



# ENGEL

## SERVICE MANUAL

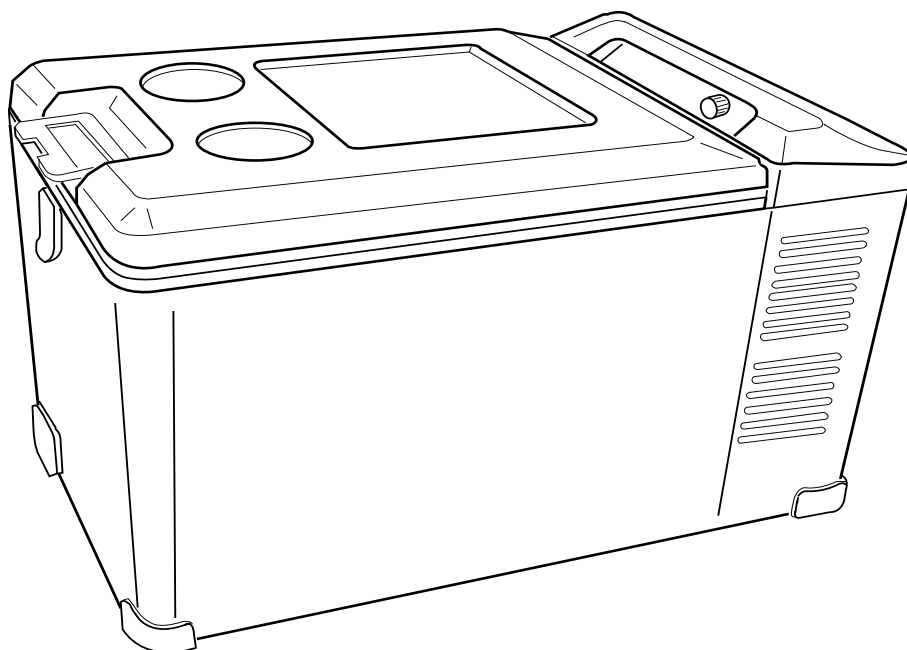
**MODEL (Type without digital display) : □**

**MT35F-U1**

**0642 032 0R12**

**MT45F-U1**

**0642 042 0R22**



**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.

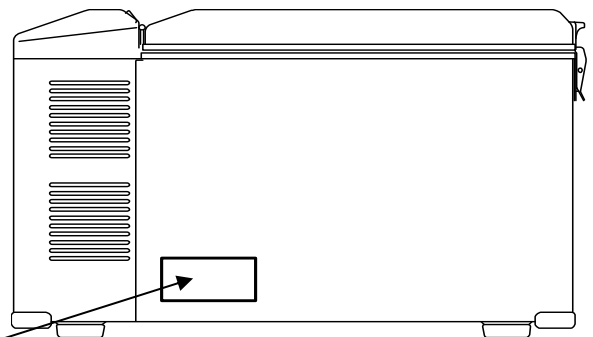
### ● SAFETY SYMBOLS

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

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

### ● REFRIGERATOR CODE NUMBERS

- This manual is compatible with described model in below. Please check refrigerator model name and number in table . (Lable place as picture)



NUMBER	MODEL NAME
0642 032 0R12	MT35F-U1
0642 042 0R22	MT45F-U1

# CONTENTS

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1. SPECIFICATIONS .....	1
■ Specifications Table .....	1
■ Exterior / Interior Dimensions .....	2
2. INSTALLATION A REFRIGERATOR .....	3
■ How to Install the Refrigerator .....	3
■ Temperature Setting .....	3
3. PART NAME .....	4
■ MT35F / MT45F .....	4
4. CONNECTING DIAGRAM .....	5
■ Block Diagrams & Wiring Diagrams .....	5
5. TROUBLE SHOOTING .....	6
■ Does not get Cold .....	6
■ Cooling is Weak .....	7
■ Refrigerator is too Cold .....	8
■ Typical Problem .....	9
■ Technical Data .....	9
6. CHECK POINT & CHECK METHOD .....	10
【Check 1】 Special Fuse & Blade Fuse .....	10
【Check 2】 Output Voltage of the Compressor .....	10
【Check 3】 Check the Resistance at the Coil if Compressor. ....	10
【Check 4】 Resistance of Thermistor .....	11
【Check 5】 Resistance of Control Assy .....	11
【Check 6】 Compressor Rated Current .....	11
【Check 7】 Resistance of Thermistor .....	12
7. REPLACING PARTS .....	13
【How to Replace Cooling Unit】 .....	14
【How to Replace Power Supply】 .....	15
【How to Replace Fan Motor】 .....	16

# 1. SPECIFICATIONS

■ Specifications Table

MODEL		MT35F-U1	MT45F-U1
MODEL CODE		0642 032 0R12	0642 042 0R22
STORAGE VOLUME	ℓ (liter)	32	42
EXTERIOR DIMENSIONS W×H×D ※1	in	14.3×16.1×25.5	14.3×20×25.5
	mm	364×408×648	364×508×648
INTERIOR DIMENSIONS W×H×D ※1	in	10.6×10.6×15	10.6×14.6×15
	mm	270×270×380	270×370×380
OUTER ENCLOSURE	CABINET	Painted steel plate	
	DOOR		
INNER ENCLOSURE	CABINET	A.B.S.Resin	
	DOOR		
HEAT INSULATOR	DOOR	Foamed Polyurethane (Cyclopentane)	
	CABINET		
INPUT VOLTAGE	AC	120V	
	DC	12/24V	
RATED AMPERAGE	DC12V	2.5A	
	DC24V	1.3A	
COMPRESSOR MODEL		SK511P (K3)	
COMPRESSOR RATING		AC 15V, 1.8A, 27W	
REFRIGERANT		HFC-134a	
AVERAGE INNER TEMPERATURE ※2		8°C±3°C by Thermostat control NOTCH 1	
TEMPERATURE CONTROL NOTCH 5 OR FREEZE ※2		-18 °C or lower	
TEMPERATURE CONTROL		Automatic temperature control by dial setting thermostat control type) (Electronic	
WEIGHT	LBS.	46.3	52.9
	Kg	21	24

※1 We took the largest measurement ( including latch and handles)□

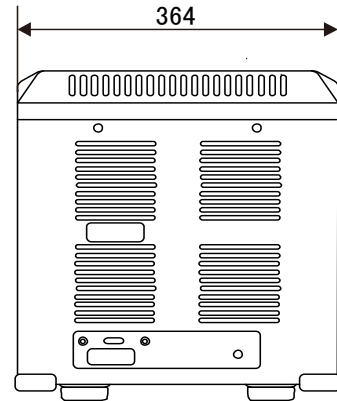
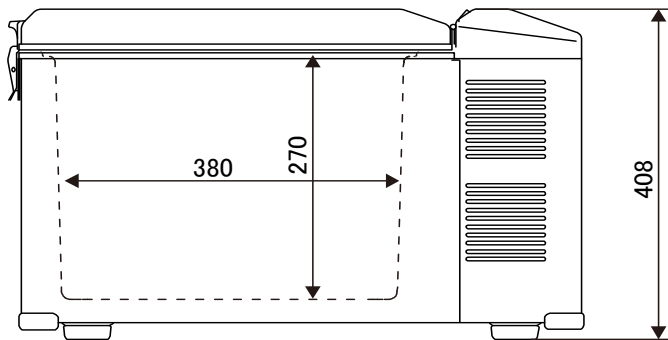
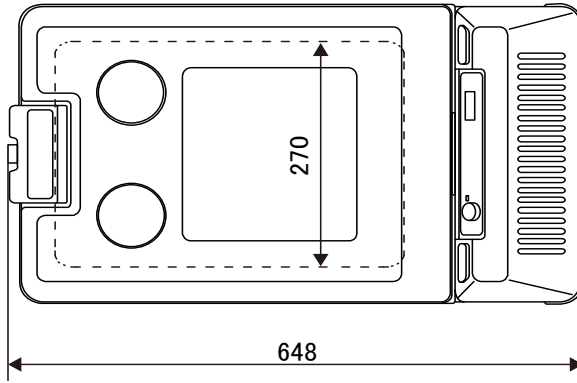
※2 At an ambient temperature of 30°C with the refrigerator door closed

# 1. SPECIFICATIONS

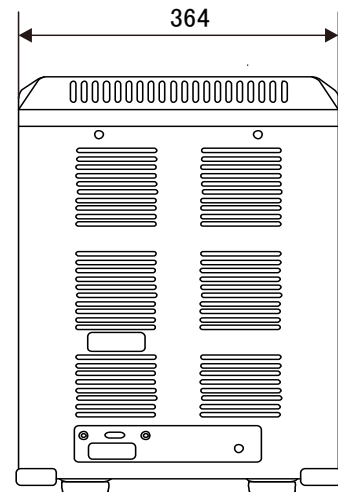
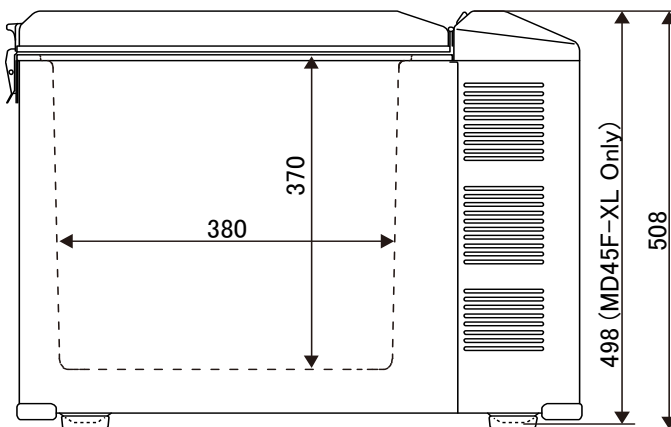
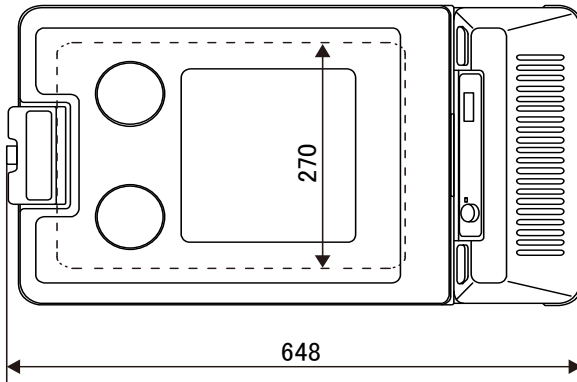
※ Tolerance is omitted

Unit (mm)

•MT35F



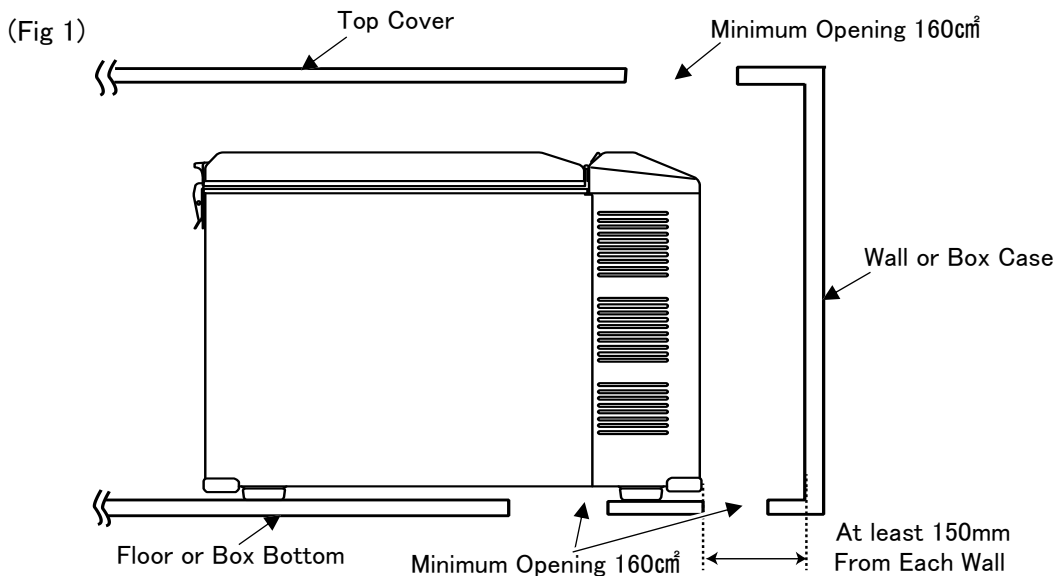
•MT45F



## 2. INSTALLATION 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.1 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<sup>2</sup> for each opening ( the more air circulation over the condenser, the more efficiently fridge will operate).

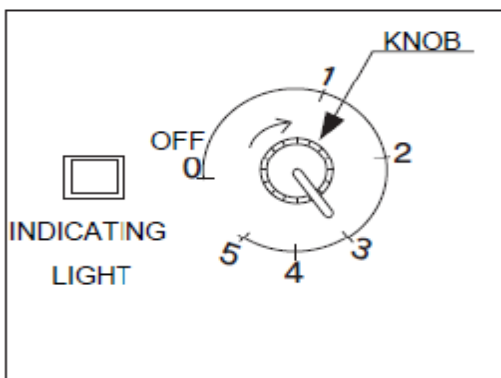


#### WORK TIPS

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

### ■ Temperature Setting

Turn the temperature setting knob to change the air temperature inside the refrigerator.

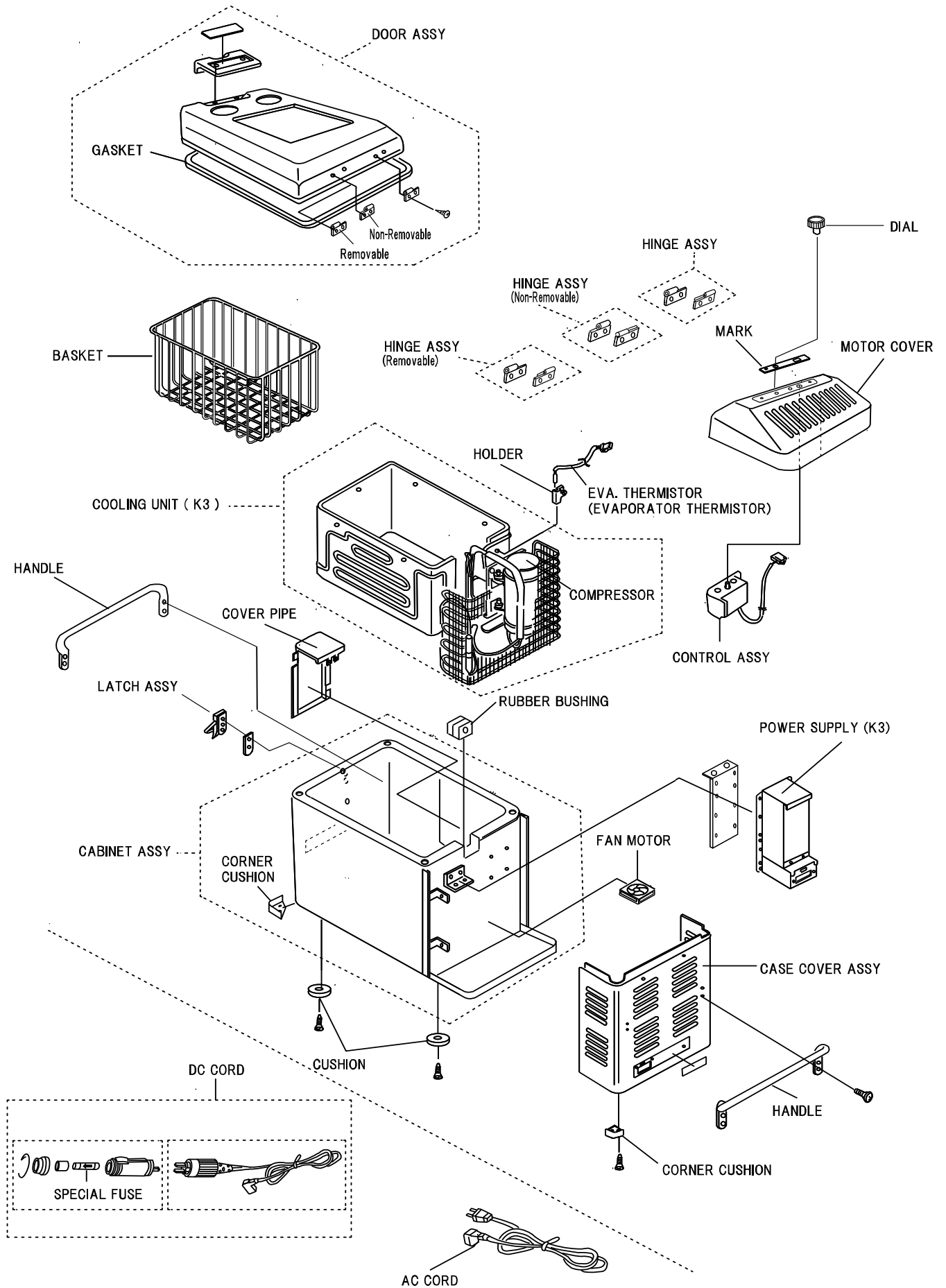


Temp setting position	Inside temperature *
0	OFF (Stop)
1	Approx. 5°C
2 - 4	Approx. 0°C - 12°C
5	Approx. -18°C

\* at an ambient temperature of 30°C with the refrigerator door closed

# 3. PART NAME

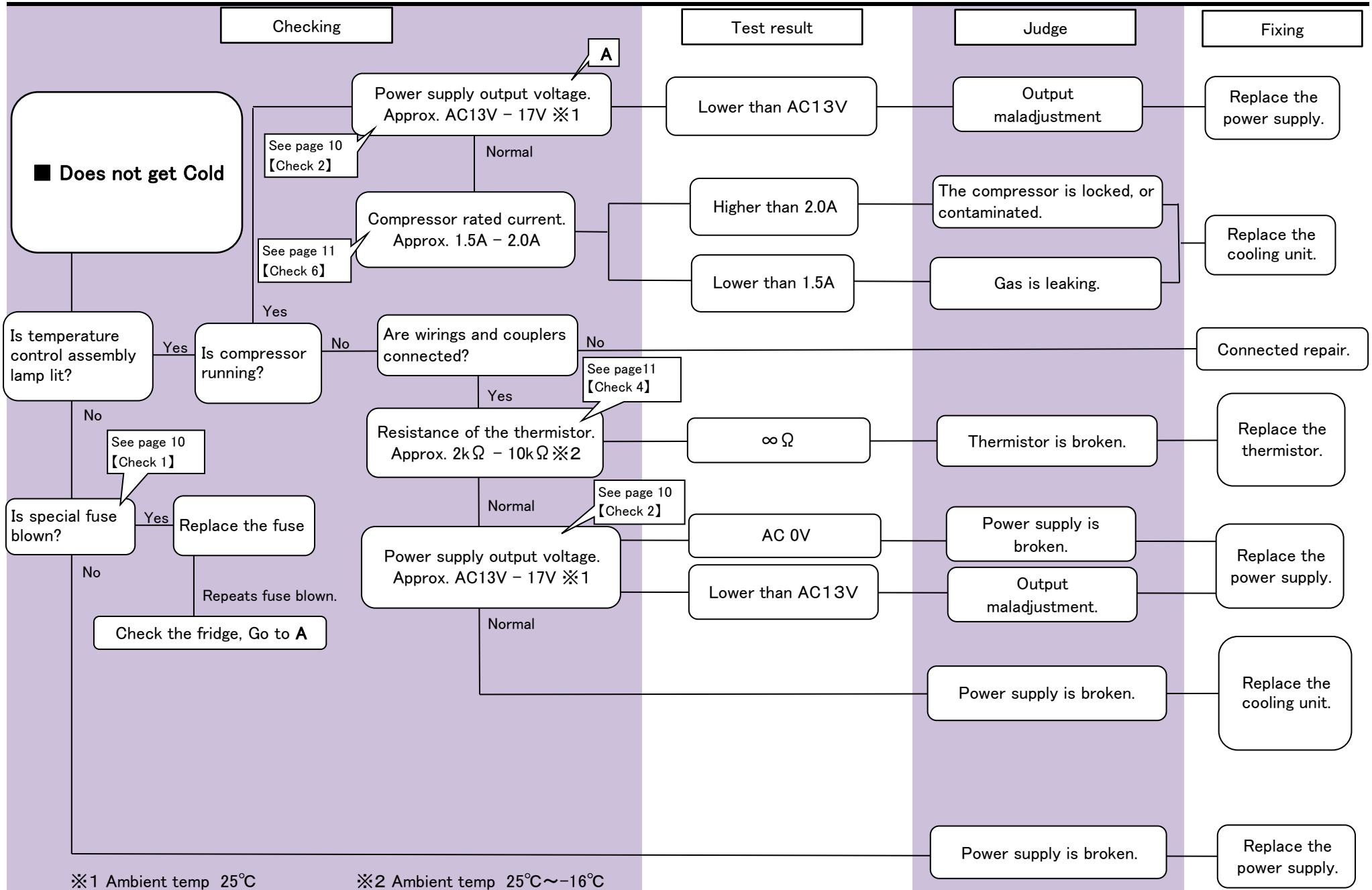
■ MT35F / MT45F



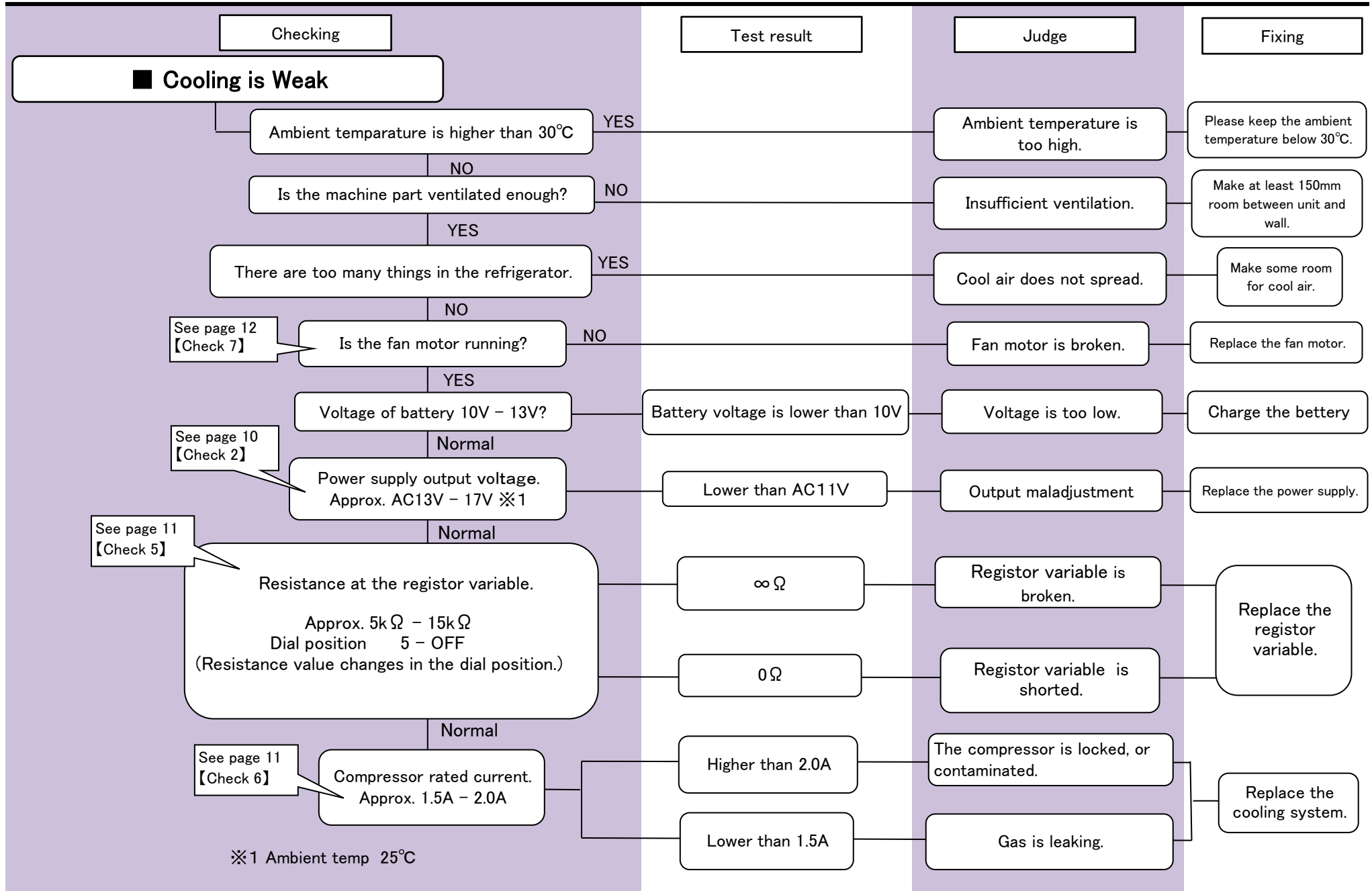




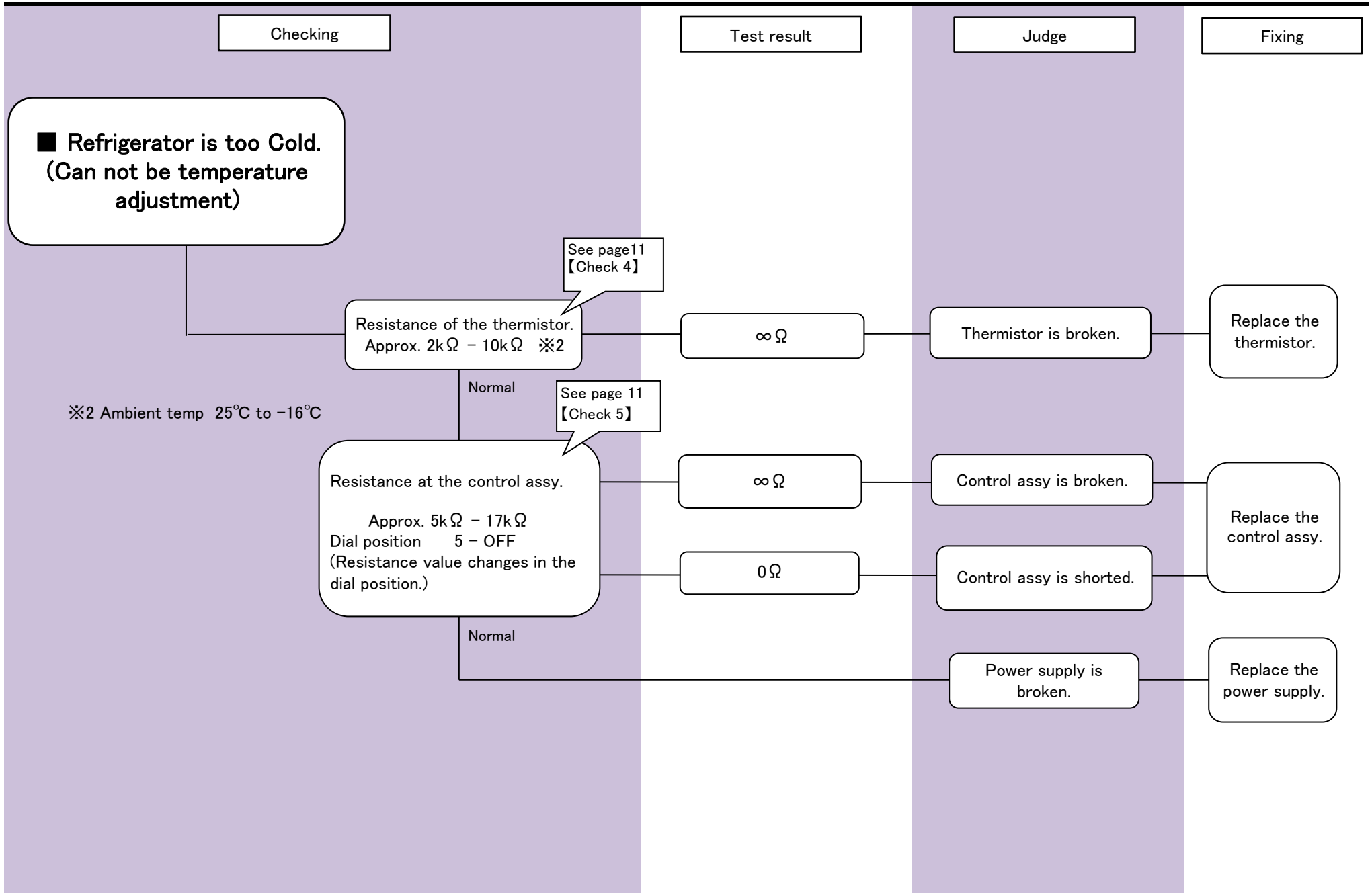
# 5. TROUBLE SHOOTING



# 5. TROUBLE SHOOTING



# 5. TROUBLE SHOOTING



# 5. TROUBLE SHOOTING

## ■ Typical Problem

※1 Ambient temp 25°C

※2 Ambient temp 25°C to -16°C

	Symptoms	Cause	Test Result	Treatment
Lamp of control assy 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 $\Omega$ (K3) ※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 thermisiter is open	Resistance of thermister •Normal: Approx. 2k $\Omega$ – 10k $\Omega$ ※2	Replace thermister
		Cooling is weak	* Gas is leaking from Cooling Unit	
	* Fan motor is broken			Replace fan motor
	* Input voltage is lower than 10V			Charge the bettery
	* 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 control assy 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 to -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 ditaching 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 $\Omega$ (K3) ※1
Resistance of thermistor	Between two pin of the coupler	Approx. 2K $\Omega$ – 10K $\Omega$ ※2
Special fuse	Special fuse of DC cord	0 $\Omega$

# 6. CHECK POINT & CHECK METHOD

## 【Check 1】 Special Fuse & Blade Fuse. (Fig.1)

◇ Check the resistance of special fuse by tester.

Test result	Judge
0Ω	Normal
∞Ω	Broken

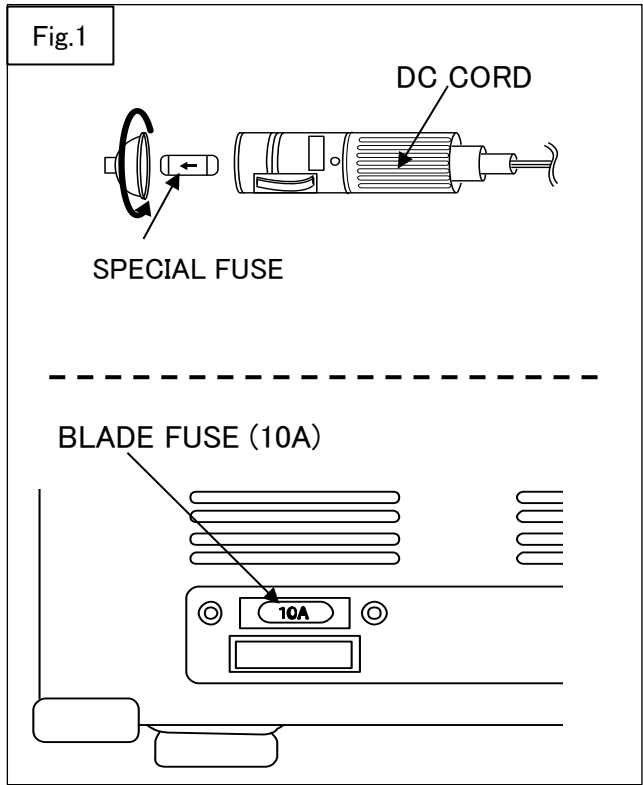
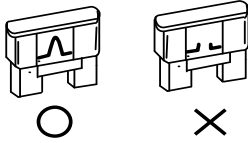
### WORK TIPS

- Please attach attention to the special fuse of orientation.
- It can not detect the temperature is in the wrong special fuse orientation. (※)

◇ Check the blade fuse. (G3, G4 Type only)

The blade fuse is in the power supply.

To remove the blade fuse, please remove the power supply.

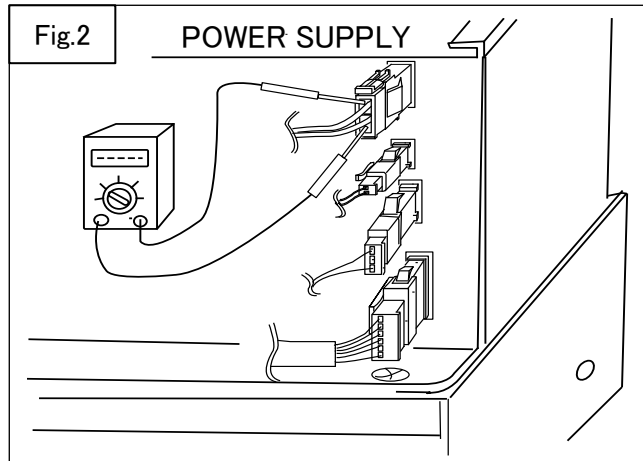


## 【Check 2】 Output Voltage of the Power Supply. (Fig.2)

◇ Checking point

Check at two pin coupler of power supply. (Fig.2)

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

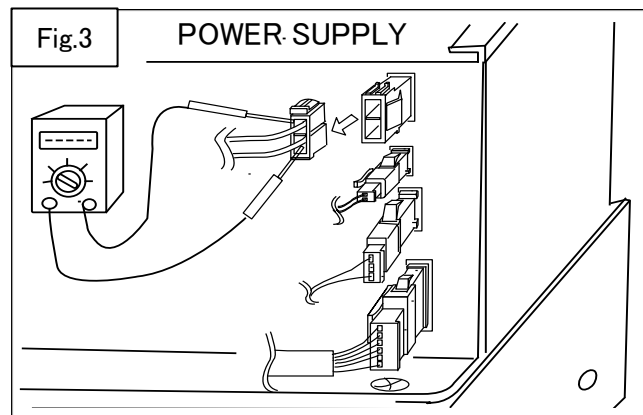


## 【Check 3】 Check the Resistance at the Coil if Compressor. (Fig.3)

◇ Checking points

Remove two pin coupler at motor cord, and check.

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



# 6. CHECK POINT & CHECK METHOD

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

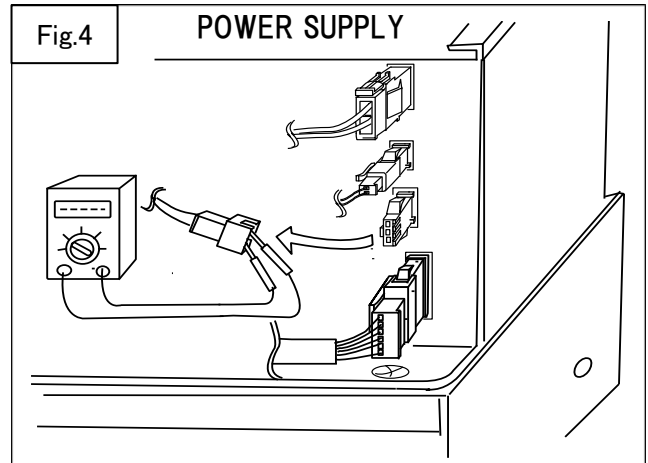
◇ Checking points

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

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

### WORK TIPS

•When short circuit, motor runs continuously.



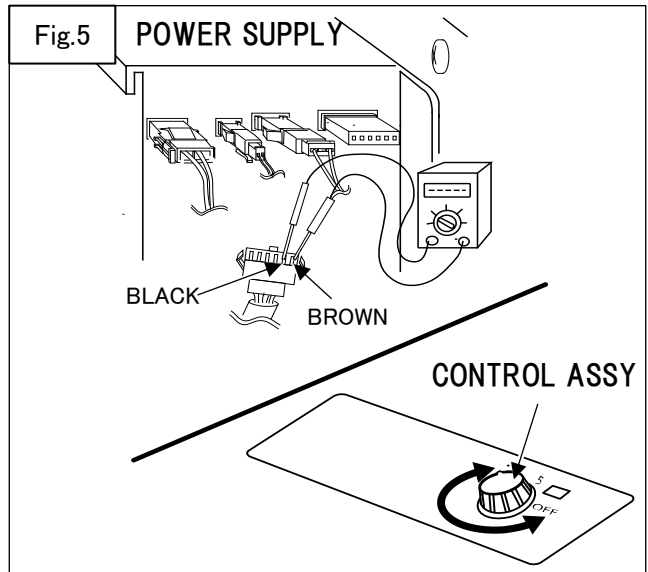
## 【Check 5】 Resistance of Control Assy. (Fig.5)

◇ Check point.

Remove six pin coupler.

Check the resistance at between terminals brown and black.

Test result	Assessment
Dial position OFF - 5	
Approx. 17kΩ - 5kΩ	Normal
∞ Ω	Broken
0 Ω	Short circuit



## 【Check 6】 Compressor Rated Current. (Fig.6)

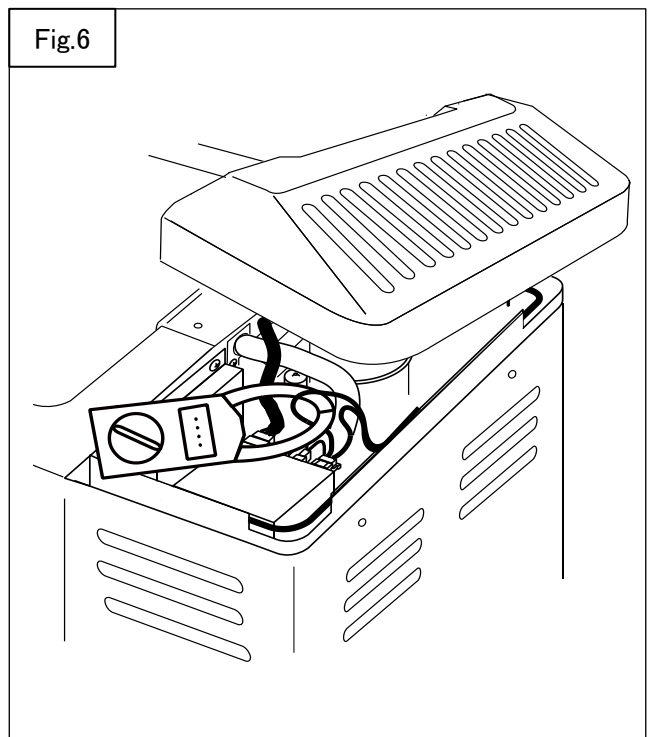
◇Checking point

Current value measurement with clamp meter between input cord terminals.

### WORK TIPS

To measure the rated current of the compressor, please measure after 15 minutes or more after starting the refrigerator.

Test result	Judge
Approx. 1.5 - 2.0A	Normal
Higher than 2.0A	Compressor is locked, or contaminated.
Lower than 1.5A	Gas is leaking.



# 6. CHECK POINT & CHECK METHOD

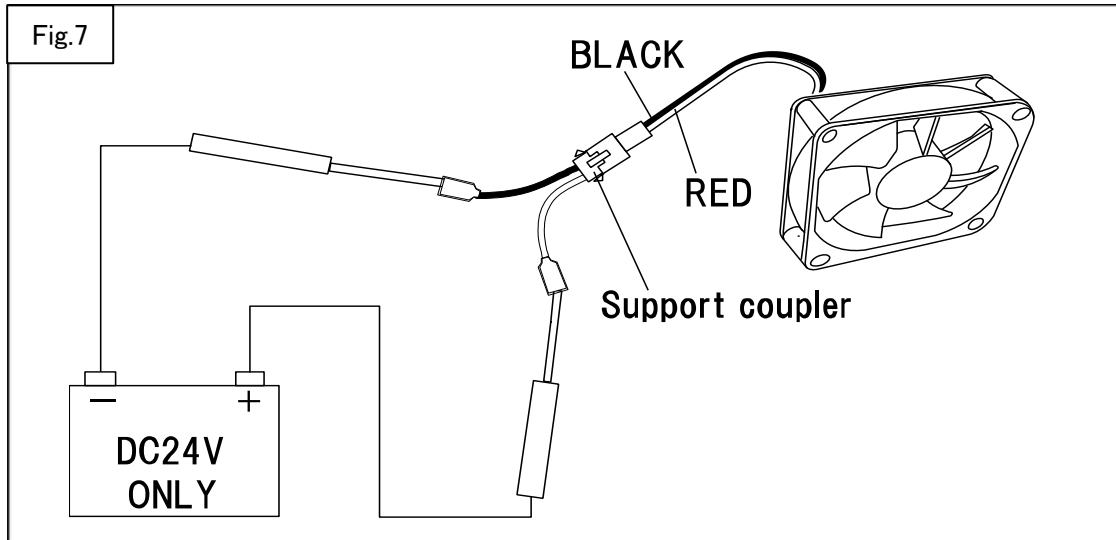
## 【Check 7】 Resistance of Thermistor. (Fig.7)

### ◇Checking point

If want to check the start-up of the fan motor directly, can check by connecting the DC24V directly. (Fig.7)

### ⚠ CAUTION

- Please be careful not to mistake the polarity of the power supply.
- When connect with DC24V or wrong polarity, fan motor will fail.
- Please use such as support coupler so as not to short-circuit power.



# 7. REPLACING PARTS

## 【How to Replace Cooling Unit】

### 1. Remove the door (Fig.1)

Open the door and take out the basket.

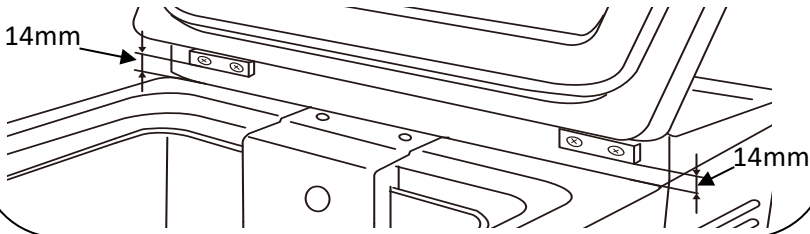
Remove four screws which hold hinges. (Fig.1-①)

#### WORK TIPS

When re-installing for door and hinges, please be care with placing position of hinge height. Position must be 14mm from the cabinet. (Please see reference picture in below)

After installation of door, please make sure for interior light not leak from side of door.

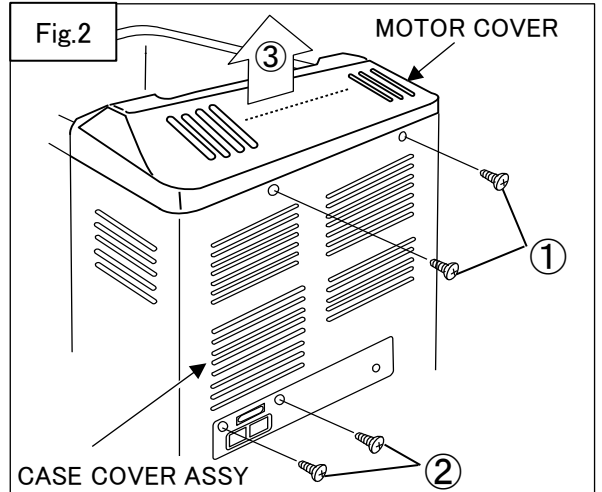
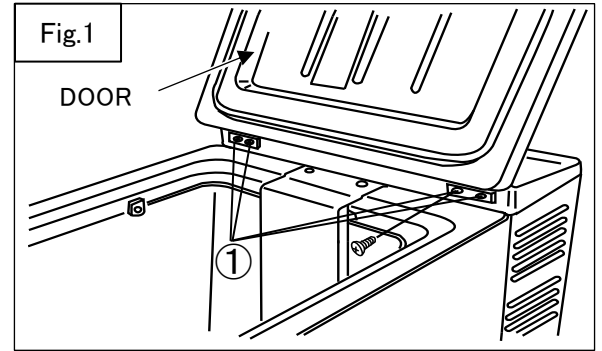
If it's possible to see the light, please adjust height of hinges.



### 2. Remove the motor cover. (Fig.2)

Remove two screws of motor cover. (Fig.2-①)

Remove two screws of case cover assy. (Fig.2-②)



### 3. Take out the power supply. (Fig.3)

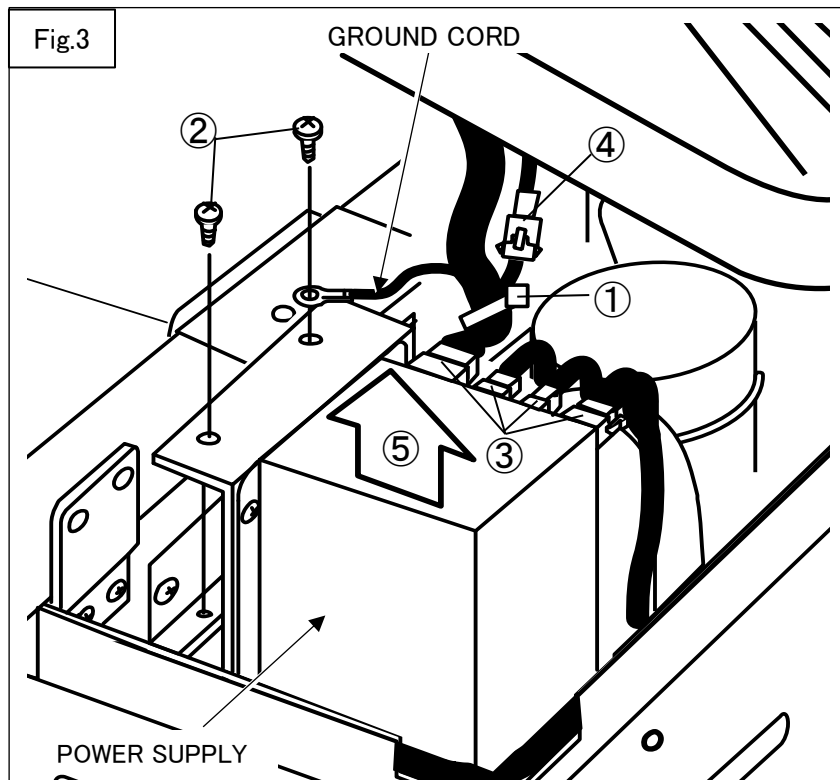
Cut the fastener. (Fig.3-①)

Remove two screws of power supply. (Fig.3-②)

Pull out four couplers. (Fig.3-③)

Pull out coupler. (LED LIGHT; MT35F / 45F-TH, G4-S Only) (Fig.3-④)

Take out the power supply. (Fig.3-⑤)



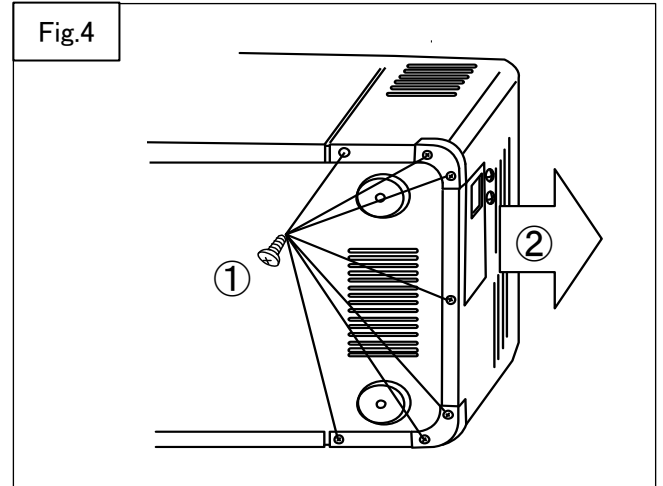


# 7. REPLACING PARTS

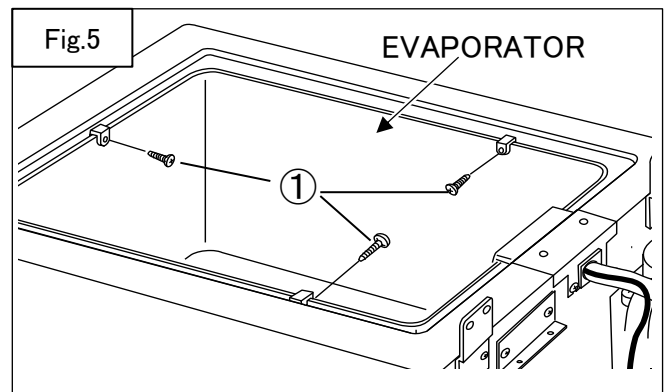
4. Remove the case cover assy. (Fig.4)

Remove seven screws of case cover assy. (Fig.4-①)

Remove case cover assy. (Fig.4-②)



5. Remove three screws of evaporator. (Fig.5-①)



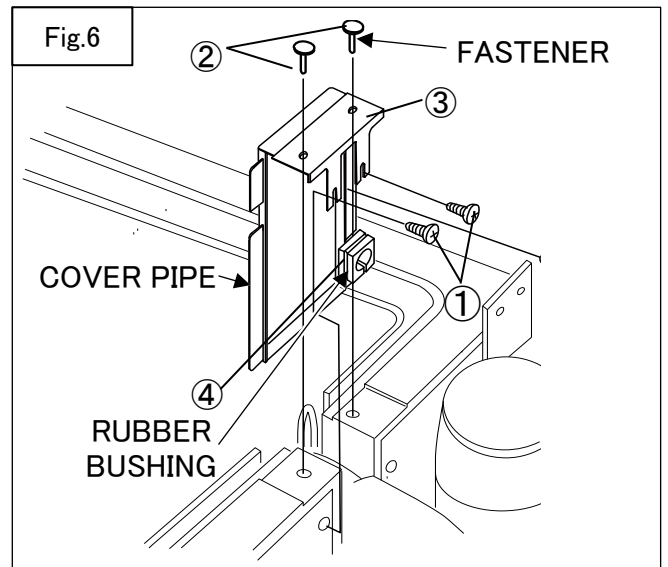
6. Remove the cover pipe. (Fig.6)

Remove two screws of cover pipe. (Fig.6-①)

Remove two fasteners of cover pipe. (Fig.6-②)

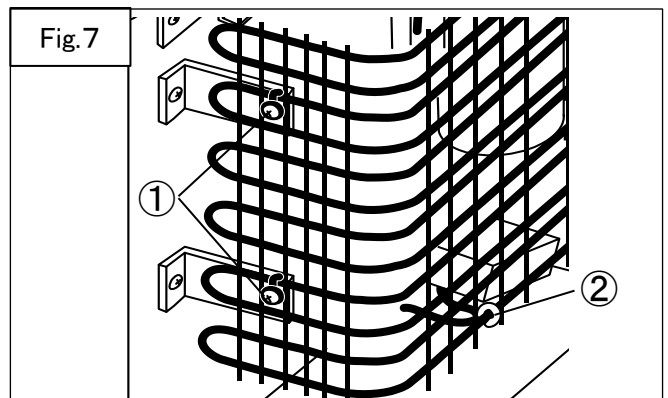
Remove the cover pipe. (Fig.6-③)

Remove the rubber bushing. (Fig.6-④)



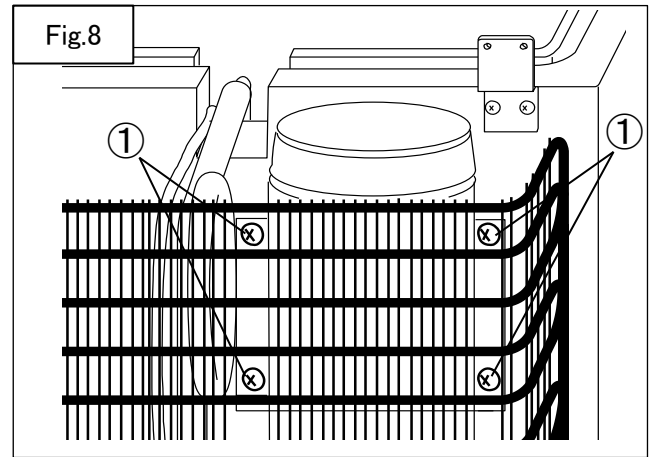
7. Remove two screws of wire condenser. (Fig.7-①)

Cut the fastener. (Fig.7-②)



# 7. REPLACING PARTS

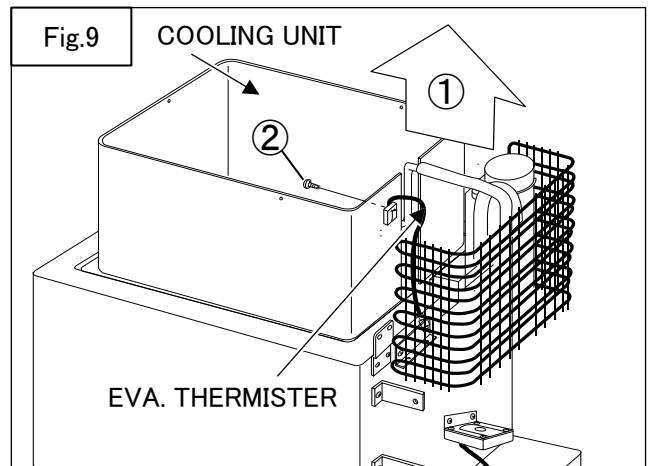
8. Remove four screws of compressor. (Fig.9)



9. Pull out cooling unit. (Fig.9)

Take out cooling unit from cabinet assy. (Fig.9-①)

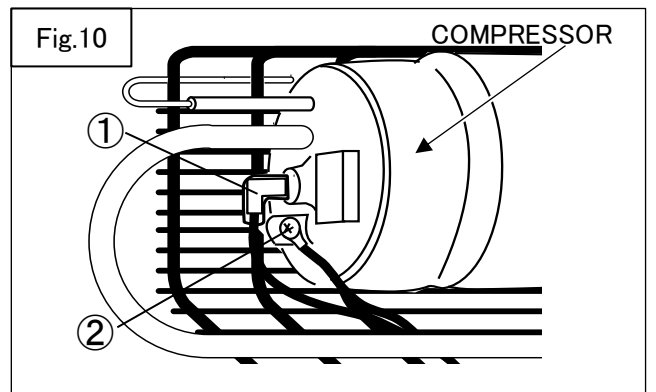
Remove screw of EVA. thermister. (Fig.9-②)



10. Pull out input cord from the compressor. (Fig.10)

Pull out the positive side. (Fig.10-①)

Pull out the negative side. (Fig.10-②)



## 【How to Replacement of Power Supply】

1. Remove the door.

(【How to Replace Cooling Unit】 STEP.1)

2. Remove the motor cover.

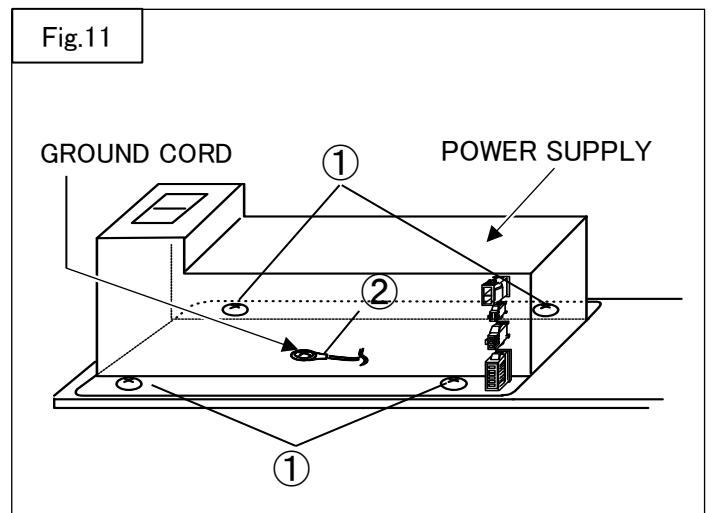
(【How to Replace Cooling Unit】 STEP.2)

3. Take out the power supply.

(【How to Replace Cooling Unit】 STEP.3)

4. Remove four screws of power supply. (Fig.11-①)

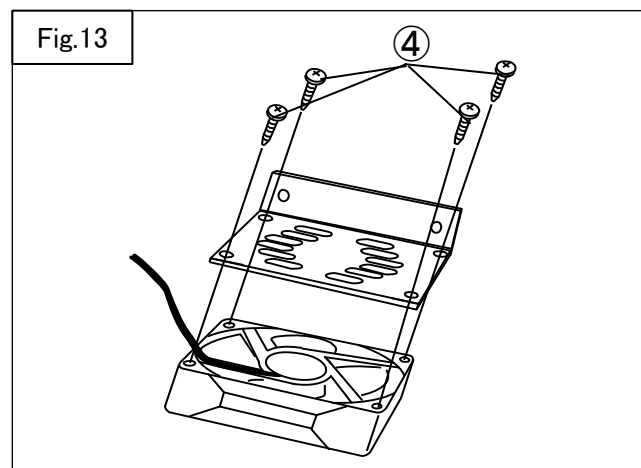
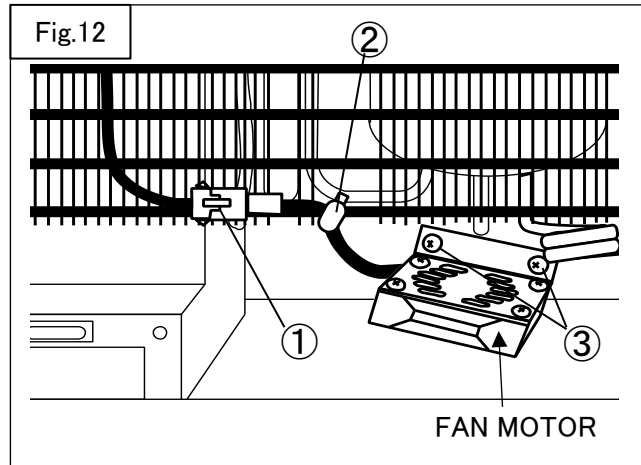
5. Remove ground cord of power supply. (Fig.11-②)



# 7. REPLACING PARTS

## 【How to Replacement of Fan Motor】

1. Remove the door.  
(【How to Replace Cooling Unit】 STEP.1)
2. Remove the motor cover.  
(【How to Replace Cooling Unit】 STEP.2)
3. Remove the case cover assy.  
(【How to Replace Cooling Unit】 STEP.4)
4. Pull out the coupler. (Fig.12-①)
5. Cut fastener. (Fig.12-②)
6. Remove two screws. (Fig.12-③)
7. Remove four screws. (Fig.12-④)



**SAW  FUJI**