

IDEC INSTRUCTION MANUAL

B-1414(1)

EC2C Control Boxes (Flameproof and 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 EC2C control 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) EC2C control boxes are ATEX certified products. EC2C cannot be used in Japan.

- EC2C control boxes can be installed only in zones 1 and 2. Do not use in zone 0.
- Turn power off to the EC2C control 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 EC2C control box. People without such expertise must not use the EC2C control 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 EC2C control 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 EC2C control box, otherwise damage, personal injury, or accident may result.

(Operation)

- Do not open the cover of the EC2C control box during operation, otherwise electric shock, fire hazard, or explosion may result.
- Operate the EC2C control 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 EC2C control 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 EC2C control 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)

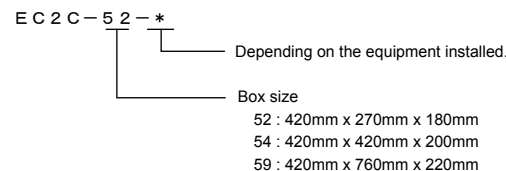
- Stop operation immediately if abnormal operation occurs. Otherwise, a secondary accident may occur.

(Maintenance and inspection)

- The surface temperature of the EC2C control box may become extremely high during operation. Before maintenance or inspection of the EC2C control box, be sure to wear gloves to prevent burn on your hand.

1 Product Structure

(1) Type number



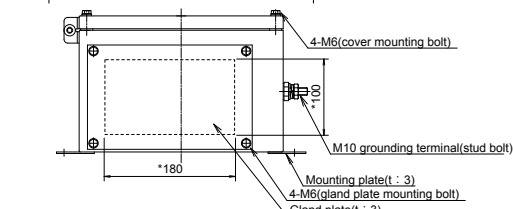
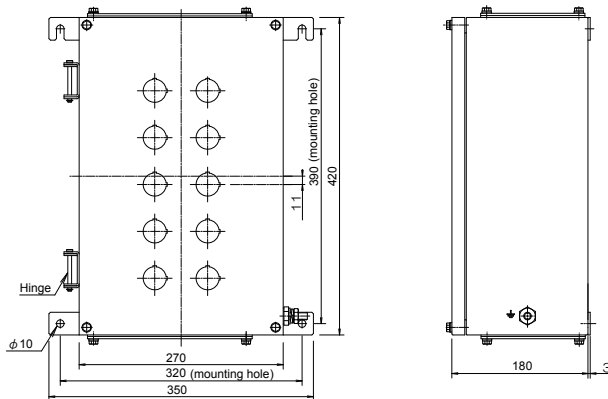
(2) Description of parts and dimensions

1) Dimensions

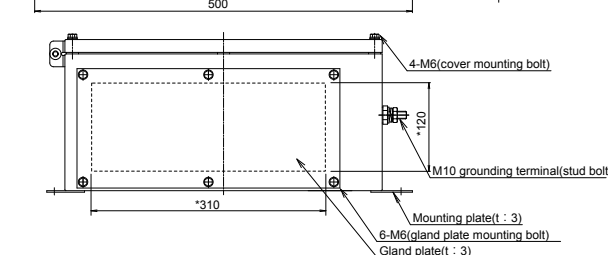
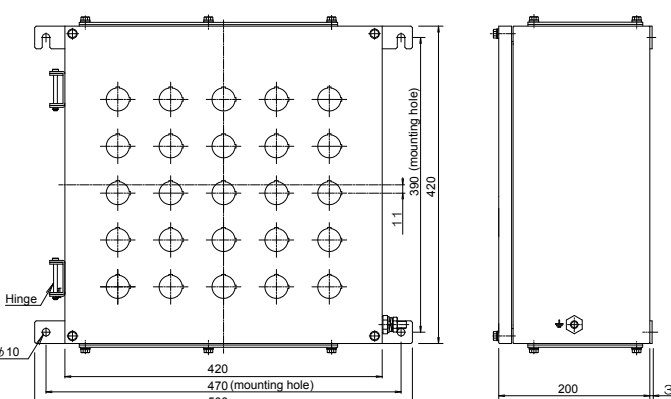
*Below are examples of hole processing on a control box surface and mounting of the gland plate.

* Dimensions marked with * show the surface area range of the fitting or the locknut that can be mounted.

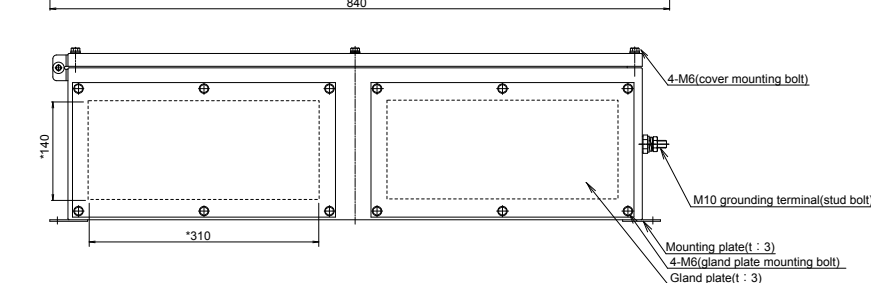
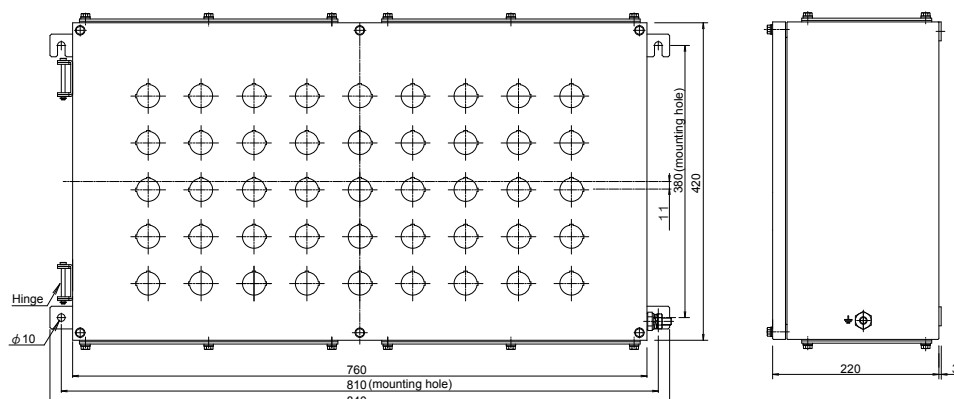
● EC2C-52-*



● EC2C-54-*



● EC2C-59-*



(3) Attachments

- 1) Attachments for all models
 Instruction manual (Japanese / English).....1 each
- 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/EN60079-1, IEC/EN60079-7 IEC/EN60079-31		
Group and category	Ex d IIC Gb, Ex tb IIC T80°C Db IP65		
Explosion protection	TÜV 12 ATEX 7189X		
Certificate number	IP65 (IEC/EN 60529)		
Degree of protection	Stainless steel 316L (body, cover)		
Box material	600V (depends on the installed devices) (Pilot light: 500V) (Terminal block WDU2.5: 550V) (AC ammeter: 300V) (DC ammeter or voltmeter: 150V)		
Rated insulation voltage	2500V AC, 1min (depends on the installed devices) (Pilot light: 2000V AC, 1min) (AC ammeter: 1600V AC, 1min) (DC ammeter or voltmeter: 1500V AC, 1 min)		
Dielectric strength	100MΩ minimum (500V DC megger)		
Insulation resistance	-20 to +50°C (no freezing)		
Operating temperature	45 to 85% RH (no condensation)		
Operating humidity	2000m maximum		
Altitude			

(Note) When using the EC2C control box, the allowable temperature rise of the cable and conduit wiring lead in the box must be taken into consideration. Use a cable or insulated wire with a heat-resistant temperature of 70°C or higher.

(2) Pushbutton switch (EU2B-YB) / Selector switch (EU2B-YS) / Key Selector switch (EU2B-YSK) / Emergency stop switch (EU2B-YBV)

Rated insulation voltage (Ui)	600V					
Thermal current (Ith)	10A(+)					
Rated operating voltage (Ue)		24V	120V	240V	500V	
Rated operating current (Ie)	AC	Resistive load (AC12)	10A(+)	10A(+)	6A	2.8A
	50/60Hz	Inductive load (AC15)	10A(+)	6A	3A	1.4A
	DC	Resistive load (AC12)	8A	2.2A	1.1A	-
		Inductive load (AC13)	4A	1.1A	0.55A	-

(Note) (+)10A (< 2 contact blocks per control unit)
 9A (= 3 contact blocks per control unit)
 Minimum switching capacity (reference): 5mA at 3V AC/DC
 (applicable range may vary with operating conditions and load types)

• Specifications

Contact resistance	50mΩ maximum (initial value)	
Impulse withstand voltage (Uimp)	6kV	
Insulation resistance	100 MΩ minimum (500V DC megger)	
Short-circuit protective device	250V/10A fuse (Type aM IEC60269-1/ IEC60269-2)	
Conditional short-circuit current	1,000A	
Mechanical durability	Pushbutton switch	1,000,000 operations minimum
	Selector switch	500,000 operations minimum
	Key Selector switch	500,000 operations minimum
	Emergency stop switch	50,000 operations minimum
	Pushbutton switch	250,000 operations minimum (at 1,800 operations/hour)
Electrical durability	Selector switch	250,000 operations minimum (at 900 operations/hour)
	Key Selector switch	250,000 operations minimum (at 900 operations/hour)
	Emergency stop switch	50,000 operations minimum (at 900 operations/hour)
	Emergency stop switch	50,000 operations minimum (at 900 operations/hour)
Minimum Direct Opening Force	Emergency stop switch: 60 N	
Minimum Direct Opening Travel	Emergency stop switch: 7.0 mm	
Maximum Travel	Emergency stop switch: 9.0 mm	

— Notes for Operation —

- Contact bouncing
 When the control unit is operating, the contacts will bounce. When designing a control circuit, take the contact bounce time into consideration (reference value: 20 ms).

(3) Pilot light (EU2B-YL)

Rated insulation voltage (Ui)	500V
Rated operating voltage (Ue)	6, 12, 24V AC/DC (Full voltage type)
	100/110, 115, 120, 200/220, 230, 240, 380, 400/440, 480V AC (Transformer type)
Impulse withstand voltage (Uimp)	4kV
Insulation resistance	100MΩ minimum (500V DC megger)
Frequency	50/60Hz
Rated power consumption (approx.)	0.3W (Full voltage type) 1.5VA (Transformer type)
Life (reference value)	Approx. 40,000 hours

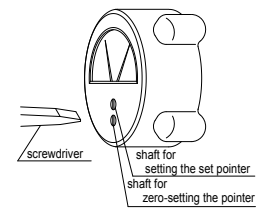
— Notes for Operation —

- The LED built-in lamp is super bright type. Note that the LED lamp may turn on even when the power is turned off because of induction.
- IDEC does not guarantee replacement of control units, nameplate, LED lamp, or padlocking cover by the customer because it may affect explosion protection characteristics. Call IDEC when you need to replace control units, LED lamps, nameplate, or padlocking cover.

(4) Meter (EU2B-YM)

Accuracy Class	2.5	
Insulation Resistance	Rated Insulation Voltage(Ui)	300V
	Principle of action	Moving-iron instrument
	Impulse Withstand Voltage(Uimp)	4kV
	Power Consumption	1VA
	Specification of Measuring Range	5A, 10A, 30A, 50A etc.
AC ammeter	Specification of Input Current	1A, 5A
	Specification of Overload Scale	3 times etc.
	Rated Insulation Voltage(Ui)	150V
	Principle of action	Permanent-magnet moving -coil instrument
	Impulse Withstand Voltage(Uimp)	2.5kV
DC ammeter DC voltmeter	Specification of Input Current or Voltage	0 to 10V DC, 4 to 20mA DC etc.
	Power Consumption (for DC ammeter)	0.01W
	Consumption Current (for DC voltmeter)	1mA

- For AC ammeter of measuring range of 10A or above, use a current transformer commercially available. Install the current transformer in the non-hazardous area.
- Note: Zero-setting the pointer and setting the set pointer.
- Using a flat screwdriver with the tip of 0.8×5w or smaller, adjust the pointer and the set pointer by turning the shafts as shown at the right. Do not apply excessive force on the shaft, otherwise the shaft will be damaged.
- DC voltmeter and DC ammeter do not require zero adjustment.



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
 Do not install the EC2C control box in an environment higher than IP65 protection degree.
 Ambient temperature: -20 to +50°C
 If the control 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
 Use four M8 bolts, or other methods with equivalent strength to install the control box.
 The thickness of mounting plate is 3 mm. (See dimensions)
 If bolts become loose due to vibration, use spring washers.
 If bolt corrosion occur, use anti-corrosion bolts or other countermeasures.
- 3) Note for emergency stop switch
 When using the emergency stop switch for safety-related equipment in a control system, to make sure of correct operation, refer to the safety standards and regulations in each country and region depending on the application purpose of the actual machines and installations. Before using the emergency stop switch, perform risk assessment to make sure of safety.
- 4) 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.

