

## HITACHI ROTARY SCREW COMPRESSOR

Air-Cooled Type, **HISCREW** **2000 Series**

**Model :** **OSP-22S5AI**  
**OSP-22S6AI**  
**OSP-22M5AI**  
**OSP-22M6AI**  
**OSP-37S5AI**  
**OSP-37S6AI**  
**OSP-37M5AI**  
**OSP-37M6AI**

**OSP-22S5ARI**  
**OSP-22S6ARI**  
**OSP-22M5ARI**  
**OSP-22M6ARI**  
**OSP-37S5ARI**  
**OSP-37S6ARI**  
**OSP-37M5ARI**  
**OSP-37M6ARI**

[Without a built-in air dryer]

[With a built-in air dryer]


Before you start operating, be sure to read this manual carefully in order to operate the machine safely and properly.


Also, prepare the manual near the machine to make it available at anytime, and refer to it as the need arises.

This manual expresses the matters that need your attention as below.

Do not fail to observe **“WARNING”** and **“CAUTION,”** as they assume considerable importance to safety.

### What Marks Say:

 **WARNING** : This is a warning. This assumes possible death or severe injury to the operator if handled wrongly.

 **CAUTION** : This is a caution. This assumes possible injury to the operator and physical damage, if handled wrongly.



: This means the things that need attention other than WARNING and CAUTION.



: This means prohibition.



: This means convenient information to know.



: This shows reference page number.



: This shows the information specific to the models with a built-in air dryer.

# Characteristics of this Manual

This manual serves daily operators and maintenance personnel of the compressor as an instructive materials including its introduction, operation, daily control and periodic servicing.

Before installation of the compressor, read the manual carefully and understand its content and follow the instructions given by it when in use.

Also, prepare the manual near the machine to make it available at anytime, and refer to it as the need arises.

If you have anything unclear or any question, please ask your dealer or your nearest Hitachi regional office.

It is convenient for ordering spare part, periodic maintenance and overhaul if type and serial number of the compressor are filled into the back cover of the manual.

## **WARNING**



**Never remove a protective device from the air compressor or modify the air compressor.**

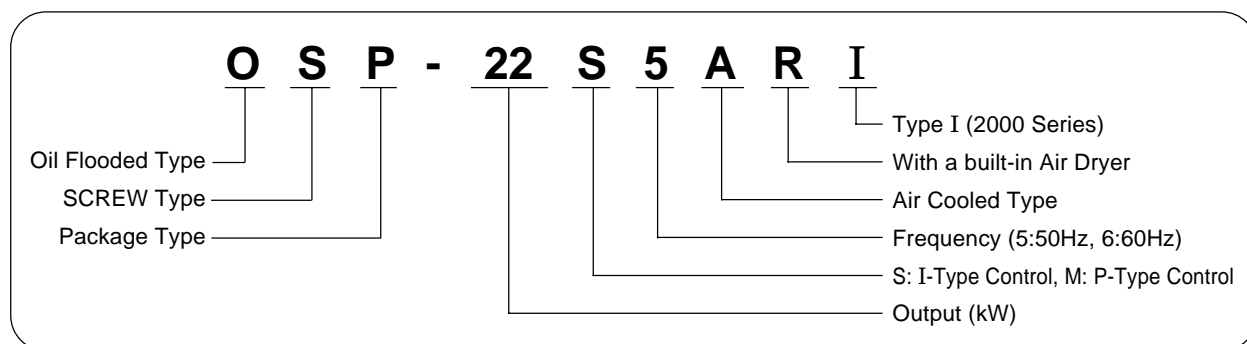


**Never fail to install an earth leakage circuit breaker on the power cable. It prevents a ground fault burning accident.**



**Never use the SCREW as a respiratory appliance by which a person breathes the compressed air directly.**

### ■ Description of Type



### ■ International System of Units (SI):

For the unit of pressure the International System of Units (SI) is used throughout this manual. To convert it into the conventional system of units, use the following conversion formula:

$$7 \text{ kgf/cm}^2 = 0.69 \text{ MPa} \quad \text{or} \quad 1 \text{ kgf/cm}^2 = 0.098 \text{ MPa}$$

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INSTALLING · PLUMBING ·  
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# 1. TO USE IN SAFETY

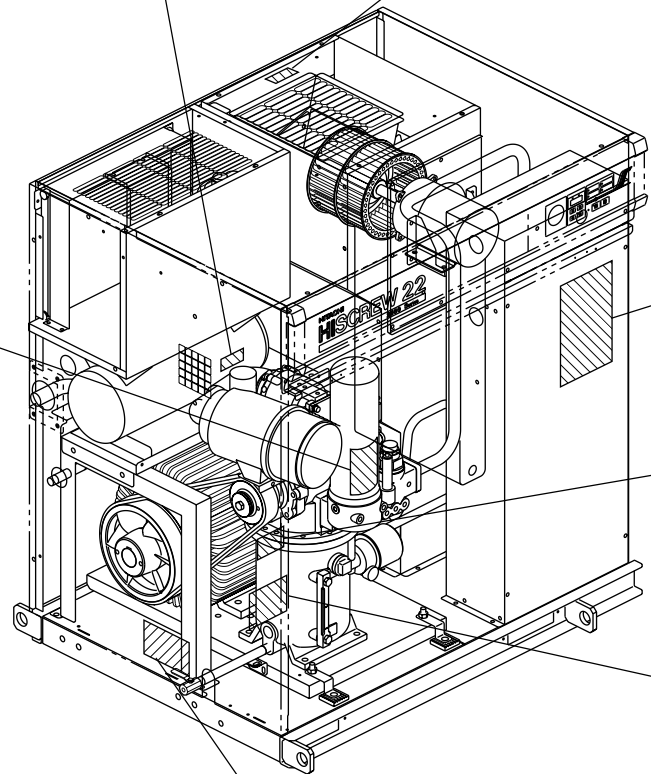
In order to operate the machine properly and safely, it is indispensable to read carefully and follow warnings and instructions hereunder mentioned prior to its use. The warnings and instructions on labels are attached to the places shown in the figure below.


	<b>⚠ WARNING</b>
	<p style="text-align: center;"><b>ROTATING PARTS UNDER THE INCOMING-AIR LOUVERS!</b></p> <p>Keep your hands and any objects away from the incoming-air louvers because the cooling fan is underneath.</p>


	<b>⚠ WARNING</b>
	<p style="text-align: center;"><b>DETERIORATED OR FLAMMABLE OIL!</b></p> <ul style="list-style-type: none"> <li>● Replace the oil and the oil separator (element and housing) regularly as scheduled by the Instruction Manual. Failure to observe this may deteriorate the oil and eventually cause a fire and/or explosion.</li> <li>● Replace the oil separator (element and housing) whenever the housing is scratched, deformed, or corroded. Otherwise, it may be damaged, ruptured allowing the oil to gush out, or exploded.</li> </ul>

	<b>⚠ WARNING</b>
	<p style="text-align: center;"><b>HOT!</b></p> <p>Do not loosen the housing when the air compressor is operating or immediately after you have stopped it (that is, the system is still internally pressurized). Otherwise, the hot pressurized air and/or oil may gush out and eventually you may be burnt or injured.</p>

	<b>⚠ CAUTION</b>
	<p>Carefully read the Instruction Manual before checking or replacing the oil separator.</p> <ul style="list-style-type: none"> <li>● Replace the oil separator (element and housing) whenever the housing is scratched, deformed, or corroded. Otherwise, it may be damaged, ruptured allowing the oil to gush out, or exploded.</li> <li>● Before checking or replacing the oil separator, stop the air compressor, disconnect the power, and make sure that the discharge air pressure gauge reads 0 (zero) MPa.</li> <li>● Do not touch the oil separator when it is still hot. Otherwise, you may be burnt in your hands.</li> <li>● Do not use an ordinary filter wrench or pipe wrench on the market for loosening and fastening the housing, because such a wrench may deform or rupture the housing and eventually the oil may gush out. Instead, use the Hitachi's special tool. For further information on the special tool, contact a Hitachi's distributor.</li> <li>● Replace the element, housing, and square ring at the same time.</li> </ul> <p>For further details, read the Instruction Manual.</p>



	<b>⚠ WARNING</b>
	<p style="text-align: center;"><b>HOT OIL UNDER PRESSURE!</b></p> <p>Do not open the oil-draining valve when the air compressor is operating. Failure to observe this may cause the hot pressurized oil to gush and eventually you may be burnt or injured.</p>

	<b>⚠ WARNING</b>
	<p style="text-align: center;"><b>HOT OIL UNDER PRESSURE!</b></p> <p>Do not touch the air compressor when the air compressor is operating or immediately after you have stopped it. Failure to observe this may cause you to be burnt.</p>

	<b>⚠ WARNING</b>
	<p style="text-align: center;"><b>ROTATING PARTS!</b></p> <ul style="list-style-type: none"> <li>● Return any detached cover to its original place before starting the air compressor.</li> <li>● Keep your hands and any objects away from the incoming-air louvers because the cooling fan is underneath.</li> <li>● Keep your hands/face and any objects away from the outgoing-air louvers.</li> </ul>

	<b>⚠ WARNING</b>
	<p style="text-align: center;"><b>RESPIRATORY DISEASES!</b></p> <ul style="list-style-type: none"> <li>● Do not use the air compressor for a direct-breath application. Failure to observe this may cause hazards (respiratory diseases etc.) as the compressed air from the air compressor contains oil particles.</li> <li>● It may also cause hazards to operate the air compressor in a badly ventilated room, tunnel, etc.</li> </ul>

	<b>⚠ WARNING</b>
	<p style="text-align: center;"><b>HOT OIL OR AIR UNDER PRESSURE!</b></p> <p>Before replacing the oil or servicing the air compressor, stop the air compressor, disconnect the power, and make sure that the discharge air pressure gauge reads 0 (zero) MPa. Be careful on the oil filling port plug, the relief valve, etc. because the hot pressurized oil or air may gush from these parts.</p>

	<b>⚠ WARNING</b>
	<p style="text-align: center;"><b>FLAMMABLES!</b></p> <ul style="list-style-type: none"> <li>● Keep a container of the flammable hazards (solvents etc.) away from the air compressor. Failure to observe this may cause it to explode.</li> <li>● Do not use any brands of oil other than "NEW <b>HISCREW OIL 2000</b>" (Hitachi's genuine synthetic oil). Replace the oil and the oil separator (element and housing) regularly as scheduled by the Instruction Manual. Failure to observe these may deteriorate the oil and eventually cause a fire and/or explosion.</li> </ul>

	<b>⚠ WARNING</b>
	<p style="text-align: center;"><b>ROTATING PARTS!</b></p> <p>Keep your hands and any objects away from the rotating parts (belts, pulleys, etc.). Be careful on the stopped air compressor in an automatic stop/restart control because it may restart without pressing the START button.</p>

	<b>⚠ WARNING</b>
	<p style="text-align: center;"><b>ROTATING PARTS!</b></p> <ul style="list-style-type: none"> <li>● Keep your hands and any objects away from the rotating parts (pulleys, belts, cooling fans, etc.).</li> <li>● Be careful on the stopped air compressor in an automatic stop/restart control because it may restart without pressing the <b>START</b> button.</li> </ul>

	<b>⚠ WARNING</b>
	<p style="text-align: center;"><b>LIVE CIRCUITRY!</b></p> <ul style="list-style-type: none"> <li>● Before servicing or wiring the air compressor, disconnect the power to avoid an electric shock. Also, put a notice saying 'Men at Maintenance Work. Do not turn on the switches.' on the power supply, and thereby prevent someone from carelessly turning on the switches.</li> <li>● Ask a qualified electrician for wiring and any other electrical works.</li> <li>● Ground the air compressor.</li> </ul>

	<b>⚠ CAUTION</b>
	<p style="text-align: center;"><b>USE THE GENUINE SYNTHETIC OIL ONLY.</b></p> <ul style="list-style-type: none"> <li>● Always use the "NEW <b>HISCREW OIL 2000</b>" (Hitachi's genuine synthetic oil) for the air compressor. Do not mix it with any other brands of oil.</li> <li>● Replace the oil regularly as scheduled by the Instruction Manual.</li> </ul>

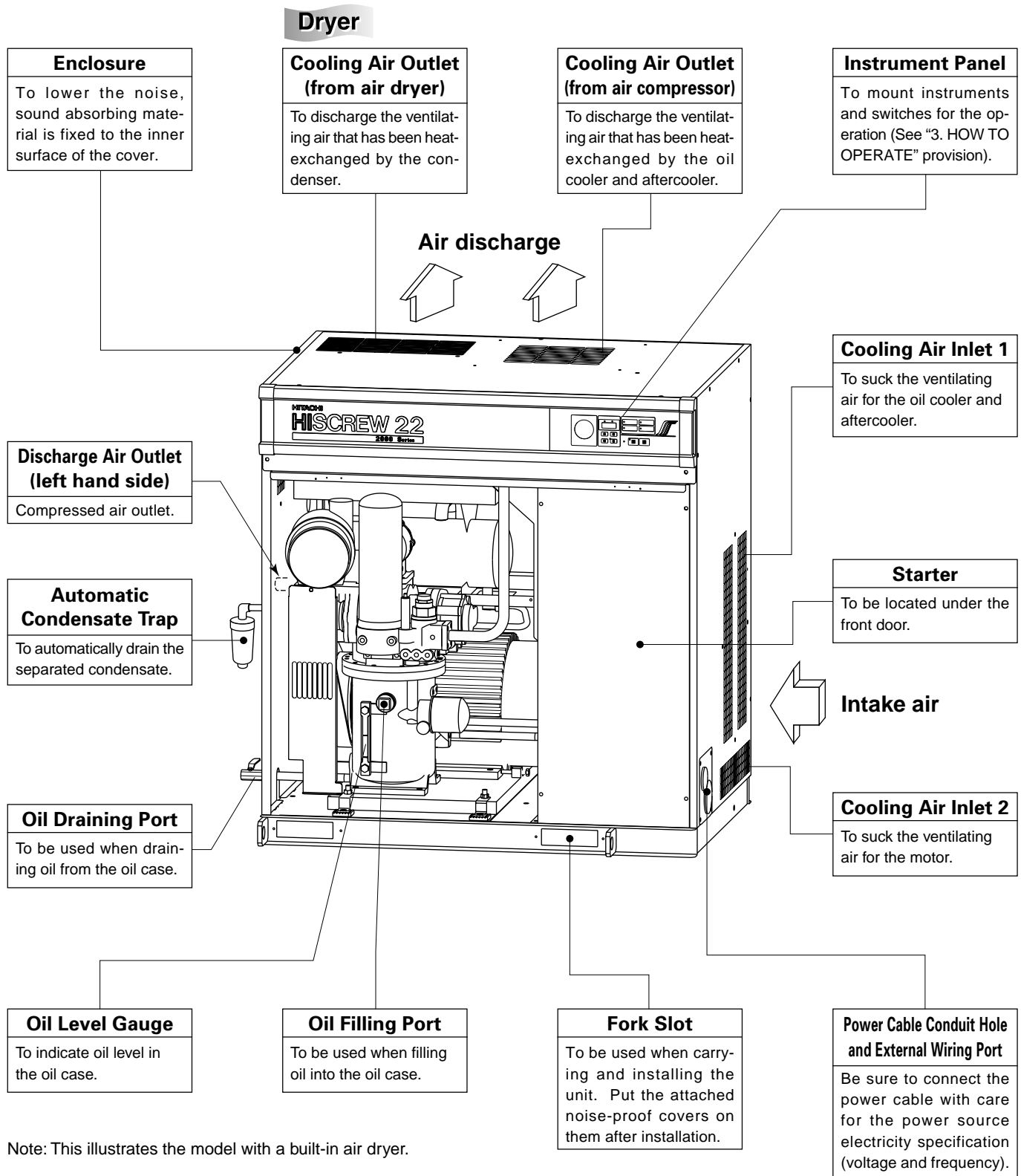
	<b>⚠ CAUTION</b>
	<p style="text-align: center;"><b>FIRE!</b></p> <ul style="list-style-type: none"> <li>● Do not use fire around the air compressor. Otherwise, the sparks from the fire may cause the air compressor to be internally burnt.</li> <li>● Do not remove any protective relays on the air compressor. Also, do not make a modification of the control circuit that will result in impairing the protective relay's function. Otherwise, a fire may occur and/or the air end may be burnt.</li> <li>● Install an earth leakage fuse free breaker on the power supply.</li> <li>● Check the oil level gauge and verify that the oil level is between the upper and lower red lines.</li> </ul>

	<b>⚠ WARNING</b>
	<p style="text-align: center;"><b>HOT OIL UNDER PRESSURE!</b></p> <p>Before replacing the oil, stop the air compressor, disconnect the power, and make sure that the discharge pressure gauge reads 0 (zero) MPa. Be careful on the stopped air compressor in an automatic stop/restart control because it may restart without pressing the <b>START</b> button.</p>

	<b>⚠ CAUTION</b>
	<p style="text-align: center;"><b>HOT!</b></p> <ul style="list-style-type: none"> <li>● Do not touch the air compressor when it is operating or immediately after you have stopped it, because its components and the oil are hot.</li> <li>● Keep your hands/face away from the outgoing-air louvers because the hot air is exhausted from the louvers.</li> </ul>

# 2. PARTS DESCRIPTION AND THEIR FUNCTIONS

## 2.1 Appearance



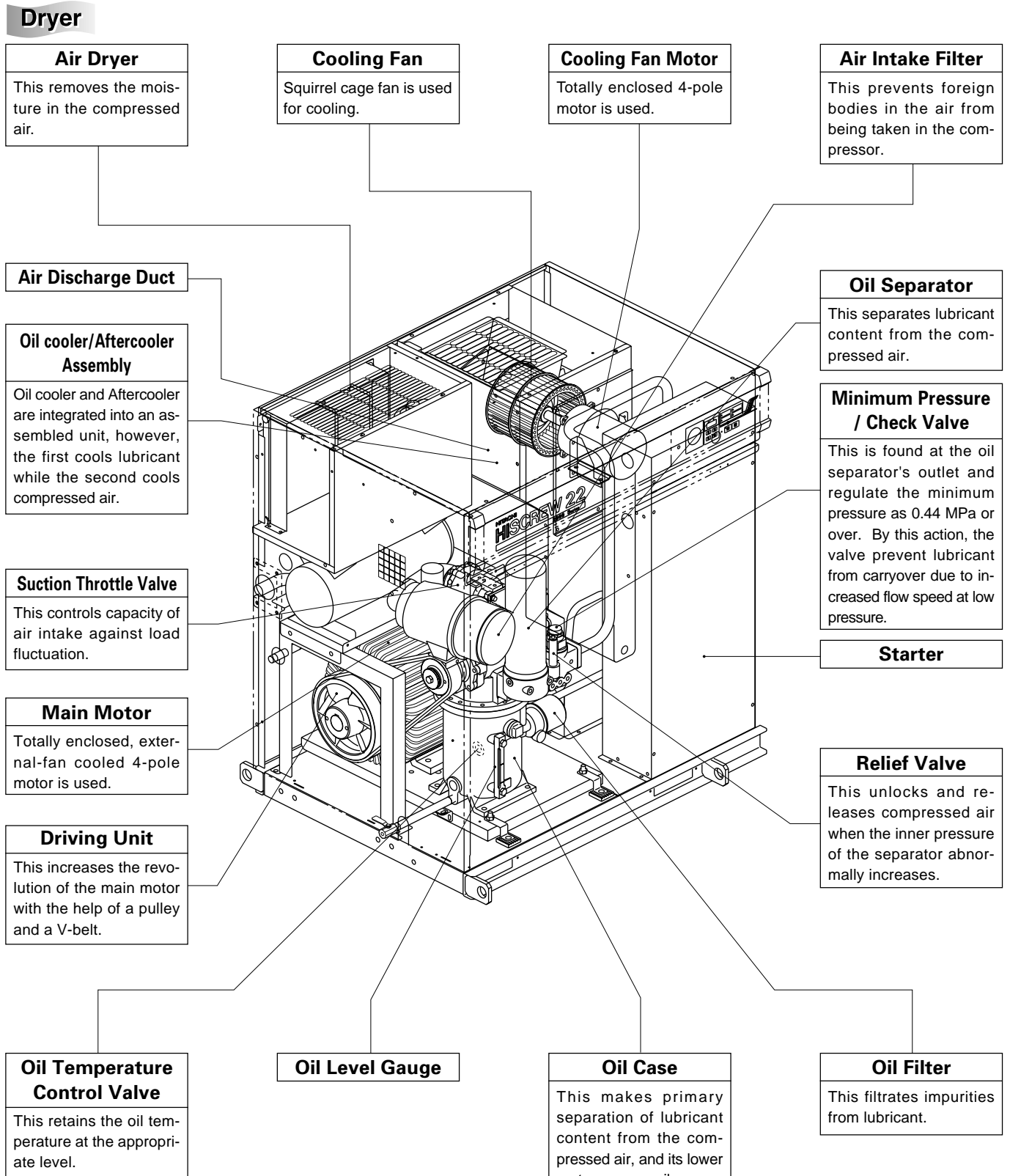
Note: This illustrates the model with a built-in air dryer.

**IMPORTANT**

A nameplate is attached on the right enclosure panel. It indicates the HISCREW type (model number), motor output and frequency, working pressure, and manufacturing number. Inform the Hitachi distributor of such information whenever asking it to service your HISCREW.

<b>HITACHI</b>	
SCREW COMPRESSOR	
TYPE:	OSP-22SSAR1
MOTOR:	22 kW 50 Hz
PRESS:	0.69 MPa
MFG. NO.:	
Hitachi, Ltd. Tokyo Japan	

## 2.2 Main Component Units and their Functions



Note: The figure shows the structure of 22 kW type.

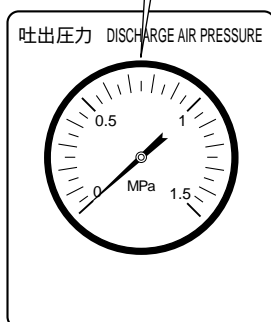
# 3. HOW TO OPERATE

## 3.1 Air Compressor Instrumentation

Buttons/Lights for Operation

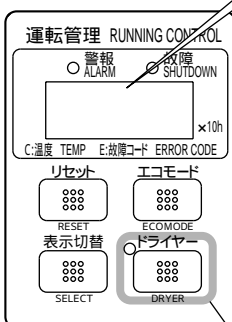
### Discharge Air Pressure Gauge

indicates the pressure of discharge air.



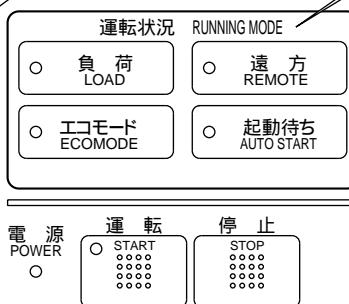
### Digital Monitor

The screen displays the running hours, discharge air temperatures, loading data, and shutdown/alarm codes. The **ALARM** and **SHUTDOWN** lights indicate that a problem has happened.



### Running Mode Lights

The **LOAD**, **REMOTE**, **ECOMODE**, and **AUTO START** lights indicate an operation mode.



### Dryer

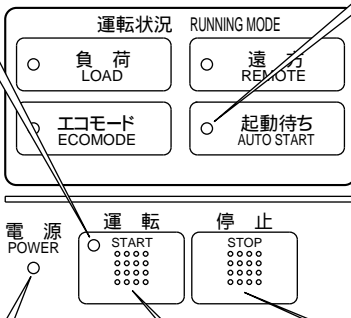
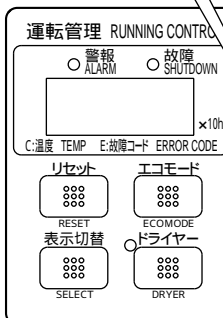
Available only to the models with a built-in air dryer

### START Light (Red)

glows when the unit is in operation as well as in automatic restart status.

### AUTO START Light (green)

- For the M-type **SCREW** with 'A' mode capacity control (p.29): Becomes on (non-flashing) when in an automatic stop state and on (flashing) when in an automatic restart state. It also becomes on (flashing) when the instantaneously interrupted power is recovered.
- For the models with a built-in air dryer: Flashes for 3 minutes after the air dryer prestarts.



### POWER Light (Yellow)

glows when main power is supplied.

### START Button

press this button when to start the unit.

### STOP Button

press this button when to stop the unit.



Buttons/Lights for Control

**RESET+ECOMODE Buttons**

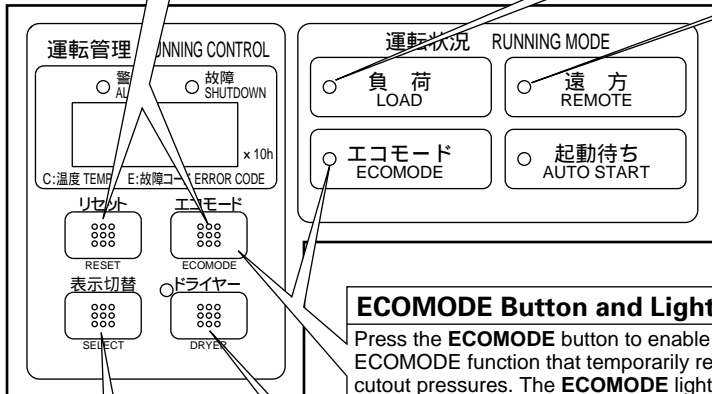
Hold down the **RESET** button and press the **ECOMODE** button to toggle between a remote operation and a local operation (☞ p.13). Refer to the IMPORTANT (1).

**LOAD Light (yellow)**

Becomes on (non-flashing) when the **HISCREW** is loading under the standard I type capacity control. Refer to the IMPORTANT (3).

**REMOTE Light (green)**

Becomes on (flashing or non-flashing) when a remote operation is enabled.



**ECOMODE Button and Light (yellow)**

Press the **ECOMODE** button to enable an **ECOMODE** function that temporarily reduces the cutout pressures. The **ECOMODE** light becomes on (non-flashing and flashing) when this function is respectively enabled and activated.

**SELECT Button**

Press the **SELECT** button to display some operating data and shutdown/alarm codes on the digital monitor (☞ p. 8).

**DRYER Button & Light (red)**

Under manual operation mode for the built-in air dryer, press the **DRYER** button to manually start and stop it. Under any operation modes for the built-in air dryer, the **DRYER** light becomes on (non-flashing and flashing) when it is operating respectively normally and abnormally. Refer to the IMPORTANT (2).

**Dryer**

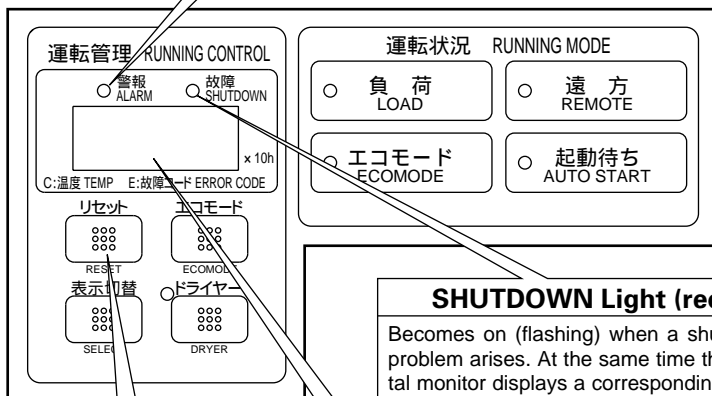
**IMPORTANT**

- (1) If you want to permanently enable a remote operation with the **REMOTE** light on (non-flashing), place the DIP switch **SW1** No. 4 in an on position. If you want to use an external setting switch for enabling/disabling a remote operation with the **REMOTE** light on (flashing), connect the wires between the external setting switch and the starter/control box. For more information, see page 13.
- (2) Before shipping the models with a built-in air dryer, Hitachi presets its operation mode to automatic. If you want to enable manual operation mode, change the settings of the DIP switch **SW2** No. 1 & 2. For more information, see page 14.  
Before disconnecting the power from the **HISCREW** under manual operation mode, press the **DRYER** button to manually stop the built-in air dryer. If you disconnect the power before manually stopping the built-in air dryer, it restarts as soon as you reconnect the power, that is, you cannot manually prestart it before starting the air compressor.
- (3) The **LOAD** light becomes on (flashing) when the **HISCREW** is loading under the alternative I type capacity control. For more information, see page 32.

Buttons/Lights for Shutdown and Alarm Indication

**ALARM Light (red)**

Becomes on (flashing) when an alarming problem arises. At the same time the digital monitor displays a corresponding alarm code. Refer to the IMPORTANT (1).



**SHUTDOWN Light (red)**

Becomes on (flashing) when a shutdown problem arises. At the same time the digital monitor displays a corresponding shutdown code. Refer to the IMPORTANT (1).

**RESET Button**

Releases a self-hold circuit made when an alarm/shutdown problem arose (☞ pp.23-24).

**Digital Monitor**

Displays an alarm/shutdown code when a corresponding light becomes on (flashing) (☞ pp.23-24). Refer to the IMPORTANT (2).

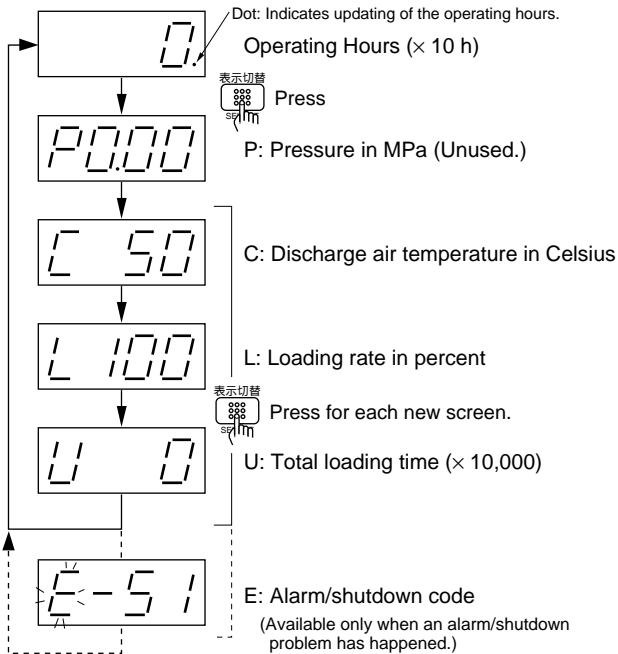
**IMPORTANT**

- (1) The digital monitor displays a discharge air temperature, instead of the alarm/shutdown code, when the alarm/shutdown light becomes on (flashing) due to high or abnormally high discharge air temperature.
- (2) At the same time the **DRYER** light becomes on (flashing) when the built-in air dryer causes an alarm/shutdown problem (☞ p. 25).

Remote and local operation means starting and stopping the **HISCREW** respectively: with external control signals from other than the built-in starter/control box and with the **START** and **STOP** buttons on the built-in instrument panel.

## 3.2 How to Use the Digital Monitor and its Controls

### (1) Displaying the Operating Hours, Pressure, Discharge Air Temperature, Loading Rate, Total Loading Time, and Alarm or Shutdown Code

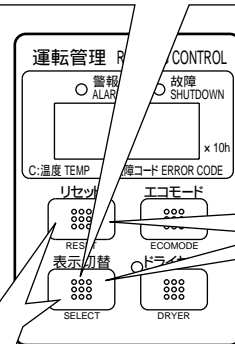


When you connect the power, the digital monitor displays the total operating hours. To display other data, do as follows:

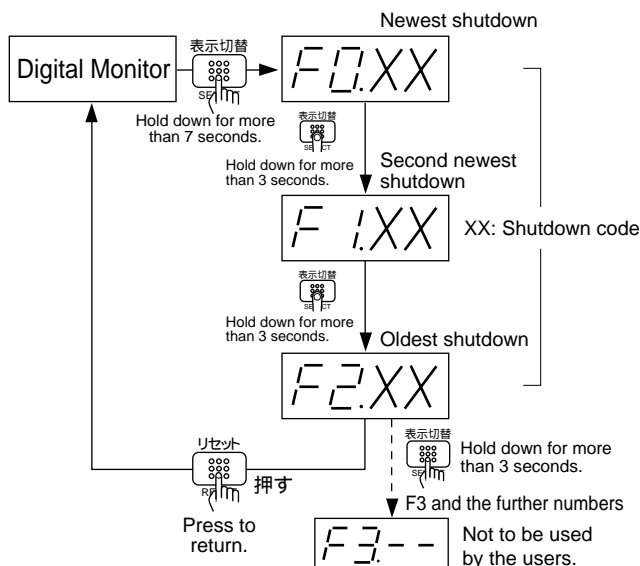
- ① Press the **SELECT** button. The screen displays “P0.00.” This screen is unused.
- ② Press the **SELECT** button. The screen displays “C” together with the discharge air temperature.
- ③ Press the **SELECT** button. The screen displays “L” together with the loading rate. The system flushes figures when in calculation.
- ④ Press the **SELECT** button. The screen displays “U” together with the total loading time (× 10,000). Refer to the IMPORTANT.
- ⑤ Press the **SELECT** button. When the alarm/shutdown light is:
  - on (flashing), the screen displays “E” (flashing) together with the alarm/shutdown code (☞ pp. 23-24). Press the **SELECT** button to return to the original screen of total operating hours.
  - off, you directly return to the original screen of total operating hours.

#### IMPORTANT

If you want to display the exact total loading time (× 10), hold down the **SELECT** button and press the **RESET** button.



### (2) Displaying the Shutdown History



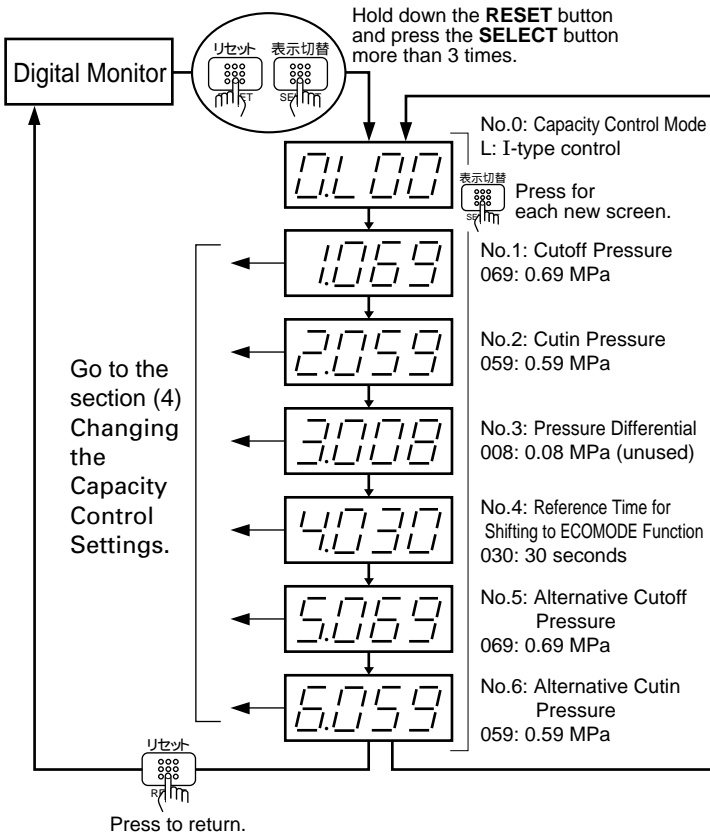
To display other data, do as follows:

- ① Hold down the **SELECT** button. The screen displays “F0” together with the shutdown code (☞ pp. 23-24). The “0” indicates the newest shutdown.
- ② Press the **SELECT** button. The screen displays “F1” together with the shutdown code. The “1” indicates the second newest shutdown.
- ③ Press the **SELECT** button. The screen displays “F2” together with the shutdown code. The “2” indicates the oldest shutdown.
- ④ Press the **RESET** button. The screen returns to what you have left with the action ① above. If you press the **SELECT** button instead, the screen displays “F3” (and the further numbers) which are not to be used by the users.

#### IMPORTANT

Displaying the “00” in the action ① indicates that no shutdowns are stored in the memory.

### (3) Displaying the Capacity Control Settings



To display the capacity control settings, do as follows:

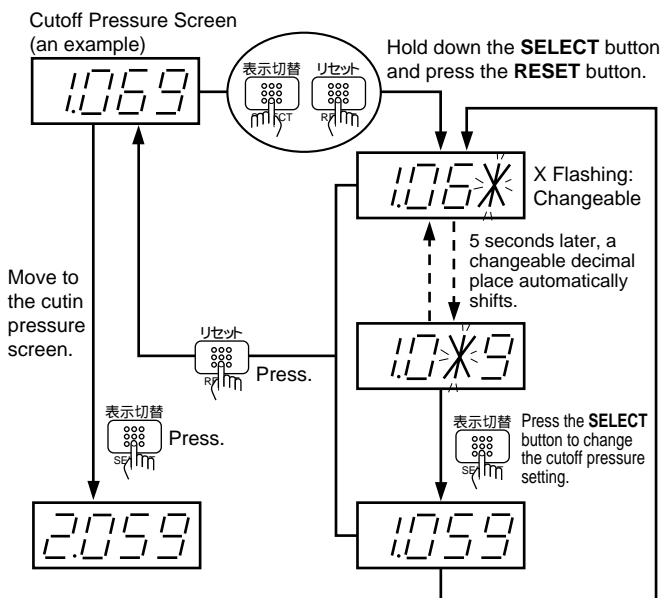
- ① Hold down the **RESET** button and press the **SELECT** button more than 3 times. The screen displays “0.L \*\*” as an example (see the **IMPORTANT** below).
- ② Press for each new screen to display the standard and alternative cutoff and cutin pressures and the reference time for shifting to ECOMODE control.
- ③ Press the **RESET** button. The screen returns to what you have left with the action ① above.

**IMPORTANT**

The first screen displays the capacity control mode symbols: A, L, or U. Each mode consists of the capacity control types as follows:  
 A: U+I+P Type  
 L: U+I Type  
 U: U Type  
 The first screen also displays the “\*\*” that may vary depending on the specifications.

### (4) Changing the Capacity Control Settings

Follow the section (3) Displaying the Capacity Control Settings to display the screen where you want to change the setting.



To change the capacity control settings, do as follows:

- ① Display the cutoff pressure screen.
- ② Hold down the **SELECT** button and press the **RESET** button. The first decimal place of the current cutoff pressure setting flashes to indicate that it is changeable.
- ③ Press the **SELECT** button as many times as required until a desired number is displayed.
- ④ Five seconds later, the first decimal place stops flashing and the second decimal place flashes. Press the **SELECT** button as many times as required until a desired number is displayed.
- ⑤ Press the **RESET** button to return to the cutoff pressure screen.
- ⑥ Press the **SELECT** button to move to the cutin pressure screen. Repeat the above actions ② through ④ to change the cutin pressure setting. Press the **RESET** button. The screen returns to what you have left with the action ① above.

Standard Factory Settings (in MPa without decimal point)

SCREW Specifications	0.69 MPa	0.83 MPa	0.92 MPa	Remark
Standard Cutoff Pressure 1	069	083	092	
Standard Cutin Pressure 2	059	074	082	
Pressure Differential 3	008	008	008	Unused.
Reference Time for Shifting to ECOMODE Control 4	030	030	030	Do not change.
Alternative Cutoff Pressure 5	069	083	092	Available as an option.
Alternative Cutin Pressure 6	059	074	082	

- IMPORTANT**
1. Do not change the reference time for shifting to ECOMODE control. See page 31.
  2. To enable the alternative cutoff/cutin pressure function, turn on the external switch that you installed to enable/disable this function.

**IMPORTANT**

Hitachi presets the standard cutoff pressure to the corresponding specification pressure. Always set the cutoff and cutin pressures to between 050 and the specification pressure 069, 083, or 092.

### 3.3 Initial Start-Up

#### ⚠ CAUTION

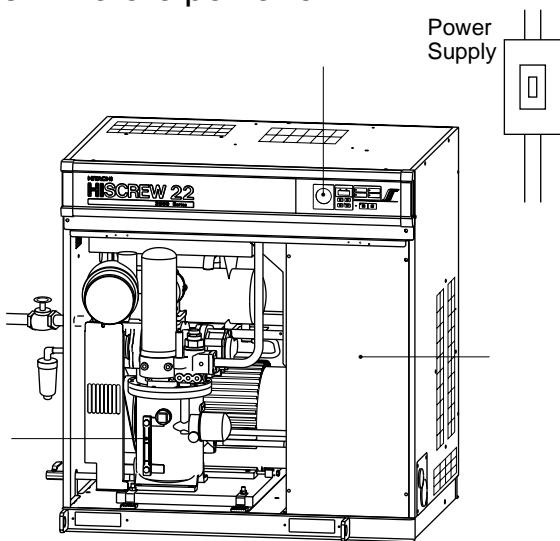
Before turn the power ON, make sure if  
① installation, ② piping and ③ electrical wiring have been properly completed.

#### IMPORTANT

Every button such as **START**, **STOP** and **RESET** will not function unless the switch held down more than 0.3 second.

After the installation, or after long unused time (over a week), run the machine by way of initial start-up.

#### 3.3.1 Before power on



- ① Be sure the power is OFF.
- ② Be sure that grounding is firmly connected.
- ③ Be sure the discharge pressure gauge indicates 0.
- ④ Detach the door (for the 22 kW models) or the front enclosure panel (for the 37 kW models) and remove the starter/control box cover. Make sure that the DIP switches **SW1** and **SW2** on the printed circuit board are correctly set. (☞ pp. 12-14)
- ⑤ Check if oil level is kept around the upper red line on the oil level gauge. (Oil level lowers while operation)

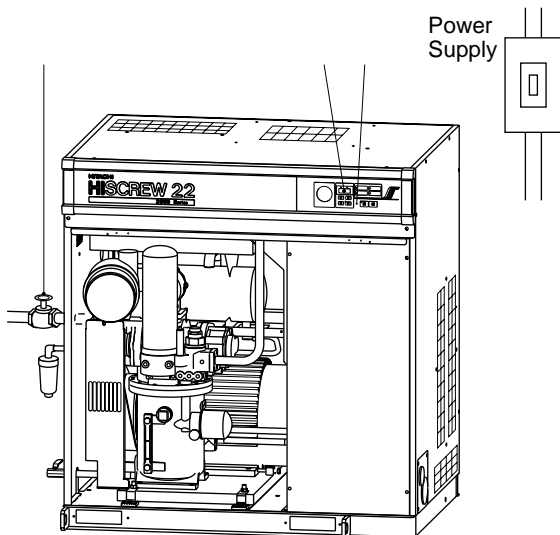
#### ⚠ CAUTION

Oil has been filled in the oil case by the factory before delivery.

#### IMPORTANT

Capacity control of S-type is preset to I-type control, and M-type is to P-type (AUTO) control. Refer to page 12 for the setting of control function when the control type is changed. Compressor shifts repeatedly between full-load and no-load operation within the range of its discharge pressure between 0.69 MPa and 0.59 MPa.

#### 3.3.2 Power on

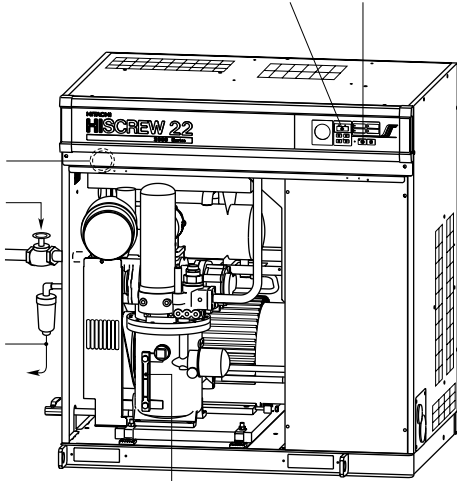


- ① Connect the power.
- ② See if **POWER** light glows on the compressor's instrument panel.
- ③ Digital monitor displays run hour in 10 hours as a unit.
- ④ Fully open the valve on discharge side.

#### IMPORTANT

For safety, the unit will not operate for 5 seconds after the power is ON, even **START** button is pressed.

### 3.3.3 Operation

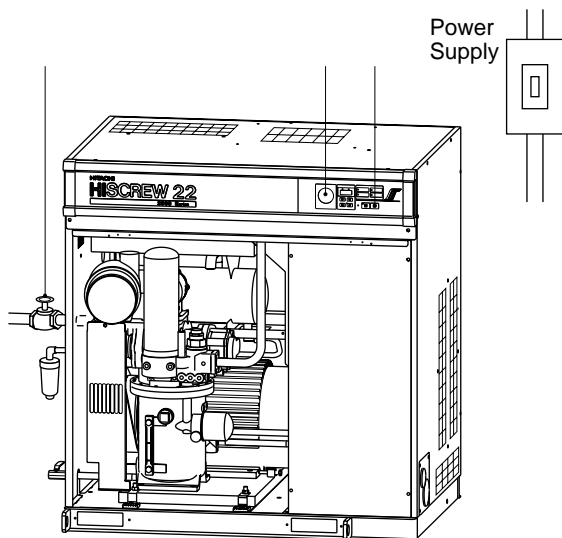


- ① Press the **START** button.
- ② **START** light glows and the compressor starts.
- ③ Gradually closing the discharge side valve, and keep running-in of the machine at the discharge pressure of 0.49-0.59 MPa for an hour.
- ④ Be sure that the oil level is kept between two red lines during operation.
- ⑤ Press the **SELECT** button on the instrument panel to display the discharge air temperature. Make sure that it is stable between 65°C and 100°C.

**Dryer**

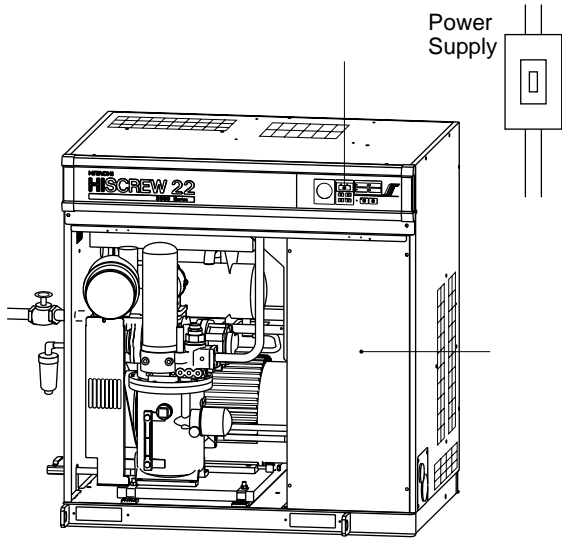
- ⑥ Make sure that, 5 to 10 minutes after starting, the refrigerant pressure gauge reads 0.41 to 0.73 MPa.
- ⑦ Make sure that, about 20 minutes after starting, the automatic condensate trap starts draining the condensate.

### 3.3.4 Stop



- ① Press the **STOP** button.  
The compressor stops.
- ② Be sure that the pressure at **DISCHARGE AIR PRESSURE GAUGE** indicates 0 (It returns to 0 for about 1 or 2 minutes after stop.)
- ③ Fully close the valve on discharge side.
- ④ Disconnect the power.

### 3.4 Setting of the Control Functions



#### 3.4.1 Setting of Capacity Control Mode

As listed in the table below:

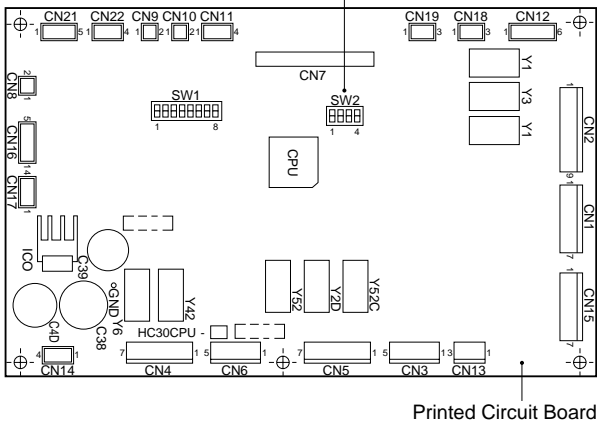
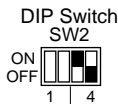
- The S- and M-type HiSCREWS provide two capacity control modes each.
- You can select either one of them by setting the No. 3 & 4 pins of the DIP switch **SW2** located on the printed circuit board.

HiSCREW Type	S-type		M-type	
	U Mode (U Type)	L Mode (U+I Type)	A Mode (U+I+P Type)	L Mode (U+I Type)
Capacity Control System				
Settings of DIP Switch SW2	No.3	ON	ON	ON
	No.4	OFF	ON	OFF
Display on Digital Monitor	0.U **	0.L **	0.A **	0.L **

NOTES:

1. The shaded cells indicate a standard factory setting.
2. The + mark indicates that the CPU automatically selects either of the 2 or 3 capacity control types whichever is appropriate.
3. Do not set the **SW2** No. 3 & 4 to other than the above.

For more information on the capacity control system, see pages 29 through 30.



#### IMPORTANT

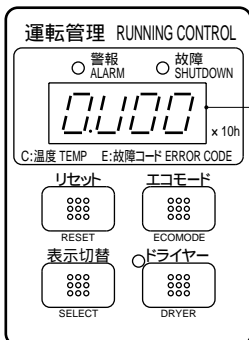
When you use an external air dryer under the 'A' mode of capacity control (U-type + I-type + P-type), enable it to keep operating even when the HiSCREW automatically stops. Thus protect the external air dryer from stopping and restating frequently.

#### 3.4.2 How to Set Capacity Control Type to U

- ① Disconnect the power.
- ② Remove the starter/control box cover.
- ③ Place the No. 4 pin of the DIP switch **SW2** in an off position.
- ④ Return the starter/control box cover to its original place.
- ⑤ Reconnect the power.
- ⑥ Display the capacity control setting screen on the digital monitor (p. 9). Make sure that the **U** as 0.U\*\* is displayed.

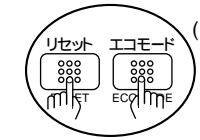
#### IMPORTANT

Do not select the U-type when your HiSCREW specifies the discharge of 0.92 MPa.

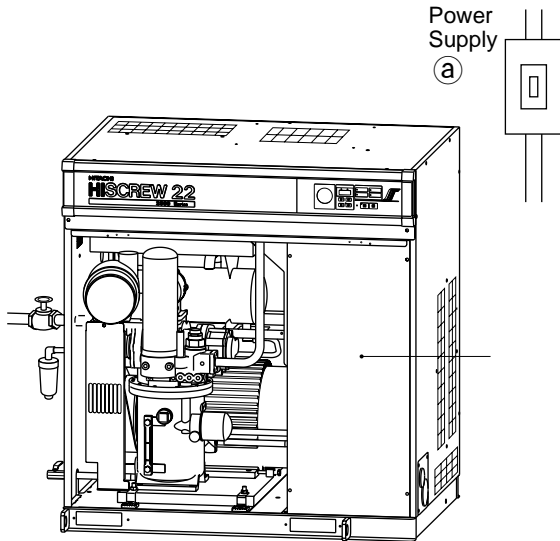


(c) (d) (2) (3)

Action of REMOTE Light	Remote Operation
ON (not flashing)	Method (1): on the instrument panel
ON (not flashing)	Enabled Method (2): on the starter
ON (flashing)	Method (3): with an external setting switch
OFF	Disabled



(1) To enable the remote operation on the HISCREW's instrument panel:  
Hold down the **RESET** button and press the **ECOMODE** button. (b)



### 3.4.3 Enabling the Remote Operation

The following 3 methods (1), (2), and (3) are available to enable the remote operation. Usually employ the method (1).

#### Method (1): On the HISCREW's Instrument Panel

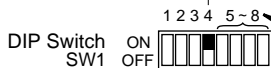
- (a) Connect the power.
- (b) Hold down the **RESET** button and press the **ECOMODE** button.
- (c) Make sure that the **REMOTE** light is on to indicate a remote operation enabled.
- (d) To disable the remote operation, hold down the **RESET** button and press the **ECOMODE** button. Make sure that the **REMOTE** light is off to indicate a remote operation disabled or a local operation enabled.

#### Method (2): On the Starter

- ① Disconnect the power.
- ② Remove the starter/control box cover.
- ③ Connect the wires between the HISCREW's starter/control box and an external control panel. For information on a wiring diagram, see pages 40 through 43.
- ④ Place the No. 4 pin of the DIP switch **SW1** (on the printed circuit board) in an on position.
- ⑤ Return the starter/control box cover to its original place.
- ⑥ Reconnect the power.
- ⑦ Make sure that the **REMOTE** light is on to indicate a remote operation enabled.

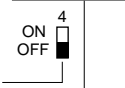
(2)

Setting of Remote Operation



(3)

Setting of Remote Operation with the External Setting Switch

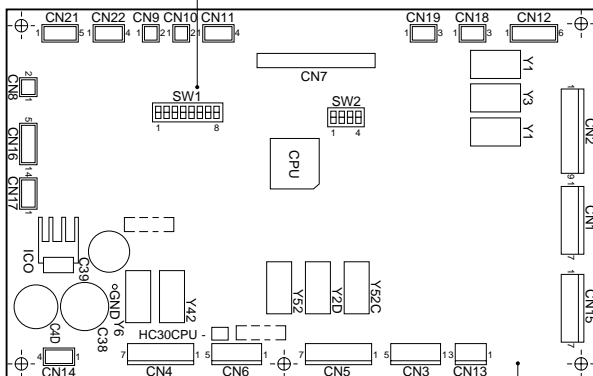


### CAUTION

Except when you proceed to an override operation, do not change the standard factory settings for the No. 5 to 8 pins. Otherwise, a proper control algorithm is lost.

### IMPORTANT

With this method, usually, you may intend to permanently use a remote operation. If you want to disable it for some reason, you need to place the No. 4 pin of the DIP switch **SW1** in an off position.



Printed Circuit Board

#### Method (3): On an External Setting Switch

- ① Disconnect the power.
- ② Remove the starter/control box cover.
- ③ Connect the wires:
  - between the HISCREW's starter/control box and an external control panel, and
  - between the HISCREW's starter/control box and the external setting switch.
 For information on a wiring diagram, see pages 40 through 43.
- ④ Make sure that the No. 4 pin of the DIP switch **SW1** (on the printed circuit board) is in an off position.
- ⑤ Return the starter/control box cover to its original place.
- ⑥ Reconnect the power.
- ⑦ Turn on the external setting switch.
- ⑧ Make sure that the **REMOTE** light flashes to indicate a remote operation enabled.
- ⑨ To disable the remote operation, turn off the external setting switch. Make sure that the **REMOTE** light is off to indicate a remote operation disabled or a local operation enabled.

### IMPORTANT

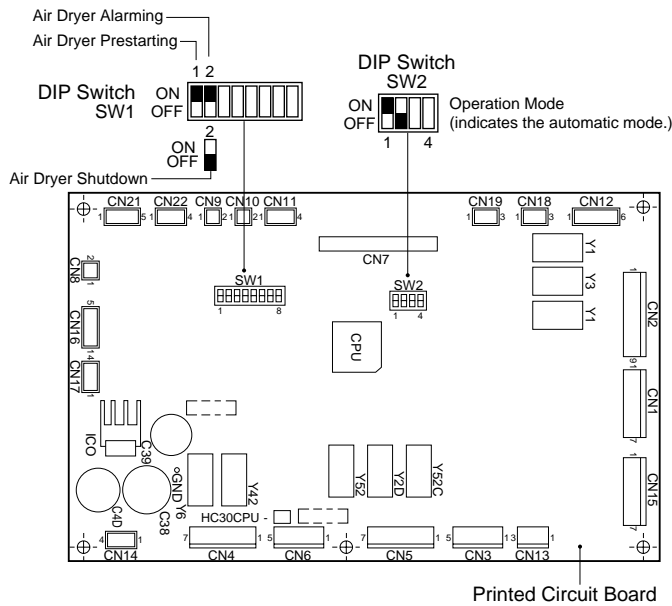
- When you disable a remote operation, always use the method used when in enabling. If you enabled it with the method (2) or (3), for example, you cannot disable it with the method (1).
- You can stop the remotely started HISCREW even by pressing the **STOP** button on the HISCREW's instrument panel.
- As an optional function, you can externally output the remote operation setting signal.

## Dryer

This page describes for the models with a built-in air dryer.

HISCREW Models		Without Built-in Air Dryer	With Built-in Air Dryer		
DIP Switch SW2	No.1	OFF	OFF	ON	ON
	No.2	OFF	ON	OFF	ON
Air Dryer Operation Mode		—	Independent (by connecting & disconnecting the power)	Automatic (by <b>START</b> and <b>STOP</b> buttons)	Manual (by <b>DRYER</b> button)
DRYER Light		OFF	ON (non-flashing) for normal operation ON (flashing) for abnormal operation		

NOTE: The shaded cells indicate a standard factory setting.

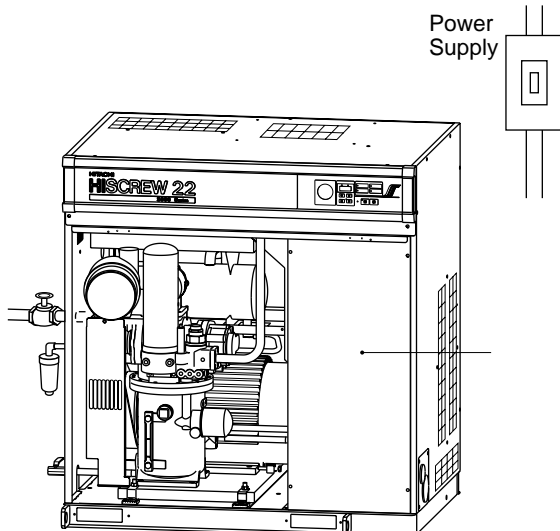


### CAUTION

When you use an external automatic control panel (multiple-unit controller, two-unit controller, etc.):

- Set the DIP switch **SW2** No.1 & 2 to **ON & ON** respectively (to enable the manual mode), and the DIP switch **SW1** No.1 to **OFF** (to disable the air dryer prestart function).

Thus you can protect the air dryer from stopping and restating frequently.



### 3.4.4 Setting of Air Dryer

#### (1) Operation Modes

As listed in the table left, the models with a built-in air dryer provide 3 operation modes. You can select either one of them by setting the No. 1 & 2 pins of the DIP switch **SW2** located on the printed circuit board. If you want to enable an air dryer prestart function, always select the automatic mode.

If you want to start and stop the built-in air dryer with the **DRYER** button, always select the manual mode.

The settings are saved in the memory when you have stopped the **HISCREW**.

#### (2) Air Dryer Prestarting

To enable the air dryer prestart function, set:

DIP switch **SW2** No.1 & 2 to **ON & OFF** respectively, and

DIP switch **SW1** No.1 to **ON**.

When you press the **START** button under the air dryer prestart function,

- The **START** light and **DRYER** light become on (non-flashing),
- The **AUTO START** light becomes on (flashing), and
- The air dryer prestarts.

Three minutes later,

- The **AUTO START** light becomes off, and
- The air compressor automatically starts.

This chills the built-in air dryer sufficiently in advance, and thus enables to discharge the dry compressed air from the beginning.

#### IMPORTANT

When the power is instantaneously interrupted and then uninterrupted, the air compressor and the air dryer start simultaneously.

#### (3) Air Dryer Warning (Shutdown/Alarm)

To enable the air dryer warning function, set the DIP switch **SW1** No.2 to:

- ON** for an alarm, and
- OFF** for a shutdown.

When the air dryer fails,

- The **SHUTDOWN** or **ALARM** light becomes on (flashing),
- The **DRYER** light begins flashing, and
- The digital monitor displays the shutdown or alarm code.

When the **SHUTDOWN** light flashes, the air compressor is automatically shut down. When the **ALARM** light flashes, the air compressor is not shut down but keeps operating. In either case, usually, the air dryer is shut down.

#### (4) Setting Procedure

When setting the DIP switches **SW1** and **SW2**:

- Disconnect the power.
- Detach the door (for the 22 kW models) or the front enclosure panel (for the 37 kW models), and then remove the starter/control box cover.
- Set the DIP switches **SW1** and **SW2** as required.
- Return the door or front enclosure panel and the starter/control box cover to their original places.

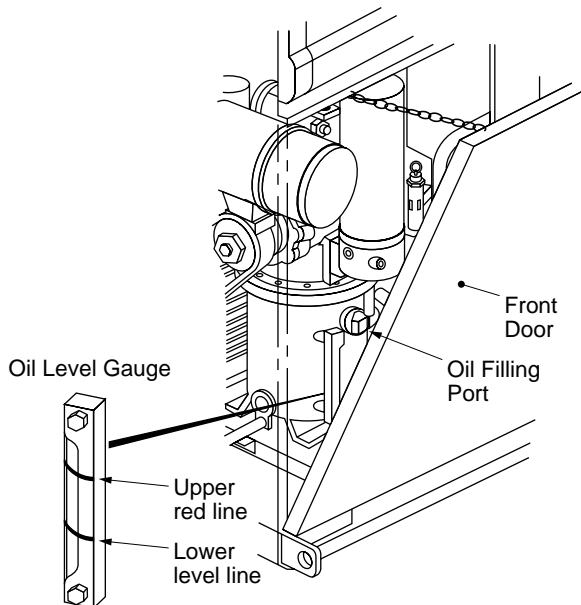


## 3.5 Daily Operation

### ⚠ CAUTION

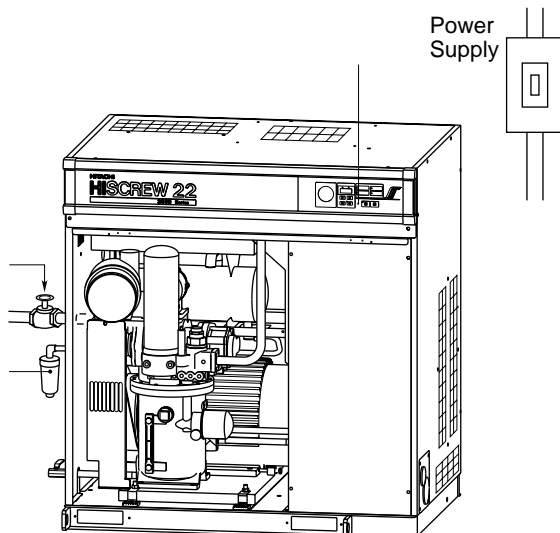
- Do not operate the machine with the pressure excess of its rated pressure. Excessive pressure gives overload to the motor and may damage some parts or even cause SHUTDOWN of the compressor.
- Investigate the cause and take necessary measures when the Relief Valve functions or the compressor stops by other safety device. Ask your dealer or your nearest Hitachi Service Station if there is any question.
- When the HISCREW automatically stops and restarts frequently, or the ambient temperature and humidity are high, open the oil/condensate drain valve of the oil case to drain the condensate from time to time. If you do not observe this instruction, the air end (rotors, bearings, etc.) and the components rust internally to cause a failure and/or the oil deteriorates. For more information, see page 17.

### 3.5.1 Before power on



- ① Check if oil level is kept within the range between upper and lower red lines. However, since the oil level may lower a little while operation of the unit, check again the level when the unit is in operation.

### 3.5.2 Power on

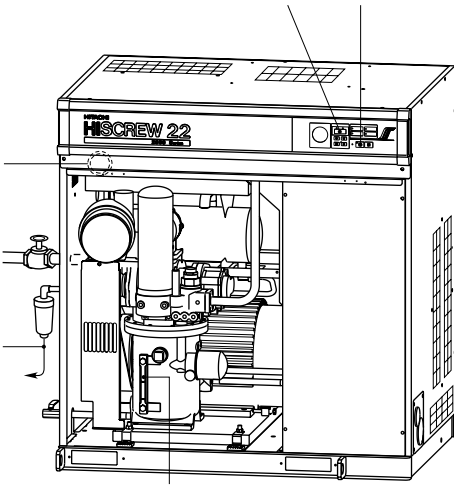


- ① Connect the power.
- ② **POWER** light on the instrument panel glows.
- ③ Fully open the valve on discharge side.

#### Dryer

- ④ Fully open the valve for the condensate drain trap.

#### 3.5.3 Operation



- ① Press the **START** button.  
Make sure that the air compressor starts.

#### Dryer

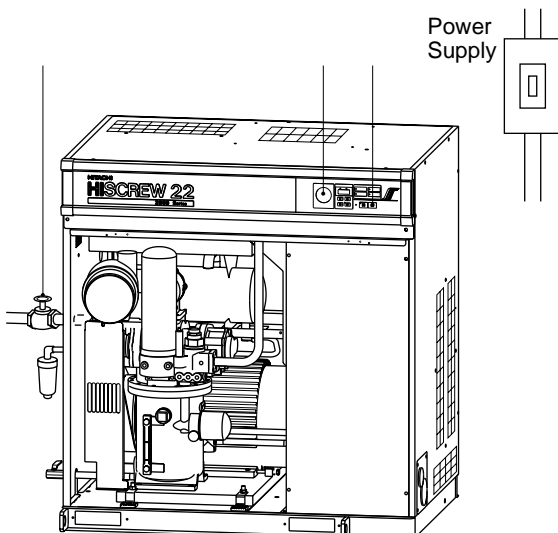
- For the air dryer prestarting (☞ p. 14) disabled:  
Make sure that the built-in air dryer starts simultaneously.
- For the air dryer prestarting enabled:  
Make sure that the built-in air dryer prestarts, the **AUTO START** light flashes for 3 minutes, and then the air compressor starts.

- ② Make sure that the oil level during operation is kept within the range between the red lines.
- ③ If it is below the lower line, follow the procedure on page 18 and replenish the genuine synthetic oil (**NEW HISCREW OIL 2000**).
- ④ Digital monitor displays run hour in 10 hours as a unit.  
Press the **SELECT** button on the instrument panel and check if the discharge temperature is within the range between 65°C and 100°C. (After temperature stabilized)

#### Dryer

- ⑤ Make sure that, 5 to 10 minutes after starting, the refrigerant pressure gauge reads 0.41 to 0.73 MPa.
- ⑥ Make sure that, about 20 minutes after starting, the automatic condensate trap starts draining the condensate.


#### 3.5.4 Stop




- ① Press the **STOP** button.  
The compressor stops.
- ② Be sure that the pressure at **DISCHARGE AIR PRESSURE GAUGE** indicates 0 (It returns to 0 for about 1 or 2 minutes after stop.)
- ③ Fully close the valve on discharge side.
- ④ Disconnect the power.

# 4. DAILY CHECK

## WARNING

1. Before check and maintenance of the compressor, carefully read "TO USE IN SAFETY" ( p. 2) again.
2. Be sure to turn OFF the POWER when check or maintenance is carried out.
3. Never touch rotating parts of the compressor (Motor Shaft, M-Sheave, V-Pulley, V-Belt and Cooling Fan).

## 4.1 Daily Operation Management

Record the operation status of the day in OPERATION RECORD LOGBOOK ( p. 67). Maintenance must be carried out if checked values show excess over allowable criteria.

## 4.2 Control of Condensate

The oil temperature control valve controls the oil temperature and thus prevents the condensate from being produced in the oil case under the normal operating conditions.

Under the following operating conditions, however, the condensate may be produced in the oil case.

1. The ambient temperature and relative humidity is as high as:
  - 30°C and more than 80%, and
  - 40°C and more than 50%.
2. The HISCREW stops and restarts repeatedly.
3. The oil cooler cools the oil excessively.

If this is the case, open the oil draining valve and check if the condensate comes out. Drain the condensate as required.

## CAUTION

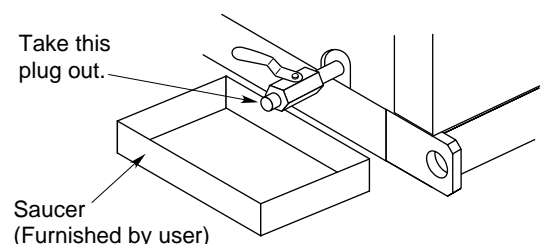
- Running the compressor for long time without draining may cause not only troubles to the Rotor and Bearings in its air end, but other major troubles like rusting inside equipments.
- In case of multiple unit operation, it is recommended to attach an oil cleaner to the unit. Ask your dealer or Hitachi's service station for this information.
- Do not open the oil-draining valve when the HISCREW is operating. Otherwise the hot oil gushes out and you may be injured or burnt.

## Draining the Condensate before Starting the HISCREW

- ① Make sure that the HISCREW is not operating and the discharge pressure gauge reads 0 MPa.
- ② Close, and then unplug, the oil-draining valve on the pipe extended from the oil case.
- ③ Place the oil pan under the oil-draining valve.
- ④ Open the oil-draining valve.
- ⑤ The oil comes out and the condensate follows.
- ⑥ When the oil starts to come out again, close and plug the oil-draining valve.

## IMPORTANT

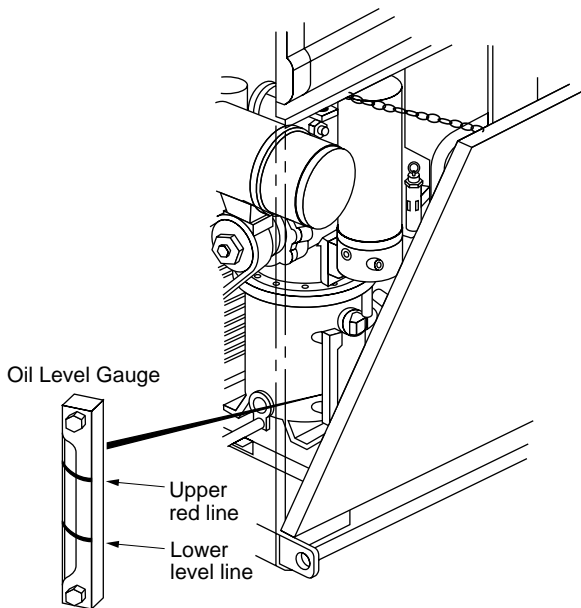
If the condensate is not discriminable from the lubricant, check its viscosity by your finger tips while draining. Be sure the condensate is well cooled before touching it. If the condensate sticks to your fingers, the lubricant is coming out.



## 4.3 Lubricant Management

### ⚠ WARNING

1. When deteriorated lubricant is used without replacement, some of it adhere to the Oil Separator Element and accumulate heat caused by its oxidization. This may bring even fire in the worst case.
2. Change lubricant and Oil Separator Element constantly according to the standard given by the Maintenance Standard (👉 pp. 45-46). Deteriorated Lubricant may result fire to the Oil Separator.
3. Use genuine synthetic oil (**NEW HISCREW OIL 2000**) for lubricant. Avoid use of other brand or mix use with it.



Type	OSP-22SA(R)I OSP-22MA(R)I	OSP-37SA(R)I OSP-37MA(R)I
Oil level between red lines	1.7 liters (0.34 liters / 1cm)	2.6 liters (0.51 liters / 1cm)
Oil replacement quantity	8 liters	13 liters

### 4.3.1 Oil level check

Check lubricant level by the oil level gauge on the oil case while the unit is working (loaded operation).

It is normal if the level is kept between two red lines.

The level over the upper line is too much. Stop the compressor and after check of no residual pressure is left inside, discharge off the surplus from the valve at oil case drain port.

If the level is lower than the lower red line, it is in short. Stop the compressor and after check of no residual pressure left inside, turn OFF the power and replenish some more of lubricant.

### IMPORTANT

Ask your dealer or Hitachi's service station for replacement of the genuine synthetic oil (**NEW HISCREW OIL 2000**).

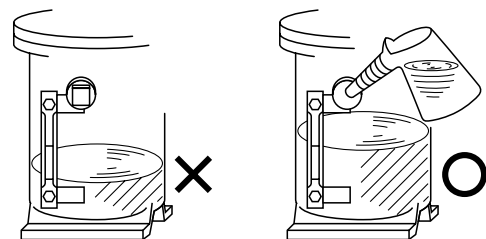
**4 liters oil can: Part No. 330**

**20 liters oil can: Part No. 332**

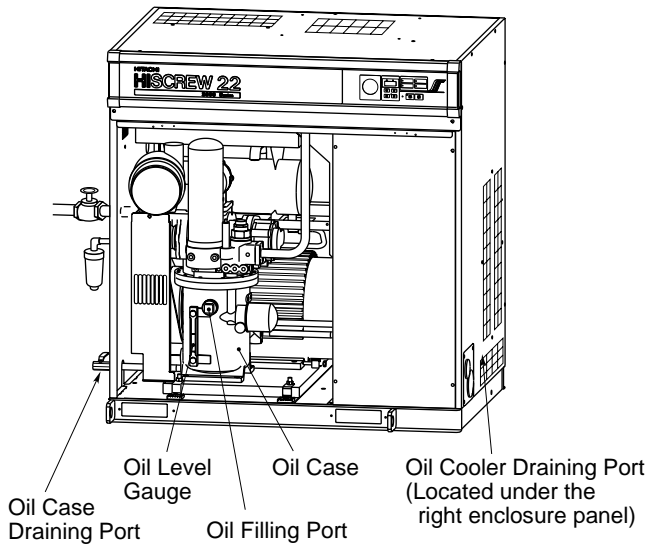
The genuine synthetic oil may get darkened due to its chemical additives soon after start of use, but it is not abnormal.

### ⚠ CAUTION

- Replenish the oil (genuine synthetic oil) periodically to maintain the proper oil level. Long time operation without the oil replenishment at low oil level, can cause the shorter oil life or oil deterioration.
- Oil replenishment shall be carried out every 1500 to 2000 operating hours. Replenish amount might be; 2 to 3 liters for 22 kW, and 3 to 4 liters for 37 kW. (Actual replenish amount shall be determined by the oil level, as it is varied by the load rate of the compressor.)
- Sampling analysis of the oil at every 3000 hours interval is recommended. Earlier oil replacement might be necessary, depending on the result of the analysis. Consult HITACHI dealer for the sampling analysis.



4.3.2 How to change oil



<b>Discharge</b>	<ol style="list-style-type: none"> <li>① Press the <b>STOP</b> button.</li> <li>② Disconnect the power.</li> <li>③ Be sure that the pressure in the compressor is decreased to the ambient pressure level (Check if the Pressure Gauge indicates 0 MPa).</li> <li>④ Detach the door and the right enclosure panel.</li> <li>⑤ Unplug the oil-draining pipe on the pipe extended from the oil case.</li> <li>⑥ Place the oil pan under the oil-draining valve. Open the oil-draining valve. Let the oil be totally drained from the oil case. Close and plug the oil-draining valve.</li> <li>⑦ Place the oil pan under the oil cooler's plug. Unplug the oil cooler. Let the oil be totally drained from the oil cooler. Plug the oil cooler.</li> </ol>
<b>Filling the oil</b>	<ol style="list-style-type: none"> <li>⑧ Unplug the oil filling port. Fill the genuine synthetic oil (<b>NEW HI SCREW OIL 2000</b>) into the oil cooler, until the oil reaches the upper red line on the oil level gauge.</li> <li>⑨ Make sure that all the plugs are tightly screwed, and return the door and the right enclosure panel to their original places.</li> </ol>
<b>Check and Replenishment</b>	<ol style="list-style-type: none"> <li>⑩ Turn the <b>POWER ON</b>. Press the <b>START</b> button and stop it 7 or 8 seconds later.</li> <li>⑪ Check the oil level with the oil gauge of the oil case. The level will lower because some of it is circulating in pipes or oil cooler.</li> <li>⑫ Confirm that the pressure decreases to the level of the ambient air pressure. Then turn the <b>POWER OFF</b> and replenish some more lubricant into the replenish port.</li> <li>⑬ After replenishment, fasten the plug on the replenish port securely.</li> <li>⑭ Press the <b>START</b> button again to check the oil level when the compressor is at its full load.</li> </ol>

**⚠ CAUTION**

- Replace the lubricant in whole every two years.
- Be sure to drain oil in use (old oil) with condensate in whole before replacement.
- Be sure to use genuine synthetic oil (**NEW HI SCREW OIL 2000**) for lubricant.

**⚠ CAUTION**

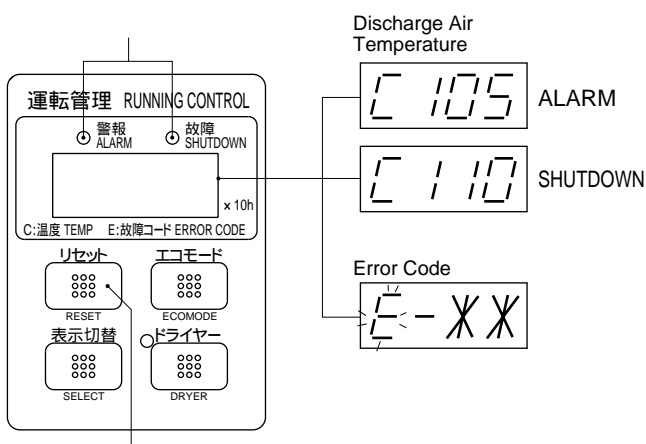
- If oil is so deteriorated as to produce the sludge or to be green, you can not recover the system's function even by cleaning the oil cooler, oil case and oil piping. You may have to replace the oil cooler and overhaul the entire system (including the air end).
- Optional Low Oil Level Alarming Feature:  
If the **ALARM** light flashes and the error code **E-22** is displayed on the digital monitor, stop the **HI SCREW**, make sure that the system has been depressurized, and turn off the main power; then add oil. Restart and fully load the **HI SCREW**; then press the **RESET** button.

# 5. TROUBLESHOOTING

## ⚠ CAUTION

In case where **ALARM** is given or a **SHUTDOWN** happens, remove its causes before restart the unit.  
Ask your dealer or your nearest Hitachi Service Station if you have any question or unclear point.

## 5.1 When ALARM or SHUTDOWN is Displayed



### 5.1.1 ALARM Light Flashing

(The **HISCREW** keeps operating.)

- ① Alarm is given (Ex.: Temperature sensor detects high discharge temperature of the compressor.).
- ② The **ALARM** light flashes. The digital monitor displays the discharge air temperature.
- ③ Remove the causes of alarm.  
(Refer to pages 23 through 24 “SHUTDOWN/ALARM Indications on the Instrument Panel” for countermeasures.)

### 5.1.2 SHUTDOWN Light Flashing

(The **HISCREW** stops operating.)

- ① Shutdown happens (Ex: Temperature sensor detects excessive in the discharge temperature of the compressor.)
- ② The **SHUTDOWN** light flashes. The digital monitor displays the discharge air temperature.
- ③ Remove the causes of shutdown.  
(Refer to pages 23 through 24 “SHUTDOWN/ALARM Indications on the Instrument Panel” for countermeasures.)
- ④ Press the **RESET** button.
- ⑤ The **SHUTDOWN** light becomes off.

### 5.1.3 When SHUTDOWN code is displayed on the digital monitor

The **ALARM** or **SHUTDOWN** light flashes. Take the similar actions as above.

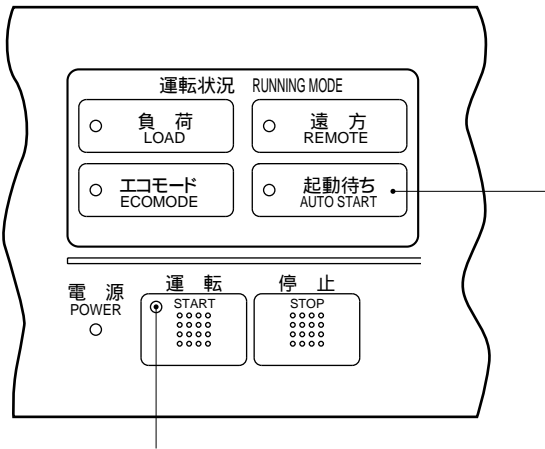
#### MEMO

The unit memorizes three items of shutdown history with different shutdown code. Its content can be checked by pressing the **SELECT** button for more than 7 seconds.

☞ See page 8 for this operation.

#### IMPORTANT

Procedure to reset ALARM and SHUTDOWN depends on what brought the ALARM or SHUTDOWN.  
(See Reset Procedure in pages 23 through 24 “SHUTDOWN/ALARM Indications on the Instrument Panel”)



### 5.1.4 Automatic Restart after Power Supply Interruption (Equipped to M-Type)

M-type unit is equipped with a function of automatic restart after power supply interruption. When an interruption of power supply in which electromagnetic contactor turns OFF happens, this function detects it. Make **AUTO START** light blink and wait until pressure drops down to 0, then the unit automatically restarts.

- ① POWER INTERRUPTION occurs.
- ② The unit stops automatically.
- ③ When the power supply is interrupted, **AUTO START** light on the operation panel blinks.
- ④ The compressor will automatically restart 60 seconds after POWER recovery.

#### IMPORTANT

- (1) Power supply interruption means the instantaneous drop of voltage to 0 V.
- (2) The compressor continues its normal operation without stop if the said drop time is shorter than 20 ms.
- (3) When such time is longer than 5 seconds, the sensor detects it as a power failure and stops the unit. In such case, the unit will not restart automatically. So, press the **START** button to start the unit again.

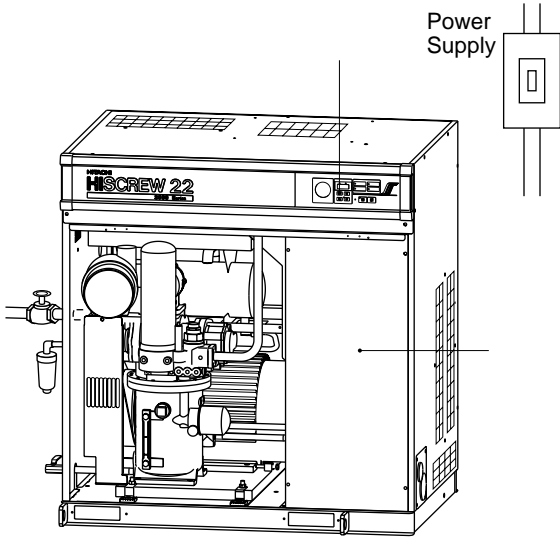
## 5.2 Override Operation

When the digital monitor displays a shutdown code, first check the wires and connectors and take corrective measures against any abnormal or loose wires/connectors. Sometimes this may solve the problem. If the problem persists or the shutdown code is still displayed, proceed to enable an override operation.

The override operation allows only the U-type capacity control. You should use the override operation as a temporary solution until you can finish fixing the **HISCREW**.

#### ⚠ CAUTION

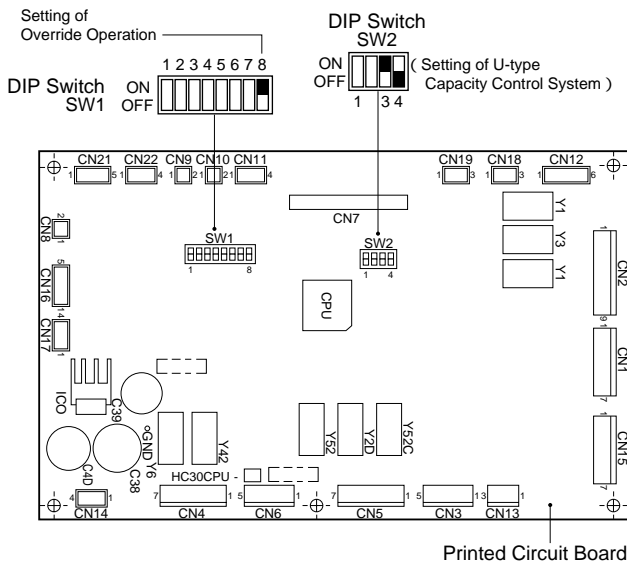
While you proceed to an override operation, contact your Hitachi distributor to fix the **HISCREW** as early as possible.



### 5.2.1 Enabling Override Operation

- ① Press the **RESET** button.
- ② Disconnect the power.
- ③ Detach the door (for the 22 kW models) or the front enclosure panel (for the 37 kW models), and remove the starter cover.
- ④ Reset the DIP switches (on the printed circuit board located in the starter/control box) as follows:
  - SW1** No. 8: ON (setting of override operation)
  - SW2** No. 3 & 4: ON & OFF (setting of U-type capacity control)
- ⑤ Return the door or the front enclosure panel to their original places.
- ⑥ Reconnect the power.

The digital monitor displays **EE** indicating that the override operation is successfully enabled.



#### IMPORTANT

- Override operation disables the following functions:
- To display the digital monitor (except for **EE**)
  - To turn on (either flashing or not flashing) the **ALARM** or **SHUTDOWN** light
  - To select a screen by pressing the **SELECT** button
  - To externally output the control signals through the dry contacts

### 5.2.2 When Override Operation is not Allowed

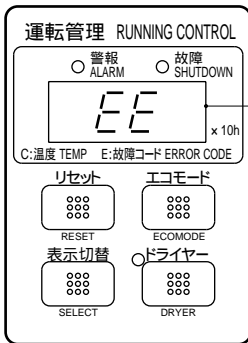
The override operation is not allowed to the following error codes:

- E-31: The thermistor **TH1** is disconnected or loosely connected
- E-32: The thermistor **TH2** is disconnected or loosely connected
- E-41: ROM error (failure of PCB)
- E-42: RAM error (failure of PCB)
- E-43: E<sub>2</sub>ROM error (failure of PCB)

If this is the case, see pages 23 through 24 to take corrective measures.

#### IMPORTANT


For the error code E-33 (failure of pressure sensor): After enabling an override operation, hold down the **SELECT** button and connect the power, and press the **START** button. Note that this clears the shutdown history.



Indicating of Override Operation Enabled



### 5.3 SHUTDOWN/ALARM Indications on the Instrument Panel

When a problem occurs, the **SHUTDOWN**, **ALARM** or **AUTO START** light flashes and the digital monitor displays a corresponding ALARM or SHUTDOWN (as 'A/S' below) code. If this is the case, refer to the following table to identify the cause. If you cannot identify the cause, or for the problem with a  mark in the table, contact a Hitachi distributor.

A/S Code	Light: Action	Category of Problem	SCREW Shutdown	Causes	What Actions to Take	Mark	What and How to Detect	How to Reset	A/S History
E-17	<b>SHUTDOWN:</b> On (flashing)	Overloading	Yes	Failure of power supply	Check the power supply for a voltage drop and imbalance. Correct it if required.		Tripping of thermal overload relay	Press the reset button of the thermal overload relay.	17
				High discharge pressure	Check and correct the capacity control settings and/or readjust the modulator valve, if the discharge pressure is higher than the specification pressure.				
				High discharge pressure	Check the oil separator element. Replace it if it is clogged.				
				Failure of main motor and/or cooling fan motor	Check the motor for insulation resistance etc.				
				Failure of air end	Check the air end.				
E-18	<b>SHUTDOWN:</b> On (flashing)	High discharge temperature 1 (*)	Yes	High ambient temperature	Ventilate the room to reduce the ambient temperature to 40°C.		Discharge temperature 1 over 110°C	Press the <b>RESET</b> button.	18
				Low oil level	Add oil. (Disconnect the power and make sure that the discharge pressure gauge reads 0 MPa in advance.)				
				Dirty or clogged oil cooler	Clean the cooling fins. See page 51.				
				Dirty or clogged oil filter	Replace the oil filter. See page 49.				
E-23	<b>ALARM:</b> On (flashing)	High discharge temperature 1 (*)	No	Same as the E-18 above	Same as the E-18 above		Discharge temperature 1 over 105°C	Automatically reset.	23
E-19	<b>SHUTDOWN:</b> On (flashing)	Failed air dryer	Yes	Tripping of an air dryer's protective device during operation	See page 25.		DIP switch <b>SW1</b> No.2 set to OFF	Press the <b>RESET</b> button.	19
	<b>ALARM:</b> On (flashing)		No						
E-01	<b>SHUTDOWN:</b> On (flashing)	Reversal phase connection	Yes	Power connected in a reversal phase	Disconnect the power and change 2 of the 3 power cord wires.		Detected for 3 seconds after connecting the power	Disconnect and reconnect the power.	01
E-02	<b>SHUTDOWN:</b> On (flashing)	Phase-lacking connection	Yes	Power connected with a lack of phase	Check the power supply. Tightly reconnect the power cord wires.		Detected for 3 seconds after connecting the power	Disconnect and reconnect the power.	02
E-11	<b>SHUTDOWN:</b> On (flashing)	High discharge temperature 2 (*)	Yes	Failure of oil separator element	Replace the oil separator element and the oil.		Discharge temperature 2 over 110°C	Press the <b>RESET</b> button.	11
E-12	<b>SHUTDOWN:</b> On (flashing)	Abnormally high discharge pressure	Yes	Failure of oil separator element	Check the oil separator element. Replace if required.		Detected during delta operation	Press the <b>RESET</b> button.	12
				Failure of contactor 52	Disconnect the power and tightly reconnect the 52 wires.				12
E-14	<b>SHUTDOWN:</b> On (flashing)	Option	Yes						14
E-16	<b>SHUTDOWN:</b> On (flashing)	Answer error of contactor 42	Yes	Failure of contactor 42 (42 answer error)	Disconnect the power and check the 42. Tightly reconnect the 42 wires. Replace the 42 if necessary.		Detected during delta operation	Press the <b>RESET</b> button.	16
E-51	<b>SHUTDOWN:</b> On (flashing)	Answer error of contactor 52	Yes	Failure of contactor 52 (52 answer error)	Disconnect the power and check the 52. Tightly reconnect the 52 wires. Replace the 52 if necessary.		Detected during star operation	Press the <b>RESET</b> button.	51

## 5. TROUBLESHOOTING [SHUTDOWN/ALARM Indications on the Instrument Panel]

A/S Code	Light: Action	Category of Problem	SCREW Shutdown	Causes	What Actions to Take	Mark	What and How to Detect	How to Reset	A/S History
E-31	<b>SHUTDOWN:</b> On (flashing)	Failed or disconnected temperature sensor 1	Yes	Failure or disconnection of thermistor <b>TH1</b>	Disconnect the power and check the <b>TH1</b> . Replace it if necessary. Tightly reconnect the <b>TH1</b> wires.		Operating temperature below $-30^{\circ}\text{C}$	Automatically reset.	31
E-32	<b>SHUTDOWN:</b> On (flashing)	Failed or disconnected temperature sensor 2	Yes	Failure or disconnection of thermistor <b>TH2</b>	Disconnect the power and check the <b>TH2</b> . Replace it if necessary. Tightly reconnect the <b>TH2</b> wires.		Operating temperature below $-30^{\circ}\text{C}$	Automatically reset.	32
E-33	<b>SHUTDOWN:</b> On (flashing)	Failed or disconnected pressure sensor	Yes	Failure or disconnection of pressure sensor <b>PS</b>	Disconnect the power and check the <b>PS</b> . Replace it if necessary. Tightly reconnect the <b>PS</b> wires.		0 (zero) MPa during operation.	Automatically reset.	33
E-41	<b>SHUTDOWN:</b> On (flashing)	Failed control device	Yes	Failure of ROM (or printed circuit board)	Disconnect and reconnect the power. If a problem still occurs, replace the printed circuit board.		Retrying action	Disconnect and reconnect the power.	41
E-42	<b>SHUTDOWN:</b> On (flashing)	Failed control device	Yes	Failure of RAM (or printed circuit board)	Disconnect and reconnect the power. If a problem still occurs, replace the printed circuit board.		Retrying action	Disconnect and reconnect the power.	42
E-43	<b>SHUTDOWN:</b> On (flashing)	Failed control device	Yes	Failure of E <sup>2</sup> ROM (or printed circuit board)	Disconnect and reconnect the power. If a problem still occurs, replace the printed circuit board.		Retrying action	Disconnect and reconnect the power.	43
E-21	<b>ALARM:</b> On (flashing)	Clogged air intake filter	No	Clogging of air intake filter	Clean the air intake filter element.		Pressure differential of 7.4 kPa	Press the <b>RESET</b> button.	21
E-59	<b>ALARM:</b> On (flashing)	Excessive load/unload	No	Total 1,000,000 times loaded/unloaded	Replace the consumable parts of suction throttle valve.		1,000,000 times	Hold down <b>SELECT</b> and press <b>RESET</b> .	59
E-22	<b>ALARM:</b> On (flashing)	Low oil level (option)	No	Low oil level					22
E-15	<b>SHUTDOWN:</b> On (flashing)	Option	Yes						15
E-54	<b>ALARM:</b> On (flashing)	Option	No						54
-	<b>AUTO START:</b> On (flashing)	Instantaneous power interruption (IPS)	No	IPS of below 5 seconds	Check the power supply.		IPS of 20 ms to 5 seconds		03
				IPS of below 5 seconds	Check the power supply.		IPS of below 20 ms		04

\* Discharge temperature 1: Temperature at the outlet of the air end  
 Discharge temperature 2: Temperature at the outlet of the oil separator element

## Dryer

### ■ Troubleshooting after the DRYER Light Flashes

When a problem occurs on the built-in air dryer, the **DRYER** light flashes and the digital monitor displays a corresponding **ALARM** or **SHUTDOWN** code. If this is the case, refer to the following table to identify the cause. After solving the problem, press the **RESET** button to reset the control circuit.

Symptoms	Causes	What to Check	What Actions to Take	Mark
(1) Operation of thermal overload relay <b>49FC</b>	Operating current: High	Check the power supply voltage.	Keep the operating voltage as specified.	
		Check the <b>PS1</b> for an operation.	Refer to the (2).	☞
	Power cables: Connected in a single phase.	Check the power supply terminal screws for looseness.	Retighten the terminal screws.	
		Check the contactors for roughness of their contacts.	Replace the contactors.	☞
	Parts of refrigerant compressor: Failed.	Check the refrigerant compressor for seizure.	Replace the refrigerant compressor.	☞
		Check the insulation resistance.	Replace the refrigerant compressor.	☞
	<b>49FC</b> : Failed.	Check the operating current.	Replace the <b>49FC</b> .	☞
Check the wires for looseness.		Tightly reconnect the wires.	☞	
(2) Operation of high-pressure pressure switch <b>PS1</b>	Incoming compressed air: High in temperature.	Check the ambient temperature.	Reduce the ambient temperature to below 40°C.	
		Check the cooling system of the air compressor.	Clean the condenser and/or replace the cooling fan.	
	Hot-gas bypass valve: Failed.	Read the refrigerant pressure gauge.	Adjust the hot-gas bypass valve to correctly set a refrigerant pressure.	☞
			Replace the hot-gas bypass valve if it is not adjustable.	☞
	Condenser fins: Dirty.	Check the condenser fins for dirtiness.	Clean the condenser fins.	
	Cooling fan motor for condenser <b>IM4</b> and/or <b>IM5</b> : Not working.	Check the fan control switch <b>PS2</b> for a failure.	Replace the <b>PS2</b> .	☞
		Check the <b>49FC</b> for continuity.	Replace the <b>49FC</b> .	☞
		Check the <b>IM4</b> and/or <b>IM5</b> for continuity.	Replace the <b>IM4</b> and/or <b>IM5</b> .	☞
		Check the contactors for a failure.	Replace the contactors.	☞
	Non-condensable gas: Mixed in the refrigerant paths.	Check the evaporator for a refrigerant leak.	Clean the refrigerant paths and replace the air cooler.	☞
Parts of pressure switches <b>PS1</b> and/or <b>PS2</b> : Failed.	Check the continuity.	Replace the <b>PS1</b> and/or <b>PS2</b> .	☞	
(3) Operation of refrigerant thermostat <b>OHR</b>	Refrigerant: Leaked.	Check the system for a refrigerant leak.	Take a corrective measure, and charge the refrigerant.	☞
	<b>OHR</b> : Failed.	Check the <b>OHR</b> for continuity.	Replace the <b>OHR</b> .	☞
	Incoming refrigerant: High in temperature.	Check the hot-gas bypass valve for degree of opening.	Adjust the hot-gas bypass valve to correctly set a refrigerant pressure.	☞

### **WARNING**

The built-in air dryer uses non-flammable, non-toxic, and odorless refrigerant (Freon gas R-407C). The Freon gas leak from the system, however, may generate toxic gas by contact with fire and it may irritate the eyes and throats. In addition, it covers the floor because it is larger in specific weight than the air, which may cause oxygen deficit to the personnel. When the Freon gas leaks, therefore, extinguish the fire, ventilate the room with a sweep-the-floor motion, and contact a Hitachi distributor.


## 5.4 A List of SHUTDOWNS Not Displayed on Instrument Panel

Ask your dealer or Hitachi's Service Station if the cause of malfunction is unknown or with ☞ mark shown in a REMARKS column.

SYMPTOMS AND TROUBLES		POSSIBLE CAUSES	SOLUTIONS	REMARKS
Unit doesn't start	Motor noise inaudible	Wire breaking	Replace of wire	☞
		Print circuit board, relays, failures, fuse blown-out, transformer failure.	Replace	☞
		Motor malfunction	Repair or replace	☞
	Motor noise audible	Voltage drop	Change Transmitter Capacity when POWER CAPACITY too small	
		Wires too thin	Replace Wires to ones of standard size	
		Motor abnormal	Repair or replace	☞
		Start Solenoid Valve*: Failed.	Replace	☞
	Compressor's revolution unable	Disassemble and inspection of the Compressor Main Body	☞	
Discharge Pressure decreased	Modulator Valve / Blow-off Solenoid Valve fault	Readjust or Replace	☞	
	Pressure Gauge Indication fault	Replace	☞	
	Leak in Pipes	Refastening/Packing change		
	Intake Filter clogging	Clean or Replace Element		
	Oil Separator clogging	Replace Element	☞	
Discharge Pressure Increased	Pressure Regulating Valve fault	Readjustment	☞	
	Suction Throttle Valve fault	Disassemble and check/Packing change	☞	
	Mechanical Sealing damage	Replace	☞	
	Pressure Gauge Indication fault	Replace	☞	
Relief Valve operated	Excess Over Rated Pressure	See "Discharge pressure increased" above.	☞	
	Relief Valve: Incorrectly adjusted or failed.	Readjust, Repair or Replace	☞	
Discharge Temp. too high	Poor operation of Oil Temperature Control Valve	Replace	☞	
	Suction Air Temperature too high	More Ventilation		
Lubricant consumption excessive	Oil Scavenge Pipe System clogging	Clean or Replace Recovery Orifice		
	Oil Separator clogging	Replace Element	☞	
	Oil level: Not between the red lines on oil level gauge.	Keep oil level between the red lines.		
Other phenomena**	Current value large	Lowered or unbalanced voltage	Adjustment of power and voltage	
		Abnormal abrasive resistance in the rotating part (oil deterioration, seizure)	Inspection, flashing, oil change	☞
	Current value small	Unload setting for pressure control valve etc. is low.	Re-adjustment	☞
		Intake Filter clogging	Clean or Replace Element	
		Over-voltage	Adjustment of power and voltage	

To be continued on page 27.

## 5. TROUBLESHOOTING [A List of SHUTDOWNS Not Displayed on Instrument Panel]

SYMPTOMS AND TROUBLES		POSSIBLE CAUSES	SOLUTIONS	REMARKS
<b>Capacity Control malfunction</b>		Adjustment failure of Modulator Valve	Readjust	🔧
		Start Solenoid Valve* and/or Blow-off Solenoid Valve: Failed	Replace	🔧
		Air-leak or clogging in plumbing system	Cleaning and refastening of Plumbing Equipments	🔧
		Cap Seal damaged	Replace	🔧
		Suction Throttle Valve's rubber seat damaged or deformed	Replace	🔧
		Inappropriate pressure setting	Resetting	🔧
<b>Lubricant deterioration too early</b>		Use of other than genuine synthetic oil (NEW  SCREW OIL 2000)	Replace with the appropriate one	🔧
		Ambient Air Temperature too high	Replace it with genuine synthetic oil (flashing inside is required.)	
		Water in the system	Check of Drain Suction Port and drainage	
		Deteriorated Lubricant still left	Flushing at Lubricant change	🔧
<b>Strange noise from the Main Body</b>		Compressor grips Foreign Particle	Disassemble/Repair	🔧
		Inappropriate friction or damage of Bearing	Replace	🔧
<b>Other unfamiliar noises</b>		Loose Bolts or Screws	Refastening	
		Fault Installation	Add some mortar to settle the foundation levelly	
<b>Strange noise from Belt</b>		Belt slipping	Adjust Belt Tension or replace it	🔧
<b>Excessive Vibration</b>		Loose Bolts or Screws	Refastening	
		Fault Installation	Add some mortar to settle the foundation levelly	
		Unbalance of the unit due to Cooling Fan contamination	Clean Fins	🔧
<b>Dryer fault</b>	<b>Refrigerant pressure is low but waterdrops gather at outlet.</b>	Drain trap clogging	Clean	
		Drain discharge system clogging	Clean drain discharge system then drain from under air cooler.	🔧
		Air cooler frozen	Adjust hot gas bypass valve to be 0.41 MPa or more. Replace bypass valve if unadjustable.	🔧
		Refrigerant leak	Repair then fill refrigerant.	🔧
	<b>Refrigerant pressure is high and waterdrops gather at outlet.</b>	High intake air temperature	Keep ambient temperature below 40°C. Clean cooler and replace fan.	
		Noncondensing gas mixed in cycle	Wash cycle then replace evaporator.	🔧
		Hot gas bypass valve fault	Adjust bypass valve to be the specified pressure. Replace if unadjustable.	🔧

\* Only for the 37 kW models.

\*\* Only if you installed an ammeter on the power supply.

### **WARNING**

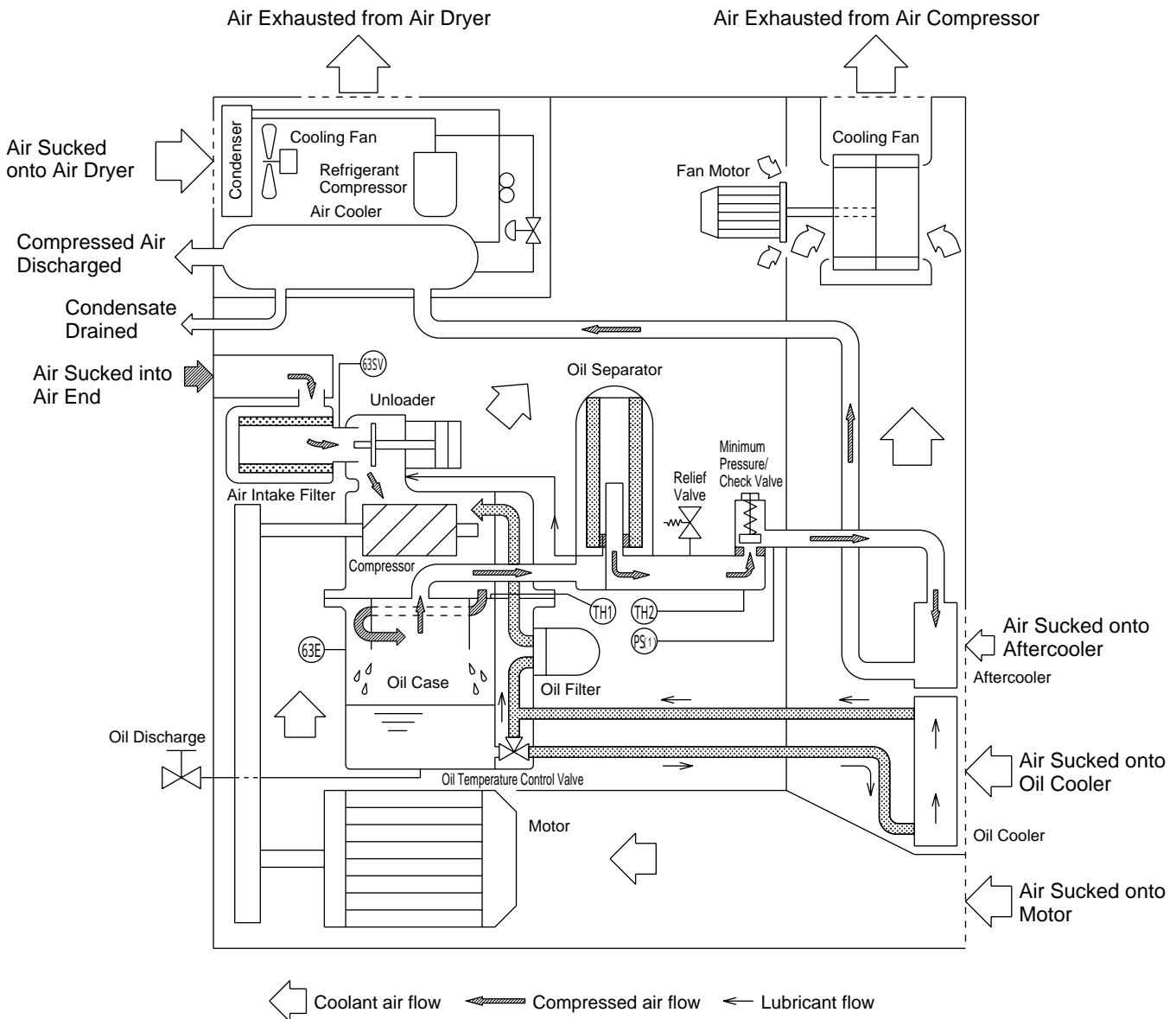
1. Running the unit with deteriorated lubricant unchanged or in a very hot condition brings the lubricant ignites and this may cause serious accident.  
Keep the lubricant well controlled (See pages 18 through 19).
2. Do not operate the unit without protective equipment. In case of SHUTDOWN, read this section "5. TROUBLESHOOTING" to remove the cause. If the cause is unknown, inform and ask your dealer or Hitachi Service Station.

### **CAUTION**

- Running the unit with its loose belt brings not only lowered discharge air capacity due to its slipping, but also life of belt shortened. If belt is broken during the operation, the lubricant blows out of the Suction Throttle Valve. Be sure to carry out your constant check on belt.
- If the unit stops due to the function of Temperature Relay, check leakage in the mechanical seal and replace it if lubricant leak is found there.

# 6. SYSTEM OF EACH COMPONENT

## 6.1 Compressed Air/Lubricant System



TH1 : Thermistor (discharge temp. 1)  
 TH2 : Thermistor (discharge temp. 2)  
 PS(1): A pressure sensor (for capacity control)

63E : Pressure switch  
 63SV : Pressure differential sensor of air intake filter

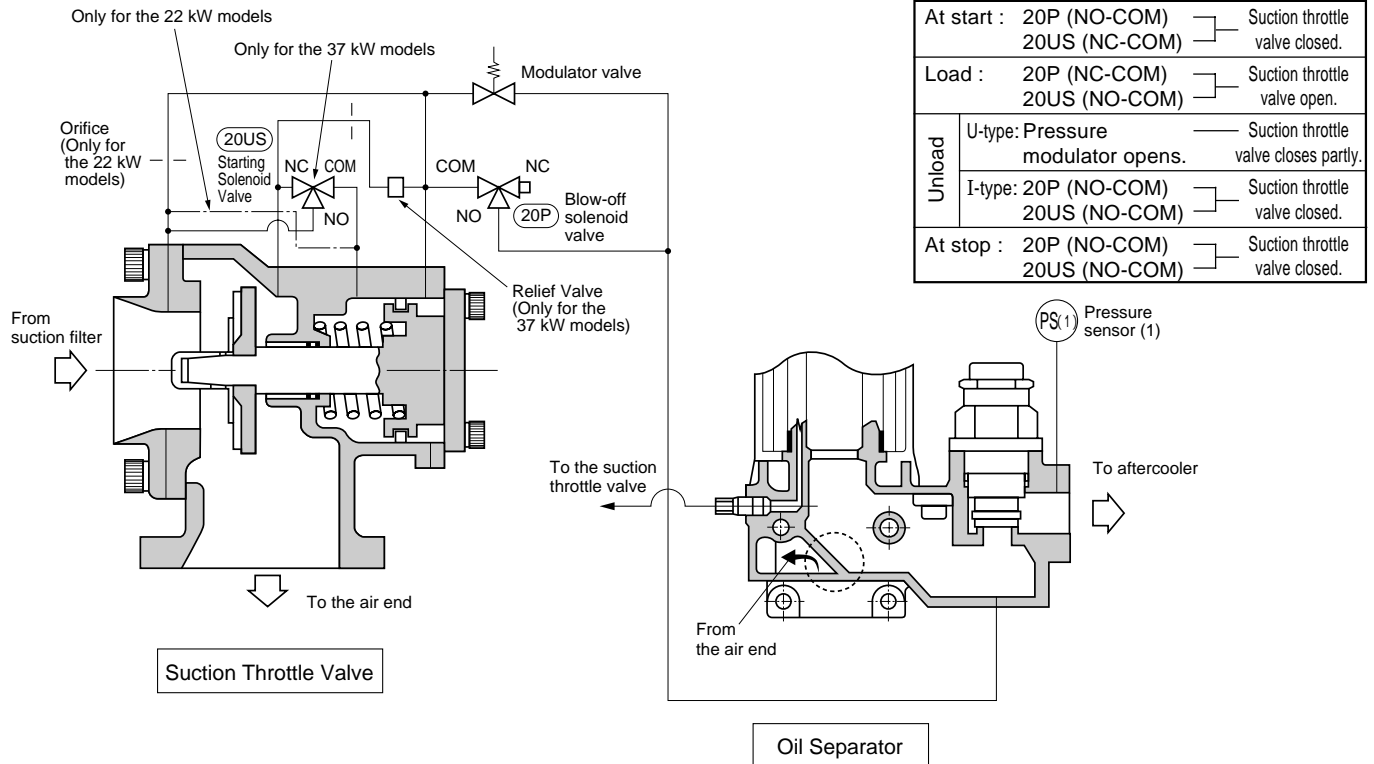
### 6.1.1 Compressed air flow

The air under atmospheric pressure is taken in the unit through Air Intake Filter and is compressed by a compressor to the specified pressure. This Compressed Air flows in the Oil Case together with Lubricant, and by which Compressed Air and Lubricant are separated. Segregated Compressed Air is cooled in the Aftercooler and then discharged out.

### 6.1.2 Lubricant flow

The Lubricant circulates in the unit by means of pressure difference between the pressure in the Oil Case and the one in the suction side of the Compressor. The mixture of Compressed Air and Heat Exchanged Lubricant are separated in the Oil Separator into the Compressed Air and the Lubricant. Segregated Lubricant is cooled in the Oil Cooler afterwards and returns to the suction side of Compressor, then it makes Heat Exchange with another Compressed Air again.

## 6.2. Capacity Control System



See page 12 for setting of capacity control mode, page 9 for changing the capacity control settings.

### 6.2.1 Types of Capacity Control

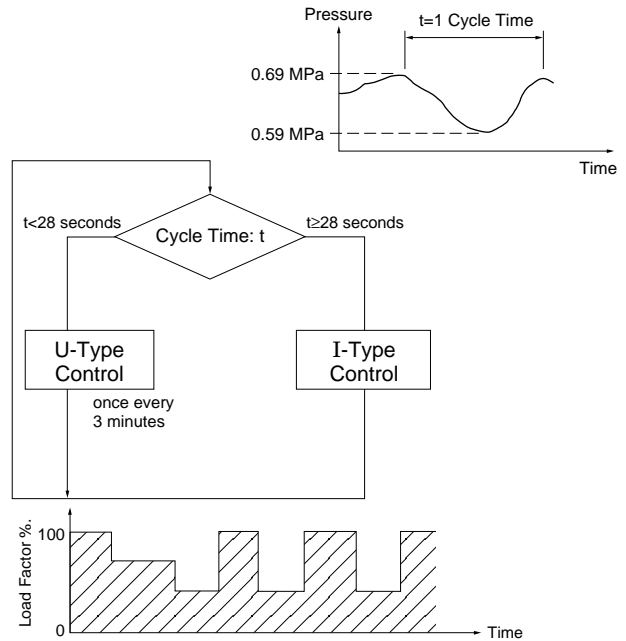
Type of capacity control	Purpose	S-type	M-type															
<p><b>I-type (Integral unload type):</b> Fully closes the suction throttle valve when discharge pressure reaches to cut-off pressure, and fully opens by cutin pressure. At full close, pressure inside the oil separator is discharged until it reaches to the atmosphere and economize power consumption more .</p> <p>The discharge pressure of the compressor is variable within the pressure range as follows: (Each pressure value is set by digital monitor on the panel)</p> <table border="1"> <tr> <td>Specification discharge pressure</td> <td>MPa</td> <td>0.69</td> <td>0.83</td> <td>0.92</td> </tr> <tr> <td>Cutoff pressure</td> <td>MPa</td> <td>0.69</td> <td>0.83</td> <td>0.92</td> </tr> <tr> <td>Cutin pressure</td> <td>MPa</td> <td>0.59</td> <td>0.74</td> <td>0.82</td> </tr> </table> <p>Pressure sensor detects pressure setting and micro computer makes judgement thereto.</p>	Specification discharge pressure	MPa	0.69	0.83	0.92	Cutoff pressure	MPa	0.69	0.83	0.92	Cutin pressure	MPa	0.59	0.74	0.82	<p>This is applicable when air consumption is less and the unit is in continuous use, and when the power consumption at unload operation must be kept less.</p>	(Standard setting) At delivery from factory.	
Specification discharge pressure	MPa	0.69	0.83	0.92														
Cutoff pressure	MPa	0.69	0.83	0.92														
Cutin pressure	MPa	0.59	0.74	0.82														
<p><b>P-type (Motor ON-OFF control type):</b> In addition to U-type and I-type control, the system automatically stops the motor when a consumed air capacity is less. (This type fluctuates pressure like I-type.)</p>	<p>This is applicable when the unit is very often operated unloaded, or when the air consumption intermittently fluctuates.</p>	-	(Standard setting) At delivery from factory.															
<p><b>U-type (Suction unload type):</b> Gradually controls discharge air capacity by opening or closing the suction throttle valve according to the increase in discharge pressure.</p>	<p>This is applicable when fluctuation of discharge pressure must be kept less.</p>		-															

### 6.2.2 I-Type Capacity Control

(Standard setting for S-type at delivery from the factory)

This controls the capacity as a flow chart in the right figure.

- (1) When “**pressure fluctuation cycle: t**” is less than 28 seconds, U-type (suction unload type) control is adopted.
- (2) When “**pressure fluctuation cycle: t**” is longer than 28 seconds, I-type (integral unload type) control is adopted.

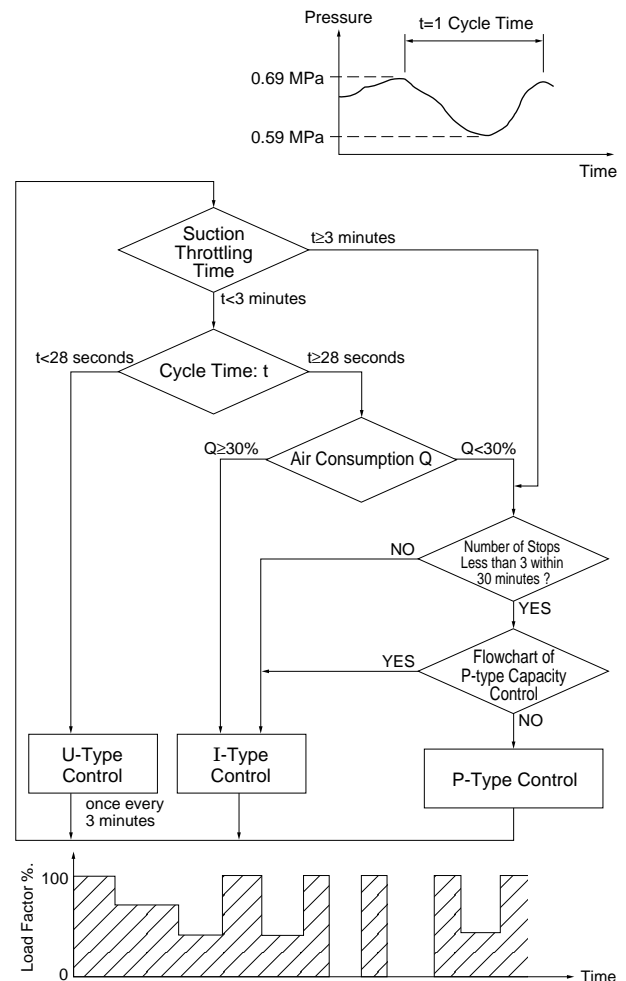


### 6.2.3 P-Type Capacity Control

(Standard setting for M-type at delivery from the factory)

This controls the capacity as a flow chart in the right figure.

- (1) If “**pressure fluctuation cycle: t**” is less than 28 seconds, U-Type control (Suction Unload Type) is adopted.
- (2) If “**pressure fluctuation cycle: t**” is over 28 seconds and the air consumption is larger than 30% of its rated capacity, I-Type control (Integral Unload Type) is adopted.
- (3) If “**pressure fluctuation cycle: t**” is over 28 seconds and the air consumption is less than 30% of its rated capacity, P-Type control (Motor ON-OFF Control Type) is adopted. However, the number of stops the motor makes is limited to 3 times during 30 minutes.
- (4) When the I-type unloading operation continues for 3 minutes, the P-type capacity control is activated.



In case of P-Type (Motor ON-OFF Control Type),  
 (1) The Motor will not start again for 45 seconds when it stops.

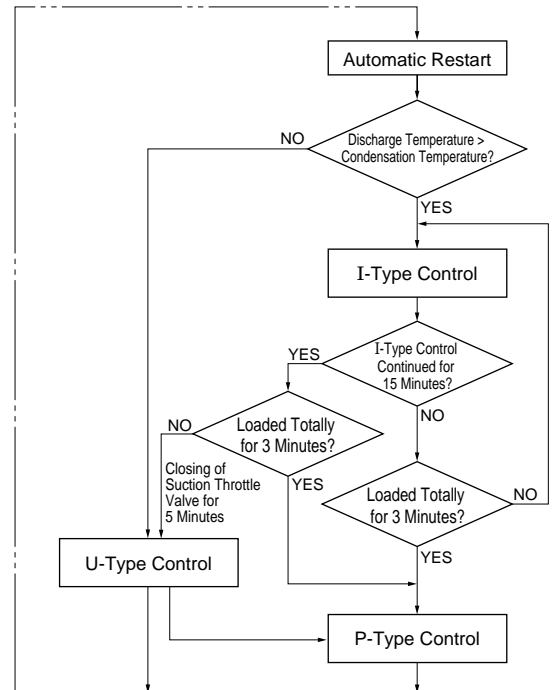
(2) Install an external air receiver tank. If you fail to observe this instruction, the plant airline pressure may critically drop within 45 seconds (or before the motor can restart). When you want to use the ECOMODE function, select a larger air receiver tank. For appropriate air receiver tank capacity, see page 36.



### 6.2.4 Condensate Control Function

Condensate control is a standard feature of the M-type H<sub>2</sub>SCREW. This function works so that the condensate can be minimally produced when the air compressor repeats an automatic stop/restart. Because the condensate is nevertheless produced and collected in the oil case when the air compressor is in an automatic stop, the condensate control function also works so that the condensate can be evaporated and carried over together with the compressed air.

- (1) The condensate control function is activated not when you press the **START** button but when the H<sub>2</sub>SCREW (in an automatic stop) restarts automatically.
- (2) The memory stores a condensation temperature that depends on the discharge pressure (e.g. 70°C for 0.69 MPa). Based on the operating pressure and temperature detected by the sensors, the CPU checks whether the operating temperature is lower or higher than the stored condensation temperature. If lower, always the U-type capacity control is selected to increase the operating temperature and thus minimize the condensate production. If higher, always the I-type capacity control is selected. Afterwards, the P-type capacity control may be selected and, when the conditions are satisfied, the motor may be automatically stopped.



Even when the automatic-stop conditions are satisfied, the condensate control function (i.e. some ambient and operating factors) may cause the motor to continue operating. This is not abnormal.

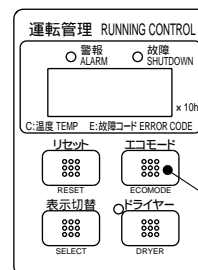
### 6.2.5 ECOMODE Function

ECOMODE function is a standard feature of the S- and M-type H<sub>2</sub>SCREW. It is disabled, however, by Hitachi before shipping the H<sub>2</sub>SCREW.

#### (1) How ECOMODE Function Works

If you want to enable the ECOMODE function under the I-type capacity control, press the **ECOMODE** button. Make sure that the **ECOMODE** light becomes on (non-flashing). When a load-unload cycle is below 30 seconds (a reference time) for shifting to the ECOMODE function, the standard cutoff pressure is used with the **ECOMODE** light non-flashing.

When a load-unload cycle is 30 seconds or over, the ECOMODE function begins to work and thereby the optional lower cutoff pressure is



○ エコモード  
ECOMODE

**ECOMODE Light**  
Off when disabled  
On (non-flashing) when enabled  
On (flashing) when worked

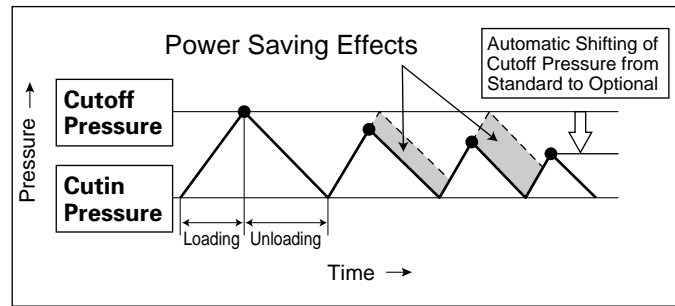
**ECOMODE Button**  
to enable or disable

## 6. SYSTEM OF EACH COMPONENT [Capacity Control System]

automatically used with the **ECOMODE** light flashing. The cutoff pressure shifts from standard to optional step-by-step until it reaches the cutin pressure + 0.05 MPa or a load-unload cycle decreases to below 30 seconds. Thus you can save the power as indicated by the shaded areas in the illustration.

### (2) Precautions

- When you use the ECOMODE function, install an air receiver tank that has a larger capacity than otherwise required. For more information, see page 36.
- Do not change the reference time of 30 seconds although it is accessible on the fourth of the capacity control setting screens.
- This function cannot work when (1) the **HISCREW** is operating under the P- or U-type capacity control and (2) you have changed the preset standard cutoff pressure.



Preset Cutoff/Cutin Differential: 0.1 MPa

Optional Cutoff Pressure: Cutin Pressure + 0.05 MPa

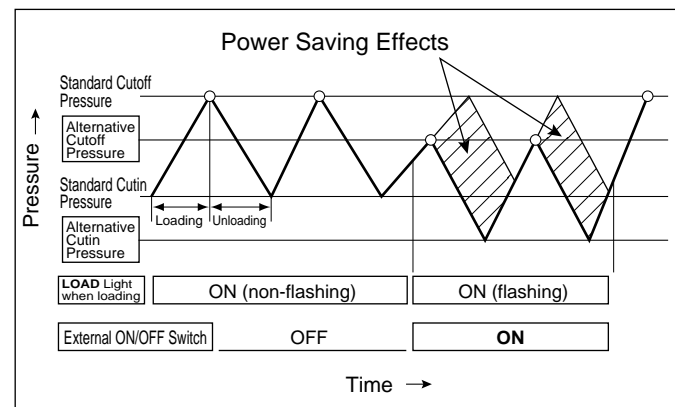
Cutoff pressure automatically shifts from standard to optional until a cycle time decreases to 30 seconds or below.

### 6.2.6 Alternative Cutoff/Cutin Pressure Function

Alternative cutoff/cutin pressure function is an optional feature of the S- and M-type **HISCREW** under the I-type capacity control. Alternative cutoff and cutin pressures are lower than the standard ones. You may use this function, when a compressed air demand is less (i.e. during overtime), and thus save the power as indicated by the shaded areas in the illustration.

If you want to use this function, contact your Hitachi distributor to modify the control circuit, install an external on/off switch, and set the cutoff and cutin pressures to as required.

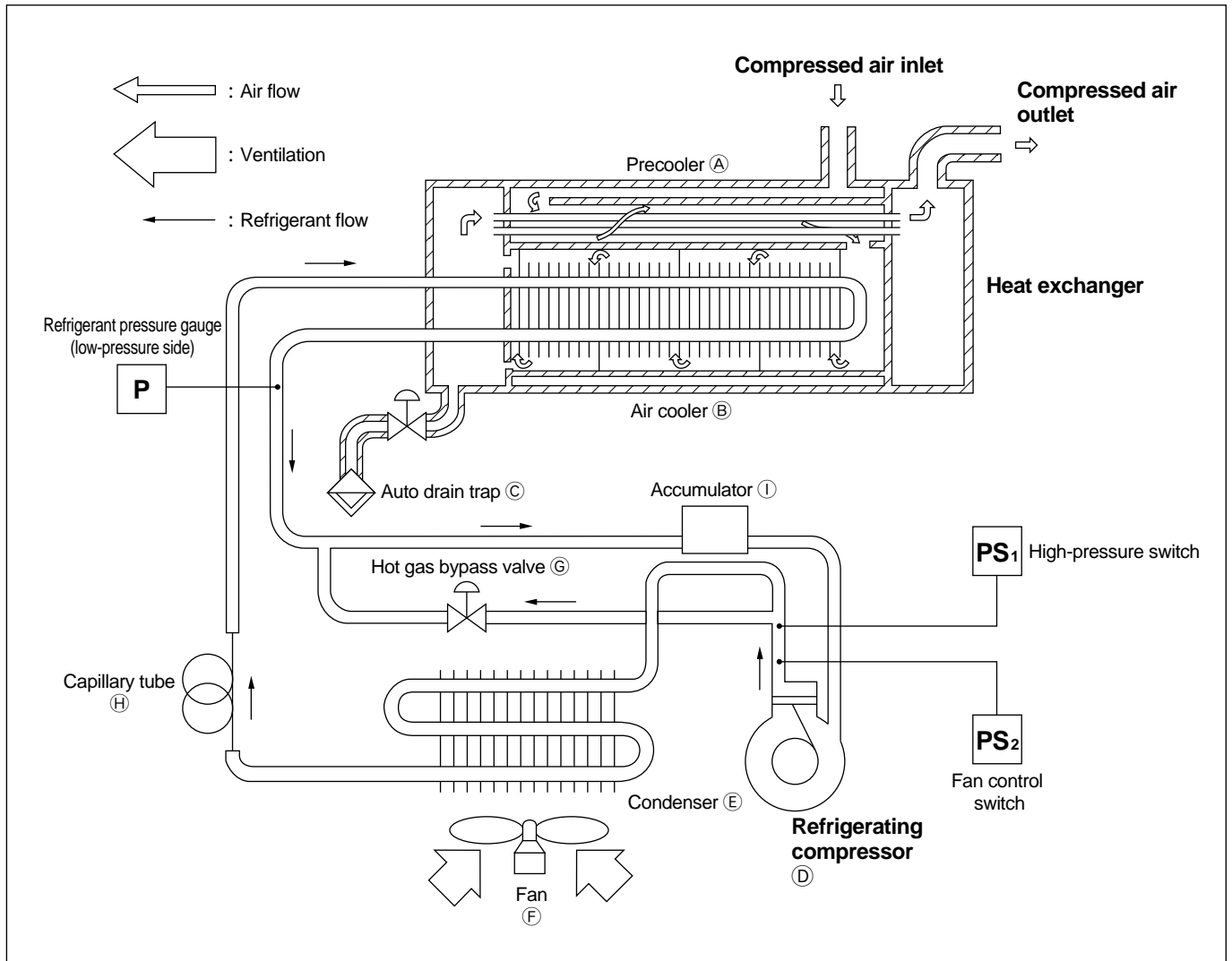
To activate this function, turn on the external on/off switch. Make sure that the **LOAD** light becomes on (flashing) and off when the **HISCREW** is respectively loading and unloading. (Note that this action of the **LOAD** light is different from when the standard cutoff and cutin pressures are used.) To deactivate this function (or to return to the standard cutoff and cutin pressures), turn off the external on/off switch.



#### IMPORTANT

- The ECOMODE function does not work when the alternative cutoff/cutin pressure function is activated.
- The alternative cutoff/cutin pressure function does not work when the compressed air demand causes the U-type (not the I-type) to be selected.

## 6.3 Dryer System Dryer



### 6.3.1 Compressed Air Flow

Compressed air precooled by the aftercooler is heat-exchanged with low-temperature compressed air by the **precooler (A)** of heat exchanger, and then with refrigerant by the **air cooler (B)**. At this time, the steam contained in the compressed air is condensed and automatically discharged as drain from the **auto drain trap (C)**. The cooled compressed air is returned to the **precooler (A)**, heat-exchanged with compressed air cooled by the aftercooler, and then discharged.

### 6.3.2 Refrigerant Flow

The high-temperature and high-pressure refrigerant gas discharged from the **refrigerating compressor (D)** gets into the **condenser (E)**. It is cooled by the **fan (F)** and turns into high-pressure liquid refrigerant.

The high-pressure refrigerant is squeezed by the **capillary tube (H)** and sent to the **air cooler (B)** as a low-pressure liquid refrigerant. The refrigerant is heat-exchanged with compressed air and evaporated. It is sucked as overheated steam into the **refrigerating compressor (D)**, recompressed and then discharged. This cycle is repeated.

The **hot gas bypass valve (G)** works automatically depending on a load and an ambient temperature, and controls the evaporation temperature of refrigerant to be kept constant in order to prevent condensed water from freezing by overcooling at a low temperature and at no load.

# 7. INSTRUCTIONS FOR INSTALLATION

## 7.1 Verification of Components

### Machine Nameplate Check

Output (kW)  
Model  
Frequency (Hz)

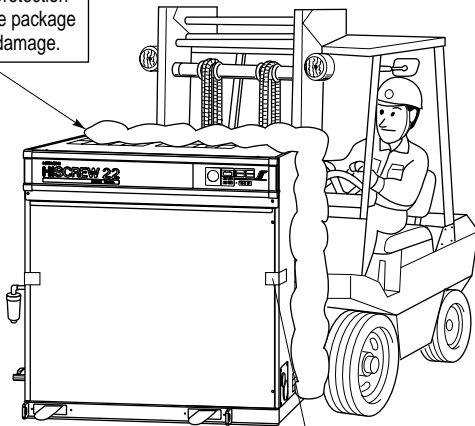
### Standard Accessory

Foundation Bracket, Foundation Bolts (M12, M16)	2 sets
Fork Slot Covers	4 pieces
M6 Bolts	8 pieces
Condensate Trap (only for the models with a built-in air dryer)	1 set

## 7.2 Instructions When Conveying

### ■ Fork Lift

Put covers or protection and prevent the package from possible damage.



Use adhesive tapes to prevent the front door from detached during conveyance.

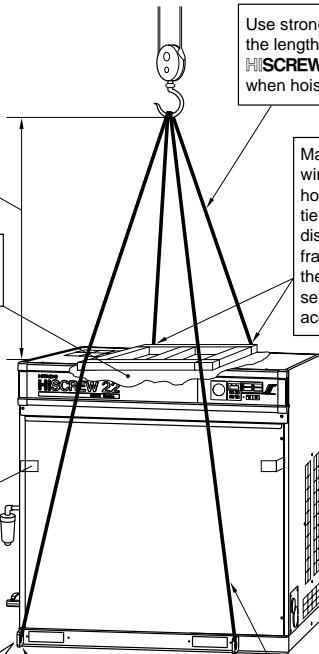
### ■ Crane

1.2 m or longer

Put a protection to prevent the enclosure from damaged.

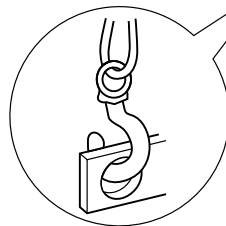
Use strong wires. Adjust the length to keep the HILSCREW's balance when hoisting it.

Make sure that the wires are firmly hooked in the wooden tie frame. If the wire is dislocated from the frame while conveying the HILSCREW, a serious personal accident may happen.



Hook the wire rope onto the eye projection of the common base.

Motor Output	Wire Diameter
22 kW	More than 8 mm
37 kW	More than 12.5 mm



Model	Total Weight (kg)
OSP-22S/M5AI	540
OSP-22S/M6AI	
OSP-22S/M5ARI	590
OSP-22S/M6ARI	
OSP-37S/M5AI	760
OSP-37S/M6AI	
OSP-37S/M5ARI	830
OSP-37S/M6ARI	

### Hoisting Jigs

For the 22 kW models: One wooden tie frame and two wooden tie bars are located in a packing crate.

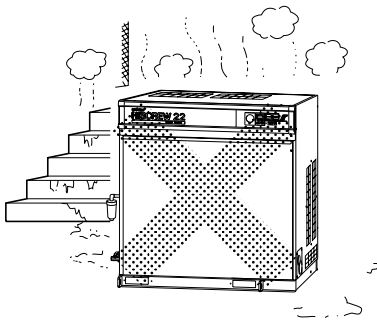
For the 37 kW models: One wooden tie frame and two steel tie channels are located in a packing crate.

### 7.3 Instructions When Installing

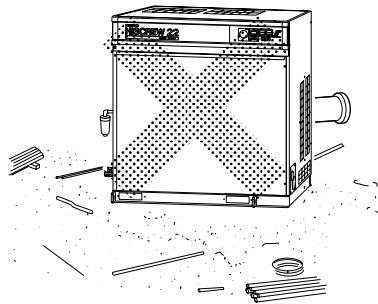
#### ⚠ WARNING

1. Never put anything inflammable (inflammable solvent etc.) near the Compressor, or such material may be compressed by the unit and brought explosion.
2. Never allow the operation which uses fire near the compressor. Sparks may get in the unit and damage inside.

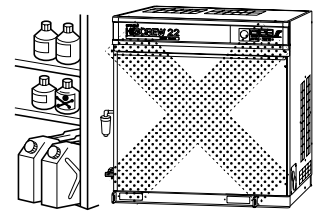
Never use the HiSCREW in the environments as illustrated below.



Temperature over 40°C  
Humidity over 90%



Place where powder of metal, cement and other dust or bits of down is found affluently or other dusty place



Place where inflammable, combustible or explosive gas or particles exists and hazardous.

#### ⚠ CAUTION

- Use the compressor in a room. Moisture or powder dust will damage the compressor when it is installed outside.
- Install the compressor in a room equipped with both intake air port and discharge air port and where enough ventilation is available. Otherwise, discharged heat from the compressor makes room temperature rise and will cause shutdown to the compressor.

##### Fan

If the location is not roomy enough, provide a ventilation fan to maintain the ambient temperature around the unit at 40°C. or below.



##### Piping Space (Left hand side space)

Secure adequate space for discharge air plumbing and maintenance servicing (0.5m or more)  
Keep a space of 0.5 m or more before setting up a pipe around the unit.

##### Maintenance Space (Back space)

Keep a space of 0.5m or more.

##### Foundation

If the vibration of the location exceeds 5µm, provide the vibration absorbable mat under the unit. Such vibration may reach the compressor and damage its bearings.

##### Intake Air and Maintenance Space (Right hand side space)

Keep a space of 0.5 m or more before setting up a power lines around the unit.

##### Maintenance Space (Front space)

Keep a space of 0.6 m or more.

Cover folk slots with noise-proof plates attached to the unit.

#### IMPORTANT

Install the unit on a level floor.  
(Horizontality should be kept less than 1 mm/1 m.)  
If there is a space between the common base and the floor, or a reflecting noise from wall or ceiling, noise will become louder.

## 7.4 Instructions When Piping

### 7.4.1. Air Receiver

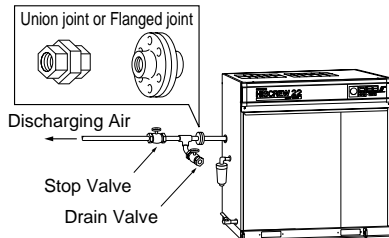
When your plant airline has the volume of more than 40 liters, you can operate the HII SCREW without an air receiver tank. In order to prevent the plant airline pressure from fluctuating or to effectively control the HII SCREW capacity for saving the power, however, install an external air receiver tank of the minimum capacity such as:

ECOMODE Function	22 kW Models	37 kW Models
Not used	0.43 m <sup>3</sup>	0.7 m <sup>3</sup>
Used	0.7 m <sup>3</sup>	1.24 m <sup>3</sup>

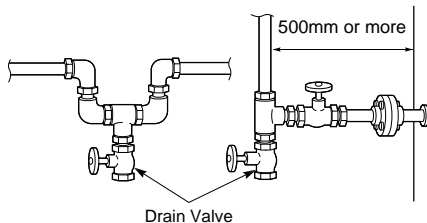
- (1) Do not install a check valve between the air receiver tank and the HII SCREW.
- (2) When you want to use the ECOMODE function, install an air receiver tank that has a larger capacity than otherwise required. When you install an external air dryer and filters under the ECOMODE function, place them after the air receiver tank so that the ECOMODE function can effectively save the power.

### 7.4.2. Discharging Air pipe

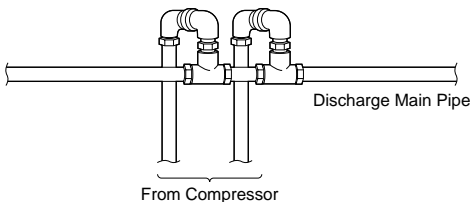
- (1) Discharging pipes must be joined with an Union or a Flanged joint, and a Stop Valve must be fixed to them for maintenance and inspection.



- (2) If there is concaved or upright piping in the run, install a drain valve at the bottom of the run to prevent the accumulation of the drain. In case of upright piping, keep a space of more than 500 mm from the unit so that its left side cover is accessible for detachment.

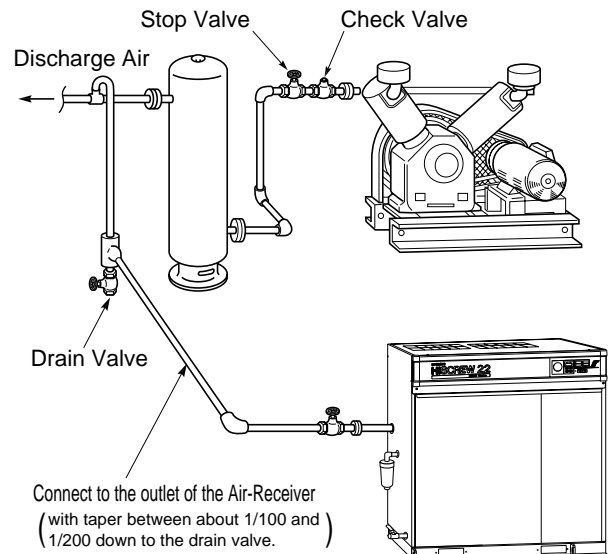


- (3) In case of connecting the discharge pipe to a main pipe, joint the discharge pipe from over to the main pipe to prevent the condensate from back-flowing.



### 7.4.3 Parallel operation

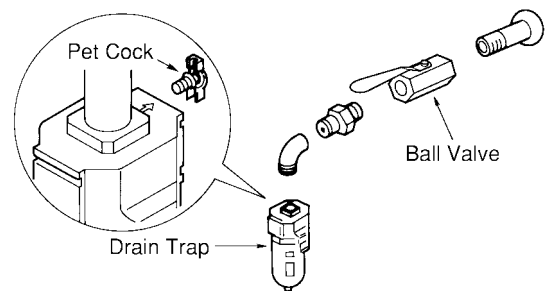
- (1) At one-unit is in operation, completely close the stop valve to the discharge pipe on the compressor which is not operating.
- (2) In case the unit is installed in parallel with a reciprocating compressor, be sure to install an air receiver in-between to prevent the propagating vibration from reciprocating compressor. Connect piping to the air receiver's outlet side as shown in the figure.



## Dryer

### 7.4.4. Drain Trap Piping for Dryer

Install a drain trap for dryer as shown in the figure below after fastening a pet cock to the trap.



- Length of the pipe between the drain trap and drain discharge port should be shorter than 3 m, and release the discharge air into the open air.
- Keep the pet cock of the drain trap always slightly open.

### ⚠ CAUTION

Be sure to follow the piping work described above. Otherwise, the condensate failed to be released may mix in the discharge air.

## 7.5. Compressor Room Ventilation

- (1) The air-cooled type compressor will release internal heat discharged as hot exhaust wind. Be careful for ventilation of the room. The table at the right shows discharged heat from the compressor. By calculating assumed ventilation capacity with the room, when the ambient temperature seems to exceed 40°C., the forced ventilation should be equipped to the room.
- (2) Air intake hole must have an opening of larger than 1 square meter per each compressor to the place as low as possible in the room. Air intake port must face to the place where fine dust or other harmful material in the ambient air are not taken into the unit.
- (3) Total ventilation

As the **figure A**, ventilation fan capacity in case of ventilating the room in whole where the compressor is installed, greater capacity than the recommended **ventilation fan capacity ①** on the right table is required. (However, it is under the condition that the allowable temperature rise in the house is 5°C.) Place the ventilation fan on top of the room.

(4) Discharge air duct

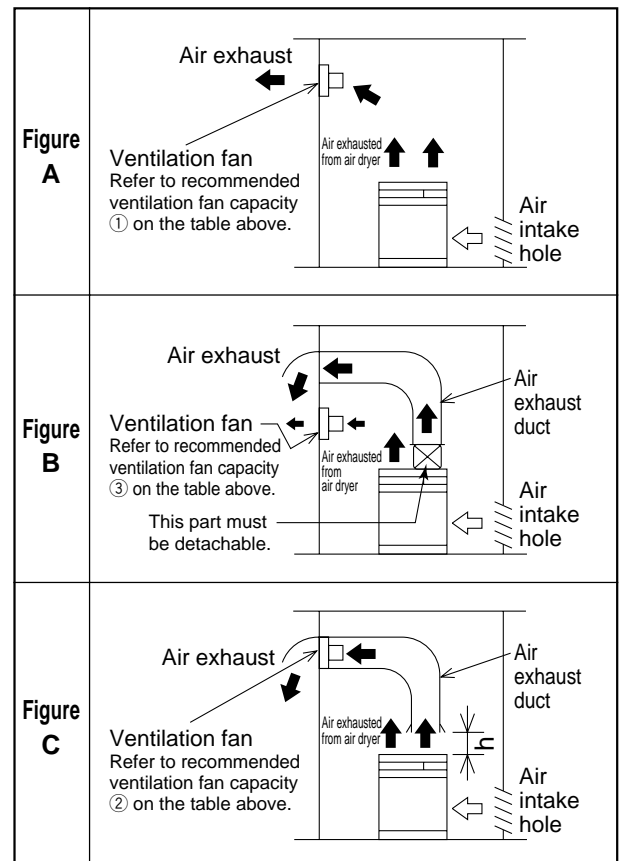
- Based on the air exhaust capacity of the compressor shown in the right table, calculate the resistance of the air exhaust duct. If it is kept within 20 Pa, no need for an extra ventilation fan. In such case, connect the duct directly to the exhaust air port of the compressor as shown in the **figure B**. The discharge air duct should be detachable structure, so that it will not hinder maintenance accessibility. On the other hand, to ventilate the exhaust air from the dryer, install a fan with larger ventilation fan capacity than the recommended one ③ to the house.
- In case where pressure loss of the duct is greater than 20 Pa, on consideration of such pressure loss, a ventilation fan with the capacity larger than the recommended quantity ② on the right table should be installed inside the duct. According to the discharged air temperature rise in the right table, choose an appropriate ventilation fan. In this case, do not connect the duct directly to the exhaust air port of the compressor, but install a hood at the entrance of the duct, and keep distance h (h must be larger than the duct diameter) between the duct and the port. (**Figure C**)
- Do not release the exhaust air from the dryer through the duct equipped with a ventilation fan. Forced ventilation may cause internal freezing to dryer's air cooler.

Ventilation data

Item	Model	OSP-22SA(R)I	OSP-37SA(R)I
		OSP-22MA(R)I	OSP-37MA(R)I
Heat generation	MJ/h	83.7( 97.1 )	142.3( 163.7 )
Air exhaust capacity of compressor	m <sup>3</sup> /min	55	75
Discharged air temperature	°C	Ambient temp.+25	Ambient temp.+35
Outside allowable pressure loss	Pa	20	20
Recommended ventilation fan capacity ①	m <sup>3</sup> /min	222( 260 )	378( 440 )
Recommended ventilation fan capacity ②	m <sup>3</sup> /min	70( 108 )	92( 154 )
Recommended ventilation fan capacity ③	m <sup>3</sup> /min	( 38 )	( 62 )

NOTES:

- (1) The values in the parentheses are for the models with a built-in air dryer.
- (2) The values of the ③ are for the models with a built-in air dryer where the duct's end contacts directly onto the **HiSCREW** (Figure B).



## 7.6 Instructions on Electrical Wiring

### **WARNING**

1. Personnel who carry out the wiring work must have a license. Ask personnel who have license. Wiring work by personnel without license may cause troubles like electric shock accident.
2. Do not take the protective relay off the compressor or make any modification which might hinder its relay function on the electrical circuit. Such modification will remove its protective functions and may cause to serious accident like burning the compressor. Ask your dealer if you must have a modification to the unit.
3. Be sure to turn the POWER OFF to get rid of electric shock accident, when the cover of starter should be removed for wiring work or inspection. Attach a plate on the POWER side saying "Maintenance Work. Do Not Electrifying" to prevent other workers from re-inputting the POWER.

### 7.6.1 Power Source Transformer and Power Cable

Prepare a power source transformer with adequate capacity. Also, use a power cable with adequate length and size. Otherwise, a voltage drop will occur when attempting to start the **SCREW**, and as a result the motor will fail to start. A voltage drop will also occur during operation, which deenergizes the control circuit and shut the air compressor down. To control a drop of starting voltage within an allowable range (5% of the rated voltage), use the adequate power source transformer and power cable as follows:

Type		22kW	37kW
<b>Power Transformer Capacity (kVA)</b>	200V Spec.	50	75
	400V Spec.		
<b>Power Cable Thickness (mm<sup>2</sup>)</b>	200V Spec.	Over 38, Max.50	Over 60, Max.100
	400V Spec.	Over 14, Max.50	Over 38, Max.100

Voltage imbalance must be 1% or lower between any two phases.



These are values for the cables less than 10m in length. For over 10m, thicker cable is required. In such case, keep the thickness below its maximum value on the compressor side by using intermediate terminals.

### 7.6.2 Connecting earth leakage circuit breaker

Be sure to use a earth leakage circuit breaker for the Circuit Breaker. For motor protection, Hitachi's genuine earth leakage circuit breaker must be equipped to the main POWER line of the compressor. If earth leakage circuit breaker other than Hitachi brand is used, ask your dealer because its specific condition is different.

Type		22kW	37kW
<b>Earth leakage circuit breaker Type (Hitachi)</b>	200V Spec.	EXK225 200A or EX225K 175A	EX400B 225A or EX225K 225A
	400V Spec.	EX100B 100A or EX100BK 75A	EXK225 150A or EX225K 125A

Use an earth leakage circuit breaker with current sensitivity of 200 mA.

### **CAUTION**

- Be sure to equip a earth leakage circuit breaker to the Power. Wiring with only disconnecter like Knife Switch is not sufficient and may not protect the compressor and cause burning when short circuit occurs.
- Be sure that the compressor is appropriately grounded. If not, this can cause electric shock accident or shutdown to the compressor. Do not use Steel Skeleton as a ground for the compressor. This may cause malfunction. Ground the cable by itself into the earth.



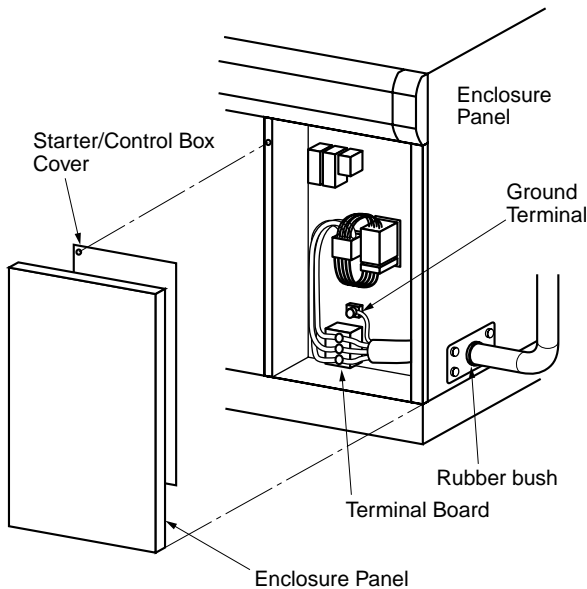
### 7.6.3 Connecting the POWER

Take the starter cover off and connect wires as the following figure.

Supply connect must not be obstructive to the disassembling work of the enclosure.

All wiring inside the compressor is completed.

(Refer to pages 40 through 43 for wiring diagram.)



#### **CAUTION**

**Use rubber bushes at the wiring holes to protect cables at wiring work inside the starter. If not protected, cables touch a steel plate at the wiring cable hole in the starter panel by a slight vibration during operation. This may damage the cable cover during long time use and result short circuit.**

### 7.6.4 Connecting a ground cable

Use Ground Terminal which is on the lower left side of the starter panel. Adopt Grounding Resistance according to the following table.

Power Source Voltage	Grounding Resistance Value
<b>200 V class</b>	Less than 100 (Type D Grounding)
<b>400 V class</b>	Less than 10 (Type C Grounding)

Use a ground cable of 22 mm<sup>2</sup> or more.

### 7.6.5 In case of Remote Operation

In case the compressor is controlled for its start and stop by the remote operation, it is required to connect signal lines from remote place to the terminal board inside the starter panel. See the figure “TB-2 terminal part” in the wiring diagram in pages 40 through 43.

To permanently enable a remote operation, access to the DIP switch **SW1** located on the PCB in the starter/control box, and place its No. 4 in ON position. For further information on a remote operation, see page 13.

One dry contact for each of operation and shutdown is prepared at the “a (normal open)” contact. Rated current is AC200V 3A.

#### **IMPORTANT**

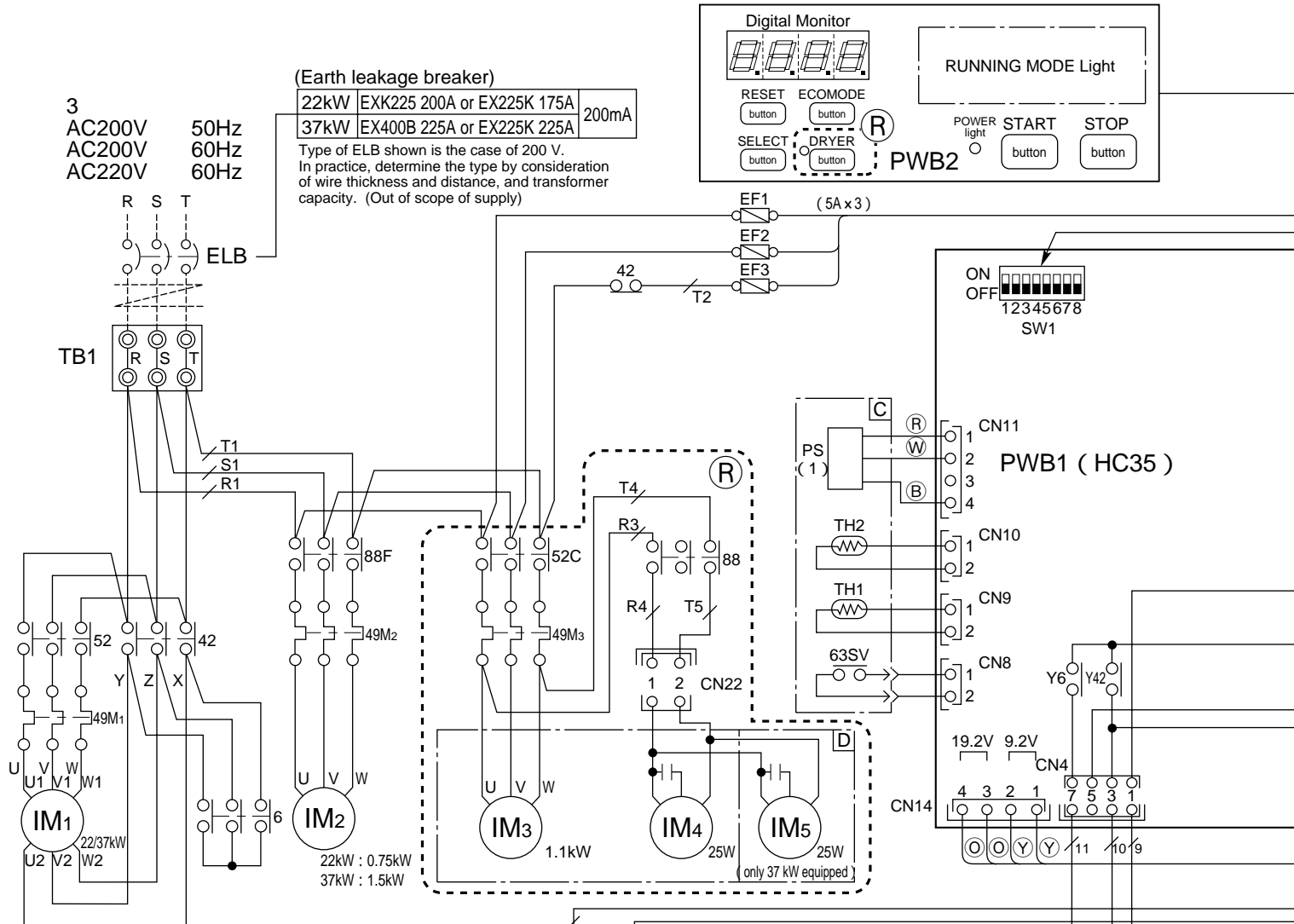
Only pulse signal of 0.5 second or more for Start/Stop Signal can actually control the compressor at remote operation.

If such signal from remote place is a level signal (Make Contact), following failures can happen:

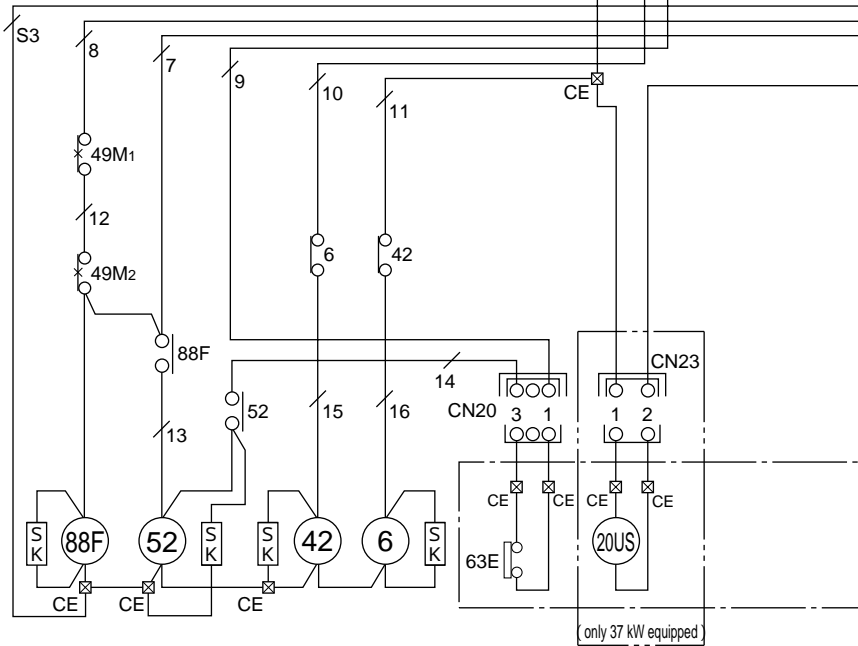
- (1) The unit automatically starts operation by setting the remote operation switch if start/stop is not canceled. (Operation by other than intentional action.)
- (2) When shutdown happens, the unit will start again by pressing the **RESET** button on the instrument panel if the operation signal by remote control is not canceled.
- (3) Even though manipulation for starting the unit is tried at the site, the unit can not start without Operation Signal at REMOTE given. (No independent operative manipulation cannot be achieved at the site.)
- (4) Despite the Stop operation at the site, the unit does not stop if REMOTE Operation and Stop Signal are not cancelled. (The unit stops while pressing the **STOP** button, and starts again when the button is released.)

# 7. INSTRUCTIONS FOR INSTALLATION [Instructions on Electrical Wiring]

## 7.6.7 Standard voltage wiring diagram (200/220 V)



Symbol	Part name	Symbol	Part name
IM1	Compressor motor	SW2	Dip switch for dryer / capacity control
IM2	Cooling fan motor	DSA	Arrestor
52	Main electromagnetic contactor	TR1	Transformer for PC boards
42	Electromagnetic contactor for $\Delta$	Tr	Transistor output
6	Electromagnetic contactor for $\Delta$	Y	Supplementary relay
88F	Electromagnetic contactor for fan	TB	Terminal board
49M	Thermal relay	EF	Fuse
PWB1	Control PC board	SK	Surge killer
PWB2	Display PC board	CE	Contactor
TH1	Thermistor (discharge temp. 1)	CN	Connector
TH2	Thermistor (discharge temp. 2)	IM3	Motor for air dryer refrigerator
20P	Blow-off solenoid valve	IM4,5	Motor for air dryer condenser
20US	Starting solenoid valve	52C,88	Electromagnetic contactor for dryer
PS(1)	Pressure sensor	PS1	High pressure switch
63E	Pressure switch	PS2	Fan control switch for dryer
63SV	Pressure differential sensor of air intake filter	OHR	Overheat protection thermostat for dryer
FM	Cooling fan motor (for starter)	49FC	Thermal protector for dryer
SW1	Dip switch for setting		



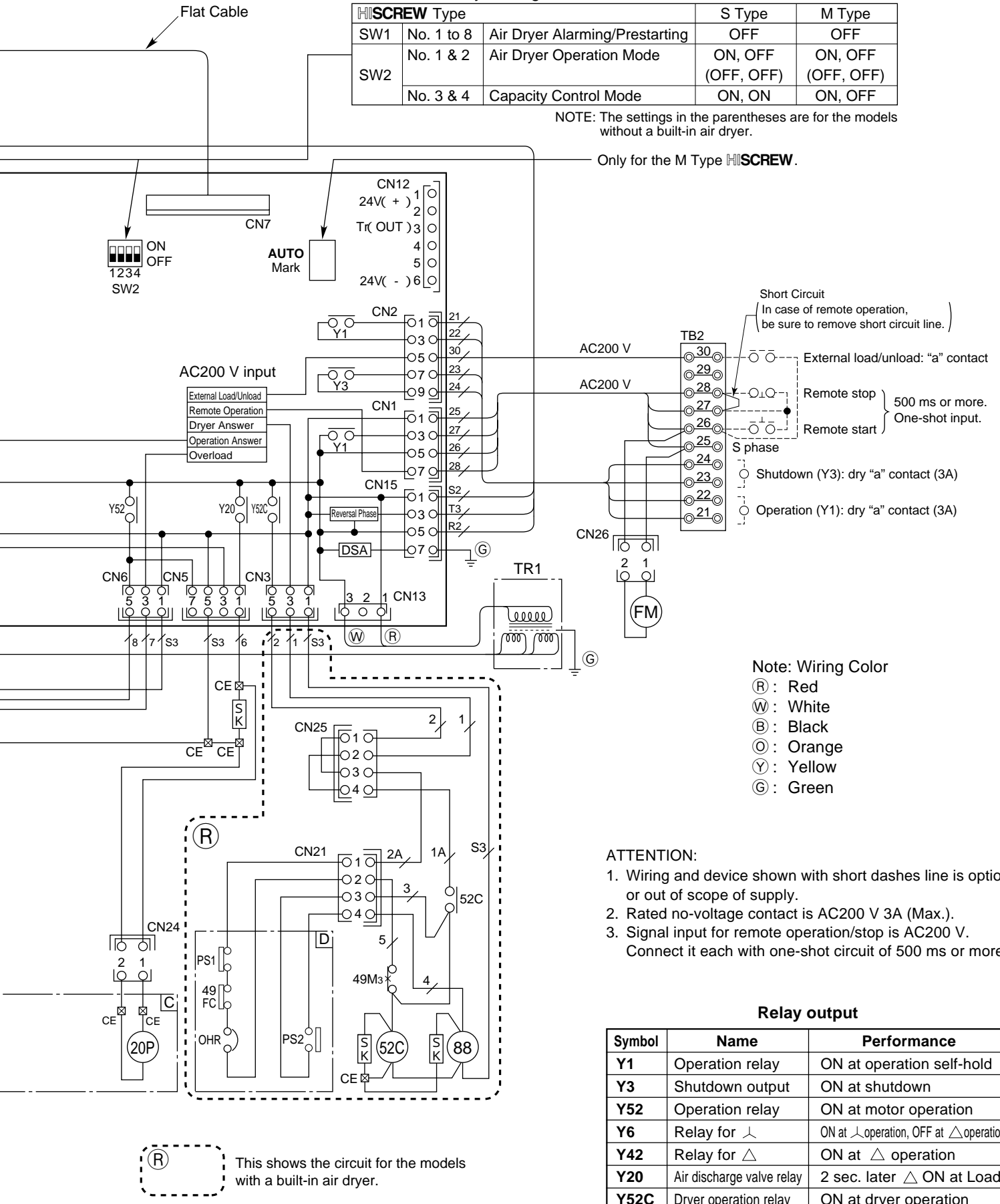
**C** This shows setting at compressor side.  
**D** This shows setting at dryer side.

# 7. INSTRUCTIONS FOR INSTALLATION [Instructions on Electrical Wiring]

## Standard Factory Settings

HISCREW Type		S Type	M Type
SW1	No. 1 to 8	Air Dryer Alarming/Prestarting	OFF
SW2	No. 1 & 2	Air Dryer Operation Mode	ON, OFF (OFF, OFF)
	No. 3 & 4	Capacity Control Mode	ON, ON

NOTE: The settings in the parentheses are for the models without a built-in air dryer.



Only for the M Type HISCREW.

Short Circuit  
(In case of remote operation,  
be sure to remove short circuit line.)

External load/unload: "a" contact  
Remote stop } 500 ms or more.  
Remote start } One-shot input.  
S phase  
Shutdown (Y3): dry "a" contact (3A)  
Operation (Y1): dry "a" contact (3A)

Note: Wiring Color  
(R) : Red  
(W) : White  
(B) : Black  
(O) : Orange  
(Y) : Yellow  
(G) : Green

### ATTENTION:

1. Wiring and device shown with short dashes line is option or out of scope of supply.
2. Rated no-voltage contact is AC200 V 3A (Max.).
3. Signal input for remote operation/stop is AC200 V. Connect it each with one-shot circuit of 500 ms or more.

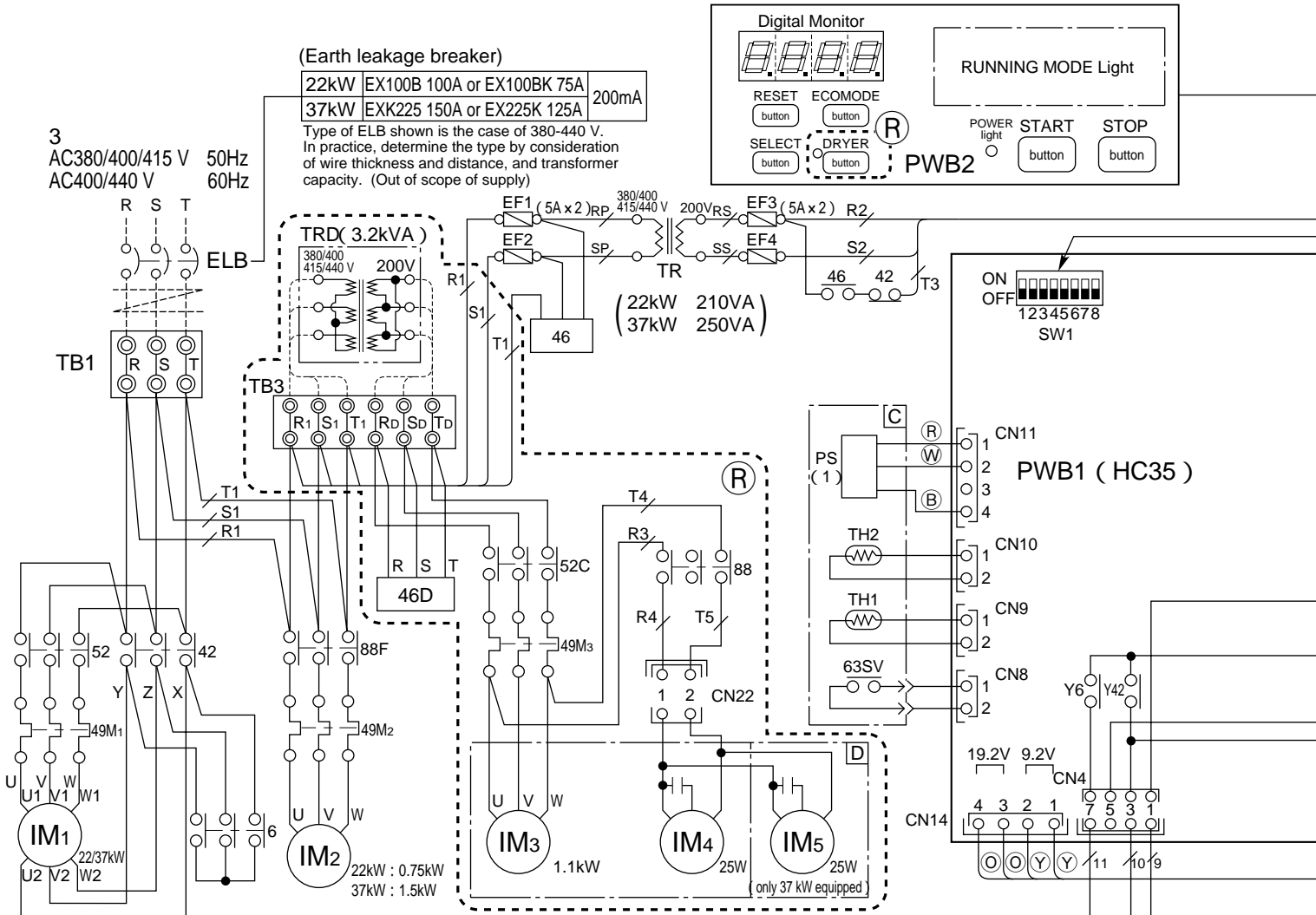
### Relay output

Symbol	Name	Performance
Y1	Operation relay	ON at operation self-hold
Y3	Shutdown output	ON at shutdown
Y52	Operation relay	ON at motor operation
Y6	Relay for $\Delta$	ON at $\Delta$ operation, OFF at $\triangle$ operation
Y42	Relay for $\triangle$	ON at $\triangle$ operation
Y20	Air discharge valve relay	2 sec. later $\triangle$ ON at Load
Y52C	Dryer operation relay	ON at dryer operation

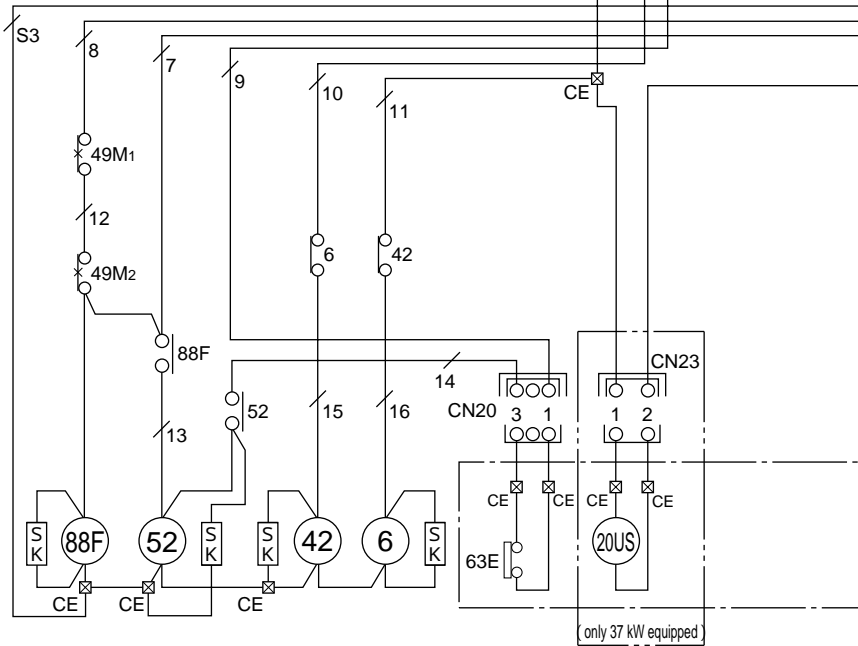
(R) This shows the circuit for the models with a built-in air dryer.

# 7. INSTRUCTIONS FOR INSTALLATION [Instructions on Electrical Wiring]

## 7.6.8 Differential voltage wiring diagram (380/400/415/440 V)



Symbol	Part name	Symbol	Part name
IM1	Compressor motor	DSA	Arrestor
IM2	Cooling fan motor	TR, TR1	Transformer
52	Main electromagnetic contactor	Tr	Transistor output
42	Electromagnetic contactor for $\Delta$	Y	Supplementary relay
6	Electromagnetic contactor for $\wedge$	TB	Terminal board
88F	Electromagnetic contactor for fan	EF	Fuse
49M	Thermal relay	SK	Surge killer
PWB1	Control PC board	CE	Contactor
PWB2	Display PC board	CN	Connector
TH1	Thermistor (discharge temp. 1)	46, 46D	Reversal phase relay
TH2	Thermistor (discharge temp. 2)	IM3	Motor for air dryer refrigerator
20P	Blow-off solenoid valve	IM4,5	Motor for air dryer condenser
20US	Starting solenoid valve	52C, 88	Electromagnetic contactor for dryer
PS(1)	Pressure sensor	PS1	High pressure switch
63E	Pressure switch	PS2	Fan control switch for dryer
63SV	Pressure differential sensor of air intake filter	OHR	Overheat protection thermostat for dryer
FM	Cooling fan motor (for starter)	49FC	Thermal protector for dryer
SW1	Dip switch for setting	TRD	Stepdown transformer for air dryer
SW2	Dip switch for dryer / capacity control		



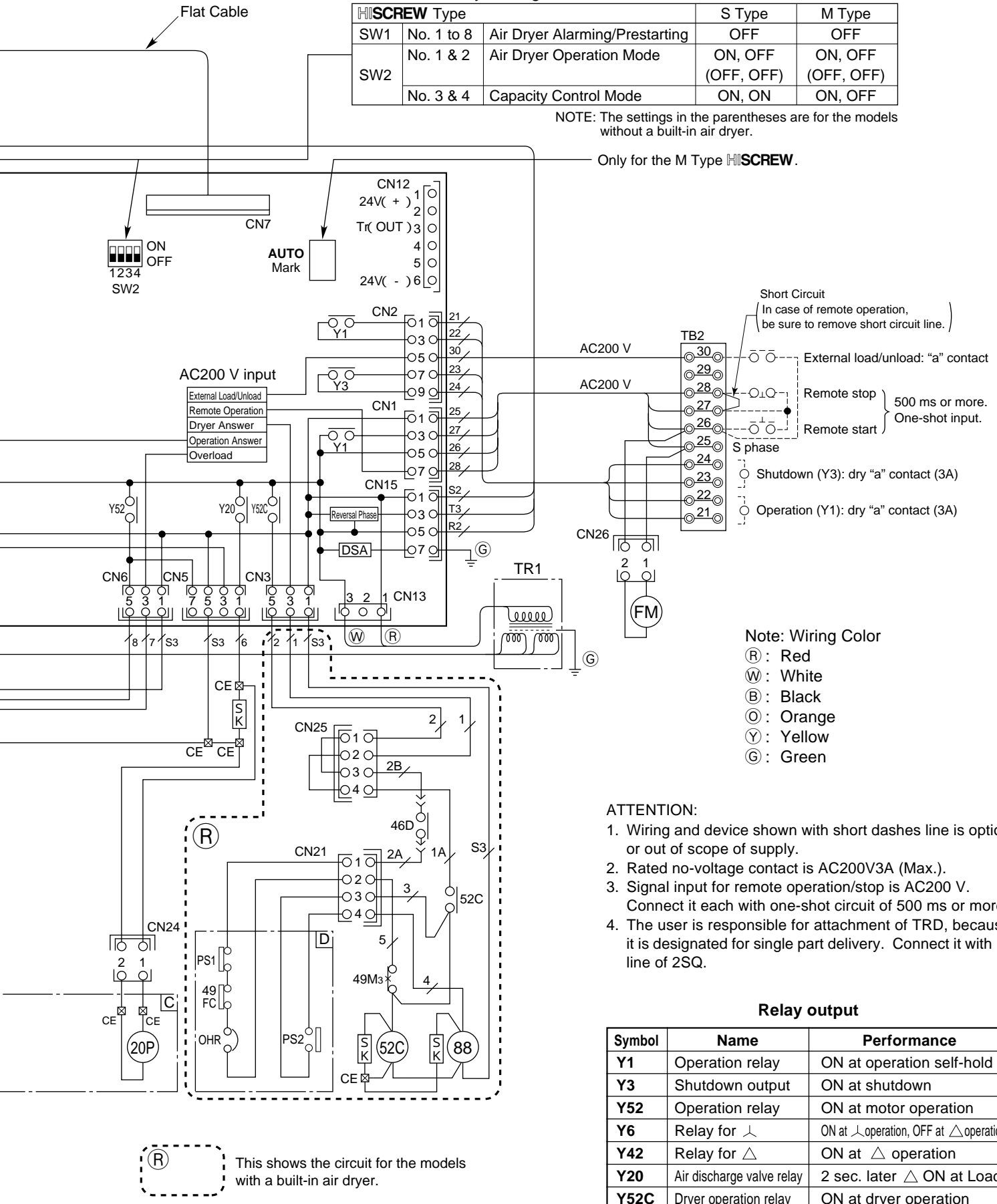
C This shows setting at compressor side.  
D This shows setting at dryer side.

# 7. INSTRUCTIONS FOR INSTALLATION [Instructions on Electrical Wiring]

## Standard Factory Settings

HISREW Type		S Type	M Type
SW1	No. 1 to 8	Air Dryer Alarming/Prestarting	OFF
SW2	No. 1 & 2	Air Dryer Operation Mode	ON, OFF (OFF, OFF)
	No. 3 & 4	Capacity Control Mode	ON, ON

NOTE: The settings in the parentheses are for the models without a built-in air dryer.



Only for the M Type HISREW.

Short Circuit  
(In case of remote operation,  
be sure to remove short circuit line.)

External load/unload: "a" contact  
Remote stop } 500 ms or more.  
Remote start } One-shot input.

### Note: Wiring Color

- (R) : Red
- (W) : White
- (B) : Black
- (O) : Orange
- (Y) : Yellow
- (G) : Green

### ATTENTION:

1. Wiring and device shown with short dashes line is option or out of scope of supply.
2. Rated no-voltage contact is AC200V3A (Max.).
3. Signal input for remote operation/stop is AC200 V. Connect it each with one-shot circuit of 500 ms or more.
4. The user is responsible for attachment of TRD, because it is designated for single part delivery. Connect it with IV line of 2SQ.

### Relay output

Symbol	Name	Performance
Y1	Operation relay	ON at operation self-hold
Y3	Shutdown output	ON at shutdown
Y52	Operation relay	ON at motor operation
Y6	Relay for $\Delta$	ON at $\Delta$ operation, OFF at $\Delta$ operation
Y42	Relay for $\Delta$	ON at $\Delta$ operation
Y20	Air discharge valve relay	2 sec. later $\Delta$ ON at Load
Y52C	Dryer operation relay	ON at dryer operation

(R) This shows the circuit for the models with a built-in air dryer.

# 8. PERIODIC MAINTENANCE

## CAUTION

- Before Maintenance work, read “To Use in Safety” (☞ p. 2) again carefully.
- Be sure to turn the POWER OFF when check or maintenance is carried out. If not, such work may cause serious accident like electric shock.
- When part of the unit needs to be disassembled or removed, be sure to release its internal pressure to the level of ambient air pressure. Residual high pressure inside the unit will blow out of it when a bolt, pipe or other part is removed, and may cause unexpected accident.

### IMPORTANT

- (1) mark on the maintenance standard chart at pages 45 through 46 means an item which the user can carry out.
- (2) mark means that you ask your dealer or Hitachi's Service Station to do.
- (3) Except for the case as specifically stated otherwise, maintenance time means consecutive maintenance schedule, e.g., once every year stands for another maintenance for the next year, and after next year, and so forth.
- (4) Operation Record Logbook is quite important for periodic maintenance as well as for finding out of cause for repair promptly in case of Shut-Down. It is recommended to record the Logbook which is attached to the end of this manual.

## 8.1 Periodic Maintenance for Compressor

Typical maintenance standards is given at pages 45 through 46.

- (1) The standards illustrates typical maintenance standards. It may require shorter period for the next maintenance depending on the condition such as ambient environment and use condition of the unit.
- (2) This maintenance standards does not mean warranty period of the unit.
- (3) Replace the part if it shows fault during inspection.
- (4) Carry out a periodic inspection once every year to prevent the unit from possible accident.
- (5) Use genuine parts for replacement.

Standard maintenance interval has five variations, namely monthly, yearly, at every 2 years, every 4 years, and every 8 years. Each of these intervals also has two different types of application depending on the run hour of the unit, which are for 3,000h and for 6,000h. Choose your suitable maintenance interval according to the run hour of your unit.

Yearly Run Hour	Maintenance Standards Table
Less than 6,000 hours	Maintenance Standards (A)
Less than 3,000 hours	Maintenance Standards (B)

### IMPORTANT

- (1) If Yearly Run Hour exceeds 6,000, carry out maintenance based on the following Run Hour:
  - Monthly: Every 500 hours.
  - Semiyearly: Every 3,000 hours.
  - Yearly: Every 6,000 hours.
  - Biyearly: 12,000 hours.
- (2) Under the condition that Run Hour is less than 3,000 and the unit had not been used for long time and its operation under low load, follow the standards of maintenance (A) of Run Hour 6,000.

## 8.2 Maintenance Standards (A) . . . In case of annual run hour less than 6,000 hours

The maintenance items marked with **①** must be carried out by users or, optionally, may be ordered to the dealer.

The maintenance items marked with **②** must be ordered to the dealer.

Maintenance part and item	Check	Inspection time						Note	Reference page No.
		Daily	1 Month	1 Year	2 Years	4 Years	8 Years		
Oil level gauge	Oil level check							Oil level must be within red lines during operation.	18
Discharge temp.	Discharge temp. check							Must be between 65°C and 100°C.	8
Refrigerant pressure	Pressure check							Must be between 0.41 and 0.73 MPa.	16
Relief valve	Performance check							Check by hand	48
Dryer auto-drain trap	Inspection/cleaning							Check condensate drainage, clean it if required.	47
Lubricant (genuine synthetic oil)	Replenish/Analysis	( )						Replenish every 1,500 to 2,000 hours Sampling analysis every 3,000 hours	18
Mechanical seal	Oil leak check								
Air intake filter element	Replacement							Clean if the error code of an element clogging appears on the digital monitor. Replace whenever the number of times of cleaning has reached 6 times even within one year interval.	50
Oil filter element	Replacement								49
Belt, Pulley	Inspection							Visual check of wear, check abnormal noise.	55
Oil separator element	Replacement							Replace the housing and square ring as well.	53
Solenoid valve	Performance check								48
Cooling fan	Crack check/cleaning								
Motor	Insulation check							1M ohm or more at DC500 V Mega	
Electric panel, instruments, sensors	Inspection/cleaning							Terminal refastening, electric line cover check and cleaning	
Pipe joints	Looseness check								
Oil cooler, Aftercooler	Cleaning								
Dryer condenser	Cleaning								
Dryer fan motor	Inspection								
Lubricant (genuine synthetic oil)	Replacement								19
Oil level gauge	Cleaning							During cleaning, also replace a seal washer.	
Consumable Parts	Suction throttle valve	Replacement *						Replace the cap seal, valve plate, and O-ring. Clean.	
	Modulator valve	Replacement						Replace the diaphragm, and rubber sheet. Clean.	
Piston of minimum pressure valve and check valve	Replacement *								52
Oil temperature control valve	Inspection/cleaning							Change O-ring.	
Oil replenish port O-ring	Replacement								
Belt, Pulley	Inspection							Tension check, wear check.	55
Oil case	Inner inspection								
Belt	Replacement							Replace the pulley as required.	
Mechanical seal	Replacement								
Check valve (1/4 inch)	Replacement							Locate it on the oil-scavenging pipe from the shaft seal.	
Oil level gauge	Replacement								
Oil temperature control valve	Replacement								
Motor bearing	Replacement							Change may be postponed according to the state of the bearing.	
Thermistor	Inspection								
Dryer auto-drain trap	Replacement								
Compressor bearing	Replacement								
CPU printed circuit board	Check/Clean/Replace							If it is dirty or shows a change in color, replace it. If not so, clean it and continue to use it.	

\* Replace these parts every 2 calendar years or when the **HILLSCREW** has loaded/unloaded total 1,000,000 times, whichever comes earlier. For the total load/unload times, watch the digital monitor.



Relation between inspection time and run hours is based upon standards of 500h/month, 6,000h/year, 24,000h/4 years and 48,000h/8 years. If run hour exceeds the standards, carry out inspection when it reaches to the standard index time, even before the inspection time.

### 8.3 Maintenance Standards (B) - - - In case of annual run hour less than 3,000 hours

The maintenance items marked with must be carried out by users or, optionally, may be ordered to the dealer.

The maintenance items marked with must be ordered to the dealer.

Maintenance part and item	Check	Inspection time						Note	Reference page No.
		Daily	1 Month	1 Year	2 Years	4 Years	8 Years		
Oil level gauge	Oil level check							Oil level must be within red lines during operation.	18
Discharge temp.	Discharge temp. check							Must be between 65°C and 100°C.	8
Refrigerant pressure	Pressure check							Must be between 0.41 and 0.73 MPa.	16
Relief valve	Performance check							Check by hand	48
Dryer auto-drain trap	Inspection/cleaning							Check condensate drainage, clean it if required.	47
Lubricant (genuine synthetic oil)	Replenish/Analysis	( )						Replenish every 1,500 to 2,000 hours Sampling analysis every 3,000 hours	18
Mechanical seal	Oil leak check								
Belt, Pulley	Inspection							Visual check of wear, check abnormal noise.	55
Air intake filter element	Replacement							Clean if the error code of an element clogging appears on the digital monitor. Replace whenever the number of times of cleaning has reached 6 times even within one year interval.	50
Oil filter element	Replacement								49
Lubricant (genuine synthetic oil)	Replacement								19
Oil level gauge	Cleaning							During cleaning, also replace a seal washer.	
Oil separator element	Replacement							Replace the housing and square ring as well.	53
Solenoid valve	Performance check								48
Cooling fan	Crack check/cleaning								
Motor	Insulation check							1M ohm or more at DC500 V Mega	
Electric panel, instruments, sensors	Inspection/cleaning							Terminal refastening, electric line cover check and cleaning	
Pipe joints	Looseness check								
Oil cooler, Aftercooler	Cleaning								
Belt, Pulley	Inspection							Tension check, wear check.	55
Dryer condenser	Cleaning								
Dryer fan motor	Inspection								
Consumable Parts	Suction throttle valve	Replacement *						Replace the cap seal, valve plate, and O-ring. Clean.	
	Modulator valve	Replacement						Replace the diaphragm, and rubber sheet. Clean.	
Piston of minimum pressure valve and check valve		Replacement *							52
Oil replenish port O-ring	Replacement								
Mechanical seal	Replacement								
Check valve (1/4 inch)	Replacement							Locate it on the oil-scavenging pipe from the shaft seal.	
Oil level gauge	Replacement								
Oil temperature control valve	Replacement								
Belt	Replacement								
Motor bearing	Replacement							Change may be postponed according to the state of the bearing.	
Thermistor	Inspection								
Dryer auto-drain trap	Replacement								
Compressor bearing	Replacement								
CPU printed circuit board	Check/Clean/Replace							If it is dirty or shows a change in color, replace it. If not so, clean it and continue to use it.	

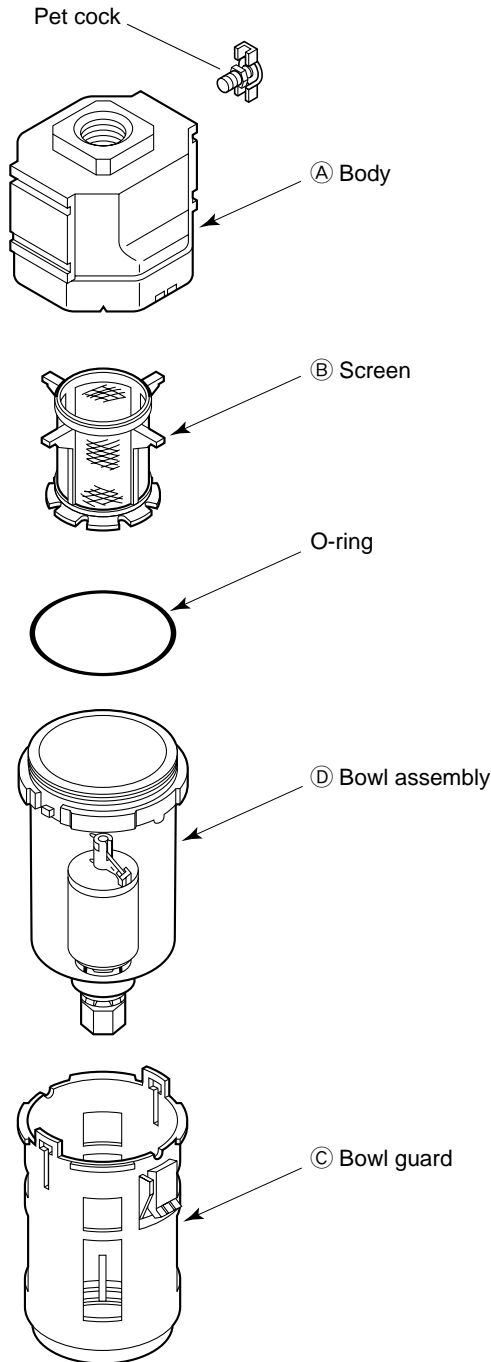
\* Replace these parts every 4 calendar years or when the HILSCREW has loaded/unloaded total 1,000,000 times, whichever comes earlier. For the total load/unload times, watch the digital monitor.



- (1) Relation between inspection time and run hours is based upon standards of 250h/month, 3,000h/year, 12,000h/4 years and 24,000h/8 years.
- (2) This standard will not be applicable in the case when run hours exceeds the above standards, no use of the unit for long time, continuous operation under low-load, or the unit is operated in the environment of high temp. and humidity, dusty environment, or with corrosive factors. Be sure to follow maintenance standards (A) (6,000h/year base) to carry out maintenance.



## 8.4 Auto Drain Trap for Dryer **Dryer**



Check the drain discharge of auto drain trap every day. Periodically clean the auto drain trap according to the maintenance standards. Handle the auto drain trap in the procedure given below.

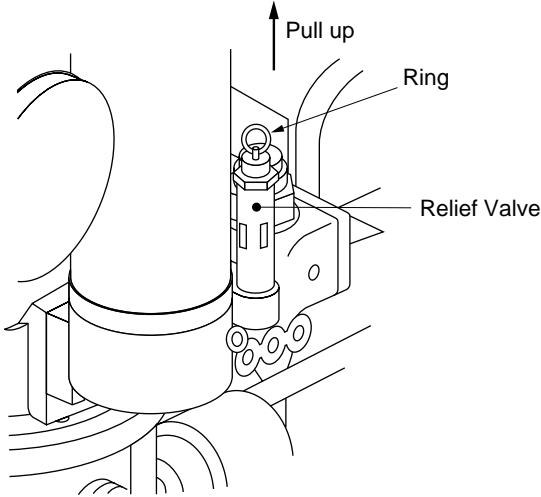
### ■ How to Disassemble/ Clean the Auto Drain Trap

- ① Close the drain stop valve.
- ② Turn the pet cock counter-clockwise and depressurize the bowl.
- ③ Hold the latch of **bowl guard** (C). Turn the latch at about 45 degrees and pull out downward. The **bowl assembly** (D) and **bowl guard** (C) can be removed from the **body** (A) together.
- ④ Remove the **screen** (B) from inside the **bowl assembly** (D), and wash (also wash the bowl at a proper time).
- ⑤ Fit the washed **screen** (B) on the **bowl assembly** (D) in the original position. Install the auto drain trap in the reverse order of disassembly.

#### **⚠ CAUTION**

- Use home-use neutral detergent whenever washing the bowl; otherwise, the bowl will be cracked.
- If a leak occurs or drain cannot be discharged after washing, replace the bowl assembly (D).

## 8.5 Performance Check of Relief Valve



Note) For 37 kW type, two relief valves are equipped

- ① Set Discharge Pressure to 0.69 MPa.
- ② Open the front door and pull up the ring of the relief valve by the hand.
- ③ If the compressed air comes out, release your hand from the ring.

### **⚠ WARNING**

Do not place your face near Relief Valve when to check its performance. Compressed air can come out and it is dangerous.

## 8.6 Performance Check of Capacity Control System

### 8.6.1 In case of P-type and I-type control (For S-type, no P-type control is available.)

- ① By closing the Stop Valve on the discharge side gradually until its pressure reaches to the specified pressure level, the Integral Unloader actuates and discharges the compressed air from the Oil Separator out into the ambient air.
- ② If the Integral Unloader actuates, make Stop Valve on the discharge side full-close immediately.
- ③ Check if inner pressure in the Separator is settled within 0.2 to 0.34MPa.

#### **IMPORTANT**

If its reservoir capacity on the discharge side is less than 40 liters, pressure in the Separator returns to the Load which the Separator had before its reaching to the stable pressure.

- ④ Fully open the Stop Valve on Discharge side and check if the Load returns to the former pressure level.

### 8.6.2 In case of U-type Control

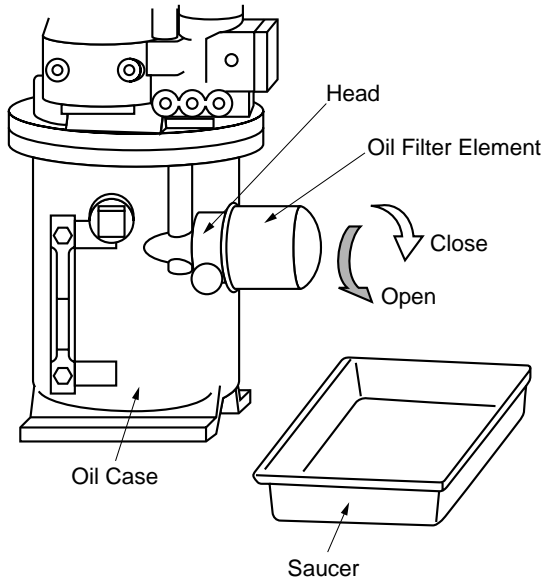
- ① Adjust the Stop Valve so that the discharge pressure reaches to its specified level.
- ② By closing the stop valve gradually, and check if the discharge pressure settles within the range specified in the table below.
- ③ In case where discharge pressure exceeds the range of the table below, or if the relief valve actuates, adjustment of the capacity control equipment is required. Ask your dealer or Hitachi Service Station.

Specified Discharge Pressure	MPa	0.69	0.83
Full-Close Discharge Pressure	MPa	0.76 to 0.80	0.87 to 0.90

NOTE (1)   means standard specifications.

(2) Do not select U-type control for 0.92 MPa discharge pressure model.

## 8.7 Replacement of Oil Filter Element



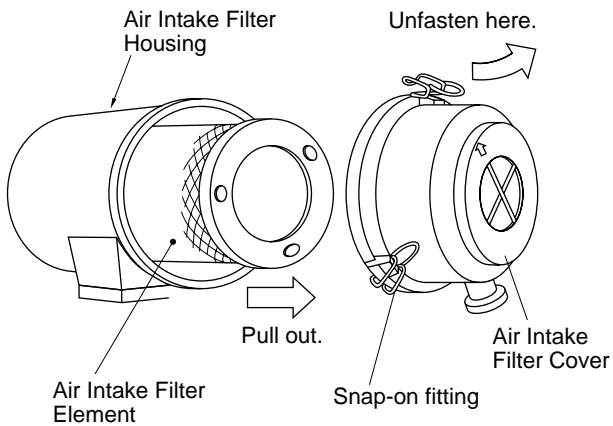
- ① Press the **STOP** button.
- ② Turn the **POWER OFF**.
- ③ Close the Stop Valve on the discharge side.
- ④ Wait for the inner pressure of the compressor depressurized to the level of ambient air.
- ⑤ Place a saucer to receive lubricant.
- ⑥ Check the oil level gauge for oil level. If it is higher than the oil filter element's center, remove the oil from the oil case as required.
- ⑦ Unfasten and remove the oil filter by a tool like filter wrench.
- ⑧ Take a gasket of new oil filter element, and spread lubricant on it, then screw it in the head as before.
- ⑨ Fasten the element by the hand without use of a tool like filter wrench.

### **⚠ CAUTION**

- If a tool like filter wrench or pipe wrench is used to fasten the oil filter element, element's housing part may be damaged or deformed, and will cause leak or breaking. Be sure to fasten it by the hand tightly.
- When the Oil Filter clogged, lubricant supply to the compressor lessens and discharged air temperature rises. This makes Discharge Temperature Relay to actuate and the compressor eventually stops. Also, lubricant feeding to the bearings becomes insufficient and this may cause shutdown of the unit.
- Be sure to change oil filter element periodically.

## 8.8 Cleaning and Replacement of Air Intake Filter Element

Clean or replace the air intake filter element, as soon as possible, if the error code of an element clogging appears on the digital monitor. Failure to do so will result in the reduction of the **HISCREW** capacity and, in the worst case, the damage of the air intake filter element.



- ① Press the **STOP** button.
- ② Turn the **POWER OFF**.
- ③ Wait for the pressure until it reaches to the level of its ambient air.
- ④ Open the front cover. Unfasten three snap-on fittings on the air intake filter cover, and pull the suction filter element out.
- ⑤ Lightly pat the filter element to remove larger dust, and then clean it with air-blow from inside.
- ⑥ If the filter is heavily contaminated, immerse it in the water solution of neutral house hold detergent for about 30 minutes, then rinse it well by clean water (with water pressure of 0.27 MPa or less), shake water off and dry it.

### IMPORTANT

Do not reuse the filter by the above cleaning more than 5 times. If its contamination is heavy, replace it with a new one.  
After cleaning of filter element, put a lamp inside the element and check if no damage happens to it before reuse.

- ⑦ Wipe dust or stains off of the air intake filter housing and inside the suction filter cover.
- ⑧ Push the filter element in its housing firmly as it was before.
- ⑨ Place the side with a mark "TOP" of the air intake filter cover to face its top, and assemble it back to the housing correctly so that three snap-on fittings are firmly hooked and fix the cover to the housing.

### ⚠ CAUTION

- Press the **STOP** button and disconnect the power before proceeding to replace the air intake filter.
- If atmospheric air contains car fumes and soots from incinerators and boilers, the air intake filter element will be clogged earlier than otherwise. If this is the case, check the atmosphere around the **HISCREW** installed, and take effective measures that will enable the **HISCREW** to suck the fume-less and soot-less air. For example, provide a suction duct or re-select a cleaner installation location.

## 8.9 Cleaning of Cooler

If dust sticks on the cooling air side of the cooler, it deteriorates its heat exchange and results lubricant and air insufficiently cooled.

Clean the cooler in such case.

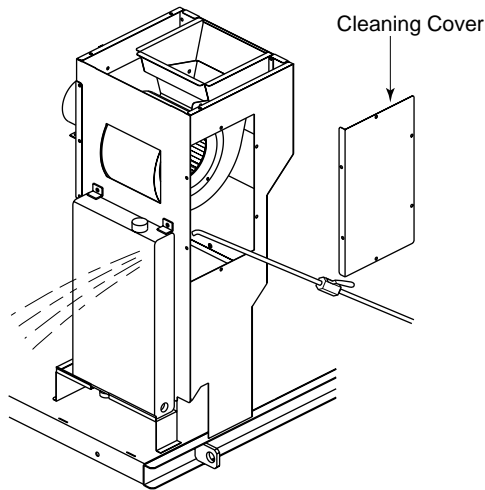


Figure A: Rear View of 22 kW Models

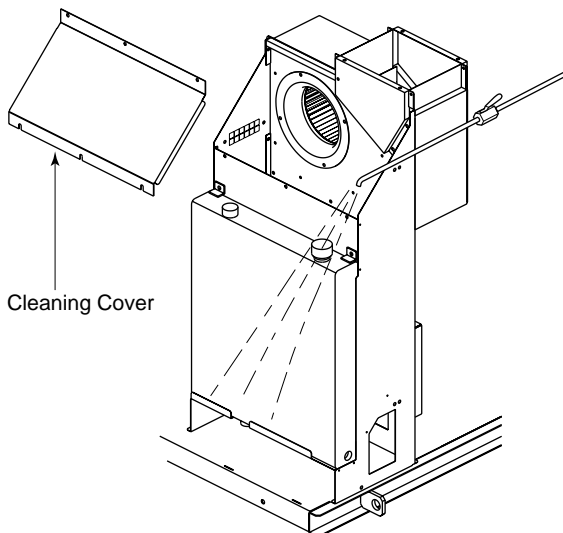
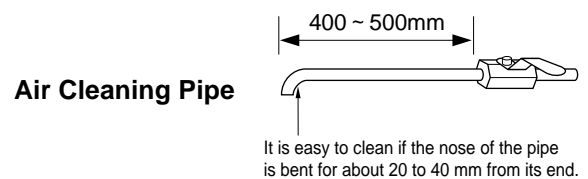


Figure B: Rear View of 37 kW Models

- ① Press the **STOP** button.
- ② Turn the **POWER OFF**.
- ③ Remove the right enclosure panel.
- ④ For the 22 kW models (**Figure A**):  
Remove the rear enclosure panel. Remove the cleaning cover on the rear of the cooler duct.  
For the 37 kW models (**Figure B**):  
Remove the cleaning cover on the front of the cooler duct.
- ⑤ Prepare an air blow nozzle with bent end.  
Blow the compressed air to the cooler fins to blow adhered dust or waste off of them.
- ⑥ Reassemble the covers to its original place.



### IMPORTANT

If the unit is heavily contaminated, more heavy duty cleaning such as steam cleaning seems to be required. Ask your dealer or Hitachi Service Station for information.

## 8.10 Inspection and Replacement of Minimum Pressure / Check Valve

### 8.10.1 Adjustment of Minimum Pressure Valve

Adjustment pressure is preset to 0.44 MPa at the delivery from the factory.

If some deviation occurs to the control pressure, readjustment can be done by the following procedures.

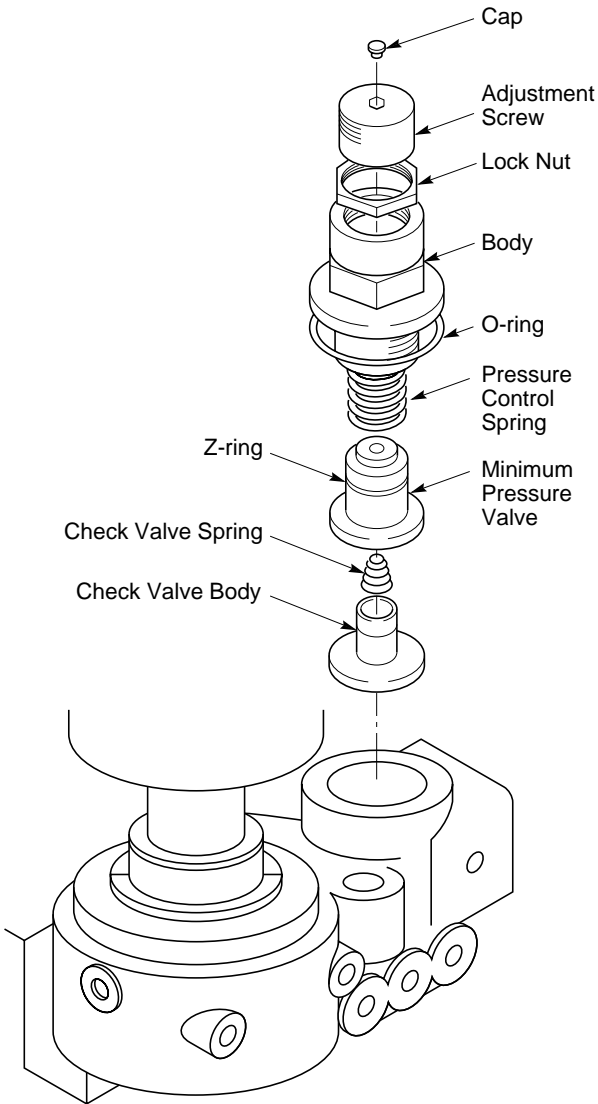
- ① Open the valve at the compressor's discharge side. Set the unit to blow operation and check the pressure by the pressure gauge.
- ② Remove the cap, fix the adjustment screw by a hexagon wrench, then unfasten the lock nut.
- ③ Fastening the adjustment screw will increase the control pressure, and unfastening will decrease.
- ④ When a specified pressure is obtained, fix the adjustment screw again with a lock nut, then fasten the cap again.

#### **⚠ CAUTION**

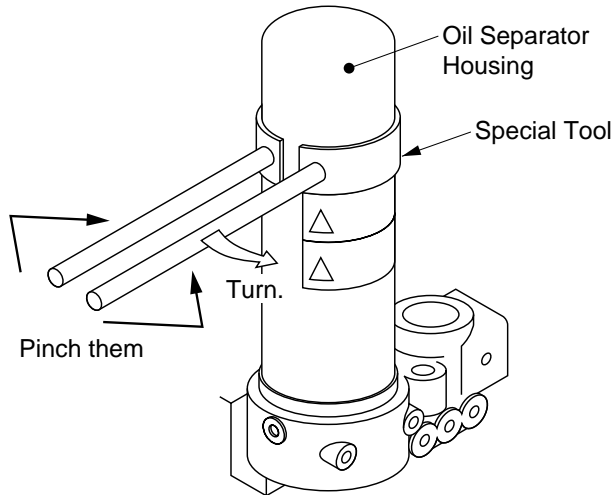
**Control pressure adjustment must be carried out while the unit is in operation. Therefore, ask your dealer or Hitachi service station for the work.**

### 8.10.2 Replacement of Minimum Pressure / Check Valve

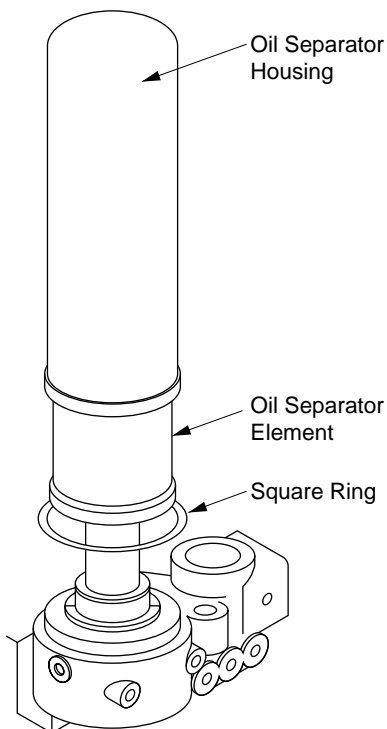
- ① Press the **STOP** button.
- ② Turn the power OFF.
- ③ Close the stop valve on discharge side.
- ④ Wait until the pressure in the compressor decreases to the ambient air pressure.
- ⑤ Hook a spanner on a hexagonal portion of the minimum pressure / check valve body. Do not unfasten its lock nut portion, remove the body in whole instead.
- ⑥ There are a control pressure spring, control pressure valve body, check valve spring, check valve body left on the element head side. Take the part out and replace it with a new one, if required.
- ⑦ If there is stain on the sheet surface of the element head side, clean it. Spread grease on the Z-ring portion of the pressure control valve body, or thinly spread the lubricant (**NEW HI-SCREW OIL 2000**) over the piston sliding portion or sheet surface O-ring portion of the check valve body, and reassemble them.
- ⑧ At this time, be careful so that the face side of the check valve spring (broader surface to its bottom).



## 8.11 Replacement of Oil Separator Element



[Figure A]



[Figure B]

### 8.11.1 Remove the Oil Separator Element

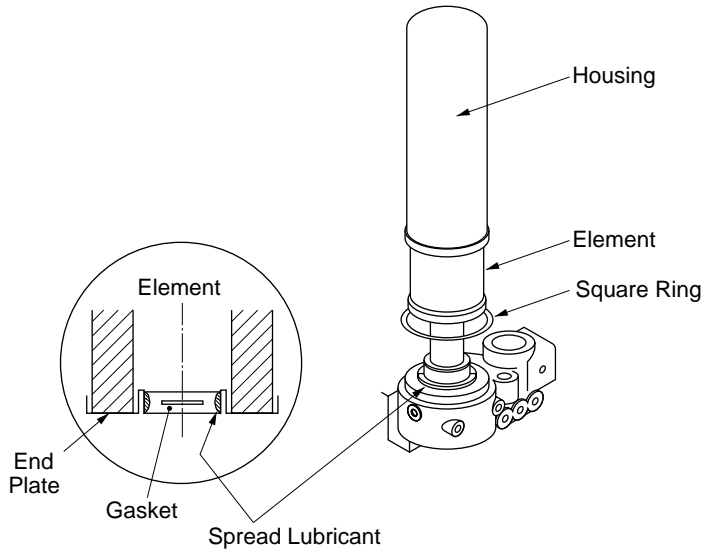
Use a special tool (genuine part No. 52303330) for removing a housing.

- ① Press the **STOP** button.
- ② Turn the **POWER OFF**.
- ③ Fasten the stop valve on the discharge side.
- ④ Wait until the pressure in the compressor decreases to the ambient air pressure.

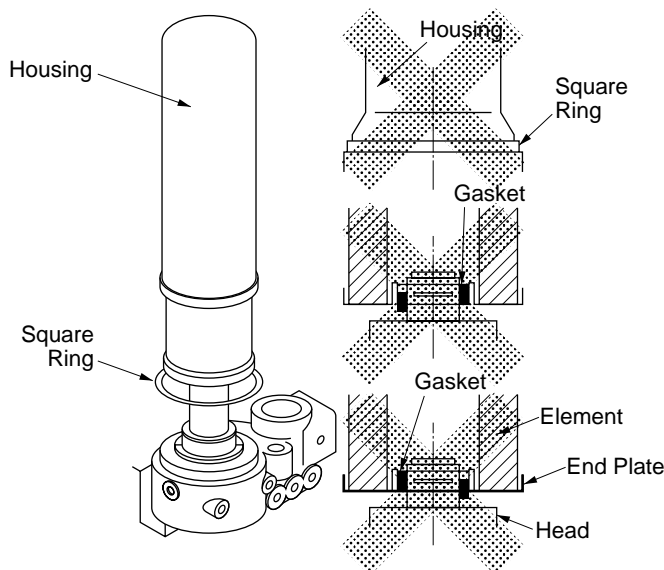
#### **CAUTION**

**Be careful not to burn your skin because the surface of the housing is very hot just after the stop.**

- ⑤ Hold a special tool around the upper part of the cylinder shaped housing, and unfasten the housing by turning it anticlockwise to remove it. [Figure A]
- ⑥ Remove the housing. Gently pull up the internal element to remove. [Figure B]
- ⑦ Remove square ring.



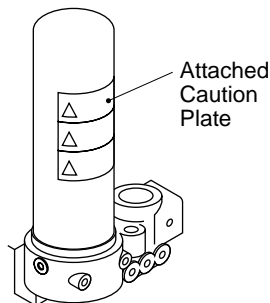
[Figure C]



[Figure D]



[Figure E]



[Figure F]

### 8.11.2 Attach Oil Separator Element

When to change the element, change housing and square ring with new replacements as well.

① Check if there is any damage found on the thread portion of the element head or the ditch portion of square ring seal. If there is any dirt or damage on them, it may cause leakage, so dress it with tool like a fine file.

② Check if there is any nick, damage or painting fault on a new housing.

③ Spread enough lubricant (new oil of **NEW HI-SCREW OIL 2000**) on the thread portion and inner surface of gasket part of the element. **[Figure C]**

Check if the gasket is properly set up with the element's end plate. **[Figure C]**

④ Silicon grease is spread on the square ring. Do not wipe it off and just set in a ditch on the element head.

⑤ Reverse the above procedure and set the element into the housing. **[Figure C]**

⑥ Firstly, pull only the element down. Hold it with both hands and push it down so that the end plate of the element adheres to the head. At this time, be careful not to allow the gasket slip out from the head. **[Figure D]**

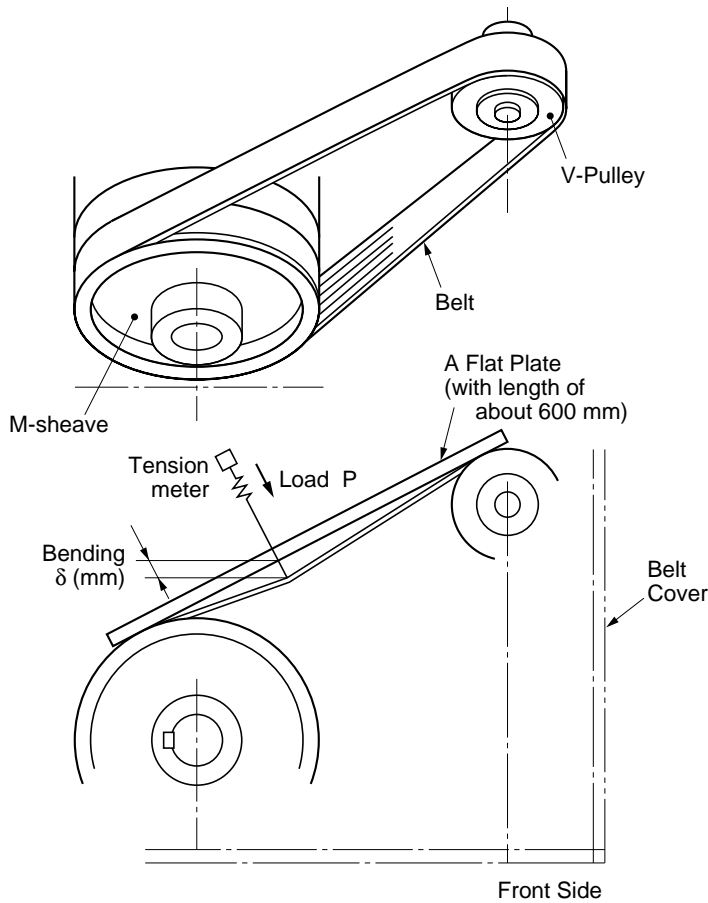
⑦ Hold the housing by both hands and put it on the thread portion of the head. At this time, be careful not to allow the square ring slip out from the head.

⑧ Fasten the housing in by the hand instead of using a tool. Housing must be securely fastened by turning it at 1/5 round or more. **[Figure E]**

⑨ Put the attached caution plate on a clearly visible position on the front surface of the unit. **[Figure F]**



## 8.12 Inspection of Belt



When the belt tension is lowered, it slips and produce noise or larger vibration of the belt during operation. Periodic check on the belt is needed.

### **⚠ WARNING**

Be sure to stop the unit and turn the power OFF before inspecting the belt. Keep your hand or other things away from the unit while operation, or such action will cause serious injury to the personnel.

### 8.12.1 Visual Check of Belt and V-Pulley

- ① Throw the light on the belt while moving and check if there is any missing of rib or crack on it. Likewise, check if there is any abnormal wear or damage to the working surface of the V-pulley and M-sheave.
- ② Check if no slipping noise (squeaking noise or creaking noise) is produced by the belt at starting or while operation.

### 8.11.2 Measurement of Belt Tension

- ① Prepare a flat plate (with length of about 600 mm).
- ② Press the plate towards belt span surface of V-pulley and M-sheave, then using a tension meter to measure the pressing load and bending displacement at its span center.  
If the bending is kept within the range shown in the left table, there is no need for tension adjustment. If deviation from the stated values is obvious, tension adjustment is needed. Ask your dealer or Hitachi service station for the adjustment.
- ③ It is possible to use a special tension meter to measure tension of the belt directly. Ask your dealer or Hitachi service station for more detail of this measurement.

Item	Discharge pressure	Load P	Bending $\delta$	Tension
Unit Model	MPa	N (kgf)	mm	N (kgf)
OSP-22 SA(R)I MA(R)I	0.69	58.8 to 98.1 ( 6 to 10 )	6.8	883 to 1471 ( 90 to 150 )
	0.84		6.6	
	0.92		6.4	
OSP-37 SA(R)I MA(R)I	0.69	49 to 78.4 ( 5 to 8 )	6.9	735 to 1177 ( 75 to 120 )
	0.84		6.9	
	0.92		6.8	

### **⚠ CAUTION**

Do not adjust the belt tension too tightly. Failure to observe this instruction may reduce the service life of the belts and/or cause an unexpected accident.

# 9. WHEN IT IS NOT USED FOR LONG TIME

Be sure to follow the measures below if the compressor is stored or stopped by reason of Power supply problem for a long time. (Follow marked items)

## Procedure for Long Time Stoppage and Storing

	Measures	Criteria	Measures If Criteria Is Not Filled	Storage Period	
				3 to 6 months	6 to 12 months
Measures Before Storing	Open the 1/2-inch stop valve at the end of the oil-draining pipe that extends from the oil case and thus drain the condensate. Close the 1/2-inch stop valve when the oil comes out instead of the condensate.	(After stop, take out condensate one day later and do not drain the lubricant.)			Special anti-rusting measures required. Ask your dealer or Hitachi Service Station for information.
Measures Before Restarting	Measure insulation resistance between each phase of the motor.	More than 1M ohm at DC 500V Mega.	To recover its insulation capacity, or replace the motor. (NOTE)		
	Check is stain is found to M-sheave and V-Pulley.	No rusting in the slots.	Remove rusting with finer sand paper from the slot (NOTE).		
	Rotate the V-Pulley manually to check compressor (screw block)'s rotation.	Smooth rotation.	Disassemble and check the compressor (screw block) (NOTE).		
	Check the V-belt.	Check it for its tension (Refer to the maintenance standards) and no crack from appearance, and enough elastic force is kept.	Replace V-belt (NOTE).		
	Replace the lubricant.	Replace in whole.	Replace it with new one.		
	Check power cables and terminals for deterioration or rusting.	No deterioration nor rusting.			

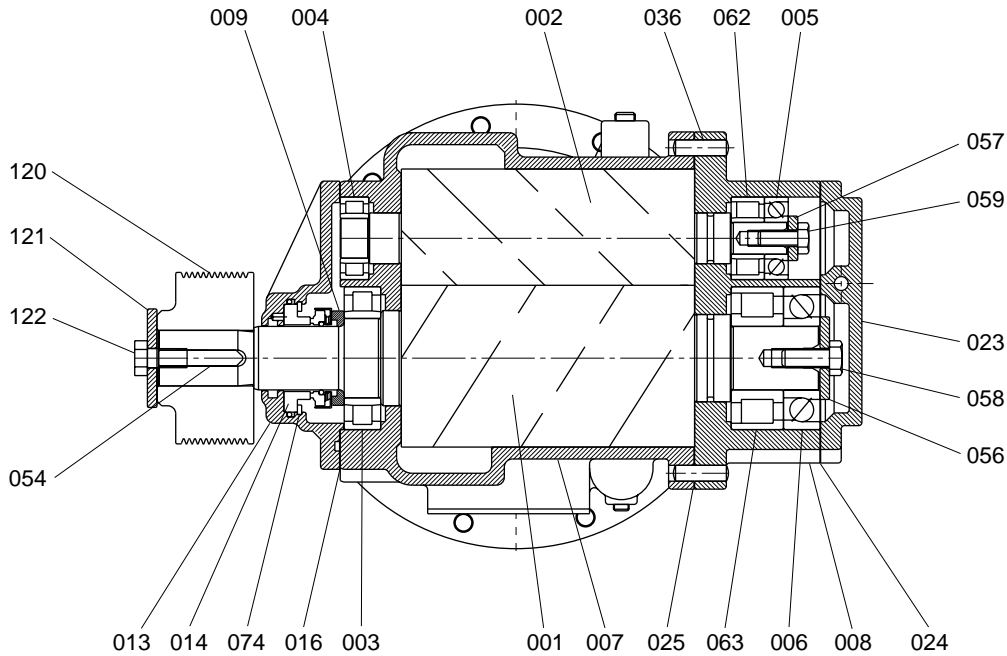
(NOTE) Ask your dealer or Hitachi Service Station for information.

### CAUTION

- The compressor air end (screw block) can have rustings if no anti-rusting measure (Measures before storing, sealing) are done to it. If the unit is restarted, this may result breakage in Locks or Bearings of the compressor.
- If necessary measures are failed when to restart the unit, it may result damage to the Locks or Bearing, burning in the motor, excessive wear of M-sheave and V-Pulley, breakage of V-Belt to the compressor.
- If lubricant has not been replaced when necessary or if enough flashing has not been done to the unit, the lubricant deteriorates earlier than usual and this may result clogging in Lock and Oil Cooler to the compressor.

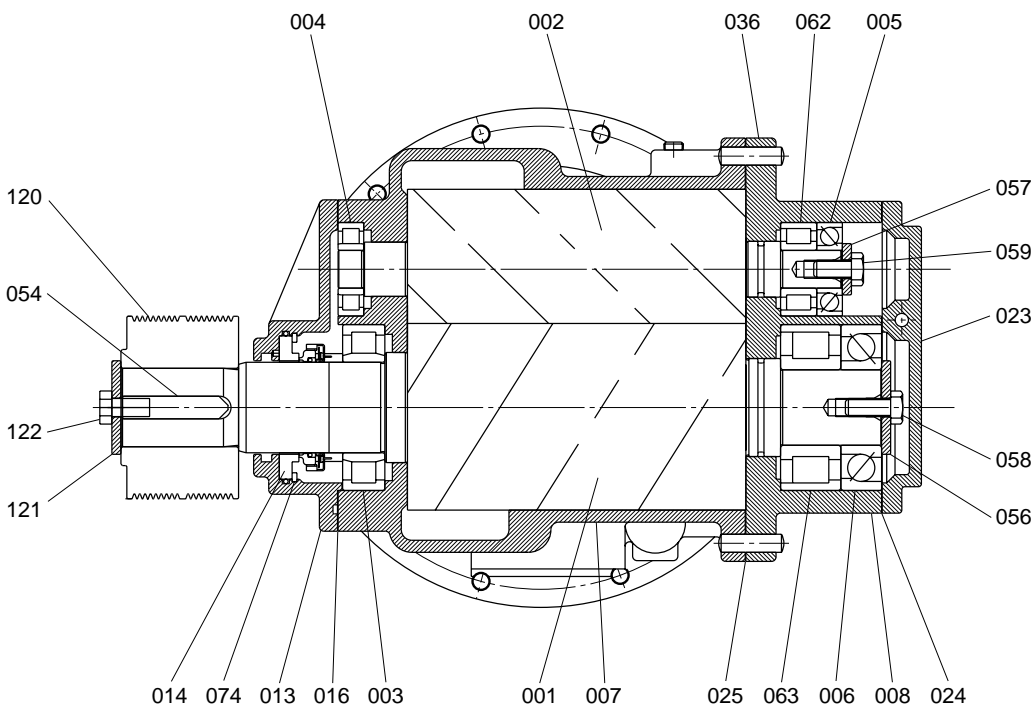
# 10. PARTS LIST

## Compressor Air End (22kW)



ITEM NO.	DESCRIPTION
000	Compressor Air End Assembly
001	Male Rotor
002	Female Rotor
003	50 Roller Bearings
004	25 Roller Bearings
005	20 Angular Ball Bearings
006	40 Angular Ball Bearings
007	Casing
008	D-Casing
009	Spacer, 50 roller bearing
013	S-Cover
014	40 Mechanical Seal
016	S-Cover Packing
023	D-Cover
024	D-Cover Packing
025	D-Casing Packing
036	Knock Pin
054	Key
056	MD Stop Plate
057	FD Stop Plate
058	MD Set Bolt
059	FD Set Bolt
062	20 Collared Roller Bearing
063	40 Collared Roller Bearing
074	Snap Ring
120	V-Pulley
121	V-Pulley Washer
122	V-Pulley Bolt

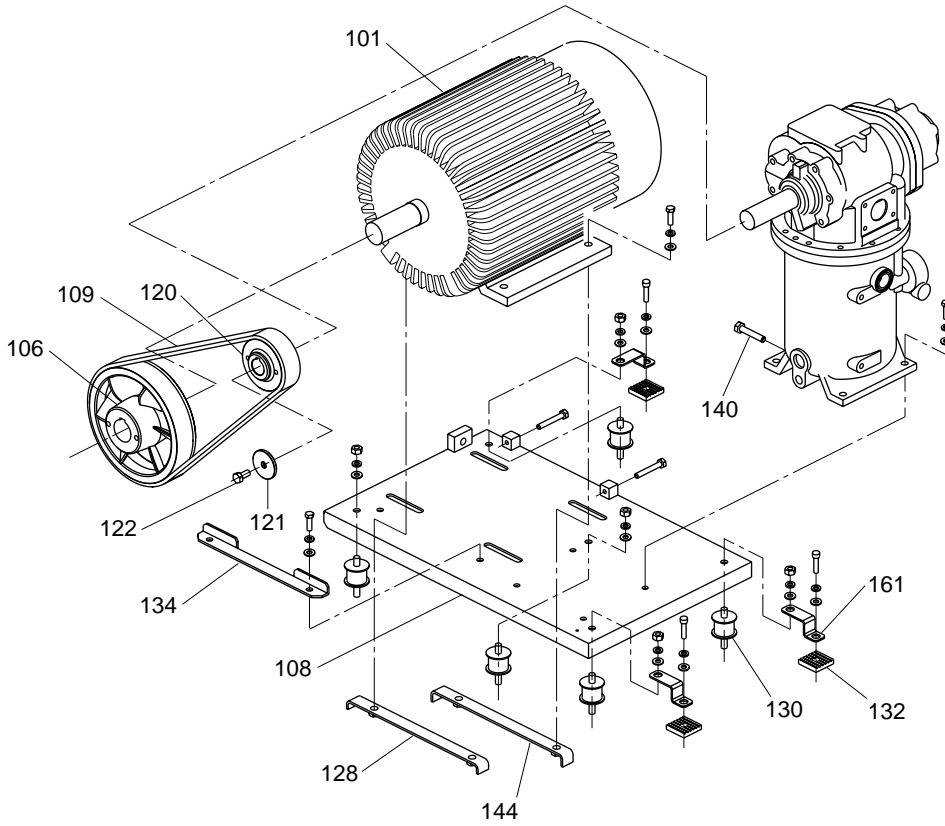
## Compressor Air End (37kW)



ITEM NO.	DESCRIPTION
000	Compressor Air End Assembly
001	Male Rotor
002	Female Rotor
003	60 Roller Bearings
004	25 Roller Bearings
005	25 Angular Ball Bearings
006	50 Angular Ball Bearings
007	Casing
008	D-Casing
013	S-Cover
014	60 Mechanical Seal
016	S-Cover Packing
023	D-Cover
024	D-Cover Packing
025	D-Casing Packing
036	Knock Pin
054	Key
056	MD Stop Plate
057	FD Stop Plate
058	MD Set Bolt
059	FD Set Bolt
062	25 Collared Roller Bearing
063	50 Collared Roller Bearing
074	Snap Ring
120	V-Pulley
121	V-Pulley Washer
122	V-Pulley Bolt

# 10. PARTS LIST

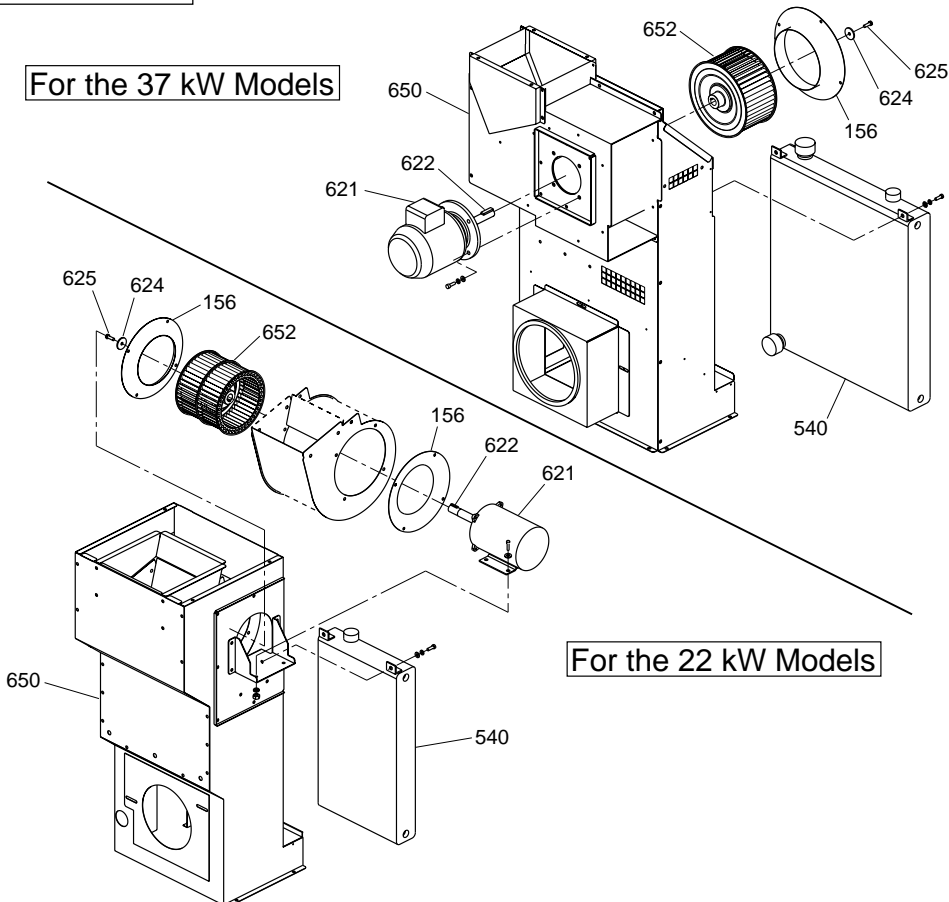
## Motor Pulley



ITEM NO.	DESCRIPTION
101	Motor
106	M-Sheave
108	Motor Base
109	Belt
120	V-Pulley
121	V-Pulley Washer
122	V-Pulley Bolt
128	Plate (1), motor-fixing
130	Vibration Suppression Rubber
132	Vibration Suppression Rubber
134	Motor Guide
140	Belt Adjusting Bolt
144	Plate (2), motor-fixing
161	Retainer, motor base

## Cooling Fan

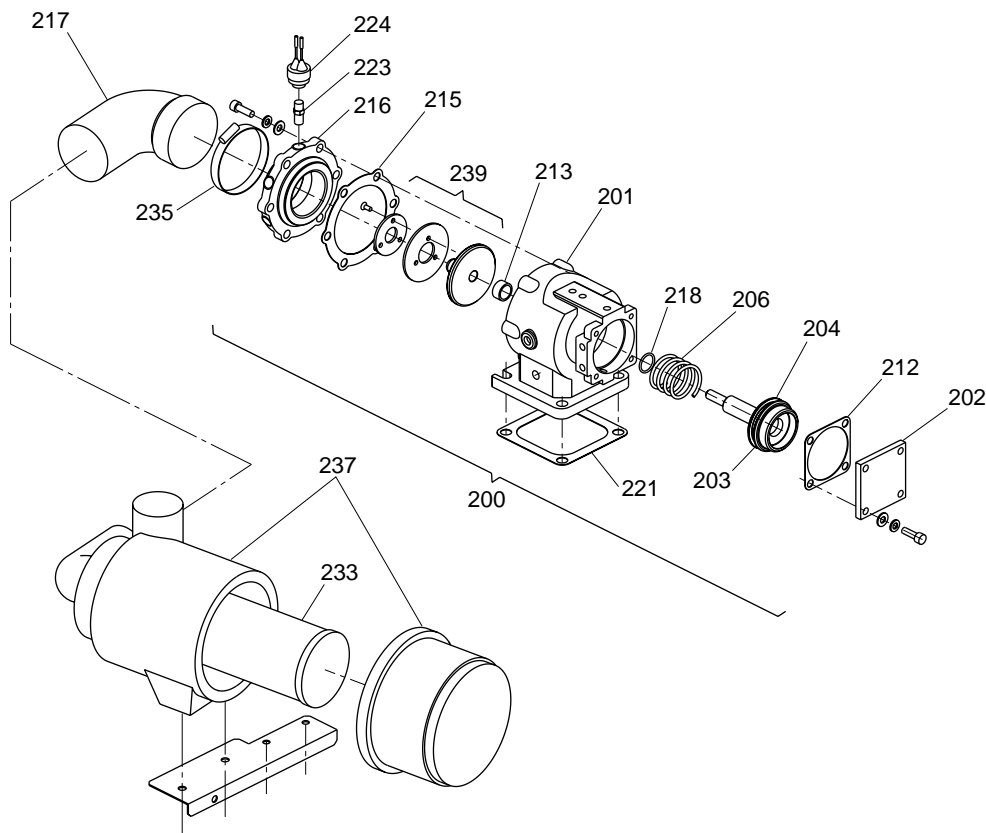
For the 37 kW Models



For the 22 kW Models

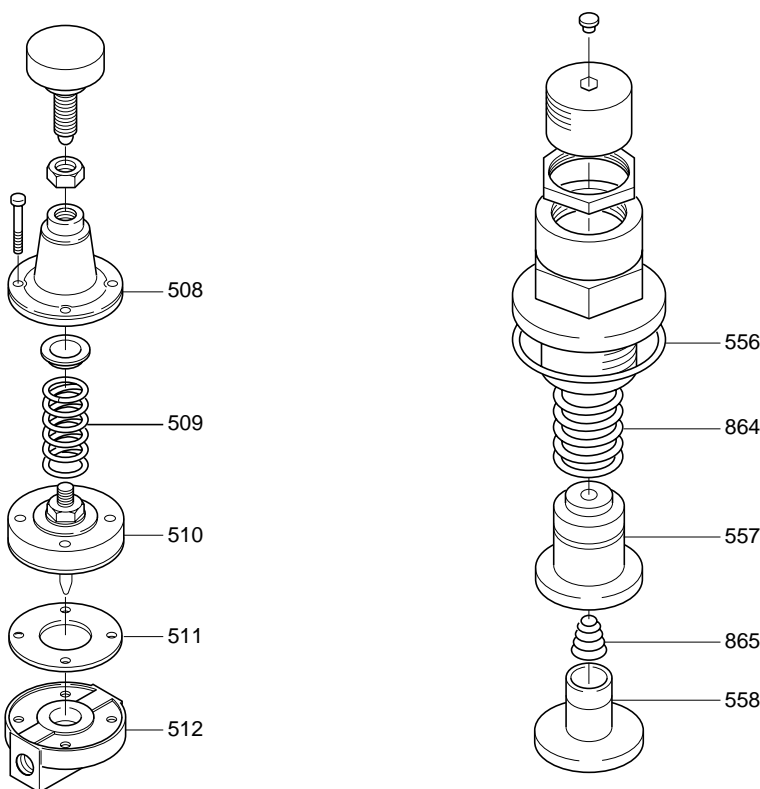
ITEM NO.	DESCRIPTION
156	Bell-Mouse
540	Cooler
621	Fan Motor
622	Fan Shaft Key
624	Fan Washer
625	Set-Bolt
650	Air Exhaust Duct
652	Impeller

**Suction Throttle Valve**



ITEM NO.	DESCRIPTION
200	Suction Throttle Valve Assembly
201	Unloader Case
202	Unloader Cover
203	Cap Seal
204	Piston
206	Unloader Spring
212	Unloader Cover Packing
213	Unloader Bush Metal
215	Unloader Body Packing
216	Unloader Cover
217	Suction Pipe
218	Unloader O-ring
221	Suction Packing
222	Unloader Cover Packing
223	Nipple for Pressure Differential Sensor
224	Pressure Differential Sensor
223	Air Intake Filter Element
235	Band
237	Air Intake Filter Housing
239	Valve Seat Assembly

**Modulator Valve, Minimum Pressure / Check Valve**



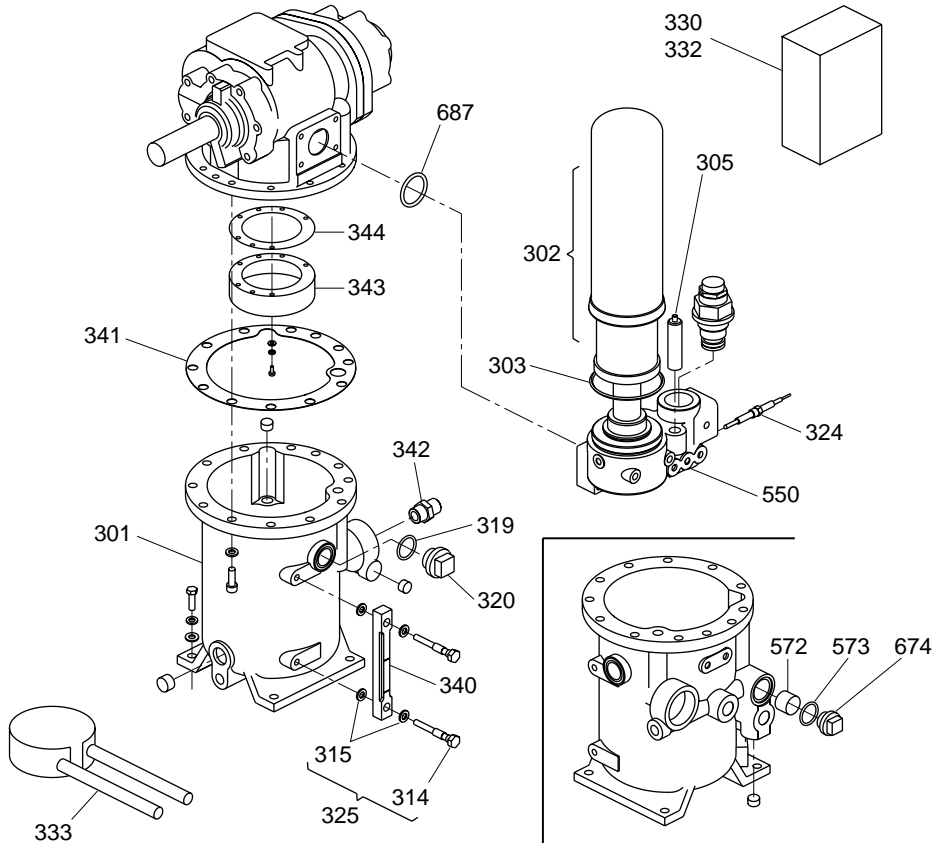
ITEM NO.	DESCRIPTION
507	Modulator Valve
508	Modulator Valve Cover
509	Modulator Valve Spring
510	Modulator Valve Diaphragm Assembly
511	Modulator Valve Rubber Packing
512	Modulator Valve Body
552	Minimum Pressure / Check Valve
556	O-ring
557	Minimum Pressure Valve Piston
558	Check Valve Piston
864	Pressure Control Spring
865	Check Valve Spring

**Modulator Valve** 507

**Minimum Pressure / Check Valve** 552

# 10. PARTS LIST

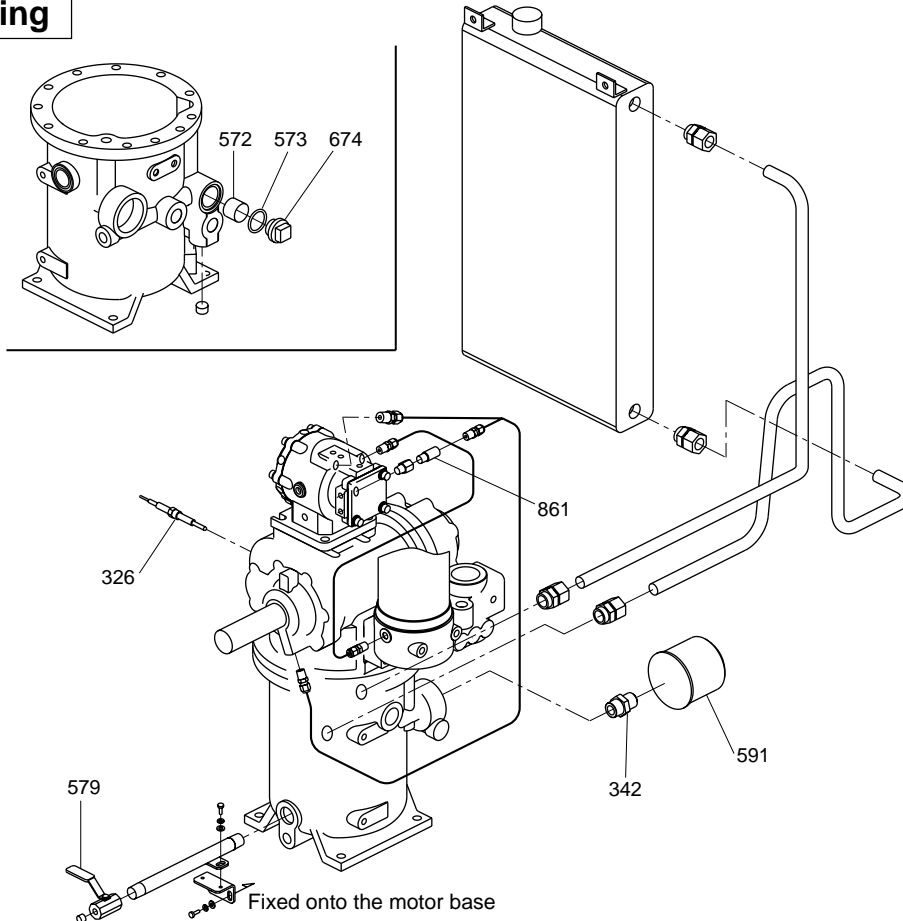
## Oil Case & Oil Separator



ITEM NO.	DESCRIPTION
301	Oil Case
302	Oil Separator
303	Square Ring
305	Relief Valve
314	Bolt
315	M12 Seal Washer
319	Replenish Port O-ring
320	Replenish Port Plug
324	Thermister
325	Oil Level Gauge Assembly
330	Lubricant 'NEW HISCREW OIL 2000' (4 liters)
332	Lubricant 'NEW HISCREW OIL 2000' (20 liters)
333	Special tools (for oil separator)
340	Oil Level Gauge (Single)
341	Packing, oil case
342	Nipple, oil filter
343	Skirt
344	Packing, skirt
550	Element head
572	Oil Temperature Control Valve
573	O-ring, oil temperature control valve
674	Cover, oil temperature control valve
687	O-ring

Option

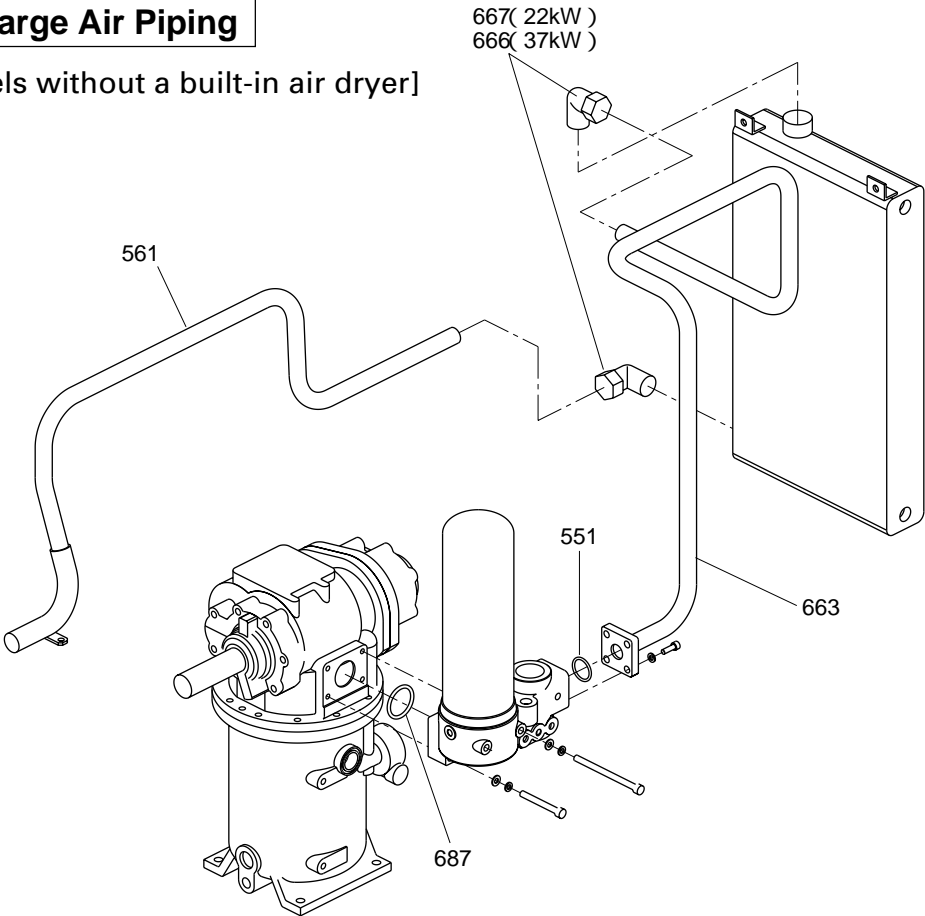
## Oil Piping



ITEM NO.	DESCRIPTION
326	Thermister
342	Nipple, oil filter
572	Oil Temperature Control Valve
573	O-ring
579	1/2 Stop Valve
591	Oil Filter Element
674	Cover, oil temperature control valve
861	Check Valve (1/4 inch)

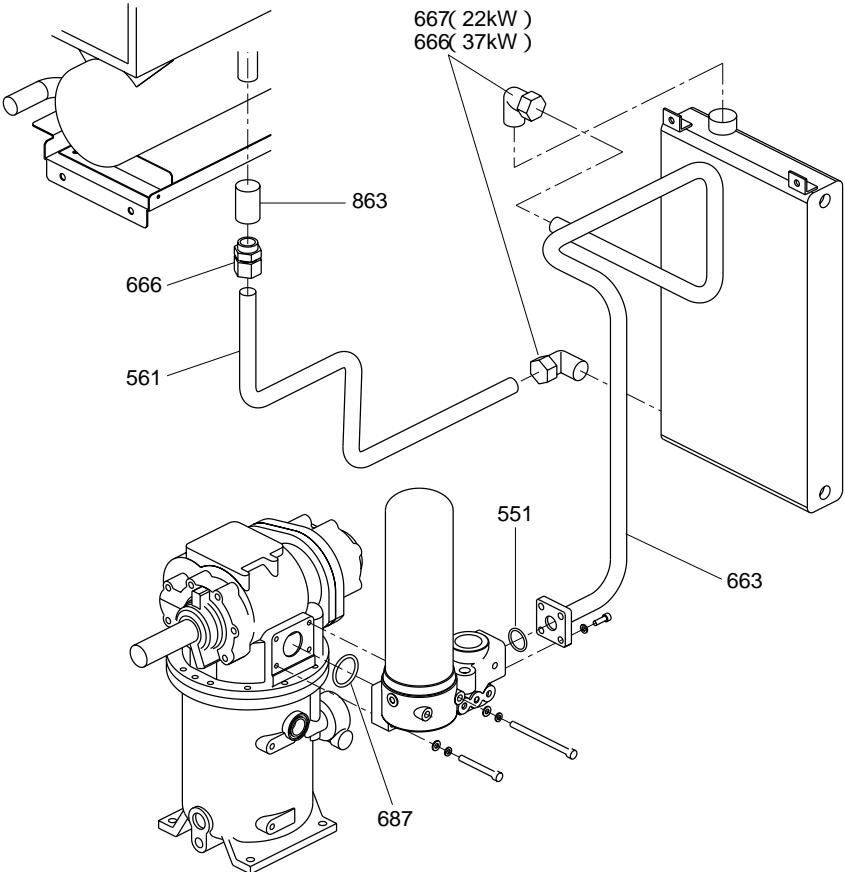
**Discharge Air Piping**

[Models without a built-in air dryer]



ITEM NO.	DESCRIPTION
551	O-ring
561	Discharge Pipe (2)
663	Discharge Pipe (1)
666	Joint, straight
667	Joint, elbow
687	O-ring

[Models with a built-in air dryer]

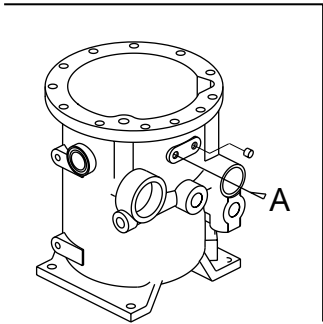
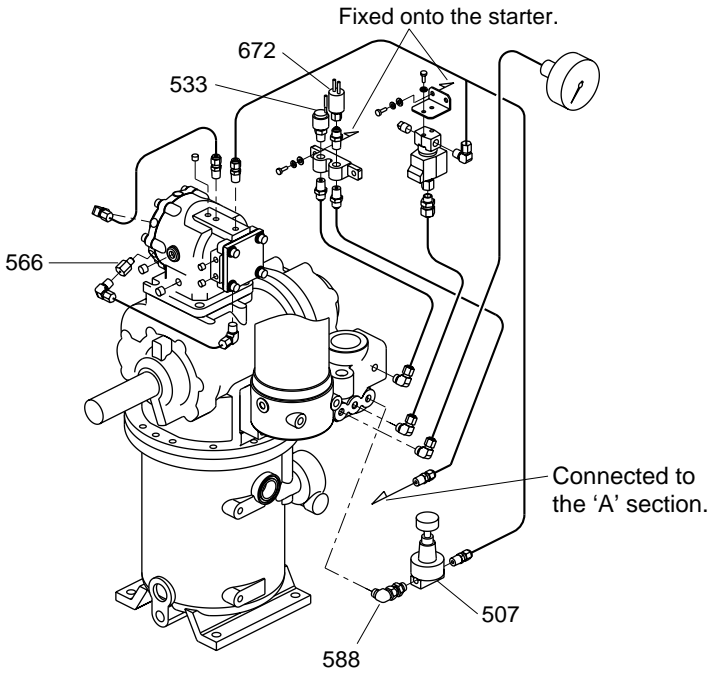


ITEM NO.	DESCRIPTION
551	O-ring
561	Discharge Pipe (2)
663	Discharge Pipe (1)
666	Joint, straight
667	Joint, elbow
687	O-ring
863	Socket

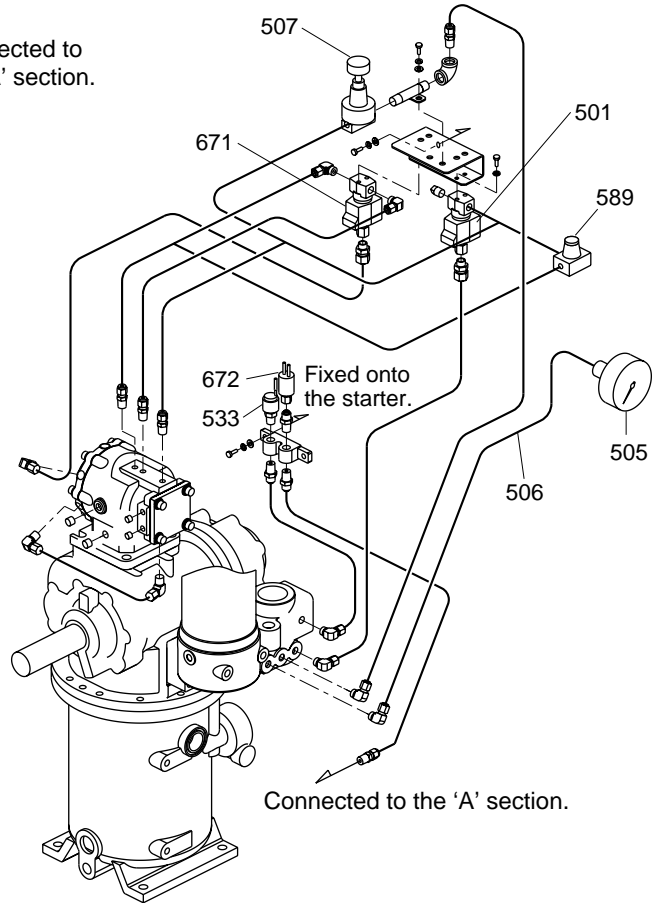
10. PARTS LIST

**Control Piping**

**For the 22 kW Models**



**For the 37 kW Models**



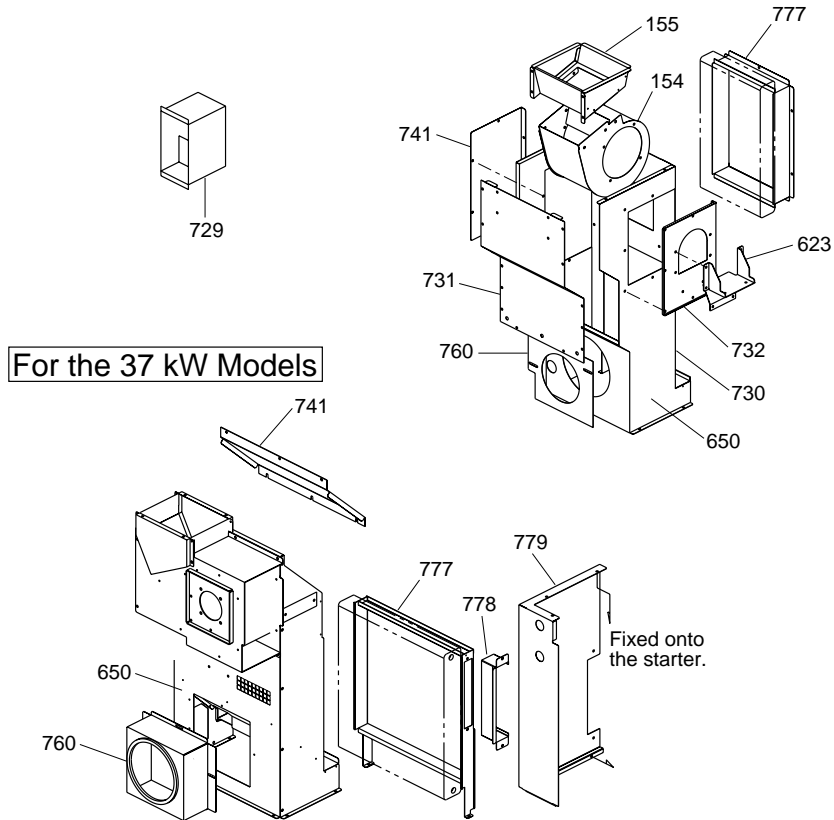
ITEM NO.	DESCRIPTION
501	Solenoid valve (20P)
505	Pressure gauge
506	Pressure gauge piping
507	Modulator Valve
533	Pressure sensor
566	3.5 Orifice
588	Adaptor
589	Vacuum relief valve
671	Solenoid Valve (20US)
672	Pressure switch



**Air Intake Duct & Air Exhaust Duct**

[Models without a built-in air dryer]

For the 22 kW Models

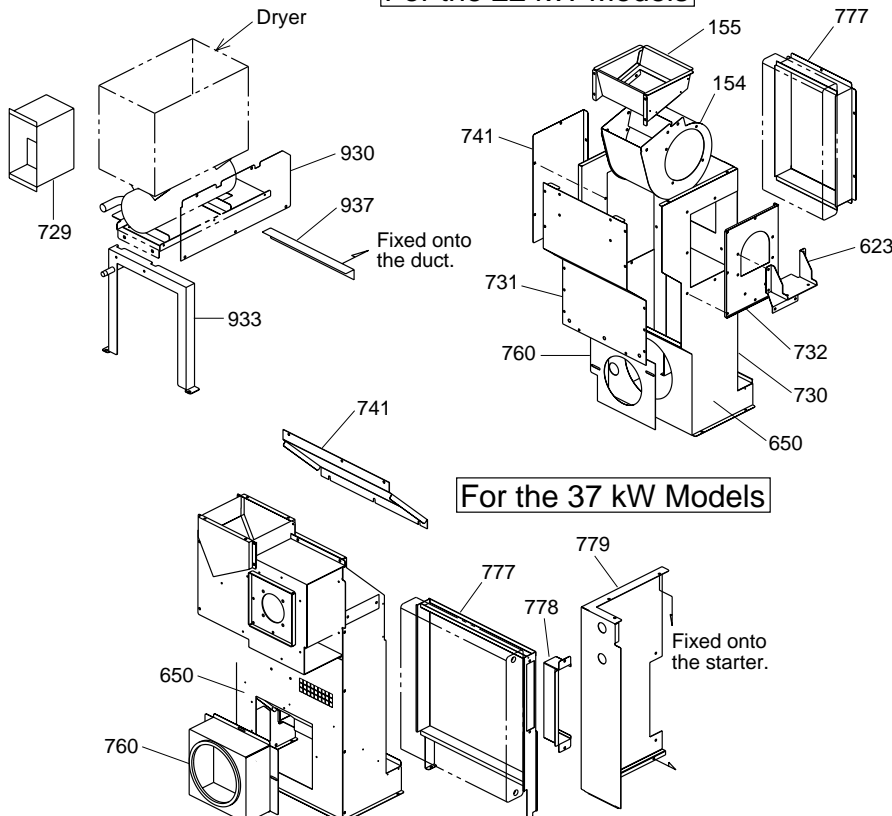


ITEM NO.	DESCRIPTION
154	Casing, cooling fan
155	Air Exhaust Duct
623	Base, cooling fan motor
650	Air Exhaust Duct Assembly
729	Air Intake Duct, air dryer
730	Cooler Duct (1)
731	Cooler Duct (2)
732	Cooler Duct (3)
741	Inspection Cover
760	Motor Duct
777	Air Intake Duct (1)
778	Air Intake Duct (2)
779	Air Intake Duct (3)

For the 37 kW Models

[Models with a built-in air dryer]

For the 22 kW Models

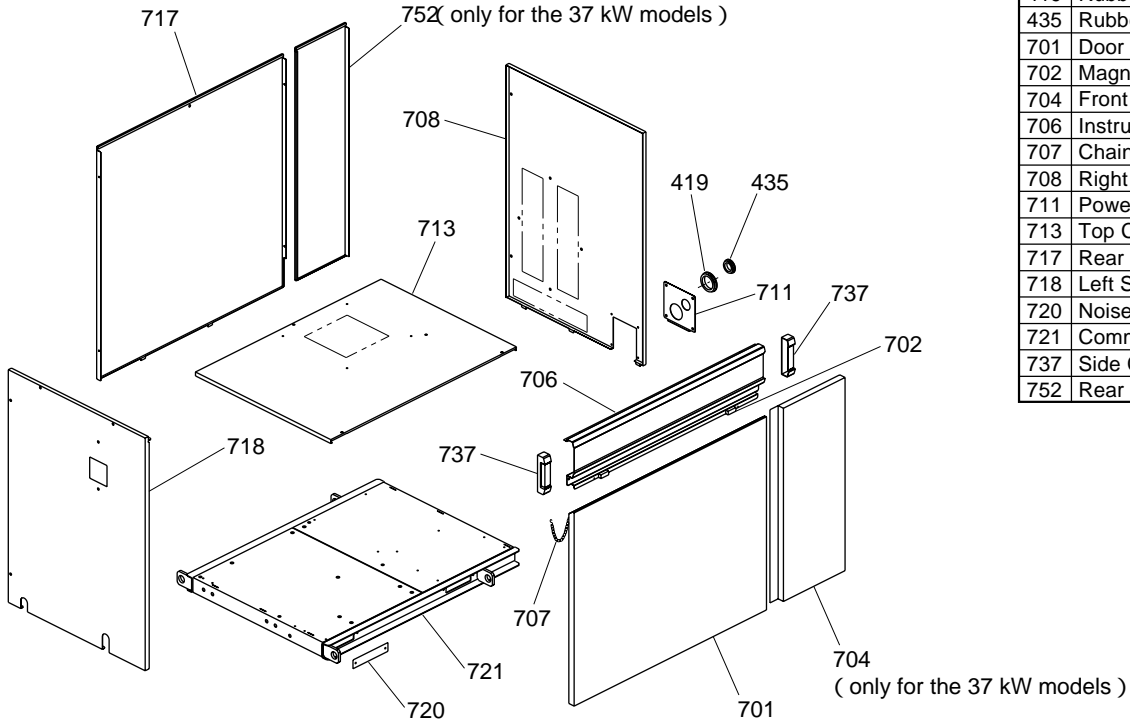


ITEM NO.	DESCRIPTION
154	Casing, cooling fan
155	Air Exhaust Duct
623	Base, cooling fan motor
650	Air Exhaust Duct Assembly
729	Air Intake Duct, air dryer
730	Cooler Duct (1)
731	Cooler Duct (2)
732	Cooler Duct (3)
741	Inspection Cover
760	Motor Duct
777	Air Intake Duct (1)
778	Air Intake Duct (2)
779	Air Intake Duct (3)
930	Front Cover, air dryer
933	Support, air dryer
937	Support Plate, air dryer

# 10. PARTS LIST

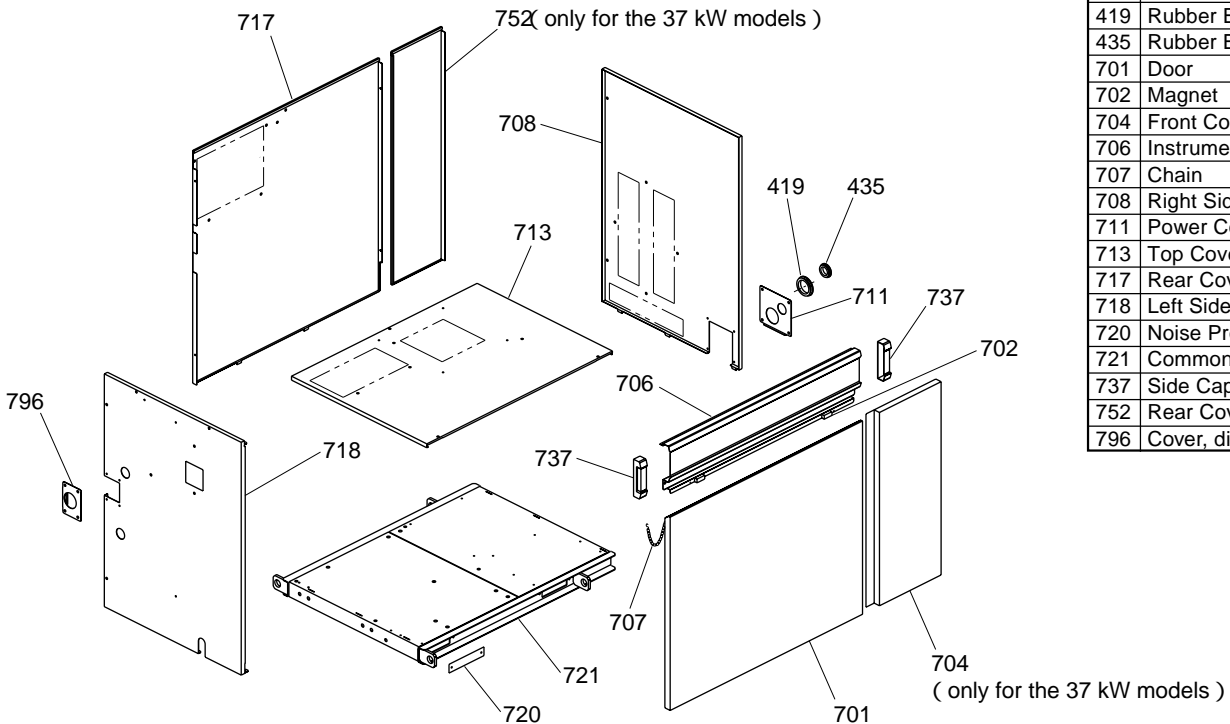
## Enclosure

[Models without a built-in air dryer]



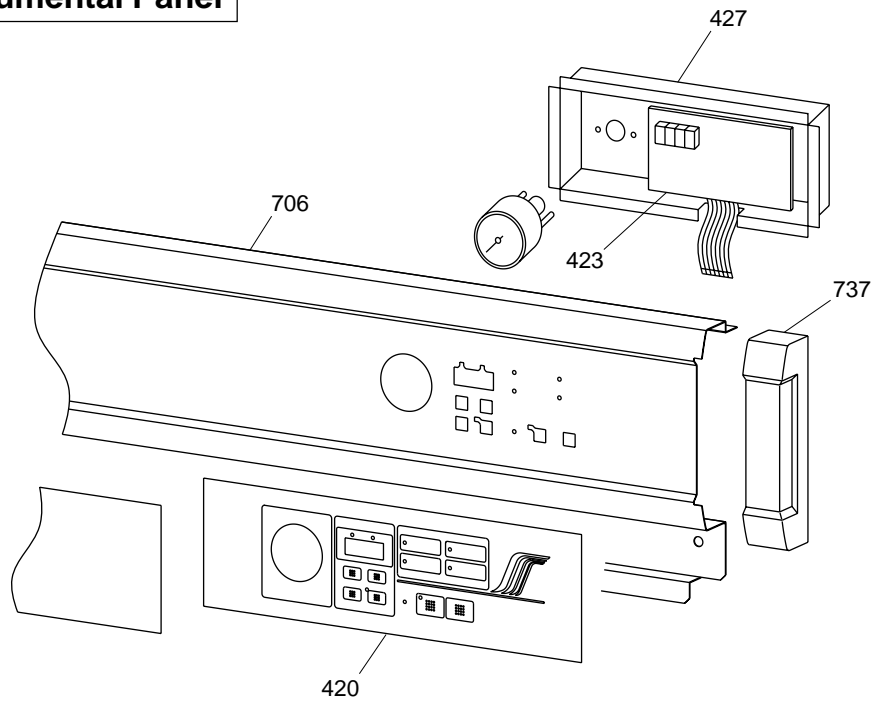
ITEM NO.	DESCRIPTION
419	Rubber Bush
435	Rubber Bush
701	Door
702	Magnet
704	Front Cover
706	Instrumental Panel
707	Chain
708	Right Side Cover
711	Power Cover
713	Top Cover
717	Rear Cover (1)
718	Left Side Cover
720	Noise Proofing Plate
721	Common Base
737	Side Cap
752	Rear Cover (2)

[Models with a built-in air dryer]



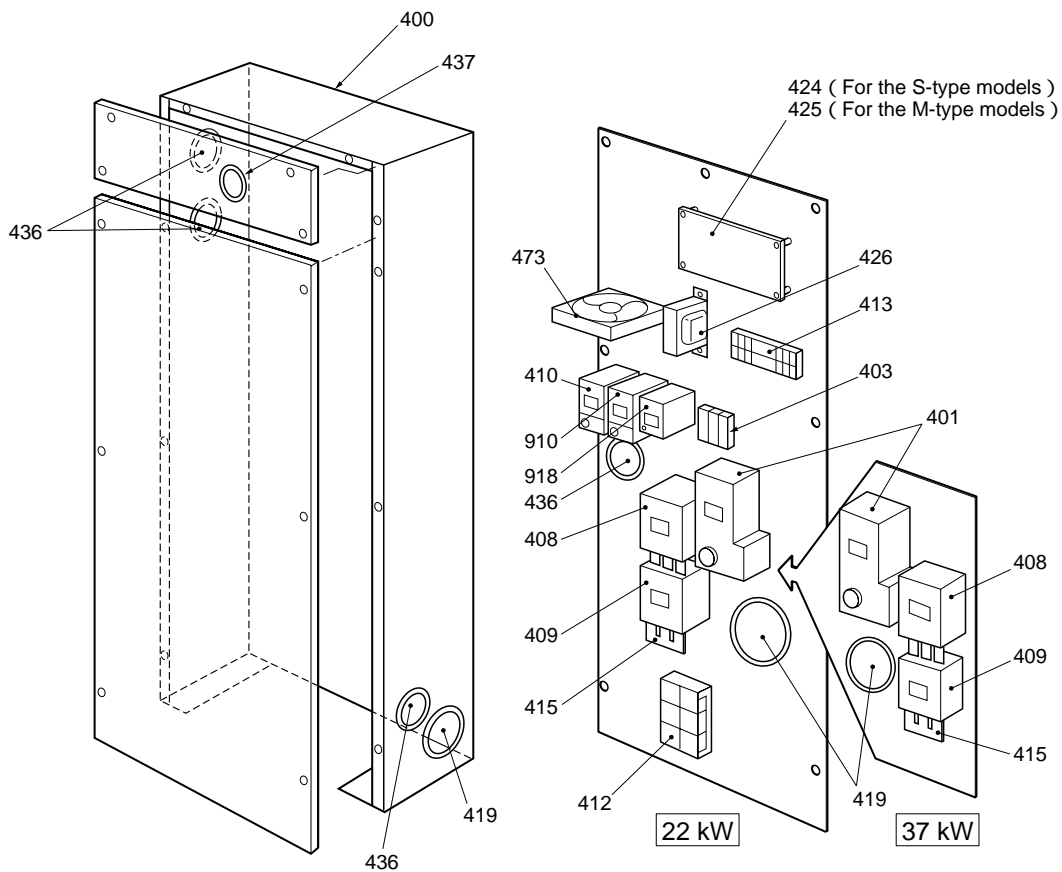
ITEM NO.	DESCRIPTION
419	Rubber Bush
435	Rubber Bush
701	Door
702	Magnet
704	Front Cover
706	Instrumental Panel
707	Chain
708	Right Side Cover
711	Power Cover
713	Top Cover
717	Rear Cover (1)
718	Left Side Cover
720	Noise Proofing Plate
721	Common Base
737	Side Cap
752	Rear Cover (2)
796	Cover, discharge pipe

**Instrumental Panel**



ITEM NO.	DESCRIPTION
420	Instrumental Panel Seat
423	Operation Printed Circuit Board
427	Printed Circuit Board Cover
706	Instrumental Panel
737	Side Cap

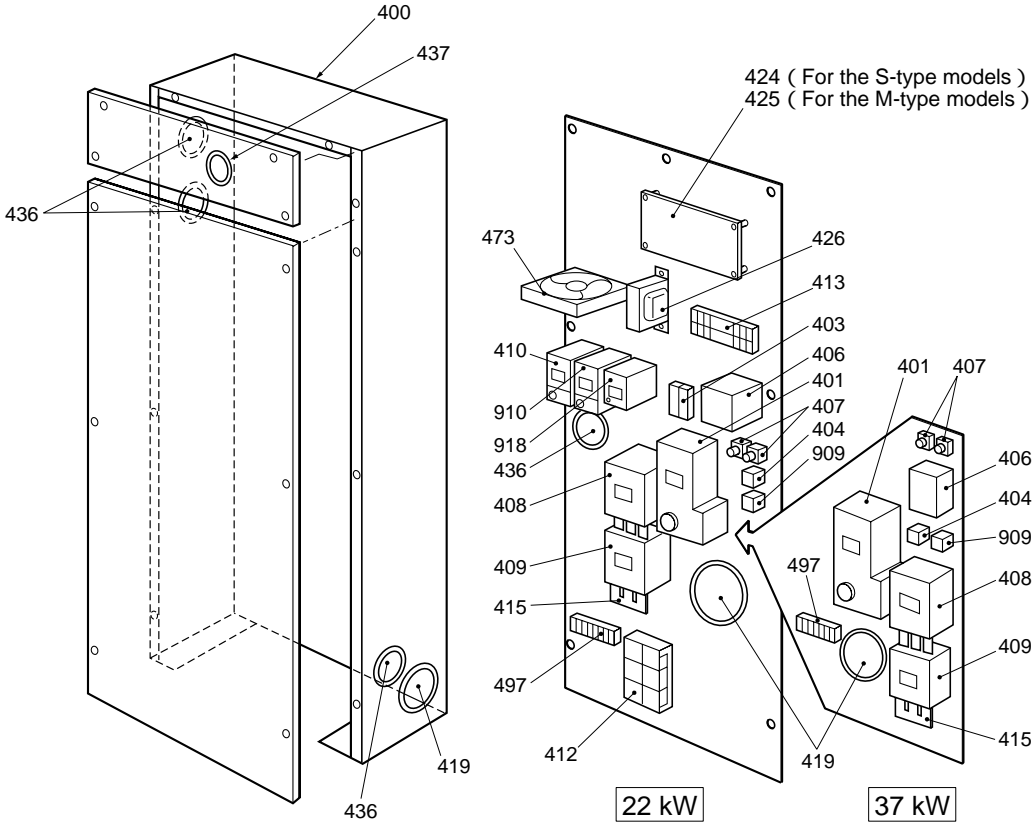
**Starter Panel (200 V class)**



ITEM NO.	DESCRIPTION
400	Starter Panel Assembly
401	Electromagnetic Contactor 52
403	Glass Tube Fuse
408	Electromagnetic Contactor 42
409	Electromagnetic Contactor 6
410	Electromagnetic Contactor 88F
412	Terminal Board
413	Terminal Board
415	Copper Plate Assembly
419	Rubber Bush
424	CPU Printed Circuit Board (for S-type)
425	CPU Printed Circuit Board (for M-type)
426	Printed Circuit Board Transformer
436	Rubber Bush
437	Rubber Bush
473	Cooling Fan, starter
910	Electromagnetic Contactor 52C
918	Electromagnetic Contactor 88

# 10. PARTS LIST

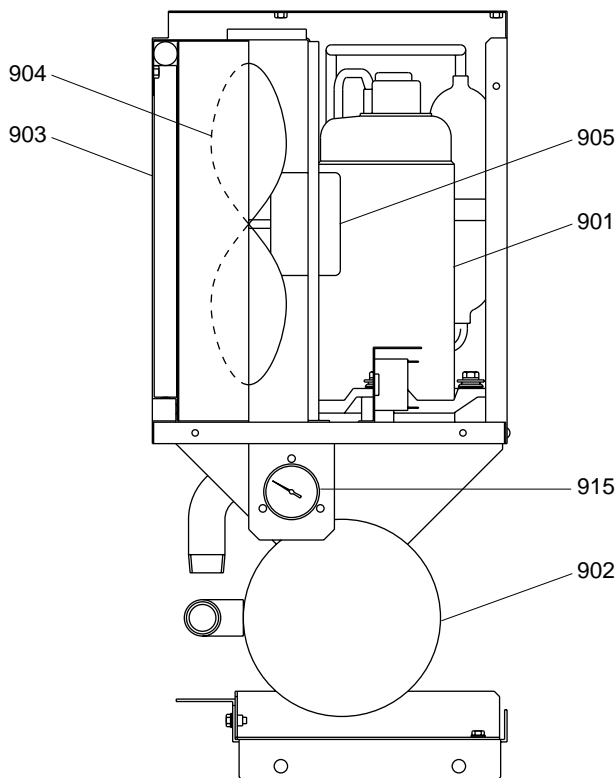
## Starter Panel (400 V class)



ITEM NO.	DESCRIPTION
400	Starter Panel Assembly
401	Electromagnetic Contactor 52
403	Glass Tube Fuse
404	Reversal Phase
406	Transformer
407	Huse
408	Electromagnetic Contactor 42
409	Electromagnetic Contactor 6
410	Electromagnetic Contactor 88F
412	Terminal Board
413	Terminal Board
415	Copper Plate Assembly
419	Rubber Bush
424	CPU Printed Circuit Board (for S-type)
425	CPU Printed Circuit Board (for M-type)
426	Printed Circuit Board Transformer
436	Rubber Bush
437	Rubber Bush
473	Cooling Fan, starter
497	Terminal Board
909	Reversal Phase, dryer
910	Electromagnetic Contactor 52C
918	Electromagnetic Contactor 88

## Air Dryer

[Only for the models with a built-in air dryer]



ITEM NO.	DESCRIPTION
900	Dryer Assembly
901	Compressor
902	Heat Exchanger
903	Condenser
904	Condenser Fan
905	Condenser Fan Motor
907	Fan Control Switch
908	High-Pressure Switch
915	Refrigerant Pressure Gauge
919	Thermostat (OHR)
920	Hot Gas Bypass Valve
945	Stop Valve
950	Condensate Trap Assembly
951	O-Ring, condensate trap
958	Screen, condensate trap
959	Bowl Set with Condensate Trap



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# 12. STANDARD SPECIFICATION

## ■ Compressor Specification

Item	Unit	OSP-22S5A(R)I / S6A(R)I OSP-22M5A(R)I / M6A(R)I			OSP-37S5A(R)I / S6A(R)I OSP-37M5A(R)I / M6A(R)I		
		Operating gas		Air			
Suction pressure		Ambient pressure					
Suction temperature		0 to 40 [5 to 40]					
Discharge pressure	MPa	<input type="checkbox"/> 0.69	0.83	0.92	<input type="checkbox"/> 0.69	0.83	0.92
Discharge air capacity	m <sup>3</sup> /min	<input type="checkbox"/> 3.8	3.1	2.9	<input type="checkbox"/> 6.3	5.3	5.0
Discharge temperature		Atmospheric temperature + 15					
Main motor output	kW	22			37		
Main motor type		Totally enclosed, external-fan cooled					
Fan motor output	kW	0.75			1.5		
Fan motor type		Totally enclosed					
Starter type		Star-Delta Starting					
Lubricating oil		<b>NEW HI-SCREW OIL 2000</b> (genuine synthetic oil)					
Lubricating oil filling amount	liter	8			13		
Capacity control type	S-type	U-type (suction throttle type) + I-type (vacuum type)					
	M-type	U-type (suction throttle type) + I-type (vacuum type) + P-type (auto start/stop)					
Dryer outlet dew point (under pressure)		10					
Dryer refrigerator nominal output	kW	1.1					
Condenser fan motor output	W	25 × 1			25 × 2		
Coolant used		R407C (360 g)			R407C (600 g)		
Total weight	kg	540 [590]			760 [830]		
Size (Width×Depth× Height)	mm	1,200 × 890 × 1,260			1,400 × 970 × 1,400		

NOTE (1)  means standard specifications.

(2) Discharge air capacity is a converted value according to the suction condition of the compressor.

(3) Dew point shown is the value measured in an environment with ambient temperature 30°C., discharge pressure 0.69 MPa.

(4) Do not select U-type control for 0.92MPa discharge pressure model.

(5) The values in the brackets are for the models with a built-in air dryer.

Note down your Compressor's Specifications for reference in the future.

<b>Model</b>	<b>OSP-</b>	<b>kW</b>	<b>Hz</b>
<b>Compressor Serial No.</b>			
<b>Installed on</b>	<b>day</b>	<b>month</b>	<b>year</b>
<b>Start-Up on</b>	<b>day</b>	<b>month</b>	<b>year</b>
<b>Purchased from</b>		<b>Phone:</b>	<b>Sales Person:</b>