DAIKIN

COMMERCIAL REFRIGERATION SLIM UNIT COOLER
LOW TEMPERATURE

OPERATING AND
INSTALLATION MANUAL

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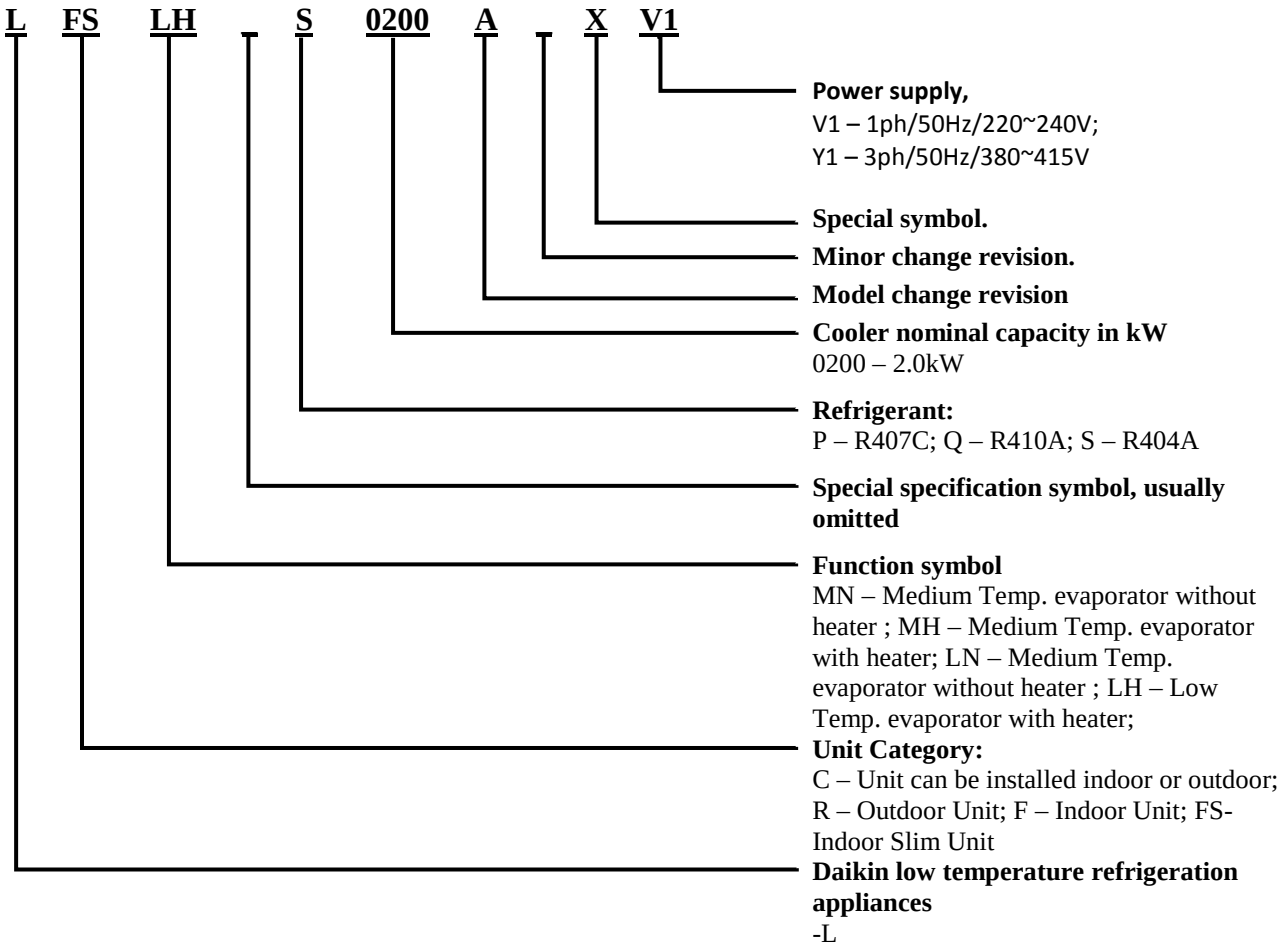
1 UNIT INFORMATION

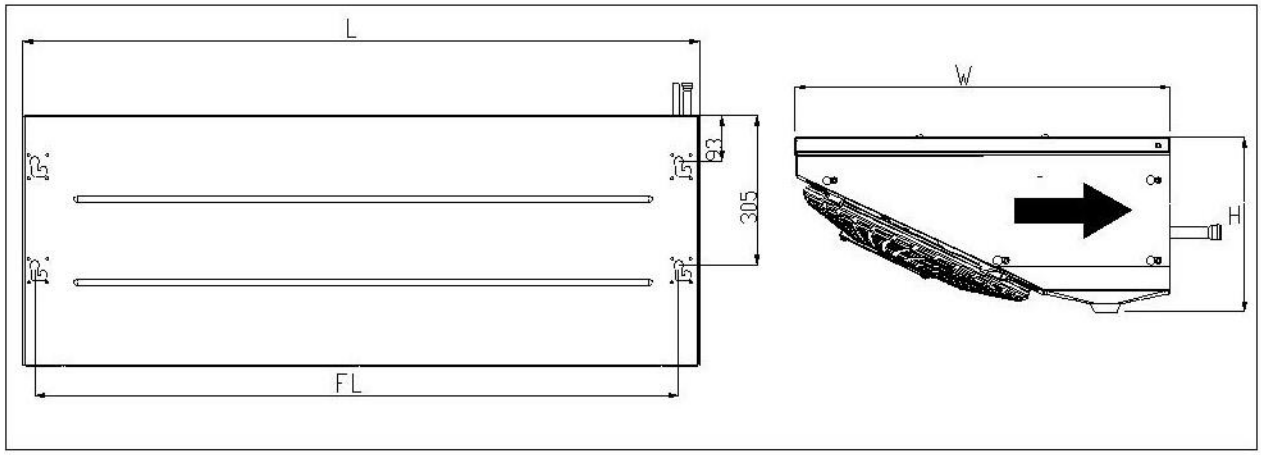
1.1 *Nomenclature*



1.2 *Product features*

- Can be used with refrigerants R404A, R410A, R507A, R448A and R449A.
- To store food product which require strict environmental conditions for storage, suitable for fresh meats & seafood etc.
- Unit can operate within -13 ºC ~ -28ºC.
- ¾" BSP drain fitting on indoor unit.
- DX evaporator coil, with shredder valve integrated into suction line for ease of superheat measurement.
- Powder coated galvanized casing.
- IP54 Axial fan with moisture environment proof protected and built in thermal overload.
- Defrost heater provided.
- Pre-fixed wiring to fan motor.

1.3 *Unit Dimension*



	L(mm)	FL(mm)	W(mm)	H (mm)
LFSLHS0200AXV1	1381	1313	510	238
LFSLHS0300AXV1	1981	1913	510	238

1.4 *General*

Upon receive of the products,

1. Please ensure:
   - The pipework should shows no signs of damage
   - The fan/ fan motor terminal box are not cracked or showing signs of obvious damage
   - The electrical screw terminals in control panels and motor mountings should be checked.

2. Product are only suitable for fix installation.
   Product contains 4 bar±1bar holding charge (N2) when despatched from factory, the holding gas should be safely released through the Schrader valve which integrated on the suction gas inlet header.

3. If the holding charge is not present, please do not use the product and contact the sales representative immediately. (Manufacturer's warranty is void for damage caused by incorrect application or unit mis-handling)

2 SPECIFICATION

2.1 *General*

(a) Low Temperature

	Model	LFSLHS0200AXV1	LFSLHS0300AXV1
Capacity	**kW**	2.0	3.0
Sound Pressure Level	**dB(A)**	60	60
General	**Power supply (V/Ph/Hz)**	220-240/1/50	220-240/1/50
	Size L/W/H (mm/mm/mm)	1381 x 510 x 238	1981 x 510 x 238
	Weight (kg)	27.0	35.0
	Room Temperature (°C)	-13 ~ -28	-13 ~ -28
	Refrigerant	R404A/R410A/R507A/ R448A/R449A	R404A/R410A/R507A/ R448A/R449A
	Max operating pressure (Bar)	25	25
Fan	**Fan Size (mm x Qty)**	300 x 2	300 x 3
	Air Flow (m^3/h)	1350	2025
	Fan Speed (rpm)	1250	1250
	Running current (A)	0.54	0.81
	Power Consumptions (W)	70	105
Air Throw	**Distance (m)**	7	7
Finishing	**Casing**	Galvanized & Powder Coated	Galvanized & Powder Coated
	Color	White	White
Connection Pipe Size (OD)	**Outlet (mm)**	15.88	19.05
	Inlet (mm)	12.7	12.7

* Capacity based on running condition of R404A at $T_{Air\ In}$ = -18°C, Evaporating temperature, T_e = -25°C. TD=7K, Temperature Difference, TD = $T_{Air\ In}$ - T_e
* Nominal capacities are given accordance EN 328 Standard Condition.
* Sound Pressure Level is measured at 1m away from every side of the unit and 1m below fan center line, inside Anechoic sound room.
* Air Throw is measured based on a final velocity of 0.4m/s.
* Design and specifications are subject to change without notice.

2.2 *Capacity Table*

(a) Low Temperature

Refrigerant	R404A				
Te / Model	-35	-30	-25	-20	
LFSLHS0200AXV1	1.57	1.74	2.00	2.40	
LFSLHS0300AXV1	2.34	2.67	3.00	3.33	

Capacity Factor					
Refrigerant / Model	R404A	R410A	R507A	R448A	R449A
LFSLHS0200AXV1	1.0	1.1	0.95	1.0	1.0
LFSLHS0300AXV1	1.0	1.1	0.95	1.0	1.0

*DT1=7K
DT1=Air inlet temperature (Ta) - evaporating temperature at the outlet (Te)
The nominal capacity according to EN 328 and calculated with refrigerant R404A.
For different refrigerants shall be referred to the table of Capacity Factor.

TD CORRECTION FACTOR

TD(K)	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5
Correction Factor	0.64	0.71	0.79	0.86	0.93	1.00	1.07	1.14	1.21	1.29	1.36

3 UNIT LOCATION AND MOUNTING

3.1 *Unit Location*

Unit coolers must be located at places that provide good air circulation; otherwise the performances of the unit cooler could be compromised. For best performance, it is desirable to arrange the air discharge blowing toward the door to minimize the entrance of warm moist air when door is open. Light fixtures, shelving and product boxes must be located in a manner whereby they do not block the air intake and air discharge from the unit cooler.

IMPORTANT:

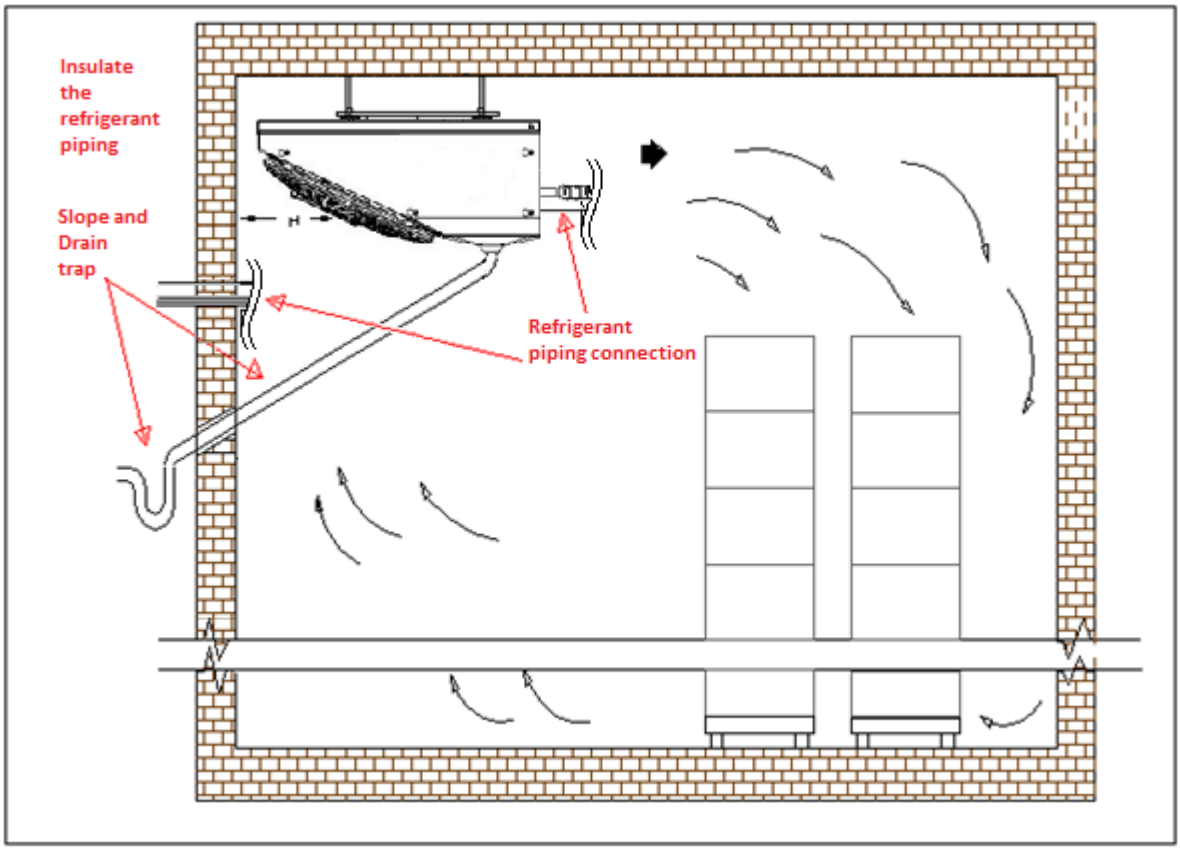
- **Installation are to be performed only by qualified personnel who are familiar with local codes and regulations, and experienced with this type of refrigeration unit cooler.**
- **The fan face must be located a minimum of 600mm (H) from walls to assure unrestricted air intake.**
- **Side clearance should be reserved so that service work can be carried out.**

3.2 *Mounting*

Unit coolers designed for ceiling mounted type and come with mounting holes that can be fixed with the use of common M10 bolts and nuts. The unit must be installed in a level manner, to ensure water condensation can be properly drain out.

IMPORTANT:

- **Ensure that the ceiling is able to withstand the unit weight and that all fixings are secure.**



3.3 *Drain Trap*

Drain pipes and traps must be at least same diameter as the drain fitting connection. See page 3 for details. Drain pan must be leveled to permit condensation from coil drain freely for the suitable depth and distance of drain trap installation.

4 *PIPING INSTALLATION*

4.1 *Refrigerant pipe connection*

Refrigerant pipe connections should be installed in accordance with all the applicable codes and using good refrigeration practices. Suction lines should be properly insulated to prevent sweating and ensure only superheated vapor is returned to compressor suction. During brazing, the system should be purged with nitrogen first, to prevent oxidation.

Use of incorrect pipe sizes can affect system pressure/temperatures and gas velocity for proper oil return. See page 3 for details.

4.2 *Vacuum and leak test*

When all refrigeration piping connections had been completed, the entire system must be tested for leaks and then vacuum. Refer to the instruction manual provided by the coupled condensing unit for the leak test and vacuum test information.

4.3 *Drain pipe*

Installing a trap is required for trouble free operation. If unit cooler is operated without the drain trap, warm air with higher temperature will draw from outside to the cold room. Thus, warm air will significantly reduce the cooler capacity and may lead to ice formation in the drain pan.

If the temperature surrounding the drain line and trap is below freezing (0^{o}C), it must be wrapped with a drain line heater and insulation until out of wall of the cool room. Be sure to wrap the drain pan coupling too. Make sure the drain line is clear to prevent drain line plugged and overflow.

4.4 *Superheat*

Check suction superheat and adjust expansion valve to prevent liquid flood back to the compressor. Recommended 5K to 20 K for suction superheat.

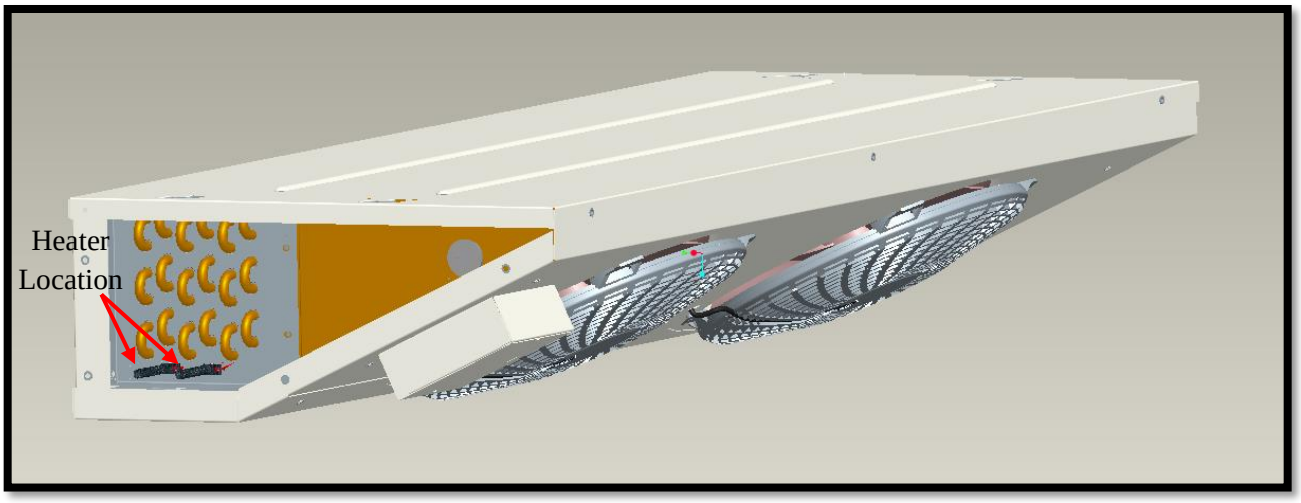
**Remarks: Expansion valve is not factory pre-fitted.

5 ELECTRICAL

5.1 *Field wiring*

Field wiring should comply with local codes. The power supply voltage, phase and frequency must match what is shown on the unit cooler data plate.

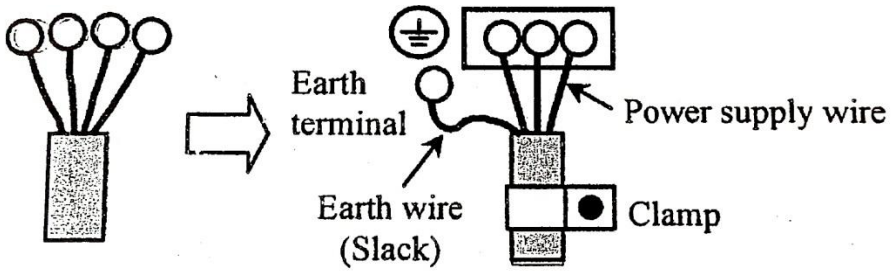
The wiring diagram for each unit is located on the inside of the control box. The unit must be grounded.



Heater slot available for defrost heaters and it had been inserted into the lower of cooling coil. It is advised to install thermal fuse (supplied by site) when the unit is used with defrost heater. The location of the thermal fuse should be appropriately located to have safety cut off when the heater is overheated.

5.2 *Earth Wiring*

Units must be earthed and no maintenance work should be attempted prior to disconnecting the electrical supply. Installation of earth wire should be made to earth screw before connecting the live wires. The earth wire shall be slacked with longer length as shown in below diagram.

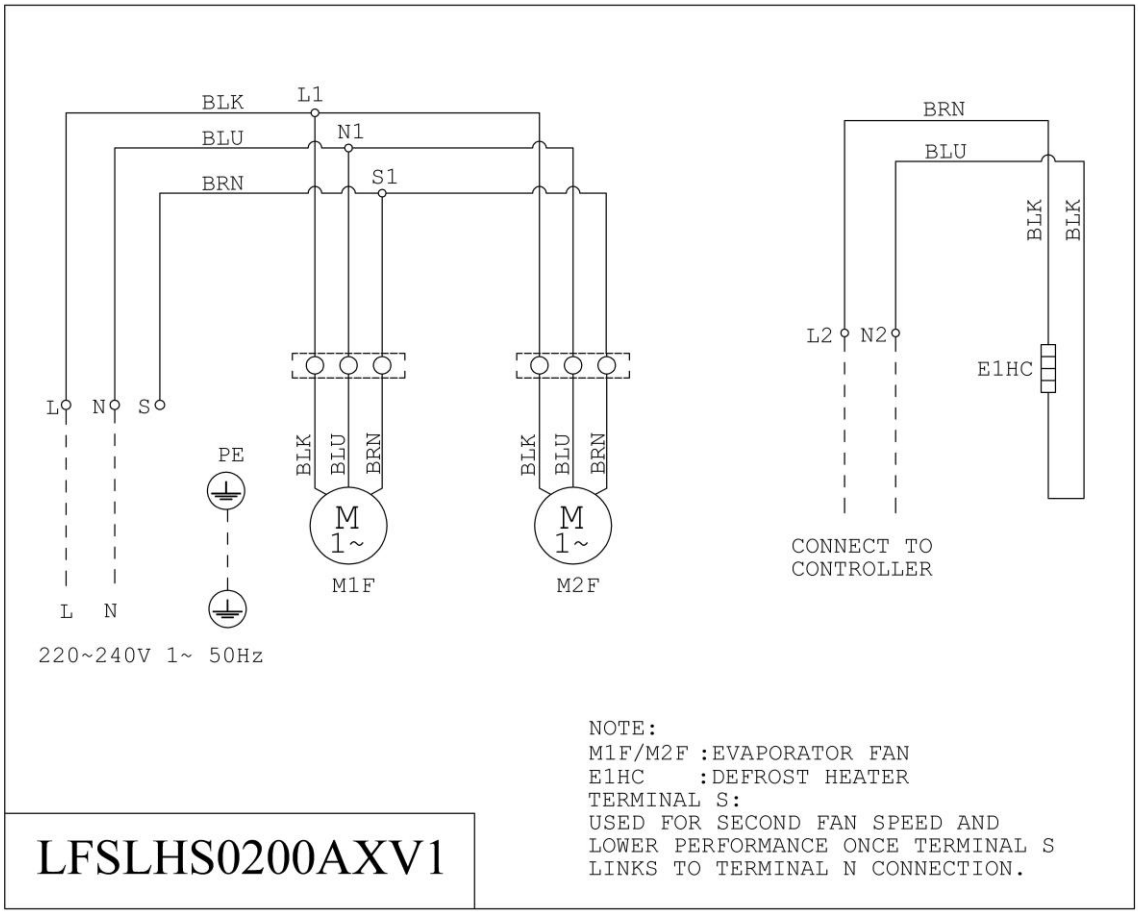


WARNING

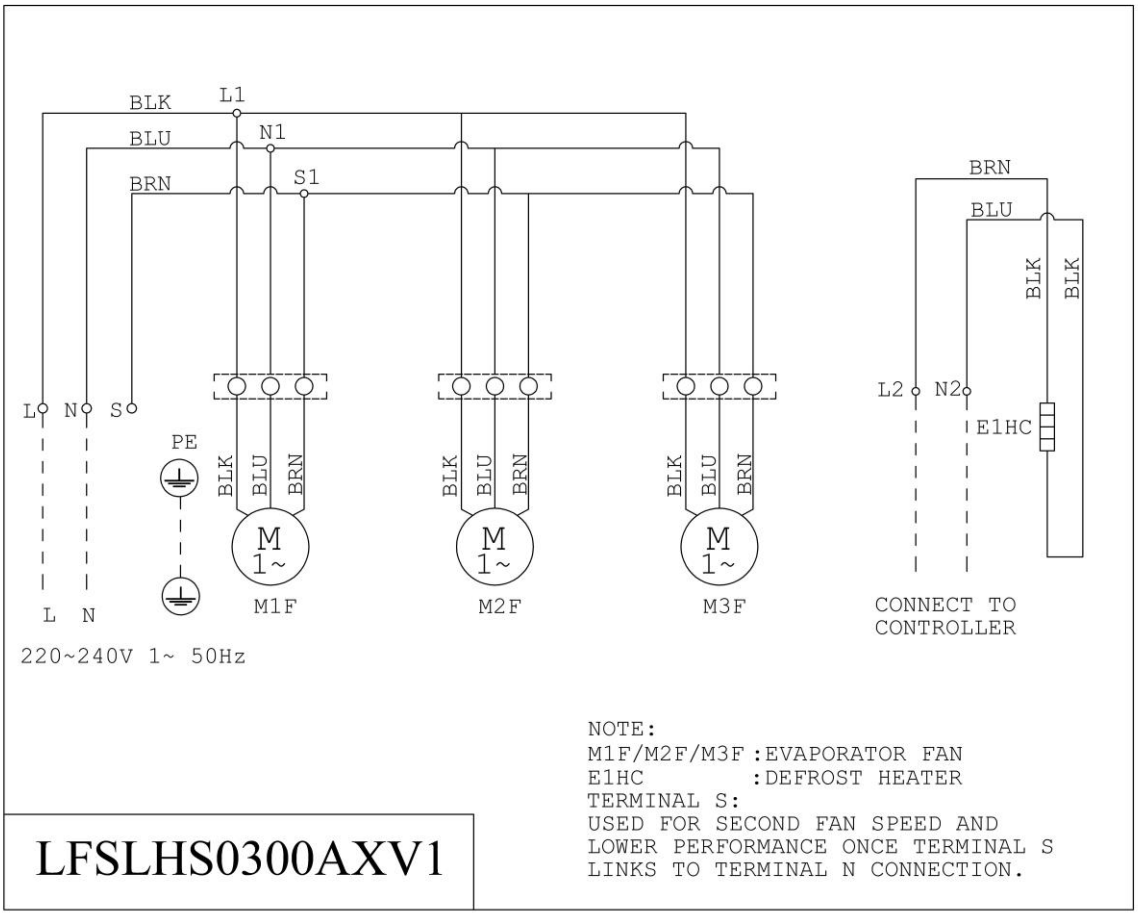
Please check electrical safety (leakage current, withstand voltage, earth continuity) after connected to heaters, fuse, and timers.

5.3 *Wiring Diagram*

(a) LFSLHS0200AXV1



(b) LFSLHS0300AXV1



6 START UP

6.1 *Pre-start up*

After the installation is completed, a review of the following items should be performed before the system is placed into operation:

Check electrical connections, fan motors, grills and all other fasteners for tightness. Be sure the thermostatic expansion valve bulb is properly located, strapped and insulated.

With the system operating, check the supply voltage. It must be within +/- 10% of the voltage marked on the unit nameplate.

6.2 *Operation Checkout*

A defrost cycle is needed when the frost build up is such that is impedes the airflow through the coil. The defrost requirements will vary on each installation and may change depending on the time of the year and other conditions.

WARNING

Please be aware that during electric defrost; the temperature of surrounding may rise dramatically. Kindly keep a safety distance away from the unit.

Check the drain line and make sure drain line is clear and unit is aligned in all position to avoid overflow of condensation water.

7 PREVENTATIVE MAINTENANCE

A preventative maintenance schedule should be set up as soon as the Unit Cooler is installed. The unit should be inspected periodically for proper operation and buildup of dirt.

1. Inspect and clean the drain pan to ensure there is no blockage. The drain pan should be cleaned regularly with warm water and neutral detergent.

WARNING: All power must be disconnected before cleaning.

2. The cabinet can be cleaned with water and neutral detergent. DO NOT clean the fans and fins using a water jet or high-pressure cleaner.

3. The evaporator coil should be checked once a month for proper defrosting. Many variables affect coil frosting such as room temperature, type of product being stored, how often new product is brought in and the length of time the door to the room remains open. Summer conditions of high humidity can cause heavier frost loads. It may be necessary to change the numbers of defrost cycles seasonally.

4. At least every six months check all fan motors. Tighten motor mounting screws and fan set screws.

8 TROUBLESHOOTING CHART

Table 1: **TROUBLESHOOTING CHART**

PROBLEM	POSSIBLE CAUSES	CORRECTIVE ACTION
Excessive buildup of frost on coil.	Defrost time is too short. Too high humidity in room.	Extend defrost time on timer. Limit access to cooler; do not keep doors open during stocking.

Accumulation of ice or water in drain pan.	Drain line plugged. Drain pipe does not have slope angle. Indoor unit not align or install in level at all directions. Drain line does not have drain trap.	Clean drain line. Make sure drain line is insulated properly. Install the drain line with slope. See page 5 for details. Check unit installation and align the unit level at all directions. Install drain line trap.
Noise	Resonance on the vibrating mounting parts. Vibration of fan or fan mounting misaligned.	Fix the position of vibrating part correctly. Fix the position of fan correctly; replace if defective.
Room temperature too high/ not cold	Room thermostat defect. Insufficient or no refrigerant supply to evaporator. Frost build up on evaporator coil. Defrosting too frequent. Wrong combination of unit: -Unit cooler is too big against to outdoor unit. -Unit cooler is too small against to cooling load.	Check thermostat setting and replace if any. Check sensor location. Investigate cause (leakage, choking, etc.), repair fault and charge system if necessary. Defrost the coil and clean the frost. Reduce defrost cycle frequency. Review and reselect the unit combination.

9 UNIT DECOMMISSIONING AND DISPOSAL

At the end of the system's useful life, a suitably qualified engineer or serviceman should decommission it. The refrigerant and compressor oil are classed as hazardous waste and as such must reclaimed and disposed of in the correct manner, including completion of waste transfer paperwork. The system components must be disposed or recycled as appropriate in the correct manner.

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