

ACUS-C Series

Air Cooled Condensing Units



R-407C
REFRIGERANT



Range 5 TR to 95TR
(17 kW to 334 kW)



Contents

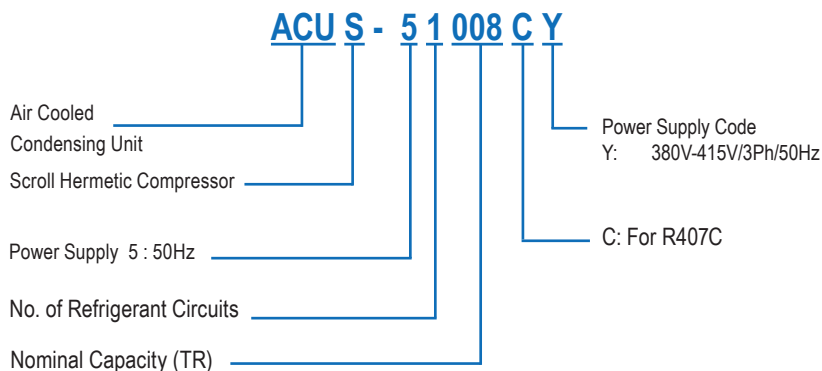
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Legend

The following abbreviations are used throughout this manual:

BPF..... By-pass Factor	MBh.... BTUH x 1000
cfm Cubic feet per minute	Ph Phase
EER Energy Efficiency Ratio	Pa Pascals
Hz Hertz	PD Pressure Drop
inwg Inches of water gauge	PI Power Input
kW Kilowatts	RPM.....Revolutions per Minute
kg kilogram	TR Tons of Refrigeration = 12 MBh
lbs Pounds weight (British units)	V Volt
L/S Liters per second	

Nomenclature



SKM reserves the right to change, in part or in whole the specifications of its Air Conditioning Equipment at any time in order to add the latest technology. Therefore, the enclosed information may change without any prior notice.

Introduction

SKM **ACUS-C** series Air cooled condensing unit are designed for the use on systems with indoor units connected to remote condensing units located outside either on ground or on roof level.

SKM **ACUS-C** units are manufactured to meet the requirements of the gulf severe climatic conditions.

The **ACUS-C** Air Cooled Condensing unit are ideal for warehouses, large halls, schools, mosques, or wherever the requirement calls for a heavy duty unit with a scroll hermetic compressor.

ACUS-C series Air cooled condensing unit (Hermetic Scroll) are available in 23 models covering nominal capacity ranges from 5 TR – 95 TR (17 kW to 334 kW) in 50Hz.

ACUS-C Air Cooled Condensing unit are rated in accordance with AHRI-365.

ACUS-C series provide efficient operation, wide range of design flexibility coupled with packaged concept requiring least on-site work.

ACUS-C series Air Cooled Condensing units are used for commercial and industrial applications where high efficient condensing units are needed to match an indoor central station AHUs or coils to get maximum performance advantages of split system with reasonable initial cost.

SKM provides qualified service and stock of replacement parts in all major cities of the G.C.C. countries, Egypt, Jordan, and Pakistan. See back cover for details or call SKM.

SKM Air Conditioning LLC



You name it.....We cool it



General Features

The complete **ACUS-C** condensing unit provides an extremely rugged, heavy duty, long-life and energy efficient that will provide higher efficiency over a long and extended life. What makes **ACUS-C** series the pride of SKM products is the use of :

- High efficiency totally sealed hermetic scroll compressor.
- Totally enclosed, Class F insulated, IP54 / IP55 protected condenser fan motor.
- Heavy duty condenser optimised in design for long-life maintenance free operation.
- Cabinet construction specifically designed for Gulf climates.
- Factory installed unit controller for operational and safety control.

The SKM **ACUS-C** series air cooled condensing units are durable, dependable, strong, reliable, versatile, quiet and energy efficient. Wherever a heavy duty condensing unit is required, the **ACUS-C** series should be an automatic choice.

Component Features

Compressor

Compressors used in **ACUS-C** condensing unit series are hermetically sealed, compact scroll with the following features:

- High Efficiency.
- Quite operation, Low Sound levels.
- Compact and light .
- Limited wear.
- 70% fewer moving parts than comparably sized reciprocating compressors
- Unique ability to handle liquid refrigerant.
- Suction gas motor cooling.
- Centrifugal oil pumps with filter and magnet.
- Brazed fittings or Rotalock as options.
- Two refrigerant circuits on larger units provides efficient part load.

Parallel Operation

A parallel compressors installation, with common suction line and common discharge line, give reduced operating cost through greater control of capacity and power consumption. This is achieved by staggering compressor switch-on sequences that allow the parallel system to match its power with the capacity needed. By switching-off individual compressor from parallel installation, while other compressor is operating 100%, the improved part load efficiency can be achieved. The specially developed and adopted oil equalization system ensures correct compressors operation, oil balancing between compressors and reliability.

Condensers

Condenser coils are manufactured of seamless copper tubes mechanically bonded to aluminum fins to ensure optimum heat transfer.



Condenser Coil

All coils are tested against leakage by air pressure of 525 psig (3615 kpa) under water. All standard coils are 2,3 or 4 rows, with 14 FPI or 16FPI, 3/8" (9.5mm) O.D. tubes.

An integral subcooling circuit is provided to increase the cooling capacity, without additional operating cost.

For different application requirements, other optional condenser fin materials are available:

- Copper fins.
- Electrotinned Copper Fins.
- Copper finned coils with electro-tinned after manufacturing.
- Precoated Aluminum fins
The pre-coated is hydrophobic polyurethane resin. This option provides substantial corrosion protection beyond standard coil construction.
- Aerie Guard Coil Coating
The Aerie Guard Coil is a self etching high performance modified epoxy finish that is specifically designed to coat and protect Aluminum and Copper surfaces. In addition, the coating is ideal for the protection of ferrous and non ferrous materials.

All models are suitable for Gulf countries, ensuring the condenser coil design shall provide long life operation with the least possibility operational blockage on the condenser.

Ample condenser surface and sensible air flow across the condenser ensures a low temperature differential between condensing temperature and the high Gulf ambient making the **ACUS-C** condensing unit perform efficiently and durably.

Condenser Fans

The condenser fans are propeller type, aluminium alloy blades, directly driven by electric motors.

Motors are Totally Enclosed Air Over (TEAO) four pole or six pole with class 'F' insulation and minimum IP55/IP54 protection.

The TEAO and class 'F' Insulation features ensure long life and are unique to SKM.

The motors are factory wired using wires specially selected for high ambient operation, to unit control panel where the motor contactors are located to control the operation of these motors.

The condenser fans are individually, statically and dynamically balanced at the factory. Complete fan assembly is provided with suitable acrylic-coated fan guard.

Casing/Structure

Designed for ease of handling and low cost to install. The **ACUS-C** Air cooled condensing Units are factory assembled and mounted on a rigid base. The unit casing used in **ACUS-C** condensing units is made of zinc coated galvanized steel sheets conforming to JIS-G3302 and ASTM A653 which is phosphatized then baked after an electrostatic powder coat of approximately 60 microns.

This finish and coating pass a 1000 hours in 5 % salt spray testing at 95°F (35°C) and 95% relative humidity as per ASTM B117.

The entire assembly comes complete with lifting holes on the base frame for rigging and installation. Access panels are provided for easy service and maintainance

Options available include hot dipped galvanized base frame and structural members aluminium/stainless steel panels are available, on request, as options.

Refrigerant Charge

Condensing units are shipped with nitrogen holding charge only.

Piping connections

ACUS-C air Cooled Condensing units piping connections come, as standard, terminated with sealed and soldered copper pipe ends.

Normal installation would require the cutting off (using roller-type tube cutters) of the ends prior to connections being resoldered and connected to the field supplied refrigerant pipework.

Refrigerant Pipe work

SKM **ACUS-C** series Condensing units are provided with all internal piping, using ACR grade copper tubing, between compressor and condenser.

Loose supplied liquid line refrigerant controls are available as an option for field installation (Please specify CRSP). When this option is ordered, the unit will be supplied with a correctly sized thermostatic expansion valve, liquid line solenoid valve, liquid line sight glass/moisture indicator and filter drier having flared or soldered ends isolatable with ball valve before and after the filter drier.

Installation of solenoid valve in the liquid line is recommended by SKM for proper operation of the unit.

Electrical Control Panel

The unit mounted control panel enclosure is fabricated out of heavy gauge sheet steel in phosphatized powder coated baked finish. The enclosure conforms to IP54 as per guidelines in IEC 529. The panel is factory wired in accordance with NEC 430 & 440, labelled, tagged and features 220V / 240V controls.

- All compressors are with DOL starting.
- Contactor provided for compressors and condenser fan motors.
- Internal overload protection for compressors.
- Internal thermal overload protection for condenser fan motors.
- Unit controller for operational and safety control.
- Compressor short cycling protection.
- High compressor motor temperature protection. (For compressors with electronic module).
- Control circuit on/off switch.
- Control circuit breaker.
- Power and control terminal blocks.
- High pressure protection.
- Low pressure protection.
- Volt-free contact to matching supply fan motor.

Unit Controller

ACUS-C units are controlled by a standalone unit controller, which provides all necessary operational and safety control of the units. Two types of controllers are used in **ACUS-C** units, depending on number of compressors.

Units with Up to two Compressors

For unit models with one compressor or two compressors, an electronic control board is provided as standard feature which provides an efficient control of the unit. This controller has diagnostic LEDS on board, which will help in trouble shooting of the units. A thermostat is to be used in conjunction with this controller to control the unit. Thermostat can be opted from SKM or can be supplied by customer.

Note:

Advanced microprocessor based controller can be provided as option, in case required. Refer to **AMCS** option for such requirement.



Units with four compressors

Unit models with four compressors are equipped with a full function microprocessor-based controller as a standard feature. The controller is factory programmed for the control of compressors and condenser fans. The controller comes with a built-in keypad and display for simple but meaningful man-machine interface. This controller provides complete operational control for the unit and has built-in auto diagnostic capability that can signal normal operation or alarm conditions as well as shutting down the unit or system if necessary.

The controller comes with a loose supplied sleek and elegant design room unit for installing in the conditioned space. Communication between unit controller and room unit is through two-wire interface. The communication cable should be 2-core, twisted pair, unscreened with stranded conductors. Maximum distance between room unit and controller can be 700 meters. The room unit has a built-in sensor for measuring the room temperature. It transmits room temperature, set point, unit operating mode, operating schedule etc. to the unit controller. Control of the compressors is based on room temperature and the set point, as standard.

For Units with Advance microprocessor controller (optional for units with One or two compressors and standard for units with four compressors) following features can be provided if required. Please specify during the time of order.

- Duct Temperature Sensor.
- BMS Interface through protocol.
- More features can be provided if required.

Optional Features

Alternative Condenser Material

Made of copper tubes and alternative fin material and/or protective coating.

- For Pre Coated aluminum fins, specify **(FAP)**.
- For Aluminum Fins with Aeris Post Coat Protection, specify **(FAA)**.
- For Copper Fins, specify **(FC)**.
- For Copper Fins with Aeris Post Coat Protection, specify **(FCA)**.

Condenser Coil Guard **(CGP)**

Galvanized wire mesh frame with painted finish for condensers. Recommended on ground level installations where coil needs to be protected against vandalism.

Pressure Gauges **(SDG1)**

Suction and discharge pressure indication of each refrigerant circuit. Gauges are mounted **outside** the Control Panel

Pressure Relief Valve **(PRV)**

To protect the unit from being over-pressurized.

Rotalock Valves on compressors **(RVC)**

For additional facilitation of maintenance of unit.

Western make scroll compressor **(WMSC)**

Western make scroll compressor.

Liquid line Controls **(CRSP)**

Refrigeration specialties comprising expansion valve, filter drier, sight glass, solenoid valve each and ball valve two numbers per refrigerant circuit. Factory sizing and selection ensures correctly sized and selected components to complete the field installation.

Hot Gas Bypass System **(GBP)**

With solenoid valve to enable operation of a large sized unit at low loads, like during low ambients due to application requirements. (Highly recommended for 100% fresh air application).

Pump Down Facility **(PD)**

The compressor will switch off each time with a Pump Down Cycle in order to prevent Liquid refrigerant migration to the compressor during off Cycle periods.

With this option, each circuit will be provided with an additional discharge check valve (if required) to prevent Refrigerant Migration from High side to Low side when the compressor is off.

IP-55 Control Panel **(ICP)**

Control Panel for special applications to meet IP55 requirements.

Main Isolator (Without door interlock) **(ISO)**

For main power isolation. (consult SKM)

Voltage Monitoring Module as per DEWA **(DVM)**

Under voltage relay as per DEWA regulations. This option is available for Dubai, UAE only. **(VMM option is not required if this option is opted).**

Circuit Breaker for Compressor **(CBC)**

For those electrical specification calls for additional over load and short circuit protection.

Manual Reset Type High Pressure Switch **(MHP)**

To replace standard auto reset, capsule type pressure switch.

External Overload Protection **(EOP)**

For those electrical specification which require additional overload protection for the compressors. **(Not required with CBC option).**

Advanced Microprocessor control system **(AMCS)**

An advanced microprocessor based controller can be provided for one or two compressors units as option, in case required. This controller will be with built-in display keypad and has many features. This optional controller is the same as the standard controller used in units with four compressors.

For this feature, additional options can be provided and to be specified during time of order:

- **DTS – Duct Temperature Sensor***
(In order to control the unit based on return/supply air duct temperature).
(This is not required with CHTS options).
- **BMSP – BMS Protocol***
(For interfacing the units with major BMS protocols such as BACnet, Modbus or LON. An extra hardware may be required depending on the protocol).

BMS Interface Volt free Contacts**(BMVF)**

Volt free contacts for run status, common fault status, auto mode status and provision for remote on/off shall be provided as option if required. For additional requirements, please contact SKM.

Circuit Breaker for Motors**(CBM)**

For those electrical specification which requires additional short circuit and overload protection for the fan motors.

Compressor Run Hour Meter**(RHM)**

To monitor operating hours of each compressor.

Voltage Monitor Module**(VMM)**

Provides protection in the event of:

- Phase burn-out.
- Phase reversal.
- Under / over voltage on the incoming line voltage.

Fire Alarm Interlock**(VFC-F)**

To provide provision for fire alarm interlock.

Options for Field Installations**Liquid Line Controls****(CRSP)**

Comprises of correctly sized thermostatic expansion valve, suitable solenoid valve, filter drier, sight glass and two numbers ball valve per circuit.

Low Voltage Thermostat**(CHTS)**

For wall mounting and for cooling /heating operation with 1 or 2 stages as per model. **(Not required with AMCS option or for units with four compressors).**

• **DTS-TH - Duct Temperature Sensor for 24V Thermostat*** (in order to control the unit based on return/supply air duct temperature) **(this is not required with AMCS options)**

Special custom built units incorporating specially required features like units for larger capacities, anti-condensation resistance heaters embedded in evaporator motors, units can be manufactured on request. Consult SKM with detailed requirements.

Contact SKM for all such applications or requirements.

Note:

- * DTS & BMSP options are only available along with AMCS option or for unit models with advanced microprocessor based controller.
- * DTS-TH option is only available along with CHTS option.
- Whenever multiple option related to unit control, please consult SKM for the drawings as the size of the control panel might change.



GENERAL DATA

Model		ACUS	51005	51007	51008	51009	52010	51012
Cooling Capacity (1)		BTUH	57000	69000	85000	110000	115000	124000
		W	16706	20223	24912	32239	33705	36342
Cooling Capacity (2)		BTUH	49000	59000	73000	95000	98000	106000
		W	14361	17292	21395	27843	28722	31067
Compressor	Type	-	Hermetic Scroll Compressor					
	Quantity	-	1	1	1	1	2	1
	Oil Charge per Circuit (A / B)	US Gal	0.47	0.47	0.66	0.86	0.47/0.47	0.86
		Liter	1.77	1.77	2.51	3.25	1.77/1.77	0.86
Condenser Coil	Type	Air cooled 2,3 or 4 rows with 14FPI (1.8mm)or 16FPI (1.6mm) fin spacing, Aluminum Fins, Copper Tubes						
	Face Area	ft²	9.7	12.2	19.4	19.4	19.4	19.4
		m²	0.9	1.1	1.8	1.8	1.8	1.8
Condenser Fan	Type	-	Propeller direct drive					
	Code / Quantity	-	D-630/1	K-710/1	D-630/2	D-630/2	D-630/2	D-630/2
	Air Flow Rate	cfm	4390	6520	9640	8780	8780	8780
		l/s	2072	3077	4550	4144	4144	4144
Condenser	Type	-	Totally enclosed, air over Class F insulation, 6-pole, IP-54/IP-55					
Motor	Size / Quantity	kW	0.25/1	0.8/1	0.25/2	0.25/2	0.25/2	0.25/2
Refrigerant Operating Charge Per Circuit		lbs	7.3	8.8	9.4	13.6	6.9/6.9	14.8
		kg	3.3	4	4.3	6.2	3.1/3.1	6.7
Number of Refrigerant Circuits		-	1	1	1	1	2	1
Unit Operating Weight		lbs	537	577	653	753	795	757
		kg	244	262	296	341	360	343

Table 1

Model		ACUS	52013	52015	52019	52024	52025	52028
Cooling Capacity (1)		BTUH	138000	168000	214000	244000	274000	314000
		W	40445	49238	62720	71512	80305	92028
Cooling Capacity (2)		BTUH	119000	142000	184000	208000	230000	268000
		W	34877	41618	53927	60961	67409	78546
Compressor	Type	-	Hermetic Scroll Compressor					
	Quantity	-	2	2	2	2	2	2
	Oil Charge per Circuit (A / B)	US Gal	0.47/0.47	0.66/0.86	0.86/0.86	0.86/0.86	0.86/0.86	0.86/0.86
		Liter	1.77/1.77	2.51/2.51	3.25/3.25	3.25/3.25	3.25/3.25	3.25/3.25
Condenser Coil	Type		Air cooled 2,3 or 4 rows with 14FPI (1.8mm)or 16FPI (1.6mm) fin spacing, Aluminum Fins, Copper Tubes					
	Face Area	ft²	24.4	26.2	26.2	26.2	35.6	40
		m²	2.3	2.4	2.4	2.4	3.3	3.7
Condenser Fan	Type	-	Propeller direct drive					
	Code / Quantity	-	K-710/2	K-710/2	K-800/2	K-800/2	K-800/3	K-800/3
	Air Flow Rate	cfm	13040	13400	18960	18080	27180	28620
		l/s	6154	6324	8948	8533	12828	13507
Condenser	Type	-	Totally enclosed, air over Class F insulation, 6-pole, IP-54/IP-55					
Motor	Size / Quantity	kW	0.8/2	0.8/2	1.5/2	1.5/2	1.5/3	1.5/3
Refrigerant Operating Charge Per Circuit		lbs	9.1/9.1	9.5/9.5	9.5/9.5	13.5/13.5	13.6/13.6	15.9/15.9
		kg	4.1/4.1	4.3/4.3	4.3/4.3	6.1/6.1	6.2/6.2	7.2/7.2
Number of Refrigerant Circuits		-	2	2	2	2	2	2
Unit Operating Weight		lbs	919	1100	1233	1291	1454	1809
		kg	417	499	559	586	659	821

Table 2

- 1). Cooling capacity at 95°F (35°C) ambient temperature according to AHRI-365.
- 2). Cooling capacity at Gulf conditions : 115°F (46.1°C) condenser entering air temperature & 45°F (7.2°C) SST.
- 3). Operating charge is approximate for condensing unit only and does not include refrigerant lines and evaporator coil.
- 4). Condensing units are shipped with nitrogen holding charge only.

GENERAL DATA

Model		ACUS-C	52034	52039	52045	52049	52051	52055
Cooling Capacity (1)		BTUH	362000	410000	470000	520000	580000	615000
		W	106096	120164	137749	152403	169988	180246
Cooling Capacity (2)		BTUH	310000	354000	400000	445000	490000	525000
		W	90856	103751	117233	130422	143611	153869
Compressor	Type	-	Hermetic Scroll Compressor					
	Quantity	-	2	2	2	2	4	4
	Oil Charge per Circuit (A / B)	US Gal	1.23/0.86	1.23/1.23	1.8/1.23	1.8/1.8	1.72/1.72	1.72/1.72
		Liter	4.67/3.25	4.67/4.67	6.8/4.67	6.8/6.8	6.52/6.52	6.52/6.52
Condenser Coil	Type	-	Air cooled 2,3 or 4 rows with 14FPI (1.8mm)or 16FPI (1.6mm) fin spacing, Aluminum Fins, Copper Tubes					
	Face Area	ft ²	40	53.3	64	72	72	72
		m ²	3.7	5	5.9	6.7	6.7	6.7
Condenser Fan	Type	-	Propeller direct drive					
	Code / Quantity	-	K-800/3	K-800/3	K-800/4	K-800/4	K-800/4	K-800/4
	Air Flow Rate	cfm	27330	31560	40760	42200	40920	40920
		l/s	12899	14895	19237	19917	19313	19313
Condenser	Type	-	Totally enclosed, air over Class F insulation, 6-pole, IP-54/IP-55					
Motor	Size / Quantity	kW	1.5/3	1.5/3	1.5/4	1.5/4	1.5/4	1.5/4
Refrigerant Operating Charge Per Circuit		lbs	21.8/18.4	20.1/20.1	24.2/21.6	25.5/25.5	33.4/33.4	35.5/35.5
		kg	9.9/8.3	9.1/9.1	11.0/9.8	11.6/11.6	15.2/15.2	16.1/16.1
Number of Refrigerant Circuits		-	2	2	2	2	2	2
Unit Operating Weight		lbs	2066	2374	2615	2721	2789	2799
		kg	937	1077	1186	1234	1265	1270

Table 3

Model		ACUS-C	52065	52075	52080	52085	52095
Cooling Capacity (1)		BTUH	730000	820000	900000	945000	1045000
		W	213951	240328	263775	276964	306272
Cooling Capacity (2)		BTUH	620000	705000	770000	805000	885000
		W	181712	206624	225674	235932	259379
Compressor	Type	-	Hermetic Scroll Compressor				
	Quantity	-	4	4	4	4	
	Oil Charge per Circuit (A / B)	US Gal	2.09/2.09	2.46/2.46	3.03/2.46	3.03/3.03	3.6/3.6
		Liter	7.92/7.92	9.32/9.32	11.48/9.32	11.48/11.48	13.64/13.64
Condenser Coil	Type	-	Air cooled 2,3 or 4 rows with 14FPI (1.8mm)or 16FPI (1.6mm) fin spacing, Aluminum Fins, Copper Tubes				
	Face Area	ft ²	130	130	130	130	130
		m ²	12.1	12.1	12.1	12.1	12.1
Condenser Fan	Type	-	Propeller direct drive				
	Code / Quantity	-	K-800/4	K-800/4	K-800/8	K-800/8	K-800/8
	Air Flow Rate	cfm	47040	46440	81920	81920	79120
		l/s	22201	21918	38663	38663	37342
Condenser	Type	-	Totally enclosed, air over Class F insulation, 6-pole, IP-54/IP-55				
Motor	Size / Quantity	kW	1.5/4	1.5/4	1.5/8	1.5/8	1.5/8
Refrigerant Operating Charge Per Circuit		lbs	50.1/50.1	65.2/65.2	53.1/53.1	53.1/53.1	66.5/66.5
		kg	22.7/22.7	29.6/29.6	24.1/24.1	24.1/24.1	30.1/30.1
Number of Refrigerant Circuits		-	2	2	2	2	2
Unit Operating Weight		lbs	5107	5729	6870	6924	7288
		kg	2317	2598	3114	3139	3303

Table 4

- 1). Cooling capacity at 95°F (35°C) ambient temperature according to AHRI-365.
- 2). Cooling capacity at Gulf conditions : 115°F (46.1°C) condenser entering air temperature & 45°F (7.2°C) SST.
- 3). Operating charge is approximate for condensing unit only and does not include refrigerant lines and evaporator coil.
- 4). Condensing units are shipped with nitrogen holding charge only.



ACUS-C CAPACITY RATINGS

Model ACUS-C	SST		Condenser Entering Air Temperature											
			95°F (35°C)			105°F (40.6°C)			115°F (46.1°C)			120°F (48.9°C)		
		°F	°C	Total Capacity		PI	Total Capacity		PI	Total Capacity		PI	Total Capacity	
			MBh	kW	kW	MBh	kW	kW	MBh	kW	kW	MBh	kW	kW
51005	35	1.7	44.7	13.1	4	41	12	4.6	36.9	10.8	5.3	34.9	10.2	5.7
	40	4.4	50.9	14.9	4.1	46.9	13.7	4.8	42.7	12.5	5.5	40.6	11.9	5.8
	45	7.2	57.4	16.8	4.3	53.1	15.6	4.9	48.8	14.3	5.7	46.6	13.7	6
	50	10	64.3	18.8	4.4	59.7	17.5	5.1	55.1	16.2	5.8	52.9	15.5	6.2
51007	35	1.7	56.8	16.6	4.5	52.7	15.4	5.2	48.3	14.2	6	46.2	13.5	6.4
	40	4.4	62.8	18.4	4.7	58.4	17.1	5.3	53.6	15.7	6.1	51.3	15	6.5
	45	7.2	69.3	20.3	4.8	64.4	18.9	5.5	59.3	17.4	6.3	56.8	16.6	6.6
	50	10	76.2	22.3	5	70.9	20.8	5.7	65.4	19.2	6.4	62.8	18.4	6.8
51008	35	1.7	70.3	20.6	5.5	65	19.1	6.3	59	17.3	7.2	55.9	16.4	7.7
	40	4.4	77.4	22.7	5.6	71.9	21.1	6.4	65.7	19.2	7.3	62.6	18.3	7.8
	45	7.2	85	24.9	5.7	79.1	23.2	6.5	72.7	21.3	7.4	69.6	20.4	7.9
	50	10	92.9	27.2	5.8	86.6	25.4	6.6	80	23.4	7.5	76.8	22.5	8
51009	35	1.7	90.9	26.7	7.1	84.4	24.7	8.2	77.4	22.7	9.3	73.9	21.7	9.9
	40	4.4	100.2	29.4	7.3	93.1	27.3	8.3	85.7	25.1	9.5	82	24	10.1
	45	7.2	110.1	32.3	7.5	102.4	30	8.6	94.5	27.7	9.7	90.6	26.5	10.2
	50	10	120.6	35.3	7.7	112.4	32.9	8.8	104	30.5	9.9	100	29.3	10.5
51012	35	1.7	102.9	30.2	8.3	94.4	27.7	9.5	85.3	25	10.8	80.8	23.7	11.5
	40	4.4	113.2	33.2	8.5	104.5	30.6	9.8	95.4	28	11.1	91.1	26.7	11.7
	45	7.2	124	36.4	8.8	115	33.7	10	105.7	31	11.3	101.3	29.7	11.9
	50	10	135.4	39.7	9.1	125.7	36.8	10.3	115.9	34	11.6	111.3	32.6	12.1
52010	35	1.7	89.4	26.2	7.9	82	24	9.2	73.9	21.7	10.7	69.9	20.5	11.4
	40	4.4	101.8	29.8	8.2	93.7	27.5	9.5	85.3	25	11	81.2	23.8	11.7
	45	7.2	114.8	33.6	8.5	106.3	31.1	9.9	97.5	28.6	11.3	93.3	27.3	12
	50	10	128.6	37.7	8.9	119.4	35	10.2	110.2	32.3	11.7	105.8	31	12.3
52013	35	1.7	113.6	33.3	9.1	105.4	30.9	10.4	96.7	28.3	12	92.3	27.1	12.8
	40	4.4	125.7	36.8	9.3	116.7	34.2	10.7	107.3	31.4	12.3	102.5	30.1	13
	45	7.2	138.6	40.6	9.6	128.8	37.8	11	118.6	34.8	12.5	113.6	33.3	13.3
	50	10	152.3	44.6	9.9	141.8	41.5	11.3	130.9	38.4	12.8	125.5	36.8	13.5
52015	35	1.7	138.5	40.6	11.3	127.6	37.4	12.9	115.5	33.8	14.8	109.5	32.1	15.7
	40	4.4	152.5	44.7	11.5	141	41.3	13.2	128.6	37.7	15	122.6	35.9	15.9
	45	7.2	167.2	49	11.7	155.1	45.5	13.5	142.5	41.8	15.3	136.5	40	16.2
	50	10	182.6	53.5	12	169.7	49.7	13.7	156.6	45.9	15.5	150.4	44.1	16.3
52019	35	1.7	178.6	52.3	14.8	165.2	48.4	16.9	151.3	44.3	19.2	144.4	42.3	20.3
	40	4.4	196.5	57.6	15.2	182.2	53.4	17.3	167.4	49.1	19.6	160.2	46.9	20.7
	45	7.2	215.6	63.2	15.6	200.1	58.6	17.8	184.4	54	20	176.8	51.8	21.1
	50	10	235.8	69.1	16.1	219.3	64.3	18.3	203	59.5	20.5	195.2	57.2	21.6
52024	35	1.7	204.1	59.8	16.9	186.9	54.8	19.3	168.6	49.4	21.9	159.8	46.8	23.2
	40	4.4	224.3	65.7	17.4	206.8	60.6	19.9	188.8	55.3	22.4	180.2	52.8	23.7
	45	7.2	245.7	72	17.9	227.5	66.7	20.4	209.2	61.3	23	200.5	58.8	24.1
	50	10	268	78.6	18.5	248.6	72.9	21	229.4	67.2	23.4	220.3	64.6	24.6
52025	35	1.7	223	65.4	18.4	204.7	60	21.1	185.9	54.5	24	176.6	51.8	25.5
	40	4.4	247.8	72.6	18.9	228.2	66.9	21.6	208.2	61	24.5	198.3	58.1	25.9
	45	7.2	274.2	80.4	19.5	253.1	74.2	22.2	231.8	67.9	25	221.2	64.8	26.3
	50	10	302.5	88.7	20.1	280	82.1	22.8	257.4	75.4	25.5	246.3	72.2	26.8
52028	35	1.7	261.1	76.5	22.5	240.8	70.6	25.6	219.4	64.3	29	208.9	61.2	30.6
	40	4.4	287.7	84.3	23.1	265.9	77.9	26.2	243.3	71.3	29.6	232.4	68.1	31.2
	45	7.2	316	92.6	23.7	292.5	85.7	26.9	268.6	78.7	30.2	257.1	75.4	31.8
	50	10	346	101.4	24.5	321	94.1	27.7	296	86.7	30.9	284.1	83.3	32.3

Table 5

Notes :

* Power input mentioned in this page should not be used for cable or fuse selection. MCA and MFA values given in the electrical data pages (15) should be referred for the same.

Computer Print outs for matched ratings with SKM Air Handling Units are available.

ACUS-C CAPACITY RATINGS

Model ACUS-C	SST		Condenser Entering Air Temperature											
			95°F (35°C)			105°F (40.6°C)			115°F (46.1°C)			120°F (48.9°C)		
	°F	°C	Total Capacity MBh	kW	PI kW	Total Capacity MBh	kW	PI kW	Total Capacity MBh	kW	PI kW	Total Capacity MBh	kW	PI kW
52034	35	1.7	301.4	88.3	26.4	278.7	81.7	30.1	255.2	74.8	34	243.7	71.4	36
	40	4.4	331.8	97.3	27.1	307.3	90.1	30.9	282.4	82.8	34.8	270.1	79.2	36.7
	45	7.2	364.1	106.7	28	337.6	99	31.8	311.1	91.2	35.6	298.2	87.4	37.4
	50	10	398.2	116.7	29	370.3	108.5	32.8	342.5	100.4	36.5	329.2	96.5	38.2
52039	35	1.7	342.6	100.4	30.1	317.5	93.1	34.4	292.1	85.6	39	279.5	81.9	41.2
	40	4.4	376.9	110.5	31.1	349.8	102.5	35.4	322.4	94.5	39.9	309	90.6	42
	45	7.2	413.3	121.2	32.1	384	112.6	36.5	354.7	104	40.9	340.4	99.8	42.9
	50	10	451.9	132.5	33.3	421	123.4	37.7	390.4	114.4	42	375.5	110.1	44
52045	35	1.7	390	114.3	32.9	360.8	105.8	37.6	331.1	97	42.8	316.3	92.7	45.3
	40	4.4	430.1	126.1	33.9	398.4	116.8	38.7	366.3	107.4	43.7	350.4	102.7	46.1
	45	7.2	472.6	138.5	35.1	438.3	128.5	39.8	403.6	118.3	44.7	386.5	113.3	47
	50	10	517.4	151.7	36.3	481	141	41	444.4	130.3	45.8	426.5	125	48
52049	35	1.7	431.2	126.4	36.7	397.8	116.6	41.9	364.1	106.7	47.7	347.1	101.7	50.5
	40	4.4	475.9	139.5	37.9	439.7	128.9	43.1	403.1	118.2	48.6	384.8	112.8	51.3
	45	7.2	523.3	153.4	39.2	483.9	141.8	44.3	444.3	130.2	49.6	424.7	124.5	52.1
	50	10	573	168	40.5	531.1	155.7	45.7	489.3	143.4	50.8	468.5	137.3	53.2
52051	35	1.7	479.2	140.5	41.6	440.6	129.1	47.4	400.6	117.4	53.7	380.9	111.6	56.8
	40	4.4	529.8	155.3	42.7	488.4	143.1	48.6	446.1	130.8	54.9	425.4	124.7	57.9
	45	7.2	583.6	171.1	44	539.1	158	50	494.1	144.8	56	472.2	138.4	58.9
	50	10	640.8	187.8	45.6	593.4	173.9	51.4	546.3	160.1	57.2	523.6	153.5	59.8
52055	35	1.7	513.6	150.5	46.3	472.5	138.5	52.7	430.1	126.1	59.3	409.5	120	62.5
	40	4.4	565.4	165.7	47.5	521.5	152.8	54	476.9	139.8	60.7	455.4	133.5	63.8
	45	7.2	620.2	181.8	49	573.1	168	55.5	526.1	154.2	62	503.7	147.6	64.9
	50	10	678.3	198.8	50.8	628.4	184.2	57.1	579.5	169.9	63.2	556.6	163.1	66
52065	35	1.7	604.1	177.1	52.5	558.8	163.8	59.9	511.9	150	67.8	488.7	143.2	71.7
	40	4.4	665.2	195	54	616.3	180.6	61.5	566.3	166	69.4	541.8	158.8	73.1
	45	7.2	730	214	55.7	677.2	198.5	63.3	623.9	182.9	71	598	175.3	74.6
	50	10	798.7	234.1	57.7	742.8	217.7	65.3	687.1	201.4	72.8	660.3	193.5	76.2
52075	35	1.7	682	199.9	60.7	632	185.2	69.3	581.1	170.3	78.5	555.9	162.9	82.8
	40	4.4	750.2	219.9	62.7	696	204	71.4	641.4	188	80.3	614.5	180.1	84.5
	45	7.2	822.4	241	64.9	763.9	223.9	73.6	705.4	206.8	82.3	676.9	198.4	86.4
	50	10	898.9	263.5	67.4	837.3	245.4	76.1	776.4	227.6	84.7	746.7	218.8	88.6
52080	35	1.7	743.3	217.9	61.3	689.2	202	70.1	633.8	185.8	79.9	606.1	177.7	84.7
	40	4.4	819.6	240.2	63.1	761	223.1	72	701.1	205.5	81.6	671.3	196.8	86.3
	45	7.2	900.8	264	65.1	837.3	245.4	74.1	772.6	226.5	83.5	740.7	217.1	88
	50	10	986.5	289.2	67.3	919.1	269.4	76.4	851.1	249.5	85.7	817.6	239.6	90.1
52085	35	1.7	781	228.9	65.6	722.7	211.8	75	663.3	194.4	85.4	633.6	185.7	90.5
	40	4.4	861.4	252.5	67.7	798.1	233.9	77.1	733.8	215.1	87.2	701.9	205.7	92
	45	7.2	946.7	277.5	70	878	257.3	79.4	808.6	237	89.1	774.4	227	93.8
	50	10	1036.5	303.8	72.3	963.6	282.4	81.8	890.6	261	91.4	854.6	250.5	95.9
52095	35	1.7	864.9	253.5	73	798.1	233.9	83.4	730.4	214.1	95	696.7	204.2	100.6
	40	4.4	954.8	279.8	75.4	882.4	258.6	85.7	809	237.1	96.8	772.5	226.4	102.1
	45	7.2	1050	307.8	78	971.4	284.7	88.2	891.8	261.4	98.8	852.6	249.9	103.8
	50	10	1150.1	337.1	80.5	1066.3	312.5	90.8	982.2	287.9	101.2	940.8	275.8	106

Table 6

Notes :

* Power input mentioned in this page should not be used for cable or fuse selection. MCA and MFA values given in the electrical data pages (15) should be referred for the same.

Computer Print outs for matched ratings with SKM Air Handling Units are available.



Capacity Control Steps

The Standard Capacity Control Steps are shown below.

ACUS-C	Standard	Number of steps
51005	100 - 0	1
51007	100 - 0	1
51008	100 - 0	1
51009	100 - 0	1
52010	100 - 50 - 0	2
51012	100 - 0	1
52013	100 - 50 - 0	2
52015	100 - 50 - 0	2
52019	100 - 50 - 0	2
52024	100 - 50 - 0	2
52025	100 - 50 - 0	2
52028	100 - 50 - 0	2
52034	100 - 57 - 0	2
52039	100 - 50 - 0	2
52045	100 - 56 - 0	2
52049	100 - 50 - 0	2
52051	100 - 77 - 50 - 27 - 0	4
52055	100 - 75 - 50 - 25 - 0	4
52065	100 - 79 - 50 - 29 - 0	4
52075	100 - 75 - 50 - 25 - 0	4
52080	100 - 77 - 53 - 29 - 0	4
52085	100 - 77 - 50 - 27 - 0	4
52095	100 - 75 - 50 - 25 - 0	4

Table 7

Selection Procedure

Example

The following information should be determined:

1. Required total capacity = 445 MBh (130.4 kW)
2. Saturated suction temperature = 50°F (10°C)
3. Condenser entering air temperature = 115°F (46°C)
4. Power Supply (V/Ph/Hz) = 380/3/50
5. Refrigerant R407C.

Enter capacity ratings from Table 5 at 115°F (46°C) condenser entering air temperature and select model **ACUS-C** 52045 having a cooling capacity of 444 MBh (130.3 kW) at 50°F (10°C) saturated suction temperature, compressor motor power input is 4.8 kW. For further details refer to physical data and specifications sheets.

Capacity ratings are based on sea level operation. Above sea level, apply the following corrections method.

Actual capacity (at level) = Sea level capacity x altitude correction factor (from Table 8).

Altitude Correction Factors

The unit ratings are based on sea level. Above sea level apply the following correction factors:

Altitude		Capacity Multiplier	Power Multiplier
feet	meter		
0	0	1	1
2000	610	0.99	1.01
4000	1219	0.98	1.02
6000	1829	0.97	1.03
8000	2438	0.96	1.04
10000	3048	0.95	1.05

Table 8

Field Connections

ACUS-C series self-contained heavy duty air cooled condensing units are designed for minimum field interaction.

Power hook-ups for AHU starter and fan interlock and control wiring of room unit or room thermostat as per Electrical hook-up diagram is all that is required to electrically connect any model of **ACUS-C** series.

Every **ACUS-C** series condensing unit requires, at most, field installed fused disconnect switches or circuit breakers, and room unit or room thermostat unit.

Refer below for a schematic representation of required field electrical hook-ups for a standard **ACUS-C** series condensing unit.

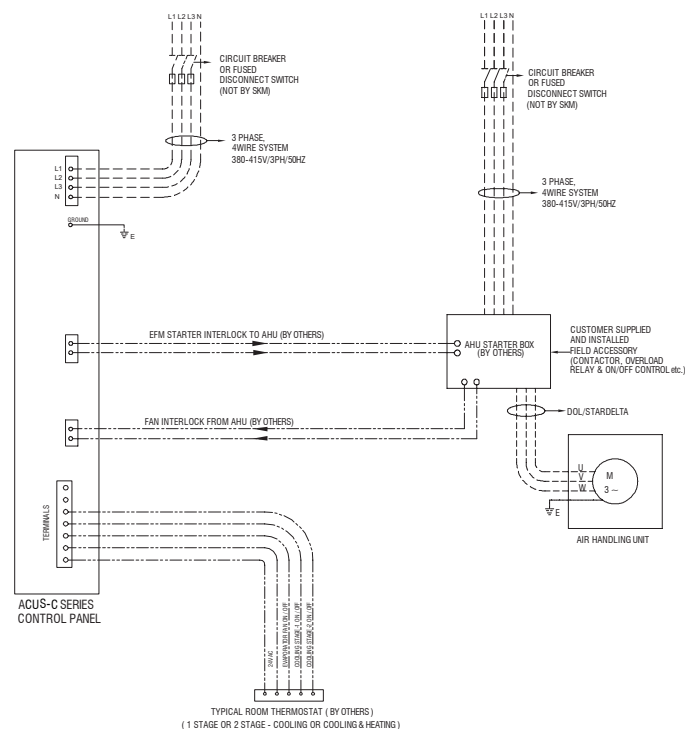
All field wiring must be done in accordance with applicable local and national codes.

For maximum recommended fuse sizes and minimum circuit amps for cable sizing, see Page 15 of this bulletin.

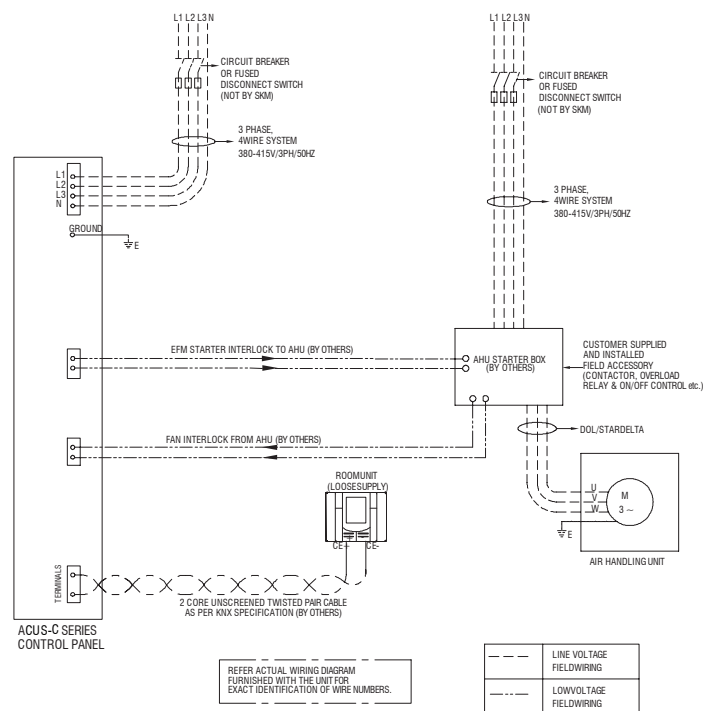
The **ACUS-C** series is then ready to provide cooling, on demand.

Field Wiring Requirement Schematic

For Units With Four Compressors:



For Units With One or Two Compressors:

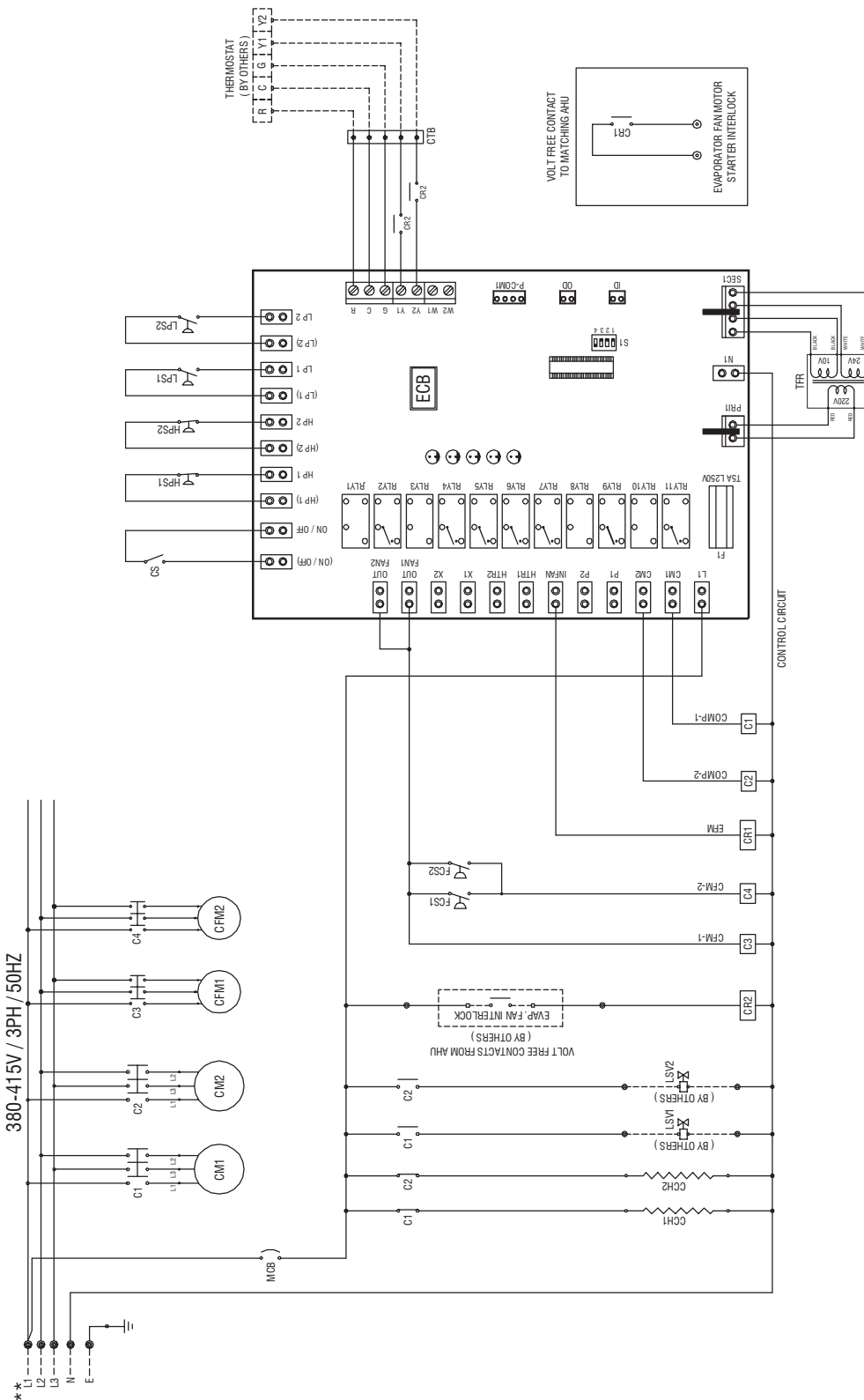




Typical Wiring Diagram

Two Compressor Unit With Electronic Control Board

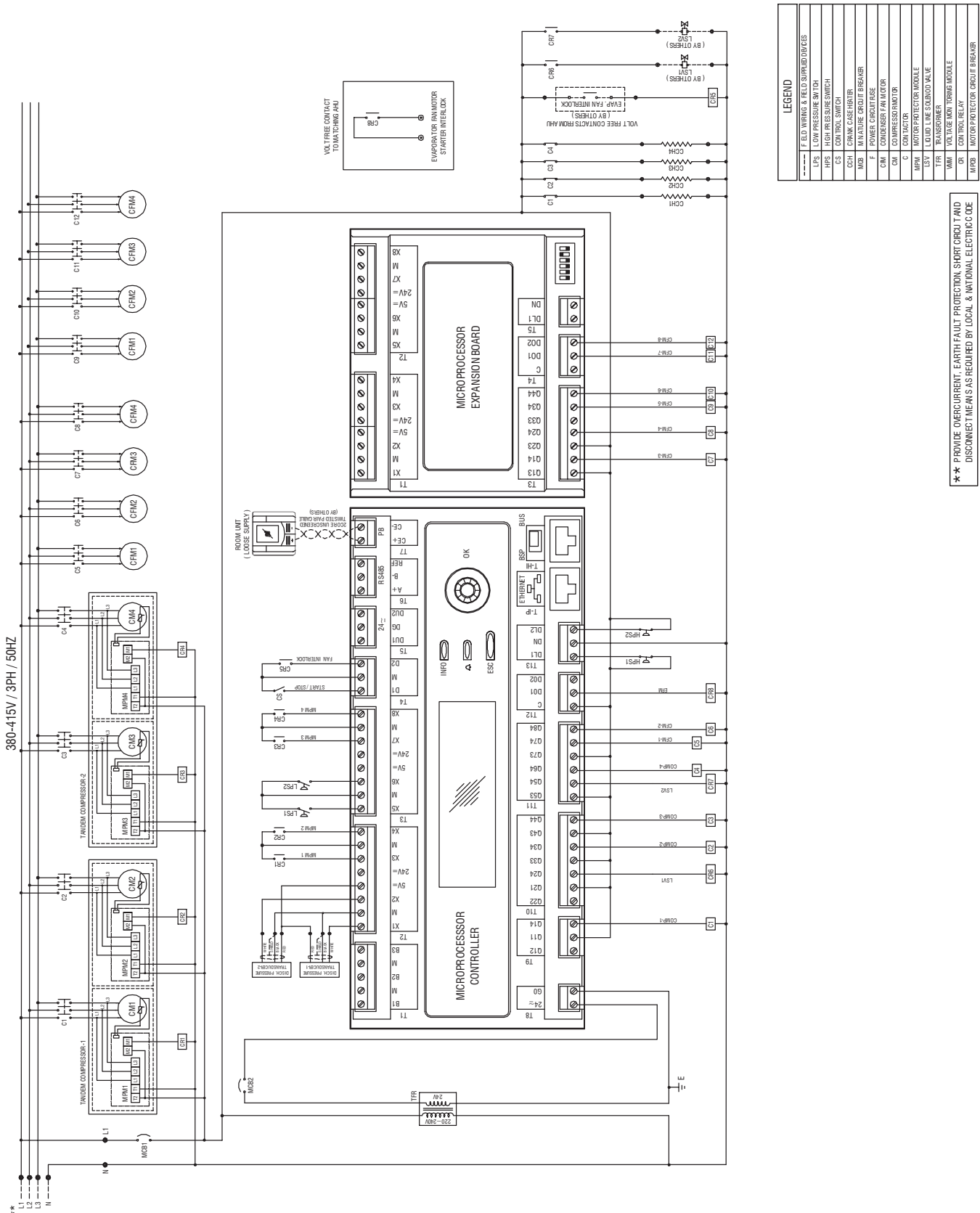
LEGEND	
----	FIELD WIRING & FIELD SUPPLIED DEVICES
LP5	LOW PRESSURE SWITCH
HP5	HIGH PRESSURE SWITCH
CS	CONTROL SWITCH
COH	CRANK CASE HEATER
MOB	MINIATURE CIRCUIT BREAKER
CFM	CONDENSER FAN MOTOR
CM	COMPRESSOR MOTOR
C	CONTACTOR
ECB	ELECTRONIC CONTROL BOARD
CTB	CONTROL TERMINAL BLOCK
FCS	FAN CYCLING SWITCH
LSV	LIQUID LINE SOLENOID VALVE
TFR	TRANSFORMER
CR	CONTROL RELAY



*** PROVIDE OVERCURRENT, EARTH FAULT PROTECTION, SHORT CIRCUIT AND DISCONNECT MEANS AS REQUIRED BY LOCAL & NATIONAL ELECTRIC CODE

Typical Wiring Diagram

Four Compressor Unit With Advance Microprocessor Controller:





ELECTRICAL DATA

POWER SUPPLY: 380-415V/3PH/50HZ

Model ACUS-C	Unit Characteristic			Compressor			Condenser Fan Motor		
	MFA	MCA	ICF	QTY	RLA	LRA	QTY	FLA	LRA
51005	25	14	78	1	10	74	1	1.2	3.6
51007	32	18	110	1	12	101	1	2.2	9.0
51008	40	23	100	1	16	95	2	1.2	3.6
51009	50	27	123	1	19	118	2	1.2	3.6
51012	63	30	123	1	22	118	2	1.2	3.6
52010	40	25	89	2	10	74	2	1.2	3.6
52013	50	32	124	2	12	101	2	2.2	9.0
52015	63	41	122	2	16	95	2	2.2	9.0
52019	80	51	157	2	19	118	2	4.0	16.5
52024	80	58	160	2	22	118	2	4.0	16.5
52025	100	69	189	2	25	140	3	4.0	16.5
52028	125	80	228	2	30	174	3	4.0	16.5
52034	160	90	279	1 + 1	38 +30	225 +174	3	4.0	16.5
52039	160	98	287	2	38	225	3	4.0	16.5
52045	160	109	338	1 + 1	44 +38	272 +225	4	4.0	16.5
52049	160	115	344	2	44	272	4	4.0	16.5
52051	200	134	282	2 + 2	30 +25	174 +140	4	4.0	16.5
52055	200	144	292	4	30	174	4	4.0	16.5
52065	200	162	351	2 + 2	38 +30	225 +174	4	4.0	16.5
52075	250	178	367	4	38	225	4	4.0	16.5
52080	250	201	430	1 + 3	44 +38	272 +225	8	4.0	16.5
52085	250	207	436	2 + 2	44 +38	272 +225	8	4.0	16.5
52095	315	219	448	4	44	272	8	4.0	16.5

Table 9

Legend

- MFA** Maximum Fuse Amps (for fuse/circuit breaker sizing), complies with NEC Article 440-22 & 430-52.
- MCA** Minimum Circuit Amps.(for wire sizing), complies with NEC article 440-33.
- ICF** Maximum Instantaneous Current Flow.

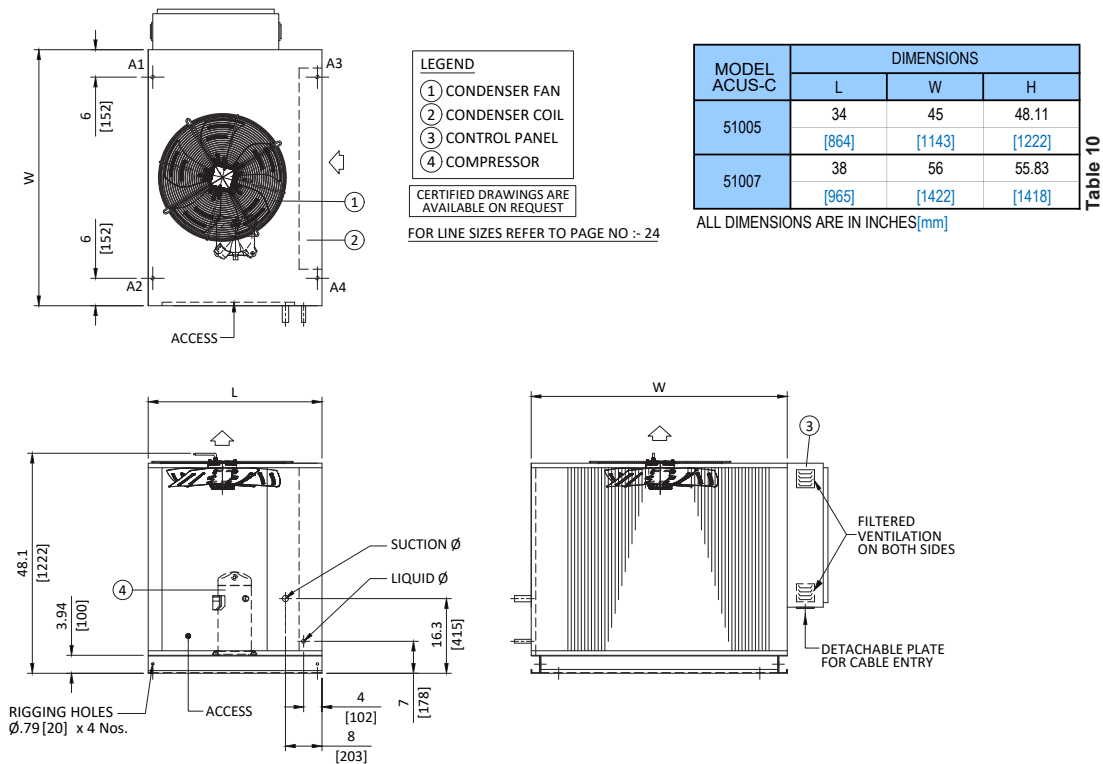
- RLA** Rated Load Amps. (at worst operating condition) .
- LRA** Locked Rotor Amps.
- FLA** Full Load Amps.

Note :

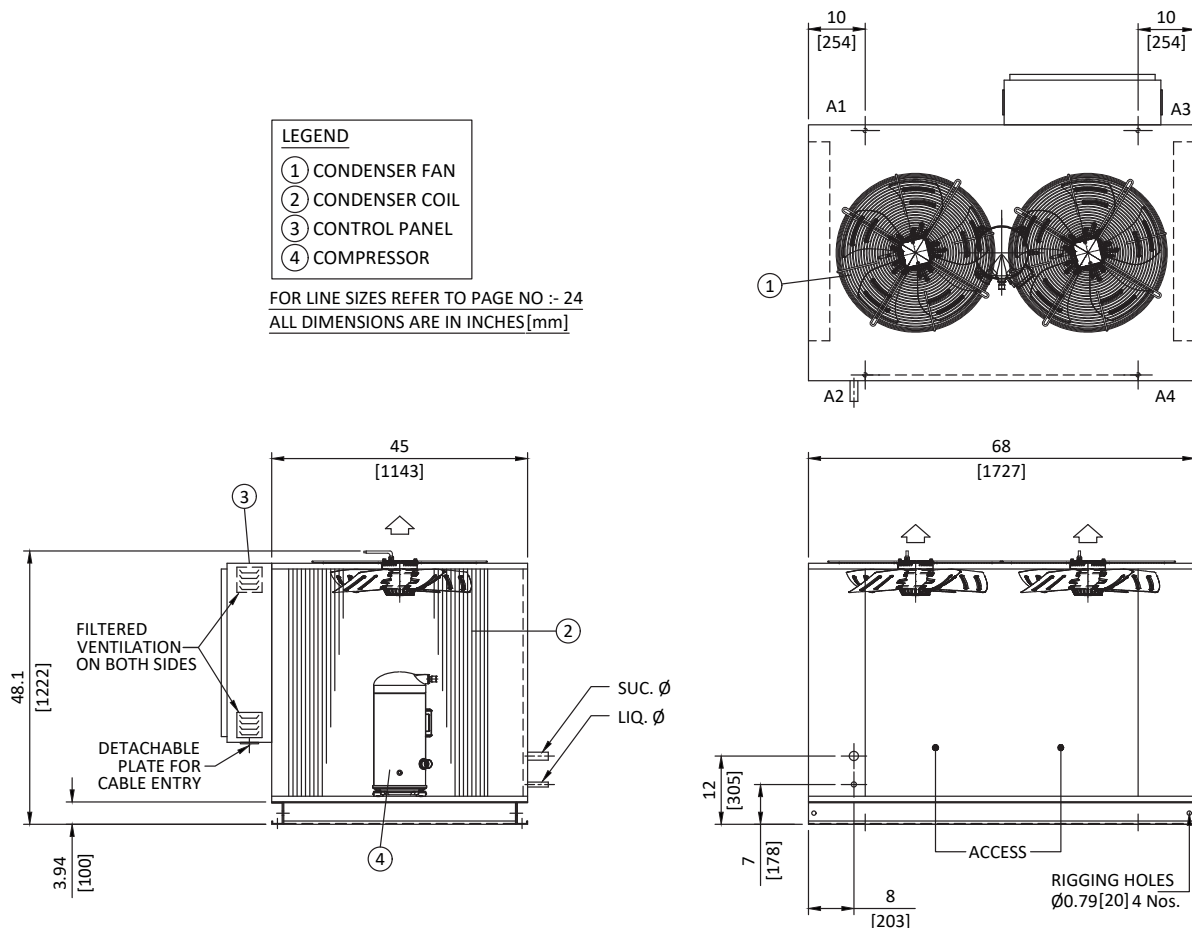
Voltage imbalance not to exceed $\pm 2\%$ of the rated voltage.

Dimensional Data

ACUS Models: 51005C, 51007C



ACUS Models: 51008C, 51009C, 51012C





Dimensional Data

ACUS Models: 52010C, 52013C, 52015C, 52019C, 52024C

MODEL ACUS-C	DIMENSIONS				
	L	W	A	C	H
52010	45 [1143]	68 [1727]	16.3 [415]	8 [203]	48.11 [1222]
52013	58 [1473]	76 [1930]	16.3 [415]	10 [254]	55.8 [1418]
52015	58 [1473]	76 [1930]	12 [305]	10 [254]	55.8 [1418]
52019	58 [1473]	84 [2133]	12 [305]	10 [254]	57.55 [1462]
52024	58 [1473]	84 [2134]	12 [305]	10 [254]	57.55 [1462]

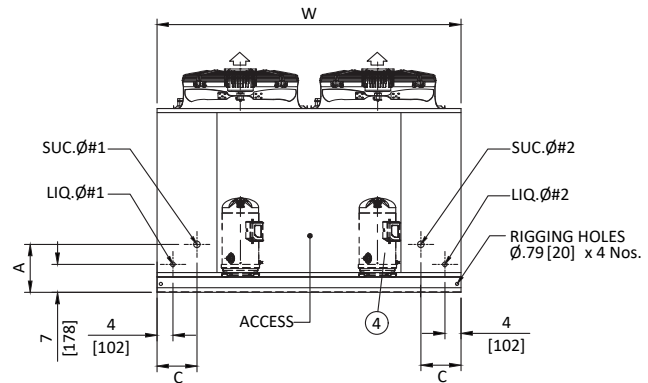
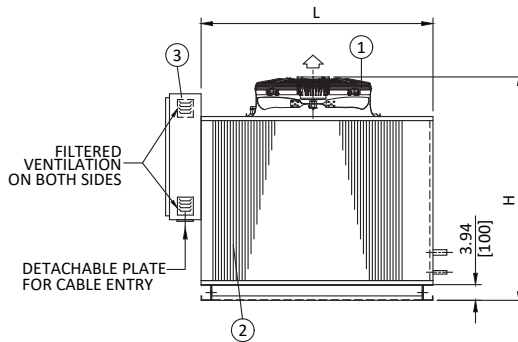
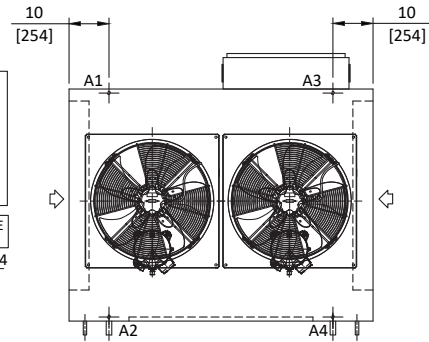
ALL DIMENSIONS ARE IN INCHES[mm]

Table 11

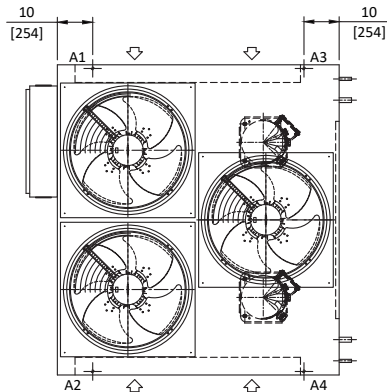
- LEGEND
- ① CONDENSER FAN
 - ② CONDENSER COIL
 - ③ CONTROL PANEL
 - ④ COMPRESSOR

CERTIFIED DRAWINGS ARE AVAILABLE ON REQUEST

FOR LINE SIZES REFER TO PAGE NO :- 24



ACUS Models: 52025C to 52039C



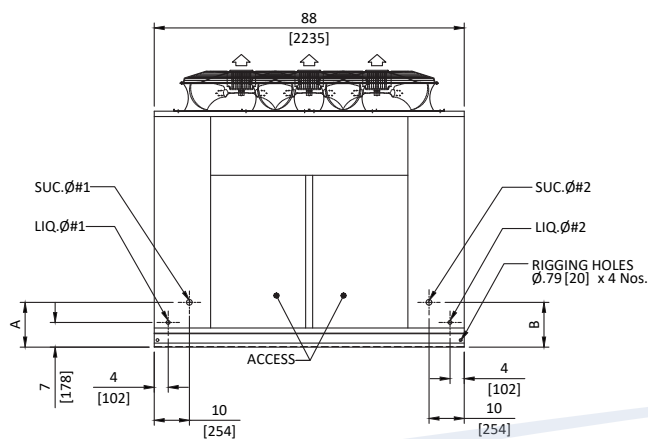
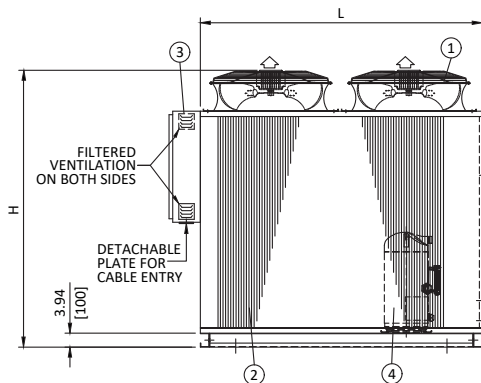
- LEGEND
- ① CONDENSER FAN
 - ② CONDENSER COIL
 - ③ CONTROL PANEL
 - ④ COMPRESSOR

FOR LINE SIZES REFER TO PAGE NO :- 24

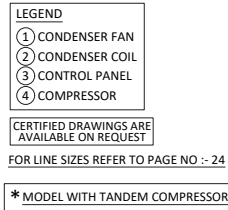
MODEL ACUS-C	DIMENSIONS			
	L	H	A	B
52025	80 [2032]	58.55 [1487]	12 [305]	12 [305]
52028	80 [2032]	66.55 [1690]	12 [305]	12 [305]
52034	80 [2032]	66.55 [1690]	12.71 [323]	12 [305]
52039	80 [2032]	78.55 [1995]	12.71 [323]	12.71 [323]

ALL DIMENSIONS ARE IN INCHES[mm]

Table 12



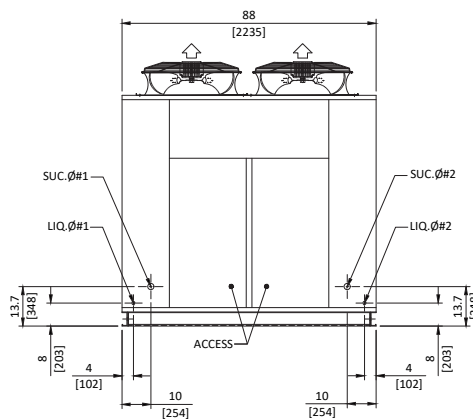
ACUS Models: 52045C to 52055C



MODEL ACUS-C	DIMENSIONS
	H
52045	83.5 [2122]
52049	91.5 [2325]
*52051	91.5 [2325]
*52055	91.5 [2325]

Table 13

ALL DIMENSIONS ARE IN INCHES[mm]

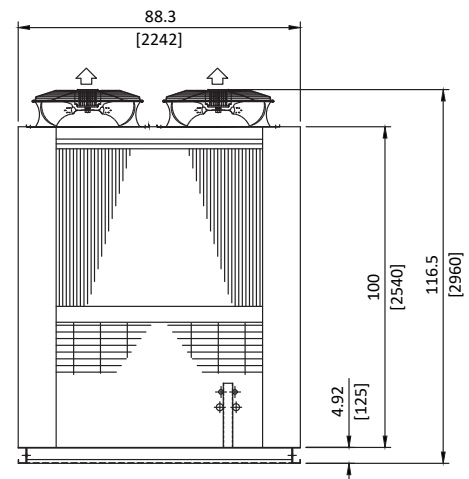


LEGEND

- ① CONDENSER FAN
- ② CONDENSER COIL
- ③ CONTROL PANEL
- ④ TANDEM COMPRESSOR

FOR LINE SIZES REFER TO PAGE NO :- 24

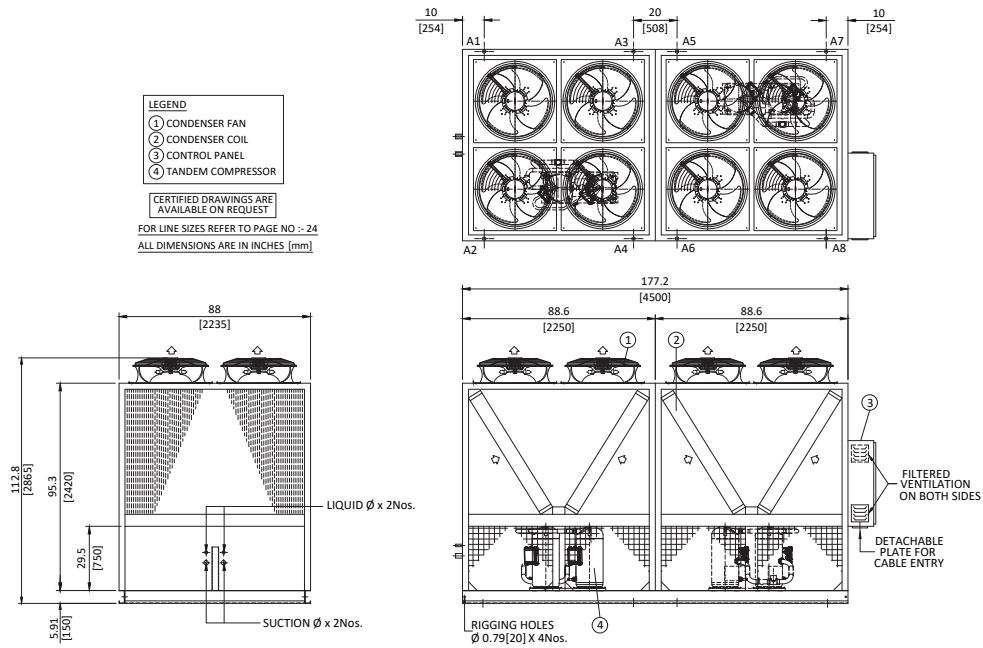
ALL DIMENSIONS ARE IN INCHES [mm]





Dimensional Data

ACUS Models: 52080C to 52095C



LOADING POINTS

ACUS-C	UNIT	LOADING POINTS								TOTAL WEIGHT
		A1	A2	A3	A4	A5	A6	A7	A8	
51005	lb.	108	130	145	154	-	-	-	-	537
	Kg.	49	59	66	70	-	-	-	-	244
51007	lb.	114	125	167	170	-	-	-	-	577
	Kg.	52	57	76	77	-	-	-	-	262
51008	lb.	163	154	181	154	-	-	-	-	653
	Kg.	74	70	82	70	-	-	-	-	296
51009	lb.	190	179	205	179	-	-	-	-	753
	Kg.	86	81	93	81	-	-	-	-	341
52010	lb.	199	190	216	190	-	-	-	-	795
	Kg.	90	86	98	86	-	-	-	-	360
51012	lb.	188	181	207	181	-	-	-	-	757
	Kg.	85	82	94	82	-	-	-	-	343
52013	lb.	232	221	247	221	-	-	-	-	919
	Kg.	105	100	112	100	-	-	-	-	417
52015	lb.	251	287	276	287	-	-	-	-	1100
	Kg.	114	130	125	130	-	-	-	-	499
52019	lb.	284	320	309	320	-	-	-	-	1233
	Kg.	129	145	140	145	-	-	-	-	559
52024	lb.	297	335	324	335	-	-	-	-	1291
	Kg.	135	152	147	152	-	-	-	-	586
52025	lb.	366	333	377	377	-	-	-	-	1454
	Kg.	166	151	171	171	-	-	-	-	659
52028	lb.	458	426	463	463	-	-	-	-	1809
	Kg.	208	193	210	210	-	-	-	-	821
52034	lb.	487	476	509	593	-	-	-	-	2066
	Kg.	221	216	231	269	-	-	-	-	937
52039	lb.	539	507	664	664	-	-	-	-	2374
	Kg.	245	230	301	301	-	-	-	-	1077
52045	lb.	633	591	686	706	-	-	-	-	2615
	Kg.	287	268	311	320	-	-	-	-	1186
52049	lb.	664	615	721	721	-	-	-	-	2721
	Kg.	301	279	327	327	-	-	-	-	1234
52051	lb.	703	653	717	717	-	-	-	-	2789
	Kg.	319	296	325	325	-	-	-	-	1265
52055	lb.	704	657	719	719	-	-	-	-	2799
	Kg.	320	298	326	326	-	-	-	-	1270
52065	lb.	1543	1329	1100	1135	-	-	-	-	5107
	Kg.	700	603	499	515	-	-	-	-	2317
52075	lb.	1732	1507	1221	1269	-	-	-	-	5729
	Kg.	785	683	554	576	-	-	-	-	2598
52080	lb.	682	759	766	1042	768	684	1233	936	6870
	Kg.	309	344	347	473	348	310	559	424	3114
52085	lb.	687	768	775	1070	768	687	1233	936	6924
	Kg.	312	348	351	485	348	312	559	424	3139
52095	lb.	722	810	817	1132	810	722	1295	980	7288
	Kg.	327	367	371	513	367	327	587	444	3303

Table 14

Sound Data

MODEL	Sound Power Level in dBA ref 10 ⁻¹² W								Overall
	Spectrum per Octave band								
ACUS-C	63	125	250	500	1k	2k	4k	8k	dBA
51005	63.2	61.4	53.7	74.4	77.5	76.6	69.7	60.3	81.6
51007	52.9	58.8	60.2	61.0	63.8	60.0	60.0	52.7	69.0
51008	66.2	64.4	56.7	77.4	80.4	79.6	71.9	63.0	84.5
51009	66.2	64.4	56.7	77.5	80.4	79.6	71.8	63.0	84.5
52010	66.2	64.4	56.7	77.4	80.5	79.6	72.7	63.3	84.6
51012	66.2	64.4	56.8	77.5	80.4	79.7	72.1	63.2	84.5
52013	55.9	61.8	63.2	64.0	66.8	63.0	63.1	55.7	72.0
52015	55.9	61.8	63.2	63.7	67.7	67.4	66.2	55.7	73.5
52019	51.3	50.6	59.5	67.4	68.6	70.5	68.1	67.3	75.7
52024	51.3	50.6	59.6	68.0	68.8	71.3	69.2	67.5	76.3
52025	53.1	52.4	61.3	68.4	70.8	72.2	74.0	69.9	78.6
52028	53.1	52.4	61.3	70.1	71.0	72.6	70.8	69.3	78.0
52034	53.1	52.5	62.2	69.9	74.7	77.9	72.1	69.4	81.1
52039	53.1	52.5	62.9	69.7	76.7	80.3	73.0	69.6	82.9
52045	54.3	53.7	65.5	72.8	78.3	80.4	74.2	70.6	83.8
52049	54.3	53.7	66.7	74.3	79.3	80.5	74.8	70.5	84.3
52051	54.3	53.6	62.7	71.4	72.9	74.6	75.3	71.2	80.5
52055	54.3	53.6	62.7	72.3	73.0	74.8	73.2	70.7	80.1
52065	54.3	53.8	63.9	72.1	77.3	80.7	74.6	71.0	83.7
52075	54.3	53.9	64.8	71.9	79.5	83.2	75.7	71.2	85.6
52080	57.3	56.8	67.7	74.8	80.7	83.4	76.8	73.6	86.5
52085	57.3	56.7	68.5	75.8	81.3	83.4	77.2	73.6	86.8
52095	57.3	56.7	69.7	77.3	82.3	83.5	77.9	73.5	87.3

Table 15

MODEL	Sound pressure level in dBA ref 2x10 ⁻⁵ Pa @ 1 meter in free field								Overall
	Spectrum per Octave band								
ACUS-C	63	125	250	500	1k	2k	4k	8k	dBA
51005	52.2	50.4	42.7	63.4	66.5	65.6	58.7	49.3	70.6
51007	41.9	47.8	49.2	50.0	52.8	49.0	49.1	41.7	58.0
51008	55.2	53.4	45.7	66.5	69.4	68.6	60.9	52.0	73.5
51009	55.2	53.4	45.8	66.5	69.4	68.7	60.8	52.0	73.5
52010	55.2	53.4	45.8	66.4	69.5	68.6	61.7	52.3	73.6
51012	55.2	53.4	45.8	66.5	69.4	68.7	61.1	52.2	73.5
52013	44.9	50.8	52.3	53.0	55.8	52.0	52.1	44.8	61.0
52015	44.9	50.8	52.3	52.7	56.7	56.4	55.2	44.8	62.5
52019	40.3	39.6	48.6	56.4	57.6	59.5	57.1	56.3	64.7
52024	40.3	39.7	48.6	57.0	57.8	60.3	58.2	56.5	65.3
52025	42.1	41.4	50.3	57.4	59.8	61.2	63.0	58.9	67.6
52028	42.1	41.4	50.4	59.1	60.0	61.6	59.8	58.3	67.0
52034	42.1	41.5	51.2	58.9	63.7	67.0	61.1	58.4	70.1
52039	42.1	41.5	51.9	58.7	65.7	69.3	62.0	58.6	71.9
52045	43.3	42.7	54.5	61.8	67.3	69.4	63.2	59.6	72.8
52049	43.3	42.7	55.7	63.3	68.3	69.5	63.9	59.5	73.3
52051	43.3	42.7	51.7	60.4	61.9	63.6	64.4	60.2	69.5
52055	43.3	42.7	51.7	61.4	62.0	63.8	62.2	59.7	69.1
52065	43.3	42.8	52.9	61.1	66.4	69.8	63.6	60.0	72.7
52075	43.3	42.9	53.8	60.9	68.5	72.2	64.7	60.2	74.6
52080	46.3	45.8	56.7	63.8	69.7	72.4	65.8	62.6	75.5
52085	46.3	45.8	57.5	64.8	70.3	72.5	66.2	62.6	75.8
52095	46.3	45.7	58.7	66.3	71.3	72.5	66.9	62.5	76.3

Table 16



Location and Space Requirements

Due to the vertical air flow discharge condenser design, it is recommended that certain precautions are to be taken before installation. There should be no obstruction on the air flow.

Orient the unit so that prevailing winds blow parallel to the unit length thus minimizing the effects on condensing pressure. If it is not practical to orient the unit in this manner, a wind deflecting shield should be considered.

It is also necessary to provide adequate clearance on all sides of the unit for service access and satisfactory performance. This will prevent excessive condensing temperatures and enhance system performance and operating economy.

A flat concrete foundation or floor which can support the weight of the equipment must be provided as the unit must be level for proper operation and functioning of controls.

Under certain critical conditions it is recommended that vibration isolators of rubber-in-shear or spring type be installed under the base.

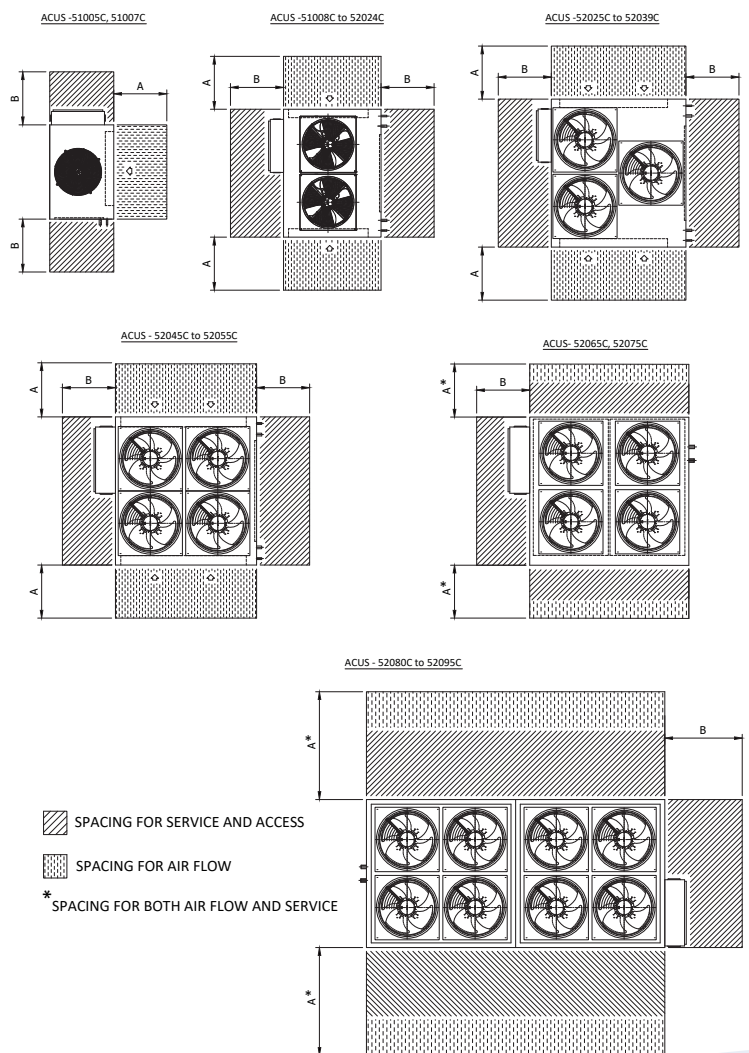
The isolators must be designed for the operating weight of the unit. For operating load points refer to Loading Points Data (page No.19). Correct selection of types of isolators depends upon application and structure.

Location and Space Requirements

ACUS-C	A	B	C
51005	40	42	60
51007		50	
51008		42	
51009			
52010			
51012		50	
52013		54	
52015			
52019			
52024		70	
52025	48	66	72
52028			
52034	60	70	90
52039	64	78	96
52045	72		108
52049			
52051			
52055			
52065	84	52	90
52075			
52080			
52085			
52095			

Table 17

SINGLE UNIT INSTALLATION



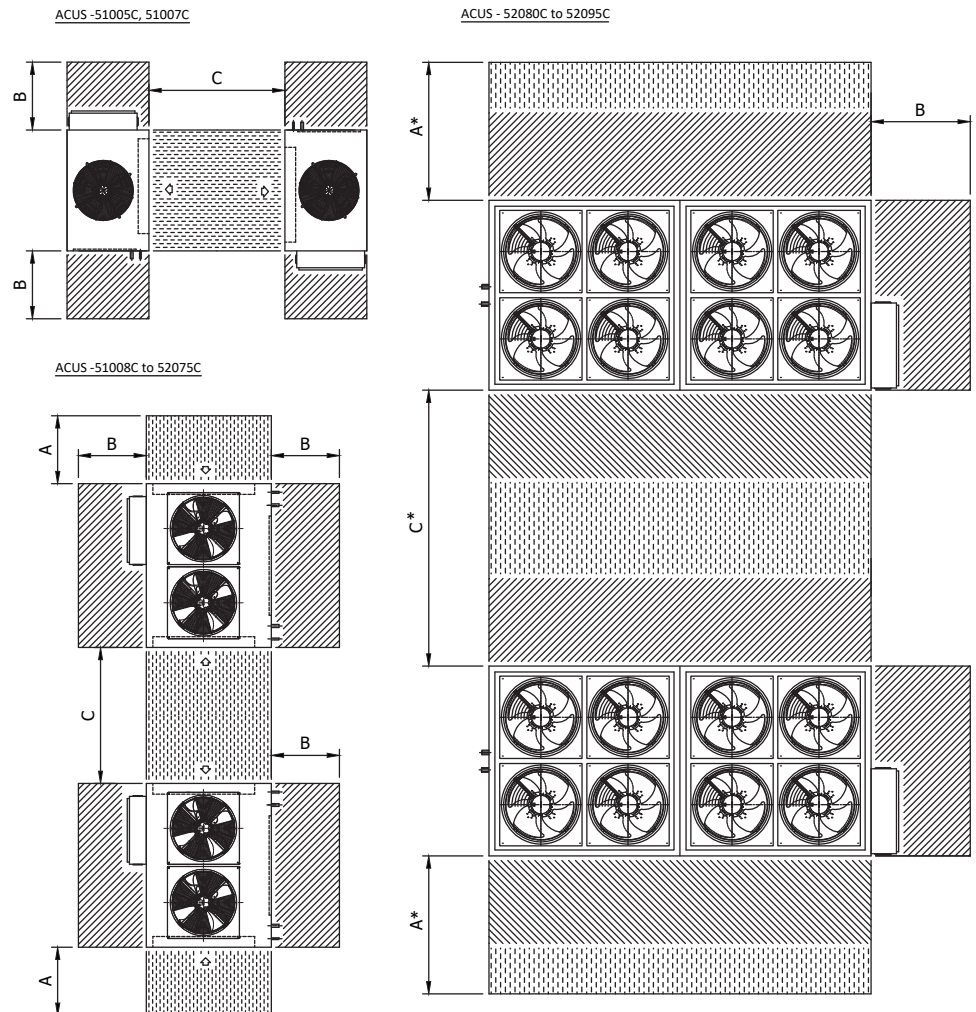
Location and Space Requirements

MULTIPLE UNIT INSTALLATION

 SPACING FOR SERVICE AND ACCESS

 SPACING FOR AIR FLOW

* SPACING FOR BOTH AIR FLOW AND SERVICE

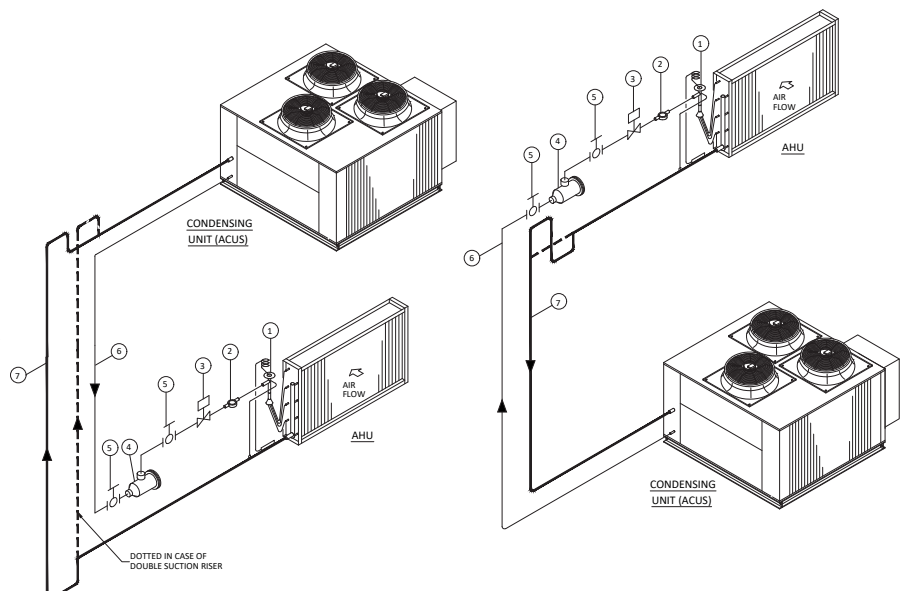


Typical Refrigeration Piping

Legend

1. Expansion Valve
2. Sight Glass
3. Solenoid Valve
4. Filter Drier
5. Shut Off Valve
6. Liquid Line
7. Suction Line

Single Circuit Unit Shown. For Dual circuit units, piping of second circuit is similar.





Refrigerant Piping

Correct design and size of refrigerant piping is necessary for proper operation. The refrigerant piping generally should be designed to accomplish the following:

- a. To ensure proper refrigerant feed to the evaporator.
- b. To provide practical refrigerant line sizes without excessive pressure drop.
- c. To maintain uniform return of lubricating oil to the compressor.
- d. To prevent refrigerant from entering the compressor and causing compressor damage due to "slugging".

Field Expansion Valve Selection

The following recommendations should be taken into consideration when selecting expansion valves in field.

1. Expansion valves should be installed as close to the evaporator as possible, mounted directly to the distributor.
2. The following possible sources of pressure drop to be considered:
 - a. Friction losses through refrigerant lines.
 - b. Pressure drop across valves and controls.
 - c. Pressure drop due to vertical lift of liquid line for R-407C 1°F (0.55°C) sub cooling must be allowed for each 5.5 ft (1.7m) vertical rise in order to avoid flash gas forming due to the weight of the column of liquid refrigerant.

SKM **ACUS-C** Series units are designed with a sub cooling circuit enough to sub cool the liquid 12°F (6.6 °C), which gives the liquid maximum 66 ft. (20m) lift without additional sub cooling. Liquid suction heat exchanger can be used for additional sub cooling in order to avoid flash gas forming.

Matching DX Coil Selection

For single circuit **ACUS-C** Series, the DX coil selection in a MAH or other air handler from SKM should be based on total capacity. For dual circuit **ACUS-C** Series, extra care should be exercised and correspondingly split, by face area or number of rows to correspond and match the capacity split available in the dual circuited **ACUS-C** Series selected. For optimum matching the DX coil should be ordered from SKM as well.

SKM provides correct no. of feeds and circuits and properly sized distribution to ensure the correct split on the DX coil is made available to match the particular selected **ACUS-C** Series model.

Recommended Refrigerant Line Sizes

Model ACUS-C	Liquid Line Size, inches								Suction Line Size, inches							
	Circuit 1				Circuit 2				Circuit 1				Circuit 2			
	25ft	50ft	75ft	100ft	25ft	50ft	75ft	100ft	25ft	50ft	75ft	100ft	25ft	50ft	75ft	100ft
51005	1/2	1/2	1/2	5/8	-	-	-	-	7/8	1 1/8	1 1/8	1 1/8	-	-	-	-
51007	1/2	1/2	1/2	5/8	-	-	-	-	7/8	1 1/8	1 1/8	1 3/8	-	-	-	-
51008	1/2	1/2	5/8	5/8	-	-	-	-	1 1/8	1 1/8	1 3/8	1 3/8	-	-	-	-
51009	1/2	5/8	5/8	5/8	-	-	-	-	1 1/8	1 3/8	1 3/8	1 3/8	-	-	-	-
52010	1/2	1/2	1/2	5/8	1/2	1/2	1/2	5/8	7/8	1 1/8	1 1/8	1 1/8	7/8	1 1/8	1 1/8	1 1/8
51012	1/2	5/8	5/8	7/8	-	-	-	-	1 1/8	1 3/8	1 3/8	1 5/8	-	-	-	-
52013	1/2	1/2	1/2	5/8	1/2	1/2	1/2	5/8	7/8	1 1/8	1 1/8	1 3/8	7/8	1 1/8	1 1/8	1 3/8
52015	1/2	1/2	5/8	5/8	1/2	1/2	5/8	5/8	1 1/8	1 1/8	1 3/8	1 3/8	1 1/8	1 1/8	1 3/8	1 3/8
52019	1/2	5/8	5/8	5/8	1/2	5/8	5/8	5/8	1 1/8	1 3/8	1 3/8	1 3/8	1 1/8	1 3/8	1 3/8	1 3/8
52024	1/2	5/8	5/8	7/8	1/2	5/8	5/8	7/8	1 1/8	1 3/8	1 3/8	1 5/8	1 1/8	1 3/8	1 3/8	1 5/8
52025	5/8	5/8	7/8	7/8	5/8	5/8	7/8	7/8	1 1/8	1 3/8	1 3/8	1 5/8	1 1/8	1 3/8	1 3/8	1 5/8
52028	5/8	5/8	7/8	7/8	5/8	5/8	7/8	7/8	1 3/8	1 3/8	1 5/8	1 5/8	1 3/8	1 3/8	1 5/8	1 5/8
52034	5/8	7/8	7/8	7/8	5/8	5/8	7/8	7/8	1 3/8	1 5/8	1 5/8	2 1/8	1 3/8	1 3/8	1 5/8	1 5/8
52039	5/8	7/8	7/8	7/8	5/8	7/8	7/8	7/8	1 3/8	1 5/8	1 5/8	2 1/8	1 3/8	1 5/8	1 5/8	2 1/8
52045	7/8	7/8	7/8	7/8	5/8	7/8	7/8	7/8	1 5/8	1 5/8	2 1/8	2 1/8	1 3/8	1 5/8	1 5/8	2 1/8
52049	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	1 5/8	1 5/8	2 1/8	2 1/8	1 5/8	1 5/8	2 1/8	2 1/8
52051	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	1 5/8	2 1/8	2 1/8	2 1/8	1 5/8	2 1/8	2 1/8	2 1/8
52055	7/8	7/8	7/8	1 1/8	7/8	7/8	7/8	1 1/8	1 5/8	2 1/8	2 1/8	2 1/8	1 5/8	2 1/8	2 1/8	2 1/8
52065	7/8	7/8	1 1/8	1 1/8	7/8	7/8	1 1/8	1 1/8	1 5/8	2 1/8	2 1/8	2 1/8	1 5/8	2 1/8	2 1/8	2 1/8
52075	7/8	7/8	1 1/8	1 1/8	7/8	7/8	1 1/8	1 1/8	2 1/8	2 1/8	2 1/8	2 5/8	2 1/8	2 1/8	2 1/8	2 5/8
52080	7/8	1 1/8	1 1/8	1 1/8	7/8	7/8	1 1/8	1 1/8	2 1/8	2 1/8	2 5/8	2 5/8	2 1/8	2 1/8	2 1/8	2 5/8
52085	7/8	1 1/8	1 1/8	1 1/8	7/8	1 1/8	1 1/8	1 1/8	2 1/8	2 1/8	2 5/8	2 5/8	2 1/8	2 1/8	2 5/8	2 5/8
52095	7/8	1 1/8	1 1/8	1 1/8	7/8	1 1/8	1 1/8	1 1/8	2 1/8	2 1/8	2 5/8	2 5/8	2 1/8	2 1/8	2 5/8	2 5/8

Table 18

SKM ACUS-C Series Condensing Units are designed for satisfactory operation with single suction line.

1. Suction Line sizing selection recommendation in Table 17 is based on 2°F temperature drop.
2. Double suction risers, for applications with systems having large variations in capacity, are recommended to ensure proper oil flow up and return to compressor.
3. Liquid line sizing selection recommendation in table 17 is based on 2°F temperature drop.
4. Recommended line sizes in Table 17 are for guidance only. For detailed proper piping, consult recognized piping references like ASHRAE Guide and Data Book for assistance.
5. Suction and liquid line sizes are based on equivalent lengths.

SKM is not responsible for faulty or improper design or sizing of refrigerant lines. The above recommendations do not incorporate necessary slopes, etc. that may be required on horizontal risers, etc.



GUIDE SPECIFICATIONS

GENERAL FEATURES

Condensing units shall be composed of compressor(s), fan(s), Coil(s), refrigerant piping, electrical components & enclosing cabinet in one piece.

Unit shall be factory assembled, internally wired, piping connections terminated with sealed and soldered copper pipe ends. Unit shall be shipped with nitrogen holding charge (actual charging with refrigerant R-407C should be done at site). Unit shall be capable to operate from 50°F (10°C) to 120°F (48.9°C) ambient temperature and shall be rated in accordance with AHRI-365 standard.

COIL(S)

Coil shall be air cooled with integral sub-cooling circuit, constructed of seamless copper tubes 3/8" OD mechanically bonded to Aluminium or Copper corrugated cross wave fins with 14FPI (1.8mm) or 16FPI (1.6mm) spacing. Coil shall be tested against leakage by pressurizing air at 525 psig (3618kPa) in coil, under water, cleaned and dehydrated at the factory.

COMPRESSOR(S)

Compressor shall be hermetic scroll, refrigerant gas cooled furnished with internal overload protection device, crankcase heater, and shall be mounted on rubber isolators.

CONDENSER FAN(S) & MOTOR(S)

The machine shall be furnished with direct driven propeller type discharging air upward condenser fans. Fans shall be constructed of corrosion resistant blades such as heavy gauge aluminum. The fan and drive shall be held in proper alignment. Fan assemblies shall be provided with heavy gauge, rust resistant steel wire fan guard. All condenser fans shall be individually, statically, and dynamically balanced for vibration free operation.

Motors shall be Totally Enclosed Air Over (TEAO), 6 poles, with class 'F' insulation, minimum IP-54/IP-55 protection and factory wired to unit control panel.

REFRIGERANT PIPING

The refrigerant circuit piping shall be fabricated from ACR grade copper piping, with 1 or 2, refrigeration circuits. The piping connections shall be terminated with sealed & soldered copper pipe ends, which give much simplicity & ease to the installation.

CASING

Unit casing shall be made of zinc coated galvanized steel sheets conforming to JIS-G3302 and ASTM A653 which shall be phosphatized and then electrostatically dry powder coated of approx. 60 microns to provide an extremely tough, scratch resistance, excellent anti-corrosive protection that can pass 1000 hrs in 5% salt spray testing at 95°F (35°C) and 95% relative humidity as per ASTM B117.

Unit casing shall be provided with access panels for easy service and maintenance of all units parts.

CONTROL PANEL

The unit mounted control panel enclosure is fabricated out of heavy gauge sheet steel in phosphatized powder coated baked finish. The enclosure conforms to IP54 as per guidelines in IEC 529. The panel is factory wired in accordance with NEC 430 & 440, labelled, tagged and features 220V / 240V controls.

- All compressors are with DOL starting.
- Individual contactor provided for compressors and condenser fan motors.
- Internal overload protection for compressors.
- Internal thermal overload protection for condenser fan motors.
- Unit controllers for operational and safety control.
- Compressor short cycling protection.
- High compressor motor temperature. (For compressors with electronic module).
- Control circuit on/off switch.
- Control circuit breaker.
- Power and control circuit terminal blocks.
- High pressure protection.
- Low pressure protection.
- Volt-free contact to matching supply fan motor.

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CONTACT US

HEAD OFFICE

P.O Box: 6004, Sharjah,
United Arab Emirates



Tel: +971 6 514 3333

Fax: +971 6 514 3300



Email: sales@skmaircon.com

Email: info@skmaircon.com



Spare Parts Division

spareparts.skm@skmaircon.com



Service Center

aftersales.skm@skmaircon.com



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