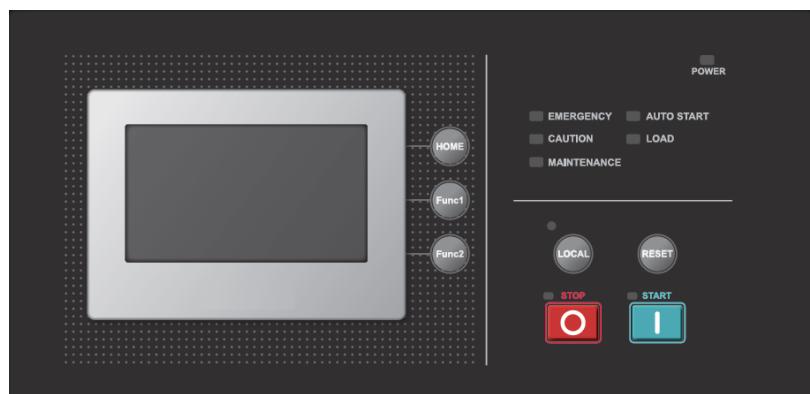


# Controller Instruction Manual



# NGSC-430

New Generation Smart Controller

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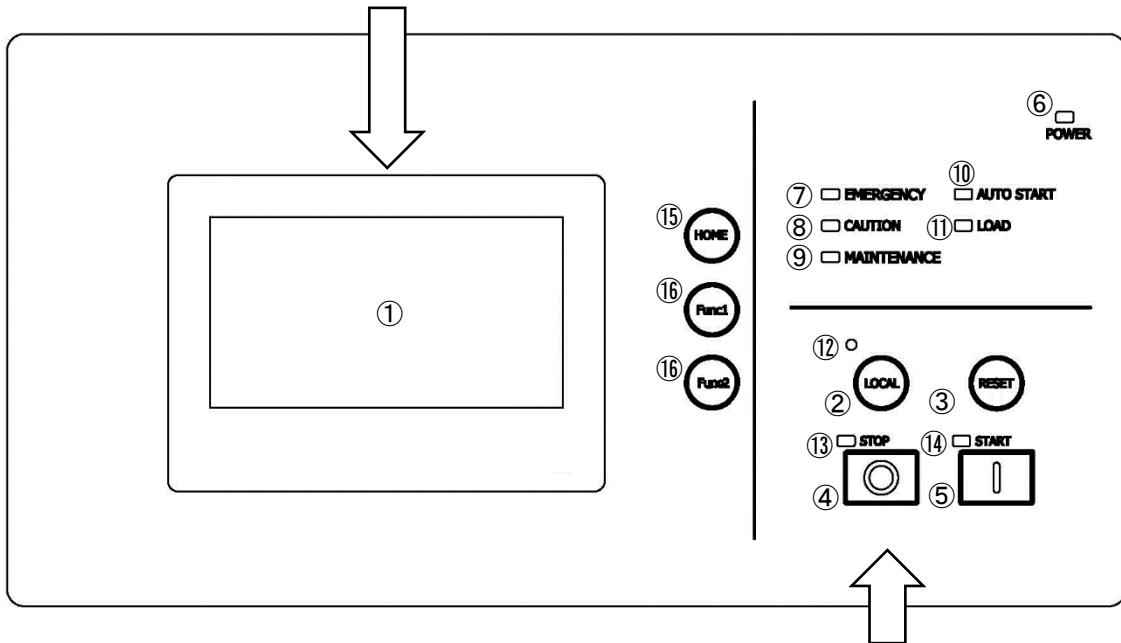
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# 1 Controller

The controller consists of a touch screen, operation panel, message lamps and operating condition lamps, which are organized according to their functions for simple and accurate settings.

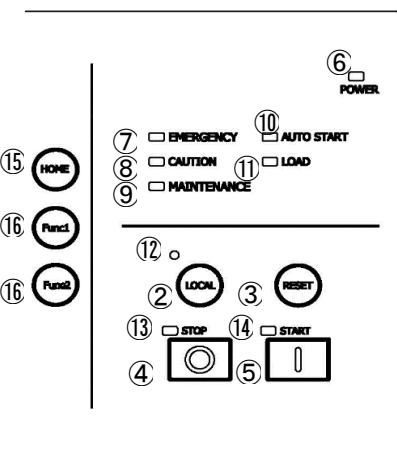
Touch Panel Screen	
① Touch panel screen	<ul style="list-style-type: none"> <li>• Indicates operating condition, various settings, and warning messages.</li> </ul>



Operation Panel	
② LOCAL button (available during the operation)	<ul style="list-style-type: none"> <li>• To select how to start or stop the compressor by local mode or remote mode.</li> <li>• The Local LED lamp is “on” in local mode or “off” in the remote mode.</li> </ul>
③ RESET button	<ul style="list-style-type: none"> <li>• To reset EMERGENCY, CAUTION and MAINTENANCE alarms.</li> </ul>
④ STOP button	<ul style="list-style-type: none"> <li>• To stop compressor operations. To unlock the standby mode.</li> </ul>
⑤ START button	<ul style="list-style-type: none"> <li>• To start the compressor in local mode.</li> </ul>
⑯ HOME button	<ul style="list-style-type: none"> <li>• To go to the home screen, which will appear after the logo displays.</li> </ul>
⑰⑱ FUNC 1 and FUNC 2 (function)button	<ul style="list-style-type: none"> <li>• Apply three minute long press to enter the data is now displayed on the screen. The entered page will be displayed automatically when the data input is complete.</li> <li>You can enter different screens into Func 1 and Func 2 respectively.</li> </ul>

### Operating Condition LEDs

- ⑦ **EMERGENCY** LED Lamp (red)
  - It lights red when compressor stopped in case of emergency situation.
- ⑧ **CAUTION** LED Lamp (orange)
  - It lights orange when an alarm has been issued on the compressor and attention is required.
- ⑨ **MAINTENANCE** LED Lamp (yellow)
  - It lights yellow when maintenance is required.



### Indicator LED Lamps

- ⑥ **POWER** LED Lamp (green)
  - It lights green when the controller is powered on.
- ⑩ **AUTO START** LED Lamp (green)
  - It lights green while the weekly timer is activated. (Set as active).
  - Blinks when discharge pressure exceeds the auto stop pressure and it leads to a compressor's automatic stop (for capacity control).
- ⑪ **LOAD** LED Lamp (green)
  - It lights green while the motor is running.
- ⑫ **LOCAL** LED Lamp (green)
  - It lights green when the local mode is selected.
- ⑬ **STOP** LED Lamp (red)
  - It lights red when the compressor has stopped.
- ⑭ **START** LED Lamp (green)
  - It lights green when the compressor is running.
  - It blinks during the alternate operation.

The LED lamps above indicate various conditions of the compressor by combination of lighting and blinking.

Refer to the next section for details.

## 2 LED Lamp Indications

The LED lamps indicate various conditions of the compressor by combination of lighting and blinking.

condition		LED Lamp (●: Lighting ◎: Blinking)								
		POWER	START	STOP	MAINTENANCE	CAUTION	EMERGENCY	AUTO START	LOAD	LOCAL
Operating	Normal Operation (Load)	●	●						●	
	Normal Operation (Unload) [Note:4]	●	●							
	Normal Stop	●		●						
	Condensate Drain [Note:4]	●	●							◎
	Standby Mode (Unload)	●	◎							
	Cooling Operation	●	◎	●						
Alarm	Maintenance	●			●					
	Alarm	●				●				
	Emergency Stop	●		●			●			
	The dryer restart , or signal is ON for "operate at dryer failure" [Note: 1]	●				◎				
	More than 100 hrs. elapsed after recent maintenance caution	●			●	◎				
Standby Mode	Capacity Control Stop (unload stop) [Note: 2]	●	●						◎	
	Pre-operation of Dryer.	●	●						◎	
	Releasing Internal Pressure (after startup)	●	●						◎	
	Alternate operation Group control operation [Note:4]	●	◎	●						
	Restart operation	●	●	●					◎	
Settings	Weekly Timer	●						●		
	Local Mode	●								●
	Remote Mode	●								
	Automatic Operation Mode [Note: 3]	●						●		
	Manual Operation Mode [Note: 3]	●								

[Note:1]

When the operation at dryer error is on, the dryer will restart a fixed time (Dryer restart) before issuing a dryer error alarm.

[Note: 2]

This will stop the motor when air consumption decreases sharply and the discharge pressure exceeds the auto stop pressure value.

To drain the condensate, the compressor shall keep operating and then it will perform capacity control stop.  
(unload stop).

Suction throttle equipped models don't have the function of capacity control stop (unload stop)

[Note: 3]

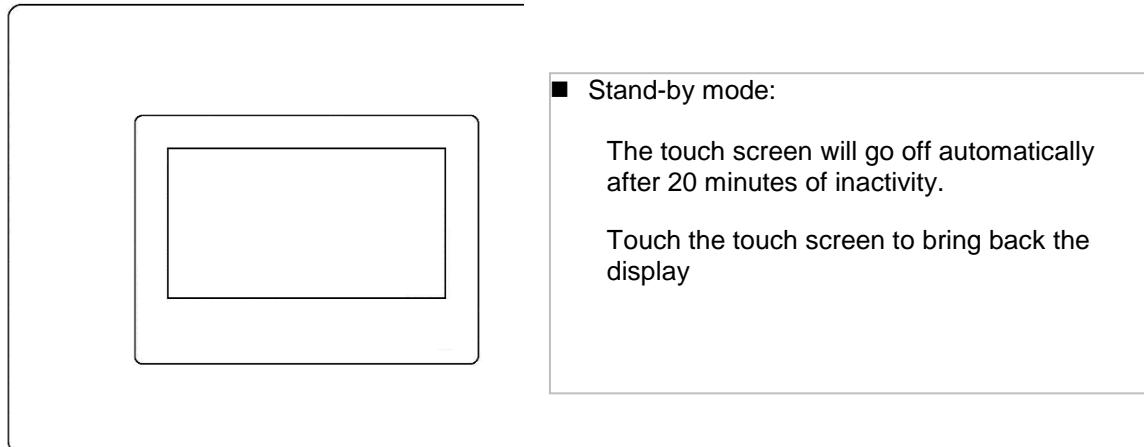
Only for standard model.

[Note: 4]

Suction throttle equipped models don't unload with the condensate drain and group control.

### 3 Touch Screen Operation

The settings of active/inactive, Yes/No, can be selected, and activated by the reset tab on the touch screen.



#### ■ Buttons and keys on the touch panel

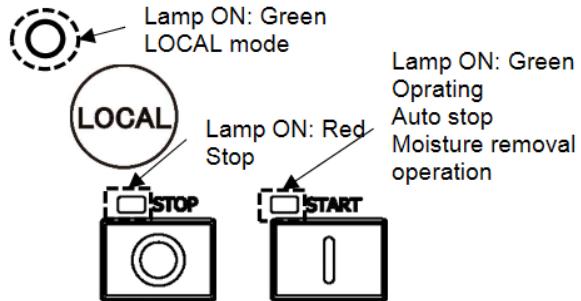
	Screen transition tabs	Menu tabs are shown on the bottom of the screen. Tap a tab to open its screen.
	Back tabs	Return to the previous screen.
	Edit tab	Open the edit screen.
	Arrow keys	Scroll the screen.
	Function select tabs	Activate or inactivate functions
	Enter tab	Enter editing and input data.
	Icons	Open the screen to edit
	On-screen Keypad	Enter and modify values by on-screen keypad. [Keys] <ul style="list-style-type: none"><li>➤ ESC: Escape, back to the previous screen.</li><li>➤ CLR: Clear</li><li>➤ ENT: Enter</li><li>➤ BS: Backspace</li><li>➤ Arrow keys: moves cursor for digits.</li><li>➤ DEL: Delete</li><li>➤ CANCEL: can cancel or reset operation.</li></ul>

## 4 Start and Stop the Compressor

### 4.1 Local Mode

Start and stop the compressor with START and STOP buttons on the operation panel.

- Start and stop the compressor with the start and stop buttons.
- In the Local mode, the remote mode signals are inactive. (Inactivate: remote startup, remote stop)
- LED lamps indicate operating condition as shown right.



### 4.2 Weekly Timer in Local Mode

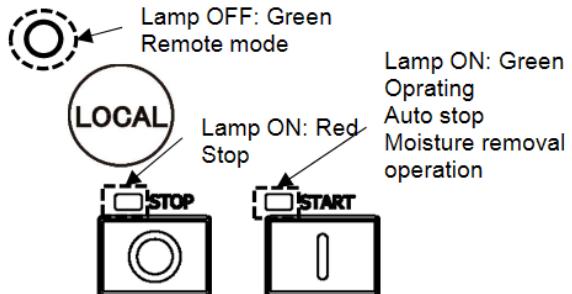
Automatic start and stop of the compressor by weekly timer setting.

- Set the start time and stop time, and activate the weekly timer for automatic start and stop of the compressor.
- Maximum seven settings can be registered.

### 4.3 Remote Mode

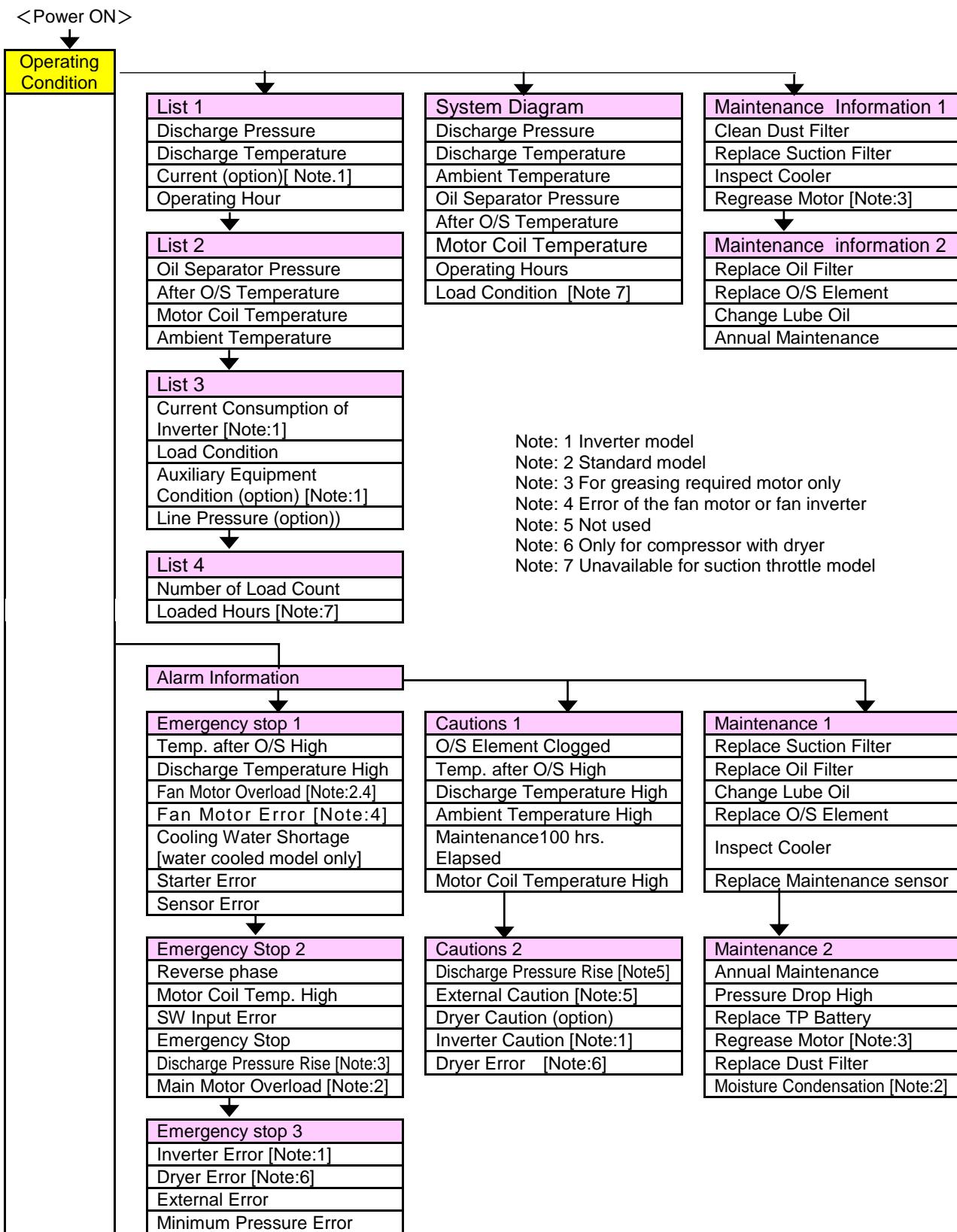
Start and stop the compressor with the signal of the remote start and the remote stop.

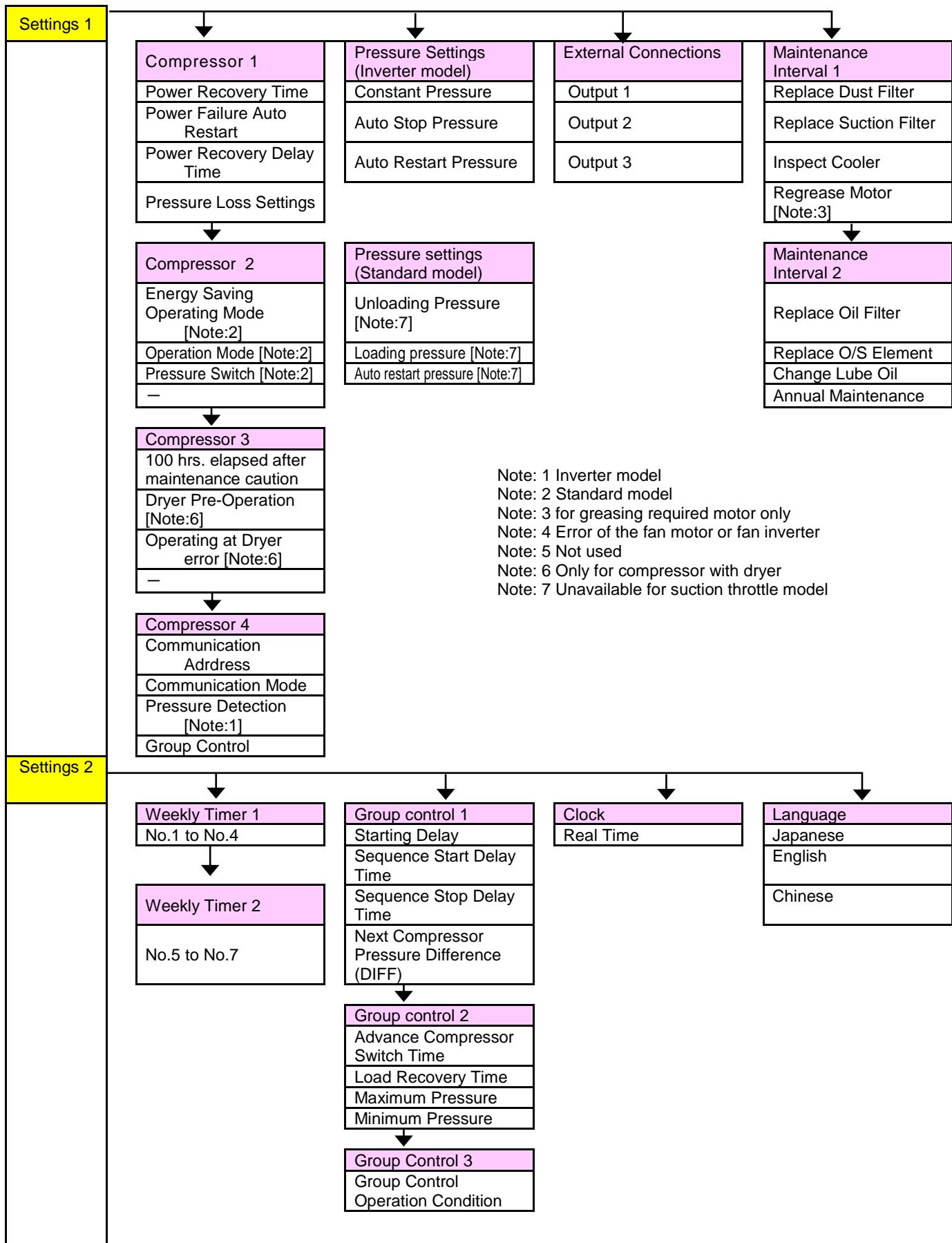
- The compressor will be started by remote start signal (one-shot on signal) and stopped by remote stop signal (one-shot off signal)
- In the remote mode, you can stop the compressor with the stop button on the monitor operation panel.
- LED lamps indicate operating condition as shown right.

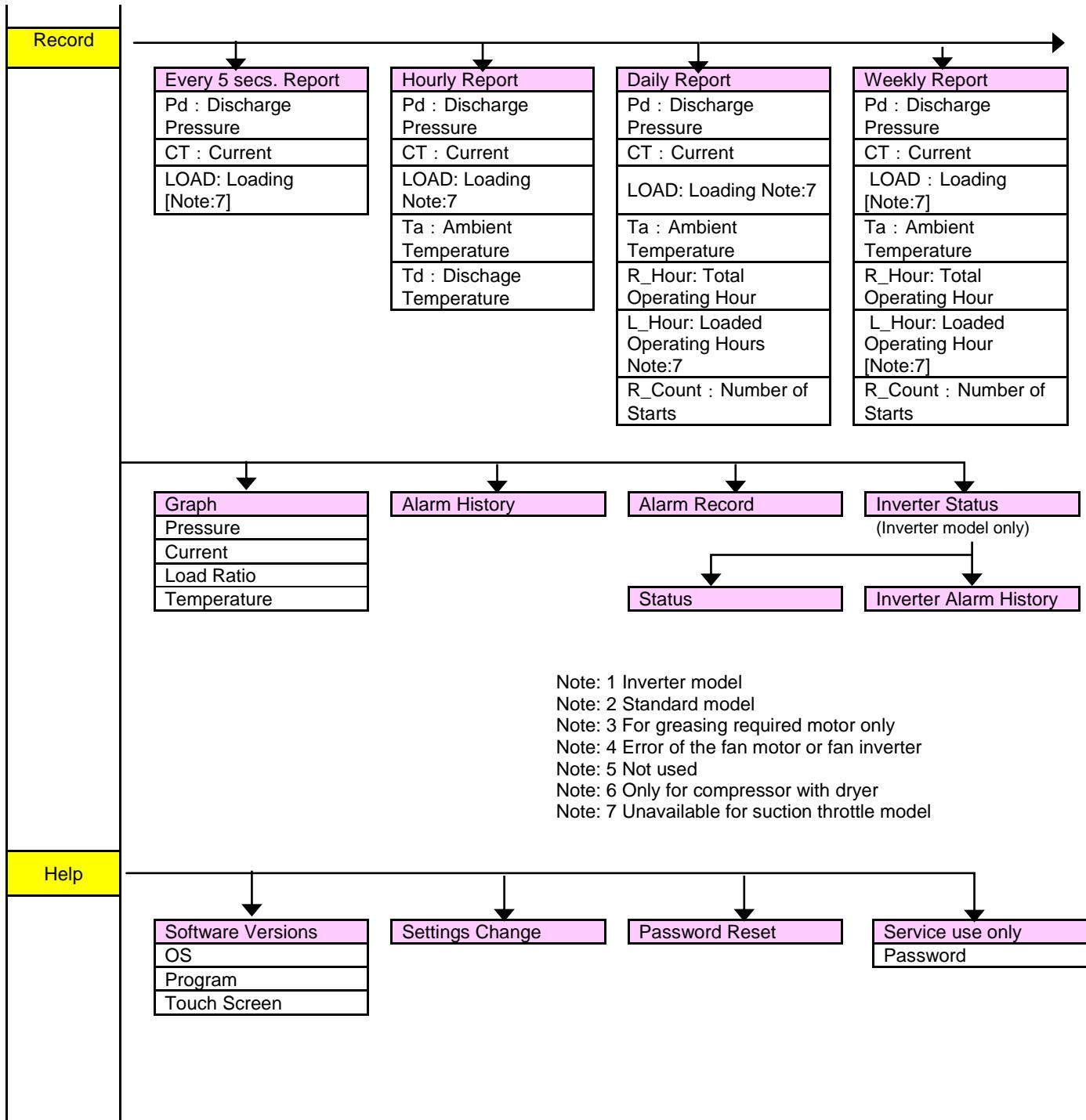


## 5 Menu Screen Flow

The screen will display information shown in the following diagram.







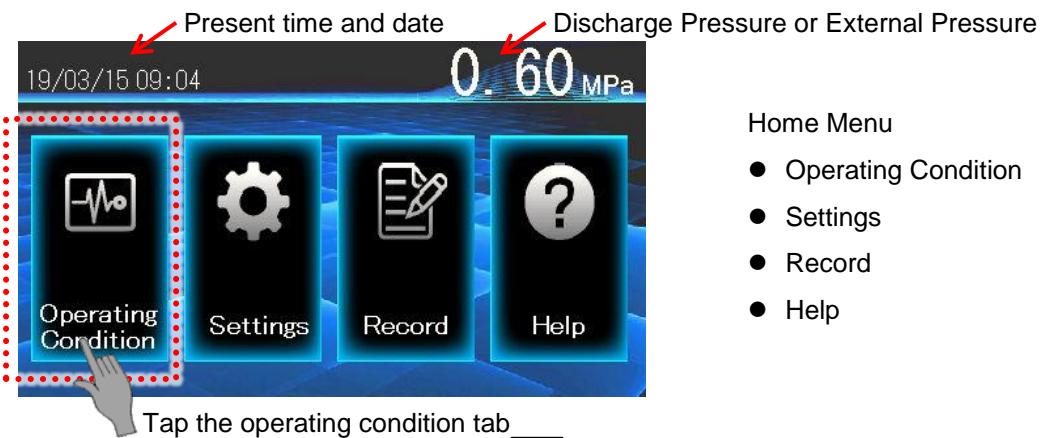
## 6 Home Screen

All functions as shown in chapter 5 can be accessed from the home screen.

The following screen will appear on the touch screen when the power is turned on.

### ■ Menu Screen

Tap an icon to access functional details and parameters as shown in chapter 5 “Menu Screen Flow”.

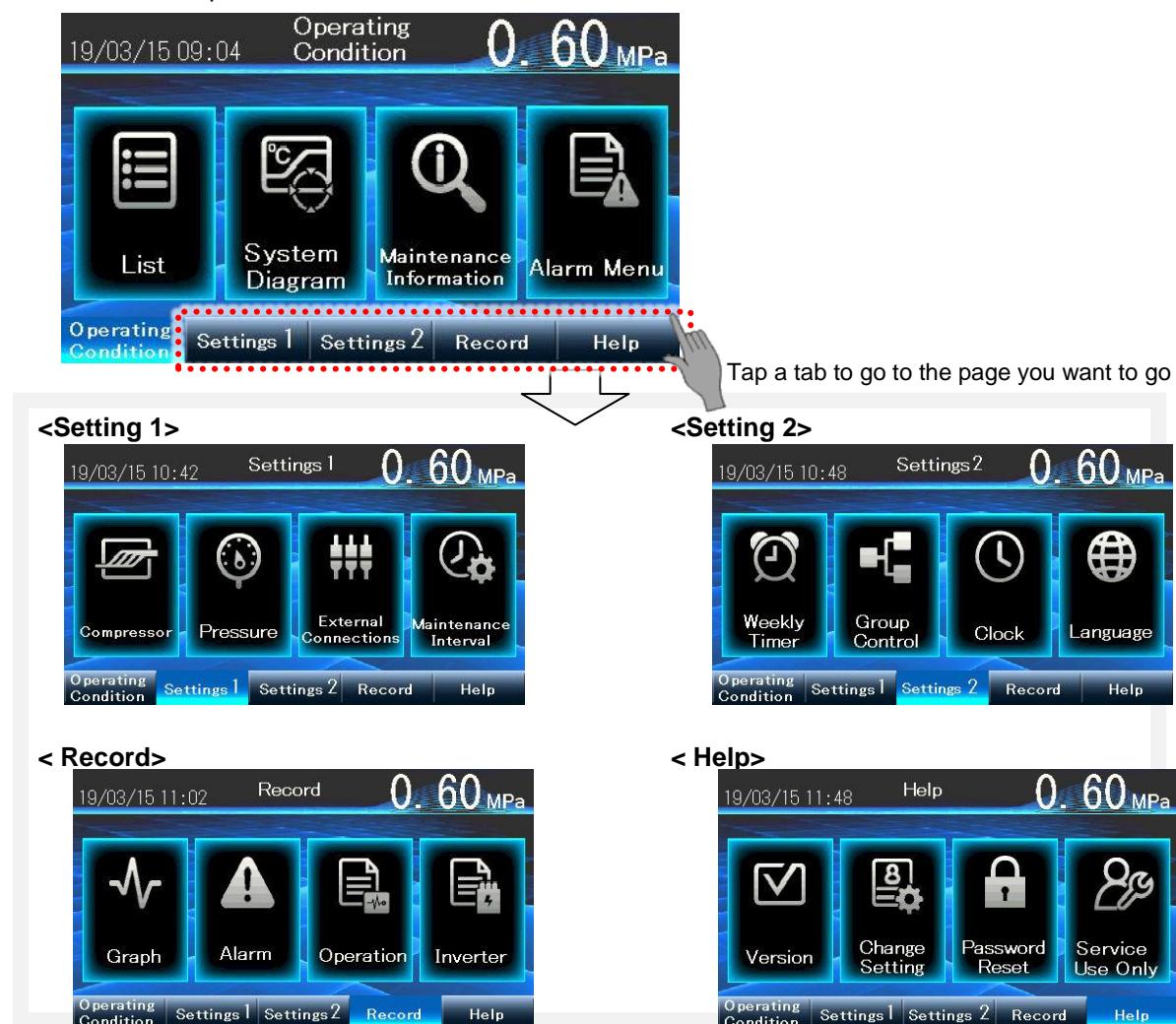


### Home Menu

- Operating Condition
- Settings
- Record
- Help

### ■ Operating Condition Screen

See next chapter 7



# 7 Operating Condition

Tap a tab on the operating condition screen to view the below menu.



## 7-1 List

### 7-2 System Diagram

### 7-3 Maintenance Information

### 7-4 Alarm Menu

1. Emergency Stop (EMS)
2. Caution
3. Maintenance

## 7.1 List



### ■ On [List] screen, the following functions will be displayed in real time.

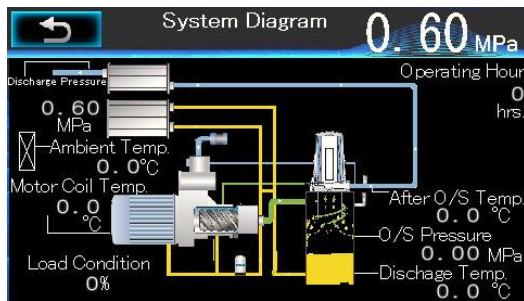
using keys, scroll pages.

- Discharge Pressure
- Discharge Temperature
- Current (option, for Inverter model)
- Operating Hour (total hours)
- Load Condition  
(Ratio of the rated rotation speed of main motor)
- Auxiliary Equipment Condition (for Inverter model only)
- Inverter Consumption Current (for Inverter model only)
- Line Pressure (option)
- Oil Separator (O/S) Pressure
- After O/S Temperature
- Motor Coil Temperature
- Ambient Temperature
- Number of Load Counts
- Loaded Hours Note:1

Note:1: not available for suction throttle model (option)

## 7.2 System Diagram

On this screen, the following functions will be displayed in real time.



- Discharge Pressure
- Ambient Temperature
- Motor Coil Temperature
- Load Condition Note:1
- Operating Hours
- After O/S Temperature
- O/S Pressure
- Discharge Temperature

Note:1: not available for suction throttle model (option)

## 7.3 Maintenance Information

On this screen, the following functions will be displayed



- Clean Dust Filter
- Replace Suction Filter
- Inspect Cooler
- Regrease Motor  
(grease required motor only)



- Replace Oil Filter
- Replace O/S Element
- Change Lube Oil
- Annual Maintenance

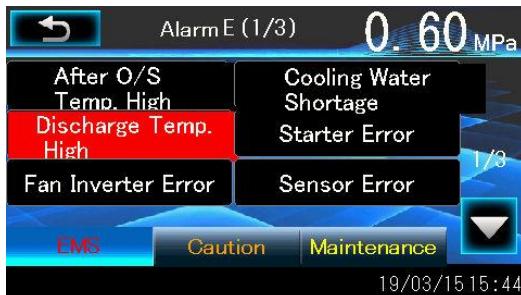
Tap the zero reset tab to reset.

See chapter 12-4-1 "How to reset the maintenance timers".

## 7.4 Alarm Menu

### 7.4.1 Emergency Stop

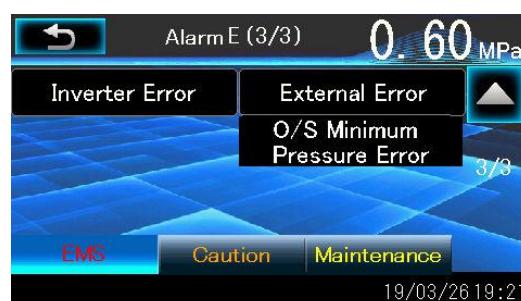
On this screen, the following functions will be displayed in real time.  
Items, which have been recently detected failures, will be highlighted.



- After O/S Temperature High
- Cooling Water Shortage [for water cooled model]
- Discharge Temperature High
- Starter Error
- Fan Motor Error [for standard model]
- Fan Inverter Error [for inverter model]
- Sensor Error
  
- Reverse Phase
- Emergency Stop (manual) (with the emergency stop pushbutton)
- Motor Coil Temperature High
- Discharge Pressure Rise (not used)
- SW Input Error

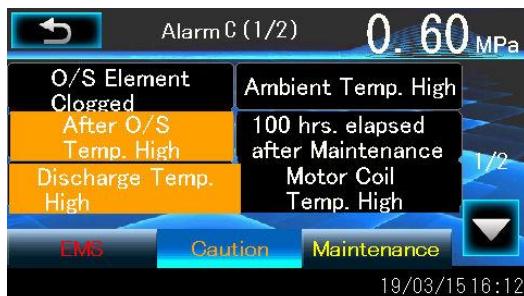


- Inverter Error [for inverter model]
- External Error
- Dryer Error [for compressor with dryer]
- O/S Minimum Pressure Error
- Main Motor Overload [for standard model]
- Fan Motor Overload [for standard model]



### 7.4.2 Caution

On this screen, the following functions will be displayed in real time.  
Items, which have been recently detected failures, will be highlighted



- Oil Separator (O/S) Element Clogged
- Ambient Temperature High
- After O/S Temperature High
- 100 hrs. elapsed after Maintenance
- Discharge Temperature High
- Motor Coil Temperature High



- Discharge Pressure Rise (not used)
- Inverter Caution [for inverter model]
- Dryer Error [for compressor with dryer]
- External Cautions (not used)
- Dryer Caution (option)

### 7.4.3 Maintenance

On this screen, the following functions will be displayed in real time.  
Items, which have been recently detected failures, will require maintenance



- Replace Suction Filter
- Replace O/S Element
- Replace Oil Filter
- Inspect Cooler
- Change Lube Oil
- Replace Sensor



- Annual Maintenance
- Regrease Motor [grease required motor only]
- Pressure Drop High
- Clean Dust Filter
- Replace TP Battery
- Moisture Condensation [for Standard model only]

## 8 Setting Menu



■ Tap the setting 1 tab on the screen to display following settings.

- 8-1. Compressor
- 8-2. Pressure
- 8-3. External Connection Setting
- 8-4. Maintenance Interval
- 8-5. Weekly Timer
- 8-6. Group Control
- 8-7. Clock
- 8-8. Language

### 8.1 Compressor



■ On the Compressor setting screen, the following item values can be set or modify.

using keys, scroll pages.

1. Power Recovery Time
2. Power Failure Auto Restart
3. Power Recovery Delay Time
4. Pressure Drop Settings
5. Energy Saving Operating mode (Standard model only)
6. Operation mode (Standard model only)
7. Pressure Switch
8. Drain Start
9. 100 hrs. elapsed after maintenance caution
10. Dryer Pre-Operation (for compressor with dryer)
11. Operation at Dryer Error (for compressor with dryer)
12. Communication Address
13. Communication Mode
14. Pressure Detection (Inverter model only)
15. Group Control Operation

Continued from the previous page

Tap these tabs to select [Active /Inactive] or [Yes / No]

Tap a value to edit by the on-screen keypad.  
The values can be changed by the keypad.

[Keypad operation]

To enter a value, tap keys of the on-screen keypad.

Escape (ESC) Clear (CLR)  
Enter (ENT) Back Space (BS)

Escape (ESC) can cancel input.

**<compressor 1/4>**

### 1. Power Recovery Time

[Default: Inactive 0.1 seconds]

Setting Range: 0.1 to 0.5 seconds for Inverter model  
0.1 to 0.3 seconds for Standard model

- ◊ If the instant power failure occurred and power is restored within the set time.
- ◊ By setting active, the compressor restarts automatically after the power is recovered.
- ◊ The compressor will stop when set as inactive.

### 2. Power Failure Auto Restart

### 3. Power Recovery Delay Time

[Default: Inactive]

- ◊ Set as active or inactive to automatically restart the compressor when power outage recovered within the set time. When you set it active, you can reset time as follows,

#### ● Power Failure Auto Restart

[Default: 1 second]

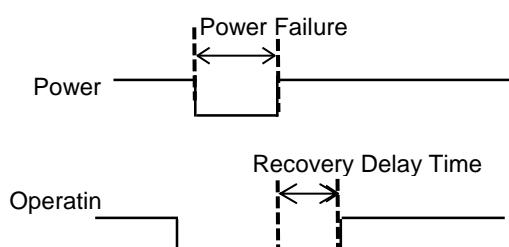
Setting Range: 1 to 20 seconds.

#### ● Power Recovery Delay Time

[Default: 5 seconds]

Setting Range: 5 to 300 seconds

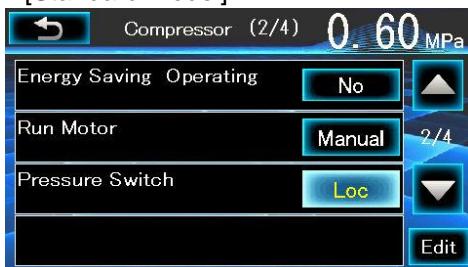
- ◊ Set the standby time between recovery from power failure and automatically restart of the compressor.
- ◊ In inactive mode, compressor will not restart automatically.



**4. Pressure Drop Setting****[Default: 0.00 MPa]**

- Setting Range: 0.00 to 0.11 MPa
- ❖ The set value [Pressure Drop High] listed in the maintenance alarm menu can be changed.
  - ❖ This function is inactive when the setting is 0.00 MPa.

[Standard model]



[Inverter model]

**5. Energy Saving Operating Mode****[Default: No]**

- for Standard model only
- ❖ [Yes] is selected, energy saving operation mode is active keeping the compressor discharge pressure higher than the loading pressure and automatically reduce unload pressure
  - ❖ The compressor usually starts loading with loading pressure, and starts unloading with unloading pressure. When the energy saving operating mode is active, the compressor is unloaded with the set time of energy saving operating mode [setting value: 30 seconds. (fixed), even if the compressor discharge pressure is lower than the unloading pressure.
  - ❖ Keeping the compressor discharge pressure higher than the auto restart pressure and repeating the cycle of load and unload operation, this mode functions to save energy

☞ Note: Default set [No] of the unload pressure specification cannot be changed to [Yes]

**6. Operation mode****[Default: Auto]**

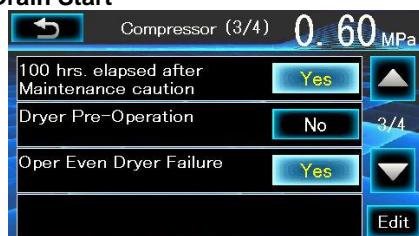
- for Standard model only
- ❖ [Auto] mode: automatic start and stop by pressure and load ratio.
  - ❖ [Manual] mode: Manually starting and stopping by pressing the start button and the stop button.
  - ❖ Automatic start and stop of operation mode is active in the local mode only.

☞ Note: Default set [Auto] of the unload pressure specification cannot be changed to [Manual] mode.

**7. Pressure Switch****[Default: Local]**

- for Standard model only
- ❖ You can select whether load operation or unload operation is performed by the pressure sensor in the compressor unit or load operation command (ON: Load OFF: Unload) from outside the compressor unit.
  - ❖ [Auto] mode: Pressure switch selection affects the remote or local mode switch.
  - ❖ [LOC] local mode: Switch load or unload operation with the built-in pressure sensor.
  - ❖ [REM] remote mode: Switch load or unload operation by external command of the load operation.

☞ Note: Default set [LOC] of the unload pressure specification cannot be changed.

**8. Drain Start****9. 100 hrs. elapsed after maintenance caution issued****[Default: Yes]**

- ❖ Select either [Yes] or [No] to indicate the alarm of informing you that more than 100 hours elapsed after the maintenance caution occurred.
- [Yes]: Alarm will be indicated.
- [No]: Alarm will not be indicated.

**10. Dryer Pre-Operation**

[Default: No]

for dryer model only

- ❖ You can select [Yes] or [No] to activate the dryer pre-operation.
- ❖ This will function if dew point exceeds the set value at the compressor startup.  
 [Yes]: The dryer starts running first, and three minutes after, the compressor will start operating.  
 [No]: The dryer and the compressor will start operating together.

**11. Operation at Dryer Failure**

[Default : Yes]

for dryer model only

- ❖ You can select either [Yes] or [No] to keep the compressor operating or not.
- ❖ [Yes]: The compressor keeps operating when dryer failure occurred.
- ❖ [No]: The compressor stops operating when dryer failure occurred as an emergency stop.

**12. Communication address settings**

[Default: 0]

for Inverter model

[Default: 1]

for Standard model

- ❖ Communication address can be set. Restart the machine to activate address setting.

Range of values

Set the address within the following range

[LINK]	...	0 to 7
[MODBUS]	...	1 to 31
[KOBELION]	...	1 to 31

☞ Note: Make sure to set different communication code in the machines connected respectively  
 The overlapping of the codes causes improper operation.

**13. Communication mode**

[Default: LINK]

- ❖ Communication mode can be set. Restart the machine to activate settings.

[LINK]	LINK communication for group control operation or pass-through operation.
[MODBUS]	Modbus communication.
[KOBELION]	Group control operation. (for the model with KOBELCO's group control board)

**14. Pressure Detection**

[Default: COMP]

for inverter model only

- ❖ Pressure detection position is set to reset the control pressure of [COMP] and [LINE]

[COMP]	Discharge pressure of the compressor
[LINE]	External Pressure (option)

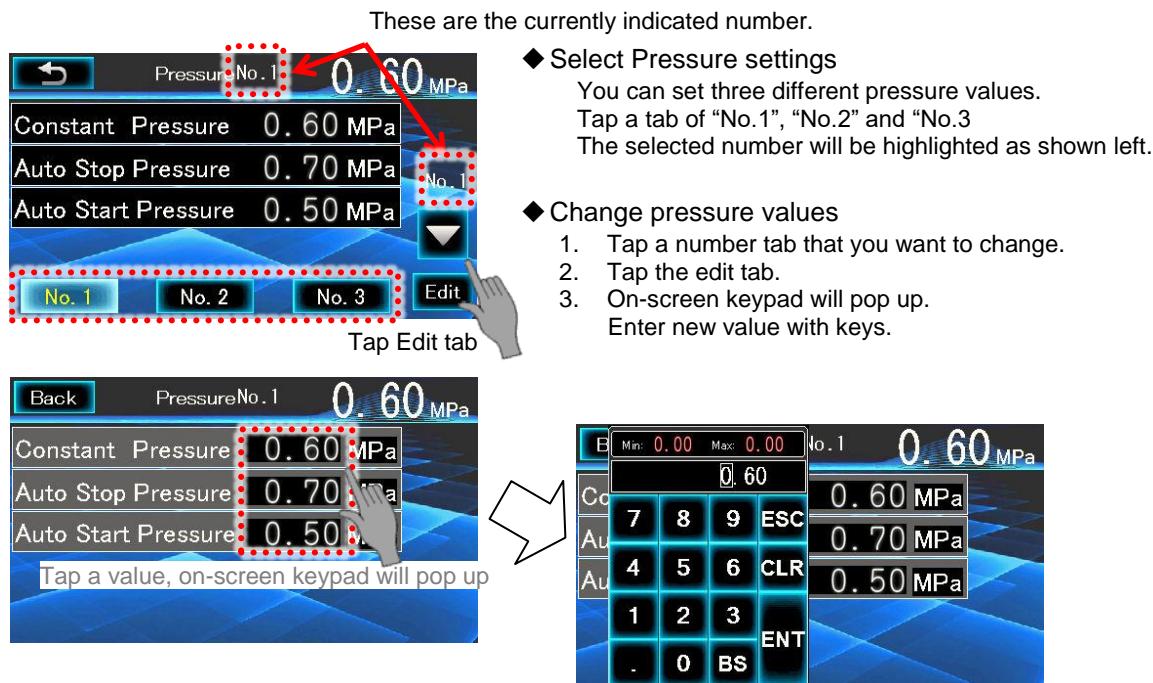
**15. Group control**

[Default : NO]

- ❖ For group control, Select either [Yes] or [No] to activate group control, and set the mode with [Advance Unit Fixed] [KL I · II] [VS II · III] or [SG II · III]

## 8.2 Pressure

The pressure setting value can be changed on the screen [Pressure] settings.



### For standard model

#### **Unloading Pressure**

This setting is for unloading. The compressor will start unloading when the discharge pressure exceeds the set value.

#### **Loading Pressure**

This setting is for loading. The compressor will start loading when the discharge pressure becomes lower than the set value.

#### **Auto Restart Pressure**

This setting is for auto restart compressor. Set pressure value as below

Unloading pressure > Loading pressure > Auto restart pressure

The difference between unloading pressure and loading pressure as the discharge valve "ON" - "OFF" and the period shall last 30 seconds or longer.

※ Note: Above items are not indicated for suction throttle equipped model.

### For inverter model

#### **Constant pressure**

This keeps the pressure constant.

#### **Auto Stop Pressure**

This pressure is to stop the compressor automatically.

The motor will stop when the air consumption extremely decreases and the pressure exceeds the set value even the motor is running at the minimum speed.

#### **Auto restart pressure**

This pressure is to restart the compressor automatically. Set pressure value as below

Auto stop pressure > Constant pressure > Auto restart pressure

## Setting Range

### ■ Standard model [MPa]

Spec.	Contents	Default	Set Range
0.75 MPa	Unloading pressure	0.70	0.56 to 0.75
	Loading Pressure	0.55	0.55 to 0.74
	Auto Restart	0.50	0.30 to 0.73
0.85 MPa	Unloading pressure	0.80	0.56 to 0.85
	Loading Pressure	0.65	0.55 to 0.84
	Auto Restart	0.60	0.30 to 0.83
1.05 MPa	Unloading pressure	0.95	0.56 to 1.05
	Loading Pressure	0.80	0.55 to 1.04
	Auto Restart	0.75	0.30 to 1.03

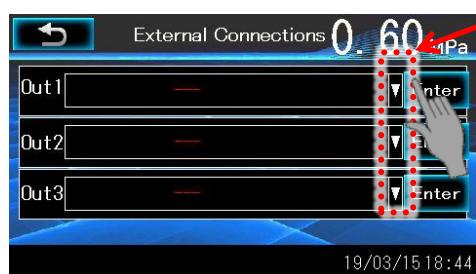
### ■ Inverter model [MPa]

Spec.	Contents	Default	Set Range
0.80 MPa	Constant Pressure	0.60	0.40 to 0.85
	Auto Stop Pressure	0.70	0.41 to 0.86
	Auto Restart Pressure	0.55	0.30 to 0.84

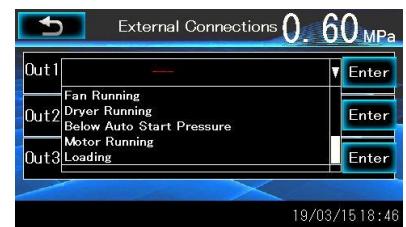
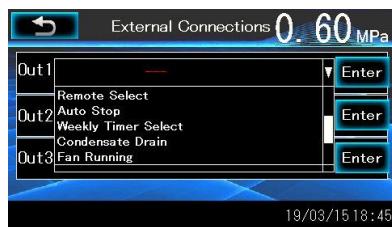
## 8.3 External Connection

for Inverter model only

On the screen, select an item select the item to send output signal via contact terminal. (3 terminals).



Tap the key to display the pull-down menu.  
Select the item to set as output to the contact terminal.  
Tap the enter tab to register the selected signal to set as output.  
Signals are listed in the pull-down menu as belows.



- 1. Operating
- 2. Emergency Stop
- 3. Cautions
- 4. Maintenance
- 5. Remote Selection
- 6. Auto Stop
- 7. Condensate drain is in process
- 8. Fan running
- 9. Dryer running
- 10. Less Auto Start Pressure
- 11. Weekly timer is active
- 12. Motor operating

## 8.4 Maintenance Interval

On the screen, you can set the following items.



- Clean Dust Filter
- Replace Suction Filter
- Inspect Cooler
- Regrease Motor
- (grease required motor only)



- Replace Oil Filter
- Replace O/S Element
- Change Lube Oil
- Annual Maintenance

Tap the edit tab to go to the edit screen.



Tap a value to edit by the on-screen keypad.  
The values can be changed by the keypad.



Maintenance	Interval Hours		
	Default	Minimum	Maximum
Clean Dust Filter	500	0	500
Replace Suction Filter	6000	0	3000
Inspect Cooler	6000	0	6000
Regrease Motor [grease required motor only]	2000	0	2000
Replace Oil Filter	6000	0	6000
Replace O/S Element	6000	0	6000
Change Lube Oil	6000	0	12000
Annual Maintenance	6000	0	6000

## 8.5 Weekly Timer

On the screen, you can set the specified time for auto start and auto stop of the compressor. Seven different settings are available.

☞ Note: Select pressure in pressure settings.

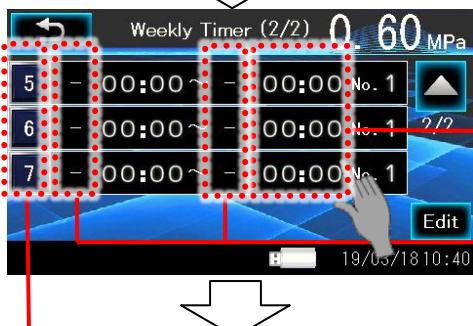
The highlighted numbers in the left line are active.



Tap the Edit tab to go to the edit screen.



Setting of the start and the stop time  
You can set the start time and stop time and select "Active" or "Inactive" of each setting.



Tap these fields to display the on-screen keypad, and to go setting screen for start time and stop time.

Tap these fields to go to the setting screen for the first day of the week and the last day. The day keys will pop up.

Tap these fields to change function to be active or inactive.

Note: If both of the first day of week and the last day of week are "-", function can be changed to be active.

Select the day that you want to set as first day of week and the last day of week.

The selected day will highlighted.

Tap the OK key to enter.

Tap the highlighted key again to cancel it.

☞ Note: when no key is selected, "-" indicates and the function is inactive.

Set start time and stop time by using the keypad.

### Time Setting Range

	Minimum	Maximum
STEP 1 to 7	00:00	23:59



## 8.6 Group Control Setting

On the screen, you can set the pressure and the time required for the group control operation of the compressor

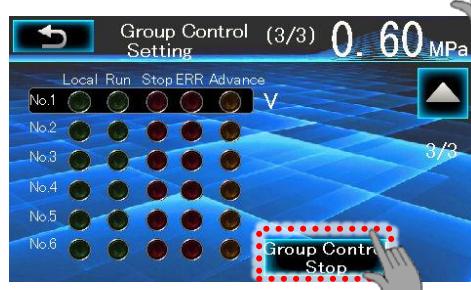
The setting procedures are the same as the compressor settings.



1. Starting Delay
2. Sequence Start Delay Time
3. Sequence Stop Delay Time
4. Next Compressor Pressure Difference



5. Advance Compressor Switch Time
6. Load Recovery Time
7. Maximum Pressure
8. Minimum Pressure



Tap the Edit tab to go to the edit screen.

### Group Control Stop

(communication address: 0 only)

This function can stop all of operating compressors under automatic group control operations.

☞ Note: Refer to Auto Group Control Operation Manual for the group control

☞ Note: This is not available for Suction throttle equipped model (option)



Tap these tabs to display the on-screen keypad, and change values by using the keys



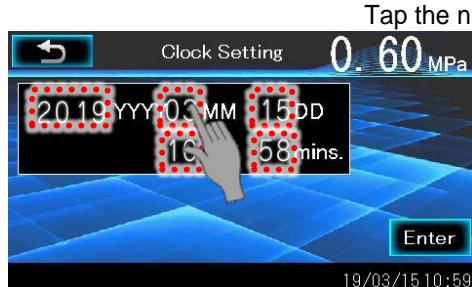
1. **Starting Delay Time** [Default: 5 minutes]  
Setting Range: 2 to 10 minutes  
Set the delay time to start the first (advanced) compressor alone and to prevent other compressors from starting operations when the group control operations get started.
2. **Sequence Start Delay Time** [Default: 2 minutes]  
Setting Range: 1 to 5 minutes  
Set the time to delay starting the next compressor after the first compressor started operating when the air consumption increases or the pressure decreases.
3. **Sequence Stop delay time** [Default: 2 minutes]  
Setting Range: 1 to 5 minutes  
Set the time to delay stopping the next compressor after one compressor stopped operating when the pressure increased.
4. **Next Compressor pressure Difference (DIFF)** [Default: 0.02 MPa]  
Setting Range: 0.01 to 0.20 MPa  
This is to control for full load operation of the next compressor adding the different pressure value to the set pressure value as below.

Constant pressure + Next Compressor pressure DIFF  $\geq$  Auto stop pressure

5. **Advance Compressor Switch Time** [Default: 0 minute]  
Setting Range: 0 to 30000 minutes  
Set time to switch the advanced compressor to the other compressor. This prevents the advanced compressor from operating too long by forcefully starting the next compressor.  
This function is inactive at the set time 0 minute.
6. **Load Recovery Time** [Default: 8 seconds]  
Setting Range: 5 to 99 seconds  
After unloading, the compressor will load again within the load recovery time under the maximum pressure
7. **Maximum pressure** [Default: 0.65 MPa]  
Setting Range: 0.01 to 1.06 MPa  
At this pressure, the advanced compressor will unload and stop, and the next compressor will be a new advanced compressor.
8. **Minimum pressure** [Default: 0.55 MPa]  
Setting Range: 0.01 to 1.06 MPa  
The pressure exceeds the minimum pressure, the next compressor will start.

## 8.7 Clock

On the clock setting screen, reset date (year-month-day) and time that is indicated at the bottom of the screen.



Tap the numbers to display the on-screen keypad.



Change the date and time with the keys.

Enter the date and time.

Tap the enter key to register the reset data.

The built-in clock has a time error, which are -120 to 120 seconds per month depending on temperature or running hours.

Check the clock regularly to keep it accurate in case it is used in the system where the time errors will cause problems.

## 8.8 Language

Language options.



Japanese, English and Chinese can be selected on the language screen.

## 9 Group Control Operation

NGSC-430 controller can perform an automatic group control operation for a maximum of six compressors that are connected together by circuit.

KOBELION VS II/III and SG II/III can perform an automatic group control operation for a maximum of two compressors that are connected together.

The combination of NGSC700, 430 and 200 is available. Some types of compressors are not compatible.

Refer to "Automatic Group Control Operation Manual for the combination of machine type, wiring method and setting of the controller.

 Note: This is not available for Suction throttle equipped model (option)

### Outline

The group control functions an energy-saving operation for multiple compressor operations, automatically selecting an optimal number of compressors running according to the amount of the air consumption.

### Control methods

#### **1. Endless control**

This is the basic function of the group control. The number of the compressor shall be accordingly controlled within the adjustment range (minimum and maximum) of the pressure switch.

This is also to equalize operating hours by automatically starting and stopping the compressors consecutively according to the amount of air consumption.

#### **2. Skip control**

One of the group-controlled compressors breaks down, which shall be disconnected from the endless control as a skip compressor.

#### **3. Start Delay**

This is to control the advanced compressor to operate alone within the setting time in order to prevent other compressors from operating consecutively, when the pipe and the air tank at downstream of the compressor has no compressed air at startup of the group control.

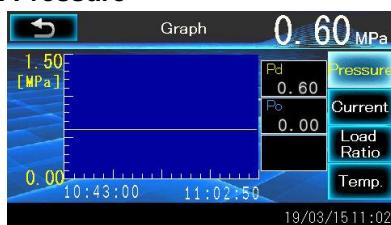
# 10 Record Menu

Tap tabs on the setting menu screen to view the following screen.



## 10.1 Graph

### 1. Pressure



### 10-1 Graph

1. Pressure
2. Current
3. Load Ratio
4. Temperature

### 10-2 Alarm

1. Alarm History
2. Alarm Record

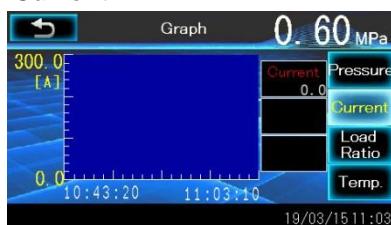
### 10-3 Operation

1. every 5 seconds
2. Hourly Report
3. Daily Report
4. Weekly Report

### 10-4 Inverter

- (for inverter model only)
1. History
  2. Alarm Record

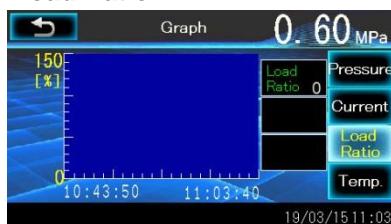
### 2. Current



On this screen, graph is displayed showing Pressure data updated every five seconds for recent 20 minutes record.

- Discharge Pressure (Pd)
- Oil Separator Pressure (Po)

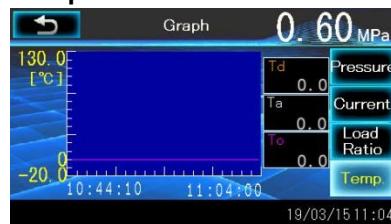
### 3. Load Ratio



On this screen, graph is displayed showing Current data updated every five seconds for recent 20 minutes record.

- Current

### 4. Temperature



On this screen, graph is displayed showing Load Ratio data updated every five seconds for recent 20 minutes record.

- Load Ratio

On this screen, graph is displayed showing Temperature data updated every five seconds for recent 20 minutes record.

- Td: Discharge Temperature
- Ta: Ambient Temperature
- To: Oil Separator Temperature

## 10.2 Alarm

### 1. Alarm History

On the screen, the recent alarm history is shown.

The highlighted items are current alarms.



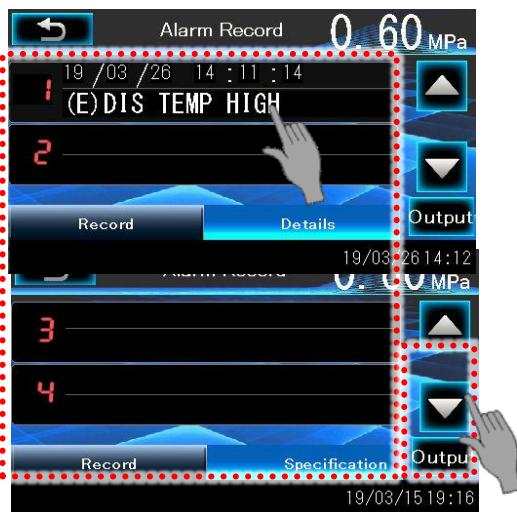
Tap the arrow key to scroll the screen



Tap the record or specification tab to scroll the screen

### 2. Alarm Record

On the screen, the recent four problems are recorded and indicated.

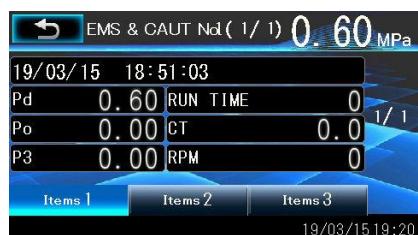


Tap these tabs to go to the screen for details of the problems.

Tap the arrow key to scroll the screen

### < Emergency and Caution Number >

The data are recorded every five seconds for two minutes. .



## 10.3 Operation Report

### 1. Every 5 seconds Report

You can see the items below on the screen recorded every five seconds for two minutes.



- Discharge Pressure (Pd)
- Current (CT)
- Load Condition (LOAD)

Note:

When the USB flash drive is plugged in, will be displayed.

Tap the output tab to upload the data into a USB flash drive.  
(See page 10-5)

### 2. Hourly Report

The data below on the screen are recorded per hour for 24 hours.

The data will be updated at the end of every hour.



- Discharge pressure (Pd)
- Ambient Temperature (Ta)
- Current (CT)
- Discharge Temperature (Td)
- Load Condition (LOAD)

### 3. Daily Report

The data below on the screen are recorded daily for 28 days.

The data will be updated every day at 23:59.

When the power is off, the data will be updated at startup after the date is being changed.



- Discharge Pressure (Pd)  
[the maximum value of the day]
- Current (CT)  
[the maximum value of the week]
- Loading (LOAD)  
[the average value of the day] [Note: 1]
- Ambient Temperature (Ta)  
[the maximum value of the day]
- Loaded Hours (L-Hour)
- Operating Hours (R-Hour)  
[Total operating hours]
- Number of Starts (R-Count)

### 4. Weekly Report

The data below on the screen are recorded weekly for four weeks.  
 The data will be updated on the last day of week at 23:59.  
 When the power is off, the data is not updated. When the power is on the data will be updated after changing the day.

Weekly Report (1 / 1)		0.60 MPa
19/03/15 15:40:53	Ta	0.0°C
Pd	0.00 MPa	L_Hour 0
CT	0.0 A	R_Hour 0
LOAD	0 %	R_Count 0
Every 5 Secs.	Hourly Report	Daily Report
		Weekly Report
		Output
19/03/15 15:43		

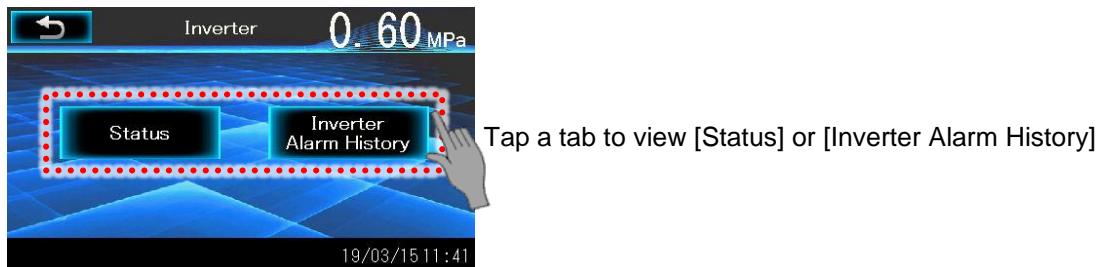
 Note:

This item is not indicated for suction throttle equipped model.

- Discharge pressure (Pd)  
[the maximum value of the week]
- Current (CT)  
[the maximum value of the week]
- Loading (LOAD)  Note  
[the average value of the week]
- Ambient Temperature (Ta)  
[the maximum value of the week]
- Loaded Hours (L-Hour)  Note
- Total Operating Hours (R-Hour)
- Number of Starts (R-Count)

## 10.4 Inverter

[Inverter] for Inverter model only



### 10.4.1 Status

You can see the inverter status on this screen.

Status (1/2)		0.60 MPa
Clockwise Rotating	Braking	
Counter-clockwise Rotating	DC LINK Bus Voltage ON	1/2
DC Braking	Torque Limiting	
Shut Down	Voltage Limiting	
		19/03/18 14:07

- Clockwise Rotating
- Braking
- Counterclockwise Rotating
- DC LINK Bus Voltage ON
- DC Braking
- Torque Limiting
- Shut Down
- Voltage Limiting
- Current Limiting

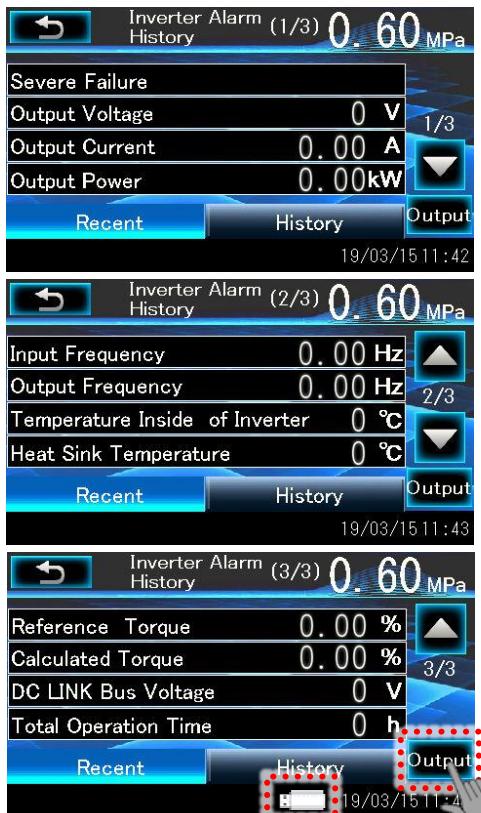
Status (2/2)		0.60 MPa
Current Limiting	Communication Active	
Accelerating	function Code Data Writing	2/2
Decelerating		
Alarm occurred		
		19/03/15 11:42

- Communication Active
- Accelerating
- Function Code Data Writing
- Decelerating
- Alarm occurred

### 10.4.2 Inverter Alarm History

■ **Recent** Recent Inverter alarm statuses are indicated.

Press the emergency stop pushbutton, OH2 emergency stop signal will be recorded.



- Severe Failure
- Output Voltage
- Output Current
- Output Power

- Input Frequency
- Output Frequency
- Temperature inside the Inverter
- Heat Sink Temperature

- Reference Torque
- Calculated Torque
- DC LINK Bus Voltage
- Total Operation Time

☞ Note:

When the USB flash drive is plugged in, will be displayed.

Tap the output tab to upload the data into a USB flash drive.  
(See page 10-6)

■ **History** Inverter alarm history is indicated.  
for Inverter model only



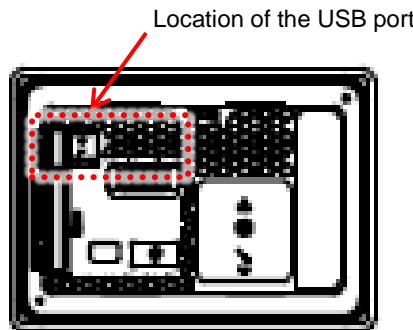
- Previous Error (first)
- Previous Total Operating Hours (first)
- Previous Error (second)
- Previous Total Operating Hours (second)



- Previous Error (third)
- Previous Total Operating Hours (third)
-

## 10.5 Save data into the USB flash drive

Open the front cover on the left side, plug in the USB flash drive in the USB port backside of the control panel.



When the USB flash drive is plugged in, the password window pops up.

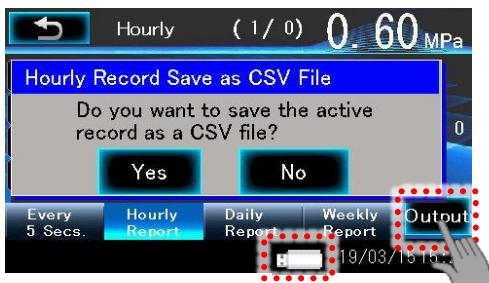
### <Password Input Screen>



Enter password to start uploading the latest operating record.

Enter the same password as the password in page 11-2 (Default: 0000)

### < e.g. Save screen >



◆ Note:

When the USB flash drive is plugged in, will be displayed.

Tap the **Output** tab to save the data as a CSV file.



■ External Connection Status [Standard model] (0: Open 1: Close)

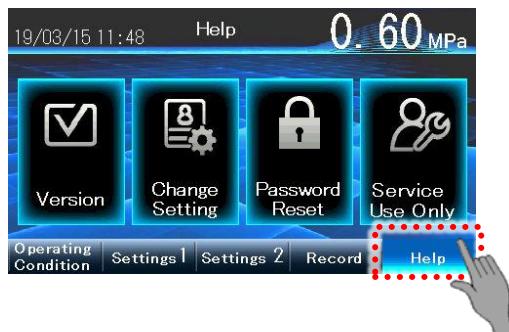
	Terminal
Emergency Stop Switch (b-contact)	(X0)
Suction Indicator	(X1)
Water Shortage Relay	(X2)
Dryer Error	(X3)
Fan Motor Overload	(X4)
Main Response	(X5)
Not used	(X6)
Motor Overload	(X7)
Remote Start	(X8)
Remote Stop (b-contact)	(X9)
Remote Load Signal	(XA)
Remote Error	(XB)
Home/Function Input	(XC)
Dryer Error (option)	(XD)
Not used	(XE)
Not used	(XF)
D I	0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 1
DO	0 0 0 0 1 0 0 0 1 0 0 1 1 0 0 0
Dryer Drain Solenoid Valve	(Y2F)
Not used	(Y2E)
Capacity Control Valve	(Y2D)
Blow-off Solenoid Valve	(Y2C)
Fan Start	(Y2B)
Delta Start	(Y2A)
Star Start	(Y29)
Main Start	(Y28)
Not used	(Y27)
Not used	(Y26)
Dryer Start	(Y25)
Operating	(Y24)
Remote select	(Y23)
Maintenance	(Y22)
Cautions	(Y21)
Emergency Stop	(Y20)

■ External Connection Status [Inverter model] (0: Open 1: Close)

	Terminal														
Emergency Stop Switch (b-contact)	(X0)														
Suction Indicator	(X1)														
Water Shortage Relay	(X2)														
Dryer Error	(X3)														
Fan Inverter Error	(X4)														
Main Inverter Caution	(X5)														
Main Inverter Response	(X6)														
Main Inverter Error	(X7)														
Remote Start	(X8)														
Remote Stop (b-contact)	(X9)														
Remote Load Signal	(XA)														
External Error	(XB)														
Not used	(XC)														
Dryer Error (option)	(XD)														
Not used	(XE)														
Not used	(XF)														
	D I	0	0	0	0	0	0	1	0	0	0	0	0	0	1
	DO	0	0	0	0	1	0	0	0	1	0	1	0	1	0
Dryer Drain Solenoid Valve	(Y2F)														
Not used	(Y2E)														
Capacity Control Valve	(Y2D)														
Blow-off Solenoid Valve	(Y2C)														
Dryer Start	(Y2B)														
Fan Inverter Start	(Y2A)														
Fan Inverter Error Reset	(Y29)														
Main Inverter Start	(Y28)														
External Connection Setting out 3	(Y27)														
External Connection Setting out 2	(Y26)														
External Connection Setting out 1	(Y25)														
Operating	(Y24)														
Remote Mode Select	(Y23)														
Maintenance	(Y22)														
Cautions	(Y21)														
Emergency Stop	(Y20)														

## 11 Help

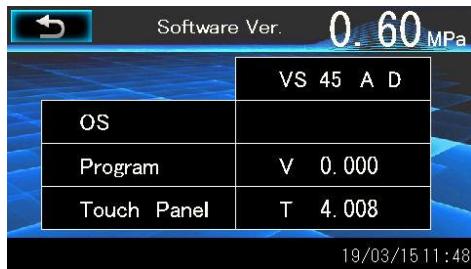
Tap the help tab on the screen to view the following items



- 11-1 Software Version
- 11-2 Change Setting
- 11-3 Password Reset
- 11-4 Menu for Service Use Only

### 11.1 Software Version

On this screen, you can see the model version, OS version, program version, and the version of the touch screen.

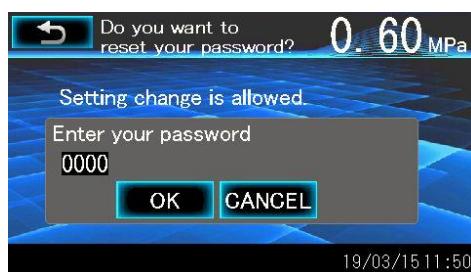
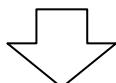


- Model
- OS
- Program
- Touch Panel

### 11.2 Change Setting

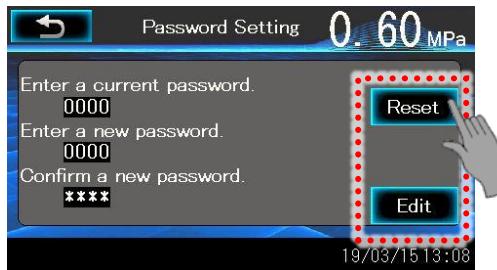


Tap [Deny] tab, and then enter the password



## 11.3 Password Reset

Tap the reset tab to enable to reset the default password “0000”.

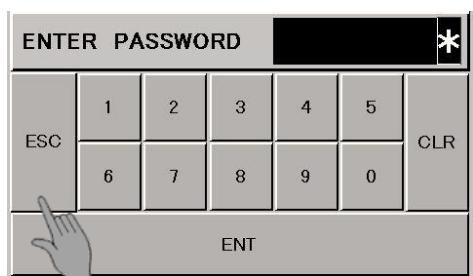


1. Tap the reset tab to enable to reset the default password “0000”.
2. Enter the current password and new password.
3. Confirm the new password.
4. Tap the Edit tab to enter the new password.



## 11.4 Menu for service use

On the screen, enter the password to go to the setting screen for service use.



Tap the ESC key to return to the main menu.

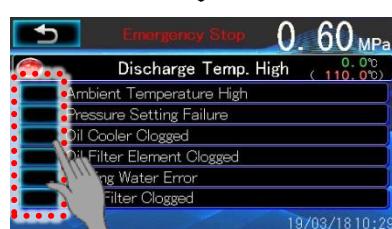
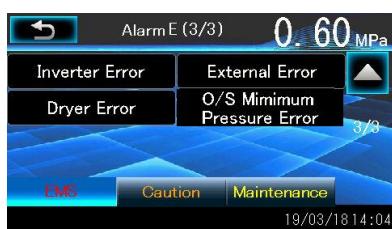
## 12 Alarms

### 12.1 Emergency Stop

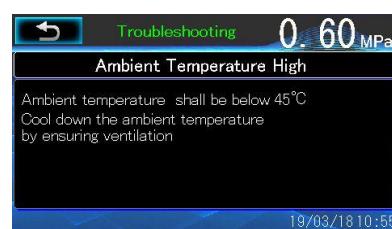
The highlighted function is detected alarm now.



Tap the tab to go to the troubleshooting screen.



Tap to next screen



Ambient temperature shall be below 45°C  
Cool down the ambient temperature  
by ensuring ventilation

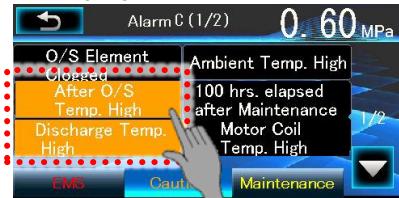
**Alarm list**

Alarm	Cause and Troubleshooting
After O/S Temp. High	Stop compressor and turn off the power supply. Release internal pressure and replace the oil separator element at pressure 0 MPa.
Discharge Temperature High	<ul style="list-style-type: none"> <li>Ambient temperature is high.</li> <li>Pressure settings failure.</li> <li>Oil cooler clogged.</li> <li>Oil filter element clogged</li> <li>Cooling water error.</li> <li>Dust filter clogged.</li> </ul>
Fan Motor Overload [Standard model only] [Note:1]	<ul style="list-style-type: none"> <li>Power supply failure</li> <li>Motor error.</li> </ul>
Fan Inverter Error [Inverter model only] [Note:1]	<ul style="list-style-type: none"> <li>Fan inverter error occurred.</li> <li>Contact KOBELCO service division.</li> </ul>
Cooling Water Shortage [water cooled model only]	Check pump and piping of the cooling water for failures, and resolve the problems.
Starter Error	<ul style="list-style-type: none"> <li>No signal from the inverter.</li> <li>Contact KOBELCO service division.</li> </ul>
Sensor Error	<ul style="list-style-type: none"> <li>Sensor (Pd, Td, Po, Tc or To) detects an error.</li> <li>Contact KOBELCO service division.</li> </ul>
Reverse Phase	Turn off power and ensure the power cable connection is accurate
Motor Coil Temp. High	<ul style="list-style-type: none"> <li>Power supply failure</li> <li>Motor error.</li> <li>Dust filter clogged.</li> </ul>
SW Input Error	<ul style="list-style-type: none"> <li>Start button or stop button error occurred.</li> <li>Contact KOBELCO service division.</li> </ul>
Emergency Stop (manual)	<ul style="list-style-type: none"> <li>Emergency stop pushbutton pushed.</li> <li>Emergency stop signal occurred.</li> </ul>
Discharge Pressure Rise (not used)	Check piping and valve for failures, and resolve the problems.
Main Motor Overload [Standard model only]	<ul style="list-style-type: none"> <li>Frequent starts and stops</li> <li>Power supply failure</li> <li>Motor error.</li> </ul>
Inverter Error [inverter model only]	<ul style="list-style-type: none"> <li>Inverter error occurred.</li> <li>Contact KOBELCO service division.</li> </ul>
Dryer Error [Dryer equipped model only]	<ul style="list-style-type: none"> <li>Ambient temperature is high.</li> <li>Condenser fins clogged.</li> <li>Frequent starts and stops</li> <li>Power supply failure</li> <li>Dryer motor error.</li> <li>Dust filter clogged.</li> </ul>
External Error	External signal error
Minimum Pressure Error	O/S minimum pressure is not maintained.

◆ Note 1: Error of the fan motor or the fan inverter error.

## 12.2 Cautions

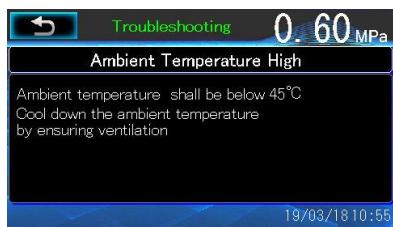
The highlighted items are detected alarms now.



Tap the tab to go to the caution screen.



Tap to next screen



### Alarm list

Caution	Cause and Troubleshooting
O/S Element Clogged	Stop compressor and turn off the power supply. Release internal pressure and replace the O/S element at pressure 0 MPa.
After O/S Temp. High	Stop compressor and turn off the power supply. Release internal pressure and replace the O/S element at pressure 0 MPa.
Discharge Temp. High	Ambient temperature is high, Pressure setting error. Oil cooler clogged. Oil filter element clogged. Cooling water error. Dust filter clogged.
Ambient Temperature High	The ambient temperature shall be below 45°C. Cool down the ambient temperature by ensuring adequate ventilation.
100 hrs. Elapsed after Maintenance Cautions	More than 100 hours elapsed after maintenance cautions.
<i>Note</i>	Contact KOBELCO service division.
Motor Coil Temp. High	Power supply failure. Motor error. Dust filter clogged.
Discharge Pressure Rise (not used)	Check piping and valve for failures, and resolve the problems.
External Cautions (not used)	External cautions signal occurred.
Dryer Caution (option)	Dew point increased. Ambient temperature is high. Condense fins clogged.
Inverter Caution [Inverter model only]	Inverter cautions. Contact KOBELCO service division.
Dryer Error [Compressor with dryer]	Ambient temperature is high. Condenser fins clogged. Frequent starts and stops. Power supply failure. Dryer motor error. Dust filter clogged.

### *Note:*

The caution lamp will blink every second, if the maintenance indicator lamp on the panel is lighting for more than 100 hours. Resolve the error immediately, and then reset the indicator lamp.

## 12.3 Maintenance

The highlighted items are detected maintenance alarm now.



Tap the tab to go to the maintenance screen.



### Alarm list

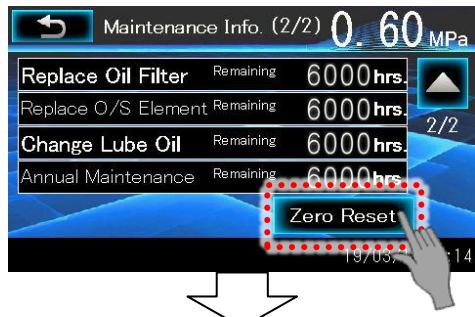
Maintenance	
Replace Suction Filter	Clean suction filter. Replace it if too dirty to clean from inside by air blower
Replace O/S Element	Stop compressor and turn off the power supply. Release internal pressure and replace the oil separator element at the pressure 0 MPa.
Replace Oil Filter	Stop compressor and turn off the power supply. Release internal pressure and replace the oil filter at the pressure 0 MPa.
Inspect Cooler	Cooler inspection required. Inspect the cooler after stopping the compressor. Make sure the cooling fan stopped completely.
Change Lube Oil	Stop compressor and turn off the power supply. Release internal pressure and change lube oil. Check the oil level and refill oil, if the oil level is below minimum level.
Replace Sensor	Contact KOBELCO service division.
Annual Maintenance	Cooler inspection and maintenance required. Contact KOBELCO service division.
Regrease Motor	Regrease the motor. (grease required motor only)
Pressure Drop High	Discharge pressure exceeds the set value. Reduce pressure loss and lower the set value.
Clean Dust Filter	Dust filter clogged. Remove the dust filter and clean by vacuum or water-wash.
Replace TP Battery	Require to replace backup battery. Open the rear cover of the touch panel to replace the backup battery.
Moisture Condensation	The drain is accumulated. Keep the compressor loading Do not stop the compressor until complete maintenance caution reset, which can be reset when the drain volume is lower than the rated volume.

## 12.4 Troubleshooting

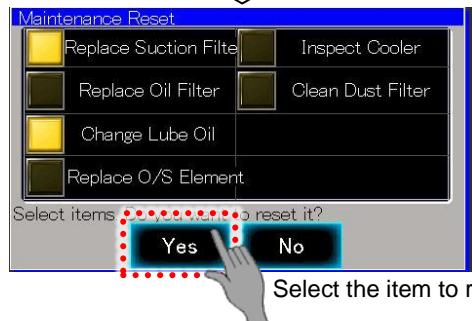
Error	Troubleshooting
Oil Filter Clogged	Stop compressor and turn off the power supply. Release internal pressure and replace the oil filter.
Dryer Motor Error.	Stop the compressor. Check the coil resistance. If resistance is $10M\Omega$ or less, contact KOBELCO service division.
Cooling Water Error	1. Cooling water temperature high Cool down the temperature of the cooling water 2. Cooling water shortage Check pump and piping for failures and resolve the problems.
Condenser Fins Clogged.	Stop the compressor. Clean the condenser fins.
Circuit Error	Stop the compressor. Turn off power, and check wiring.
Oil Cooler Clogged	Cooler cleaning required. Clean the cooler after stopping the compressor and make sure the cooling fan is stopped completely.
Power Supply Failure	Stop the compressor. Check voltage drop, voltage imbalance and single phase operating for failures, and resolve problems.
Motor Error.	Stop the compressor. Check the coil resistance. If lower than $10 M\Omega$ , contact KOBELCO service division.
Ambient Temperature High	The ambient temperature shall be below $45^{\circ}\text{C}$ . Cool down the ambient temperature by ensuring adequate ventilation.
Frequent Starts and Stops	Minimum 3 minutes of operation required. Stopping the compressor within 3 minutes after starting may cause dryer failure. Starting the compressor within 3 minutes after stopping may cause overcurrent in the dryer motor and may activate the interlock of the dryer motor.
Pressure Setting Error	Wait more for than 3 minutes after starting and stopping operations. Check pressure setting of the compressor and the volume of the air receiver tank.
Dust Filter clogged.	Remove the dust filter and clean it by air blower and clean the filter attached below the controller as well.

### 12.4.1 How to reset Maintenance Timer

After maintenance work, reset the maintenance timer as follows.



Long press the reset tab for three seconds.



[Maintenance Reset] screen will be displayed.

Select the item to reset and then press the Yes tab.



The confirmation window of the maintenance reset will pop up.

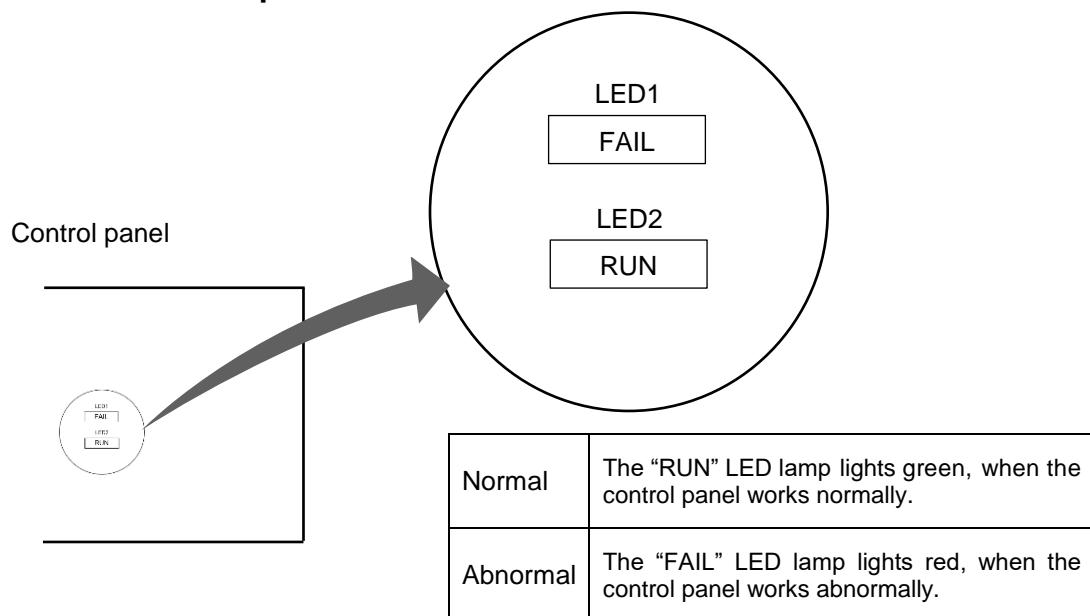
Tap [Yes] tab to reset

The reset is completed. The maintenance indicator lamp will light off.

Note:

Make sure all of maintenance is done properly, and then reset the timer.

### 12.4.2 How to check Operation Panel



# 13 Interlock

## 13.1 Emergency Stop

	Error	Location	Detector	Condition 1	Condition 2	Note
1	Main Motor Coil Temperature High	Main Motor Coil	Thermocouple	180°C, 3 secs. [for Inverter model] 165°C, 3 secs. [for Standard model]	175°C, 3 mins. [for Inverter model] 155°C 3 mins. [for Standard model]	
2	Discharge Temperature High	Inside of the Oil Separator	Thermocouple	110°C or higher		
3	Temperature after O/S High	after Oil Separator	Thermocouple	110°C or higher		
4	Sensor Error	Discharge Temperature Thermocouple	Controller	Cut off	Zero error > 5 %	for Inverter model
		After O/S Temperature High Thermocouple	Controller			
		Discharge Pressure Sensor	Controller			
		Oil Recovery Unit Pressure Sensor	Controller			
		External Pressure Sensor (option)	Controller			
		Main Motor Coil Temperature Thermocouple	Controller			
5	Input Phases Loss	Inverter	Inverter	Input Phases Loss		
6	Main Motor Overload	Inverter	Inverter	Overload		
7	Inverter Overload	Inverter	Inverter	Overload		
8	Inverter Derating	Inverter	Inverter	Inverter Derating		
9	Instant Overcurrent	Inverter	Inverter	Overcurrent		
10	Cooling fin Overheat	Inverter	Inverter	Cooling fin overheat		
11	Inverter Error	Inverter	Inverter	—		
12	Starter Error	Inverter [for inverter equipped model] Contactor [standard model]	Controller	No startup signal for 1 minute..		
13	Main Motor overload	Main Motor	Thermal	SW start up		for standard model
14	Fan Motor Overload	Fan Motor	Thermal	SW start up		Error of the fan motor or the fan inverter
15	SW Input Error	Controller	Controller	20 secs. passed after pressing the START button	20 secs. passed after pressing the STOP button	
16	Emergency Stop Pushbutton Switch Push	Emergency Stop Pushbutton Switch	Controller	Emergency Stop Signal (Auto)	Emergency stop pushbutton pressed	
17	Discharge Pressure High	after After Cooler	Pressure Sensor	Pressure setting 0.75MPa,Pd≥0.85 MPa,1s 0.85MPa,Pd≥0.95 MPa,1s 1.05MPa,Pd≥1.15 MPa,1s		not used
18	External Error	Controller	Controller	External Contact Error		
19	Minimum Pressure Error	Inside of Oil Separator	Pressure Sensor	1 mins. passed after start up Po < 0.3 MPa		
20	Dryer Error	Dryer	Controller	Error Signal ON		Select "Operation

						at Dryer Error: NO"
21	Reverse Phase	Controller	Controller	RST wiring Connection Error		

## 13.2 Cautions

	Caution	Location	Detector	Condition 1	Condition 2	Note
1	Discharge Temperature High	Inside of the Oil Separator	Thermocouple	105°C or higher		
2	After the O/S Temperature High	after Oil Separator	Thermocouple	105°C or higher		
3	Oil separator Element clogged	Pressure difference between the Oil Separator and after the After Cooler	Pressure Sensor	0.12 MPa or more		
4	Inverter Error	Inverter	Inverter			for Inverter model
5	Ambient Temperature High	Compressor Air Inlet	Thermocouple	47°C or higher		
6	100 hrs. elapsed after maintenance alarm	Controller	Controller			
7	Main Motor Coil Temperature High	Main Motor Coil	Thermocouple	175°C, 3 secs. [for Inverter model] 155°C, 3 secs. [for Standard model]		
8	Discharge Pressure Rise	Controller	Pressure Sensor	Pressure setting 0.75MPa,Pd≥0.82 MPa,1s 0.85MPa,Pd≥0.92 MPa,1s 1.05MPa,Pd≥1.12 MPa,1s		not used
9	External Caution	Controller	Controller	External contact Signal		not used
10	Dryer Error	Dryer	Controller	Error Signal ON		Select "Operation at Dryer Error: YES"
11	Dryer Caution (option)	Controller	Controller	Alarm Signal: ON		

## 13.3 Maintenance

	Maintenance	Condition	Detector	Condition 1		Condition 2
1	Replace Suction Filter	Operating Hours difference of pressure	Controller	Operating Hours	3000 hrs.	Indicator -6.23kPa
2	Replace Oil Filter	Operating Hours	Controller	Operating Hours	6000 hrs.	
3	Change Lube Oil	Operating Hours	Controller	Operating Hours	6000 hrs.	
4	Replace Oil Separator Element	Operating Hours difference of pressure	Controller	Operating Hours	6000 hrs.	0.11 MPa or more
5	Inspect Cooler	Operating Hours	Controller	Operating Hours	6000 hrs.	
6	Replace Sensor	Ambient Temperature	Thermocouple			
7	Annual Maintenance	Operating Hours	Controller	Operating Hours	6000 hrs.	Operation start to 1 year
8	Pressure Drop High	Discharge of Compressor, Line Pressure	Controller	Line pressure – Discharge pressure ≥ Pressure loss settings		Using the line pressure (option)
9	Grease Motor [for grease required]	Operating Hours	Controller	Operating Hours	2000 hrs.	

	motor]					
10	Moisture Condensation	Controller	Controller	Amount of drain> Amount of oil replenishment 3.5%	Standard model only	
11	Clean Dust Filter	Operating Hours	Controller	Operating Hours	500 hrs.	
12	Replace TP Battery	Touch Screen	Touch Screen	Battery Voltage Reduction		

## 14 Connection to MODBUS

Using the RS485 communication protocol, you can connect the compressors with a personal computer and programmable controllers, and also you can upload the operating record and perform remote control.

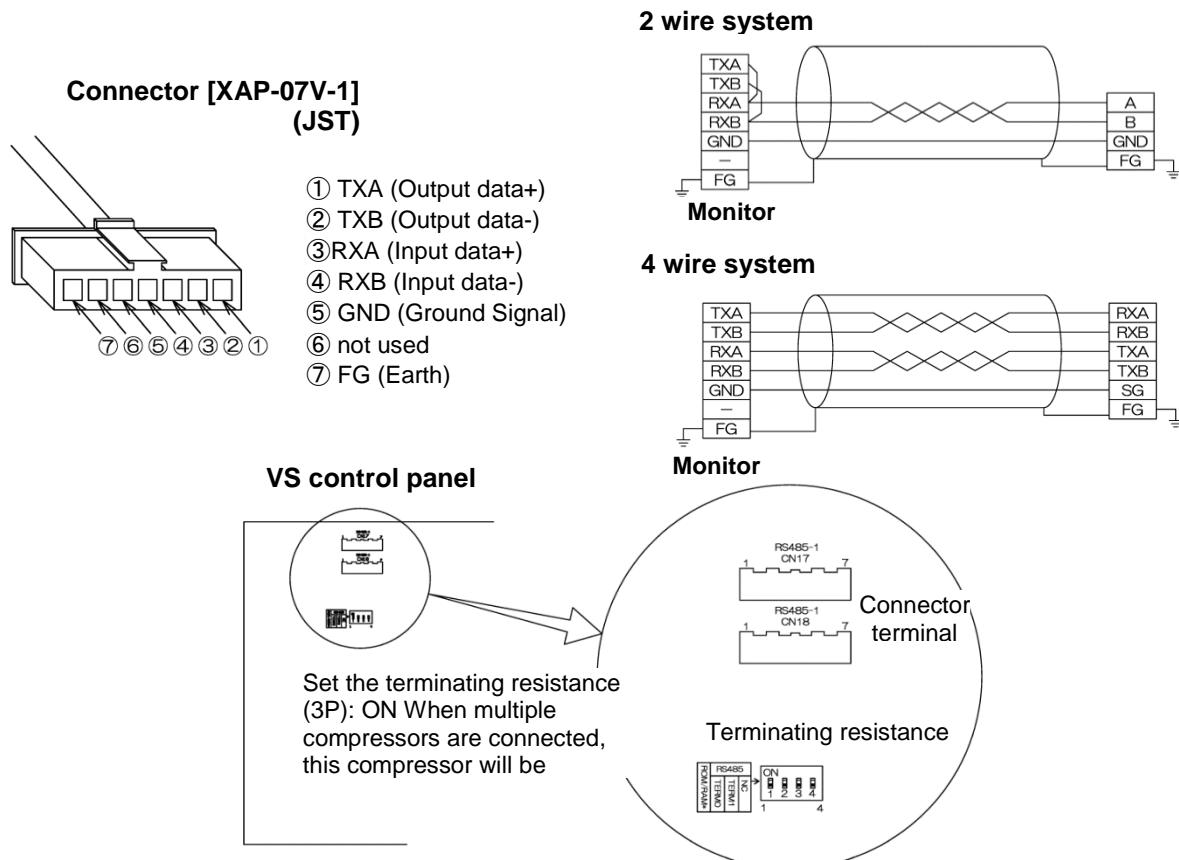
 Note:

If the communication protocol is MODBUS, the LINK communication (alternate and group control) and ITCS communication (group operation panel) are unavailable.

### 14.1 Specification

Communication Condition	
Protocol	MODBUS-RTU
Transmission speed	19200 bps
Transmission system	Full duplex system
Synchronous method	start-stop synchronization
Bit data	8 bit
Parity bit	Even number
Stop bit	1 bit
DCE specified	DTE mode
Signal control (DTR/DSR)	Default OFF
Signal flow control (RTS/CTS)	-
XON/XOFF control	-

### 14.2 Cable Connection



## 14.3 Remote Communication Register

- Standard and Inverter Unit

Address	VS	Note
40001	Command	See the below table.
40002	—	not used
40003	P1) Discharge Pressure	Ex.50⇒0.05 MPa
40004	P2) Oil Separator Pressure	Ex.50⇒0.05 MPa
40005	P3) Line Pressure (option)	Ex.50⇒0.05 MPa
40006	—	Not used
40007	T3) Ambient Temperature	Ex.200 ⇒ 20.0°C
40008	T2) Motor Coil Temperature	Ex.200 ⇒ 20.0°C
40009	Spare	Not used
40010	T1) Discharge Temperature	Ex.200⇒20.0°C
40011	T4) after Oil Separator Temperature	Ex.200⇒20.0°C
40012	—	Not used
40013	Current	Ex.100⇒100A
40014	Inverter Current Consumption	Ex.100⇒100A [only for Inverter model]
40015	Load Condition	Ex.100⇒100%
40016	Auxiliary Equipment Condition	Ex.100⇒100%
40017	D I_1	BIT data
40018	D I_2	BIT data
40019	D O_1	BIT data
40020	—	Not used
40021	Operating Hours (minimum)	Double word
40022	Operating Hours (maximum)	
40023	Number of Starts (Low order)	Double word
40024	Number of Starts (High order)	
40025	Emergency Stop (1)	BIT data
40026	Emergency Stop (2)	BIT data
40027	Cautions	BIT data
40028	LED Lamp Status	BIT data
40029	Maintenance (1)	BIT data
40030	—	Not used
40031	—	Not used
40032	—	Not used

## 14.4 Command Data

Address	Input value	Item
40001	1	Remote Operation
	2	Remote Stop
	4	Remote Load Signal

## 14.5 BIT Data Details

### 14.5.1 Standard model

40017 (DI)		40018		40019 (DO)		40025 (E1)	
0	Emergency Stop (b-contact)	0	Reverse Phase (b-contact)	0	Emergency stop (customer)	0	-
1	Suction Indicator	1	Power Failure detected	1	Caution (customer)	1	Dryer error
2	-	2	-	2	Maintenance (customer)	2	After O/S Temperature High
3	Dryer Error	3	-	3	Remote select (customer)	3	Discharge temperature high
4	Fan Motor Overload	4	-	4	Operating (customer)	4	Fan inverter error
5	Main Response	5	-	5	Dryer Start Signal	5	-
6	-	6	-	6	-	6	Starter Error
7	Motor Overcurrent	7	-	7	-	7	Sensor error
8	Remote Start ON	8	-	8	Main Start Signal	8	Reverse phase
9	Remote Start OFF (b-contact)	9	-	9	Star Start Signal	9	Inverter error
A	Remote Load Signal	A	-	A	Delta Start Signal	A	Motor coil temperature high
B	External Error	B	-	B	Fan start Signal	B	Main motor overload
C	-	C	-	C	Bow-off Solenoid valve	C	External Error
D	Dryer Caution (option)	D	-	D	Solenoid Valve for Capacity Control Valve	D	SW error input
E	-	E	-	E	-	E	Discharge pressure high
F	-	F	-	F	Dryer Solenoid Valve	F	Emergency Stop Switch

40026 (E2)		40027 (C )		40028		40029 (M)	
0	Minimum Pressure Error	0	Dryer Error	0	POWER	0	Replace Suction Filter
1	Discharge Pressure Sensor Error	1	Element Clogged	1	EMERGENCY	1	Replace Oil Filter
2	O/S Pressure Sensor Error	2	Discharge Temperature High	2	AUTO START	2	Change Lube Oil
3	Line pressure Sensor Error	3	After O/S Temperature High	3	CAUTION	3	Replace O/S Element
4	Motor Coil Temperature Sensor Error	4	Ambient Temperature High	4	LOAD	4	Inspect Cooler
5	after the O/S Temperature Sensor Error	5	Inverter Caution	5	MAINTENANCE	5	Replace TP Battery
6	Discharge Temperature Sensor Error	6	Maintenance 100 hrs. Elapsed	6	LOCAL	6	Maintenance Sensor Error
7	-	7	Motor Coil Temperature High	7	STOP	7	Annual Maintenance
8	-	8	External Caution not use	8	START	8	Pressure Drop High
9	-	9	Discharge Pressure High not use	9	-	9	Dust Filter
A	-	A	Dryer Caution (option)	A	-	A	Moisture Condensation
B	-	B	-	B	-	B	Regrease Motor
C	-	C	-	C	-	C	-
D	-	D	-	D	-	D	-
E	-	E	-	E	-	E	-
F	-	F	-	F	-	F	-

### 14.5.2 Inverter model

40017 (DI)	
0	Emergency Stop (b-contact)
1	Suction Indicator
2	Water Shortage Relay (for water cooled model)
3	Dryer Error
4	Fan Inverter Error
5	Main Inverter Cautions
6	Main Inverter Response
7	Inverter Error
8	Remote Start ON
9	Remote Start OFF (b-contact)
A	Remote Load Command
B	External Error
C	-
D	Dryer Caution (option)
E	-
F	-

40018	
0	Reverse Phase (b-contact)
1	Power Failure detected
2	-
3	-
4	-
5	-
6	-
7	-
8	-
9	-
A	-
B	-
C	-
D	-
E	-
F	-

40019 (DO)	
0	Emergency Stop (customer)
1	Caution (customer)
2	Maintenance (customer)
3	Remote Select (customer)
4	Operating (customer)
5	External Connection Setting (Out1)
6	External Connection Setting (Out2)
7	External Connection Setting (Out3)
8	Main inverter Start Signal
9	Fan Inverter Error Reset
A	Fan Inverter Start Signal
B	Dryer start Signal
C	Bow-off Solenoid Valve
D	Solenoid Valve for Capacity Control Valve
E	-
F	Dryer Solenoid Valve

40025 (E1)	
0	-
1	Dryer Error
2	After O/S Temperature High
3	Discharge Temperature High
4	Fan Inverter Error
5	Cooling Water Shortage
6	Starter Error
7	Sensor Error
8	Reverse Phase
9	Inverter Error
A	Motor Coil Temperature High
B	Main Motor Overload
C	External Error
D	SW Error Input
E	Discharge Pressure High
F	Emergency Stop Switch

40026 (E2)	
0	Minimum Pressure Error
1	Discharge Pressure Sensor Error
2	O/S Pressure Sensor Error
3	Line Pressure Sensor Error
4	Motor Coil Temperature Sensor Error
5	After O/S Temperature High Sensor Error
6	Discharge Temperature Sensor Error
7	-
8	-
9	-
A	-
B	-
C	-
D	-
E	-
F	-

40027 (C)	
0	Dryer Error
1	O/S Element Clogged
2	Discharge Temperature High
3	After O/S Temperature High
4	Ambient Temperature High
5	Inverter Caution
6	Maintenance 100 hrs. Elapsed
7	Motor Coil Temperature High
8	External Caution
9	Discharge Pressure High
A	Dryer Caution (option)
B	-
C	-
D	-
E	-
F	-

40028	
0	POWER
1	EMERGENCY
2	AUTO START
3	CAUTION
4	LOAD
5	MAINTENANCE
6	LOCAL
7	STOP
8	START
9	-
A	-
B	-
C	-
D	-
E	-
F	-

40029 (M)	
0	Replace Suction Filter
1	Replace Oil Filter
2	Change Lube Oil
3	Replace O/S Element
4	Inspect Cooler
5	Replace TP Battery
6	Replace Sensor
7	Annual Maintenance
8	Pressure Drop High
9	Clean Dust Filter
A	Moisture Condensation
B	Regrease Motor
C	-
D	-
E	-
F	-

## Controller Emergency, Caution and Maintenance Log Sheet

## Model:

Customer:

Date of inspection: MM/ DD/ YY

Serial #:

SF:

Date of accident: MM/ DD/ YY

Monitor version:

Date of delivery: MM/ DD/ YY

OS version:

**【SINGAPORE】****KOBELCO MACHINERY ASIA PTE. LTD.**

20 Pioneer Crescent #04-01 West Park Bizcentral, 628555 SINGAPORE

Tel : +65-6261-9621 Fax : +65-6261-3719

**【THAILAND】****KOBELCO COMPRESSORS (THAILAND) LTD.**

2170 Bangkok Tower, Room No.1102, 11th Floor, New Petchburi Road, Bangkapi, Huaykwang, Bangkok 10310

Tel: (66) 2 308 0211, Fax: (66) 2 308 0214

**【MALAYSIA】****KOBELCO COMPRESSORS MALAYSIA SDN . BHD.**

No 9, Jalan Sepadu 25/123A, Seksyen 25,40400 Shah Alam Selangor, Malaysia

Tel : +60-3-5525-2757 Fax : +60-3-5525-3596

**【VIETNAM】****KOBELCO COMPRESSORS VIETNAM CO., LTD.**

43-45 Lam Ha Street, Bo De Ward, Long Bien District, Hanoi, Vietnam

Tel : +84-4-3944-7781 Fax : +84-24-3944-7780

**【INDONESIA】****PT KOBELINDO COMPRESSORS**

JL. RAYA TANJUNG BARAT NO. 85. TANJUNG BARAT, JAGAKARSA JAKARTA SELATAN, 12530, INDONESIA.

Tel : +62-21-782-7002 Fax : +62-21-782-7025

**【PHILIPPINES】****KOBELCO COMPRESSORS AND MACHINERY PHILIPPINES CORPORATION**

19th Floor Panorama Tower, 34th Street Corner Lane A, Bonifacio Global City, Taguig City

Tel : +632-897-8736 +632-899-1997 Fax : +632-897-8737

**【INDIA】****KOBELCO COMPRESSORS INDIA PVT.LTD.**

249G, 3rd Floor AIHP TOWER Udyog Vihar, Phase IV, Near India Bulls Building, 122015 Gurgaon

Tel +91-124-4380750 Fax +91-124 438 0770

**Machinery Business / Compressor Division**

9-12, Kita-Shinagawa 5-Chome, Shinagawa-ku, Tokyo 141-8688,JAPAN

Tel : +81-3-5739-5342 Fax : +81-3-5739-5345

**Kobelco Compressors Manufacturing (Shanghai) Corporation**

1515 Xing Rong Road Jiading Industrial District Shanghai,

201815, People's Republic of China

**[www.kobelco-comp.co.jp](http://www.kobelco-comp.co.jp)**

Address inquiries to.....