



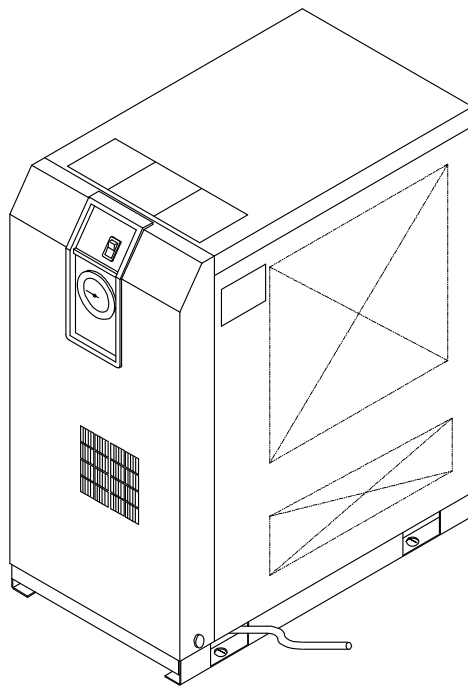
# Operation Manual

PRODUCT NAME

## Refrigerated Air Dryer

MODEL / Series

### IDFA6E-20-A,C,G,H,K,L,R,T,V



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

## 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.

Note: 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**

**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. When the cover panel of this unit is open, the ON/OFF switch must be in the off position, 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 these statements carefully and thoroughly understand them before operating or performing maintenance on the unit.


 **DANGER**  
"DANGER" indicates that there is an imminent 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 protect operator's safety, we group danger into some types uniquely and attached labels indicating those types. Confirm the contents of the danger types and positions of the labels before operation.

 <b>Warning</b>
<p><b>No one but professionals should operate an air dryer.</b></p> <p><b>Transportation, installation, and maintenance involve risks. These should be done by someone who have enough knowledge and experience about this product and incidental devices.</b></p> <p><b>No one but our service personnel or qualified person should open the cover panel of this product.</b></p>

 <b>Warning</b>
<p><b>Should any problem occur, address it according to statements on this manual.</b></p> <ul style="list-style-type: none"> <li>• <b>Identify problems according to “Chapter 5 Troubleshooting.”</b></li> <li>• <b>Ask repair and maintenance.</b></li> </ul>

 <b>Warning</b>
<p><b>The product should not be operated in the event of any problems.</b></p> <p><b>When the product gets out of order, shutdown it immediatery, and contact our service person or qualified person.</b></p>

### i-2-1 Danger Classifications

Specific danger classification of this product is as follows.

#### **Danger of Electricity**

Since this product runs at high voltage, there is the danger of electric shock. So, we display a symbol with indications, “**Caution**”, “**Warning**” or “**Danger**,” on the product and this manual.



#### **Danger of Heat**

Since this product becomes hot while driving, there is the danger of burn injury. So, we display a symbol with indications, “**Caution**”, “**Warning**” or “**Danger**,” on the product and this manual.



#### **Danger of Rotor**

Since this product has parts that rotate while driving, there is the danger of catching your fingers in or injury. So, we display a symbol with indications, “**Caution**”, “**Warning**” or “**Danger**,” on the product and this manual.



**i – 2 – 2 Hazard of Electricity**

Inside of this product, there is power-supplying section with high voltage separated by the cover panel. Do not operate the product without the cover panel.

No one but trained qualified person should operate or inspect in the power transmission sections.

**Warning**

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

Do not remove or rub danger warning labels.

Confirm the positions of danger warning labels.

**i – 2 – 3 Hazard of High Heat****Warning**

Since this product has parts that become hot during operation, there is the danger of burn injury resulting from contact with them. What is more, there is also the danger of burn injury due to remaining heat after the power supply is cut. Therefore, wait until the temperature of hot parts become 50°C and below.

**i – 2 – 4 Hazard of Rotor****Warning**

Since this product has parts that rotate during operation, there is the danger of burn injury resulting from contact with them. Though sometimes those parts can temporarily stop the rotation, they will rotate again, and so do not work with them while driving.

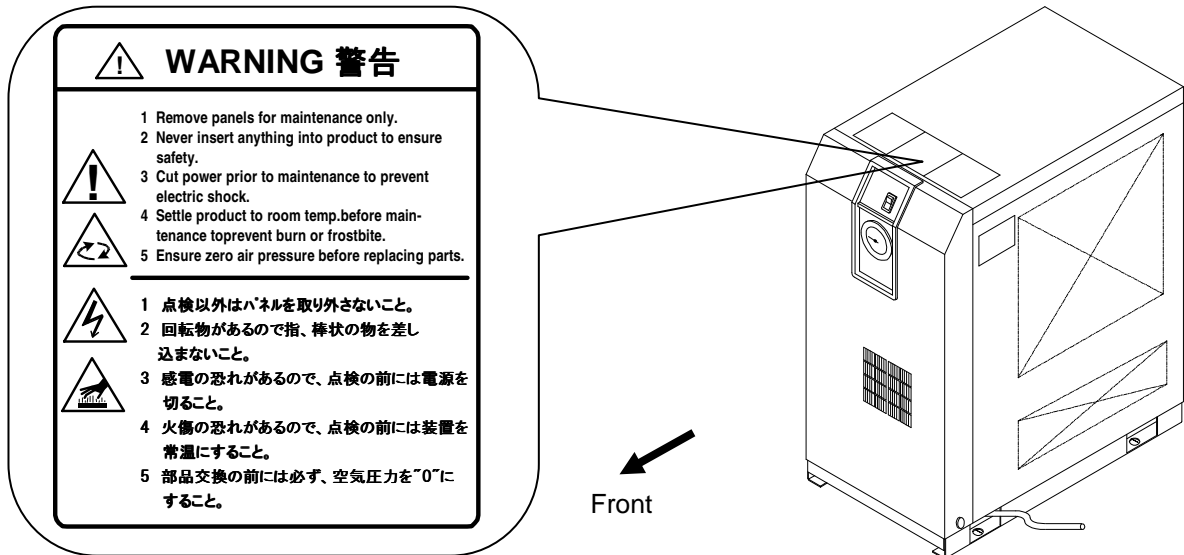
**i – 2 – 5 Hazard of Compressed Air Circuit****Warning**

Before replacing or cleaning parts, be sure to bleed compressed air remain inside of the product until the gauge indicates “0”. If you do not do this air-bleeding, there would be the great danger of unexpected accident, such as shooting out of parts when they are being unscrewed.

**i-2-6 Positions of Hazard Warning Label**

**Warning**

Read with caution and pay attention to the notations of danger warning labels.  
Do not remove or modify danger warning labels.  
Confirm the positions of danger warning labels.



**i-2-7 Hazard of Refrigerant**

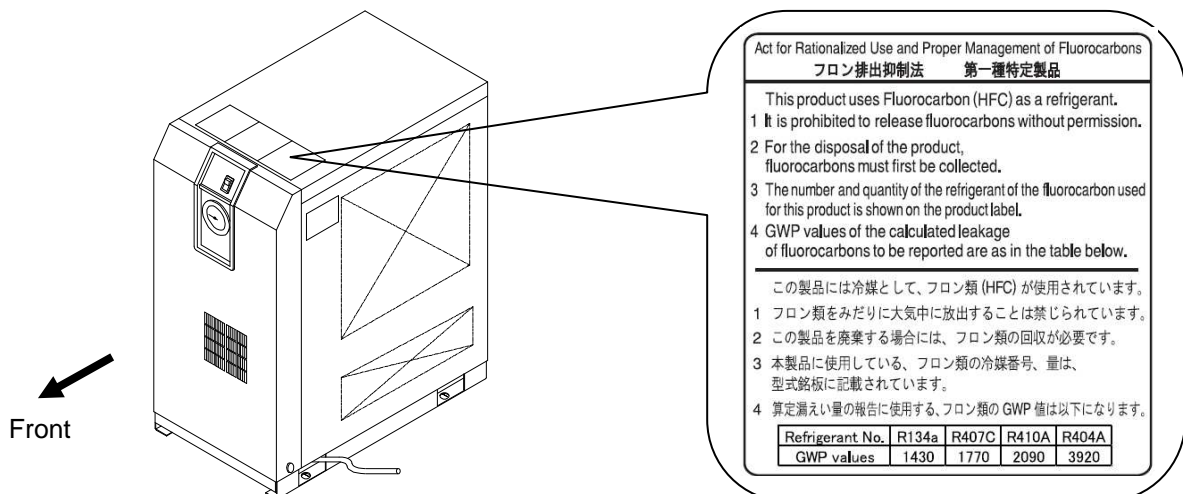
**Caution**

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 credentials 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 - 5.





**i-2-8 Cautions about Usage**

 <span style="font-weight: bold; font-size: 1.2em;">Warning</span>
<p><b>Please follow the instructions on all warning labels. Do not remove or deface warning labels, and confirm the location of all warning labels.</b></p>

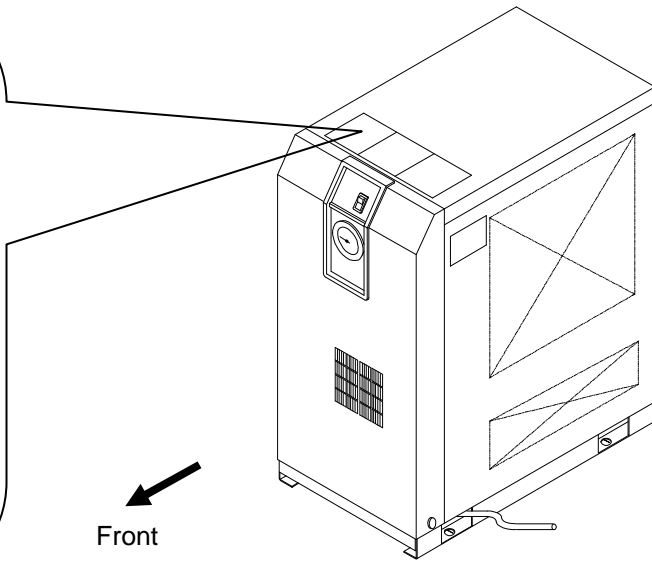
 **CAUTION 注意**

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- 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.

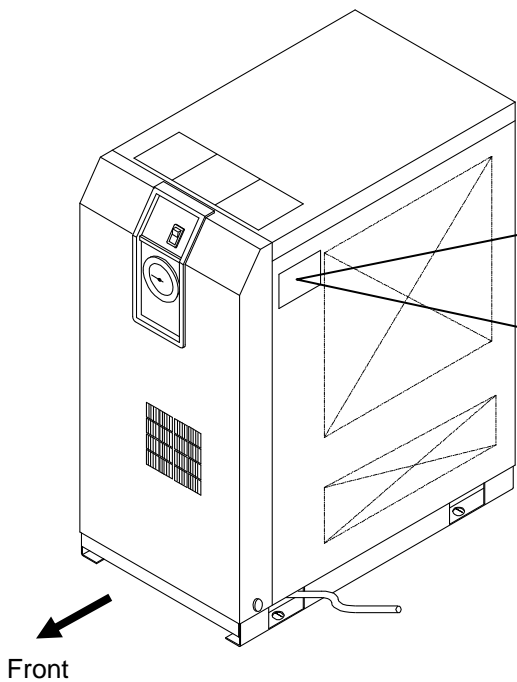
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- 1 ご使用前に必ず取扱説明書を読んでください。
- 2 通風、メンテナンススペースを確保してください。
- 3 雨や水滴がかからないようにしてください。
- 4 IN/OUTポートをスパナで固定して配管してください。
- 5 再起動は運転停止3分後に行ってください。
- 6 RUNNING CONDITION・蒸発温度計はグリーン帯で使用してください。



**i-2-9 Other Label**

Please confirm the type and the content of the specification described in the label.




IDFA6E - 20 - □


\*\*\*-\*\*\*

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

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



1550515060001




MADE IN


CE

G

### **i-3 Disposal**

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

 <b>Caution</b>
<p><b>This product contains Fluorocarbon HFC.</b></p> <p><b>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 credentials are allowed to handle refrigerant.</b></p> <p><b>Only properly trained and qualified personnel are allowed to remove the cover panel of the product.</b></p> <p><b>The quantity and the type of Fluorocarbon are mentioned on the specification label.</b></p>

 <b>Caution</b>
<p><b>Dispose of the refrigerant and compressor oil according to the regulation of local government.</b></p> <p><b>Only personnel with proper credential are allowed to collect refrigerant and compressor oil.</b></p> <p><b>Only properly trained and qualified personnel are allowed to remove the cover panel of the product.</b></p> <p><b>For any questions, please contact an SMC authorized dealers.</b></p>

## **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**

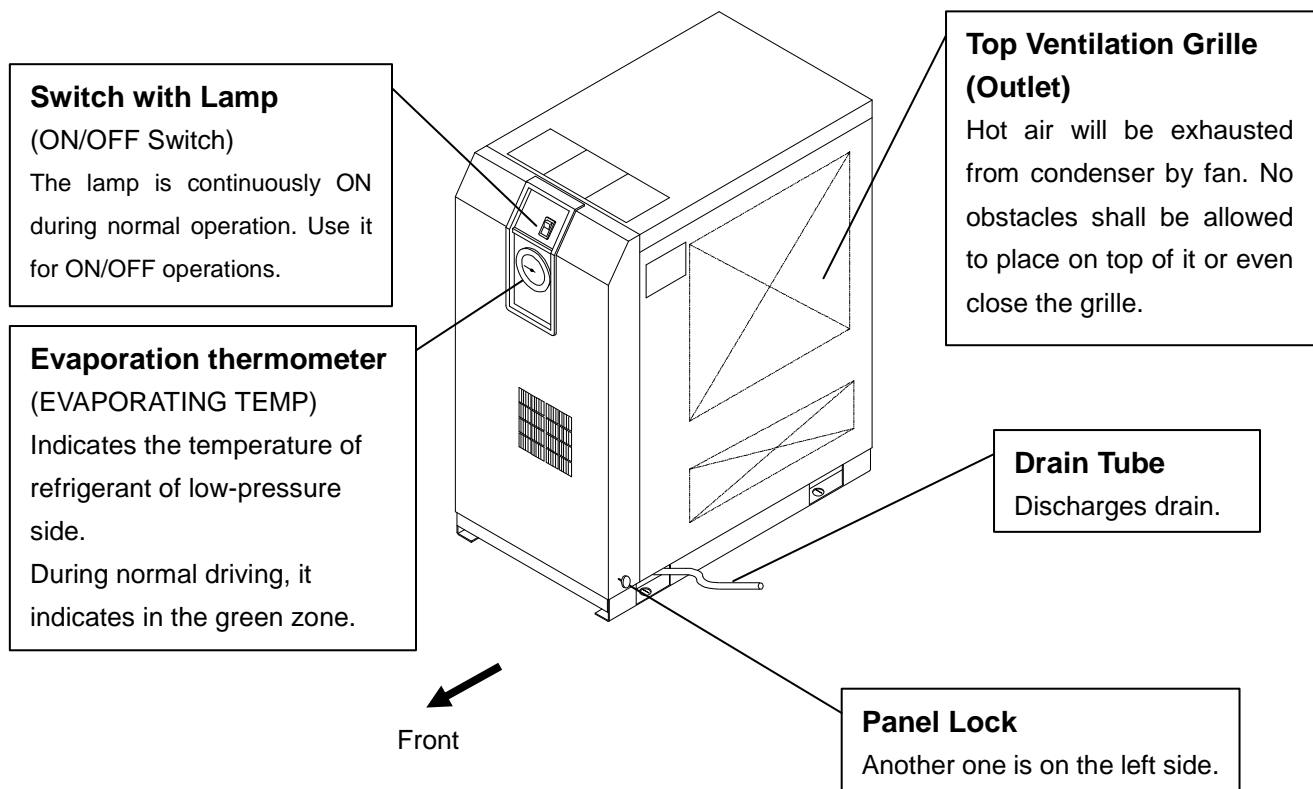
1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulation of the countries involved 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.**

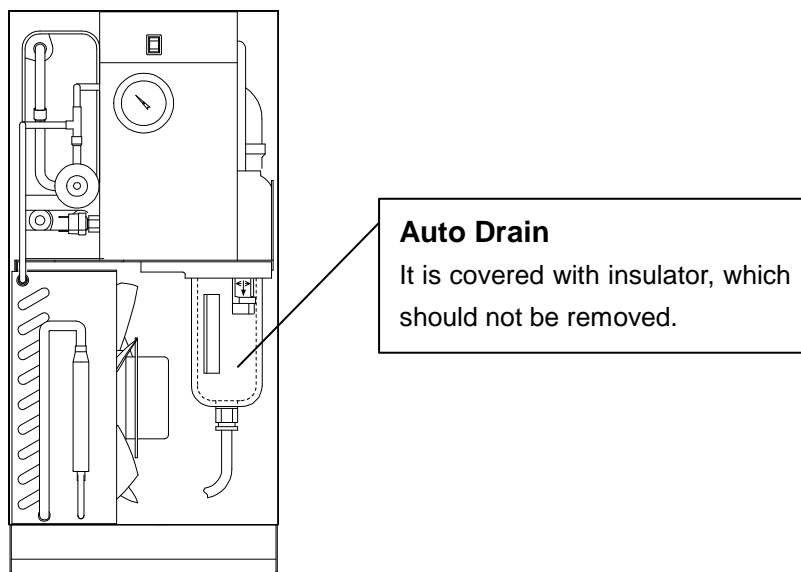
# 1 Parts Name and Functions

## 1-1 Parts Name and Functions



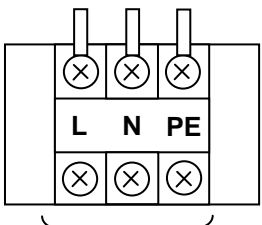
### No Front Panel

※ Please improve it vertically toward on when you remove the front panel.



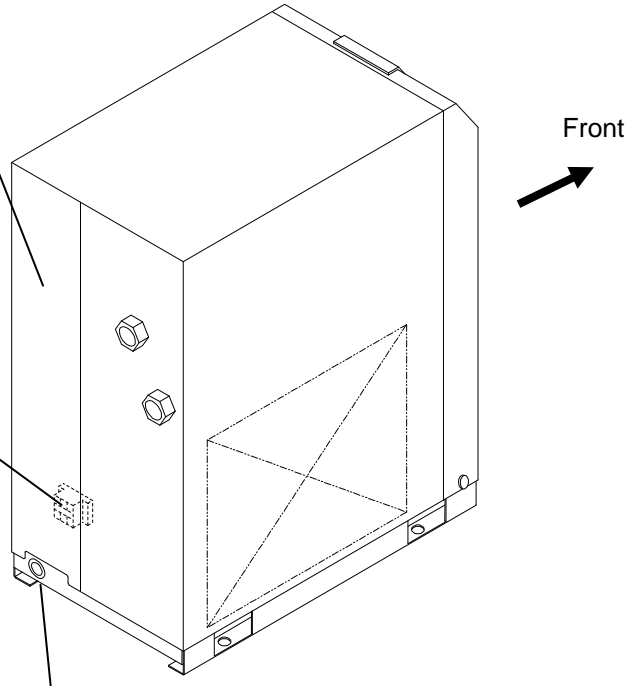
**Rear panel**  
There is a terminal block when detaching it, and connect power cable through the grommet with the film, please.

**Electrical Terminal Cover**  
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  
Applied Pressure Terminal: 1.25-3  
(Width 6.5mm and below)



**Power cord**  
Base hole size :  $\phi 22$   
Grommet with membrane :  $\phi 17$



## Transportation/Installation



### Warning

Use the product in the right way. During Installation, operation, maintenance, and check, you should be careful in keeping the safety of human body.



### Caution

Transportation, installation, and maintenance including dangerous work must be done by a personnel who has enough knowledge and experience about the product and the 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.



### Warning

This product is heavy.

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 circumstances as follows. Those circumstances will cause not only malfunction but also failures.

- Environment where the product is exposed to rainwater, moisture vapor, salty water, oil and so on.
- Locations where dust or particles are.
- Locations where inflammable or explosive gas are.
- Locations where corrosive gas, solvent, combustible gas are.
- Locations that receive direct sunlight or where radiant heat is generated.
- Locations where ambient temperature is beyond following range:
  - On-stream: 2 ~ 40°C
  - Storage: 0 ~ 50°C (when there is no drain water inside of the piping)
- Locations where temperature changes rapidly.
- Locations where strong electromagnetic noise is generated (locations where electromagnetic field, strong magnetic field, surge is generated)
- Circumstances where static electricity is produced or discharged through the body of the product.
- Locations where strong high frequency wave is generated.
- Locations where danger of thunder is apparent.
- Locations by loading on vehicles, marine vessels, and so on.
- Locations whose 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 enough spaces cannot be taken to do maintenance (in the plant where the product is operated).
  - Spaces needed for maintenance
 

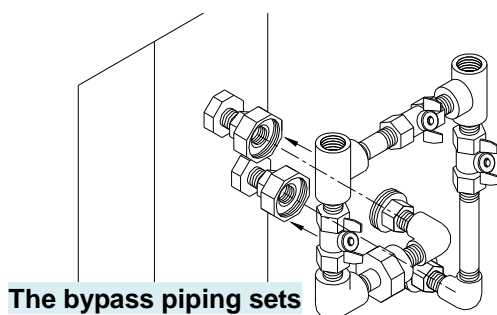
Front	: 600 mm
Rear	: 600 mm
Top	: 600 mm
Right	: 600 mm
Left	: 600 mm
- Locations the ventilation grille of the product can be blocked.
- Place where rejection style air of air compressor or other driers (hot wind) is inhaled.
- Place where rapid pressure fluctuation and fluid velocity variation happen

### 2-2-2 Anchorage

- The air dryer should be installed on a vibration-free, stable, horizontal, flat surface.
- Refer to “Chapter6 6-3 Dimensions” for the dimensions.
- The air dryer should be bolted by anchor bolts to prevent falling. We recommend the anchor bolt sets that

### 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. If a metallic flexible tubing is used for the air gateway piping, the allophone might be generated in piping. In that case, please change to the piping of the steel pipe.
- Please set up the filter in the drier secondary for the drain dispersion prevention when a rapid pressure fluctuation and the fluid velocity variation happen.



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

### 2-2-4 Drain Tube

- A polyurethane tube of 10mm external diameter is attached to the drain tube. The outlet end of the tube is released to atmosphere. And let drain flow through the tube into a scupper and so on.
- Using the pressure of the compressed air, drain will be discharged periodically. Fix the outlet end of the tube so as not to swing during discharge.
- Prevent the drain tube from riser piping.
- Prevent the drain tube from being folded or flatted. Since the drain tube is coming from the bottom of the body, be careful to avoid the body from stomping over the tube during installation.



## Warning

During drain work, follow the procedure that you define to keep the safety of worker (ex. Put on protective glass, apron, and gloves).

In case that oil gets mixed in the wasted water that is discharged from the auto drain, the waste liquid treatment is necessary. Handle it following the bylaw or regulation of local government.

## 2-2-5 Electric Wiring



### Warning

No one but qualified person should do the wiring work.

- Before wiring, you must cut the power off for safety. Do not work under any energized conditions.
- Supply power from a stable place, which 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 for the product should meet the specifications.
- The product should be grounded for safety.
- Do not connect the earth to a water pipe, a gas pipe, or a lightning rod.
- Do not plug too many leads into a single socket. That causes exothermic heat or fire.
- Do not convert the wiring to use.
- In European countries, a circuit breaker that meets the IEC standard should be used for the supply power.
- 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.

- Remove the terminal block cover or the rear cover in the rear of the product, and connect the power (200V AC) to the terminal block.
- Install a Ground Fault Circuit Interrupter(GFCI) to the power supply (sensitivity of leak current 30mA and rated current 5A). (Prepare by yourself)

### Specification of power cable

Prepare following power cable and signal cable

Cable: 1.25mm<sup>2</sup>(16AWG), Three wicks (The earth is contained), 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 length of the power cable and signal cable should extend less than 30m from the product..

### Connecting to the power supply

Connect the power cable and signal cable to the terminal block. M3 screw is used for the connection part. Make sure to use round crimped terminal.

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 membrane grommet and connect it to the terminal block (refer to the label on the terminal block). M3 screw tightening torque: 0.6~1Nm
- During wiring work, do not touch other sections except terminal block.
- Attach the cover or the rear panel as it were.



**2 - 3 Cautions for Reinstallation****Caution**

**No one but someone who has enough knowledge about the product and incidental devices should reinstall in another place. And following instructions must be executed.**

If you move the product and reinstall it into another place after some operations (including trial running), instructions that are not only following ones but also all of those in the chapter 2 should be followed.

**Disassembly of the power cable**

**Cut off the power source when you disassemble the power cable.**

**Warning**

**No one but qualified personnel should do the electric wiring.  
Cut off the power supply for safety before the wiring. Do not work under energized condition.**

**Disassembly of the air piping****Warning**

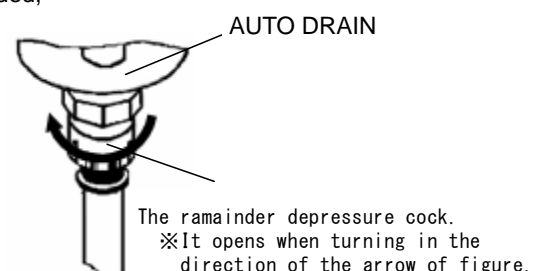
**No one but qualified personnel should do the air piping.  
Separate the compressor from the product for safety before removing the piping.  
Do not remove any piping when there is remaining compressed air pressure inside of it.**

- Remove the seal tape completely after detaching the piping. Remained tape will cause imperfect cooling and failure by entering into the body of the product.

**Residual compressed air pressure release procedure**

- Even while the dryer is removed, only when compressed air is needed, open the bypass piping valve.
- Close the compressed air inlet and outlet valve.
- Unscrew the front panel fixing screw (in 2 points) and remove the front panel with upholding it a little.
- Open the residual pressure release cock of auto drain tube, and release compressed air pressure left inside of the product.

Refer to the figure at right .



## 3 Operation/Shutdown



### Caution

No one but someone who has enough knowledge and experience about the product and incidental devices should operate or shut down 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.  
make sure the product is tied down with anchor bolts.  
Do not place heavy objects on the top of the product.  
Ensure the piping does not apply load to the unit.
- 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 switch.
- The lamp will light up. Few minutes later, the cooling fan will rotate and hot air will be exhausted from the ventilation grille.  
Place of the ventilation grille: Right Side Ventilation Grille
- Open the IN / Out side valve slowly. Make sure the bypass valve is completely closed. Confirm there is no air leakage.
- Depending on the condition of compressed air or ambient temperature, the cooling fan sometimes alternates between rotation and stop at the beginning. Then, the refrigerator will go into continuous run and the pointer of the evaporation thermometer will indicate in the green zone. If the pointer of the evaporation thermometer indicates higher than the green zone, refer to "Chapter5 Troubleshooting."
- After a while from the start of flowing the compressed air, drain will be discharged from the drain tube automatically.
- Keep the condition of continuous run to use.



### 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 illuminated switch of the product and then the breaker to the power supply.

- There is no leakage of compressed air.
- Compressed air pressure, temperature, flow rate, and ambient temperature meet the specifications.
- Drain is being discharged from the drain tube.
- The pointer of evaporation thermometer is indicating in the green zone.
- There are no abnormal sound, vibration, or smelling.

### **3-6 Precautions for long-term -non-operation**

- If the product will not be operated for more than 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 usual operations. If you find some problems, immediately stop the operation and refer to “Chapter 5 Troubleshooting” as soon as possible.

- There is no air leakage
- The running lamp is lighting during operation
- Drain is being discharged from drain tube
- The pointer of the evaporation thermometer indicates in the green zone when it is running with pressurized air supply.
- The pointer of the evaporated thermometer indicates about 3~10oC lower than that of ambient temperature when the product is suspended with no pressurized air supply.
- There is no abnormal sound or vibration coming up from the product.
- There are no abnormal smell or smoke coming up from the product.

### 4-2 Periodical Maintenance

#### 4-2-1 Cleaning of ventilation grille (suction grille)

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

Danger

During air blowing, put on protective glass and mask to prevent dusts from coming into throat or eyes.

#### 4-2-2 Service parts

It is recommended to replace the following parts regularly. The values shown in this operation manual depend on the operating conditions (ambient temperature, installation environment, etc.), and they are not guaranteed.

- 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

#### 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.



## 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

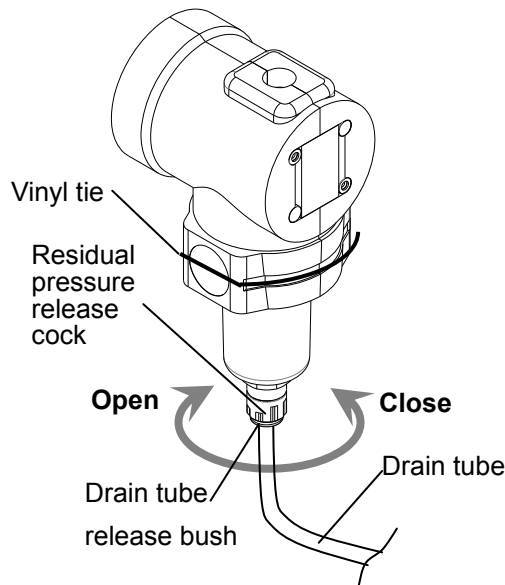
- When replacing or cleaning parts of the air dryer, be sure to remove the compressed air pressure inside the air dryer to "0". Never remove the case assembly when the air dryer is operated or air pressure remains inside. It is extremely dangerous if compressed air pressure remains inside the air dryer, 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.

## How to clean and replace the auto drain/strainer.

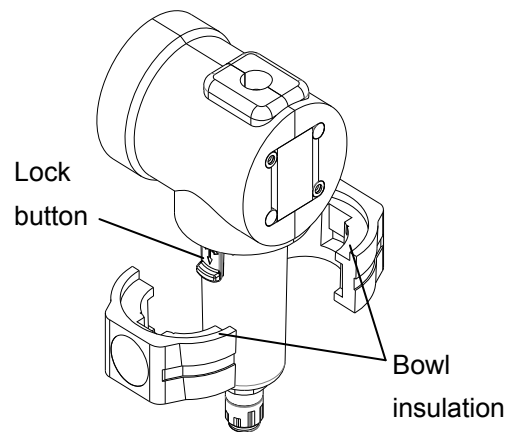
**When carrying out maintenance work on the auto drain and auto drain strainer, please follow the steps below.**

- Turn off the illuminated ON/OFF switch.
- Disconnect the earth leakage breaker at the power supply or unplug the power plug from the socket.
- Fully close the IN/OUT valves. Only open the bypass when compressed air is required during work.
- Only the point that is necessary for work please remove a decoration panel.

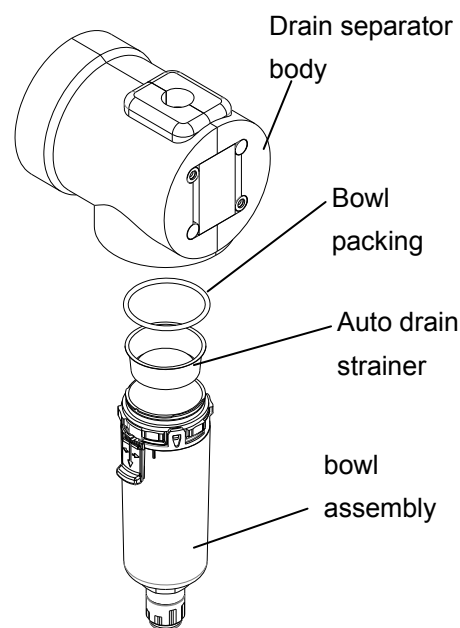
- Open the residual pressure release cock at the drain tube connection port to release air and drain fluid left in the product.  
(Leave the drain tube connected and hold it with hand so that it does not get twisted.)
- Because drain may be given by air pressure left in a product like a careful.



- 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 30° 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.



## Auto drain product number for replacement

Product number	Product name	QTY	Remarks
AD48-A	Bowl assembly	1	With bowl packing

Note) This product number is the product part number only for the auto drain part except the drain separator part.  
The drain separator part cannot be exchanged.

## Auto drain strainer and bowl packing product number for replacement

Product number	Product name	QTY
IDF-S0002	Auto drain strainer	1
C42FP-260S	Bowl packing	1

Auto drain strainer is not included in bowl assembly.

## Case thermal insulator product number for replacement

Product number	Product name	QTY	Remarks
IDF-S1933	Case thermal insulator	1	For one set with 2 pieces

## 5

## Troubleshooting

**5-1 Cause and countermeasure of errors**

Should any problem occur, inspect 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
Although the switch with lamp is turned on, the lamp does not light up and the product does not start operating.	The power supply cable has been loosened or disconnected.	Perform proper connection on the power cord and plug.
	The ground fault circuit interrupter is not turned ON.	Check the capacity of the ground fault circuit interrupter. - Check the product was not restarted within 3 minutes after being stopped. - Turn on the ground fault circuit interrupter and try to operate. If the ground fault circuit interrupter turns back off, the insulation failure of the product is suspected. Turn off the power supply and contact SMC.
Running lamp extinguishes and compressor stops during operation but resumes normal operation illuminating the lamp after a period of time.	The product is installed in an inappropriate location. Ambient temperature is excessive.	- Improve ventilation condition and reduce the ambient temperature as much as possible..
	The ventilation port is obstructed by a wall or clogged with dust.	- Keep the product 600mm or more away from the surrounding walls. - Clean the ventilation ports once every month.
	The compressed air temperature is too high.	- Improve the ventilation in the location where the air compressor is installed, or decrease the ambient temperature to allow the discharge air temperature of the air compressor to go down. - Install an aftercooler after the air compressor to reduce the temperature.
	The fluctuation of the power supply voltage is too large.	- Install a power supply transformer or use a different power supply to provide appropriate voltage. - The fluctuation of the power supply voltage should be kept within +/-10% of the rated voltage.



Problem	Probable Causes	Remedy
The evaporation thermometer is over the green area without hot air coming from the ventilation port (exhaust port). (The compressor for refrigeration has stopped with the lamp lit up.	The product is installed in an inappropriate location. Ambient temperature is excessive.	- Improve ventilation condition and reduce the ambient temperature as much as possible.
	The ventilation port is obstructed by a wall or clogged with dust.	- Keep the product 600mm or more away from the surrounding walls. - Clean the ventilation ports once every month.
	The compressed air temperature is excessive.	- Improve the ventilation in the location where the air compressor is installed, or decrease the ambient temperature to allow the discharge air temperature of the air compressor to go down. - Install an aftercooler after the air compressor to reduce the temperature.
	The fluctuation of the power supply voltage is too large.	- Install a power supply transformer or use a different power supply to provide appropriate voltage. - The fluctuation of the power supply voltage should be kept within +/-10% of the rated voltage.
The evaporation thermometer is over the green area with hot air coming from the ventilation port (exhaust port).	The product is installed in an inappropriate location. Ambient temperature is excessive.	- Improve ventilation condition and reduce the ambient temperature as much as possible.
	The ventilation port is obstructed by a wall or clogged with dust.	- Keep the product 600mm or more away from the surrounding walls. - Clean the ventilation ports once every month.
	The compressed air temperature is excessive.	- Improve the ventilation in the location where the air compressor is installed, or decrease the ambient temperature to allow the discharge air temperature of the air compressor to go down. - Install an aftercooler after the air compressor to reduce the temperature.
Moisture is generated at the downstream of the compressed air line.	The bypass valve is open.	- Be sure to fully close the bypass valve.
	Condensate is not drained from the auto drain.	- Check the draining piping is not used in an upward direction nor bent. - Check the auto drain. - Check the auto drain strainer.
	The pressure fluctuation (pulsation) of the compressed air is too high.	- Install an air tank on the primary side of the dryer. - Avoid intermittent compressed air flow.
	Residual drainage in the air dryer splashes over when the unit is re-started.	- Install a filter on the outlet of the air dryer. - Blow the unit by air to eliminate the residual drainage after stopping or re-starting the operation.
	The piping of a different system without an air dryer joins the piping after the product.	- Install another air dryer (this product) in that system. - Keep the two systems separate.
The compressed air pressure is too large.	The valves at the inlet and outlet of the piping of the product are not fully opened.	- Be sure to fully open the valves at the inlet and outlet of the product.
	The air filter, etc. installed in the compressed air piping has got clogged.	- Replace the element of the air filter. (Follow the Operation Manual of the equipment.)

# 6 References

## 6 - 1 Specifications

Specification		Model	IDFA6E-20-□
Rated Condition	Air Flow Rate	50Hz	0.75
	m <sup>3</sup> /min (ANR)(Note 1)	60Hz	0.82
	Operating Pressure		0.7MPa
	Inlet Air Temperature		35°C
	Ambient Temperature		32°C
	Outlet Pressure Dew Point		10°C
Operating Range	Working Fluid		Compressed Air
	Inlet Air Temperature		5~50°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		1Phase AC200/200,220V±10% (50/60Hz)
	Starting current	A AC200V (50/60Hz)	9/8
	Operating current	A AC200V (50/60Hz)	1.2/1.3
	Power Consumption	W AC200V (50/60Hz)	180/202
	Circuit Breaker		Rated current : 5A Sensitive current : 30mA
Condenser		Air cooling	
Refrigerant		R134a(HFC) [GWP : 1430]	
Refrigerant Charge Quantity		g	230±5
Air IN/OUT Connection		Rc3/4	
Drain Connection (Outside Diameter of Tubing)		10mm	
Color		Panel: Urbanwhite1	
		Base:Urbangray2	
Weight		kg	23
Application air compressor output (Reference)		kW	5.5

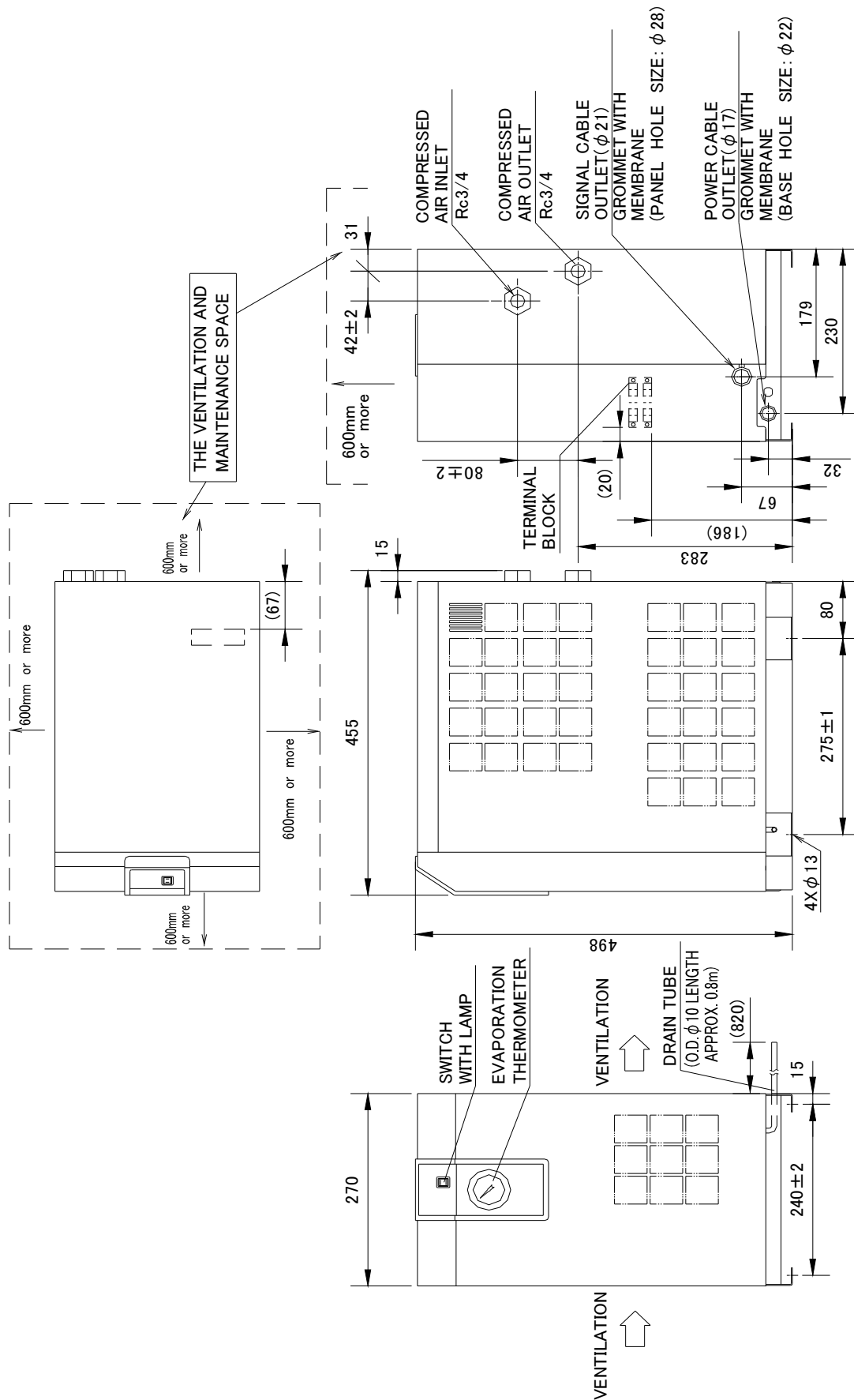
Note1: The data for m<sup>3</sup>/h (ANR) is referring to the conditions of 20°C, 1atm . pressure & relative humidity of 65%.

Note 2: The value is that of operation under rated condition.

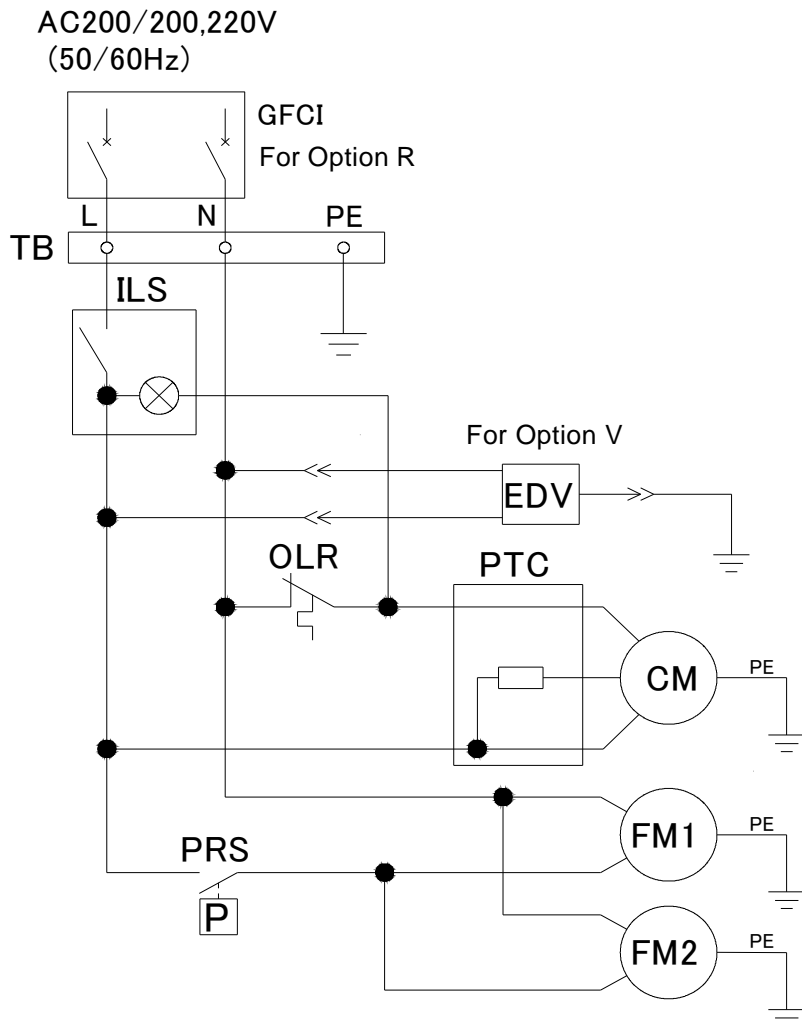
Note 3: Install GFCI breaker that comes with sensivity of 30mA.

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.

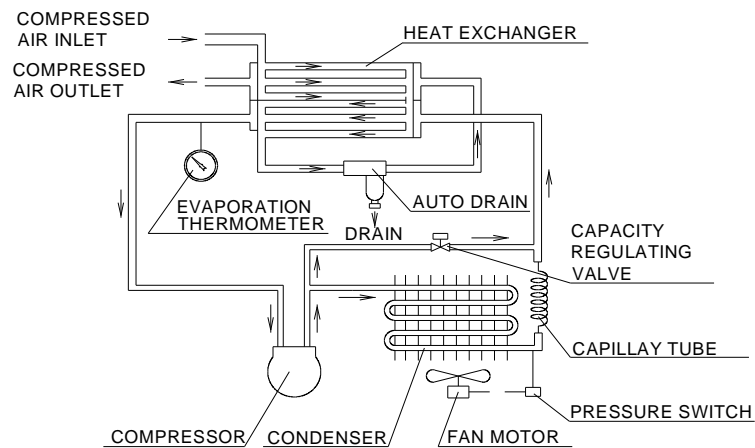
**6 - 2**      **Dimensions**



**6 - 3      Electrical Circuit**



Symbol	Name
CM	Compressor Motor
FM1,FM2	Fan Motor
OLR	Overload Relay
PRS	Pressure Switch
ILS	ON/OFF Switch with Lamp
PTC	PTC Starter
TB	Terminal Block
GFCI	Ground Fault Circuit Interrupter
EDV	Electronic Drain Valve

**6 - 4 Compressed Air and Refrigerant Circuit/Operation Principles****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 freon gas 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.

## 7 Specification for Option A

### 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      **Specification**

The specification for this air dryer is used for cooling down the compressed air. The compressed air comes out after cooled down and dehumidified without reheating. Remind that the air flow capacity is less than the standard models.

Air flow rate	m <sup>3</sup> /min(ANR) 注1)	(50/60Hz)	0.32/0.375
Outlet air temp.		°C	10

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

Note2) This air dryer for cooling compressed air indicates temperature, while the standard product indicates dew point of outlet air pressure.

### 7-3      **Air piping**

Since cool air comes out from an outlet of air dryers, carefully attach thermal insulation to the piping at air outlet and keep the piping length as short as possible in order to prevent condensation on the outlet piping and temperature increase on the outlet due to ambient temperature.



## Specification for Option C

When performing the installation and maintenance of the product, the following points must be understood and followed.

### **8-1** **Safety instructions**

When handling the product, take care of 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.

### **8-2** **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 from 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 of the painted surfaces of copper tube is damaged, such as when the panels are removed for maintenance, the effect of its rust proofing painting is lost.  
Do not give damage any painted surfaces of copper tube.

### **8-3** **Specifications**

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

# **9 Specification for Option G**

## **9-1 Specifications**

- Outside panel has Chinese name plate and Chinese operation manual.





## Specification for Option H

### 10-1 Safety instructions

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

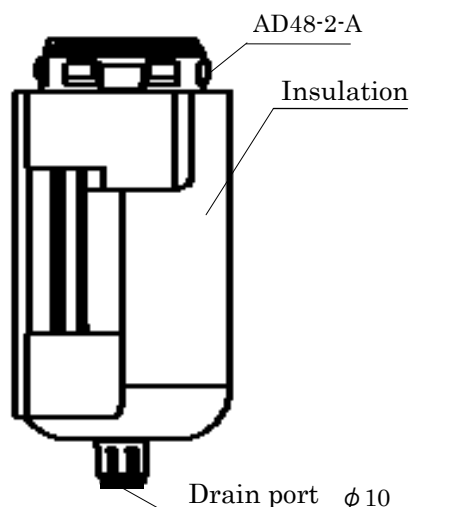


#### Warning

- Do not remove the auto drain with the air pressure remaining internally. If the compressed air is left in the product, when some part is loosened, it may cause sudden lurching or other unexpected accidents.
- When removing the panel, wear protective gloves to prevent injuries.
- There is a risk of touching drained waste liquid during replacement.  
When draining, follow the user's own procedure to keep operators safe. (E.g. Wear protective goggles, apron and gloves to prevent contact with the drained condensate.)
- When oils can enter the drained condensate, waste water treatment is necessary. Follow the bylaws or rules of the local municipality for disposal.

### 10-2 Specifications

The maximum operating pressure 1.6MPa. A metal bowl with a level gauge which can confirm the water label is used for auto drain.



Item	Model	IDFA6E-20-H
Auto drain type		Float type
Auto drain valve type		N. O. (Normal Open: Open under non-energized status. )
Operating pressure		0.15 to 1.0MPa

## Auto drain product number for replacement

Product number	Product name	QTY	Remarks
IDF-S1941	Bowl assembly thermal insulator	1	—
AD48-2-A	Bowl assembly	1	With bowl packing


## Auto drain Parts

Product number	Product name	QTY
IDF-S0002	Auto drain strainer	1
C42FP-260S	Bowl packing	1

# 11 Specification for Option K

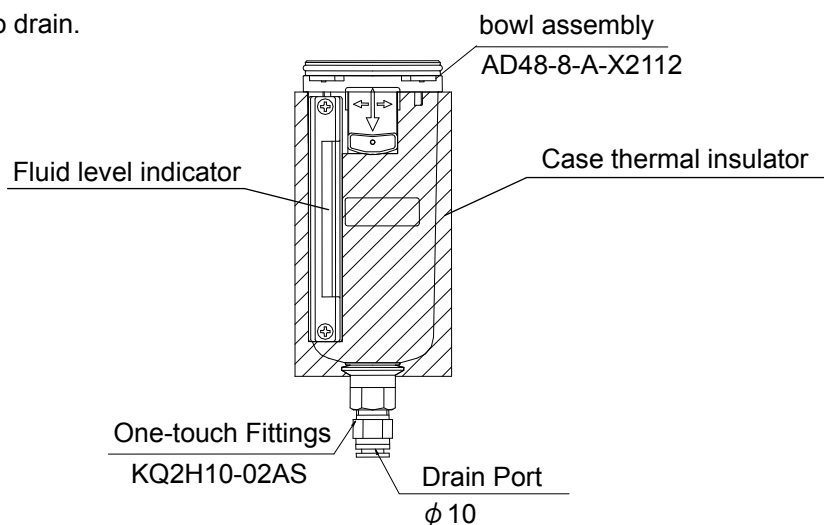
## 11-1 Safety instructions

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

 <b>Warning</b>
<ul style="list-style-type: none"> <li>- Do not remove the auto drain with the air pressure remaining internally. If the compressed air is left in the product, when some part is loosened, it may cause sudden lurching or other unexpected accidents.</li> <li>- When removing the panel, wear protective gloves to prevent injuries.</li> <li>- There is a risk of touching drained waste liquid during replacement. When draining, follow the user's own procedure to keep operators safe. (E.g. Wear protective goggles, apron and gloves to prevent contact with the drained condensate.)</li> <li>- When oils can enter the drained condensate, waste water treatment is necessary. Follow the bylaws or rules of the local municipality for disposal.</li> </ul>

## 11-2 Specifications

The maximum operating pressure 1.6MPa. A metal bowl with a level gauge which can confirm the water label is used for auto drain.



	Model	IDFA6E-20-K
Auto drain type		Float type
Auto drain valve type		N. O. (Normal Open: Open under non-energized status. )
Operating pressure		0.15 to 1.6MPa

## Auto drain product number for replacement

Product number	Product name	QTY	Remarks
IDF-S1926	Bowl assembly thermal insulator	1	—
AD48-8-A-X2112	Bowl assembly	1	With bowl packing

## Auto drain Parts

Product number	Product name	QTY
IDF-S0002	Auto drain strainer	1
C42FP-260S	Bowl packing	1

## Case thermal insulator product number for replacement

Product number	Product name	QTY
IDF-S0529	Case thermal insulator	1

## 12

## Specification for Option L

**12-1 Safety instructions**

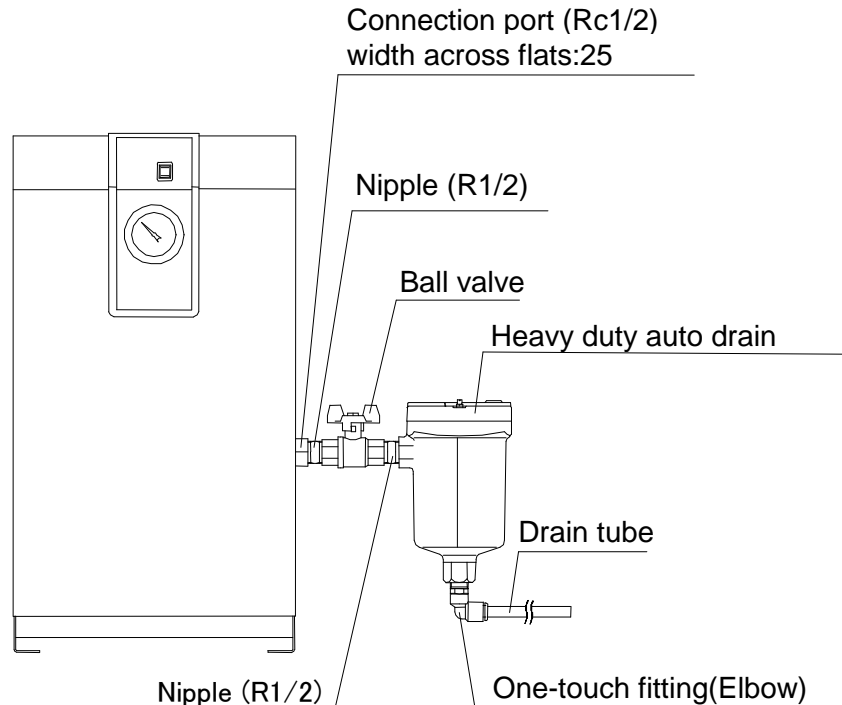
When handling the product, take care of the following precautions.

**Warning**

1. Do not remove the auto drain if air pressure remains in 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 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 ensure the safety of the operators. (Ex. Put protective goggles, apron and/or gloves to protect body from toucing the drain waste when performing maintance on the product.)

**12-2 Specification**

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

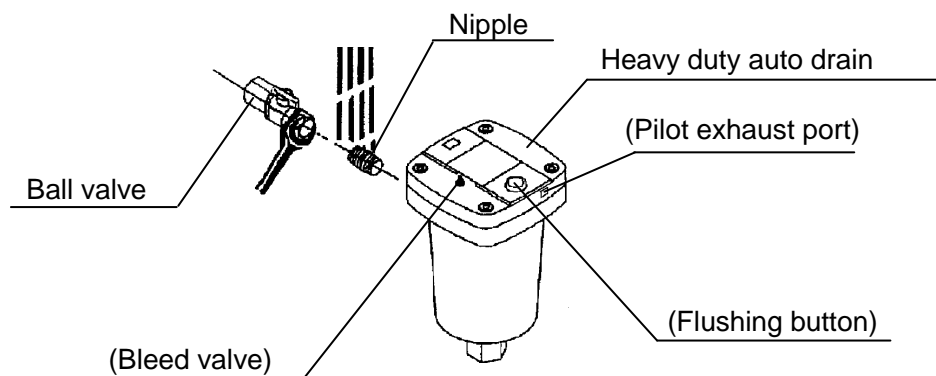


Heavy duty auto drain assembly

Order number	ADH4000-04
Type of auto drain valve	N.O( normally opened)
The highest working pressure	1.6MPa
Working pressure	0.05 ~ 1.6MPa
The highest drain emission	400cc/min(Pressure 0.7MPa,the case of water)

### 12-3 Installation of heavy duty auto drain

1. Hold the hexagon-head part 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: 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.



### 12-4 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

Option R installs a Ground Fault Circuit Interrupter (GFCI), 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, see 13-2.

### **13-1 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 safety. Without grounding, the GFCI can not operate normally.
5. Do not ground to water pipe, gas tube or lightning 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.

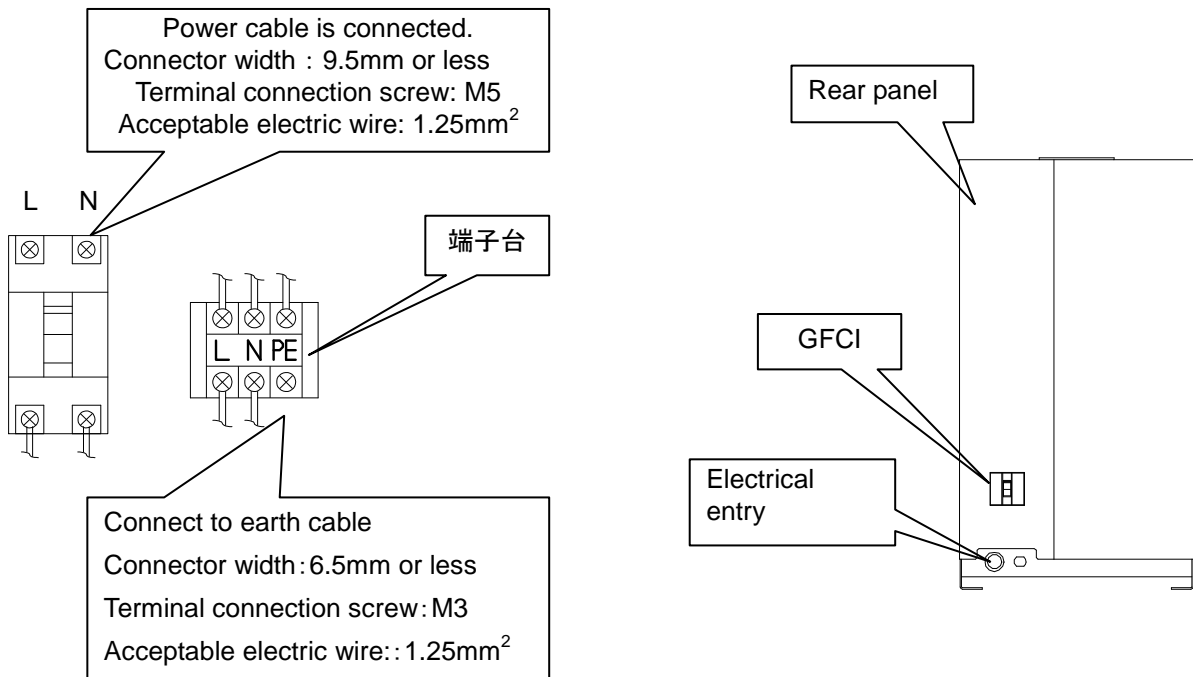
**13-2 Specifications of the GFCI**

Dryer model number	Specifications of GFCI
IDFA6E-20-□R□	Rated current: 5A, Current sensitivity: 30mA

**13-3 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.



※Please refer to page 6-3 or 14-3 for the electrical diagram.



## 14 Specification for Option T

This option installs a terminal block that has outputs for the operation and failure signals. The signals are non voltage contact style. For details, refer to 14-2, 14-3.

### **14-1 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 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.

### **14-2 Specifications**

This option installs a terminal block that has outputs for the operation and failure signals.

- 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
  - AC200V/2A    DC24V/2A
  - Minimum current for signal    20V/3mA (AC/DC)

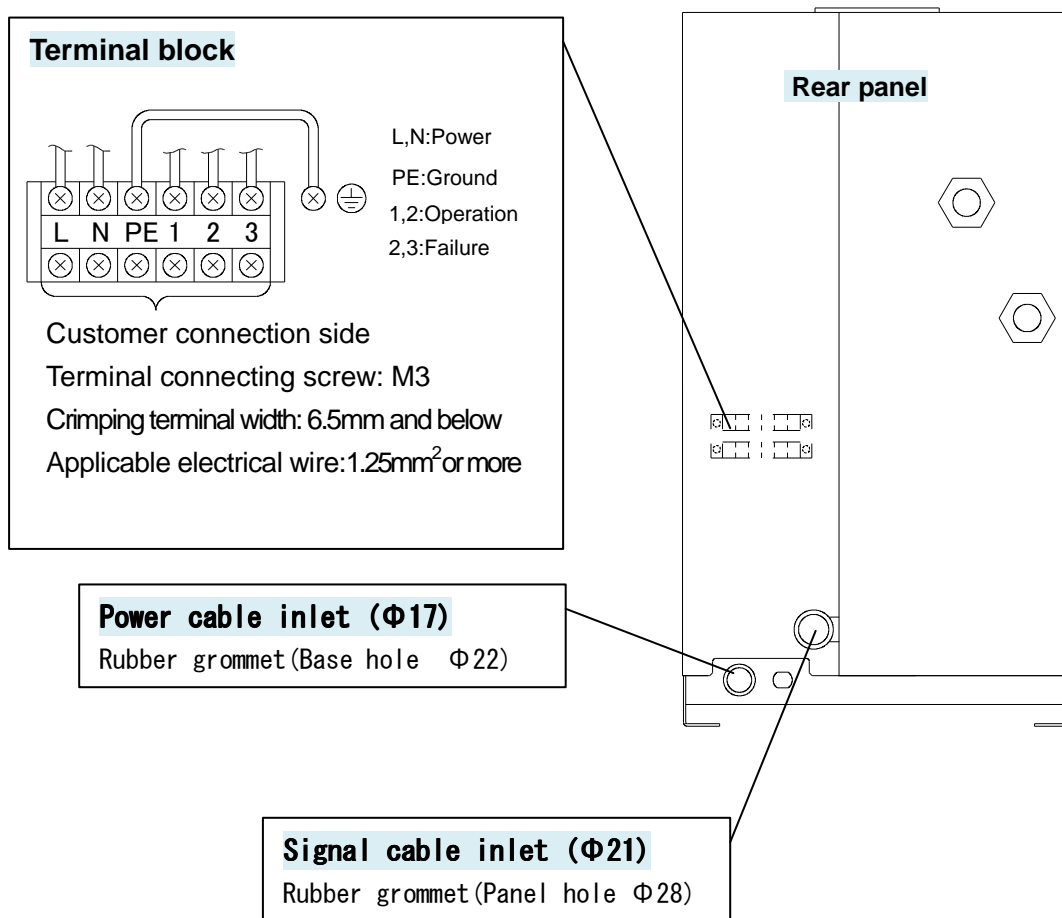
**14-3 Remote operation**

- For the remote operation, turn on and off the power supply side under the condition of the Switch with Lamp ON.
- Ensure at least 3 minutes is left after the unit is stopped before restarting it, even for the remote operation. If the product is restarted within less than 3 minutes, 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).

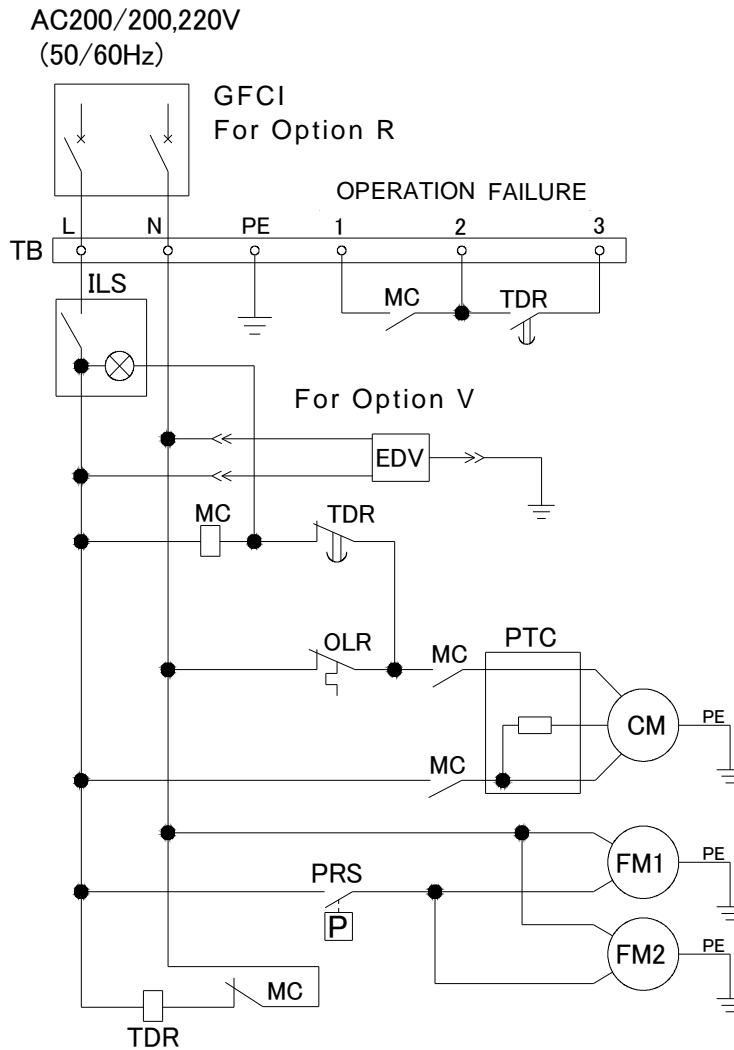
**14-4 How to connect the power supply and signal cable**

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



**14-5 Electric circuit**



Symbol	Name
CM	Compressor Motor
FM1,FM2	Fan Motor
OLR	Overload Relay
PRS	Pressure Switch
ILS	ON/OFF Switch with Lamp
PTC	PTC Starter
MC	Magnetic Contactor
TDR	Time Delay Relay
TB	Terminal Block
GFCI	Ground Fault Circuit Interrupter
EDV	Electronic Drain Valve

## 15 Specification for Option V

This option installs the timer operated auto drain. When performing the installation and maintenance work for the product, the following points must be understood and followed. Additionally, read 12-3 for maintenance work.

### **15-1** **Safety instructions**

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

#### **Warning**

1. Do not remove the auto drain if air pressure remains in 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 when replacing the auto drain. Follow the procedures prepared by the customer to ensure the safety of the operators. (Ex. Put protective goggles, apron and/or gloves to protect body from touching the drain waste when performing maintenance on the unit.)

#### **Warning**

**Only qualified people must perform wiring.**

1. Provide the power suitable for the product specifications.
2. Be sure to ground the product for safety. Do not ground to water pipe, gas tube or lightning 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.

**15-2 Specifications**

The timer is set to have ON time of 0.5sec and OFF time 30sec of min. 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.

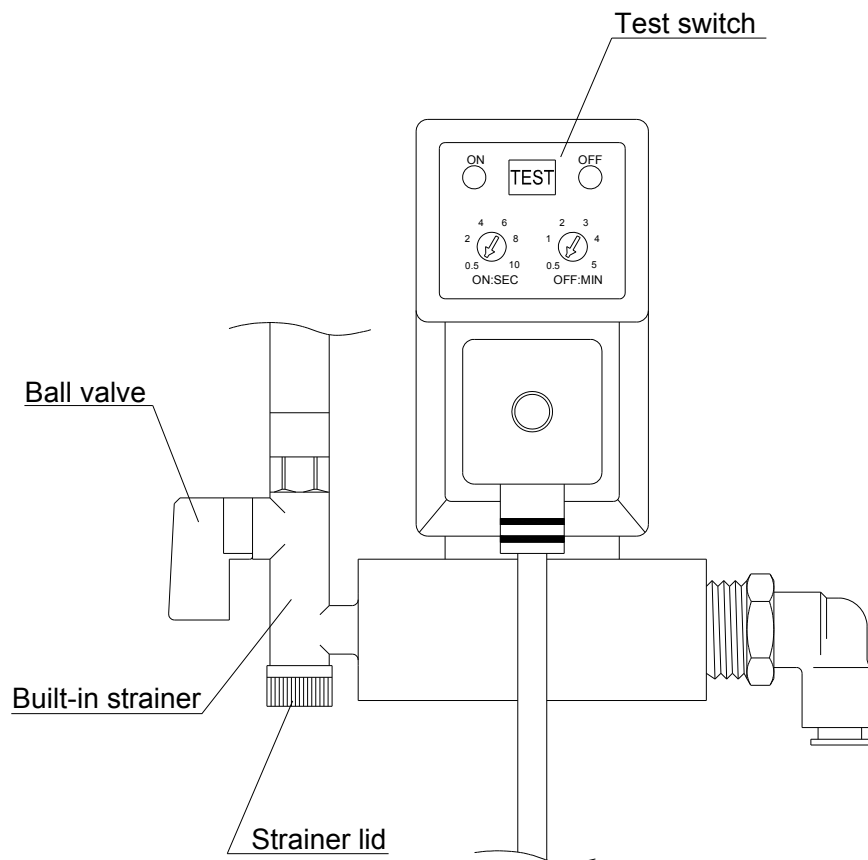
Order number (service parts)	IDF-S0198
Max. operating pressure	1.6MPa
ON time ( Valve: open)	0.5sec
OFF time ( Valve: close)	30sec

※Please refer to page 6-3 or 14-3 for the electrical diagram.

**15-3 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 is released.
- 3) Remove the strainer and clean it.
- 4) Reassemble the strainer and open the ball valve.



**16 Service Record**

**16-1 Service Record**

It is recommended to keep a maintenance/service record.

Parts No.	Description	Maintenance/Service Work Description	Date



[Revision history]

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Note: Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.  
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