



United Technologies



38LH Series

Air-cooled Condensing Unit
Nominal: 5.0 & 7.0 Tons








MAXIMING PERFORMANCE, ENERGY SAVINGS AND COMFORT.

38 Series

High Quality Condensing Units for Diversified Commercial Use

38LH units are air-cooled condensing units which are easily connected by refrigerant lines and low voltage control wiring to matching Carrier packaged air handling units or other suitable evaporator units to provide customized packages covering a wide range of cooling requirements.

38LH units are ideal for new construction or renovation where quality and performance are required.

Product Matching		5.0 tons	7.0 tons
INDOOR UNIT	Underceiling/ Console	 42XQ/XQA	-
	DX Split	 40LX	 40LH
OUTDOOR UNIT	Air-cooled Condensing Unit	 38LH	 38LH

Features & Benefits

- Puron (R410a) HFC refrigerant.
- Fully Hermetic Scroll compressor – engineered for higher efficiency and dependable operation.
- High and Low pressure switches and crankcase heater ensure safety and long term reliability.
- Direct Driven propeller fan for horizontal air discharge.
- Suitable for longer piping length to suit most difficult installation.
- Ease of servicing with only few components involved.
- Pre-painted casing and withstanding minimum 500 hours of salt spray test as per ASTM B117.

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Specifications

MODEL NUMBER		38LH-060	38LH-085	
General	Type		Air-cooled Condensing Unit	
	Nominal Capacity	Btu/hr	60,000	85,000
		kW	17.58	24.91
	Refrigerant		R410a	
	Operating Charge ***	kg	4	7.2
	Power Source	V-Ph-Hz	400-3-50	
	Operating Weight	kg	112	159
	Unit Dimension (WxLxH)	mm	410 x 1040 x 875	602 x 1200 x 1055
	Casing Material / Treatment		Galvanized Steel / Powder Painted	
	External Finish		Morning Mist	
	Sound Pressure Level**	dBA	66	62
Compressor	Type		Scroll	
	Oil Charge	ml	1570	3300
	Input Power	kW	5.56	7.73
	Power Supply	V-Ph-Hz	380~400 - 3 - 50	
	Locked Rotor Amps	Amps	87	142
	Rated Load Amps	Amps	12.2	17.9
	Protective Device		Overload Protector	
Condenser Coil	Fin Material		Aluminium	
	Coil Type		Direct Expansion Coil	
	No. of Rows / FPI		2/18	2/17
	Total Face Area	sq.m	0.99	1.72
Condenser Fan Motor	Type		Direct Driven	
	Quantity		1	2
	Motor Speed	rpm	930	920 (x2)
	Power Output	kW	0.37	0.107 (x2)
	Full Load Amps	Amp	2.7	1.1 (x2)
	Power Supply	V-Ph-Hz	230-1-50	
Condenser Fan	Type		Propeller – Draw thru	
	Quantity		1	2
	No. of Blades		4	3
	Blade Diameter	mm	610	495
Piping Connections	Type		Sweat and Flare	
	Suction (sweat) / Material	mm (in)	22.2 (7/8) / Copper	28.6 (1 1/8) / Copper
	Liquid (thread) / Material	mm (in)	12.7 (1/2) / Brass	15.9 (5/8) / Brass

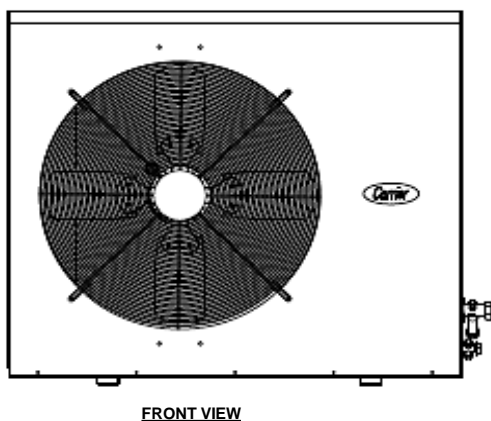
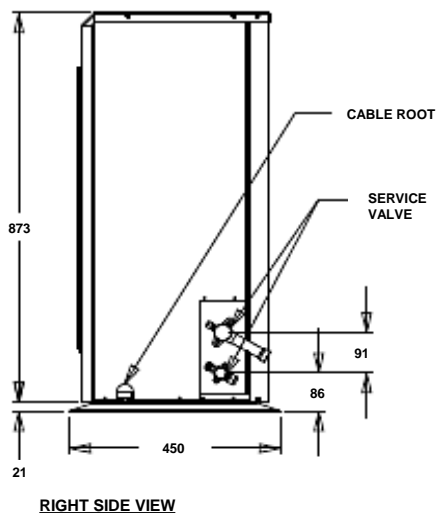
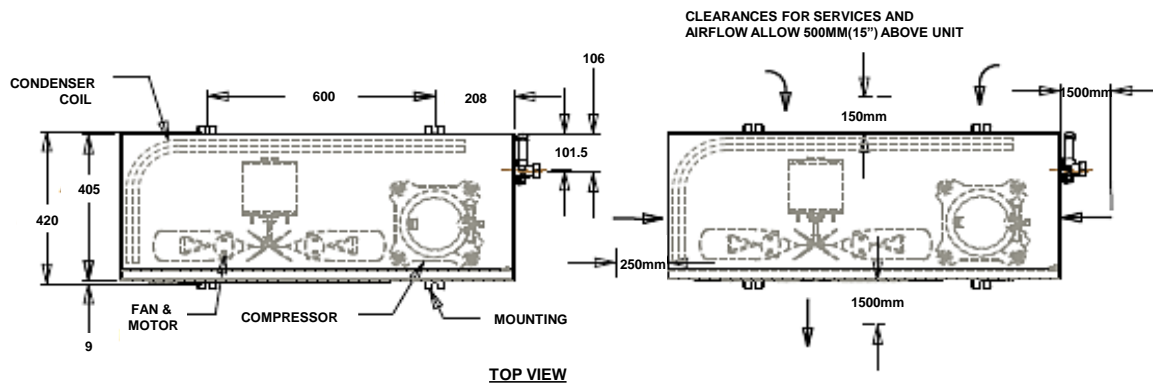
* Data is rated as per JIS Standard at 35° (95°F) ambient, 27°C/19°C (80.6°F/66.2°F) indoor condition.

** Data is measured at 1m front of the unit and 1m above the ground.

*** Unit pre-charged from factory.

Unit Dimension

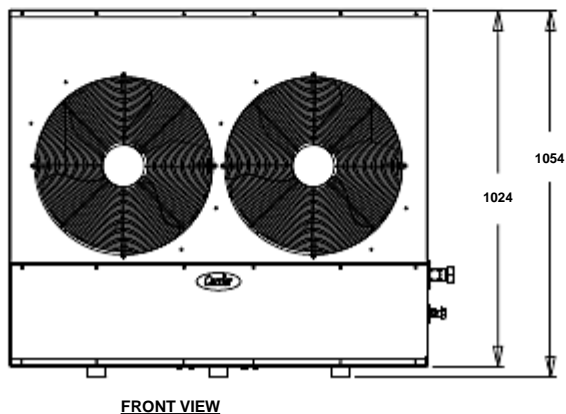
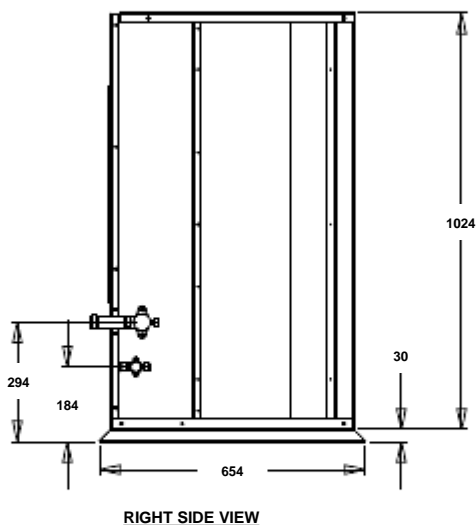
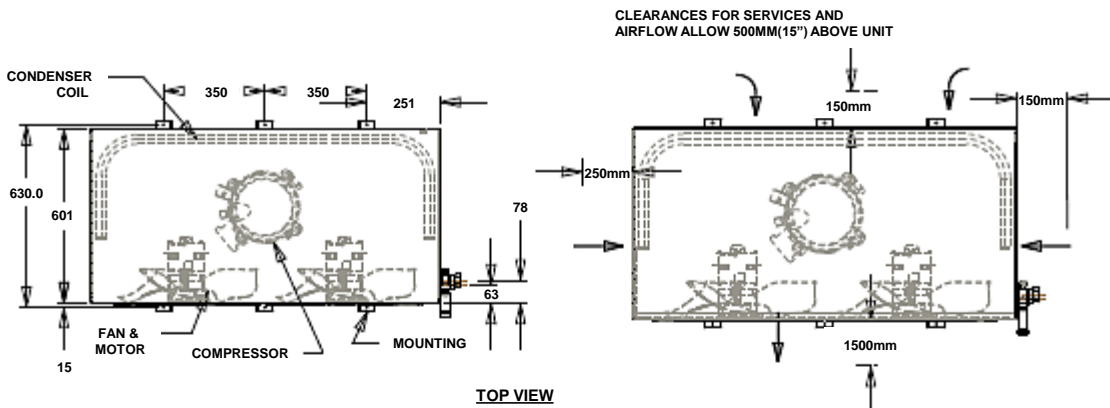
38LH-060



NOTES:
1) AIR DIRECTION →

Unit Dimension

38LH-085



NOTES:
1) AIR DIRECTION →

Selection Procedure

- Determine cooling load requirements:

Given:

Total Cooling Load..... 24.0 kW
 Sensible Heat Load..... 20.0 kW
 Indoor Air Quantity..... 1400 ℓ/s

Evaporator Air Entering:

Wet-bulb Temperature (ewb)..... 19.0°
 Dry-bulb Temperature (edb)..... 27.5°
 Outdoor Air Temperature..... 35°C

- Select a system with combination rating which will meet cooling requirements.

Enter combination ratings at 19°C indoor ewb and 35°C condenser air entering temperature. At high speed of 1756 ℓ/s indoor air quality, 38LH-085 c/w 40LH-085 has total gross cooling capacity of 24.95kW and gross cooling capacity of 20.49kW. Bypass factor is 0.10.

Corrected Sensible Heat Capacity (SHC):

$$= \text{SHG} + \ell/S \times \frac{1.23 (1 - \text{BF}) (\text{Cdb} - 27)}{1,000}$$

$$= 20.49 + 1756 \times \frac{1.23 (1 - 0.10) (27.5 - 27)}{1,000}$$

$$= 21.46$$

Performance Data

38LH-060 c/w 40LX-060 SYSTEM COOLING CAPACITIES

Temperature (°C)		Evaporator Air ℓ/s : BF								
		00:00.0			30:00.0			00:00.0		
Air Entering		Evaporator Air Ewb (°C)								
		16			19			22		
Condenser		16	19	22	16	19	22	16	19	22
25	TCG	16.84	18.31	20.05	17.47	19.01	20.75	17.84	19.47	21.12
	SHG	14.34	12.19	10.10	15.54	13.12	10.68	16.57	13.98	11.15
	kW	5.36	5.47	5.55	5.46	5.58	5.67	5.67	5.80	5.90
30	TCG	16.14	17.69	19.32	16.78	18.31	20.01	17.17	18.73	20.36
	SHG	13.99	11.94	9.80	15.22	12.84	10.40	16.29	13.69	10.87
	kW	5.82	5.98	6.06	5.97	6.08	6.18	6.14	6.30	6.40
35	TCG	15.32	16.98	18.56	15.93	17.56	19.20	16.38	17.90	19.52
	SHG	13.58	11.63	9.50	14.80	12.54	10.09	15.86	13.36	10.57
	kW	6.30	6.51	6.60	6.44	6.62	6.71	6.65	6.83	6.94
40	TCG	14.18	16.14	17.76	14.87	16.69	18.34	15.45	17.01	18.62
	SHG	13.04	11.28	9.19	14.30	12.18	9.77	15.32	13.01	10.25
	kW	6.71	7.04	7.14	6.85	7.16	7.25	7.07	7.37	7.47
43	TCG	13.55	15.44	17.25	14.24	16.06	17.79	14.90	16.43	18.05
	SHG	12.73	10.97	8.99	13.99	11.93	9.56	14.90	12.79	10.05
	kW	6.95	7.29	7.47	7.08	7.48	7.57	7.32	7.68	7.80

TCG : Gross Cooling Capacity (kW)

SHG : Gross Sensible Heat Capacity

kW : Total Power

Performance Data

38LH-060 c/w 42XQ-/XQA060 SYSTEM COOLING CAPACITIES

Temperature (°C)		Evaporator Air ℓ/s : BF								
Air Entering		43:00.0			06:00.0			30:00.0		
Condenser		Evaporator Air Ewb (°C)								
		16	19	22	16	19	22	16	19	22
25	TCG	15.10	16.31	17.41	15.28	16.50	17.48	15.42	16.63	17.53
	SHG	12.17	10.38	8.56	12.42	10.57	8.65	12.65	10.73	8.72
	kW	4.64	4.66	4.69	52.13	56.29	59.65	52.61	56.76	59.83
30	TCG	14.45	15.83	17.08	14.65	15.97	17.19	14.83	16.09	17.25
	SHG	11.85	10.17	8.40	12.13	10.34	8.51	12.40	10.50	8.60
	kW	5.11	5.15	5.18	49.98	54.49	58.64	50.59	54.91	58.87
35	TCG	13.60	15.17	16.55	13.79	15.33	16.66	14.01	15.47	16.76
	SHG	11.41	9.88	8.18	11.69	10.08	8.29	12.01	10.25	8.39
	kW	5.54	5.67	5.70	47.07	52.32	56.86	47.79	52.77	57.19
40	TCG	12.70	14.35	15.78	12.90	14.54	15.92	13.07	14.69	16.05
	SHG	10.98	9.50	7.85	11.28	9.73	7.98	11.54	9.92	8.10
	kW	6.00	6.21	6.25	44.03	49.61	54.33	44.59	50.11	54.75
43	TCG	12.13	13.78	15.32	12.31	13.95	15.42	12.48	14.14	15.54
	SHG	10.71	9.25	7.67	10.99	9.45	7.78	11.26	9.69	7.89
	kW	6.27	6.49	6.58	42.02	47.59	52.63	42.57	48.23	53.01

38LH-085 c/w 40LH-085 SYSTEM COOLING CAPACITIES

Temperature (°C)		Evaporator Air ℓ/s : BF								
Air Entering		36:00.1			02:00.1			16:00.1		
Condenser		Evaporator Air Ewb (°C)								
		16	19	22	16	19	22	16	19	22
25	TCG	22.85	24.98	27.24	24.33	26.38	28.61	26.26	27.25	29.46
	SHG	18.85	16.01	13.06	22.01	18.19	14.36	25.23	21.42	16.02
	kW	8.13	8.39	8.68	8.61	8.92	9.2	9.46	9.95	10.25
30	TCG	22.05	24.09	26.25	23.41	25.35	27.5	25.01	26.11	28.19
	SHG	18.44	15.6	12.68	21.57	17.76	13.94	25.01	20.95	15.58
	kW	8.76	9.02	9.31	9.19	9.54	9.83	10.06	10.57	10.86
35	TCG	21.23	23.17	25.22	22.51	24.3	26.35	24.07	24.95	26.88
	SHG	18.03	15.19	12.29	21.07	17.31	13.51	24.07	20.49	15.11
	kW	9.45	9.71	9.99	9.88	10.22	10.5	10.77	11.24	11.53
40	TCG	20.4	22.22	24.16	21.58	23.23	25.15	23.38	23.77	25.58
	SHG	17.62	14.76	11.88	20.51	16.85	13.06	22.28	20.02	14.65
	kW	10.2	10.45	10.73	10.61	10.95	11.22	11.54	11.95	12.23
43	TCG	19.86	21.64	23.52	21.05	22.58	24.42	22.58	23.09	24.79
	SHG	17.34	14.5	11.62	20.25	16.57	12.8	22.52	19.77	14.36
	kW	10.68	10.92	11.19	11.04	11.41	11.67	11.99	12.37	12.68

TCG : Gross Cooling Capacity (kW)

SHG : Gross Sensible Heat Capacity

kW : Total Power

Air – Cooled Condensing Unit Performance Rating

38LH-060 AIR-COOLED CONDENSING UNIT CAPACITIES						
SST		Air Temperature Entering Condenser (°C)				
(°C)		25	30	35	40	46
-1	TCG	14.04	12.86	11.57	10.17	8.33
	SDT	38.41	42.21	45.95	49.57	53.68
	kW	3.92	4.32	4.73	5.14	5.62
0	TCG	14.65	13.46	12.17	10.77	8.93
	SDT	39.02	42.79	46.53	50.13	54.28
	kW	3.97	4.36	4.77	5.19	5.68
4	TCG	17.70	16.05	14.67	13.25	11.41
	SDT	42.47	45.45	48.95	52.51	56.64
	kW	4.25	4.57	4.97	5.40	5.92
8	TCG	21.06	19.39	17.86	15.98	14.00
	SDT	47.04	50.46	53.72	55.59	59.18
	kW	4.63	5.00	5.47	5.71	6.18
10	TCG	22.96	21.14	19.47	17.42	15.39
	SDT	50.69	54.39	57.96	60.00	64.24
	kW	5.52	5.70	5.92	6.07	6.53

38LH-085 AIR-COOLED CONDENSING UNIT CAPACITIES						
SST		Air Temperature Entering Condenser (°C)				
(°C)		25	30	35	40	46
-1	TCG	22.36	21.26	20.19	19.14	17.89
	SDT	44.98	49.06	53.16	57.22	61.92
	kW	6.90	7.49	8.14	8.86	9.81
0	TCG	23.10	21.97	20.87	19.77	18.49
	SDT	45.43	49.47	53.54	57.53	62.22
	kW	6.97	7.56	8.21	8.93	9.88
4	TCG	25.94	24.69	23.46	22.25	20.77
	SDT	46.97	50.96	54.90	58.79	63.26
	kW	7.26	7.85	8.49	9.20	10.11
8	TCG	27.00	26.05	24.92	23.80	22.38
	SDT	48.17	51.98	55.83	59.61	64.00
	kW	7.51	8.08	8.71	9.40	10.29
10	TCG	27.54	26.61	25.51	24.41	23.03
	SDT	48.72	52.28	56.09	59.78	64.14
	kW	7.56	8.13	8.76	9.45	10.34

TCG : Total Capacity (kW)

kW : Compressor Motor Power Input

SDT : Saturated Condensing Temperature (°C)

SST : Saturated Suction Temperature (°C)

Note:

- 1) Direct interpolation is permissible. Do not extrapolate.
- 2) Saturated Suction Temperature (SST) shown correspond to pressure at compressor, actual suction temperature is higher due to superheat.

Electrical Data

Model Number	Power Supply	Permissible Voltage Range	Compressor		Fan Motor	Unit	
	V-Ph-Hz		LRA	RLA	FLA	MCA	MOCP
38LH-060	400-3-50	380~440	87	12.2	2.7	18.6	33.5
38LH-085	400-3-50	380~440	142	17.9	2 x 1.1	25.1	45.2

Legend:

- FLA - Full Load Amps
- LRA - Locked Rotor Amps
- RLA - Rated Load Amps
- MCA - Minimum Circuit Amps
- MOCP - Maximum Over-current Protection

Notes:

- 1) MCA values are for sizing for the field supplied wires.
- 2) MOCP values are used for sizing the field supplied standard fuses or circuit breakers.

Sound Pressure Level

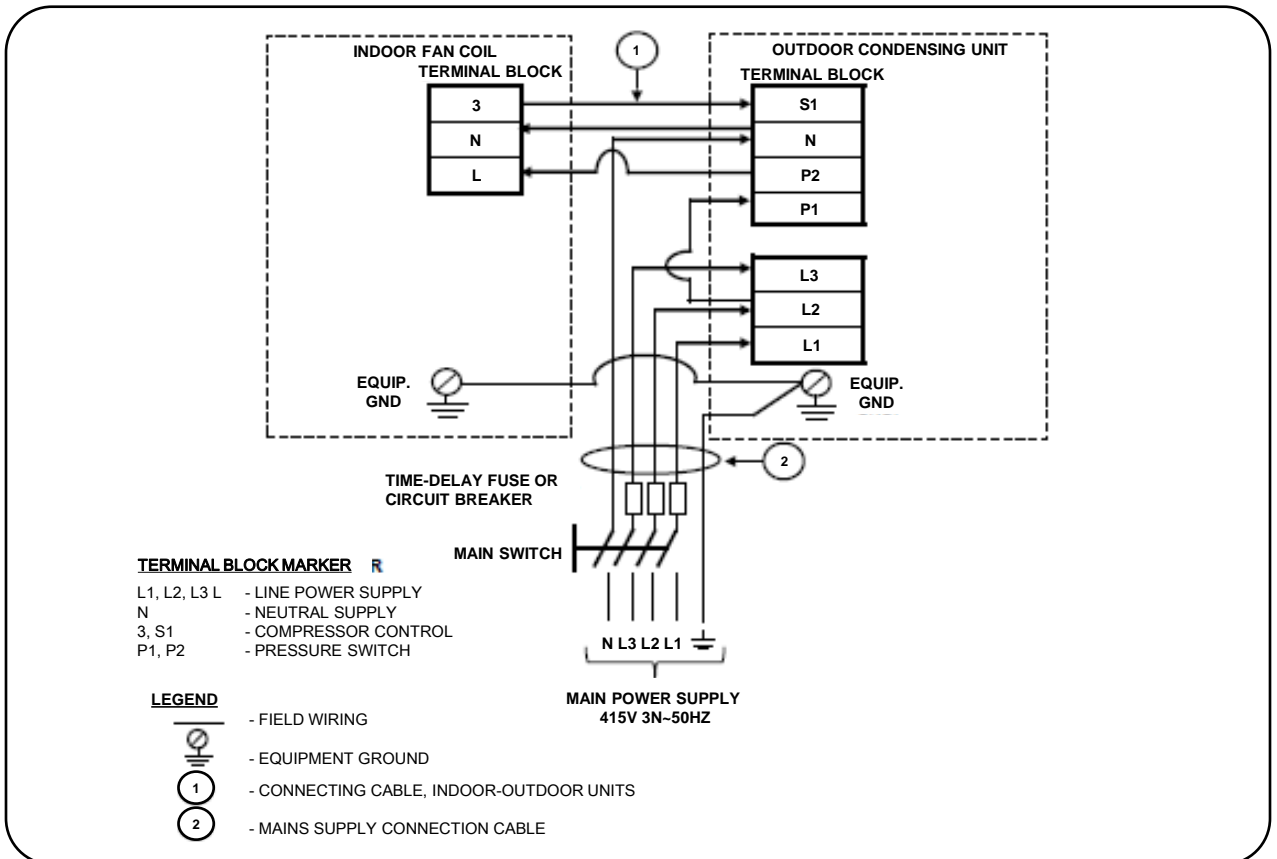
Model	Octave Band Centre Frequency (Hz)								
	63	125	250	500	1000	2000	4000	8000	dB(A)
38LH-060	51	53	53	58	63	59	51	41	66
38LH-085	31	47	50	56	56	55	52	42	62

Note:

Data is measured at 1m front of the unit and 1m above the ground.

Wiring Diagram

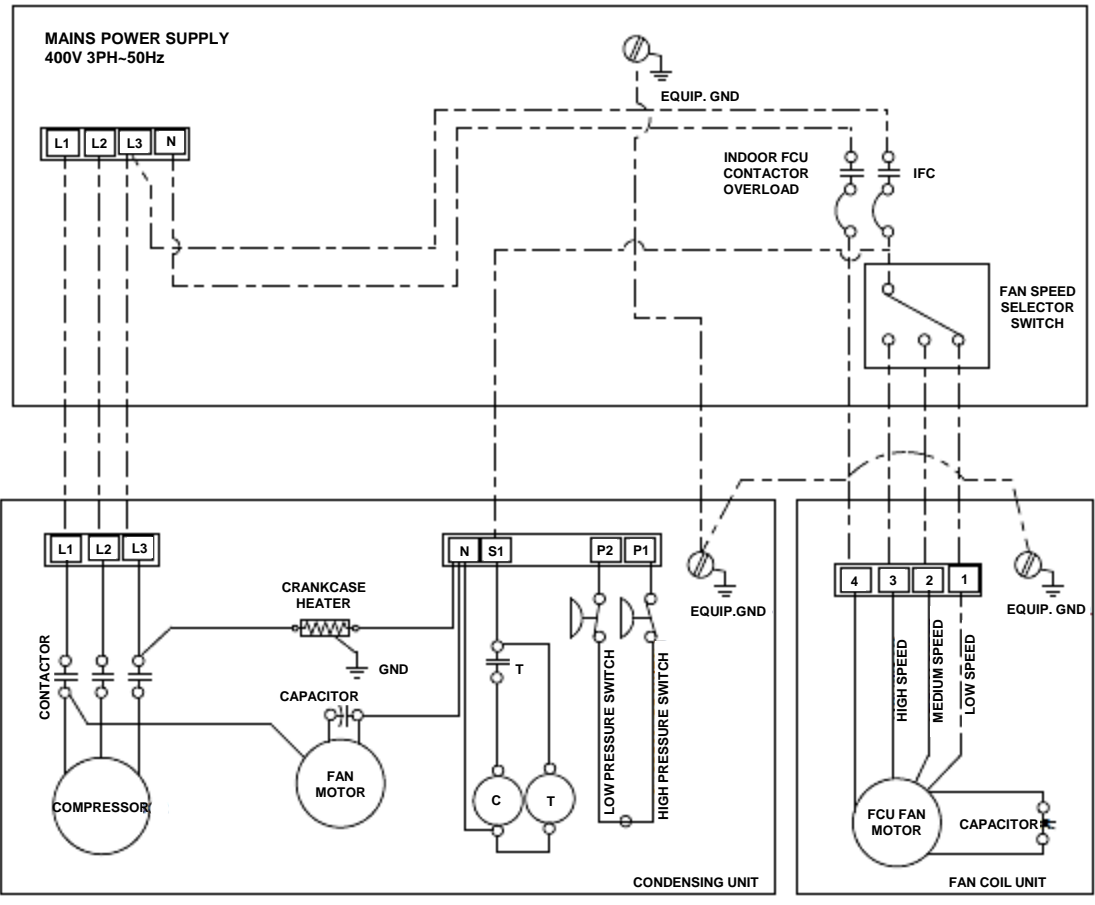
38LH-060 c/w 42XQ/XQA060 SYSTEM WIRING DIAGRAM



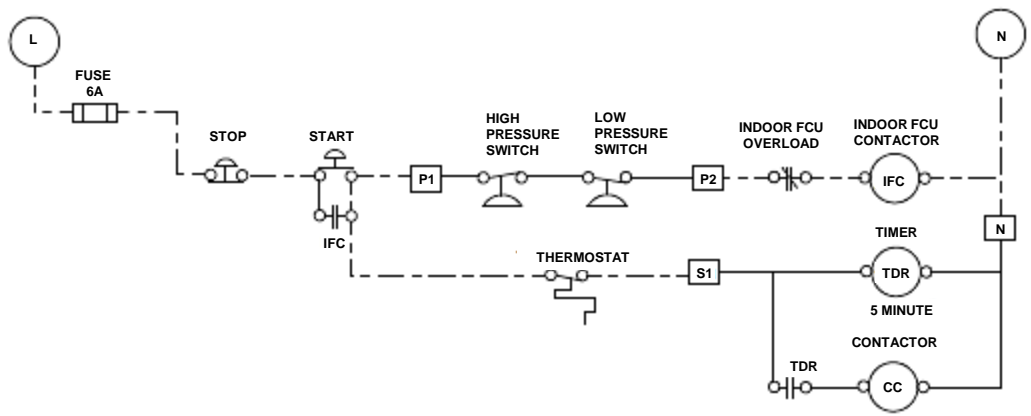
Wiring Diagram

38LH-060 c/w 40LX-060 SYSTEM WIRING DIAGRAM

DOL STARTER WITH HPS & LPS MANUAL RESTART



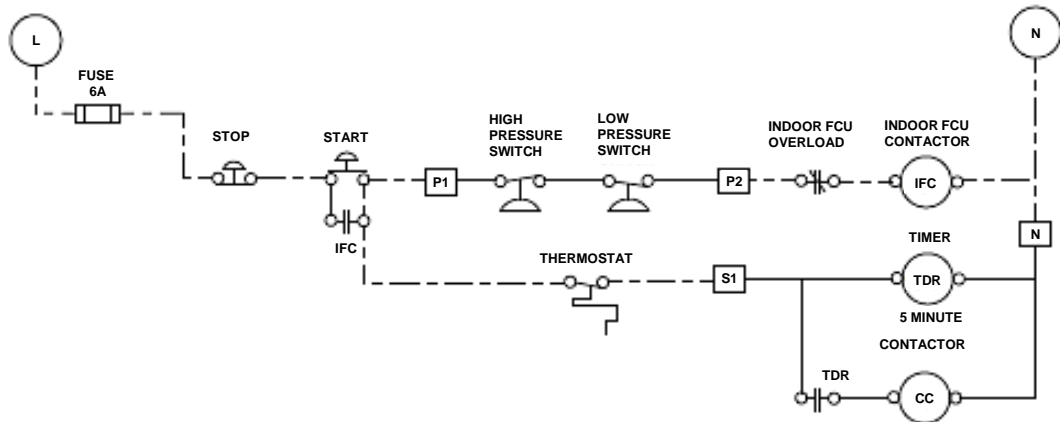
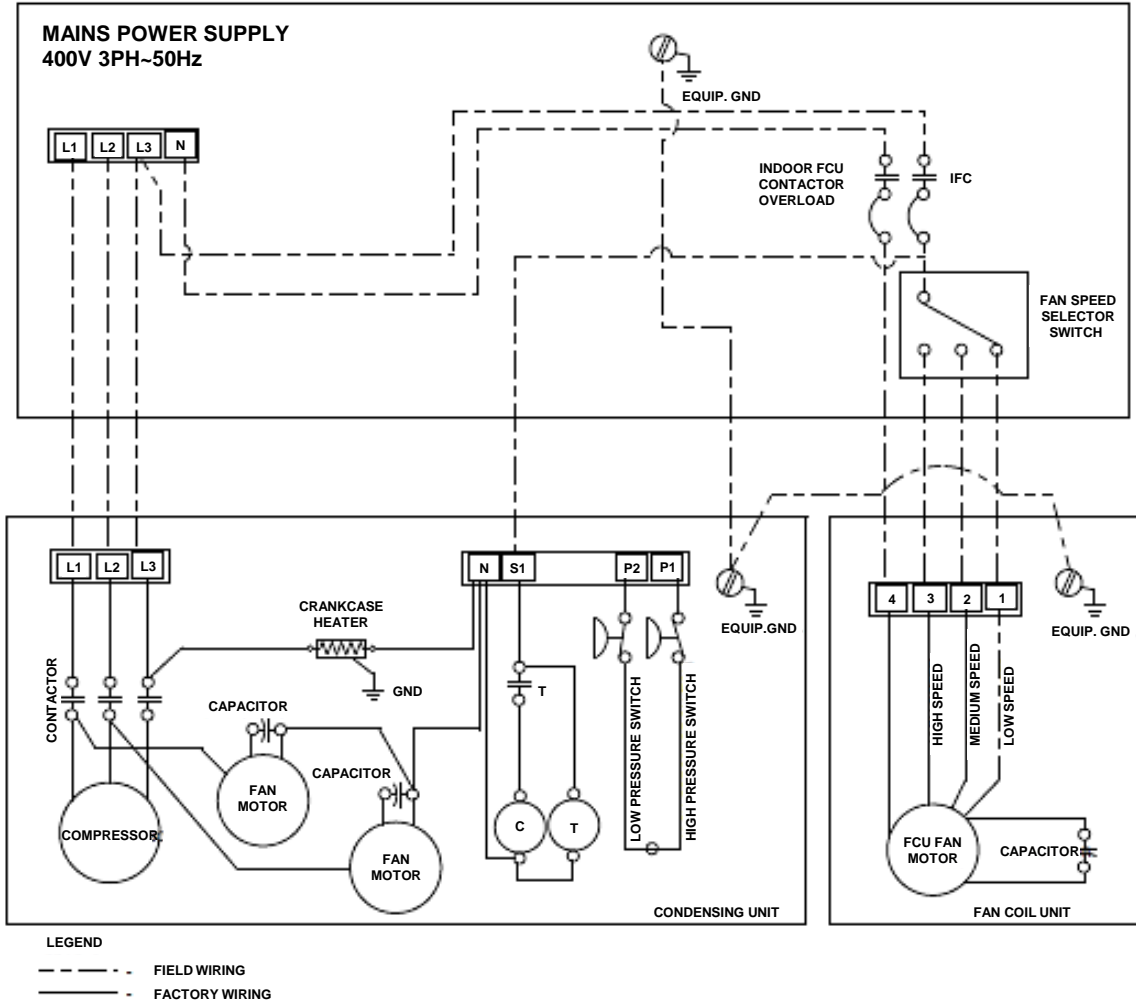
LEGEND
 - - - - - FIELD WIRING
 _____ FACTORY WIRING



Wiring Diagram

38LH-085 c/w 40LH-085 SYSTEM WIRING DIAGRAM

DOL STARTER WITH HPS & LPS MANUAL RESTART



Guide Specifications

Commercial Air-cooled Condensing Units

HVAC Guide Specifications

Size Range: 5.0 tons & 7.0 tons

Carrier Model Numbers:
38LH-060 (5 tons) and 38LH-085 (7 tons)

Part 1 – General

1.0 SYSTEM DESCRIPTION

The air-cooled condensing unit suitable for on-the-ground or rooftop installation. Unit shall consist of a hermetic scroll air conditioning compressor assembly, an air-cooled coil, propeller type condenser fans and a control box.

1.1 QUALITY ASSURANCE

- a. Unit shall be rated in accordance with JIS standard.
- b. Unit cabinet shall withstanding 500 hour in salt-spray exposure per ASTM B117.
- c. Air-cooled condenser coil shall be leak tested at 400 psig while submerged under water and coil performance is rated in accordance to ARI Standard 410.
- d. Unit shall be manufactured in a facility registered to ISO 9001 manufacturing quality standard.

1.2 DELIVERY, STORAGE AND HANDLING

Unit shall be shipped in a single package only, and shall be stored and handled according to manufacturer's recommendations (refer installation, Start-up & Service Instruction manual).

1.3 WARRANTY

- a. Manufacturer will be liable for the product DOA & Epidemic failure. In these situations, manufacturer's liability will be limited to repair or correct the actions.
- b. In case the material and or equipment manufactured accordance with specifications, drawings or instructions of the buyer, manufacturer will not be responsible for any defects malfunctions, non-performance or other faults caused by errors or omissions in such specifications, drawings of any kind.

Part 2 – Products

A. CONDENSER FAN

1. Condenser fans shall be furnished with direct driven, propeller type fan arrangement for horizontal discharge.
2. Condenser fan and motor shaft shall be corrosion resistant.

B. COMPRESSOR

1. Compressor shall be of hermetic scroll type.
2. Compressor shall be mounted on rubber grommets and sleeves.
3. Compressor shall include overload protection.
4. Compressor shall equipped with internal High and Low pressure switches.

C. CONDENSER COILS

1. The condenser coil shall be of non-ferrous construction such that it has aluminium plate fins with "Lanced Sine Wave" pattern mechanically bonded to seamless copper tubing.
2. The evaporator and condenser coil are tested for leakage at 400 psig while submerged under water.

D. OPERATING CHARACTERISTICS

1. The capacity of the condensing unit shall meet or exceed _____ Btuh at a suction temperature of _____ °C/°F. The power consumption at full load shall not exceed _____ kW.
2. The combination of the condensing unit and the evaporator unit or fan coil unit shall have a total cooling capacity of _____ Btu/hr or greater at conditions of _____ cfm entering air temperature at the evaporator at _____ °C/°F wet bulb and _____ °C/°F dry bulb, and air entering the condensing unit at _____ °C/°F.
3. The system shall have an EER of _____ Btuh/Watt or greater at standard ARI conditions.

E. ELECTRICAL REQUIREMENTS

Nominal unit electrical characteristics shall be _____ V, 3-Ph, 50Hz. The unit shall be capable of satisfactory operation within voltage limits of _____ volt to _____ volt.



Carrier International Sdn Bhd, Malaysia

Manufacturer reserves the right to discontinue, or change at anytime, specifications or designs without notice and without incurring obligations.

38LH-D13-1SL