keep the surface temperature below 50°C.

(2) Installation

1) Use four M8 bolts, or other methods with equivalent strength to install the terminal box.

The thickness of mounting plate is 3 mm. (See dimensions)

2) If bolts become loose due to vibration, use spring washers.

3) If bolt corrosion occur, use anti-corrosion bolts or other countermeasures.

(3) Opening/ Closing the Cover

1) Loosen cover mounting bolts, while holding the unhinged side, open the cover slowly without exerting excessive force on the hinge.

2) Before closing the cover, make sure of the following:

- No foreign substances on the packing or joint surfaces
- No displacement of the waterproof packing
- Wires are not caught between the joint surfaces
- Cover mounting bolt is either not caught between the lid and the body.

Then, close the cover slowly, temporary fixing and tighten the cover mounting screws to a proper torque of 2.4 to 3.0 N·m.

(4) Removing/Installing the gland plate, hole processing

1) Loosen the mounting bolts to remove the gland plate.

2) When opening a hole in the gland plate, refer to the specification of the fitting.

3) Be sure that the fitting is ATEX certified (Explosion protection: II 2GD Ex e II) performance of at least IP65 and install properly.

4) Before installing the gland plate, make sure of the following:

- No foreign substances on the packing or joint surfaces
- No displacement of the waterproof packing

Then, install the gland plate and tighten the gland plate mounting bolts to a proper torque of 2.4 to 3.0 N·m.

(Note) Check that the gland plate mounting bolts are tightened correctly, after tightening the bolt.

(5) Leading conductors into the control box

1) Lead-in cables

• When leading cables, use ATEX certified packing type cable lead-in fitting.

Follow the procedure as described in "8 Leading in Cables with HPN Flameproof Packing Type Cable Lead-in Fitting". (See diagram below)

Flameproof packing type cable lead-in fitting Type no.	Applicable cable diameter (mm)	Dimensions (mm)		
		D	A	B
HPN21 R8E	$\phi 6 \leq D \leq \phi 8$	36	G1/2 (16)	67 to 70.5
HPN21 R10E	$\phi 8 < D \leq \phi 10$			
HPN21 R12E	$\phi 10 < D \leq \phi 12$			
HPN22 R14E	$\phi 12 < D \leq \phi 14$	40	G3/4 (22)	67 to 70.5
HPN22 R16E	$\phi 14 < D \leq \phi 16$			
HPN33 R18E	$\phi 16 < D \leq \phi 18$	50	G1 (28)	77.5 to 81
HPN33 R20E	$\phi 18 < D \leq \phi 20$			

(Note) The dimension of B in () is the nominal designation of the applicable metal conduit. (JIS C 8305)
 • When choosing cables, take into consideration the chemical resistance and the maximum operating temperature of the EJ5C terminal box. The cable should have as little loose space as possible to prevent ingress of explosive gas through the cable. Choose cables with flat, smooth surface and round in cross-section.
 Size and insulation material of the cable must be selected in consideration of the temperature rise of the cable.
 • Protect the cables from external damage by covering the cables with conduits or by providing a concrete duct to install the cable.

② Attaching fitting to G thread, M thread, and an NPT thread, and lead-in metal conduits

When constructing conduit lines, observe laws and regulations set by each country.

• Make sure that the protection degree IP65 is achieved.

• Choose conduit wiring size and insulation material in consideration of the temperature rise during operation.

• Thread the metal conduit appropriately and connect firmly with the box and fittings.

• On the conduit line, install a sealing fitting on either sides of the boundary between hazardous areas, between hazardous and non-hazardous, and in the vicinity of the terminal box.

5 Wiring

(1) Applicable wires

Stranded wire: 1.25 to 2.5 mm²; solid wire: $\phi 1.2$ to $\phi 1.6$ mm (AWG16 to 14)

(Note) Do not connect more than 2 wires to the same terminal.

<For terminal block (WDU2.5: Weidmuller)>

• Stripping length: 10mm

(3) Recommended tightening torque
 WDU2.5 terminal block (M2.5): 0.4 to 0.8 N·m

WARNING

Incorrect wiring may cause fire hazard. Observe the following conditions.

- When using stranded wires, make sure that there are no wire whiskers.
- Make sure that the spade and ferrules are inserted all the way in.

6 Protective Grounding

Protective grounding must be performed according to the installation environment and rating requirements. Observe laws and regulations set by each country.

• Connect the M10 stud bolt of the EJ5C terminal box to a proper ground (grounding resistance 10Ω maximum). When operating the EJ5C terminal box by connecting to circuits below 300V, the grounding resistance must be 100Ω maximum.

• When using cables, connect one of the cable cores to the ground.

• Recommended tightening torque M10: 21.6 to 25.5 N·m.

• For grounding, use appropriate wires (size, material, insulation) that can tolerate the expected maximum grounding current. If outside of the stud bolt (M10) is installed, be sure to protect the grounding wire with protection such as metal conduits from external damage.

7 Accessories

(1) Earth bar

• Recommended tightening torque M5: 1.8 to 2.2 N·m.
 (Note) Only use accessories and spare parts specified by IDEC. Use of any other accessories and spare parts will void the warranty.

8 Leading in Cables with HPN Flameproof Packing Type Cable Lead-in Fitting

(1) Description of parts (See figure 1)

(2) Leading in cables

(Note) Nipples are usually installed on the terminal box, and do not need to be removed when leading in cables.

Do not remove the nipple as it will degrade explosion protection performance.

Should the nipple be removed, make sure that the packing is attached and reinstall the nipple correctly.

1) Check if the cable diameter fits with the HPN flameproof packing lead-in fitting.

If not, change the cable to fit to the size of the cable entry, or replace with a control box installed with a conduit that fits the diameter of the selected cable.

2) Remove parts from the nipple in the order of nut, ring, gland, slip ring, and packing. (Figure 2)

The gland can be removed by loosening the gland set screw using a hexagon wrench (Hex 2). (Figure 2)

3) Attach the parts to the cable in the order of nut, ring, gland, slip ring, and packing. (Figure 3)

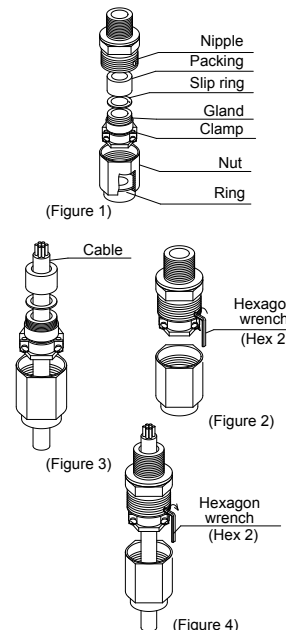
4) Insert the packing and the slip ring onto the nipple. Then, screw in the gland to compress the packing.

Tighten the packing according to the diameter of the cable. When the cable fits the inner hole of the packing (pull the cable and make sure that the cable is not loose), screw the gland in once.

If it is difficult to install the clamp, adjust the gland within the range of 1/3 of a turn.

Then, tighten the gland set screw. (Figure 4)

5) Screw the nut and ring onto the nipple.



9 Maintenance and Inspection

(1) Notes for inspecting the EJ5C terminal box

1) Observe the laws and regulations set by each country.

2) Do not open the cover while operating the EJ5C terminal box.

3) Never disassemble the terminal box.

4) Do not use tools that cause impact sparks during maintenance and inspection.

5) When using measuring devices, use explosion-protected types.

6) When the EJ5C terminal box needs to be disassembled or assembled for maintenance or repair, contact IDEC.

(2) Maintenance and inspection

1) Perform daily or periodical maintenance and inspection for items such as damages and temperature rise of the terminal box listed in table 1.

2) To maintain explosion-proof performance, perform daily or periodical inspection listed in table 2. Perform visual inspection of the electrical wiring of the EJ5C terminal box daily and periodically as the wiring is particularly subjected to external damage.

Table 1 Maintenance and inspection examples

Inspection items	Inspection method	Inspections	Actions
Box base	Visual	• No rusting • No damages	• Cleaning • Rust-resistant treatment
Tightening bolts, screw	Visual, tactile	• No loosening • No rusting	• Tightening • Cleaning
Packings	Visual	• No cracks • No apparent deformation	• Replacement
Lead-in fittings	Visual, tactile	• No damage or deterioration • No loosening	• Replacement • Tightening
Connecting parts	Visual, tactile	• No loosening of screws • No dirt on insulation materials	• Tightening • Cleaning
Temperature rise	Thermometer, tactile	• Surface temperature 80°C maximum	• Investigate the cause

Table 2 Inspection and maintenance of wiring

	Inspection Items	Inspection measure	Details
Cable wiring	Appearance of cable	Visual, tactile	• No damage • No swelling or hardening
	Insulation resistance of cable	Measuring	• 5MΩ minimum
	Appearance of cable protection parts	Visual, tactile	• No damage or corrosion
Metal conduit wiring	Appearance of ducts, cable/wiring trench, etc.	Visual, tactile	• No damage or corrosion • No displacement of the cover
	Insulation resistance of wires	Measuring	• 5MΩ minimum
	Appearance of conduits and fittings	Visual, tactile	• No damage or corrosion • No loosening
	Screw connection	Visual, tactile	• No damage or corrosion • No loosening

10 Disposal

Observe the laws and regulations set by each country concerning refuse disposal.

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