

---

NO. R262-841

ISSUED: MAY. 31, 2011

REVISED: APR. 30, 2014

---



**HOSHIZAKI  
COMMERCIAL  
REFRIGERATOR/FREEZER**

**MODEL      HRE-MA series  
              HFE-MA series  
              HRFE-MA series**

**SERVICE MANUAL**

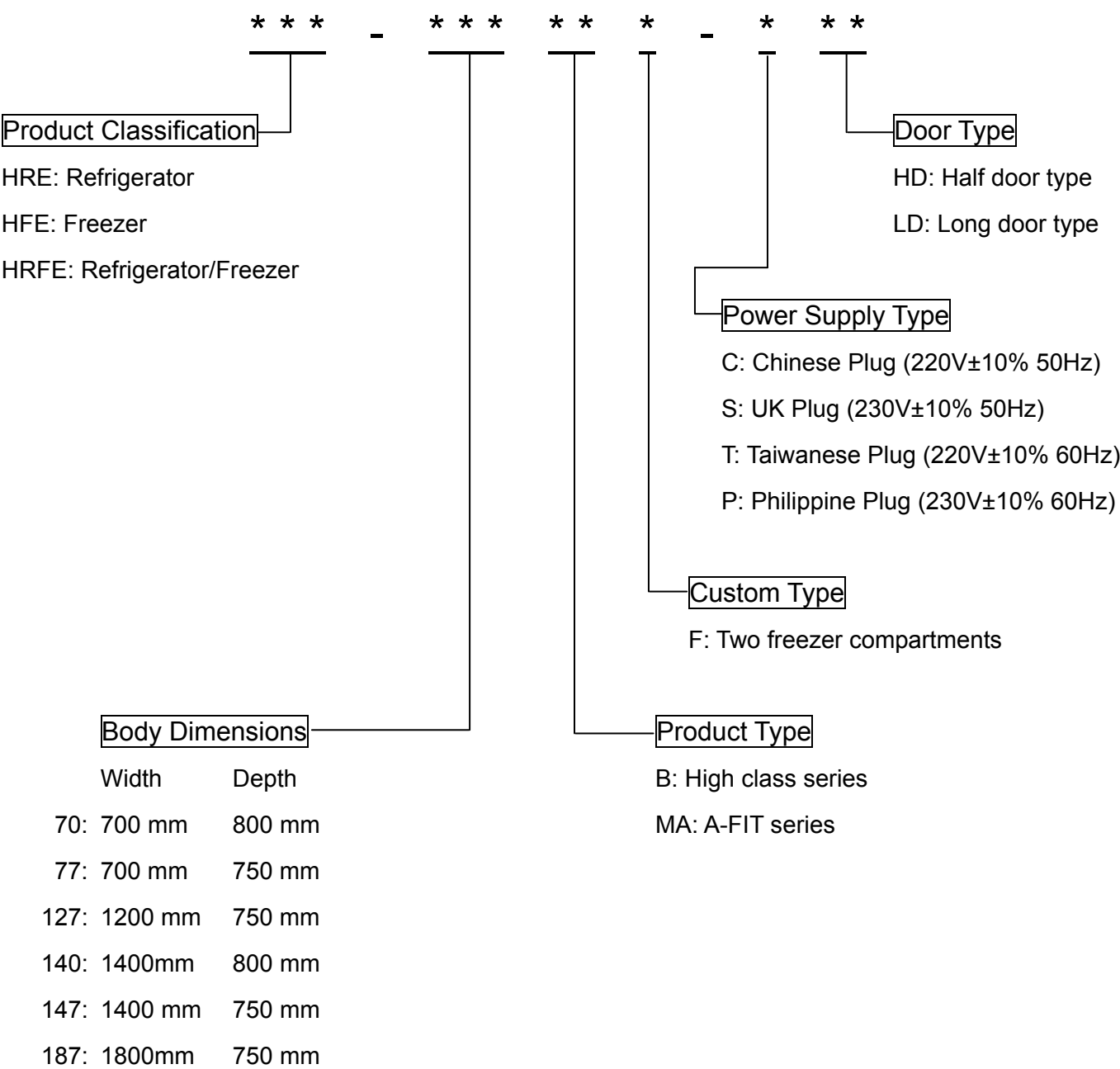
# CONTENTS

PAGE

I. GENERAL INFORMATION -----	1
1. SAFETY INSTRUCTIONS -----	1
2. DIMENSIONS/SPECIFICATIONS -----	3
[a] HRE-77MA-CHD -----	3
[b] HRE-127MA-CHD -----	4
[c] HRE-147MA-CHD -----	5
[d] HRE-187MA-CHD -----	6
[e] HFE-77MA-CHD -----	7
[f] HFE-127MA-CHD -----	8
[g] HFE-147MA-CHD -----	9
[h] HFE-187MA-CHD -----	10
[i] HRFE-77MA-CHD -----	11
[j] HRFE-127MAF-CHD -----	12
[k] HRFE-147MAF-CHD -----	13
[l] HRFE-187MAF-CHD -----	14
II. TECHNICAL INFORMATION -----	15
1. WIRING DIAGRAM -----	15
Standard models -----	15
[a] HRE-77MA-CHD -----	15
[b] HRE-127MA-CHD, HRE-147MA-CHD -----	15
[c] HRE-187MA-CHD -----	16
[d] HFE-77MA-CHD -----	16
[e] HFE-127MA-CHD, HFE-147MA-CHD -----	17
[f] HFE-187MA-CHD -----	17
[g] HRFE-77MA-CHD -----	18
[h] HRFE-127MAF-CHD, HFE-147MAF-CHD -----	19
[i] HRFE-187MAF-CHD -----	20
Forced drain water evaporation models -----	21
[j] HRE-77MA-CHD -----	21
[k] HRE-127MA-CHD, HRE-147MA-CHD -----	22
[l] HRE-187MA-CHD -----	23
[m] HFE-77MA-CHD -----	24
[n] HFE-127MA-CHD, HFE-147MA-CHD -----	25
[o] HFE-187MA-CHD -----	26
2. REFRIGERATION CIRCUIT -----	27
3. ELECTRONIC CONTROLS -----	29
[a] SET POINT TEMPERATURE -----	29
[b] CABINET TEMPERATURE DIFFERENTIAL -----	29
[c] DEFROST CYCLE -----	29
[d] DEFROST TERMINATION TEMPERATURE -----	29
[e] TEMPERATURE DISPLAY -----	29
[f] COMPRESSOR SOFT START -----	30
[g] HIGH PRESSURE SWITCH -----	30
[h] CHECKING SET POINT TEMPERATURE -----	31
[i] MANUAL DEFROST -----	32

[j] ERROR CODES -----	32
4. TIMING CHART -----	33
[a] STARTUP - CONTROL -----	33
[b] DEFROST -----	34
5. CONTROLLER -----	35
[a] HRE SERIES, HRFE SERIES - REFRIGERATOR -----	35
[b] HFE SERIES, HRFE SERIES - FREEZER -----	38
III. SERVICE DIAGNOSIS-----	43
1. ERROR CODES -----	43
[a] HRE SERIES, HRFE SERIES - REFRIGERATOR -----	43
[b] HFE SERIES, HRFE SERIES - FREEZER -----	43
2. FLOWCHART -----	44
[a] HRE SERIES, HRFE SERIES - REFRIGERATOR -----	44
[b] HFE SERIES, HRFE SERIES - FREEZER -----	46
3. COMPONENTS -----	47
4. CONTROLLER -----	49
[a] SERVICING CONTROLLER-----	49
[b] CHECKING THERMISTOR-----	50
IV. REMOVAL AND REPLACEMENT OF COMPONENTS -----	51
1. CONTROLLER AND THERMISTOR-----	51
[a] CONTROLLER-----	51
[b] THERMISTOR-----	51
2. REFRIGERATION CIRCUIT -----	54
[a] COMPRESSOR-----	54
[b] CONDENSER AND DRIER -----	54
[c] EVAPORATOR -----	55
[d] CONDENSER FAN MOTOR-----	55
[e] DEFROST HEATER AND THERMAL FUSE -----	56
3. AIR DUCT-----	57
[a] AIR DUCT -----	57
[b] INTERIOR FAN MOTOR (Except HRFE-77MA)-----	58
[c] INTERIOR FAN MOTOR (HRFE-77MA)-----	59
4. DOOR PARTS -----	60
[a] HINGE SPACER-----	60
[b] LIFT HINGE -----	60
[c] DOOR GASKET-----	60
5. EVAPORATION TANK-----	61
[a] DRAIN TANK HEATER-----	61
[b] THERMOSTAT -----	61
[c] THERMAL FUSE-----	61
6. CONDENSER CLEANING PAN-----	62
7. OPTIONAL PARTS -----	63
[a] HINGE KIT -----	63
[b] LEG -----	63
[c] CASTER -----	63

Explanation for Model Name



# I. GENERAL INFORMATION

## 1. SAFETY INSTRUCTIONS

The following instructions contain important safety precautions and should be strictly observed. The terms used here are defined as follows:

**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 to their property\* due to improper service operations or defects in serviced products.

\* The term "damage to their property" here refers to extensive damage to household effects, houses and pets.

### WARNING

1. Always ask the user to keep children away from the work area. They may be injured by tools or disassembled products.
2. 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.
3. 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.
4. 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 braise 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.

5. 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 model for replacement of defective parts. Use proper tools to secure the wiring. Otherwise abnormal operation or trouble may occur and cause electric leaks or fire.
- (3) Check for proper part installations, wiring conditions 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 the insulation resistance of at least 1 megohm between the live part (attachment plug) and the dead metal part (earth terminal).
- (7) Do not service the electrical parts with wet hands to prevent electric shocks.
- (8) The capacitors used for the compressor and other components may be under high voltage and should be discharged properly before servicing.

## **CAUTION**

1. 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 vermins resulting in a short circuit between terminals and possible ignition.

2. DIMENSIONS/SPECIFICATIONS \*Representative (standard) models only

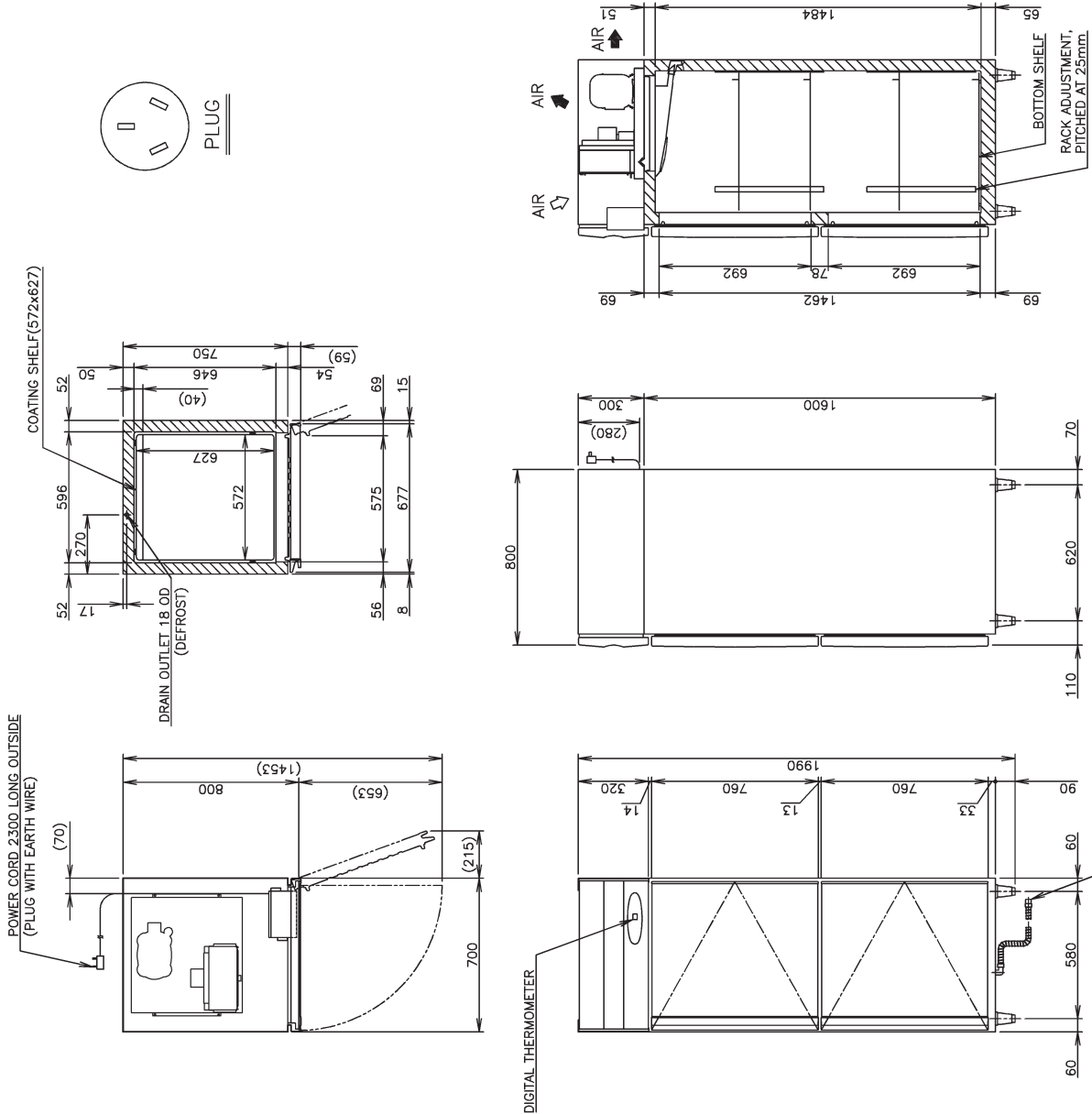
[a] HRE-77MA-CHD (Model Code: R262-C501)

ITEM	Hoshizaki Reach-in Refrigerator
MODEL	HRE-77MA-CHD
POWER SUPPLY	1 Phase 220 - 240V 50Hz Capacity: 0.46kVA (2.10A)
AMPERAGE	Rated: 1.61A Starting: 6.8A
ELECTRIC CONSUMPTION	237 (Power Factor: 64%) Heater: 26W Defrost: 26W
HEAT REJECTION	410W
POWER CORD	2.3m (Plug with Earth Wire)
EFFECTIVE CAPACITY	546L
OUTSIDE DIMENSIONS	700mm(W)×800mm(D)×1990(−2020)mm(H)
INSIDE DIMENSIONS	596mm(W)×646mm(D)×1484mm(H)
EXTERIOR	Stainless Steel, Galvanized Steel(Rear, Bottom)
INTERIOR	Stainless Steel, ABS Plastic(Door)
INSULATION	Polyurethane Foam
INSULATION FOAM BLOWING AGENT	Cyclopentane
REFRIGERATION SYSTEM	Forced Air Circulation
DEFROST SYSTEM	Off Cycle
COMPRESSOR	Hermetic 158W
CONDENSER	Fin and Tube type, Air-cooled
EVAPORATOR	Fin and Tube type
REFRIGERANT	R134a
TEMPERATURE CONTROL	Microprocessor (Digital Temp. Indication) Adjustable from −2 to 12° C
DEFROST CONTROL	Microprocessor
ELECTRIC CIRCUIT PROTECTION	Earth Wire
REFRIGERANT CIRCUIT PROTECTION	Motor Protector (Auto-reset)
LEG	Plastic Adjustable from 90 to 120mm
SHELF	4 pcs.(Include Bottom Shelf)
WEIGHT	98kg (Gross 120kg)
PACKAGE	Carton (Wooden Pallet) 760mm(W)×900mm(D)×2075mm(H)
ACCESSORIES	Drain Hose× 1
OPERATING CONDITIONS	Ambient Temperature: 5 - 43°C Voltage Range: Rated Voltage ±6%

\*We reserve the right to make changes in specifications and design without prior notice.

1. Install the product properly in accordance with the instructions on location, water supply/ drain connections and electrical connections stated in the instruction and installation manuals provided.  
Allow 10mm extra space at the installation site to meet any installation requirements (additional spacing is also required for proper air flow and pipe connections).
2. The heat rejection is based on the reached pull-down temperature at ambient temperature of 35°C.
3. Product Code: R262-C501

\*CUSTOMIZED  
SUS 430



[b] HRE-127MA-CHD (Model Code: R263-C501)

ITEM	Hoshizaki Reach-in Refrigerator
MODEL	HRE-127MA-CHD
POWER SUPPLY	1 Phase 7/0 - 240V 50Hz Capacity: 0.77kVA (3.3A)
AMPERAGE	Rated: 2.44A Starting: 1.2A
ELECTRIC CONSUMPTION	343W (Power Factor: 60%) Heater: 52W Defrost: 52W
HEAT REJECTION	560W
POWER CORD	2.3m (Plug with Earth Wire)
EFFECTIVE CAPACITY	1110L
OUTSIDE DIMENSIONS	1200mm(W)×800mm(D)×1990(-2020)mm(H)
INSIDE DIMENSIONS	1096mm(W)×646mm(D)×1484mm(H)
EXTERIOR	Stainless Steel, Galvanized Steel(Rear, Bottom)
INTERIOR	Stainless Steel, ABS Plastic(Door)
INSULATION	Polyurethane Foam
INSULATION FOAM BLOWING AGENT	Cyclopentane
REFRIGERATION SYSTEM	Forced Air Circulation
DEFROST SYSTEM	Off Cycle
COMPRESSOR	Hermetic 270W
CONDENSER	Fin and Tube type, Air-cooled
EVAPORATOR	Fin and Tube type
REFRIGERANT	R134a
TEMPERATURE CONTROL	Microprocessor (Digital Temp. Indication) Adjustable from -2 to 12° C
DEFROST CONTROL	Microprocessor
ELECTRIC CIRCUIT PROTECTION	Earth Wire
REFRIGERANT CIRCUIT PROTECTION	Motor Protector (Auto-reset)
LEG	Plastic, Adjustable from 90 to 120mm
SHELF	8 pcs.(Include Bottom Shelf)
WEIGHT	141kg (Gross 172kg)
PACKAGE	Carton (Wooden Pallet) 1280mm(W)×900mm(D)×2075mm(H)
ACCESSORIES	Drain Hose×1
OPERATING CONDITIONS	Ambient Temperature: 5 - 43° C Voltage Range: Rated Voltage ±6%

\*We reserve the right to make changes in specifications and design without prior notice.

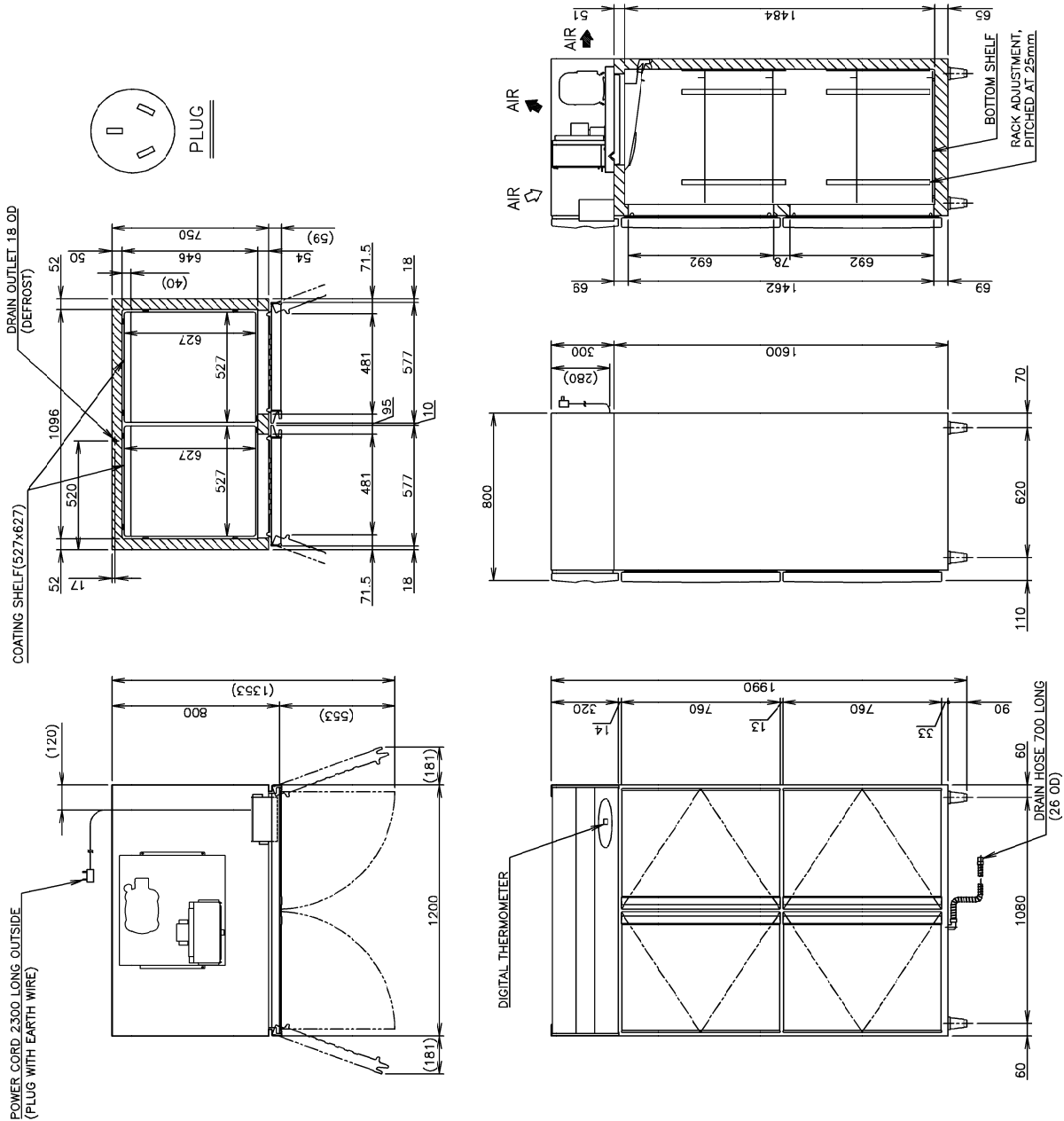
1. Install the product properly in accordance with the instructions on location, water supply/ drain connections and electrical connections stated in the instruction and installation manuals provided.

Allow 10mm extra space at the installation site to meet any installation requirements (additional spacing is also required for proper air flow and pipe connections).

2. The heat rejection is based on the reached pull-down temperature at ambient temperature of 35° C.

3. Product Code: R263-C501

\*CUSTOMIZED  
SUS 430





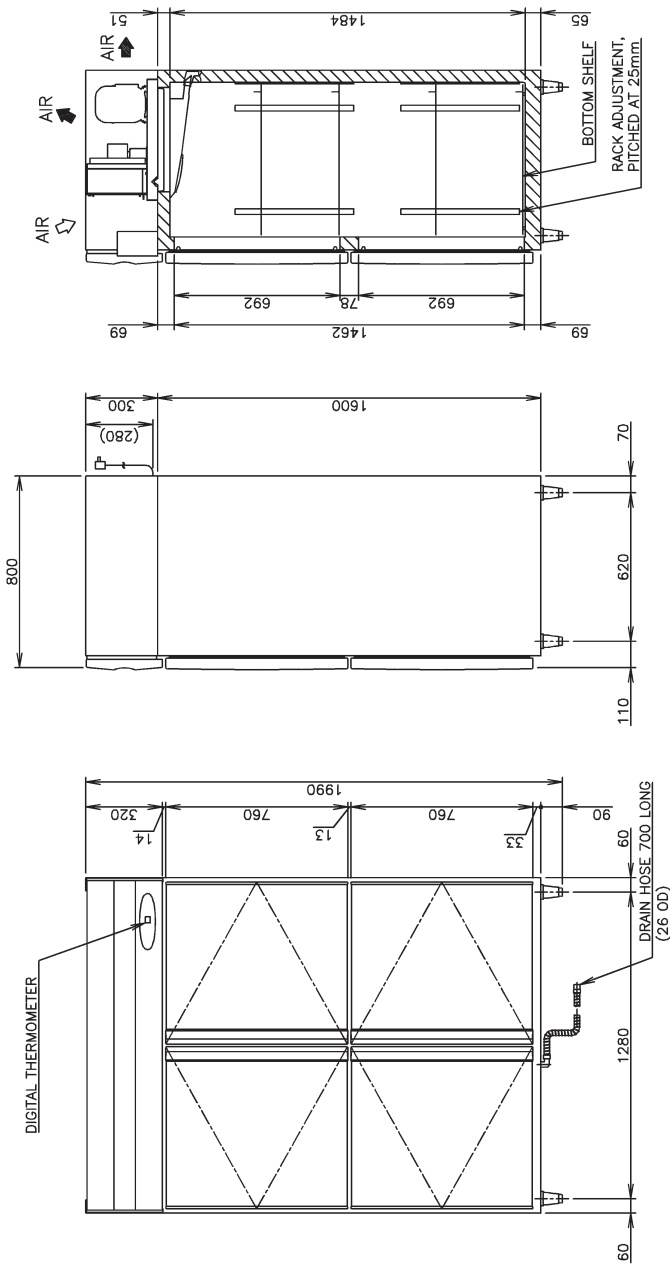
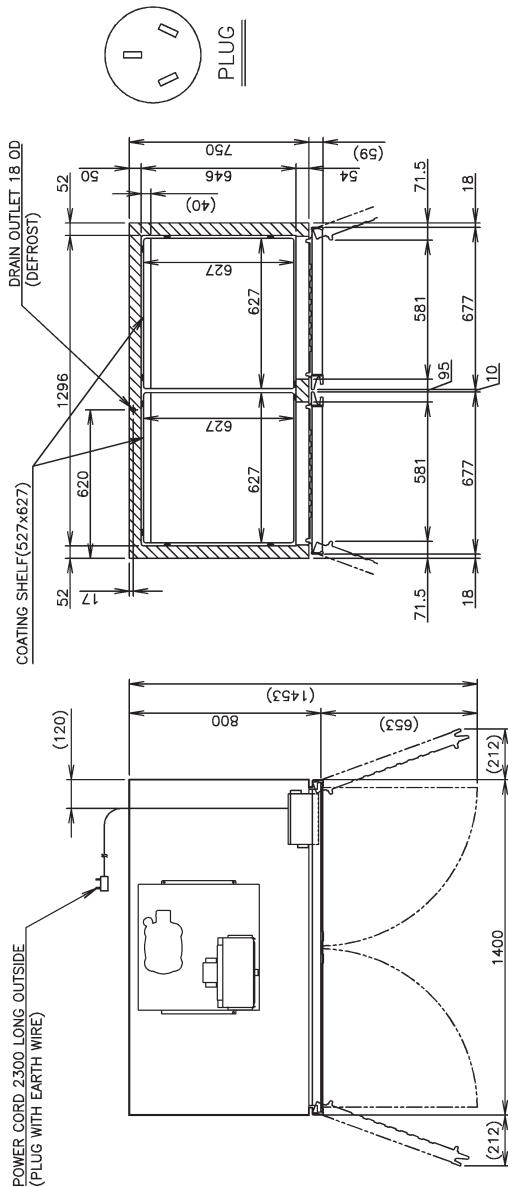
[c] HRE-147MA-CHD (Model Code: R264-C501)

ITEM	Hoshizaki Reach-in Refrigerator
MODEL	HRE-147MA-CHD
POWER SUPPLY	1 Phase 220 ~ 240V 50Hz Capacity: 0.72kVA (3.3A)
AMPERAGE	Rated: 2.44A Starting: 12A
ELECTRIC CONSUMPTION	343W (Power Factor: 60%) Heater: 52W Defrost: 52W
HEAT REJECTION	610W
POWER CORD	2.3m (Plug with Earth Wire)
EFFECTIVE CAPACITY	1217L
OUTSIDE DIMENSIONS	1400mm(W)×800mm(D)×1990(–2020)mm(H)
INSIDE DIMENSIONS	1296mm(W)×646mm(D)×1484mm(H)
EXTERIOR	Stainless Steel, Galvanized Steel(Rear, Bottom)
INTERIOR	Stainless Steel, ABS Plastic(Door)
INSULATION	Polyurethane Foam
INSULATION FOAM BLOWING AGENT	Cyclopentane
REFRIGERATION SYSTEM	Forced Air Circulation
DEFROST SYSTEM	Off Cycle
COMPRESSOR	Hermetic 270W
CONDENSER	Fin and Tube type, Air-cooled
EVAPORATOR	Fin and Tube type
REFRIGERANT	R134a
TEMPERATURE CONTROL	Microprocessor (Digital Temp. Indication) Adjustable from –2 to 12° C
DEFROST CONTROL	Microprocessor
ELECTRIC CIRCUIT PROTECTION	Earth Wire, Circuit Breaker
REFRESHING CIRCUIT PROTECTION	Motor Protector (Auto–reset)
LEG	Plastic Adjustable from 90 to 120mm
SHELF	8 pcs.(Include Bottom Shelf)
WEIGHT	159kg (Gross 193kg)
PACKAGE	Carton (Wooden Pallet) 1460mm(W)×900mm(D)×2075mm(H)
ACCESSORIES	Drain Hose x 1
OPERATING CONDITIONS	Ambient Temperature: 5 – 43°C Voltage Range: Rated Voltage ±6%

\*We reserve the right to make changes in specifications and design without prior notice.

1. Install the product properly in accordance with the instructions on location, water supply/ drain connections and electrical connections stated in the instruction and installation manuals provided.  
Allow 10mm extra space at the installation site to meet any installation requirements (additional spacing is also required for proper air flow and pipe connections).
2. The heat rejection is based on the reached pulldown temperature at ambient temperature of 35°C.
3. Product Code: R264–C501

\*CUSTOMIZED  
SUS 430



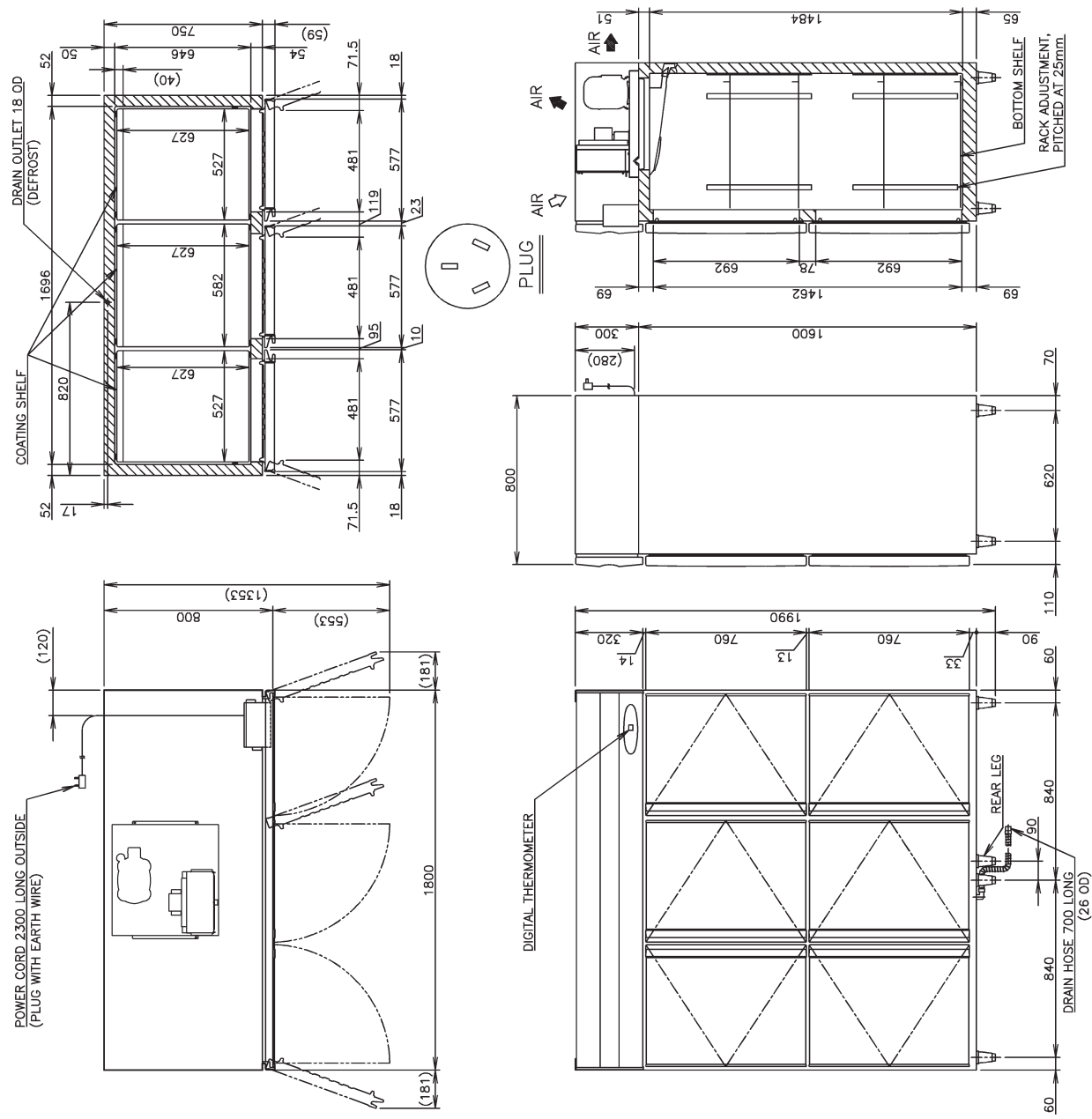
[d] HRE-187MA-CHD (Model Code: R265-C501)

ITEM	Hoshizaki Reach-in Refrigerator
MODEL	HRE-187MA-CHD
POWER SUPPLY	1 Phase 220 - 240V 50Hz Capacity: 0.84kVA (3.80A)
AMPERAGE	Rated: 2.99A Starting: 12.75A
ELECTRIC CONSUMPTION	430W (Power Factor: 60%)
HEAT REJECTION	Heater: 75W Defrost: 75W
POWER CORD	2.3m (Plug with Earth Wire)
EFFECTIVE CAPACITY	1600L
OUTSIDE DIMENSIONS	1800mm(W)×800mm(D)×1990(−2020)mm(H)
INSIDE DIMENSIONS	1696mm(W)×646mm(D)×1484mm(H)
EXTERIOR	Stainless Steel, Galvanized Steel(Rear, Bottom)
INTERIOR	Stainless Steel, ABS Plastic(Door)
INSULATION	Polyurethane Foam
INSULATION FOAM BLOWING AGENT	Cyclopentane
REFRIGERATION SYSTEM	Forced Air Circulation
DEFROST SYSTEM	Off Cycle
COMPRESSOR	Hermetic 330W
CONDENSER	Fin and Tube type, Air-cooled
EVAPORATOR	Fin and Tube type
REFRIGERANT	R134a
TEMPERATURE CONTROL	Microprocessor (Digital Temp. Indication) Adjustable from −2 to 17°C
DEFROST CONTROL	Microprocessor
ELECTRIC CIRCUIT PROTECTION	Earth Wire
REFRIGERANT CIRCUIT PROTECTION	Motor Protector (Auto-reset)
LEG	Plastic Adjustable from 90 to 120mm
SHELF	12 pcs (Include Bottom Shelf)
WEIGHT	184kg (Gross 226kg)
PACKAGE	Carton (Wooden Pallet) 1860mm(W)×900mm(D)×2075mm(H)
ACCESSORIES	Drain Hose x 1
OPERATING CONDITIONS	Ambient Temperature: 5 - 43°C Voltage Range: Rated Voltage ±6%

\*We reserve the right to make changes in specifications and design without prior notice.

1. Install the product properly in accordance with the instructions on location, water supply/ drain connections and electrical connections stated in the instruction and installation manuals provided.  
Allow 10mm extra space at the installation site to meet any installation requirements (additional spacing is also required for proper air flow and pipe connections).
2. The heat rejection is based on the reached pulldown temperature at ambient temperature of 35°C.
3. Product Code: R265-C501

\*CUSTOMIZED  
SUS 430



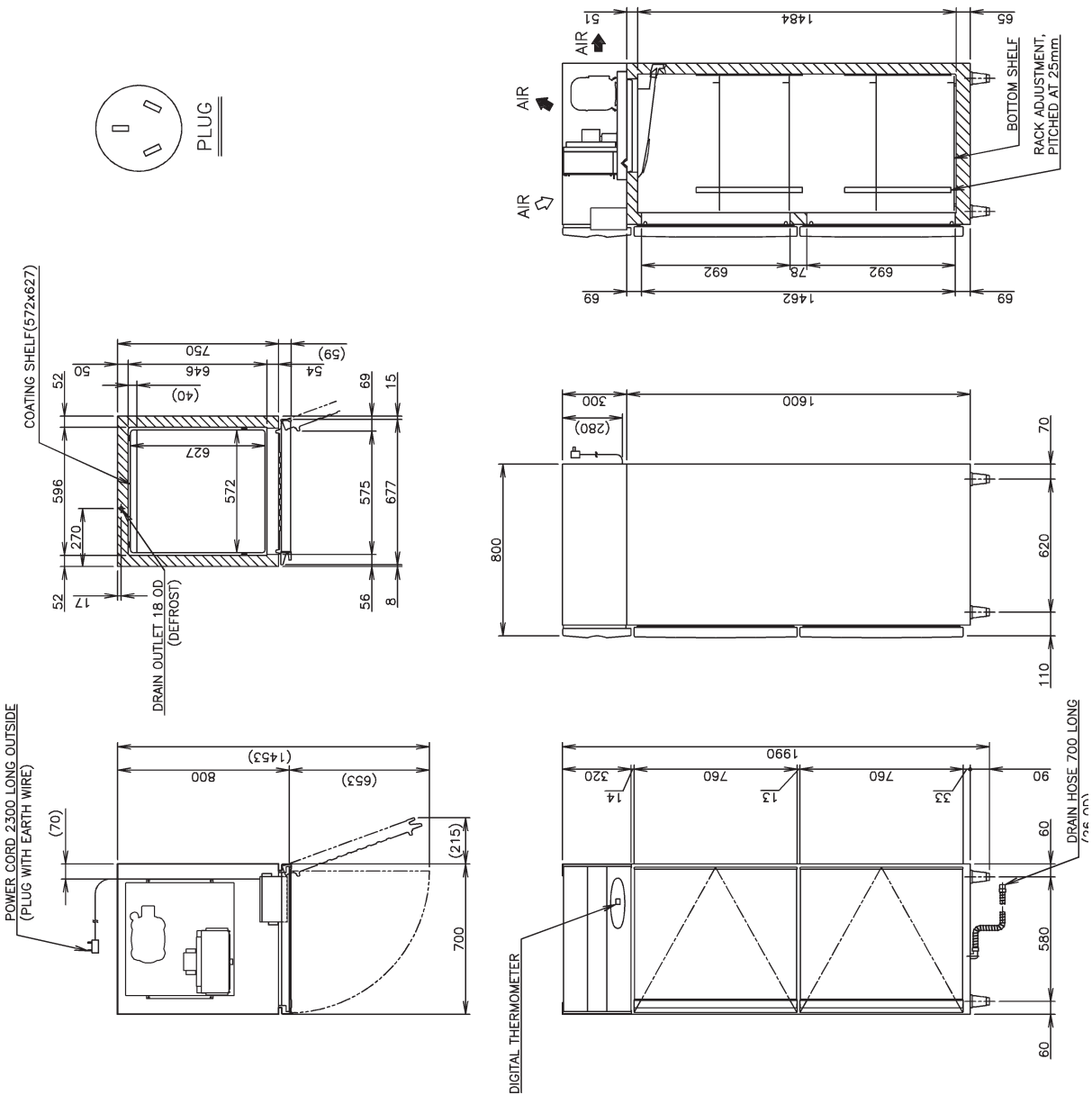
[e] HFE-77MA-CHD (Model Code: R266-C501)

ITEM	Hoshizaki Reach-in Freezer
MODEL	HFE-77MA-CHD
POWER SUPPLY	1 Phase 220 – 240V 50Hz Capacity: 0.65kVA (3.0A)
AMPERAGE	Rated: 2.13A Starting: 10.7A
ELECTRIC CONSUMPTION	419W (Power Factor: 87%)
HEAT REJECTION	Heater: 316W Defrost: 316W
POWER CORD	2.3m (Plug with Earth Wire)
EFFECTIVE CAPACITY	546L
OUTSIDE DIMENSIONS	700mm(W)×800mm(D)×1990(–2020)mm(H)
INSIDE DIMENSIONS	596mm(W)×646mm(D)×1484mm(H)
EXTERIOR	Stainless Steel, Galvanized Steel(Rear, Bottom)
INTERIOR	Stainless Steel, ABS Plastic(Door)
INSULATION	Polyurethane Foam
INSULATION FOAM BLOWING AGENT	Cyclopentane
REFRIGERATION SYSTEM	Forced Air Circulation
DEFROST SYSTEM	Heater
COMPRESSOR	Hermetic 480W
CONDENSER	Fin and Tube type, Air-cooled
EVAPORATOR	Fin and Tube type
REFRIGERANT	R404A
TEMPERATURE CONTROL	Microprocessor (Digital Temp. Indication) Adjustable from –23 to –76
DEFROST CONTROL	Microprocessor
ELECTRIC CIRCUIT PROTECTION	Earth Wire, Circuit Breaker
REFRIGERANT CIRCUIT PROTECTION	Motor Protector (Auto–reset)
LEG	Plastic, Adjustable from 90 to 120mm
SHELF	4 pcs.(Include Bottom Shelf)
WEIGHT	102kg (Gross 124kg)
PACKAGE	Carton (Wooden Pallet) 760mm(W)×900mm(D)×2075mm(H)
ACCESSORIES	Drain Hose x 1
OPERATING CONDITIONS	Ambient Temperature: 5 – 43°C Voltage Range: Rated Voltage ±6%

\*We reserve the right to make changes in specifications and design without prior notice.

1. Install the product properly in accordance with the instructions on location, water supply/ drain connections and electrical connections stated in the instruction and installation manuals provided.  
Allow 10mm extra space at the installation site to meet any installation requirements (additional spacing is also required for proper air flow and pipe connections).
2. The heat rejection is based on the reached pull-down temperature at ambient temperature of 35°C.
3. Product Code: R266–C501

\*CUSTOMIZED  
SUS 430



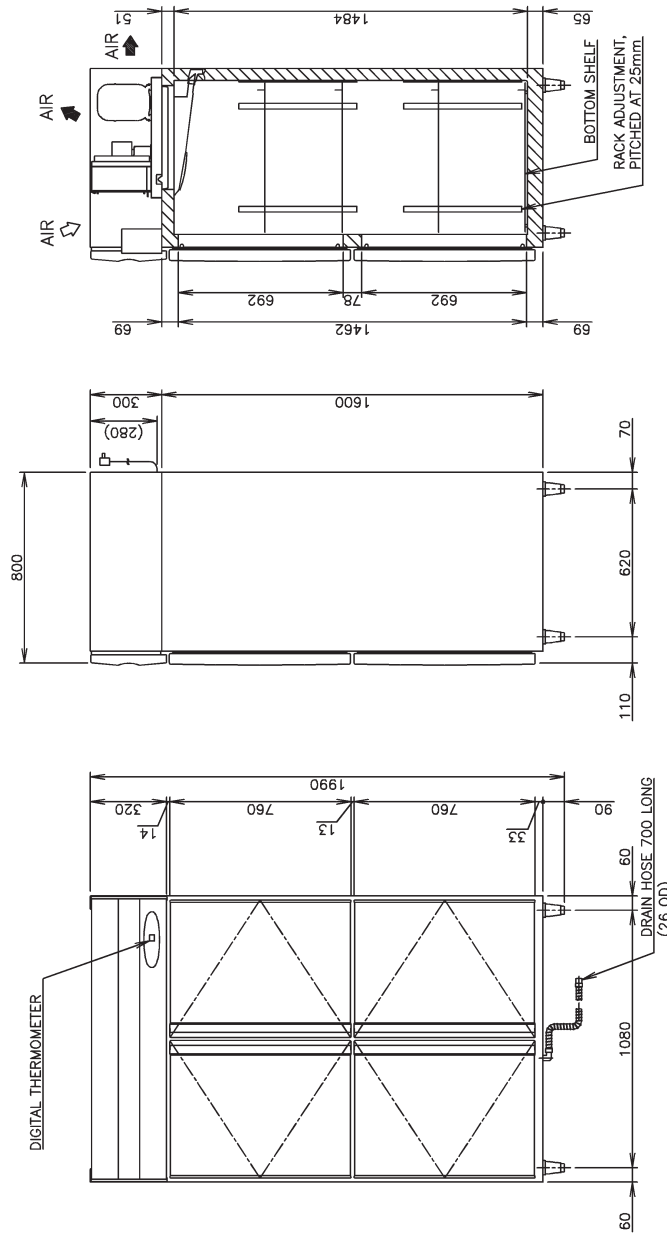
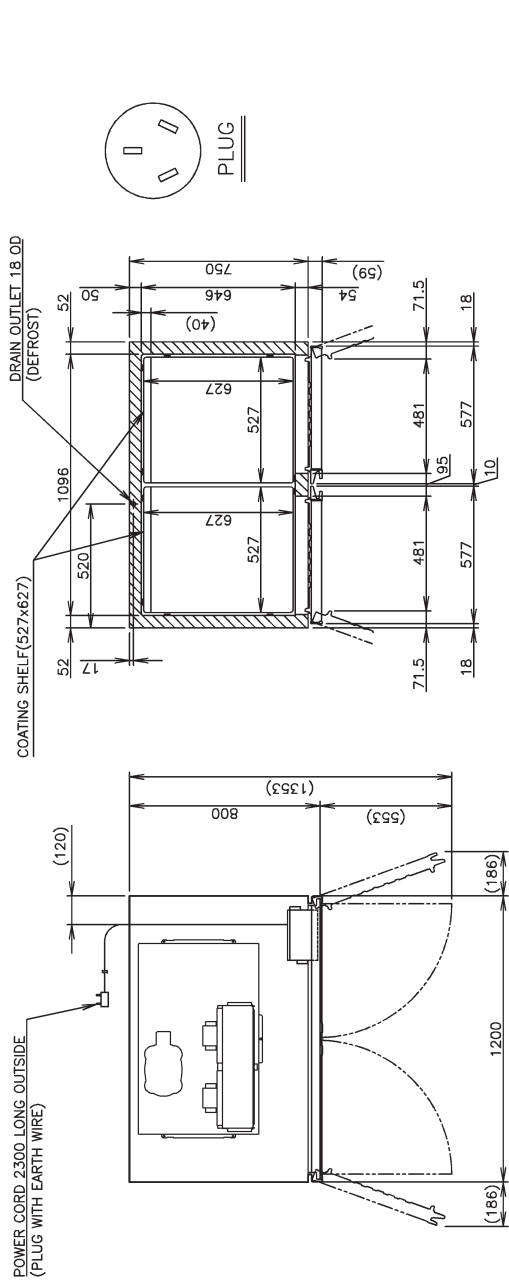
[f] HFE-127MA-CHD (Model Code: R267-C501)

ITEM	Hoshizaki Reach-in Freezer
MODEL	HFE-127MA-CHD
POWER SUPPLY	1 Phase 220 ~ 240V 50Hz Capacity: 1.26kVA (5.80A)
AMPERAGE	Rated: 3.72A Starting: 21.0A
ELECTRIC CONSUMPTION	696W (Power Factor: 82%)
HEAT REJECTION	Heater: 471W Defrost: 471W
POWER CORD	2.3m (Plug with Earth Wire)
EFFECTIVE CAPACITY	1100L
OUTSIDE DIMENSIONS	1200mm(W)×800mm(D)×1990(–2020)mm(H)
INSIDE DIMENSIONS	1096mm(W)×646mm(D)×1484mm(H)
EXTERIOR	Stainless Steel Galvanized Steel(Rear, Bottom)
INTERIOR	Stainless Steel, ABS Plastic(Door)
INSULATION	Polyurethane Foam
INSULATION FORM BLOWING AGENT	Cyclopentane
REFRIGERATION SYSTEM	Forced Air Circulation
DEFROST SYSTEM	Heater
COMPRESSOR	Hermetic 774W
CONDENSER	Fin and Tube type, Air-cooled
EVAPORATOR	Fin and Tube type
REFRIGERANT	R404A
TEMPERATURE CONTROL	Microprocessor (Digital Temp. Indication) Adjustable from -23 to -70
DEFROST CONTROL	Microprocessor
ELECTRIC CIRCUIT PROTECTION	Earth Wire, Circuit Breaker
REFRESHMENT PROTECTION	Motor Protector (Auto-reset)
LEG	Plastic Adjustable from 90 to 120mm
SHELF	8 pcs (Include Bottom Shelf)
WEIGHT	146kg (Gross 177kg)
PACKAGE	Carton (Wooden Pallet) 1260mm(W)×900mm(D)×2075mm(H)
ACCESSORIES	Drain Hose x 1
OPERATING CONDITIONS	Ambient Temperature: 5 ~ 43°C Voltage Range: Rated Voltage ±6%

\*We reserve the right to make changes in specifications and design without prior notice.

1. Install the product properly in accordance with the instructions on location, water supply/ drain connections and electrical connections stated in the instruction and installation manuals provided.  
Allow 10mm extra space at the installation site to meet any installation requirements (additional spacing is also required for proper air flow and pipe connections).
2. The heat rejection is based on the reached pulldown temperature at ambient temperature of 35°C.
3. Product Code: R267-C501

\*CUSTOMIZED  
SUS 430



[g] HFE-147MA-CHD (Model Code: R268-C501)

ITEM	Hoshizaki Reach-in Freezer
MODEL	HFE-147MA-CHD
POWER SUPPLY	1 Phase 220 - 240V 50Hz Capacity: 1.26kVA (5.80A)
AMPERAGE	Rated: 3.72A Starting: 21.0A
ELECTRIC CONSUMPTION	696W (Power Factor: 82%) Heater: 471W Defrost: 471W
HEAT REJECTION	1150W
POWER CORD	2.3m (Plug with Earth Wire)
EFFECTIVE CAPACITY	1203L
OUTSIDE DIMENSIONS	1400mm(W)×800mm(D)×1990(-2020)mm(H)
INSIDE DIMENSIONS	1296mm(W)×646mm(D)×1484mm(H)
EXTERIOR	Stainless Steel, Galvanized Steel(Rear, Bottom)
INTERIOR	Stainless Steel, ABS Plastic(Door)
INSULATION	Polyurethane Foam
INSULATION FOAM BLOWING AGENT	Cyclopentane
REFRIGERATION SYSTEM	Forced Air Circulation
DEFROST SYSTEM	Heater
COMPRESSOR	Hermetic 774W
CONDENSER	Fin and Tube type, Air-cooled
EVAPORATOR	Fin and Tube type
REFRIGERANT	R404A
TEMPERATURE CONTROL	Microprocessor (Digital Temp. Indication) Adjustable from -23 to -7℃
DEFROST CONTROL	Microprocessor
ELECTRIC CIRCUIT PROTECTION	Earth Wire, Circuit Breaker
REFRESHMENT CIRCUIT PROTECTION	Motor Protector (Auto-reset)
LEG	Plastic Adjustable from 90 to 120mm
SHELF	8 pcs.(Include Bottom Shelf)
WEIGHT	164kg (Gross 198kg)
PACKAGE	Carton (Wooden Pallet) 1480mm(W)×900mm(D)×2075mm(H)
ACCESSORIES	Drain Hose x 1
OPERATING CONDITIONS	Ambient Temperature: 5 - 43℃ Voltage Range: Rated Voltage ±6%

\*We reserve the right to make changes in specifications and design without prior notice.

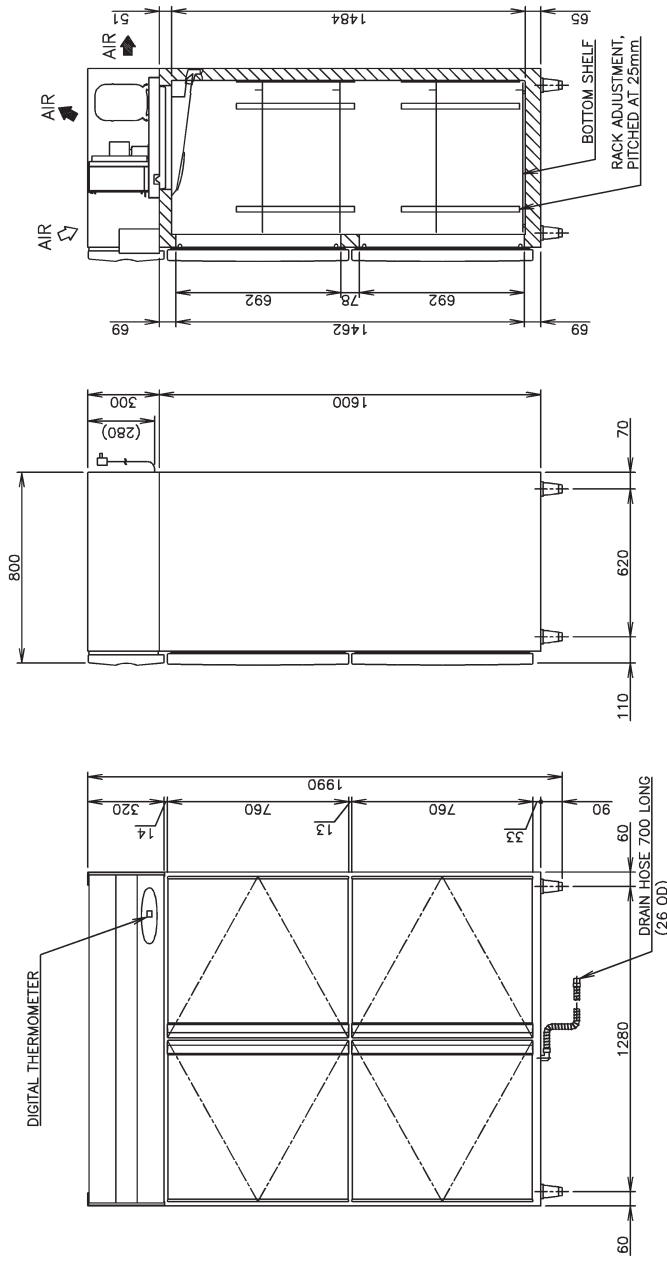
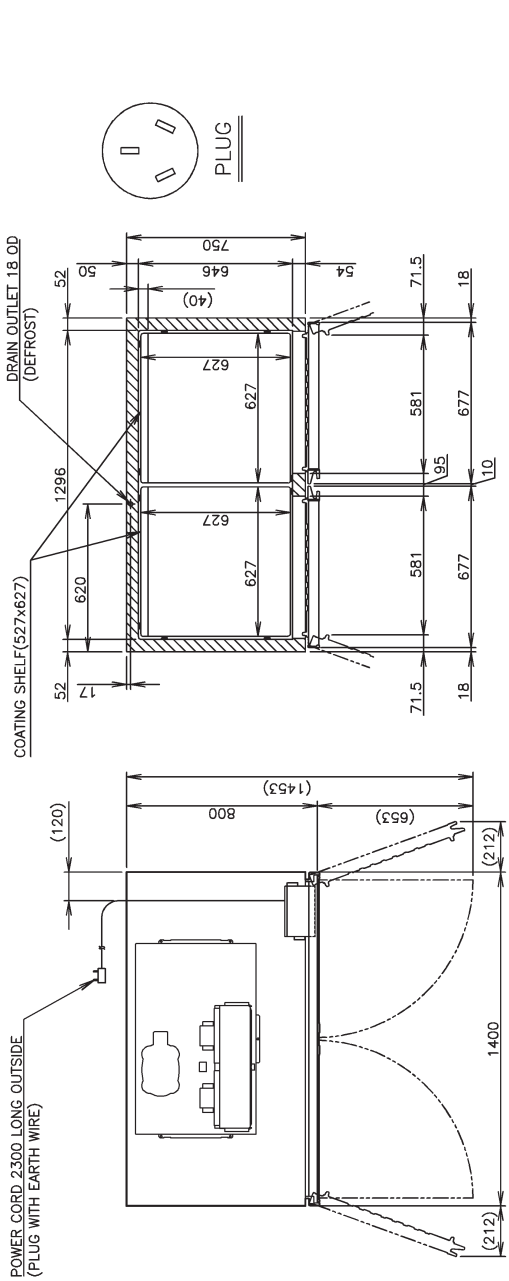
1. Install the product properly in accordance with the instructions on location, water supply/drain connections and electrical connections stated in the instruction and installation manuals provided.

Allow 10mm extra space at the installation site to meet any installation requirements (additional spacing is also required for proper air flow and pipe connections).

2. The heat rejection is based on the reached pull-down temperature at ambient temperature of 35℃.

3. Product Code: R268-C501

\*CUSTOMIZED  
SUS 430



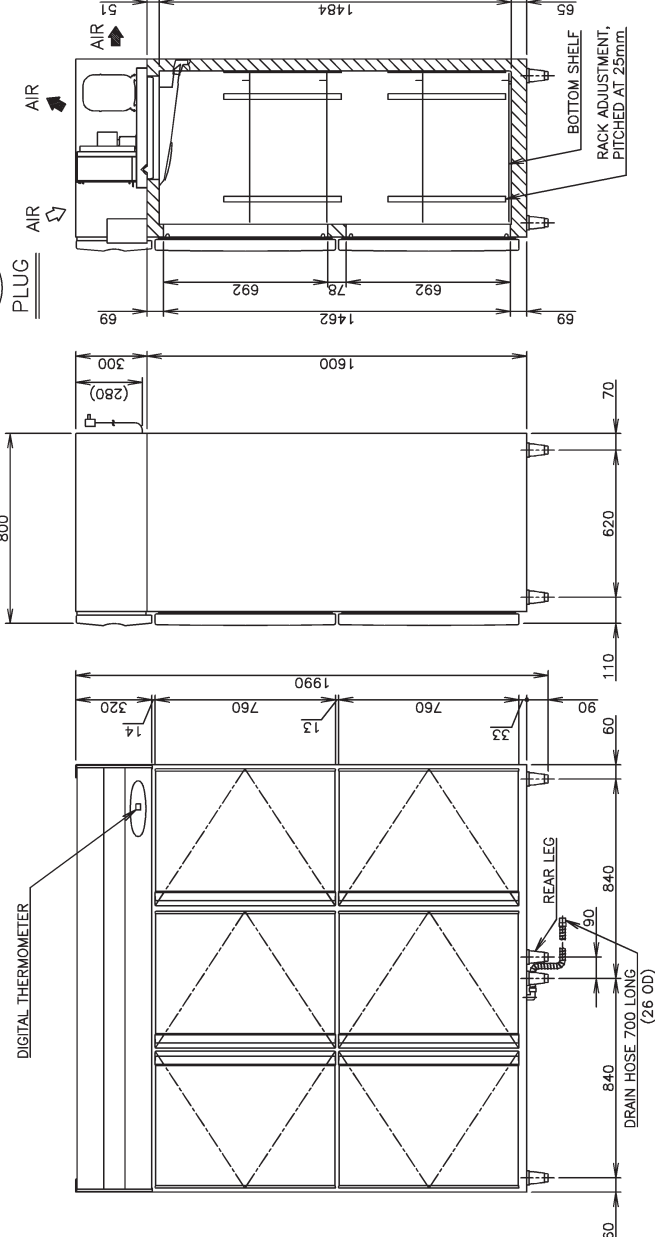
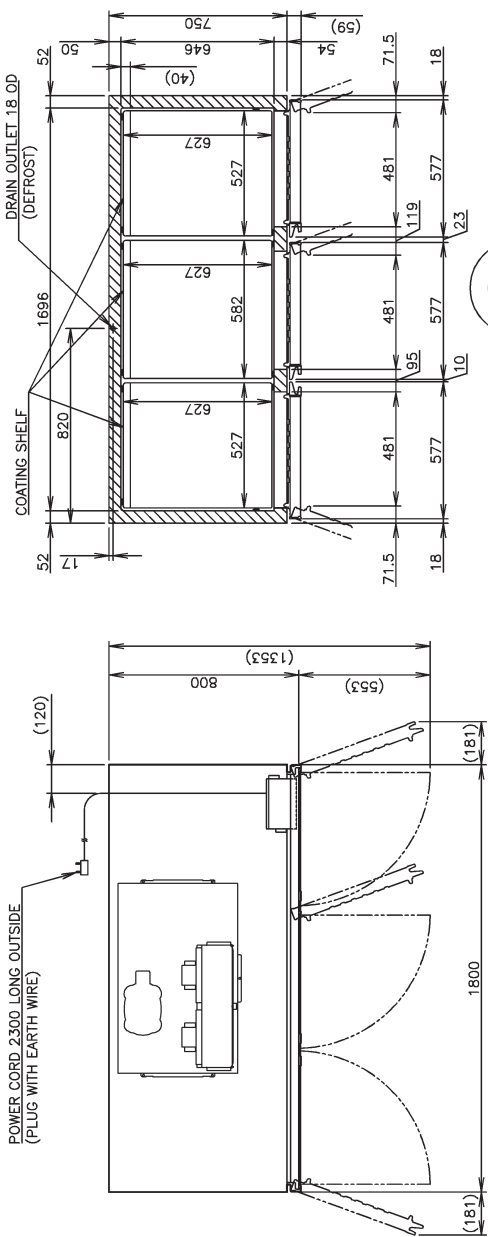
[h] HFE-187MA-CHD (Model Code: R269-501)

ITEM	Hoshizaki Reach-in Freezer
MODEL	HFE-187MA-CHD
POWER SUPPLY	1 Phase 220-240V 50Hz Capacity: 1.41kVA (6.0k)
AMPERAGE	Rated: 4.46A Starting: 23.4A
ELECTRIC CONSUMPTION	788W (Power Factor: 76%)
HEAT REJECTION	Heater: 517W Defrost: 517W
POWER CORD	2.3m (Plug with Earth Wire)
EFFECTIVE CAPACITY	1600L
OUTSIDE DIMENSIONS	1800mm(W)×800mm(D)×1990(-2020)mm(H)
INSIDE DIMENSIONS	1696mm(W)×646mm(D)×1484mm(H)
EXTERIOR	Stainless Steel, Galvanized Steel(Rear, Bottom)
INTERIOR	Stainless Steel, ABS Plastic(Door)
INSULATION	Polyurethane Foam
INSULATION BLOWING AGENT	Cyclopentane
REFRIGERATION SYSTEM	Forced Air Circulation
DEFROST SYSTEM	Heater
COMPRESSOR	Hermetic 10.33W
CONDENSER	Fin and Tube type, Air-cooled
EVAPORATOR	Fin and Tube type
REFRIGERANT	R404A
TEMPERATURE CONTROL	Microprocessor (Digital Temp. Indication) Adjustable from -23 to -7℃
DEFROST CONTROL	Microprocessor
ELECTRIC CIRCUIT PROTECTION	Earth Wire, Circuit Breaker
REARVIEW CIRCUIT PROTECTION	Motor Protector (Auto-reset)
LEG	Plastic Adjustable from 90 to 120mm
SHELF	12 pcs.(Include Bottom Shelf)
WEIGHT	196kg (Gross 238kg)
PACKAGE	Carton (Wooden Pallet) 1860mm(W)×900mm(D)×2075mm(H)
ACCESSORIES	Drain Hose x 1
OPERATING CONDITIONS	Ambient Temperature: 5 - 43℃ Voltage Range: Rated Voltage ±6%

\*We reserve the right to make changes in specifications and design without prior notice.

1. Install the product properly in accordance with the instructions on location, water supply / drain connections and electrical connections stated in the instruction and installation manuals provided.  
Allow 10mm extra space at the installation site to meet any installation requirements (additional spacing is also required for proper air flow and pipe connections).
2. The heat rejection is based on the reached pull-down temperature at ambient temperature of 35℃.
3. Product Code: R269-C501

\*CUSTOMIZED  
SUS 430



POWER CORD 2300 LONG OUTSIDE  
(PLUG WITH EARTH WIRE)



ITEM	Hoshizaki Reach-in Freezer/Refrigerator		
MODEL	HRFE-77MA-CHD		
POWER SUPPLY	1 Phase 220 ~ 240V 50Hz Capacity: 1.12kVA (5.10A)		
AMPERAGE	Rated: 4.2A Starting: 10.0A		
ELECTRIC CONSUMPTION	478W (Power Factor: 51%) Heater: 316W Defrost: 316W		
HEAT REJECTION	1030W		
POWER CORD	2.3m (Plug with Earth Wire)		
EFFECTIVE CAPACITY	Total 540L (Refrigerator: 260L, Freezer: 280L)		
OUTSIDE DIMENSIONS	700mm(W) x 800mm(D) x 1990(-2020)mm(H)		
INSIDE DIMENSIONS	Refrigerator 596mm(W) x 580mm(D) x 708mm(H) Freezer 596mm(W) x 611mm(D) x 721mm(H)		
EXTERIOR	Stainless Steel, Galvanized Steel(Reor, Bottom)		
INTERIOR	Stainless Steel, ABS Plastic(Door)		
INSULATION	Polyurethane Foam		
INSULATION BLOWING AGENT	Cyclopentane		
REFRIGERATION SYSTEM	Forced Air Circulation		
DEFROST SYSTEM	Refrigerator Off Cycle Freezer Heater		
COMPRESSOR	Refrigerator Hermetic 110W(Motor Size) Freezer Hermetic 275W(Motor Size)		
CONDENSER	Refrigerator Fin and Tube Type, Air-cooled Freezer Fin and Tube type		
EVAPORATOR	Refrigerator Fin and Tube type Freezer Fin and Tube type		
REFRIGERANT	Refrigerator R134a Freezer R404A		
TEMPERATURE CONTROL	Refrigerator <small>Wingspanned Control (Digital Temperature Indicator)</small> Adjustable from -2 to 10℃ Freezer <small>Wingspanned Control (Digital Temperature Indicator)</small> Adjustable from -23 to -7℃		
DEFROST CONTROL	Microprocessor		
REFRIGERANT CIRCUT PROTECTION	Earth Wire, Circuit Breaker		
REFRIGERANT CIRCUT PROTECTION	Motor Protector (Auto-reset)		
LEG	Plastic Adjustable from 90 to 120mm		
SHELF	4 pcs.(Include Bottom Shelf)		
WEIGHT	121kg (Gross 143kg)		
PACKAGE	Carton (Wooden Pallet) 760mm(W) x 900mm(D) x 2075mm(H)		
ACCESSORIES	Drain Hose x 2		
OPERATING CONDITIONS	Ambient Temperature: 5 ~ 43℃ Voltage, Pressure, Rated Voltage, etc.		

	Voltage Range Rated voltage $\pm 5\%$
--	---------------------------------------

We reserve the right to make changes in specifications and design without prior notice.

1. Install the product properly in accordance with the instructions on location, water supply/drain connections and electrical connections stated in the instruction and installation manuals provided.
2. Allow 10mm extra space at the installation site to meet any installation requirements (additional spacing is also required for proper air flow and pipe connections).
3. The heat rejection is based on the reached pull-down temperature at ambient temperature of 35°C.

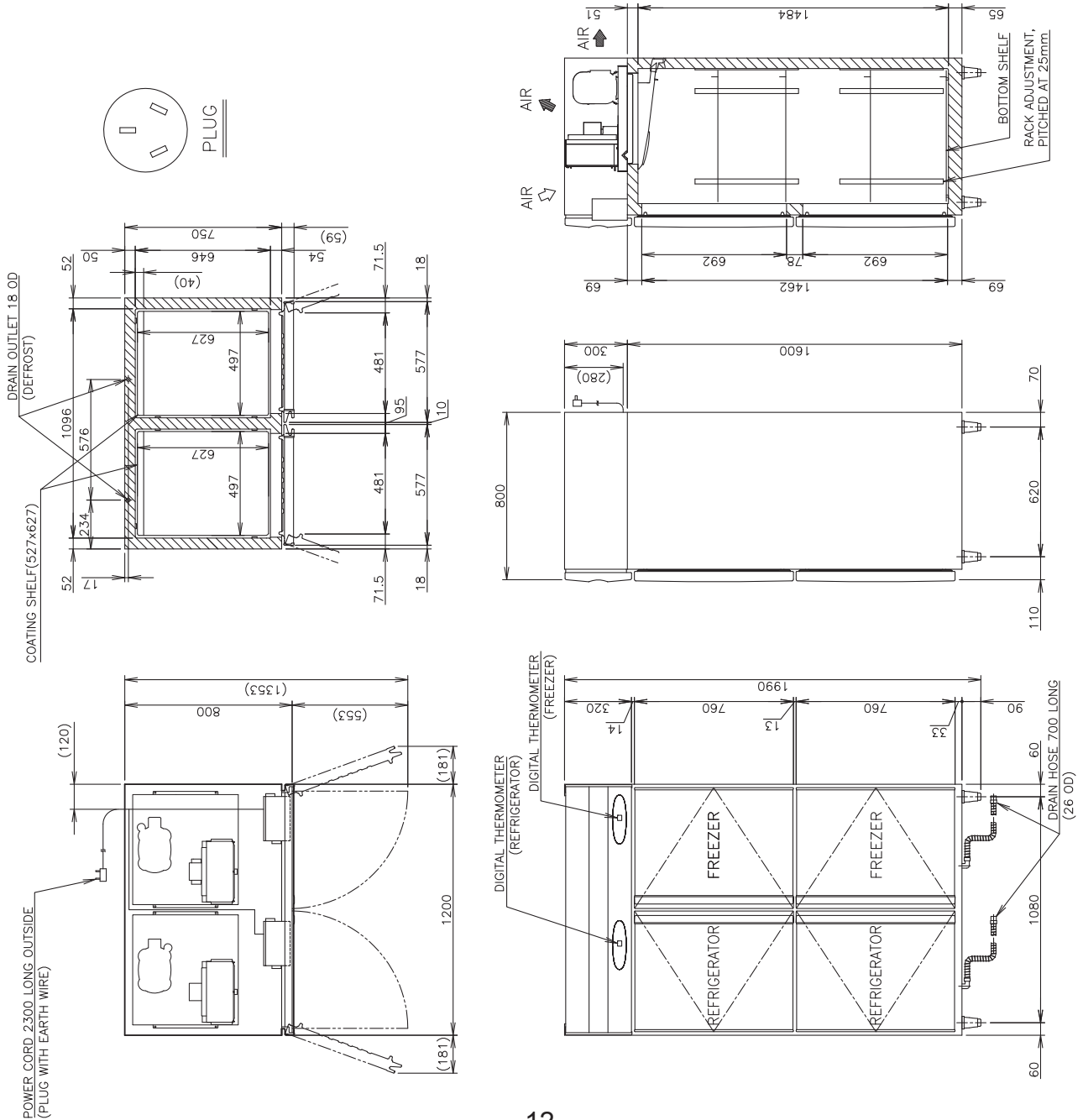


[J] HRFE-127MAF-CHD (Model Code: R282-C501)

ITEM	Hoshizaki Reach-in Freezer/Refrigerator
MODEL	HRFE-127MAF-CHD
POWER SUPPLY	1 Phase 220 ~ 240V 50Hz Capacity: 1.06kVA (4.80A)
AMPERAGE	Rated: 4.8A Starting: 10.7A
ELECTRIC CONSUMPTION	672W (Power Factor: 78%)
HEAT REJECTION	Heater: 360W Defrost: 360W 1140W
POWER CORD	2.3m (Plug with Earth Wire)
EFFECTIVE CAPACITY	Total 908L (Refrigerator: 454L, Freezer: 454L)
OUTSIDE DIMENSIONS	1200mm(W)×800mm(D)×1990mm(H)
INSIDE DIMENSIONS	Refrigerator 521mm(W)×646mm(D)×1484mm(H) Freezer 521mm(W)×646mm(D)×1484mm(H)
EXTERIOR	Stainless Steel, Galvanized Steel(Rear, Bottom)
INTERIOR	Stainless Steel, ABS Plastic(Door)
INSULATION	Polyurethane Foam
INSULATION FOAM BLOWING AGENT	Cyclopentane
REFRIGERATION SYSTEM	Forced Air Circulation
DEFROST SYSTEM	Refrigerator Off Cycle Freezer Heater
COMPRESSOR	Refrigerator Hermetic 158W(Cooling Capacity) Freezer Hermetic 480W(Cooling Capacity)
CONDENSER	Refrigerator Fin and Tube Type, Air-cooled Freezer Fin and Tube Type, Air-cooled
EVAPORATOR	Refrigerator Fin and Tube type Freezer Fin and Tube type
REFRIGERANT	Refrigerator R134a Freezer R404A
TEMPERATURE CONTROL	Refrigerator Refrigerator Freezer Freezer
DEFROST CONTROL	Microprocessor
ELECTRIC CIRCUIT PROTECTION	Earth Wire
REFRIGERANT CIRCUIT PROTECTION	Motor Protector (Auto-reset)
LEG	Plastic Adjustable from 90 to 120mm
SHELF	8 pcs.(Include Bottom Shelf)
WEIGHT	167kg (Gross 198kg)
PACKAGE	Carton (Wooden Pallet) 1260mm(W)×900mm(D)×2075mm(H)
ACCESSORIES	Drain Hose×2
OPERATING CONDITIONS	Ambient Temperature: 5 ~ 43° C

\*We reserve the right to make changes in specifications and design without prior notice.

1. Install the product properly in accordance with the instructions on location, water supply/ drain connections and electrical connections stated in the instruction and installation manuals provided.  
Allow 10mm extra space at the installation site to meet any installation requirements (additional spacing is also required for proper air flow and pipe connections).
2. The heat rejection is based on the reached pulldown temperature at ambient temperature of 35°C.
3. Product Code: R282-C501



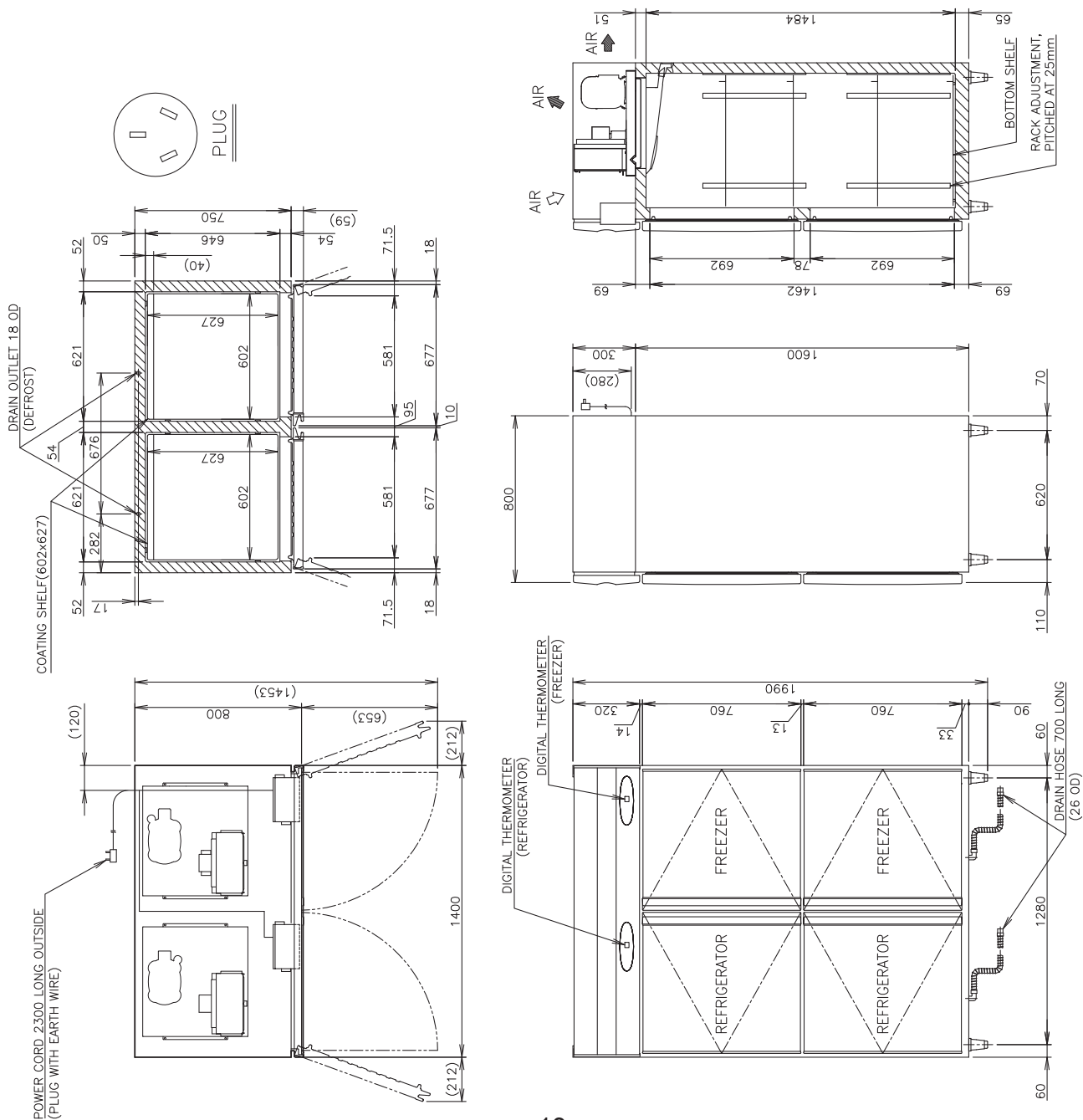


**[k] HRFE-147MAF-CHD (Model Code: R283-C501)**

ITEM	Hoshizaki Reach-in Freezer/Refrigerator		
MODEL	HRFE-147MAF-CHD		
POWER SUPPLY	1 Phase 220 ~ 240V	50Hz	Capacity: 1.02MVA (4.70A)
AMPERAGE	Rated: 5.1A Starting: 10.7A		
ELECTRIC CONSUMPTION	672W (Power Factor: 80%)		
HEAT REJECTION	Heater: 367W Defrost: 367W		
POWER CORD	1140W		
EFFECTIVE CAPACITY	2.3m (Plug with Earth Wire)		
OUTSIDE DIMENSIONS	Total 1100L (Refrigerator: 550L, Freezer: 550L)		
INSIDE DIMENSIONS	1400mm(W) x 800mm(D) x 1900(-2020)mm(H)		
EXTERIOR	Refrigerator	621mm(W) x 646mm(D) x 1484mm(H)	
INTERIOR	Freezer	621mm(W) x 646mm(D) x 1484mm(H)	
INSULATION	Stainless Steel, Galvanized Steel(Rear, Bottom)		
INSULATION FOAM BLOWING AGENT	Stainless Steel, ABS Plastic(Door)		
REFRIGERATION SYSTEM	Polyurethane Foam		
DEFROST SYSTEM	Cyclopentane		
COMPRESSOR	Forced Air Circulation		
CONDENSER	Refrigerator	Off Cycle	
EVAPORATOR	Freezer	Heater	
REFRIGERANT	Refrigerator	Hermetic 158W(Cooling Capacity)	
TEMPERATURE CONTROL	Freezer	Hermetic 480W(Cooling Capacity)	
DEFROST CONTROL	Refrigerator	Fin and Tube Type, Air-cooled	
ELECTRIC CIRCUIT PROTECTION	Freezer	Fin and Tube Type, Air-cooled	
REFRIGERANT CIRCUIT PROTECTION	Refrigerator	Fin and Tube Type	
LEG	Freezer	Fin and Tube type	
SHELF	Refrigerator	RT134a	
WEIGHT	Freezer	R404A	
PACKAGE	Refrigerator	Microprocessor	
ACCESSORIES	Freezer	Wapressure Controlled (Digital Temperature Indicator)	Adjustable from -2 to 17C
OPERATING CONDITIONS	Freezer	Wapressure Controlled (Digital Temperature Indicator)	Adjustable from -20 to -7C
	Earth Wire, Circuit Breaker		
	Motor Protector (Auto-reset)		
	Plastic Adjustable from 90 to 120mm		
	8 pcs.(Include Bottom Shelf)		
	183kg (Gross 218kg)		
	Carton (Wooden Pallet) 1460mm(W)x900mm(D)x2075mm(H)		
	Drain Hose x2		
	Ambient Temperature: 5 ~ 43°C		
	Voltage Range: Rated Voltage ±6%		

We reserve the right to make changes in specifications and design without prior notice.

1. Install the product properly in accordance with the instructions on location, water supply/drain connections and electrical connections stated in the instruction and installation manuals provided.  
Allow 10mm extra space at the installation site to meet any installation requirements (additional spacing is also required for proper air flow and pipe connections).
2. The heat rejection is based on the reached pull-down temperature at ambient temperature of 35°C.
3. Product Code: R283—C501

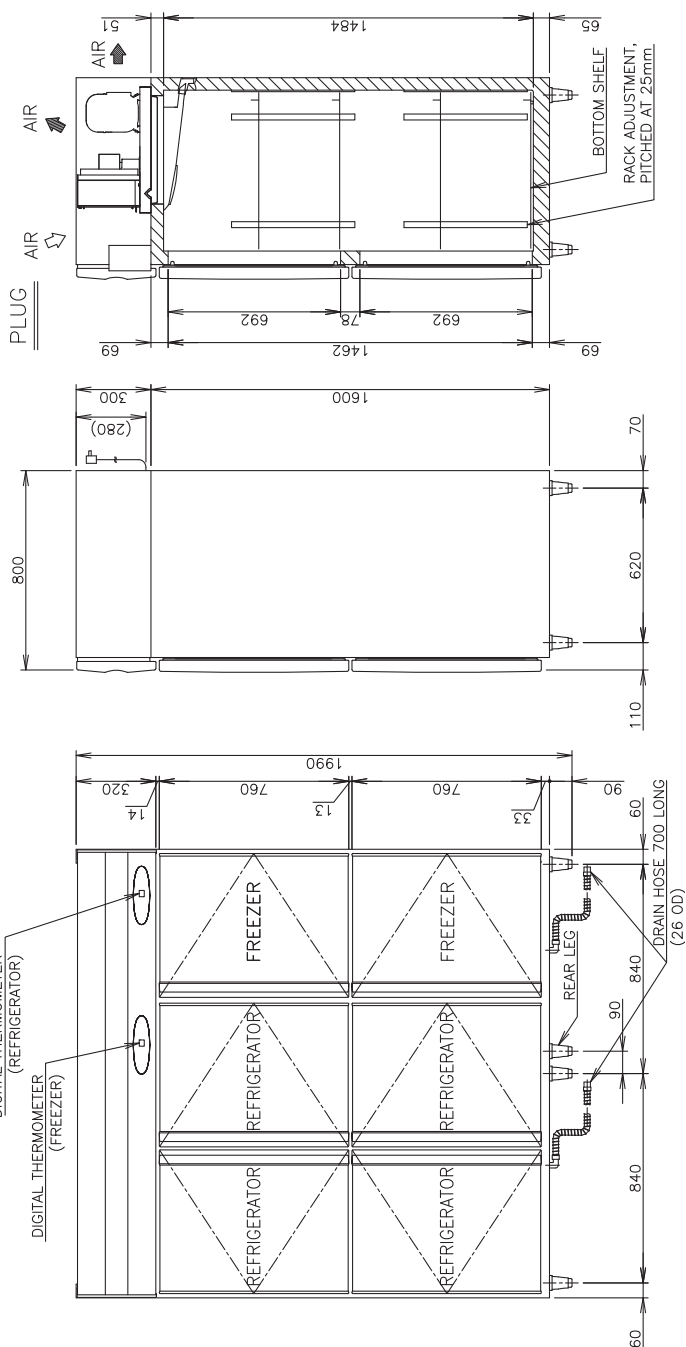
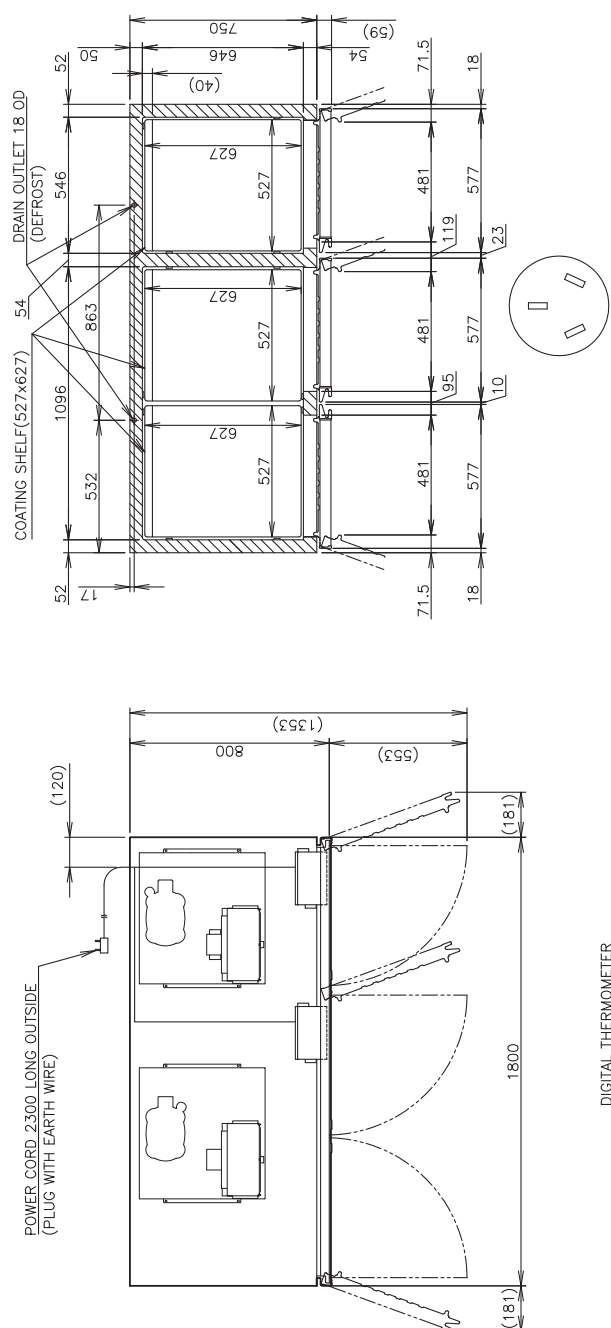


**[I] HRFE-187MAF-CHD (Model Code: R284-C501)**

ITEM	Hoshizaki Reach-in Freezer/Refrigerator		
MODEL	HRFE-187MAF-CHD		
POWER SUPPLY	1 Phase 220 ~ 240V 50Hz Capacity: 1.25kVA (5.70A)		
AMPERAGE	Rated: 6.0A Starting: 12.0A		
ELECTRIC CONSUMPTION	752W (Power Factor: 73%) Heater: 385W Defrost: 385W		
HEAT REJECTION	1320W		
POWER CORD	2.3m (Plug with Earth Wire)		
EFFECTIVE CAPACITY	Total 1523L (Refrigerator: 1025L, Freezer: 498L)		
OUTSIDE DIMENSIONS	1800mm(W) x 800mm(D) x 1900 (-2020)mm(H)		
INSIDE DIMENSIONS	Refrigerator 1096mm(W) x 646mm(D) x 1484mm(H) Freezer 546mm(W) x 646mm(D) x 1484mm(H)		
EXTERIOR	Stainless Steel, Galvanized Steel (Rear, Bottom)		
INTERIOR	Stainless Steel, ABS Plastic (Door)		
INSULATION	Polyurethane Foam		
INSULATION FOAM BLOWING AGENT	Cyclopentane		
REFRIGERATION SYSTEM	Forced Air Circulation		
DEFROST SYSTEM	Refrigerator Off Cycle Freezer Heater		
COMPRESSOR	Refrigerator Hermetic 270W (Cooling Capacity) Freezer Hermetic 480W (Cooling Capacity)		
CONDENSER	Refrigerator Fin and Tube Type, Air-cooled Freezer Fin and Tube Type, Air-cooled		
EVAPORATOR	Refrigerator Fin and Tube type Freezer Fin and Tube type		
REFRIGERANT	Refrigerator R134a Freezer R404A		
TEMPERATURE CONTROL	Refrigerator Microprocessor Controlled (Digital Temperature Indication) Adjustable from -2 to 17C Freezer Microprocessor Controlled (Digital Temperature Indication) Adjustable from -23 to -7C		
DEFROST CONTROL	Microprocessor		
ELECTRIC CIRCUIT PROTECTION	Earth Wire		
REFRIGERANT CIRCUIT PROTECTION	Motor Protector (Auto-reset)		
LEG	Plastic Adjustable from 90 to 120mm		
SHELF	12 pcs. (Include Bottom Shelf)		
WEIGHT	216kg (Gross 258kg)		
PACKAGE	Carton (Wooden Pallet) 1860mm(W) x 900mm(D) x 2075mm(H)		
ACCESSORIES	Drain Hose x 2		
OPERATING CONDITIONS	Ambient Temperature: 5 ~ 43°C Voltage Range: Rated Voltage $\pm 6\%$		

**Voltage Range:** 100V-240V

1. Install the product properly in accordance with the instructions on location, water supply/drain connections and electrical connections stated in the instruction and installation manuals provided.
  - Allow 10mm extra space at the installation site to meet any installation requirements (additional spacing is also required for proper air flow and pipe connections).
2. The heat rejection is based on the reached pulldown temperature at ambient temperature of 35°C.

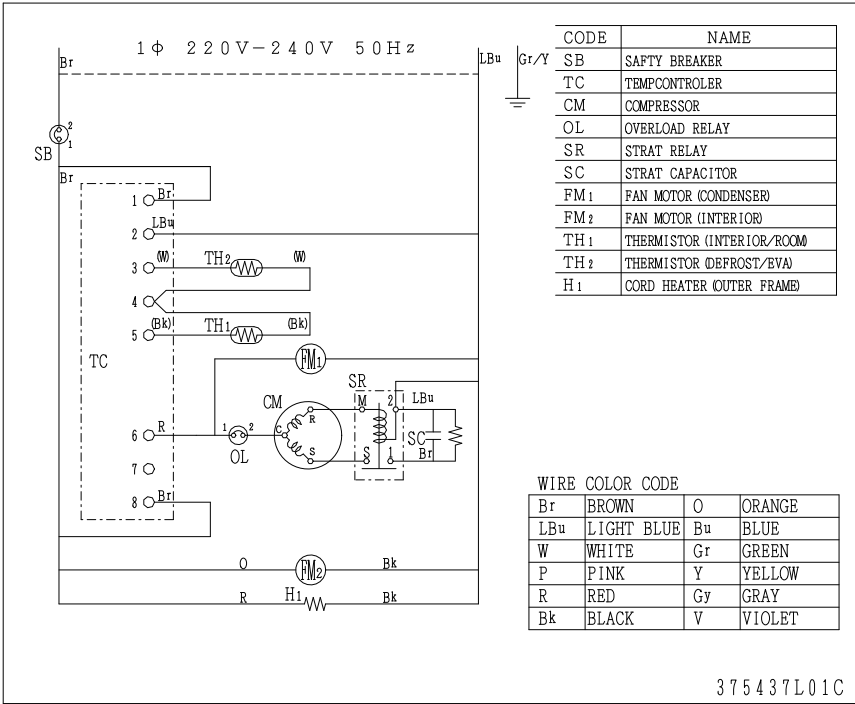


# II. TECHNICAL INFORMATION

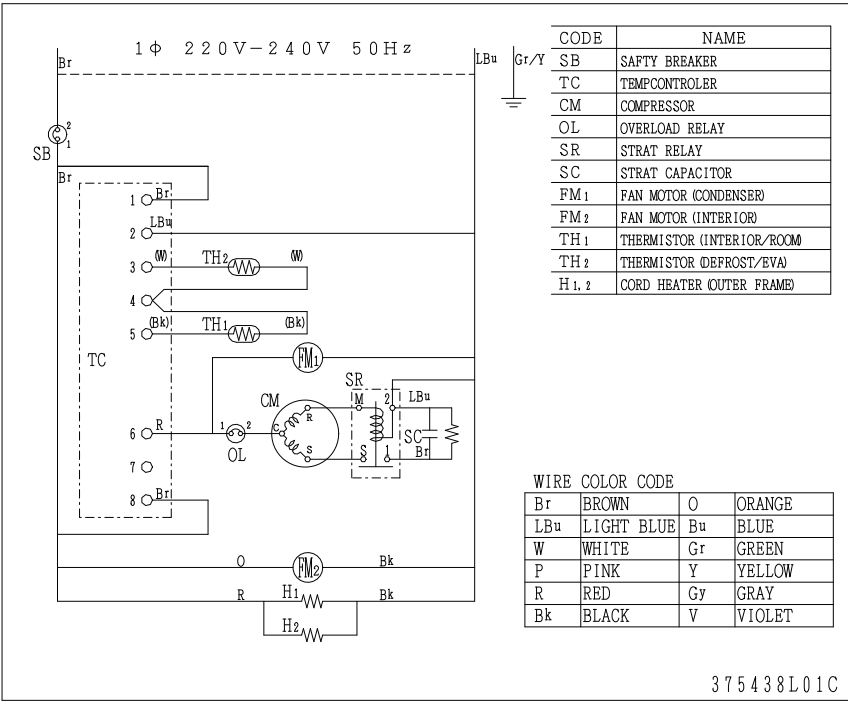
## 1. WIRING DIAGRAM

\*Standard models: model names and model codes for representative models only

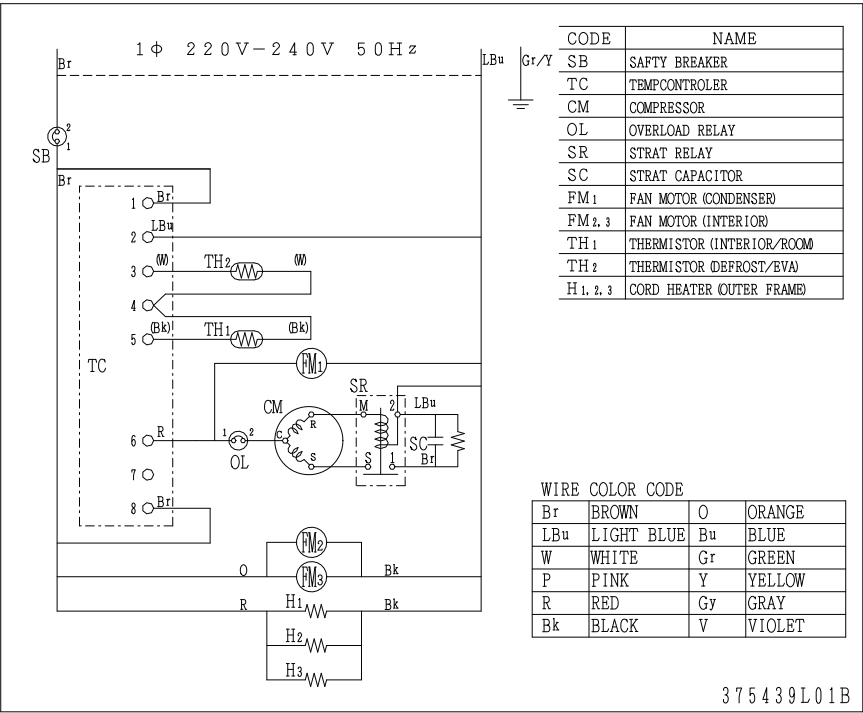
### [a] HRE-77MA-CHD (Model Code: R262-C501)



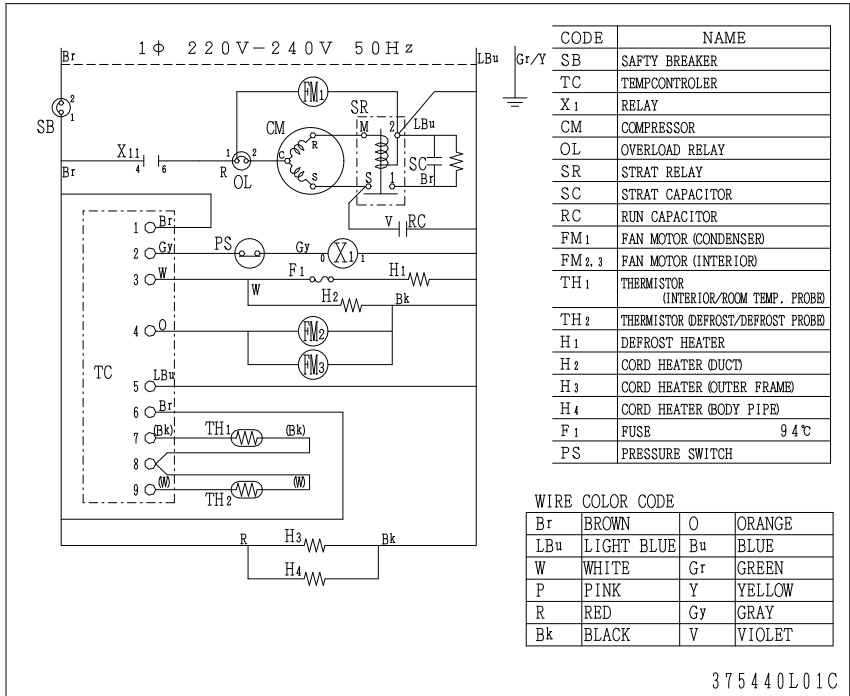
### [b] HRE-127MA-CHD (Model Code: R263-C501) HRE-147MA-CHD (Model Code: R264-C501)



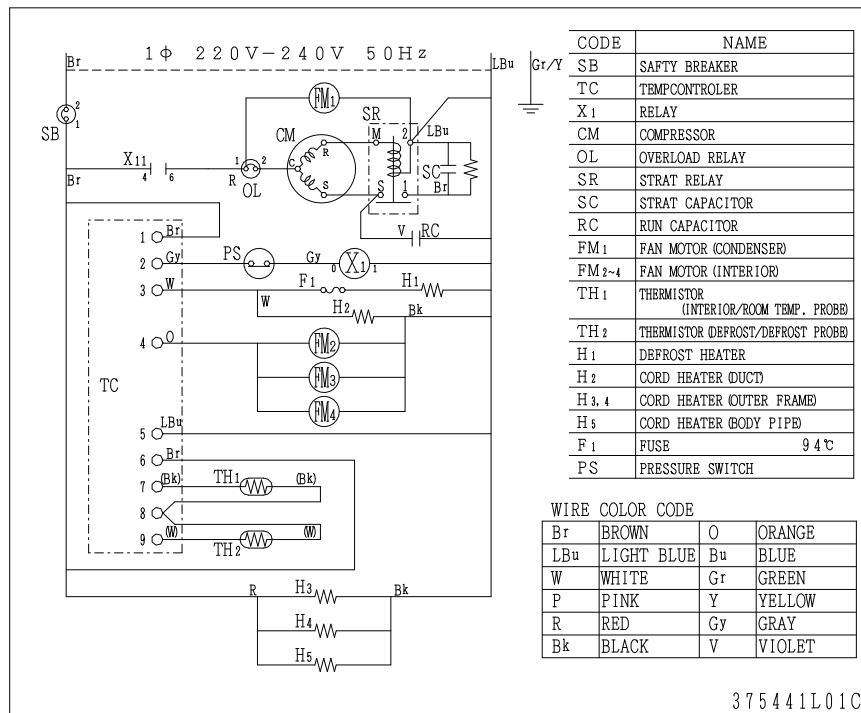
[c] HRE-187MA-CHD (Model Code: R265-C501)



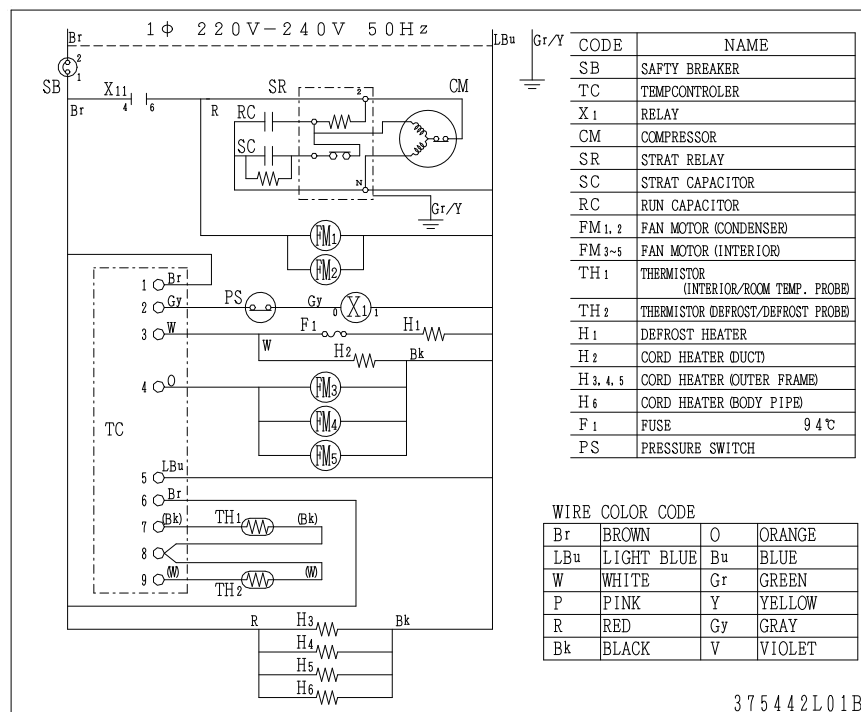
[d] HFE-77MA-CHD (Model Code: R266-C501)



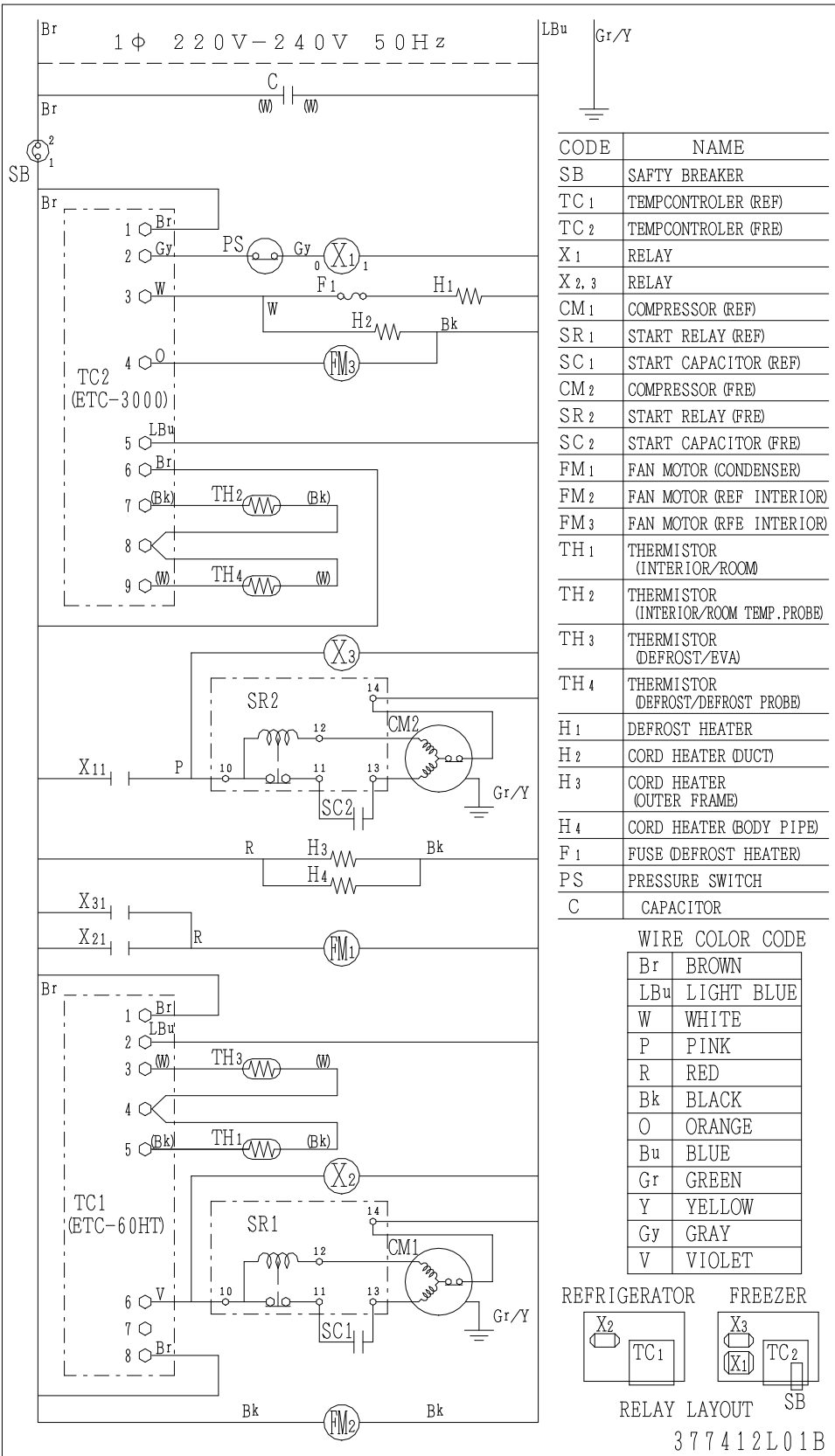
**[e] HFE-127MA-CHD (Model Code: R267-C501)**  
**HFE-147MA-CHD (Model Code: R268-C501)**



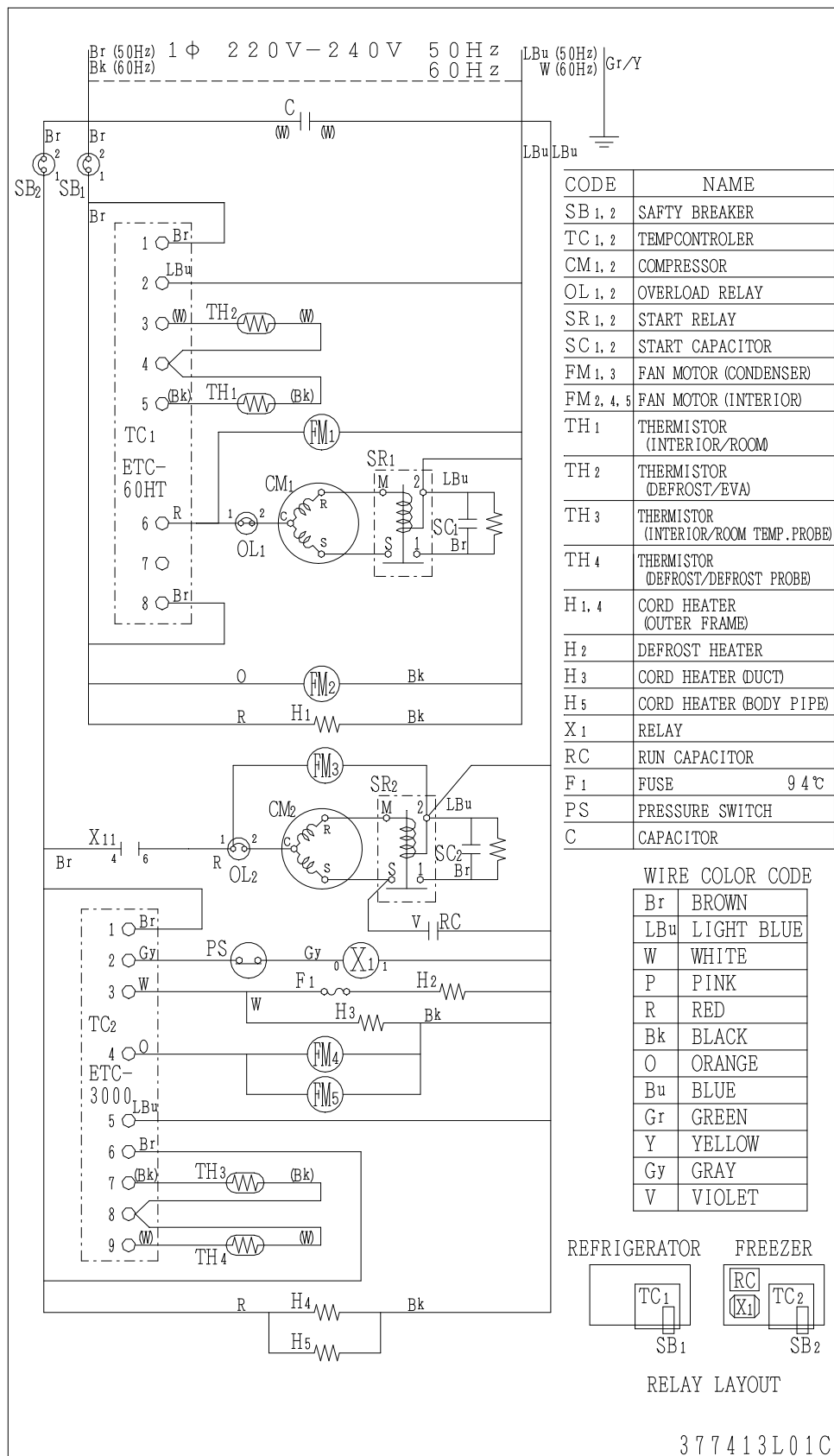
**[f] HFE-187MA-CHD (Model Code: R269-501)**



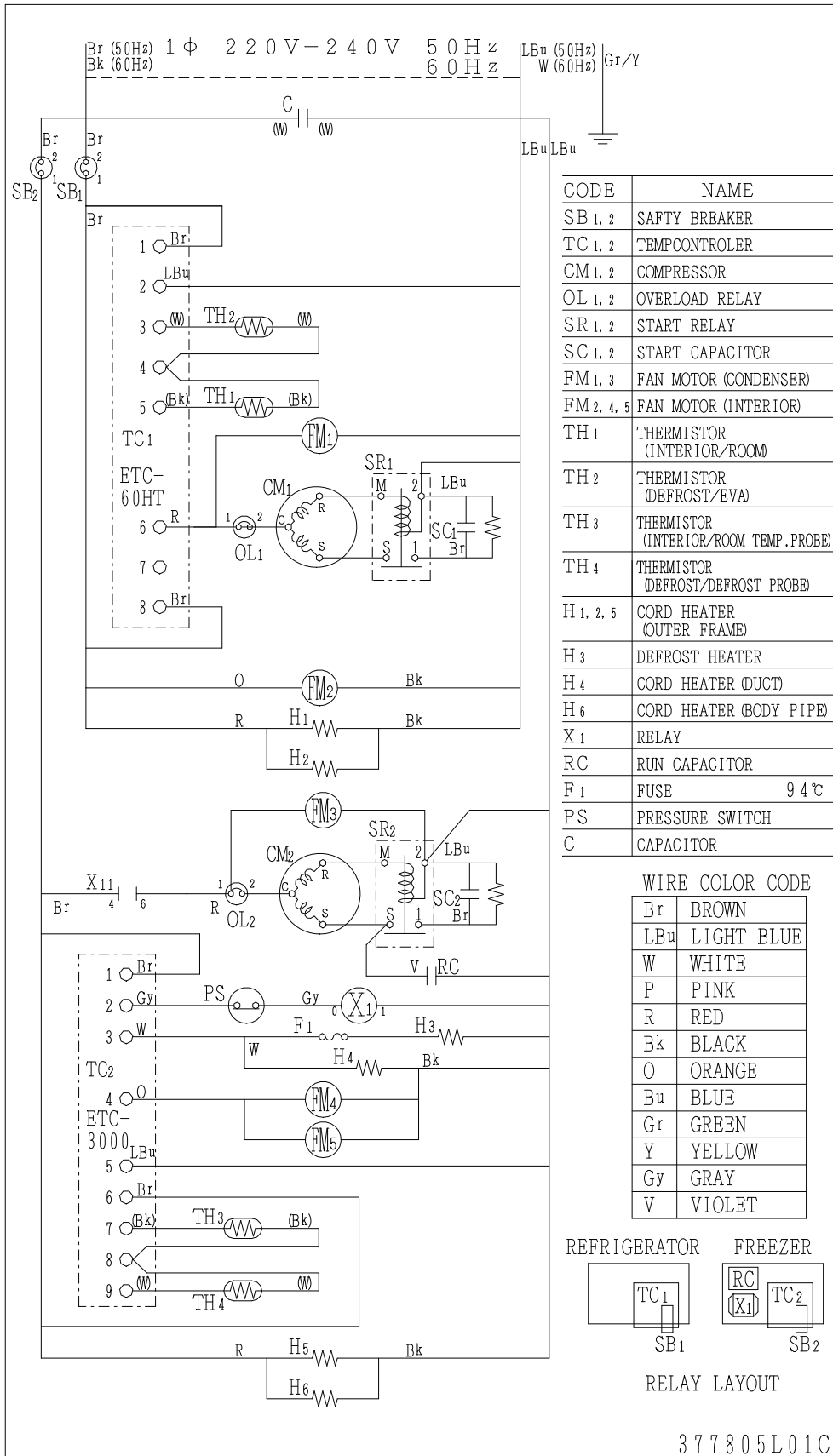
[g] HRFE-77MA-CHD (Model Code: R281-C501)



**[h] HRFE-127MAF-CHD (Model Code: R282-C501)**  
**HRFE-147MAF-CHD (Model Code: R283-C501)**



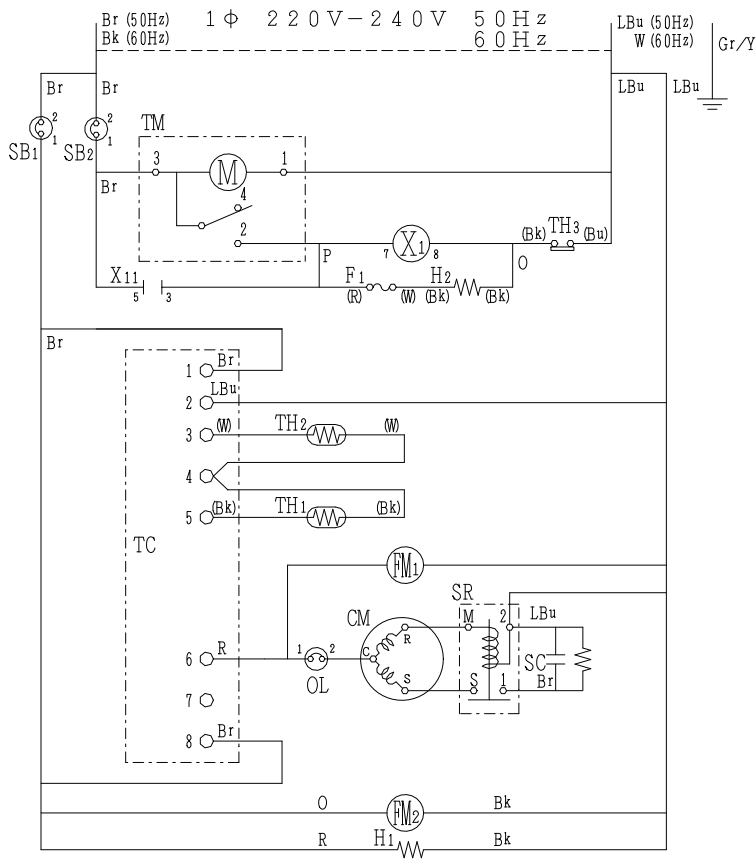
**[i] HRFE-187MAF-CHD (Model Code: R284-C501)**





\*Forced drain water evaporation models: model names and model codes for representative models only

[j] HRE-77MA-CHD (Model Code: R262-C571)

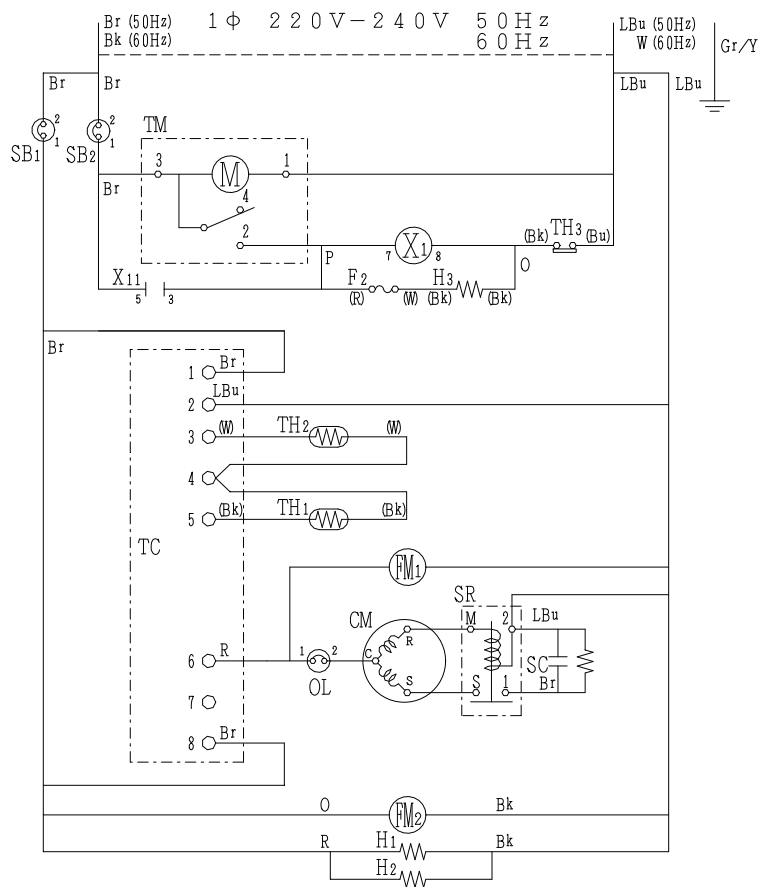


CODE	NAME
SB 1	SAFTY BREAKER
SB 2	SAFTY BREAKER
TC	TEMPCONTROLLER
X 1	RELAY
CM	COMPRESSOR
OL	OVERLOAD RELAY
SR	STRAT RELAY
SC	STRAT CAPACITOR
FM 1	FAN MOTOR (CONDENSER)
FM 2	FAN MOTOR (INTERIOR)
TH 1	THERMISTOR (INTERIOR/ROOM)
TH 2	THERMISTOR (DEFROST/EVA)
TH 3	THERMOSTAT
H 1	CORD HEATER (OUTER FRAME)
H 2	DRAIN TANK HEATER
F 1	FUSE (DRAIN TANK) 9 4 °C
TM	TIMER

WIRE COLOR CODE

Br	BROWN	O	ORANGE
LBu	LIGHT BLUE	Bu	BLUE
W	WHITE	Gr	GREEN
P	PINK	Y	YELLOW
R	RED	Gy	GRAY
Bk	BLACK	V	VIOLET

**[k] HRE-127MA-CHD (Model Code: R263-C571)**  
**HRE-147MA-CHD (Model Code: R264-C571)**

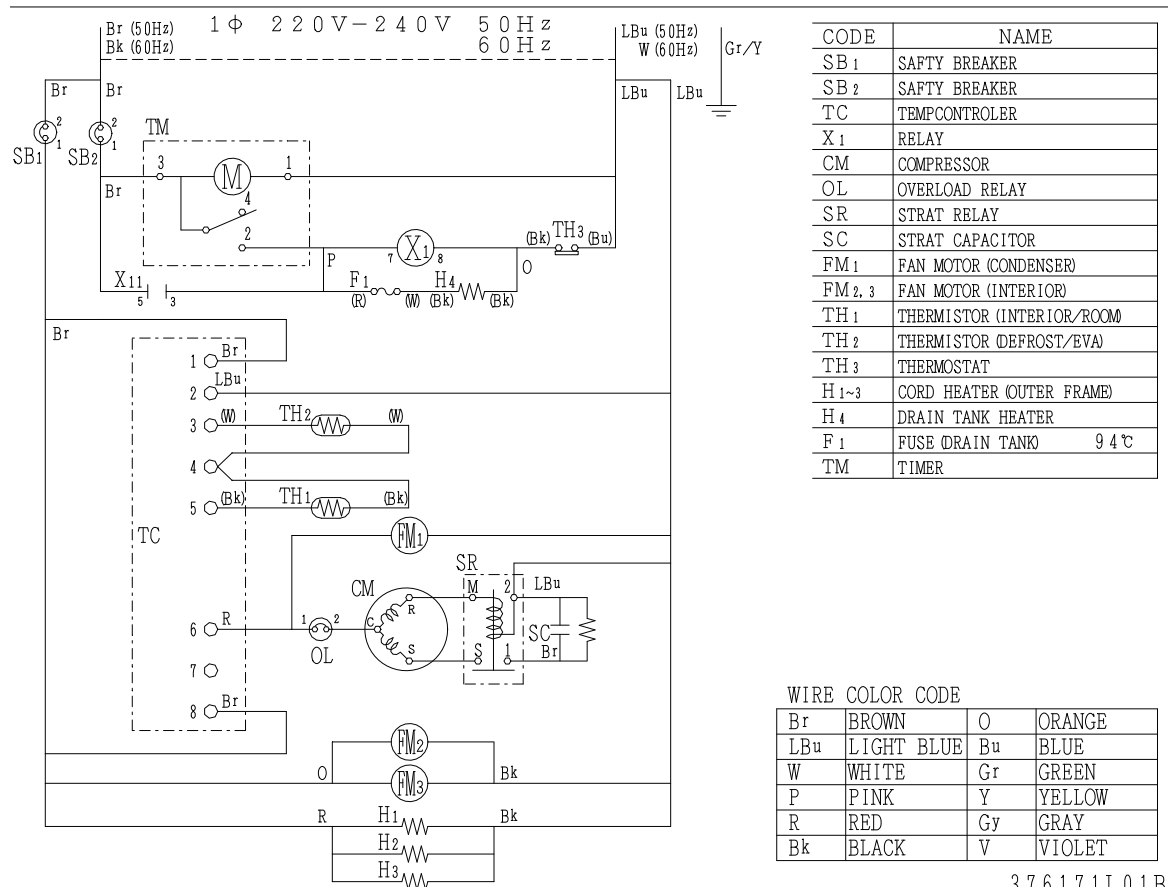


CODE	NAME
SB <sub>1</sub>	SAFTY BREAKER
SB <sub>2</sub>	SAFTY BREAKER
TC	TEMPCONTROLLER
X <sub>1</sub>	RELAY
CM	COMPRESSOR
OL	OVERLOAD RELAY
SR	STRAT RELAY
SC	STRAT CAPACITOR
FM <sub>1</sub>	FAN MOTOR (CONDENSER)
FM <sub>2</sub>	FAN MOTOR (INTERIOR)
TH <sub>1</sub>	THERMISTOR (INTERIOR/ROOM)
TH <sub>2</sub>	THERMISTOR (DEFROST/EVA)
TH <sub>3</sub>	THERMOSTAT
H <sub>1,2</sub>	CORD HEATER (OUTER FRAME)
H <sub>3</sub>	DRAIN TANK HEATER
F <sub>1</sub>	FUSE (DRAIN TANK) 9.4℃
TM	TIMER

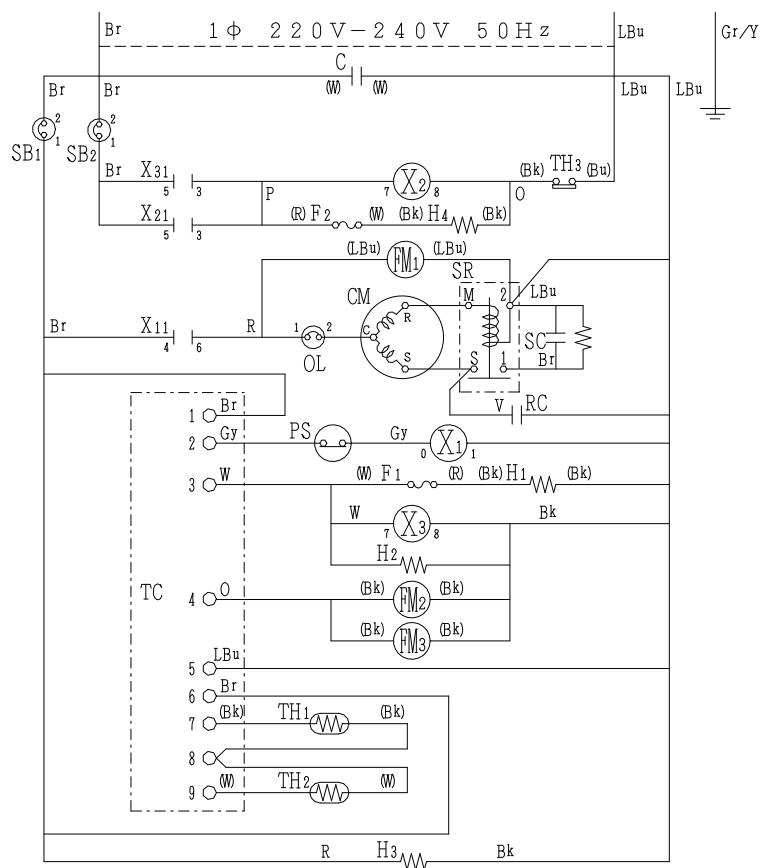
WIRE COLOR CODE

Br	BROWN	O	ORANGE
LBu	LIGHT BLUE	Bu	BLUE
W	WHITE	Gr	GREEN
P	PINK	Y	YELLOW
R	RED	Gy	GRAY
Bk	BLACK	V	VIOLET

[I] HRE-187MA-CHD (Model Code: R265-C571)



# [m] HFE-77MA-CHD (Model Code: R266-C571)



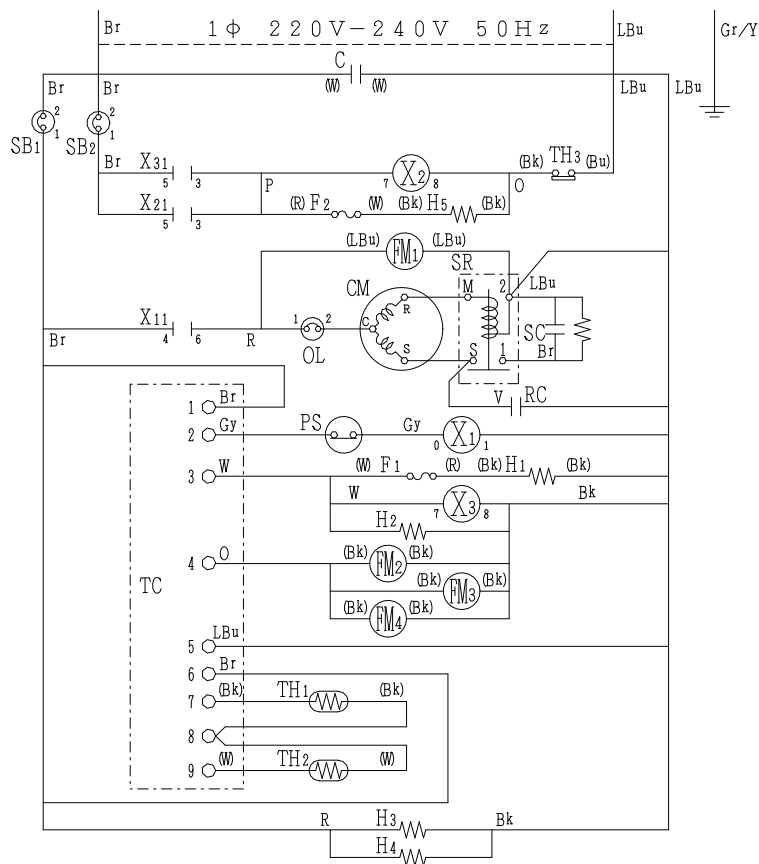
CODE	NAME
SB <sub>1</sub>	SAFTY BREAKER 20A
SB <sub>2</sub>	SAFTY BREAKER 10A
TC	TEMPCONTROLER
X <sub>1</sub>	RELAY
X <sub>2,3</sub>	RELAY
CM	COMPRESSOR
OL	OVERLOAD RELAY
SR	STRAT RELAY
SC	STRAT CAPACITOR
RC	RUN CAPACITOR
FM <sub>1</sub>	FAN MOTOR (CONDENSER)
FM <sub>2,3</sub>	FAN MOTOR (INTERIOR)
TH <sub>1</sub>	THERMISTOR (INTERIOR/ROOM TEMP. PROBE)
TH <sub>2</sub>	THERMISTOR DEFROST/DEFROST PROBE)
TH <sub>3</sub>	THERMOSTAT
H <sub>1</sub>	DEFROST HEATER
H <sub>2</sub>	CORD HEATER (DUCT)
H <sub>3</sub>	CORD HEATER (OUTER FRAME)
H <sub>4</sub>	DRAIN TANK HEATER
F <sub>1</sub>	FUSE 94℃
F <sub>2</sub>	FUSE DRAIN TANK 94℃
PS	PRESSURE SWITCH
C	CAPACITOR

## WIRE COLOR CODE

Br	BROWN	O	ORANGE
LBu	LIGHT BLUE	Bu	BLUE
W	WHITE	Gr	GREEN
P	PINK	Y	YELLOW
R	RED	Gy	GRAY
Bk	BLACK	V	VIOLET

379529L01A

**[n] HFE-127MA-CHD (Model Code: R267-C571)**  
**HFE-147MA-CHD (Model Code: R268-C571)**



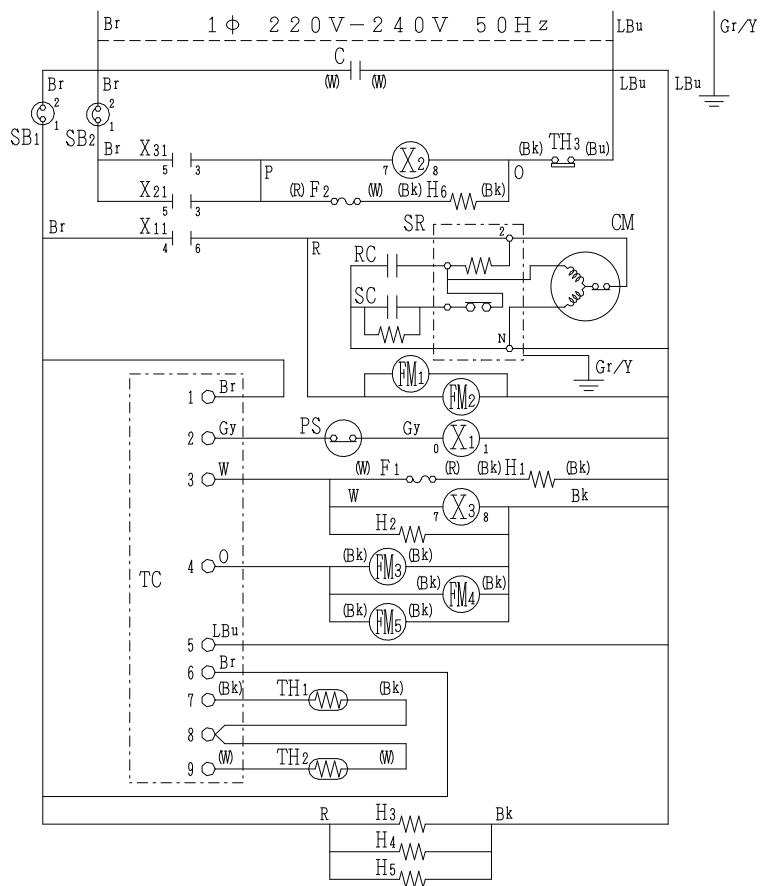
CODE	NAME
SB <sub>1</sub>	SAFTY BREAKER 20A
SB <sub>2</sub>	SAFTY BREAKER 10A
TC	TEMPCONTROLER
X <sub>1</sub>	RELAY
X <sub>2, 3</sub>	RELAY
CM	COMPRESSOR
OL	OVERLOAD RELAY
SR	STRAT RELAY
SC	STRAT CAPACITOR
RC	RUN CAPACITOR
FM <sub>1</sub>	FAN MOTOR (CONDENSER)
FM <sub>2~4</sub>	FAN MOTOR (INTERIOR)
TH <sub>1</sub>	THERMISTOR (INTERIOR/ROOM TEMP. PROBE)
TH <sub>2</sub>	THERMISTOR DEFROST/DEFROST PROBE)
TH <sub>3</sub>	THERMOSTAT
H <sub>1</sub>	DEFROST HEATER
H <sub>2</sub>	CORD HEATER (DUCT)
H <sub>3, 4</sub>	CORD HEATER (OUTER FRAME)
H <sub>5</sub>	DRAIN TANK HEATER
F <sub>1</sub>	FUSE 94℃
F <sub>2</sub>	FUSE DRAIN TANK 94℃
PS	PRESSURE SWITCH
C	CAPACITOR

**WIRE COLOR CODE**

Br	BROWN	O	ORANGE
LBu	LIGHT BLUE	Bu	BLUE
W	WHITE	Gr	GREEN
P	PINK	Y	YELLOW
R	RED	Gy	GRAY
Bk	BLACK	V	VIOLET

379393L01A

# [o] HFE-187MA-CHD (Model Code: R269-C571)



CODE	NAME
SB 1	SAFTY BREAKER 20A
SB 2	SAFTY BREAKER 10A
TC	TEMPCONTROLLER
X 1	RELAY
X 2, 3	RELAY
CM	COMPRESSOR
SR	STRAT RELAY
SC	STRAT CAPACITOR
RC	RUN CAPACITOR
FM 1, 2	FAN MOTOR (CONDENSER)
FM 3~5	FAN MOTOR (INTERIOR)
TH 1	THERMISTOR (INTERIOR/ROOM TEMP. PROBE)
TH 2	THERMISTOR DEFROST/DEFROST PROBE)
TH 3	THERMOSTAT
H 1	DEFROST HEATER
H 2	CORD HEATER (DUCT)
H 3~5	CORD HEATER (OUTER FRAME)
H 6	DRAIN TANK HEATER
F 1	FUSE 9 4℃
F 2	FUSE DRAIN TANK 9 4℃
PS	PRESSURE SWITCH
C	CAPACITOR

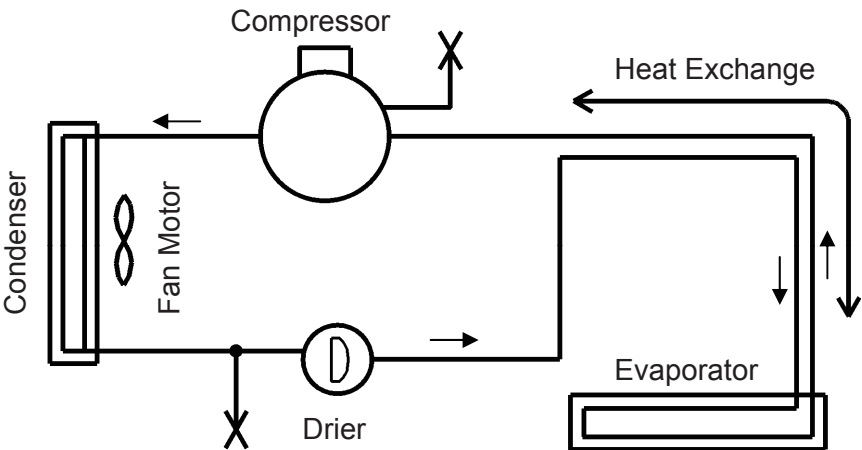
## WIRE COLOR CODE

Br	BROWN	O	ORANGE
Lbu	LIGHT BLUE	Bu	BLUE
W	WHITE	Gr	GREEN
P	PINK	Y	YELLOW
R	RED	Gy	GRAY
Bk	BLACK	V	VIOLET

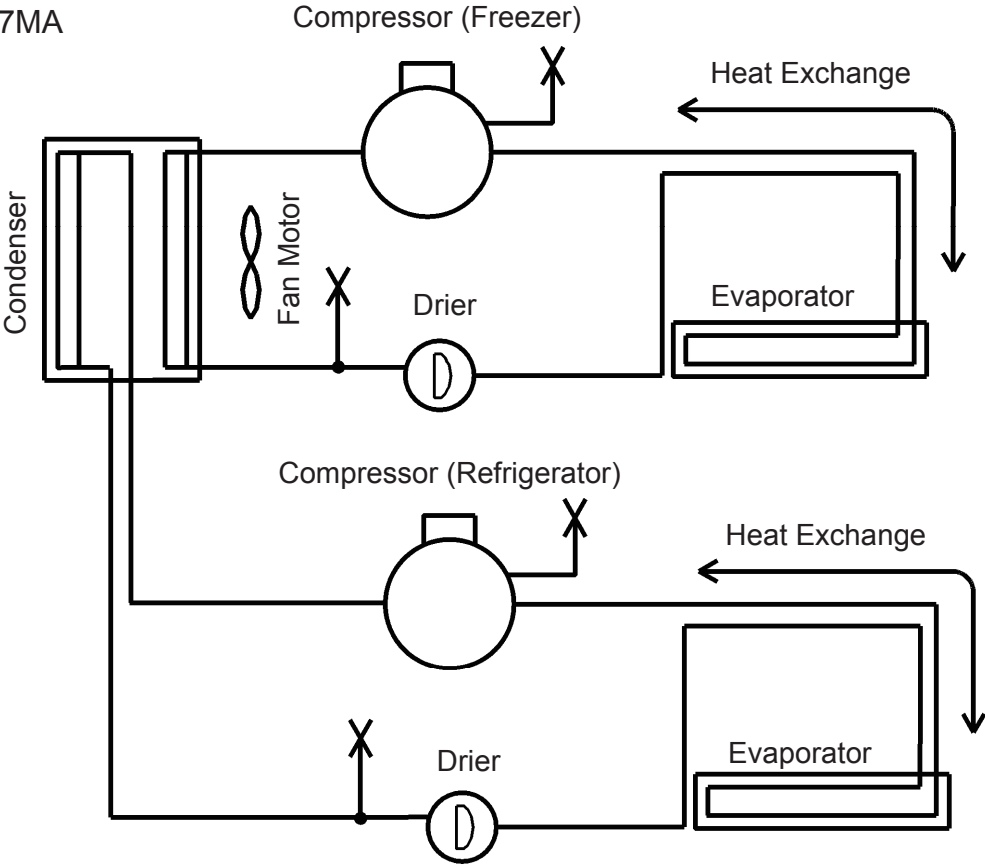
379530L01A

# 2. REFRIGERATION CIRCUIT

HRE/HFE

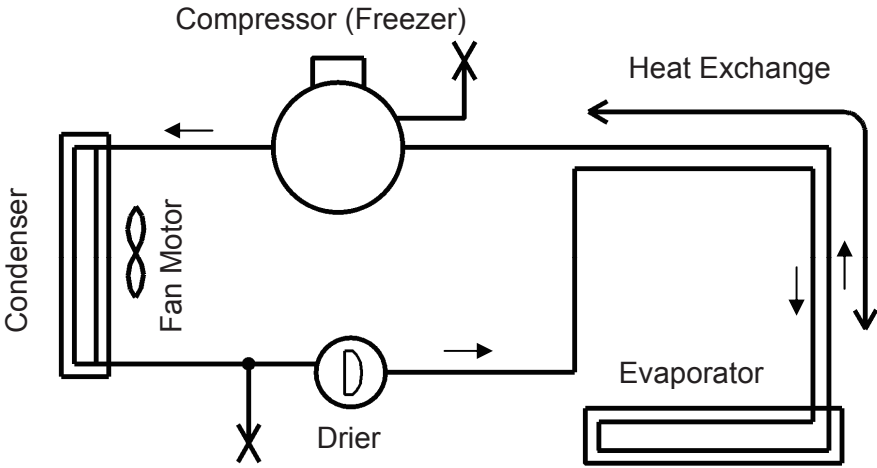
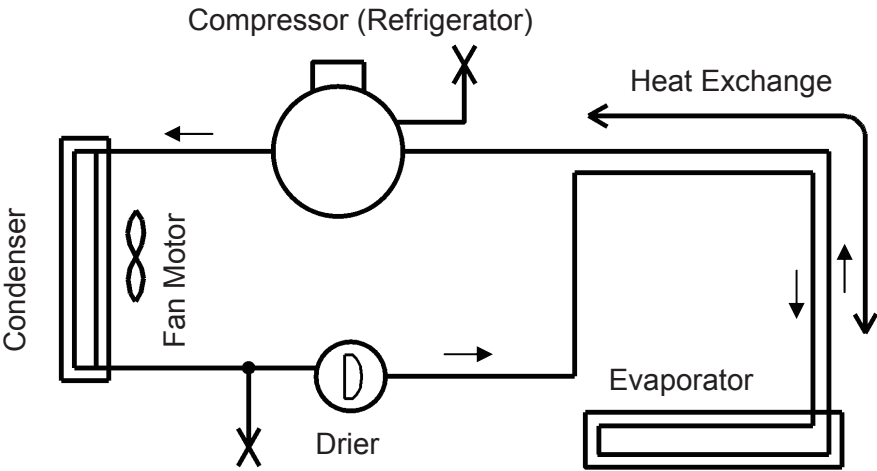


HRFE-77MA



Refrigerant:	HFC-134a	(HRE series) (HRFE refrigerator)
	HFC-404A	(HFE series) (HRFE freezer)

There may be exceptions for some customized models.

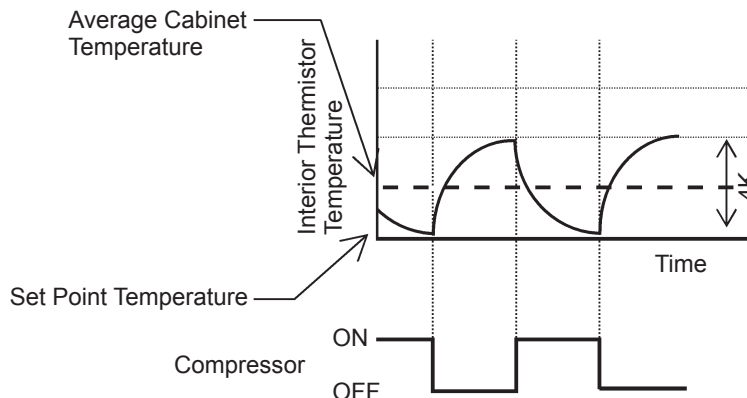




### 3. ELECTRONIC CONTROLS

#### [a] SET POINT TEMPERATURE (compressor OFF temperature)

Off-cycle defrost (HRE series, HRFE series - refrigerator): -2 to +12°C  
Heater defrost (HFE series, HRFE series - freezer): -23 to -7°C



#### [b] CABINET TEMPERATURE DIFFERENTIAL

4 K (from “set point temp” to “set point temp + 4 K”)

The compressor stops when the cabinet temperature reaches down to the set point temperature, and starts when the cabinet temperature rises to the set point temperature + 4°C. Accordingly, the average cabinet temperature will be around the set point temperature + 2°C.

#### [c] DEFROST CYCLE

The unit automatically defrosts the evaporator 3 hours (refrigerator) or 6 hours (freezer) after the refrigeration starts. The defrost indicator light on the operation panel comes on when the defrost cycle starts.

#### [d] DEFROST TERMINATION TEMPERATURE

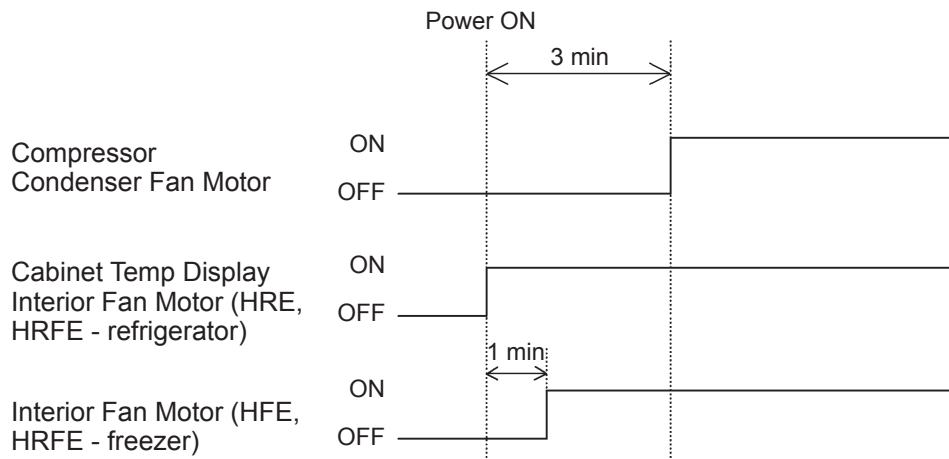
Off-cycle defrost (HRE series, HRFE series - refrigerator): +5  
Heater defrost (HFE series, HRFE series - freezer): +30°C  
Heater defrost (Only HFE-187MA): +20°C

#### [e] TEMPERATURE DISPLAY

During a defrost cycle, the screen indicates “dF” (HFE series, HRFE series - freezer).

## [f] COMPRESSOR SOFT START

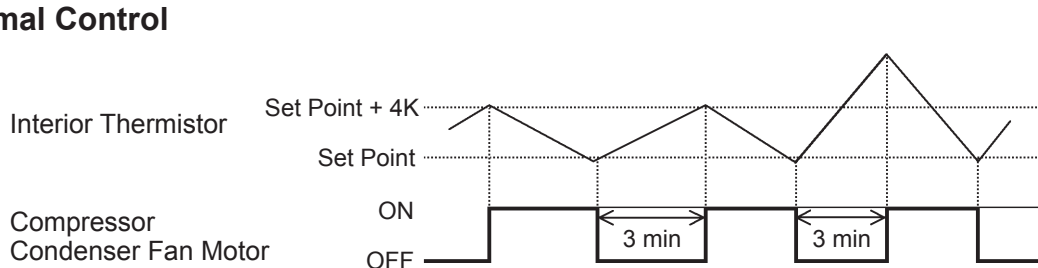
### 1) Startup



When the power supply is turned on, the screen shows the cabinet temperature and the interior fan motor starts up immediately (HRE series, HRFE series - refrigerator) or with a 1 minute delay (HFE series, HRFE series - freezer). The compressor and condenser fan motor start up with a 3 minute delay.

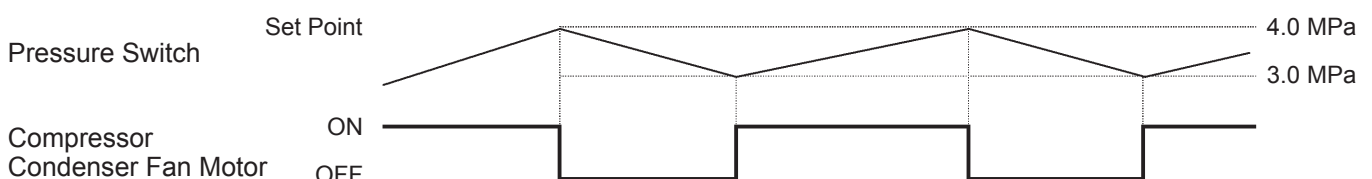
This delay is intended to minimize the difference between the high-side and low-side pressures and to reduce the load on the compressor so that it can start easily in case of a short (especially instantaneous) power failure.

### 2) Normal Control



When the compressor turns off during normal control, it has a mandatory 3 minute delay before startup. For example, if the compressor turns off by its thermistor and the door is opened immediately after (causing the cabinet temperature to immediately exceed the restart temperature), the compressor will still not start until 3 minutes have passed since its shutdown.

## [g] HIGH PRESSURE SWITCH (HFE series, HRFE series - freezer)



## [h] CHECKING SET POINT TEMPERATURE

Note: See “5. CONTROLLER” for the operation panel key locations.

### HRE series, HRFE series - refrigerator

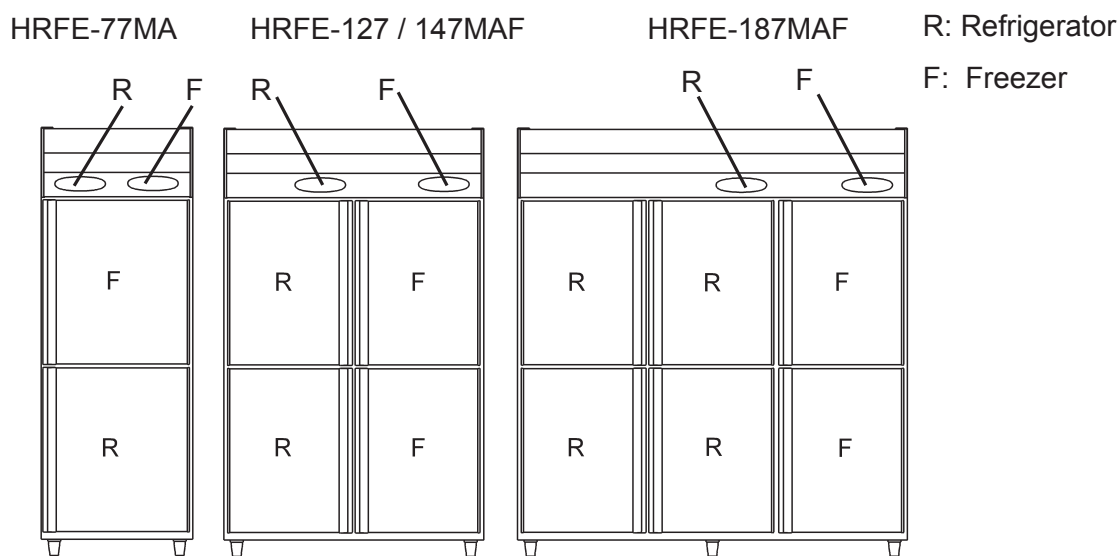
Press and hold the up key on the operation panel to display the set point temperature on the screen. When releasing the up key, the screen displays the cabinet temperature again.

### HFE series, HRFE series - freezer

Press and hold the set key on the operation panel for 3 seconds to display “SEt” on the screen. Press the set key again to display the set point temperature on the screen. After 10 seconds, the screen displays the cabinet temperature again.

- Use the controller on the left side to set the refrigerator compartment temperature. Refer to the standard model instruction manual for temperature setting details.
- Use the controller on the right side to set the freezer compartment temperature. Refer to the standard model instruction manual for temperature setting details.

Note: The right side controller has a darker display than the left side controller, but is not defective.



## [i] MANUAL DEFROST

To start the manual defrost cycle, press the defrost/rest key (HRE series, HRFE series - refrigerator) or defrost key (HFE series, HRFE series - freezer) for 3 seconds. The defrost indicator light on the operation panel comes on when the defrost cycle starts.

## [j] ERROR CODES

### HRE series, HRFE series - refrigerator

Code	Possible Cause	Operation and Remedy
E1	Cabinet sensor (interior thermistor) error	Compressor shuts down. Press any key to stop beep. When troubleshooting is over, system recalculates compressor delay time. See "III. 1. ERROR CODES" for further details.
E2	Evaporator (defrost thermistor) error	Defrost termination temperature is invalid. Press any key to stop beep. See "III. 1. ERROR CODES" for further details.

### HFE series, HRFE series - freezer

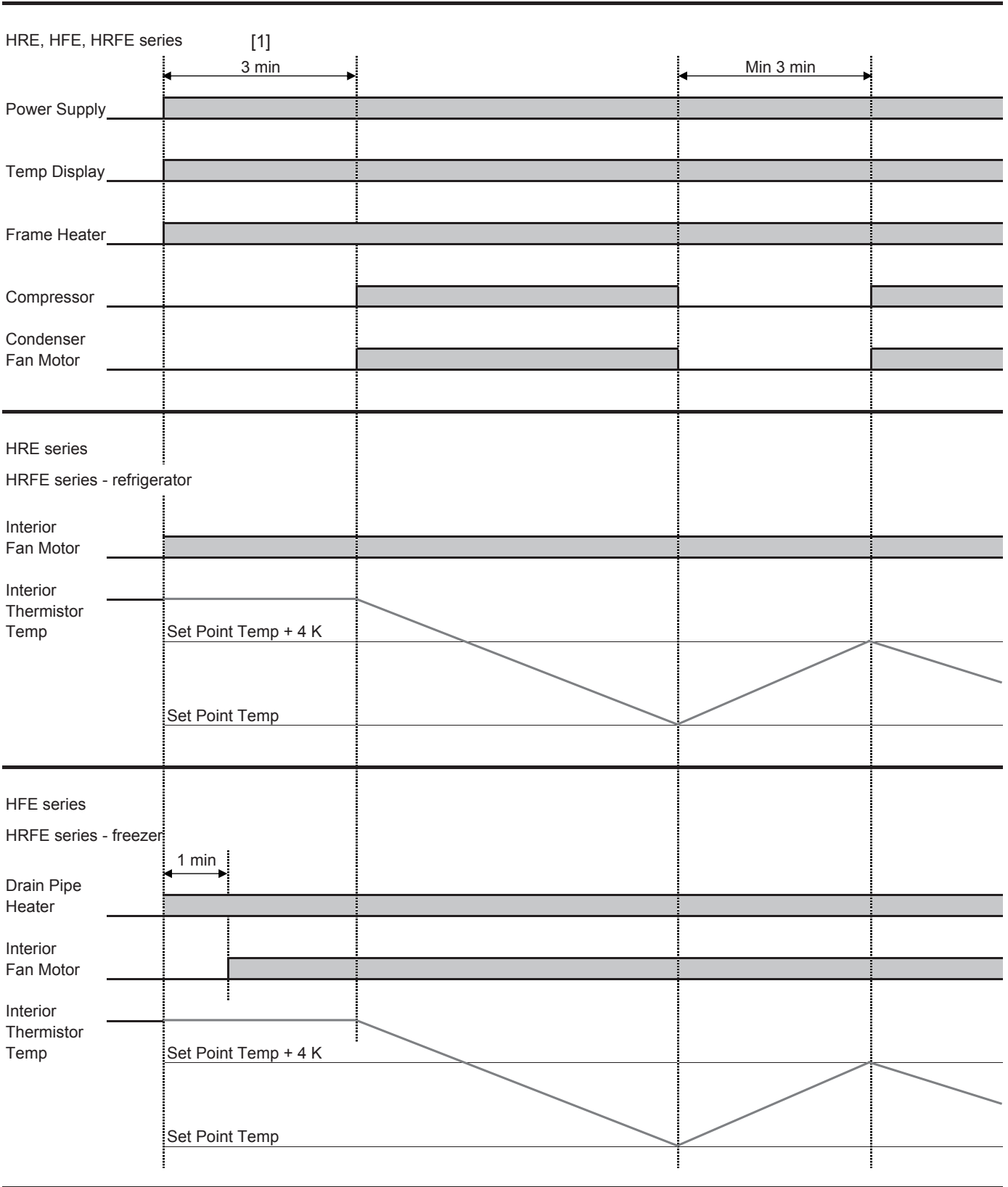
Code	Possible Cause	Operation and Remedy
HHH	Cabinet sensor (interior thermistor) error	Compressor cycles on for 45 minutes and off for 15 minutes. Check cabinet temperature. See "III. 1. ERROR CODES" for further details.
LLL		
HHH * With [6] down key pressed	Cabinet sensor (defrost thermistor) error	Forcibly finishes defrost cycle at the end of defrost time. See "III. 1. ERROR CODES" for further details.
LLL * With [6] down key pressed		

\* The code "dF" is not an error code but indicates the unit is in defrost cycle.

\* When the defrost thermistor is defective, error code will not be displayed without [6] down key being pressed. See "5. [b] HFE SERIES, HRFE SERIES - FREEZER" for operation panel detail.

# 4. TIMING CHART

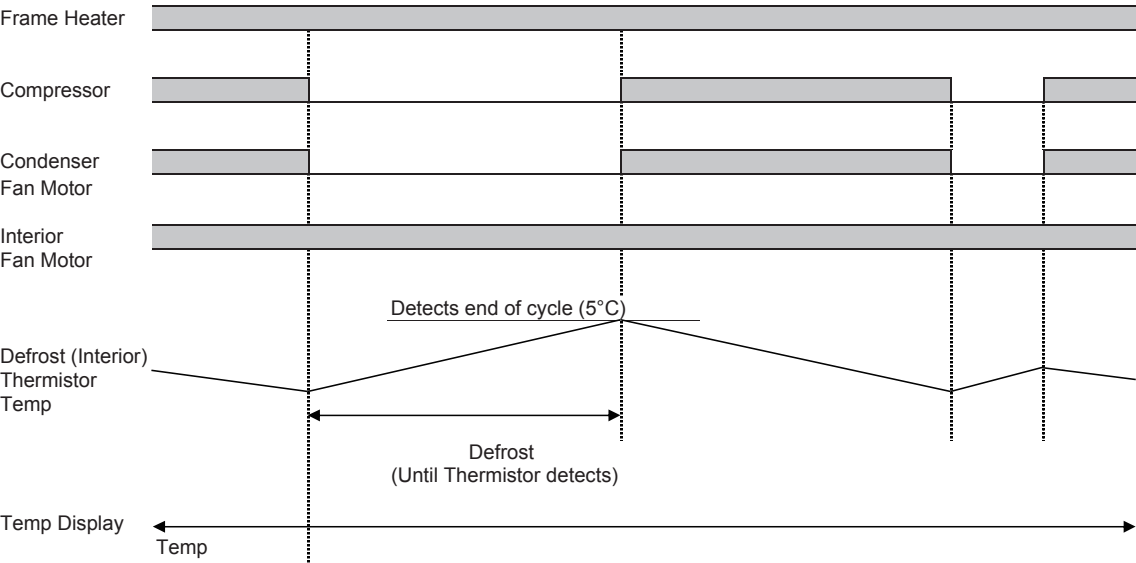
## [a] STARTUP - CONTROL



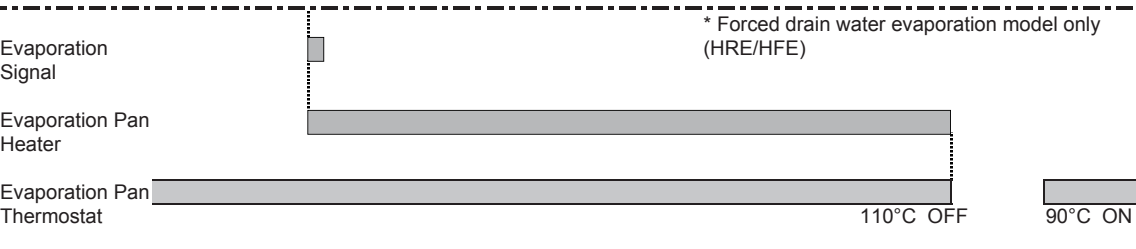
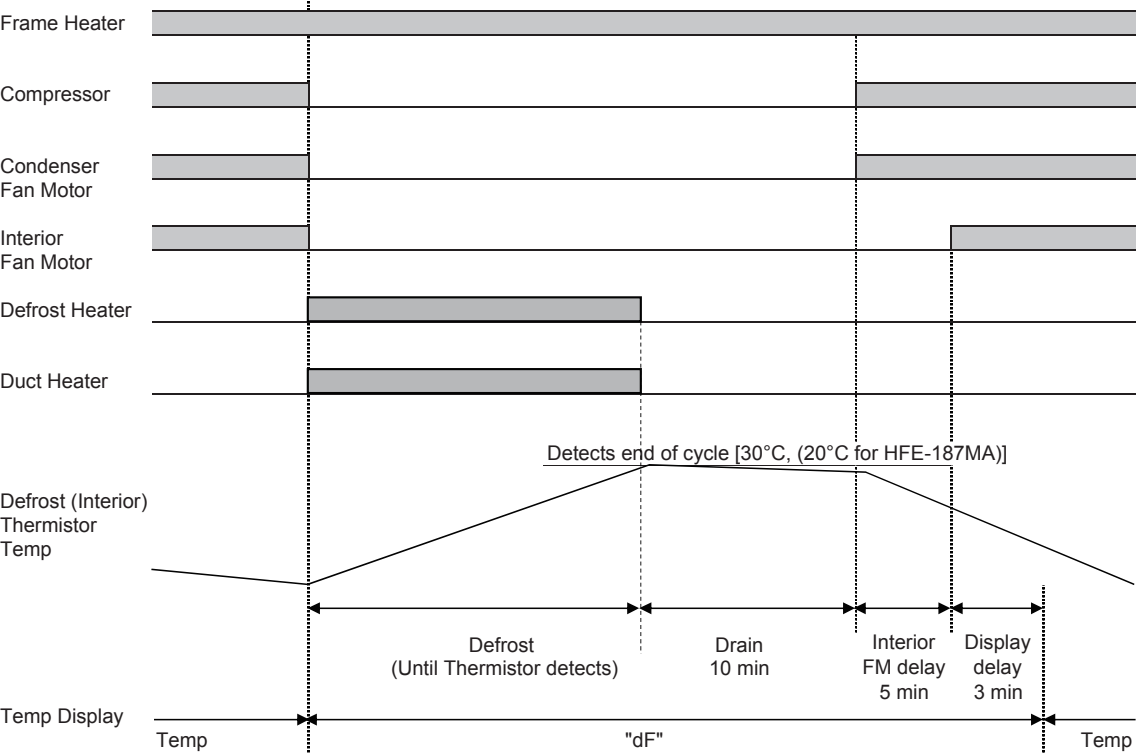
[1] Standby at Startup  
Only temperature indication is available for 3 min (not a sign of failure).

[b] DEFROST

HRE series, HRFE series - refrigerator (Off-cycle defrost)

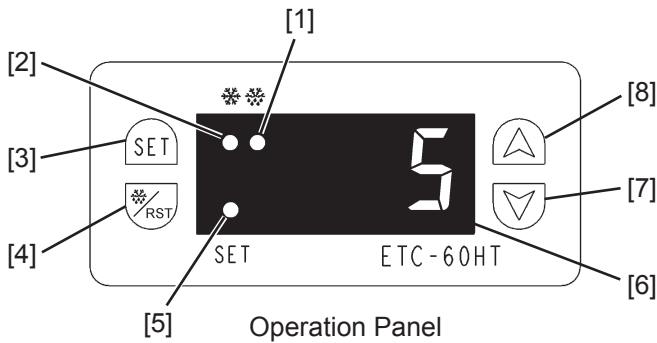


HFE series, HRFE series - freezer (Heater defrost)



## 5. CONTROLLER

### [a] HRE SERIES, HRFE SERIES - REFRIGERATOR



- [1] Defrost Indicator Light
- [2] Refrigeration Indicator Light
- [3] Set Key
- [4] Defrost/Reset Key
- [5] Set Indicator Light
- [6] Screen
- [7] Down Key
- [8] Up Key

#### Indicator Lights

Indicator Light	Symbol	Status	Meaning
Set indicator light	SET	On	Parameter setting
		Off	Measuring and controlling status
		Flash	Parameter check, password input
Refrigeration indicator light	❄️	On	Refrigerating
		Off	Refrigeration stopped
		Flash	Refrigeration delayed
Defrost indicator light	❄️	On	Defrosting
		Off	Defrost stopped

#### Parameters

Code	Function	Set Range	Default	Unit
F01	Menu password	00 to 99 00: cancel keypad lock function	55	NC
F02	Temperature value setting	-2 to 12	1	°C
F03	Temperature return difference setting	1 to 15	4	°C
F04	Delay time of compressor startup	1 to 15	3	min
F05	Cabinet temperature calibration	-5 to +5	-1	°C
F06	Maximum defrost time	1 to 60	60	min
F07	Defrost cycle	1 to 30	6	30 min
F08	Defrost termination temperature	-20 to +30	5	°C
F09	Whether activate evaporator sensor or not	00: inactivate 01: activate	1	NC

#### Key Functions

Key	Function
Set key SET	Press to enter password input status; Parameter setting mode; Switch mode between menu and parameter
Up key ▲	Press to check set point temperature; Choose menu item; Adjust parameter and password value
Down key ▼	Press to check evaporator sensor value; Choose menu item; Adjust parameter and password value
Defrost/reset key ❄️/RST	Exit parameter setting status; Manually start or stop defrosting

## Operations

### 1. Under temperature measuring and controlling status:

#### 1) Press the set key for 3 seconds:

When the keypad password is set as "0", the set indicator light comes on and the screen displays the "F01" menu. There is no password authentication, so directly enter the menu mode to set parameter.

When the keypad password is not set as "0", the set indicator light flashes and the screen displays "00". Press the up or down key to input the password. Press the set key to confirm the password input. Then, the system enters the menu setting status if the password is correct. If the password is incorrect, the set indicator light goes off and the system goes back to the normal measuring and controlling status.

#### 2) Parameter check:

Press the up key. The set indicator light flashes and the screen displays the set point temperature.

Press the down key. The set indicator light flashes and the screen displays the temperature of the evaporator sensor.

### 2. After entering the menu setting status, press the up or down key to choose the desired menu item (from F01 to F09).

### 3. After choosing the desired menu item, press the set key to set parameter value. Press the up or down key to adjust parameter value, and then repress the set key to go back to the menu setting status.

### 4. Under the setting status, press the defrost/reset key or perform no operation for 30 seconds. The system will save the parameters and exit from the parameter setting mode.

### 5. Press the defrost/reset key for 3 seconds to start or stop the manual defrost cycle.

## Output Control

### 1. Compressor:

The compressor starts up when the delay time runs out, if the measured temperature is higher than the "fixed temperature value + temperature return difference".

The compressor stops running when the measured temperature is lower than the set point temperature.

### 2. Defrosting:

Defrosting starts automatically according to the defrost cycle setting, or can be started manually. If the evaporator sensor is activated and the evaporator sensor temperature is higher than the defrost termination temperature, the manual start is not available.

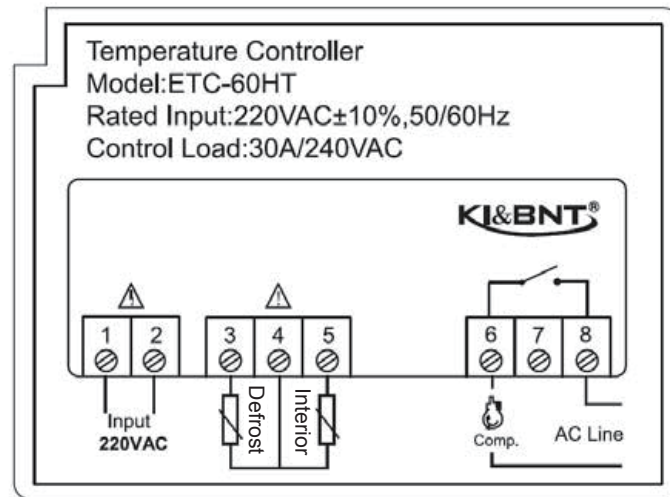


Defrosting stops automatically when the evaporator temperature reaches the defrost termination temperature or when the defrost time runs out, or can be stopped manually. If the evaporator sensor is not activated or in error, defrosting stops when the defrost time runs out, or can be stopped manually.

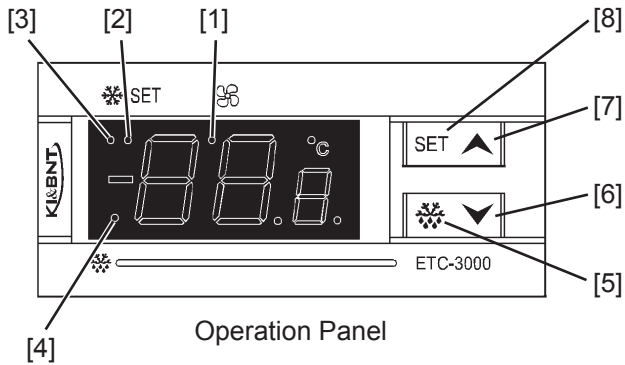
### Sensor Error Alarm

Alarm Code	Possible Cause	Operation
E1	Cabinet sensor (interior thermistor) error	Compressor shuts down. When troubleshooting is over, system recalculates compressor delay time.
E2	Evaporator sensor (defrost thermistor) error	Defrost termination temperature is invalid.

### Wiring Diagram



## [b] HFE SERIES, HRFE SERIES - FREEZER



- [1] Fan Indicator Light
- [2] Set Indicator Light
- [3] Refrigeration Indicator Light
- [4] Defrost Indicator Light
- [5] Defrost Key
- [6] Down Key
- [7] Up Key
- [8] Set Key

### Indicator Lights

Indicator Light	Symbol	Status	Meaning
Refrigeration		On	Compressor running
		Off	Compressor stopped
		Flash	Compressor delayed
		Quick flash	Manual refrigeration
Defrost		On	Defrosting
		Off	Defrost stopped
		Flash	Defrost drain
		Quick flash	Manual defrost
Fan		On	Fan running
		Off	Fan stopped
		Flash	Fan delayed
Set	SET	On	Setting mode
		Off	Normal mode
Celsius	C	On	Celsius display under normal mode
		Off	Fahrenheit display under normal mode

### Key Functions and Setting Modes

Key Operation	Function 1 (Normal Mode)	Function 2 (User Setting Mode)	Function 3 (Administrator Setting Mode)
Set		Enter parameter setting	Save parameter and return to setting interface
Set (3 sec)	Enter user setting	Exit setting	Exit setting
Set + Down (10 sec)	Enter administrator setting		
Down		Check menu item	Calibrate parameter
Down (3 sec)		Fast forward menu item	Quickly calibrate parameter
Up	Upload copy key	Check menu item	Calibrate parameter
Up (3 sec) *See Note	Start/stop forced refrigeration	Fast rewind menu item	Quickly calibrate parameter
Defrost (3 sec)	Start/stop manual defrost		
Up + Down (10 sec)	Lock key operation		

Note: Do not use "Up (3 sec)" in normal mode because defrost cycle may not start.

If "Up (3 sec)" key operation starts forced refrigeration, defrost cycle will not start until temperature reaches set point. During forced refrigeration, [3] refrigeration indication light will flash quickly. Forced refrigeration can be cancelled by "Up (3 sec)" key operation. After cancellation, defrost cycle will automatically start.

**Parameters** (Items with \* are to be changed to administrator menu later.)

Menu	Item	Range	Default	Remark
User	SEt	Min temp setting to max temp setting	-20	Temp parameter setting
	*HY	1 to 25°C	4	Return difference setting
	*MdF	0 to 255 min	60	Defrost time
	*IdF	0 to 120 hrs	6	Defrost cycle
Administrator	LS	-45.5°C to SEt	-23	Min temp setting
	US	SEt to 99.9°C	-7	Max temp setting
	ot	-10 to +10°C	-1	Room temp calibration
	oE	-10 to +10°C	0	Defrost temp calibration
	AC	0 to 50 min	3	Compressor delay time
	CON	0 to 255 min	45	Interior thermistor error compressor ON time
	CoF	0 to 255 min	15	Interior thermistor error compressor OFF time
	CF	°C: Celsius, °F: Fahrenheit	°C	Temp measurement unit
	tdF	EL: 0 (Electric heating) HtG: 1 (Thermal)	EL	Defrost type
	dtF	-45.5 to +49.9°C	30	Defrost termination temp (except HFE-187MA)
			20	Defrost termination temp (only HFE-187MA)
	dFd	Rt: 0 (Normal display of room temp) It: 1 (Defrost start temp) SEt: 2 (Display set point) dEF: 3 (Display dF)	dEF	Display delay after defrosting
	dAd	0 to 255 min	18	Display delay time after defrosting
	Fdt	0 to 255 min	10	Draining time after defrost
	dPo	y: 0 (Immediately), n: 1 (Later)	n	Defrost cycle at initial startup
	dAF	0 to 24 hrs	0	Defrost delay after forced refrigeration
	FnC	C-N: Start/stop with compressor, OFF when defrosting O-N: Continuous, OFF when defrosting C-Y: Start/stop with compressor, ON when defrosting O-Y: Continuous, ON when defrosting	O-N	Fan operation mode
	Fnd	0 to 255 min	15	Fan delay after defrosting
	FCt	0 to 50°C	50	Forced startup by difference between room temp and evaporator temp
	ALU	ALL to 110°C	110	Upper alarm temp limit
	ALL	-45.5°C to ALU	-45.5	Lower alarm temp limit
	ALd	0 to 255 min	15	Temp alarm delay
	dAo	0 to 24 hrs	1	Temp alarm delay after energized
	Cot	0 to 255 min	0	Thermistor error delay
	FSt	-45.5 to 49.9	40	Fan stop temp

## Operations

### 1. Compressor functions:

#### A. Under electric heating defrost mode:

Start condition: Compressor relay closes when both a) and b) or both a) and c) are met.

- a) Compressor delay time exceeds the set delay time.
- b) Forced refrigeration starts when the room temperature is higher than the set point temperature.
- c) Under non-defrost mode, the room temperature is higher than the set point temperature + return difference.

Stop condition: Compressor relay opens when any of the following conditions is met.

- a) Room temperature is lower than the set point temperature.
- b) At the start of defrost cycle.
- c) Forced refrigeration stops.

#### B. Under thermal defrost mode:

Start condition: Compressor relay closes when both a) and b), both a) and c) or both a) and d) are met.

- a) Compressor delay time exceeds the set delay time.
- b) Under non-defrost mode, the room temperature is higher than the set point temperature + return difference.
- c) Forced refrigeration starts when the room temperature is higher than the set point temperature.
- d) In defrost cycle.

Stop condition: Compressor relay opens when any of the following conditions is met.

- a) Room temperature is lower than the set point temperature.
- b) At the end of defrost cycle.
- c) Forced refrigeration stops, and defrost cycle does not start immediately.

### 2. Defrost functions:

Defrost relay closes when the following conditions are met.

- a) Defrost delay time meets the set delay time.
- b) Defrost thermistor temperature is lower than the defrost termination temperature.
- c) Defrost cycle ends or manual defrost starts.

Defrost relay opens when any of the following conditions is met.

- a) Defrost time runs out.
- b) Defrost thermistor temperature is higher than the defrost termination temperature.

### 3. Fan functions:

Fan relay closes when any of the following conditions is met.

- a) Defrost temperature is higher than the fan stop temperature; Difference between room temperature and evaporator temperature is more than the set difference.
- b) Operation mode "0"; Compressor starts; Defrost thermistor temperature is lower than the fan stop temperature; Fan delay time after defrost exceeds the set value.
- c) Operation mode "1"; Under non-defrost mode, the defrost temperature is lower than the fan stop temperature; Fan delay time after defrost exceeds the set value.
- d) Operation mode "2"; When the compressor is running or during defrost cycle, the defrost temperature is lower than the fan stop temperature; Fan delay time after defrost exceeds the set value.
- e) Operation mode "3"; Defrost temperature is lower than the fan stop temperature.

Fan relay opens when the following conditions are met.

- a) Defrost temperature is higher than the fan stop temperature; Difference between room temperature and evaporator temperature is less than the set difference.
- b) Operation mode "0"; Compressor stops or defrost starts.
- c) Operation mode "1"; Defrost starts.
- d) Operation mode "2"; Compressor stops.

### 4. Alarm functions:

LED flashes and displays alarm information when the room temperature exceeds the upper or lower alarm temperature limit and the set alarm delay time runs out.

LED displays "HHH" when the room temperature exceeds the upper limit of measured temperature or the thermistor short-circuits and runs out of the thermistor error delay time.

LED displays "LLL" when the room temperature is lower than the lower limit of measured temperature or the thermistor short-circuits and runs out of the thermistor error delay time.

### 5. Copy key operations:

Under the controller power-on mode, plug in the copy key and press the up key to display "UPL". At this time, press the set key to upload the parameters to the copy key. LED displays normal temperature after uploading. Then, turn off the controller and unplug the copy key. LED flashes and displays "err" if there is any error while uploading.

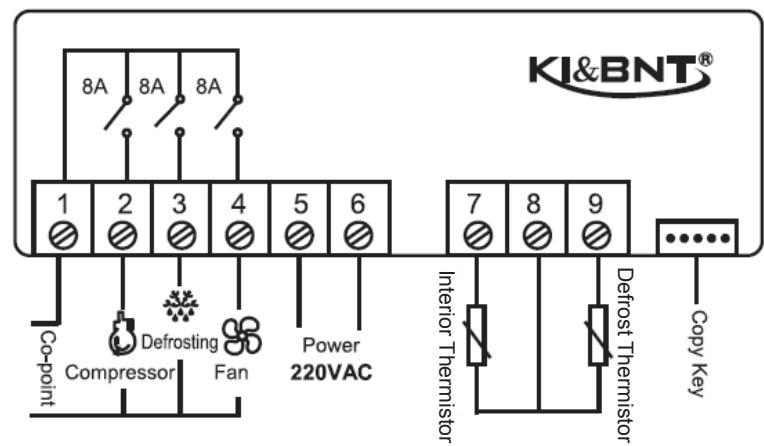
Under the controller power-off mode, plug in the copy key and turn on the controller. At this time, the controller automatically detects the copy key and downloads the parameters. LED displays "DOW" while downloading and "End" after downloading. Then, turn off the controller and unplug the copy key. Restart the controller. LED flashes and displays "err" if there is any parameter error or controller model error.

### 6. Key lock functions:

Under normal mode, press and hold the up and down keys at the same time for 10 seconds to turn on/off the key lock. At this time, LED displays the key lock on/off mode. Release the up and down keys. LED displays normal temperature. All the parameters can be checked but cannot be modified.

Wiring Diagram

ETC-3000



### III. SERVICE DIAGNOSIS

#### 1. ERROR CODES

##### [a] HRE SERIES, HRFE SERIES - REFRIGERATOR

Code	Display	Error	Description	Possible Cause	Reset
E1	E1 only	Interior thermistor defective	Interior thermistor is defective. Compressor stops. Beeper sounds.	<ul style="list-style-type: none"> <li>Interior thermistor circuit open, connector unplugged</li> <li>Interior thermistor circuit shorted, dusty connector</li> </ul>	<ul style="list-style-type: none"> <li>Press any key to stop beep</li> <li>Automatically resets after cause is removed</li> </ul>
E2	E2 and temperature alternately	Defrost thermistor defective	Defrost thermistor is defective. Defrost cycle ends by timer control. Beeper sounds.	<ul style="list-style-type: none"> <li>Defrost Thermistor circuit open, connector unplugged</li> <li>Defrost Thermistor circuit shorted, dusty connector</li> </ul>	<ul style="list-style-type: none"> <li>Press any key to stop beep</li> <li>Automatically resets after cause is removed</li> </ul>

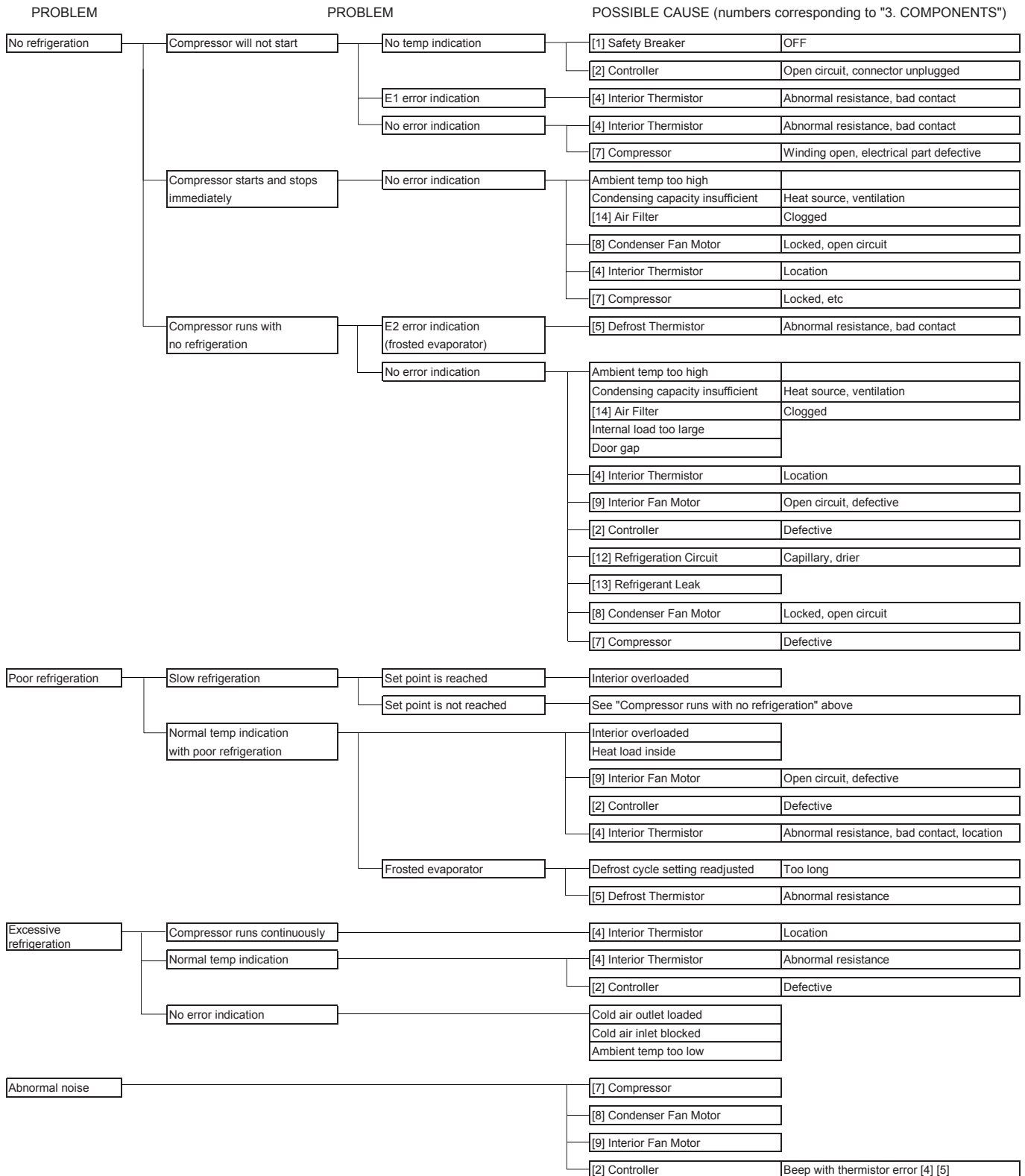
##### [b] HFE SERIES, HRFE SERIES - FREEZER

Display	Error	Description	Possible Cause	Reset
HHH	Interior thermistor defective	Repeats starting and stopping operation at certain interval.	Interior thermistor circuit shorted, dusty connector	Automatically resets after cause is removed
LLL		Repeats starting and stopping operation at certain interval.	Interior thermistor circuit open, connector unplugged	Automatically resets after cause is removed
HHH * With [6] down key pressed	Defrost thermistor defective	Forcibly finishes defrost cycle at the end of defrost time and starts normal operation.	Defrost Thermistor circuit shorted, dusty terminal	Automatically resets after cause is removed
LLL * With [6] down key pressed		Forcibly finishes defrost cycle at the end of defrost time and starts normal operation.	Defrost Thermistor circuit open, connector unplugged	Automatically resets after cause is removed

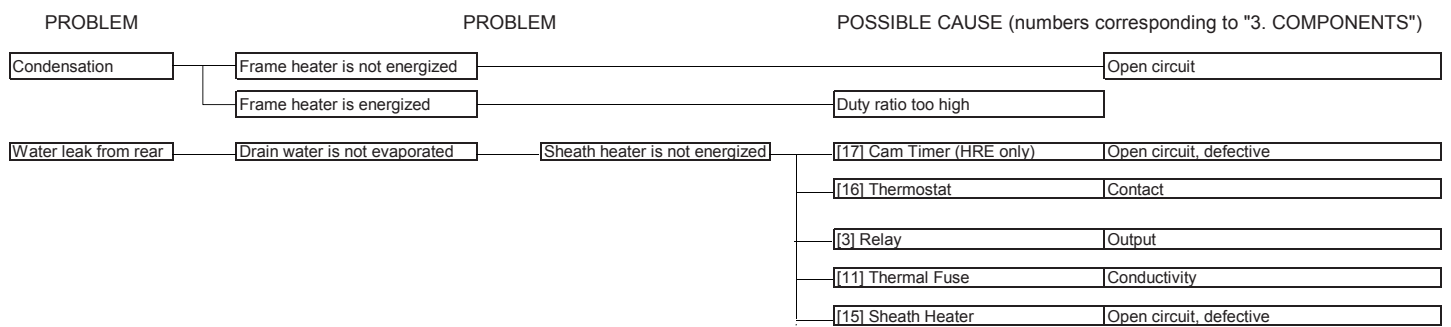
\* When the defrost thermistor is defective, error code will not be displayed without [6] down key being pressed. See “II. 5. [b] HFE SERIES, HRFE SERIES - FREEZER” for operation panel detail.

## 2. FLOWCHART

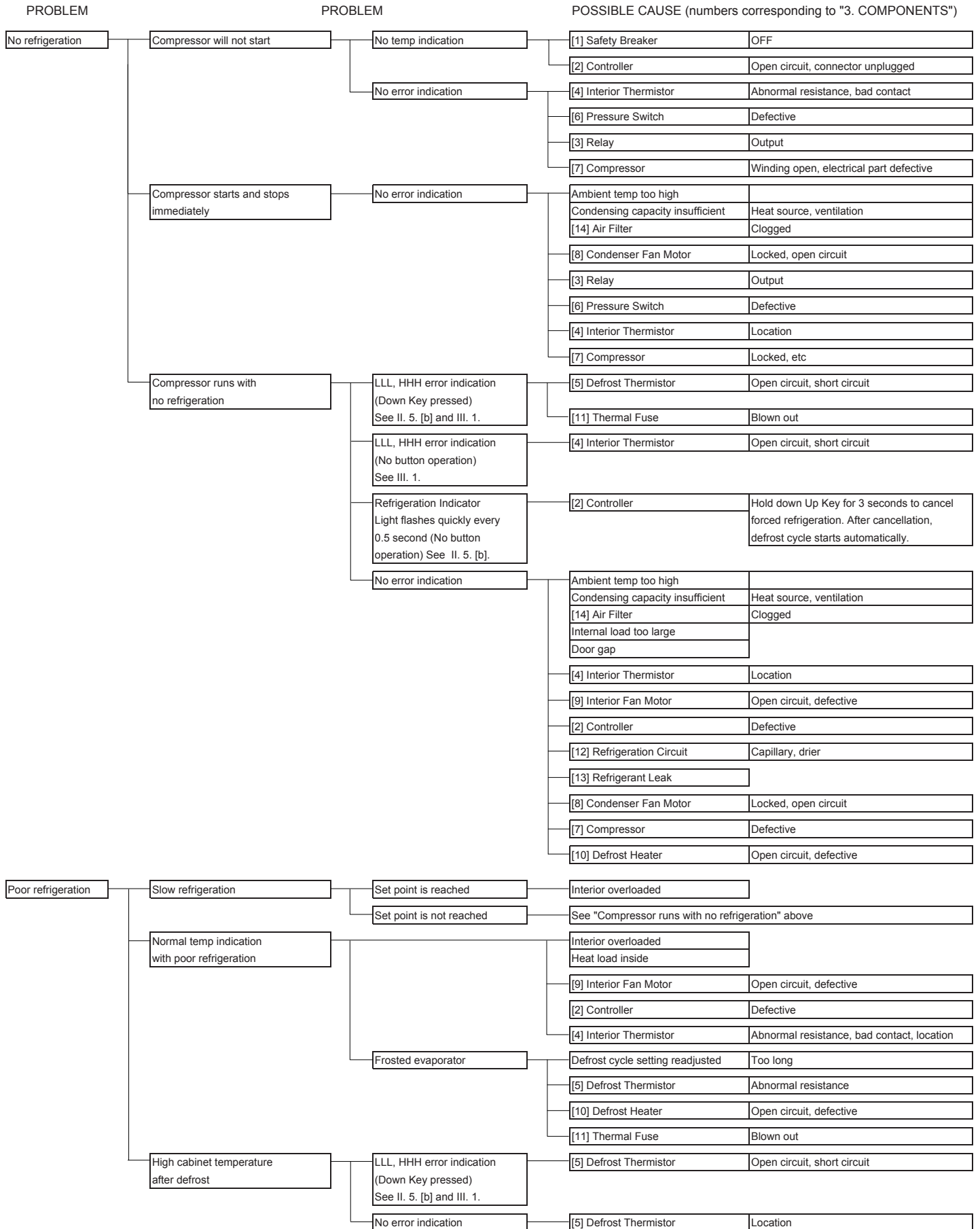
### [a] HRE SERIES, HRFE SERIES - REFRIGERATOR

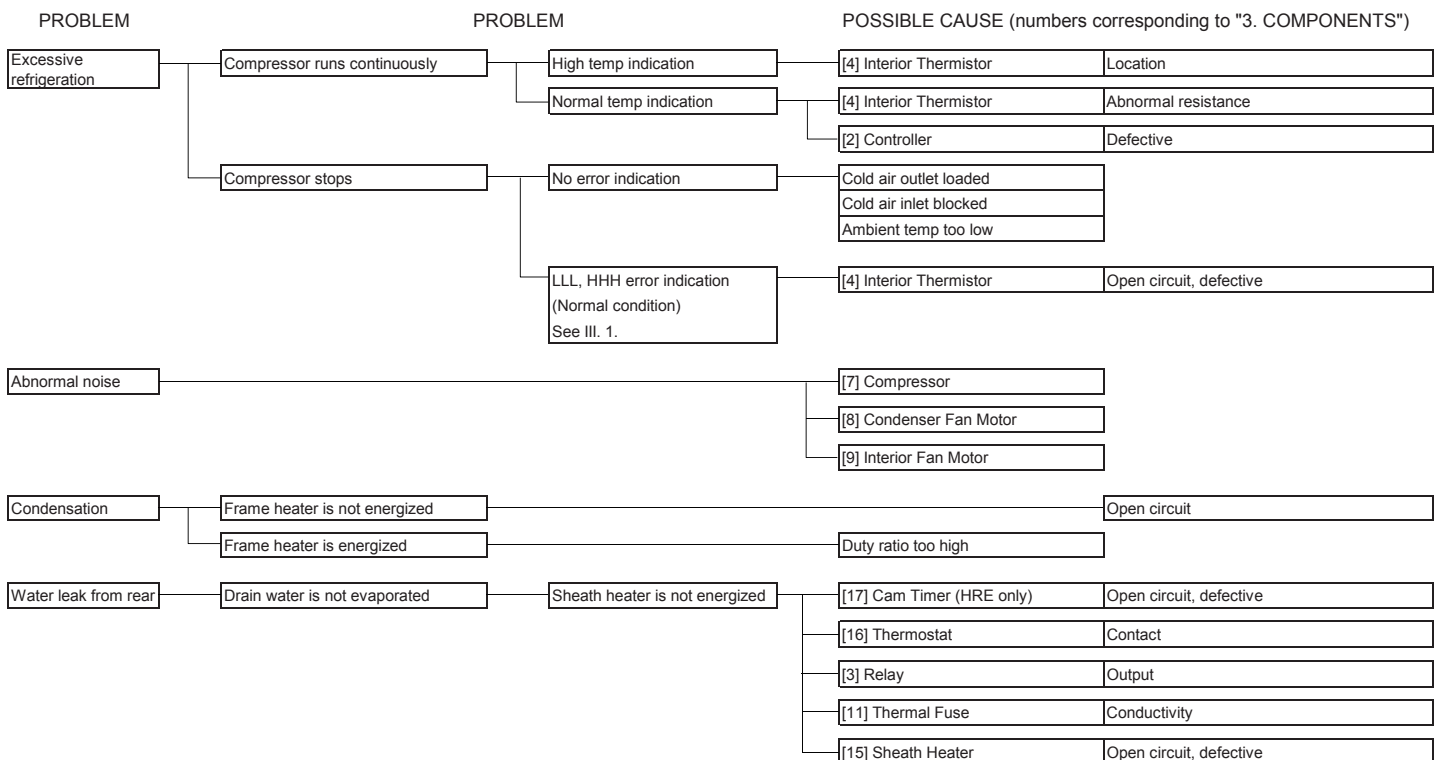






## [b] HFE SERIES, HRFE SERIES - FREEZER





### 3. COMPONENTS

CHART NO.	COMPONENT	CHECK	REMEDY
[1]	Safety Breaker	Safety breaker trips	Locate earth leakage/short circuit
		Safety breaker splashed with water	Dry and replace if necessary
[2]	Controller	Open circuit	Correct or replace
		Input/output (interior fan motor) See wiring label	Replace
		Connector disconnected	Correct
		Connector dusty/dirty	Remove
		7 segment display partially/totally off	Replace
		Electronic parts defective/burnt out	
[3]	Relay	Fast-on terminal/pin disconnected	Correct
		Connector dusty/dirty	Remove
		Open circuit	Correct
		Output to each load Check with wiring diagram/timing chart	Replace
		Abnormal noise	
[4]	Interior Thermistor	Location (holder in front of evaporator) Disconnected, replaced with defrost thermistor, etc	Correct
		Incorrect temp indication	Immerse in ice water to check resistance (25 - 30k) Replace if necessary
	(HRE series)	Short circuit (temp displayed as "E1")	Clean/dry connector
			Replace
		Open circuit (temp displayed as "E1")	Replace
	(HFE series)	Short circuit (temp displayed as "HHH")	Clean/dry connector
			Replace
		Open circuit (temp displayed as "LLL")	Replace
[5]	Defrost Thermistor	Location (plug in from evaporator back) Disconnected, replaced with interior thermistor, etc	Correct
		Abnormal resistance	Immerse in ice water to check resistance (25 - 30k) Replace if necessary
	(HRE series)	Short circuit (temp displayed as "E2")	Clean/dry connector
			Replace
		Open circuit (temp displayed as "E2")	Replace
	(HFE series)	Short circuit (temp displayed as "HHH")	Clean/dry connector
			Replace
		Open circuit (temp displayed as "LLL")	Replace
[6]	Pressure Switch	Open circuit	Replace

CHART NO.	COMPONENT	CHECK	REMEDY
[7]	Compressor	Resistance between terminals	Replace
		Compressor Winding resistance ( $\Omega$ )	
		Start Run	
		AE2360Y 22.37 11.49	
		AEA2410Y 21.29 7.00	
		AE2420ZK-SR 17.70 6.10	
		AE2432ZK 8.56 3.26	
		AEA2413Y 17.00 4.20	
		SC21CL 14.4 3.4	
		SC12CL 13.7 5.0	
		TL4G 18.2 15.1	Replace if no gas leaks
		FR8.5CL 12.0 7.3	
		AE1350Y-2 29.77 9.68	
		AE2390Y-2 17.40 5.40	
		AE2411Y-2SR 10.39 4.57	
		AE2428ZK-2SR 6.30 3.10	
		SC18CLX.2 9.5 2.6	
		Abnormal noise	
		Insufficient compression (discharge temp too low)	
		Compressor electrical part defective	Replace
		- Run/start capacitor ruptured/deformed	
		- Capacitor defective	
		Check resistance between terminals	
		Gradually reduces: No problem	
		0 from start: Defective	
		- Starter defective	
		Loose terminal, no conductivity, damaged	
		- Overload relay defective	
		Loose terminal, no conductivity, damaged	
[8]	Condenser Fan Motor	Open circuit	Correct
		Locked (not rotating with voltage)	Replace
		Abnormal noise	
		Burning smell	
[9]	Interior Fan Motor	Open circuit	Correct
		Locked (not rotating with voltage)	Replace
		Abnormal noise	
		Burning smell	
[10]	Defrost Heater	Open circuit	Correct
		Conductivity	Replace
		Insulation resistance 1M $\Omega$ or more at 500V	
[11]	Thermal Fuse	Conductivity	Replace
		Contact welding of relay	Replace relay
[12]	Refrigeration Circuit Clogged	Discharge pressure: High Suction pressure: Low (vacuum)	Replace capillary/expansion valve (Replace drier at same time)
[13]	Refrigerant Leak	Discharge pressure: Low Suction pressure: Low Compressor discharge pipe will not heat up Compressor suction pipe will not cool down	Locate leakage and replace (Replace drier at same time)
[14]	Air Filter	Clogged	Clean
[15]	Sheath Heater *	Open circuit	Correct
		Conductivity	Replace
		Insulation resistance 1M $\Omega$ or more at 500V	Replace
[16]	Thermostat *	Open circuit	Correct
		Conductivity	Replace if not conductive
		Air-Cooled Condenser Dirty fins	

\*Forced drain water evaporation model only

## 4. CONTROLLER

### [a] SERVICING CONTROLLER

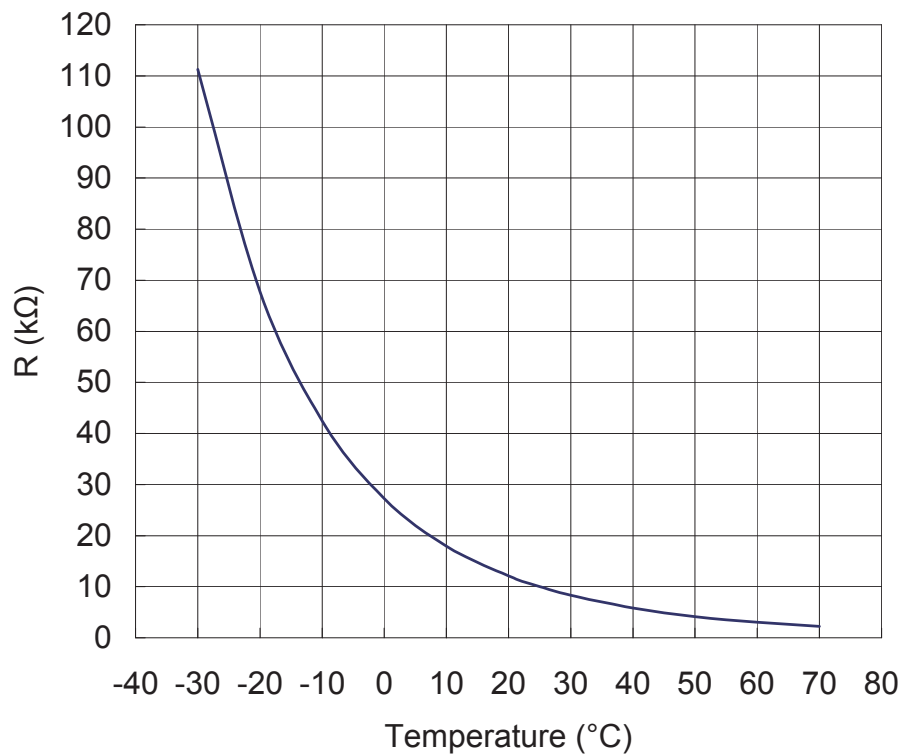
- 1) When receiving a service call, ask the user to turn off the power supply and turn it back on after 30 seconds, while watching the unit. This will reset the controller, and in some cases normal operation will resume.
- 2) Keep the following in mind when servicing the controller:
  - \* Check that the unit has been earthed properly. If not, the controller will not work properly.
  - \* To get static free, always touch the cabinet (earth) before servicing. Electrostatic discharge will cause severe damage to the controller.
  - \* The controller and thermistor can be replaced separately.
  - \* Do not drop the controller on the floor.
  - \* The thermistor and pressure switch leads have a thin coating and are potentially breakable. Do not tension the leads.
  - \* The connectors must not be subjected to tension to prevent disconnection or breakage. After servicing the controller, check for disconnected connectors.
  - \* The thermistor is provided with single-wire leads. Do not bend or stretch them.
  - \* Do not pinch or weigh down the thermistor and thermistor leads. The coatings may be broken, resulting in a short circuit.

## [b] CHECKING THERMISTOR

- 1) Remove the thermistor from the controller.
- 2) Put ice and water in a glass or other container to make 0°C water. Immerse the thermistor bulb in the water for 5 minutes (at the center of the container).
- 3) Use the  $\Omega$  range of the tester to measure the resistance between the thermistors.
- 4) If the measured resistance is not within 25 - 30 k $\Omega$  (standard 27 k $\Omega$ ), replace the thermistor (see the T-R curve below).

### T-R Curve (Interior/Defrost Thermistor)

The graph shows reference values only and may differ from actual values.

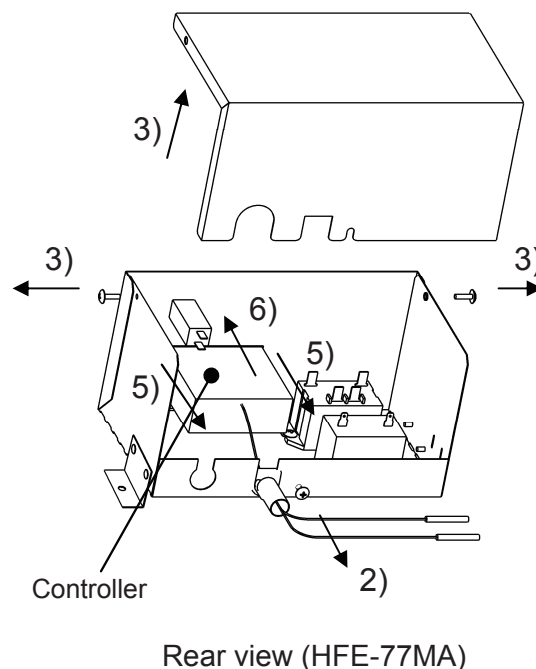


## IV. REMOVAL AND REPLACEMENT OF COMPONENTS

### 1. CONTROLLER AND THERMISTOR

#### [a] CONTROLLER

- 1) Unplug the unit.
- 2) Loosen the screw at the rear.
- 3) Remove the two screws at both sides to take off the control box cover.
- 4) Use a precision screwdriver to remove the wiring cover and wiring.
- 5) Push the stoppers at both sides of the controller, and slide off the stoppers to the rear.
- 6) Remove the controller to the front.
- 7) To replace the removed parts, reverse the above procedure.
- 8) Check that the operation panel is securely mounted.



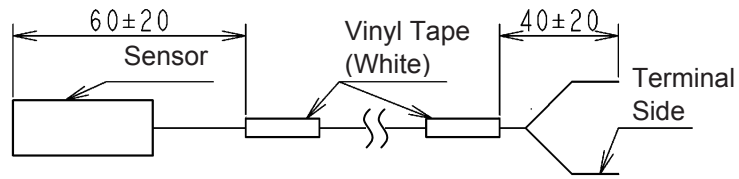
#### [b] THERMISTOR

- 1) Remove the air duct inside the cabinet. See “3. [a] AIR DUCT”.
- 2) Remove the interior thermistor bulb on the ceiling in front of the evaporator by unhooking the two tabs securing the thermistor holder.
- 3) Remove the defrost thermistor bulb inside the evaporator fins by pinching off the thermistor holder.
- 4) Pull out the thermistors through the hole in the refrigeration unit base. Be careful not to press hard on the bulbs and leads.
- 5) Remove the control box cover, use a precision screwdriver to loosen the terminal block screws, and remove the thermistors.

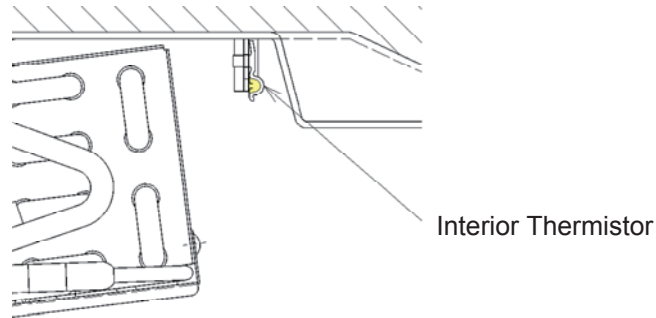
Note: 1. To replace the removed parts, reverse the above procedure.

2. To prevent the evaporator from freezing, putty the wire hole in the refrigeration unit base.

- If the defrost thermistor color is not white, wind white vinyl tape around the thermistor as shown below for indication.

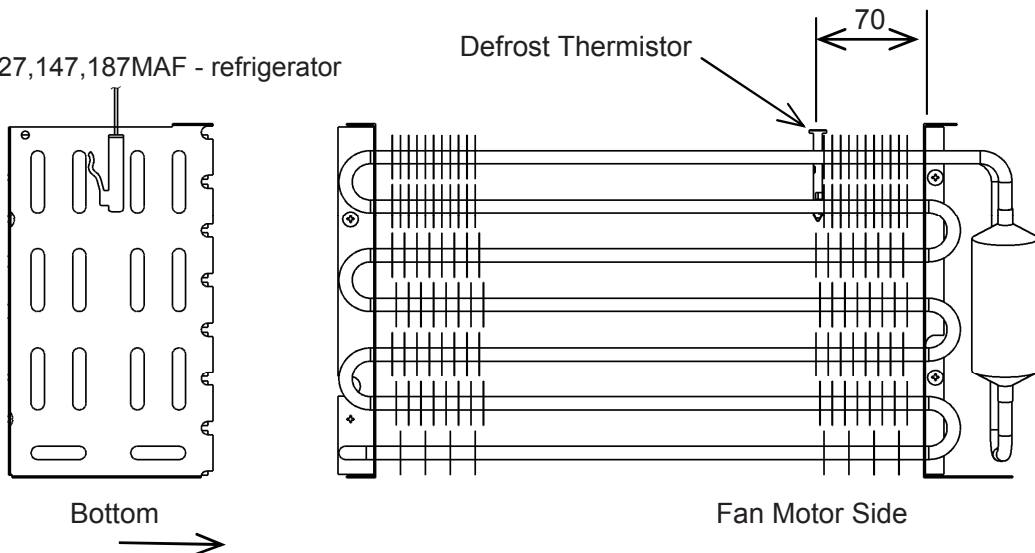


#### Interior Thermistor Bulb Location

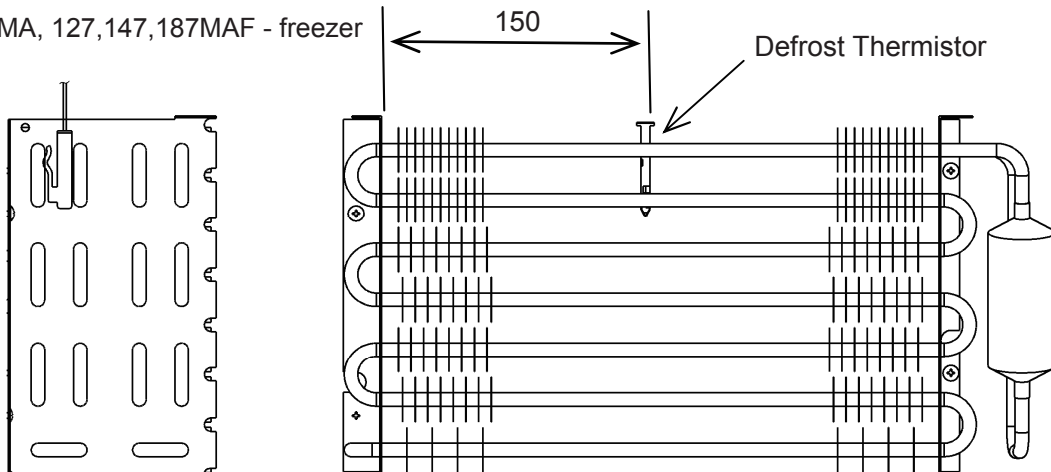


#### Defrost Thermistor Bulb Location

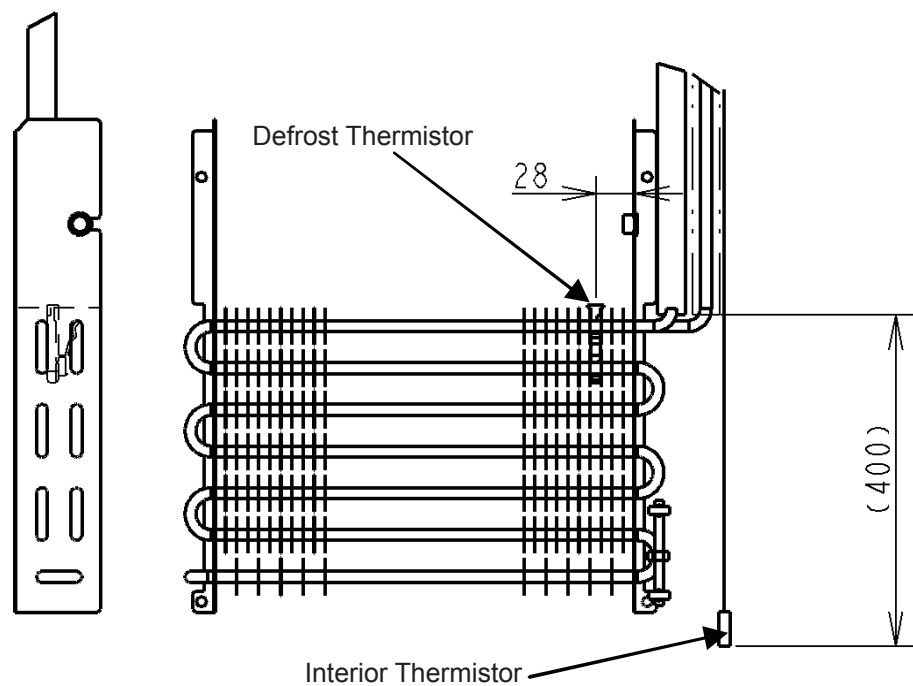
HRE  
HRFE-127,147,187MAF - refrigerator



HFE  
HRFE-77MA, 127,147,187MAF - freezer







## **2. REFRIGERATION CIRCUIT**

For HRFE-77MA, it is structurally difficult to replace the whole refrigeration circuit. Replace the individual parts.

### **[a] COMPRESSOR**

- 1) Unplug the unit.
- 2) Remove the front panel.
- 3) Remove the top panel.
- 4) Remove the protector cover enclosing the electrical parts. Remove the overload relay, starting relay, and other parts.
- 5) Recover the refrigerant from the low side access valve.
- 6) Disconnect the discharge and suction pipes by using brazing equipment.
- 7) Remove the hexagon bolts securing the compressor.
- 8) To replace the removed parts, reverse the above procedure.

### **[b] CONDENSER AND DRIER**

- 1) Unplug the unit.
- 2) Remove the front panel.
- 3) Recover the refrigerant from the low side access valve.
- 4) Unscrew the condenser.
- 5) Disconnect the condenser from the upper inlet pipe connection using brazing equipment.
- 6) Remove the condenser and drier from the refrigeration unit base, and disconnect them using brazing equipment.
- 7) To replace the removed parts, reverse the above procedure.

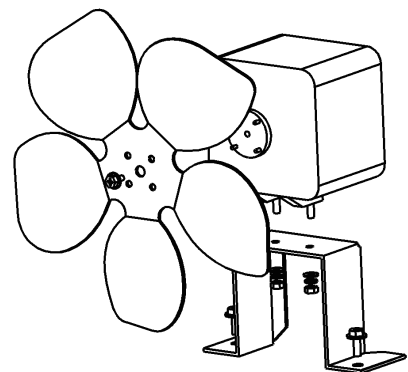
Note: The capillary tube is directly brazed to the drier. To prevent brazing material from clogging, be sure to insert the capillary tube securely into the point of stopper before brazing.

### **[c] EVAPORATOR**

- 1) Unplug the unit.
- 2) Remove the front panel.
- 3) Recover the refrigerant from the low side access valve.
- 4) Remove the insulation hoses on the refrigeration unit base. Disconnect the evaporator using brazing equipment.
- 5) Remove the air duct.
- 6) Disconnect the defrost heater wires. See “[e] DEFROST HEATER AND THERMAL FUSE”.
- 7) Unscrew and remove the evaporator.
- 8) To replace the removed parts, reverse the above procedure.

### **[d] CONDENSER FAN MOTOR**

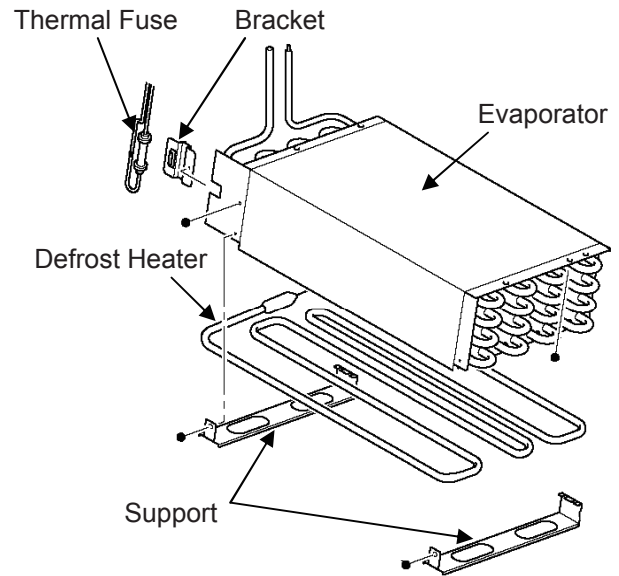
- 1) Unplug the unit.
- 2) Remove the front panel.
- 3) Disconnect the condenser fan motor.
- 4) Remove the two screws securing the bracket on the refrigeration unit base.
- 5) Pull up the fan motor together with the bracket.
- 6) Loosen the nut securing the fan motor shaft, and remove the fan motor.
- 7) Remove the fan motor from the bracket.
- 8) To replace the removed parts, reverse the above procedure.



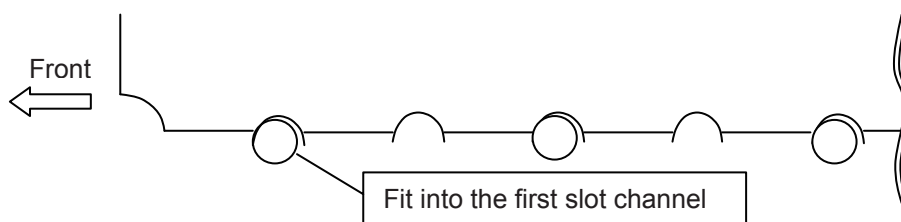
Note: After replacement, check for abnormal noise or vibration noise by trial run.

## [e] DEFROST HEATER AND THERMAL FUSE

- 1) Unplug the unit.
- 2) Disconnect the defrost heater at the back of the refrigeration unit. The defrost heater and thermal fuse are connected in series and interchangeable without any operational problems.
- 3) Remove the putty from the wire hole in the refrigeration unit base, and put the connector through the hole.
- 4) Remove the air duct. See “3. [a] AIR DUCT”.
- 5) Remove the supports at both ends of the evaporator bottom by loosening the screws at the front and unhooking the backside.
- 6) Remove the defrost heater from the evaporator by pulling each U bend from the front to the back.
- 7) Unscrew and remove the thermal fuse from the evaporator and bracket.
- 8) Pull out the wire through the hole in the refrigeration unit base.
- 9) To replace the removed parts, reverse the above procedure.



Note: Locate the defrost heater in the same position as before. Fit the first front line into the first slot channel, and position the rest according to the U-bend dimensions.

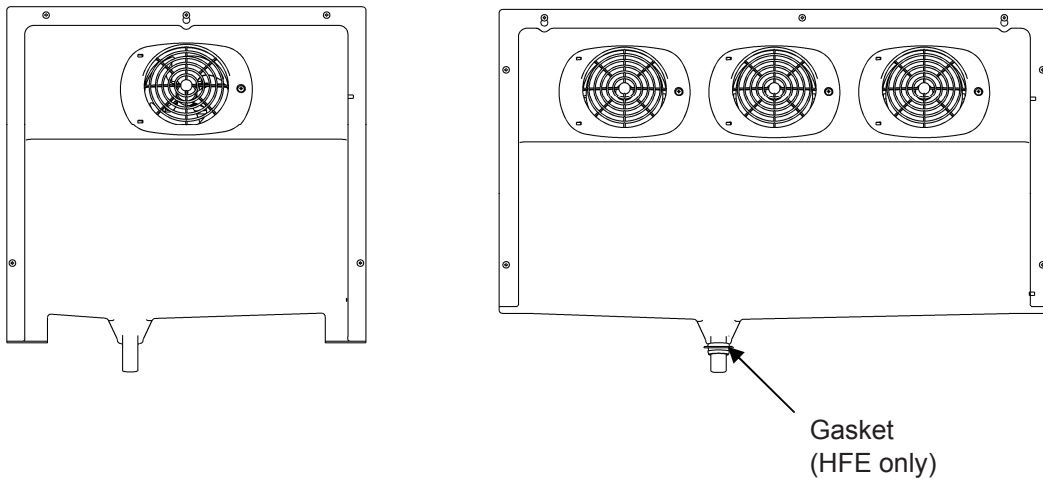


### 3. AIR DUCT

#### [a] AIR DUCT

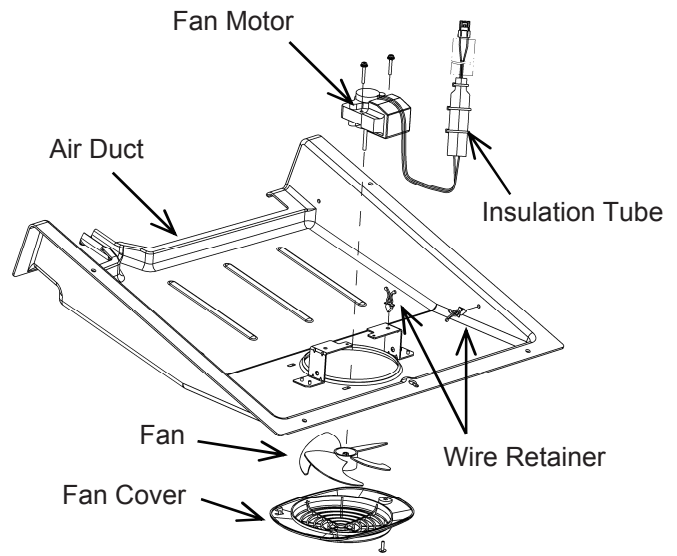
- 1) Remove the screws securing the air duct.
- 2) Hold both sides of the air duct, and pull it out towards you. The air duct for the HFE series is provided with a gasket in the drain pipe and must be pulled hard to remove.
- 3) To prevent tension on the wires, place the removed air duct on a shelf.
- 4) To replace the air duct, first insert the drain pipe into the drain outlet at the rear of the unit.
- 5) Fit the air duct in the back.
- 6) Tighten all the screws.

Note: Be careful not to catch the interior fan motor leads in the air duct.



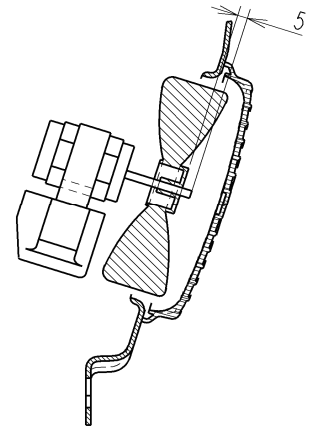
## [b] INTERIOR FAN MOTOR (Except HRFE-77MA)

- 1) Unplug the unit.
- 2) Disconnect the interior fan motor connector beside the refrigeration unit.
- 3) Unscrew the refrigeration unit.
- 4) Slightly lift up the refrigeration unit, and put the interior fan motor leads inside the cabinet.
- 5) Remove the air duct.
- 6) Loosen the screws securing the fan cover, and remove the fan cover.
- 7) Remove the interior fan motor from the air duct.



- 8) To replace the removed parts, reverse the above procedure. Keep the fan 5 mm from the end of the motor shaft as shown. Cover the interior fan motor leads with the insulation tube as a cushion through the hole in the refrigeration unit.

Note: To prevent the leads from being caught between the fan blades, fix the leads with the wire retainer inside the air duct before fitting the air duct.

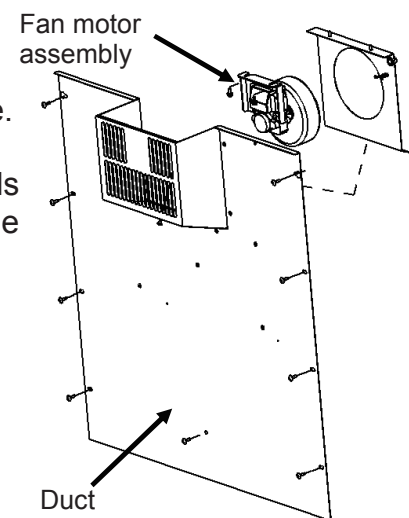


### [c] INTERIOR FAN MOTOR (HRFE-77MA)

- 1) Unplug the unit.
- 2) Open the door to the refrigerator. Unscrew and remove the cooling duct.
- 3) Unscrew and remove the interior fan motor assembly.
- 4) Remove the screws securing the interior fan motor to the bracket, and take off the interior fan motor.
- 5) Cut the fan motor leads at their connection. (Keep the lead re-connectable.)
- 6) Loosen the screws securing the fan cover, and remove the fan cover.
- 7) Remove the interior fan motor from the air duct.
- 8) To replace the removed parts, reverse the above procedure.

Note: 1. To prevent water from coming in, the lead terminals must be caulked and covered with plastic bag. Be sure to connect the leads outside the unit.

2. Seal the lead hole with putty later.

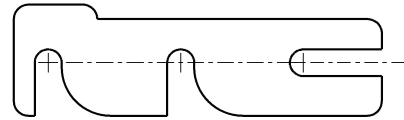


## 4. DOOR PARTS

### [a] HINGE SPACER

For door closing adjustment, the hinge spacers may be provided between the hinges and cabinet. When removed, the hinge spacers must be reinstalled in the correct position. When the door is replaced or the gasket is often caught in the door, order the following parts and replace the hinge spacers:

Hinge Spacer      473352M01



### [b] LIFT HINGE

To ensure smooth door closing, the hinge shaft employs a lift hinge. If the hinge makes an abnormal noise or the worn out lift hinge hinders smooth door closing, apply White Alcom Grease or equivalent food grade grease. If the lift hinge is severely worn out, replace the hinge collar (lift hinge) on both the door and hinge sides.

\* Apply White Alcom Grease also when the door is replaced in the field.

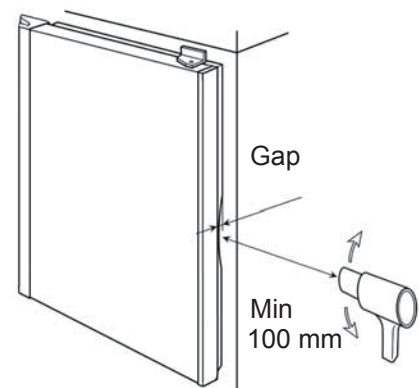
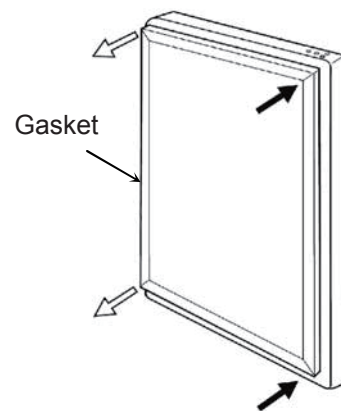
### [c] DOOR GASKET

To replace the door gasket:

- 1) Pinch and pull out the door gasket from the corners.
- 2) Push the convex of the new door gasket into the concave of the door interior. Insert the corners first to facilitate replacement.

Replacement of the door or door gasket may cause a gap between the cabinet and the gasket. To correct this gap, slightly heat the gasket with a drier. To avoid melting the gasket:

- 1) Keep the drier at least 100 mm away from the gasket.
- 2) Move the drier up and down to heat the entire gap.





## 5. EVAPORATION TANK (Forced drain water evaporation model only)

- 1) Unplug the unit.
- 2) Unscrew and remove the rear panel.
- 3) Unscrew the upper part of the evaporation tank cover, and lift off the cover.

### [a] DRAIN TANK HEATER

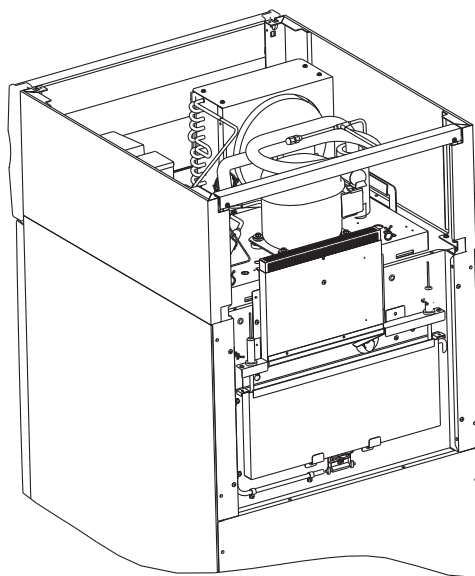
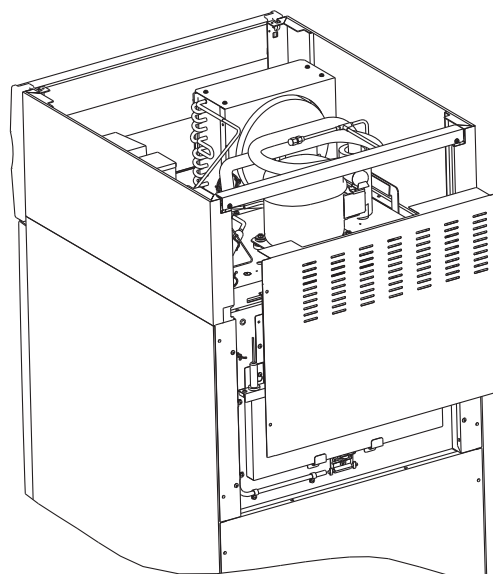
- 1) Unscrew and remove the drain tank duct.
- 2) Unscrew the drain tank flange securing the drain tank heater.
- 3) Cut the drain tank heater leads at their connection.
- 4) Lift the drain tank heater off the drain tank.
- 5) Lift off the drain tank heater together with the heater bush from the drain tank flange.
- 6) Remove the heater bush from the drain tank heater.
- 7) To replace the removed parts, reverse the above procedure.

### [b] THERMOSTAT

- 1) Unscrew the thermostat attached to the drain tank bottom.
- 2) Cut the thermostat leads at their connection.
- 3) To replace the removed parts, reverse the above procedure.

### [c] THERMAL FUSE

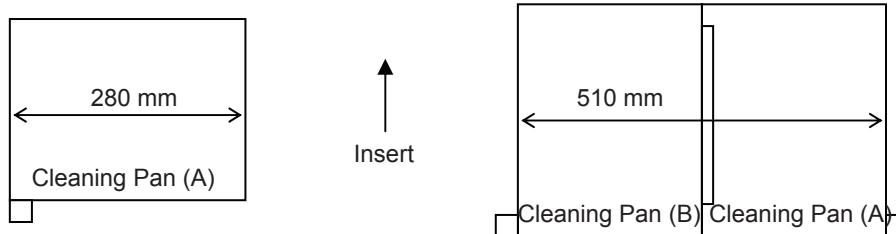
- 1) Unscrew the fuse holder at the drain tank bottom, and remove the thermal fuse.
- 2) Cut the thermal fuse leads at their connection.
- 3) To replace the removed parts, reverse the above procedure.



## 6. CONDENSER CLEANING PAN

The condenser is designed to allow the cleaning pan at the bottom.

- \* Insert the cleaning pan (wastewater pan), and connect the drain hose to the drain outlet. Use the cleaning pan (A) for the 280 mm wide condenser [HRE / HRFE-77/127/147/187, HFE-77], and connect the cleaning pan (A) and cleaning pan (B) for the 500 mm wide condenser [HFE-127/147/187].

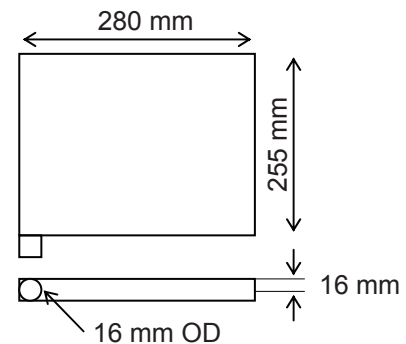


- \* Cover the cleaning pan with a waste cloth to prevent wastewater from splashing around (especially the compressor and condenser fan motor).
- \* The cleaning pan has a capacity of about 1 L and takes 1 minute to drain. Do not allow a large amount of water into the cleaning pan.

The cleaning pan is not provided in the unit and must be ordered by the following part numbers:

Cleaning Pan (A) 354309G01  
 Cleaning Pan (B) 354310G01 for connection only

Dimensions: W280 x D255 x H16 (t 0.8) mm  
 Drain Outlet: 16 mm OD x 14 mm ID  
 Drain Hose: 16 mm DIA  
 Capacity: 1.0 L



## 7. OPTIONAL PARTS

### [a] HINGE KIT

The door hinges for HRE-77MA, HFE-77MA and HRFE-77MA can be moved to the other side of the door by using the following hinge kit.

#### Hinge Kit (R)

Door Hinge (R) - Lo	375316G01	1 pc
Door Hinge (R) - Up	375317G01	1 pc
Door Hinge (R) - CT	375315G01	1 pc
Hinge Collar - Hinge	339948-01	2 pcs

#### Hinge Kit (L)

Door Hinge (L) - Lo	375319G01	1 pc
Door Hinge (L) - Up	375318G01	1 pc
Door Hinge (L) - CT	375320G01	1 pc
Hinge Collar - Hinge	339948-01	2 pcs

### [b] LEG

<u>Width</u>		<u>700/1200/1400mm</u>	<u>1800mm</u>
Leg H=90	P00316-01	4 pcs	6 pcs
Leg H=150	446733-01	4 pcs	6 pcs
Leg SUS H=90	4Y2043-01	4 pcs	6 pcs

### [c] CASTER

<u>Width</u>		<u>700/1200/1400mm</u>	<u>1800mm</u>
Caster	P00635-01	4 pcs	6 pcs
Plain Washer	FWPL20F0	4 pcs	6 pcs
Spacer - Caster	471512M01	4 pcs	6 pcs
Spanner	471513M01	1 pc	1 pc

To adjust the height of the unit, use the spanner (accessory) to loosen the casters and insert the spacers (accessory). The unit should always be level from side to side and back to front.

All the four casters are provided with stoppers. Always lock the stoppers of the front casters when in use.

Unlock the casters to move the unit for cleaning or other purposes.

Be sure to attach the plain washer (M20) provided before fixing the caster to the cabinet. The fixing part of caster may deform without the plain washer (M20).

