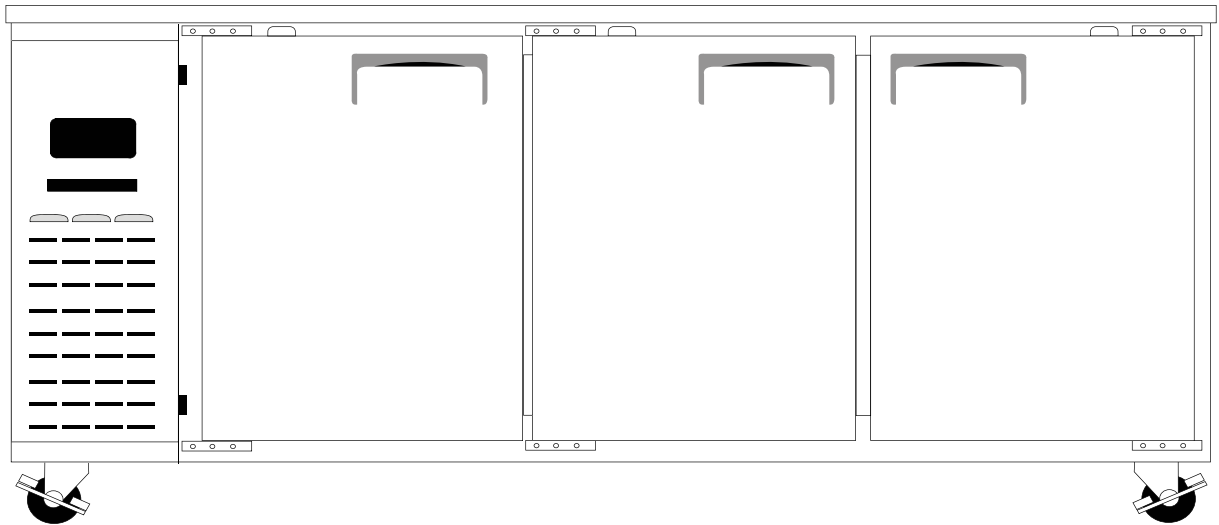


# Service Manual

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## SIDE MOUNT UNDERCOUNTER REFRIGERATORS / FREEZERS

**MODEL :** ETR1 / ETF1  
ETR2 / ETF2  
ETWR2 / ETWF2  
ETR3 / ETF3  
ETRF2  
ETRF3



**REFRIGERATION**  
**EVEREST**

201 W.Artesia Blvd.  
Compton, CA 90220  
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# 1. SAFETY PRECAUTIONS

---

## 1. Safety Precautions

The power cable should be unplugged before replacing or repairing any electrical parts.

When replacing electrical parts, rated parts should be used.

- The procedure also requires that specifications such as model, rated voltage, rated current and operating temperature are precisely matched.

Use appropriate tools when replacing parts.

Coupling harnesses and lead wirings should be connected without exposing the core strip.

When servicing the unit, dust or other impurities must not come in contact with the wiring assembly located in the housing.

Check for moisture marks on all electrical parts.

- If moisture marks exist, it is recommended that you replace the part/s or take measures in preventing further moisture exposure.

Check assembly state of parts after service.

- Ensure that it matches the assembly state before service.

If operation seems unstable, it is recommended that you change the unit's location.

- The unit must be installed in a temperature regulated room with low humidity and away from heat sources or combustible products. Allow sufficient room for ventilation.

Determine whether unit should be grounded.

- It should be grounded if you determine that moisture or water exposure may cause electrical leakage.

High energy consumption products such as heaters should have exclusive outlets. Avoid having several power plugs in one outlet.



## 2. MAINTENANCE

---

### 2.1 INTERIOR AND EXTERIOR CLEANING

Use ONLY stainless steel cleaners to clean the interior and exterior of the cabinet.

**WARNING**     The unit's exterior stainless steel surface is made of 430 series material which will rust if exposed to non-stainless steel cleaners.

**CAUTION**     • Never use steel wool, strong acids, or abrasive cleaners when cleaning the exterior or interior of the unit.  
• Acidic products or products containing vinegar must be stored in sealed containers to prevent acid damage to the interior of the cabinet and evaporator coil.

### 2.2 CONDENSER CLEANING

**IMPORTANT :**     Use this procedure to clean the condenser once a month

A dirty condenser restricts airflow, resulting in excessively high operating temperatures. This reduces efficiency and shortens component life.

**WARNING**     • Disconnect electrical power to the unit before cleaning the condenser.  
• The condenser fan blade is sharp. Be careful when cleaning.

**CAUTION**     • If you are cleaning the condenser fan blades, cover the fan motor to prevent water damage.



## 2. MAINTENANCE

---

1. Clean the air filter.
2. Clean the outside of the condenser with a soft brush or vacuum brush. Clean from top to bottom, not from side to side. Shine a flashlight through the condenser to check for dirt between the fins. If dirt remains:
  - a. Blow compressed air through the condenser coil.
  - b. Use a commercial condenser coil cleaner. Follow the directions and any precautions supplied with the cleaner.
3. Repeat 2 until all dirt is removed.
4. Carefully wipe off the fan blade and motor with a soft cloth. Do not bend the fan blades. If the fan blades are excessively dirty, wash with warm, soapy water and rinse thoroughly.



## 3. REFRIGERATION CYCLE

### 3.1. Refrigeration Cycle

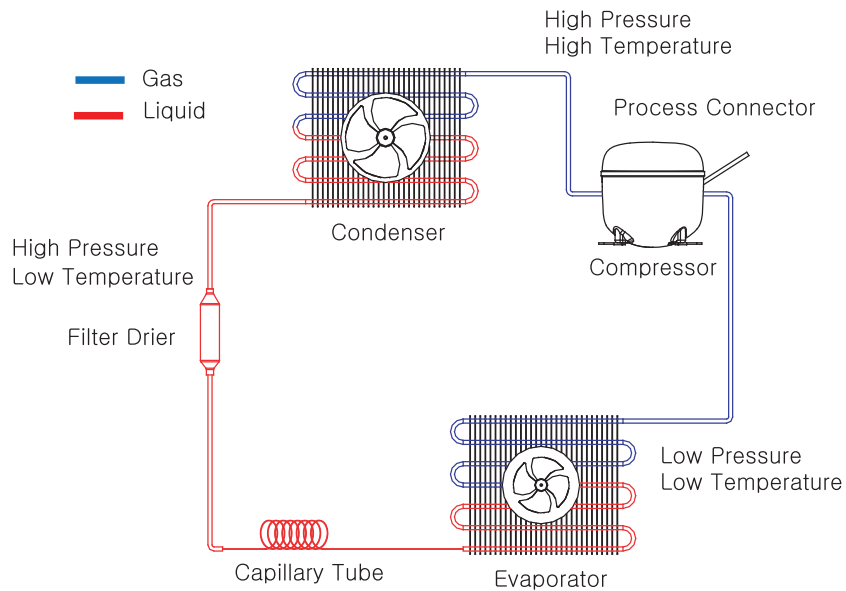
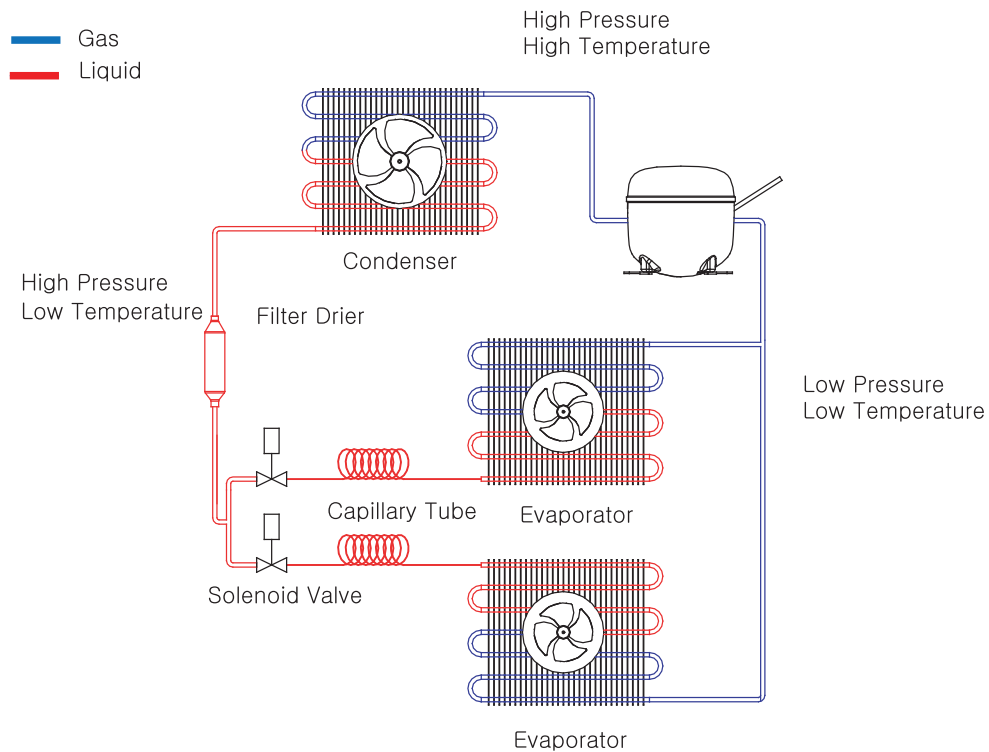


Fig 3-1

### 3.2 Dual Temperature Refrigeration Cycle





## 4. WHERE TO INSTALL

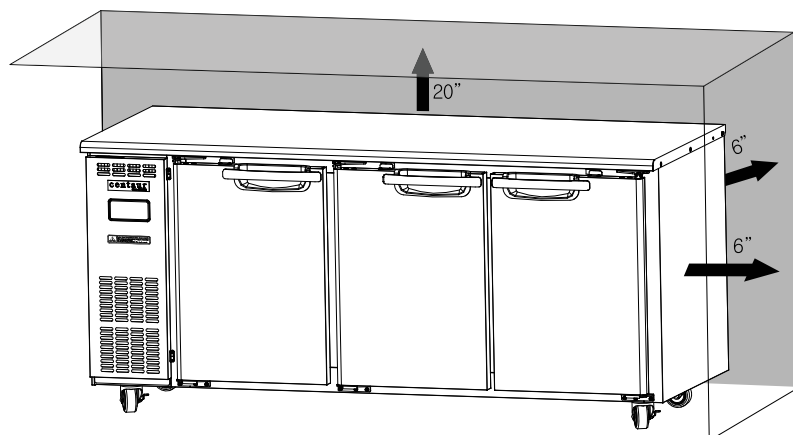
1. The unit should be installed on a level surface.

**CAUTION :** Temperature and drainage issues will occur if the product is tilted slightly forward or backward. If necessary, adjust the height of the caster(s) by using washers to ensure that the unit is leveled.

2. The unit is designed for indoor and commercial use. Outdoor installation will cause a decrease in performance and significant damage if exposed to sunlight and rain.
3. Do not install the unit under a shelf or any location where a foreign object could fall into the condensing unit area or the top of the cabinet.
4. Select a location away from heat and moisture generating equipment such as a stove, oven, dish washer, etc.
5. Minimum Clearance Requirements [Figure 4-1]  
Top : 20" above the condensing unit  
Back & Side : 6" at the back and each side
6. Do not tilt the unit during delivery and installation. Compressor oil might run into condensing coil through high pressure pipe, which will cause pressure problems due to a clog in the capillary tube.

**CAUTION :** If minimum clearances are not maintained, cooling capacity will be reduced. This may lead to product loss or premature component failure.

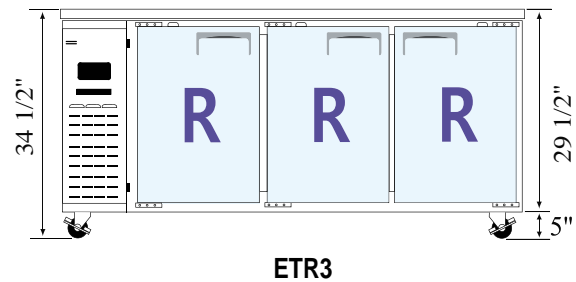
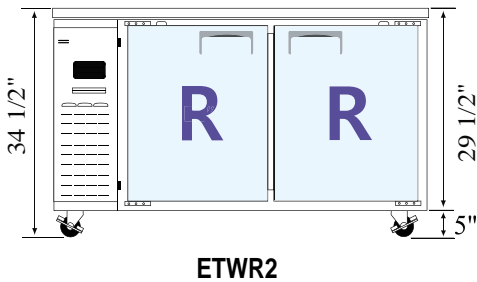
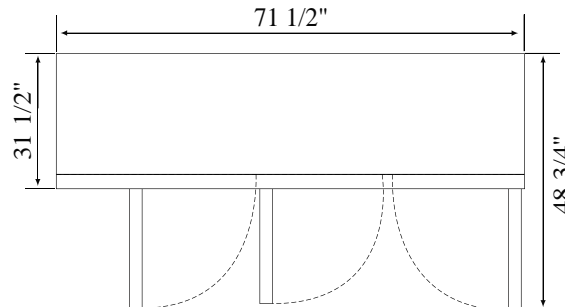
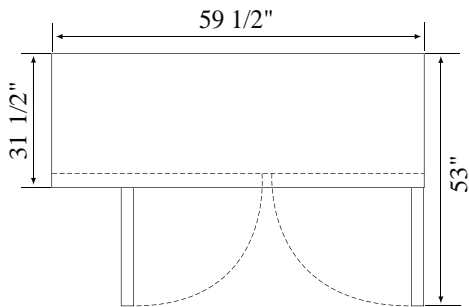
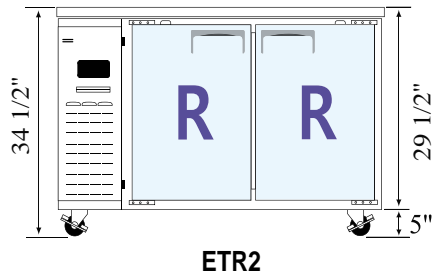
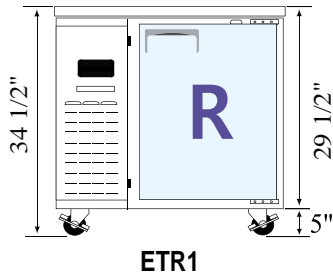
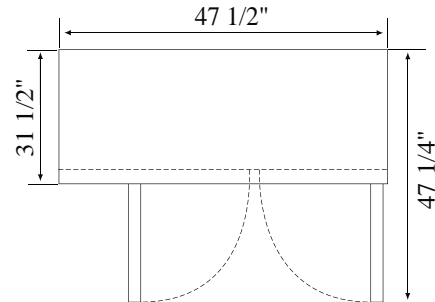
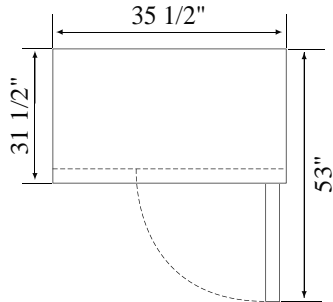
- 7 . The four casters supplied by the manufacturer must be installed. Failure to do so will cause a malfunction in the condensate pan heater located underneath the cabinet.
- 8 . Ambient Temperature for Condenser  
Minimum : 50°F  
Maximum : 90°F





## 5. SPECIFICATIONS

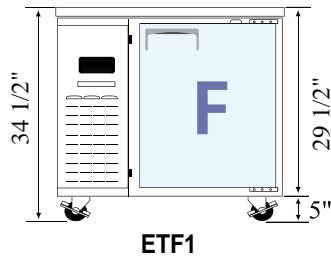
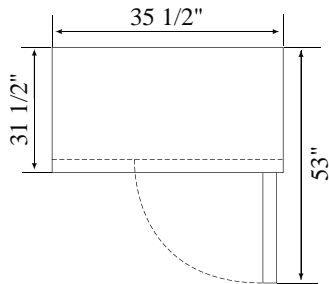
### 5.1 Dimension & Room Section



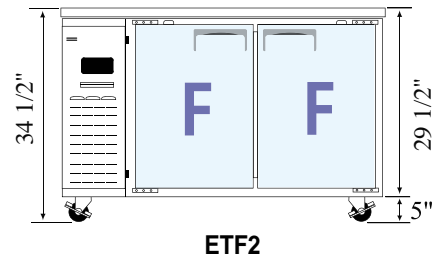
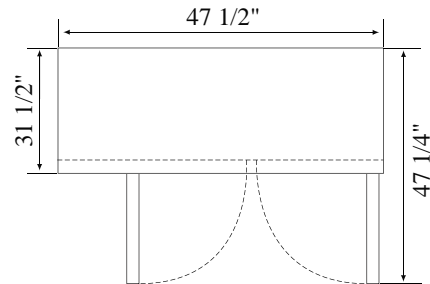


## 5. SPECIFICATIONS

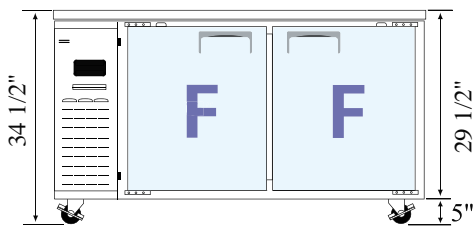
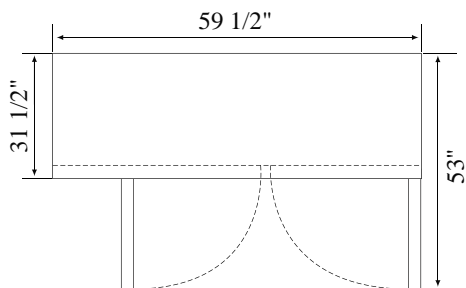
### 5.1 Dimension & Room Section



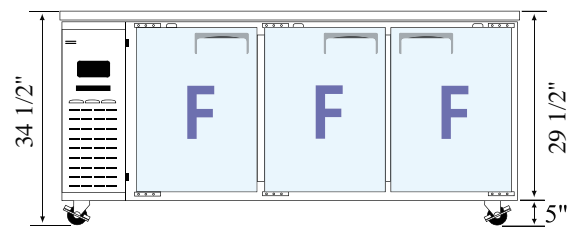
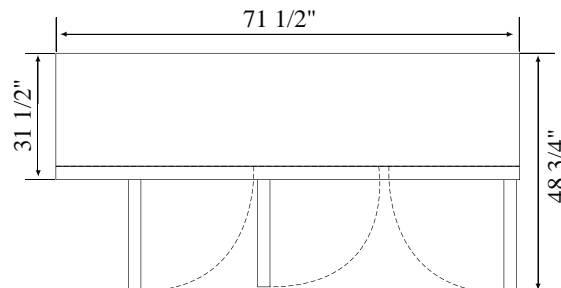
**ETF1**



**ETF2**



**ETWF2**



**ETF3**



## 5. SPECIFICATIONS

### 5.2 Electricity Per Model

MODEL		ETR1	ETF1	ETR2	ETF2	ETRW2	ETWF2
Product		Solid Door Units (Refrigerators/Freezers)					
Dimensions (W x D x H)	Exterior	900 x 700 x 840		1200 x 700 x 840		1500 x 700 x 840	
	Interior	550 x 530 x 610		850 x 530 x 610		1150 x 530 x 610	
Doors		1	1	2	2	2	2
Shelves		2	2	4	4	4	4
Capacity(ℓ)		177		275		370	
Insulation Blowing Agent		R141b					
Refrigerations Unit	Compressor	FFI8.5HAKW	FFI10HAKW	FFI8.5HAKW	NE2134GK	FFI8.5HAKW	NE2134GK
	Refrigerant	R-134A	R-134A	R-134A	R-404A	R-134A	R-404A
	Charge	230g	270g	240g	350g	240g	360g
	Capillary tube	0.96Øx1650	0.9Øx2600	0.96Øx1650	0.96Øx1550	0.96Øx1650	0.96Øx1550
	Condenser	3/8x2Rx13S	3/8x2Rx13S	3/8x2Rx13S	3/8x4Rx13S	3/8x2Rx13S	3/8x4Rx13S
	Evaporator	3/8x4Rx7S	3/8x4Rx9S	3/8x4Rx7S	3/8x4Rx9S	3/8x4Rx7S	3/8x4Rx9S
Power Voltage		220-240 V ~, 50Hz					
Rated Current		2.12 (A)	1.76 (A)	2.33 (A)	4.13 (A)	2.44 (A)	4.15 (A)
Defrost Current		2.15 (A)	1.87 (A)	2.21 (A)	2.44 (A)	2.23 (A)	1.98 (A)
PCB Controller	PZBUSNP0E1K	1		1		1	
	PZBUC0H011K		1		1		1
Evaporator fan motor		220V, 50-60Hz,12W					
Condenser fan motor		240V, 50Hz,27W					
Lighting		Lamp, 240V 25W					
Relay	Spec	N/A					
	Q 'TY						
Power Supply Cord Set		H05VV-F , 3x1.0mm² , 250V~ , 10A					
Solenoid Valve 3-WAY	Spec	Electrical: 220V ±15% ,Outlet Tube : Ø3.97 Power Consumption: 7W, Inlet Tube: Ø6.35					
	Q 'TY	N/A					
Service Valve	1/4"	2					
	3/8"	N/A					

Table 5-1



## 5. SPECIFICATIONS

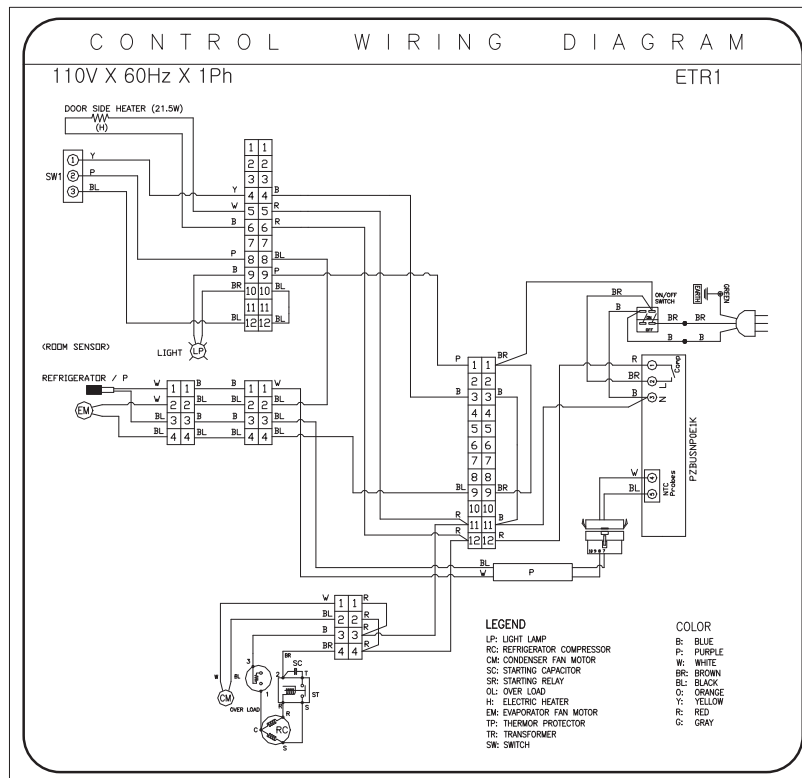
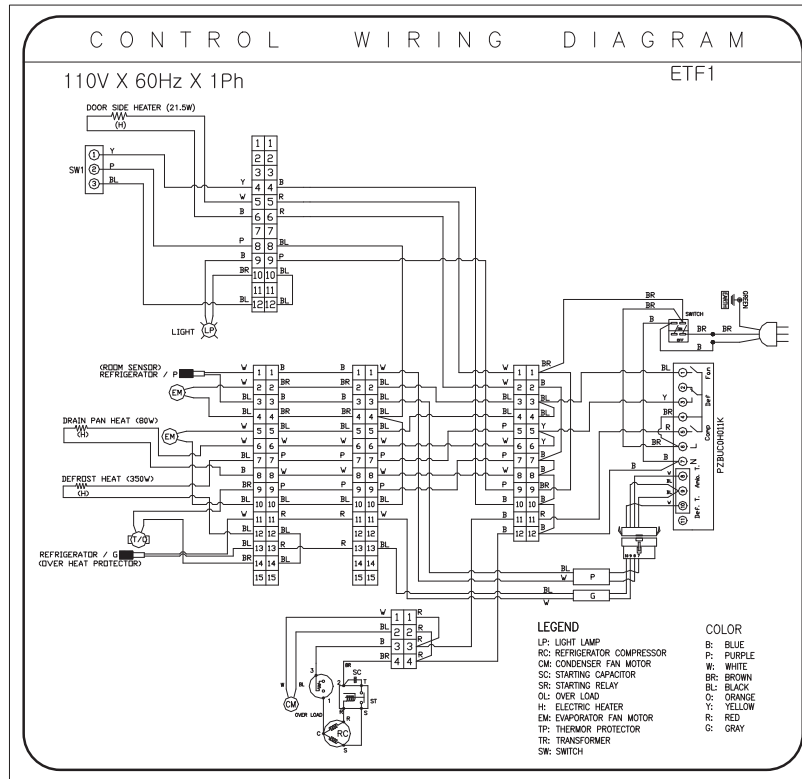
### 5.3 Electricity Per Model

MODEL		BC180C – 3RRRS-E	BC180C – 3FFFS-E	BC150C – 2FR0S-E	BC180C – 3FRRS-E
Product		Solid Door Units (Chiller/Freezer)			
Dimensions (W x D x H)	Exterior	1800 x 700 x 8400		1500 x 700 x 840	1800 x 700 x 8400
	Interior	1450 x 530 x 610		550(550) x 530 x 610	450(950) x 530 x 610
Doors		3	3	2	3
Shelves		6	6	4	6
Capacity(ℓ)		469		177(F) , 177(C)	177(F) , 275(C)
Insulation Blowing Agent		R141b			
Refrigerations Unit	Compressor	FFI10HAKW	NE2134GK	NE2134GK	NE2134GK
	Refrigerant	R-134A	R-404A	R-404A	R-404A
	Charge	370g	350g	350g	350g
	Capillary tube	1.2Øx1650	1.0Øx1800	1.2Øx1650	(1.0Øx1800)x2
	Condenser	3/8x3Rx13S	3/8x4Rx13S	3/8x4Rx13S	3/8x4Rx13S
	Evaporator	3/8x4Rx9S	3/8x4Rx9S	3/8x4Rx9S,3/8x4Rx7S	3/8x4Rx9S,3/8x4Rx7S
Power Voltage		220-240 V ~, 50Hz			
Rated Current		2.55 (A)	4.12 (A)	4.15 (A)	4.21 (A)
Defrost Current		2.88 (A)	3.37 (A)	4.05 (A)	4.96 (A)
PCB Controller	PZBUSNP0E1K	1		1	1
	PZBUC0H011K		1	1	1
Evaporator fan motor		220V, 50-60Hz,12W			
Condenser fan motor		240V, 50Hz,27W			
Lighting		Lamp, 240V 25W			
Relay	Spec	N/A		Contact Rating: 30A 250VAC , 30A 30VDC Rated Coil Voltage: 220VAC	
	Q 'TY			2	
Power Supply Cord Set		H05VV-F , 3x1.0mm² , 250V~ , 10A			
Solenoid Valve 3-WAY	Spec	Electrical: 220V ±15% ,Outlet Tube : Ø3.97 Power Consumption: 7W, Inlet Tube: Ø6.35			
	Q 'TY	N/A		2	
Service Valve	1/4"	2	2	2	2
	3/8"	N/A		1	1

Table 5-2

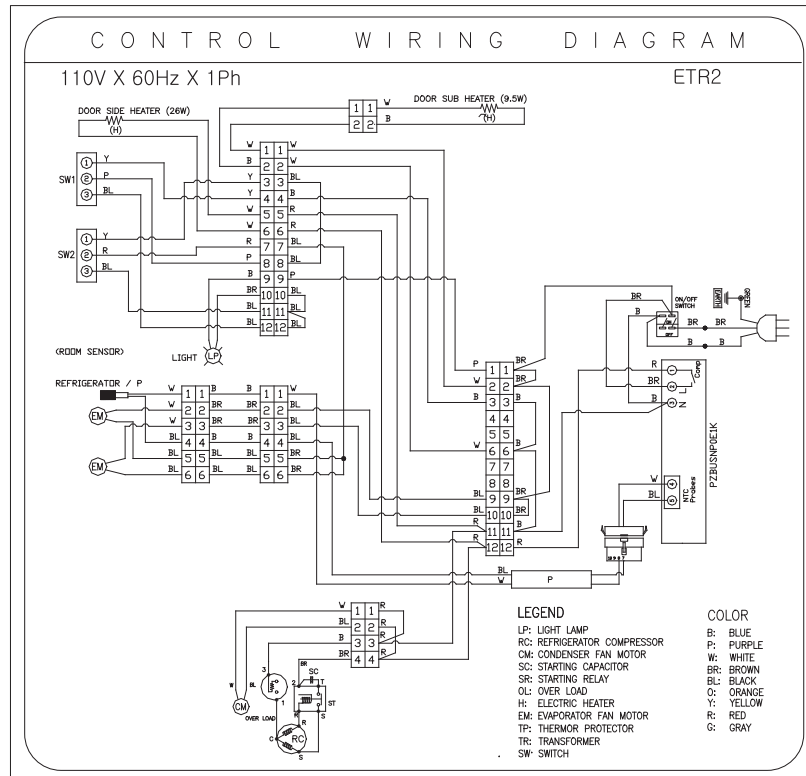
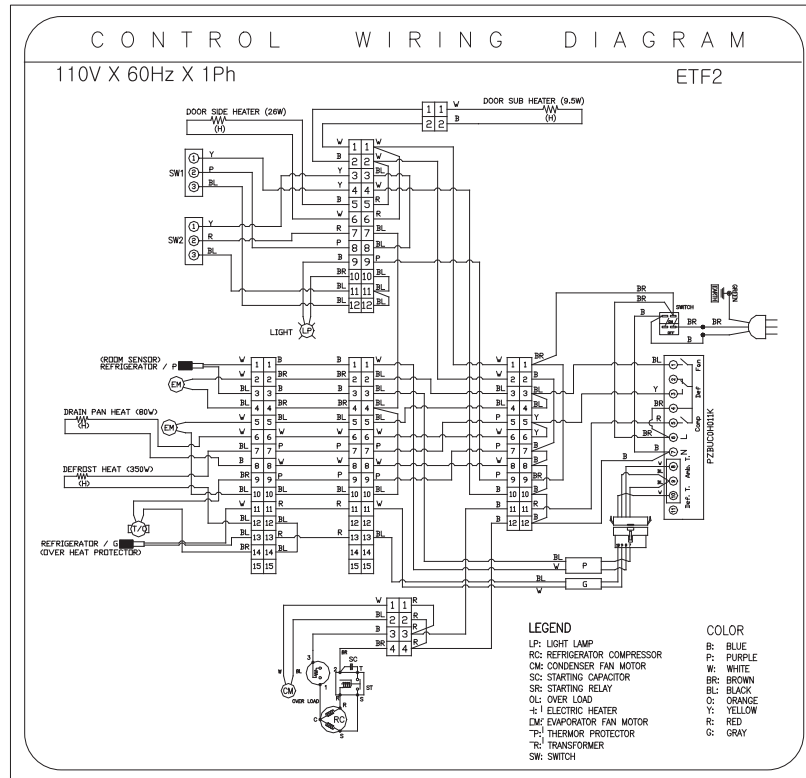


## 6. WIRING DIAGRAMS



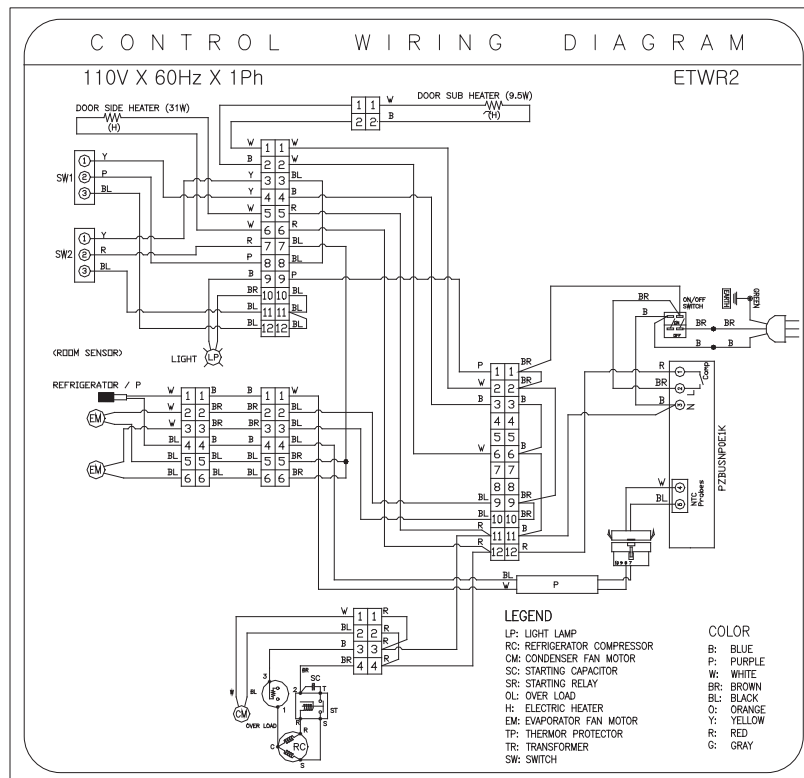
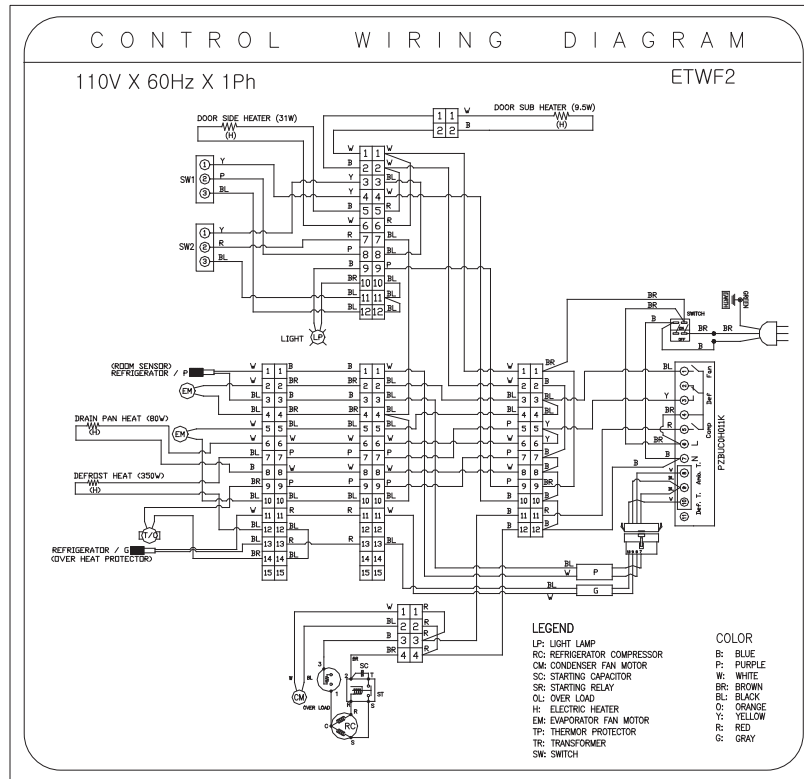


## 6. WIRING DIAGRAMS



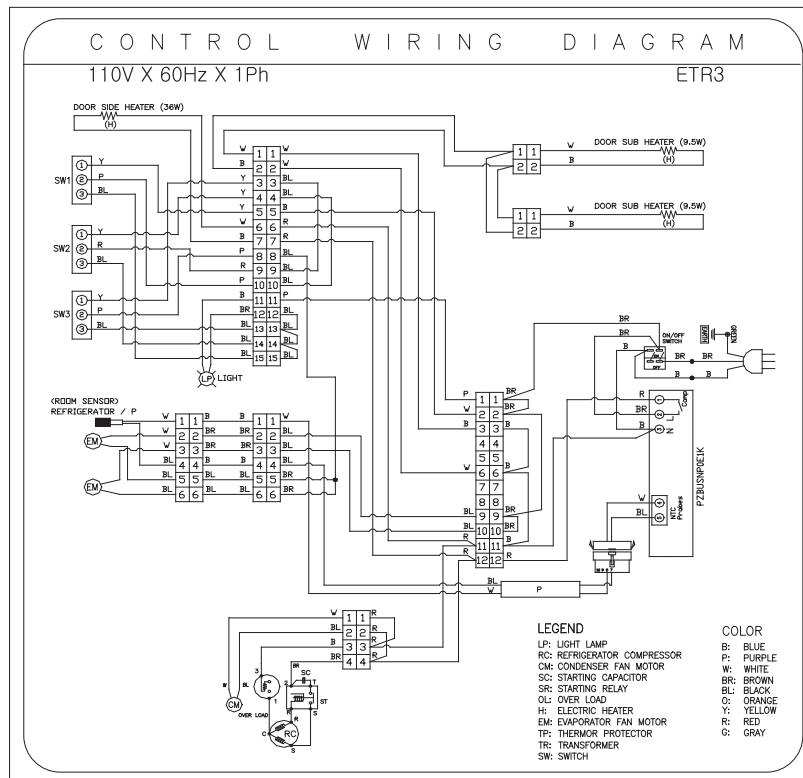
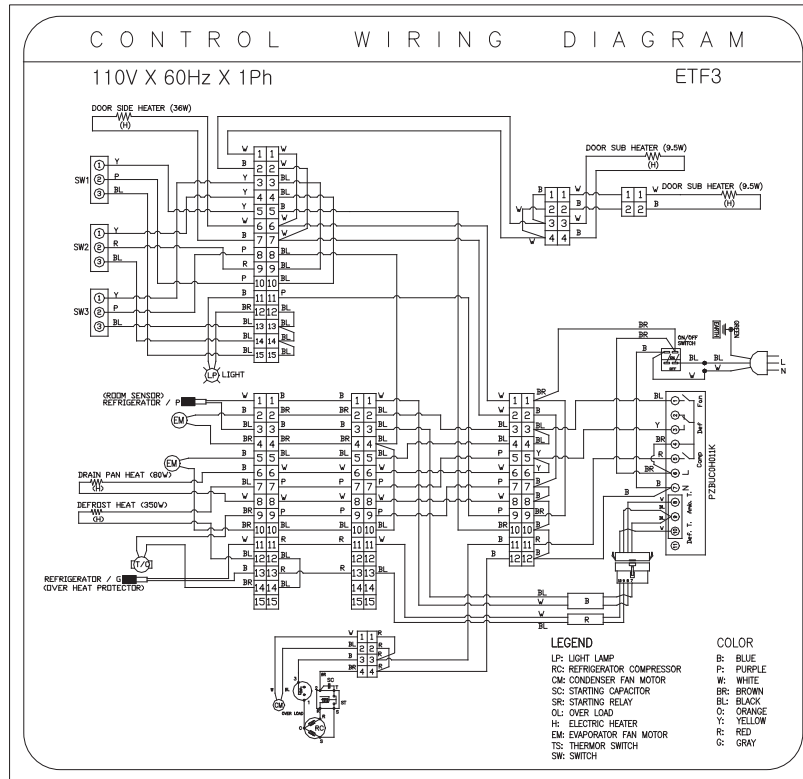


## 6. WIRING DIAGRAMS



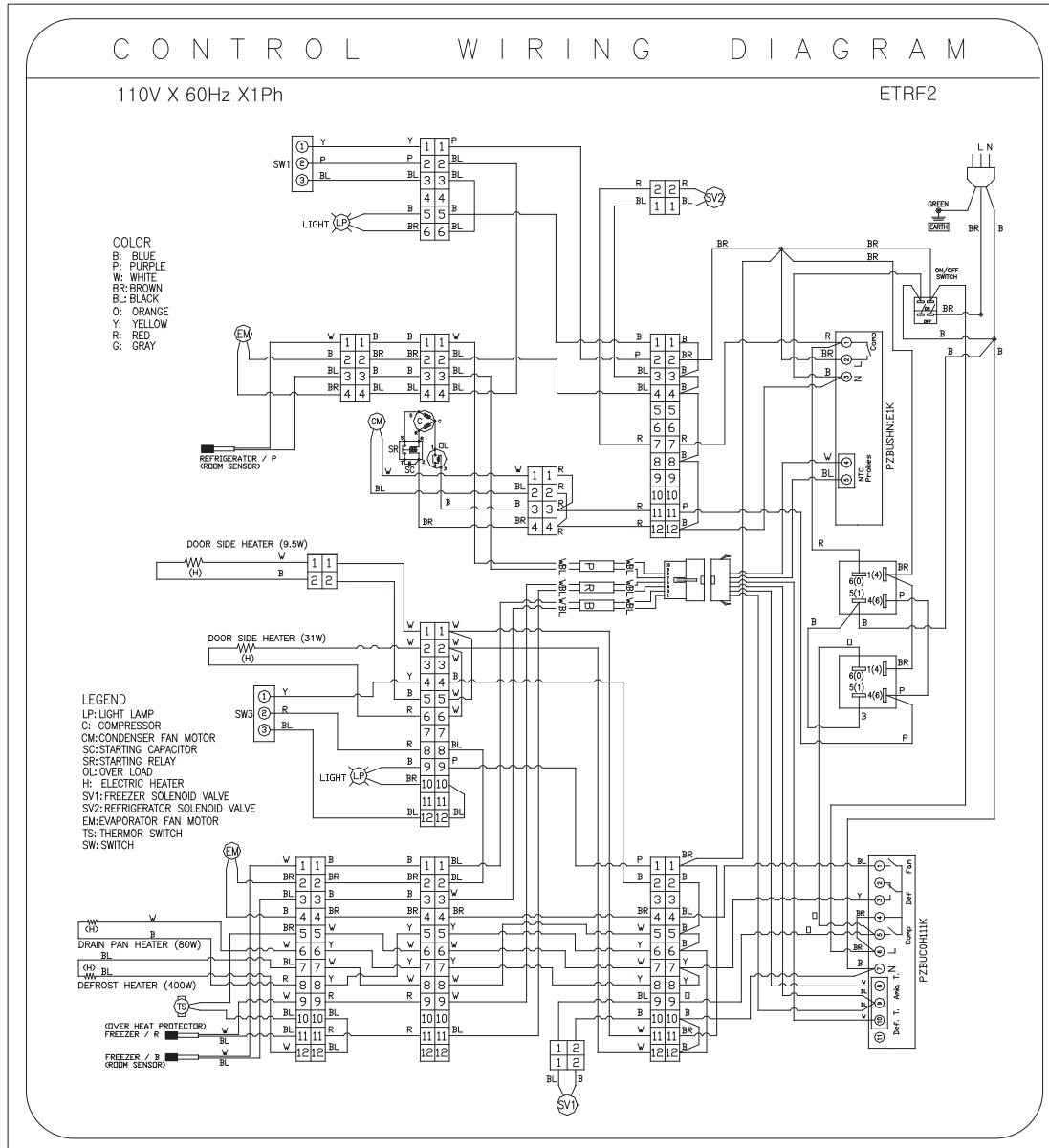


## 6. WIRING DIAGRAMS



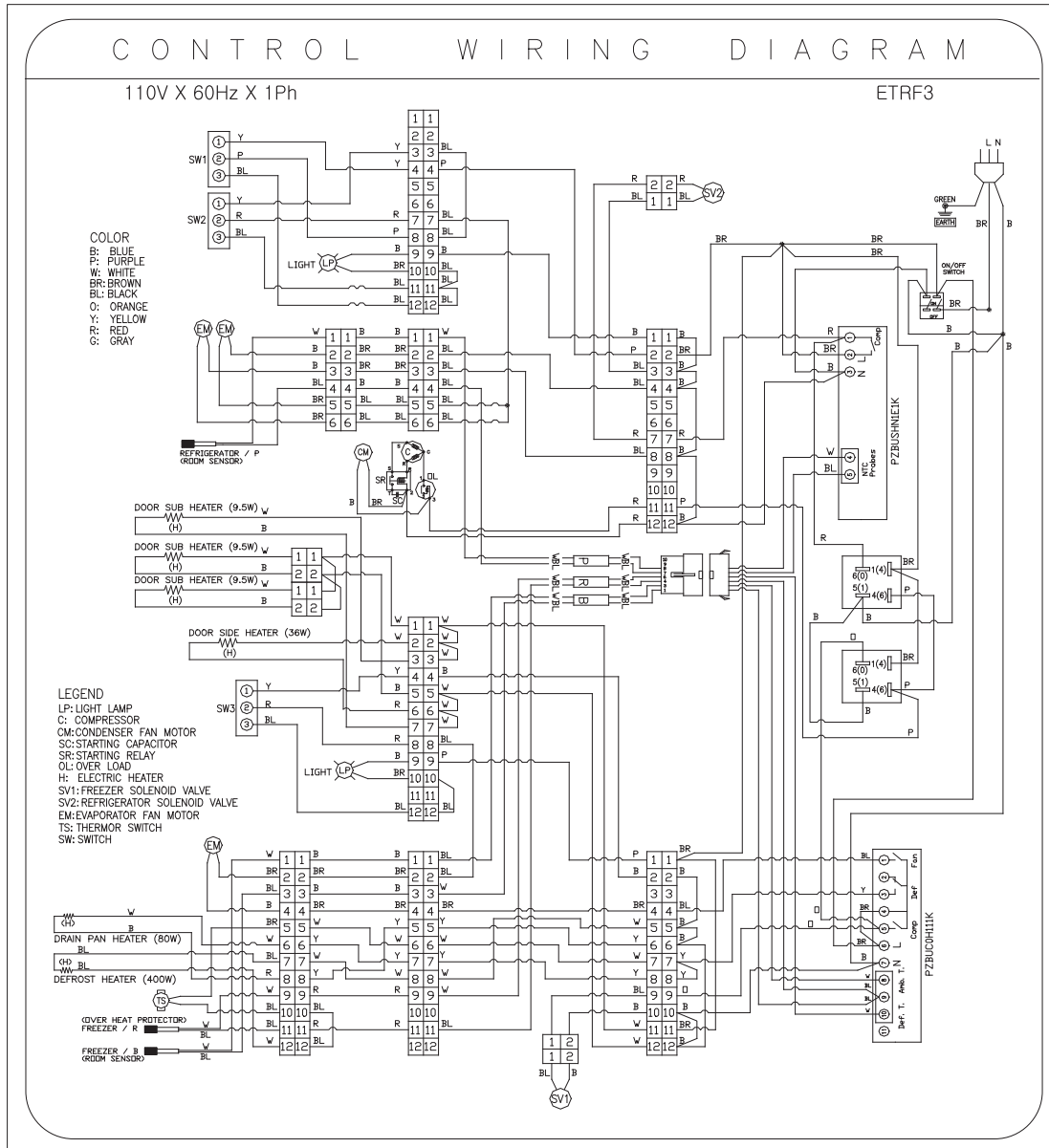


## 6. WIRING DIAGRAMS





## 6. WIRING DIAGRAMS



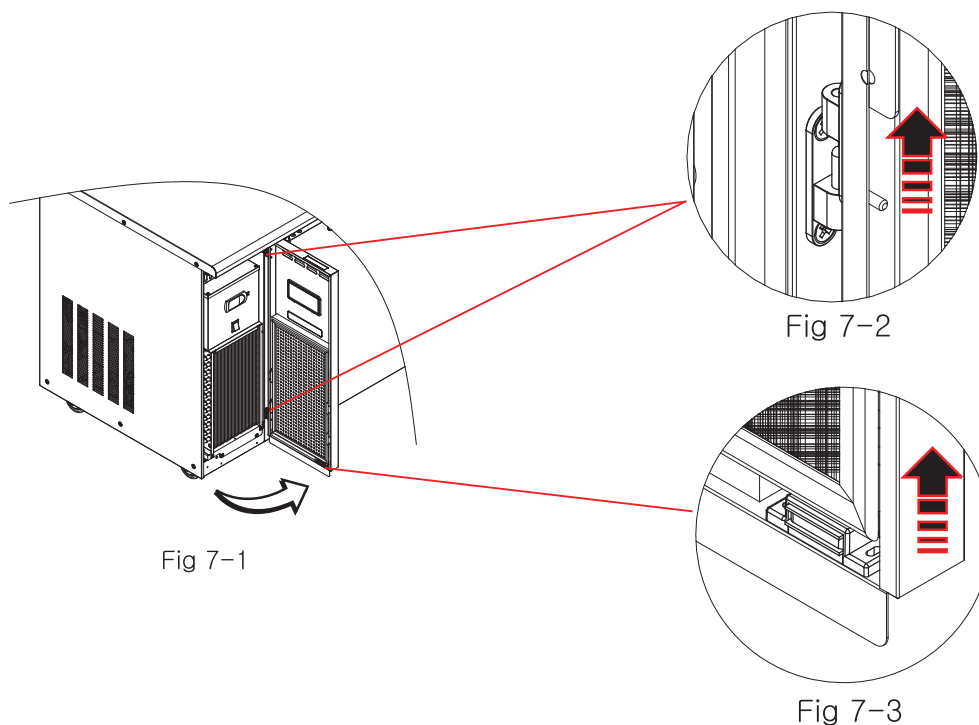


## 7. Disassembling the Machine Room for Service

For controller operation, cleaning or other A/S related service, first remove the cover of the machine room as seen in Fig 7-10. For the removal of the machine room's rear and side plates, please refer to 7.2 and 7.3.

### 7.1 Removal and Disassembly of the Cover

The machine room cover is held by two hinges (Fig 7-2) and a magnet (Fig 7-3). Swing the cover along the direction of the arrow (Fig 7-1). To completely remove the cover, lift it up vertically to detach it from the body frame (Fig 7-2).



### 7.2 Side Plate Disassembly

To remove the side plate, it is necessary to loosen 6 side screws and 1 rear screw. Note that the top corner of is inserted inside the plate. Pull it out to detach.



## 7. Disassembling the Machine Room for Service

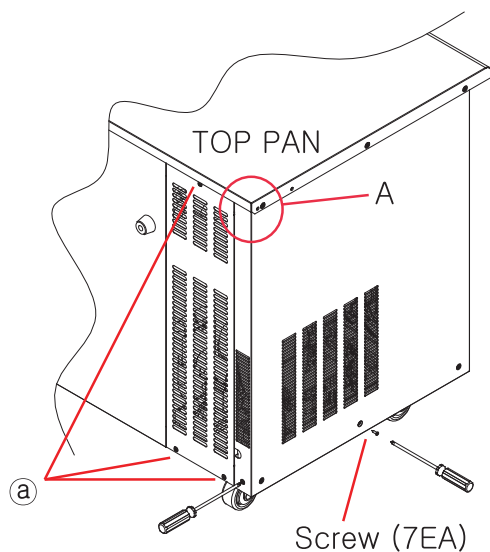
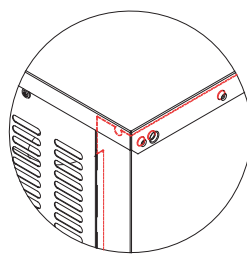


Fig 7-4



Detail A

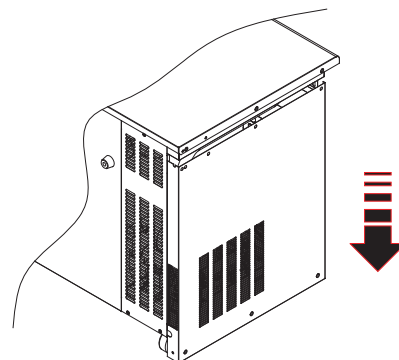


Fig 7-5

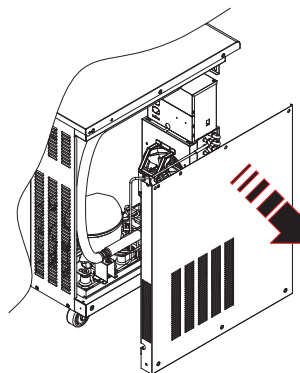


Fig 7-6

### 7.3 Rear Plate Disassembly

To remove the rear plate, first remove the side plate as shown in Fig 7.2 and loosen 3 “a” screws marked in Fig 7-4. The rear plate detaches when the last bolt inside the machine room is unscrewed.

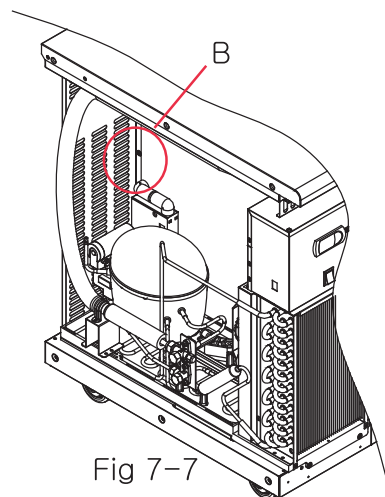
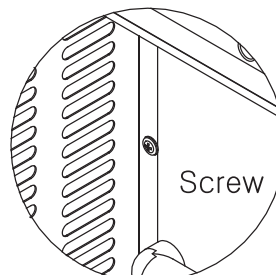


Fig 7-7



Detail B



## 8. ELECTRONIC CONTROLLER

### How to operate the controller



#### 8.1 Display (User Interface)

The console is a typical 3-button CAREL display which regularly shows values from the operating sensor and alternately represents temperature and alarm codes once an alarm is generated.

#### 8.2 LED Display Symbols (Fig 8-1)

- ①, : ON if compressor output is ON.
- ②, : ON if evaporator fan is in operation.
- ③, : ON if manual and electric defrost is in operation.
- ④, : ON if temperature is displayed (-99 ~ 99°C).
- ⑤, : Alarm in progress.

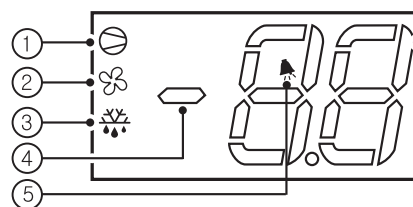


Fig 8-1

#### 8.3 Button Symbols (Fig 8-2)

- ①,: Output ON/OFF if pressed for over 3 seconds.
- ②,: Changes operating values if pressed for 1 second.  
Access parameter settings if pressed for over 3 seconds.
- ③,: Manual defrost ON/OFF if pressed for over 3 seconds.

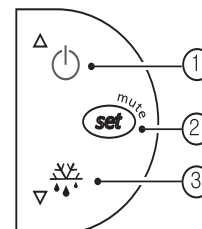


Fig 8-2

#### 8.4 Checking and Changing Operating Values


To check operating values, press  button for 1 second.

Preset values flickers.

Change the values by using  buttons and press  button.




#### 8.5 Manual Defrost ON/OFF

Defrost ON: press  Down button for 3 seconds and longer.

Defrost OFF: press  Down button for 3 seconds and longer while on defrost.

#### 8.6 Parameter Settings

Press  key for over 3 seconds and it displays parameters and then displays [PS].

Move to the desired parameter code by using  Up or  Down keys and press .

Change a selected parameter by using  Up or  Down keys.

Press  key to save the changed values.

To exit the menu, press  key over 3 seconds.

(The present temperature is displayed)



## 8. ELECTRONIC CONTROLLER

### 8.7 Parameter Settings (“C” parameter)


Hold down  key for over 3 seconds so it displays parameters and then [PS].

Press  again so it displays “00.” Enter “22” for the password and press .

The first parameter “/2” is displayed.

Move to the desired parameter code by using  Up or  Down keys and press .

Change a selected parameter by using  Up or  Down keys.

Press  key to save the changed values. .

To exit the menu, hold down the  key over 3 seconds.

(The present temperature will be displayed)

### 8.8 Table of Alarms and Signals.

When an alarm is activated, the display shows the corresponding message that alternately flashes with the temperature. If fitted and enabled, the buzzer and the alarm relay are also activated.

All the alarms have automatic reset (that is, they stop when the cause of alarm is no longer present). The exception to this is alarm “CHt” which has a manual reset.

Alarm Code	Buzzer And Alarm Relay	LED	Alarm Description
E0	active	ON	probe 1 error = control
E1	not active	ON	probe 2 error = defrost
LO	active	ON	low temperature alarm
HI	active	ON	high temperature alarm
EE	not active	ON	unit parameter error
	not active	OFF	defrost running

Table 8–1



## 8. ELECTRONIC CONTROLLER

### 8.9 Table of Easy Parameters.

NOTES : "F" means that the parameters can be accessed without a password.  
"C" means that the parameters are protected by a password.

Type "A": ETR1, ETR2, ETWR2  
ETR3, ETRF2 (Refrigerator)  
ETRF3 (Refrigerator)

Type "B" : ETF1, ETF2, ETWF2  
ETF3, ETRF2 (Freezer)  
ETRF3 (Freezer)

Name	Description	Type " A "		Type " B "	
		Def	Vis.	Def	Vis.
Pw	Password	22	F	22	F
/2	/2 Probe measurement stability	15	C	15	C
/4	/4 Select probe display	1	C	1	C
/5	/5 Select u.d.m. probe °C / °F	1	C	1	C
/6	/6 Disable decimal point	1	C	1	C
/C1	/C1 Probe 1 offset	0	F	0	F
/C2	/C2 Probe 2 offset	0	F	0	F
/C3	/C3 Probe 3 offset	0	C	0	C
St	Set point	35	S	-4	S
rd	rd Control differential	4	F	4	F



## 8. ELECTRONIC CONTROLLER

r1	r1 Minimum set point value	1	C	-23	C
r2	r2 Maximum set point value	12	C	12	C
r3	r3 Select direct / reverse operation	0	C	0	C
r4	r4 Night-time set point delta	3	C	3	C
c0	c0 Compressor and fan start delay on power-up	1	C	1	C
c1	c1 Minimum time between consecutive compressor starts	0	C	0	C
c2	c2 Minimum compressor off time	0	C	0	C
c3	c3 Minimum compressor on time	0	C	0	C
c4	c4 Duty setting	0	C	0	C
cc	cc Continuous cycle duration	4	C	4	C
c6	c6 Temperature alarm bypass after continuous cycle	2	C	2	C
d0	d0 Type of Defrost	0	C	2	C
dl	dl Interval between defrost	6	F	6	F
dt	dt End defrost temperature set point	16	C	16	C
dP	dP Maximum defrost duration ALARM_ED	20	F	20	F
d4	d4 Defrost when switching the instrument on	0	C	0	C
d5	d5 Defrost delay on power-up	0	C	0	C
d6	d6 Freeze control temperature display during defrost	0	C	0	C
dd	dd Dripping time	2	C	2	C
d8	d8 Alarm bypass time after defrost	1	C	1	C
d9	d9 Defrost priority over compressor protectors	0	C	0	C
d/	d/ Defrost probe reading	-	F	-	F
dC	dC time base	0	C	0	C
A0	A0 Alarm and fan temperature differential	0	C	0	C
AL	AL Absolute/relative temperature for low temp. alarm	-50	C	-50	C
AH	AH Absolute/relative temperature for high temp. alarm	50	C	50	C
Ad	Ad Temperature alarm delay	0	C	0	C
A4	A4 3rd input configuration	0	C	0	C
A7	A7 Digital input alarm delay	0	C	0	C
A8	A8 Enable alarm ED(end defrost by timeout)	0	C	0	C
Ac	Ac Set point dirty condenser alarm	70	C	70	C
AE	AE Dirty condenser alarm differential temperature	5	C	5	C
Acd	Acd Dirty condensor alarm delay	0	C	0	C
F0	F0 Enable evaporator fan control	0	C	0	C
F1	F1 Evaporator fan control set point	5	C	5	C
F2	F2 Stop evaporator fan if compressor off	0	C	0	C
F3	F3 Evaporator fan status during defrost	1	C	1	C
Fd	Fd Post-dropping time	1	C	5	C
H0	H0 Serial address	1	C	1	C
H1	H1 AUX output configuration	0	C	0	C
H2	H2 Enable keypad	1	C	1	C
H5	H5 Detect changed parameters	1	C	1	C
EZY	Rapid parameter set selection	0	C	0	C

Table 8-2



## 9. SERVICE INSTRUCTIONS

### 9.1 Control Box Assembly

**Warning :** Make sure that the power is disconnected before servicing the unit. Allow for sufficient working area to ensure your safety and the safety of the unit. Please note that grounding is necessary when reinstalling the unit after service.

#### 9.1.1 How to Disassemble the Control Box Assembly

Remove the machine room cover to gain access to the control box. (Fig 7-2).

Unscrew the 2 bolts securing the condensing unit. Pull the unit out until there is sufficient room for service (Fig 9-2).

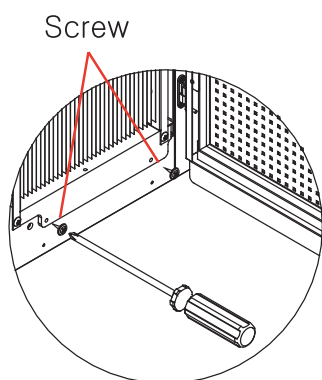


Fig 9-1

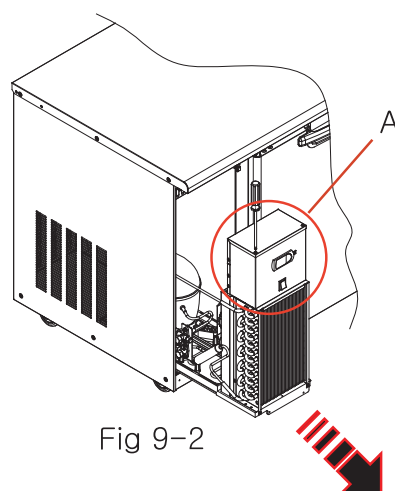
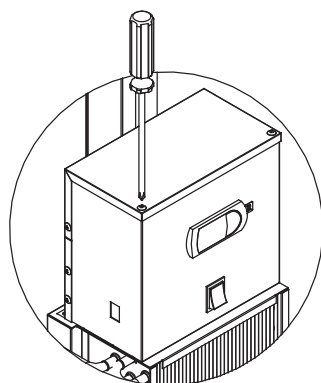


Fig 9-2

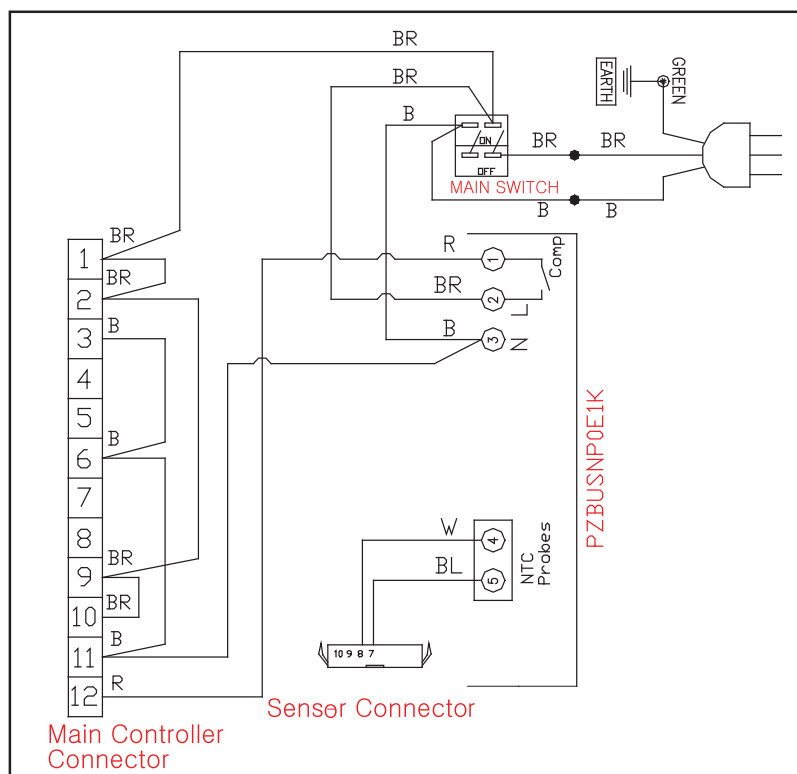


Detail A

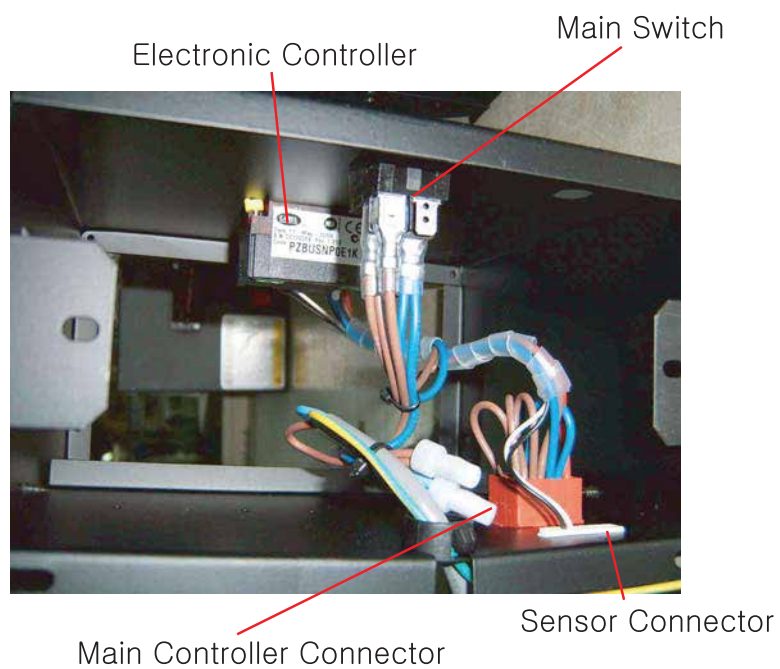
To access the control box interior, unscrew the 4 bolts located on the top cover of the housing. To replace the entire control box assembly, remove the main controller connector and sensor connector. Unbolt the screws fixing the control box housing to the condenser coil in the machine compartment. Also unbolt the screws fixing the grounding wire and power cord set.



## 9. SERVICE INSTRUCTIONS



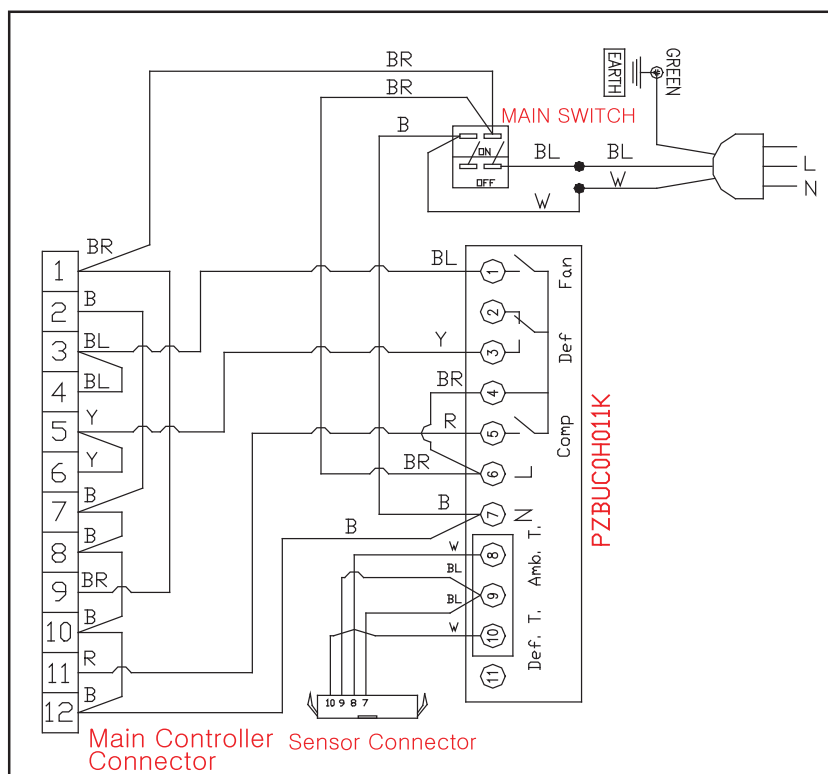
DETAIL DIAGRAM ( Model: ETR3 )



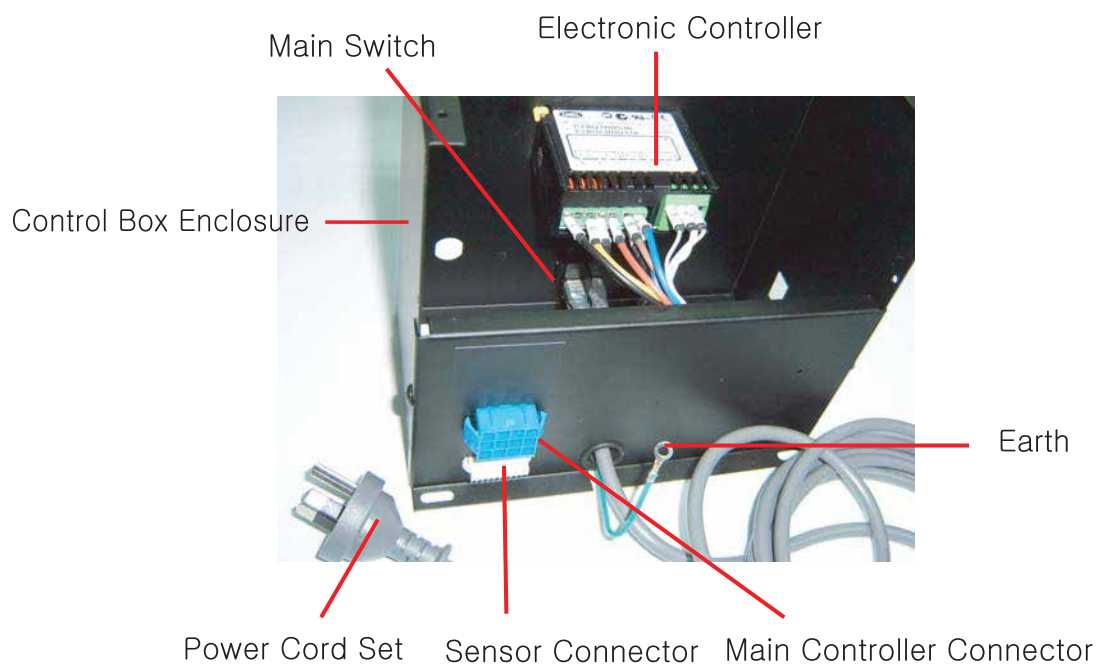
Pic 9-1 ( Model: ETR3 )



## 9. SERVICE INSTRUCTIONS



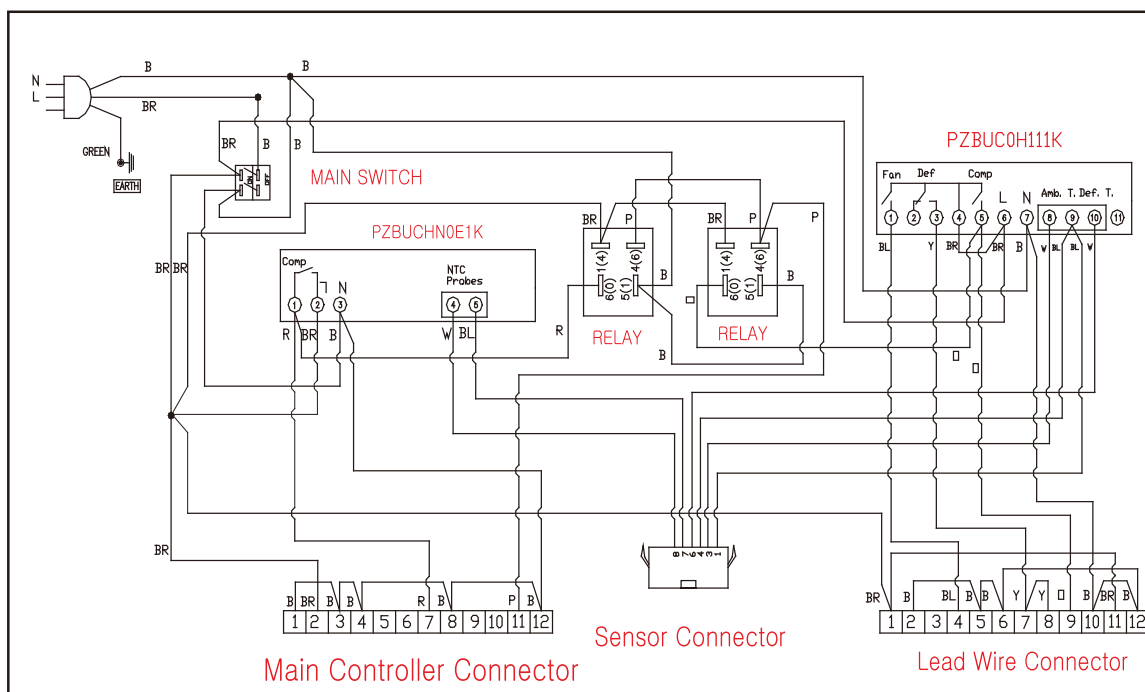
DETAIL DIAGRAM ( Model: ETF3 )



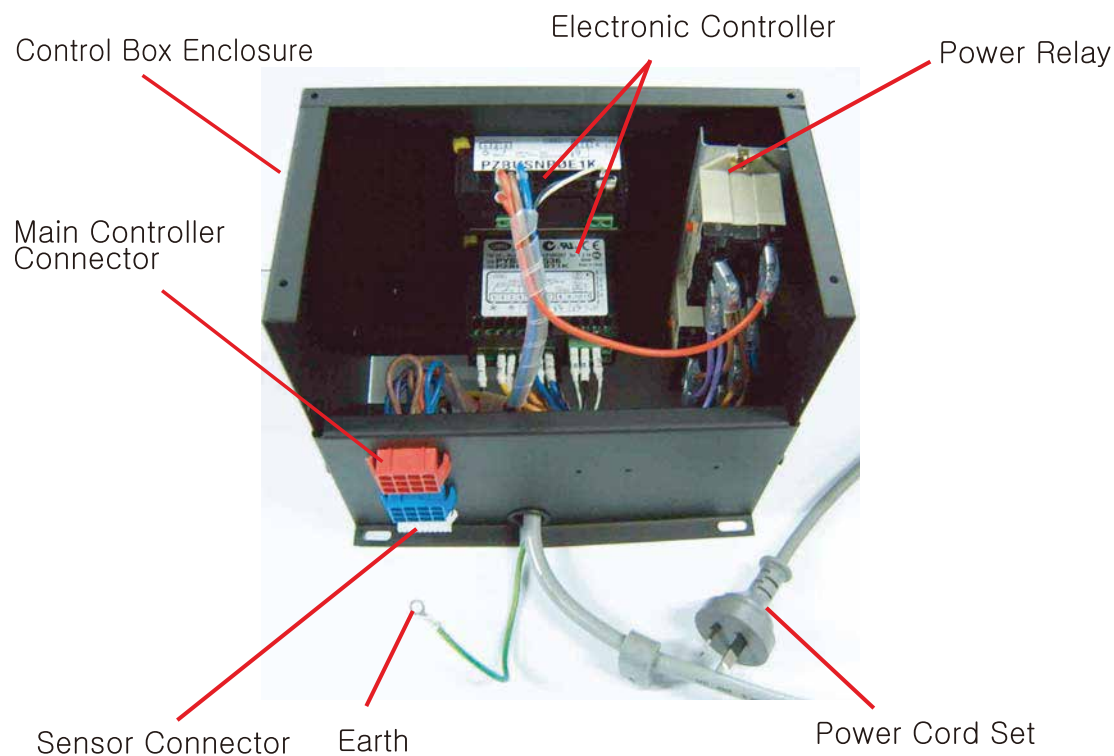
Pic 9-2 ( Model: ETF3 )



## 9. SERVICE INSTRUCTIONS



DETAILED DIAGRAM ( Model: ETRF3 )



Pic 9-3 ( Model: ETRF3 )



## 9. SERVICE INSTRUCTIONS

### 9.1.2 Electronic Controller

Model	PZBUC0H0E1K
Power Supply (*)	230 Vac +10 /-15% 50/60 Hz;
Rated Power	3.5 VA
Inputs (*)	NTC probe
Relay Outputs (*)	16A relay UL: 12 A resistive 5 FLA, 30 LRA 250 Vac 30000 cycles EN60730-1: 12(2)A or 10(4)A (N.O. only) 250 Vac
Type Of Probe (*)	Std CAREL NTC 10 K $\Omega$ at 25 °C
Power supply/ relay output connector (*)	screw terminals pitch 5mm for cables with cross-sect. from 0.5 mm <sup>2</sup> to 1.5 mm <sup>2</sup> ; 12 A max;.
Probe connector(*)	screw terminals: – 2-pin pitch 5mm for models with 1 probe (cable cross-section from 0.5 mm <sup>2</sup> to 1.5 mm <sup>2</sup> ); 12 A max;
Assembly (*)	using screws from the front
Display	LED display, 2 digits plus sign, decimal point and compressor icon
Keypad	3 buttons with membrane
Operating conditions	-10T50 °C – humidity <90% rH non-condensing
Storage conditions	-20T70 °C – humidity <90% rH non-condensing
Range of measurement	-50T90 °C (-58T194 °F) – resolution 0.1 °C/°F
Front panel index of protection	panel installation with IP65 gasket
Case	plastic terminal, 81x36x38 mm
Classification according to protection against electric shock	Class II when suitably integrated
Environmental pollution	II
PTI of the insulating material	250 V
Period of stress across the insulating parts	long
Category of resistance to heat and fire	category D (UL94 – V0)
Immunity against voltage surges	category 1
Type of action and disconnection	micro-disconnection 1C
No. of relay automatic operating cycles (*)	EN60730-1:100,000 operations UL:30,000 operations (250 Vac)
Software class and structure	Class A
Cleaning the instrument	Only use neutral detergents and water.
Cable max. length	serial: 1 km, probes: 30 m, relay: 10 m

Table 9-1



## 9. SERVICE INSTRUCTIONS

Model	PZBUC0H011K
Power Supply (*)	230 Vac +10 /-15% 50/60 Hz;
Rated Power	3.5 VA
Inputs (*)	NTC probes 1 or 3 inputs. Digital input as alternative to third probe
Relay Outputs (*)	1.5HP relay on Pin -5 UL: 12 A Res. 10 FLA 60 LRA - 250 Vac
	8A relay on Pin -3 UL: 8 A Res. 2 FLA 12 LRA - 250 Vac C300, EN60730-1: 8(4) A NO, 6(4) A NC, 2(2) A CO - 250 Vac
	8A relay on Pin -1 UL: 8 A Res. 2 FLA 12 LRA - 250 Vac C300, EN60730-1: 8(4) A NO, 6(4) A NC, 2(2) A CO - 250 Vac
Type Of Probe (*)	Std CAREL NTC 10 K $\Omega$ at 25 °C
Connections (*)	screw terminals for cables with cross-sect. from 0.5 mm <sup>2</sup> to 1.5 mm <sup>2</sup> . Rated maximum current per terminal 12 A.
Assembly (*)	terminal: using screws from the front panel. Interface: wall
Display	3 digit LED display with sign (-199 to 999) and decimal point; six status LEDs
operating conditions	-10T50 °C - humidity <90% rH non-condensing
storage conditions	-20T70 °C - humidity <90% rH non-condensing
front panel index of protection	panel installation with IP65 gasket
case	plastic terminal, 81x36x65 mm
classification according to protection against electric shock	Class II when suitably integrated
environmental pollution	normal
PTI of the insulating material	250 V
period of stress across the insulating	long
category of resistance to heat and fire	category D (UL94 - V0)
immunity against voltage surges	category 1
type of action and disconnection	1C relay contacts
no. of relay automatic operating	EN60730-1:100,000 operations
software class and structure	Class A
cleaning the instrument	Only use neutral detergents and water.
cable max. length	serial: 1 km probes: 30 m relay: 10 m

Table 9-2



## 9. SERVICE INSTRUCTIONS

### 9.1.3 How to Remove the Electronic Controller

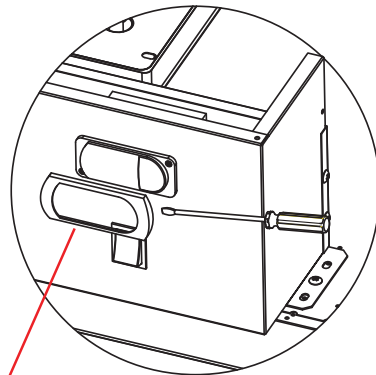


Fig 9-3

Controller Cover

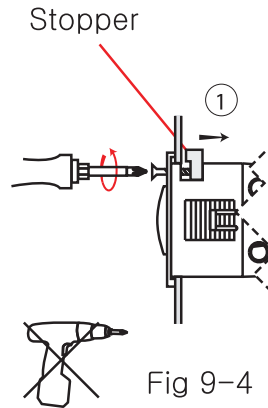


Fig 9-4

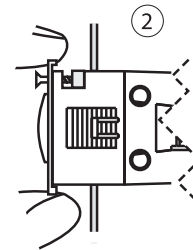


Fig 9-5

Remove the controller cover by using a blunt / flat tool as shown in the above figure (Fig 9-3). Use a (+) screwdriver to loosen the two screws on the controller until you get a gap on the stopper (Fig 9-4). Pull out the controller from the control box.

Reassemble in reverse order. (Fig 9-5)

### 9.1.4 Power Cord Set

When replacing the power cord set, check to ensure it is rated. Unrated components may cause a fire, fault or electrical shock. To re-wire the power cord set, twist the same colored wires together (natural + natural, live + live). Tighten it using a close end connector (Fig 9-6).

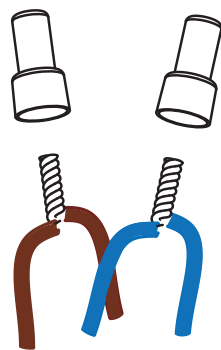


Fig 9-6

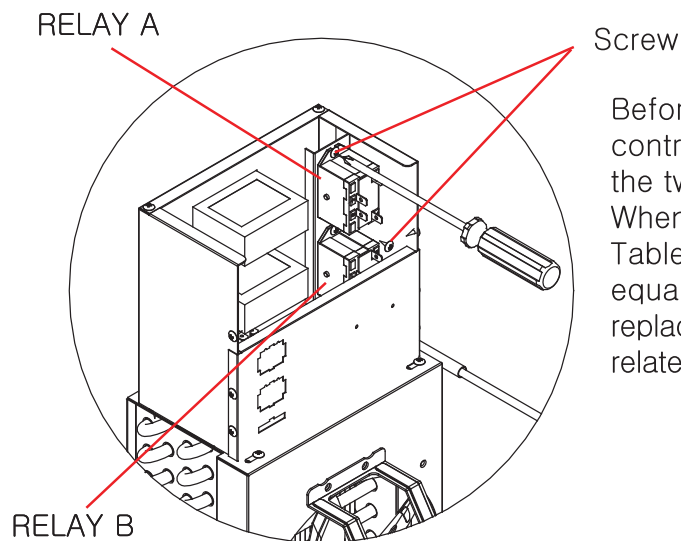
When selecting a new power cord set, refer to Table 5. Currently, new sets should have equal or higher capacity. Ensure that the replacement is suitable to avoid electrical-related accidents.



## 9. SERVICE INSTRUCTIONS

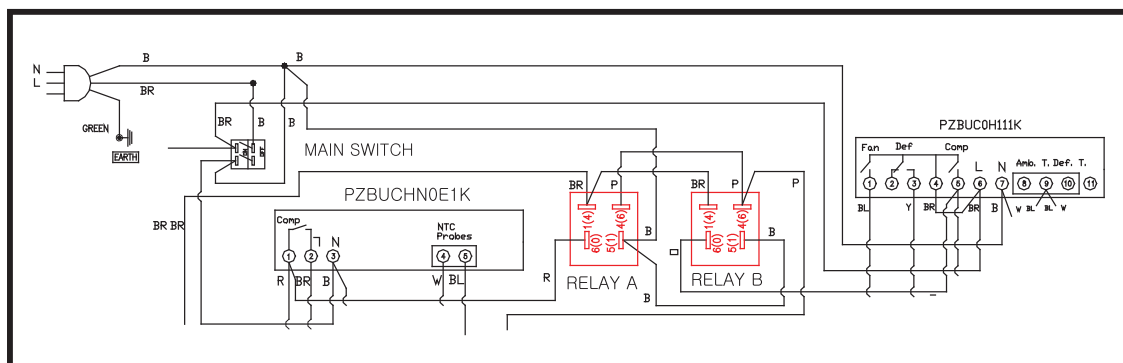
### 9.1.5 How to Remove the Relay

Warning : Make sure the power is disconnected before servicing. Wait until the condenser fan is stopped completely. Due to the weight of the unit assembly, at least 2 people are recommended for this task.



Before replacing the relay, remove the control cover (Fig 7.1 and 9.1.1.) Remove the two screws holding the relay in place. When selecting a new relay, refer to Table 5. Currently, new relays should have equal or higher capacity. Ensure the replacement is suitable to avoid electrical-related accidents.

Fig 9-7



DETAIL DIAGRAM ( Model: ETRF3 )



## 9. SERVICE INSTRUCTIONS

### 9.2 Condensing Unit Assembly

**Warning :** Make sure the power is disconnected before servicing.  
Wait until the condenser fan is stopped completely.

#### 9.2.1 How to Remove the Condensing Unit Assembly

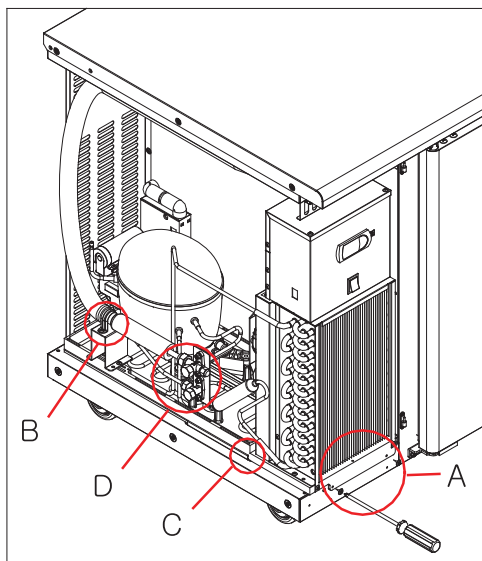
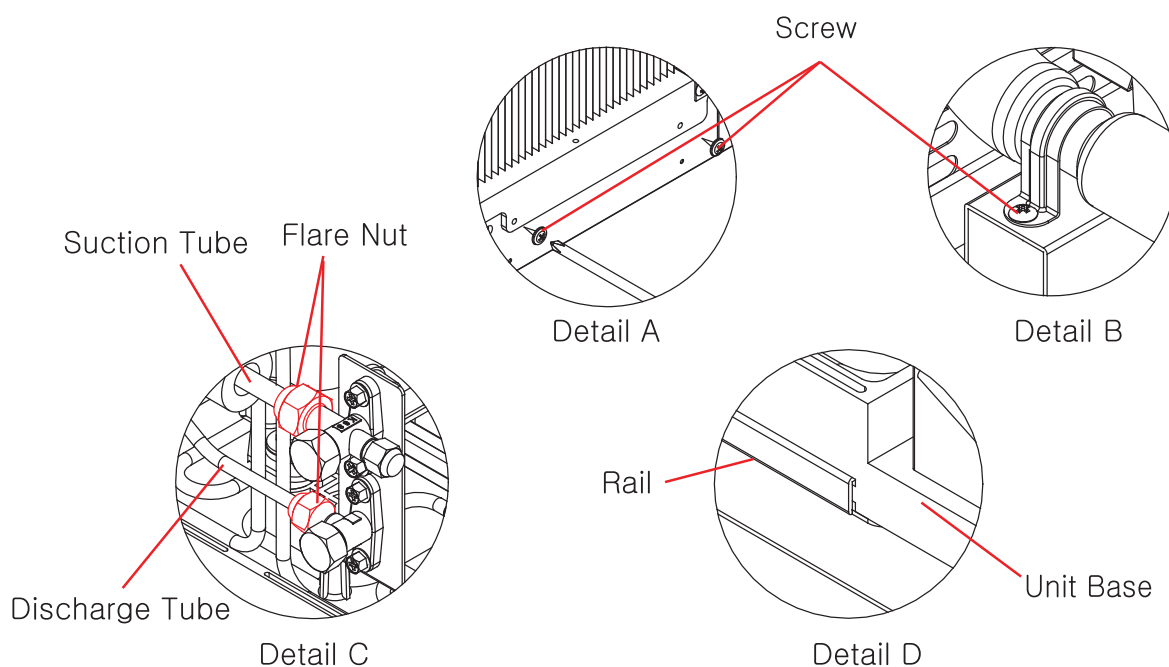


Fig 9-8

1. To remove the condensing unit, detach the machine room cover. Refer to Fig 7.1 and Fig 9.1.1.
2. Remove two screws on the unit base (**Detail A**).
3. Remove two screws on the clamp holding the suction pipe in place (**Detail A**).
4. To disassemble the suction pipe assembly, use a spanner to loosen the high/low pressure flare nuts connected to the service valve (**Detail A**).
5. Detach the Condensing Unit Connector, Main Controller Connector, and Sensor Connector.
6. Loosen the screws and the grounding screw(s) coupled in the inner wall of the machine room.
7. Since the unit base is coupled with the rail, set it down and pull it out to detach. (**Detail A**).





## 9. SERVICE INSTRUCTIONS



Condensing Unit  
Connector Pic 9-5



Main Controller  
Connector  
Sensor  
Conector  
Ground  
Pic 9-6

### 9.2.2 Components of Condensing Unit Assembly (Normal System)

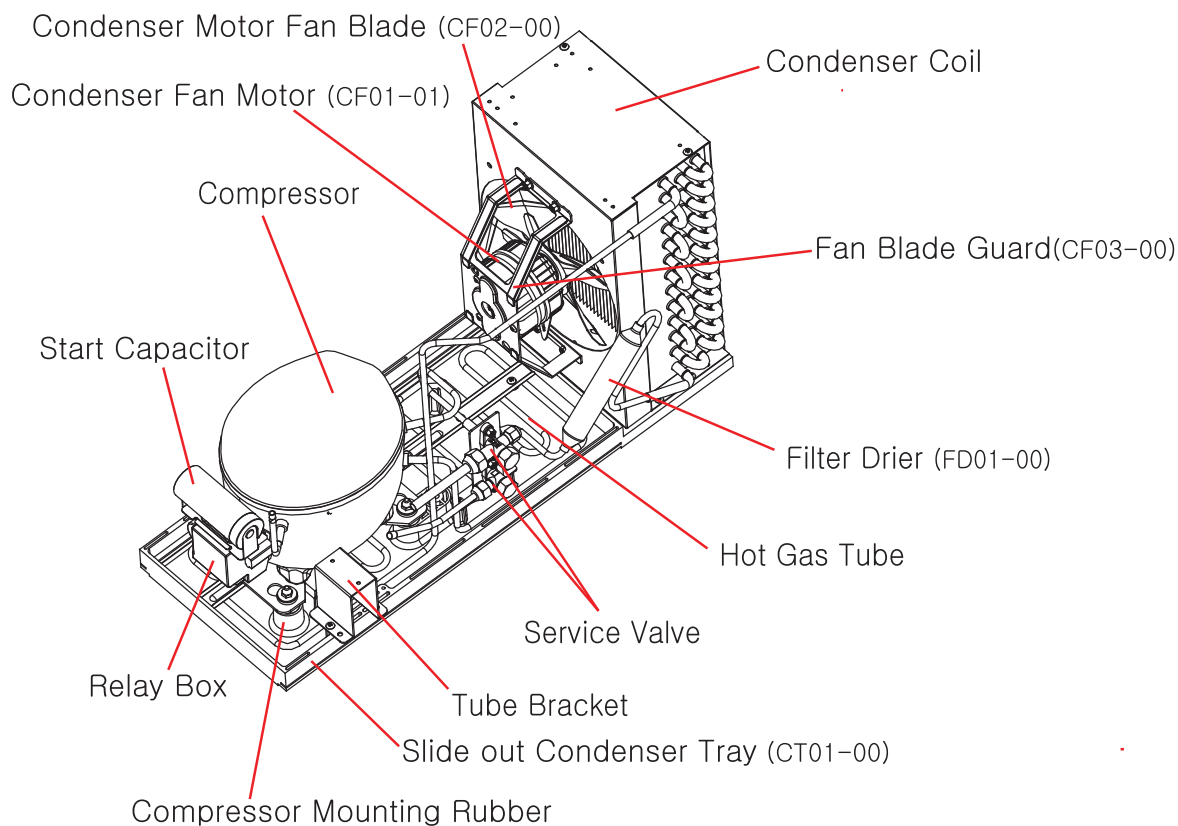


Fig 9-9



## 9.SERVICE INSTRUCTIONS

### 9.2.3 How to Remove the Compressor

1. Open compressor's electrical components housing and remove the lead wire coupled into the power motor and other parts. This is connected to the relay and overload protector. (Fig 9-10)
2. Before removing the compressor, check the machine for remaining refrigerant.
3. To remove remaining refrigerant and balance internal pressure, cut the process tube.
4. Remove discharge tube and suction tube by using a gas burner.
5. Loosen the nuts on the compressor. (Fig 9-11)
6. Lift up the compressor to detach.

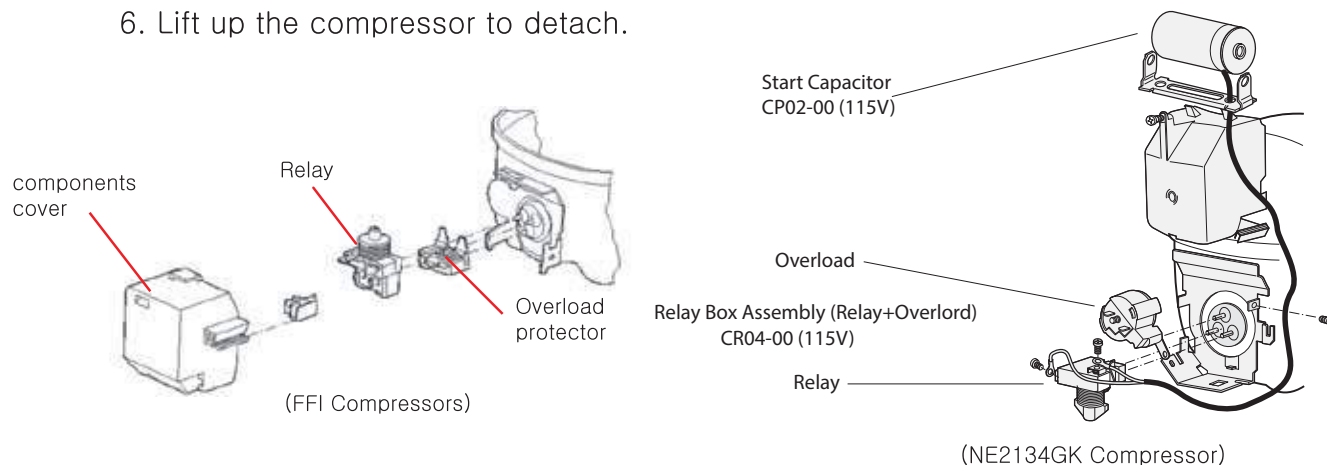


Fig 9-10

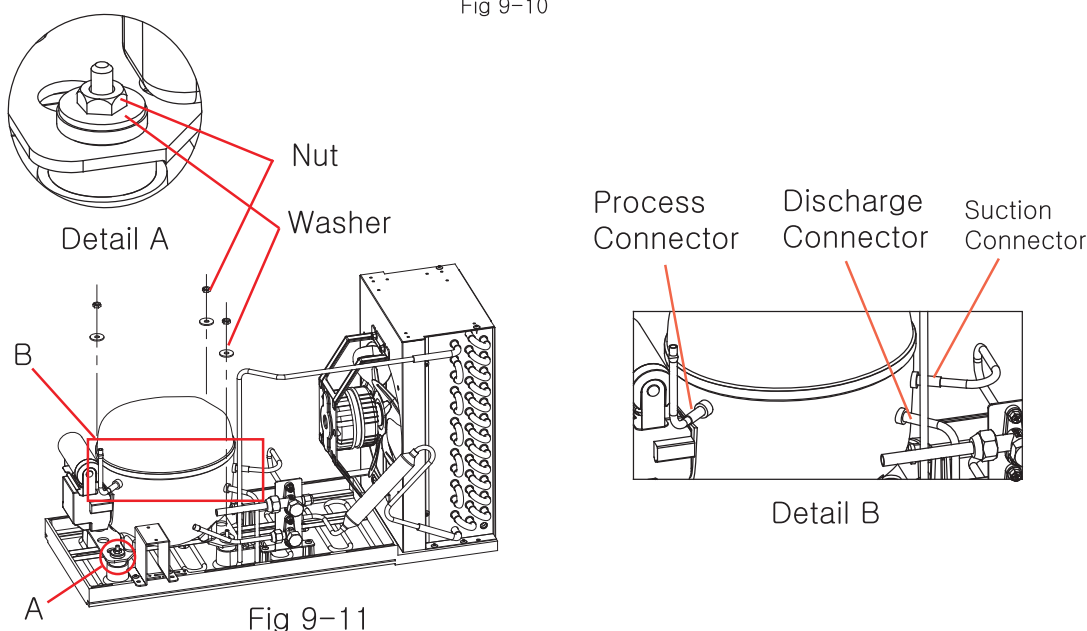


Fig 9-11



## 9.SERVICE INSTRUCTIONS

### 9.2.4 Compressor Technical Data

Model				FFI8.5HAKW [1/4HP]				
Type				Hermetic reciprocating compressor				
Refrigerant				R-134a				
Nominal voltage and frequency				220-240 / 50		[ V / Hz ]		
Application type				Low-Medium Back Pressure				
Evaporating temperature range				-35°C to -5°C				
Motor type				RSIR/CSIR				
Starting torque				LST – Low Starting Torque				
Expansion device				Capillary tube				
Maximum condensing pressures								
Operating (gauge)				16.2 [kgf/cm²]		(230 psig)		
Peak (gauge)				20.6 [kgf/cm²]		(293 psig)		
Maximum winding temperature				130		[ °C ]		
Performance								
Cooling capacity			Power consumption	Current consumption	Gas flow rate	EFFICIENCY RATE		
[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[Btu/Wh]	[W/W]
702	177	206	157	1.34	3.99	4.49	1.13	1.32
Start capacitor				64-77(200)		[μF(VAC minimum)]		
Motor protection (external)								
Code				4TM757KDBYY-53				
Opening Temperature								
Closing Temperature								
Tripping Current at 25°C (77°F)								
Reaction Time								
Current Relay								
Pick Up Current (A)								
Drop-Out Current (A)								
EXTERNAL CHARACTERISTICS								
SUCTION				6.5		[mm]		
DISCHARGE				6.5		[mm]		
PROCESS				6.5		[mm]		

[Compressor : FFI8.5-HAKW]

Table 9-3



## 9.SERVICE INSTRUCTIONS

### 9.2.5 Compressor Technical Data

Model				FFI10-HAKW [1/3HP]				
Type				Hermetic reciprocating compressor				
Refrigerant				R-134a				
Nominal voltage and frequency				220-230 / 50-60		[ V / Hz ]		
Application type				Low-Medium Back Pressure				
Evaporating temperature range				-35[ °C ] to -5[ °C ]				
Motor type				RSIR/CSIR				
Starting torque				LST – Low Starting Torque				
Expansion device				Capillary tube				
Maximum condensing pressures								
Operating (gauge)				16.2 [kgf/cm²]		(230 psig)		
Peak (gauge)				20.6[kgf/cm²]		(293 psig)		
Maximum winding temperature				130		[ °C ]		
Performance								
Cooling capacity			Power consumption	Current consumption	Gas flow rate	EFFICIENCY RATE		
[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[Btu/Wh]	[W/W]
850	214	249	191	1.73	4.83	4.45	1.12	1.3
Start capacitor				53-64(230)		[μF(VAC minimum)]		
Motor protection (external)								
Code				4TM757KFBYY-53				
Opening Temperature				105°C (221°F)				
Closing Temperature				61°C (141,8°F)				
Triping Current at 25°C (77°F)				9,8 A				
Reaction Time				5.0s – 15.0s				
Current Relay								
Pick Up Current (A)				6,8				
Drop-Out Current (A)				5,2				
EXTERNAL CHARACTERISTICS								
SUCTION				6.5		[mm]		
DISCHARGE				6.5		[mm]		
PROCESS				6.5		[mm]		

[Compressor : FFI10-HAKW]

Table 9-4



## 9.SERVICE INSTRUCTIONS

### 9.2.6 Compressor Technical Data

Model				NE 2134GK [1/2HP]				
Type				Hermetic reciprocating compressor				
Refrigerant				R-404a				
Nominal voltage and frequency				220-240 / 50		[ V / Hz ]		
Application type				Low-Medium Back Pressure				
Evaporating temperature range				-40[ °C ] to -10[ °C ]				
Motor type				CSIR				
Starting torque				LST – Low Starting Torque				
Expantion device				Capillary tubeor Expansion valve				
Maximum condensing pressures								
Operating (gauge)				25.7 [kgf/cm²]		(365 psig)		
Peak (gauge)				28.7 [kgf/cm²]		(408 psig)		
Maximum winding temperature				130		[ °C ]		
Performance								
Cooling capacity			Power consumption	Current consumption	Gas flow rate	EFFICIENCY RATE		
[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[Btu/Wh]	[W/W]
1629	411	477	388	2.59	11.04	4.2	1.06	1.23
Start capacitor				53-64(230)		[μF(VAC minimum)]		
Motor protection (external)								
Code				T0546/G6				
Opening Temperature								
Closing Temperature								
Triping Current at 25°C (77°F)								
Reaction Time								
Current Relay								
Pick Up Current (A)								
Drop-Out Current (A)								
EXTERNAL CHARACTERISTICS								
SUCTION				8.1		[mm]		
DISCHARGE				6.1		[mm]		
PROCESS				6.1		[mm]		

[Compressor : NE2134GK]

Table 9-5



## 9.SERVICE INSTRUCTIONS

### 9.2.7 Compressor Troubleshooting

Compressor will not start – No hum.	Line disconnected. Starting relay open	Check the line and the starting relay contacts.
	Overload protector tripping.	Check the electrical connections.
	Thermostat not correctly adjusted.	Reset or replace the thermostat.
	Electrical connections improper or loose.	Check wiring against diagram, or tighten the connections.
Compressor will not start (hums) but trip on the overload protector.	Improperly wired.	Check wiring against diagram. Redo the electrical connections according to the electrical diagram.
	Low voltage at the compressor.	Determine reason and correct.v
	Start capacitor defective.	Determine reason and replace the capacitor if necessary.
	Relay failing to close.	Determine reason and correct, replace the relay if necessary.
	Compressor motor has a winding open or shorted.	Replace the compressor.
	Internal mechanical problem in compressor.	Replace the compressor.
Compressor starts and runs, but short cycles on overload protector.	Additional current passing through overload protector.	Check wiring diagram. Check for added fan motors, pump, etc. connected to the wrong side of protector.
	Low voltage at compressor (or unbalanced if three phase).	Determine reason and correct.
	Overload protector defective.	Check current, replace protector.
	Run capacitor defective.	Determine reason and replace.
	Excessively high discharge pressure.	Check ventilation, restrictions in cooling medium, restriction in refrigeration system.
	Excessively high suction pressure.	Check for possibility of incorrect application. Use stronger unit.
	Compressor too hot. Return gas hot.	Check refrigerant charge, repair leaks, and add gas if necessary.
	Compressor motor has a winding shorted	Replace the compressor.



## 9.SERVICE INSTRUCTIONS

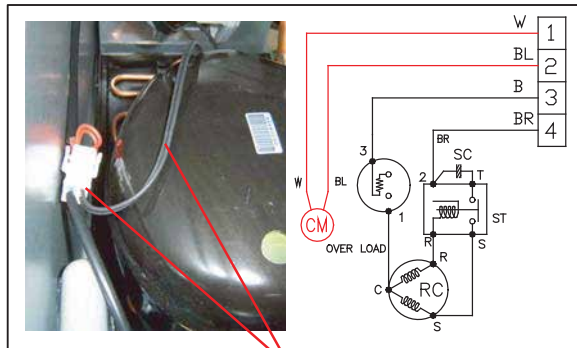
Compressor starts, but does not switch off of start winding.	Improperly wired.	Check wiring against diagram.
	Low voltage at the compressor.	Determine reason and correct.
	Run capacitor defective.	Determine reason and replace.
	Relay failing to open.	Determine reason and correct, replace if necessary.
	Excessively high discharge pressure.	Check discharge shut-off valve, possible overcharge, or insufficient cooling at condenser.
	Compressor motor has a winding open or shorted.	Replace the compressor.
	Internal mechanical problem in compressor (tight).	Replace the compressor.

Table 9-6



## 9.SERVICE INSTRUCTIONS

### 9.2.8 Condenser Fan Motor Assembly



Motor Wire & Motor terminal  
Pic 9-7

1. To replace the condenser fan motor, detach the motor terminal from the condensing unit connector (Fig 9-7).

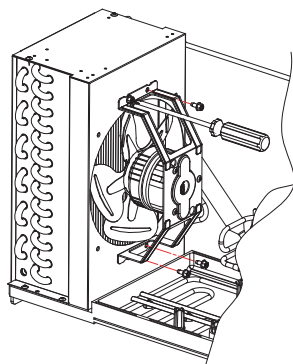


Fig 9-12

2. Loosen the bolts of the condenser fan motor assembly from the condenser.  
( Fig 9-12 )

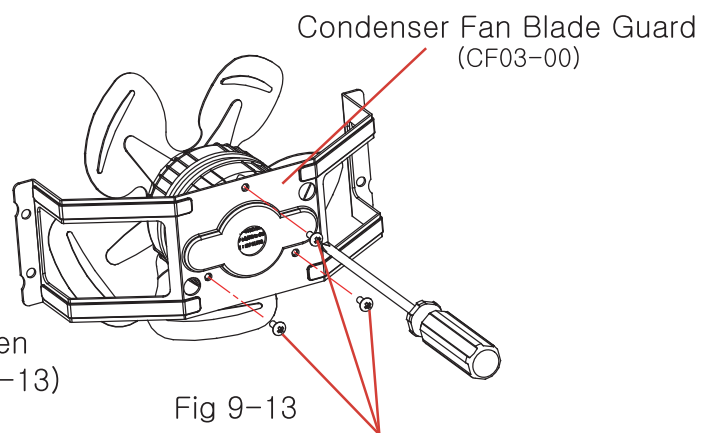


Fig 9-13

3. Loosen the connecting bolts between the fan motor and fan guard. (Fig 9-13)

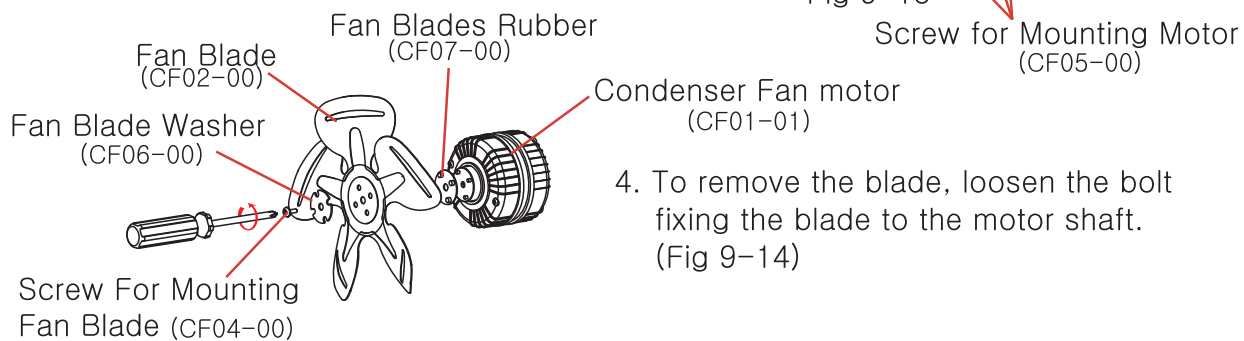


Fig 9-14

4. To remove the blade, loosen the bolt fixing the blade to the motor shaft.  
(Fig 9-14)



## 9.SERVICE INSTRUCTIONS

### 9.2.9 Replacing the Condenser and Filter Drier

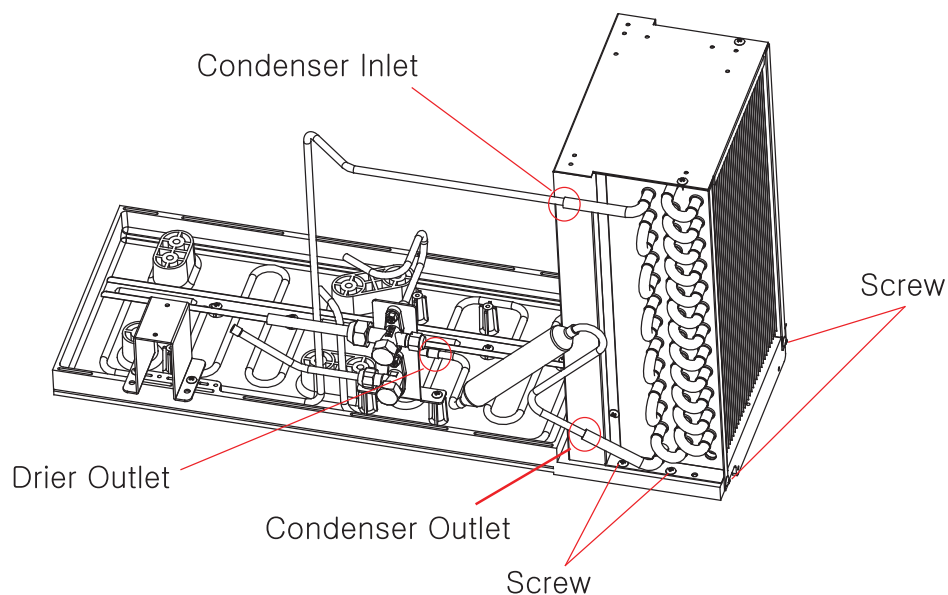


Fig 9-15

1. When replacing the condenser, remove the 6 screws on the front, left and right of the base.
2. Using a gas burner, take out the joint points marked in the figure above.
3. Refer to Table 5 to confirm the size of the condenser.
4. Re-assemble in the reverse order.

### 9.2.10 Replacing the Service Valve

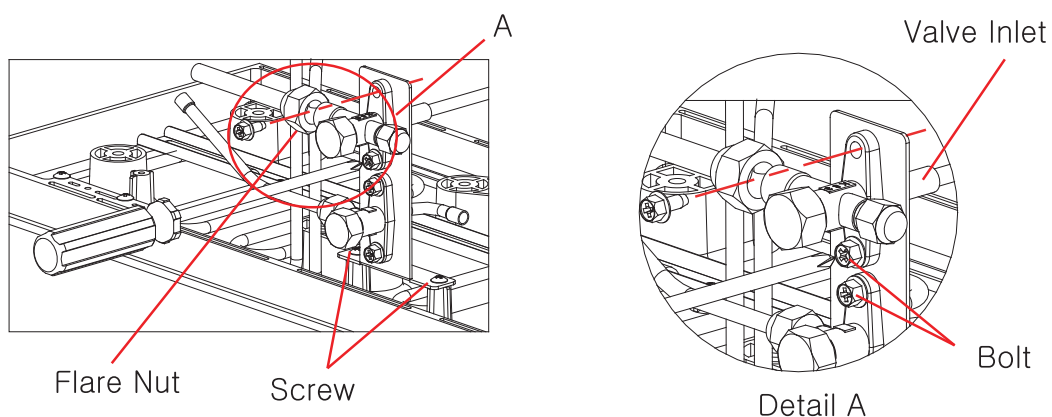


Fig 9-16



## 9.SERVICE INSTRUCTIONS

1. Using a gas burner, take out the pipes connected to the valve inlet.
2. Remove the flare nuts connected to valve outlet.
3. Loosen the screws on the service valve assembly bracket. Remove the pairs of bolts holding the valves in place.
4. Refer to Table 5 to confirm the Q·ty. and the size of the valve.
5. Reassemble in the reverse order.

### 9.2.11 Solenoid Valve (Dual Temperature System)

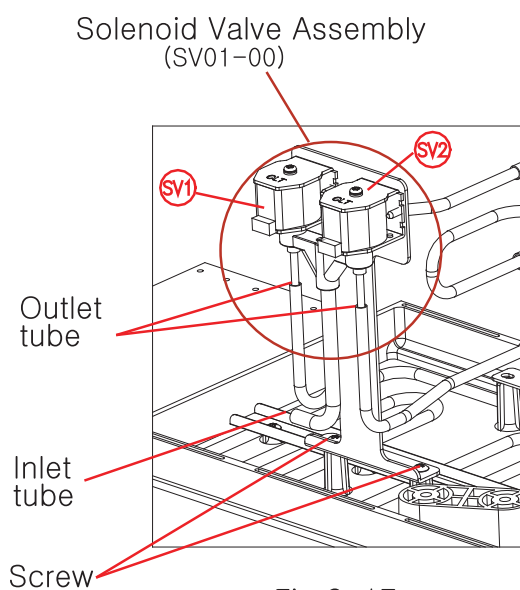
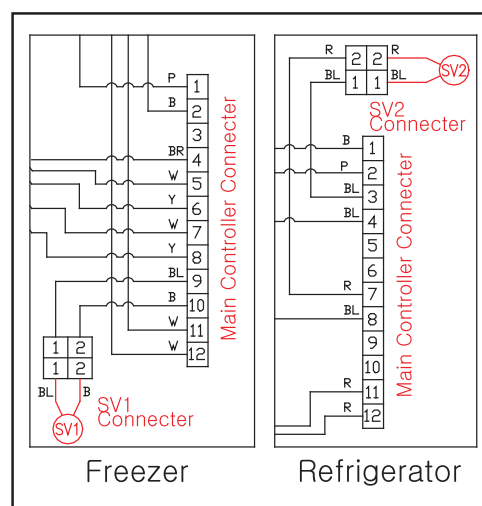


Fig 9-17



DETAIL DIAGRAM  
( Model: ETRF2,ETRF3 )

1. Take out the tubes connected to outlet tube and the inlet tube with the use of a gas burner.
2. In order to remove the solenoid valve, remove the two screws fixing the bracket to the base.
3. Refer to Table 5 to confirm the specs of the valve.
4. Reassemble in the reverse order.



## 9.SERVICE INSTRUCTIONS

### 9.3 Evaporator Parts

WARNING : Make sure that the power is disconnected before servicing.  
Allow for sufficient working space to ensure your safety  
and the safety of the unit.

#### 9.3.1 Disassembling wire box cover

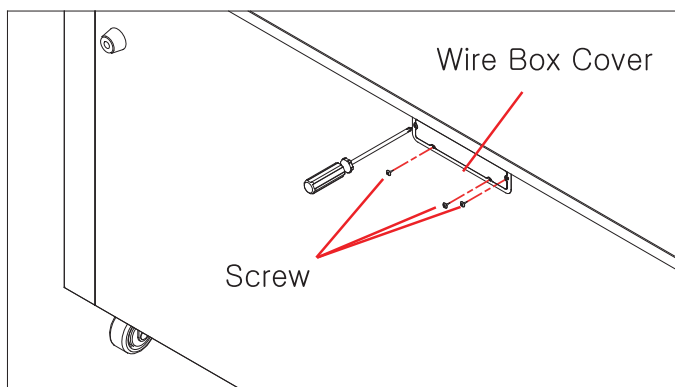


Fig 9-18

Evaporator Connector

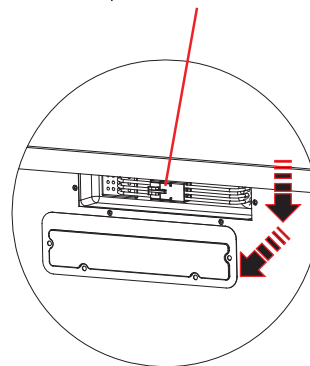
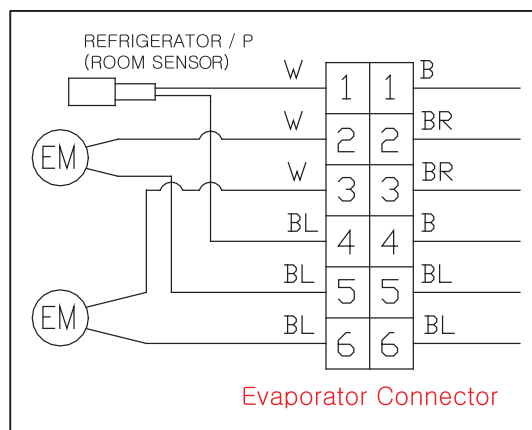


Fig 9-19



CIRCUIT DIAGRAM  
( Model: ETR3 )

Pic 8-5

Follow these procedures when replacing the evaporator assembly (evaporator fan motor, defrost heater, room sensor, etc.)

1. Remove the 4 screws on the wire box cover located at the rear of the unit.
2. The top corner of the cover is inserted between the top pan and the body frame, push it down to detach.
3. Refer to the circuit diagram and detach the terminal for repair.



## 9.SERVICE INSTRUCTIONS

### 9.3.2 Evaporator Cover Assembly.

**WARNING :** Make sure that the power is disconnected before servicing.  
Allow for sufficient working space to ensure your safety  
and the safety of the unit.

1. For refrigerators, the evaporator cover does not have a drain pan heater so it can be detached simply by removing the 5 screws that hold it in place.  
(Fig 9-20)
2. For freezers, the evaporator cover contains a drain pan heater. First remove the drain pan heater terminal from the connector by referring to 9.3.1. Proceed to remove the 5 screws that hold the cover in place.
3. Replace it with the new evaporator cover assembly or repair it by referring to the disassembly manual.
4. Reassemble in the reverse order.

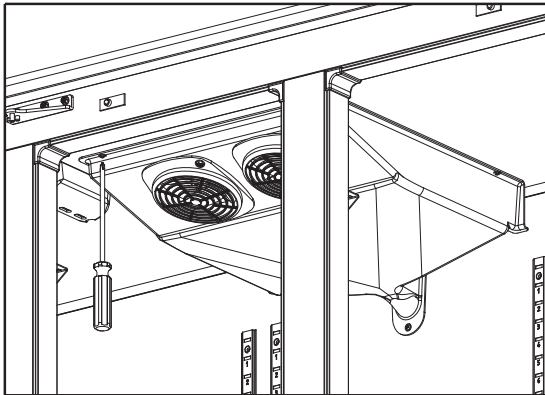
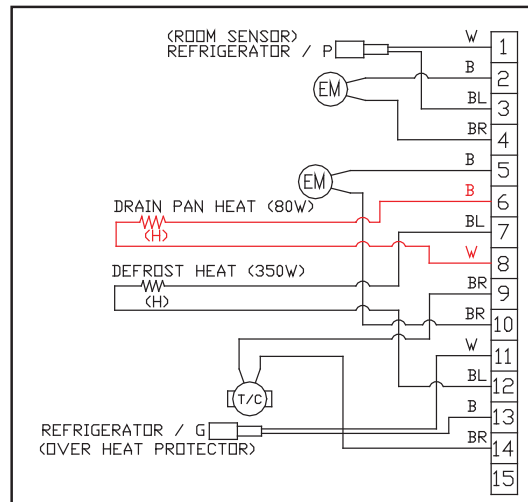


Fig 9-20



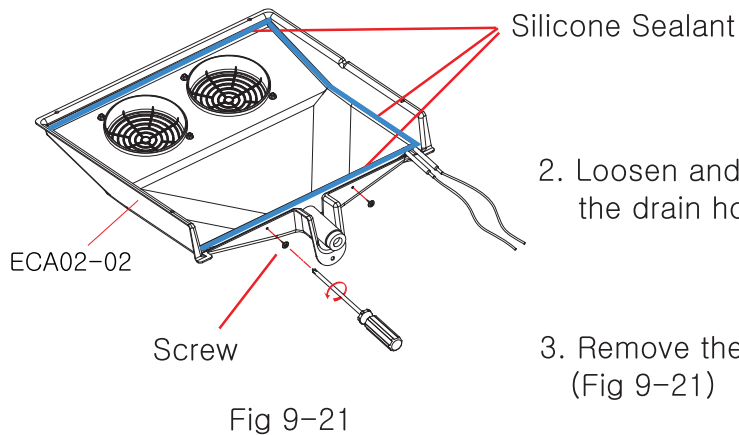
DETAIL DIAGRAM  
( Model: ETF3 )



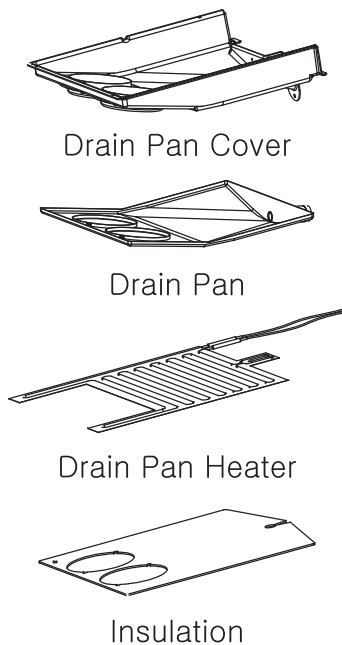
## 9.SERVICE INSTRUCTIONS

### 9.3.3 Drain Pan Heater (Freezer,Dual Temperature Model)

1. Detach the evaporator cover assembly in accordance with the procedure described in 9.3.2



2. Loosen and remove the two screws by the drain hole access tube. (Fig 9-21)
3. Remove the marked silicone sealant. (Fig 9-21)



4. Separate the drain pan from the cover.
5. Remove the insulation on the rear of the drain pan.
6. Remove the drain pan heater with the silver foil sheet is attachment.

Fig 9-22



## 9.SERVICE INSTRUCTIONS

7. Remove the protective sheet of the new drain pan heater and uniformly spread it onto the bottom. (Fig 9-23)

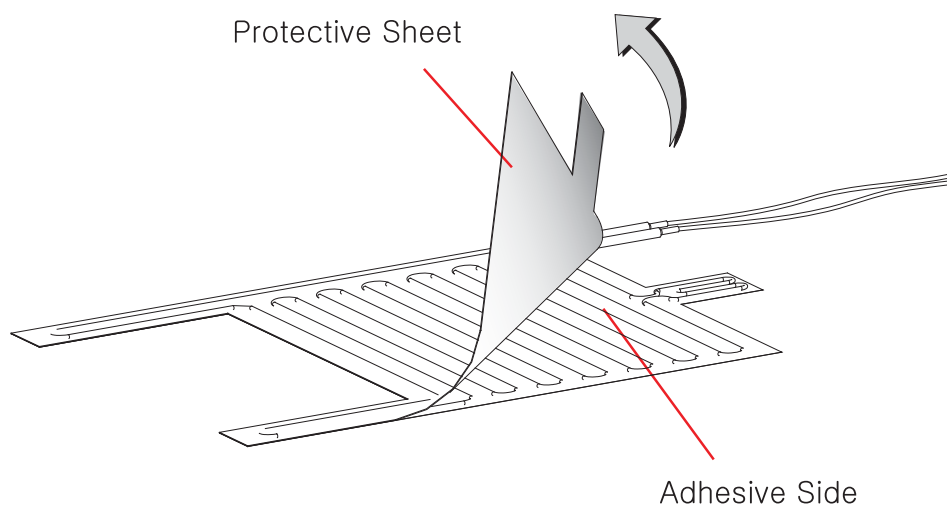


Fig 9-23

8. Reassemble in the reverse order.

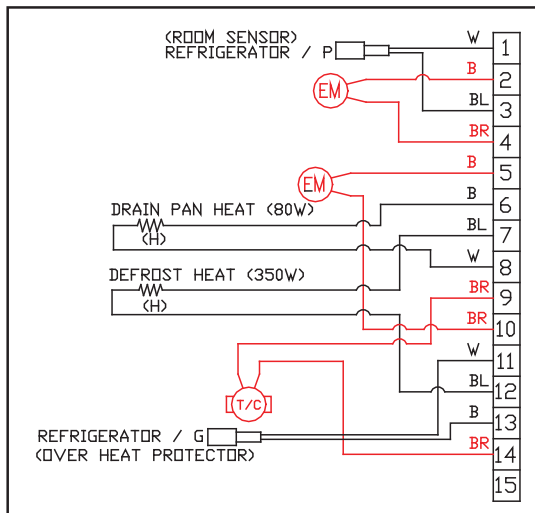
**IMPORTANT :** During reassembly, ensure that it is air tight by using silicone sealant.



## 9.SERVICE INSTRUCTIONS

### 9.3.4 Evaporator Fan Motor And Defrost Termination Backup Switch

**WARNING :** Make sure that the power is disconnected before servicing.  
Allow for sufficient working space to ensure your safety and the safety of the unit.

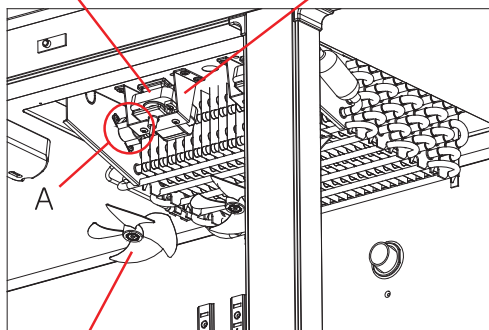


DETAIL DIAGRM  
( Model: ETF3 )

1. For instructions on how to disassemble the evaporator cover, refer to 9.3.2.
2. For instructions on how to remove evaporator fan motor and DTBS, detach the evaporator fan motor and DTBS terminal from the connector, refer to 9.3.1 (Note that DTBS is only freezer or dual temperature units).
3. Pull out the fan blades from the motor. (Fig 9-24)
4. Remove the screws holding the motor in place. (Fig 9-25)
5. Remove the screws on the DTBS and install new parts. (Detail A)

Evaporator  
Fan Motor (EM01-01)

Mounting Bracket  
(EM06-00)



Fan Blades (EM03-00)

Fig 9-24

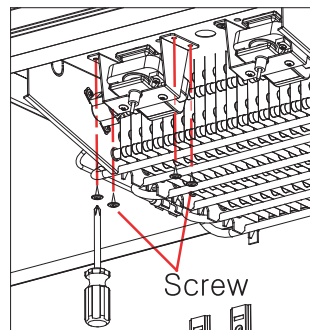
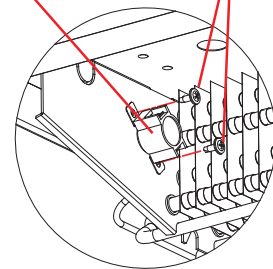


Fig 9-25

Defrost Termination  
Backup Switch (RS04-00)

Screw



Detail A



## 9.SERVICE INSTRUCTIONS

### 9.3.5 Defrost Heater (Freezer,Dual Temperature Model)

**WARNING :** Make sure that the power is disconnected before servicing.  
Allow for sufficient working space to ensure your safety and the safety of the unit.

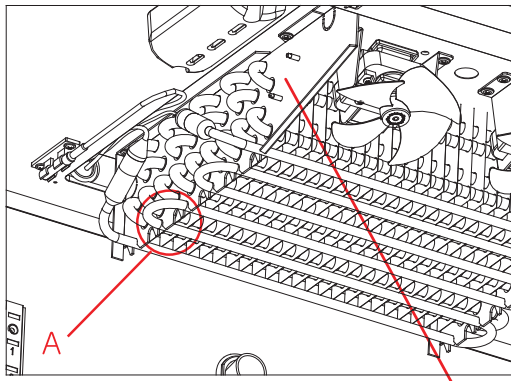
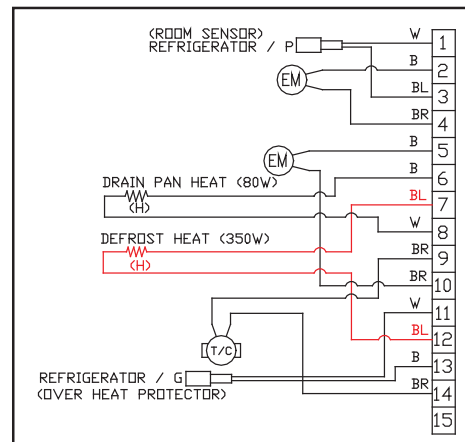
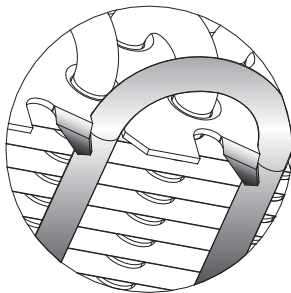


Fig 9-26 Tube Sheet



DETAIL DIAGRAM  
( Model: ETF3 )



DETAIL A

1. For instructions on how to disassemble the evaporator cover, please refer to 9.3.2.
2. To remove the defrost heater, detach the defrost heater terminal from the connector located in the condensing unit. Refer to 9.3.1.
3. To repair the defrost heater, spread the bent tube sheet blade using appropriate tools. (Fig 9-27)
4. Carefully separate the heater from the evaporator. (Fig 9-28)
5. Replace it with the new part.

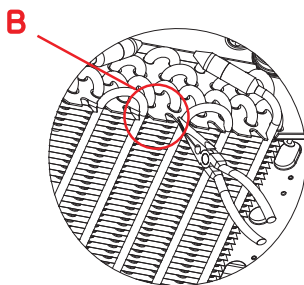
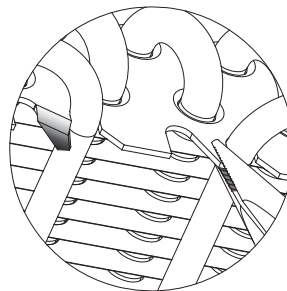


Fig 9-27



DETAIL B

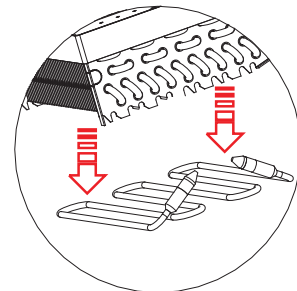


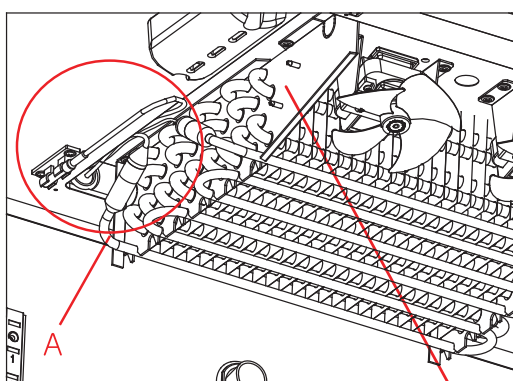
Fig 9-28



## 9.SERVICE INSTRUCTIONS

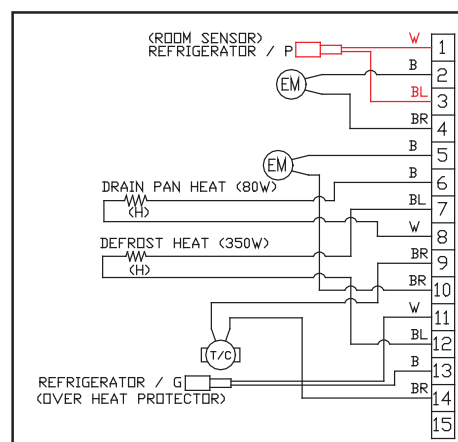
### 9.3.6 Room Sensor.

**WARNING :** Make sure that the power is disconnected before servicing.  
Allow for sufficient working space to ensure your safety  
and the safety of the unit.

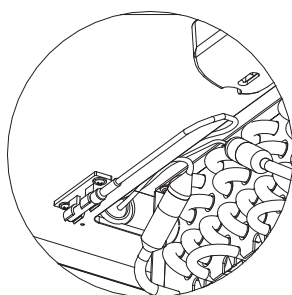


Tube Sheet

Fig 9-29



DETAIL DIAGRAM  
( Model: ETF3 )



DETAIL A

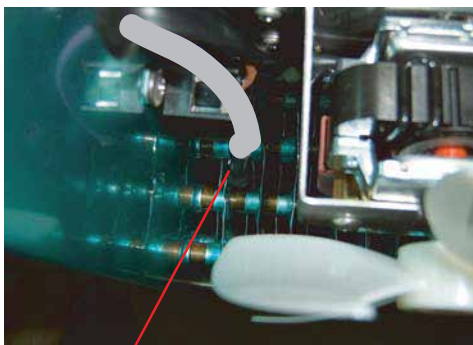
1. For instructions on how to disassemble the evaporator cover, please refer to 9.3.2.
2. To remove the overheat protector, detach its terminal from the condensing unit connector. Refer to 9.3.1.
3. Pull the sensor out from the inside.
4. Replace it with the new part.



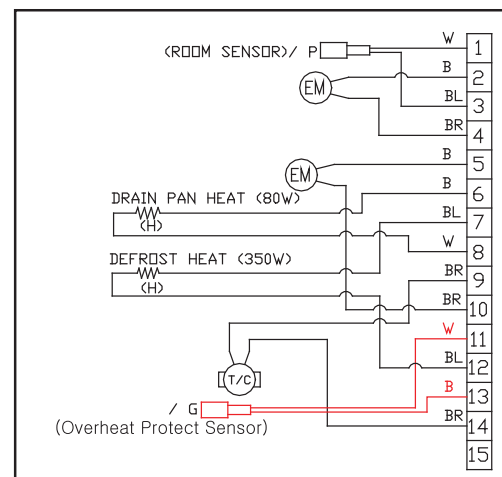
## 9.SERVICE INSTRUCTIONS

### 9.3.7 Overheat Protect Sensor.(Freezer,Dual Temperature Model)

**WARNING :** Make sure that the power is disconnected before servicing.  
Allow for sufficient working space to ensure your safety  
and the safety of the unit.



Pic 9-8  
Overheat  
Protect Sensor (RS02-00)



DETAIL DIAGRAM  
( Model: ETF3 )

All reach-in refrigerators and freezers have an overheat protect sensing bulb located in the evaporator coil which reads the evaporator coil temperature and controls defrost cycle. A defective sensor will cause the evaporator coil to freeze up.

1. For instructions on how to disassemble the evaporator cover, refer to 9.3.2.
2. Locate the sensor between the evaporator coil fins as seen in the above figure. (Pic 9-8)
3. To remove the overheat protector, detach its terminal from the condensing unit connector, refer to 9.3.1.
4. Replace it the new part.
5. Reassemble in the reverse order. .

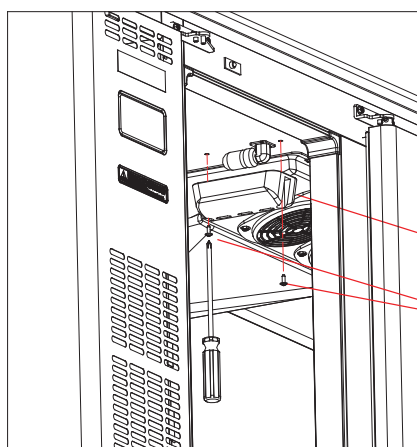


## 9.SERVICE INSTRUCTIONS

### 9.4 Interior Light and Switch

#### 9.4.1 Light Bulb Cover

**WARNING :** Make sure the power is disconnected before servicing to ensure your safety and the safety of the unit.



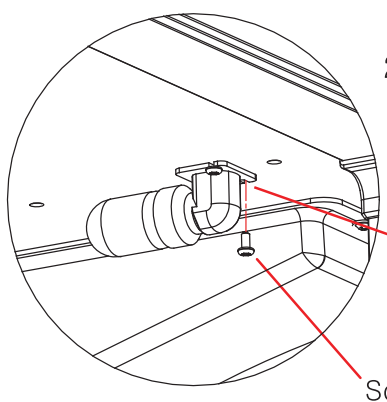
1. Unscrew the bolts fixing the light bulb cover to the ceiling.(Fig 9-30)
2. Replace it with the new cover.

Light Bulb Cover (SS13-00)

Screw

Fig 9-30

#### 9.4.2 Light Bulb Socket



1. Unscrew the bolts fixing the light bulb cover to the ceiling. (Fig 9-30)
2. Unbolt the screws fixing the socket. (Fig 9- 31)

Lamp and  
Socket

Screw

Fig 9-31



## 9.SERVICE INSTRUCTIONS

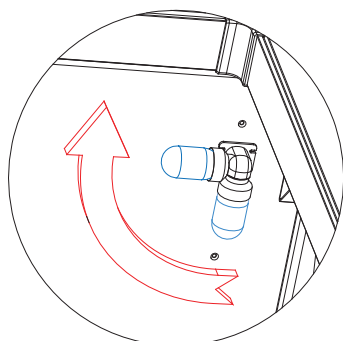


Fig 9-32

3. Turn the socket about 90 degrees. (Fig 9-32)  
(Remove before servicing to avoid damaging the bulb)

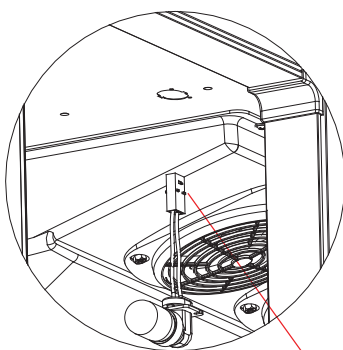
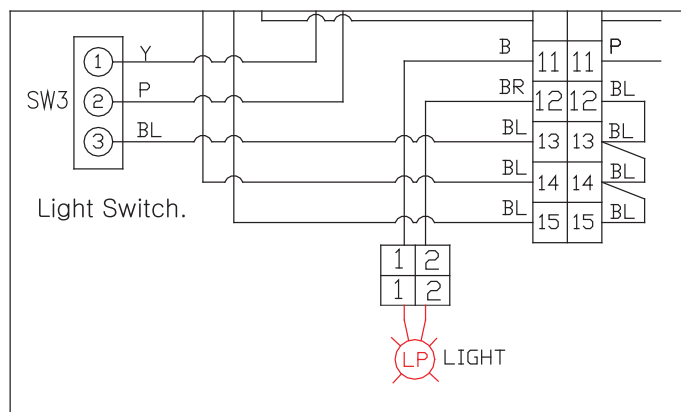


Fig 9-33

Connector

4. Take the socket and remove the wire and connector from the wall. (Fig 9-33)  
(It is recommended that you use a tool for this due to the sharp steel plate around the hole.)
5. Separate the connector.
6. Replace it with a new one.
7. Reassemble in the reverse order.



DETAIL DIAGRAM  
( Model: ETR3 )



## 9.SERVICE INSTRUCTIONS

### 9.4.3 Light Switch

**WARNING :** Make sure that the power is disconnected before servicing.  
Allow for sufficient working space to ensure your safety  
and the safety of the unit.

1. Check the switches for repair. (Fig 9-34)  
(Open the door and press both switches to check operation.)

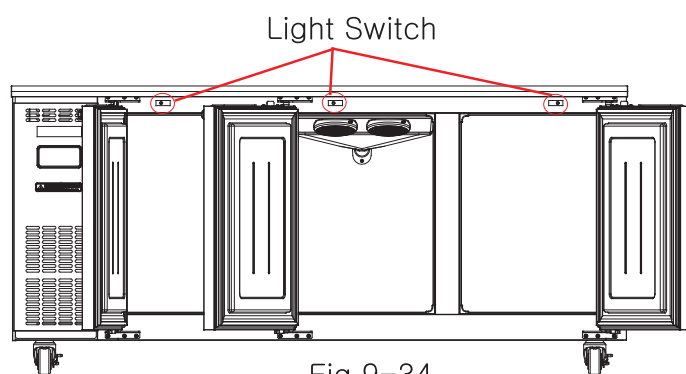


Fig 9-34

2. Keep the doors open.

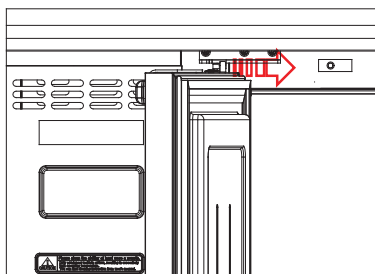


Fig 9-35

3. While applying pressure on the door switch, push it towards the center of the unit or left as indicated. (Fig 9-35)

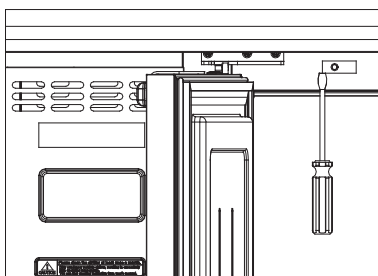


Fig 9-36

4. Lift up the corner of the switch using appropriate tools. (Fig 9-36)



## 9.SERVICE INSTRUCTIONS

5. Completely pull out the switches by using a switch bead tool.(Fig 9-37)

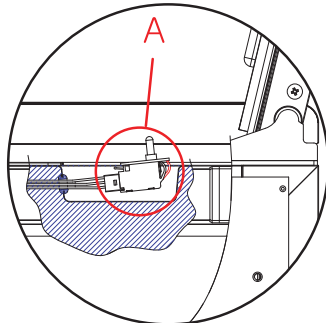
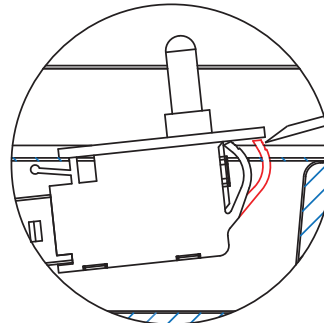
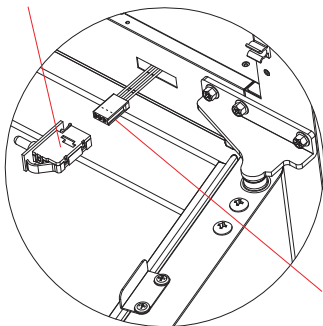


Fig 9-37



DETAIL A

Interior Light Switch (SS19-00)



Connector

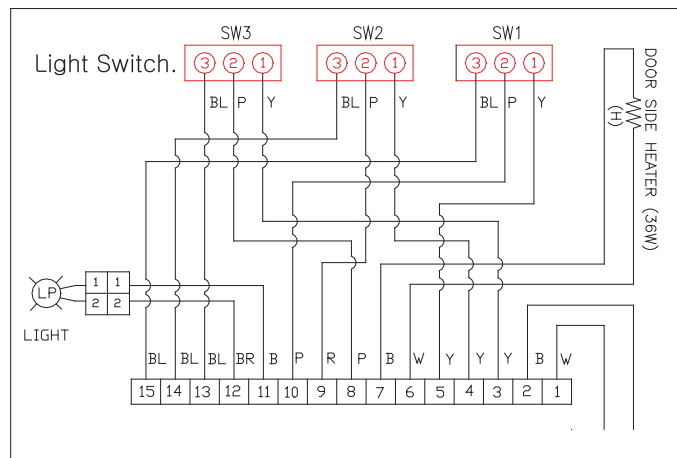
Fig 9-38

6. Carefully pull out the switch so that the connectors and lead wires in the switch box are not damaged. (Fig 9-38)

(Because of the shard steel plate, it is recommended that you use a tool.)

7. Detach the connector completely.

8. Replace it with a new switch and reassemble it in reverse order.



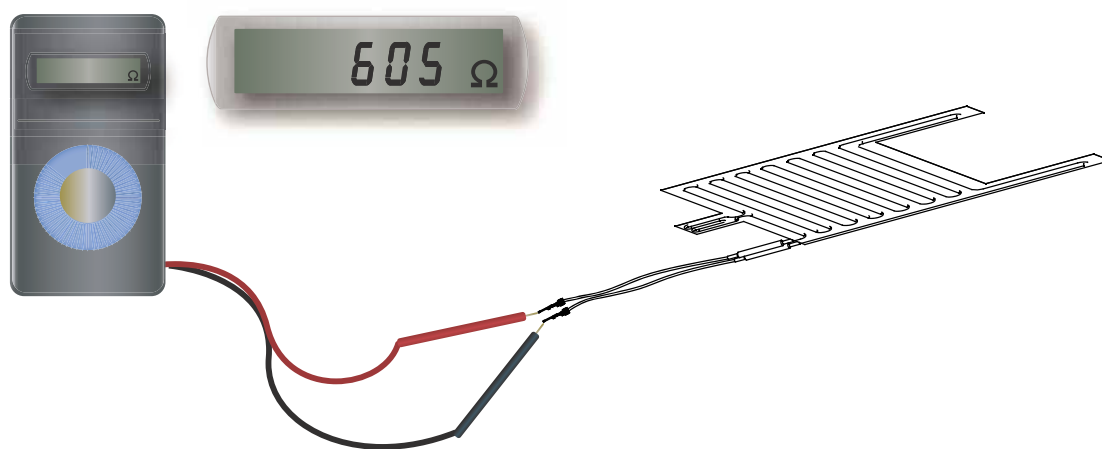
DETAIL DIAGRAM  
( Model: ETR3)



## 9.SERVICE INSTRUCTIONS

### 9.5 How to Check Heater

1. Locate the heater connector to check operation.
2. After removing the connector, connect the tester probes to both ends of the terminal where the heater is connected.
3. Read the resistance on the tester.
4. Refer to Table 9-7. It is considered normal if the resistance is  $\pm 5\%$ .
5. Locate the door sub-heater by removing the screws of the top pan. (Fig 9-39)



(Example: Evaporator Drain Pan Heater)

	Power Consumption	Resistance	Model
Door Side Heater	21.5 W	2.251kΩ	ETR1,ETF1
	26W	1.861kΩ	ETR2,ETF2
	31 W	1.561kΩ	ETWR2,ETWF2,ETRF2
	36 W	1.344kΩ	ETR3,ETF3,ETRF3
Door Sub Heater	9.5 W	5.094kΩ	Common
Drain Pan Heater	80 W	605Ω	Freezer, Dual Temperature Model
Defrost Heater	350 W	138Ω	Freezer, Dual Temperature Model

Table 9-7



## 9.SERVICE INSTRUCTIONS

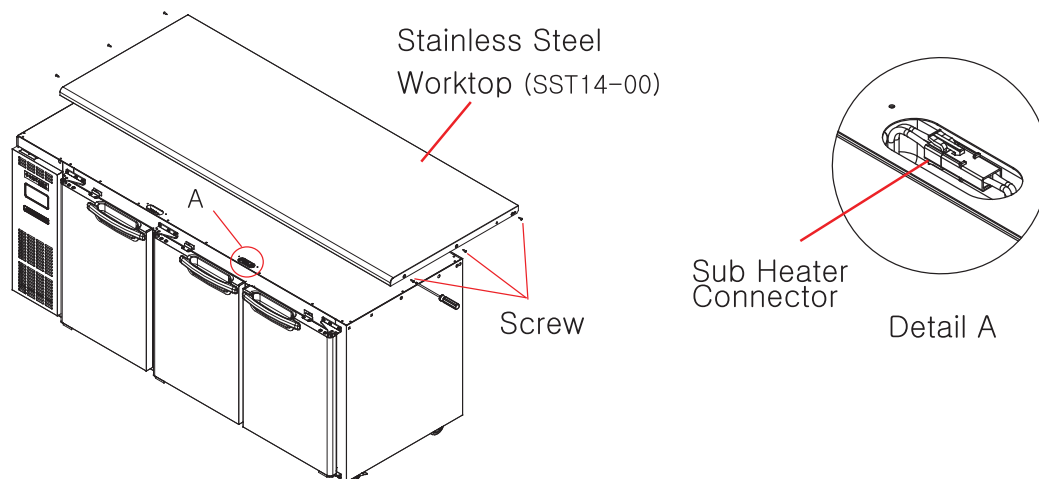


Fig 9-39

6. Refer to figure 9-40 for the location of the door side heater and the door sub heater.

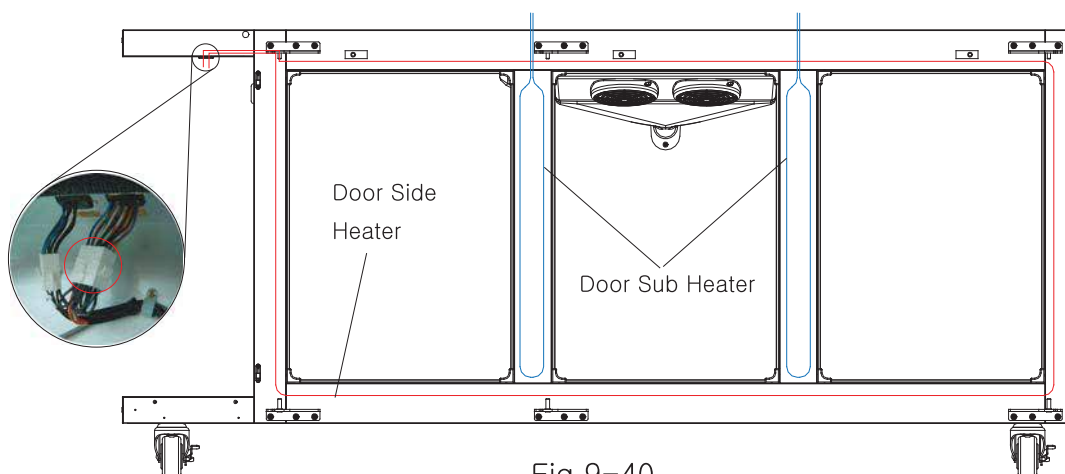
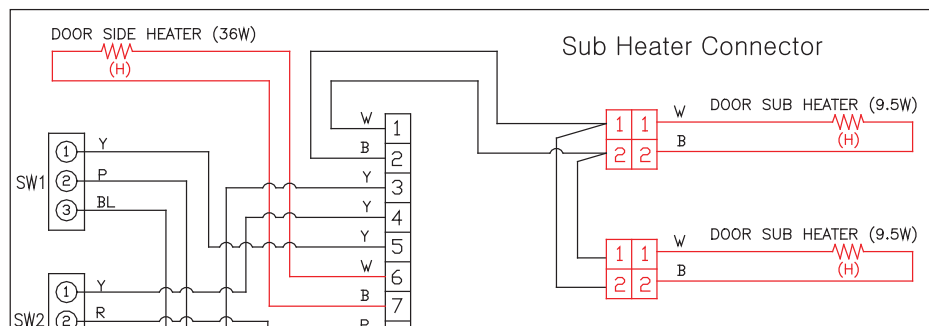


Fig 9-40



DETAIL DIAGRAM  
( Model: ETR3 )



## 9.SERVICE INSTRUCTIONS

### 9.6 Door

#### 9.6.1 How to Remove Door Assembly

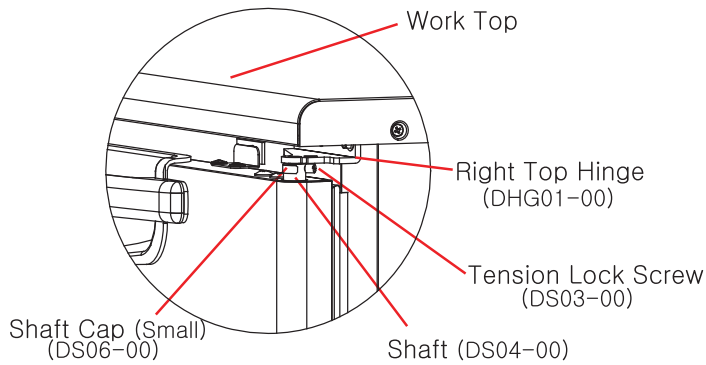


Fig 9-41

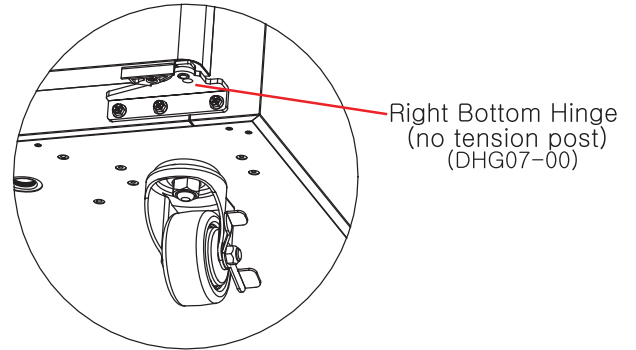


Fig 9-42

To replace the door, remove the tension between the shaft and spring.  
Refer to figure 9-41.

Preparation : (1) Small size screwdriver, (2) small steel stick

**WARNING** : Take extra precaution when handling the spring tension.  
Make sure to follow procedure.

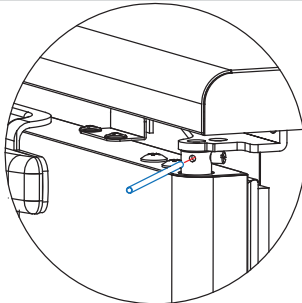


Fig 9-43

1. Insert the steel stick between the shaft holes. (Fig 9-43)

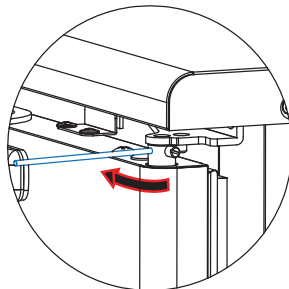


Fig 9-44

2. To remove the tension pin, slightly turn the stick along the direction of the arrow. Maintain the position of the stick by resisting the spring tension. (Fig 9-44)



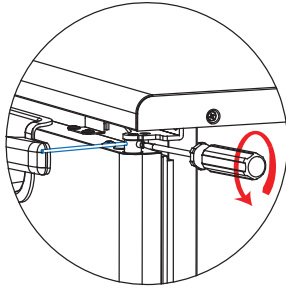


Fig 9-41

3. Turn and detach the tension pin by using the a (-) screwdriver. Avoid dropping or losing the pin. (Fig 9-41)

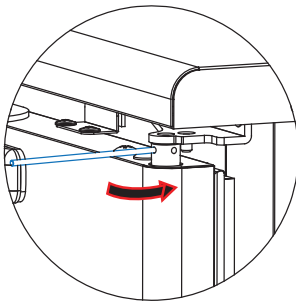


Fig 9-42

4. Take the steel stick and slowly loosen it toward the direction of the arrow. If tension is completely released before the stick touches the body, remove the stick from the shaft and go to the next step. (Fig 9-42)

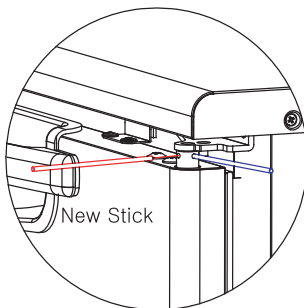


Fig 9-43

5. If tension is still present even after completing steps 1 through 4, repeat the procedure by using the steel stick. (Fig 9-43)

6. Remove the top pan and the shaft cap. For instructions on how to remove the top pan, refer to 9.5.



## 9.SERVICE INSTRUCTIONS

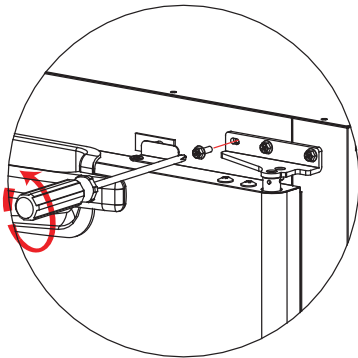


Fig 9-44

7. While supporting the door so it does not detach, unscrew the three bolts that hold the upper hinge in place. (Fig 8-43)

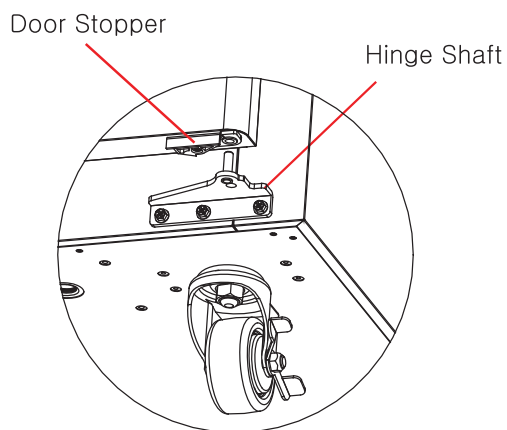


Fig 9-45

8. While lifting the door up, completely detach the door from the lower hinge shaft. (Fig 8-45)

9. Attach the new door or proceed to the next step.



### 9.6.2 Door Tension Adjustment

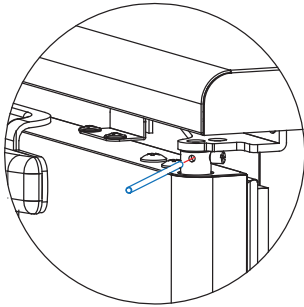


Fig 9-46

1. Remove Front Cover Grill and Shaft Cap. Insert one steel stick into the shaft hole. (Fig 9-46)

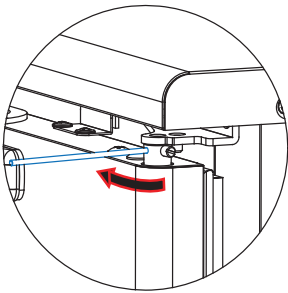


Fig 9-47

2. To remove the tension pin, slightly turn the stick in the direction of the arrow. Maintain the position of the steel stick by resisting the spring tension. (Fig 9-47)

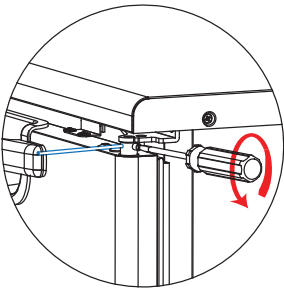


Fig 9-48

3. Turn and detach the tension pin by using a (-) screwdriver. Avoid dropping or losing the pin. (Fig 9-48)

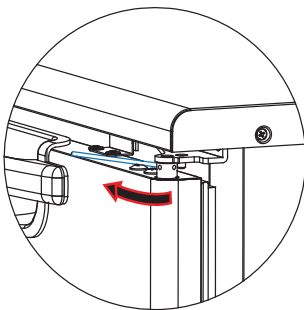


Fig 9-49

4. Turn the stick in the direction of the arrow until the next hole is visible. Avoid dropping or losing the pin. (Fig 9-49)



### 9.6.2 Door Tension Adjustment

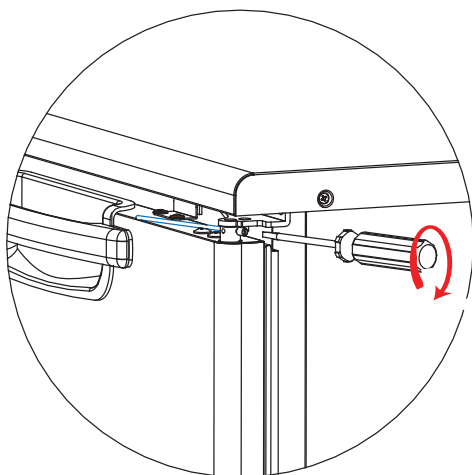


Fig 9-50

5. Turn and drive the tension pin into the next step hole. (Fig 9-50)
6. Adjust the tension of the lower shaft.

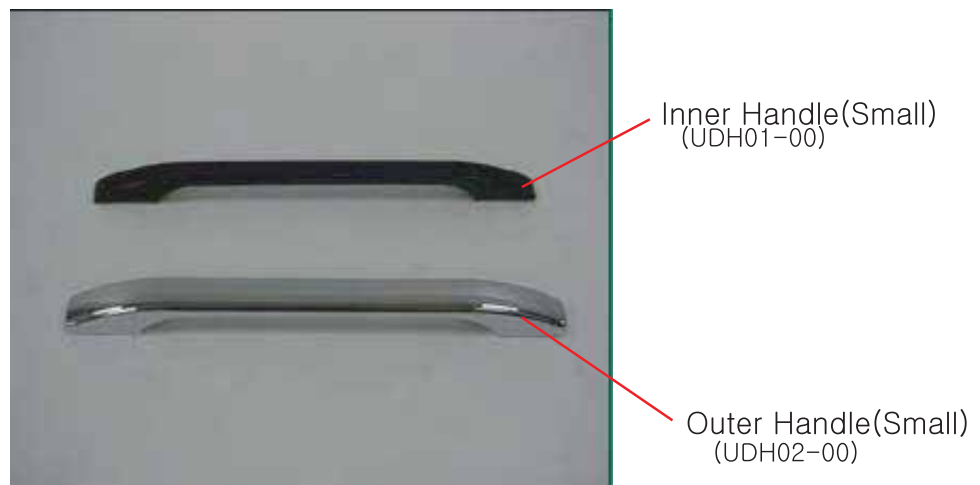


## 9.SERVICE INSTRUCTIONS

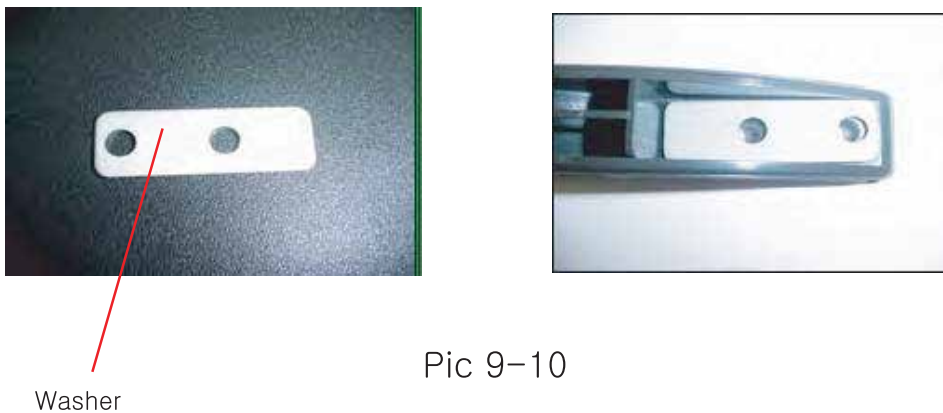
### 9.6.3 Door Handle (Protruding Type)

1. Pop out the outer handle.
2. Remove four (4) screws from the inner handle.  
(Two (2) screws each for top and bottom)

CAUTION : Be sure to use a door handle washer. (Pic 9-9)



Pic 9-9



Pic 9-10



## 9.SERVICE INSTRUCTIONS

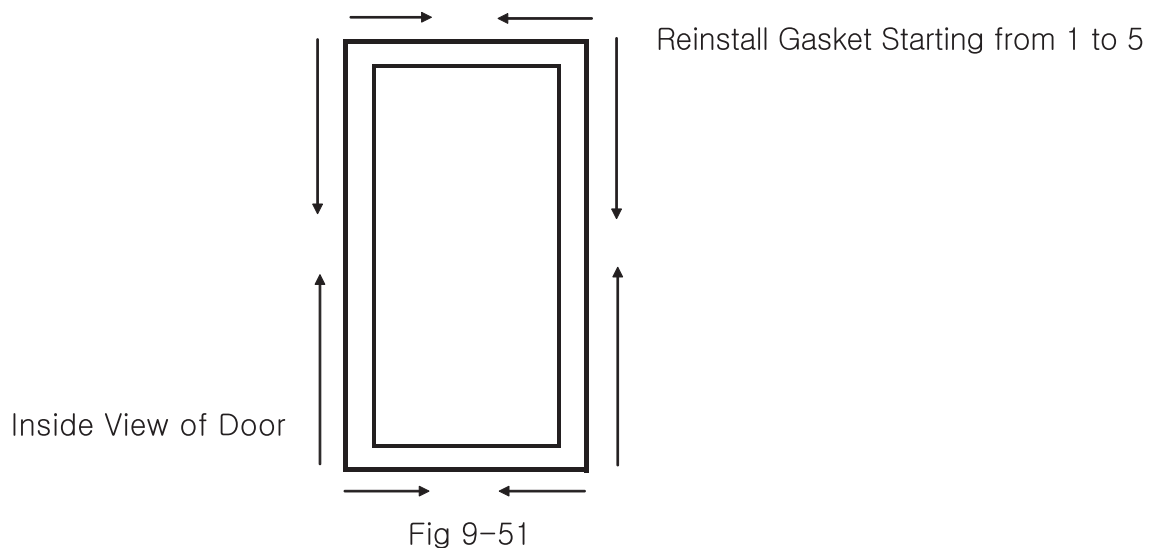
### 9.6.4 Door Gasket

1. Keep the door open.
2. Firmly grasp the door gasket on the top corners with both hands.
3. Slowly pull the gasket out of the slotted groove. Continue until the gasket is removed. (Pic 9-11)
4. To install the replacement door gasket, start snapping it into the groove at the top of the door. Begin at the two corners and move evenly from each side towards the middle as shown below. (Fig 8-51)
5. Work the gasket evenly down both sides and then across the bottom, (Fig 8-51)

CAUTION : Do not stretch or bend the door gasket.



Pic 9-11





# 10.DIAGNOSTIC

## 10.1 SERVICE DIAGNOSTIC CHART

Symptom	Possible Cause	Corrective Action	References
Unit Does not run	Main power button on control box is OFF.	Press and hold "POWER ON/OFF" button on the control box.	7.3
	Voltage is too low.	Correct the electrical service so it does not vary more than +/- 10%.	
	Electronic Controller is defective.	Replace the Electronic Controller	8.1.3
	Compressor is defective.	Replace the compressor.	8.2.2
	Relay and/or capacitor is defective.	Replace the relay and/or capacitor.	
	Delay time.	It takes about one (1) minute to run the unit after plug-in.	7.9
Cabinet does not maintain proper temperature	High pressure in refrigeration system		
	- Condenser coil is too dirty.	Clean the condenser coil.	3.2
	- Refrigerant was overcharged.	Evacuate and recharge the system with proper amount of refrigerant.	
	- Condenser fan motor does not run.	Check motor electrically, replace if defective.	8.2.5
	- Evaporator fan motor does not run.	Check motor electrically, replace if defective.	8.2.6
	- Capillary tube is clogged.	Evacuate and recharge the system	
	- Clearance around the unit is insufficient.	Reinstall the unit.	4
	- Condenser air is recirculating or ambient temperature is above specification.	Reinstall the unit.	4
	System is on "Defrost Cycle".	During the defrost cycle, compressor and fan motor of the evaporator & condensing do not run. The cycle is terminated by both temp (16°C) and time(within 20 minutes). Factory defrost setting is 4 times a day for both freezers and refrigerators.	7.9



# 10.DIAGNOSTIC

## 10.1 SERVICE DIAGNOSTIC CHART

Cabinet does not maintain proper temperature          (Freezers only)	Refrigerant charge is low.	Find and repair any refrigeration leak, replace the filter drier, evacuate and recharge the system.	
	Temp. control system problems.		
	– Temperature setting is incorrect.	Reset the desired temperature.	7
	– Control is defective.	Replace the circuit board(s).	8.1.3
	Condenser coil is too dirty.	Clean the condenser coil. (Factory recommends condenser cleaning once a month)	3.2
	Frozen evaporator coil.		
	– Air flow is restricted.	Arrange product for proper interior airflow, check the evaporator coil for debris.	8.4
	– Pressure(Vacuum) relief control is open.	Check for leaks, repair or replace if necessary.	
	– Defrost heater is defective.	Replace the defrost heater.	8.2.7
	– Drain pan heater is defective.	Replace the evaporator drain cover.	8.4.1
	– Insufficient number of defrost setting.	Defrost the evaporator coil first, then reset sufficient number of defrost cycle.	
	– Door is open or gasket is not sealing properly.	Close door propely, adjust tension and/or replace gasket if necessary.	8.7
	– Light switch is not properly pressed	Adjust location of light switch bracket.	
	– Light switch is defective.	Check electrically and replace the door switch if defective.	8.3.3
Compressor does not operate	Wiring problem.	Check for and correct any incorrect connections. Check for any loose or bad connections to the control box.	8.1.1
	Relay is defective.	Check the start relay, replace if necessary.	8.2.2
	Capacitor is defective.	Check the start relay, replace if necessrry.	8.2.2



## 10.DIAGNOSTIC

### 10.1 SERVICE DIAGNOSTIC CHART

Door(s) difficult to open.	Pressure(vacuum) relief control is not functioning.	Check the component, replace if defective.	
	Wrong installation.	Check casters and floor to see if the unit is properly leveled.	4
Water is leaking	In the Cabinet.		
	– Drainage tube is not inserted.	Open the evaporator drain cover and check the drainage tube.	8.4
	– Evaporator drain cover is broken.	Check if there is any crack, replace if damaged.	8.4
	Out of the Cabinet.		
	– Condensate pan heater located at bottom of unit is defective.	Check electrically first, and replace the wire type condensate pan heater if defective.	8.5
Noise	In the cabinet.		
	– Evaporator motor fan damaged due to ice built on evaporator coil.	Check the defrost heater or control box to see if they are energizing. Replace defrost heater or Electronic Controller if defective.	8.2.7
	Out of Cabinet.		
	– Condensing motor fan blades are broken.	Replace the fan blades.	8.2.5
	– Condensing motor is defective.	Check motor, replace if necessary.	8.2.5