



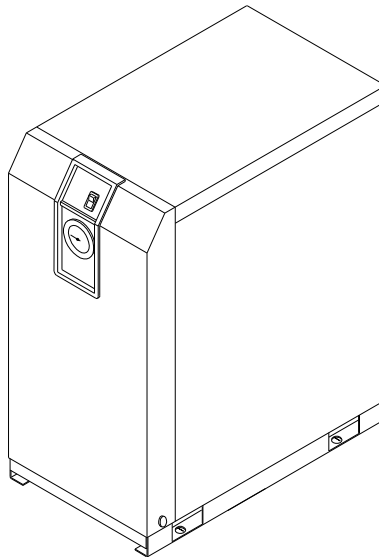
Operation Manual

PRODUCT NAME

Refrigerated Air Dryer

MODEL / Series

IDU3E-23-C,K,L,R,T,V
IDU4E-23-C,K,L,R,T,V
IDU6E-23-C,K,L,R,T,V



**Please read this manual prior of using the air dryer.
Keep the manual readily available for reference.**

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SMC Corporation

Dear Customers

Thank you for selecting SMC Refrigerated Air Dryer.

This operation manual must be read and understood thoroughly before using the product. It provides all essential information pertaining to safety, as well as, maximizing product efficiency in order to extend the life of the product.

In addition, it is strongly recommended that you follow all the safety guidelines and regulations set forth by the local government agency for proper installation and usage.

This manual explains about installation and trial operation of the product. These tasks should be performed only by individuals with the proper training and have a good understanding of the air dryer.

There is no production amends or financial compensation due to dryers trouble.

This manual contains confidential information proprietary to SMC. It must not be reproduced or disclosed to others, or used in any other way, in part or in whole, except as authorized in writing by SMC.

Caution: Please understand that the contents of this operation manual are subjected to change without prior notice.



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Safety Instructions



Be sure to read and comprehend important cautionary notifications in this operation manual before use



Do not operate the product without the cover panel.

i-1 Warning: Before Using Air Dryer

In this chapter, the stated contents are especially about safety.

This Air Dryer is installed downstream of the air compressor to remove moisture. The manufacturer is not responsible for any misuses or misapplications.

This air dryer operates with high voltage and hot surfaces during operation. In addition, this air dryer has high speed rotating fan and motor, which can cause serious injury upon accidental contact. It is advised that you contact the factory or SMC authorized dealer for spare parts or other servicing needs.

We strongly recommend that any one who is working with this air dryer need to read and understand the instructions in this manual beforehand. Often, it's necessary for the people involved, to receive training in order to address the issues of safety and proper application.

When short period power shortage (including instantly recovered shortage) is recovered, it may take a longer starting period than usual starting or may not start due to the protective devices.

In this case, turn off the ON-OFF switch on dryer panel and wait 3 minutes. After this step, turn on the switch to restart. Whenever open the cover panel of this unit, do not miss to turn off the ON-OFF switch, because dryer may start itself when the power supply is recovered.

Connections to a power source where the product is exposed to transient stresses exceeding overvoltage category II (as defined in IEC60664-1).

Only connect to TN-S power distribution systems with N conductively connected to PE.

i-1-1 Hazard, Warning, and Caution Used in This Manual

This product is designed with the first priority on safety. However, there are some inherent risks that cannot be eliminated. This manual classifies these risks into the following three categories according to the severity: **DANGER**, **WARNING** and **CAUTION**. Read the warning statements carefully and thoroughly understand them before operating or performing maintenance on the unit.



DANGER

“DANGER” indicates that there is an imminence hazard that will cause serious injury or death if not avoided.



WARNING

“WARNING” indicates that there is a hazard that may cause serious injury or death if not avoided.




CAUTION

“CAUTION” indicates that there is a hazard that may cause minor injury.

i-2 Danger Classifications & Position of Hazard warning Labels

To help you recognize the hazards, the unit utilizes special graphics to indicate different hazards. Confirm the contents of the hazards and the location of the labels before operation.

 Warning
<ul style="list-style-type: none"> • Only properly trained, qualified personnel are allowed to perform tasks such as: Operation, installation, relocation of product and maintenance works. • Should any problem occurs, address it according to instruction in this manual. • Identify problems following the guidelines in Chapter 5 for Troubleshooting before proceed with maintenance works. • The product should not be turn on in the event of any problems. When the product gets out of order, shutdown immediately, and contact for service

i-2-1 Danger Classifications

Specific danger classification of this product is as follows.

Hazard of Electricity

Since this product operates with high voltage, there is the danger of electric shock. This special symbol is used, along with key words: **“CAUTION”**, **“WARNING”** or **“DANGER”**, on the product and in this manual.



Hazard of Hot Surface

Since this product becomes hot while running, there is the danger of burn injury. This special symbol is used, along with key words: **“CAUTION”**, **“WARNING”** or **“DANGER”**, on the product and in this manual.



Hazard of Rotor

Since this product has parts that rotate at high speed while running, there is the danger of bodily injury. This special symbol is used, along with key words: **“CAUTION”**, **“WARNING”** or **“DANGER”**, on the product and in this manual.



i-2-2**Hazard of Electricity****Warning**

Inside of this product, there is a power-supplying section with high voltage separated by the cover panel. Do not operate the product with the cover panel off.

i-2-3**Hazard of Hot Surface****Warning**

Since this product has parts that become hot during operation, there is the danger of burn-associated injuries. These parts remain hot even after power is off. Wait until the unit has cooled down before touching.

i-2-4**Hazard of Rotating Fan Motor****Warning**

Since this product has parts that rotate during operation, there is the danger of injury resulting from direct contact. The fan and rotor will start/stop automatically. Thus, do not work on them when power is on.

i-2-5**Danger of Compressed Air Circuit****Warning**

Before replacing or cleaning parts, be sure to relief the pressure remained inside of the product until the gauge indicates “0”. High pressure can propel object at high velocity and cause injury.

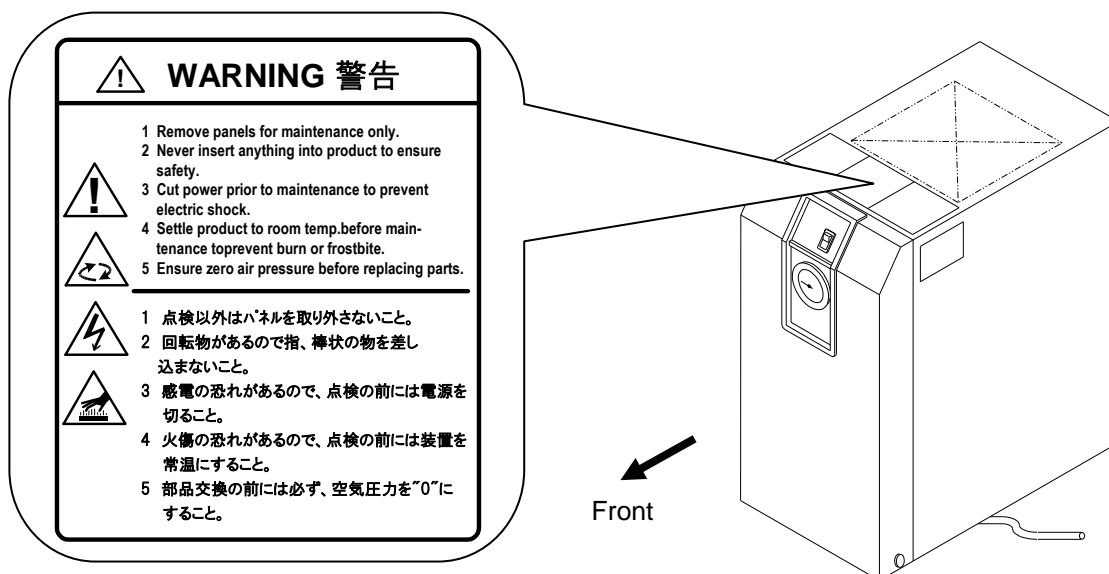
i-2-6 Positions of Danger Warning Label

**Warning**

Read with caution and pay attention to the notations of danger warning labels.

Do not remove or rub danger warning labels.

Confirm the positions of danger warning labels.



i-2-7 Hazard of Refrigerant

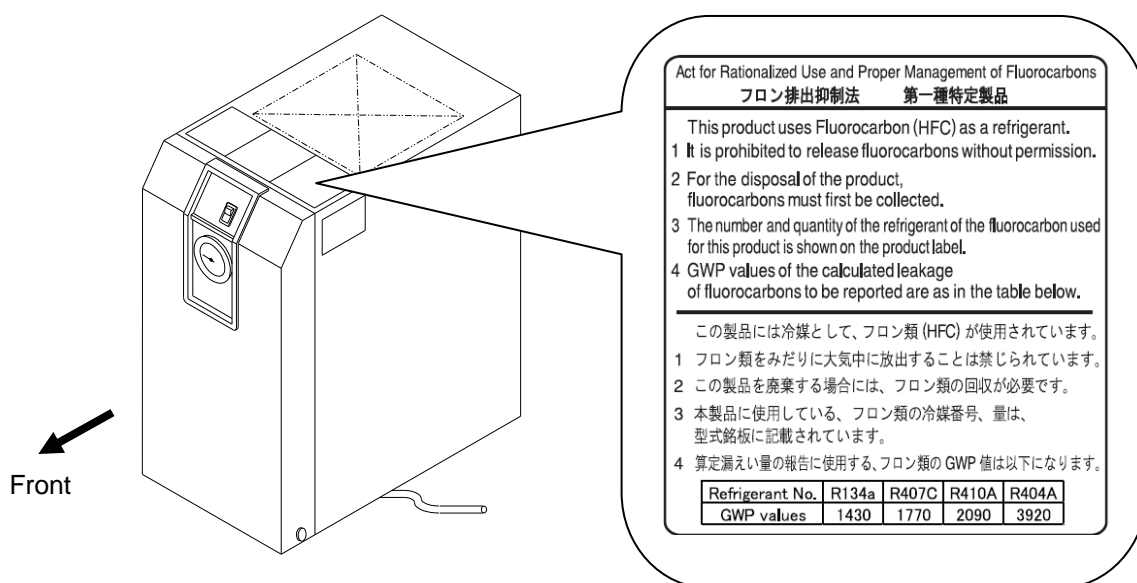
**Caution**

This product uses Fluorocarbon (HFC) as a refrigerant.

It is strictly forbidden to emit Fluorocarbon into the atmosphere. Before you repair the refrigerant circuit, you should collect the refrigerant with proper evacuation system. The collected refrigerant should be properly recycled by qualified agency. Only personnel with proper credential are allowed to handle refrigerant.

Only properly trained qualified personnel are allowed to remove the cover panel of the product.

The quantity and the type of Fluorocarbon are mentioned on the specification label. See Page i - 6.



i-2-8 Cautions about Usage



Warning

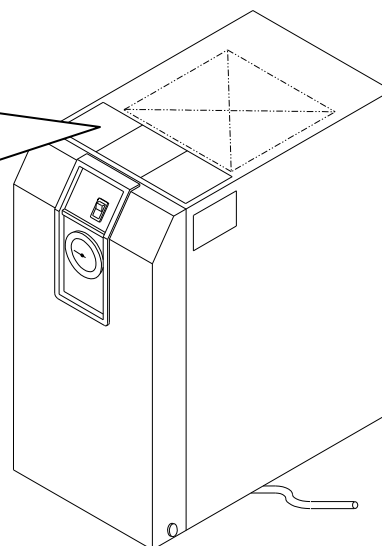
Please follow the instructions on all warning labels. Do not remove or deface warning labels, and confirm the location of warning labels.

CAUTION 注意

- 1 Read manual before operation.
- 2 Ensure ventilation and maintenance space.
- 3 Keep water away from the product.
- 4 Secure In / Out connector with spanner during piping.
- 5 Wait 3 minutes before restart.
- 6 Ensure Running Condition / Evaporating Temp. in green zone.

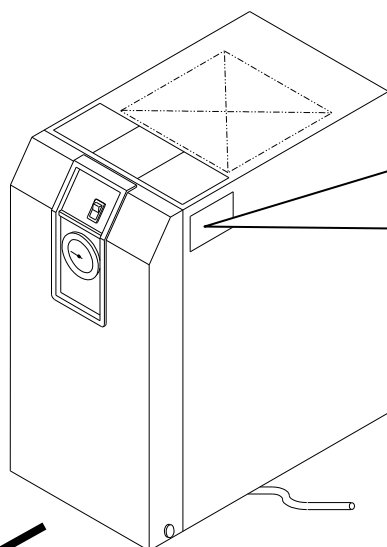
- 1 ご使用前に必ず取扱説明書を読んでください。
- 2 通風、メンテナンススペースを確保してください。
- 3 雨や水滴がかからないようにしてください。
- 4 IN/OUTポートをスパナで固定して配管してください。
- 5 再起動は運転停止3分後に行ってください。
- 6 RUNNING CONDITION・蒸発温度計はグリーン帯で使用してください。

Front



i-2-9 Other Label

Front



IDU**E-**

-

VOLTAGE
RUNNING CURRENT
REFRIGERANT
WEIGHT
MAX. PRESS.
SERIAL No.

4-14-1, Sotokanda, Chiyoda-ku,
Tokyo 101-0021, Japan



MADE IN



Specification Label

i-3 Disposal

When you dispose of the product, you should collect the refrigerant and the refrigerant oil inside the refrigerant circuit.



Caution

This product contains Fluorocarbon HFC.

It is strictly forbidden to emit Fluorocarbon into the atmosphere. Before you repair the refrigerant circuit, you should collect the refrigerant with proper evacuation system. The collected refrigerant should be properly recycled by qualified agency. Only personnel with proper credential are allowed to handle refrigerant.

Only properly trained and qualified personnel are allowed to remove the cover panel of the product.

The quantity and the type of Fluorocarbon are mentioned on the specification label. See Page i - 6.



Caution

Dispose of the refrigerant and refrigerant oil according to the regulation of local government.

Only personnel with proper credential are allowed to collect refrigerant and refrigerant oil.

Only properly trained and qualified personnel are allowed to remove the cover panel of the product.

For any questions, please contact our factory or SMC authorized dealers.

i – 4 Limited warranty and Disclaimer / Compliance Requirements

The product used subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements. Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered. Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulation of the countries involved in the transaction. Prior to the shipment of a SMC product of a SMC product to another country, assure that all local rules governing that export are known and followed.



Caution

The Product is provided use in manufacturing industries.

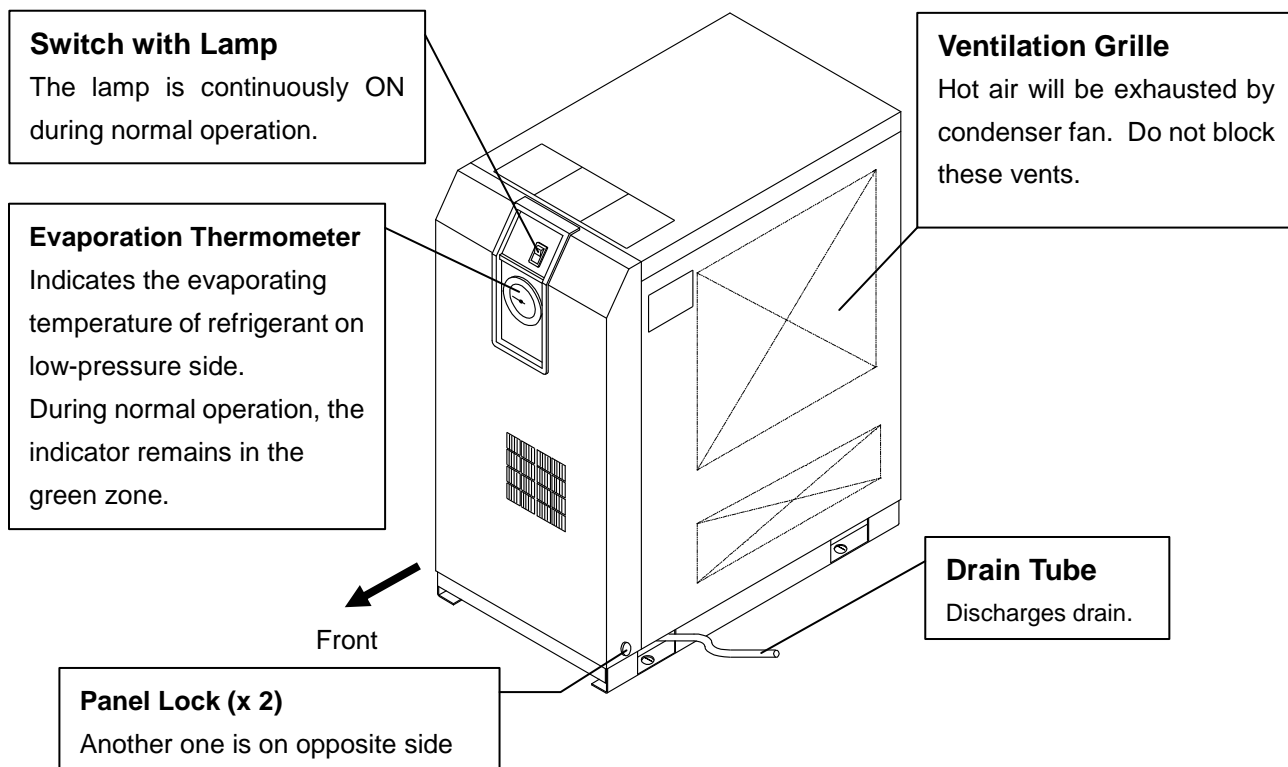
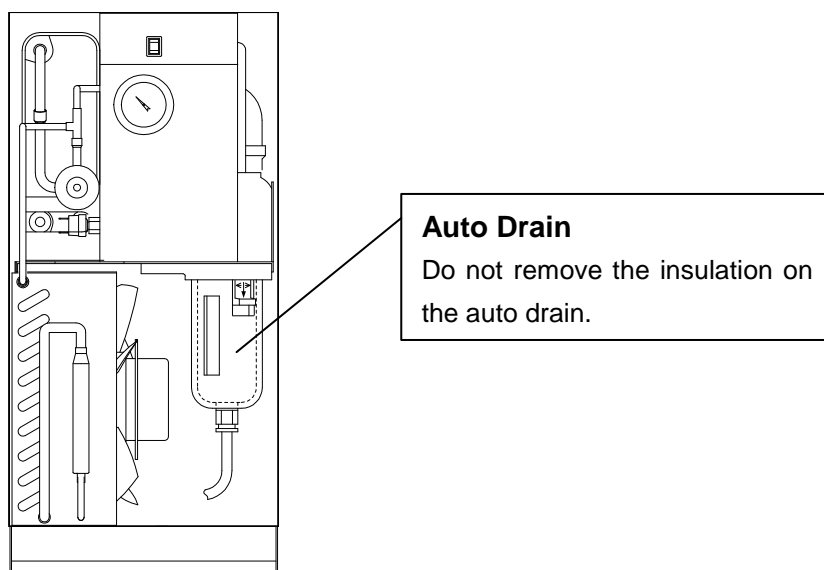
The product herein described is basically provided for peaceful use in manufacturing industries.

If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contact if necessary.

If anything is unclear, contact your nearest sales branch.

1

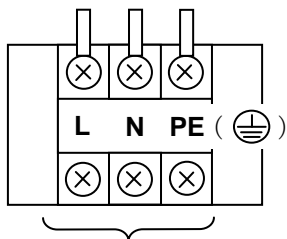
Parts Name and Functions

1-1 Parts Name and Functions**• IDU3E to 6E****View with Front Panel removed****IDU3E to 6E**

• IDU3E to 6E

Rear Panel

You can see the terminal block when you remove this cover. Connect the power cable through the membrane grommet.

**Customer Connection Side**

Terminal Connecting Screw: M3

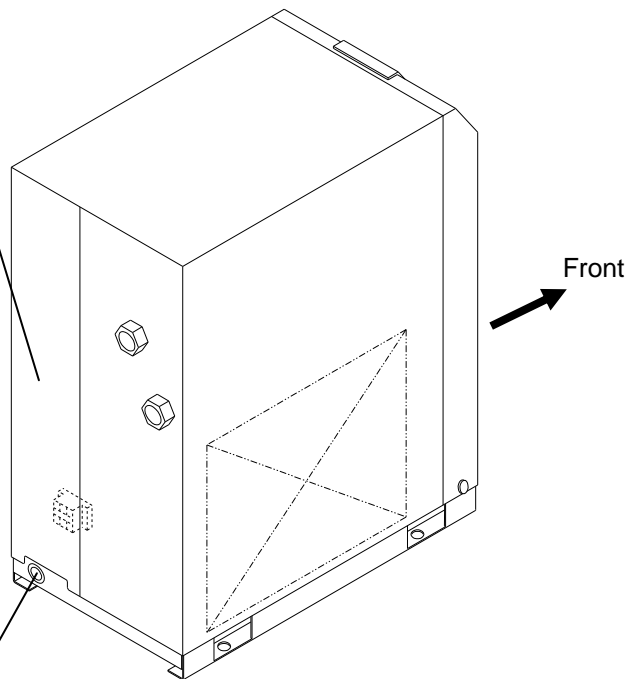
Ring terminals: 1.25-3

(Width 6.5mm and below)

(Screw head dimension: 0.25" (6.5mm))

Rubber Grommet

Power cord inlet





Transportation / Installation



Warning

- Only properly trained, qualified personnel are allowed to perform tasks such as: Operation, installation, relocation of product and maintenance works.
- Strongly recommend to prepare the spare dryer when applying the dryer for important product or system.

2 - 1 **Transportation**

When you transport the product, you should follow the instructions below:

- You should lift the product from the base surface with careful attention to prevent tipping over.
- Do not lay the product sideways, or you will damage the product.
- Do not suspend the product from the ceiling or hang from the wall.
- Do not transport the product with any part such as an air filter mounted on the fittings at the air inlet or outlet port of the product. If it is unavoidable to transport the product with such a part mounted, support the mounted part with a bracket to prevent the product from being affected by vibration during transportation.



Warning

This product is heavy.

Each model IDU3E to 6E weights about 20kg or more. It must be transported by more than one person, a forklift is necessary.

2 - 2 Installation

2-2-1 Location

The product should not be used or stored in the following conditions: Those conditions will cause not only malfunction but also failures.

- Environment where the product is exposed to rainwater, moisture, salt water or oil.
- Locations where the product is exposed to dust or particles
- Locations where the product is exposed to flammable, combustible or explosive fumes.
- Locations where the product is exposed to corrosive gas or solvent.
- Locations where the product is exposed to direct sunlight or radiated heat.
- Locations where ambient temperature is beyond following range:
 - On-stream: 2 to 40°C
 - Storage: 0 to 50°C (when there is no drain water inside of the piping)
- Locations where temperature changes rapidly.
- Locations where strong electromagnetic noise is generated.
- Circumstances where static electricity is produced or discharged through the body of the product.
- Locations where strong high frequency shock wave is generated
- Locations where danger of thunder is apparent.
- Locations where loading on vehicles, marine vessels, and so on
- Locations where altitude is higher than 2,000 meters
- Circumstances where strong vibration or impact are transmitted.
- Circumstances where too much force and weight are put on the body of the product that causes it to deform.
- Circumstances where not enough clearance spaces to do maintenance
 - Spaces needed for maintenance

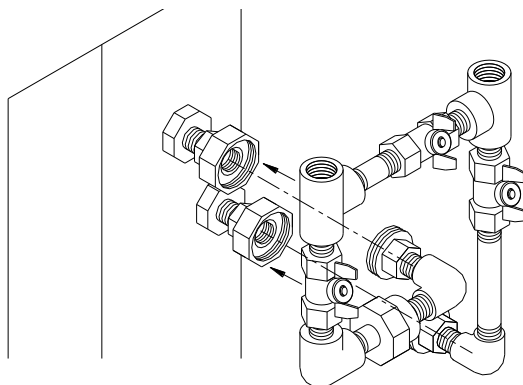
Front	: 600 mm
Rear	: 600 mm
Top	: 600 mm
Right	: 600 mm
Left	: 600 mm
- Locations where ventilation grille of the product can be blocked.
- Locations where the dryer could intake warm air (for example from a compressor or other dryers).

2-2-2 Anchorage

- The air dryer should be installed on a vibration-free, stable, horizontal, flat surface.
- Refer to “Chapter6 6-2 Dimensions” for the dimensions.
- IDU3E~6E should be bolted by anchor bolts to prevent falling. We recommend the anchor bolt sets that we are selling separately as accessories.

2-2-3 Air piping

- Connection to the inlet and outlet of compressed air should be made removable by using union and so on.
- Pressing the hexagonal fitting with screw wrench and so on, connect the air piping fittings to the body.
- When mounting any part such as an air filter on the fitting at the compressed air inlet or outlet port, support the part to prevent excessive force from being applied to the product.
- Be careful not to let the vibration of the air compressor transmit.
- If the temperature of compressed air on the inlet side is higher than 50°C, place an aftercooler after the air compressor. Or, make the temperature of the place where the air compressor is installed lower than 50°C.
- Flash the piping sufficiently in order to avoid any foreign substances such as dust, sealing tape, liquid gasket, etc. when piping before piping connection. Foreign substances in the piping can cause cooling failure or drainage failure.
- Use pipes and fittings that have enough endurance against the operating pressure and temperature. And connect it firmly to prevent air leakage.
- Provide bypass piping to make it possible to do maintenance without stopping the air compressor.



We recommend the bypass piping sets that we are selling separately as accessories.

The bypass piping sets

2-2-4 Drain Tube

- A polyurethane tube (10mm) O.D. is attached to the auto drain. The end of the tube is open to atmosphere to let drain flow through the tube into a collector or drain pipe.
- The compressed air is used to push out the drain periodically. Fix the outlet end of the tube in order to prevent whipping action during discharge.
- Install the drain tube in such a way so that no drain is trapped.
- During installation, make sure the dryer does not sit on the drain tube which is at the bottom of the unit. Be careful to avoid the dryer from crushing the tube during installation.

**Warning**

To handle drain discharge, follow the safety guidelines such as wearing protective goggles, apron, and gloves.

In case that oil gets mixed in the wastewater discharged from the auto drain, the liquid would be considered as toxic waste and treatment is necessary in accordance with local regulations.

2-2-5 Electric Wiring**Warning**

Only properly trained and qualified personnel are allowed to perform wiring work.

- **Before wiring, you must disconnect the power. Do not work under any energized conditions.**
- **Supply power from a stable source that is free from the effect of surge.**
- **Ensure that a Ground Fault Circuit Interrupter(GFCI) with appropriate capacity for earth leakage and load is used in the power supply of the product to prevent electrical shock and burnout of the compressor motor. See “6-1 List of specifications” for details.**
- **Supply power of the product should meet the specifications on page 6-1.**
- **The product must be grounded for safety.**
- **Do not connect ground wire to a water pipe, a gas pipe, or a lightening rod.**
- **Do not plug too many leads into a single cocket.**
- **Circuit breaker must be properly selected to meet safety standard of local regulations.**
- **Always be sure to connect the protective conductor first, disconnect it last in respect to the other connections.**
- **Be sure that the protective conductor has some additional length in respect to the live conductors, so that it is not subject to mechanical stresses.**
- **Be sure to install the circuit breaker correctly so that it disconnects all live conductors and so that the operating handle can be easily accessible.**

Specification of power cable

Prepare following power cable.

Power cable: 1.25mm²(16AWG), Three-cores (including the ground cable), External diameter: about 8 to 12mm.

Additional length of about 0.1m (4in) is needed to wire inside of the product.

Length of the power cable

The maximum length of the power cable should be no more than 98ft (30m).


Connecting to the power supply

- Connect the power cable and the ground to the terminal block. Make sure to use the ring terminals for M3 screws.
- Applicable crimped terminal: 1.25-3 (Width: 6.5mm and below)

Wiring procedure

- Remove the terminal block cover or the rear panel.
- Insert the cord through the rubber grommet and connect it to the terminal block (refer to the label on the terminal block). M3 screw tightening torque: 0.6 to 1Nm
- During wiring work, do not touch other sections except terminal block.
- Re-attach the cover or rear panel after wiring is done.


2 - 3 Cautions for Reinstallation

	Caution
Only properly trained, qualified personnel are allowed to perform reinstallation.	


If the product is moved and reinstalled in another place after some trial operations, the following instructions must be followed as well as procedures in Chapter 2.

Removing the power cable

Disconnect the power source before removing the power cable.

	Warning
Only properly trained, qualified personnel are allowed to perform wiring. Disconnect the power source before wiring. Do not work under energized condition	

Disconnecting air pipes

	Warning
Only properly trained, qualified personnel are allowed to perform piping works. Separate the compressor from the product before disconnecting the air pipe. Do not disconnect any piping when there is residual air pressure inside of the pipe.	

- Remove the seal tape completely after removing the piping. Loose seal tape can clog up the system.

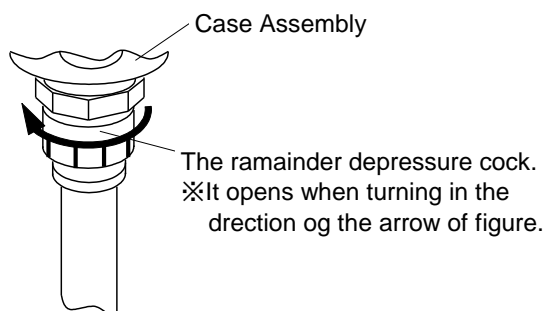
Releasing residual pressure

Bypass valve should open even after the dryer has been removed.

Close the compressed air inlet and outlet valve.

Unscrew the front panel screws (in 2 places) and remove the front panel.

Open the auto drain residual pressure release valve to release air pressure inside the product. Refer to the figure at right.



3 Operation / Shutdown



Caution

Only properly trained and qualified personnel are allowed to perform operation/shutdown of the product.

3-1 Check points before operation

Before trial run, check the following points:

- **Installed Conditions:**
By visual inspection, check that the product is level.
Model IDU3E to 6E, make sure the product is tied down with anchor bolts.
Do not place heavy objects on the top of the product. Make sure piping does not add weight to the product.
- Power cord, and the ground should be connected firmly.
- Drain tube should be connected correctly.
- Make sure the piping for compressed air is connected correctly.

3-2 Operation

Start operation according to the procedure below.

- Turn on the breaker of the main power supply. Then, turn on the illuminated ON/OFF switch.
- The lamp will light up. Few minutes later, the cooling fan will rotate and hot air will be exhausted from the ventilation grille.
Location of the ventilation grille: Model: IDU3E to 6E: Right Side Ventilation Grille
- Open the IN/OUT side valve slowly. Make sure the bypass valve is completely closed. Confirm there is no air leaks.
- Depending on the condition of compressed air or ambient temperature, the cooling fan sometimes alternates between start/stop at the beginning. Then, the refrigerant compressor will start and the pointer of the evaporating temperature will indicate in the green zone. If the pointer indicates higher than the green zone, refer to "Chapter 5 Troubleshooting."
- After running for a while, moisture will be discharging from the drain tube automatically.



Caution

Avoid frequent On/Off operation, which may cause problems.
The auto drain used for the product has a structure that closes the valve with air pressure higher than 0.15MPa. Therefore, until the pressure increase, air will be emitting from the drain outlet at the start of opening the "IN" valve. Keep in mind that sometimes the pressure cannot increase due to under-sized air compressor.

3-3 Shutdown

- Turn off the ON/OFF switch.
- The lamp will go out and then, the operation will stop. Depending on the condition of operation, hot air continues to be emitted from the ventilation grille by the cooling fan for a while after turning off the switch.

3-4 Cautions about restart

- Wait at least 3 minutes before restarting the air dryer after it has been shut down. Failure to do this may cause safety devices to trip due to over load.

3-5 Check points before restart

Check following points before you start operation. If any abnormalities occur, immediately stop the operation.

Turn off the ON/OFF switch follow by the breaker to the power supply.

- There is no air leaks.
- Air pressure, temperature, flow rate, and ambient temperature meet the specifications.
- Moisture is being discharged from the drain tube.
- The pointer of evaporating temperature indicates in the green zone.
- There are no abnormal sound, vibration, or odor.

3-6 Precautions for long-term non-operation

- If the product will not be operated for 24 hours, for example at the weekend, turn off the ILS (Switch with lamp) or power supply, for energy saving and safety. It is also recommended to release the pressure inside the compressed air piping and this air dryer.

4

Maintenance

4 - 1 Daily Inspection

Check following points during normal operations. If you find some problems, immediately stop the dryer and refer to "Chapter 5 Troubleshooting" as soon as possible.

- There is no air leaks.
- The running lamp is on during operation
- Moisture is being discharged from drain tube
- The pointer of the evaporating temperature indicates in the green zone
- The pointer of the evaporating temperature indicates about 5 to 15°C lower than that of the ambient temperature when compressed air stops supplying to the air dryer.
- There is no abnormal odor or smoke coming from the product.
- It is recommended to keep a maintenance/service record. Please refer to "Chapter 13-1 Service Record"

4 - 2 Periodical Maintenance**4-2-1 Cleaning the condenser and aftercooler fins**

Clean dust and other foreign particles from the ventilation area with vacuum cleaner or air blow nozzle once a month.

**Caution**

When performing air blowing wear protective goggles and/or mask to prevent dust from entering the eyes and trachea.

4-2-2 Service parts

It is recommended to replace the following parts regularly. The interval shown in this operation manual depend on the operating conditions (ambient temperature, installation environment, etc.), so that they are for reference .

- Table 1. List of parts to be replaced regularly

Description	Recommended replacement interval
Pressure switch	One Million times.
Fan motor	20,000 hours
Magnetic Contactor, Magnetic Switch (Note)	One Million times.

*Note) If it is mounted by option "T" (With terminal block for power supply , run , alarm signal and remote operation) or special order.

4-2-3 Cleaning of auto drain strainer

Remove the dust deposited in the auto drain strainer every month. Use neutral detergent for cleaning. If they are too dirty, replace them and shorten the period of maintenance from next time.

- Auto Drain Strainer order part number

Part No.	Name	Quantity	Applicable Model
IDF-S0002	Auto Drain Strainer	1	IDU3E, IDU4E, IDU6E,



Warning

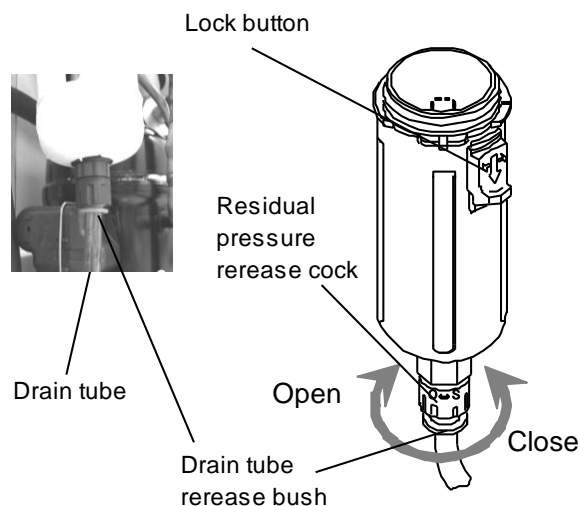
- Maintenance of the air dryer should only be carried out by someone with sufficient knowledge and experience of air dryers and related equipment.
- Before carrying out maintenance, the important warnings in this manual must be thoroughly read and understood.



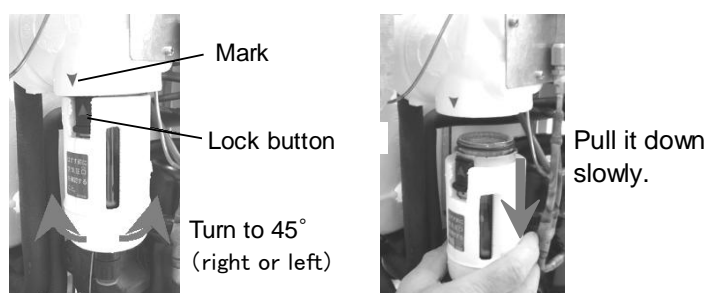
Danger

- When replacing or cleaning parts of the air dryer, be sure to remove the compressed air pressure inside the air dryer to "0". Never remove the case assembly when the air dryer is operated or air pressure remains inside. It is extremely dangerous if compressed air pressure remains inside the air dryer, as parts may come flying off at speed when loosened, or other unexpected accidents.
- This product has parts that become hot during operation and a power supply with high voltage applied. There is a risk of burns due to heat or electrification by high voltage. Even when operation is shut down after switching off the air dryer's illuminated light, there are also charging lines. When working on the charged sections, be sure to switch off the earth leakage breaker installed before starting work.
- As some parts of the air dryer will remain hot, there is a risk of burns due to residual heat after the power is switched off. So do not carry out replacement work until the temperature of these parts has fallen to 50°C or less. Wait for about 10 to 15 minutes as a guide.
- When carrying out maintenance work on the auto drain strainer and auto drain, there is a risk of touching the drain fluid during work. Please follow the safety procedure for operators specified by customer. (Example: carry out work wearing safety glasses, apron and gloves to prevent discharged fluid from touching the human body.)
- Use neutral detergent solution to clean parts such as the auto drain strainer and auto drain. Never use solvent such as thinner.
- When removing the outer casing panel or case assembly of the auto drain, wear gloves to prevent injuries.

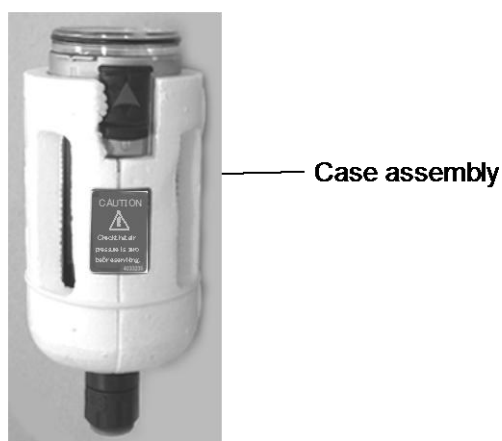
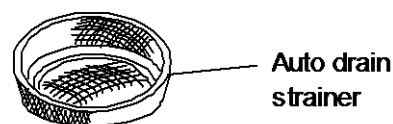
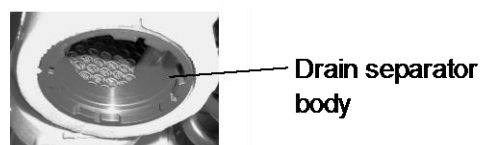
- Open the residual pressure release cock at the drain tube connection port to release air and drain fluid left in the product.
(Leave the drain tube connected and hold it with hand so that it does not get twisted.)
- Because drain may be given by air pressure left in a product like a careful.
- Remove the drain tube.
Pull out the tube while pushing up the drain tube release bush.



- Hold the case assembly lightly and pull down the lock button with thumb. Then, turn the case assembly to the left (or right) to 45° to align the marks.
- Release your thumb from the lock button and slowly pull down the case assembly (vertically) to remove it.



- Remove the auto drain strainer and clean it. Take care not to cut your hand with the sharp edges of the strainer.
- Pour solution of neutral detergent into the case assembly and shake it well to clean.
- Check the case O-ring for damage such as scratches, twisting or foreign particles attached to it. Then, apply grease thinly and fit it in the groove in the case assembly.
- Fit the auto drain strainer to the case assembly and fit it into the drain separator body. Turn it until the lock button clicks.
- Try to turn the case assembly lightly and check that it does not turn. If it turns, start with fitting the case assembly to the body again.
- Close the residual pressure release cock and mount the drain tube and front panel as they were.
- When reapplying compressed air to the air dryer, first open the valve on the inlet side slowly. Check for compressed air leak and if everything is all right, open the valve on the outlet side.
- If the auto drain strainer or case assembly is damaged or very dirty, replace it with a new one.





Troubleshooting

Should any problem occur, inspect with the following table, and if the problem cannot be solved, shut off the power supply and then contact one of our sales offices for further instructions.

Problem	Probable Causes	Remedy
Air dryer does not operate and run lamp does not light on, when the switch is ON.	Power cord or plug is loose or not connected to the power source.	Perform proper connection on the power cord and plug.
	Circuit breaker is OFF.	Confirm whether the proper capacity of the circuit breaker is used. It is not possible to restart the air dryer within 3 minutes after shutdown. Wait for 3 minutes before restarting. Resume the operation after resetting the circuit breaker to ON. If the circuit breaker still trip to OFF, failure of electrical insulation may have occurred. Remove the power supply and contact the factory for further instructions.
Running lamp extinguishes and compressor stops during operation but resumes normal operation illuminating the lamp after a period of time.	Installation place is poorly ventilated. Ambient temperature is too high.	Improve the ventilation system to lower the ambient temperature.
	The ventilation grilles are obstructed by wall or clogged with dust.	Install the air dryer more than 0.6m away from the wall. Clean the ventilation grilles once a month.
	Temperature of the Compressed air is too high.	Improve the ventilation system around air or make ambient temperature low. Reduce the temperature of the compressed air by installing an additional aftercooler before the air dryer.
	Supply voltage is not in the following range:	Set the voltage to a proper value by installing a transformer or review the electrical wiring.
Evaporation thermometer indicates higher than green zone.	Installation place is poorly ventilated. Ambient temperature is too high.	Improve the ventilation system to lower the ambient temperature.
	The ventilation grilles are obstructed by wall or clogged with dust.	Install the air dryer more than 0.6m away from the wall. Clean the ventilation grilles once a month.
	Temperature of the compressed air is too high.	Improve the ventilation system around the air compressor or make ambient temperature around the air compressor low to lower the temperature of discharge from compressor. Reduce the temperature of the compressed air by installing an additional after-cooler after the air dryer.
Moisture occurs downstream of the compressed air lines.	Bypass valve of air dryer is not fully closed.	Close the valve completely.
	Drain is not discharged from auto drain properly.	Check if the drainpipe has fluid trap or bent. Check auto drain. Check auto drain strainer.
	Moisture from separate air circuit that is without air dryer.	Install additional air dryer on the line that does not have one. Separate two lines not to converge.
Large pressure drop	IN/OUT valve on the air dryer side is not fully opened.	Open IN/OUT valve fully.
	Filter that is installed separately in compressed air line is clogged.	Replace the filter element. (Follow the instruction manual of each individual device.)

6

References

6-1 Specifications

Specification		Model	IDU3E	IDU4E	IDU6E
Air Flow Rate (ANR)(Note 1)	At Outlet Pressure Point of 10°C Dew		0.32m ³ /min	0.52m ³ /min	0.75m ³ /min
Rated Condition	Operating Pressure		0.7MPa		
	Inlet Air Temperature		55°C		
	Ambient Temperature		32°C		
	Voltage		230V 50Hz		
Operating Range	Working Fluid		Compressed Air		
	Inlet Air Temperature		5 ~ 80°C		
	MIN.Inlet Air Pressure		0.15MPa		
	MAX.Inlet Air Pressure		1.0MPa		
	Ambient Temperature		2 ~ 40°C (Relative Humidity of 85% or less)		
Electrical Specification	Power source		1 φ AC230V±10% 50Hz (Note 4)		
	Starting current (Note 2)		9A	11A	19A
	Operating current (Note 2)		1.5A	1.6A	2.9A
	Power consumption (Note 2)		210W	220W	400W
	Circuit Breaker (Note 3)		5A		
Noise at 50Hz			50dB		
Condenser			Air cooling		
Refrigerant			R134a (HFC)		
Refrigerant Charge Quantity			230±5g	270±5g	260±5g
Air IN/OUT Connection			Rc3/8	Rc1/2	Rc3/4
Drain Connection (Outside Diameter of Tubing)			10mm		
Color			Panel: Urbanwhite1 : Base:Urbangray2		
Weight			23kg	27kg	28kg
Applicable Compressor (Standard) kW			2.2	3.7	5.5

Note1: The data for m³/h (ANR) is referring to the conditions of 20°C, 1atm . pressure & relative humidity of 65%.

Note 2: The value is that of under specified condition.

Note 3: Install GFCI breaker that comes with sensitivity of 30mA.

Note 4: When short period power shortage (including instantly recovered shortage) is recovered, it may take a longer starting period than usual starting or may not start due to the protective devices.

6-2 Refrigerant with GWP reference

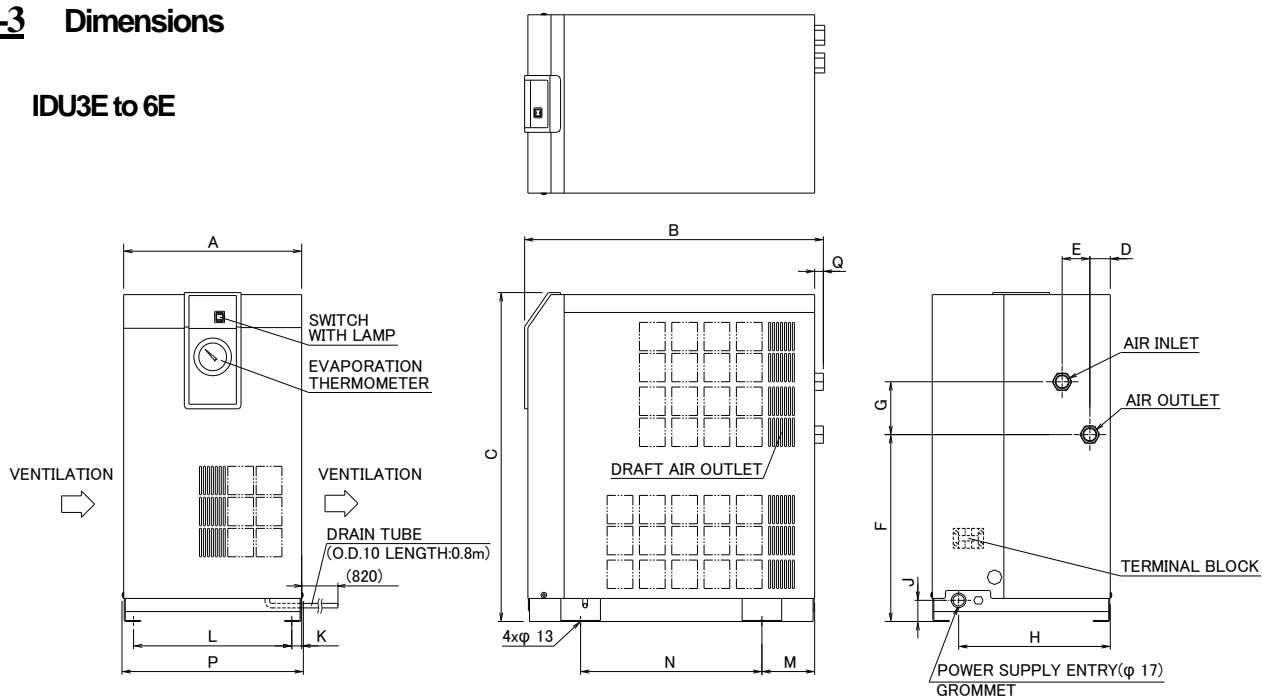
Refrigerant	Global Warming Potential (GWP)	
	Regulation (EU) No 517/2014 (Based on the IPCC AR4)	Revised Fluorocarbons Recovery and Destruction Law (Japanese law)
R134a	1,430	1,430
R404A	3,922	3,920
R407C	1,774	1,770
R410A	2,088	2,090

Note1 : This product is hermetically sealed and contains fluorinated greenhouse gases.

Note2 : See specification table for refrigerant used in the product.

6-3 Dimensions

- IDU3E to 6E

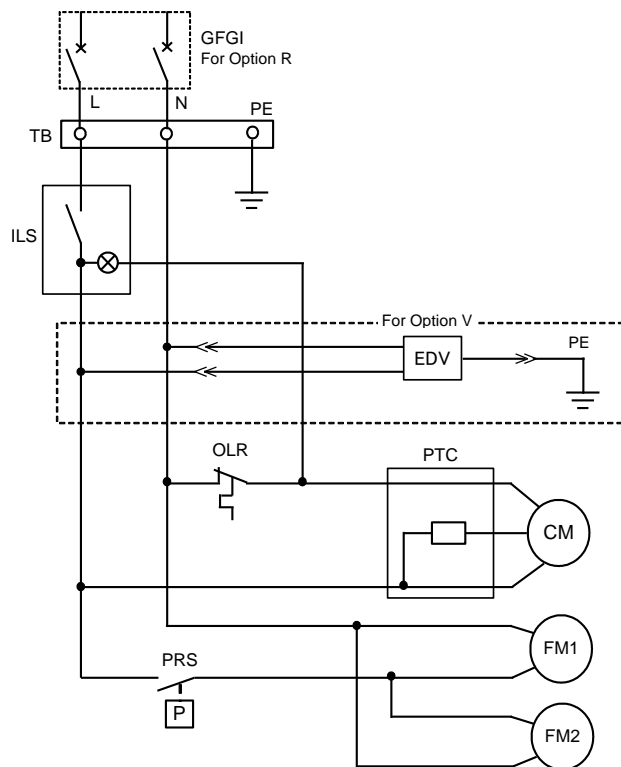


Model	Thread Size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
IDU3E	Rc3/8	270	455	498	31	42	283	80	230	32	15	240	80	275	275	15
IDU4E	Rc1/2		485	568			355							300		
IDU6E	Rc3/4															

unit : mm

6-4 Electrical Circuit

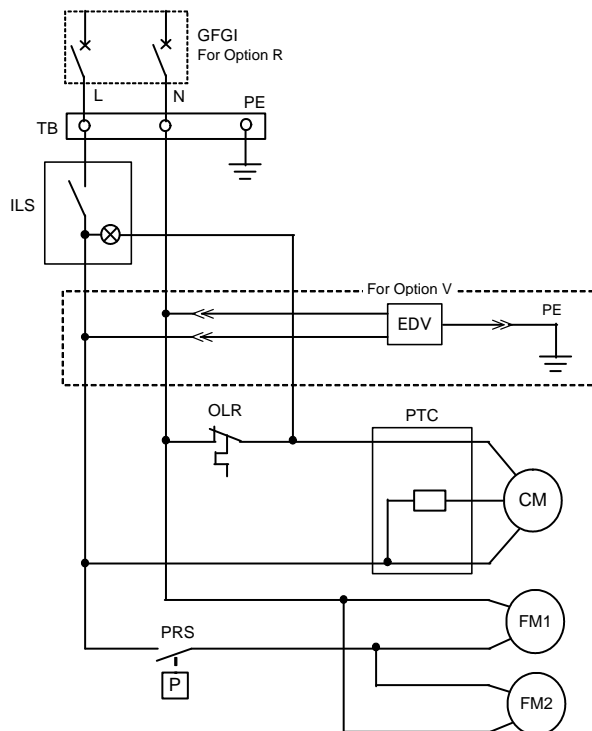
- IDU3E / 4E



IDU3E / 4E

SYMBOL	DESCRIPTION
CM	Compressor Motor
FM1	Fan Motor
FM2	Fan Motor
OLR	Overload Relay
PTC	PTC Starter
ILS	Switch with Lamp
PRS	Press. Switch
TB	Terminal Block
GFCI	Ground Fault Circuit Interrupter
EDV	Electronic Drain Valve

- IDU6E

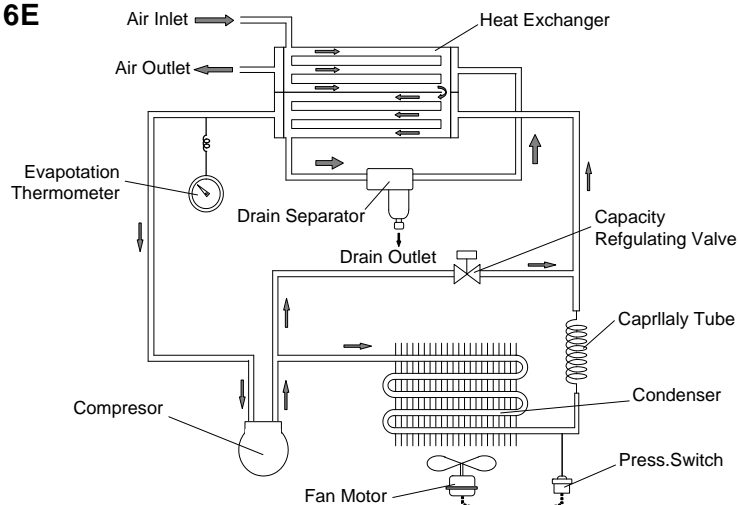


IDU6E

SYMBOL	DESCRIPTION
CM	Compressor Motor
FM1	Fan Motor
FM2	Fan Motor
OLR	Overload Relay
PTC	PTC Starter
ILS	Switch with Lamp
PRS	Press. Switch
TB	Terminal Block
GFCI	Ground Fault Circuit Interrupter
EDV	Electronic Drain Valve

6-5 Compressed Air and Refrigerant Circuit/Operation Principles

- IDU3E to 6E



Compressed Air Circuit

Humid hot air entering air dryer is cooled in the cooler. At this time, the condensate is separated from the air by the drain separator and automatically discharged. The dry air is heated by the re-heater until it gets about the same temperature as that of ambient air. It is then discharged from air dryer outlet.

Refrigerant Circuit

The Fluorocarbon charged in the refrigerant circuit is compressed by the compressor and cooled by the condenser to become liquid. Then, going through the capillary tube, the refrigerant pressure and temperature (evaporating temperature) decreased rapidly. Passing through the cooler part, it draws heat from the hot compressed air and intensely boils. Finally, it is sucked into the compressor again. The hot gas bypass valve opens to prevent drain from freezing when compressed air is too cold.



Specification for Option C

This product adds Specifications in Item 3 as option. When performing the installation and maintenance of the product, the following points must be understood and followed.

7-1 Safety instructions

When handling the product, take care to the following precautions.



Warning

Shut off the power supply when removing the panel for maintenance work, etc. The product has a fan(s) and could cause serious danger to operators.

7-2 Precautions for the installation and handling of the product

- 1) The surface of copper tube is painted with a special epoxy to improve the rust proof effect to corrosive gas, but it is not perfect rust proof. Therefore, avoid installing the product in the place exposed to corrosive gas as much as possible.
- 2) If any flaw is given on the painted surface of copper tube such the case as panels are removed for maintenance, the effect of its rust proof painting is lost. Do not give any flaw on the painted surface of copper tube.

7-3 Specifications

The surface of copper tube is painted with a special epoxy resin for the rust proof. The parts covered with aluminum fins and insulations are not painted.



Specification for Option K

This product mounts the auto drain in Item 2 Specifications. When performing the installation and maintenance of the product, the following points must be understood and followed. Additionally, for replacement work, read 4-2 “Periodical Maintenance” of the Operation Manual of standard product and keep safety.

8-1 **Safety instructions**

When handling the product, take care to the following precautions.



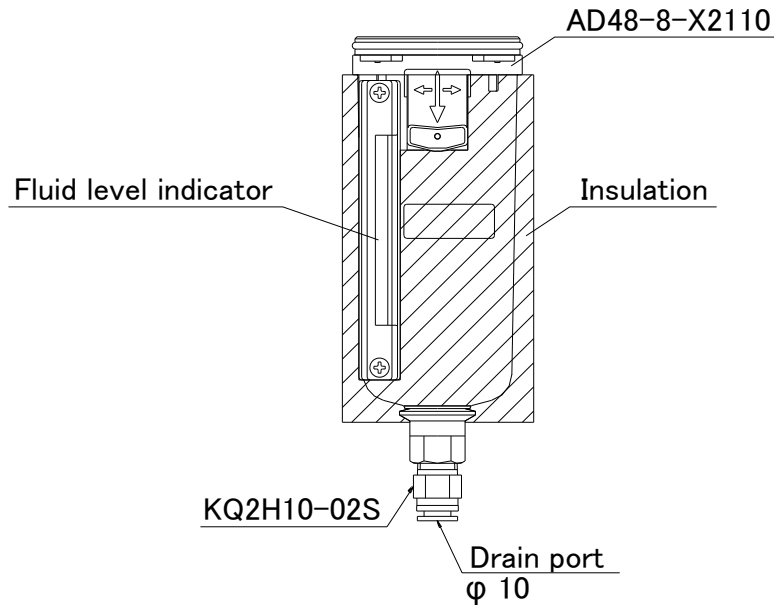
Warning

1. Do not remove the auto drain if air pressure remains of the product. When removing the auto drain, stop the supply of air to the primary side of the product, exhaust the air from the secondary side and ensure there is no residual pressure. If the air pressure is left at the inside of the product, parts could suddenly pop out and cause accident when loosened.
2. Put gloves to prevent injury when removing the auto drain.
3. Operator could touch the drain waste from repalced auto drain. Follow the procedures prepared by the customer to keep safety of operators. (Ex. Put protective goggles, apron and/or gloves to protect body from toucing the drain waste for replacement worken replacing the product.)

8-2 Specifications

The auto drain has a maximum operating pressure of 1.6MPa and uses the metal case with a fluid level indicator.

IDU3E to 6E



Item \ Model	IDU3E to 6E-23-K
Auto drain / Case Assembly	AD48-8-X2110 (Note)
Max. operating pressure	1.6MPa
Auto drain type	Floating type
Auto drain valve type	N.O. (normally opened: Released without pressurization)
Working pressure	0.1 to 1.6MPa
Fluid	Compressed air

Note) The above part number does not include the auto drain strainer. If the strainer needs to be replaced, order it.

(Part number for the auto drain strainer: IDF-S0002)



Specification for Option L

9-1 Safety instructions

When handling the product, take care to the following precautions.

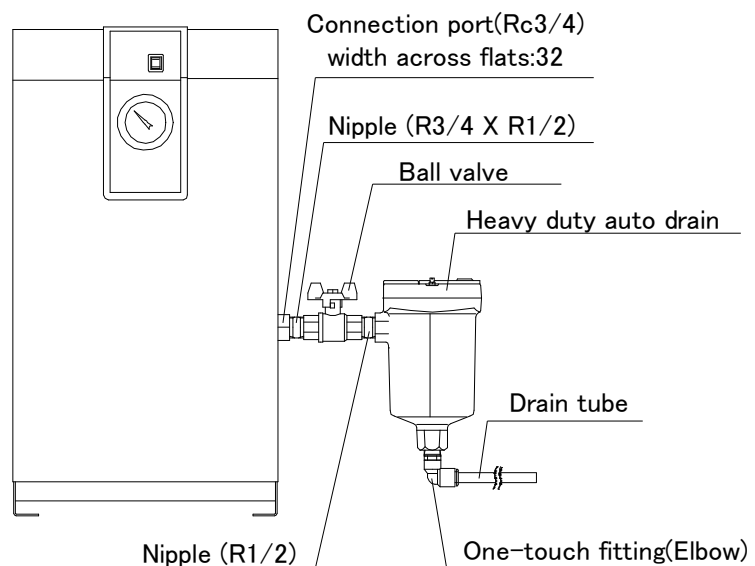


Warning

1. Do not remove the auto drain if air pressure remains of the product. When removing the auto drain, stop the supply of air to the primary side of the product, exhaust the air from the secondary side and ensure there is no residual pressure. If the air pressure is left at the inside of the product, parts could suddenly pop out and cause accident when loosened.
2. Put gloves to prevent injury when removing the auto drain.
3. Operator could touch the drain waste from repalced auto drain. Follow the procedures prepared by the customer to keep safety of operators. (Ex. Put protective goggles, apron and/or gloves to protect body from toucing the drain waste for replacement worken replacing the product.)

9-2 Specification

The specification of this product is dryer with heavy duty Auto drain .The heavy duty auto drain will be assembled by the customer.



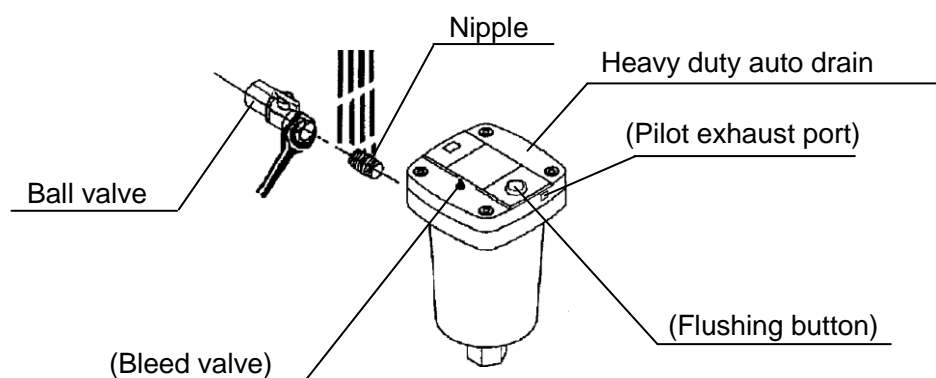
Heavy duty auto drain assembly

9-3 Specification of heavy duty auto drain (ADH4000-04).

Model	IDU3E to 6E-23-L
Auto drain type	Floating type
Auto drain valve type	N.O(normally opened: Open in the case of pressure loss)
Max. operating pressure	1.6MPa
Working pressure range	0.05 to 1.6MPa
Working fluid	Compressed air
Max. drain discharge	400cc/min(Pressure 0.7MPa,the case of water)

9-4 Installation of heavy duty auto drain

1. Hold the hexagon-head part (width across flats: 26) at port Rc1/2 of the air dryer with spanner. Then install nipple, ball valve (width across flats: 25).
Note 1) Put up the seal tape or the sealant to the nipple.
Torque R1/2 : 28 to 30N·m
2. Hold the ball valve with the spanner. Then install a nipple and a heavy duty auto drain.
Install with "out port" down in a vertical position. Inclination from the vertical line should be less than 5°.
3. Install one-touch fitting (width across flats: 22) to drain port (width across flats: 27) and the drain tube.



9-5 Maintenance

1. Check drain condition periodically (more than once a day).
Then push flushing button to open exhaust valve.
2. Pilot air is exhaust from the port indicated in the figure. Do not cover this exhaust port.
Clean exhaust port so that port is not blocked by dust, etc.
3. Close the ball valve before removing the heavy duty auto drain and open the bleed valve or push the flushing button and confirm air pressure is 0.



Specification for Option R

This product mounts the Ground Fault Circuit Interrupter (GFCI) in Item 2. It will shut off the power supply in case the product should have over current or current leakage. Additionally, the power supply should be connected directly to the primary side of the GFCI. For the details of the GFCI such as the specifications and mounting position, refer to Item 2 or later.

10-1 Safety instructions

When handling the product, take care to the following precautions.



Warning

Only qualified person must perform wiring and observing the following points.

1. Be sure to shut off the power supply before wiring. For safety, do not perform any work on the unit with the power supply on. The power supply cannot be completely shut off just by turning off the illuminated switch. Be sure to turn off all power lines connected to the product.
2. Supply the power from a stable source, free from surges.
3. Provide the power suitable for the product specifications.
4. Be sure to ground the product for the safety. Without grounding, the GFCI can not operate normally.
5. Do not ground to water pipe, gas tube or lightening rod line.
6. Do not connect too many wires to the same outlet, which could results in heat generation and fire.
7. Do not retrofit the wiring of the dryer and the power supply line.

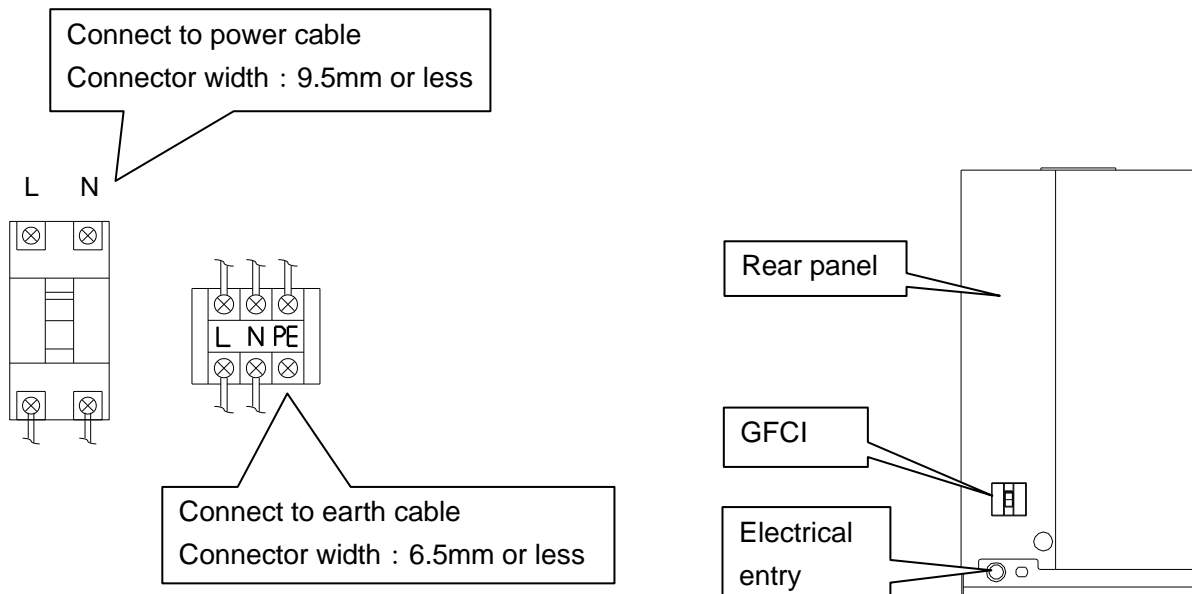
10-2 Specifications of the GFCI

Dryer model number	Specifications of GFCI
IDU3E to 6E-23-R	Rated current: 5A, Current sensitivity: 30mA

10-3 How to connect the power supply

Connect the power cables in the following procedure.

- 1) Take off the Rear panel.
- 2) Insert the power cable prepared by the customer into the power code fixture and bring the power cable near the terminal base through the base hole.
- 3) Connect the power cable to the terminal of the GFCI.
- 4) Put back the Rear panel.





Specification for Option T

This product mounts the terminal block which can transfer the operation and failure signals to Item 2 Specifications. The signals are a no voltage contact style. For details, refer to Item 2 or later.

11-1 Safety instructions

When handling the product, take care to the following precautions.



Warning

Only qualified person must perform wiring and observing the following points.

1. Be sure to shut off the power supply before wiring. For safety, do not perform any work on the unit with the power supply on. The power supply cannot be completely shut off just by turning off the illuminated switch. Be sure to turn off all power lines connected to the product.
2. Supply the power from a stable source, free from surges.
3. Be sure to mount the Ground Fault Circuit Interrupter (GFCI) with adequate sensitivity and load capacity to prevent electrical shock and protect the refrigerating compressor motor from burning out.
4. Provide the power suitable for the product specifications.
5. Be sure to ground the product for the safety. Without grounding, the GFCI can not operate normally.
6. Do not ground to water pipe, gas tube or lightening rod line.
7. Do not connect too many wires to the same outlet, which could results in heat generation and fire.
8. Do not retrofit the wiring of the dryer and the power supply line.
9. For the use of the product in Europe, mount the breaker compatible to IEC standard to the power supply for the product.

11-2 Specifications

The product mounts the terminal block which can transfer the operation and failure signals on the standard product.

- The operation and failure signals are no voltage contact style.
 - Operation • • • • • When the product is operating; Close
 - Failure • • • • • When the product stops due to failure; Close
- Contact capacity
 - AC230V,4A DC24V,5A
 - Minimum current for signal 20V,5mA(AC/DC)

11-3 Remote operation

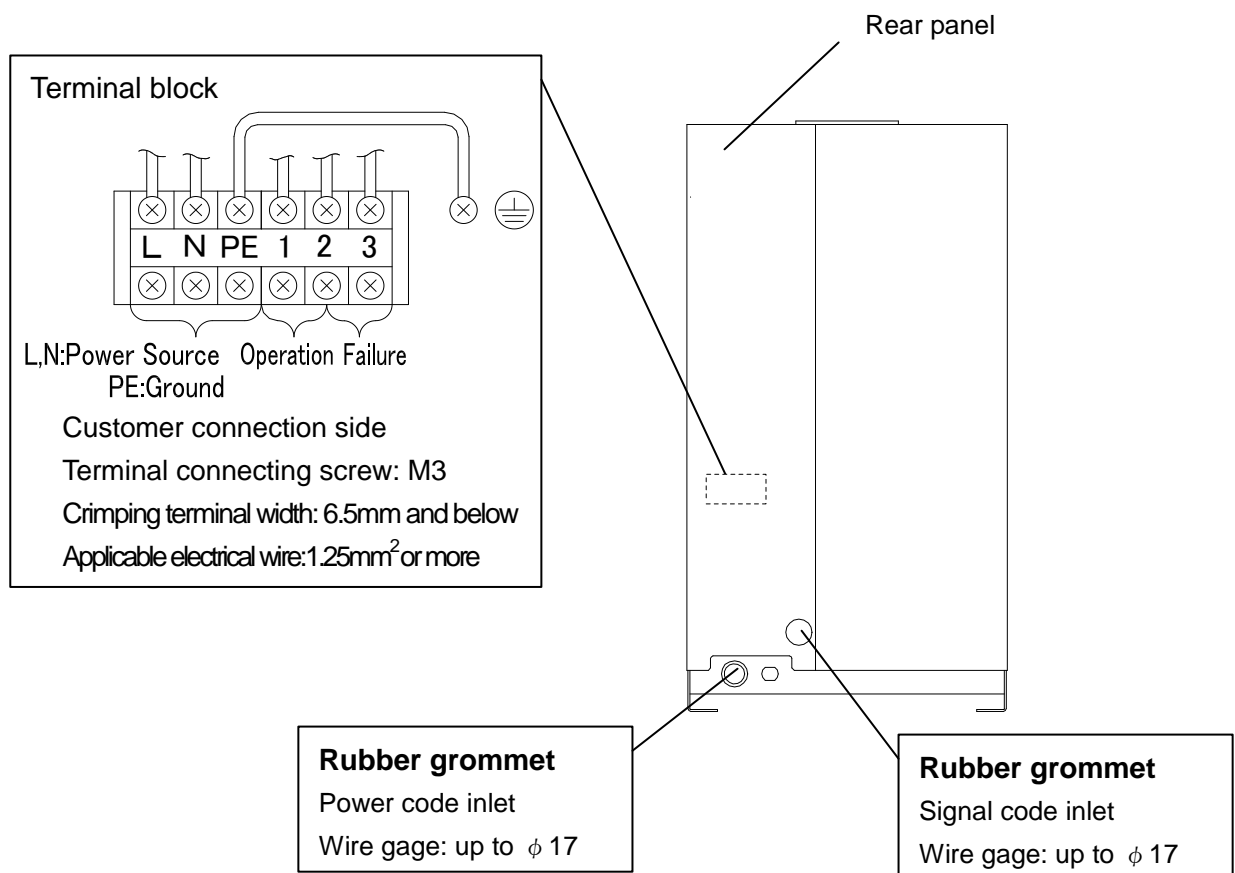
- For the remote operation, turn on and off the power supply side under the condition of the illuminated switch ON.
- Keep 3 min. at minimum after stopping the product to restart even for the remote operation. If the product is restarted within less than 3 min., protective equipment (overload relay) may activate and prevent the product from restarting.

Additionally, the frequency to start and stop the operation must be restricted to 5 times per hour (to prevent breakage of the motor).

11-4 How to connect the power supply and signal cable

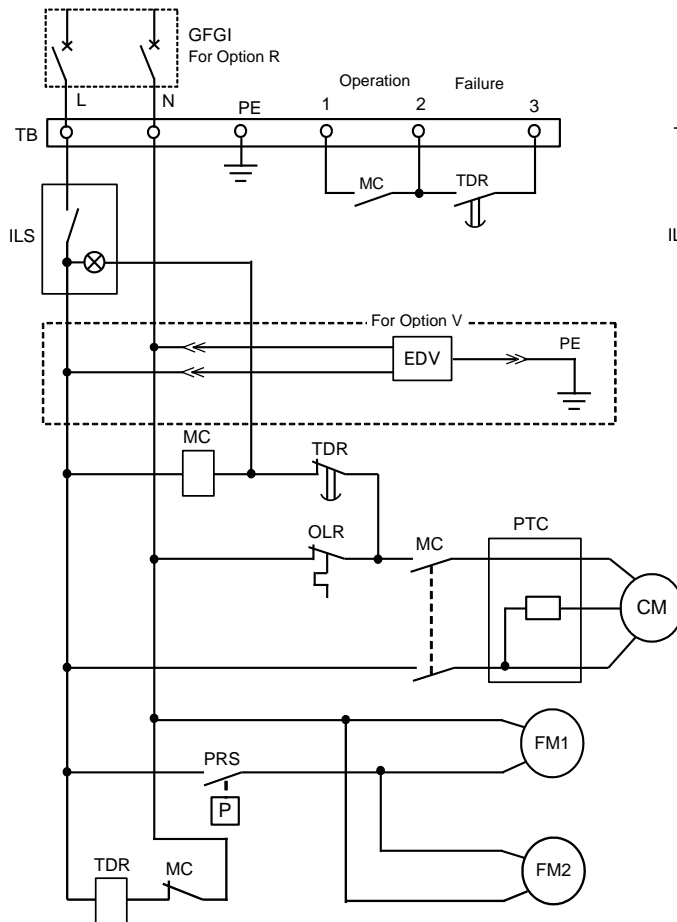
Connect the power cable and signal cable in the following procedures.

- 1) Take off the rear panel.
- 2) Insert the power cable prepared by the customer into the power code inlet (with rubber grommet) and bring the power cable near the terminal block through the base hole.
- 3) Connect the power cable to the terminal.
- 4) Insert the signal cable prepared by the customer into the signal code inlet (with rubber grommet) and bring the signal cable near the terminal block.
- 5) Connect the signal cable to the each terminal.
- 6) Put back the rear panel.

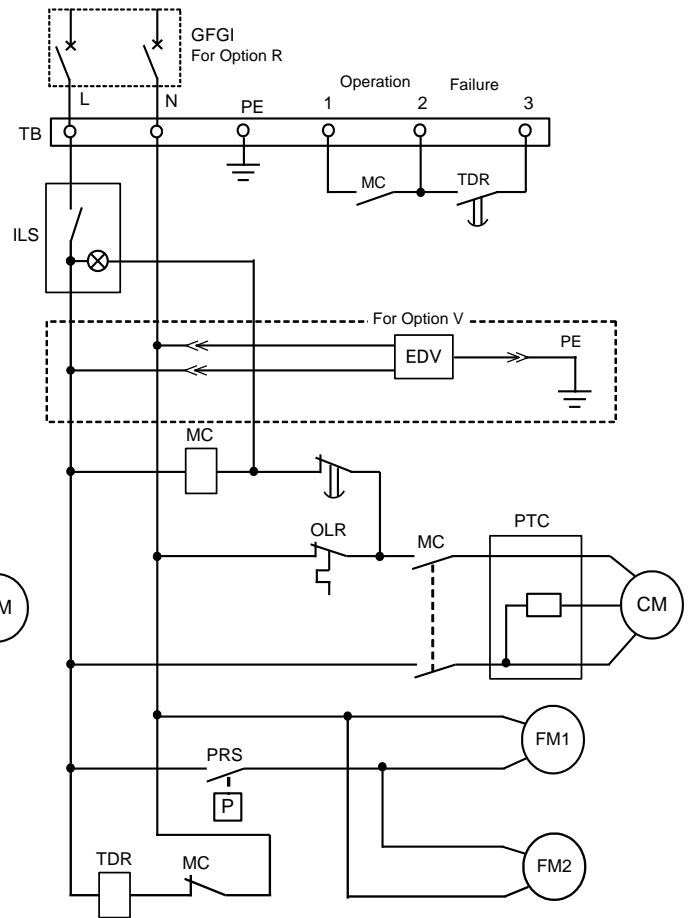


11-5 Electric circuit

IDU3E, 4E-23-T



IDU6E-23-T



SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
CM	Compressor Motor	MC	Magnetic Contactor
FM1,FM2	Fan Motor	TDR	Time Delay Relay
OLR	Overload Relay	TB	Terminal Block
PRS	Press. Switch	GFCI	Ground Fault Circuit Interrupter
ILS	Switch with Lamp	EDV	Electronic Drain Valve
PTC	PTC Starter		



Specification for Option V

This product mounts the timer operated auto drain in Item 2 Specifications. When performing the installation and maintenance work for the product, the following points must be understood and followed. Additionally, read Item 3 for replacement work.

12-1 Safety instructions

When handling the product, take care to the following precautions.



Warning

1. Do not remove the auto drain if air pressure remains of the product. When removing the auto drain, stop the supply of air to the primary side of the product, exhaust the air from the secondary side and ensure there is no residual pressure. If the air pressure is left at the inside of the product, parts could suddenly pop out and cause accident when loosened.
2. Put gloves to prevent injury when removing the auto drain.
3. Operator could touch the drain waste from repalced auto drain. Follow the procedures prepared by the customer to keep safety of operators. (Ex. Put protective goggles, apron and/or gloves to protect body from toucing the drain waste for replacement worken replacing the product.)



Warning

Only qualified person must perform wiring.

1. Provide the power suitable for the product specifications.
2. Be suer to ground the product for the safety. Do not ground to water pipe, gas tube or lightening rod line.
3. Do not connect too many wires to the same outlet, which could results in heat generation and fire.
4. Do not retrofit the wiring of the dryer and the power supply line.

12-2 Specifications

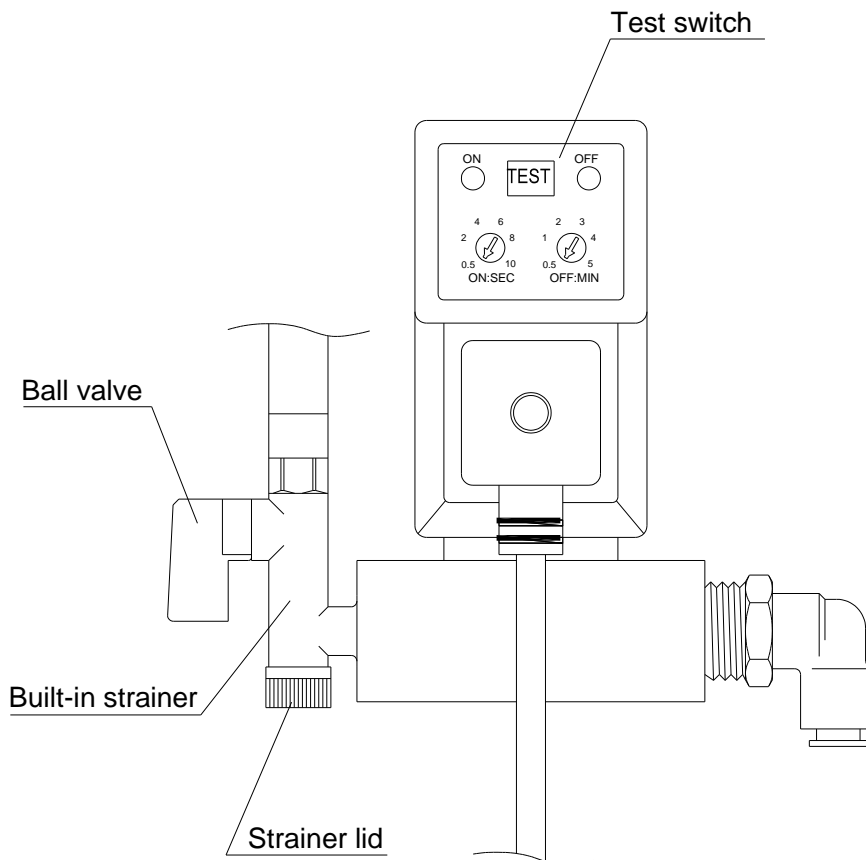
The timer is set to have ON time of 0.5sec and OFF time of 0.5min. at the time of shipment from the factory. Do not change this timer setting. If it is changed, water could be discharged from the outlet line of the dryer. Service parts number will change depending on the power supply voltage of the dryer.

Power supply voltage of dryer	AC230V
Order number (service parts)	IDF-S0198
Max. operating pressure	1.6MPa
Fluid	Drain
Power supply voltage of drain timer	AC230V \pm 10% (50Hz)
ON time	0.5sec
OFF time	0.5min

12-3 How to perform maintenance

The product needs to be maintained. Clean it in the following procedure periodically.

- 1) Close the ball valve.
- 2) Press the test switch and make the residual pressure zero.
- 3) Remove the strainer and clean it.
- 4) Reassemble the strainer and open the ball valve.





Service Record

13-1 Service Record

It is recommended to keep a maintenance/service record.

Parts No.	Description	Maintenance/Service Work Description	Date