

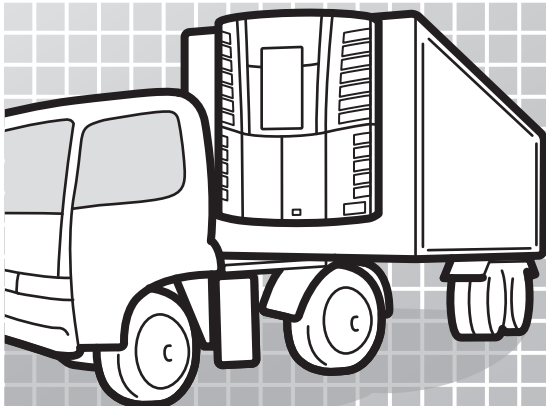
OPERATION MANUAL

MITSUBISHI TRANSPORT REFRIGERATION UNIT TEF1500SA

This operation manual is intended to provide users with a good knowledge to use Mitsubishi Refrigeration Unit safely.

Operate or service the refrigeration unit only after you have read this manual and understand its contents.

Carefully store this manual in a fixed place so that it is immediately available for your reference when you need it.



Original	Instructions
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TSJ012A282



YEAR:2025

Thank you for your purchase of Mitsubishi Transport Refrigeration Unit.

Purpose of use and application

This Refrigeration Unit is intended to carry the cargo (with the exception of volatile, inflammable, hazardous matter) keeping inside container temperature at a certain degree.

If the Refrigeration Unit is used for any purposes other than this purpose, it may cause accidents or damages.

Important information

- For questions or information, contact your nearest dealer.
- Be sure to follow the contents described in this manual in order to protect yourself and other people from potential risks of this refrigeration unit and to prevent it from getting damaged.
- We are not able to foresee all potential risks of this refrigeration unit or dangers due to mishandling by the customers. Therefore, it is necessary to take measures for safety in addition to the items described in this manual or on warning labels.
- For the following works, contact your nearest dealer. If these works were carried out by customer, the refrigeration unit may lose its performance and we may not be able to ensure the safety of the customer.
 - (a) Installation, modification, specification change and disposal for the refrigeration unit
 - (b) Maintenance of electric appliances
 - (c) Abnormal treatments which are not described in this manual
- **This product contains fluorinated greenhouse gases.**
 - Refrigerant : R410A (GWP (Global Warming Potential)=2088)
Refer to a label on unit about weight of fluorinated greenhouse gases and CO₂ equivalent. (☞ Refer to page 3.)

Operation manual

- This operation manual is prepared for people who speaks English. In case that person whose native language is not English handles this refrigeration unit, he or she must be instructed on safety by the customer. Furthermore, the warning labels described in their native language must be prepared and stuck on the proper places.
- This operation manual is copyrighted and all rights are reserved by our company. The drawings and technical information described in this manual may not, in whole or part, be published, copied, translated for the purposes other than above-mentioned and reduced to any electronic medium or machine-readable form without prior written consent with our company.
- The contents of this operation manual may differ from that of the refrigeration unit used by a customer due to specification change.
- The contents described in this operation manual may be changed without a prior notice.
- When transferring or lending the refrigeration unit, attach this operation manual together with the unit so that the operators should be able to have a good knowledge on safety.
- Keep this operation manual in the vehicle so that it is available for your reference when you need it.
- Unless otherwise noted, "right" and "left" directions are given as viewed from the front of the refrigeration unit.

For disposal

Contact your nearest dealer when disposing the refrigeration unit. Conform the applicable laws and regulations in your country when disposing refrigerants.

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1 Function of Refrigeration Unit

This refrigeration unit has the following functions.

(1) Operation pattern switching function

This is the function to switch operation pattern (continuous operation/automatic start/stop operation).

Continuous mode may also be considered as strict temperature control mode. Automatic start/stop mode may also be considered as energy saving mode.

☞ Refer to pages 40 and 41 for how to switch operation pattern.

(2) Defrosting operation function

This is the function to protect evaporator from frosting during cooling/heating operation and to prevent refrigerating power from decreasing. There are following 2 methods to start defrosting operation.

1) Automatic defrosting operation

Defrosting starts automatically by the timer setting.

☞ Refer to page 33 for defrosting timer setting.

2) Manual defrosting operation

Defrosting starts forcibly by pressing the defrost switch of controller.

☞ Refer to page 47 for how to operate.

After the defrosting operation completes, the refrigeration unit stops once and restarts automatically to return to base operation.

Defrosting operation will not start when the evaporator temperature is high even during cooling operation.

(3) Timer operation function

This is the function to set automatic starting time and stopping time of the operation .

☞ Refer to pages from 48 to 51 for how to set.

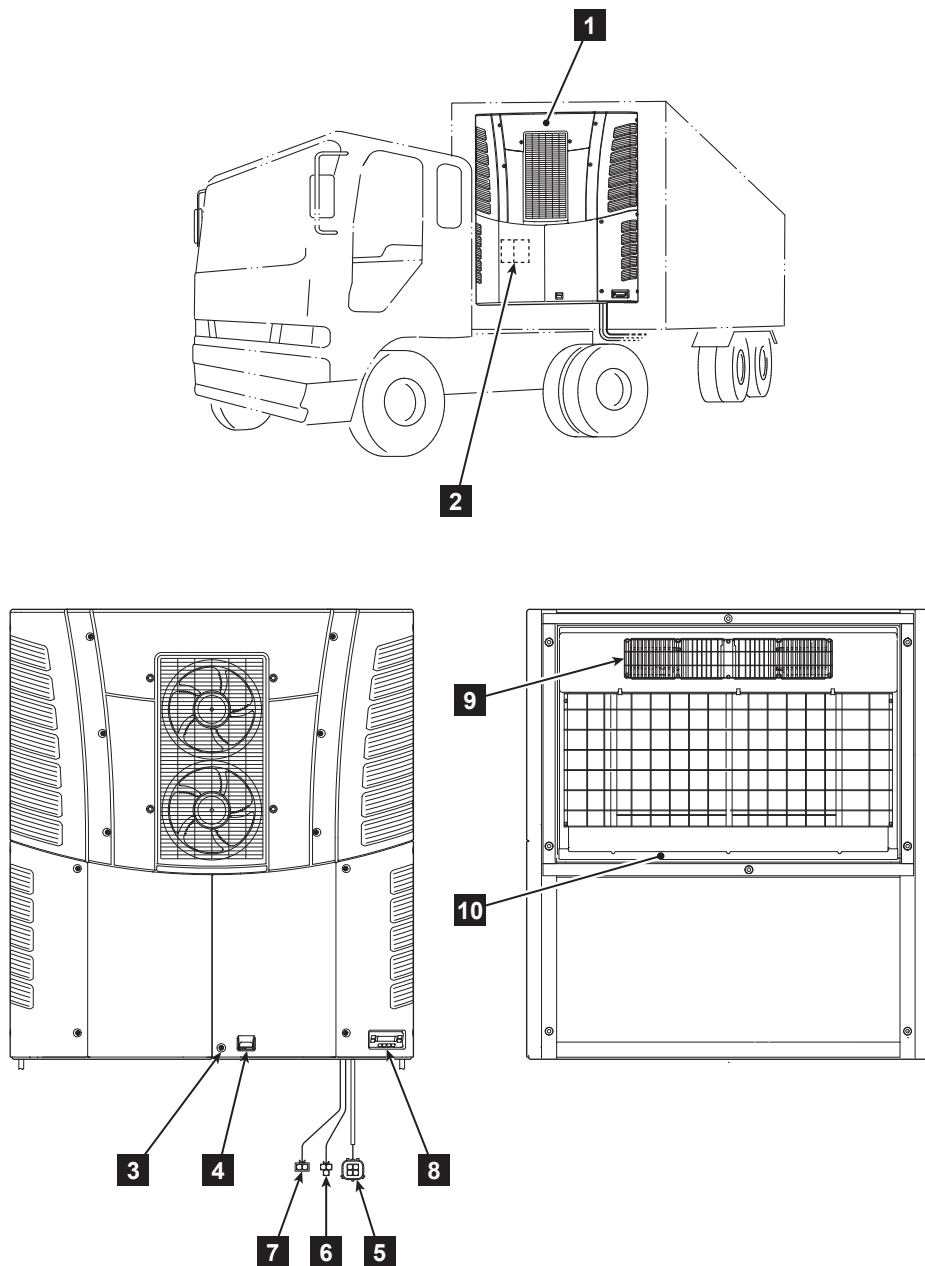
(4) Self diagnosis operation function (PTI operation)

This is the function to diagnose the refrigeration unit automatically to identify whether there is any trouble.

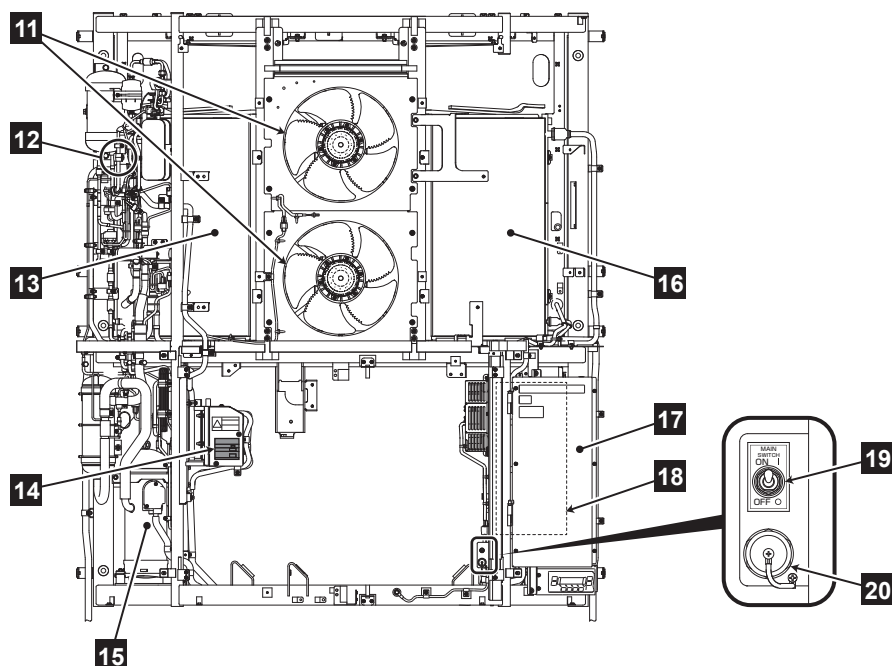
☞ Refer to pages 52 to 53 for how to operate.

2 Key components and details

Main parts

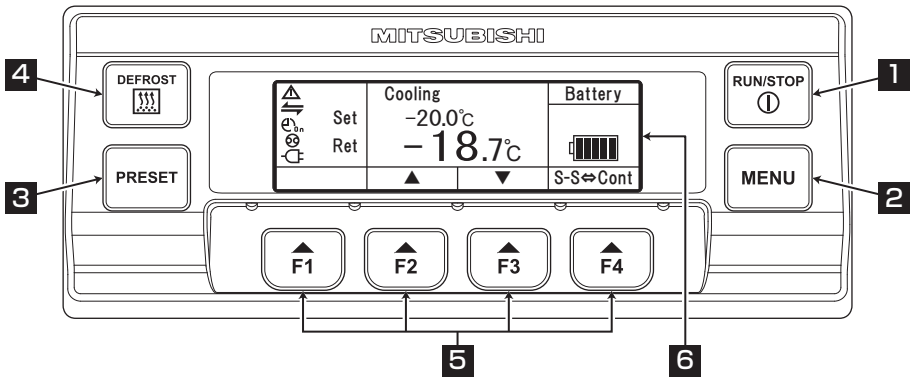


2 Key components and details



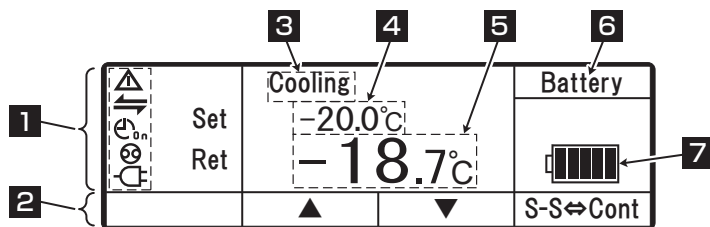
1	Refrigeration Unit	11	Condenser fan
2	Battery	12	Sight glass
3	Lock for the cover	13	Left condenser
4	Cover latch	14	Label (F-Gas)
5	High-voltage cable (orange color)	15	Compressor
6	Communication cable with the power system	16	Right condenser
7	Signal line with the power system	17	AC control box
8	Controller	18	DC control box
9	Supply air outlet for evaporator	19	Main switch
10	Drain pan	20	Communication port USB

Controller



1	RUN/STOP switch	Starts and stops the refrigeration unit.
2	MENU switch	Displays Menu mode when pressed. Displays blank screen while the refrigeration unit is stopped.
3	PRESET switch	Display changes to preset setting screen when pressed.
4	DEFROST switch	Starts the manual defrost.
5	FUNCTION switches 1 – 4	Functions corresponding to respective display screen can be selected.
6	LCD	Displays the inside compartment temperature, setting temperature, state of operation, etc.

LCD display area



Description of monitor display item

- 1** Monitor displays following items corresponding to respective setting states.
The display items light or blink depending on the operation of respective functions.

- Error display
Lights or blinks when any error occurs.
- Display for the state of external communication.
Lights when the input, such as the remote monitor device, etc., is turned ON.
- Displays for ON/OFF timer.
Lights when the ON timer and the OFF timer are set simultaneously.
- Displays the ON timer.
Lights when the ON timer operation is set.
- Displays for OFF timer.
Lights when the OFF timer operation is set.
- Display for automatic operation start/stop.
Lights when the automatic operation start/stop is selected.
- Display for commercial power supply.
Lights when the unit is connected to the commercial power supply.
- Displays for need of maintenance.
Lights when the operation time or number of operations reaches the [Maintenance required time] on each device.

- 2** Displays the allocation of function switch corresponding to the screen.

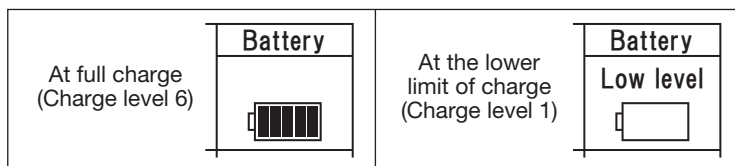
- 3** Displays the operation modes.
<Display contents> Cooling, Heating, Defrost, Sleep, Stop and Fan.
* There is no display when Thermostat is OFF with evaporator fan motor OFF.
Fan is displayed when Thermostat is OFF with evaporator fan motor ON.
If temperature is out of adequate range, the Cooling or Heating display blinks.

- 4** Displays the setting temperature.

- 5** Displays the inside compartment temperature.

6 Displays "Battery".

7 Remaining charge of the refrigeration unit battery is displayed with 6 bars. Bars disappear starting from the left most one as the charge depletes. If it reaches Charge level 1, it displays "Low level".



Protective devices

This refrigeration unit is provided with the following protective devices to ensure the safety of the operators.

- (a) Main switch
If refrigeration unit starts during the work such as inspection, it may cause an accident. In such a case, set this switch to “OFF” so that the safety is secured.
- (b) Cover
The cover prevents operators from contacting with the rotating part during operation.
- (c) Fin guard
Metal guard is provided on heat exchanger to protect from any damages due to cargo loading or mishandling.
- (d) Fan guard
Metal and plastic guard is provided near all fan-motor to prevent damages due to direct human contact with fan-motor.
- (e) Safety labels
Labels pointing out potential risks are pasted at all the dangerous locations for safety purposes.
- (f) Cover key
Lock is provided to the cover 1 in order to prevent unintended opening and handling of unit. (☞ Refer to pages 61 and 62.)

People who handle this refrigeration unit are requested to understand the functions of these protective devices completely to use it safely. Do not deactivate these protective devices or do not operate the refrigeration unit in the situation that the devices are inactivated. Keeping protective devices functioning in normal status continuously is of utmost importance for safety.

3 Precaution for safety

In this section, necessary safety precautions are provided to prevent accidents resulting in injuries or death, property damages and environment pollution. Read and understand contents of the cautions before starting to use this refrigeration unit.

Signs on safety

Signs and Symbols on safety in this operation manual and the warning labels call the attention of the people who handle this refrigeration unit.

Signs on safety

Kinds	Description
 DANGER	Indicates imminent potentially dangerous situation, which if mis-handled, will result in death, injury, or serious accident such as damage of the refrigeration unit.
 WARNING	Indicates dangerous situation, which if mis-handled, could result in death, serious injury, and serious accident such as damage of the refrigeration unit.
 CAUTION	Indicates potentially dangerous situation, which if mis-handle, will result in minor injury or moderate property damage.

Symbols

Symbols	Description	Symbols	Description
	Never perform.		Always observe the instructions.
	Disconnect power supply plug from socket.		Never touch.
	Repairs and disassembly must be done only by qualified personnel.		

Other symbol

Other advice for the refrigeration unit is described with the following symbol.

Kind	Description
 NOTE	Useful information for function or performance of equipment

Precautions

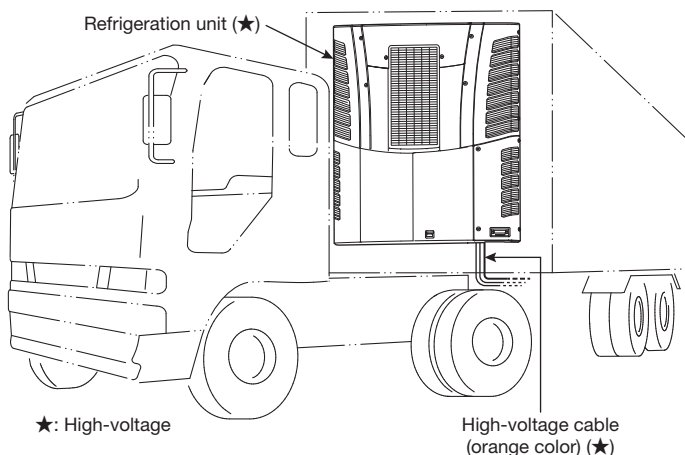
Handling of high-voltages

WARNING



The high-voltage cables are identified by the orange color.

Do not disassemble, disconnect, or replace ①High-voltage parts ②cables ③wiring connectors.



When disassembling, removing, or replacing high-voltage cables or components, serious burns or electric shock may occur, causing serious personal injury or death. Never disassemble, remove, and replace not only the high-voltage parts and cables, but also the wiring connectors. The customer never disassembles, removes, and replaces the high-voltage system. For details about the necessary maintenance, contact the nearest dealer or the contact address stated in the instruction manual for power system.

 WARNING

If a high-voltage cable or component is exposed, never touch it.

- Otherwise, it may cause electric shock.

To prevent electric shock, do not touch any high-voltage cable, connector, or high-voltage component (control box or power system, etc.).



Please maintain a safe distance from the vehicle in case a fire occurs from the refrigeration unit.

Always use a fire extinguisher for electric fire when doing fire fighting.

Do not use water or improper fire extinguishers, it may result in serious injury or electric shock.

Do not touch the refrigeration unit or vehicle, in case of accident/damage to unit. Please contact the nearest dealer and inform the details. Leave the vehicle, contact the nearest dealer or the contact address stated in the instruction manual for power system, and inform that the electric drive type refrigeration unit is installed.

General precautions

DANGER



Do not paint on cover panel. (This will make refrigeration unit out of warranty.)

- Cracking occurs in panel, which cause a risk of falling down of panel while the vehicle is running.

Never mistake the polarity of the battery cable.

- The electrical parts, may get damaged when connecting + and – terminal of battery in reverse.

WARNING

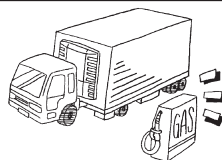


Do not modify or perform specification change for the refrigeration and vehicle. (This will make refrigeration unit out of warranty.)

- It may cause a serious accident if customer modify the refrigeration unit or change the specification by himself/herself.

Do not use the refrigeration unit in the atmosphere which could cause explosion at such place like gas station.

- Otherwise, it may cause an explosion or a fire.



When it is necessary to charge or retrieve the refrigerant or refrigerating machine oil, be sure to consult the nearest service center.

- Customer should refrain from attempting to do these on their own. Otherwise, it could result in serious accident.

Do not pile up the refrigeration unit containers.

- It leads to unit failure or accident, due to waste heat from the heat exchanger.



Make sure that no one left inside the container before closing the door.

- He or she might be frozen to death if the refrigeration unit is operated with someone inside.



! WARNING



Be sure to carry out the periodic inspections.

- Otherwise, it may cause troubles of the refrigeration unit or accidents.



Be sure to use a device that emits radio waves (on-vehicle radio device, etc.) within its setting range.

- When a device with an illegal output is used, this may cause the refrigerator to malfunction or an accident.

The appliance is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction.

- It is preferable to perform the monitoring so that a person (including a child) who needs assistances does not use the refrigeration unit alone.

! CAUTION



Do not insert sticks or fingers into cold air outlet or inlet.

- Otherwise, it may cause trouble on the equipment or injury by the fan.



Do not climb up, hang down or put your leg onto the refrigeration unit.

- Otherwise, it may cause damage of the equipment or injury.



Use the refrigeration unit as the equipment for transport refrigeration.

- Otherwise, it may deteriorate quality of the cargo if it is used for any other purpose.

When entering the cabinet during loading or unloading of cargos, be sure to wear appropriate clothing or protective gear suitable for the temperature.

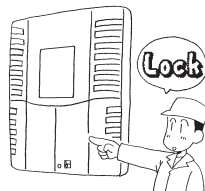
During and after the operation

CAUTION



Make sure that the cover of the refrigeration unit is closed before starting the operation.

- Otherwise, it may cause accidents.



In case of abnormal operation, abnormal sound, error indication during a test run, immediately stop the unit, investigate the cause and try again after solving the issue.



Do not touch the compressor and the refrigerant pipe during operation or immediately after the operation.

- Otherwise it may cause burns, as compressor and refrigerant pipe will get hot.



Do not operate the refrigeration unit when it is flooded up to the bottom face of vehicle chassis.

- It could cause trouble.

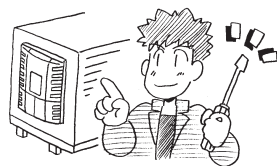
Inspection/Cleaning/Repair

WARNING



Do not disassemble and repair by yourself.

- Otherwise, it may cause damages or an electric shock.



Do not allow a person (including a child) who needs assistances to perform the inspection, cleaning, or repair without monitoring or instructions.

When inspecting or cleaning the refrigeration unit, apply the parking brake and put chocks under wheels.

- Otherwise, the vehicle may start to move, causing injury or accident.

⚠ CAUTION



When refrigerant or refrigerating machine oil has spilled, take care not get it in eyes and avoid accidental contact to skin or inhaling or swallowing.

- Otherwise, it may cause health disorders such as frostbite, loss of eyesight and pneumonia.

Do not wash the refrigeration unit with a steam washer or a high pressure jet.

- High pressure may damage various components such as heat exchanger fins etc.
- Steam washer may damage unit panel and internal components.



Set the “Main switch” to “OFF” to stop the refrigeration unit during the inspection and cleaning.

- Otherwise, it may cause injury or electric shock due to an unexpected start.

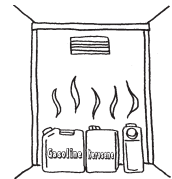
Loading

⚠ WARNING



Do not load the volatile or inflammable or explosive possibly cargos in the container.

- Otherwise, it may cause an explosion or a fire.



⚠ CAUTION



Cool down or heat up the cargos to the designated temperature in advance with other refrigerating device.

- If the cargos are not kept in the designated temperature, it may deteriorate quality of the cargos due to inside container temperature rise.

Waterproof the cargos if they need to be.

- Water may drip or splash from the evaporator unit.

When stacking cargos, secure safety. When loading fragile cargos, use appropriate protective materials.

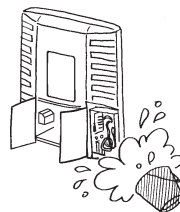
- It could damage cargos or cause injury or accident.

Handling of electric equipment and power cords

WARNING



- **Do not directly splash water on the electric equipment such as control box, etc. or wash them with water, especially with the cover open.**
- It could result in severe damages to refrigeration unit and this will make refrigeration unit out of warranty.



- **Never touch the electric equipment or operate the switches with wet hands.**



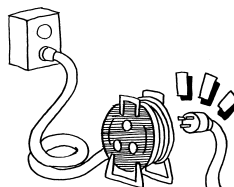
- **Do not modify the power cord or apply force on it, by bending it by force, pulling it strongly or twisting it, or do not put cargos on it.**



- **Do not wet the electrical equipment. In particular, equipment inside the control box in a rain or snow.**
- **Do not touch the high-voltage section, when opening the inside of control box.**
- It may cause troubles of electric circuit, damage to power cord or an electric shock.



- **Use 4-core cabtyre cables (conductor cross section with 8mm² or more) for power cable. Do not connect it to extension cord.**



CAUTION



- **Do not start and stop the operation while pulling out or inserting the power supply breaker or power cord.**

- Otherwise, it may cause troubles of electric circuit, damages of power supply cord or an electric shock.

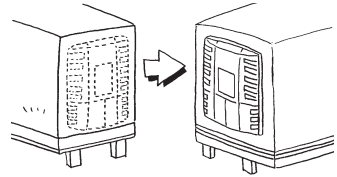
Reinstallation of the refrigeration unit

WARNING



Do not reinstall this refrigeration unit on other container by yourself. Contact your nearest dealer in that case.

- The refrigeration unit may fall down and cause a serious accident due to improper installation or insufficient strength if the work is performed by the customer.



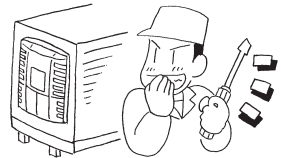
Modification of the refrigeration unit and specification change

WARNING



Do not modify the refrigeration unit or change the specification.

- It may cause a serious accident if customer modify the refrigeration unit or change the specification by himself/herself.



Do not use any refrigerant or refrigerating machine oil other than those specified. (☞ Refer to page 66.)

- Otherwise, it may cause explosion or fire.
-

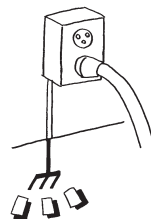
Power supply equipment

WARNING



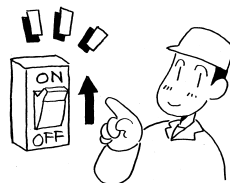
Be sure to perform the grounding work (PEN) for the electric equipment that supplies the power to the refrigeration unit.

- If the grounding work is not performed correctly, this may cause a fire.



Be sure to perform the electrical construct work in accordance with IEC 60364 and use the dedicated circuits and overcurrent circuit breakers.

- It may cause an electric shock or a fire if there is capacity shortage of electric circuit.



Emergency measure

(1) Refrigerant

- **When refrigerant gets in your eye**

Wash your eye with clean running water for more than 15 minutes immediately. Wash rear side of the eyelid as well. Then, consult a physician as soon as possible.

- **When refrigerant comes in contact with your skin**

Take off wet clothes, shoes and socks immediately, as it may cause frostbite if you touch the refrigerant. Wash the contact part thoroughly with water. If you still have irritation, consult a physician as soon as possible.

- **When inhaling the gas**

When someone has inhaled high level of gas, move to the place with fresh air immediately holding him/her with a blanket or like to keep warm. Then consult a physician as soon as possible. When he/she has difficulty in breathing, loosen his/her clothes and practice artificial respiration after securing the air passage. Depending on the circumstance, have him/her inhale oxygen and take him/her to a physician as soon as possible.

- **When swallowing refrigerant**

Do not throw up by force and consult a physician as soon as possible.

- * **Precautions for physician**

Use of Catecholamine system medicine such as adrenaline and so on may cause heart arrhythmia. Therefore it is required to use only for the emergency life-sustaining treatment with special consideration.

(2) Compressor oil

- **When compressor oil gets in your eye**

Wash your eye with clean running water for more than 15 minutes immediately. Wash rear side of the eyelid as well. If you still have irritation, consult a physician as soon as possible.

- **When compressor oil comes in contact with your skin**

Wash the part thoroughly with water and soap well and apply conditioning cream on it.

- **When inhaling evaporated gas**

Move to the place with fresh air immediately holding him/her with a blanket or the like to keep warm. Then consult a physician if it is necessary. When he/she does not breathe or hardly breathe, loosen his/her clothes and practice artificial respiration after securing the air passage. Depending on the circumstance, have him/her inhale oxygen and take him/her to a physician as soon as possible.

3 Precaution for safety

- **When swallowing compressor oil**

Do not throw up the oil by force and consult a physician as soon as possible. When inside of mouth is contaminated, wash it well with water. (When throwing up the oil by force, it easily gets into air passage and causes high fever if it gets into lung. It may cause hardly incurable hemorrhagic pneumonia accordingly.)

Handling of warning labels

- Important precautions are stated on the warning labels. Never operate the refrigeration unit unless fully understanding the meanings of the warning labels. When you found some difficulties to understand, contact your nearest dealer.
- Always keep the labels in good condition to read. Do not peel off, tear off or damage the labels or do not wipe with solvent or paint them.
- When the labels become illegible, purchase them from your nearest dealer and change them.

Refrigeration unit

■ Front view

TRANSPORT REFRIGERATION UNIT			
No.	0000000006BL	CE	UK
Year	2024	Month	12
MODEL	TEF150SA-CNA1DE		
UNIT WEIGHT	450	kg	
REFRIGERANT (GWP)	R410A (2088)		
MAX. PRESSURE	HIGH SIDE	4.15	MPa
	LOW SIDE	2.21	MPa

TYPE:TC12			
E10 R - 05 14647			
POWER SUPPLY	INPUT(MAX.)	CURRENT(MAX.)	
AC1	3-φ 100V/50Hz	12.3 OR LESS	18.8 OR LESS A
DC	HIGH		kw
	LOW	1/2V	0.5 OR LESS kW
IP NUMBER	IP40		
ALIMATIC CLASS	CLASS 4		
PROTECTION AGAINST ELECTRIC SHOCK CLASS	I		

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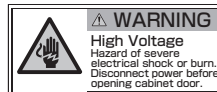
View A



TSJ011H120



TSJ011H072Y



TSJ011H110



TSJ011H118



PSA011H011



TSJ011H113

■ Back view



PSA011H011



TSJ011H113

Prevention of start during inspection work

While several people are working together for inspection at the same time, it is required to prevent other workers from getting injured by unintended start of refrigeration unit.

- Switch OFF the main switch (☞ Refer to page 3.) and remove the battery terminals before starting work. Prepare a tag which states “WORKING” and hang it on the control panel.

Clothing and protective equipment

Wear proper clothing and use protective equipment to prevent from getting injured.

- Wear the clothing such as long sleeves, long pants, gloves and eye protections.
- Do not wear accessories such as necklaces or a necktie to prevent it from getting rolled in. Fasten the cuffs firmly.
- When entering the cabinet during loading or unloading of cargos, be sure to wear appropriate clothing or protective gear suitable for the temperature.

When abnormal conditions are detected

Refer to “9 For emergency” when abnormal conditions are detected. Please contact your nearest dealer when it is too difficult to handle.

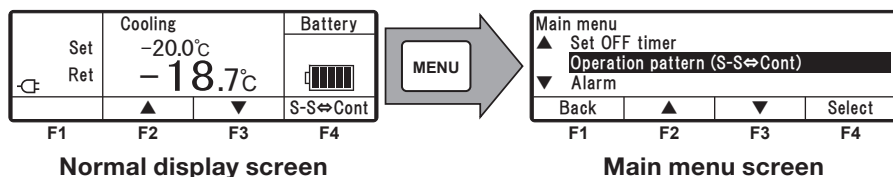
For emergency

Contact the public agencies such as the police or the fire department immediately when an accident could result in serious injury, death, serious property damage or environmental damage occurred. Contact your nearest dealer to prevent second accident.

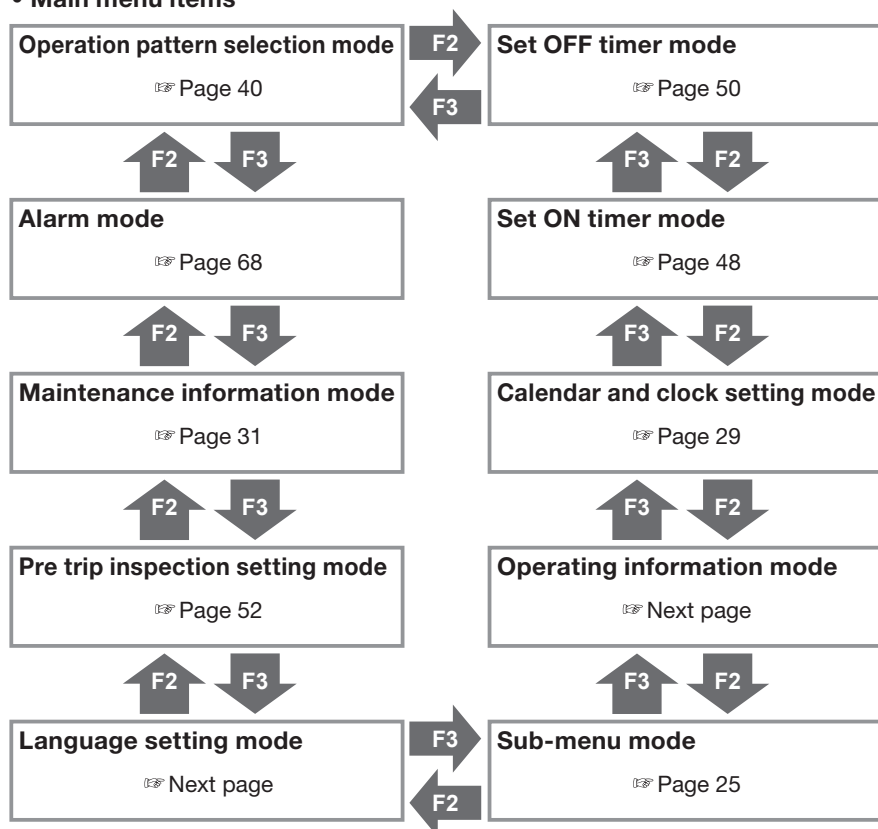
4 Initial setting

Display and function of main menu

If you press the “MENU” switch once on the “Normal display screen” which is displayed when the refrigeration unit is stopped or operating, the display changes to the “Main menu” screen. Each push on “F2 (▲)” or “F3 (▼)” switch changes the display so that various settings can be made. In the following figure, “F2” switch changes sequence clockwise while “F3” switch changes counter clockwise.



• Main menu items



4 Initial setting



If you press “F4 (Select)” switch on each MAIN menu screen on previous page, the display changes to the following screens.

Current setting			
Start-Stop operation			
Back	Start-Stop	Continuous	Set

Operation pattern selection mode

Mode to select the operation mode start/stop or continuous operation
(Page 40)

Alarm1			
E010	16 Jan 2024 07:10		
E016	15 Jan 2024 08:15		
E013	30 Nov 2023 10:30		
Back		Clear	Next

Alarm display mode

Up to 5 error codes and dates/times of alarm occurred are displayed. These are cleared by pressing “F3 (Clear)” switch.
(Page 68)

Maintenance information			
Standby operation time/5310Hr			
Back			Next

Maintenance information display mode

Operation time of each device is displayed in this mode.
(Page 31)

Current setting			
Pre trip inspection(Basic)			
Back	Basic (Min)	Detail (Max)	PTI Start

Pre trip inspection (PTI) setting mode

Mode to set the self diagnosis operation (PTI)
(Page 52)

Language setting			
▲ German			
English			
▼ French			
Back	▲	▼	Set
F1	F2	F3	F4

Language setting mode

Selects a language (English, French, Italian, Spanish, Swedish or German). Press “F2 (▲)” or “F3 (▼)” switch to select a language, and finalize the selection by pressing “F4 (Set)” switch.

Sub-menu			
▲ BDS function setting			
Zoom mode setting			
▼ Defrost interval timer			
Back	▲	▼	Select

Sub-menu selection mode

Functions of the controller operability, or other, are displayed and set in this mode.
(Page 25)

Operating information1 C003			
HP	2560kPa	TD	125°C
LP	150kPa	REV	0/102
AT	38°C		
Back	Unlock	Lock	Next

Operating information display mode

State of operation is displayed in this mode. In the next page, operation mode such as cooling and EVT is displayed.

Calendar and clock setting			
01 Jan 2024 00:00			
Back	▲	▼	Next

Calendar and clock setting mode

Date, Month, Year and current time are set in this mode.
(Page 29)

Set ON timer			
ON timer disable			
Back	Enable	Disable	Set

Set ON timer mode

Date and time to start the refrigeration unit automatically is set in this mode.

( Page 48)

Set OFF timer			
OFF timer disable			
Back	Enable	Disable	Set

Set OFF timer mode

Date and time to stop the refrigeration unit automatically is set in this mode.

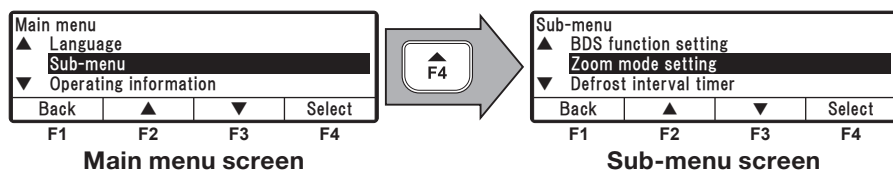
( Page 50)

Display and function of Sub-menu

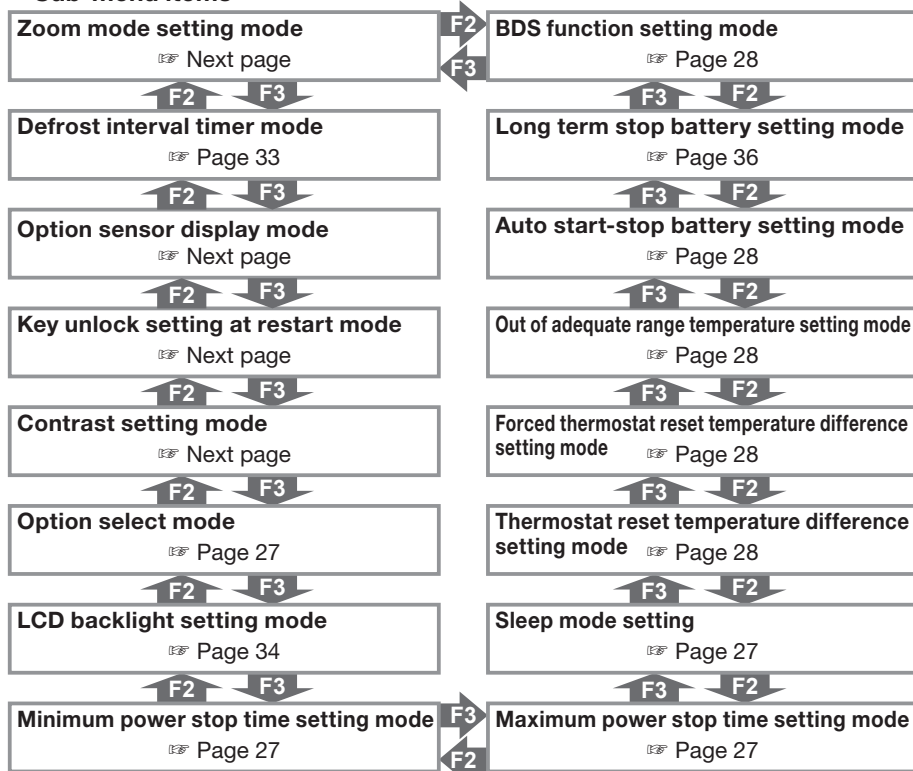
On the “Sub-menu”, the screen changes in the following order at each push on “F2 (▲)” or “F3 (▼)” switch. In the following figure, “F2” switch changes sequence clockwise while “F3” switch changes counter clockwise.

NOTE

- If “MENU” switch is pressed for more than 1 second while changing settings, the display returns to the normal display screen, and the change content is not reflected. The change content will also be lost if the setting change is aborted in any way.



• Sub-menu items





If “F4 (Select)” switch is pressed on each Sub-menu screen on previous page, the display changes to following screens.

Zoom mode setting			
Disable			
Back	Enable	Disable	Set

Zoom mode setting			
Waiting time 2 min			
Back	▲	▼	Set
F1	F2	F3	F4



Current setting			
6.0Hr			
Back	▲	▼	Set

Option sensor display			
-20.7°C			
Back			

Key unlock setting at restart			
ON			
Back	ON	OFF	Set
F1	F2	F3	F4

Contrast setting			
Back	▲High	▼Low	Set
F1	F2	F3	F4

Zoom mode setting mode

Enable/disable Zoom mode and set the Waiting time.

(Setting option)

OFF: Disable

ON: Enable (Default)

Waiting time: 1 to 10 minutes which can be changed in the unit of 1 minute.

(Default: 2 minutes)

• Zoom mode

If Zoom mode is enabled and there is no operation or event during the “Waiting time”, the screen contents are enlarged and displayed. (Example: Left figure)

Defrost interval timer setting mode

The defrost interval is displayed and set in this mode. Factory default is set at “6.0Hr”. The interval can be changed in steps of 1.0Hr.

(☞ Page 33)

Option sensor temperature display mode

When the optional sensor is installed, the sensor temperature is displayed in this mode. If no option sensor is installed, it displays “Lo”.

Key unlock setting at restart mode

Key unlock at restart is set in this mode.

Press “F2 (ON)” or “F3 (OFF)” switch to select ON or OFF, and press “F4 (Set)” switch to finalize the selection.

(Default: ON)

ON: Key lock is cancelled when RUN/STOP switch is turned ON and OFF.

OFF: Key lock is NOT cancelled even when RUN/STOP switch is turned ON and OFF.

Contrast setting mode

Screen contrast is adjusted in this mode.

Use “F2 (▲)” switch to increase the contrast or “F3 (▼)” switch to reduce the contrast.

4 Initial setting

Option select			
Option1 setting		OFF	
Back	Previous	Next	Select

↑ F1 [Back] ↓ F4 [Select] ↑ F4 [Set]

Option1 setting			
		OFF	
Back	ON	OFF	Set
F1	F2	F3	F4

LCD backlight setting			
▲ Always OFF			
Always ON			
▼ Lit at key operation only(20sec)			
Back	▲	▼	Select

Minimum power stop time setting			
8min			
Back	▲	▼	Set

Maximum power stop time setting			
OFF			
Back	▲	▼	Set

Sleep mode setting			
Disable			
Back	Enable	Disable	Set

Option select/set mode

Press “F2 (Previous)” or “F3 (Back)” switch to select options 1 to 8.

Press then “F4 (Select)” switch to change to Option1 (~ 8) setting mode. Press then “F2 (ON)” or “F3 (OFF)” switch to select ON or OFF, and press “F4 (Set)” switch to finalize the selection.

LCD backlight setting mode

LCD backlight is set in this mode.

(☞ Page 34)

Minimum power stop time setting mode

Setting minimum time before starting operation after thermostat OFF to improve power consumption by reducing frequent starting actions. (Setting option)

1~30 minutes, which can be changed minute by minute.

(Default: 8 minutes)

Maximum power stop time setting mode

Setting maximum time to restart unit forcibly after thermostat OFF to prevent no start trouble due to sensor failure or the like.

(Setting option)

OFF, 10~240 minutes which can be changed minute by minute.

(Default: OFF)

Sleep mode setting mode

Mode to automatically start unit operation when the commercial power supply is activated while the unit is stopped and plugged into the commercial power supply without needing to press the RUN/STOP switch of the controller.

(Setting option)

OFF: Disable (Default)

ON: Enable

NOTE

- For the TEF1500SA unit, it is recommended to leave this option in OFF (Default) mode.

Thermostat reset temp. diff. setting 2.0°C			
Back	▲	▼	Set

Thermostat reset temperature difference setting mode

Setting temperature difference from target temperature to be used as thermostat resetting condition.

(Setting option)

1~6°C which can be changed in the unit of 0.5°C.

(Default: 2°C)

Forced thermostat reset temp. diff. setting 4.0°C			
Back	▲	▼	Set

Forced thermostat reset temperature difference setting mode

Setting temperature difference from target temperature to be used as forced thermostat restarting condition after thermostat OFF.

(Setting option)

2~10°C which can be changed in the unit of 0.5°C.

(Default: 4°C)

Out of adequate range temp. setting 4.0°C			
Back	▲	▼	Set

Out of adequate range temperature setting mode

Setting the allowable temperature range around the target temperature within which the system will recognize as acceptable.

(Setting option)

2~6°C which can be changed in the unit of 0.5°C.

(Default: 4°C)

Auto start-stop battery setting 12.5V			
Back	▲	▼	Set

Auto start-stop battery setting mode

Setting for battery charging operation during thermostat OFF.

(Setting option)

12.0~12.5V which can be changed in the unit of 0.1V.

(Default: 12.5V)

Long term stop battery setting 12.2V			
Back	▲	▼	Set

Long term stop battery setting mode

Setting for battery charging operation during unit stop.

(☞ Page 36)

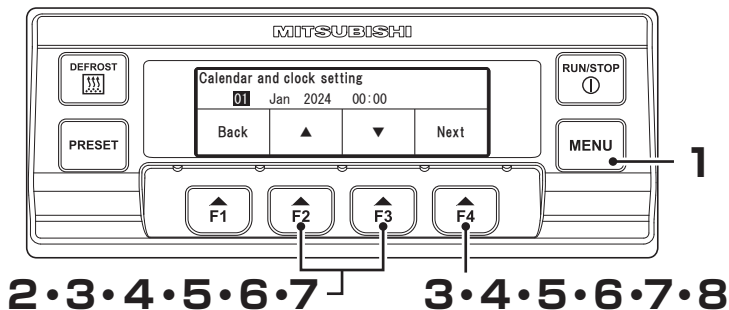
BDS function setting ON			
Back	ON	OFF	Set
F1	F2	F3	F4

BDS function setting mode

BDS function is set in this mode.

Press “F2 (ON)” or “F3 (OFF)” switch to select ON or OFF, and press “F4 (Set)” switch to finalize the selection.

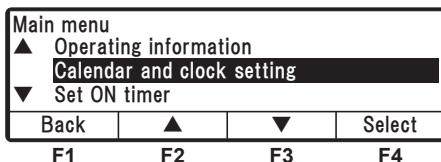
Setting the calendar and clock (Date, Month, Year)



1 Press “MENU” switch.

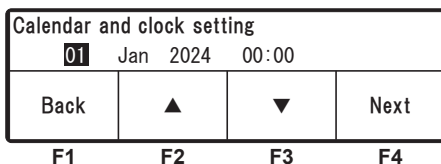
⇒ The display changes to “Main menu” screen.

2 Press “F2 (▲)” or “F3 (▼)” switch till “Calendar and clock setting” screen is displayed (Right figure).



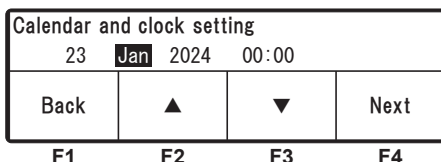
3 Press “F4 (Select)” switch to change to “Calendar and clock setting” mode (Right figure).

⇒ Press “F2 (▲)” or “F3 (▼)” switch to adjust at current date.



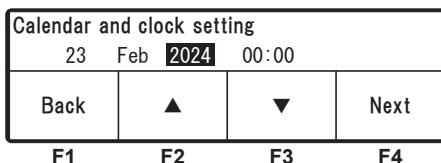
4 Press “F4 (Next)” switch.

⇒ Press “F2 (▲)” or “F3 (▼)” switch to adjust at current month.



5 Press “F4 (Next)” switch.

⇒ Press “F2 (▲)” or “F3 (▼)” switch to adjust at current year.



6 Press “F4 (Next)” switch.

⇒ Press “F2 (▲)” or “F3 (▼)” switch to adjust at current time (Hour).



NOTE

- Time is displayed in the 24-hour scale. If it is “7 PM”, set as “19:00”.

Calendar and clock setting			
23	Feb	2024	00:00
Back	▲	▼	Next
F1	F2	F3	F4

7 Press “F4 (Next)”.

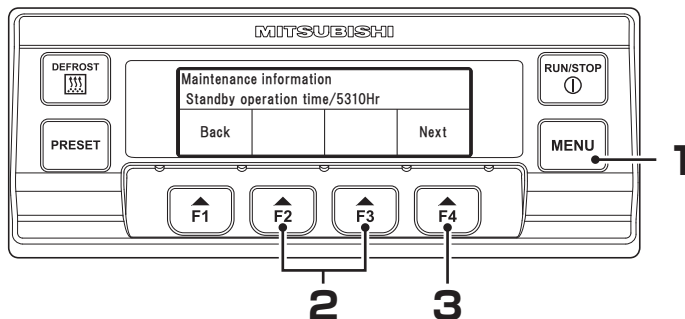
⇒ Press “F2 (▲)” or “F3 (▼)” switch to adjust at current time (Minute).

Calendar and clock setting			
23	Feb	2024	09:00
Back	▲	▼	Set
F1	F2	F3	F4

8 Press “F4 (Set)” switch.

⇒ The setting is completed, and the display returns to the screen of Step 2, “Main menu”.

Displaying the maintenance information



1 Press “MENU” switch.

⇒ The display changes to “Main menu” screen.

2 Press “F2 (▲)” or “F3 (▼)” switch till the display changes to the “Maintenance information” mode.

Main menu			
▲ Alarm			
Maintenance information			
▼ Pre trip inspection			
Back	▲	▼	Select
F1	F2	F3	F4

3 Press “F4 (Select)” switch.

⇒ “Standby operation time” is displayed.

Maintenance information			
Standby operation time/5310Hr			
Back			Next
F1	F2	F3	F4

Display of Maintenance due

- If the operation time or number of operations reaches the “Maintenance required time” on each device, “Maintenance due” (Right figure) is displayed for 10 seconds after the start of operation of the refrigeration unit. And the maintenance mark is displayed in the upper left of the Normal display screen (Right figure).

Maintenance due			

	Set	Cooling		Battery
	Ret	-20.0°C		
		-18.7°C		
		▲	▼	S-S⇌Cont

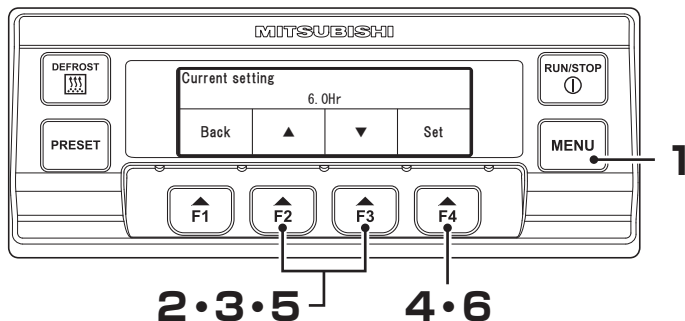
- If you press “F4 (Next)” switch, the display changes to each parts in the table bellow. In case any part other than those listed in the table are displayed when pressing “F4 (Next)”, this is the part on which maintenance is required. The replacement of parts listed in the table should be done based on the interval shown in the table.

Maintenance information			
CF1 operation time/****Hr			
Back			Next
F1	F2	F3	F4

- Parts replacement time**

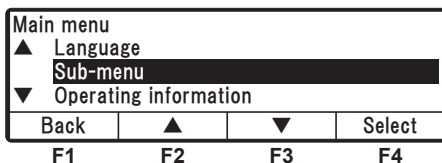
Display item	Replacement interval
Standby operation time	–
Compressor operation time	30,000 hours or more
CF1 operation time	30,000 hours or more
CF2 operation time	30,000 hours or more
EF1 operation time	30,000 hours or more
EF2 operation time	30,000 hours or more

Setting the defrost interval

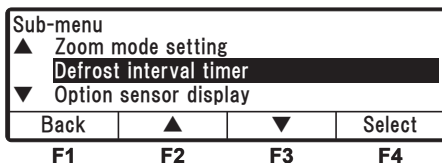


- 1** Press “MENU” switch.
⇒ The display changes to “Main menu” screen.

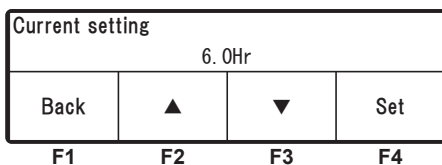
- 2** Press “F2 (▲)” or “F3 (▼)” switch till the display changes to “Sub-menu” screen (Right figure).



- 3** Press “F2 (▲)” or “F3 (▼)” switch till the display changes to “Defrost interval timer”.



- 4** Press “F4 (Select)” switch.
⇒ Current setting of “Defrost interval timer” is displayed.

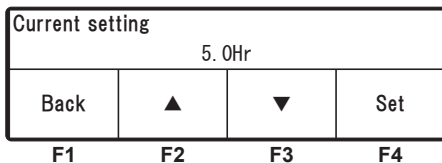


- 5** Press “F2 (▲)” or “F3 (▼)” switch to select a setting time.



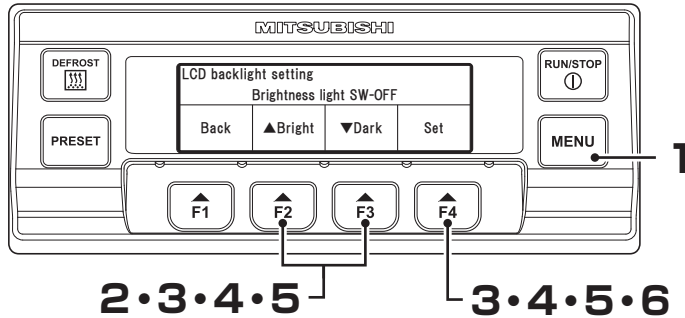
NOTE

- The defrosting can be set at OFF, or at every 1 hour in the range of from 1.0 hours to 12 hours.



- 6** Press “F4 (Set)” switch.
⇒ The setting completes, and the display returns to the screen of Step 3, “Sub-menu”.

Setting LCD backlight



1 Press “MENU” switch.

⇒ The display changes to “Main menu” screen.

2 Press “F2 (▲)” or “F3 (▼)” switch till the display changes to “Sub-menu” screen (Right figure).

Main menu			
▲	Language		
	Sub-menu		
▼	Operating information		
Back	▲	▼	Select
F1	F2	F3	F4

3 Press “F4 (Select)” switch to change to “Sub-menu” screen. Press “F2 (▲)” or “F3 (▼)” switch till the display changes to “LCD backlight setting” screen (Right figure).

Sub-menu			
▲	Option select		
	LCD backlight setting		
▼	Minimum power stop time setting		
Back	▲	▼	Select
F1	F2	F3	F4

4 Press “F4 (Select)” switch.

⇒ Press “F2 (▲)” or “F3 (▼)” switch to select the following LCD backlight setting.

LCD backlight setting			
▲	Always OFF		
	Always ON		
▼	Lit at key operation only(20sec)		
Back	▲	▼	Select
F1	F2	F3	F4

[Lit at key operation only(20sec)] : Lights for 20 seconds only when any switch is pressed.

[Always OFF] : Always turning off the light.

[Always ON] : Always lighting.

5 Press “F4 (Select)” switch. 【Lit at key operation only(20sec)】

⇒ Step 6

【Always OFF】

⇒ Step 6

【Always ON】

⇒ Adjust the brightness of the LCD backlight for Always ON by pressing “F2 (▲Bright)” or “F3 (▼Dark)” switch. ⇒ Step 6

LCD backlight setting			
Lit at key operation only(20sec)			
Back			Set
F1	F2	F3	F4

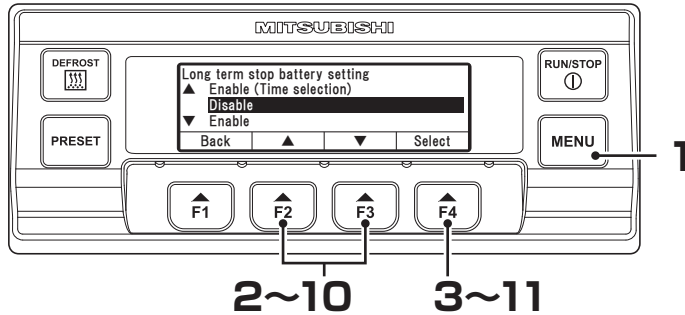
LCD backlight setting			
Always OFF			
Back			Set
F1	F2	F3	F4

LCD backlight setting			
Brightness of always ON			
Back	▲Bright	▼Dark	Set
F1	F2	F3	F4

6 Press “F4 (Set)” switch.

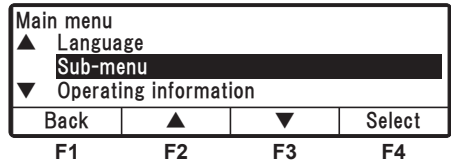
⇒ The setting completes, and the display returns to “Sub-menu” screen of Step 3.

Setting Long term stop battery

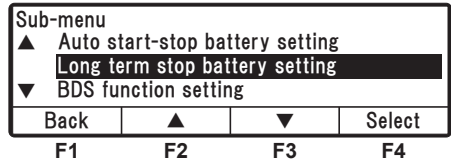


- 1** Press “MENU” switch.
⇒ The display changes to “Main menu” screen.

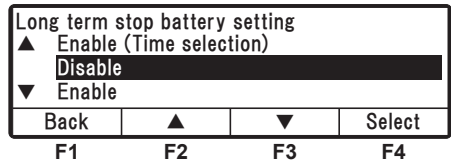
- 2** Press “F2 (▲)” or “F3 (▼)” switch till the display changes to “Sub-menu” screen (Right figure).



- 3** Press “F4 (Select)” switch to change to “Sub-menu” screen. Press “F2 (▲)” or “F3 (▼)” switch till the display changes to “Long term stop battery setting” screen (Right figure).



- 4** Press “F4 (Select)” switch.
⇒ Press “F2 (▲)” or “F3 (▼)” switch to select the long term stop battery setting.



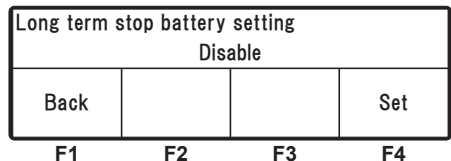
[Disable] : Disable long term stop battery.

[Enable] : Enable long term stop battery (check interval and voltage).

[Enable(Time selection)] : In addition to the above, time selection.

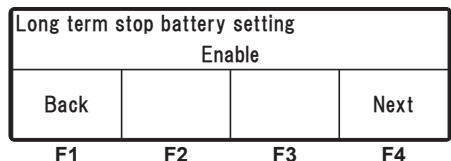
- 5** Press “F4 (Select)” switch.
[Disable]

⇒ Step 11



[Enable]

⇒ Step 9



4 Initial setting

[Enable(Time selection)]

⇒ Press “F2 (▲)” or “F3 (▼)” switch, and adjust the time (Hour) of start of Long term stop battery setting start.



NOTE

- Time is displayed in the 24-hour scale. If it is “7 PM”, set as “19:00”.

Long term stop battery setting			
10:00 - 16:00			
Back	▲	▼	Next
F1	F2	F3	F4

6 Press “F4 (Next)” switch.

⇒ Press “F2 (▲)” or “F3 (▼)” switch, and adjust the time (Minute) of start of Long term stop battery setting.

Long term stop battery setting			
10:30 - 16:00			
Back	▲	▼	Next
F1	F2	F3	F4

7 Press “F4 (Next)” switch.

⇒ Press “F2 (▲)” or “F3 (▼)” switch, and adjust the time (Hour) of end of Long term stop battery setting.

Long term stop battery setting			
10:30 - 17:00			
Back	▲	▼	Next
F1	F2	F3	F4

8 Press “F4 (Next)” switch.

⇒ Press “F2 (▲)” or “F3 (▼)” switch, and adjust the time (Minute) of end of Long term stop battery setting.

Long term stop battery setting			
10:30 - 17:30			
Back	▲	▼	Next
F1	F2	F3	F4

9 Press “F4 (Next)” switch.

⇒ Press “F2 (▲)” or “F3 (▼)” switch, and set check interval of Long term stop battery Setting.
(Setting option)
60, 30, 15min (Default: 60min)

Long term stop battery setting			
Check interval Every 60 min			
Back	▲	▼	Next
F1	F2	F3	F4

10 Press “F4 (Next)” switch.

⇒ Press “F2 (▲)” or “F3 (▼)” switch, and set voltage of battery charging operation during unit stop.
(Setting option)
12.0~12.5V (Default: 12.2V)

Long term stop battery setting			
12.2V			
Back	▲	▼	Set
F1	F2	F3	F4



NOTE

- Each press on “F2” switch increases the value by 0.1 while the value decreases by 0.1 at each press on “F3” switch.

11 Press “F4 (Set)” switch.

⇒ The setting completes, and the display returns to “Sub-menu” screen of Step 3.

5 Operation



WARNING



Do not operate the refrigeration unit in the place where there is a risk of combustible gas leakage.

- Otherwise, it may cause a fire.

Do not touch the electric devices such as power plug etc. with wet hands.

- Otherwise, it may cause an electric shock.



When driving the unit with the vehicle's engine in a building, sufficient ventilation must be provided.

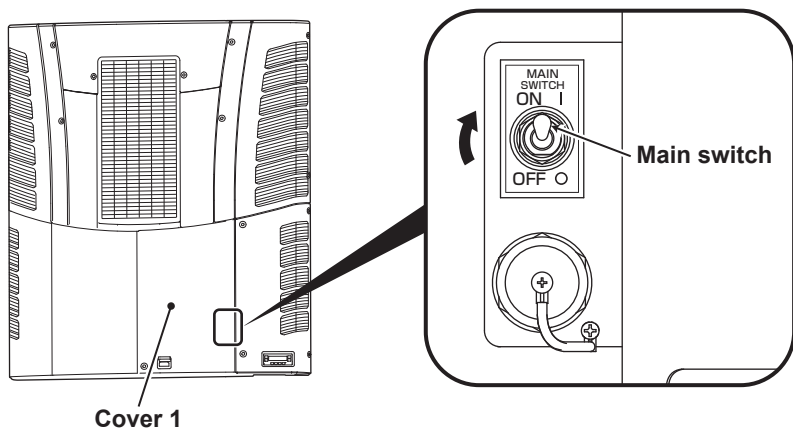
- Otherwise, it may cause oxygen deficiency due to exhaust gas.



NOTE

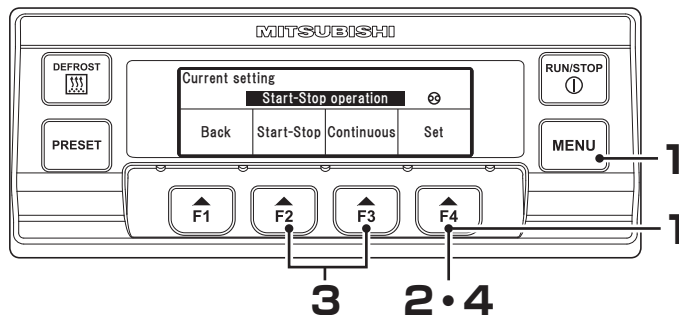
-
- Be sure to carry out the self diagnosis operation (PTI operation) before the operation.
-

Power on



- 1 Open the cover 1. (☞ Refer to page 61.)
- 2 Set the “Main switch” to “ON” side.
- 3 Close the cover 1. (☞ Refer to page 62.)

Selecting the operation pattern



- 1** On the normal display screen (Right figure), press “F4 (S-S⇔Cont)” switch.

⇒ The display changed to the mode screen of Step 2 below.

Set Ret 	Cooling		Battery
	-20.0°C -18.7°C		
	▲	▼	S-S⇌Cont
F1	F2	F3	F4

- 1** Press “MENU” switch.

⇒ The display changes to “Main menu” screen.

Main menu			
▲	Set OFF timer		
	Operation pattern(S-S⇔Cont)		
▼	Alarm		
Back	▲	▼	Select
F1	F2	F3	F4

- 2** Press “F4 (Select)” switch to change to “Operation pattern selection” screen (Right figure).

Current setting			
Continuous operation			
Back	Start-Stop	Continuous	Set
F1	F2	F3	F4

- 3** Press “F2 (Start-Stop)” or “F3 (Continuous)” switch to select the automatic Start/Stop operation or the continuous operation.

⇒ Start/Stop display lights when the Start/Stop operation is set.

Current setting			
Start-Stop operation			
Back	Start-Stop	Continuous	Set
F1	F2	F3	F4

- 4** Press “F4 (Set)” switch.

⇒ The setting completes, and the display returns to the normal display screen.

NOTE

● What is the automatic start/stop operation?

Temperature inside container is maintained within a range of set point temperature by turning magnetic contactor ON & OFF. This is also called as “Thermostat ON” and “Thermostat OFF” mode. Automatic start/stop operation consumes less electricity than the continuous operation but has a relatively large fluctuation of the inside container temperature. This pattern of operation is suitable for cargos with a larger allowance in the control temperature.

*Thermostat OFF: The action in which the magnetic contactor turns off automatically after inside container temperature reached to the setting temperature.

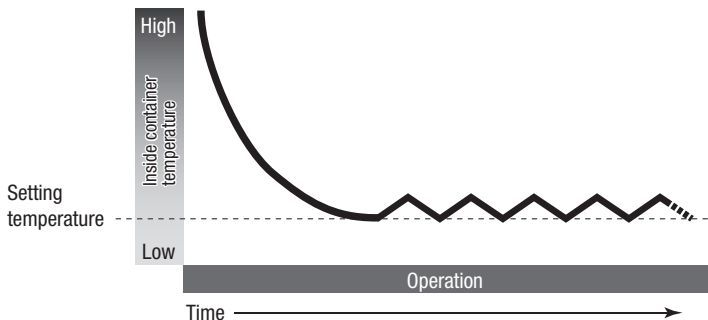
(As the controller is active, it re-starts automatically.)

Thermostat ON: The action in which the operation re-starts automatically when the temperature inside the container deviates outside of the designated range of the setting temperature during thermostat OFF.

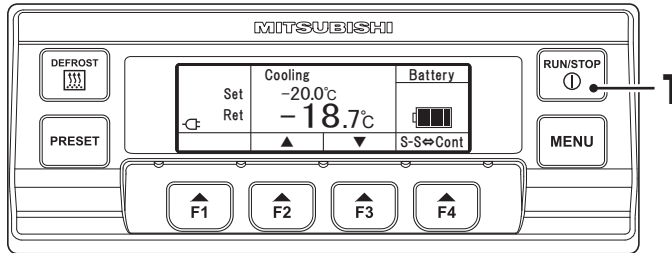


● What is the continuous operation?

The refrigeration unit operates without turning off the magnetic contactor. Since this operation can maintain the inside container temperature very close to the setting temperature, it is suitable for cases such as chilled transportation, pharma transport which require strict quality control.



Starting the operation



WARNING



Start the operation after making sure that all covers for the refrigeration unit are closed.

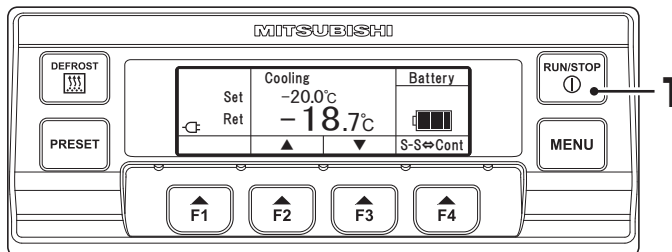
- It may cause accidents if the operation is started with the covers opened.

**1 Press "RUN/STOP" switch.
(The refrigeration unit is turned "ON".)**

⇒ LCD indicates the inside compartment temperature and the setting temperature.

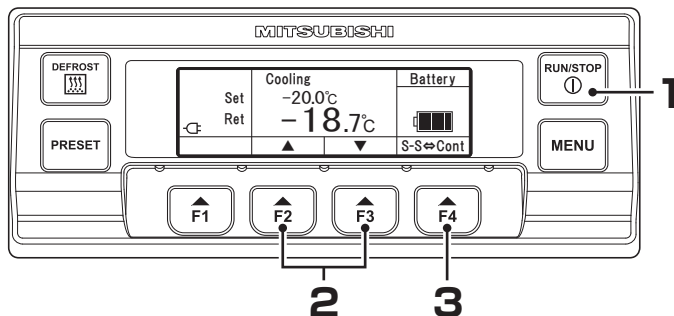
When the unit is connected to the commercial power supply, LCD indicates the display for commercial power supply.

Stopping the operation



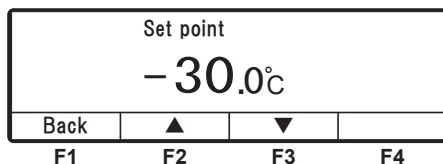
**1 Press "RUN/STOP" switch.
(The refrigeration unit is turned "OFF".)**

Setting the temperature



1 Start the operation of refrigeration unit. (☞ Page 42)

2 Press “F2 (▲)” or “F3 (▼)” switch, and set a temperature.

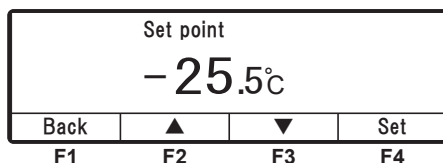


NOTE

- Each push on “F2” switch increases the value by 0.5 while the value decreases by 0.5 at each push on “F3” switch. If the switch is held down, the value changes continuously.

3 Press “F4 (Set)” switch.

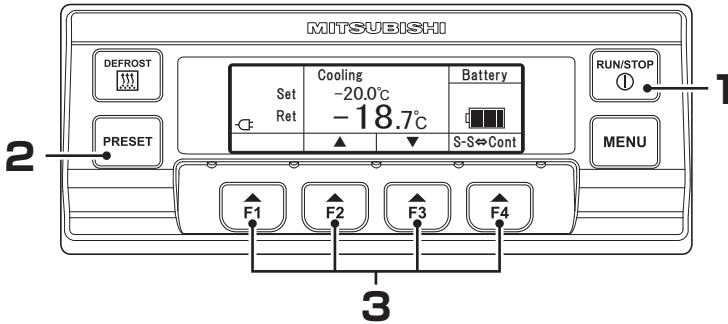
⇒ The setting completes, and the display returns to the normal display screen.



NOTE

- The “Preset” function is provided, with which it can be selected from 4 setting temperatures which you have registered in advance. (☞ Pages 44 to 46)

Setting the preset operation pattern, defrost interval and set point



1 Start the refrigeration unit. (☞ Page 43)

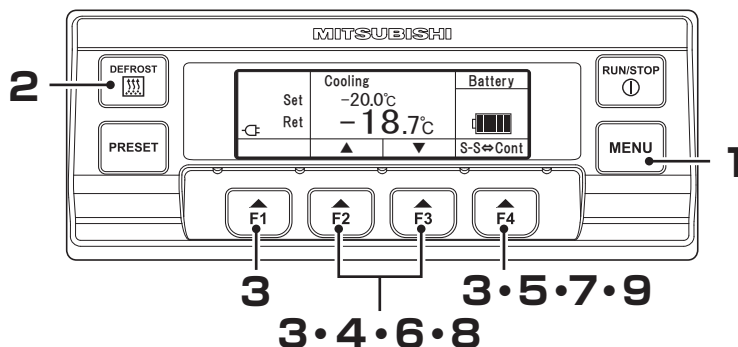
2 Press the “PRESET” switch.

⇒ The display changes to the preset setting screen. Right figure shows the setting values at the shipping from factory.

Start-stop Def 6.0Hr Set temp. -18.0°C	Start-stop Def 6.0Hr Set temp. -5.0°C	Start-stop Def 6.0Hr Set temp. 5.0°C	Start-stop Def 6.0Hr Set temp. 20.0°C
F1	F2	F3	F4

3 Press “F1 (~ F4)” switch.

⇒ Desired preset operation pattern, defrost interval and temperature are set, and the display returns to the normal display screen.



Changing the registered preset operation pattern, defrost interval and set point

1 Press the “MENU” switch when the refrigeration unit is stopped.

⇒ The controller becomes activated and the display changes to the “Normal display screen”.

2 Press the “PRESET” switch.

Start-stop Def 6.0Hr Set temp. -18.0°C	Start-stop Def 6.0Hr Set temp. -5.0°C	Start-stop Def 6.0Hr Set temp. 5.0°C	Start-stop Def 6.0Hr Set temp. 20.0°C
F1	F2	F3	F4

3 Hold down “F1 (~ F4)” switch for 3 seconds.

⇒ Registered preset of “Operation pattern setting” is displayed.

Operation pattern setting			
Start-Stop operation			
Back	Start-Stop	Continuous	Set
F1	F2	F3	F4

4 Press “F2 (Start-Stop)” or “F3 (Continuous)” switch to select the automatic Start-Stop operation or the Continuous operation (Right figure).

Operation pattern setting			
Continuous operation			
Back	Start-Stop	Continuous	Set
F1	F2	F3	F4

5 Press “F4 (Set)” switch.

⇒ Registered preset of “Defrost interval timer” is displayed.

Defrost interval timer setting			
6. 0Hr			
Back	▲	▼	Set
F1	F2	F3	F4

6 Press “F2 (▲)” or “F3 (▼)” switch to select a setting time.

- The defrosting can be set at OFF, or at every 1 hour in the range of from 1.0 hours to 12 hours.

Defrost interval timer setting			
5. 0Hr			
Back	▲	▼	Set
F1	F2	F3	F4

7 Press “F4 (Set)” switch.

⇒ Registered preset of “Set point” is displayed.

Set point			
- 18.0°C			
Back	▲	▼	Set
F1	F2	F3	F4

8 Press “F2 (▲)” or “F3 (▼)” switch, and set a temperature.

Set point			
- 30.0°C			
Back	▲	▼	Set
F1	F2	F3	F4

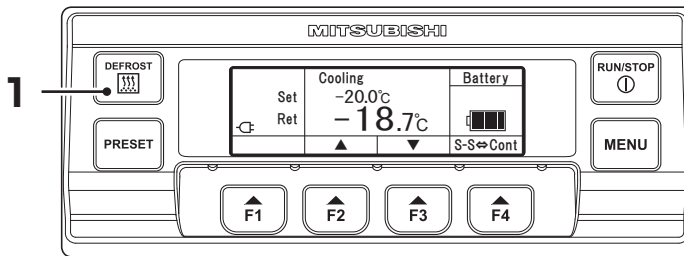


- Each push on “F2” switch increases the value by 0.5 while the value decreases by 0.5 at each push on “F3” switch. If the switch is held down, the value changes continuously.

9 Press “F4 (Set)” switch.

⇒ The setting completes, and the display returns to the normal display screen.

Manual defrost operation



Starting the manual defrost operation

- 1 Press the “DEFROST” switch once during cooling operation.

⇒ The defrost operation starts.



NOTE

- The defrost operation may not start when the inside container temperature is higher.

Ending the manual defrost operation

If the defrost operation completes, it returns to the cooling operation.

If it is necessary to interrupt the defrost operation and to return to the cooling operation, press the “DEFROST” switch once more.

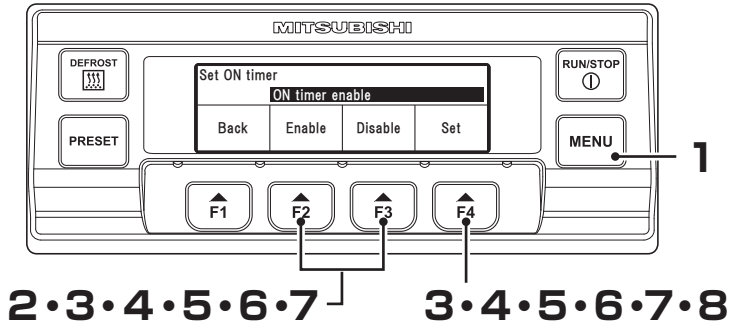
If the “RUN/STOP” switch is turned “OFF”, it interrupts the defrost operation and stops the operation of refrigeration unit.



NOTE

- The manual defrost operation can be made also during the thermostat OFF stop.
- Unit will not enter manual defrost mode when “Defrost” switch is pressed while unit is not operating.

Setting the ON timer



1 Press "MENU" switch.

⇒ The display changes to "Main menu" screen.

2 Press "F2 (▲)" or "F3 (▼)" switch till the display changes to "Set ON timer" screen (Right figure).

Main menu			
▲	Calendar and clock setting		
	Set ON timer		
▼	Set OFF timer		
Back	▲	▼	Select
F1	F2	F3	F4

3 Press "F4 (Select)" switch to change to "Set ON timer" mode (Right figure).

⇒ If Enable is selected by pressing "F2 (Enable)" switch, go to Step 4.

⇒ When Disable has been selected by pressing "F3 (Disable)" switch, if "F4 (Set)" switch is pressed, the display returns to the screen of Step 2.

Set ON timer			
	ON timer enable		
Back	Enable	Disable	Set
F1	F2	F3	F4

4 Press "F4 (Set)" switch.

⇒ Press "F2 (▲)" or "F3 (▼)" switch, and set the time (Date) of Set ON timer.

Set ON timer			
21	Oct	20:25	Starting operation
Back	▲	▼	Next
F1	F2	F3	F4

5 Press “F4 (Next)” switch.

⇒ Press “F2 (▲)” or “F3 (▼)” switch, and set the time (Month) of Set ON timer.

Set ON timer			
22	Oct	20:25	Starting operation
Back	▲	▼	Next
F1	F2	F3	F4

6 Press “F4 (Next)” switch.

⇒ Press “F2 (▲)” or “F3 (▼)” switch, and adjust the time (Hour) of Set ON timer.

Set ON timer			
22	Oct	23:25	Starting operation
Back	▲	▼	Next
F1	F2	F3	F4

**NOTE**

- Time is displayed in the 24-hour scale. If it is “7 PM”, set as “19:00”.

7 Press “F4 (Next)” switch.

⇒ Press “F2 (▲)” or “F3 (▼)” switch, and adjust the time (Minute) of Set ON timer.

Set ON timer			
22	Oct	23:30	Starting operation
Back	▲	▼	Set
F1	F2	F3	F4

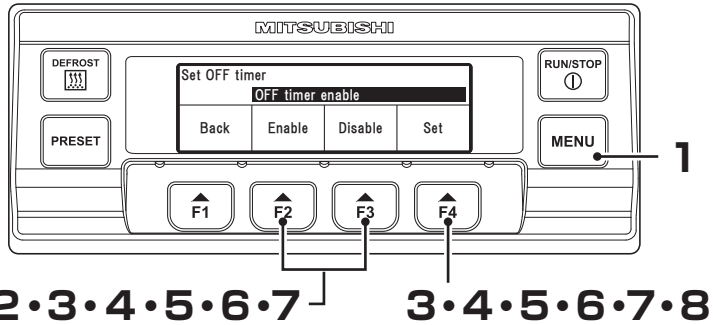
8 Press “F4 (Set)” switch.

⇒ The setting completes, and the display returns to the screen of Step 2, “Main menu”.

**NOTE**

- Take note that the refrigeration unit starts the operation automatically at the setting time when the ON timer is set.

Setting the OFF timer



1 Press "MENU" switch.

⇒ The display changes to "Main menu" screen.

2 Press "F2 (▲)" or "F3 (▼)" switch till the display changes to "Set OFF timer" screen (Right figure).

Main menu			
▲	Set ON timer		
	Set OFF timer		
▼	Operation pattern (S-S⇄Cont)		
Back	▲	▼	Select
F1	F2	F3	F4

3 Press "F4 (Select)" switch to change to "Set OFF timer" mode (Right figure).

⇒ If Enable is selected by pressing "F2 (Enable)" switch, go to Step 4.

⇒ When Disable has been selected by pressing "F3 (Disable)" switch, if "F4 (Set)" switch is pressed, the display returns to the screen of Step 2.

Set OFF timer			
	OFF timer enable		
Back	Enable	Disable	Set
F1	F2	F3	F4

4 Press "F4 (Set)" switch.

⇒ Press "F2 (▲)" or "F3 (▼)" switch, and set the time (Date) of Set OFF timer.

Set OFF timer			
	21	Oct 20:25	Stopping operation
Back	▲	▼	Next
F1	F2	F3	F4

5 Press “F4 (Next)” switch.

⇒ Press “F2 (▲)” or “F3 (▼)” switch, and set the time (Month) of Set OFF timer.

Set OFF timer			
22	Oct	20:25	Stopping operation
Back	▲	▼	Next
F1	F2	F3	F4

6 Press “F4 (Next)” switch.

⇒ Press “F2 (▲)” or “F3 (▼)” switch, and adjust the time (Hour) of Set OFF timer.

Set OFF timer			
22	Oct	23:25	Stopping operation
Back	▲	▼	Next
F1	F2	F3	F4



NOTE

- Time is displayed in the 24-hour scale. If it is “7 PM”, set as “19:00”.

7 Press “F4 (Next)” switch.

⇒ Press “F2 (▲)” or “F3 (▼)” switch, and adjust the time (Minute) of Set OFF timer.

Set OFF timer			
22	Oct	23:30	Stopping operation
Back	▲	▼	Set
F1	F2	F3	F4

8 Press “F4 (Set)” switch.

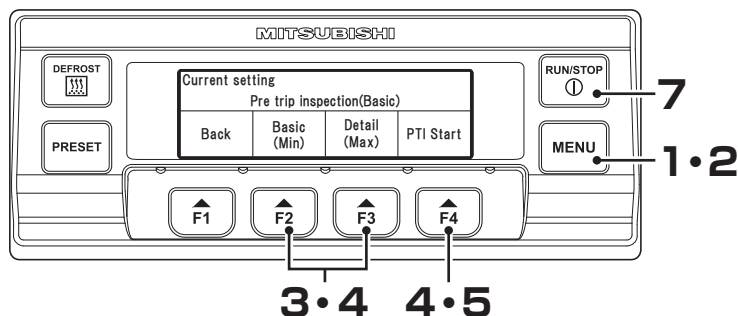
⇒ The setting completes, and the display returns to the screen of Step 2, “Main menu”.



NOTE

- Take note that the refrigeration unit stops the operation automatically at the setting time when the OFF timer is set.

Self diagnosis operation (PTI operation)



NOTE

- Perform the self diagnosis operation without fail before the operation.
- The inspection of the commercial power supply is skipped when the power supply is not connected.

Starting the operation

- 1 Press the “MENU” switch when the refrigeration unit is stopped.
⇒ The controller becomes activated and the display changes to the “Normal display screen”.

NOTE

- Go to the procedure 2 while the refrigeration unit is operating.

- 2 Press the “MENU” switch.
⇒ The display changes to the “Main menu”.

- 3 Press “F2 (▲)” or “F3 (▼)” switch till “Pre trip inspection” screen display.

Main menu			
▲	Maintenance information		
	Pre trip inspection		
▼	Language		
Back	▲	▼	Select
F1	F2	F3	F4

- 4 Press “F4 (Select)” switch to change to “PTI selection” mode (Right figure).

⇒ Press “F2 [Basic (Min)]” or “F3 [Detail (Max)]” switch to select the pre trip inspection.

Current setting			
Pre trip inspection(Basic)			
Back	Basic (Min)	Detail (Max)	PTI Start
F1	F2	F3	F4

5 Operation

- [Basic (Min)]** **Basic self diagnosis operation**
[Detail (Max)] **Detail self diagnosis operation**
 (With the cooling and defrost operations)

NOTE

- Self diagnosis operation takes approx. 5 minutes for "Basic (Min)" or 2.5 hours (It may take a little longer depending on the setting temperature and the outdoor air temperature.) for "Detail (Max)" from start to end.

5 Press the "F4 (PTI Start)" switch.

- ⇒ If the "F4 (PTI Start)" switch is pressed during operation, the refrigeration unit stops temporarily.
- ⇒ To interrupt PTI operation, press "F4 (Cancel)" switch.
- ⇒ When the diagnosis is completed, the unit stops and the result of diagnosis will be displayed.

Pre trip inspection(Basic)			
Under inspection			
F1	F2	F3	Cancel F4

Finishing the operation when no defects are detected

6 When no abnormal condition has been detected, "Success" is displayed.

Pre trip inspection(Basic)			
Success			
Back			

7 Press the "RUN/STOP" switch to turn it "OFF".

- ⇒ The controller will stop.

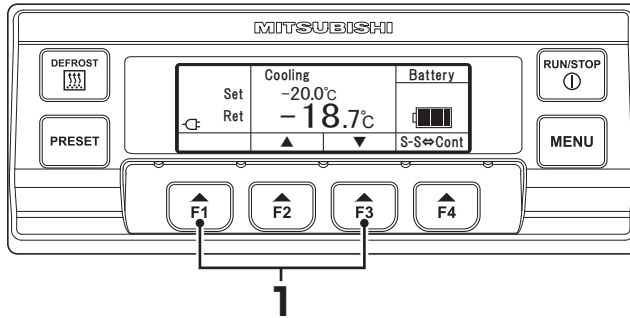
Perform the same procedures when stopping the PTI operation during the inspection.

When abnormal conditions are detected

"Failure", "Step No." and the error code corresponding to the abnormal condition are displayed. When multiple abnormalities occur, display contents are switched and displayed every 2 seconds. Check the alarm code (👉 Refer to pages from 71 to 73) and perform proper treatment or contact your nearest dealer.

Pre trip inspection(Basic)			
Failure Step No.17 E010			
Back	▲	▼	Cancel
Alarm code		Step No.	

Setting the key lock/unlock



NOTE

- Key lock setting disables switch operation except for the "RUN/STOP" switch.

Setting the key lock

- 1 Hold down "F1" and "F3" switch for 3 seconds during the refrigeration unit operation or "Normal display screen".

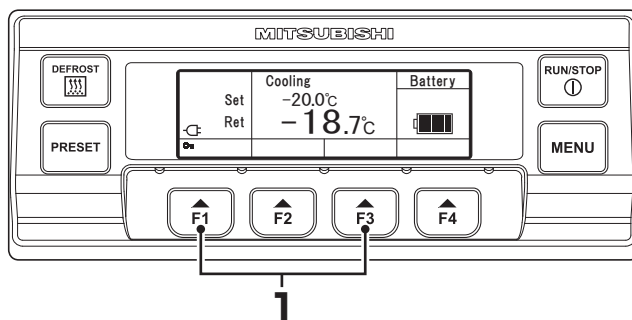
Set Ret On	Cooling		Battery
	-20.0°C		
-18.7°C			
	▲	▼	S-S↔Cont

Key lock screen

⇒ The setting completes, and the key mark is displayed (Upper right figure, call "key lock screen").

⇒ If you press any switch other than "RUN/STOP" switch while the key is locked, the "key operation locked" is displayed (Lower right figure).

Key operation locked			
On			



NOTE

- This section describes when “key unlock setting at restart” is OFF.
- If “key unlock setting at restart” is ON, the key lock is released when the refrigeration unit stops. (→ page 26)

Setting the key unlock

- 1 Hold down “F1” and “F3” switch for 3 seconds during the refrigeration unit operation or “key lock screen”.

⇒ The setting completes, and the display returns to the normal display screen.

6 Loading

Preparation before loading

- 1 Cargos must be cooled down or heated up to the designated temperature with other refrigeration device in advance.
- 2 Clean inside of the container.
- 3 Perform the inspection of the refrigeration unit and the body*.
(☞ Refer to page 59.)
* Check with the body manufacturer for the items to be inspected.
- 4 Set the right temperature for transportation of the cargo and cool down or heat up inside of the container to the setting temperature.
(☞ Refer to page 43.)



NOTE

- The temperature inside of the closed container may reach 60°C under a blazing sun. Loading in such a container causes damages or deterioration of the quality. Be sure to cool down inside of the container to the setting temperature before loading.
- When sufficient cooling cannot be achieved, contact your nearest dealer before loading.

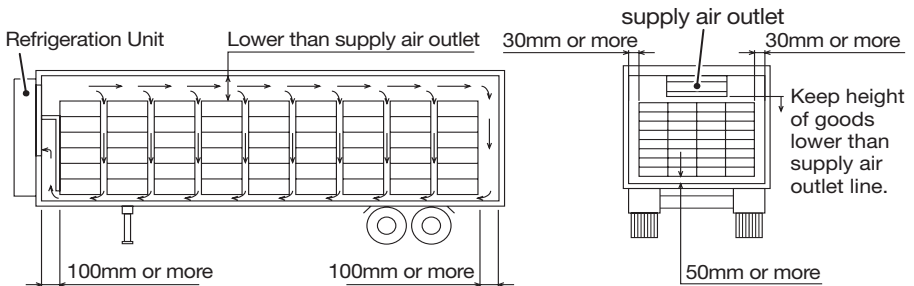
Loading and unloading

Loading procedure

1 Stop the cooling operation. (☞ Refer to page 42.)

2 Load the cargos in the container.

Leave a space between the cargo and inner wall of the container as shown in the following figure in order to circulate airflow.



3 Keep the top layer of the cargo as flat as possible.

CAUTION



Waterproof the cargo if necessary.

- Otherwise, quality of the cargo may deteriorate due to spattering water during defrosting.

4 When loading the cargos which need to be protected from water, cover the cargos in the vicinity of evaporator outlet with waterproof sheet.

5 After completing loading, start the operation of the refrigeration unit. (☞ Refer to page 42.)

Unloading

1 Stop the cooling operation. (👉 Refer to page 42.)

2 Unload the cargos.

 NOTE

- Frost forms and accumulates on the evaporator coil while the refrigeration unit is operated during loading or unloading.
 - Since the inside container temperature rises (or falls during cold winter) while the door is kept opened, load or unload as quickly as possible.
 - A curtain helps to prevent ambient air from entering or inside air from escaping during loading or unloading.
-

7 Inspection

Precautions for inspection

Always carry out the following inspections before operation to prevent any damage to the refrigeration unit.

WARNING



Do not perform the inspection in the place where the combustible gas leakage may happen.

- Otherwise, leaked gas may catch fire when in contact with hot components of refrigeration unit.



Do not modify or remove the protective device mounted to the cover.

- It may cause injury if the refrigeration unit is operated with the cover opened.



Be sure to perform daily and periodic inspections.

- Otherwise, it may cause troubles of the refrigeration unit or accidents.

The area must be well ventilated when performing the inspection indoors.

- Otherwise, collection of exhaust gases indoors may lead to difficulty in breathing.

CAUTION



Use 3-phase AC400V 50Hz for power supply.

- It may cause damage of the refrigeration unit or a fire if any other power supply was used.

Watch your step when climbing up on the trailer for opening and closing the cover or inspection.

- If you step off, you may fall down and get injured.

When leakage of the refrigerant is detected, contact your nearest dealer immediately.

- Otherwise, it may cause blindness or frostbite.



When inspecting unit, stop the unit and wait until the unit has cooled down.

- High temperature parts such as compressor, refrigerant high pressure piping, etc. may cause burns.



Do not start maintenance without more than 5 minutes after stopping operation.

- Refrigerant pipes are dangerously hot. There is risk of burn if touched carelessly.



Before performing the inspection or cleaning work, stop the refrigeration unit using the RUN/STOP switch, and disconnect the battery terminals and the plug of the power cord.

After that, when 5 min. or longer elapse, start the inspection or cleaning work.

- Otherwise, it may cause injury or an electric shock due to unexpected start.

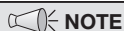


Apply the parking brake and put chocks under wheels during inspection.

- If the vehicle moves, it could cause injury or accident.
-

Opening of the covers

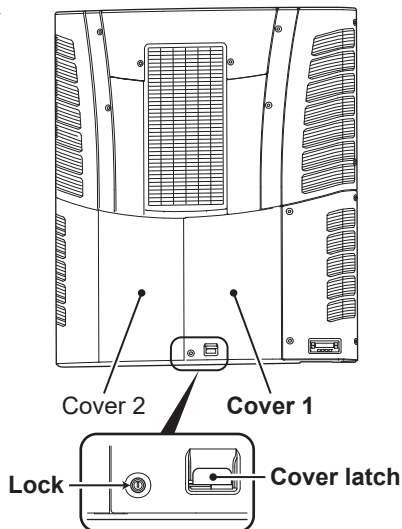
The covers can be opened without using tools when performing the inspection.



- Open the cover 1 at first.

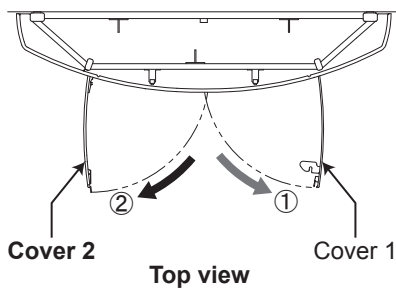
Cover 1

- 1 Open the lock located left the “Cover latch”.
- 2 Pull the “Cover latch”.
⇒ The lock is released and the cover 1 opens a little.
- 3 Open the cover 1 by hand.



Cover 2

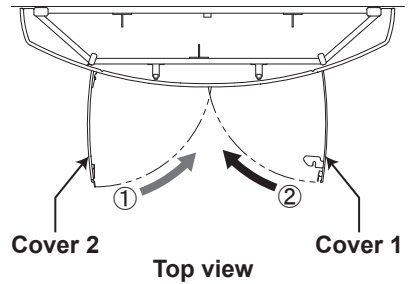
- 1 Open the cover 2 by hand.



Closing the covers

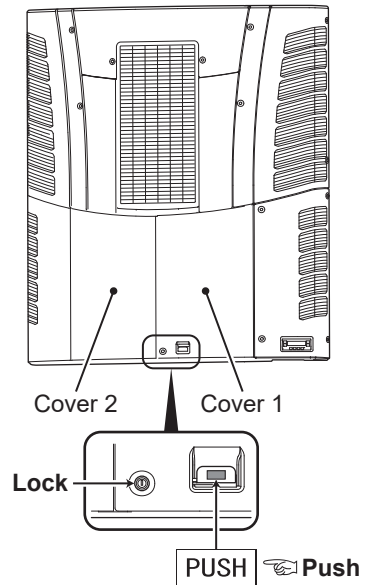
When closing the covers, close the cover 2 first and then cover 1 which has protective device for a safety purpose.

- 1 Close the cover 2.
- 2 Close the cover 1.
- 3 Press the metal latch at **PUSH** mark to secure the covers.
- 4 Lock the cover 1 using key.



NOTE

- If the covers are not pushed enough to lock, it may open while the vehicle is moving. Lock the covers securely.



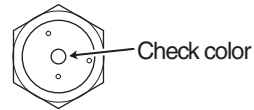
Daily inspection

Inspection of leakage and wiring condition

- 1** Check if there is no damage on the wire connected to the unit lead battery and external power supply.
- 2** If any abnormal conditions are detected, contact your nearest dealer.

Inspection with the sight glass

- 1** Run the refrigeration unit for 10 minutes.



- 2** Confirm if the check color appears in green.



ADVICE

- If the check color appears in yellow, contact your nearest dealer.

When operating the refrigeration unit with low inside container temperature continuously for a long period

When operating the refrigeration unit continuously for a long period at 10°C or lower, ice adheres to locations such as the drain pan. Stop the unit operation once or twice a week, and keep the door open to return the inside temperature to normal so that the ice in the drain pan is melted.

Periodic inspection

Please ask your nearest dealer to perform periodic inspection to ensure to use the refrigeration unit in the best condition all the time.

Periodic inspection consists of the following items.

1. Inspection at commissioning
2. Inspection at every 1 month
3. Inspection at every 6 months
4. Inspection at every 3000 hours
5. Inspection at 24000H operation hour timing

Check the contents of inspection with the check sheet submitted after the periodic inspection.

Periodic inspection check sheet

Customer							Customer's signature		
Inspection interval			Refrigeration unit	Model serial No.		Body manufacturer		Delivery date	
				Operation time				Inspection date	
Every 6 months	Every 1 month	Installation test run	Vehicle	Model serial No.		Refrigeration unit installation company		Inspection company	
				Operation time				Inspector	
Inspection items								Inspection result	Remarks
☐	☐	☐	Inspection for contact with other parts (wiring)						
☐		☐	Tightening of installation bolts (refrigeration unit, bracket, cover of refrigeration unit)						
		☐	Inspection for incorrect wiring and for adequacy of clamps						
☐		☐	Inspection for electrical wiring terminal looseness, damage on wiring and sheath (* Particularly, high-voltage cable and ground cable)						
☐			Inspection of relay contact and contactor contact						
☐	☐		Cleaning of refrigeration unit, drain discharge ports and heatsink fin (back of control box)						
☐		☐	Inspection for refrigerant system gas leaks (oil leaks)						
☐		☐	Inspection for abnormal noise and abnormal vibration (compressor, fan & motor, piping)						
☐		☐	Confirmation of compressor, condenser fan and evaporator fan start/stop with thermostat						
☐	☐	☐	Cooling inspection (indication of LCD display temperature, high/low pressure inspection)						
☐		☐	Confirmation of defrosting operation						
☐		☐	Confirmation of high pressure switch operation						
	☐		Perform Min. PTI						
☐			Confirmation of unit lead battery status						
☐			Perform Max. PTI						
Daily inspection			Operation check						
Every 3000H									
CHECK			Check unit panels, latch etc. for any signs of damage						
CHECK			Check control box internal components for breakage						
CLEAN			Clean evaporator / condenser						
At 24000H operation hour timing									
CHECK			Perform a full unit check (Maintenance of risky parts)						

Refrigerant and refrigerating machine oil

	Kind/Brand
Refrigerant	R410A
Refrigerating machine oil	ENEOS Diamond Freeze MA32R

Power supply system

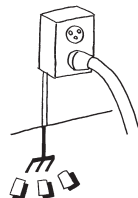
Specification of power supply					
Capacity of power supply (kVA)	Switch		Voltage fluctuation	Voltage drop at start-up	Interphase imbalance
	Molded-case circuit breaker				
	Capacity of switch (A)	Rated capacity of over-current breaker (A)			
15	36	36	Within 10% of rated voltage	Within 15% of rated voltage	Within 3%

WARNING



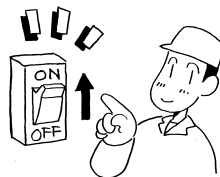
Be sure to perform the grounding work (PEN) for the electric equipment that supplies the power to the refrigeration unit.

- If the grounding work is not performed correctly, this may cause a fire.



Be sure to perform the electrical construct work in accordance with IEC 60364 and use the dedicated circuits and overcurrent circuit breakers.

- It may cause an electric shock or a fire if there is capacity shortage of electric circuit.



CAUTION



Use 3-phase AC400V 50Hz for power supply.

- It may cause damage of the refrigeration unit or a fire if any other power supply is used.

Climate class

The climate class of this refrigeration unit is as follows.

- Climate class 4 (ambient of $32 \pm 2^\circ\text{C}$ with 55%RH)

8 Cautions for use

When operating at a low inside container temperature for a long period of time:

If the refrigeration unit is operated for a long period time with the inside container temperature below 10°C, ice will grow on the inside refrigeration unit, etc. Stop the operation of refrigeration unit once or twice every week and open up the door on the vehicle body to return the inside of container to ordinary temperature and melt grown ice.



CAUTION



Park the vehicle at a flat place and operate the refrigeration unit.

- Otherwise, the evaporator becomes unable to drain and water overflows in the container, damaging cargoes with water.

When stopping the refrigeration unit for a long period of time:

To prevent troubles by stopping for prolonged time, operate the refrigeration unit for 15 minutes once every 3 to 4 days.

9 For emergency

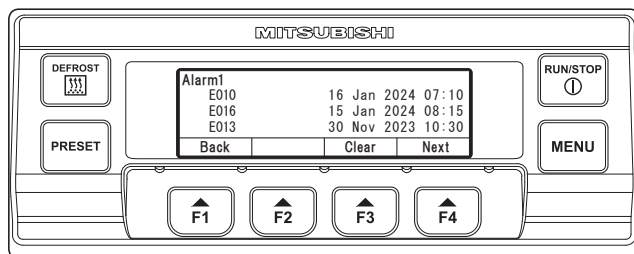
Alarm display

- If any error occurs, the abnormal display  lights or blinks on the LCD (the backlight lights or blinks).
- Check the alarm code displayed at the right-hand side of the abnormal display. (There are a few errors where alarm content is not displayed.)

When no error code is displayed at the LCD, change to the alarm display as described below, and check the alarm content.

Abnormal display		Alarm code		Alarm content	
	E010	HP abnormally high			
	Set	-20.0°C			
	Ret	-18.7°C			

Switching “Normal display” and “Alarm display”



Switching from “Normal display screen” to “Alarm display mode”

Press once each on the [MENU] switch, [F3(▼)] switch and [F4(Select)] switch. (The display returns to the “Normal display screen” 20 seconds later.)

Switching from “Alarm display mode” to “Normal display screen”

Press the [F1(Back)] switch 2 times on the extended display of “Alarm display mode”. (The screen changes to “Normal display screen” in 20 seconds in case of 1 press.) or hold down [MENU] switch.

Countermeasures

Refer to "Alarm code table" for the contents of each error code and its countermeasure.

(☞ Refer to pages 71 to 73)

CAUTION



Abide by the instructions of this operation manual for the countermeasures of the errors.

- Otherwise, it may cause injury or an electric shock due to unexpected start.

When you contact your nearest dealer

When you contact your nearest dealer for the error occurred during operation of the refrigeration unit, give them the following information.

- | | |
|-----------------------------------|--|
| ● Company name | ● Kind of cargo |
| ● Customer's name | ● Setting temperature |
| ● Company telephone number | ● Present inside container temperature |
| ● Number of the plate | ● Specific condition of trouble |
| ● Type of the refrigeration unit | ● Alarm code displayed on the LCD. |
| ● Present location of the vehicle | |
| ● Destination | |

Resuming operation after an emergency stop

If a remark "Automatic operation reset" is written in the column for the Unit condition in the list of alarm codes, the operation will resume as soon as required conditions are satisfied. If a remark "Unit operation stops" is written in the same column, start the operation in usual procedure after removing causes of the troubles.

Resuming operation after an emergency stop

- Press the [RUN/STOP] switch on the controller to stop the unit.
(Confirm that the LCD display is turned off.)
- Press the [RUN/STOP] switch once more to resume the operation of the unit.



CAUTION



If the unit stops due to the same error immediately after the operation is resumed, stop the operation and contact your nearest dealer.

- Otherwise, it may cause serious damages or accidents.

List of alarm codes

Alarm Code	Trouble	Countermeasure	Alarm Display	Unit Condition
E006	Load drive circuit fuse is blown.	AC Fuse F2 has blown. Ask a dealer for inspection.	On	Unit stops.
E009	Commercial power supply is faulty.	Commercial power supply is interrupted or the power plug is not connected to the power socket. Check the power supply. If there is no problem, there is a possibility of short circuit or leakage of electricity in the Refrigeration Unit. Do not touch the Refrigeration Unit. Ask a dealer for inspection.	Blinking	Unit stops. (Automatic operation reset)
E010	High-pressure protection device tripped.	High-pressure switch has tripped. 1) Check if there is nothing restricting the movement of propeller fan. 2) Check to see if the condenser coil is fouled heavily. Ask a dealer for inspection.	On	Unit stops.
E013	Discharge gas temperature is abnormally high.	Refrigerant temperature at the compressor discharge side has reached the protective temperature. Consult a dealer.	Blinking	Unit stops. (Automatic operation reset)
E014	Insufficient refrigerant quantity	Refrigerant quantity is extremely low. Ask a dealer for inspection.	On	Unit stops.
E016	Low-pressure is abnormally low.	Refrigerant pressure at the compressor suction side has dropped to the protective pressure. Ask a dealer for inspection.	On	Unit stops.
E017	High-pressure sensor failed.	High-pressure sensor is not operating normally. Ask a dealer for inspection.	On	Unit stops.
E050	Inside container temperature sensor failed.	Inside container temperature sensor has blown or short-circuited. Ask a dealer for inspection.	Blinking	Unit operation continues.
E060	High-pressure switch failed.	High-pressure switch has failed. Ask a dealer for inspection.	Blinking	Unit stops. (Automatic operation reset)
E063	Discharge gas temperature sensor failed.	Discharge gas temperature sensor has blown or short-circuited. Ask a dealer for inspection.	Blinking	Unit operation continues.
E087	Defrost termination sensor failed.	Defrost termination sensor (DTS) has failed. Ask a dealer for inspection.	Blinking	Unit operation continues.
E099	Controller communication error	Controller cannot communicate properly. Ask a dealer for inspection.	Blinking (lights after 10 sec)	Unit stops. (Automatic operation reset repeats up to 10 times.)
E202	R phase is interrupted.	R phase of commercial 3-phase power supply is interrupted (current does not flow). Ask for inspection on electric equipment.	Blinking	Unit operation continues.
E204	DCS fuse break	Fuse F41, 42 or 43 has blown. Replace the fuse F41, 42 or 43 (10 A) in the DC control box. Ask a dealer for inspection.	Blinking	Unit operation continues.
E206	T phase is interrupted.	T phase of commercial 3-phase power supply is interrupted (current does not flow). Ask for inspection on electric equipment.	Blinking	Unit operation continues.

Alarm Code	Trouble	Countermeasure	Alarm Display	Unit Condition
E210	Pump down failure	Pump down error has been detected during self diagnosis operation (PTI operation).	On	Unit stops.
E250	Evaporator outlet temperature sensor failed.	Evaporator outlet temperature sensor has blown or short-circuited. Ask a dealer for inspection.	On	Unit stops.
E252	Supply air temperature sensor failed.	Supply air temperature sensor has blown or short-circuited. Ask a dealer for inspection.	Blinking	Unit operation continues.
E256	Ambient temperature sensor failed.	Ambient temperature sensor has blown or short-circuited. Ask a dealer for inspection.	Blinking	Unit operation continues.
E265	Fluid bypass solenoid valve failed.	Fluid bypass solenoid valve (SV5) has failed. Ask a dealer for inspection.	Blinking	Unit operation continues.
E266	Electronic expansion valve failed.	Electronic expansion valve (EEV) has failed. Ask a dealer for inspection.	On	Unit stops
E268	Buzzer circuit failed.	External buzzer circuit has short-circuited. Ask a dealer for inspection.	Blinking	Unit operation continues.
E280	Battery voltage dropped.	Battery voltage has dropped. Replace the battery if it is aged.	Blinking	Unit operation continues. (Operation stops if abnormal is detected during PTI.)
E282	Economizer solenoid valve failed	Economizer solenoid valve (SV8) has failed. Ask a dealer for inspection.	Blinking	Unit operation continues.
E301	Inverter overheat	Inverter heat sink temperature is upper 75°C. 1) Stop and restart the unit 2) In case E502 is displayed in parallel, that is the source of error. Ask a dealer for inspection.	On	Unit stops.
E302	Inverter overcurrent	Inverter current has reached the protective value. Stop and restart the unit	On	Unit stops.
E305	Inverter start failure	Inverter start up has failed. Stop and restart the unit. If the same alarm repeats, ask a dealer for inspection.	On	Unit stops.
E306	Abnormal Inverter stepped out	Inverter operation has stepped out. Ask a dealer for inspection.	On	Unit stops.
E502	Abnormal ARRF relay circuit	Cooling fan motor relay has failed. Ask a dealer for inspection.	On	Unit stops.
E503	Abnormal MCCF circuit	Outside fan motor contactor has failed. Inspect outside fan motor contactor, connector and harness .	On	Unit stops.
E504	Abnormal MCEF circuit	Inside fan motor contactor has failed. Inspect Inside fan motor contactor, connector and harness.	On	Unit stops.
E602	Abnormal Heat sink temperature sensor	Inverter heat sink temperature sensor has failed. Ask a dealer for inspection.	Blinking	Unit operation continues.
E603	HTS-CF tripped	Outside fan motor temperature switch has tripped. Check blockage of air flow path. If the same alarm repeats, ask a dealer for inspection.	Blinking (lights after 10 sec)	Unit stops. (Automatic operation reset repeats up to 3 times.)
E604	HTS-EF tripped	Outside fan motor temperature switch has tripped. Check blockage of air flow path. If the same alarm repeats, ask a dealer for inspection.	Blinking (lights after 10 sec)	Unit stops. (Automatic operation reset repeats up to 3 times.)

9 For emergency

Alarm Code	Trouble	Countermeasure	Alarm Display	Unit Condition
E605	Abnormal AC-DC converter	AC/DC converter has failed. Ask a dealer for inspection.	Blinking (lights after 10 sec)	Unit stops. (Automatic operation reset repeats up to 3 times.)
E606	Abnormal commercial power supply (ARCPS) relay circuit	Power supply change relay has failed. Ask a dealer for inspection.	On	Unit stops.
E608	Current sensor failure	Current sensor has failed. Inspect harness and current sensor. Ask a dealer for inspection.	Blinking	Unit operation continues.
E609	AC-DC converter one phase loss	AC/DC converter detects 1 phase loss. Ask a dealer for inspection.	On	Unit stops.
E610	AC-DC converter two phase loss	AC/DC converter detects 2 phase loss. Ask a dealer for inspection.	On	Unit stops.
E611	AC-DC converter overheat	AC/DC converter temperature has reached the protective value. Ask a dealer for inspection.	Blinking (lights after 10 sec)	Unit stops. (Automatic operation reset repeats up to 3 times.)
E612	AC-DC converter voltage high	AC/DC converter voltage has reached the protective value. Ask a dealer for inspection.	On	Unit stops.
E613	AC-DC converter short-circuit	AC/DC converter output side harness has short-circuited. Ask a dealer for inspection.	On	Unit stops.
E614	AC-DC converter start failure	AC/DC converter start up has failed. Ask a dealer for inspection.	Blinking (lights after 10 sec)	Unit stops. (Automatic operation reset repeats up to 3 times.)
E702	Abnormal 4way valve	4way valve has failed. Ask a dealer for inspection.	On	Unit stops.
E940 & E945	Power supply system failure	power supply system has failed. Ask a dealer for inspection.	On or Blinking	Unit stops. (Automatic operation reset for E940, E942, E944.)
E991	Abnormal Communication (Main-Comm)	Communication between main board and communication board has failed. Ask a dealer for inspection.	ON	Unit stops.
E992	Communication failure (Comm-INV)	Communication between inverter board and communication board has failed. Ask a dealer for inspection.	On or Blinking	Unit stops. (Automatic operation reset repeats up to 4 times.)
E993	Communication failure (ROC-PSS)	Communication between controller and power supply system has failed. Ask a dealer for inspection.	Blinking	Unit operation continues.

10 Specification

Item		Type	TEF1500SA	
Function		–	Cooling / Heating / Defrost	
Position		–	Flash mount	
Compressor		–	Electric drive	
Operating modes		–	Automatic start/stop mode	
			Continuous operation mode	
Defrost method		–	Reverse cycle defrost	
			Start: Automatic, Manual	
			Stop: Automatic, Manual	
Ambient temperature		°C	–20 to +40	
Set point range		°C	–30 to +30	
Refrigerant charge volume		kg	R410A , 5.7	
Design pressure		MPa	High pressure side: 4.15	
			Low pressure side: 2.21	
AC Power supply	Voltage	AC-V	400 ± 10%	
	Frequency	Hz	50 ± 3%	
	Power	W	MAX 12300	
DC Power supply	Voltage	DC-V	Rated output 14.4 ± 0.3	
	Power	W	Max 600	
Battery	Name	–	VARTA SILVER DYNAMIC	
	Voltage	V	12	
	Capacity@20hour rating	Ah	77	
	Weight	Kg	17.94	
Unit dimensions	Outside	LxHxW	2000 × 2216 × 430	
	Inside	mm	1680 × 1150 × 100	
Unit weight		kg	440	
Cooling capacity	Ambient temperature	°C	30	
	Room temp. 0°C	W	14700	
	Room temp. –20°C		8090	
Heating capacity	Ambient temperature	°C	–10	–20
	Room temp. 12°C	W	15900	12100



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