

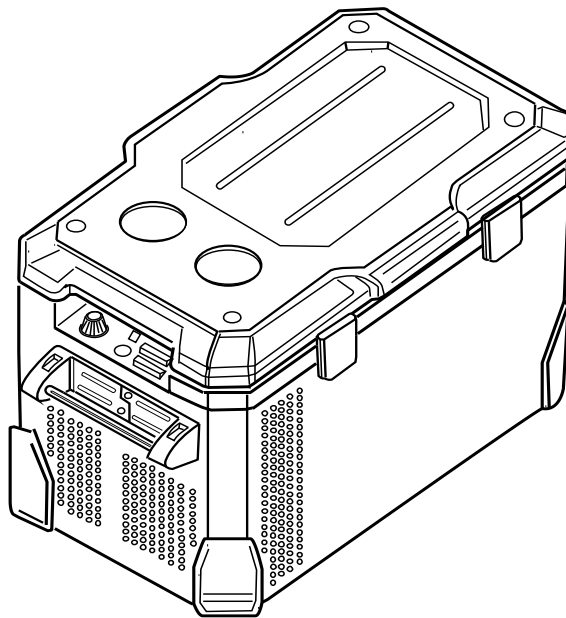


ENGEL

SERVICE MANUAL

MODEL :

MR040F-U1 (COMPRESSOR TYPE; K3)



SAWAFUJI ELECTRIC CO.,LTD.

This service manual describes maintenance procedures for ENGEL refrigerator.

This manual is intended for repair engineers who are familiar with basics service skills and knowledge for ENGEL refrigerator.

This manual does not guarantee correct maintenance when service is done by a non-skilled worker without technical knowledge.

Note that the content of this booklet including product specifications is subject to change for improvement without notice.

● FOR REFRIGERATOR USERS



- Failing to service properly may result in poor reliability of the refrigerator.
- Read this booklet carefully and perform servicing with great care.
- Always comply with the procedures, directions, and work tips in this booklet when servicing the refrigerator.

● FOR SAFETY OF YOURSELF

- To secure safe and correct servicing, read this manual thoroughly in advance and check if there are protective equipment and appropriate tools and service parts ready as well as technical skills necessary to perform servicing.

● SAFETY SYMBOLS

- The following warning labels in this booklet indicate precautions for service work. Comply with what each symbol indicates whenever it appears.

 WARNING	May lead to death or serious injury if failed to comply with this precaution
 ATTENTION	May lead to injury if failed to comply with this precaution
WORK TIPS	Lead to failure of the refrigerator set or its components if failed to comply with this precaution

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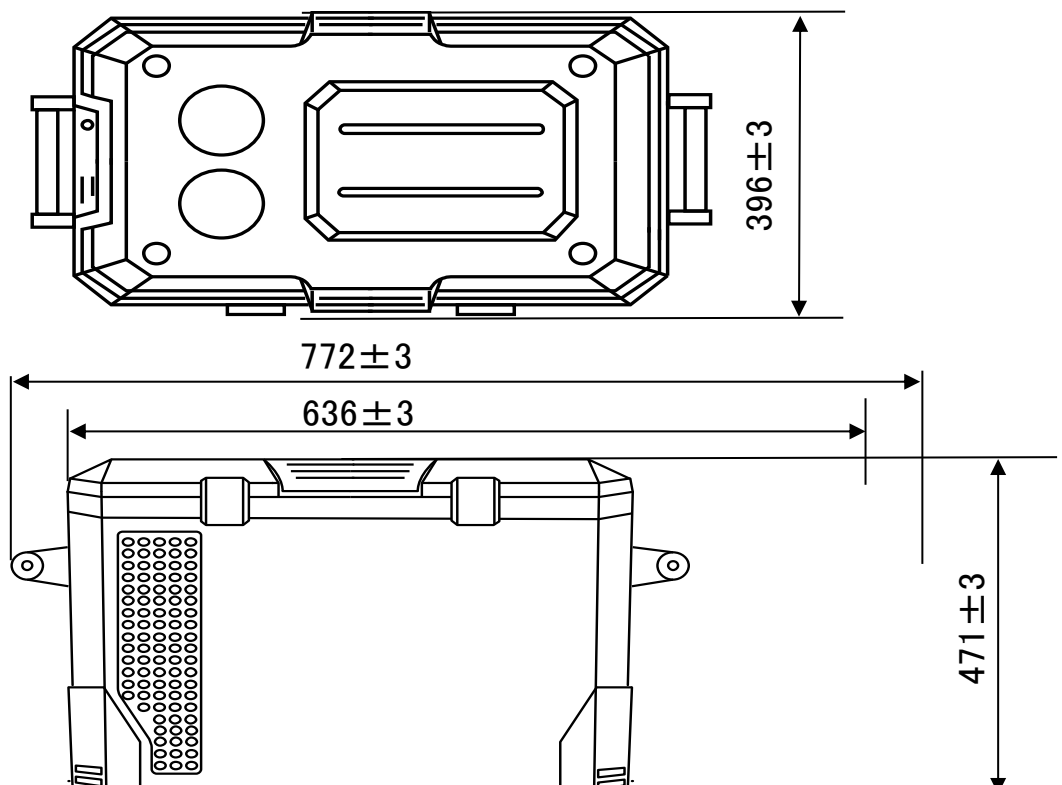
1. SPECIFICATIONS

● Specifications Table

Model		MR040F-U1
Model code		0642 041 0R13
Storage volume	L (liter)	38
Exterior dimensions W × D × H	in	25 × 15.6 × 18.5
	mm	636 × 396 × 471
Interior dimensions W × D × H	in	15.2 × 10.5 × 14.2
	mm	386 × 266 × 360
Outer enclosure	Cabinet	P.P resin
	Door	
Interior enclosure	Cabinet	ABS resin
	Door	P.P resin
Heat insulator	Cabinet	Foamed Polyurethane
	Door	
Input voltage	AC	120V
	DC	12V / 24V
Rated amperage	DC12V	2.75A
	DC24V	1.4A
	AC	0.71A
Compressor rating		AC15V, 1.8A, 27W
Refrigerant		Dichlorodifluoromethane (HFC-134a)
Average inside room temperature (At ambient air temperature 30°C)		8 ± 3°C by Thermostat control NOTCH (COOL)
Temperature control NOTCH 5		Less than -18 °C
Temperature control		Electronic thermostat control type
Weight	LBS.	48.5
	Kg	22

● Exterior Dimensions

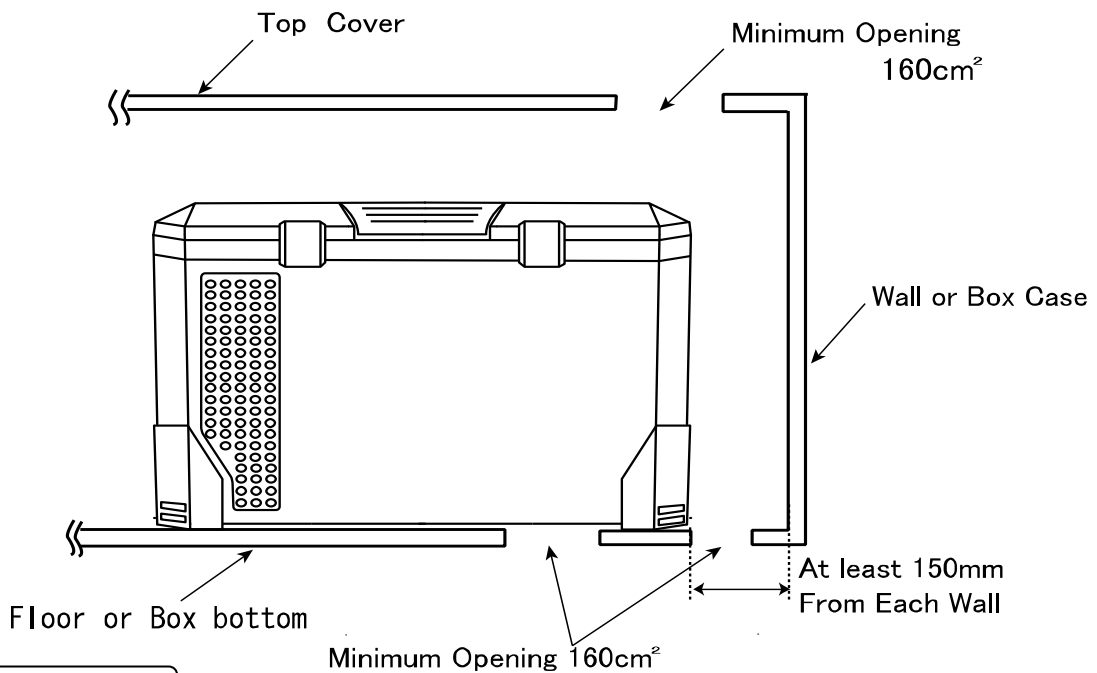
Unit (mm)



2. INSTALLING A REFRIGERATOR

● How to Install the Refrigerator.

- (1) Your shockproof fridge is best installed on a solid surface.
- (2) Be sure your fridge is not placed near a gas stove, heater or other heat-generating appliances.
- (3) Adequate ventilation and suitable distance from each wall (at least 150mm or more) is necessary for the maximum cooling efficiency and minimum electric current consumption for "free standing use" (see Fig. shown below).
- (4) Avoid installing your fridge close to kitchen sink or faucet.
- (5) If you use the fridge under the counter or in the fixing box, please note the following air ventilation conditions.
 - 1) Make vent opening both under fridge or bottom and above fridge top cover.
 - 2) Vent opening size must be larger than 160cm^2 for each opening
(the more air circulation over the condenser, the more efficiently fridge will operate).

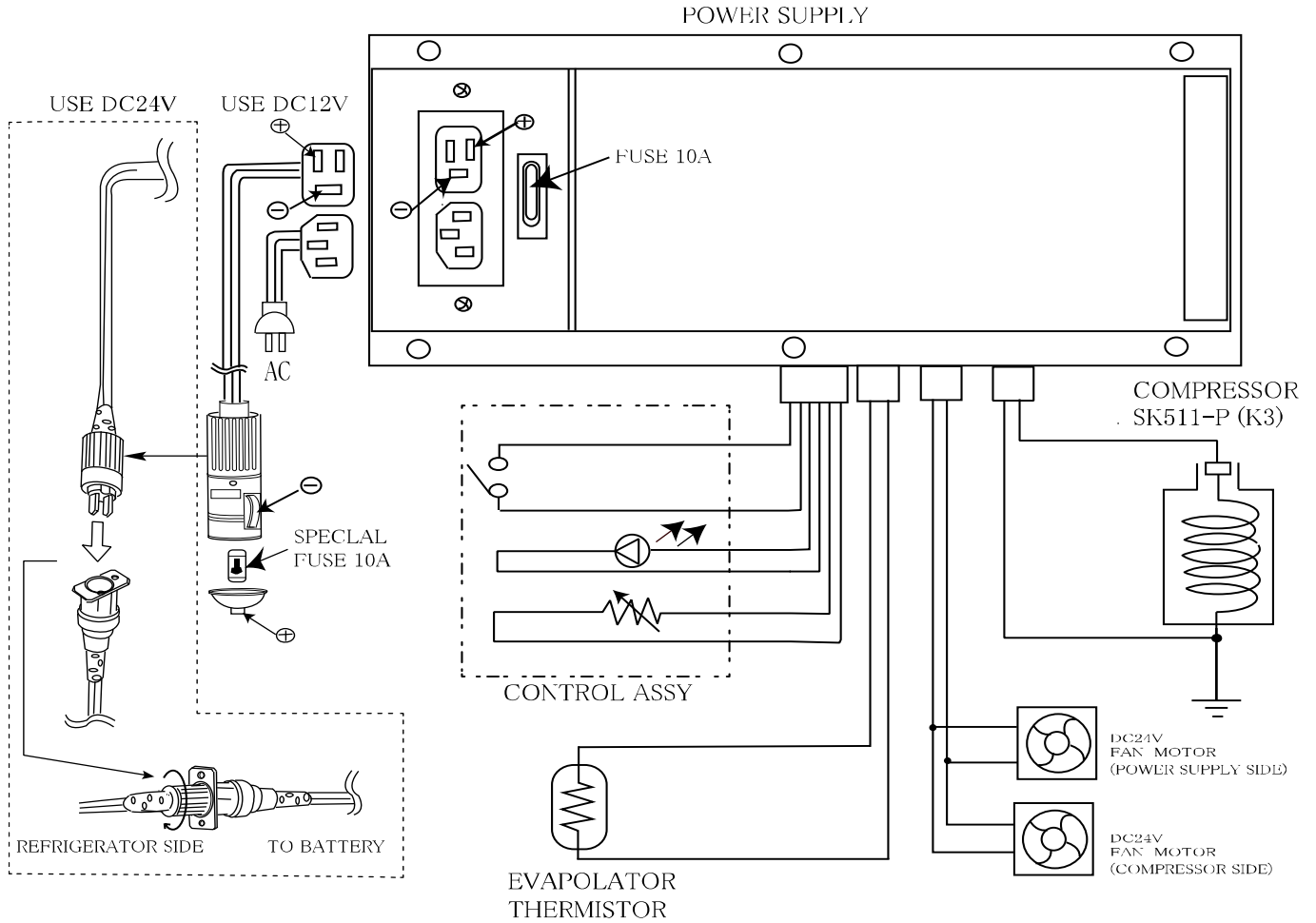


WORK TIPS

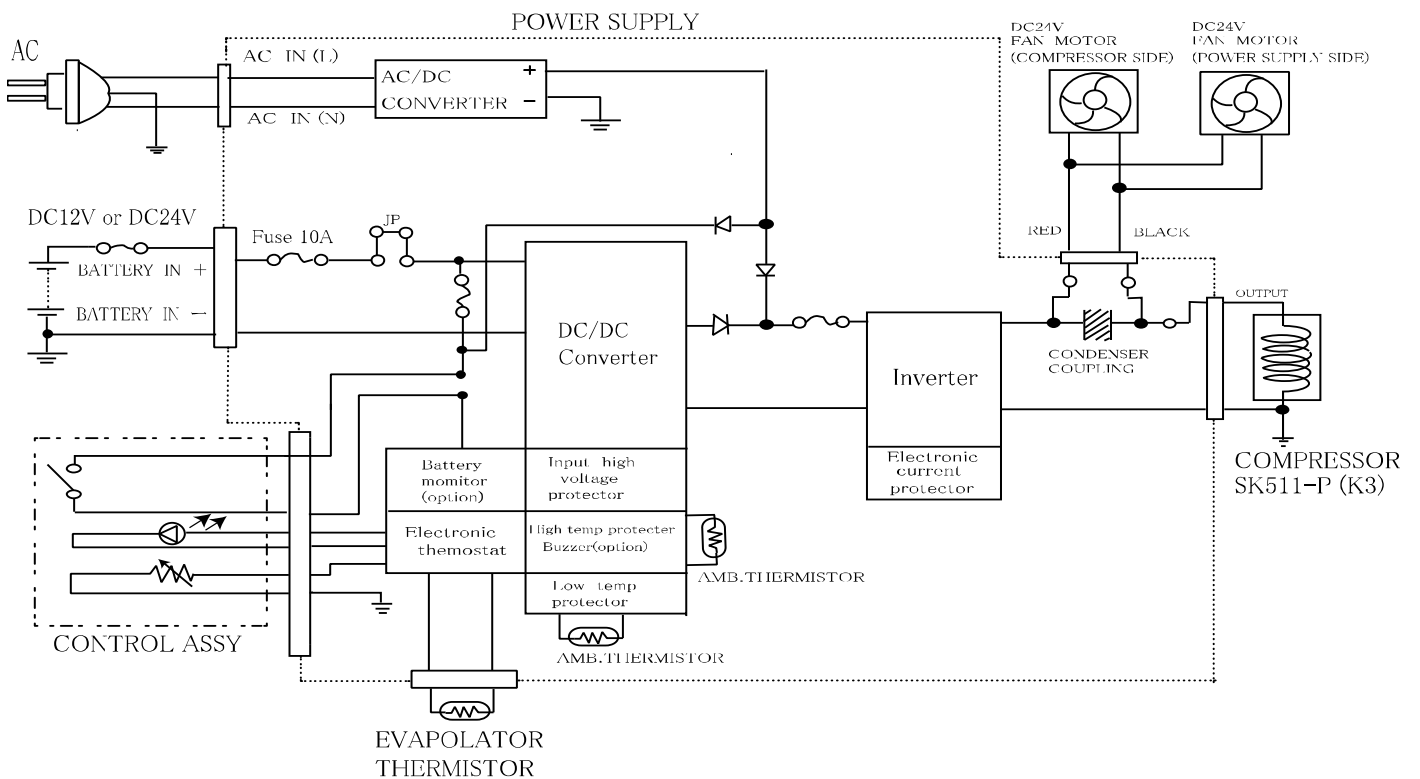
Failure to provide the necessary venting will result in poor refrigeration, continuous compressor operation, accelerated battery discharge and sometimes shorten the life of fridge.

3 .CONNECTING DIAGRAM

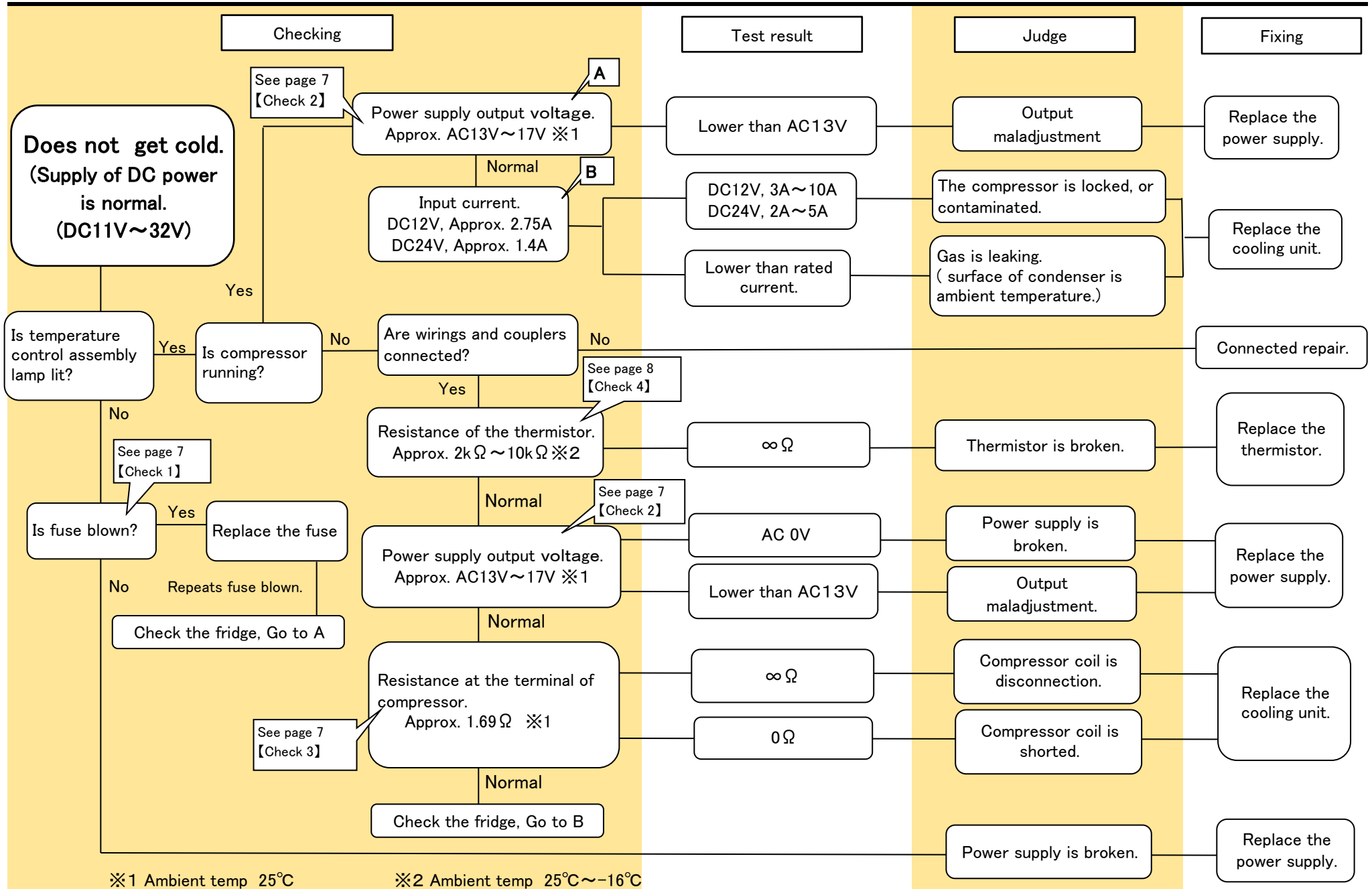
● Block Diagrams



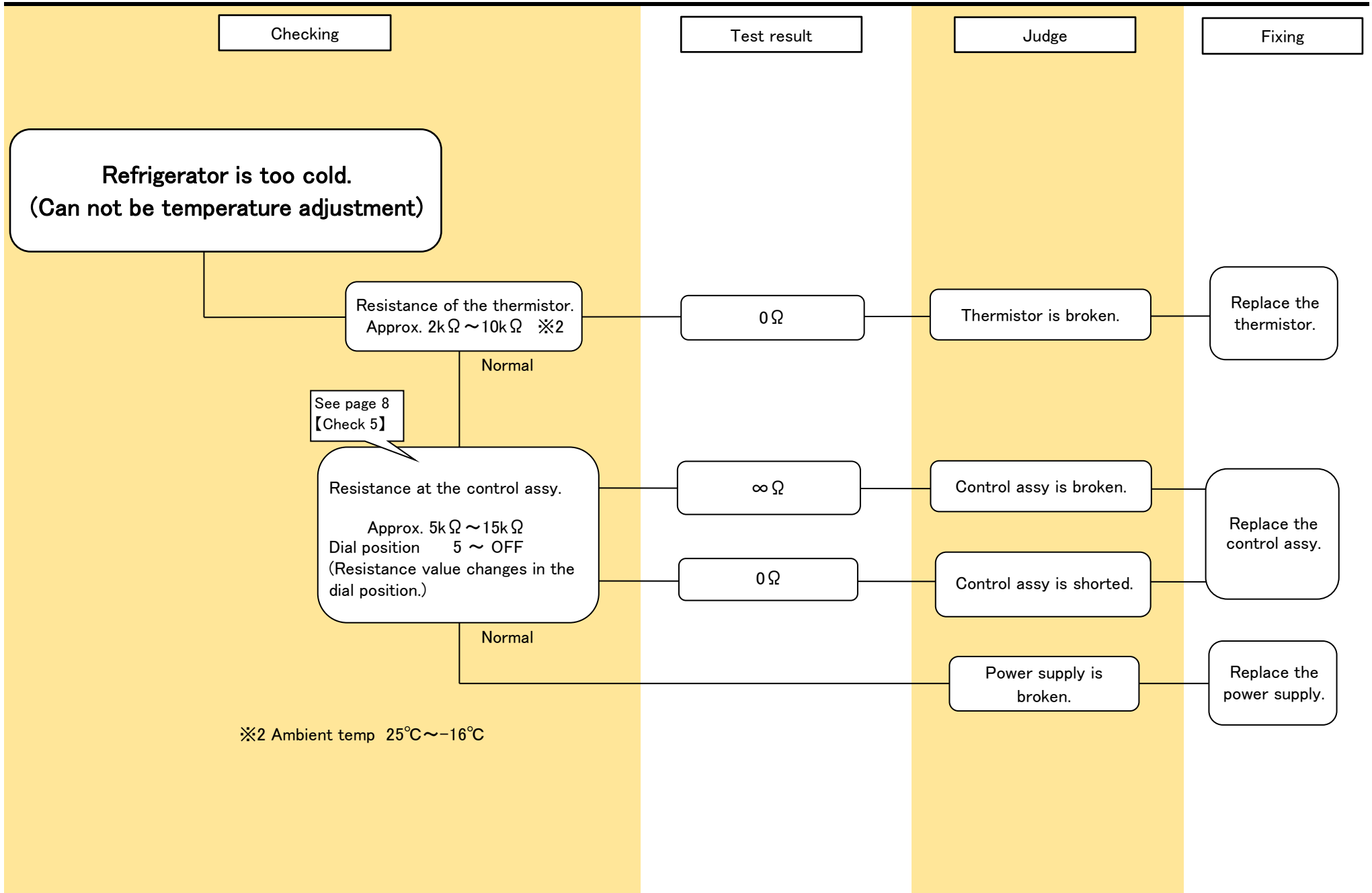
● Wiring Diagrams



4. TROUBLE SHOOTING



4. TROUBLE SHOOTING



※2 Ambient temp $25^{\circ}\text{C} \sim -16^{\circ}\text{C}$

4. TROUBLE SHOOTING

● Typical Problem

※1 Ambient temp 25°C

※2 Ambient temp 25°C~-16°C

	Symptoms	Cause	Test Result	Treatment
Lamp of temperature control assembly is lit.	Inside of the fridge does not get cold	Coil of the compressor is open	Resistance of compressor coil is $\infty \Omega$ •Normal: Approx. 1.69 Ω ※1	Replace the cooling unit
		Power supply is broken	Output voltage of power supply is AC 0V •Normal: Approx. AC13~17V ※1	Replace power supply
	Compressor does not work	Wire thermistor is open	Resistance of thermistor •Normal: Approx. 2k Ω ~ 10k Ω ※2	Replace thermistor
		Cooling is weak	* Gas is leaking from Cooling Unit	
	* Fan motor is broken			Replace fan motor
	* Input voltage is lower than 10V			Charge the battery
	* Ambient temperature is higher than 30°C			
	* Ventilation at mechanical part is not enough			Make at least 150mm room between unit and wall
	* Too many things are put inside			Make some room for cool air
	Lamp of temperature control assembly is not lit.		* The special fuse inside DC cord is open	
		* Fuse in the vehicle is open		Replace the fuse
		* Socket or other DC power line in the vehicle is bad		Check the vehicle

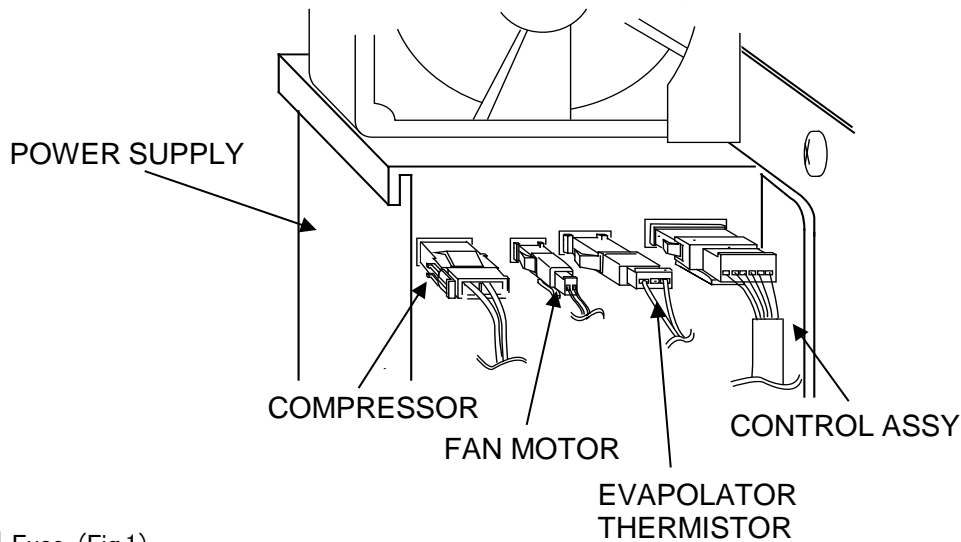
● Technical Data

※1 Ambient temp 25°C

※2 Ambient temp 25°C~-16°C

Checking items	Checking Points	Normal data
Input voltage at compressor	Between terminals of compressor	Approx. AC 13V ~ 17V ※1
Output voltage of Power Supply	Between outgoing cords from power supply (by detaching from terminal of compressor)	Approx. AC 13V ~ 17V ※1
Resistance of the compressor	Between incoming cords to compressor (by detaching from terminal of compressor)	Approx. 1.69 Ω ※1
Resistance of thermistor	Between 2 pin of the coupler	Approx. 2K Ω ~ 10K Ω ※2
Fuse	Fuse at power supply	0 Ω

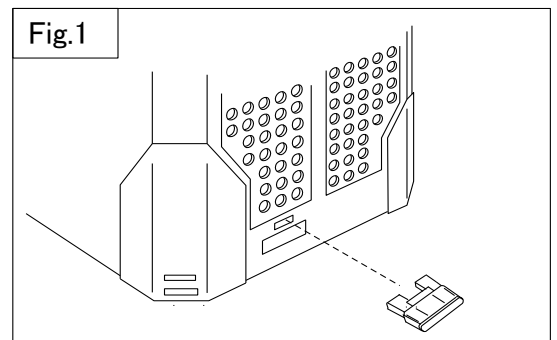
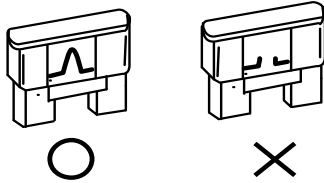
5. CHECK POINT & CHECK METHOD



【Check 1】 Fuse. (Fig.1)

◇ Check the resistance of fuse by tester.

Test result	Judge
0 Ω	Normal
∞ Ω	Broken

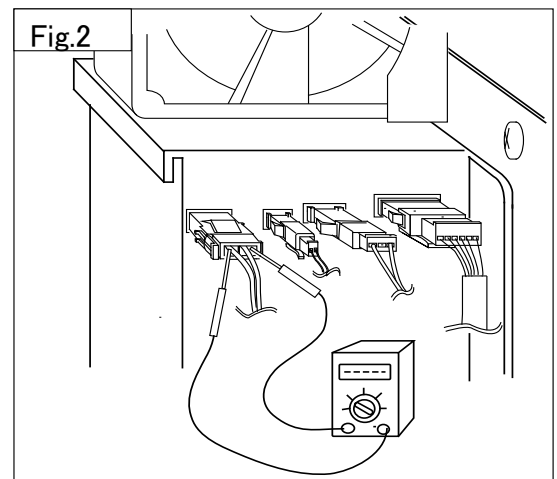


【Check 2】 Input Voltage of the Compressor. (Fig.2)

◇ Checking point

- Check at 2 pin coupler of power supply or at input terminals of the compressor.
- (Should be checked when the compressor is connected)
(Ambient temp 25°C)

Test result	Judge
Approx. AC13~17V	Normal
AC 0 V	Power Supply is broken
Approx. AC13V or lower	Compressor is locked

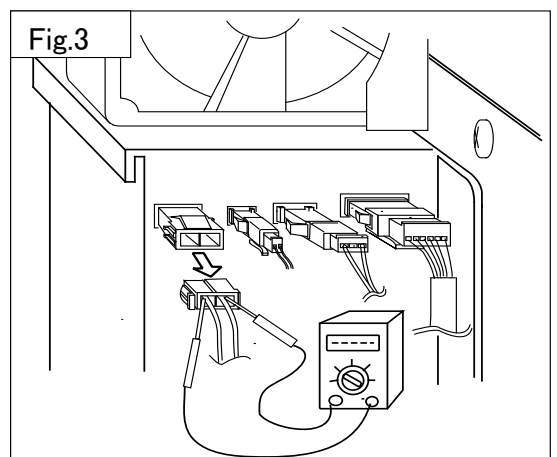


【Check 3】 Resistance of the Coil Compressor. (Fig.3)

◇ Checking points

- Remove 2p couplers at motor cord, and check.
- (Ambient temp 25°C)

Test result	Judge
Approx. 1.69 Ω	Normal
∞ Ω	Broken
0 Ω	Coil of compressor is short circuit



5. CHECK POINT & CHECK METHOD

【Check 4】Resistance of the Thermistor. (Fig.4)

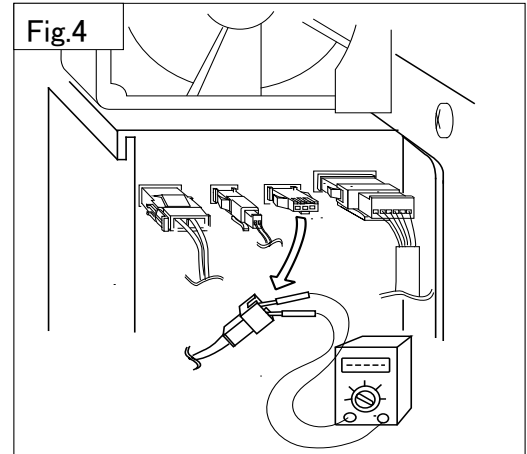
◇Checking points

Remove the 3 pin couplers from power supply, and test.

(Ambient temp 25°C ~ -16°C)

Test result	Judge
Approx. 2 kΩ ~ 10 kΩ	Normal
∞ Ω	Broken
0 Ω	Short Circuit

※ When short circuit, motor runs continuously.



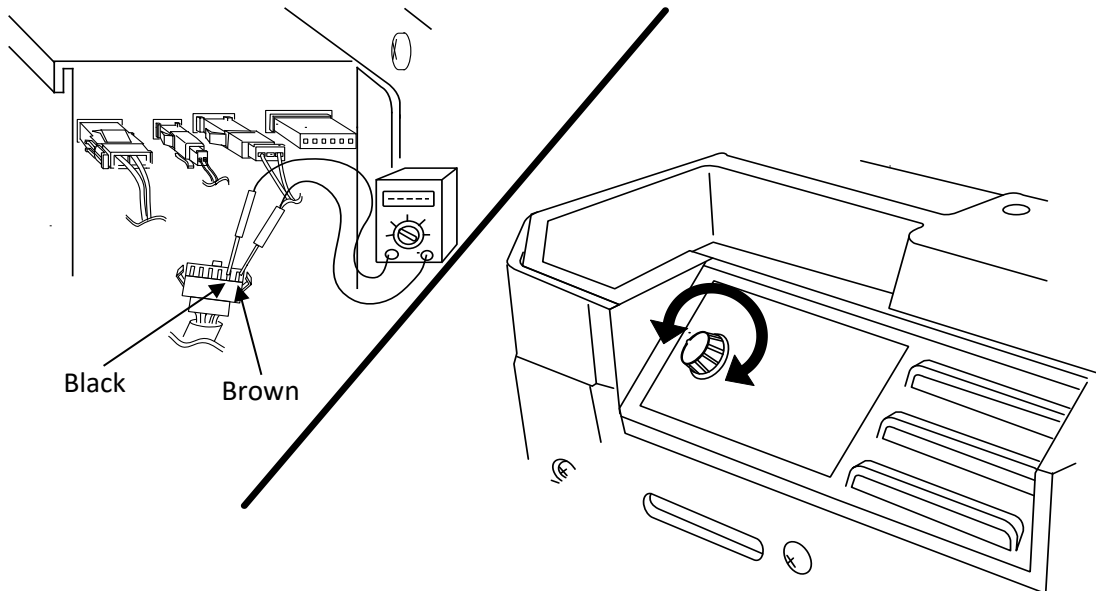
【Check 5】Resistance of the Control Assy. (Fig.4)

◇Checking point

Remove 6pin coupler.

Check the resistance at between terminals brown and black.

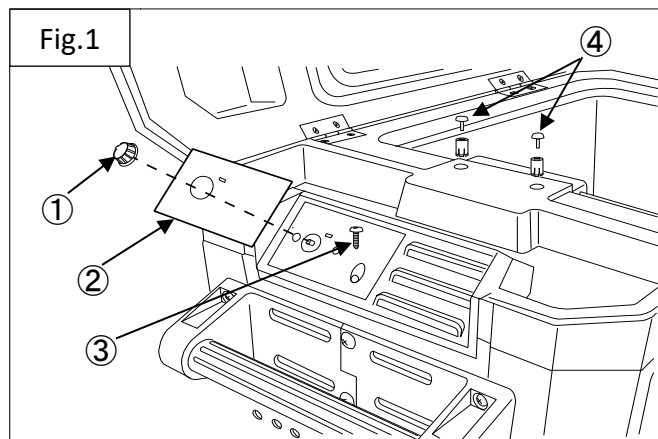
Test result	Assessment
Dial position OFF ~ 5	
Approx. 15kΩ ~ 5kΩ	Normal
∞ Ω	Broken
0 Ω	Short Circuit



6. REPLACING PARTS

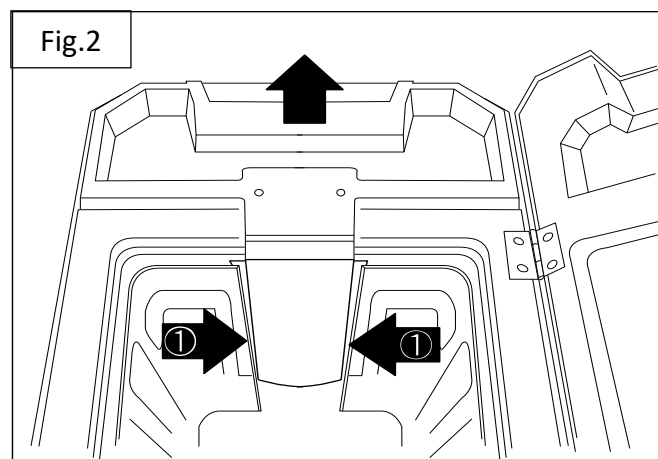
【How to Replace Cooling Unit】

1. Remove dial assembly (Fig.1-①)
2. Remove mark (Fig.1-②)
3. Remove 1 screw (Fig.1-③)
4. Remove the fastener.(Fig1-④)



5. The motor cover is removed.

It removes pushing in the direction of the arrow.
(Fig.2-①)



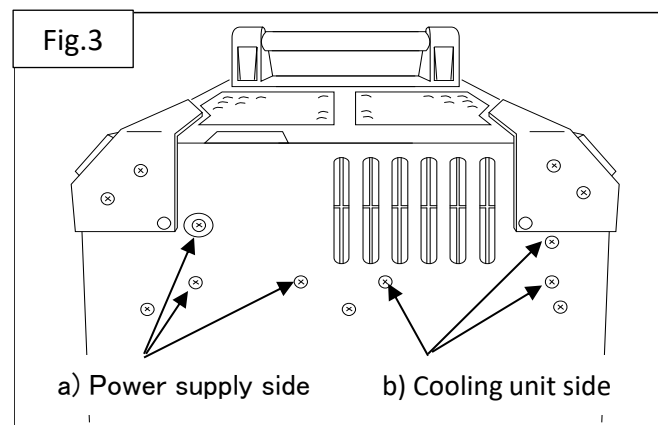
6. Six screws are removed. (Fig.3)

- a) It removes three that stops the cooling unit screws.

WORK TIPS

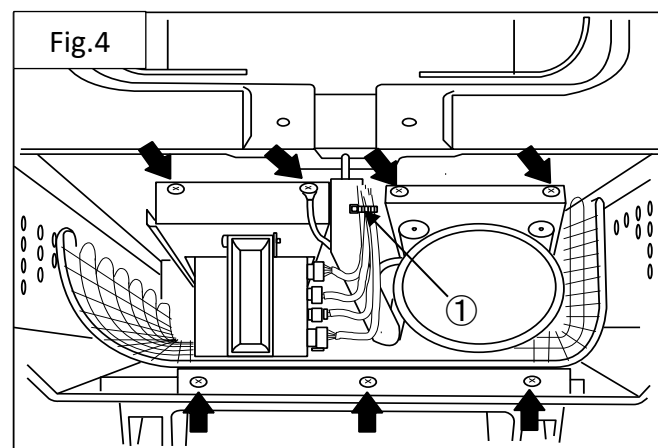
If you remove only the power supply,
b) do not remove.

- b) It removes three that stops the power supply screws.



7. Seven screws of the arrow are removed. (Fig.4)

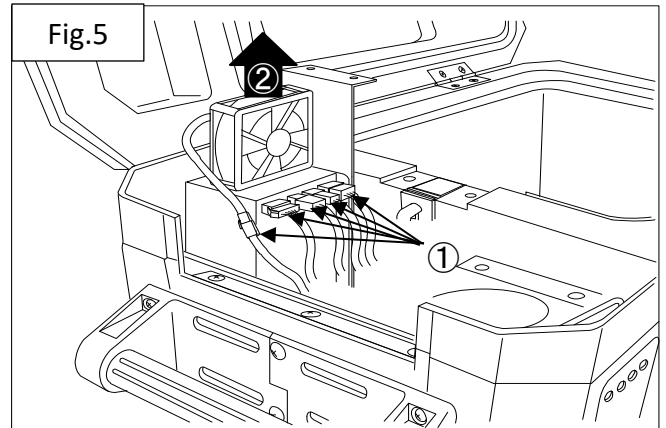
8. Cut the fastener. (Fig.4-①)



6. REPLACING PARTS

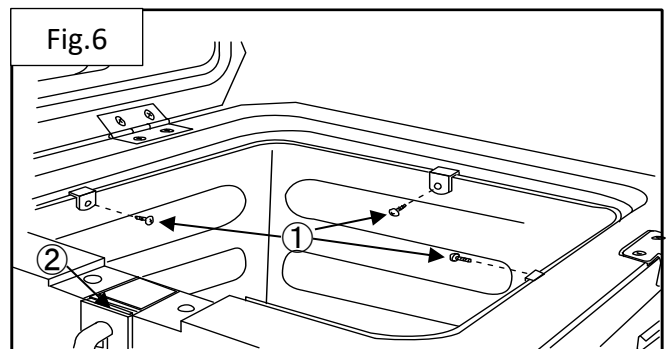
9. The coupler is removed and five places are removed.
(Fig.5-①)

Pull out power supply. (Fig.5-②)



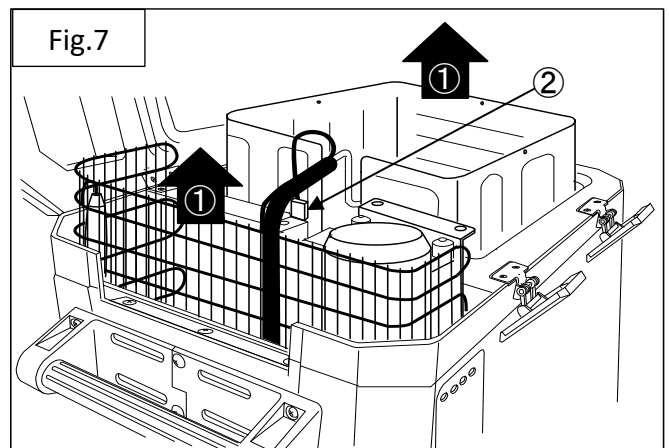
10. Remove 3 screws at evaporator. (Fig.6-①)

11. Remove the bushing. (Fig.6-②)

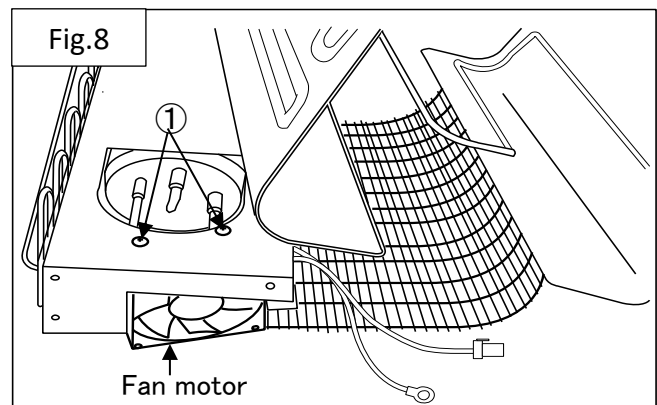


12. Pull out cooling unit. (Fig.7-①)

13. The thermistor is removed. (Fig.7-②)



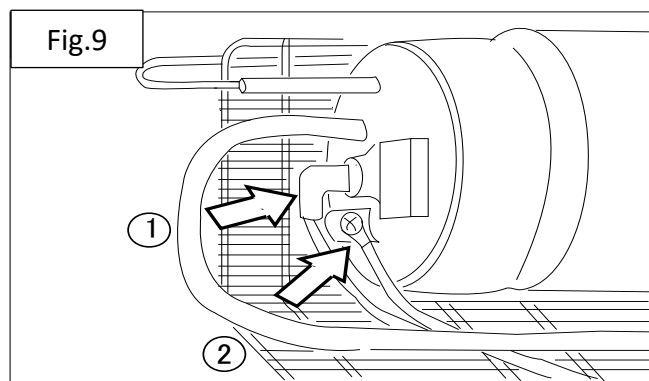
14. Remove 2 screws. (Fig.8-①)
Fan motor is removed.



6. REPLACING PARTS

15. The motor input code is removed. (Fig9-①)

The earth code is removed. (Fig9-②)

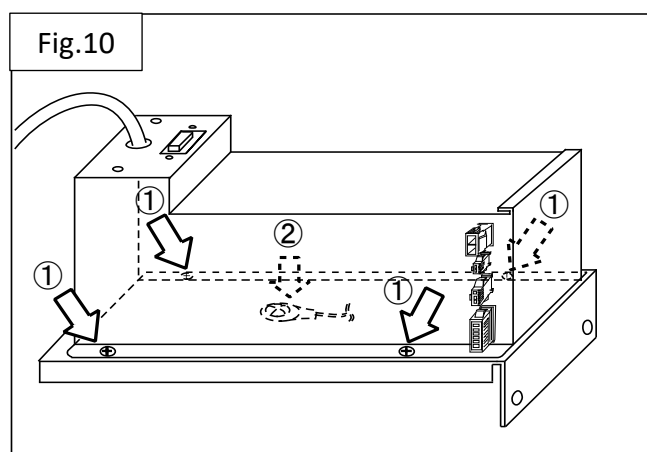


【How to Replace Power Supply】

1. Perform the procedure of how to replace the cooling unit. (See page 6 No.1~10)

2. Remove 4 screws. (Fig.10-①)
The plate is removed.

3. The ground terminal is removed. (Fig.10-②)



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