



Operation Manual

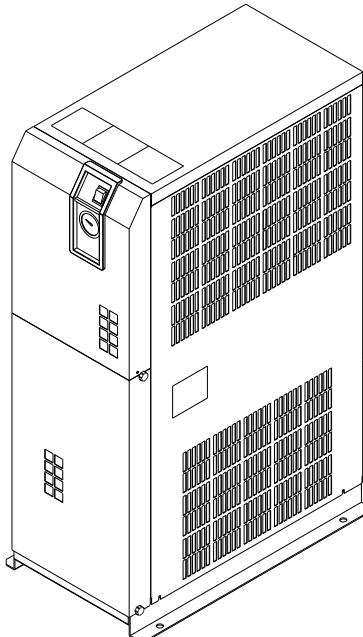
PRODUCT NAME

Refrigerated Air Dryer

MODEL

IDU15E1-10 (-C,K,L,M,R,S,T)

IDU15E1-20 (-C,K,L,M,R,T)



This manual is intended to explain the installation and operation of the product. Only people who understand the basic operation of the product, or have basic knowledge and ability to handle industrial machinery, are allowed to work on the product.

Keep this manual available whenever necessary.

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SMC Corporation

Foreword

Thank you for purchasing SMC's refrigerant type air dryer (hereinafter referred to as the "product").

For safety and long life of the product, be sure to read this Operation Manual (hereinafter referred to as the "manual") and clearly understand the contents.

- The instructions described in this manual must be followed in addition to ISO 4414*1) and JIS B 8370*2) and other safety regulations.

*1) ISO4414: Pneumatic fluid power – Recommendations for the application of equipment to transmission and control systems.

*2) JIS B 8370: General rules for pneumatic equipment.

- This manual is intended to explain the installation and operation of the product. Only people who understand the basic operation of the product through this manual, or who install and operate industrial machinery and have basic knowledge and ability to handle such equipment, are allowed to work on the product.
- This manual and other documents attached to the product do not constitute a contract, and will not affect any existing agreements or commitments.
- It is strictly prohibited to copy this manual entirely or partially for use by a third party without prior permission from SMC.

Note: This manual is subject to change without prior notice.

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Safety Instructions



Before using the product be sure to read and understand all the important actions highlighted in this manual.

i.1 Warning: Before using this product

This chapter is intended to specifically describe the safety related issues for handling the product. Read this before handling the product.

- The product is designed to dehumidify compressed air. SMC does not take any responsibility for any problems that may arise from using the product for other purposes.
- The product is operated at high voltage and contains components which become hot and rotate. If a component needs to be replaced or repaired, contact a specialized vendor for parts and service.
All personnel who work with or around the product should read and understand the safety related information in this manual carefully before starting work.
- This manual is not a comprehensive manual covering safety and health related issues. This should be handled by a person in charge of safety training.
- All personnel who work with or around the product should have sufficient knowledge about the dangers inherent to the product and be trained in safety measures.
- The safety manager is responsible for strictly observing safety standards, but responsibility in respect to safety standards during daily work resides with each individual operator and maintenance personnel.
- The operator and maintenance personnel should consider work places and environments for each task with due consideration of safety issues.
- It is necessary to undergo appropriate general safety training before being trained about this product.
Training without having sufficient knowledge about safety is very dangerous. Training must not be conducted without consideration to safety.
- This manual must be kept available to the operator whenever necessary.
- If the product is subjected to a short power outage (including voltage sag), it may take a long time to start operating normally or be unable to restart normally due to the protective equipment triggered after the power is recovered. In that case, turn off the switch with lamp on the body once, on dryer panel and wait 3 minutes. After this step, turn on the switch to restart. Sudden restart of the product is possible after the recovery of power, so be sure to turn off the switch with lamp when removing the cover panel of the product.

i.1.1 Danger, Warning and Caution

The instructions given in this manual aim to assure the safe and correct operation of the product, and to prevent injury of operators or damage to the product. These instructions are grouped into three categories, "Danger", "Warning" and "Caution", which indicate the level of hazard, damage and also the degree of emergency. All safety critical information should be carefully observed at all times.

DANGER, WARNING and CAUTION signs are in order according to severity (DANGER> WARNING> CAUTION). The signs are explained on the following page.



Danger

"Danger" indicates a hazard with a high level of risk which will result in death or serious injury if an operator performs incorrect handling during the operation and maintenance of the product or does not follow the instructions necessary to avoid it.



Warning

“Warning” indicates a hazard with a medium level of risk which will result in death or serious injury if an operator does not follow the specified procedures during the operation or maintenance of the product or does not follow the instructions necessary to avoid it.



Caution

“Caution” indicates a hazard of a low level of risk which will result in minor and moderate injury or damage to product and equipment if an operator does not follow the specified procedures during the operation and maintenance of the product or does not follow the instructions to avoid it.

i.2 Hazard classification and locations of hazard labels

The product has various potential hazards and they are marked with warning labels. Read this section before starting any work on the product.



Warning

- Only trained personnel should handle the product.
- Only people who have sufficient knowledge and experience about the product and its accessories are allowed to carry out transportation, installation and maintenance work.
- Only maintenance personnel or people who have sufficient knowledge and experience are allowed to open the cover panels of the product.



Warning

If any error occurs, take measures as instructed in this manual.



Warning

- If any error occurs, do not start operating the product.
- If any error occurs, immediately stop the product, and call for the maintenance personnel or a person who has sufficient knowledge and experience about the product and its accessories.

i.2.1 Hazards

The hazards inherent to the product are as follows.

Warning related to electricity

The product is operated at a high voltage and can cause electrical shock internally. This risk is indicated with the mark  in addition to "Danger", "Warning" and "Caution" on the product or in this manual.

Warning related to heat

The product has surfaces that can reach high temperatures during operation, which may cause burns. This risk is indicated with the mark  in addition to "Danger", "Warning" and "Caution" on the product or in this manual.

Warning related to rotating objects

The product has parts that will rotate during operation, which may cause fingers to get caught and injured. This risk is indicated with the mark  in addition to "Danger", "Warning" and "Caution" on the product or in this manual.

i.2.2 Warning related to electricity



**The product is operated at a high voltage and contains the power supply isolated by the cover panel.
Do not operate the product without cover panels fitted.**

Only people who have sufficient knowledge and experience are allowed to perform work and inspections in locations with the power supplied.



Warning

- Fully read and understand the contents of the hazard labels.
- Do not peel or rub off the hazard labels.
- Carefully confirm where the hazard labels are affixed.

i.2.3 Warning related to high temperature



Warning

The product has surfaces that can reach high temperatures during operation, and cause burns by contact. Even after the power is turned off, there can still be residual heat in the product, which may cause burns. Do not start work until the temperature of the surfaces has fallen below 50°C.

i.2.4 Warning related to rotating objects



Warning

The product has parts that can rotate during operation, and cause injury by contact. Also, the rotating parts might stop rotating temporarily and restart during operation. Do not perform work during operation.

i.2.5 Warning related to pneumatic circuit



Warning

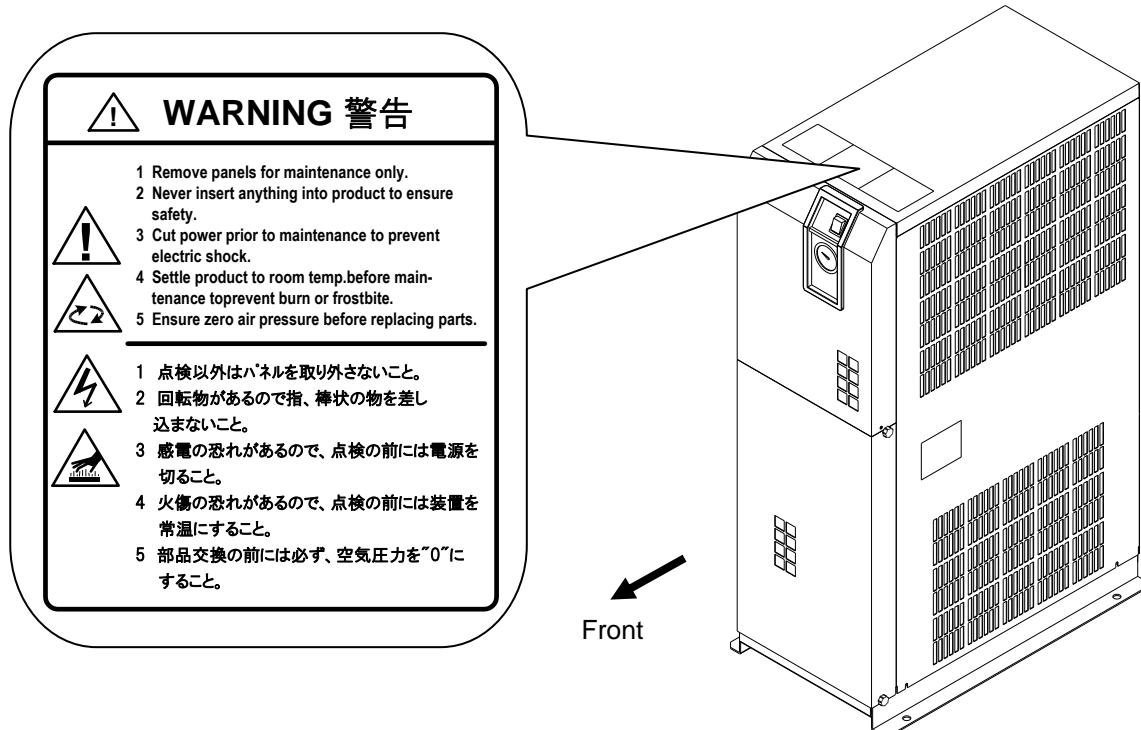
Be sure to release compressed air from the product and ensure the internal pressure is zero before replacing or cleaning the parts of the product. If the compressed air is left in the product, when some part is loosened, it may cause sudden lurching or other unexpected accidents.

i.2.6 Location of hazard label



Warning

- Fully read and understand the contents of the hazard labels.
- Do not peel or rub off the hazard labels.
- Carefully confirm where the hazard labels are affixed.

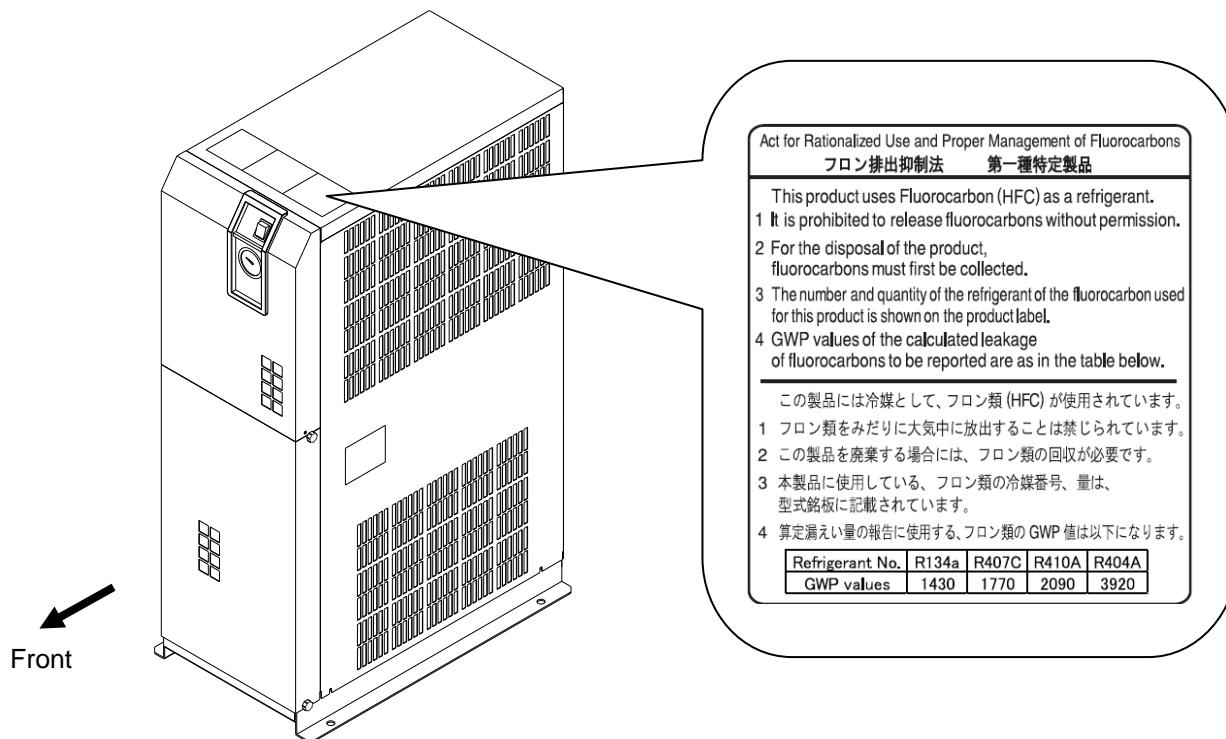


i.2.7 Caution related to refrigerant



Caution

- The product uses hydro-fluorocarbon type refrigerant (HFC).
 - The product is categorized as category 1 under the fluorocarbon recovery and destruction law in Japan.
- The release of refrigerant into the atmosphere is banned by law. When the product is serviced, the refrigerant must be recovered using “refrigerant recovery equipment” and disposed of by a specialist disposal company. Only people who have sufficient knowledge and experience about the product and its accessories are allowed to recover the refrigerant.
- Only maintenance personnel or people who have sufficient knowledge and experience are allowed to open the cover panels of the product.
 - The type and necessary amount of HFC can be found on the specification label explained on page 6 of Section i.

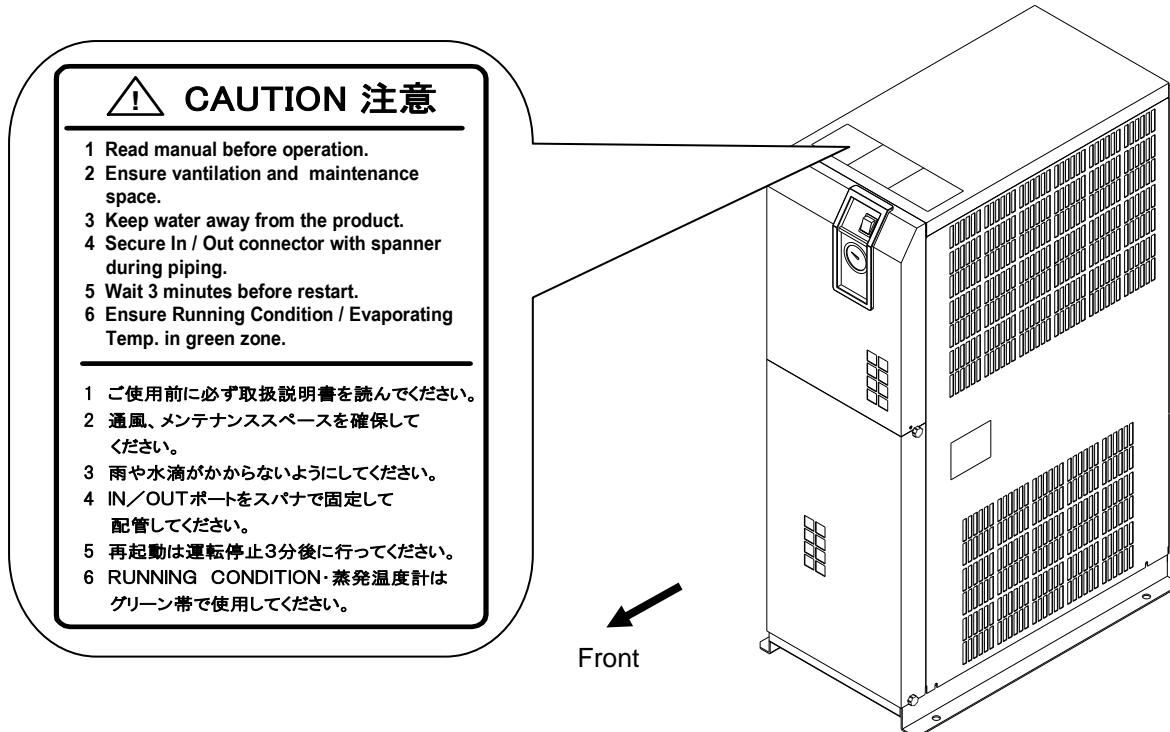


i.2.8 Caution related to handling



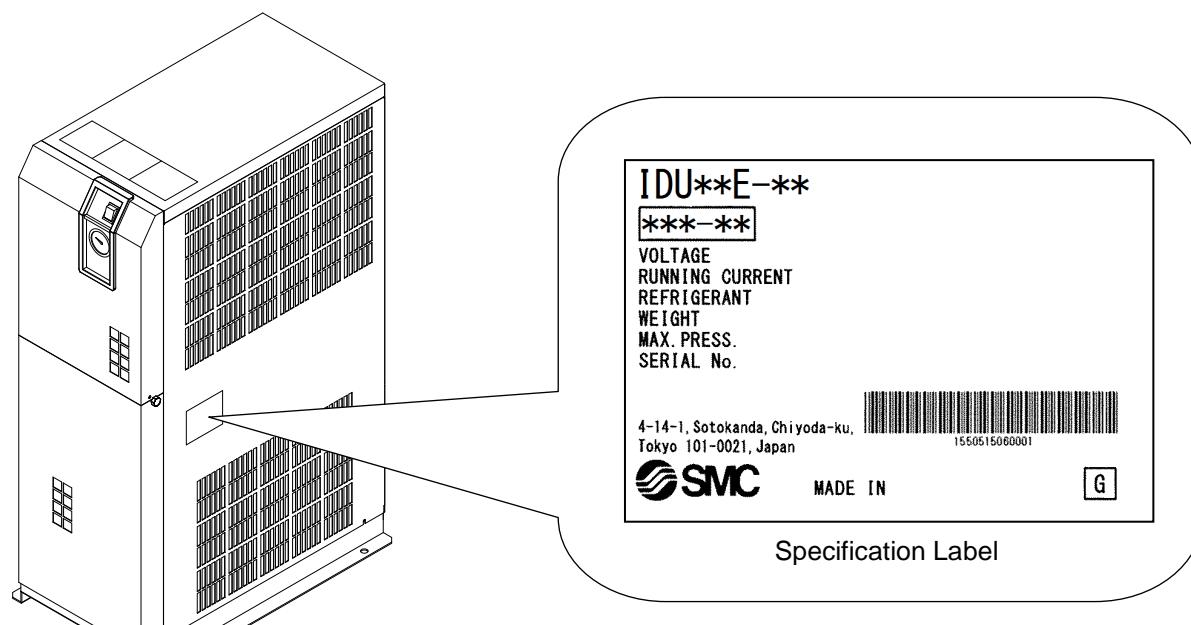
Warning

- Fully read and understand the contents of the hazard labels.
- Do not peel or rub off the hazard labels.
- Carefully confirm where the hazard labels are affixed.



i.2.9 Other labels

Confirm the model and specifications described in the label.



i.3 Waste disposal

When disposing of the product, recover the refrigerant and compressor oil contained in the refrigerant circuit.



Caution

- The product uses hydro-fluorocarbon type refrigerant (HFC).
- The product is categorized as category 1 under the fluorocarbon recovery and destruction law in Japan.
- The release of refrigerant into the atmosphere is banned by law. When the product is serviced, the refrigerant must be recovered using “refrigerant recovery equipment” and disposed of by a specialist disposal company.
- Only people who have sufficient knowledge and experience about the product and its accessories are allowed to recover the refrigerant.
- Only maintenance personnel or people who have sufficient knowledge and experience are allowed to open the cover panels of the product.
- The type and necessary amount of HFC can be found on the specification label.



Caution

- The disposal of the compressor oil must be in compliance with the bylaws or rules of the local municipality.
- Do not mix the compressor oil with domestic waste for disposal. Also, the disposal of the waste must only be conducted by specific facilities that are permitted for that purpose.
- Only people who have sufficient knowledge and experience about the product and its accessories are allowed to recover the compressor oil.
- Only maintenance personnel or people who have sufficient knowledge and experience are allowed to open the cover panels of the product. If anything is unclear, contact your local supplier or SMC.

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 or 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

Name and Function of Parts

1.1 Name and function of parts

Switch with lamp

The switch to start and stop the product, which will light up in green during operation.

Evaporation thermometer

Displays the evaporating temperature of refrigerant.
Normally, it is in the green area.

Drain confirmation window

From this confirmation window, confirm the discharge of drain.

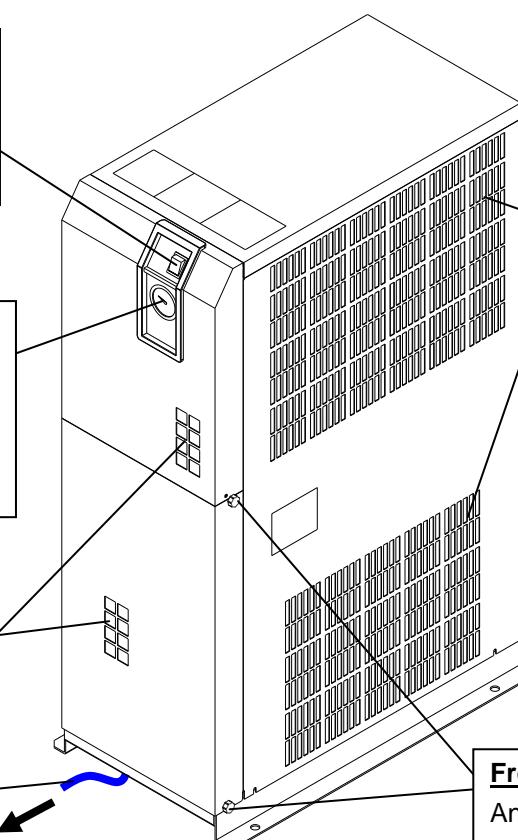
Drain tube

Discharges drain.

Ventilation air outlet

Hot air will be exhausted from condenser by fan.
No obstacles shall be allowed to place on top of it or even close the grille.

Appearance



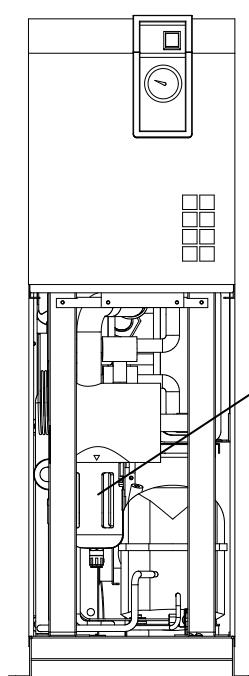
Front

Front panel mounting screw

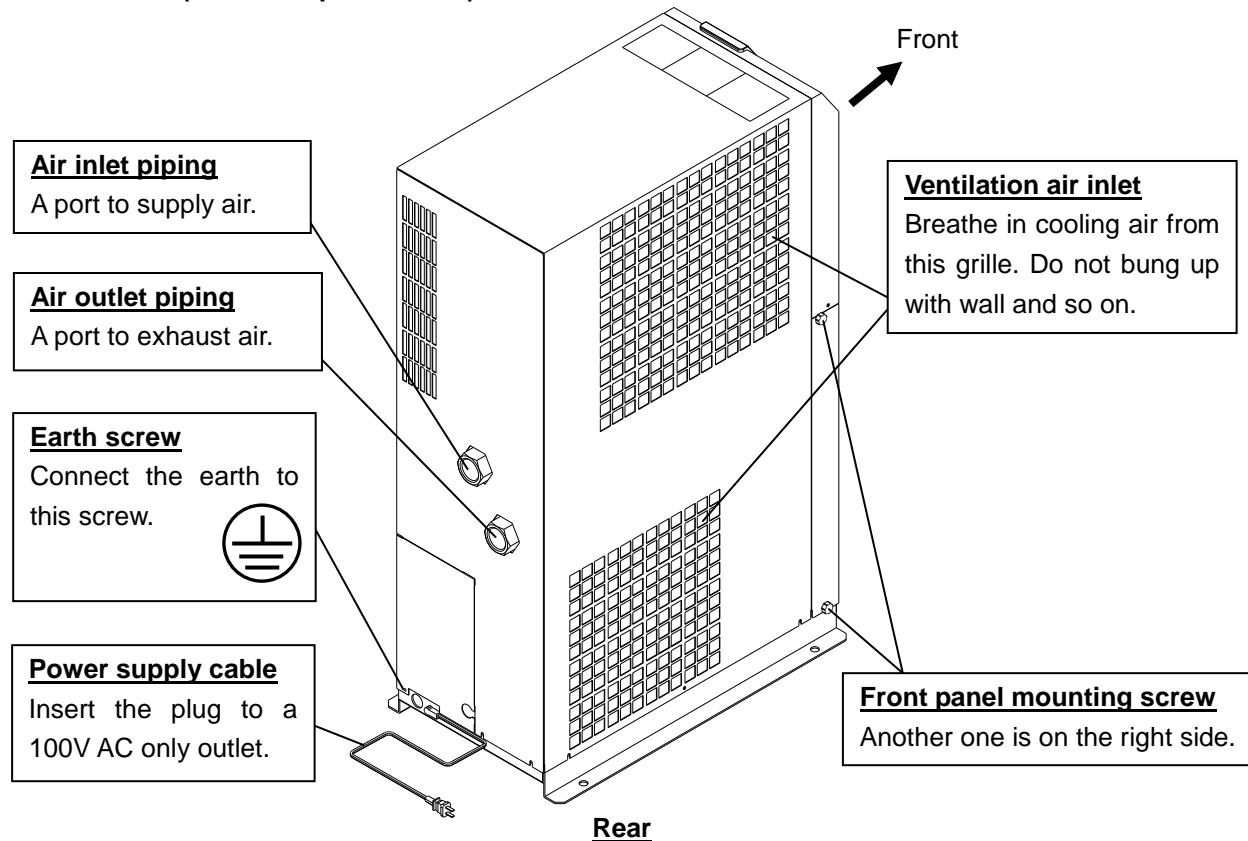
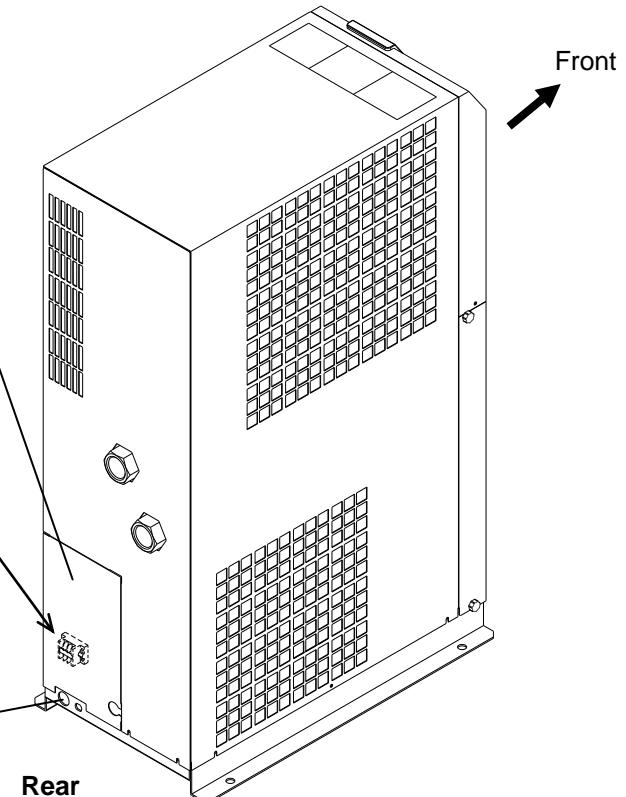
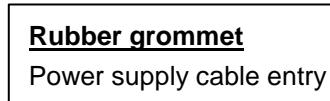
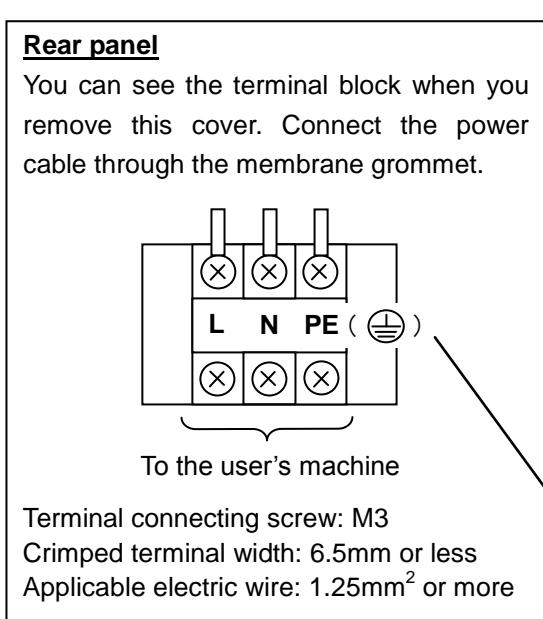
Another one is on the left side.

Auto drain

It is covered with insulator, which should not be removed.



Front panel removal

IDU15E1-10 (100V AC specification)

IDU15E1-20 (200V AC specification)


2

Transportation and installation



Warning

- Use the product in an appropriate manner, and pay attention to safety, particularly physical safety of operators, during the installation, operation, maintenance and checks of the product.
- When the product is used for a critical facility or equipment, prepare a spare product or alternative machine in case of stoppage of the product due to the operation of the protective equipment or the failure of the product itself.



Caution

- Only people who have sufficient knowledge and experience about the product and system are allowed to perform the transportation, installation and maintenance of the product, including dangerous work.

2.1 Transportation

Be sure to follow the instructions below when transporting the product.

- The product is filled with refrigerant. Transport it (by land, sea or air) in accordance with laws and regulations specified.
- 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.
- Do not lift the product by holding the panel, fittings or piping.



Warning

- The product is heavy and has potential dangers in transportation. Be sure to follow the instructions above.
- To transport the product, a tool like a fork lift must be prepared.

2.2 Installation

2.2.1 Environment

(1) Do not use or store the product under the following conditions, as these may cause breakage of the product as well as a failure of the product to operate.

- In an environment where the product will come into direct contact with rain, wind and snow or with a lot of moisture (relative humidity 85% or more).
- In a location with a large quantity of dust.
- In a location containing flammable or explosive gases.
- In a location exposed to corrosive or flammable gases or solvent.
- In a location where the ambient temperature is outside the following ranges.
In operation: 2 to 40°C, In storage: 0 to 50°C (with no condensate in piping)
- In a location that is subjected to abrupt changes in temperature.
- In a location that is subjected to strong electromagnetic noise (intense electric field, intense magnetic field, or surges)
- In a location that is subjected to static electricity, or conditions where static electricity can discharge to the product.
- In a location that is subjected to strong high frequency radiation (microwaves)
- In a location that is subjected to potential lightning strikes.
- Locations by loading on vehicles, marine vessels, and so on.
- In a location with an altitude of 2,000 metres or higher.
- In a location where the product is affected by strong vibrations or impacts.
- Conditions where external force or weight is applied that could deform the product.
- In a location where there are obstacles blocking the ventilation ports of the product.
- In a location where the dryer is drawing in high temperature air that is discharged from an air compressor or other dryers.

(2) Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

- Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
- Installation on equipment in conjunction with atomic energy, railways, air navigation, shipping, vehicles, medical treatment or recreation equipment, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
- An application which could have negative effects on people, property, or animals requiring special safety analysis.

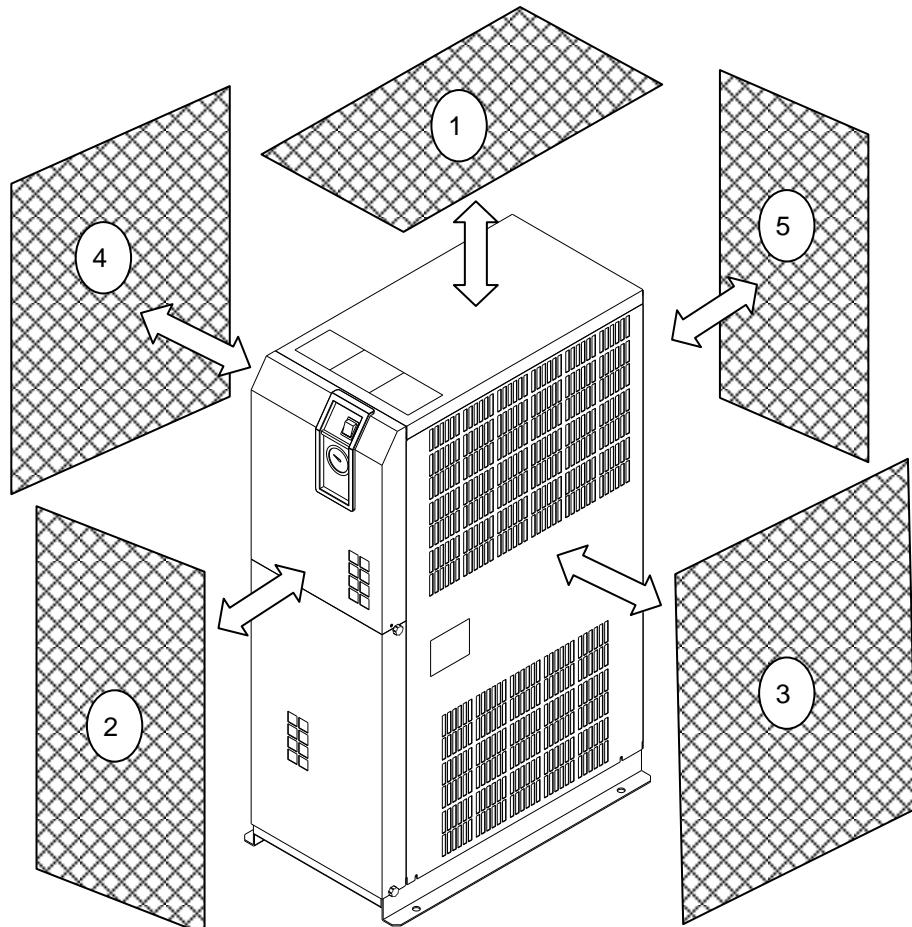
2.2.2 Fixing of product

Mount the product on a flat and stable floor with no vibrations.

- Refer to "6.2 Outer dimensions" on page 6-2 for dimensions.
- Use the foundation bolts to prevent the product from falling over.

The foundation bolts are available separately as a set.

- If there is not enough space around the ventilation ports of the product, loss of the original performance or failure of the product can result. Follow the conditions shown in the figure below for installation.

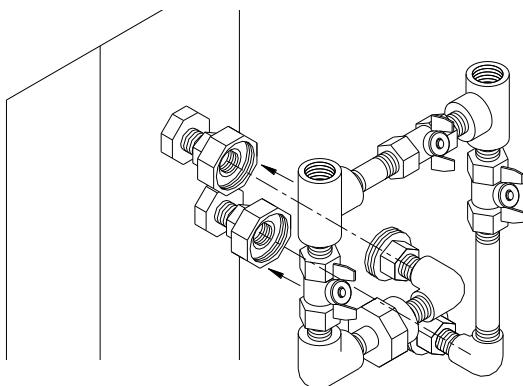


	Necessary maintenance space *1
1. Top	600mm or more
2. Front	600mm or more
3. Right side	600mm or more
4. Left side	600mm or more
5. Rear	600mm or more

* 1 The necessary maintenance space is to conduct maintenance and repairs when the product fails. Ensure that sufficient space can be secured for repair.

2.2.3 Pneumatic piping

- Piping to the compressed air inlet and outlet should be connected with a union or fitting so that it can be removed.
- 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 transmit vibration resulting from the compressor.
- When the compressed air inlet temperature exceeds 50°C, install an aftercooler behind the air compressor or decrease the temperature of the area where the air compressor is installed to keep it 50°C or less.
- To prevent foreign matter such as dust from getting in the supply air to the product, flush the piping before connecting. Dust or oil in the piping can cause cooling failure or other failures of the product. Install a main line filter to the compressed air source to the product.
- Use a pipe capable of withstanding the specified operating pressure and temperature and connect so that it will not have leakage.
- Be sure to install a bypass pipe to allow 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 Draining piping

- The drain tube is equipped with a polyurethane tube of outside diameter 10mm. Release the draining end of the tube to atmosphere to let condensate flow into a water outlet.
- Condensate will be drained regularly using compressed air pressure. Fix the draining end of the tube firmly to prevent it from vibrating during draining.
- Ensure the drain tube does not rise up.
- Do not bend or crush the drain tube. When installing the product, take care not to place the product on the drain tube.



Warning

- When draining, follow the user's own procedure to keep operators safe. (E.g. Wear protective goggles, apron and gloves to prevent contact with the drained condensate.)
 - When oils can enter the drained condensate, waste water treatment is necessary.
- Follow the bylaws or rules of the local municipality.

2.2.5 Electric wiring

Warning

Only qualified persons are allowed to wire the product.

- Before wiring, be sure to shut off the power supply. Never perform wiring work while the product is energized.
- Ensure a stable power supply with no voltage surges.
- Ensure that an ground fault circuit interrupter with appropriate capacity for ground fault and load is used in the power supply of the product to prevent electrical shock and burnout of the compressor motor. See “6-1 Specification table” for details.
- Use a power supply suitable for the specifications of the product.
- Be sure to connect the ground connection.
- Grounding should never be connected to a water line, gas line or lightning rod.
- Multiple wiring is dangerous because it may lead to heat generation and cause a fire.
- Do not modify the electrical wiring of the power supply.
- For use in Europe, install a breaker compliant with applicable IEC standards to the power supply of the product.

[Wiring of power supply]

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

IDU15E1-10 (100V AC specification)

Insert the power plug into an outlet of AC100V.

* Be sure to install an ground fault circuit interrupter to the power supply. (To be prepared by the user.)

[Sensitivity of leak current: 30mA or less, Rated current: 10A]

Do not extend the power cable using power strip and so on.

That causes decrease of the voltage and the product cannot be operated.

IDU15E1-20 (200V AC specification)

Remove the terminal block cover or the rear cover in the rear of the product, and connect the power (AC200V) to the terminal block.

* Be sure to install an ground fault circuit interrupter to the power supply. (To be prepared by the user.)

[Sensitivity of leak current: 30mA or less, Rated current: 10A]

Specifications of power supply cable

Prepare the following power supply cable.

Power supply cable: 1.25mm²(16AWG) or larger, Cable outside diameter Approx. 8 to 12mm, 3 cores (including ground)

Approx. 0.1m is necessary to route the internal wiring of the product.

Power supply cable length

The power supply cable length from the product should be less than 30m.

Terminal block (refer to “1.1 Name and function of parts” for details).

Connect the power cable and the ground to the terminal block. The connection size is M3.

Be sure to use a round crimped terminal.

Applicable crimped terminal width: 6.5mm or less

[Wiring procedure]

1. Remove the terminal block cover or the rear panel.

2. Insert the cord through the rubber grommet and connect it to the terminal block (refer to the label on the terminal block).

M3 screw tightening torque: 0.63 to 1Nm

During wiring work, do not touch other sections except terminal block.

3. Re-attach the cover or real panel after wiring is done.

2.3 Reinstallation of the product



Caution

- Only people who have sufficient knowledge and experience about the product and its accessories are allowed to reinstall the product in a different location. Also, be sure to follow the instructions below.

When moving the product to a different location or reinstalling it after it has been used (including trial run), follow the whole procedure in Chapter 2 beforehand.

- Disconnection of power supply cable

Be sure to cut the facility power supply before disconnecting the power supply cable.



Warning

- Only people who have sufficient knowledge and experience are allowed to perform wiring.
- Before wiring, be sure to shut off the power supply. Never perform wiring work while the product is energized.

Removal of pneumatic piping



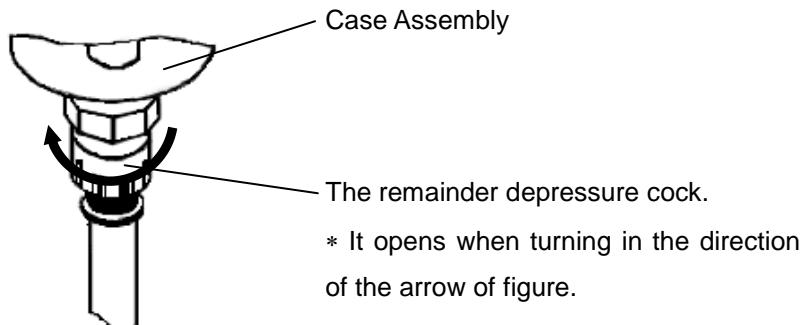
Warning

- Only people who have sufficient knowledge and experience are allowed to perform piping work.
- Before removing piping, be sure to shut off the air supply and the product.
- Do not remove piping with any air pressure remaining internally.

Clean off any sealant debris after the piping is removed. If any sealant debris gets into the product during reinstallation, it may lead to cooling failure or other product failures.

Residual compressed air pressure release procedure

1. Even while the dryer is removed, only when compressed air is needed, open the bypass piping valve.
2. Close the compressed air inlet and outlet valve.
3. Unscrew the front panel fixing screw (in 2 points) and remove the front panel with upholding it a little.
4. 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 below.



3

Start and stop



Caution

Only people who have sufficient knowledge and experience about the product and its accessories are allowed to start and stop the product.

3.1 Before Starting

Check the following items before performing a trial run of the product.

- Installation conditions

Check visually that the product is installed horizontally.

Ensure the product is fixed firmly by the anchor bolts.

Do not place any heavy object on the product, or apply excessive force to the product by the external piping.

- Connection of cables

Check the power supply and ground are correctly connected.

- Drain tube

Check proper connection of the drain tube.

- Pneumatic piping

Check proper connection of pneumatic piping. Ensure the valves at the inlet and outlet and bypass of the product are completely closed.

3.2 Start

Start the product by the following procedure.

- 1) Turn on the main power supply. Then, turn on the switch with lamp.
- 2) The lamp will light up and the cooling fan will start turning a while later, and hot air will blow out from the exhaust port.
- 3) Open the valve at the inlet and outlet of the product slowly and fully. Ensure the bypass valve is completely closed. Check there is no air leakage.
- 4) The cooling fan keeps starting and stopping depending on the compressed air and ambient temperature conditions, but the compressor keeps operating continuously, and the evaporation thermometer stays within the green area. If the evaporation thermometer exceeds the green area (indicates a higher temperature), refer to "Chapter 5 Troubleshooting".
- 5) A while after the compressed air starts being supplied, the drain tube will drain condensate automatically.
- 6) Keep operation in that condition.



Caution

- Frequently turning on and off the switch can cause failure.
- Since the auto drain of the product is designed in such a way that the valve closes at 0.05MPa or higher (N.C. type), air will blow out from the drain port when the pressure increases. Therefore, if the air compressor has a small air delivery, the pressure may not be sufficient.

3.3 Stop

- 1) Turn off the switch with lamp.
- 2) The lamp will go off and operation will stop.

3.4 Precautions for restarting operation

- Allow at least 3 minutes before restarting the product. If the product is restarted within 3 minutes after being stopped, the protection circuit will be activated, operating light will turn off and the dryer will not be activated.
If operation cannot be restarted, refer to "Chapter 5 Troubleshooting" to solve it.

3.5 Check items after starting

Check the following items when starting the product. Immediately stop the operation in the event of failure.

Turn off the switch with lamp and shut off the breaker of the main power supply.

- There is no compressed air leakage.
- The pressure, temperature, flow rate and ambient temperature of the compressed air are within the specified range.
- Condensate is coming out from the drain tube.
- The evaporation thermometer is in the green area.
- There is no abnormal sound, vibration or odor from the product.

3.6 Precautions for long-term non-operation

If the product will not be operated for 24 hours, for example at the weekend, turn off the 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 inspection

4.1 Daily check

Check the following items daily. Immediately stop the operation in the event of failure, and refer to "Chapter 5 Troubleshooting" to solve it.

- There is no compressed air leakage.
- The START lamp lights up during operation.
- Condensate comes out of the drain tube during operation.
- The evaporation thermometer is in the green area during operation with the compressed air supplied.
- The evaporation thermometer indicates a temperature approx. 3 to 10°C lower than the ambient temperature when operation is stopped and no compressed air supplied.
- There is no abnormal sound or vibration.
- There is no abnormal odor or smoke.

4.2 Parts requiring regular maintenance

4.2.1 Cleaning the condenser and aftercooler fins

To eliminate dust at the ventilation port (suction port), apply an electrical vacuum or air blow once every month. Wear protective goggles and a mask to prevent dust from entering the eyes or throat during air blow.

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	Tecommended 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 the auto drain strainer

Remove dust from the auto drain strainer once a month. Use a neutral detergent for cleaning. Also, if the auto drain becomes heavily polluted replace it with a new one and shorten the next cleaning interval.

Part number of the auto drain strainer

Part no.	Description	Qty.
IDF-S0002	Auto drain strainer	1

4.2.4 Replacement of case assembly

Replace the case assembly with a new one if after cleaning it the auto drain continues operating failure.

Part number

Part no.	Description	Qty.
AD48	Auto drain	1



Warning

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



Danger

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

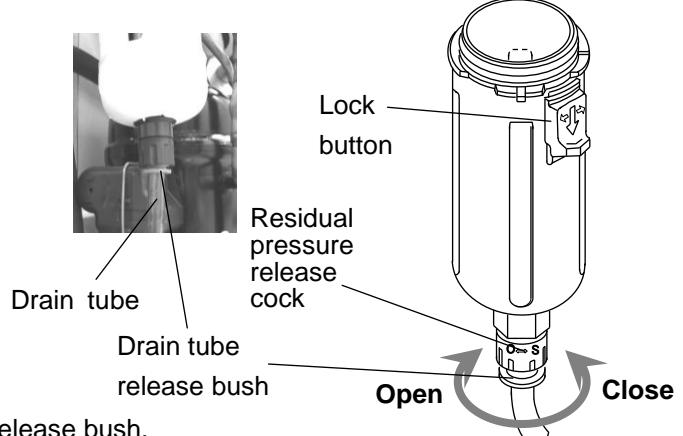
[How to clean and replace the auto drain/strainer]

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

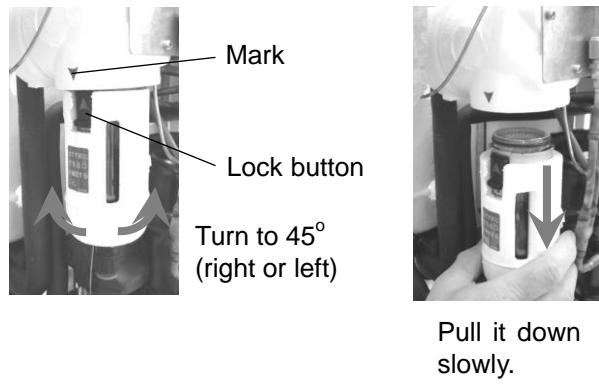
- Turn off the switch with lamp.
- Disconnect the earth leakage breaker at the power supply or unplug the power plug from the socket.
- Fully close the inlet and outlet valves. Only open the bypass when compressed air is required during work.
- Only the point that is necessary for work please remove a decoration panel.

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

Pull out the tube while pushing up the drain tube release bush.



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



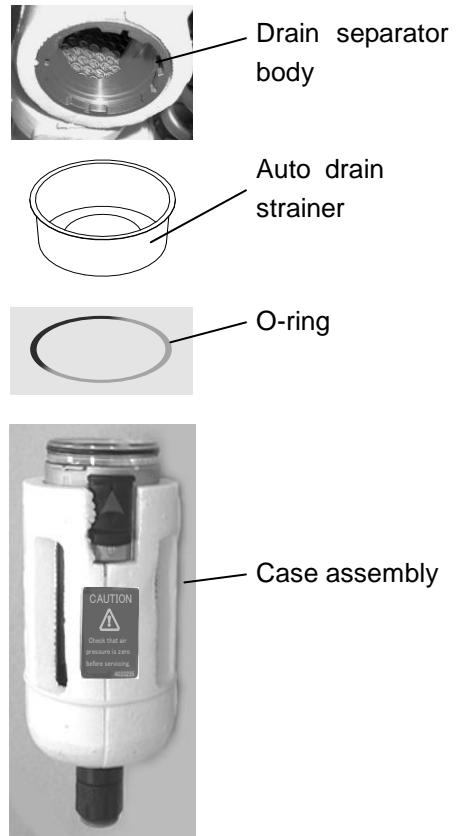
- Remove the auto drain strainer and clean it. Take care not to cut your hand with the sharp edges of the strainer.
- Pour solution of neutral detergent into the case assembly and shake it well to clean.
- Check the case O-ring for damage such as scratches, twisting or foreign particles attached to it. 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.



5**Troubleshooting****5.1 Troubleshooting**

If any error is found in the product, investigate the following points. If the error cannot be solved, turn off the power supply and contact your local supplier or SMC sales representative.

Trouble	Possible cause	Remedy
Although the switch with lamp is turned on, the lamp does not light up and the product does not start operating.	The power supply cable has been loosened or disconnected. The ground fault circuit interrupter is not turned on.	- Reconnect it firmly. Check the capacity of the ground fault circuit interrupter. - Check the product was not restarted within 3 minutes after being stopped. - Turn on the ground fault circuit interrupter and try to operate. If the ground fault circuit interrupter turns back off, the insulation failure of the product is suspected. Turn off the power supply and contact SMC.
Running lamp extinguishes and compressor stops during operation but resumes normal operation illuminating the lamp after a period of time.	The product is installed in an inappropriate location. Ambient temperature is excessive.	- Improve ventilation condition and reduce the ambient temperature as much as possible.
	The ventilation port is obstructed by a wall or clogged with dust.	- Keep the product 60cm or more away from the surrounding walls. - Clean the ventilation ports once every month.
	The compressed air temperature is too high.	- Improve the ventilation in the location where the air compressor is installed, or decrease the ambient temperature to allow the discharge air temperature of the air compressor to go down. - Install an aftercooler after the air compressor to reduce the temperature.
	The fluctuation of the power supply voltage is too large.	- Install a power supply transformer or use a different power supply to provide appropriate voltage. - The fluctuation of the power supply voltage should be kept within +/-10% of the rated voltage.
The evaporation thermometer is over the green area without hot air coming from the ventilation port (exhaust port). (The compressor for refrigeration has stopped with the lamp lit up.)	The product is installed in an inappropriate location. Ambient temperature is excessive.	- Improve ventilation condition and reduce the ambient temperature as much as possible.
	The ventilation port is obstructed by a wall or clogged with dust.	- Keep the product 60cm or more away from the surrounding walls. - Clean the ventilation ports once every month.
	The compressed air temperature is excessive.	- Improve the ventilation in the location where the air compressor is installed, or decrease the ambient temperature to allow the discharge air temperature of the air compressor to go down. - Install an aftercooler after the air compressor to reduce the temperature.
	The fluctuation of the power supply voltage is too large.	- Install a power supply transformer or use a different power supply to provide appropriate voltage. - The fluctuation of the power supply voltage should be kept within +/-10% of the rated voltage.
	The built-in overload relay of the compressor for refrigeration has started.	- Check the product was not restarted within 3 minutes after being stopped.

Trouble	Possible cause	Remedy
The evaporation thermometer is over the green area with hot air coming from the ventilation port (exhaust port).	The product is installed in an inappropriate location. Ambient temperature is excessive.	- Improve ventilation condition and reduce the ambient temperature as much as possible.
	The ventilation port is obstructed by a wall or clogged with dust.	- Keep the product 60cm or more away from the surrounding walls. - Clean the ventilation ports once every month.
	The compressed air temperature is excessive.	- Improve the ventilation in the location where the air compressor is installed, or decrease the ambient temperature to allow the discharge air temperature of the air compressor to go down. - Install an aftercooler after the air compressor to reduce the temperature.
Moisture is generated at the downstream of the compressed air line.	The bypass valve is open.	- Be sure to fully close the bypass valve.
	Condensate is not drained from the auto drain.	- Check the draining piping is not used in an upward direction nor bent. - Check the auto drain. - Check the auto drain strainer.
	The piping of a different system without an air dryer joins the piping after the product.	- Install another air dryer (this product) in that system. - Keep the two systems separate.
The compressed air pressure is too large.	The valves at the inlet and outlet of the piping of the product are not fully opened.	- Be sure to fully open the valves at the inlet and outlet of the product.
	The air filter, etc. installed in the compressed air piping has got clogged.	- Replace the element of the air filter. (Follow the Operation Manual of the equipment.)

6

Reference

6.1 Specification table

Item	Model		
		IDU15E1-10	IDU15E1-20
Operating range	Fluid		Compressed air
	Inlet air temperature °C		5 to 80
	Inlet air pressure MPa		0.15 to 1.0
	Ambient temperature (humidity) °C		2 to 40 (Relative humidity 85% or less)
Rated specifications	Air flow capacity m³/min	Standard conditions (ANR) ^{Note 1)} 50Hz	2.6
		60Hz	2.8
	Air compressor suction condition	50Hz	2.7
		60Hz	2.9
	Inlet air pressure MPa		0.7
	Inlet air temperature °C		55
	Ambient temperature °C		32
	Outlet dew point °C		10
Electric specifications	Power supply voltage (frequency)		1 phase AC100V (50Hz) AC100,110V (60Hz) ^{Note 3)}
	Power consumption (50/60Hz) W		460 / 530
	Running current (50/60Hz) A		4.6 / 4.9 3.6 / 3.4
Applicable ground fault circuit interrupter capacity ^{Note 4)} A		10	
Refrigerant		R134a (HFC)	
Quantity of refrigerant g		350±10	
Auto drain		Float type (N.O.)	
Port size		Rc1	
Weight kg		71	
Coating color		Panel: Urban white 1 / Base: Urban gray 2	
Applicable air compressor output (referential) kW		15	

Note 1) Air flow capacity under the standard condition (ANR) [20°C atmospheric pressure and 65% relative humidity].

Note 2) Air flow capacity calculated for atmospheric condition [32°C, atmospheric pressure]

Note 3) 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.

Note 4) Use an ground fault circuit interrupter with sensitivity of 30mA.

6.2 Refrigerant with GWP reference

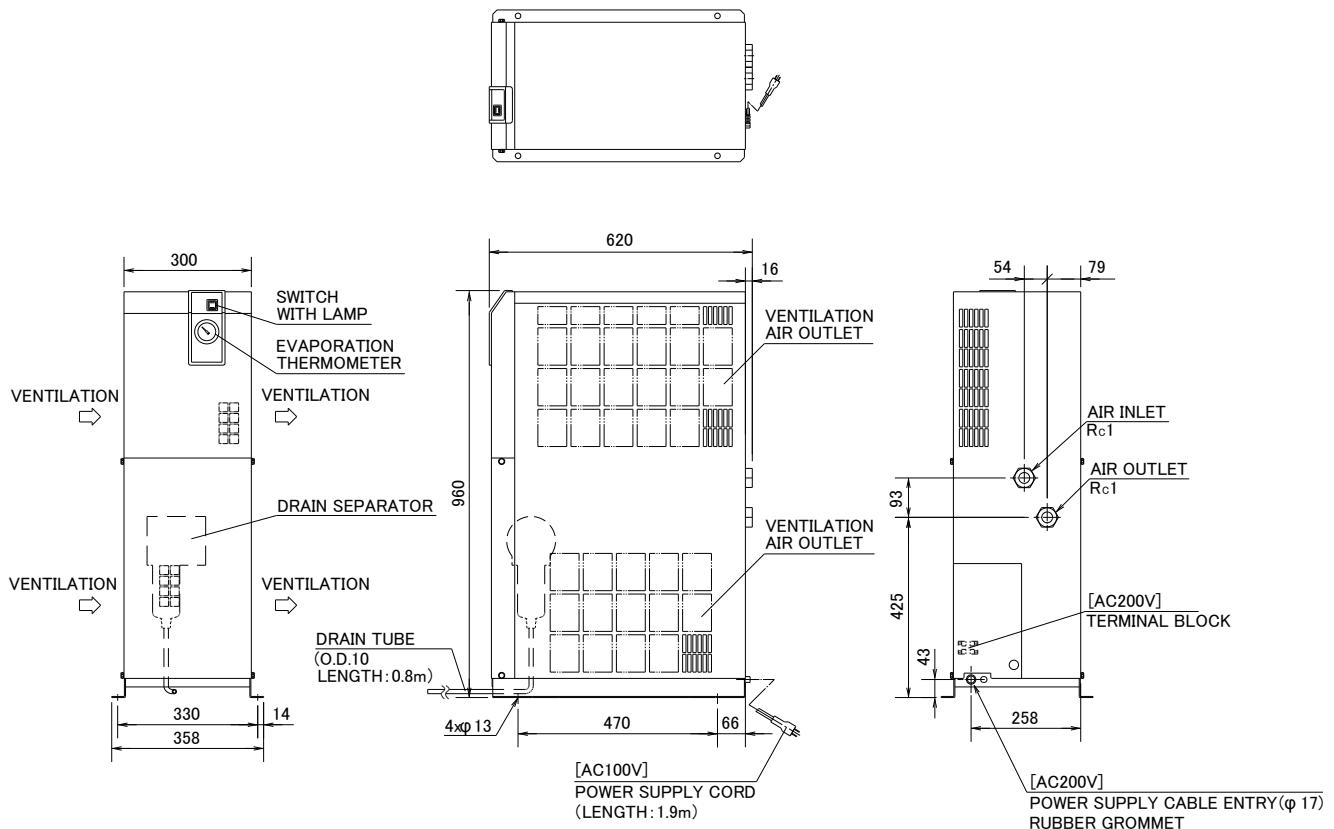
Refrigerant	Global Warming Potential (GWP)	
	Regulation (EU) No 517/2014 (Based on the IPCC AR4)	Revised Fluorocarbons Recovery and Destruction Law (Japanese law)
R134a	1,430	1,430
R404A	3,922	3,920
R407C	1,774	1,770
R410A	2,088	2,090

Note 1) This product is hermetically sealed and contains fluorinated greenhouse gases.

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

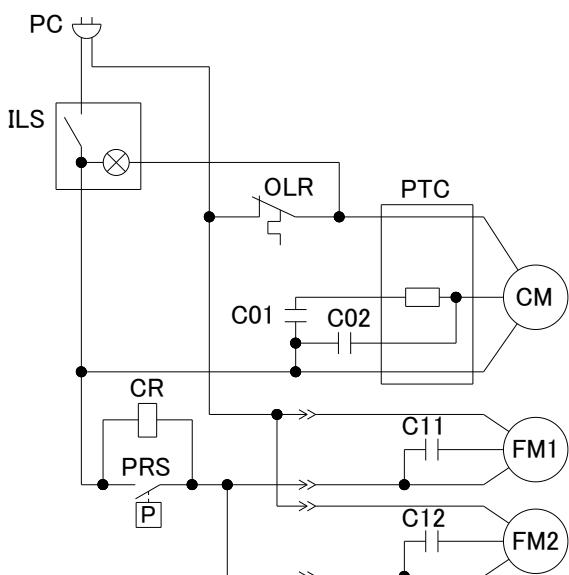
6.3 Outer dimensions

[IDU15E1] Unit: mm



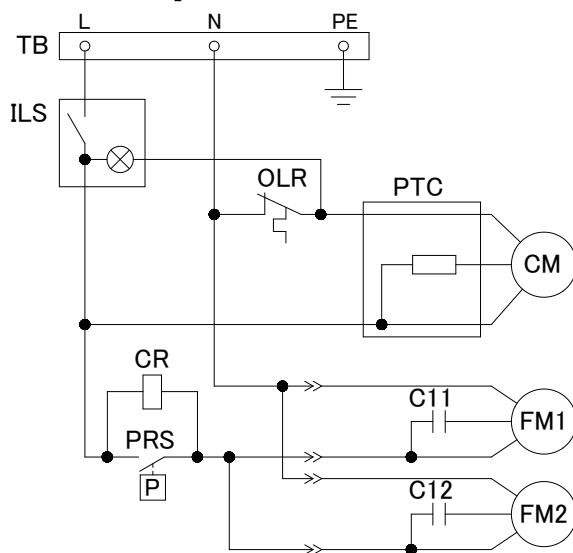
6.4 Electric wiring diagram

[IDU15E1-10]



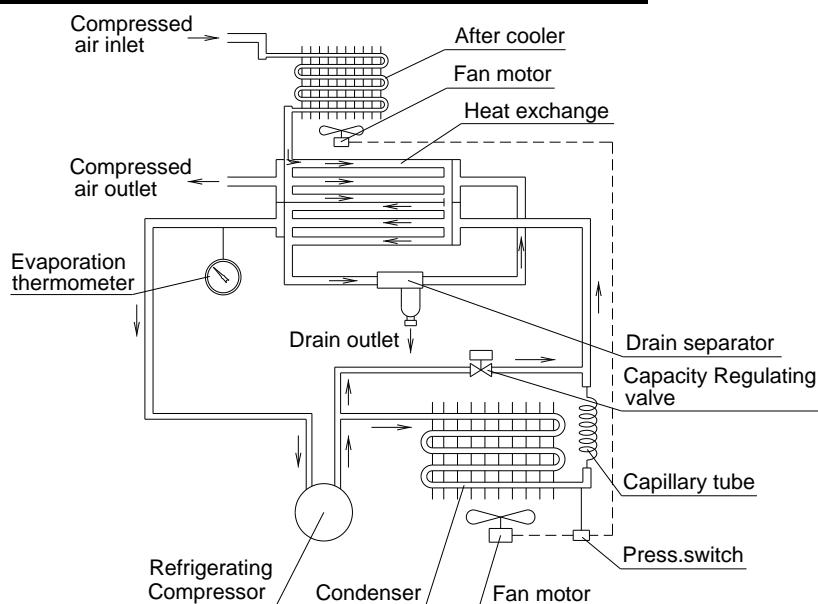
Symbol	Description
CM	Refrigerating compressor
FM1	Fan motor
FM2	Fan motor
OLR	Overload relay
ILS	Switch with lamp
PTC	PTC Startor
PRS	Pressure switch
PC	Power supply cable
CR	CR Unit
C01	Capacitor for running refrigerating compressor
C02	Capacitor for starting refrigerating compressor
C11	Capacitor for running fan motor
C12	Capacitor for running fan motor

[IDU15E1-20]



Symbol	Description
CM	Refrigerating compressor
FM1	Fan motor
FM2	Fan motor
OLR	Overload relay
ILS	Switch with lamp
PTC	PTC Startor
PRS	Pressure switch
TB	Terminal block
CR	CR Unit
C11	Capacitor for running fan motor
C12	Capacitor for running fan motor

6.4 Pneumatic and refrigerant circuits and their functions



Pneumatic 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 HFC gas contained in the refrigerant circuit is compressed by the compressor, and cooled and liquefied by the condenser. When passing through the capillary tube, the HFC gas is regulated and its temperature decreases. While passing through the cooler part, it evaporates rapidly, taking the heat from the compressed air, and is sucked in by the compressor. The capacity regulating valve opens when the compressed air has been cooled sufficiently, and prevents condensed water from being frozen by excessive cooling.

7

Specification for Option C

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 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.

7.3 Precautions for the installation and handling of the product

- 1) The surface of cooper 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**Specification for Option K****8.1 Safety instructions**

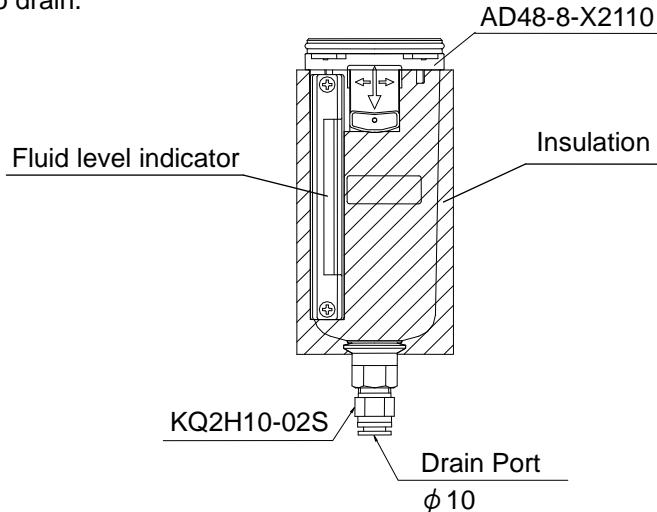
When handling the product, take care to the following precautions.

**Warning**

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

8.2 Specifications

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



Item	Model	IDU15E1-10-K	IDU15E1-20-K
Part number ^{Note1)}		IDF-S0086	
Auto drain type		Floating type	
Auto drain valve type		N.O. (normally opened: Released without pressurization)	

Note1) The above part number does not include the auto drain strainer. If the strainer needs to be replaced, order it.

Part no.	Description	Qty.
IDF-S0002	Auto drain strainer	1

9**Specification for Option L****9.1 Safety instructions**

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

**Warning**

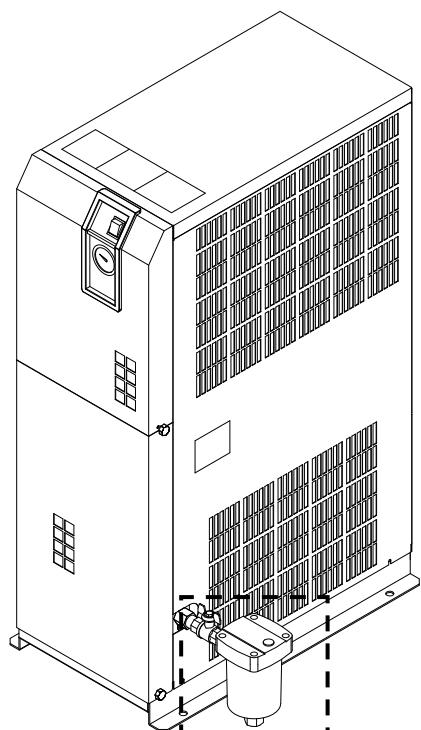
- Do not remove the auto drain with the air pressure remaining internally. If the compressed air is left in the product, when some part is loosened, it may cause sudden lurching or other unexpected accidents.
- When removing the panel, wear protective gloves to prevent injuries.
- There is a risk of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

9.2 Specifications

The maximum operating pressure 1.6MPa. The float type auto drain used in the standard air dryer is replaced with a heavy duty auto drain (ADH4000-04). The customer is required to mount the auto drain to the air dryer.

Item	Model	IDU15E1-10-L	IDU15E1-20-L
Auto drain type		Floating type	
Auto drain valve type		N.O. (normally opened: Released without pressurization)	
Working pressure range		0.05 to 1.6MPa	
Max. drain discharge		400cc/min (Pressure 0.7MPa, the case of water)	

Note) Use for air compressor with flow more than 50L/min (ANR).



Parts shown in [] are accessories attached to the unit.

9.3 Installation of heavy duty auto drain

1) Hold the hexagon-head part (width across flats: 32) at port Rc1/2 of the air dryer with spanner.

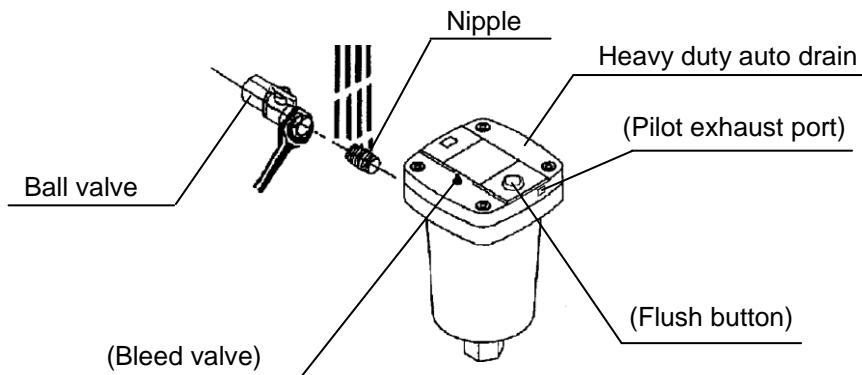
Then install nipple, ball valve (width across flats: 25).

Note 1) Put up the seal tape or the sealant to the nipple. Tightening torque: 28 to 30Nm

2) Hold the ball valve with the spanner. Then install a nipple and a heavy duty auto drain.

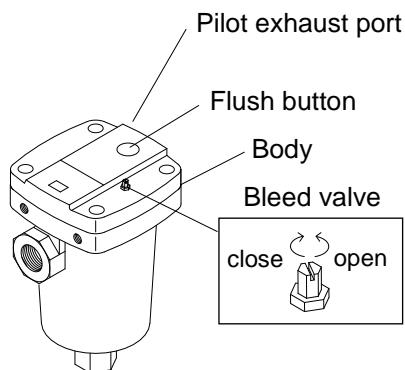
Install with "out port" down in a vertical position. Inclination from the vertical line should be less than 5°.

3) Install one-touch fitting (width across flats: 22) to drain port (width across flats: 27) and the drain tube.



9.4 Maintenance

- 1) As a preventive maintenance, press the flush button of the heavy-duty auto drain regularly to clean the discharge valve (for flushing).
- 2) The pilot exhaust of the heavy-duty auto drain is at the position shown in the figure. **Do not close the exhaust port.** Also, clean the exhaust port to prevent it from getting blocked by dust.
- 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 released.



10**Specification for Option M****10.1 Safety instructions**

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

**Warning**

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

**Warning**

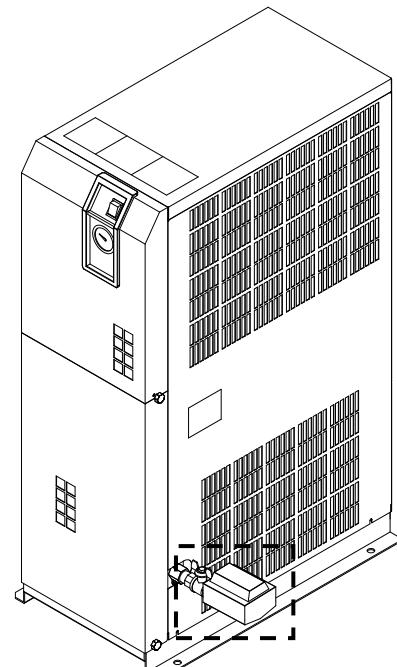
Only qualified persons are allowed to wire the product.

- Use a power supply suitable for the specifications of the product.
- Be sure to connect the ground connection.
- Grounding should never be connected to a water line, gas line or lightning rod.
- Multiple wiring is dangerous because it may lead to heat generation and cause a fire.
- Do not modify the electrical wiring of the power supply.

10.2 Specifications

The float type auto drain used in the standard air dryer is replaced with a motor type auto drain (ADM200). The customer is required to mount the auto drain to the air dryer.

Model Item	IDU15E1-10-M	IDU15E1-20-M
Part No.	IDF-S0087	IDF-S0090
Max. pressure	1.0MPa	
Operating cycle	Once every minute	
Operating time	2 seconds/cycle	
Power supply voltage of dryer	AC100V (50/60Hz)	AC200V (50/60Hz)
Power consumption	4W	



Parts shown in [] are accessories attached to the unit.

10.3 Installation of motor type auto drain

1) Hold the hexagon-head part (width across flats: 32) at port Rc1/2 of the air dryer with spanner.

Then install nipple, ball valve (width across flats: 25).

Note 1) Put up the seal tape or the sealant to the nipple. Torque R1/2: 28 to 30Nm

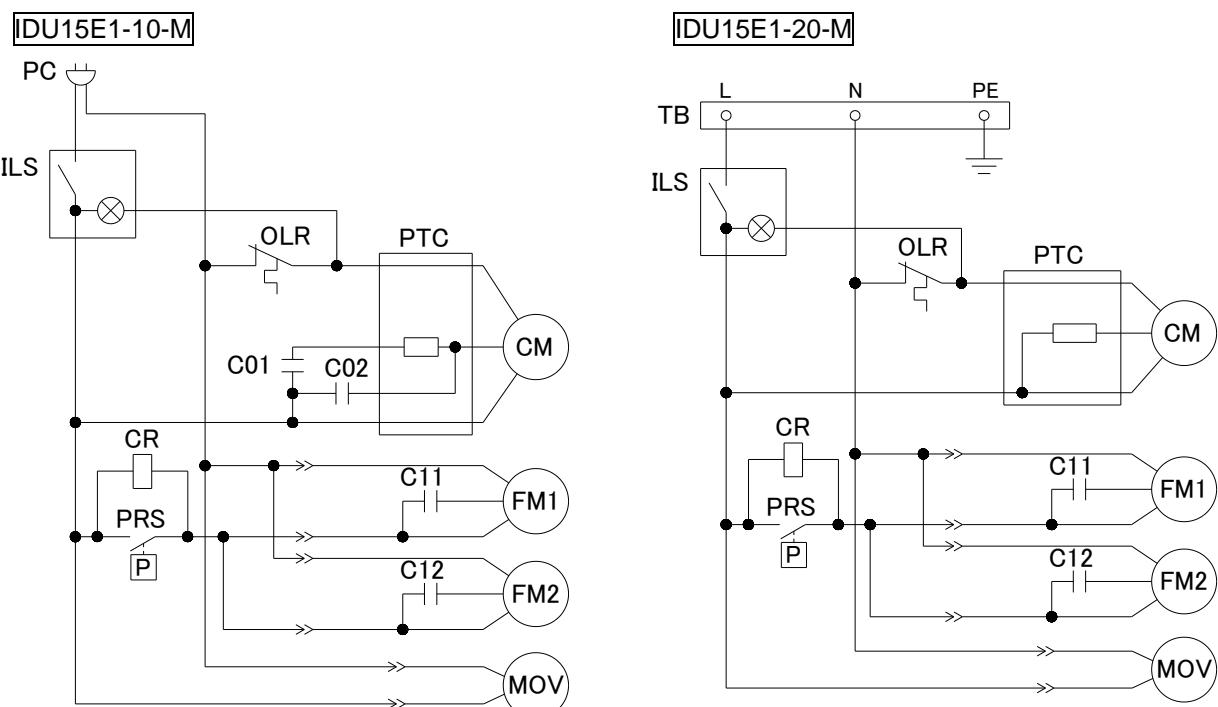
2) Hold the ball valve with the spanner. Then install a nipple and a motor type auto drain.

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: 17) to drain port (width across flats: 30) and the drain tube.

4) Connect the 2 electric cables coming out from the auto drain with the two electric cables from the dryer unit. Insert the drip-proof connector to the deepest part.

10.4 Electric wiring diagram



Symbol	Description	Symbol	Description
CM	Refrigerating compressor	TB	Terminal block
FM1	Fan motor	C01	Capacitor for running refrigerating compressor
FM2	Fan motor	C02	Capacitor for starting refrigerating compressor
OLR	Overload relay	C11	Capacitor for running fan motor
ILS	Switch with lamp	C12	Capacitor for running fan motor
PTC	PTC Starter	CR	CR Unit
PRS	Pressure switch	MOV	Motor type auto drain
PC	Power supply cable		

11**Specification for Option R****11.1 Safety instructions**

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

 **Warning**

Only qualified persons are allowed to wire the product.

- Before wiring, be sure to shut off the power supply. Never perform wiring work while the product is energized.
- Ensure a stable power supply with no voltage surges.
- Use a power supply suitable for the specifications of the product.
- Be sure to connect the ground connection.
- Grounding should never be connected to a water line, gas line or lightning rod.
- Multiple wiring is dangerous because it may lead to heat generation and cause a fire.
- Do not modify the electrical wiring of the power supply.

11.2 Specifications

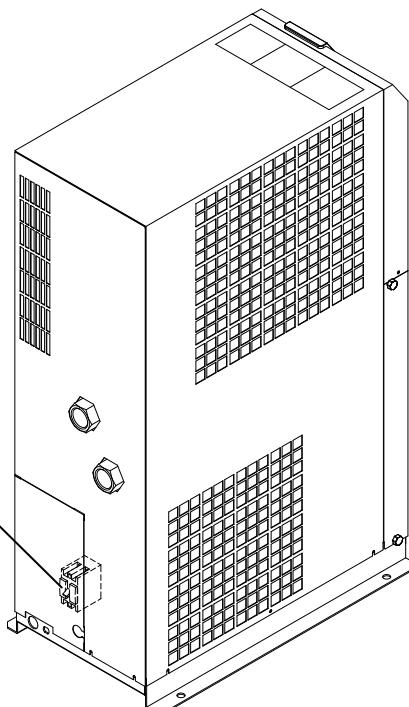
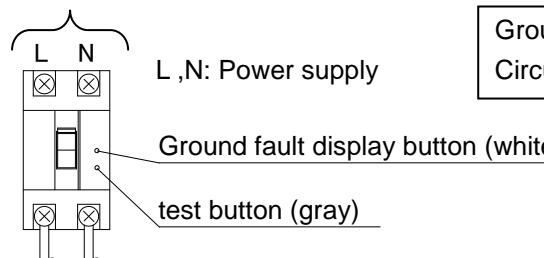
Customer should connect power cords at primary side of ground fault circuit interrupter, which is different from standard such as plug-in type (AC100V) or terminal block type (AC200V). The ground fault circuit interrupter is located at the rear side (air inlet and outlet side).

Item \ Model	IDU15E1-10-R	IDU15E1-20-R
Current rating (A)	10	
Sensitivity current (mA)	30	

11.3 Power supply connection 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.

To the user's machine
 Terminal connecting screw: M5
 Connector width: 9.5mm or less
 Applicable electrical wire: 1.25mm² or more

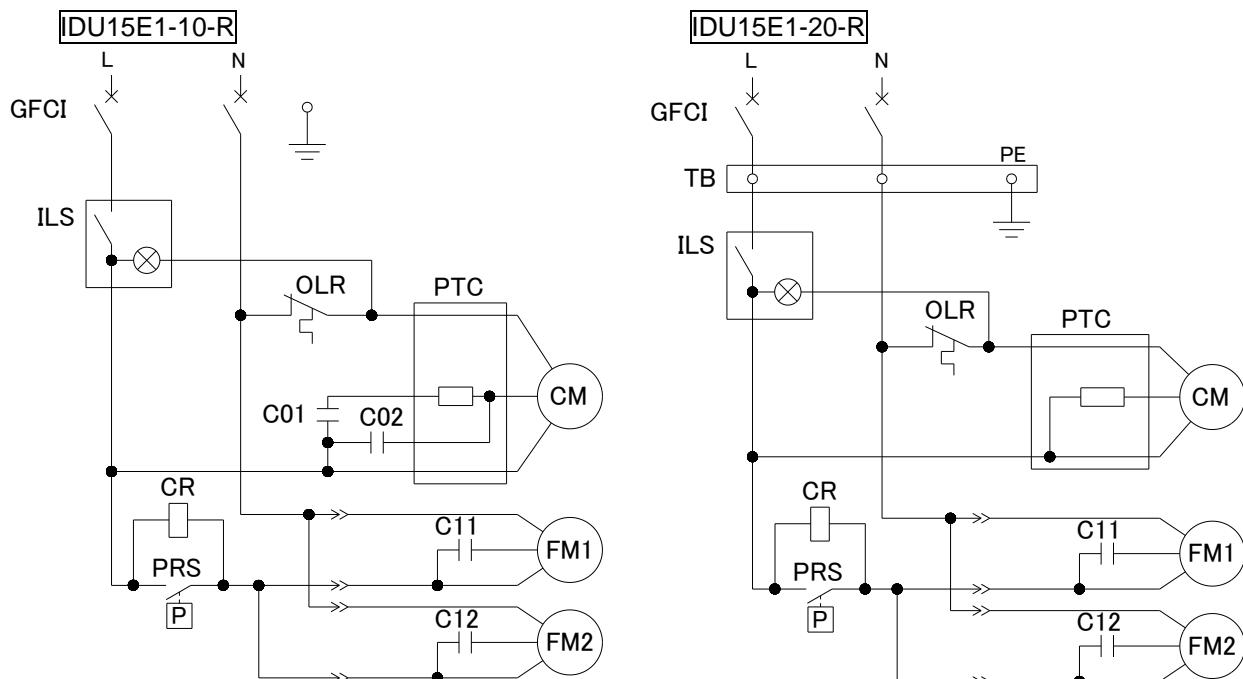


- 3) Connect the power cable to the terminal of the GFCI.
- 4) Connect the ground line.
 - AC100V: Connect the ground line to M4 screw on the left side of the GFCI (with the name plate).
 - AC200V: Connect it to the terminal block (ground connection thread: M3)
- 5) Mount the rear panel.

11.4 Cautions for handling the GFCI

- 1) When the breaker is tripped, cut off the power supply and contact the nearest sales distributor or SMC sales.
 - With the Ground fault display button (white) released → Current leakage
 - With the Ground fault display button (white) pressed → Over current
- 2) Check the operation once a month by pressing the test button (gray) with the breaker on and Switch with Lamp off.

11.5 Electric wiring diagram



Symbol	Description	Symbol	Description
CM	Refrigerating compressor	TB	Terminal block
FM1	Fan motor	C01	Capacitor for running refrigerating compressor
FM2	Fan motor	C02	Capacitor for starting refrigerating compressor
OLR	Overload relay	C11	Capacitor for running fan motor
ILS	Switch with lamp	C12	Capacitor for running fan motor
PTC	PTC Startor	CR	CR Unit
PRS	Pressure switch	GFCI	Ground fault circuit interrupter
PC	Power supply		

12

Specification for Option S

12.1 Safety instructions

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

Warning

Only qualified persons are allowed to wire the product.

- Before wiring, be sure to shut off the power supply. Never perform wiring work while the product is energized.
- Ensure a stable power supply with no voltage surges.
- Use a power supply suitable for the specifications of the product.
- Be sure to connect the ground connection.
- Grounding should never be connected to a water line, gas line or lightning rod.
- Multiple wiring is dangerous because it may lead to heat generation and cause a fire.
- Do not modify the electrical wiring of the power supply.

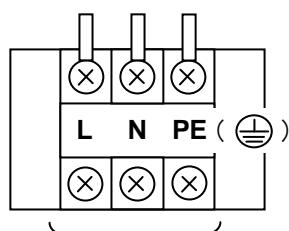
12.2 Specifications

The option allows the connection of a power cable to a terminal block.

IDU15E1-20 is equipped as standard.

Rear panel

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



To the user's machine

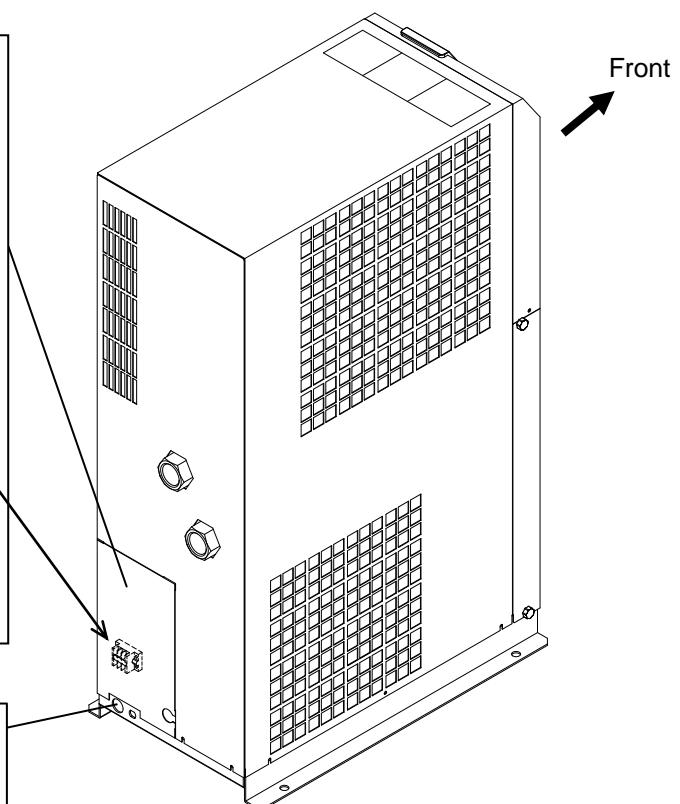
Terminal connecting screw: M3

Crimped terminal width: 6.5mm or less

Applicable electric wire: 1.25mm² or more

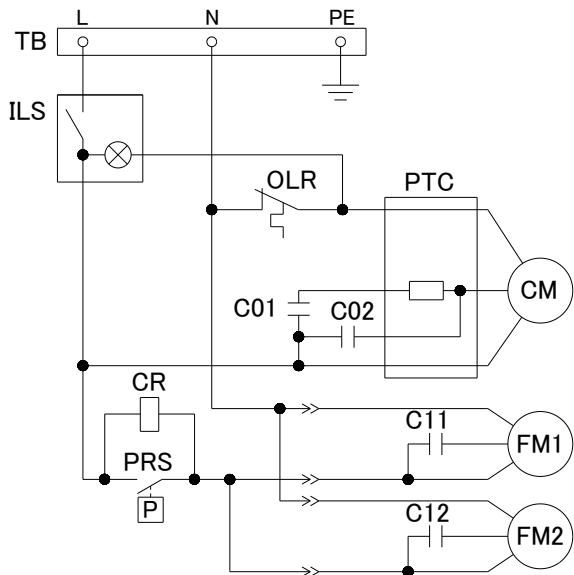
Rubber grommet

Power supply cable entry



12.3 Electric wiring diagram

IDU15E-10-S



Symbol	Description
CM	Refrigerating compressor
FM1	Fan motor
FM2	Fan motor
OLR	Overload relay
ILS	Switch with lamp
PTC	PTC Starter
PRS	Pressure switch
TB	Terminal block
CR	CR Unit
C01	Capacitor for running refrigerating compressor
C02	Capacitor for starting refrigerating compressor
C11	Capacitor for running fan motor
C12	Capacitor for running fan motor

13**Specification for Option T****13.1 Safety instructions**

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

Warning

Only qualified persons are allowed to wire the product.

- Before wiring, be sure to shut off the power supply. Never perform wiring work while the product is energized.
- Ensure a stable power supply with no voltage surges.
- Ensure that an ground fault circuit interrupter with appropriate capacity for ground fault and load is used in the power supply of the product to prevent electrical shock and burnout of the compressor motor.
- Use a power supply suitable for the specifications of the product.
- Be sure to connect the ground connection.
- Grounding should never be connected to a water line, gas line or lightning rod.
- Multiple wiring is dangerous because it may lead to heat generation and cause a fire.
- Do not modify the electrical wiring of the power supply.
- For use in Europe, install a breaker compliant with applicable IEC standards to the power supply of the product.

13.2 Specifications

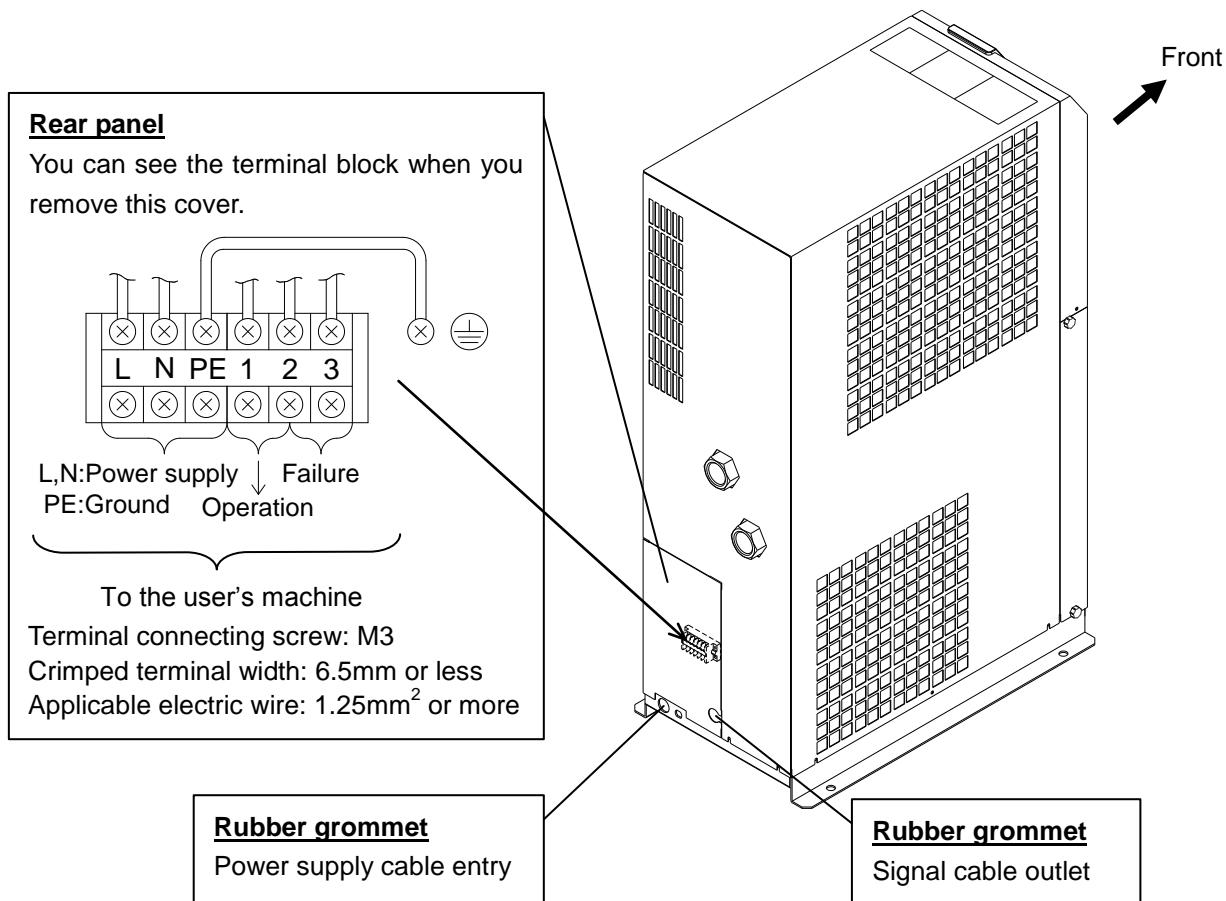
This option installs a terminal block that has outputs for the operation and failure signals.

- 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, 1A
 - Minimum current for signal: AC10mA, DC30mA

13.3 Remote operation

- When a remote operation is used, the switch with lamp should remain on; turn the power supply on and off to start and stop operations.
- Wait 3 minutes before restart after the air dryer is stopped for both manual and remote operation. Restart within 3 minutes will cause the protective equipment (overload relay) to move and the operation will be prevented.
Also, the frequency of starting and stopping should be 5 times per hour or less (to prevent the motor failed.)

13.4 How to connect the power and signal cable

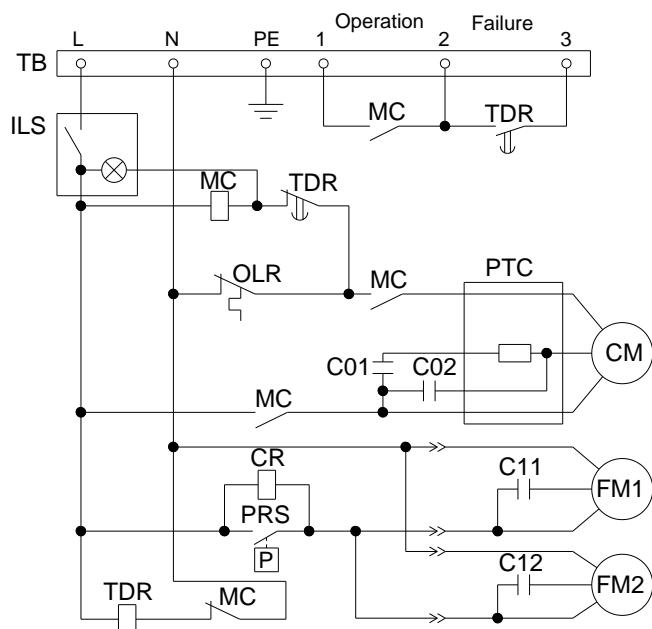


Connect the power cable and signal cable in the following procedures.

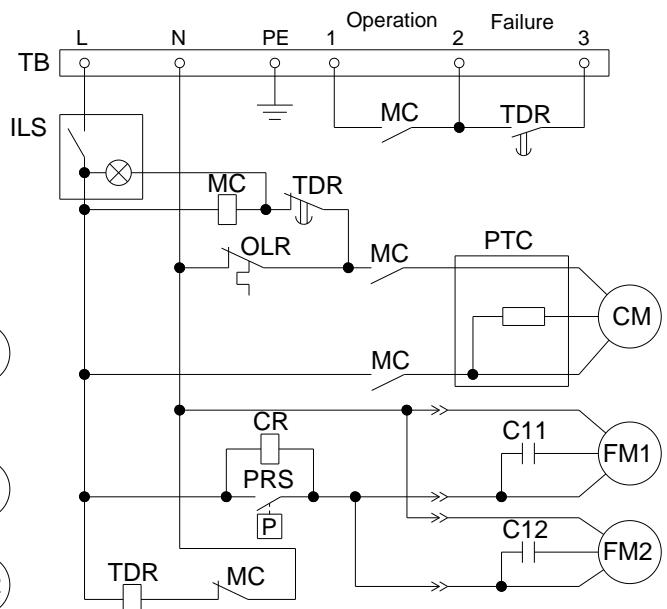
- 1) Take off the rear panel.
- 2) Insert the power cable prepared by the customer into the power cord inlet (with rubber grommet) and bring the power cable near the terminal block through the base hole.
- 3) Connect the power cable to the terminal.
- 4) Insert the signal cable prepared by the customer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

13.5 Electric wiring diagram

IDU15E1-10-T



IDU15E1-20-T



Symbol	Description	Symbol	Description
CM	Refrigerating compressor	C01	Capacitor for running refrigerating compressor
FM1	Fan motor	C02	Capacitor for starting refrigerating compressor
FM2	Fan motor	C11	Capacitor for running fan motor
OLR	Overload relay	C12	Capacitor for running fan motor
ILS	Switch with lamp	CR	CR Unit
PTC	PTC Starter	TDR	Time delay relay
PRS	Pressure switch	MC	Magnetic contactor
TB	Terminal block		