



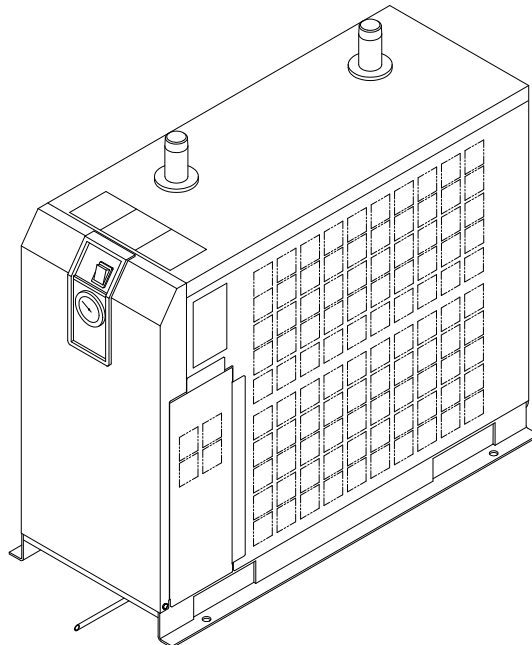
# Operation Manual

## PRODUCT NAME

### Refrigerated Air Dryer

## MODEL / Series

- |              |                       |
|--------------|-----------------------|
| IDFB22E-11 □ | IDFB22E-11 □- K,R,T,V |
| IDFB22E-23 □ | IDFB22E-23 □- K,R,T,V |
| IDFB37E-23 □ | IDFB37E-23 □- K,R,T,V |
| IDFB55E-46 □ | IDFB55E-46 □- L,R,T,V |
| IDFB75E-46 □ | IDFB75E-46 □- L,R,T,V |



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

## To Customers

Thank you for selecting SMC Refrigerated Air Dryer.

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

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

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

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

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

<p>Caution: Please understand that the contents of this operation manual are subjected to change without prior notice.</p>
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## Safety Instructions



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



Do not operate the equipment without the cover panel.

### i-1 Warning: Before Using Air Dryer

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

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

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

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

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

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

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

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

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

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



#### **DANGER**

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



#### **WARNING**

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




#### **CAUTION**

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

## i-2 Danger Classifications & Position of Hazard warning Labels

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

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

### i-2-1 Danger Classifications

Specific danger classification of this equipment is as follows.

#### **Hazard of Electricity**

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



#### **Hazard of Hot Surface**

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




#### **Hazard of Rotor**


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




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

 <b>Warning</b>
<p>Inside of this equipment, there is a power-supplying section with high voltage separated by the cover panel. Do not operate the equipment with the cover panel off.</p>


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

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

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

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

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

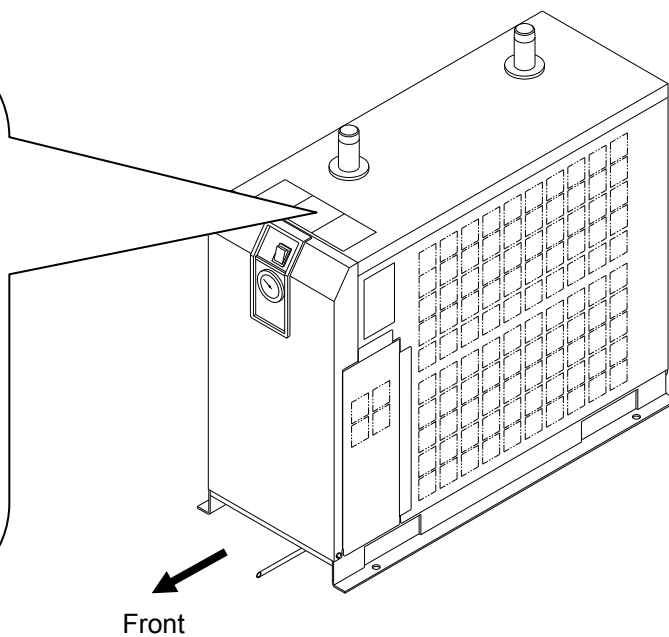
 <b>Warning</b>
<p>Before replacing or cleaning parts, be sure to relief the pressure remained inside of the equipment until the gauge indicates "0". High pressure can propel object at high velocity and cause injury.</p>

## i-2-6 Positions of Danger Warning Label



## Warning

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

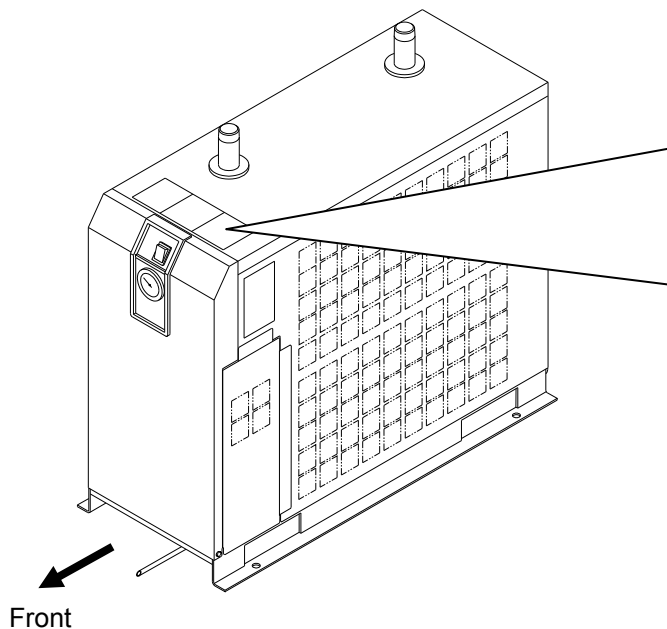


## i-2-7 Hazard of Refrigerant



## Caution

- This equipment uses Fluorocarbon (HFC) as a refrigerant.
- It is strictly forbidden to emit Fluorocarbon into the atmosphere. Before you repair the refrigerant circuit, you should collect the refrigerant with proper evacuation system. The collected refrigerant should be properly recycled by qualified agency. Only personnel with proper credential are allowed to handle refrigerant.
- Only properly trained qualified personnel are allowed to remove the cover panel of the equipment.
- The quantity and the type of Fluorocarbon are mentioned on the specification label. See Page i - 6, i - 7.



Fluorocarbon Collection and Destruction Law in Japan  
フロン回収破壊法第一種特定製品


This product uses  
Fluorocarbon (HFC) as a refrigerant.

- 1 It is strictly forbidden to emit Fluorocarbon to the atmosphere.
- 2 When disposing this product, Fluorocarbon must be collected in an appropriate manner.
- 3 The kind of Fluorocarbon and the amount used in this product is printed on the name label.

この製品には冷媒として、  
フロン類(HFC)が使われています。

- 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 フロン類の種類及び数量は、型式銘板に記載されています。

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

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

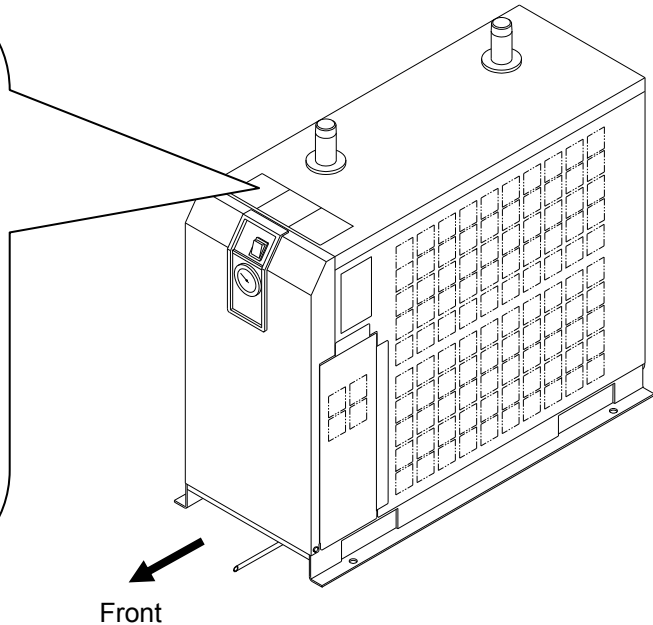
 **CAUTION 注意**

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

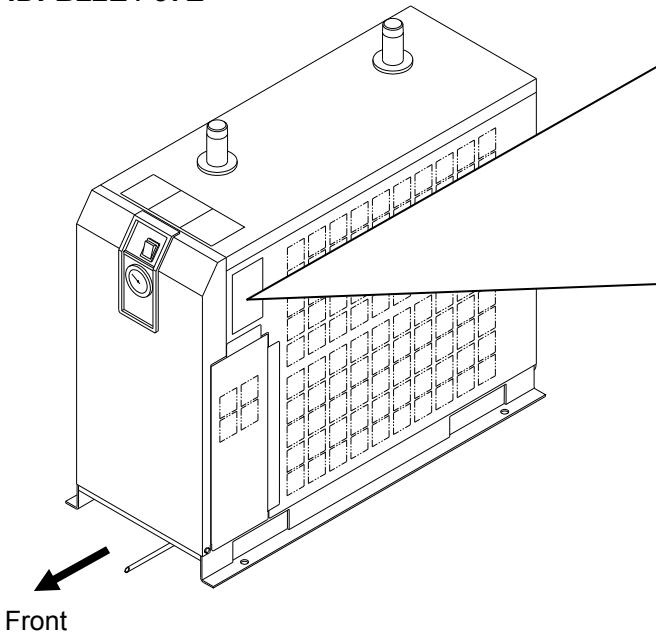
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- 1 ご使用前に必ず取扱説明書を読んでください。
- 2 通風、メンテナンススペースを確保してください。
- 3 雨や水滴がかからないようにしてください。
- 4 IN/OUTポートをスパナで固定して配管してください。
- 5 再起動は運転停止3分後に行ってください。
- 6 RUNNING CONDITION・蒸発温度計はグリーン帯で使用してください。



**i-2-9 Other Label**


**IDFB22E / 37E**



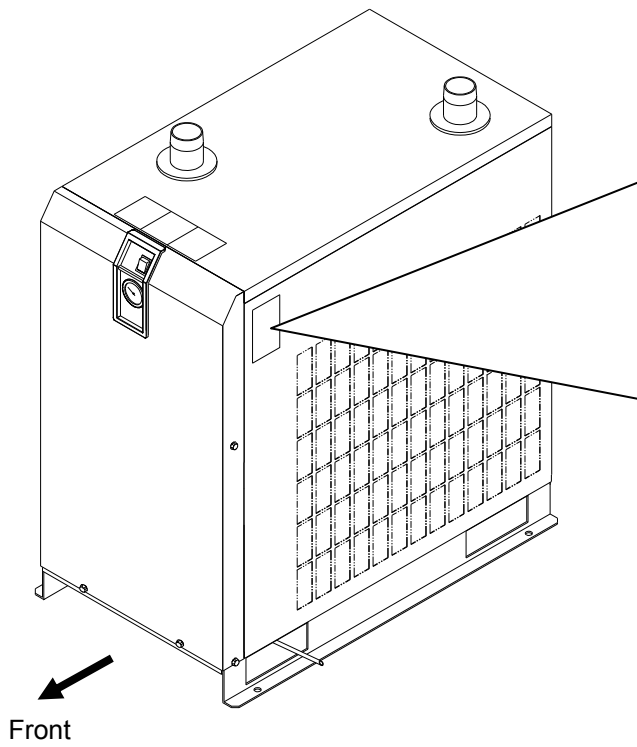
	<b>AIR DRYER</b>
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MODEL  
 VOLTAGE  
 RATED CURRENT  
 MCA  
 MOPD  
 CMP LRA  
 AIR FLOW RATE  
 MAX. INLET PRESS.  
 MAX. INLET TEMP.  
 MAX. AMBIENT TEMP  
 MIN. AMBIENT TEMP  
 REFRIGERANT R134a  
 LO. SIDE PRESS.  
 HI. SIDE PRESS.  
 WEIGHT  
 SERIAL No.  
 MAKER

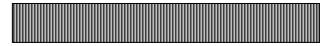
  
 \*12456789\*

IDFB55E / 75E



AIR DRYER


MODEL  
VOLTAGE  
MCA  
MOPD  
COMPRESSOR RLA/LRA  
FAN MOTOR HP/FLA  
AIR FLOW RATE  
MAX. INLET PRESS.  
MAX. INLET TEMP.  
MAX.AMBIENT TEMP.  
MIN. AMBIENT TEMP.  
REFRIGERANT R407C  
LO. SIDE PRESS.  
HI. SIDE PRESS.  
WEIGHT  
SERIAL No.  
MAKER




\*12456789\*

### **i-3 Disposal**

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

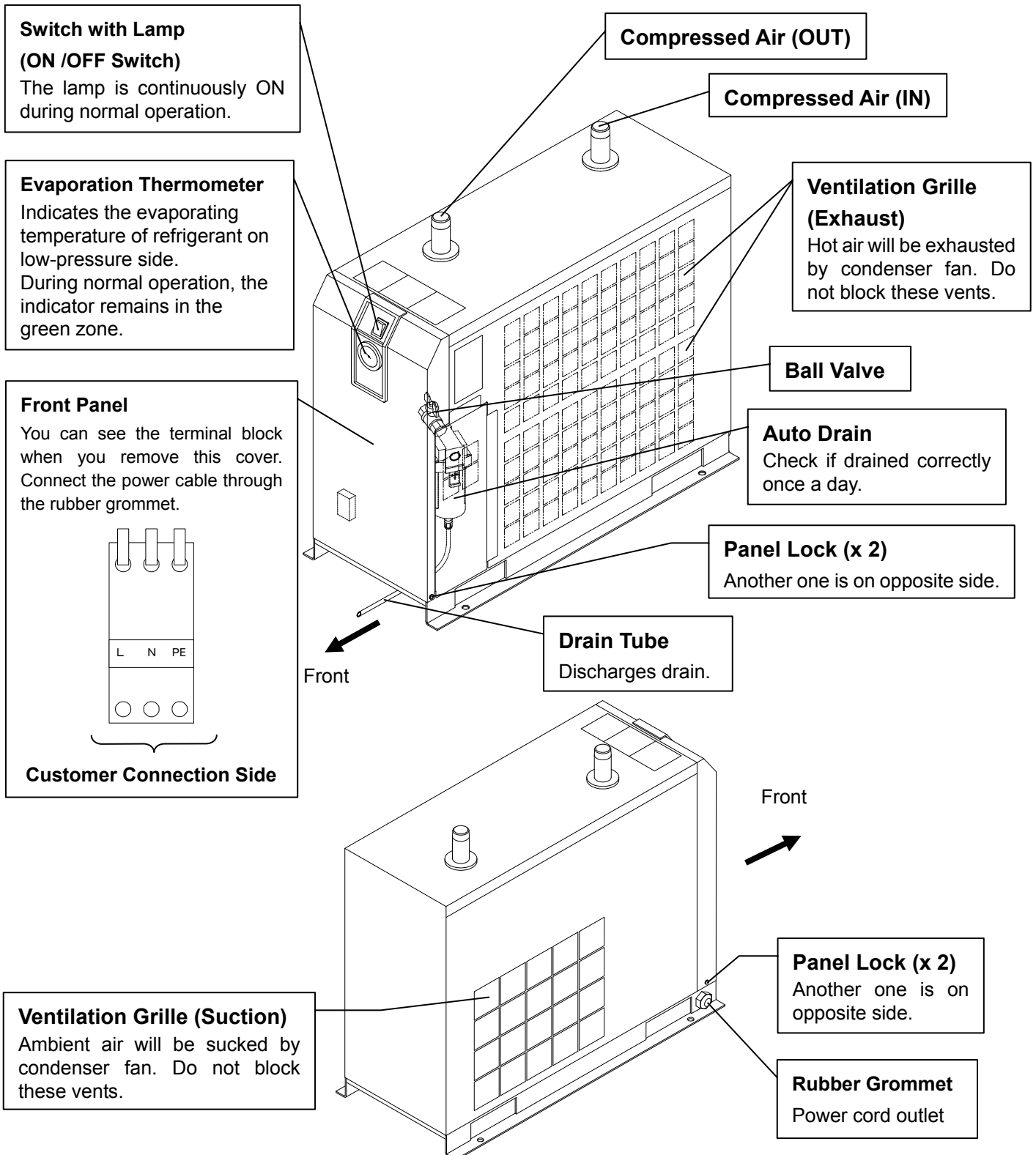
 <b>Caution</b>
<p><b>This equipment contains Fluorocarbon HFC.</b></p> <p><b>It is strictly forbidden to emit Fluorocarbon into the atmosphere. Before you repair the refrigerant circuit, you should collect the refrigerant with proper evacuation system. The collected refrigerant should be properly recycled by qualified agency. Only personnel with proper credential are allowed to handle refrigerant.</b></p> <p><b>Only properly trained and qualified personnel are allowed to remove the cover panel of the equipment.</b></p> <p><b>The quantity and the type of Fluorocarbon are mentioned on the specification label. See Page i - 6, i - 7.</b></p>

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

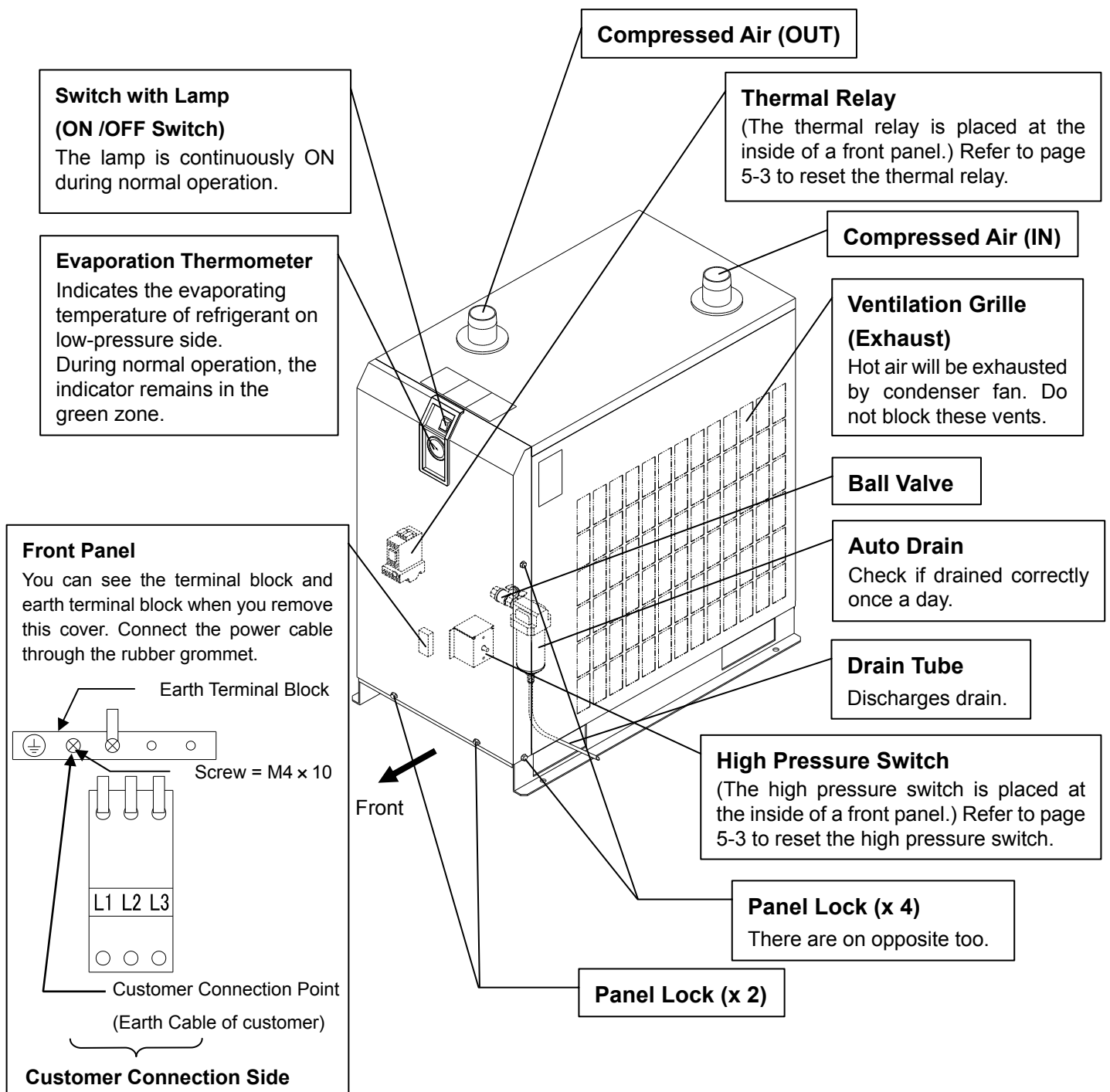
# 1 Parts Name and Functions

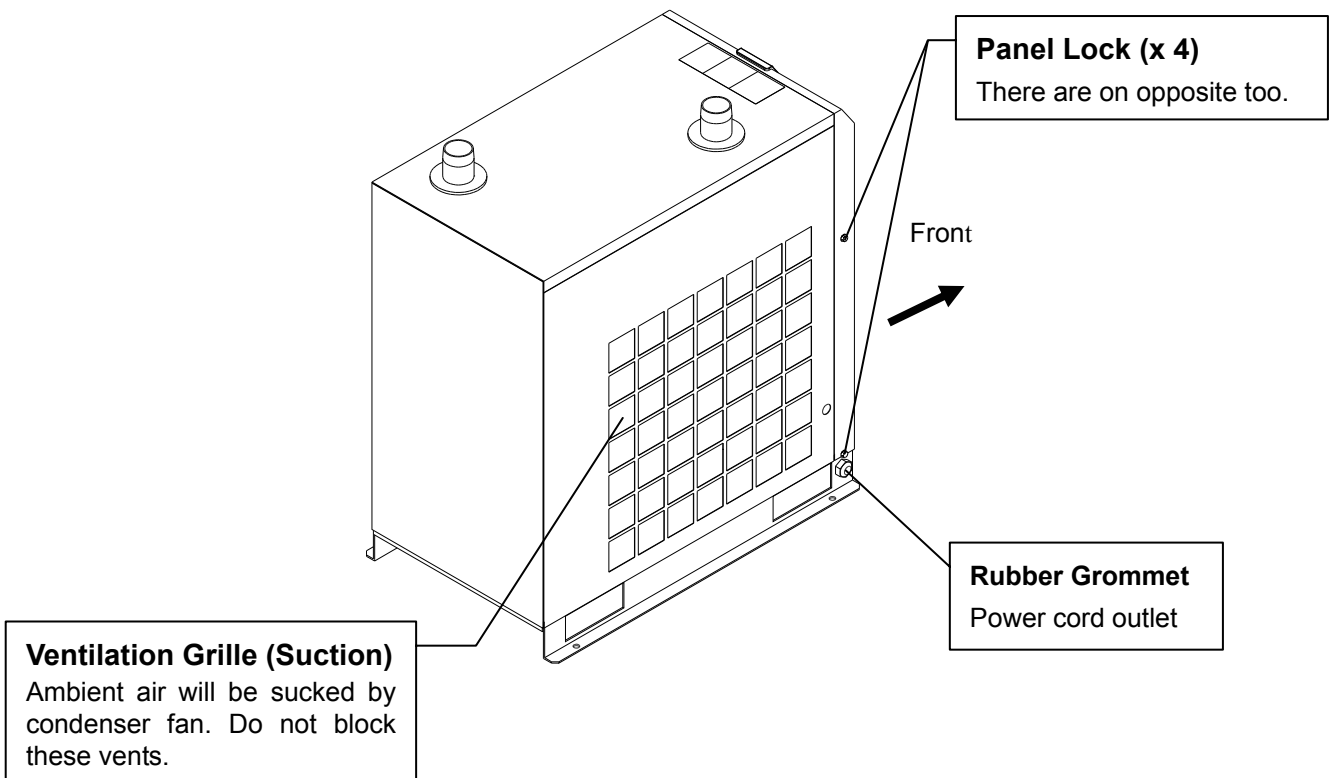
## 1-1 Parts Name and Functions

• IDFB22E, 37E



• IDFB55E, 75E





**2**

**Transportation / Installation**



**Warning**

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

**2-1 Transportation**

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

- You should lift the equipment from the base surface with careful attention to prevent tipping over.
- Do not lay the equipment sideways, or you will damage the equipment.
- Do not suspend the equipment from the ceiling or hang from the wall.



**Warning**

This equipment is heavy.

Each model weights about 110lbs (50kg) or more. More than one person is required to move it, a forklift is necessary.

## 2-2    Installation

### 2-2-1    Location

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

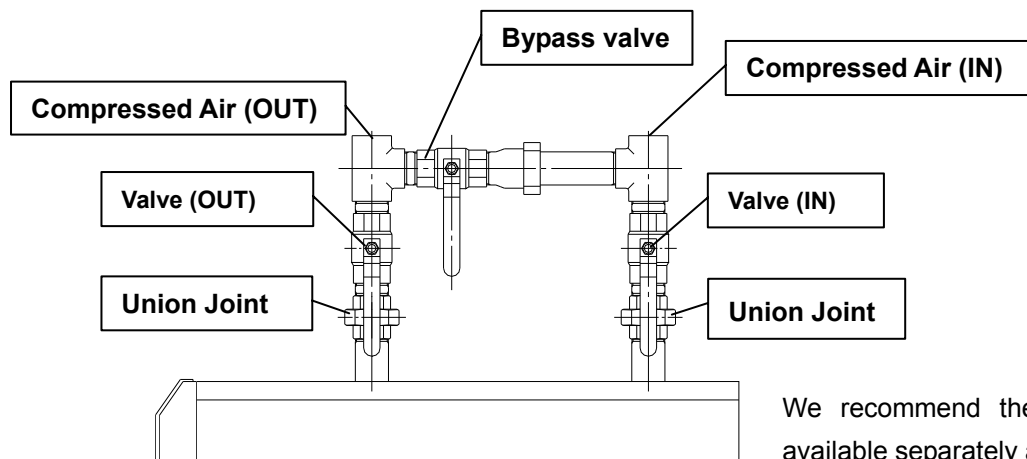
- Environment where the equipment is exposed to rainwater, moisture, salt water or oil.
- Locations where the equipment is exposed to dust or particles
- Locations where the equipment is exposed to flammable, combustible or explosive fumes.
- Locations where the equipment is exposed to corrosive gas or solvent.
- Locations where the equipment is exposed to direct sunlight or radiated heat.
- Locations where ambient temperature is beyond following range:
  - On-stream: 36 to 104 ° F (2 to 40°C)
  - Storage: 32 to 122 ° F (0 to 50°C)
  - (when there is no drain water inside of the piping)
- Locations where temperature changes rapidly.
- Locations where strong electromagnetic noise is generated.
- Circumstances where static electricity is produced or discharged through the body of the equipment
- Locations where strong high frequency shock wave is generated
- Locations where danger of thunder is apparent.
- Locations where loading on vehicles, marine vessels, and so on
- Locations where altitude is higher than 2,000 meters
- Circumstances where strong vibration or impact are transmitted.
- Circumstances where too much force and weight are put on the body of the equipment that causes it to deform.
- Circumstances where not enough clearance spaces to do maintenance
  - Spaces needed for maintenance
  - Front        : 2feet (0.6m)
  - Rear         : 2feet (0.6m)
  - Top          : 2feet (0.6m)
  - Right        : 2feet (0.6m)
  - Left         : 2feet (0.6m)
- Locations where ventilation grille of the equipment can be blocked.
- Locations where the dryer could intake warm air (for example from a compressor or other dryers).

### **2-2-2 Tie Down**

- The air dryer should be installed on a vibration-free, stable, horizontal, flat surface.
- Refer to “Chapter6 6-2 Dimensions” for the dimensions.
- This model should be installed using anchor bolts (not included) to prevent shifting during a potential earthquake.

### **2-2-3 Air piping**

- Connection to the inlet and outlet of compressed air should be made removable by using union or similar connection.
- Support the IN/OUT ports with a wrench during tightening or loosening of fittings.
- Do not allow the equipment to support the weight of the piping.
- Isolate the vibration generated by the compressor.
- If the temperature of compressed air on the inlet side is higher than 122 ° F (50°C), place an aftercooler unit after the air compressor.
- Clean pipes and fittings before use and select a suitable filter to prevent dust, oil or chips from entering the air dryer, which can cause failure to the equipment.
- Use pipes and fittings that can withstand the operating pressure and temperature of the compressed air. Make sure all connections are leak-free.
- Provide bypass piping to make it possible to do maintenance without stopping the air compressor.



We recommend the bypass piping sets available separately as accessories.

### **2-2-4 Drain Tube**

- A polyurethane tube (3/8inch) O.D. is attached to the auto drain. The end of the tube is open to atmosphere to let drain flow through the tube into a collector or drain pipe.
- The compressed air is used to push out the drain periodically. Fix the outlet end of the tube in order to prevent whipping action during discharge.
- Install the drain tube in such a way so that no drain is trapped.
- During installation, make sure the dryer does not sit on the drain tube which is at the bottom of the unit. Be careful to avoid the dryer from crushing the tube during installation.

**Warning**

- To handle drain discharge, follow the safety guidelines such as wearing protective goggles, apron, and gloves.
- In cases where oil is mixed in the wastewater discharged from the auto drain, the liquid would be considered as toxic waste and treatment is necessary in accordance with local regulations.

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

- Only properly trained and qualified personnel are allowed to perform wiring work.
- Before wiring, you must disconnect the power. Do not work under any energized conditions.
- Supply power from a stable source that is free from the effect of surge.
- Referring to “6-1 Specifications,” make sure to install a GFCI breaker that has the right short circuit capacity and load capacity.
- Supply power of the equipment should meet the specifications on page 6-1.
- The equipment must be grounded for safety.
- Do not connect ground wire to a water pipe, a gas pipe, or a lightning rod.
- Do not plug too many leads into a single socket.
- The customer must prepare for countermeasures of the power failure. The dryer may not start normally at the moment of power failure.
- Circuit breaker must be properly selected to meet safety standard of local regulations.
- Always be sure to connect the protective conductor first, disconnect it last in respect to the other connections.
- Be sure that the protective conductor has some additional length in respect to the live conductors, so that it is not subject to mechanical stresses.
- Be sure to install the circuit breaker correctly so that it disconnects all live conductors and so that the operating handle can be easily accessible.

**Specification of power cable**

Prepare following power cable.

Power cable: 16AWG (1.25mm<sup>2</sup>), Three-cores (including the ground cable) [IDFB22E/37E], Four-cores (including the ground cable) [IDFB55E/75E], External diameter: about 0.3inch (8mm) to 0.5inch (12mm). Additional length of about 4inch (0.1m) is needed to wire inside of the equipment.

**Length of the power cable**

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

**Connecting to the power supply**

- Connect the power cable and the ground to the terminal block.

**Wiring procedure**

1. Remove the terminal block cover or the front panel.
2. Insert the cord through the rubber grommet and connect it to the terminal block (refer to the label on the terminal block).

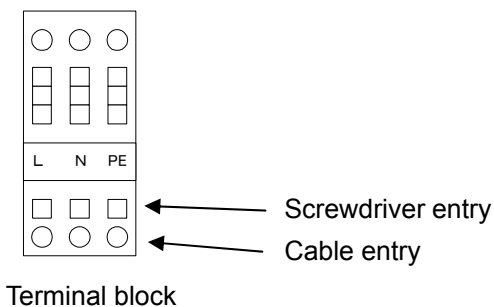
During wiring work, do not touch other sections except terminal block.

3. Insert the screwdriver into terminal block and open spring of terminal.

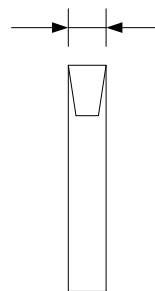
(The cable insulator must be stripped at 3/8inch (10mm).)

4. Insert the cable and remove the screwdriver.
5. Re-attach the cover or real panel after wiring is done.

**IDFB22E, 37E**

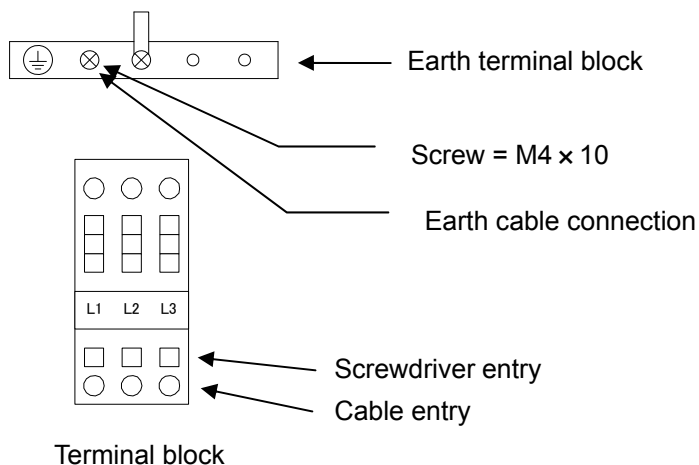


118 to 138 mil  
( 3 to 3.5mm )

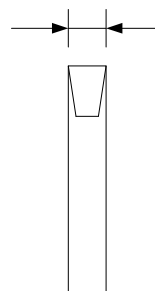


Applicable screwdriver

**IDFB55E, 75E**



118 to 138 mil  
( 3 to 3.5mm )



Applicable screwdriver

## 2-3 Cautions for Reinstallation



### Caution

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

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

### Removing the power cable

Disconnect the power source before removing the power cable.



### Warning

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

### Disconnecting air pipes



### Warning

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

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

### Releasing residual pressure

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

Close the compressed air inlet and outlet valve.

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

Open the auto drain residual pressure release valve to release air pressure inside the equipment. Refer to the method of cleaning the auto drain strainer in "Chapter 4 Maintenance" for detail.

## **3** Operation / Shutdown



### **Caution**

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

### **3-1 Check points before operation**

Before trial run, check the following points:

- **Installed Conditions:**  
By visual inspection check that the equipment is level.  
Make sure the equipment is tied down with anchor bolts.  
Do not place heavy objects on the top of the equipment. Make sure piping does not add weight to the equipment.
- Power cord, and the ground should be connected firmly.
- Drain tube should be connected correctly.
- Make sure the piping for compressed air is connected correctly.
- Make sure the ball valve located next to the auto drain opened.

### **3-2 Operation**

Start operation according to the procedure below.

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



### **Caution**

**Avoid frequent On/Off operation, which may cause problems.  
The auto drain used for the equipment has a structure that closes the valve with air pressure higher than 22psi ( 0.15MPa ) . Therefore, until the pressure increase, air will be emitting from the drain outlet at the start of opening the "IN" valve. Keep in mind that sometimes the pressure cannot increase due to under-sized air compressor.**

### **3-3 Shutdown**

Turn off the ON/OFF switch.

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

### **3-4 Cautions about restart**

- Wait at least 3 minutes before restarting the air dryer after it has been shut down. Failure to do this may cause safety devices to trip due to over load. If it is not possible to restart, refer to “Chapter 5 Troubleshooting.”

### **3-5 Check points before restart**

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

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

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

## 4

## Maintenance

**4-1 Daily Inspection**

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

- There is no air leaks.
- The running lamp is on during operation
- Moisture is being discharged from drain tube
- The pointer of the evaporating temperature indicates in the green zone
- The pointer of the evaporating temperature indicates about 41 to 59 ° F (5 to 15°C) lower than that of the ambient temperature when compressed air stops supplying to the air dryer.
- There is no abnormal odor or smoke coming from the equipment.
- It is recommended to keep a maintenance/service record. Please refer to “Chapter 12-1 Service Record”

**4-2 Periodical Maintenance**

As a preventive maintenance, clean following parts periodically.

- Auto Drain Once a month; \*Note  
\* Note: If they are too dirty, replace them and shorten the period of maintenance for next time.

Clean any dust and other foreign particles from the ventilation area with vacuum cleaner or air blow nozzle once a month. During air blowing, wear protective goggles and masks.

**Cleaning of Auto Drain Strainer****Danger**

**Do not remove the case assembly when there is still air pressure left inside the equipment. Air pressure can propel the casing at high speed when unscrew it from the body. Put on gloves to prevent injury when remove the case assembly.**

**Danger**

**There is the risk of touching discharged drain fluid during replacement. Wear protective goggles, aprons, and gloves to prevent direct contact.**

**Danger**

**Use aqueous solution of neutral detergent to clean. Do not use solvent such as thinner.**

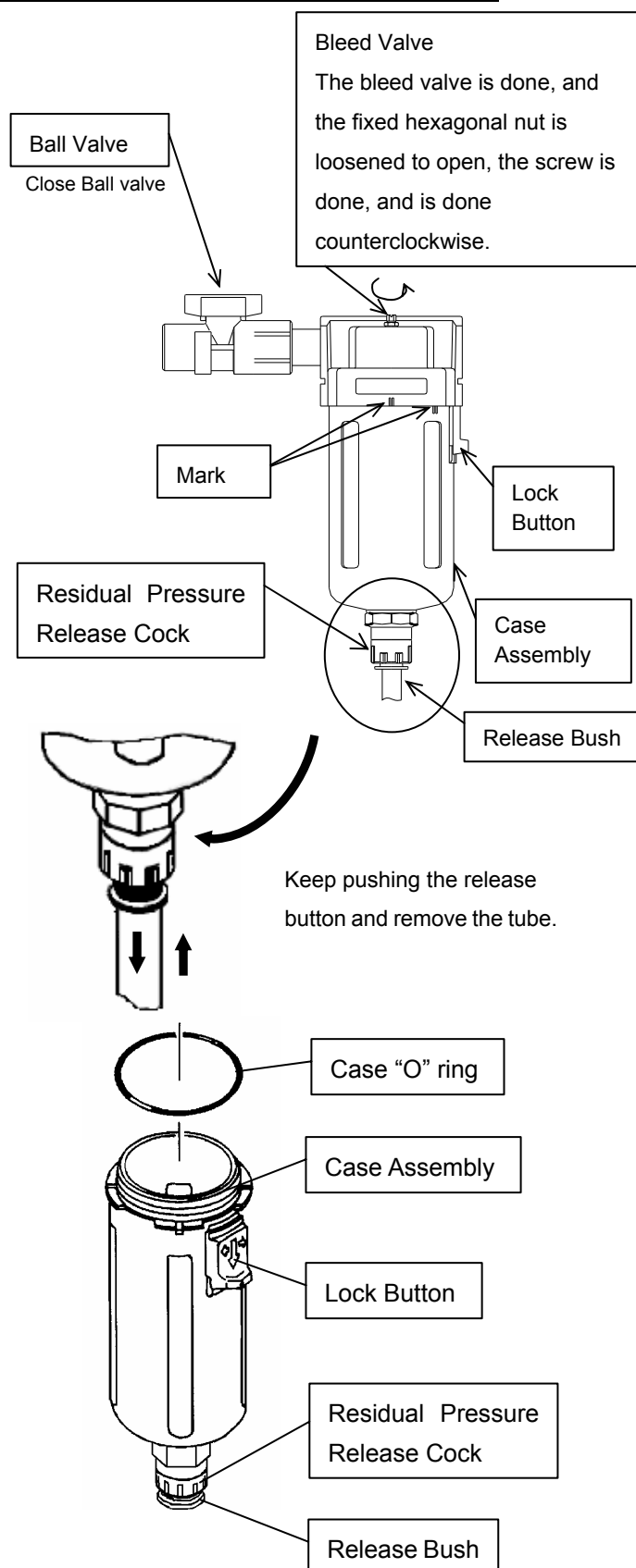


### Warning

**In case that oil get mixed in the drain discharged from the auto drain, the wastewater treatment is needed. Follow the regulations of local government.**

#### How to remove the Auto Drain

1. Close the ball valve.
2. The air pressure in the case is pulled out by either of a) or b) the following method.
  - a) Open the bleed valve rotating anticlockwise to release the residual pressure. After the air pressure is discharged, it tightens as before, and it shuts.
  - b) Open the Residual Pressure Release Cock at the drain tube connection entrance as the cock is clockwise. The drain in the case is exhausted at the same time as discharging the air pressure. (Please hold the drain tube by the hand so as not to twist while applied.)
3. Remove the drain tubing from case assembly.
4. Grip the case assembly lightly and pull down the lock button with thumb. Then, directly turn the case assembly left (or right) to match the eye marks. Remove thumb from the lock button and pull the case assembly down slowly (vertically) to remove the case assembly.
5. Put aqueous solution of neutral detergent into the case assembly and shake it to clean.
6. Check case "O" Ring for damage such as: scarring, twist, deformation, or foreign matters adhering to it. Then, apply grease thinly and fit it in the gap of the case assembly.
7. Load the auto drain strainer to the case assembly and fit it with the body of the auto drain. Turn it until it clicks in place.
8. As a safety check to make sure the casing is secured in place, try to turn the case assembly lightly to confirm whether it cannot be turned. If it can be turned, try to re-attach the casing again until it snap in place.



9. The drain tube is installed according to original. After the cock is closed of Residual Pressure Release Cock, the drain tube is installed according to original Residual Pressure Release Cock when the cock is opened.
10. Open the ball valve.

## 5 Troubleshooting

### 5-1 Cause and countermeasure of errors

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

Problem	Probable Causes	Remedy
Air dryer does not operate and run lamp does not light on, when the switch is ON.	Power cord or plug is loose or not connected to the power source.	<ul style="list-style-type: none"> <li>Perform proper connection on the power cord and plug.</li> </ul>
	Circuit breaker is OFF.	<ul style="list-style-type: none"> <li>Confirm whether the correct capacity of the circuit breaker is used.</li> <li>It is not possible to restart the air dryer within 3 minutes after shutdown. Wait for 3 minutes before restarting.</li> <li>Resume the operation after resetting the circuit breaker to ON. If the circuit breaker still trip to OFF, failure of electrical insulation may have occurred. Remove the power supply and contact the factory for further instructions.</li> </ul>
	Power line connection is wrong. (Phase Reversal Relay switch can't be ON.)	Connect the power line correctly.
Running lamp extinguishes and compressor stops during operation but resumes normal operation Switch with lamp after a period of time.	Installation place is poorly ventilated. Ambient temperature is too high.	<ul style="list-style-type: none"> <li>Improve the ventilation system to lower the ambient temperature.</li> <li>Reset the protective circuit by referring to "5-2 How to reset the thermal relay and high pressure switch." (Only IDFB55E,75E)</li> </ul>
	The ventilation grilles are obstructed by wall or clogged with dust.	<ul style="list-style-type: none"> <li>Install the air dryer more than 2feet (0.6m) away from the wall.</li> <li>Clean the ventilation grilles once a month.</li> <li>Reset the protective circuit by referring to "5-2 How to reset the thermal relay and high pressure switch." (Only IDFB55E,75E)</li> </ul>
	Temperature of the Compressed air is too high.	<ul style="list-style-type: none"> <li>Improve the ventilation system around air or make ambient temperature low.</li> <li>Reduce the temperature of the compressed air by installing an additional aftercooler before the air dryer.</li> <li>Reset the protective circuit by referring to "5-2 How to reset the thermal relay and high pressure switch." (Only IDFB55E,75E)</li> </ul>
	Supply voltage is not in the following range:	<ul style="list-style-type: none"> <li>Set the voltage to a proper value by installing a transformer or review the electrical wiring.</li> <li>Reset the protective circuit by referring to "5-2 How to reset the thermal relay and high pressure switch." (Only IDFB55E,75E)</li> </ul>
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 2feet (0.6m) away from the wall. Clean the ventilation grilles once a month.
	Temperature of the compressed air is too high.	Improve the ventilation system around the air compressor or make ambient temperature around the air compressor low to lower the temperature of discharge from compressor. Reduce the temperature of the compressed air by installing an additional after-cooler after the air dryer.

<b>Problem</b>	<b>Probable Causes</b>	<b>Remedy</b>
Evaporation thermometer indicates higher than green zone.	Supply voltage is not in the following range:	Set the voltage to a proper value by installing a transformer or review the electrical wiring.
	Overload relay for the compressor is activated	It is not possible to restart the air dryer within 3 minutes after shutdown. Wait for 3 minutes before restarting.
Evaporation thermometer indicates higher than green zone without warm air exhausted from the ventilation grille.	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 2feet (0.6m) away from the wall. Clean the ventilation grilles once a month.
	Temperature of the compressed air is too high.	Improve the ventilation system around air or make ambient temperature low. Reduce the temperature of the compressed air by installing an additional aftercooler before the air dryer.
Moisture occurs downstream of the compressed air lines.	Bypass valve of air dryer is not fully closed.	Close the valve completely.
	Drain is not discharged from auto drain properly.	Check if the drainpipe has fluid trap or bent. Check auto drain. Check auto drain strainer.
	Moisture from separate air circuit that is without air dryer.	Install additional air dryer on the line that does not have one. Separate two lines not to converge.
Large pressure drop	IN/OUT valve on the air dryer side is not fully opened.	Open IN/OUT valve fully.
	Filter that is installed separately in compressed air line is clogged.	Replace the filter element. (Follow the instruction manual of each individual device.)

## 5-2 How to reset the thermal relay and high pressure switch (Only IDFB55E, 75E)

If light goes off during operation and refrigerating compressor stops, the thermal relay or high pressure switch (for only the IDFB55E and IDFB75E) to protect the refrigerating compressor starts operating and needs to be reset manually. For the position of the thermal relay and high pressure switch, refer to page 1-2.

Before resetting the thermal relay and high pressure switch identify and cure problem that caused the unit to trip out, by referring to “5-1 Cause and countermeasure for errors”.



### How to reset a thermal relay

Turn off the ON/OFF switch.

Take off the front panel. You can see the electric parts bracket.

The thermal relay can be found left side and upper side in the electric parts bracket.

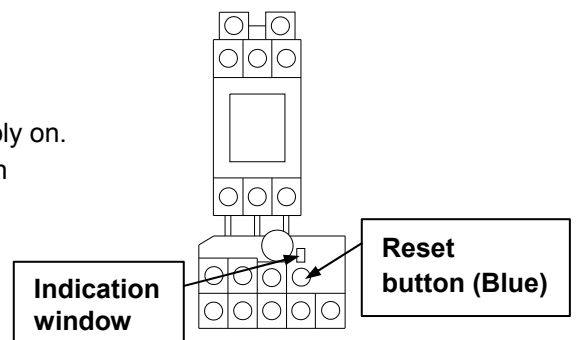
Confirm that a green indication does not appear in the indication window of thermal relay.

If the green indication appears, there are other possible causes and contact an SMC Authorized Dealer keeping the power supply on.

Press the blue reset button and confirm that the green indication comes to appear at the indication window.

Put back the front panel.

When the ON/OFF switch is turned on, the product will restart operation.



**Thermal relay**

### How to reset a high pressure switch

Turn off the ON/OFF switch.

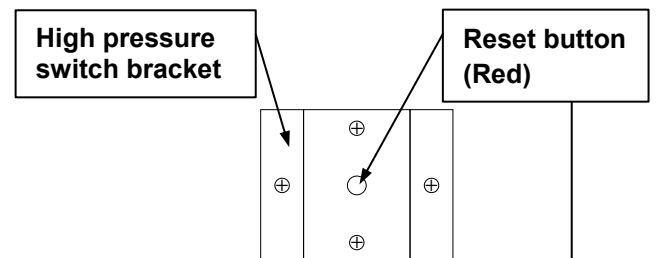
Take off the front panel. You can see the electric parts bracket.

The high pressure switch can be found at right side of electric parts bracket.

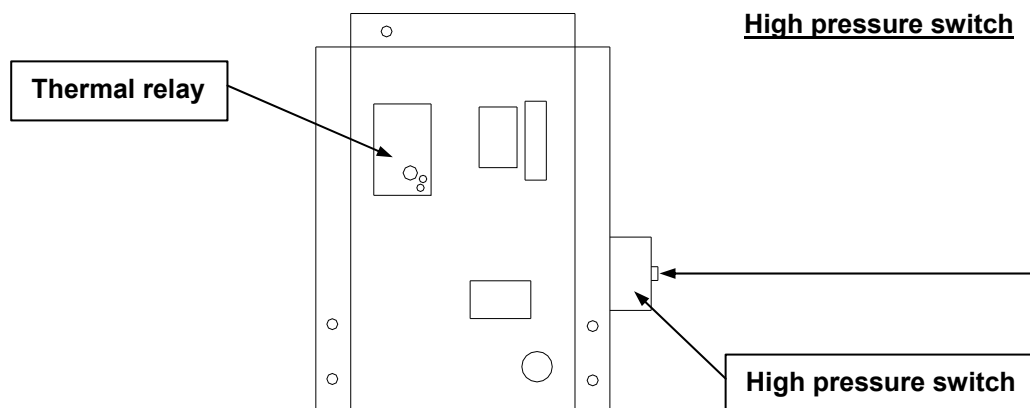
Press the red reset button.

Put back the front panel.

When the ON/OFF switch is turned on, the product will restart operation.



**High pressure switch**



**Electric parts bracket**

## 6

## References

## 6-1

## Specifications

Specification		Model			
		IDFB22E-11	IDFB22E-23	IDFB37E-23	IDFB55E-46
Air FlowRate (ANR)(Note 1)	At Expected Outlet Press.Dew Point of 37 ° F ( 2.8 )	107SCFM (182 m <sup>3</sup> /h)	161SCFM (273 m <sup>3</sup> /h)	226SCFM (384 m <sup>3</sup> /h)	300SCFM (510 m <sup>3</sup> /h)
	At Expected Outlet Press.Dew Point of 45 ° F ( 7.2 )	120SCFM (205 m <sup>3</sup> /h)	173SCFM (294 m <sup>3</sup> /h)	258SCFM (438 m <sup>3</sup> /h)	353SCFM (600 m <sup>3</sup> /h)
	At Expected Outlet Press.Dew Point of 50 ° F ( 10 )	130SCFM (221 m <sup>3</sup> /h)	181SCFM (308 m <sup>3</sup> /h)	297SCFM (504 m <sup>3</sup> /h)	406SCFM (690 m <sup>3</sup> /h)
Rated Condition	Operating Pressure	100psig (0.7MPa)			
	Inlet Air Temperature	100 ° F (37.8 )			
	Ambient Temperature	100 ° F (37.8 )			
	Voltage	115V 60Hz	230V 60Hz	460V 60Hz	
Operating Range	Working Fluid	Compressed Air			
	Inlet Air Temperature	40-122 ° F (5-50 )			
	MIN.Inlet Air Pressure	22psig ( 0.15MPa )			
	MAX.Inlet Air Pressure	150psig ( 1.0MPa )			
	Ambient Temperature	36-104 ° F (2 ~ 40 ) Relative Humidity of 85% or less			
Electrical Specification	Power Source	1 AC115V ± 10% 60Hz (Note4)	1 AC230V ± 10% 60Hz (Note4)	3 AC460V ± 10% 60Hz (Note4)	
	Starting Current and LRA (Note2)	42A	26A	30A	27A
	Operating Current (Note2)	9A	4.5A	5.6A	3.8A
	Power Consumption (Note2)	1000W		1270W	2400W
	Circuit Breaker Capacity (Note3)	15A			10A
Condenser		forced air cooling			
Refrigerant		R134a(HFC)		R407C(HFC)	
Refrigerant Charge Quantity		18.7 ± 0.4oz (530 ± 10g)	25.7 ± 0.4oz (730 ± 10g)	15.2 ± 0.4oz (430 ± 10g)	20.8 ± 0.4oz (590 ± 10g)
Thread Type and Size	Thread Symbol "N" (male)	NPT1		NPT1-1/2	NPT2
	Thread Symbol "None" (male)	R1		R1-1/2	R2
Drain Tube	Thread Symbol "N"	3/8inch			
	Thread Symbol "None"	10mm			
Painting Finish		baking finish			
Colour		Panel : Urbanwhite1			
Weight		119lbs (54kg)	137lbs (62kg)	258lbs (117kg)	271lbs (123kg)

Note1: The data for SCFM (ANR) is referring to the conditions of 68 ° F (20°C), 1atm . pressure & relative humidity of 65%.

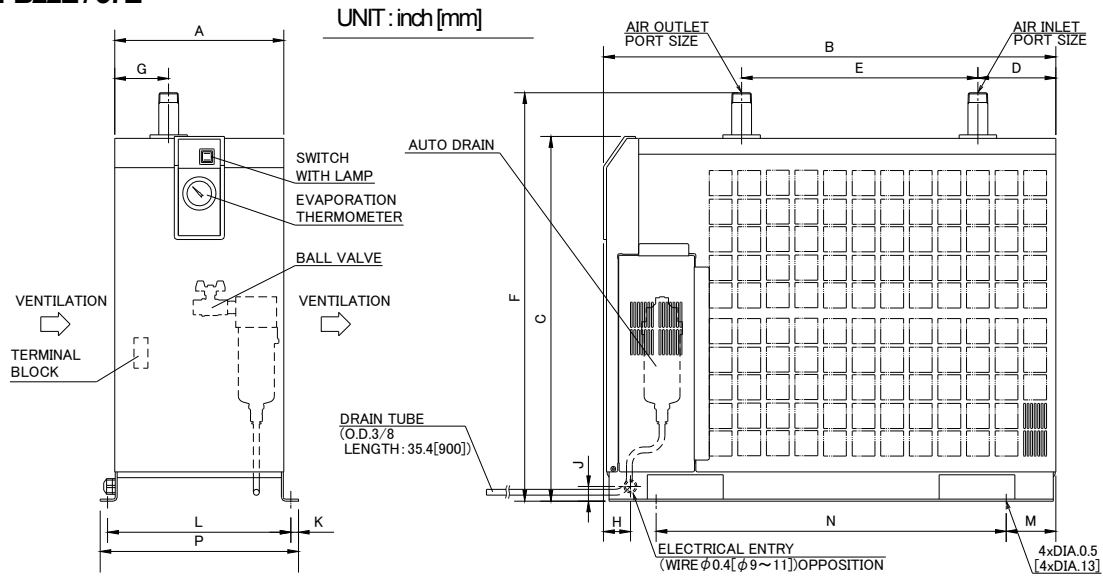
Note 2: The value is that of under specified condition.

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

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

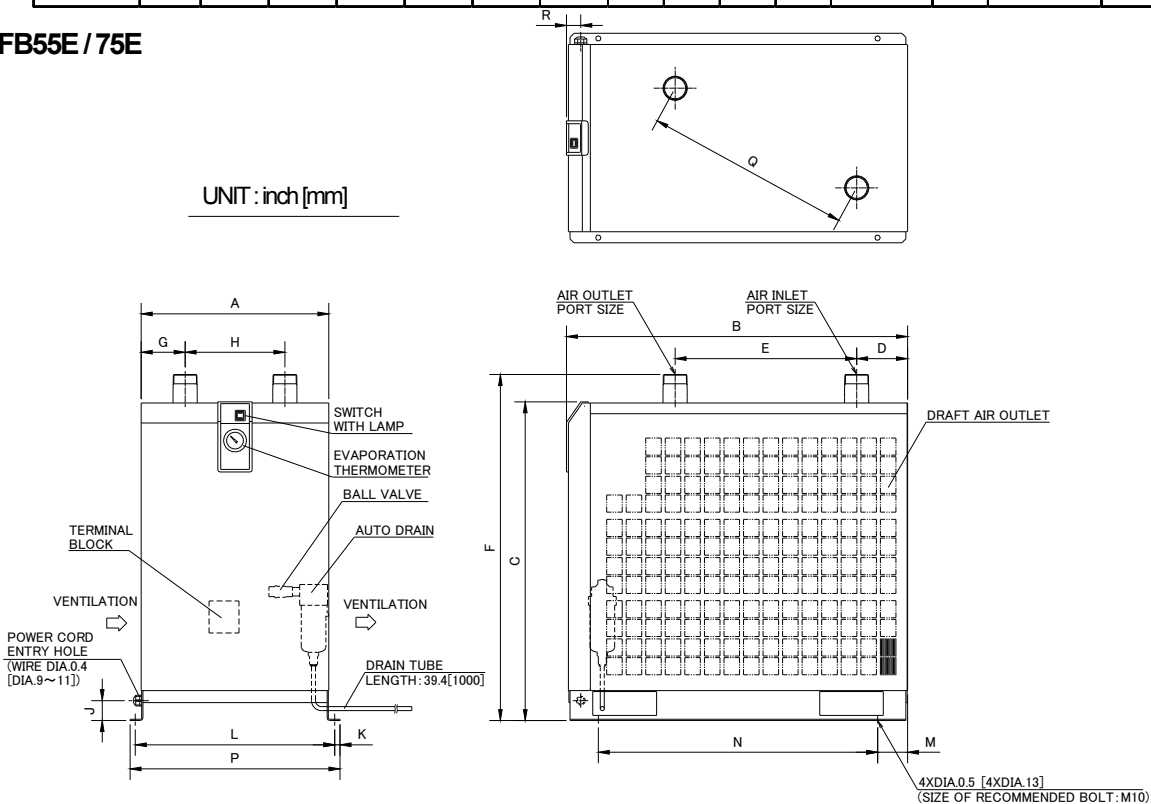
## 6-2 Dimensions

### • IDFB22E / 37E



Model	Port Size	Dimensions (inch [mm])													
		A	B	C	D	E	F	G	H	J	K	L	M	N	P
IDFB22E	1	11.4 [290]	30.5 [775]	24.5 [623]	5.3 [134]	15.9 [405]	27.5 [698]	3.7 [93]	1.8 [46]	1 [25]	0.5 [13]	12.4 [314]	3.3 [85]	23.6 [600]	13.4 [340]
IDFB37E	1/2		33.7 [855]											26.8 [680]	

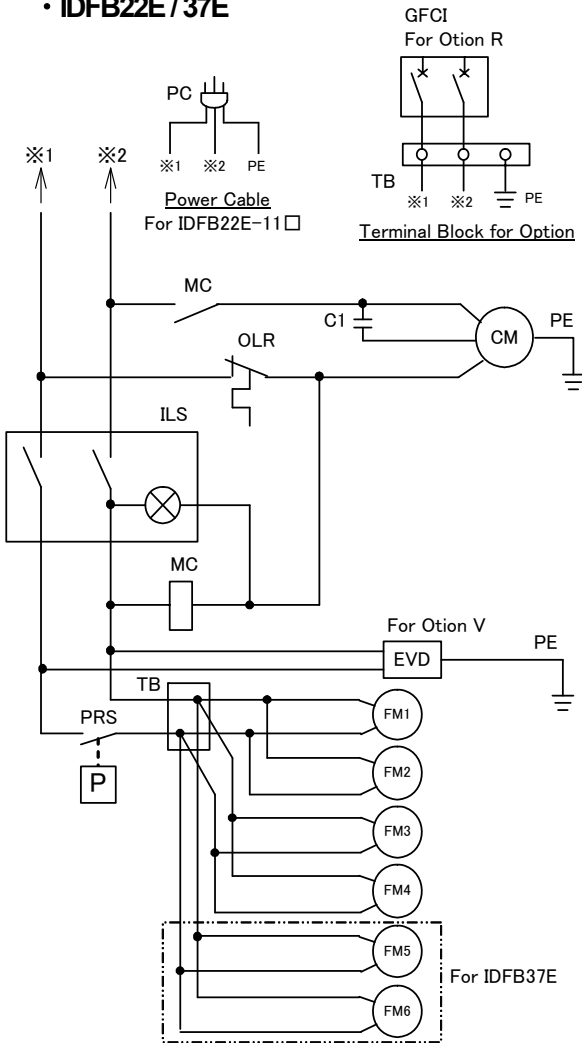
### • IDFB55E / 75E



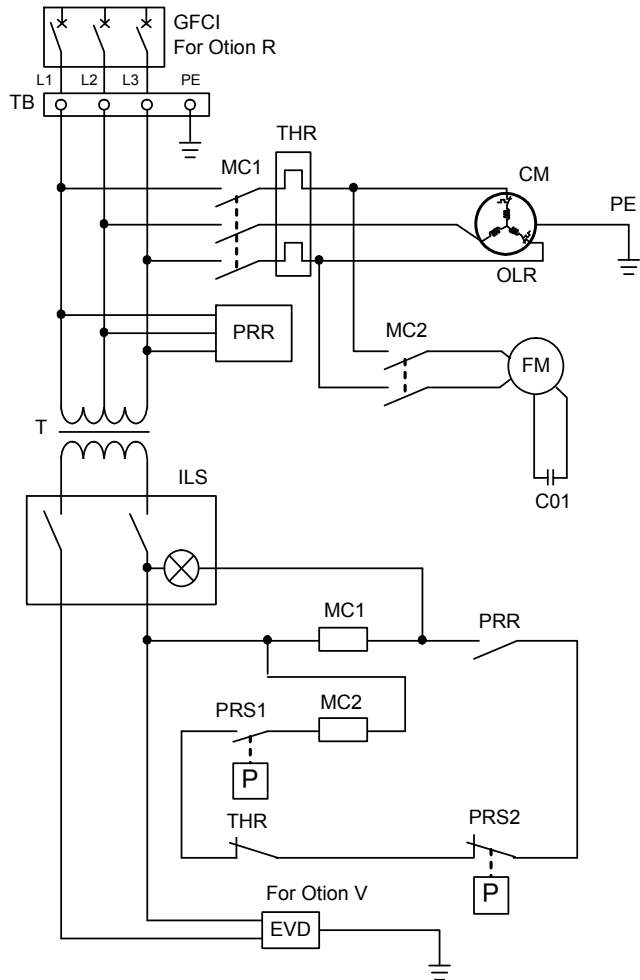
Model	Port Size	Dimensions (inch [mm])															
		A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
IDFB55E	2	18.5 [470]	33.7 [855]	31.5 [800]	5.0 [128]	17.9 [455]	34.2 [868]	4.3 [110]	9.8 [250]	2 [50]	0.5 [13]	19.7±0.1 [500±2]	3.0 [75]	27.6±0.04 [700±1]	20.7 [526]	20.4±0.2 [519±5]	1.4 [36]
IDFB75E	2			35.4 [900]			38.1 [968]										

### 6-3 Electrical Circuit

• IDFB22E / 37E



• IDFB55E / 75E

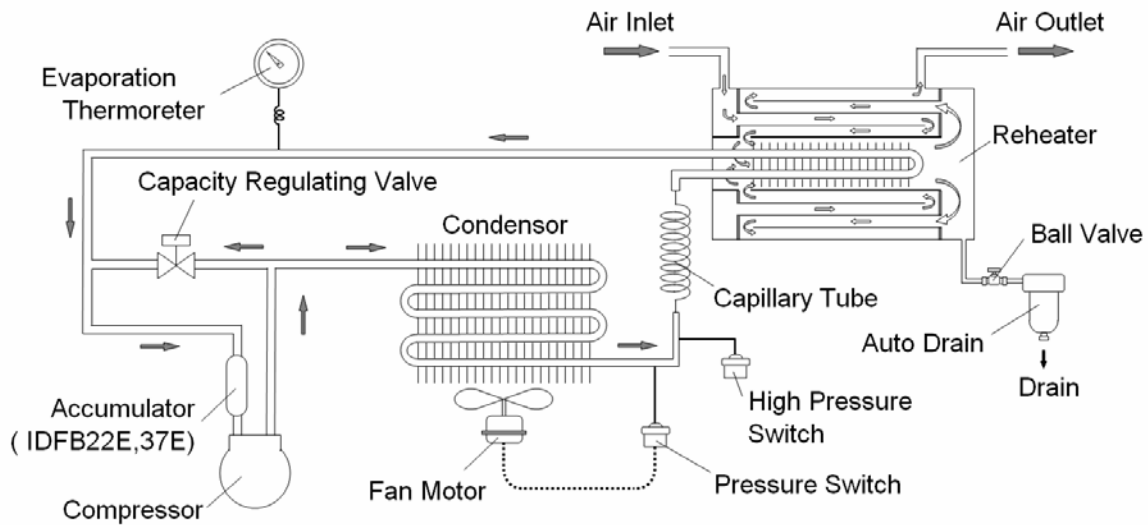


SYMBOL	DESCRIPTION
CM	Compressor Motor
FM1~6	Fan Motor
OLR	Overload Relay (Inside of compressor terminal cover)
C1	Capacitor For Compressor Motor
ILS	Switch with Lamp
PRS	Pressure Switch
TB	Terminal Block
MC	Magnetic Contactor
GFCI	Ground Fault Circuit Interrupter
EDV	Electronic Drain Valve

SYMBOL	DESCRIPTION
CM	Compressor Motor
OLR	Overload Relay
FM	Fan Motor
MC1,2	Magnetic Contactor
C01	Capacitor For Fan Motor
ILS	Switch with Lamp
PRS1	Pressure Switch
PRS2	High Pressure Switch
TB	Terminal Block
T	Transformer
THR	Thermal Relay
PRR	Phase Reversal Relay
GFCI	Ground Fault Circuit Interrupter
EDV	Electronic Drain Valve

## 6-4 Compressed Air and Refrigerant Circuit/Operation Principles

IDFB22E / 37E / 55E / 75E



### Compressed Air Circuit

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

### Refrigerant Circuit

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

## 6-5 Service Parts List

Parts No.	Description	IDFB22E	IDFB37E	IDFB55E	IDFB75E
AD48N-Z (Thread Symbol : N)	Auto Drain	1	1	1	1
AD48 (Thread Symbol : None)	Auto Drain	1	1	1	1



## Specification for Option K

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

### 7-1 Safety instructions

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

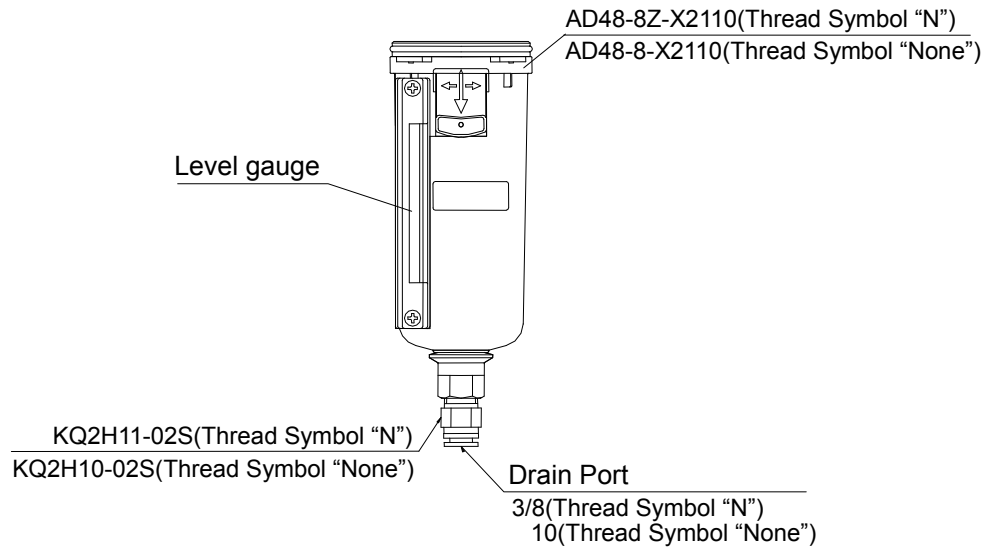
#### **Warning**

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

## 7-2 Specifications

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

**IDFB22E, 37E**



Item	Model	Thread Symbol "N"	Thread Symbol "None"
Auto drain		AD48-8Z-X2110	AD48-8-X2110
Max. operating pressure		240psig (1.6MPa)	
Auto drain type		Float type	
Auto drain valve type		N. O. ( Normal Open: Open under non-energized status. )	
Operating pressure		15 to 240psig (0.1 to 1.6MPa)	
Operating fluid		Compressed air	

**8****Specification for Option R**

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

**8-1 Safety instructions**

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

**Warning**

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

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

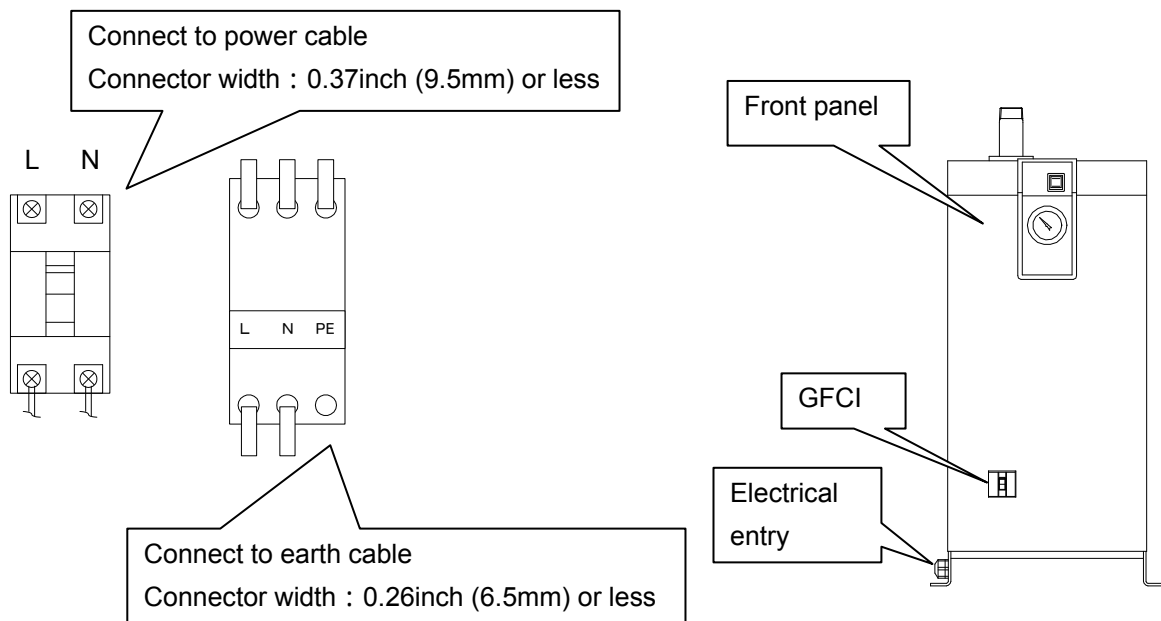
## 8-2 Specifications of the GFCI

Dryer model number	Specifications of GFCI
IDFB22E-11□-R	Rated current: 15A, Current sensitivity: 30mA
IDFB22E/37E-23□-R	
IDFB55E/75E-46□-R	Rated current: 10A, Current sensitivity: 30mA

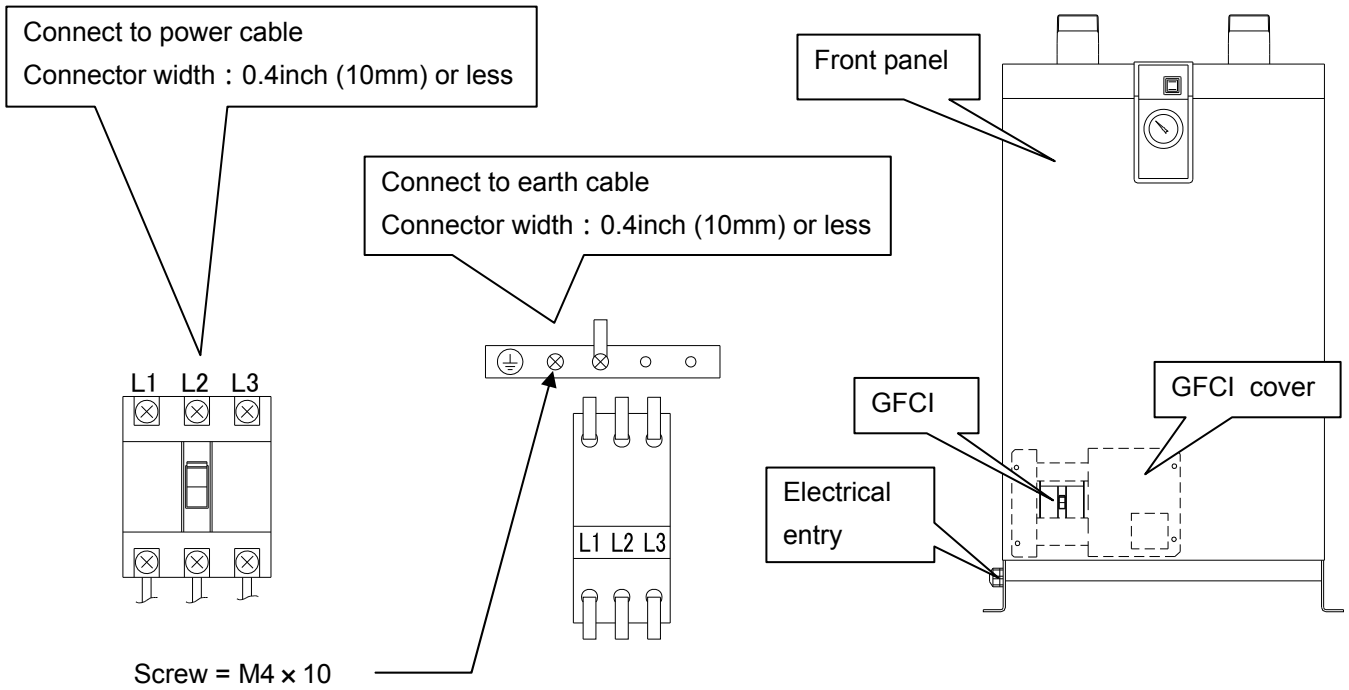
## 8-3 How to connect the power supply

- 1) Take off the front panel.
- 2) Take off the GFCI cover. (Only IDFB55E, 75E)
- 3) 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.
- 4) Connect the power cable to the terminal of the GFCI.
- 5) Put back the GFCI cover. (Only IDFB55E, 75E)
- 6) Put back the front panel.

### IDFB22E, 37E



**IDFB55E, 75E**



## 9

**Specification for Option T**

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

**9-1 Safety instructions**

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

**Warning**

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

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

**9-2 Specifications**

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

- The operation and failure signals are no voltage contact style.
  - Operation · · · · · When the product is operating; Close
  - Failure · · · · · When the product stops due to failure; Close
- Contact capacity
  - AC220V,5A DC24V,5A
  - Minimum current for signal 20V,5mA(AC/DC)

### 9-3 Remote operation

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

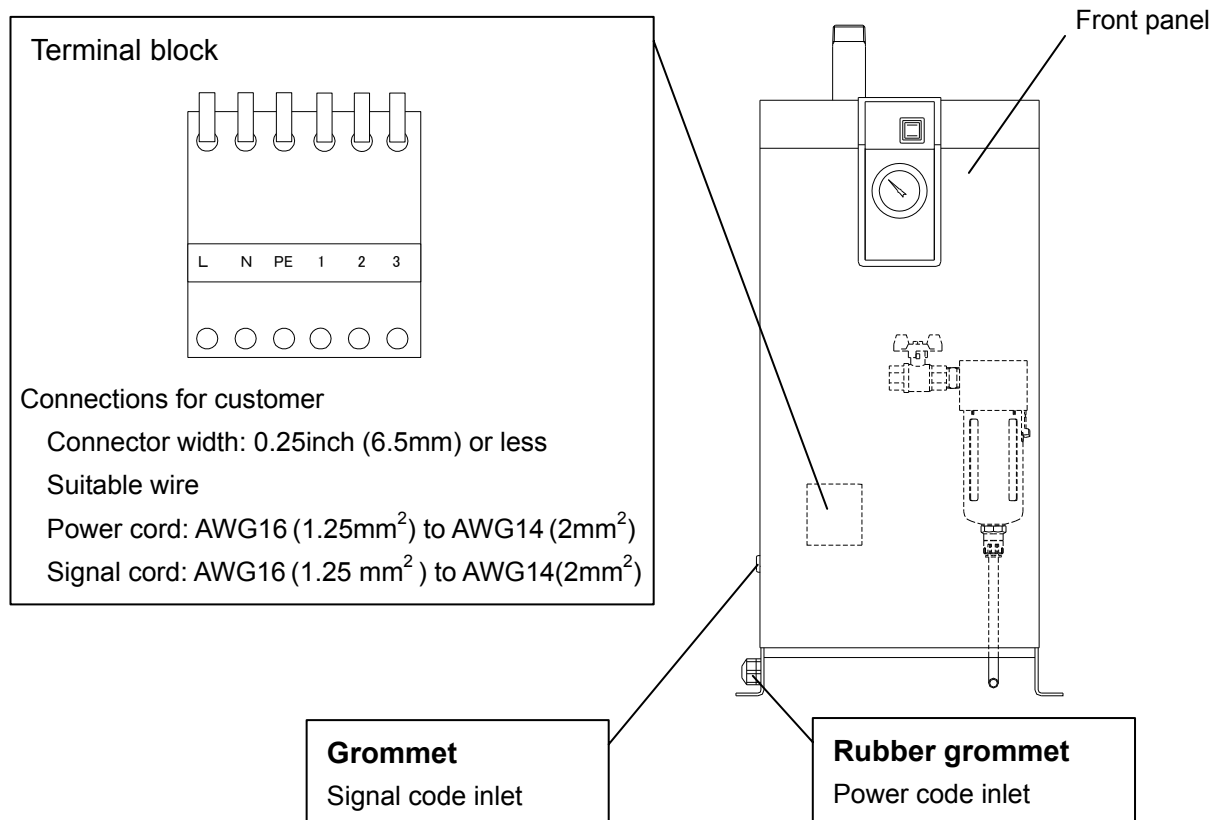
Additionally, the frequency to start and stop the operation must be restricted to 5 times per hour (to prevent breakage of the motor).

### 9-4 How to connect the power supply and signal cable

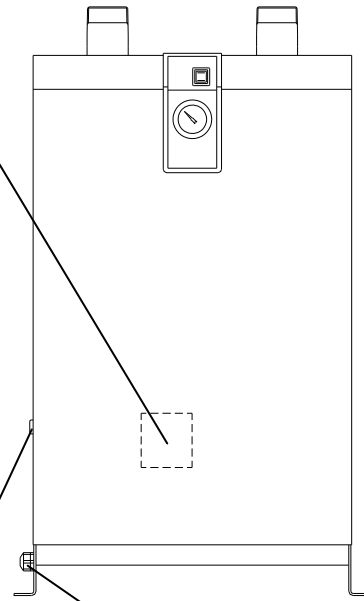
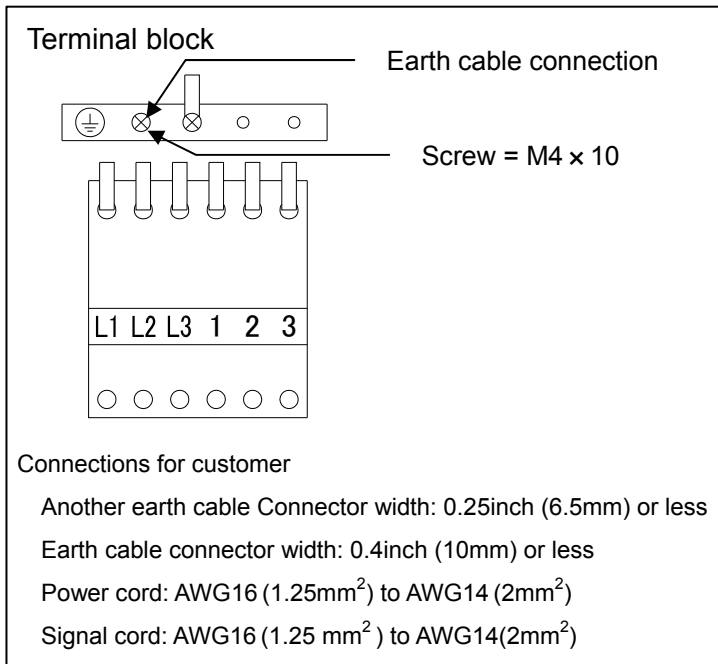
Connect the power cable and signal cable in the following procedures.

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

#### IDFB22E, 37E



**IDFB55E, 75E**

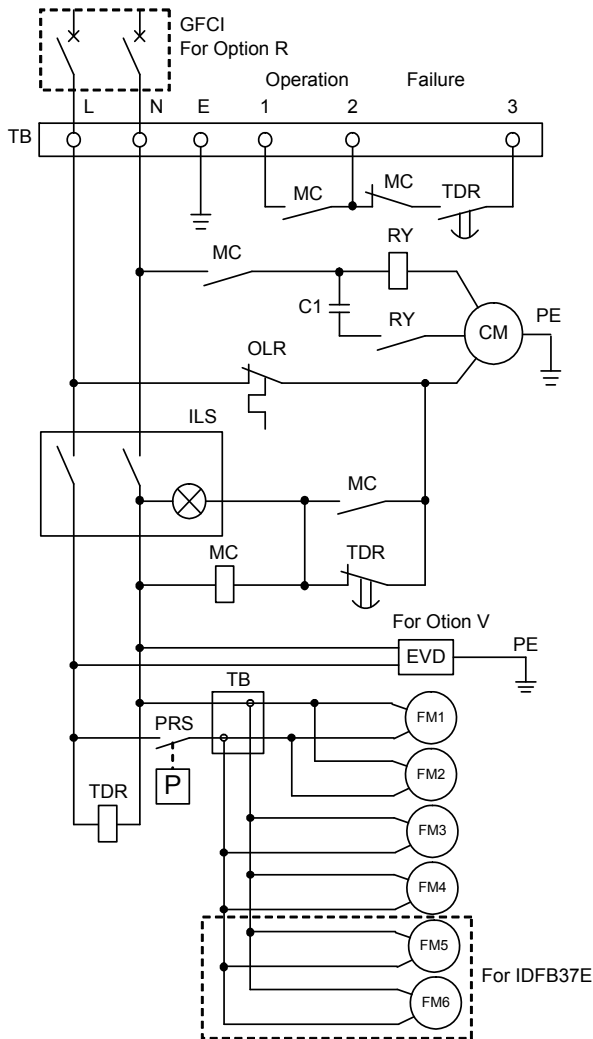


**Grommet**  
Signal code inlet

**Rubber grommet**  
Power code inlet

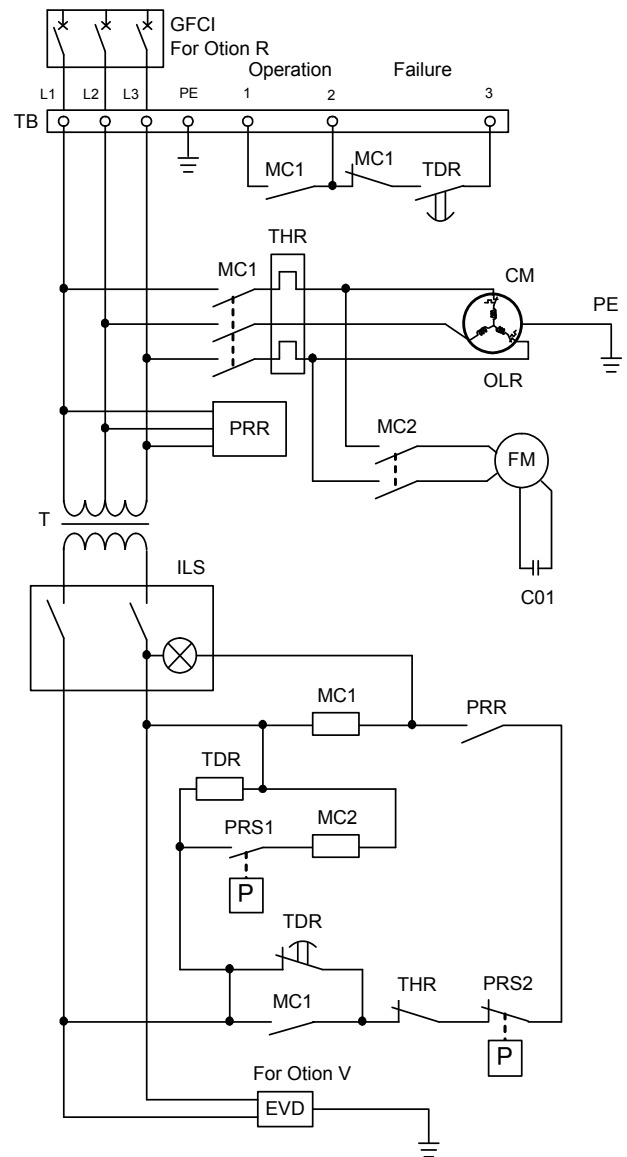
9-5 Electric circuit

IDFB22E, 37E



SYMBOL	DESCRIPTION
CM	Compressor Motor
FM1~6	Fan Motor
OLR	Overload Relay (Inside of compressor terminal cover)
C1	Capacitor For Compressor Motor
ILS	Switch with Lamp
PRS	Pressure Switch
TB	Terminal Block
MC	Magnetic Contactor
TDR	Time Delay Relay
GFCI	Ground Fault Circuit Interrupter
EDV	Electronic Drain Valve

IDFB55E, 75E



SYMBOL	DESCRIPTION
CM	Compressor Motor
OLR	Overload Relay
FM	Fan Motor
MC1,2	Magnetic Contactor
C01	Capacitor For Fan Motor
ILS	Switch with Lamp
PRS1	Pressure Switch
PRS2	High Pressure Switch
TB	Terminal Block
T	Transformer
THR	Thermal Relay
PRR	Phase Reversal Relay
TDR	Time Delay Relay
GFCI	Ground Fault Circuit Interrupter
EDV	Electronic Drain Valve



## Specification for Option V

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

### 10-1 Safety instructions

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

#### **Warning**

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

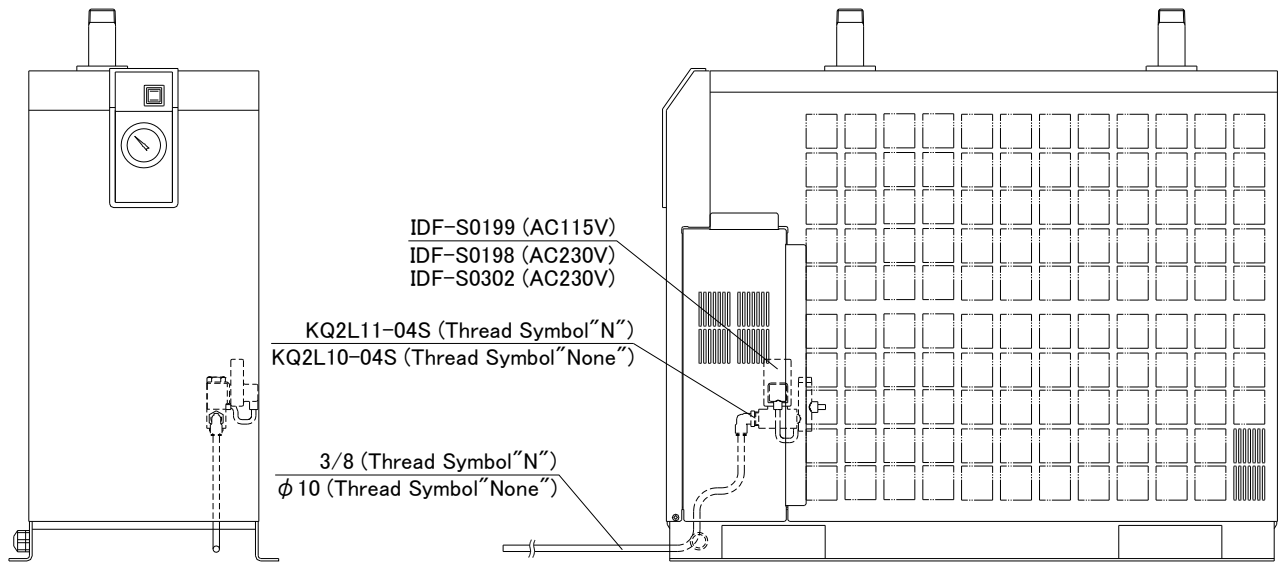
#### **Warning**

**Only qualified person must perform wiring.**

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

### 10-2 Specifications

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

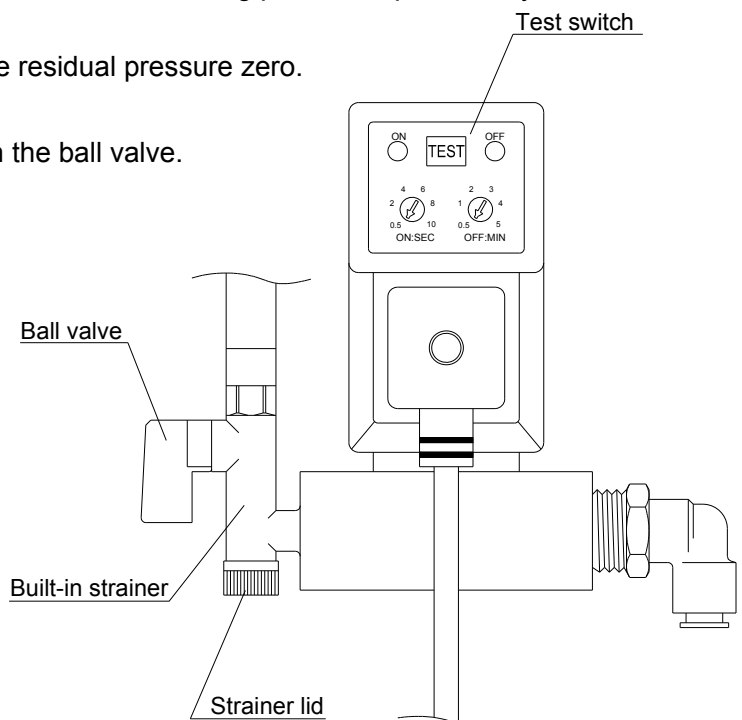


Power supply voltage of dryer	AC115V	AC230V	AC460V
Order number (service parts)	IDF-S0199	IDF-S0198	IDF-S0302
Max. operating pressure	240psig (1.6MPa)		
Fluid	Drain		
Power supply voltage of drain timer	AC115V±10% (60Hz)	AC230V±10% (60Hz)	AC230V±10% (60Hz)
ON time	0.5sec		
OFF time	0.5min		

### 10-3 How to perform maintenance

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

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





## Specification for Option L

### 11-1 Safety instructions

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

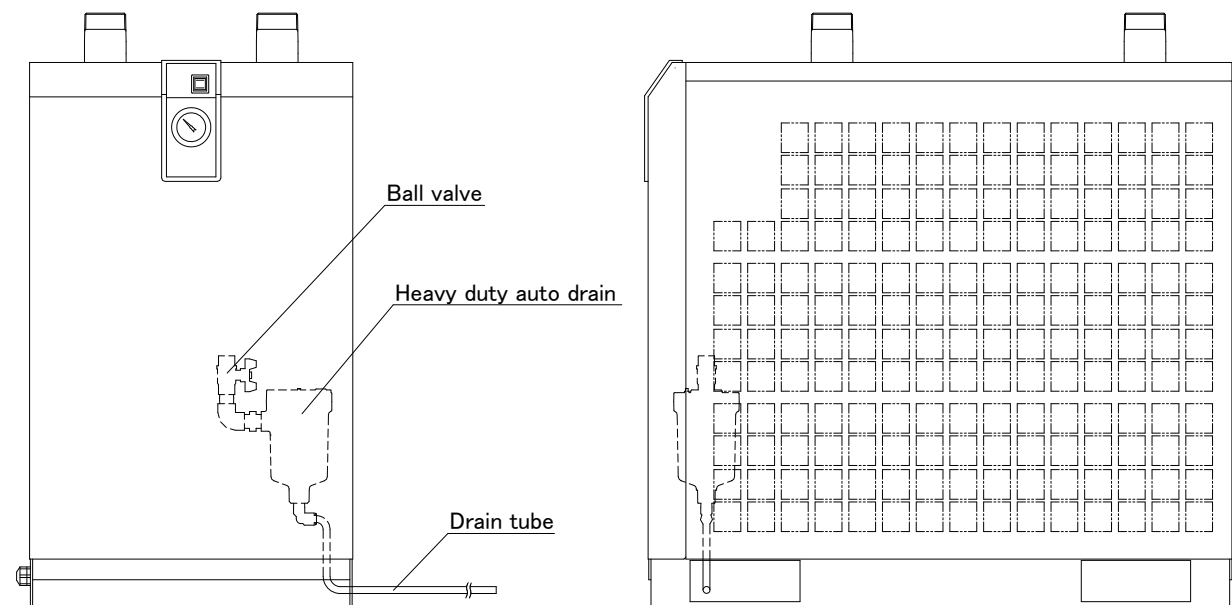
#### Warning

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

### 11-2 Specifications

The specification of this product is dryer with heavy duty auto drain.

And, the auto drain has a maximum operating pressure of 240psig (1.6MPa).



Heavy duty auto drain assembly

Model	IDFB55E/75E-46□-L
Order number (service parts)	ADH-E400
Auto drain type	Floating type
Auto drain valve type	N.O(normally opened: Open in the case of pressure loss)
Max. operating pressure	240psig (1.6MPa)
Working pressure range	7.5 to 240psig (0.05 to 1.6MPa)
Working fluid	Compressed air
Max. drain discharge	0.014SCFM(Pressure 0.7MPa,the case of water)

Note) Use for air compressor with flow more than 1.77SCFM (ANR) [3 m<sup>3</sup>/h (ANR)].

### **11-3 Maintenance**

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

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**12** Service Record

**12-1 Service Record**

It is recommended to keep a maintenance/service record.

Parts No.	Description	Maintenance/Service Work Description	Date