



Operation Manual

PRODUCT NAME

Refrigerated Air Dryer

MODEL / Series

IDF1E-10

IDF2E-10

IDF3E-10

IDF3E-20

IDF4E-10

IDF4E-20

IDF6E-10

IDF6E-20

IDF8E-10

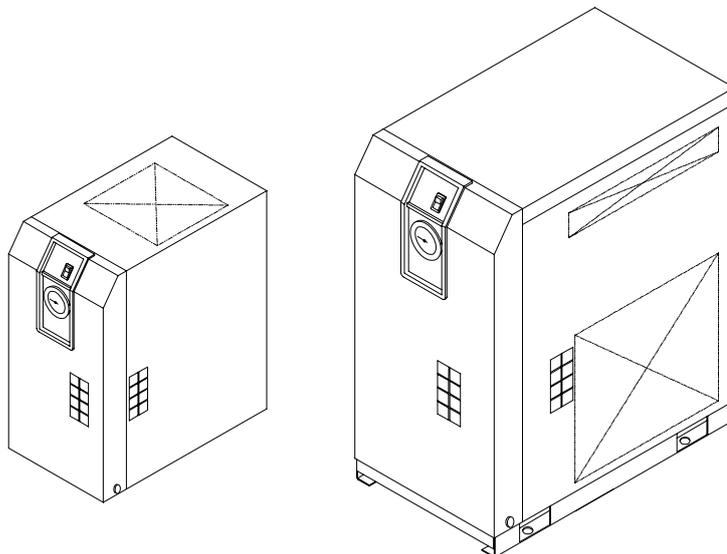
IDF8E-20

IDF11E-10

IDF11E-20

IDF15E-10

IDF15E-20



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

To Customers

Thanks for purchasing SMC Refrigerated Air Dryer.

This operation manual must be read and understood throughoutly before handling. It provides all essential information for maximizing product operating efficiency, as well as, for safe and longer life span operation.

For safety operation of SMC Refrigerated Air Dryer, read thoroughly and follow stated safety instructions, as well as regulation stated within ISO 4414^{*1} & JIS B 8370^{*2}.

*1) ISO 4414: Pneumatic fluid power – Recommendations for the application of equipment to transmission and control systems.

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

This manual explains about 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 product for the installation and operation of the product are qualified to perform installation and operation.

The contents of the operation manual and the other documents attached to the product cannot become a part of the contract clause or cannot change and modify existing agreements, promises, and relationship.

Any statements contained in the operation manual cannot be newly guaranteed and modify existing guarantee certificate.

You are not allowed to copy any part of this operation manual for usage of third person without informing it to us beforehand.

<p>Caution: Please understand that the contents of this operation manual are subject to changed without previous notice.</p>
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Safety Instructions



Before use, read and comprehend important cautionary notification well on this operation manual.

i – 1 **Warning: Before Using Air Dryer**

In this chapter, the stated contents are especially about safety way to use the product. for customer.

An Air Dryer is installed on the downstream of the air compressor to remove moisture. We, manufacturer, cannot take any responsibility if you use it for any other purpose.

An Air Dryer works with high voltage and has some parts that gets hot or rotates during operation. Ask vendor if you need component replacement and servicing.

Not only people handle the air dryer but every people who perform maintenance on or do works related to it should read safety instructions on this operation manual before handling.

This operation manual is not a general safety manual which is practiced by safety training representatives.

People who handle this product or work around it need to take training to comprehend inherent risks of it and master measures for safety.

It is usually responsible for super visor to follow the safety instructions, but each operator or maintenance representative should do daily operations on their own head.

Operators and maintenance representatives should take the safety of working place and work environment into account.

It is necessary to think of the safety of working place and work environment for each task

Take enough safety training before the operation training. It is very dangerous to do operation training without any safety training. Operation training must be paid attention to its safety.

Keep this operation manual handy for workers related to above contents to refer to anytime.

i – 1 – 1 Meaning of Signs: Caution, Warning, Danger

These safety instructions are intended to prevent hazardous situation and/or product damage.

These instructions indicate the level of potential hazard by signs “**Caution**”, “**Warning**” or “**Danger**”. Contents with these signs state about important instructions concerning safety. Confirm where those signs are, and read and comprehend notices and cautionary notices well before handling.

“**Caution**”, “**Warning**” or “**Danger**” is the order of importance (Danger>Warning>Caution). Followings are the meanings of those signs.



Danger

Statements with the “Danger” sign explain about conditions in which there is a possible result of serious injury or loss of life if someone handles wrongly during operation or maintenance and did not follow the procedure to avoid danger.



Warning

Statements with the “Danger” sign explain about possibilities that can result in serious injury or loss of life if someone handle wrongly during operation or maintenance and did not follow the procedure to avoid danger.



Caution

Statements with the “Danger” sign explain about possibilities that can result in injury or product damage if someone handles wrongly during operation or maintenance and did not follow the procedure to avoid danger.

i – 2 Danger Classifications / Position of Danger Warning Label

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.

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

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

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

 Warning
<p>Read with caution and pay attention to the notations of danger warning labels.</p> <p>Do not remove or rub danger warning labels.</p> <p>Confirm the positions of danger warning labels.</p>


WARNING 警告

1 Remove panels for maintenance only.

2 Never insert anything into product to ensure safety.

3 Cut power prior to maintenance to prevent electric shock.

4 Settle product to room temp. before maintenance to prevent burn or frostbite.

5 Ensure zero air pressure before replacing parts.

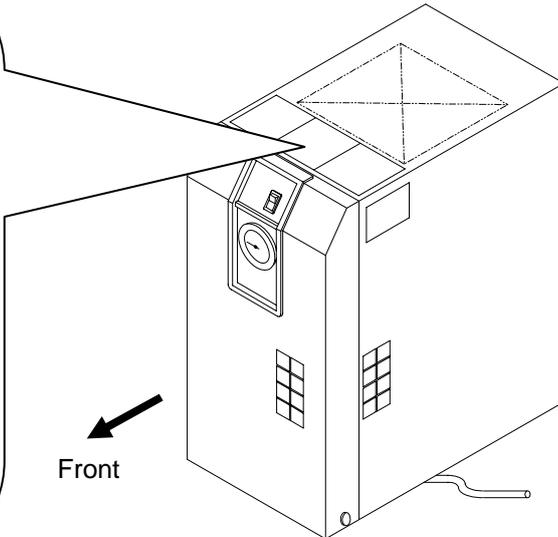
1 点検以外はパネルを取り外さないこと。

2 回転物があるので指、棒状の物を差し込まないこと。

3 感電の恐れがあるので、点検の前には電源を切ること。

4 火傷の恐れがあるので、点検の前には装置を常温にすること。

5 部品交換の前には必ず、空気圧力を“0”にすること。



Front

i – 2 – 7 Danger of Refrigerant



Caution

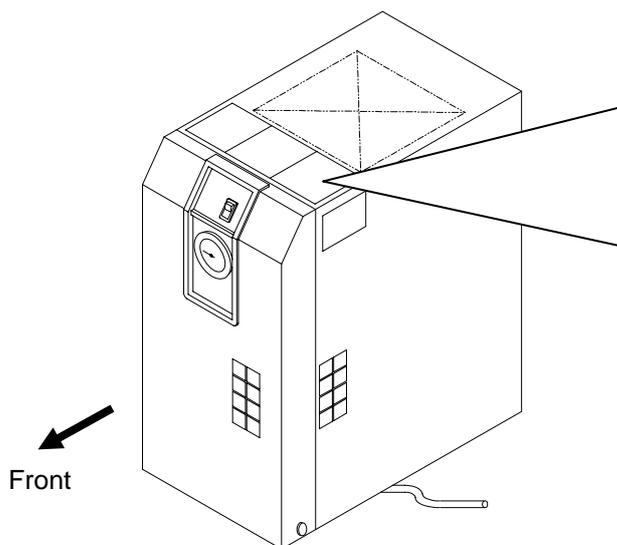
This product uses Fluorocarbon (HFC) as a refrigerant.

This product is specified by “Class 1 Fluorocarbon Collection and Destruction Law in Japan.”

It is strictly forbidden to emit Fluorocarbon to the atmosphere. Before you repair this product, you should collect the refrigerant with “Refrigerant collector.” Then, ask a destruction agency to dispose of collected refrigerant. No one but someone have enough knowledge and experience about the product and incidental device should do the collection of the refrigerant.

No one but service person or qualified person should remove the cover panel of the product.

The quantity and the sort of the Fluorocarbon are mentioned on the specification label that are explained on Page i – 8.



Act for Rationalized Use and Proper Management of Fluorocarbons
フロン排出抑制法 第一種特定製品

- This product uses Fluorocarbon (HFC) as a refrigerant.
- 1 It is prohibited to release fluorocarbons without permission.
 - 2 For the disposal of the product, fluorocarbons must first be collected.
 - 3 The number and quantity of the refrigerant of the fluorocarbon used for this product is shown on the product label.
 - 4 GWP values of the calculated leakage of fluorocarbons to be reported are as in the table below.

- この製品には冷媒として、フロン類 (HFC) が使用されています。
- 1 フロン類をみだりに大気中に放出することは禁じられています。
 - 2 この製品を廃棄する場合には、フロン類の回収が必要です。
 - 3 本製品に使用している、フロン類の冷媒番号、量は、型式銘板に記載されています。
 - 4 算定漏えい量の報告に使用する、フロン類のGWP値は以下になります。

Refrigerant No.	R134a	R407C	R410A	R404A
GWP values	1430	1770	2090	3920

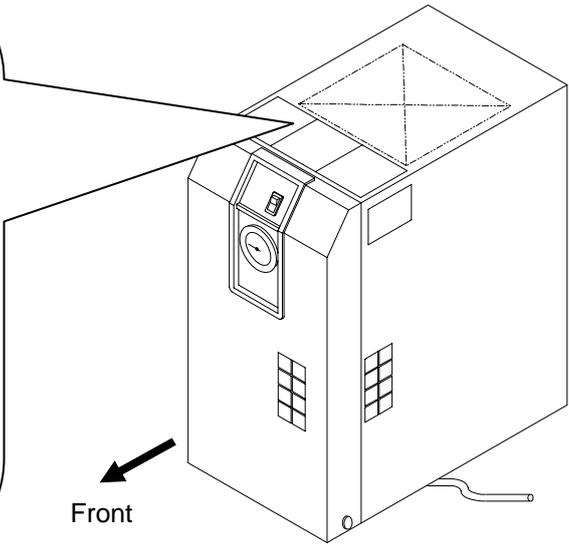
i - 2 - 8 Cautions about Usage

 Warning
<p>Read with caution and pay attention to the notations on danger warning labels.</p> <p>Do not remove or rub danger warning labels.</p> <p>Confirm the positions of danger warning labels.</p>


CAUTION 注意

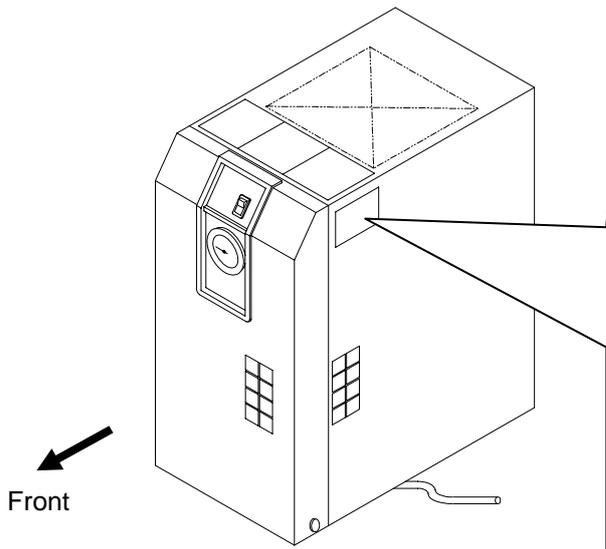
- 1 Read manual before operation.
- 2 Ensure ventilation and maintenance space.
- 3 Keep water away from the product.
- 4 Secure In / Out connector with spanner during piping.
- 5 Wait 3 minutes before restart.
- 6 Ensure Running Condition / Evaporating Temp. in green zone.

- 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。



i - 2 - 9 Other Label

Confirm the model, contents of specifications on the label.



IDF ** E - **

-

VOLTAGE

RUNNING CURRENT

REFRIGERANT

WEIGHT

MAX. PRESS.

SERIAL No.

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


1550515060001


MADE IN

G

Specification Label

i – 3 Disposal

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

 Caution
<p>A sort of Fluorocarbon (HFC) is used for this product as refrigerant.</p> <p>This product is specified by “Class1 Fluorocarbon Collection Destruction Law in Japan.”</p> <p>It is strictly forbidden by the law to emit the refrigerant to the atmosphere. Before you repair this product, you should collect the refrigerant with “Refrigerant collector.” Then, ask a destruction agency to dispose of collected refrigerant.</p> <p>No one but someone who has enough knowledge and experience about the product and incidental devices should do the collection of the refrigerant.</p> <p>No one but a service person or qualified person should remove the cover panel of the product.</p> <p>The quantity and the sort of the Fluorocarbon are printed on the specification label.</p>

 Caution
<p>Dispose of the refrigerant and refrigerant oil according to the bylaw or regulation of local government.</p> <p>Do not dispose of refrigerant oil together with domestic garbage. And do not burn it in unauthorized incinerators.</p> <p>No one but someone who has enough knowledge and experience about the product and incidental devices should do the collection of the refrigerant oil.</p> <p>No one but a service person or qualified person should remove the cover panel of the product.</p> <p>If there are something not clear, please contact our service office.</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.

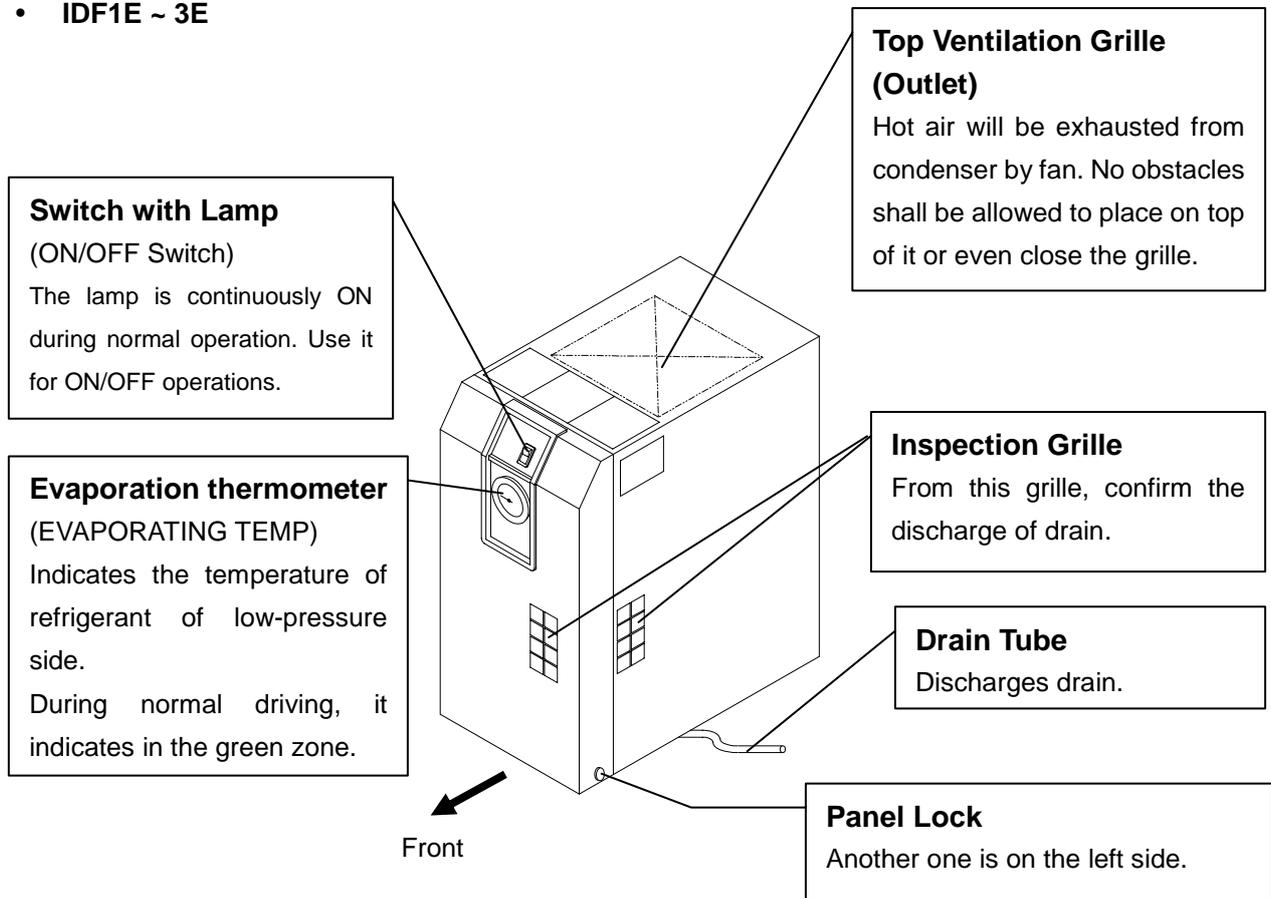
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contact if necessary.

If anything is unclear, contact your nearest sales branch.

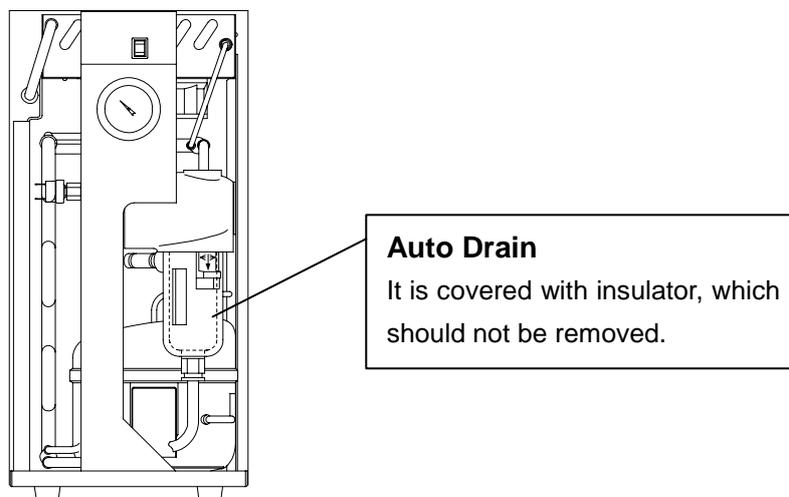
1 Parts Name and Functions

1-1 Parts Name and Functions

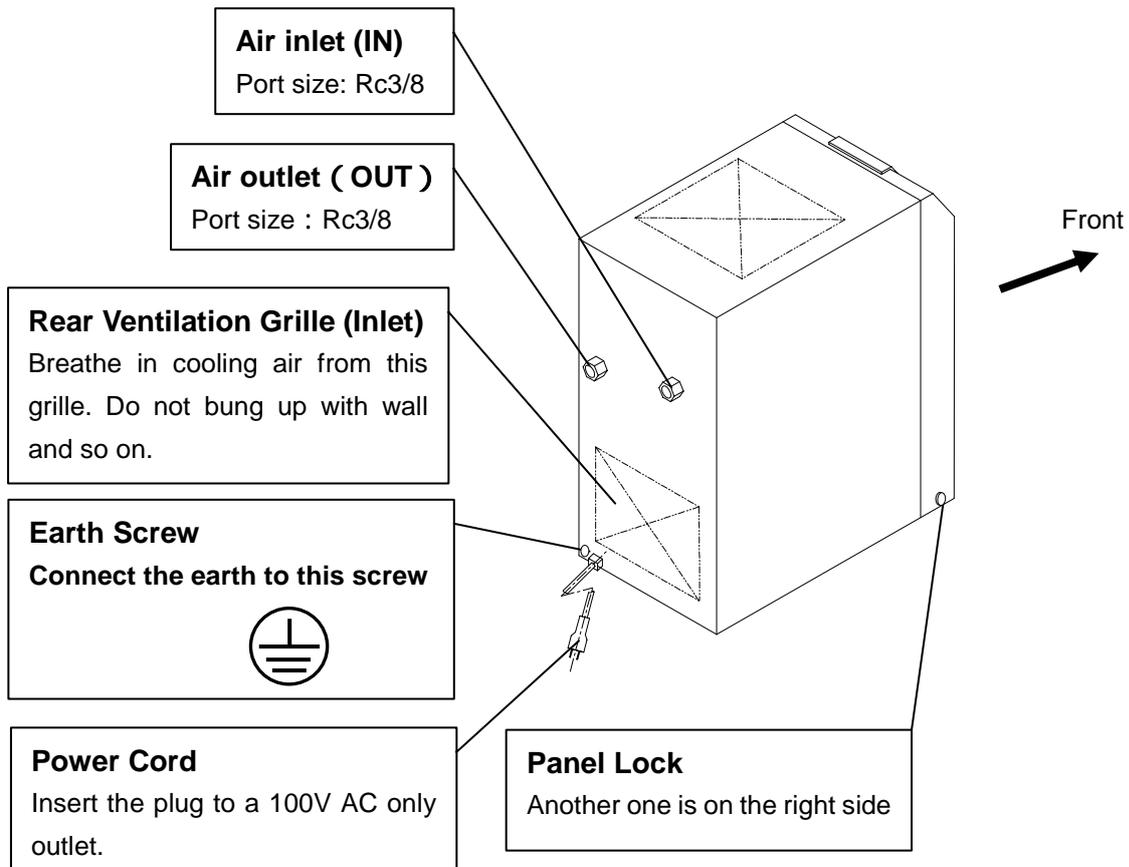
- IDF1E ~ 3E



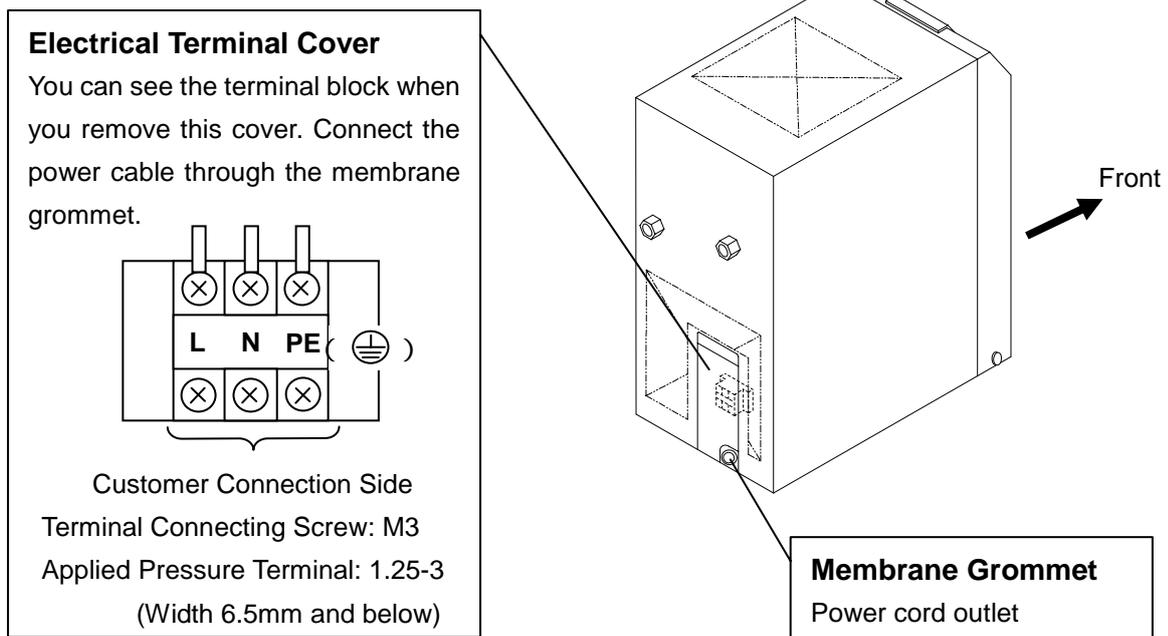
No Front Panel



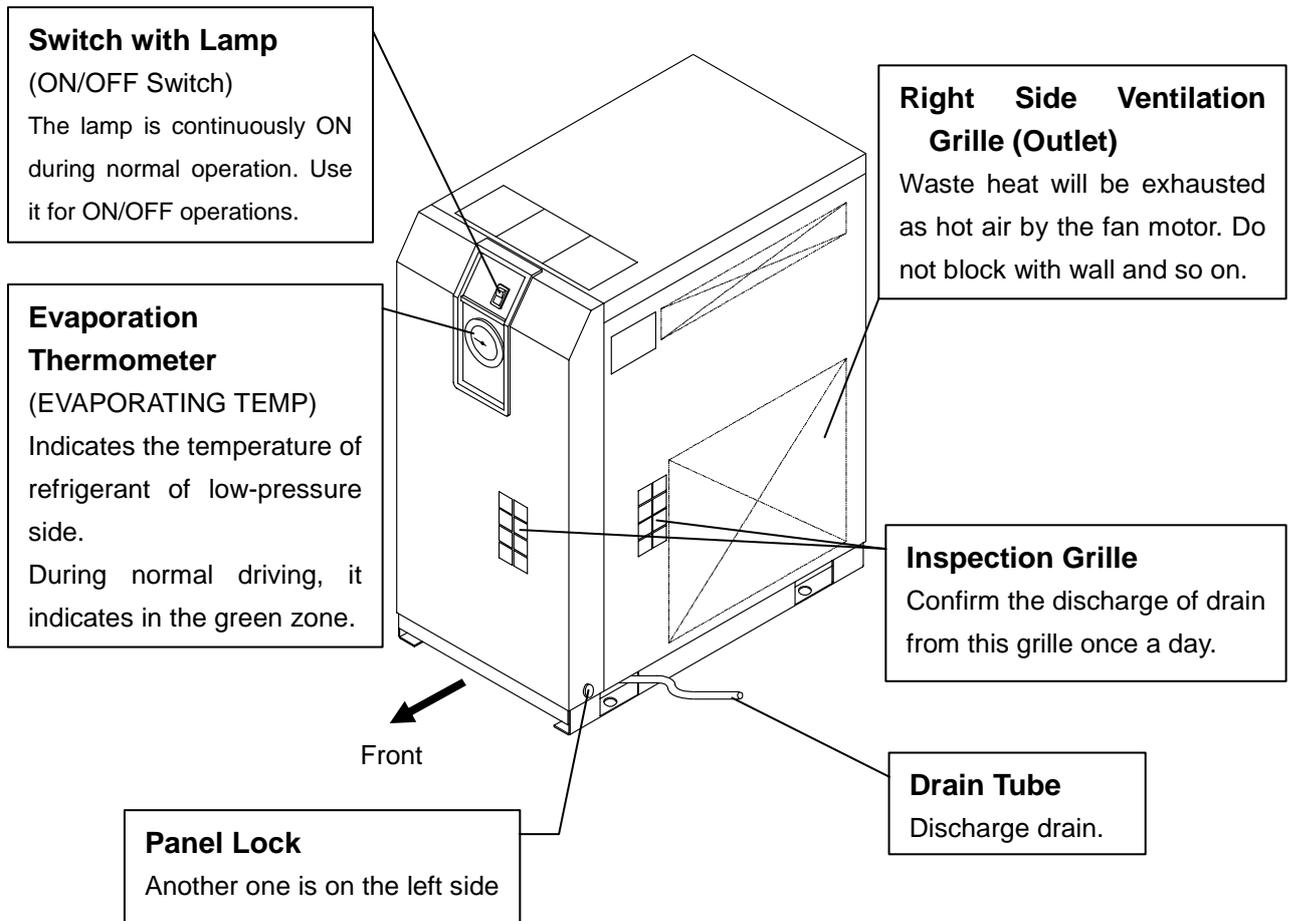
• **IDF1E ~ 3E-10 (100V AC specification)**



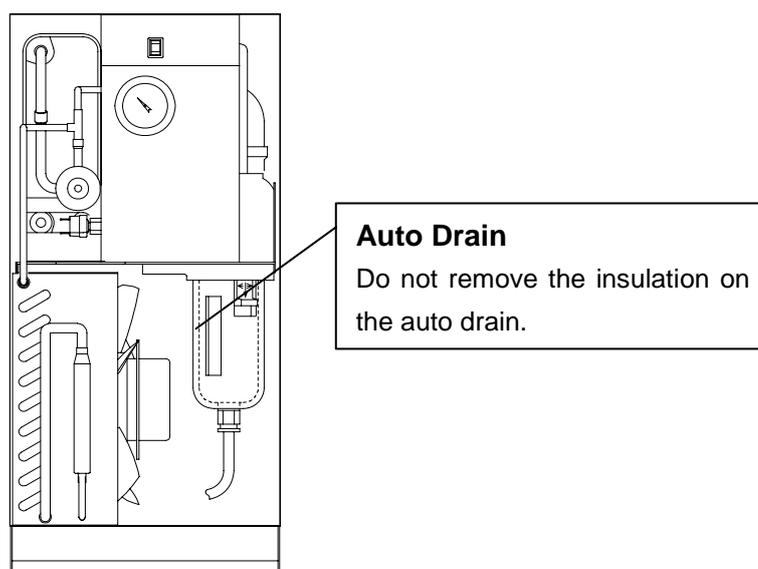
• **IDF3E-20 (200V AC specification)**



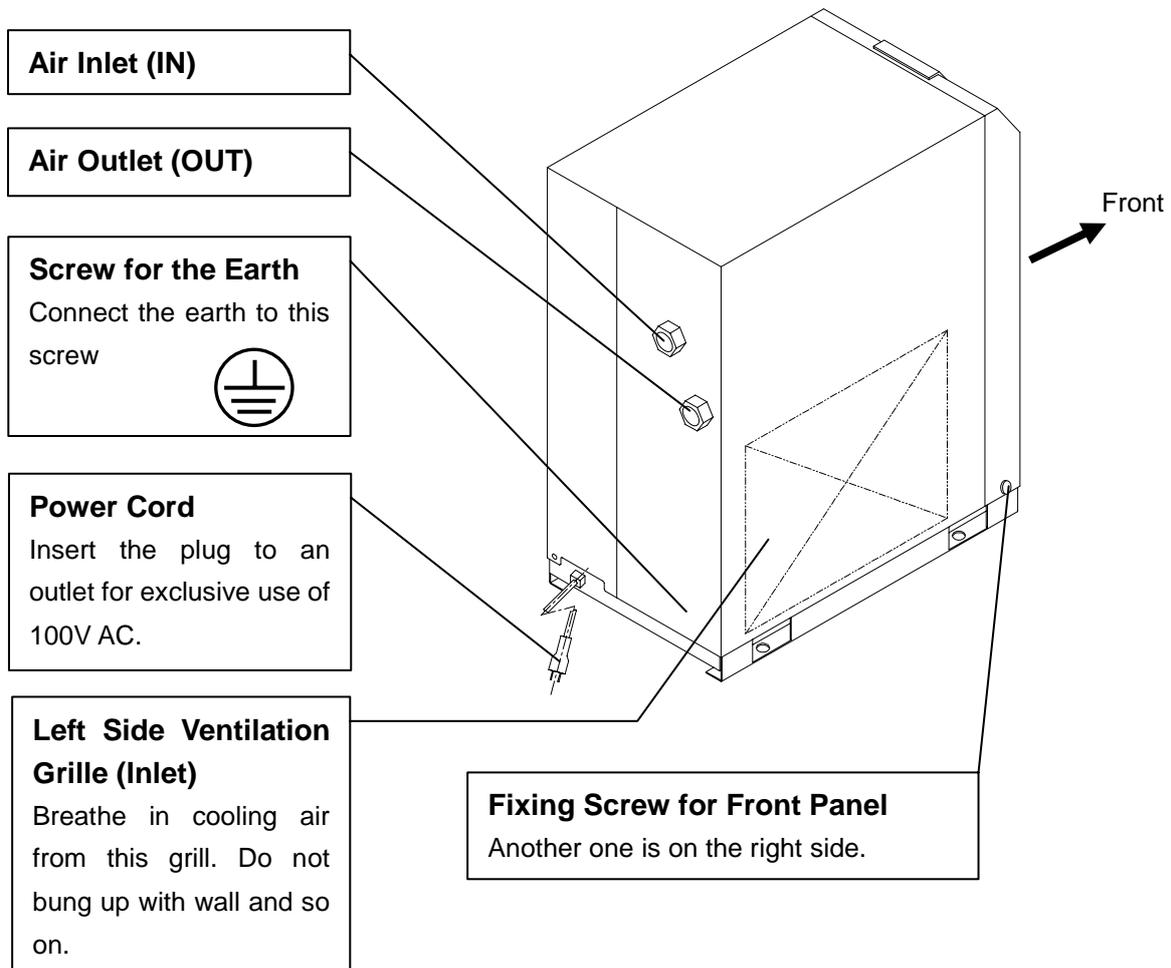
• IDF4E ~ 15E



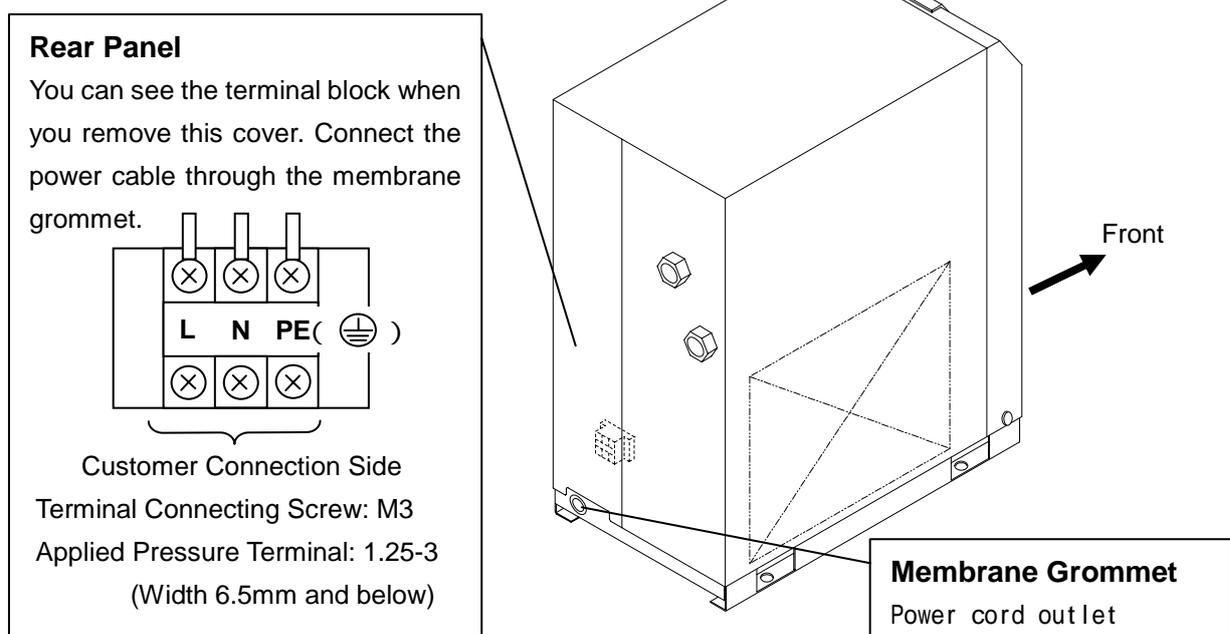
View with Front Panel removed



• IDF4E ~ 15E-10(100V AC specification)



• IDF4E ~ 15E-20 (200V AC specification)





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 these instructions below.

- You should uplift the product from the base surface with careful attention to prevent falling sideways and drop.
- Do not bring the product lying sideways. If you lay it sideways, it will be broken.
- Do not hang up the product.
- 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

Those instructions above must be followed because the product is so heavy that it carries a great risk to transport.

IDF4~11E are 20kg or more. They must be transported by more than one person, a forklift and so on.

IDF15E is 46kg or more. They must be transported by forklift.

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 : 6001500 mm
 Rear : 600400 mm
 Top : 600400 mm
 Right : 600400 mm
 Left : 600400 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.

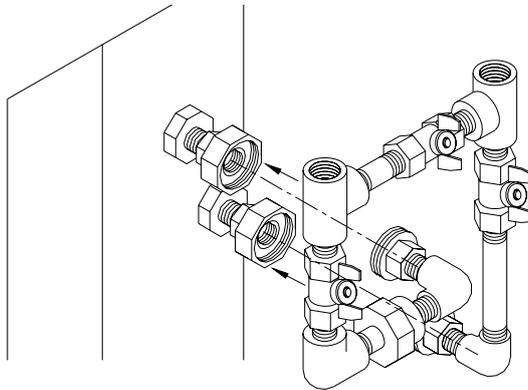
2 - 2 - 2 Anchorage

- The air dryer should be installed on a vibration-free, stable, horizontal flat surface.
- Refer to "Chapter6 6-2 Dimensions" for the dimensions.
- IDF4E~15E should be bolted by anchor bolts to prevent falling. We recommend the anchor bolt sets that we are selling separately as accessories.

2 - 2 - 3 Air piping

- Connection to the inlet and outlet of compressed air should be made removable by using union and so on.
- Pressing the hexagonal fitting with screw wrench and so on, connect the air piping fittings to the body.
- When mounting any part such as an air filter on the fitting at the compressed air inlet or outlet port, support the part to prevent excessive force from being applied to the product.
- Be careful not to let the vibration of the air compressor transmit.
- If the temperature of compressed air on the inlet side is higher than 50°C, place an aftercooler after the air compressor. Or, make the temperature of the place where the air compressor is installed lower than 50°C.

- Flash the piping sufficiently in order to avoid any foreign substances such as dust, sealing tape, liquid gasket, etc. when piping before piping connection. Foreign substances in the piping can cause cooling failure or drainage failure.
- Use pipes and fittings that have enough endurance against the operating pressure and temperature. And connect it firmly to prevent air leakage.
- Provide bypass piping to make it possible to do maintenance without stopping the air compressor.



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

The bypass piping sets

2 - 2 - 4 Drain Tube

- A polyurethane tube 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
<p>No one but qualified person should do the wiring work.</p> <ul style="list-style-type: none"> • 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.

There are two methods depends on model (specified power).

IDF1E-10 ~ 15E-10 (100V specified)

- Insert the power plug into an outlet of 100V AC.
Install a Ground Fault Circuit Interrupter(GFCI) to the power supply (sensitivity of leak current 30mA and rated current 10A). (Prepare by yourself)
- Do not extend the power cable using power strip and so on. That causes decrease of the voltage and the product cannot be operated.

IDF3E-20 ~ 15E-20 (200V specified)

- 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 10A). (Prepare by yourself)

Specification of power cable

Prepare following power cable.

Power cable: 1.25mm^2 (16AWG), Three-cores (including the earth), External diameter: about 8 ~ 12mm

Additional length of about 0.1m 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 about Reinstallation

	Caution
<p>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.</p>	

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
<p>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.</p>	

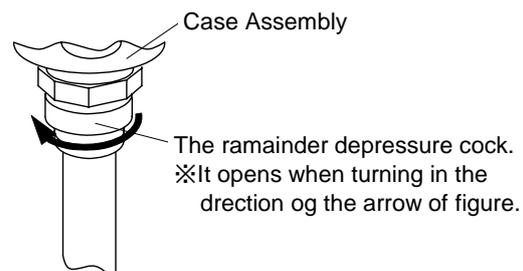
Disassembly of the air piping

	Warning
<p>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.</p>	

- 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 a trial running, check following points.

- **Installed Condition**
By visual inspection check that the product is installed horizontally.
The product make sure the product is fixed enough with anchor bolts.
Do not place heavy obstacles on the product and add unreasonable loading by piping and so on.
- **Wiring Connections**
Power cord, and the earth should be connected firmly.
- **Drain Tube**
Drain tube should be connected correctly.
- **Air Piping**
Make sure the piping for compressed air is connected correctly. Those valves of IN / Out side of the product and of the bypass piping should be completely fasten.

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: IDF1E ~ 3E: Top Ventilation Grille
IDF4E ~ 15E: 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 can cause troubles.

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 emitted from the drain outlet at the beginning of opening the IN side valve. Keep in mind that sometime the pressure cannot increase enough with air compressor that has low discharge flow rate.

3 - 3 **Shutdown**

- Turn off the illuminated switch.
- The lamp will go out and then, the operation will be stopped. 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, which is not an abnormality but a process for safety shutdown.

3 - 4 **Cautions about restart**

- One must wait for at least 3 minutes before restarting 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 3~10°C 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 interval shown in this operation manual depend on the operating conditions (ambient temperature, installation environment, etc.), so that they are for reference .

- Table 1. List of parts to be replaced regularly

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

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

4-2-3 Cleaning of Auto Drain Strainer

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

- Auto Drain Strainer order part number

Part No.	Name	Quantity	Applicable Model
IDF-S0001	Auto Drain Strainer	1	IDF1E, IDF2E, IDF3E, IDF4E
IDF-S0002	Auto Drain Strainer	1	IDF6E, IDF8E, IDF11E, IDF15E



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.

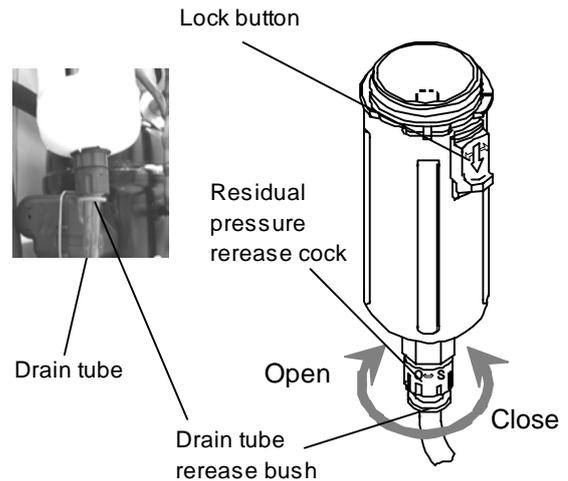
How to clean and replace the auto drain/strainer.

Please execute work through the following procedure when an auto drain and auto drain strainer are washed and you exchange it .

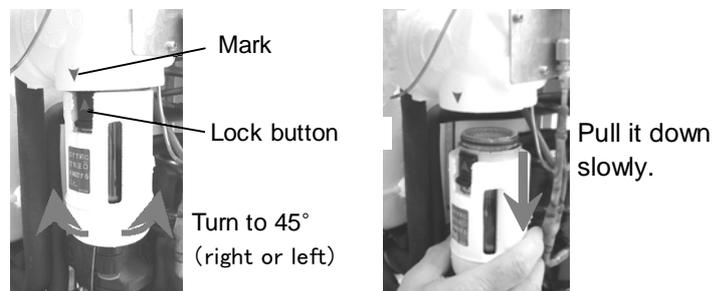
- Turn off the illuminated ON/OFF switch.
- Disconnect the earth leakage breaker at the power supply or unplug the power plug from the socket.
- Fully close the IN/OUT valves. Only open the bypass when compressed air is required during work.
- Only the point that is necessary for work please remove a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

【IDF1E ~ 11E】

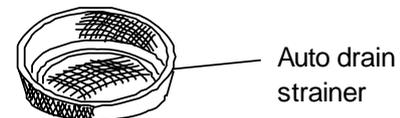
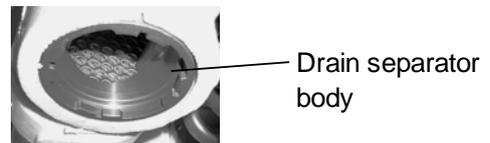
- Open the residual pressure release cock at the drain tube connection port to release air and drain fluid left in the product.
(Leave the drain tube connected and hold it with hand so that it does not get twisted.)
- Because drain may be given by air pressure left in a product like a careful.



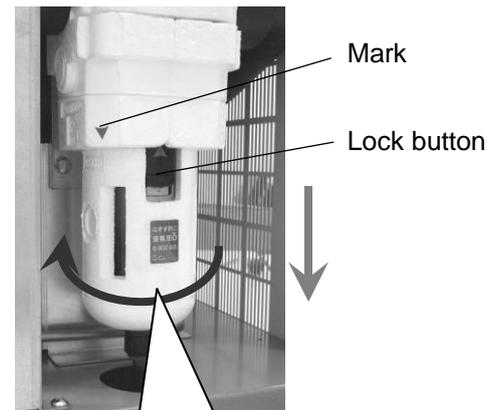
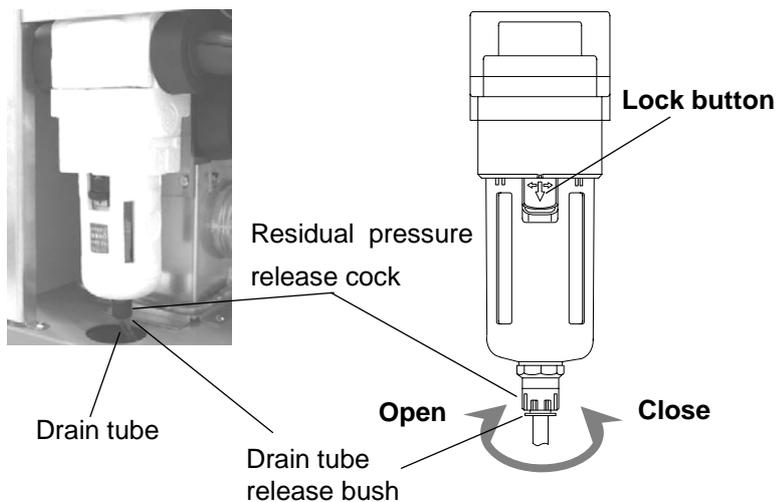
- Remove the drain tube.
Pull out the tube while pushing up the drain tube release bush.
- Hold the case assembly lightly and pull down the lock button with thumb. Then, turn the case assembly to the left (or right) to 45° to align the marks.
- Release your thumb from the lock button and slowly pull down the case assembly (vertically) to remove it.



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

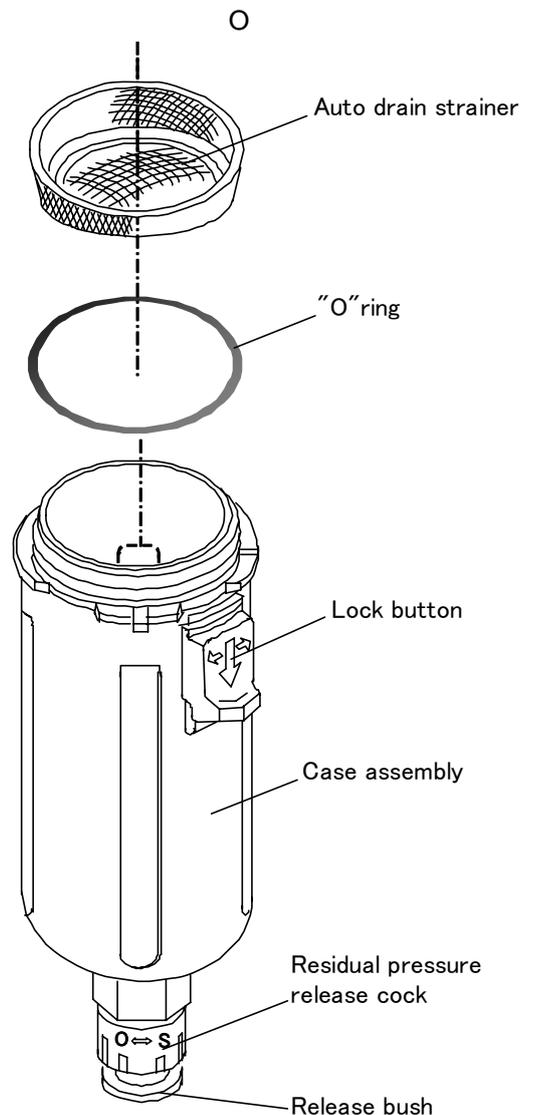


【IDF15E】



To remove the case assembly, turn it to 45 ° until the lock button and mark align. Then, pull it down slowly.

- 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.)
- Remove the tube while pushing the release bush.
- Hold the case assembly lightly and pull down the lock button with thumb. Then, turn the case assembly to the left (or right) to 45° to align the marks. Release your thumb from the lock button and slowly pull down the case assembly (vertically) to remove it.
- Remove the auto drain strainer and clean it. Take care not to cut your hand with the sharp edges of the strainer.
- Pour solution of neutral detergent into the case assembly and shake it well to clean.
- Check the case O-ring for damage such as scratches, twisting or foreign particles attached to it. Then, apply grease thinly and fit it in the groove in the case assembly.
- Fit the auto drain strainer to the case assembly and fit it into the drain separator body. Turn it until the lock button clicks. Try to turn the case assembly lightly and check that it does not turn. If it turns, start with fitting the case assembly to the body again.
- Close the residual pressure release cock and mount the drain tube and front panel as they were.
- If the auto drain strainer or case assembly is damaged or very dirty, replace it with a new one.



5 Troubleshooting

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
Air dryer does not operate and running lamp does not light on, even switch is ON.	Power cord or plug is in loosening state or completely pulling out.	Perform proper connection on the power cord and plug.
	Circuit breaker is OFF.	Confirm whether the proper capacity of the circuit breaker is used. It is not possible to restart the air dryer within 3 minutes after shutdown. Wait for 3 minutes before restarting. Resume the operation after resetting the circuit breaker to ON. If the circuit breaker still trips to OFF, failure of electrical insulation may have occurred. Remove the power supply and contact one of our agents for further instructions.
Running lamp extinguishes and compressor stops during operation but resumes normal operation illuminating the lamp after a period of time.	Installation place is poorly ventilated. Ambient temperature is too high.	Improve the ventilation system to lower the ambient temperature.
	The ventilation grilles are obstructed by wall or clogged with dust.	Install the air dryer more than 600mm away from the wall. Clean the ventilation grilles once a month.
	Temperature of the compressed air is too high.	Improve the ventilation system around air compressor or make ambient temperature around air compressor low to lower the temperature of discharge from compressor. Reduce the temperature of the compressed air by installing an additional after-cooler after air dryer.
	Supply voltage is not in the following range: 100VAC: 90V ~ 110V/90V ~ 121V (50/60Hz) 200VAC: 180V ~ 220V/180V ~ 242V (50/60Hz)	Set the voltage to a proper value by installing a transformer or review the electrical wiring.
Evaporation thermometer indicates higher than green zone.	Installation place is poorly ventilated. Ambient temperature is too high.	Improve the ventilation system to lower the ambient temperature.
	The ventilation grilles are obstructed by wall or clogged with dust.	Install the air dryer more than 600mm away from the wall. Clean the ventilation grilles once a month.
	Temperature of the compressed air is too high.	Improve the ventilation system around air compressor or make ambient temperature around air compressor low to lower the temperature of discharge from compressor. Reduce the temperature of the compressed air by installing an additional after-cooler after 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 drain pipe has been raised up or bent. Check auto drain. Check auto drain strainer.
	Confluence of piping with another unit without air dryer.	Install air dryer on the line that does not have it. 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 thoroughly.

6

References

6 - 1 Specifications

Specification		Model									
		IDF1E	IDF2E	IDF3E	IDF4E	IDF6E	IDF8E	IDF11E	IDF15E		
Rated Condition	Air Flow Rate m ³ /min (ANR)(Note 1)	50Hz	0.1	0.2	0.32	0.52	0.75	1.22	1.65	2.8	
		60Hz	0.12	0.235	0.37	0.57	0.82	1.32	1.82	3.1	
	Operating Pressure	0.7MPa									
	Inlet Air Temperature	35°C									
	Ambient Temperature	32°C									
Pressurized Dew Point	10°C										
Operating Range	Working Fluid	Compressed Air									
	Inlet Air Temperature	5 ~ 50°C									
	Inlet Air Pressure	0.15 ~ 1.0MPa									
	Ambient Temperature	2 ~ 40°C(Relative Humidity of 85% or less)									
Electrical Specification	Power source	100VAC(50/60Hz)	Single phase AC100/100 , 110V [Voltage fluctuations ± 10%]								
		200VAC(50/60Hz)	Single phase AC200/200 , 220V [Voltage fluctuations ± 10%]								
	Starting current (Note 2) A	100VAC(50/60Hz)	18/16	18/16	18/16	19/18	19/18	22/22	28/26	27/26	
		200VAC(50/60Hz)			8/8	7/8	9/8	11/10	21/20	23/22	
	Operating current (Note 2) A	100VAC(50/60Hz)	2.4/2.5	2.4/2.5	2.4/2.5	2.4/2.5	2.4/2.5	3.0/3.1	5.7/5.7	4.3/4.6	
		200VAC(50/60Hz)			1.2/1.3	1.2/1.3	1.2/1.3	1.5/1.5	3.4/3.0	3.4/3.1	
	Power consumption (Note 2) W	100VAC,200VAC (50/60Hz)	180/202	180/202	180/202	180/202	180/202	208/236	385/440	480/480	
Circuit Breaker (Note 3)	100VAC	10A									
	200VAC	5A									
Condenser	Plate fin tube type with forced air cooling										
Refrigerant	R134a (HFC) (GWP:1300)										
Refrigerant Charge(AC100V/200V)	g	70±5	115±5	150±5	180±5	200±5	250±5	260±5	350±10		
Drain Connection	Rc3/8			Rc1/2		Rc3/4			Rc1		
Drain Connection	10mm										
Coating Color	Panel: Urbanwhite 1 Base: Urbangray 2										
Weight	kg	16	17	18	22	23	27	28	46		
Applicable Compressor(Standard)	kW	0.75	1.5	2.2	3.7	5.5	7.5	11	15		

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

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

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

6 - 2 Refrigerant with GWP reference

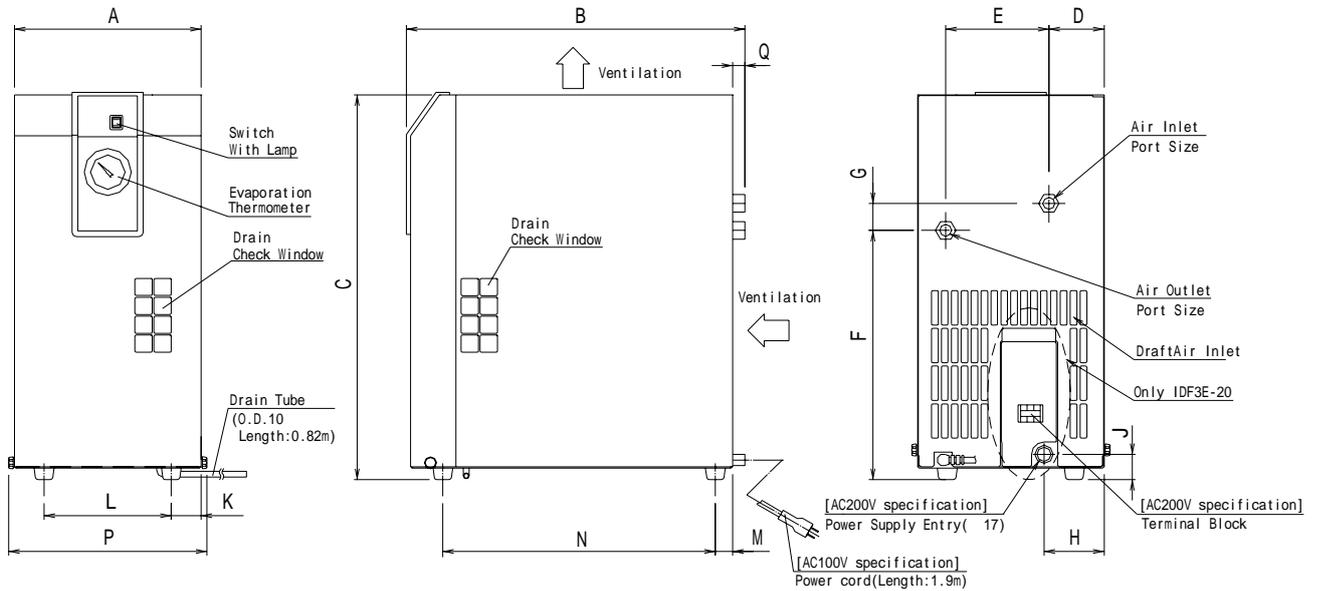
Refrigerant	Global Warming Potential (GWP)	
	Regulation (EU) No 517/2014 (Based on the IPCC AR4)	Revised Fluorocarbons Recovery and Destruction Law (Japanese law)
R134a	1,430	1,430
R404A	3,922	3,920
R407C	1,774	1,770
R410A	2,088	2,090

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

Note 2: See specification table for refrigerant used in the product.

6 - 3 External Dimensions

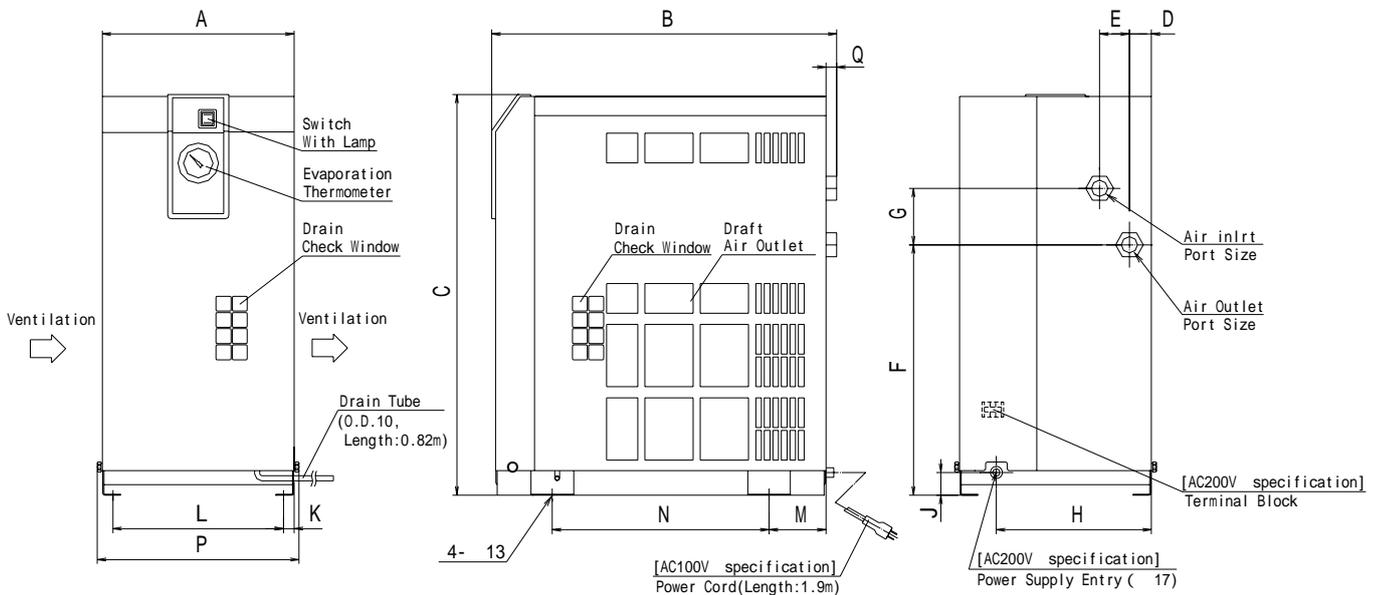
IDF1E / IDF2E / IDF3E



measure : mm

Model	Port size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
IDF1E	Rc3/8	226	410	413	69	101	270	32	-	-	38	150	21	330	240	15
IDF2E	Rc3/8				51	125	232	138					24	327		
IDF3E	Rc3/8				473	67	125	304					33	73		

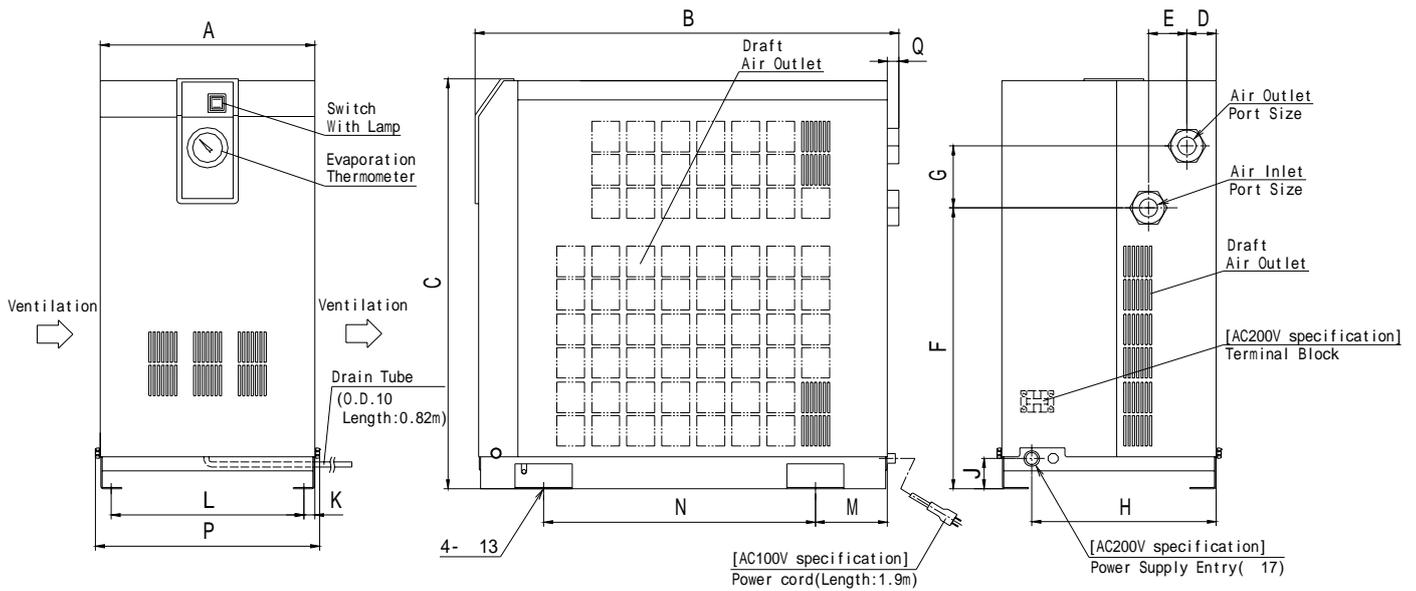
IDF4E / IDF6E / IDF8E / IDF11E



measure : mm

Model	Port size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q		
IDF4E	Rc1/2	270	453	498	31	42	283	80	230	32	15	240	80	275	284	13		
IDF6E	Rc3/4		455													300	15	
IDF8E	Rc3/4		485													568	355	300
IDF11E	Rc3/4		485													568	355	300

IDF15E

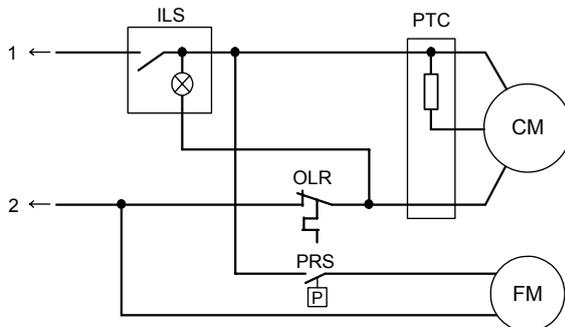
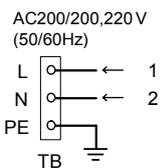
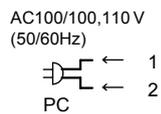


measure : mm

Model	Port size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
IDF15E	Rc1	300	603	578	41	54	396	87	258	43	15	270	101	380	314	16

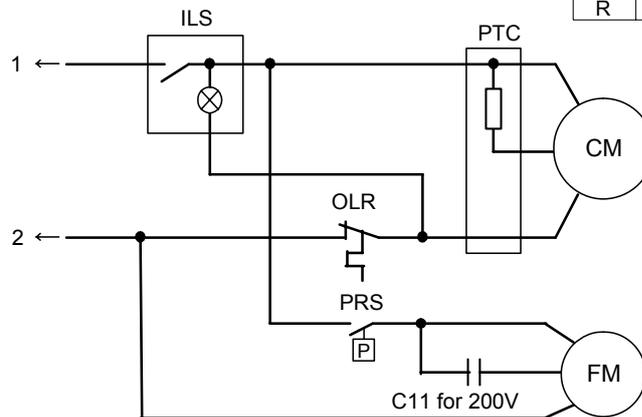
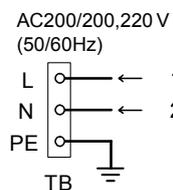
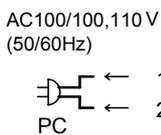
6 - 4 Electrical Circuit

• **IDF1E ~ 3E**

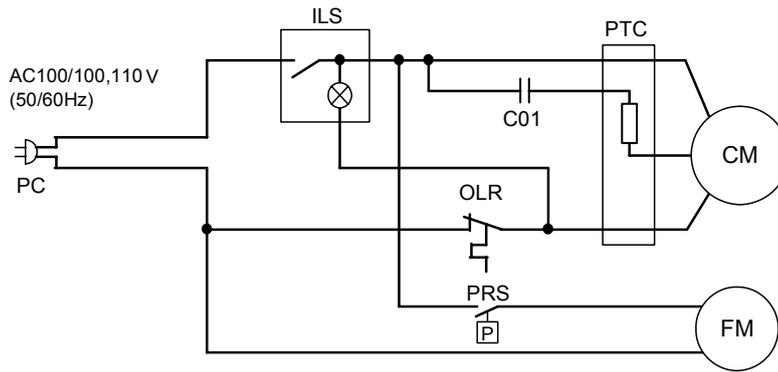


SYMBOL	DESCRIPTION
CM	Compressor Motor
FM	Fan Motor
OLR	Overload Relay
PTC	PTC Starter
ILS	Switch with Lamp
PRS	Pressure Switch
C01	Capacitor For Running Compressor Motor
C02	Capacitor For Starting Compressor Motor
C11	Capacitor For Running FAN Motor
TB	Terminal Block
TM	Terminal Block
RY	Starting Relay
PC	Power Supply Code
R	Resister

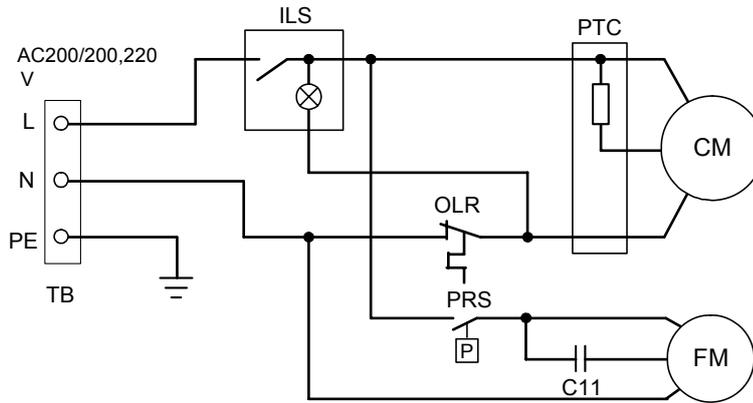
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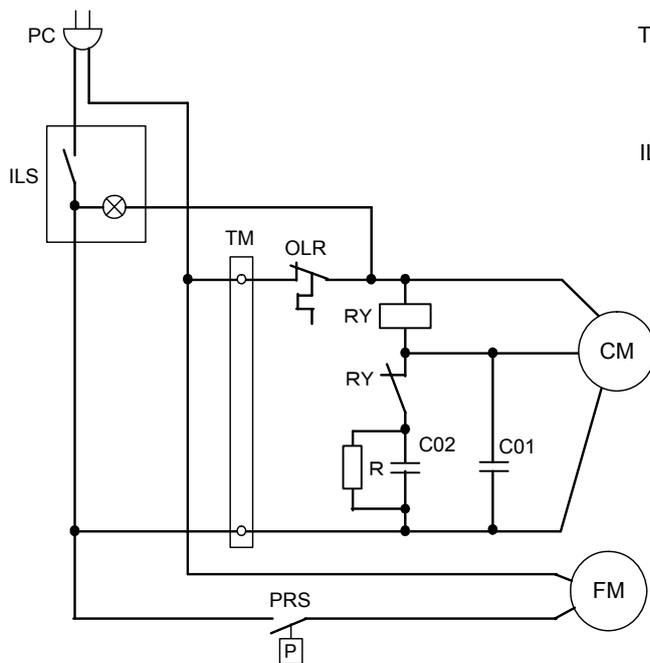
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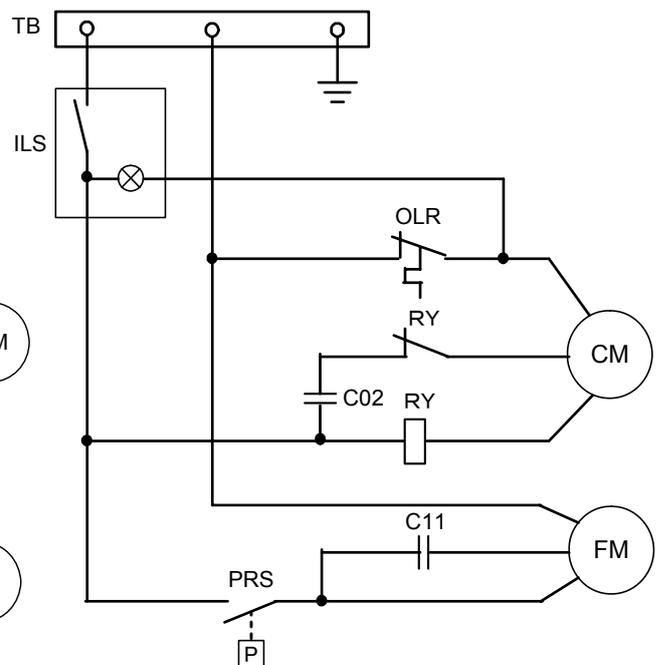
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• IDF15E-10

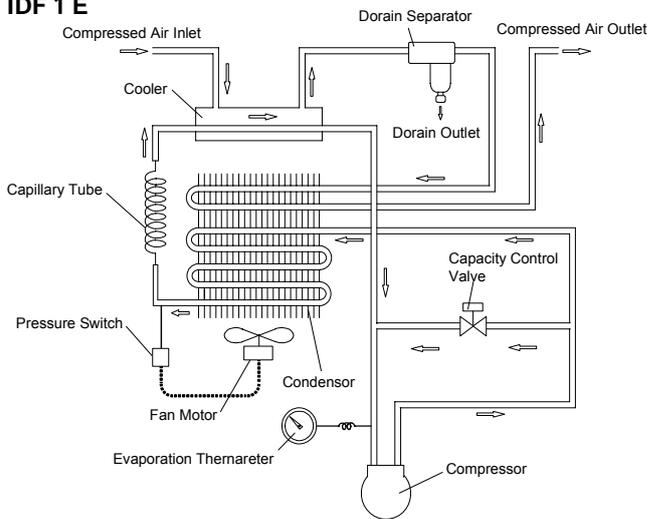


• IDF15E-20

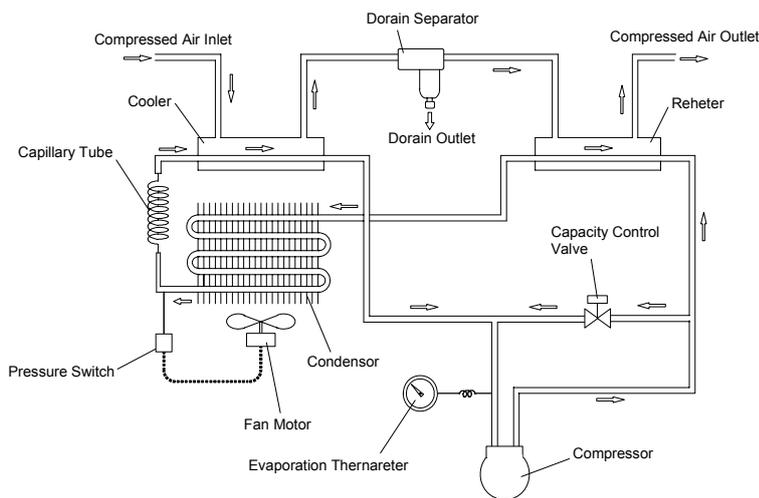


6 - 5 Compressed Air and Refrigerant Circuit / Operation Principles

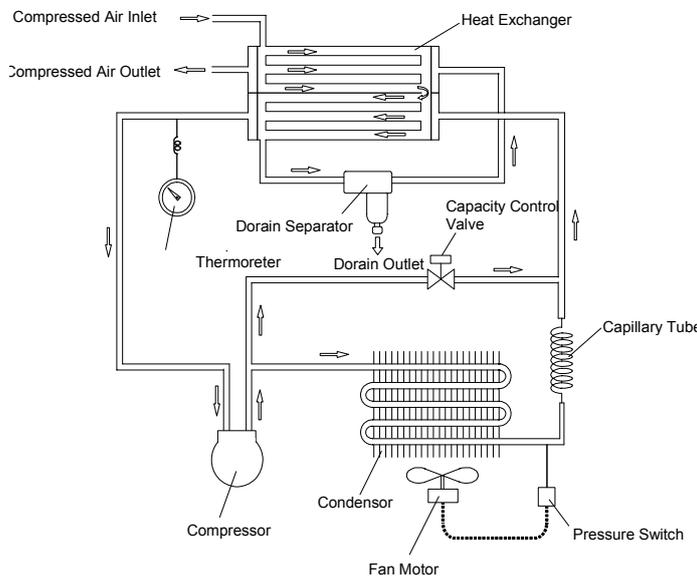
• **IDF 1 E**



• **IDF2E , IDF3E**



• **IDF4E , IDF6E , IDF8E , IDF11E , IDF15E**



Compressed Air Circuit

Humid hot air entering air dryer is cooled in the cooler. At this time, the condensed moisture is separated from the air by the drain separator and automatically discharged. The dried clean air is heated by the reheater until it gets about the same temperature as that of ambient air. It is then discharged from air dryer outlet.

Refrigerant Circuit

The Fluorocarbon charged in the refrigerant circuit is compressed by the compressor and cooled by the condenser to become liquid. Then, going through the capillary tube, it is decreased the pressure to reach a low temperature. Passing through the cooler part, it draws heat from compressed air and intensely boils. Finally it is inhaled into the compressor again. The capacity control valve opens to prevent dew drops from freezing when compressed air is cooled enough.