



Operation Manual

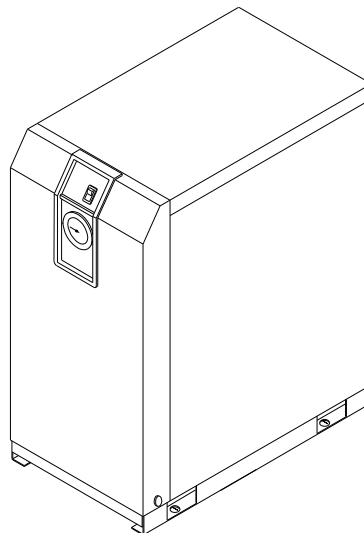
Original Instructions

PRODUCT NAME

Refrigerated Air Dryer

MODEL / Series

IDFA3E-23-A,C
IDFA4E-23-A,C,L,R,T,V
IDFA6E-23-A,C,K,L,R,T,V
IDFA8E-23-A,C,K,L,R,T,V
IDFA11E-23-A,C,K,L,R,T,V
IDFA15E1-23-A,C,K,L,R,T,V



This manual is intended to explain the installation and operation of the product. Only those who have thorough understanding of the fundamental operating procedure or have basic knowledge and skills of handling industrial products are qualified to perform installation and operation.

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 handling this product. It provides all essential information for maximizing the product operating efficiency, as well as for safety and longer life.

For safe operation of SMC Thermo-dryer, thoroughly read and follow the safety instructions, as well as regulations stated within ISO 4414^{*1} & JIS B 8370^{*2}.

*1) ISO 4414: Pneumatic fluid power – General rules and safety requirements for systems and their components

*2) JIS B 8370: Pneumatic fluid power – General rules relating to systems

This manual is intended to explain the installation and operation of the product. Only those who have thorough understanding of the fundamental operating procedure or have basic knowledge and skills of handling industrial products are qualified to perform installation and operation.

This operation manual and other documents provided with the product do not constitute a contract, and will not affect any existing agreements or commitments.

Statements contained in this operation manual cannot be newly guaranteed or modify any existing guarantee certificate.

It is strictly prohibited to copy this manual entirely or partially for use by a third party without prior permission from 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



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. 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 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. • In the event of any problems the product should not be turned on. When the product fails or a fault occurs, shutdown immediately, and contact for service

i-2-1 Danger Classifications

Specific danger classifications of this product are 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: **“DANGER”**, **“WARNING”** or **“CAUTION”**, 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: **“DANGER”**, **“WARNING”** or **“CAUTION”**, on the product and in this manual.



Hazard of Rotating Object

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: **“DANGER”**, **“WARNING”** or **“CAUTION”**, 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**

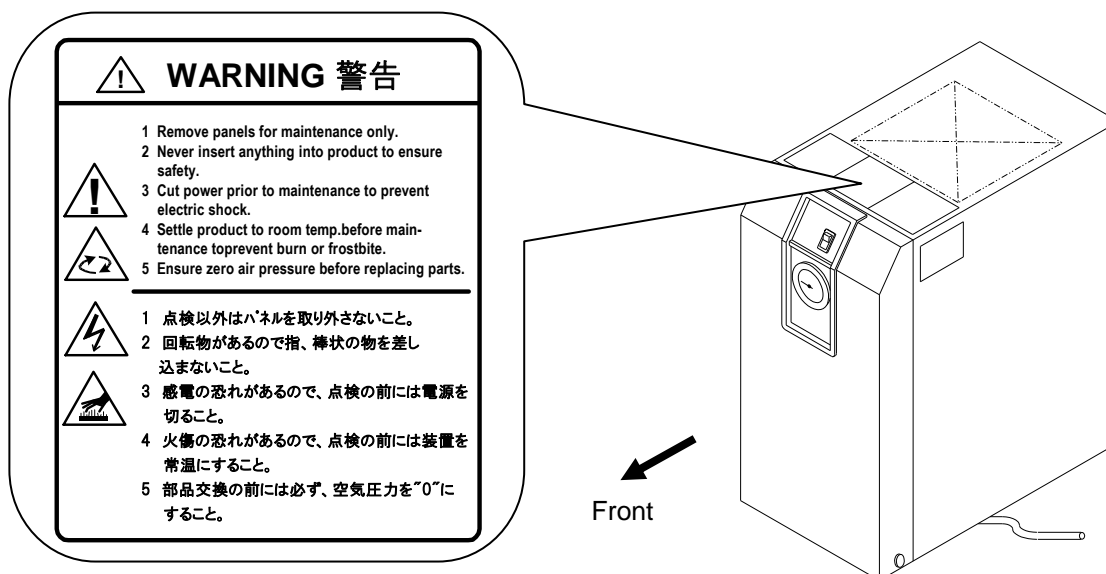
Since this product has parts that rotate during operation, there is the danger of injury resulting from direct contact. The fan and rotor will start/stop automatically. Thus, do not work on them when power is on.

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 modify danger warning labels.
Confirm the positions of danger warning labels.



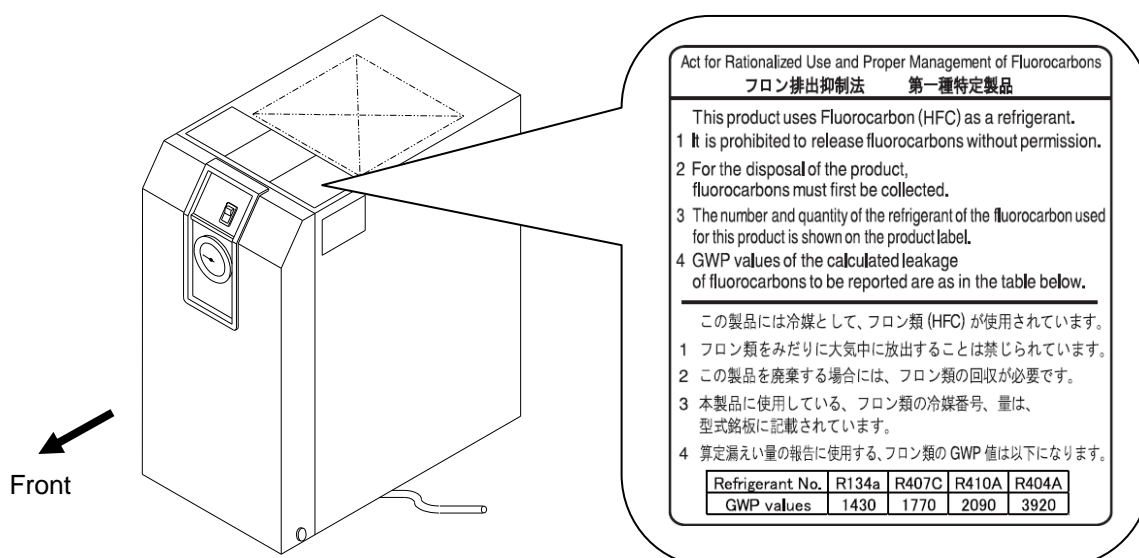
i-2-7 Hazard of Refrigerant**Caution**

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 - 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 all 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

IDFAE-****

-

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

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

MADE IN G

Specification Label

Front

Contents

MODEL: Model
 VOLTAGE: Power supply voltage (frequency)
 RUNNING CURRENT: Running current
 REFRIGERANT: Type of refrigerant (amount)
 WEIGHT : Weight MAX.PRESS: Maximum operating pressure
 SERIAL No.: Serial No.
 MAKER : Maker
 MADE IN: Country of manufacture

i-3 Disposal

When you dispose of the product, you should collect the refrigerant and the compressor 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 credentials 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 compressor oil according to the regulation of local government.

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

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

For any questions, please contact an 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.



Caution

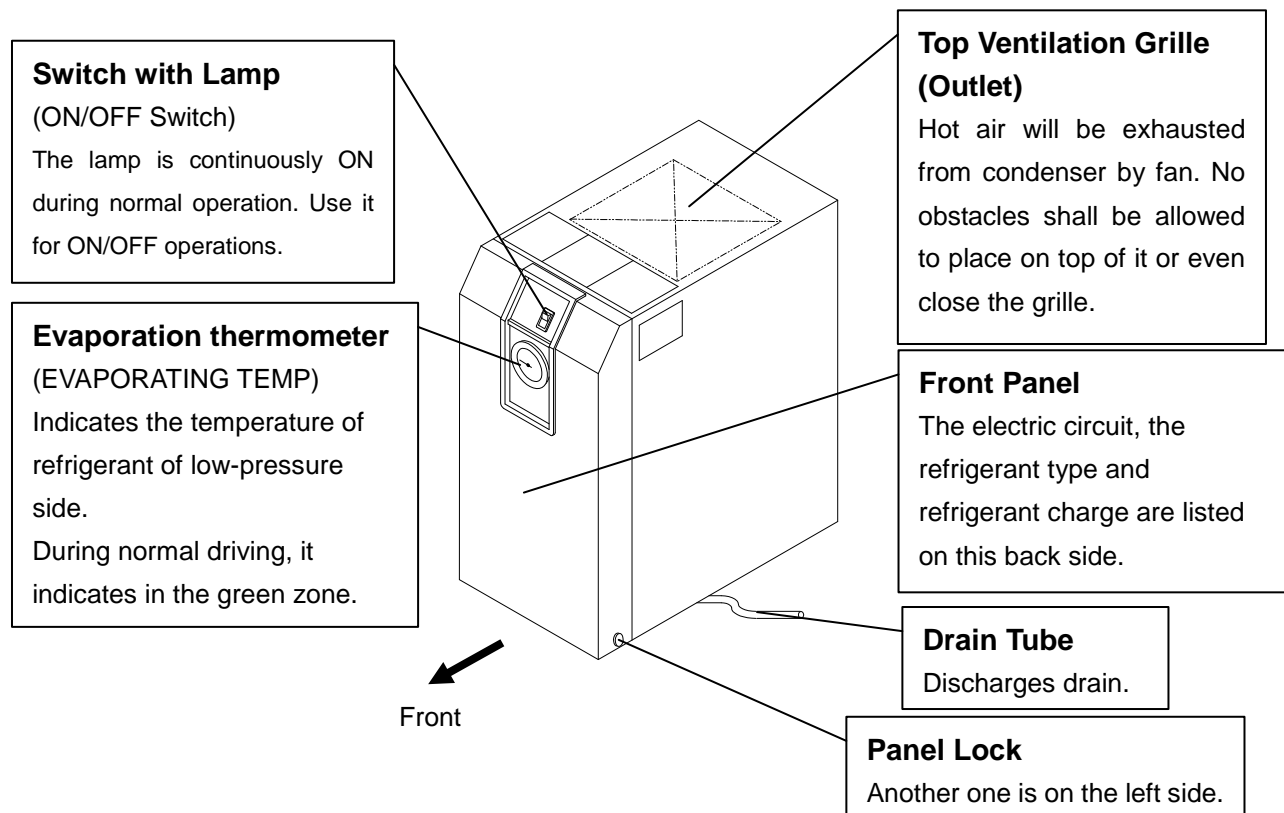
SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

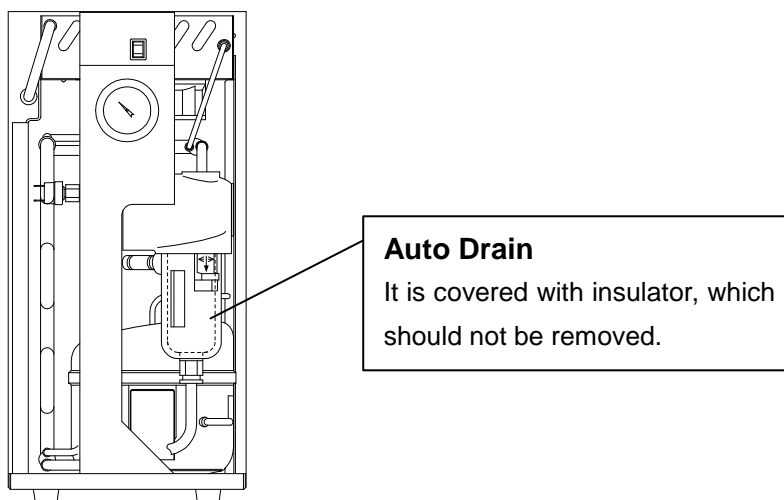
1

Parts Name and Functions**1-1 Parts Name and Functions**

• IDFA3E



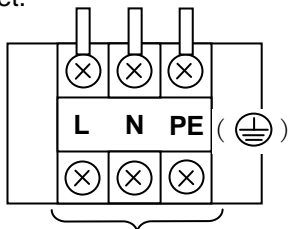
No Front Panel



• IDFA3E

Electrical Terminal Cover

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

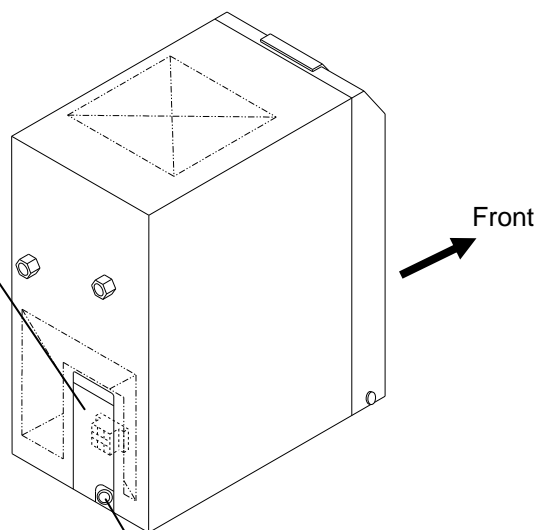


Customer Connection Side

Terminal Connecting Screw: M3

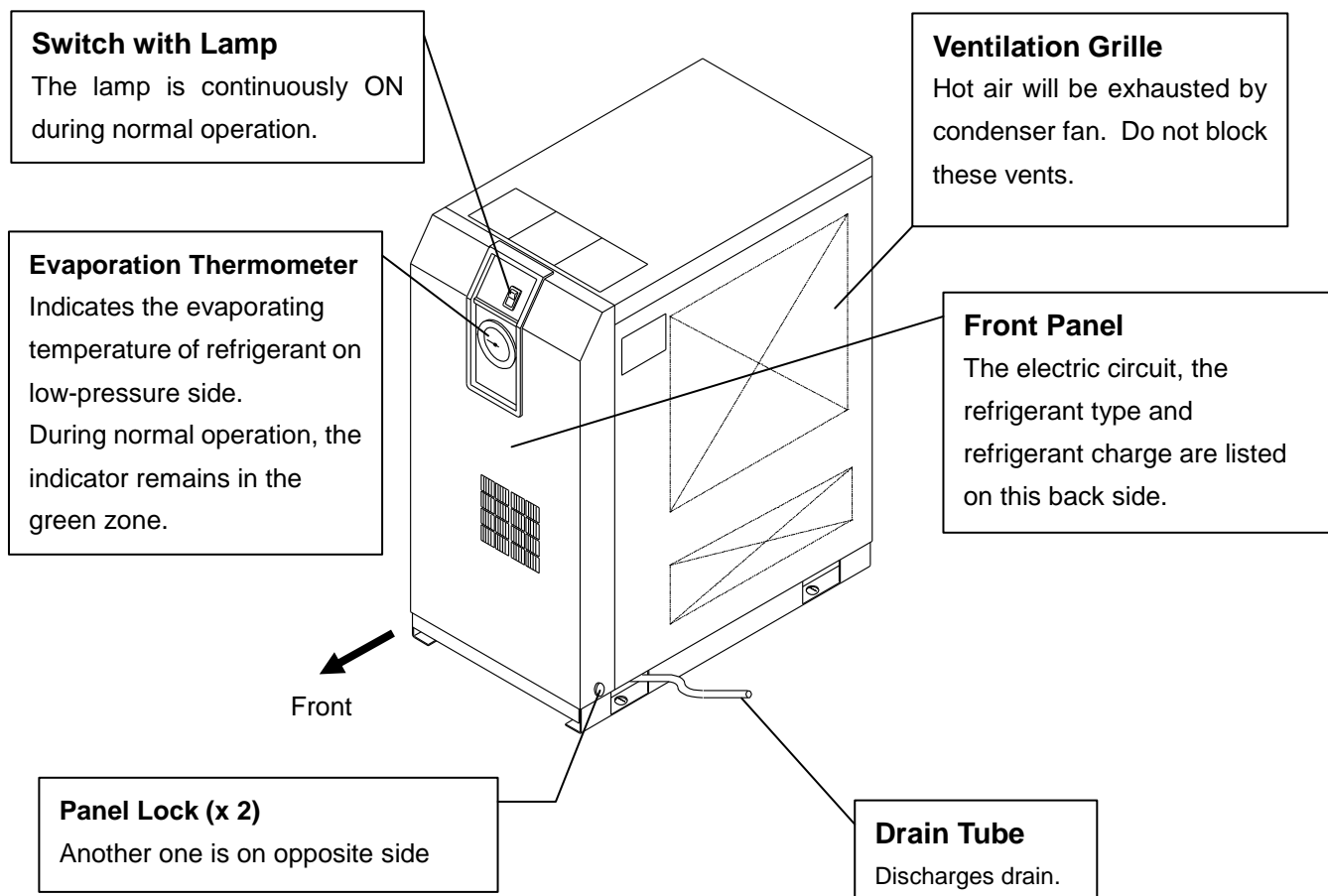
Applied Pressure Terminal: 1.25-3

(Width 6.5mm and below)

**Membrane Grommet**

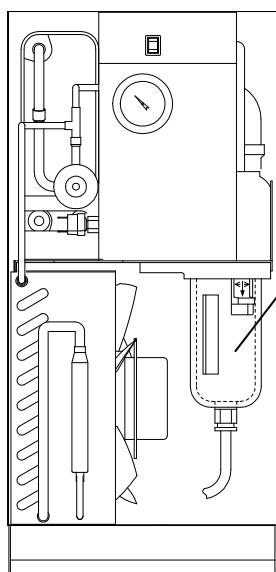
Power cord outlet

• IDFA4E to 15E1



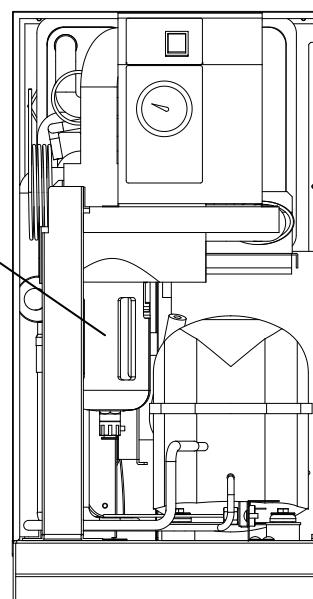
View with Front Panel removed

IDFA4E~11E

**Auto Drain**

Do not remove the insulation on the auto drain.

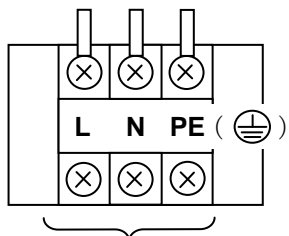
IDFA15E1



• IDFA4E to 15E1

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

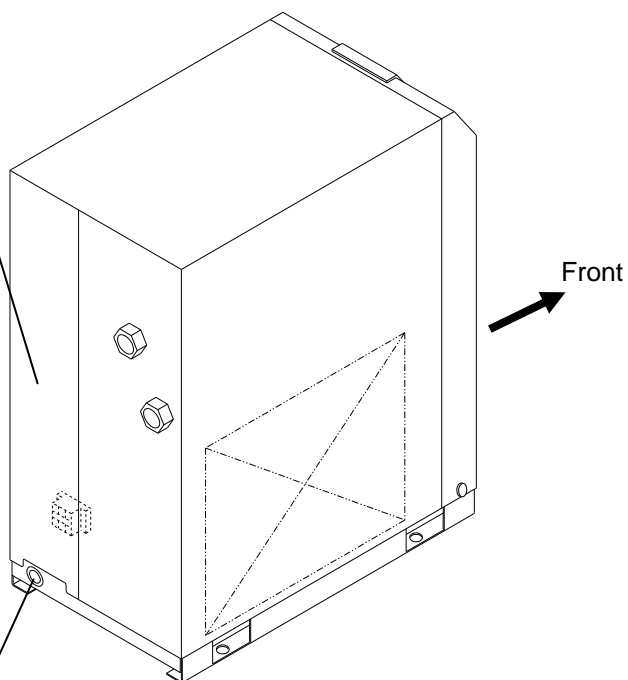
Ring terminals: 1.25-3

(Width 6.5mm and below)

(Screw head dimension: 0.25" (65mm))

Rubber Grommet

Power cord outlet





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.
- 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 models weights about 45lbs (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 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.
- Condition which has sudden pressure/flow rate change.

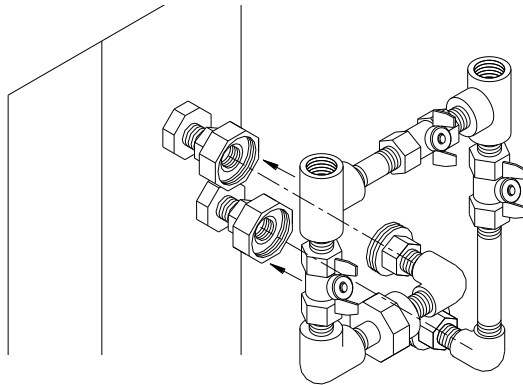
2 - 2 - 2 Anchorage

- The air dryer should be installed on a vibration-free, stable, horizontal, flat surface.
- Refer to "Chapter6 6-3 Dimensions" for the dimensions.
- IDFA3E to 15E1 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.



The bypass piping sets

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 (230V 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.

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 length of the power cable should extend less than 30m from the product..

Connecting to the power supply

Connect the power cable and the earth 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.**

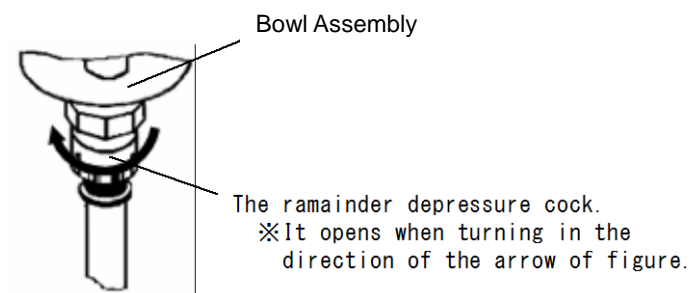
Disassembly of the air piping**Warning**

**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 .





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.
Model, 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 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: IDFA3E to 15E1: 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.
- **Avoid using this product under the condition which has sudden pressure/flow rate changes. Otherwise, drain (condensed water) may flow out to the secondary piping.**

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

Checks and Maintenance

4.1 Daily Check Points

Check the following points during normal operation. If you find any problems, immediately stop the operation and refer to "Chapter 5 Troubleshooting".

- There is no air leakage.
- The running lamp is on during operation.
- Moisture (condensate fluid) is being discharged from the 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 evaporation thermometer indicates about 3 to 10°C lower than the ambient temperature when the equipment is suspended with no pressurized air supply.
- There is no abnormal sound or vibration coming from the equipment.
- There are no abnormal smell or smoke coming from the equipment.

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.



Caution

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 interval values 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 period *Note}
Pressure switch	One Million times.
Fan motor	20,000 hours
Magnetic Contactor, Magnetic Switch	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 bowl assembly every month. Use neutral detergent for cleaning. If the degree of dirt is heavy and operating failure still continues even after cleaning, replace the product. Also, shorten cleaning interval 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. Do not carry out replacement work until the temperature of these parts has fallen to 50°C or less. Wait approximately 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.

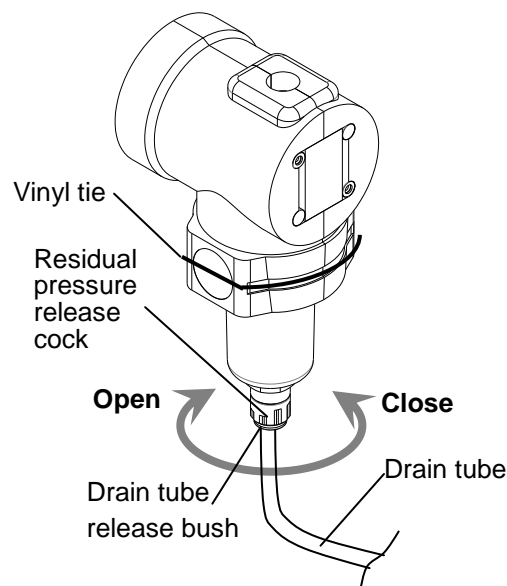
[How to clean and replace the auto drain/strainer]

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

(1) Removal of the bowl assembly

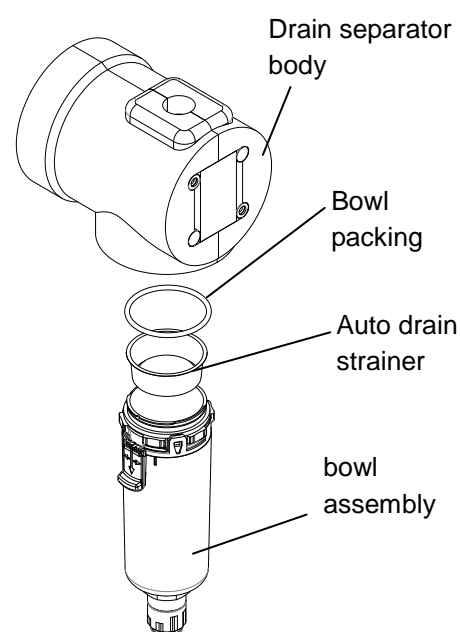
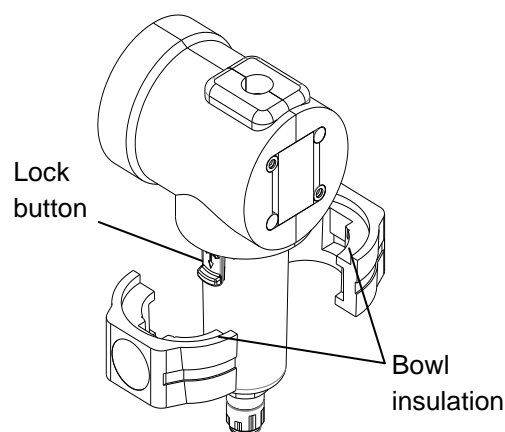
- 1) Turn off the illuminated ON/OFF switch.
- 2) Disconnect the earth leakage breaker at the power supply or unplug the power plug from the socket.
- 3) Fully close the inlet and outlet valves. Only open the bypass when compressed air is required during work.
- 4) Only remove the outer panels when necessary for work.
- 5) 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 so that it does not get twisted.)
- 6) Take care because condensate fluid may spurt out due to residual air pressure in the product.
- 7) Remove the drain tube.
- 8) Pull out the tube while pushing up the drain tube release bush.

- 9) Loosen the vinyl tie fixing the bowl insulation and remove the bowl insulation.
- 10) Hold the bowl assembly lightly and pull down the lock button with thumb.
Then, turn the bowl assembly to the left (or right) to 30° to align the marks.
Release your thumb from the lock button and slowly pull down the bowl assembly (vertically) to remove it.
- 11) Remove the auto drain strainer and clean it.
Take care not to cut your hand with the sharp edges of the strainer.
- 12) Pour solution of neutral detergent into the assembly and shake it well to clean.



(2) Mounting of the bowl assembly

- 1) Check the bowl packing for damage such as scratches, twisting or foreign particles attached to it.
Then, apply grease thinly and fit it in the groove in the bowl assembly.
- 2) Fit the auto drain strainer to the case assembly and fit it into the drain separator body.
Turn it until the lock button clicks.
- 3) Try to turn the bowl assembly gently and check that it does not turn.
If it turns, start again from fitting the bowl assembly to the body.
- 4) Attach the bowl insulation to the bowl assembly and fix the bowl assembly with the vinyl tie.
- 5) Close the residual pressure release cock and mount the drain tube and front panel as they were.
- 6) When reapplying compressed air to the air dryer, first open the valve on the inlet side slowly.
Check for compressed air leakage and if everything is all right, open the valve on the outlet side.
- 7) If the auto drain strainer or case assembly is damaged or very dirty, replace it with a new one.



Replacement part of Auto drain

Part no.	Description	Qty.	Applicable model	Remarks
AD38-A	Bowl assembly	1	IDFA3E/4E	With bowl packing
AD48-A		1	IDFA6E~15E1	

Note) The drain separator body can not replaced.

Replacement part of Auto drain strainer and Bowl packing

Part no.	Description	Qty.	Applicable model
IDF-S0001	Auto drain strainer	1	IDFA3E/4E
IDF-S0002		1	IDFA6E~15E1
C32FP-260S	Bowl packing	1	IDFA3E/4E
C42FP-260S		1	IDFA6E~15E1

Bowl insulation

Part no.	Description	Qty.	Applicable model	Remarks
IDF-S1932	Bowl insulation	1	IDFA3E/4E	2 pieces per model
IDF-S1933		1	IDFA6E~15E1	



Troubleshooting

Should any problem occur, inspect the following table, and if the problem cannot be solved, shut off the power supply and then contact an SMC authorized dealer for further instructions.

Problem	Probable Causes	Remedy
Air dryer does not operate and run lamp does not light up, 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 correct 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.
During normal operation the Running lamp goes off and the compressor stops. After a period of time normal operation resumes.	Installation place is poorly ventilated. Ambient temperature is too high.	Improve the ventilation around the unit 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 around the unit to lower the ambient temperature. Reduce the temperature of the compressed air by installing an additional aftercooler before the air dryer.
	Supply voltage is not correct.	Ensure the correct voltage is supplied to the unit
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 around the air compressor or make ambient temperature around the air compressor lower to reduce 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. Check auto drain function. 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	IDFA3E	IDFA4E	IDFA6E	IDFA8E	IDFA11E	IDFA15E1
Air Flow Rate (ANR)(Note 1)	At Outlet Pressure Point of 3°C Dew		12m³/h	24m³/h	36m³/h	65m³/h	80m³/h	120m³/h
	At Outlet Pressure Point of 7°C Dew		15m³/h	31m³/h	46m³/h	83m³/h	101m³/h	152m³/h
	At Outlet Pressure Point of 10°C Dew		17m³/h	34m³/h	50m³/h	91m³/h	112m³/h	168m³/h
Rated Condition	Operating Pressure		0.7MPa					
	Inlet Air Temperature		35°C					
	Ambient Temperature		25°C					
	Voltage		230V 50Hz					
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		1 ϕ AC230V±10% 50Hz (Note 4)					
	Operating current(Note 2)		1.2A	1.2A	1.2A	1.4A	2.7A	2.9A
	Power consumption(Note 2)		180W	180W	180W	208W	385W	420W
	Circuit Breaker (Note 3)		5A					10A
Noize at 50Hz			50dB					
Condenser			Air cooling					
Refrigerant			R134a (HFC) (WGP:1300)					
Refrigerant Charge Quantitiy			150 ±5g	200 ±5g	230 ±5g	270 ±5g	290 ±5g	350 ±5g
Air IN/OUT Connection			Rc3/8	Rc1/2	Rc3/4			Rc1
Acceesory (Hexagon nipple)			R3/8	R1/2	R3/4			R1
Drain Connection (Outside Diameter of Tubing)			10mm					
Color			Panel: Urbanwhite1 : Base:Urbangray2					
Weight			18kg	22kg	23kg	27kg	28kg	46kg

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 operation under rated 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

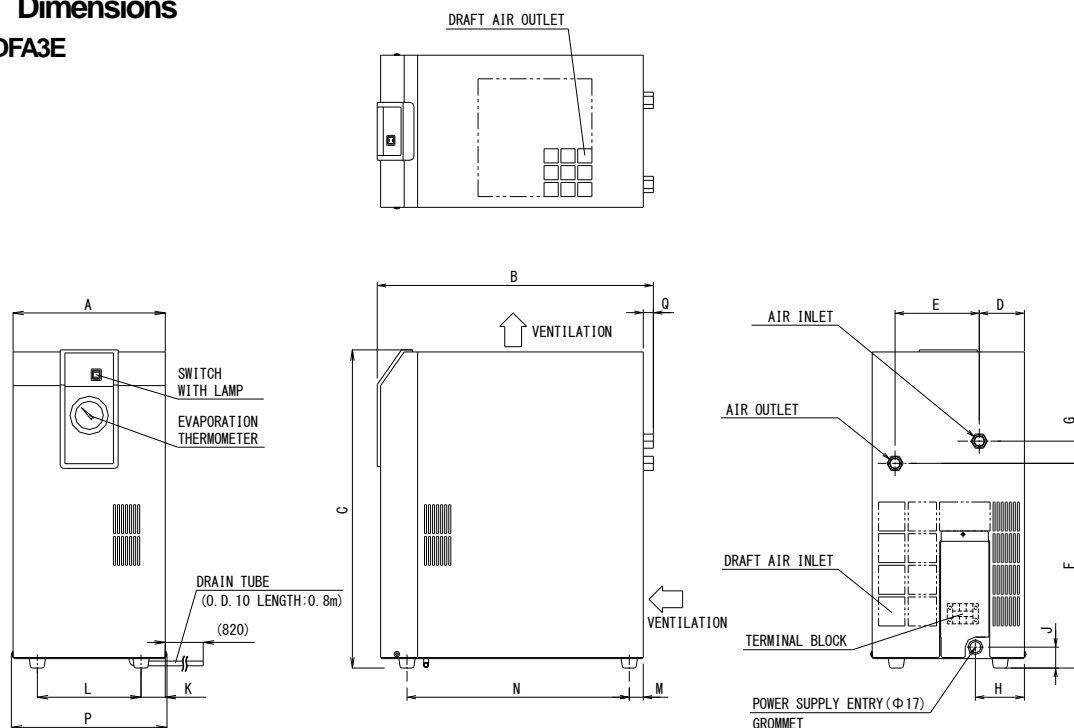
Refrigerant	Global Warming Potential (GWP) ^o	
	Regulation (EU) No 517/2014 ^o (Based on the IPCC AR4) ^o	Revised Fluorocarbons Recovery and Destruction Law ^o (Japanese law) ^o
R134a ^o	1,430 ^o	1,430 ^o
R404A ^o	3,922 ^o	3,920 ^o
R407C ^o	1,774 ^o	1,770 ^o
R410A ^o	2,088 ^o	2,090 ^o

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

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

6-3 Dimensions

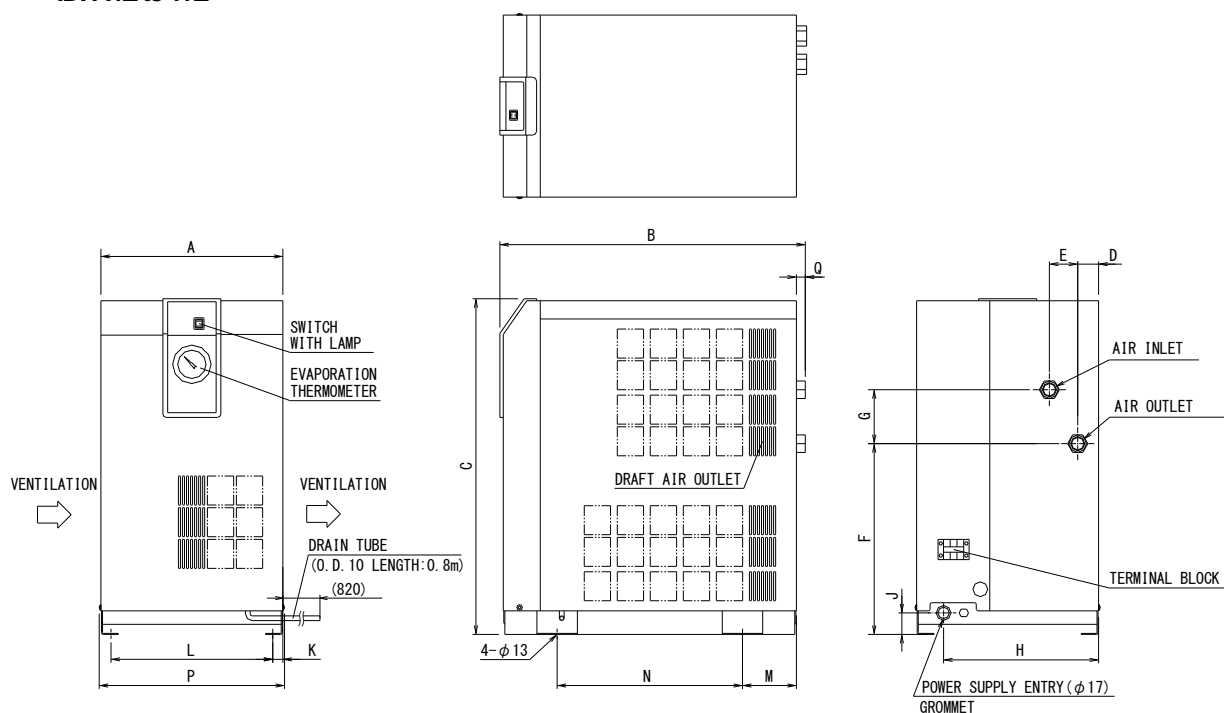
• IDFA3E



Measure : mm

Model	Thread size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
IDFA3E	Rc3/8	226	410	473	67	125	304	33	73	31	36	154	21	330	231	15

• IDFA4E to 11E

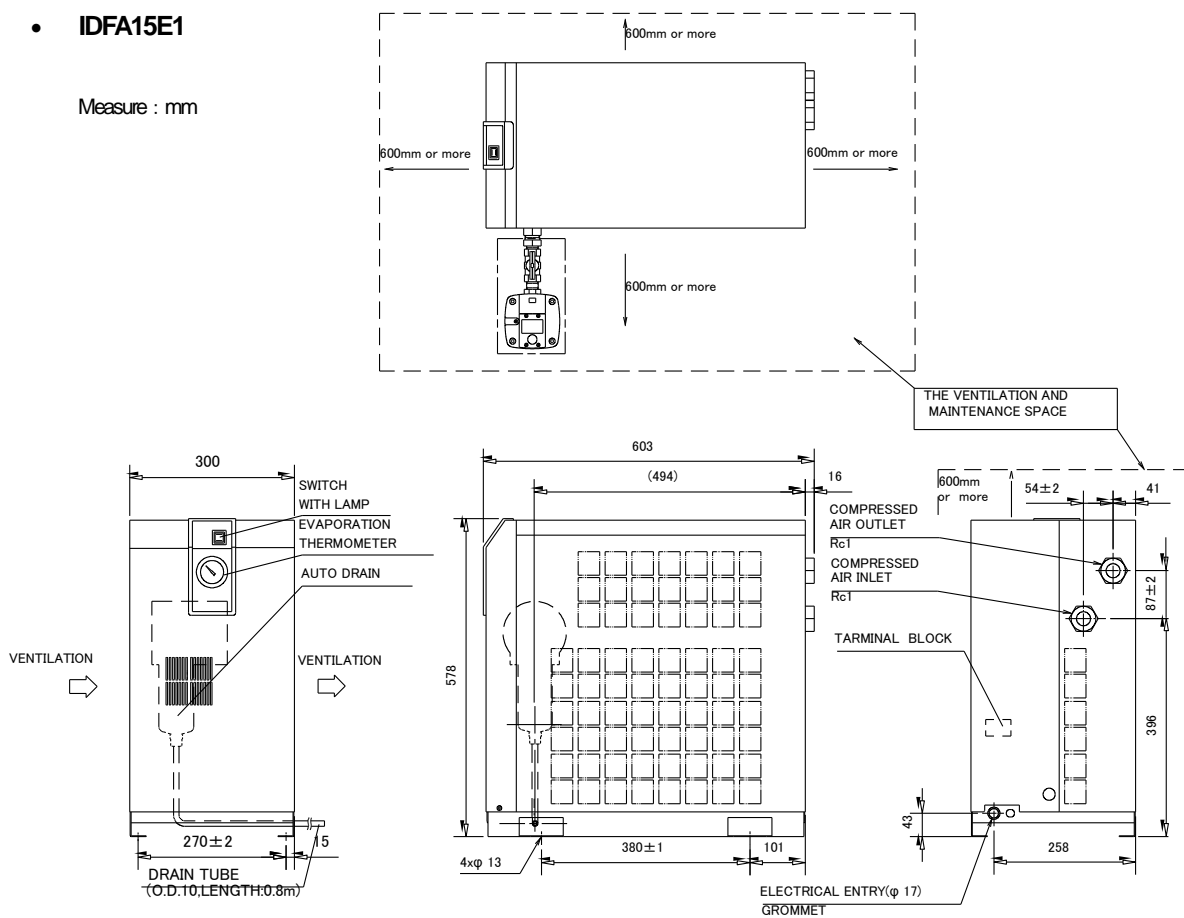


Measure : mm

Model	Thread Size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
IDFA4E	Rc1/2	270	453	498	31	42	283	80	230	32	15	240	80	275	275	13
IDFA6E	Rc3/4		455	568			355							300		15
IDFA8E																
IDFA11E																

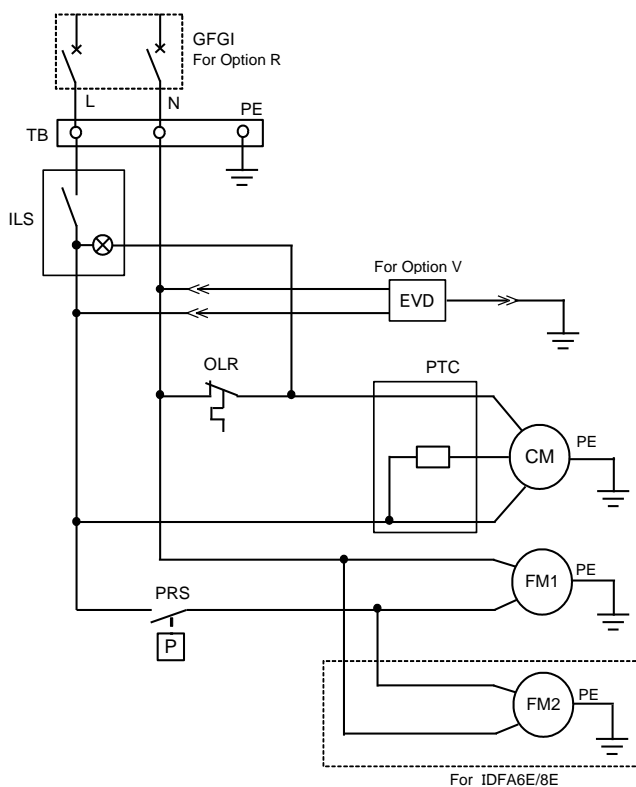
- IDFA15E1

Measure : mm

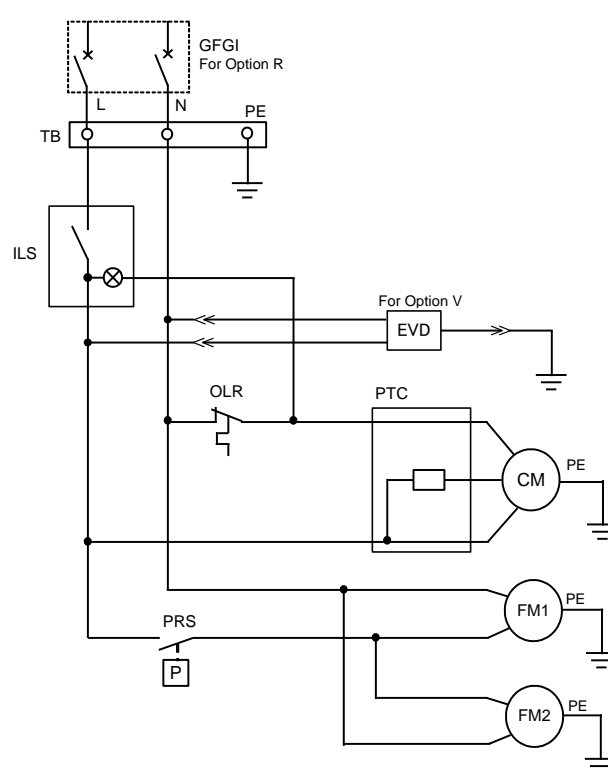


6-4 Electrical Circuit

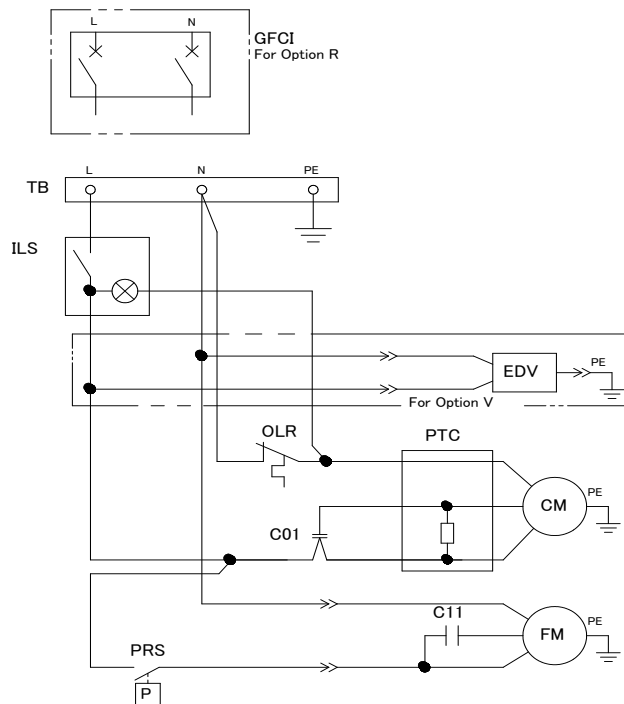
- IDFA3E/4E/6E/8E



- IDFA11E



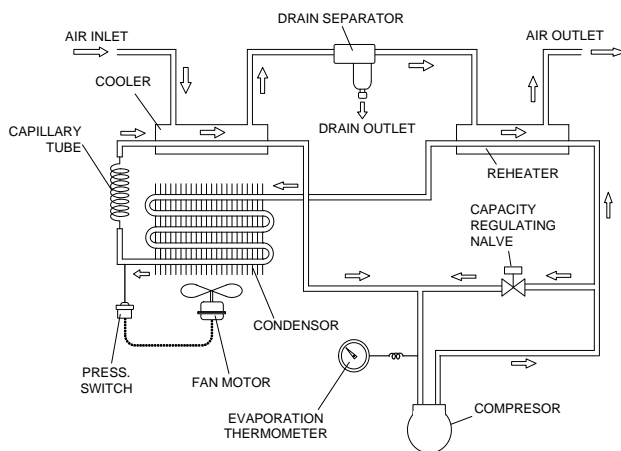
- IDFA15E1



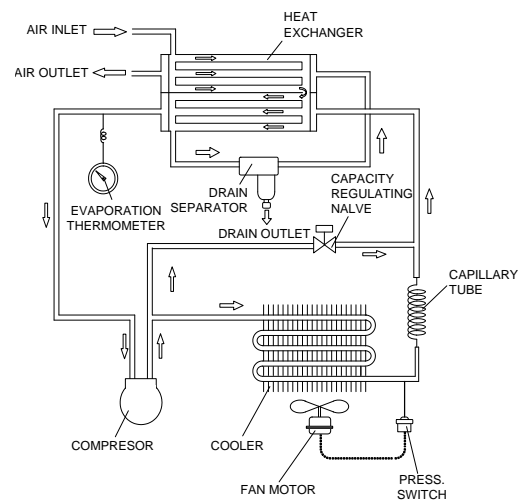
SYMBOL	NAME
CM	Compressor Motor
FM	Fan Motor
OLR	Overload Relay
PTC	PTC Starter
ILS	Switch with Lamp
PRS	Pressure Switch
TB	Terminal Block
C01	Capacitor for Starting Compressor
GFCI	Ground Fault Circuit Interrupter
EDV	Electronic Drain Valve

6-5 Compressed Air and Refrigerant Circuit/Operation Principles

- IDFA3E



- IDFA4E to 15E1



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.



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.

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.

7-4 Dryer specifications

Models	IDFA3E	IDFA4E	IDFA6E	IDFA8E	IDFA11E	IDFA15E1
Air flow rate (ANR)	8 m ³ /h	23 m ³ /h	29 m ³ /h	32 m ³ /h	39 m ³ /h	72 m ³ /h
Outlet air temp.	10°C					

- The data for ANR is referring to the conditions of 20°C, 1atm. pressure & relative humidity of 65%.
- This air dryer for cooling compressed air indicates temperature, while the standard product indicates dew point of outlet air pressure.
- The conditions are the same as the ones for standard models other than air flow capacity.

8**Specification for Option C**

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

8-1 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.

8-2 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.



Specification for Option K

9-1 Safety instructions

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

For IDFA6E/8E/11E/15E1



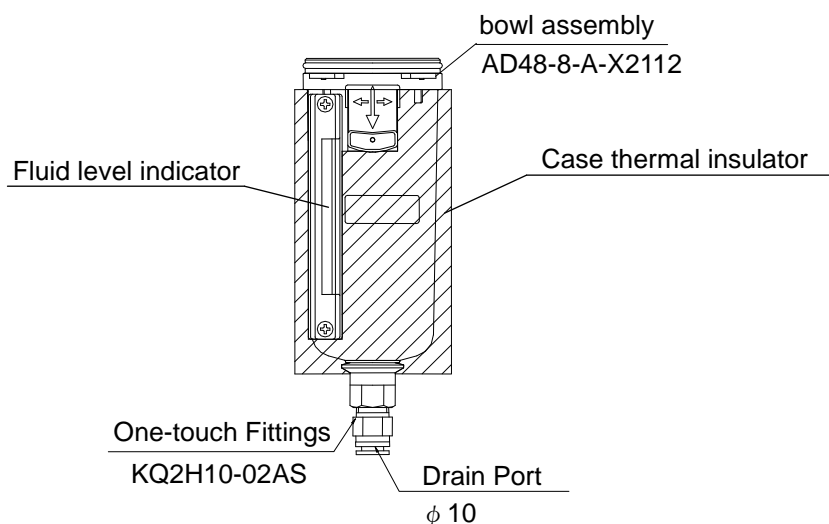
Warning

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.)

9-2 Specifications

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

IDFA6E to 15E1



Item \ Model	IDFA6E to 15E1-*K
Operating pressure	0.15 to 1.6MPa
Auto drain type	Floating type
Auto drain valve type	N.O. (normally opened: Released without pressurization)

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



Specification for Option L

10-1 Safety instructions

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

For IDFA4E/6E/8E/11E/15E1

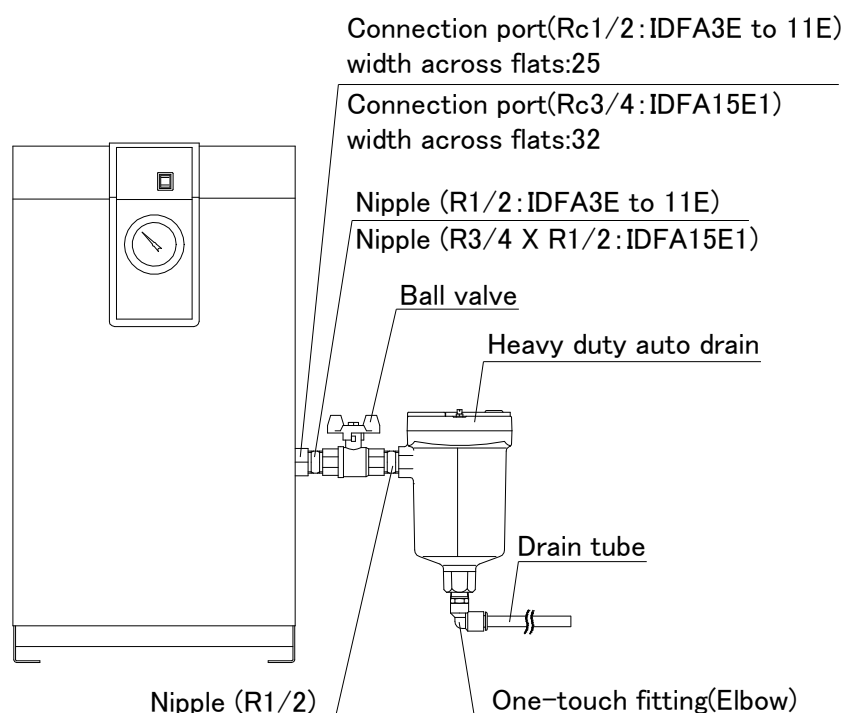


Warning

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.)

10-2 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

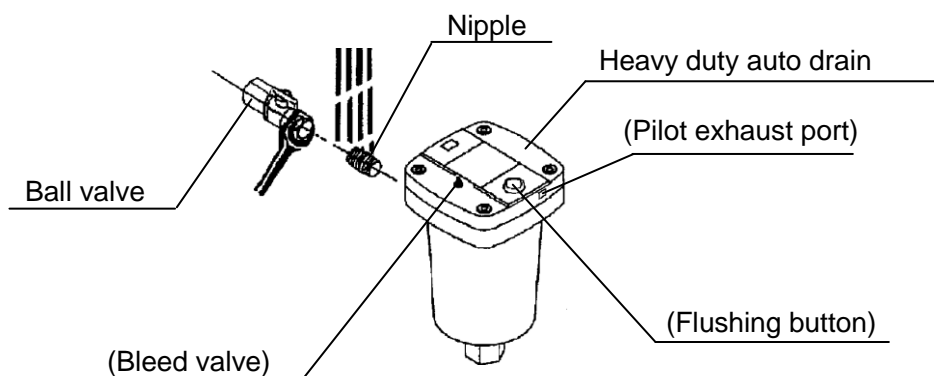
10-3 Specification of heavy duty auto drain (ADH4000-04).

Model	IDFA4E to 15E1-23-L
Operating pressure Note)	0.15 to 1.6MPa
Auto drain type	Floating type
Auto drain valve type	N.O. (normally opened: Released without pressurization)

Note) Use for air compressor with flow more than 3m³/h (ANR).

10-4 Installation of heavy duty auto drain

1. Hold the hexagon-head part (width across flats: 32 only IDFA15E1) 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 ,R3/4: 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.

**10-5 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

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 11-2 and 11-3.

For IDFA4E/6E/8E/11E/15E1

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. 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 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.

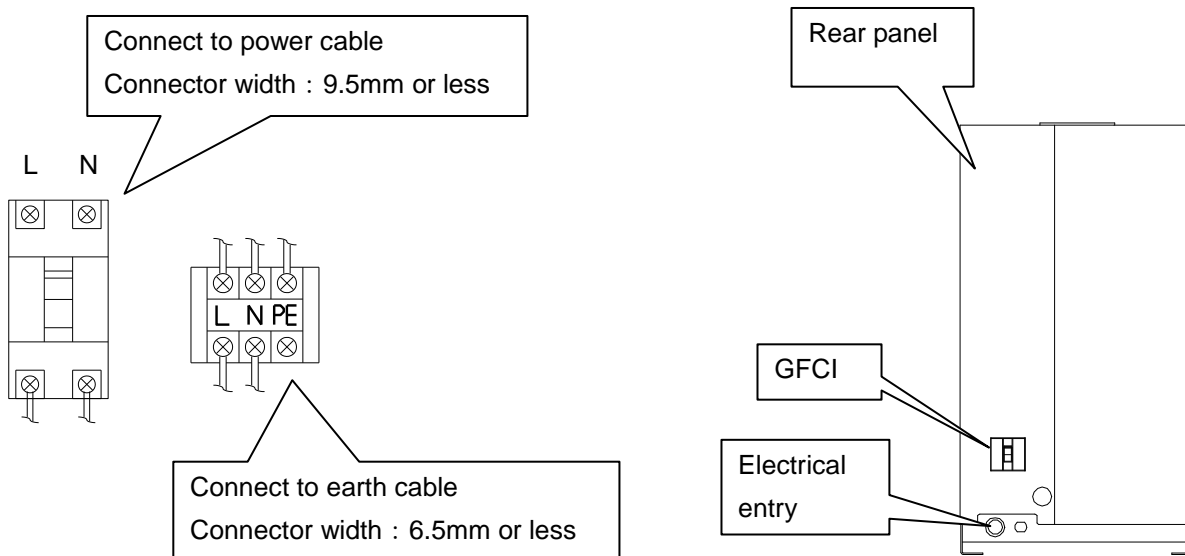
11-2 Specifications of the GFCI

Dryer model number	Specifications of GFCI
IDFA4E/6E/8E/11E-23-R	Rated current: 5A, Current sensitivity: 30mA
IDFA15E1-23-R	Rated current: 10A, Current sensitivity: 30mA

11-3 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.

**11-4 Electric circuit**

For details of the electric circuit, refer to the label on the back of the front panel of this product (see page 1-1)



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 12-2, 12-3 and 12-4.

12-1 Safety instructions

For IDFA4E/6E/8E/11E/15E1

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.

12-2 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 applicable load: 20V / 5mA)

12-3 Remote operation

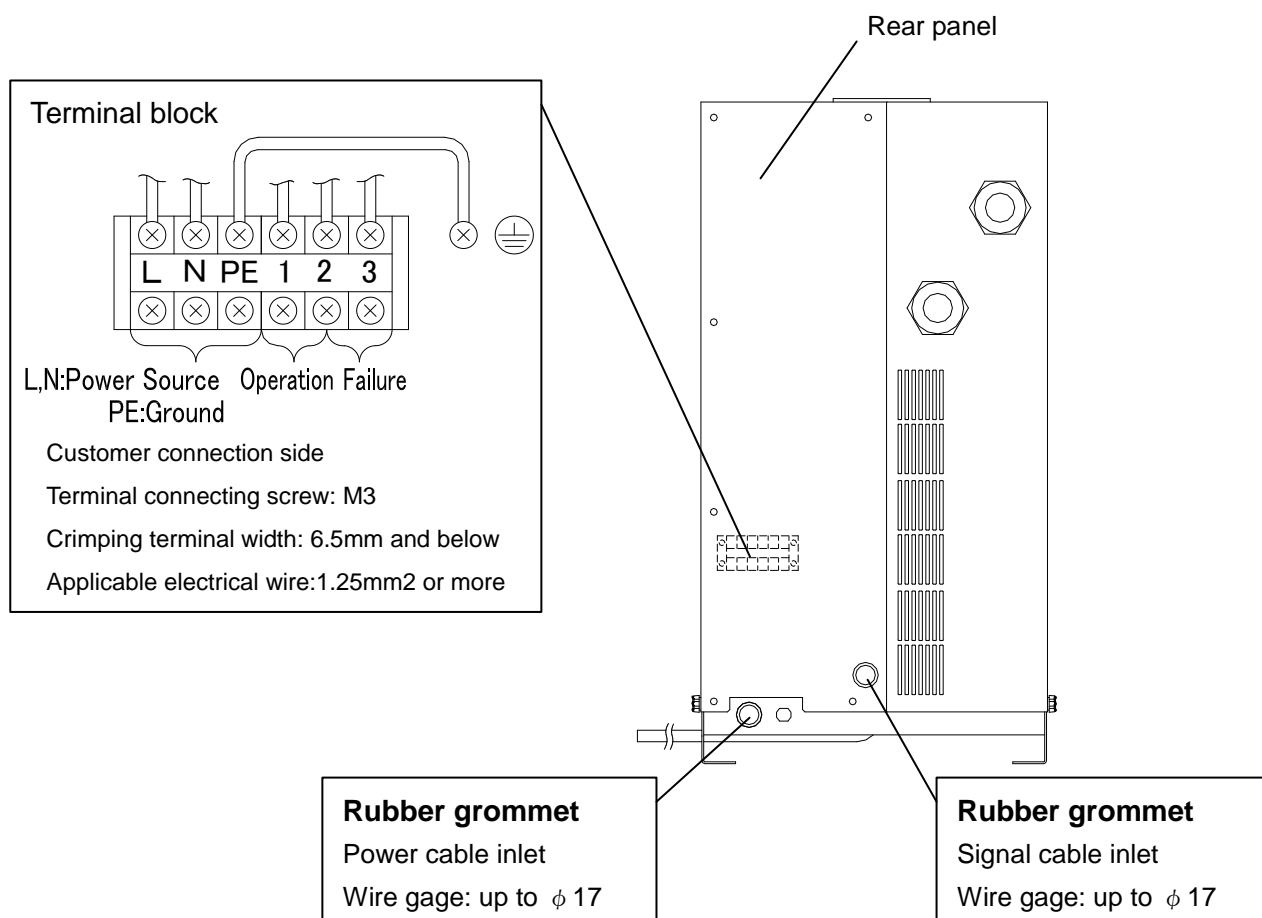
- For the remote operation, turn on and off the power supply side under the condition of the Switch with Lamp ON.
- Ensure at least 3 minutes is left after the unit is stopped before restarting it, even for the remote operation. If the product is restarted within less than 3 minutes, protective equipment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

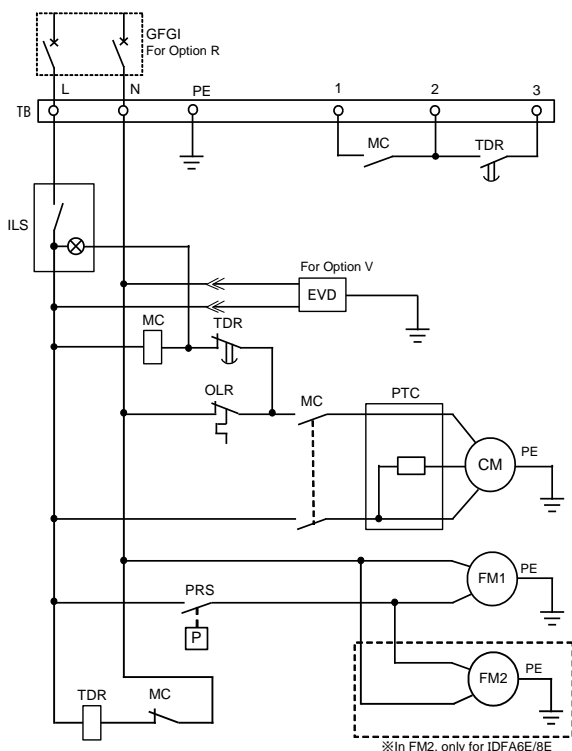
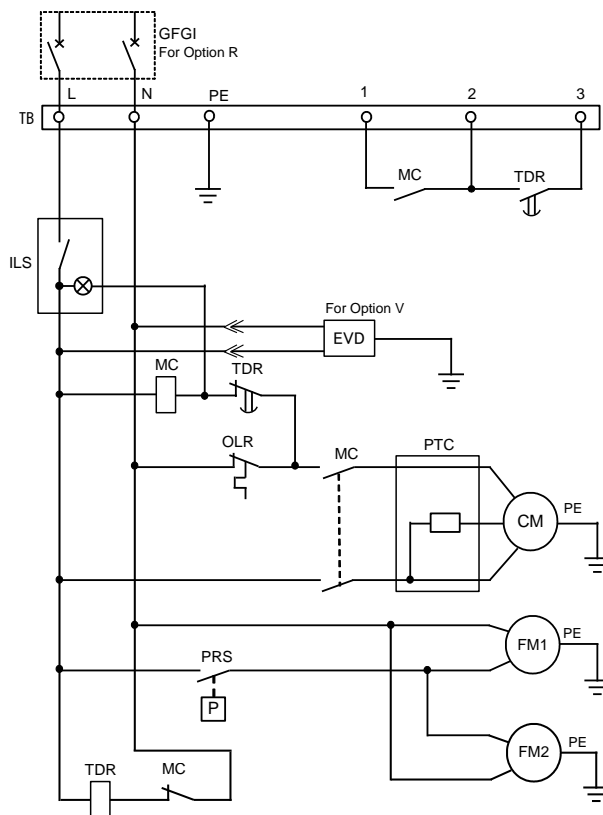
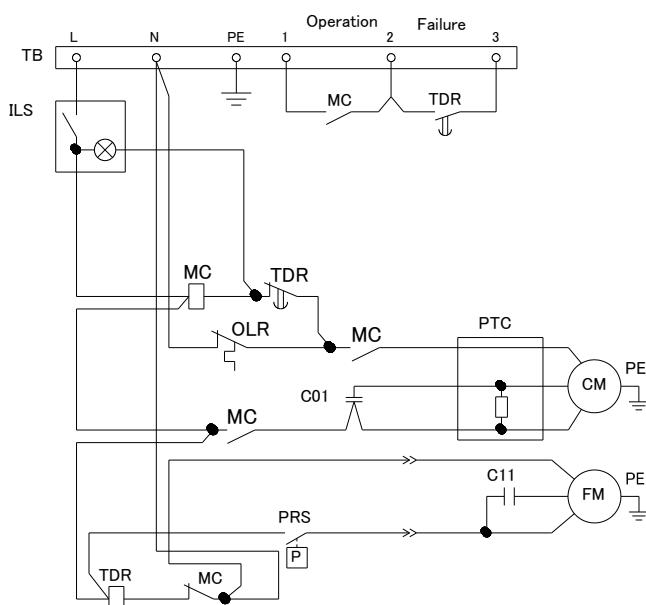
Additionally, the frequency to start and stop the operation must be restricted to 5 times per hour (to prevent breakage of the motor).

12-4 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.
- 3) Connect the power cable to the terminal.
- 4) 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.
- 5) Connect the signal cable to the each terminal.
- 6) Put back the rear panel.



12-5 Electric circuit**IDFA4E to 8E-23-T****IDFA11E-23-T****IDFA15E1-23-T**

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
C02	Capacitor for Starting Compressor Motor
C11	Capacitor For Running Fan Motor
RY	Starting Relay
GFCI	Ground Fault Circuit Interrupter
EDV	Electronic Drain Valve



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 13-3 for maintenance work.

For IDFA4E/6E/8E/11E/15E1

13-1 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 repalcing 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 toucing 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 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.

13-2 Specifications

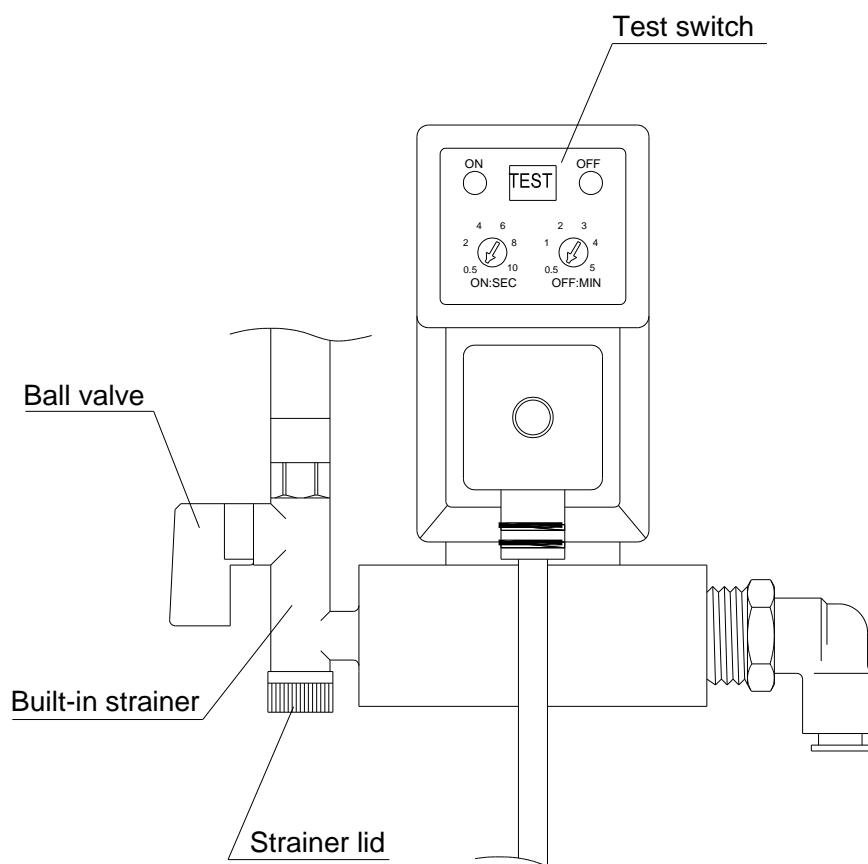
The timer is set to have ON time of 0.5sec and OFF time of 0.5min. at the time of shipment from the factory. Do not change this timer setting. If it is changed, water could be discharged from the outlet line of the dryer. Service parts number will change depending on the power supply voltage of the dryer.

Model	IDFA4E to 15E1-23-V
Order number (service parts)	IDF-S0198
Max. operating pressure	1.6MPa
Power supply voltage of drain timer	AC230V±10% (50Hz)
ON time	0.5sec
OFF time	0.5min

13-3 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.



13-4 Electric circuit

The power supply of timer operated auto drain is connected to the dryer main unit. Customers do not have to wire

For details of the electric circuit, refer to the label on the back of the front panel of this product (see page 1-1).



Service Record

14-1 Service Record

It is recommended to keep a maintenance/service record.

Parts No.	Description	Maintenance/Service Work Description	Date

Revision
Revision C : Oct, 2020

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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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