

Date	12-01-15
Rev No	0
DOC NO	RBC/SM/12-01-16



# COMMERCIAL REFRIGERATOR

## HRW 77 & 147

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## Safety instructions:

The following instructions contain important safety precautions and should be strictly observed

**WARNING:** There is a possibility of death or serious injury to the service person and a third party or the user due to improper service operations or defects in serviced products.

**CAUTION:** there is a possibility of injury to the service person and a third party or the user or damage their property due to improper service operations or defects in serviced products.

**WARNING:**

- Always ask the user to keep children away from the work area. They may be injured by tools or disassembled products.
- when there is no need to energize the unit during disassembly or cleaning be sure to unplug the unit or disconnect the main power supply before servicing the unit to prevent electric shocks
- If the unit must be energized for inspection of the electric circuit, use rubber gloves to avoid contact with any live parts resulting in electric shocks.
- Keep the following in mind when servicing the refrigeration circuit.

1) Be sure to recover the refrigerant, Do not discharge it into the atmosphere. It will affect the environment.

2) Check for any flames in the vicinity, and ensure good ventilation.

3) If the refrigerant should leak in servicing, immediately put out any fire used in the vicinity.

4) When unbrazing the refrigeration circuit connections, check that the circuit is completely evacuated. The refrigerant may produce a poisonous gas when coming in contact with an open flame.

5) Do not braze in an enclosed room to prevent carbon monoxide poisoning .

6) In case of a refrigerant leak, locate and repair the leaking part completely before recharging the refrigerant and checking for further leaks. If the leaking part cannot be

located, be sure to check again for further leaks after recharging the refrigerant. Leaked refrigerant may produce a poisonous gas when coming in contact with an open flame of a gas cooking stove or a fan heater.

7) Before servicing, check the surface temperature of the refrigeration circuit to prevent a burn.

➤ Keep the following in mind when making electrical connections.

1) Check for proper earth connections, and repair if necessary to prevent electric shocks.

2) Always use service parts intended for the applicable models for replacement of defective parts. Use proper tools to secure the wiring. Otherwise abnormal operation or trouble may occur and cause electric shocks.

3) Check for proper part installations, wiring condition and soldered or solderless terminal connections to avoid fire, heat or electric shocks.

4) Be sure to replace damaged or deteriorated power cords and lead wires to prevent fire, heat or electric shocks.

5) Cut-off lead wires must be bound using closed end connectors or the like, with their closed ends up to avoid entrance of moisture that could lead to electric leaks or fire.

6) After servicing, always use a megohmmeter (500V DC) to check for insulation resistance of at least 1 megohm between the live part and dead metal part.

7) Do not service the electrical parts with wet hands to prevent electric shocks.

8) The capacitors used for the compressor and the other components may be under high voltage and should be discharged properly before servicing.

## **CAUTION**

➤ After servicing, follow the instructions below:

1) Always check the unit for proper operation before finishing services.

2) Be sure to reassemble the parts completely. Loose assembly of such parts as control box cover may cause entrance of vermin's resulting in a short circuit between terminals and possible ignition.

## Product Intended Use :

### HRW Series

These products are solid door commercial refrigerator used to store/preserve Refrigerated food products. This is mainly used in commercial establishment.

It operates at 230V/50Hz power input.

HRW-77 is two door models and HRW-147 is four door model. Both uses electronic temperature controller, R134A as refrigerant, CFC free insulation and are classified climatic class T (5) i.e. Ambient 40°C and 40% RH

### Nomenclature

H – Hoshizaki

R – Refrigerator

W– Made by Western Refrigeration

7/14 – width in cm (70 / 140)

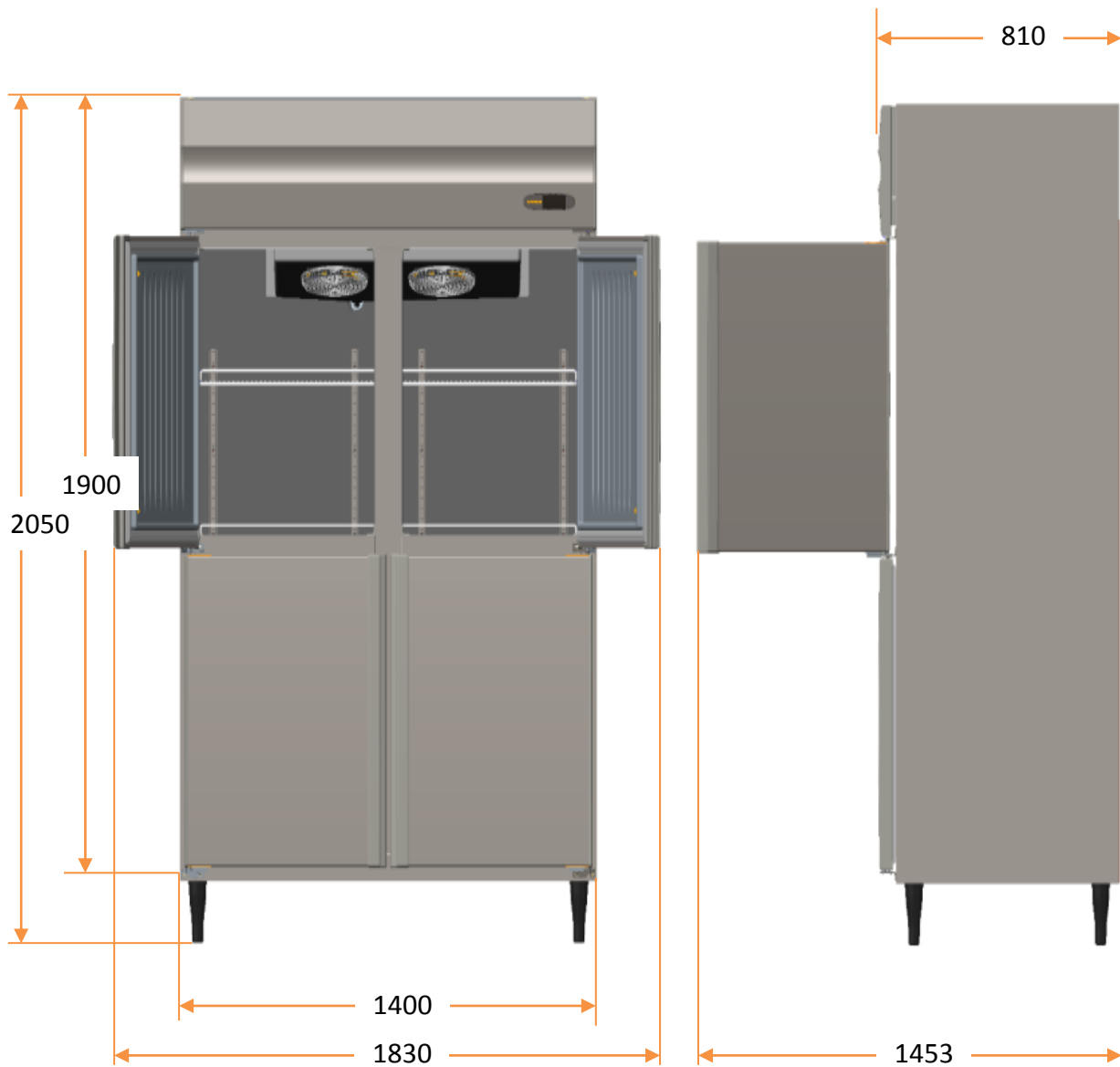
7– Depth (0: 85cm / 7: 800cm)

## DIMENSIONAL LAYOUT: 2 DOOR REFRIGERATOR:



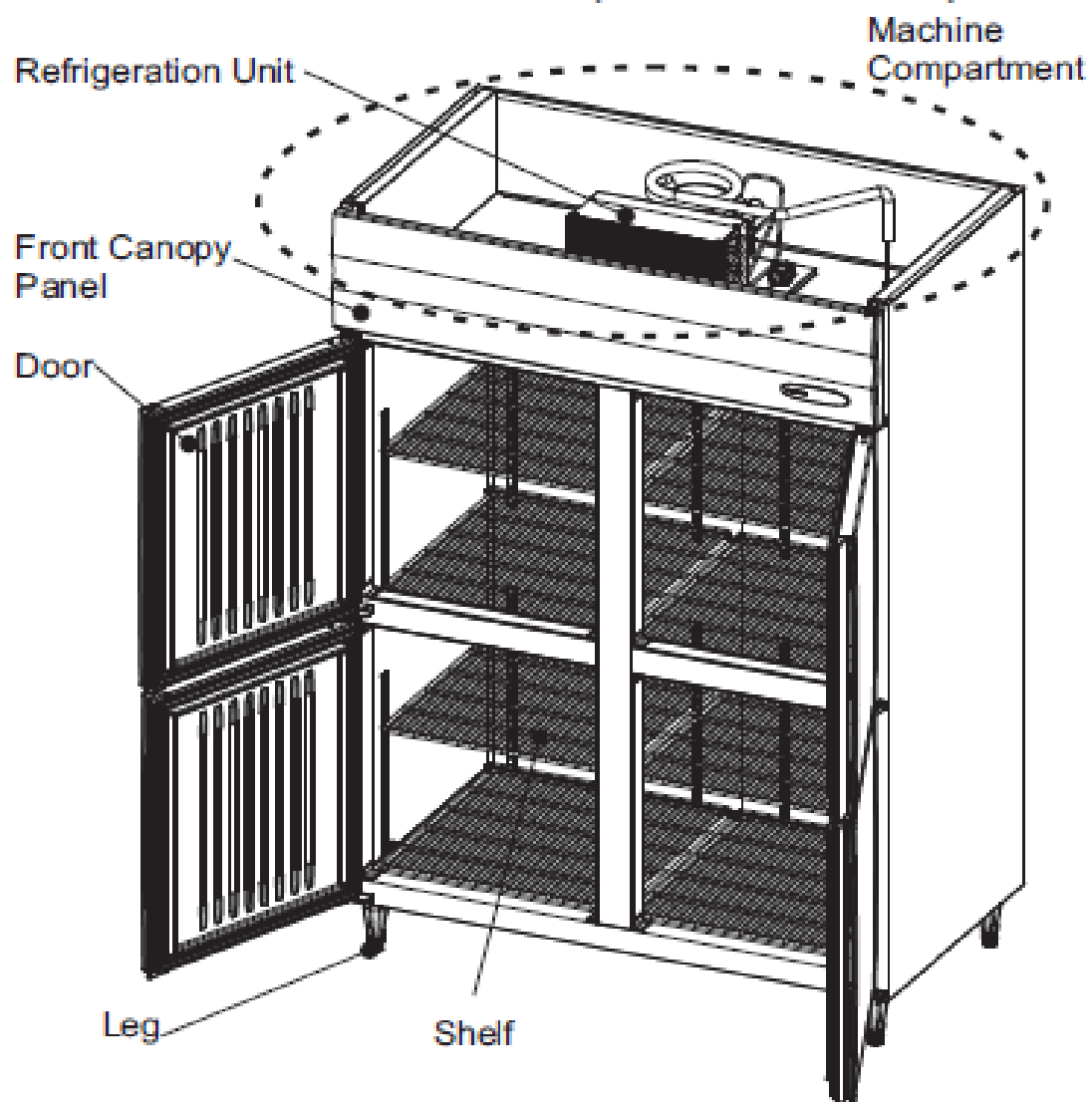
Product Footprint: 0.57 sq. m

## DIMENSIONAL LAYOUT: 4 DOOR REFRIGERATOR:



Product Footprint: 1.13 sq. m

## EXPLODED VIEW:



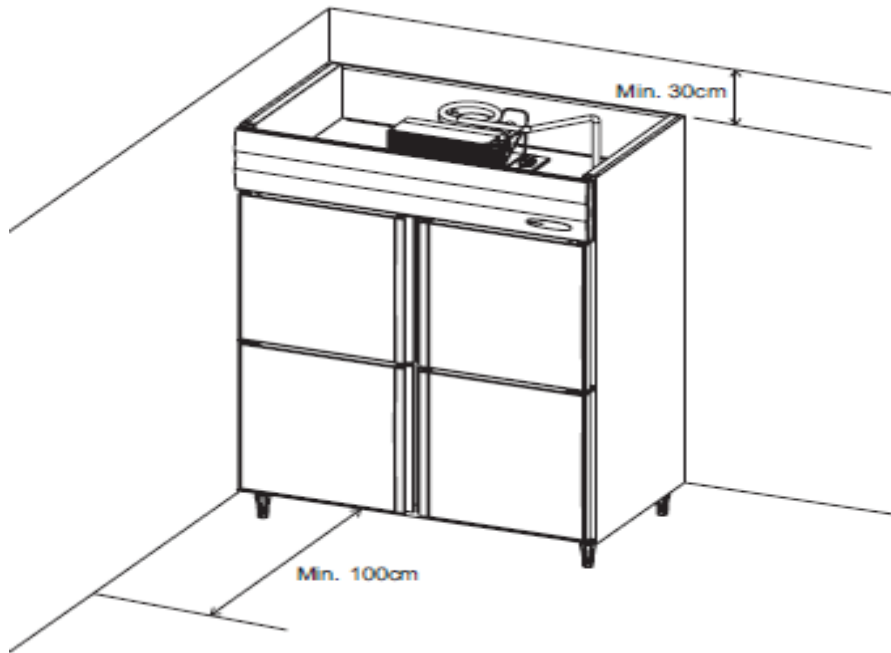


## INSTALLATION REQUIREMENTS:

### LOCATION:

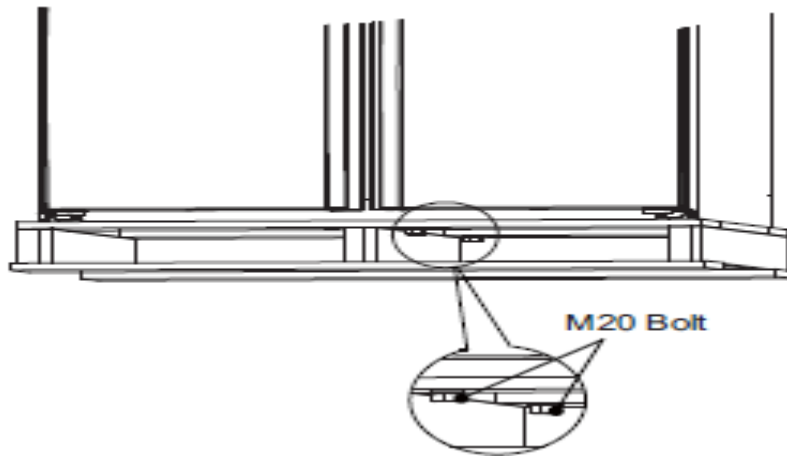
For best operating results,

- 1) The refrigerator should not be located next to ovens, grills and other high heat producing equipments.
- 2) The location should provide a firm foundation for the equipments.
- 3) Avoid a site where dripping is not allowed. Especially a side by side , back to back installation.
- 4) Do not expose the unit to direct sun light or higher temperatures.
- 5) Allow 100 cm clearance at front of the unit for smooth operation. Also allow 30 cm clearance from the ceiling to the top of the unit.



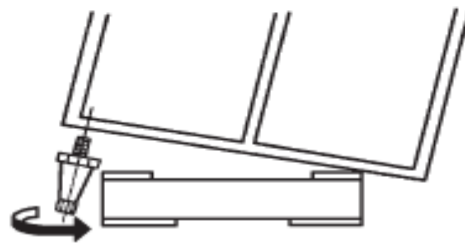
### SET UP:

- 1) Cut the vinyl shipping tape and remove the carton
- 2) Take out the accessory shelves, shelf clips and legs. Attach the four shelf clips horizontally to the shelf posts. Place the shelf's on the shelf clips.
- 3) Remove the two bolts on the bottom of the unit.

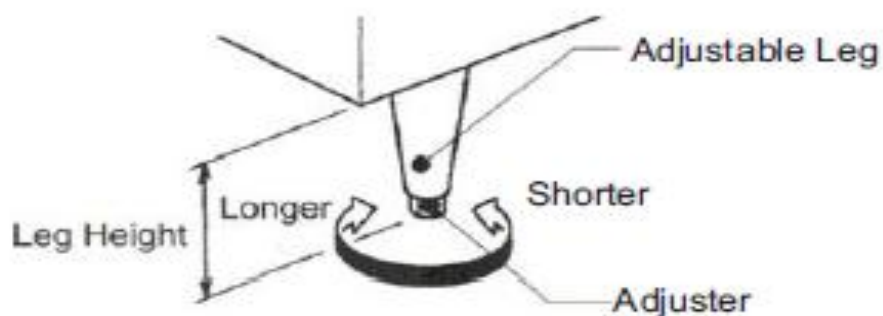


- 4) Turn the unit 90 degrees on the pallet, tilt the unit sideways, and screw in the two adjustable legs.

**Note:** Keep the adjusters 2 cm longer to make it easy to pull out the pallet.



- 5) Tilt the unit in opposite direction and screw the other two legs.
- 6) Slide out the pallet form the unit.
- 7) Level the freezer in both left and right, front and rear sides.



## TECHNICAL SPECIFICATIONS: HRW-77

Sl. No.	PARAMETERS	DETAILS
1	Model name	HRW-77MS4
2	Gross volume	628 Liters
3	Net volume	593 Liters
4	Temperature setting range	-2°C to 12°C
5	No load @ ambient condition	41 mins @ 40.6°C ambient and 75% RH (D condition)
6	External dimensions (mm)	700 (W) x 810 (D) x 2050 (H - with 150mm leg)
7	Internal dimensions (mm)	596 (W) x 700 (D) x 1505 (H)
8	Footprint (floor space) (sq. m)	0.57 sq. m
9	Outer cabinet material	SS 430 2B hair line No. 4 finished
10	Inner cabinet material	SS 430 2B mirror finished
11	Net weight	107 Kg
12	Insulating material / thickness	PUF (CFC free) / 50mm
13	Shelves external dimension (mm) / quantity	570 (W) x 625 (D) / 4 nos
14	Door type / Door frame / type of section / number of doors	Solid swing door/ SS 430 2B hair line No. 4 finished / integrated handle / 2 number
15	Door external dimension (mm)	676.5 (W) x 760 (H)
16	Type of wheels / legs / qty. / leveling bolt	4 nos of adjustable legs or 4 nos of caster wheels
17	Power source (primary)	Electric / 230V AC / 50 Hz

18	Filter drier type / make / model	Solid core / Danfoss / 023Z8128 (DCL032S x 2/3mm)
19	Capillary bore / length / number / heat exchange	0.050" / 5000mm / 1 no / 2000mm
20	Refrigerant number / mass	R134A / 300 gram
21	Maximum current / power @ ambient condition Rated current / power @ ambient condition	4 Amps / 432 W @ 40.6°C ambient and 75% RH (D condition) 1.75 Amps / 370 W @ 40.6°C ambient and 75% RH (D condition)
22	Stabilizer rating (recommended)	0.85 KVA, In put = 110 to 280V AC, Out put = 190 to 250V AC

## TECHNICAL SPECIFICATIONS: HRW-147

Sl. No.	PARAMETERS	DETAILS
1	Model name	HRW-147MS4
2	Gross volume	1365 Liters
3	Net volume	1288 Liters
4	Temperature setting range	-2°C to 12°C
5	No load @ ambient condition	41mins @ 40.6°C ambient and 75% RH (D condition)
6	External dimensions (mm)	1400 (W) x 810 (D) x x 2050 (H - with 150mm leg)
7	Internal dimensions (mm)	1296 (W) x 700 (D) x 1505 (H)
8	Footprint (floor space) (sq. m)	1.13 sq. m
9	Outer cabinet material	SS 430 2B hair line No. 4 finished
10	Inner cabinet material	SS 430 2B mirror finished

11	Net weight	170 Kg
12	Insulating material / thickness	PUF (CFC free) / 50mm
13	Shelves external dimension (mm) / quantity	630 (W) x 625 (D) / 8 nos
14	Door type / Door frame / type of section / number of doors	Solid swing door/ SS 430 2B hair line No. 4 finished / integrated handle / 4 number
15	Door external dimension (mm)	676.5 (W) x 760 (H)
16	Type of wheels / legs / qty. / leveling bolt	4 nos of adjustable legs or 6 nos of caster wheels
17	Power source (primary)	Electric / 230V AC / 50 Hz
18	Compressor make / model	Danfoss / SC18CLX.2 - 104L2197
19	Overload protector location / model	Internal/ Not applicable
20	Capillary bore / length / number / heat exchange	0.070" / 4500mm / 1 no / 3000mm
21	Refrigerant number / mass	R404A / 790 gram
22	Temperature controller type / make / model / setting (set point)	Electronic / Carel / PJEZCOP000 / SP: - 20°C
23	Door switch	No
24	Power cord rating / length	16 Amps / 3 meter
25	Maximum current / power @ ambient condition Rated current / power @ ambient condition	3.9 Amps / 867 W @ 40.6°C ambient and 75% RH (D condition) 3.3 Amps / 710 W @ 40.6°C ambient and 75% RH (D condition)

## PROEDURE TO OPEN THE CANOPY:

### STEP 1



### STEP 2



### STEP 3

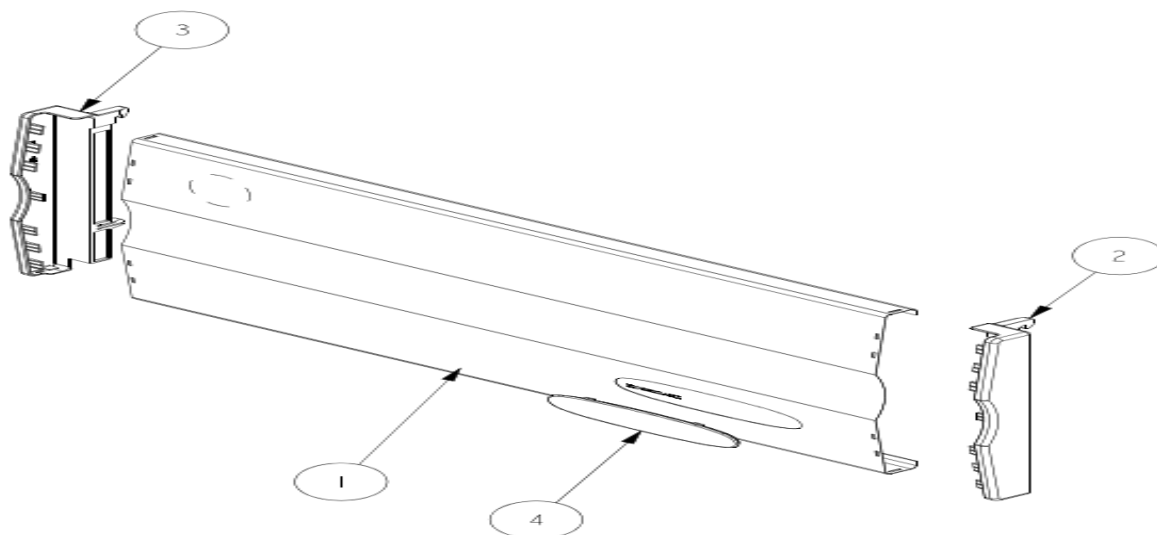


Step 1: Catch the canopy on both sides at the bottom

Step 2: After that pull canopy on your side, the locks will release at bottom as shown in figure

Step 3: Then remove the canopy by lifting it up as shown in figure

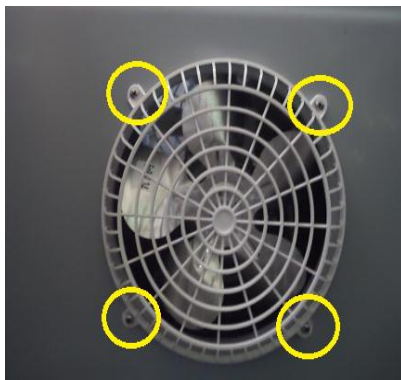
After removing the canopy we can get the access to machine room for service.



INDEX NO.	SAP CODE	DESCRIPTION	QTY
1	1107302	CANOPY PANEL 2D	1
2	1508142	CORNER FRONT PANEL R	1

3	1508143	CORNER FRONT PANEL L	1
4	1508081	WINDOW PANEL	1

## PROCEDURE TO REPLACE EVAPORATOR FAN MOTOR:



Unscrew the four screws T4 X 12 (4nos) fitted to fan guard

### STEP 2

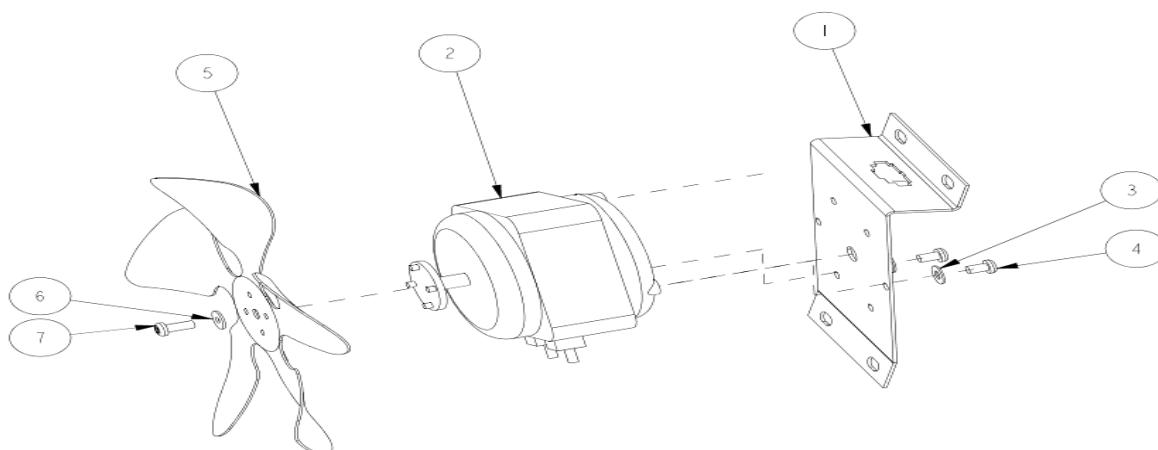


Unscrew the impeller(5x8,V 34) motor screw and take out with washer

### STEP 3



Unscrew the four screws N4 X 8 (4 nos) fitted to the motor bracket, then remove the motor from the bracket

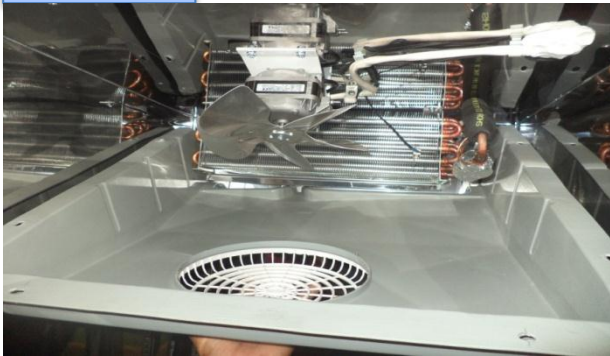


INDEX NO.	SAP CODE	DESCRIPTION	QTY
1	1107300	EVAP FAN MOTOR BRACKET	1
2	1503912	MOTOR 10W – ELCO(NET4T10ZVN022)	1
3	1502215	WASHER W6 SUS	3
4	1502114	SCREW + N4 X 8 SUS	3
5	1500876	IMPELLER 5 X 8 " V34 DEG	1
6	SUPPLIED WITH MOTOR	MOTOR WASHER	1
7	SUPPLIED WITH MOTOR	MOTOR SCREW	1



# PROCEDURE TO REPLACE THE DEFROST SENSOR

## STEP 1



Step 1: open the dew collector assembly as explained previously

## STEP 3



Step 3: After opening the dew collector we can find a sensor fitted in between the evaporator fins as shown in figure.  
Step 4: Remove the sensor from the evaporator fins and replace with new one.  
Step 5: After replacing with new sensor reassemble the parts as viceversa.

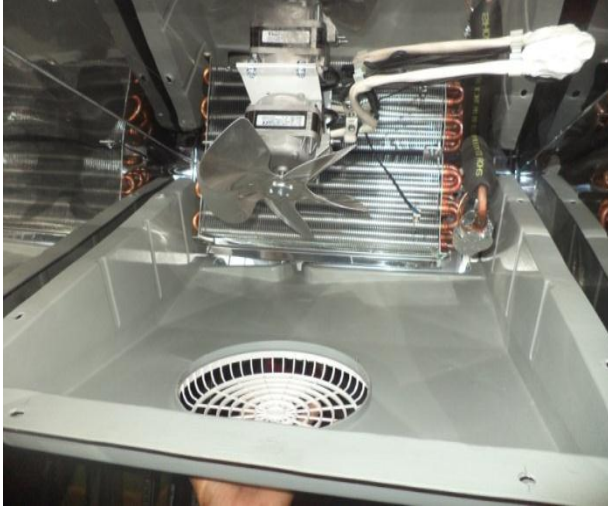
## STEP 2



Step 2: unplug the sensor connector from the power box

# PROCEDURE TO REPLACE APPLICATION SENSOR

## STEP 1



Step 1: open the dew collector assembly as explained previously

## STEP 3



Step 3: after opening the dew collector we can find a sensor fitted to bracket as shown in figure.

Step 4: remove the sensor bracket by unscrewing three screws and replace the new one.

Step 5: after replacing with new sensor reassemble the parts as vice versa.

## STEP 2



Step 2: unplug the sensor connector from the power box

## PROCEDURE TO REPLACE CONDENSER FAN MOTOR:

### STEP 1



Step 1: Remove the **condenser motor bracket** from the unit frame by unscrewing the four screws M5 X 12.

### STEP 2



Step 2: After removing the bracket, unscrew the three screws N3 X 30 SUS fitted with the motor

**Motor Specification:**  
**MOTOR 10W - ELCO**  
**(NET4T10ZVN022)**

### STEP 3



Step 3: unplug the connector from the power box, remove the impeller(5x10" V 28) connected to the motor by unscrewing the motor screw as shown in figure.



Step 4: After removing the fan motor change with new one and reassemble the parts as per the sequence.

## HOW TO ENTER INTO THE CONTROLLER PERAMETERS:

- 1) Open front panel
- 2) Press the set key for 3 seconds. The screen displays the PS menu. Press the set button again, the screen displays zero, use up and down key to input the password 22. Press the set key to confirm the password input. Then the screen shows PS if the password is correct.
- 3) Temperature Setting: Press the set key for 1 sec the screen displays the Set and set temperature will flash. Press up and down key to set the temperature. Then press the set key to accept the new cabinet temperature setting.

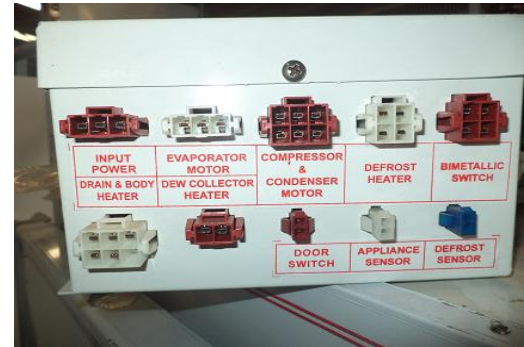
## PROCEDURE TO REPLACE CAREL CONTROLLER:

### STEP 1



Remove the power box assembly by unscrewing the two screws placed on either side to the **leg control box**.

### STEP 2



Then unplug all the connectors connected to power box assembly. Now the power box is free from unit assembly.

### STEP 3

Unscrew the three screws M4 X 8 fitted to the **control box cover** as shown in figure





#### STEP 4



After the removal of top cover CAREL CONTROLER is visible as shown in figure.

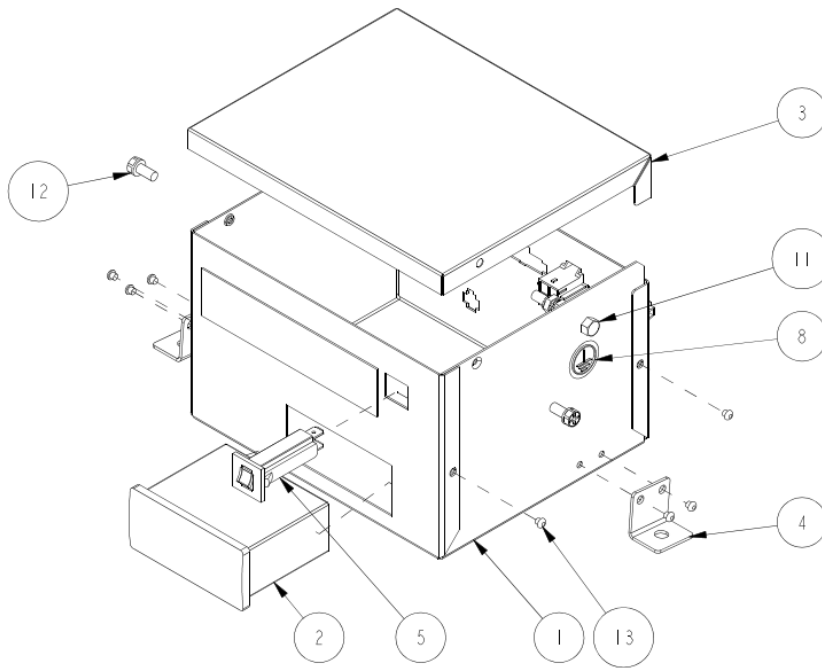
#### STEP 5



Now remove the side brackets connected either sides as shown in figure.

Now the CAREL CONTROLER can be removed from the power box  
Replace it with new one and adopt the procedure vice versa to reassemble the power box

## POWER BOX ASSY HRW-77:



INDEX NO.	SAP CODE	DESCRIPTION	QTY
1	1107291	CONTROL BOX BASE	1
2	1505267	PJEZSOG000 CONTROLLER PJEZ230VAC 8A NTC	1
3	1107293	CONTROL BOX COVER	1
4	1107867	LEG CONTROL BOX	2
5	1507818	TYCO 10A CIRCUIT BREAKER W28-XQ1A	1
6	1508661	LABEL SUS SENSOR 0505080	1
7	1508549	SUS CONTROL BOX CAUTION STICKER 505037	1
8	1400673	CAUTION STICKER EARTHING - 0502251_B	1
9	1400674	CAUTION STICKER HIGH VOLTAGE	1
10	1507716	HARN POWER BOX HRW77 0600573	1
11	1502067	BOLT EARTHING M4X25-BRASS	1
12	1508312	SCREW TAPTITE M4X8 - 445994-05	3
13	1507963	POP RIVIT SS-304 1/8" X 5/16"	8
14	1508662	LABLE SUS CONNECTOR 0505079	1
15	1508666	HARNESS POWER BOX SENSOR 2D/4D 600646	1
16	1502208	STAR WASHER M4	7
17	1502088	NUT M4 EARTHING - BRASS	5

## PROCEDURE TO REPLACE DOOR GASKET:



Remove the old gasket by pulling it from any of the four corner

After that fix the gasket into the groove from any one of the four corners and then simply press looking that the gasket is fixed into the groove throughout the door



## PROCEDURE TO REPLACE DOOR ASSEMBLY:

**STEP 2**



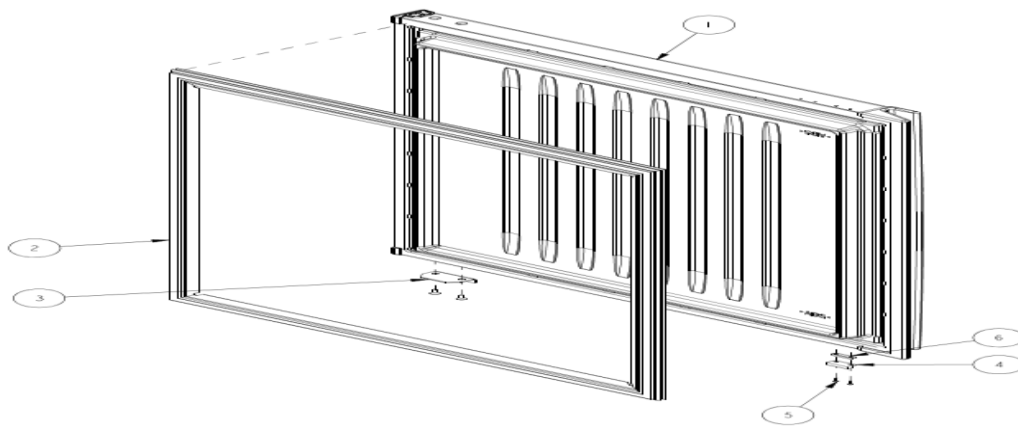
**STEP 3**



Step 1: Remove the top door hinge by unscrewing the two screws fixed to the cabinet

Step 2: Remove the top door by pulling it upwards as shown in figure. Remove the middle hinge by unscrewing the two screws fixed to the cabinet now you can remove the bottom door by pulling it upwards.

Step 3: Replace the new doors accordingly and assemble them by adopting the procedure reverse side.



INDEX NO.	SAP CODE	DESCRIPTION	QTY
1	1107858	HRW/HFW FOAMED DOOR ASSEMBLY RT	1
2	1508318	SUS DOOR GASKET 705 X 616	1
3	1508121	SUS DOOR STOPPER	1
4	-	DOOR MAGNET	1
5	1503231	M5 X 12 SCREW COUNTER SHANK	2
6	1505675	SPACER FOR MAGNET SWITCH	1

There is access provided in this model, depending upon the customer requirement we can change the door opening direction. For that there is a provision on cabinet body as shown in figure.



# CAREL CONTROLLER PROGRAM:

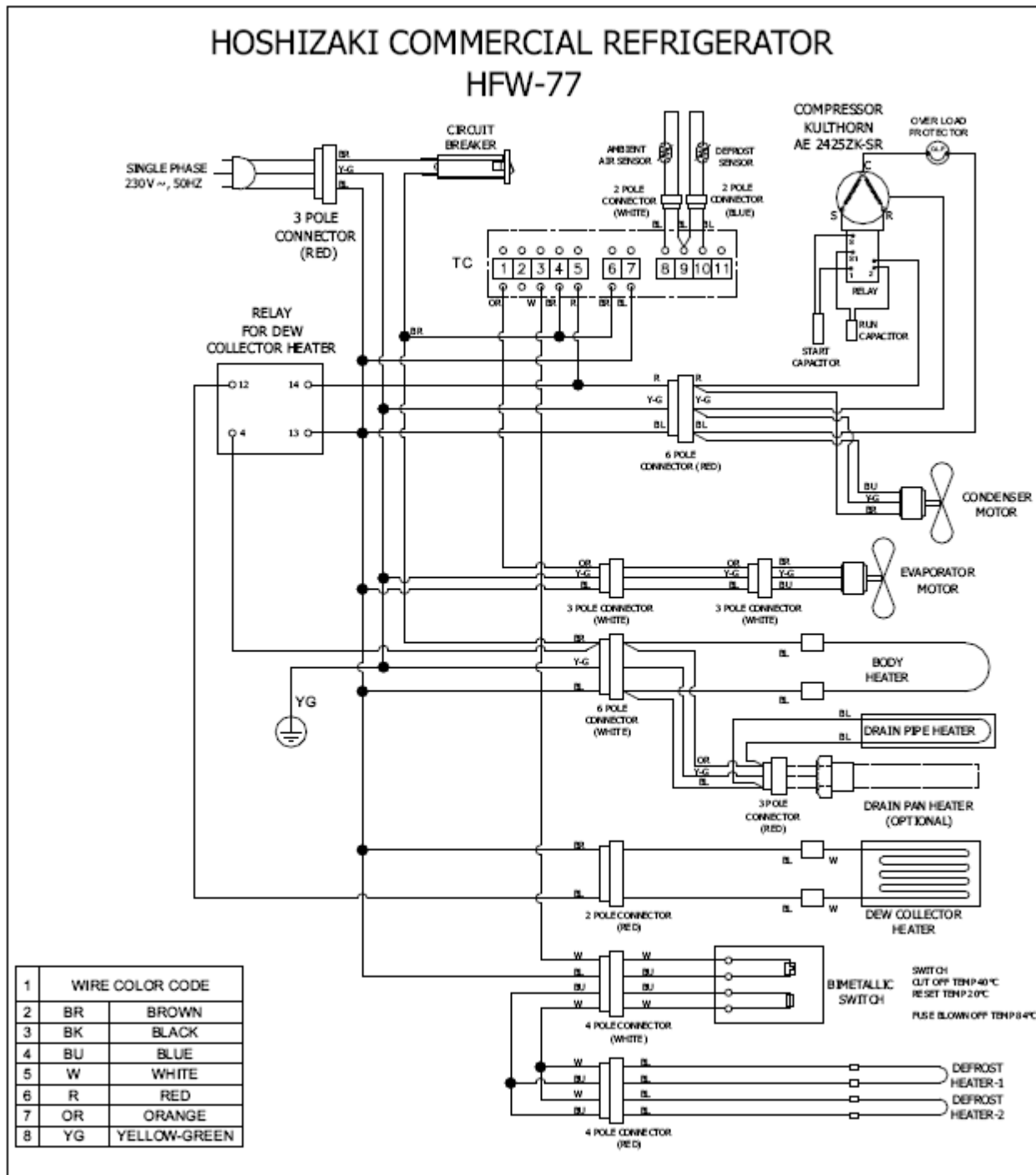
CAREL PJEZS0G000 ELECTRONIC TEMPERATURE CONTROLLER PARAMETER SETTINGS FOR HRW MODELS								Revision	0
								Date	25-09-14
Sr. No.	Display on controller	Parameters	VIS	Min.	Max.	UOM	Factory setting	HRW-77MS4	HRW-147MS4
1	PS	PASSWORD	F	0	200	..	22	22	22
2	St	Control temperature	F	r1	r2	°C/°F	4.0	2.0	2.0
PROBE PARAMETER									
1	/2	Mesurment stability	C	1	15	-	4	4	4
2	/4	Select Probe / input displayed (*)	F	1	3	-	1	1	1
3	/5	Select °C / °F (0=°C, 1=°F)	C	0	1	-	0	0	0
4	/6	Disable decimal point	C	0	1	-	0	1	1
5	/C1	Preobe calibration	F	-12.7	12.7	°C/°F	0.0	0.0	0.0
6	/C2	Preobe calibration	F	-12.7	12.7	°C/°F	0.0	0.0	0.0
7	/C3	Preobe calibration	F	-12.7	12.7	°C/°F	0.0	0.0	0.0
CONTROL PARAMETERS									
1	rd	Contole differential (hysteresis)	F	0.0	19.0	°C/°F	2.0	1.5	1.5
2	r1	Minimum set point allowed to user	C	-50.0	r2	°C/°F	-50.0	-2.0	-2.0
3	r2	Maximum set point allowed to user	C	r1	150	°C/°F	90.0	12.0	12.0
4	r3	Operation mode (0=direct+defrost; 1=direct; 2=reverse)	C	0	2	-	0.0	0	0
5	r4	Automatic night-time set point variation	C	-50.0	50.0	°C/°F	3.0	0.0	0.0
COMPRESSOR PARAMETERS									
1	c0	Comp. and fan start delay after start-up	C	0	100	min	0	3	3
2	c1	Min. time between successive comp. start	C	0	100	min	0	3	3
3	c2	Min. compressor off time	C	0	100	min	0	3	3
4	c3	Min. compressor on time	C	0	100	min	0	0	0
5	c4	r4 safty (duty setting)	C	0	100	min	0	30	30
6	cc	compressor cycle duration	C	0	15	h	4.0	0	0
7	c6	Alarm by pass time after cont. cycle	C	0	15	h	2.0	0	0
DEFROST PARAMETERS									
1	d0	Type of defrost (0=heater; 1=hot gas; 2=heater by time; 3=hot gas by time; 4=heater by time with temp. cont.)	C	0	4	-	0	0.0	0.0
2	dI	Interval between two defrost	F	0	199	h/min	8	4	4
3	dt	End defrost temperature	F	-50.0	127.0	°C/°F	4.0	4.0	4.0
4	dP	Max of effective defrost duration	F	1	199	min/s	30.0	60.0	60.0
5	d4	Defrost when the instrument switch on (1=activated)	C	0	1	-	0	1	1
6	d5	Defrost delay on start-up or from digital input	C	0	199	min	0	0	0
7	d6	Disable temperature display during defrost (1=display disabled)	C	0	1	-	1	1	1
8	dd	Dripping time after defrost	F	0	15	min	2	5	5
9	d8	Alarm bypass time after defrost	F	0	15	h	1	1	1
10	D9	Defrost priority over comp. protecttors (0=protection time respected; 1=protesction time not respected)	C	0	1	-	0	0	0
11	d/	Display defrost probe temp.	F	-	-	-	-	Coil probe temp.	Coil probe temp.
12	dc	Time base (for defrost repected only; 0=h/min; 1=min/s)	C	0	1	-	0	0	0
ALARM PARAMETERS									
1	A0	Alarm and fans differential	C	-20.0	20.0	°C/°F	2.0	2.0	2.0
2	AL	Low temp. alarm threshold/deviation (AL=0; alarm disabled)	F	-50.0	150.0	°C/°F	0.0	0.0	0.0
3	AH	High temp. alarm threshold/deviation (AH=0; alarm disabled)	F	50.0	150.0	°C/°F	0.0	0.0	0.0
4	Ad	Low and high temperature alarm delay	C	0	199	min	0	0	0
5	A4	Digital input configuration	C	0	11	-	0	0	0
6	A7	External alarm detection delay	C	0	199	min	0	0	0
7	A8	Enable alarm 'Ed': end defrost by timeout (1=enabled)	C	0	1	-	0	0	0
8	Ac	High condenser temperature alarm	C	-50.0	150.0	°C/°F	70.0	70.0	70.0
9	AE	High condenser temperature alarm differential	C	0.1	20	°C/°F	5.0	5.0	5.0
10	Acd	High condenser temperature alarm delay	C	0	250	min	0	0	0

## CAREL CONTROLLER ALARMS

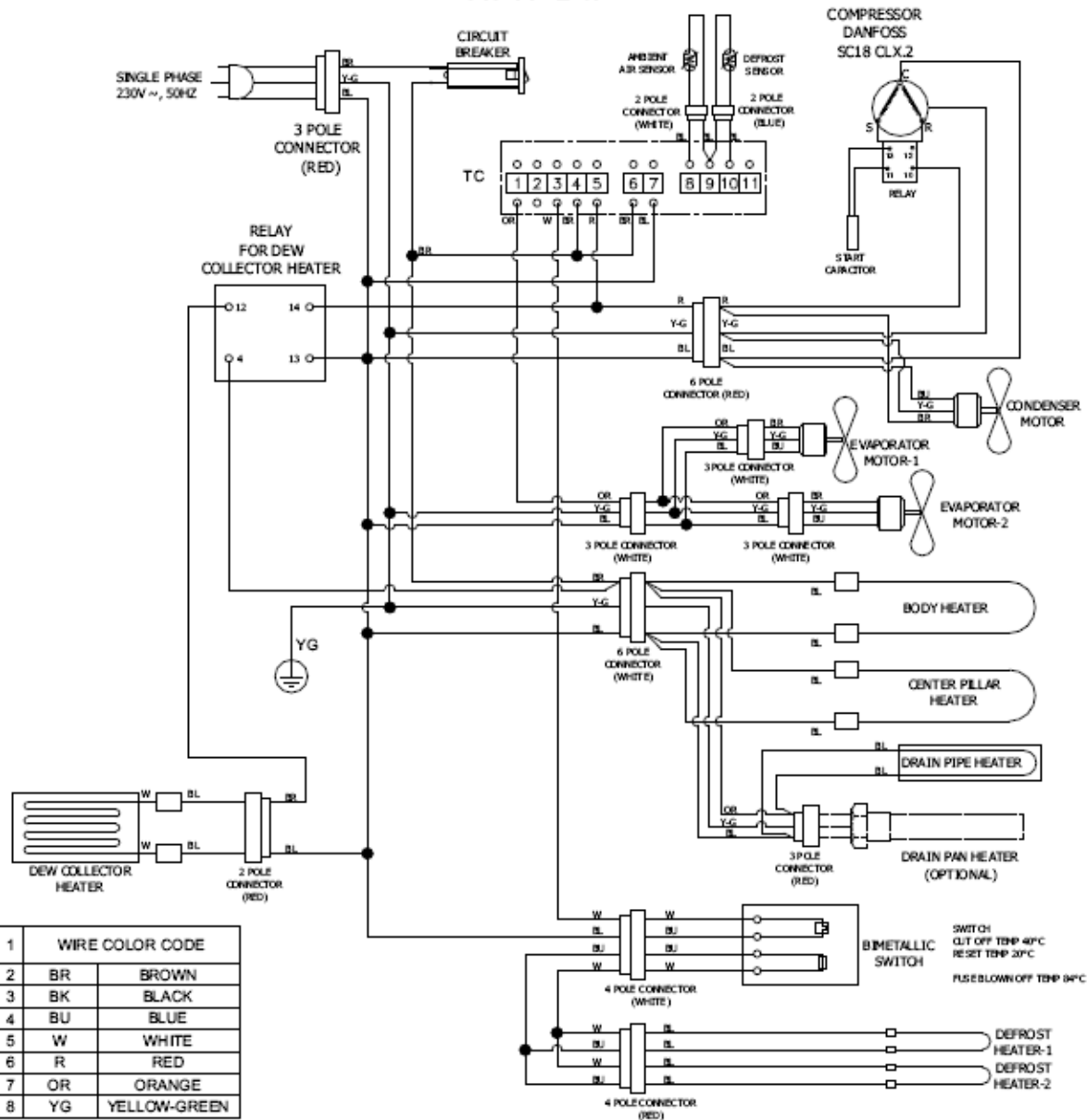
- **E0- probe 1 error:** This error belongs to appliance sensor control, if this error showing on carel display, need to change the appliance sensor fitted in the dew collector assembly.
- **E1- probe 2 error:** This error belongs to defrost sensor failure, if this error displays on the carel controller display, need to change defrost sensor fitted in evaporator fins.
- **Ed- defrost ended by timeout:** this error belongs to defrost timeout, if the defrost cycle finish without reaching the required temperature, then this alarm will displays in carel.

For all these type of errors, the values are programmed before to the carel controller.

## Wiring Drawing:

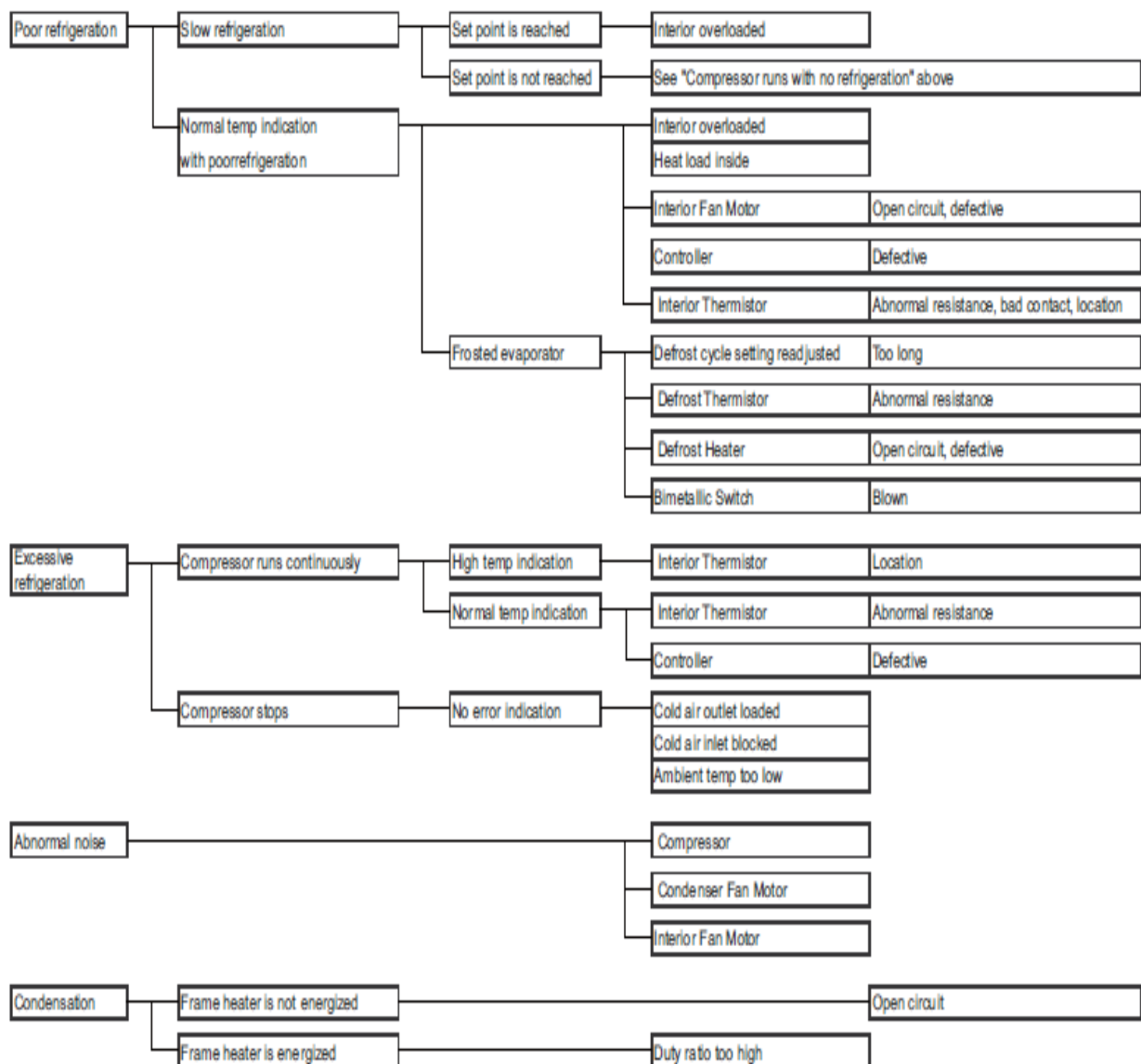


# HOSHIZAKI COMMERCIAL REFRIGERATOR HFW-147



## Trouble Shooting:

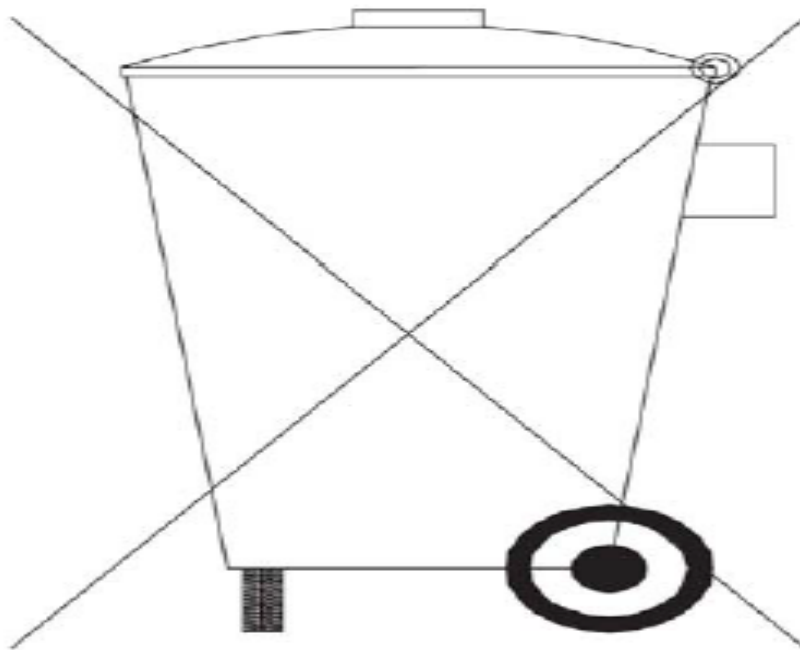
PROBLEM		PROBLEM		POSSIBLE CAUSE		
No refrigeration	Compressor will not start	No temp indication	Safety Breaker	OFF		
			Controller	Open circuit, connector unplugged		
		No error indication	Interior Thermistor	Abnormal resistance, bad contact		
			Pressure Switch	Defective		
			Relay	Output		
			Compressor	Winding open, electrical part defective		
	Compressor starts and stops immediately	No error indication	Ambient temp too high			
			Condensing capacity insufficient	Heat source, ventilation		
			Condenser Fan Motor	Locked, open circuit		
			Relay	Output		
			Pressure Switch	Defective		
	Compressor runs with no refrigeration	LLL error indication (frosted evaporator)	Interior Thermistor	Location		
			Compressor	Locked, etc		
		No error indication	Defrost Thermistor	Abnormal resistance, bad contact		
			Defrost Heater	Open circuit, defective		
				Ambient temp too high		
				Condensing capacity insufficient	Heat source, ventilation	
		Internal load too large				
		Door gap				
	Interior Thermistor	Location				
	Interior Fan Motor	Open circuit, defective				
	Controller	defective				
	Refrigeration Circuit	Capillary, drier				
	Refrigerant Leak					
	Condenser Fan Motor	Locked, open circuit				
	Compressor	Defective				





## DISPOSAL:

This marking indicated that this product should not be Disposed with other household wastes throughout the European union. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the Sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.



### IMPORTANT



The insulation foaming agent used for the unit body contains flammable gas cyclopentane. With this in mind, dispose of the refrigerator/freezer properly.

