



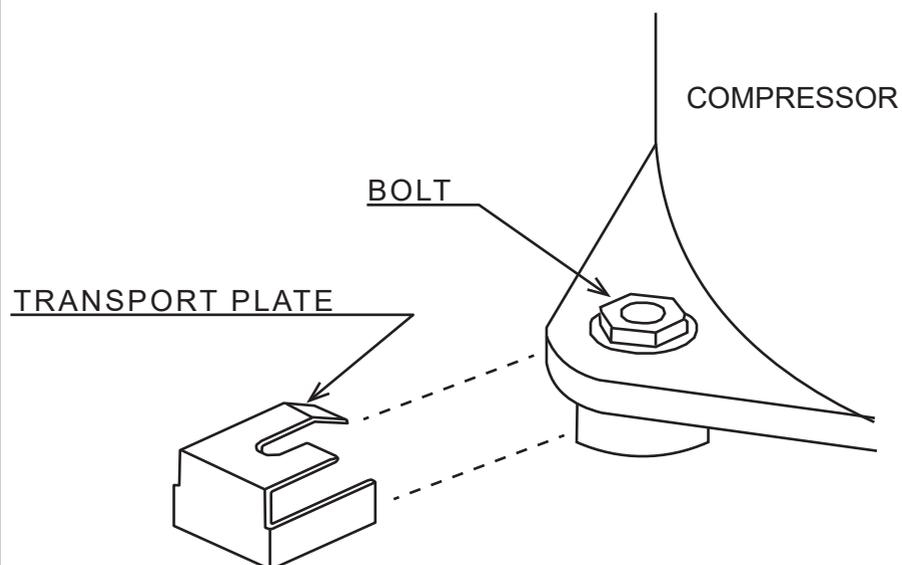
CAUTION

To those who install the unit

PRECAUTIONS FOR TEST RUN

BEFORE TEST RUN

1. REMOVE TRANSPORT PLATES (YELLOW).
2. BE SURE TO TIGHTEN COMPRESSOR FIXING BOLTS AGAIN.



NOTE: View is only for reference

APPLICABLE MODELS :

- CCMS1200ARY16
- CCMS1400ARY16
- CCLS1200ARY16
- CCLS1400ARY16



Technical Manual

COMMERCIAL CONDENSING UNIT

Medium Temperature (MT) application

CCMR0200ARY16
CCMR0300ARY16
CCMS0400ARY16
CCMS0600ARY16
CCMS0800ARY16
CCMS1000ARY16
CCMS1200ARY16
CCMS1400ARY16

Low Temperature (LT) application

CCLR0200ARY16
CCLR0300ARY16
CCLS0400ARY16
CCLS0600ARY16
CCLS0800ARY16
CCLS1000ARY16
CCLS1200ARY16
CCLS1400ARY16

High-Medium Temperature (HMT) application

CCHMS0400ARY16
CCHMS0600ARY16
CCHMX0150AV16

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1. Nomenclature

C	C	M	S	0	4	0	0	A	R	Y	1	6
1	2	3	4	5	6	7	8	9	10	11	12	13

Digit	Description
1 & 2	CC – Commercial Condensing Unit
3	L – Low Temperature M – Medium Temperature HM – High Medium Temperature
4	R – Reciprocating S – Scroll
5, 6, 7 & 8	Compressor horse power, 0400 – 4 HP
9	A – Major Design Category (Progress according to design change).
10	R - Minor Design Category (Progress according to design change).
11 & 12	Power supply: Y1 - 3ph/50Hz/380V~ 415V V1- 1ph/50Hz/220V~ 240V
13	6 - India

2. Product Overview

★ R410A ◆ R404A ▲ R32

MODEL	CAPACITY (HP)													
	1	1.5	2	3	4	5	6	7	8	9	10	12	14	
Medium Temperature*														
CCMR0200ARY16			◆											
CCMR0300ARY16				◆										
CCMS0400ARY16					◆									
CCMS0600ARY16							◆							
CCMS0800ARY16									◆					
CCMS1000ARY16											◆			
CCMS1200ARY16												◆		
CCMS1400ARY16													◆	
Low Temperature**														
CCLR0200ARY16			◆											
CCLR0300ARY16				◆										
CCLS0400ARY16					◆									
CCLS0600ARY16							◆							
CCLS0800ARY16									◆					
CCLS1000ARY16											◆			
CCLS1200ARY16												◆		
CCLS1400ARY16													◆	
High-Medium Temperature***														
CCHMS0400ARY16					▲									
CCHMX0150AV16		▲												
CCHMS0600ARY16							★							

*Evaporation temperature = -10°C, Outside ambient temperature = 43°C
 **Evaporation temperature = -35°C, Outside ambient temperature = 43°C
 ***Evaporation temperature = 0°C, Outside ambient temperature = 43°C

3. Specifications

Model	Electical Data	Compressor							Fan Motor	
	Power Input	Type	Swept Volume (m3/hr)	Oil Type	Oil Charge (Ltr)	Operating Current(A)*	MCC (A)**	LRC(A)	No.	FLC(A)
CCMR0200ARY16	415V/3~/50Hz	KCM511-CAL	7.2	POE	1.33	3.5	4.5	20	1	1
CCMR0300ARY16	415V/3~/50Hz	KCM522-CAL	12.8	POE	1.33	7.0	8.0	45	1	1
CCMS0400ARY16	415V/3~/50Hz	ZB29KQE-TFD	11.4	POE	1.36	10.0	11.0	50	1	2.75
CCMS0600ARY16	415V/3~/50Hz	ZB45KQE-TFD	17.1	POE	1.77	13.1	14.2	74	1	2.75
CCMS0800ARY16	415V/3~/50Hz	ZB58KQE-TFD-550	22.1	POE	2.51	15.9	23.0	95	2	2.5
CCMS1000ARY16	415V/3~/50Hz	ZB76KQE-TFD-550	29.1	POE	3.25	20.4	28.0	118	2	2.5
CCMS1200ARY16	415V/3~/50Hz	ZB95KQE-TFD-551	36.4	POE	3.3	19.8	35	140	2	4.6
CCMS1400ARY16	415V/3~/50Hz	ZB114KQE-TFD-551	43.3	POE	3.3	24.8	39	174	2	4.6
CCLR0200ARY16	415V/3~/50Hz	KCM512-LAL	14.7	POE	1.33	7.0	8.0	45	1	1
CCLR0300ARY16	415V/3~/50Hz	KCM515-LAL	15.9	POE	1.30	7.0	8.0	45	1	1
CCLS0400ARY16	415V/3~/50Hz	ZF13K4E-TFD	11.7	POE	1.90	8.6	10.0	65.5	1	2.75
CCLS0600ARY16	415V/3~/50Hz	ZF18K4E-TFD	17.1	POE	1.90	10.5	12.5	74	1	4.6
CCLS0800ARY16	415V/3~/50Hz	ZF25KQE-TFD-550	21.4	POE	1.90	13.7	16.6	102	2	2.5
CCLS1000ARY16	415V/3~/50Hz	ZF34KQE-TFD-554	29.1	POE	3.37	22.0	25.0	100	2	2.5
CCLS1200ARY16	415V/3~/50Hz	ZF41KQE-TFD-564	35.3	POE	3.4	12.8	27	118	2	4.6
CCLS1400ARY16	415V/3~/50Hz	ZF49KQE-TFD-564	42.4	POE	3.4	14.9	28.3	139	2	4.6
CCHMS0400ARY16	415V/3~/50Hz	ZE55KME-TFM	8.19	POE	1.24	11	13.8	64	1	1
CCHMX0150AV16	230V/1~/50Hz	KSF165S2VFPC3	2.97	VG74	0.410	5.7	7.0	37	1	0.65
CCHMS0600ARY16	415V/3~/50Hz	ZP72KCE-TFD-52E	11.67	POE	1.774	15.0	17.5	75.0	1	2.75

Model	Coil Volume (Litre)	Condenser Airflow (m3/hr)	Accumulator/ Receiver Volume (Litre)	Connection		Dimensions			Weight (Kg)
				Liquid (inch)	Suction (inch)	Height (mm)	Width (mm)	Depth (mm)	
CCMR0200ARY16	2.0	4050	3	3/8	5/8	700	1025	410	73
CCMR0300ARY16	2.6	4050	3	3/8	5/8	700	1025	410	76
CCMS0400ARY16	4.4	7450	4.5	1/2	7/8	930	1025	410	94
CCMS0600ARY16	5.6	7450	4.5	1/2	7/8	930	1025	410	107
CCMS0800ARY16	7.7	17698	12.6	5/8	1-1/8	930	1650	620	167
CCMS1000ARY16	7.7	17698	12.6	5/8	1-1/8	930	1650	620	167
CCMS1200ARY16	11.69	17698	20	5/8	1-1/8	930	1650	620	210
CCMS1400ARY16	11.69	17698	20	5/8	1-1/8	930	1650	620	210
CCLR0200ARY16	2.6	4050	3	3/8	5/8	700	1025	410	78
CCLR0300ARY16	3.9	4050	3	3/8	5/8	700	1025	410	86
CCLS0400ARY16	4.4	7450	4.5	1/2	7/8	930	1025	410	108
CCLS0600ARY16	4.4	8100	4.5	1/2	7/8	930	1025	410	112
CCLS0800ARY16	7.7	17698	12.6	5/8	1-1/8	930	1650	620	133
CCLS1000ARY16	7.73	17698	12.6	5/8	1-1/8	930	1650	620	172
CCLS1200ARY16	7.86	17698	20	5/8	1-1/8	930	1650	620	200
CCLS1400ARY16	11.69	17698	20	5/8	1-1/8	930	1650	620	220
CCHMS0400ARY16	3.4	7450	3.25	3/8	5/8	990	940	350	85
CCHMX0150AV16	1.76	3120	1.2	1/4	1/2	595	845	300	41
CCHMS0600ARY16	4.2	7475	4.5	1/2	7/8	930	1025	410	105

Refer to condition:

- * Evaporation temperature = -10°C, Outside ambient temperature = 43°C (Medium temperature application, R404A)
- * Evaporation temperature = -35°C, Outside ambient temperature = 43°C (Low temperature application, R404A)
- * Evaporation temperature = 0°C, Outside ambient temperature = 43°C (High-Medium temperature application, R32)

** MCC= Maximum Continuous Current

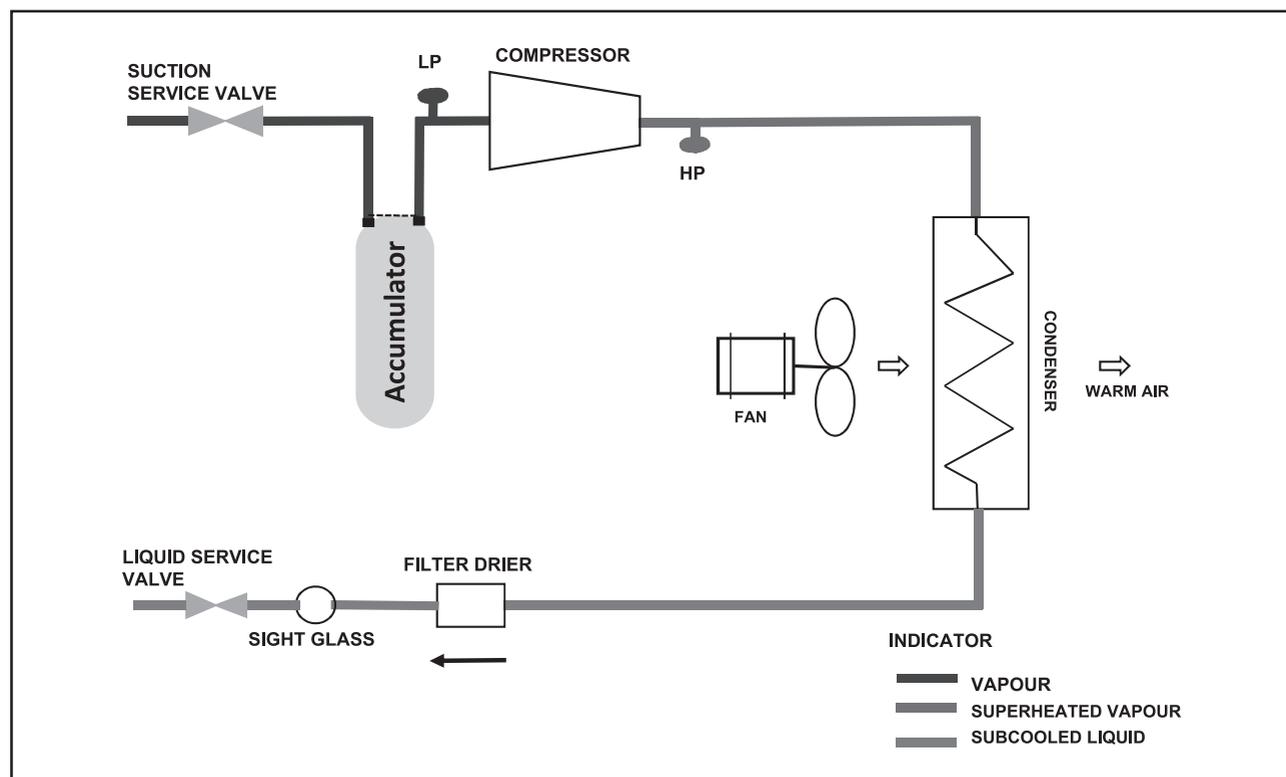
4. Standard Product Configuration

- Hermetic Scroll compressors & Reliable reciprocating type compressor for medium and low temperature models with oil sight glass.
- IP54 rated control panel.
- Magnetic contactor.
- Stop valves for quick installation and easy access and maintenance.
- Powder coated casing.
- Corrugated aluminium fin and inner groove hairpin condenser except for CCHM unit which have slit fins.
- Receiver to accumulate refrigerant amount up to 25m piping length during pump down.
- Suction Accumulator to protect against refrigerant flood back during operation and also against off-cycle migration.
- Oil separator and non-return valve for low temperature models.
- Sight glass and Braze type filter drier with TW to detect leak point with the help of UV torch.
- HP/LP switches (2~6HP) and dual pressure Auto/Manual switch LP/HP (8~14HP) to protect the compressor.
- Designed for zero ozone depletion potential (ODP=0) refrigerant R404A, R32 and R410A.
- The MT and LT units are fully factory tested and is filled with nitrogen in order to always ensure the highest quality of our products.
- HMT unit is pre-filled with R32 refrigerant and 6 HP HMT unit is filled with R410A refrigerant.

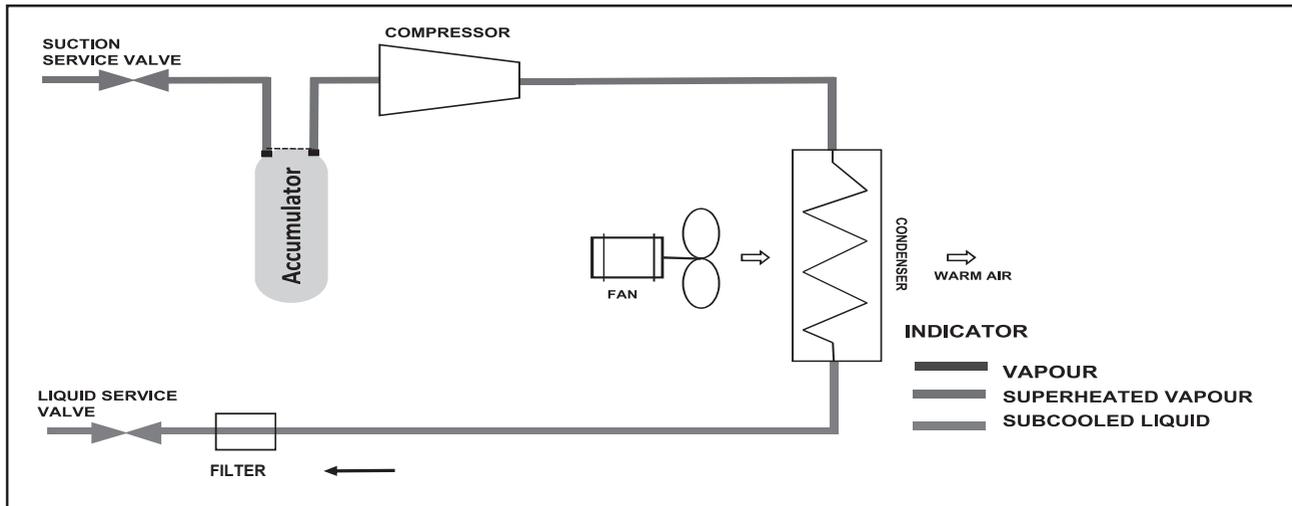
5. Product System Cycle

2/3/4/6 HP MT : CCMR0200ARY16, CCMR0300ARY16, CCMS0400ARY16, CCMS0600ARY16

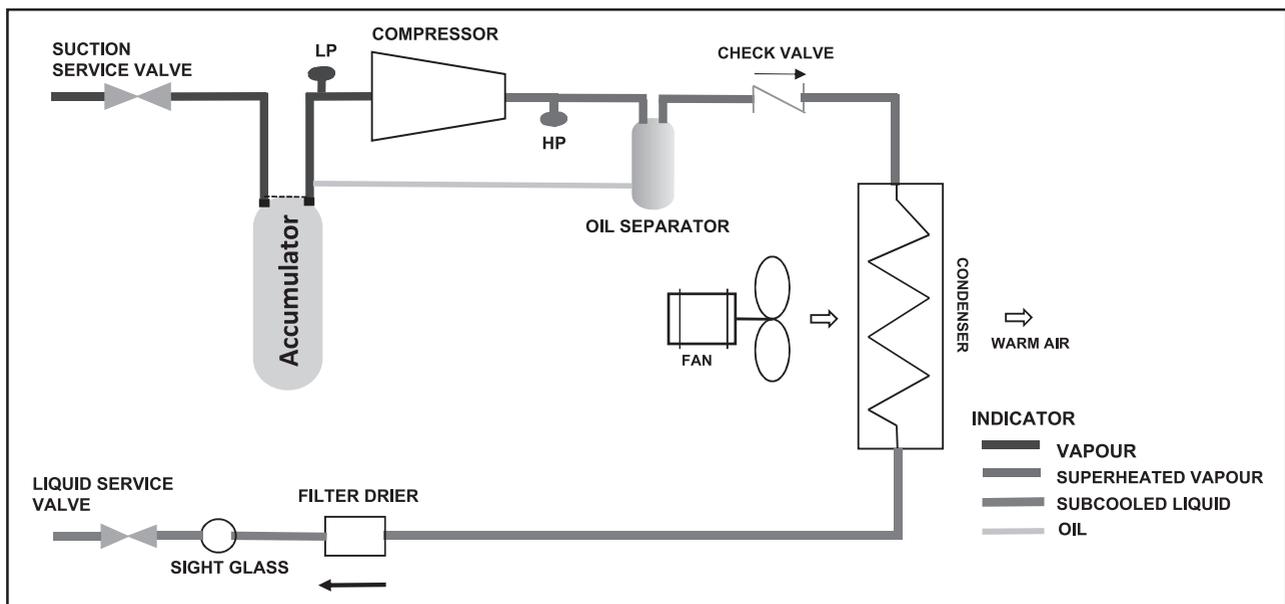
4 HP HMT : CCHMS0400ARY16 6 HP HMT : CCHMS0600ARY16



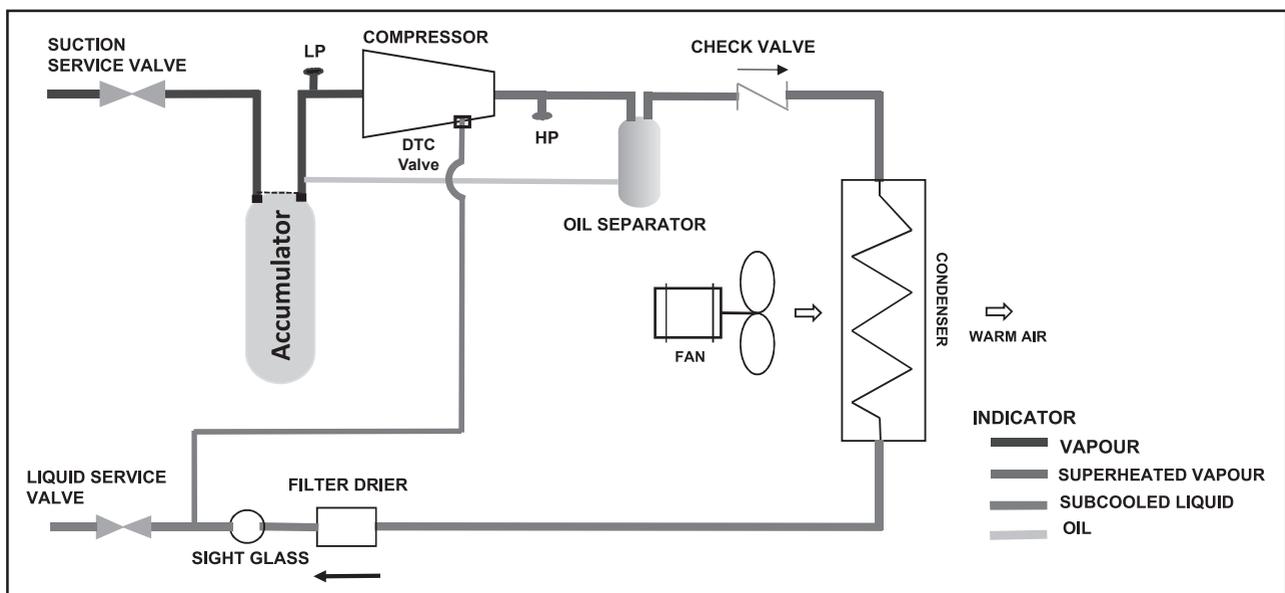
1.5 HP HMT : CCHMX0150AV16



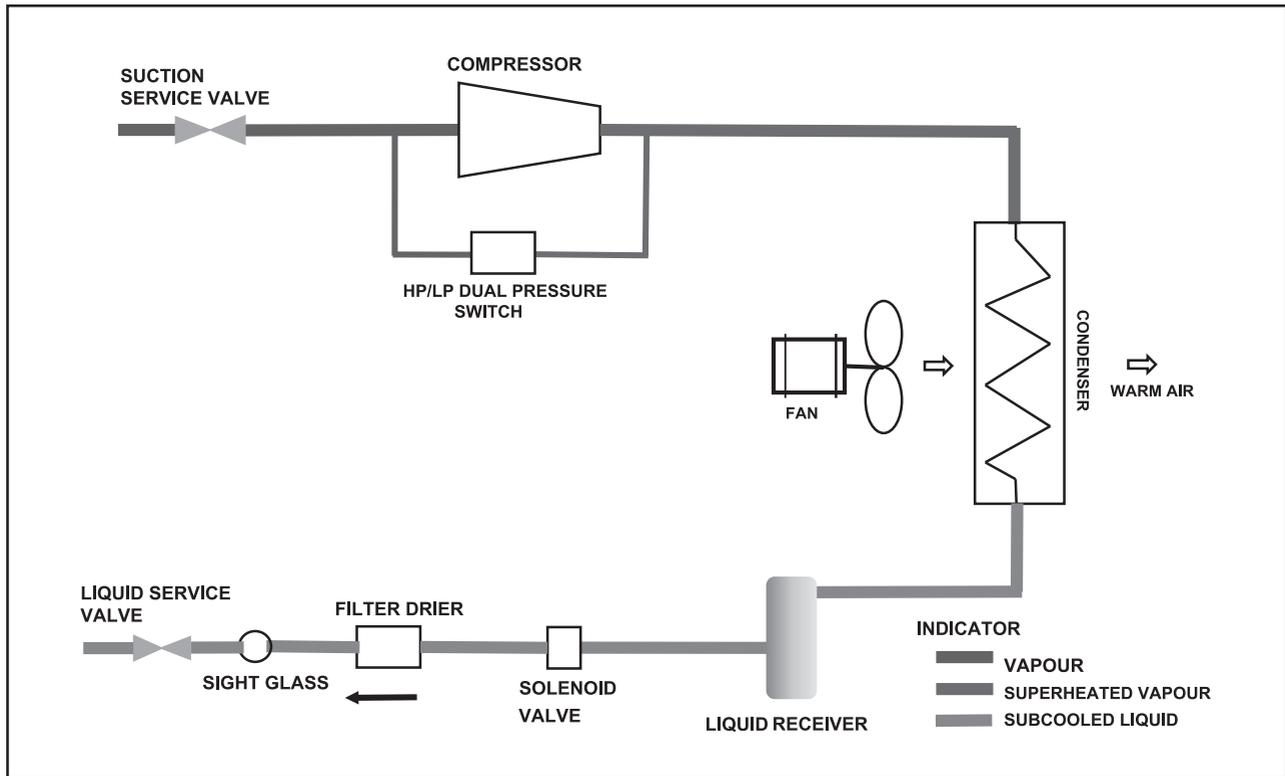
2/3 HP LT : CCLR0200ARY16, CCLR0300ARY16



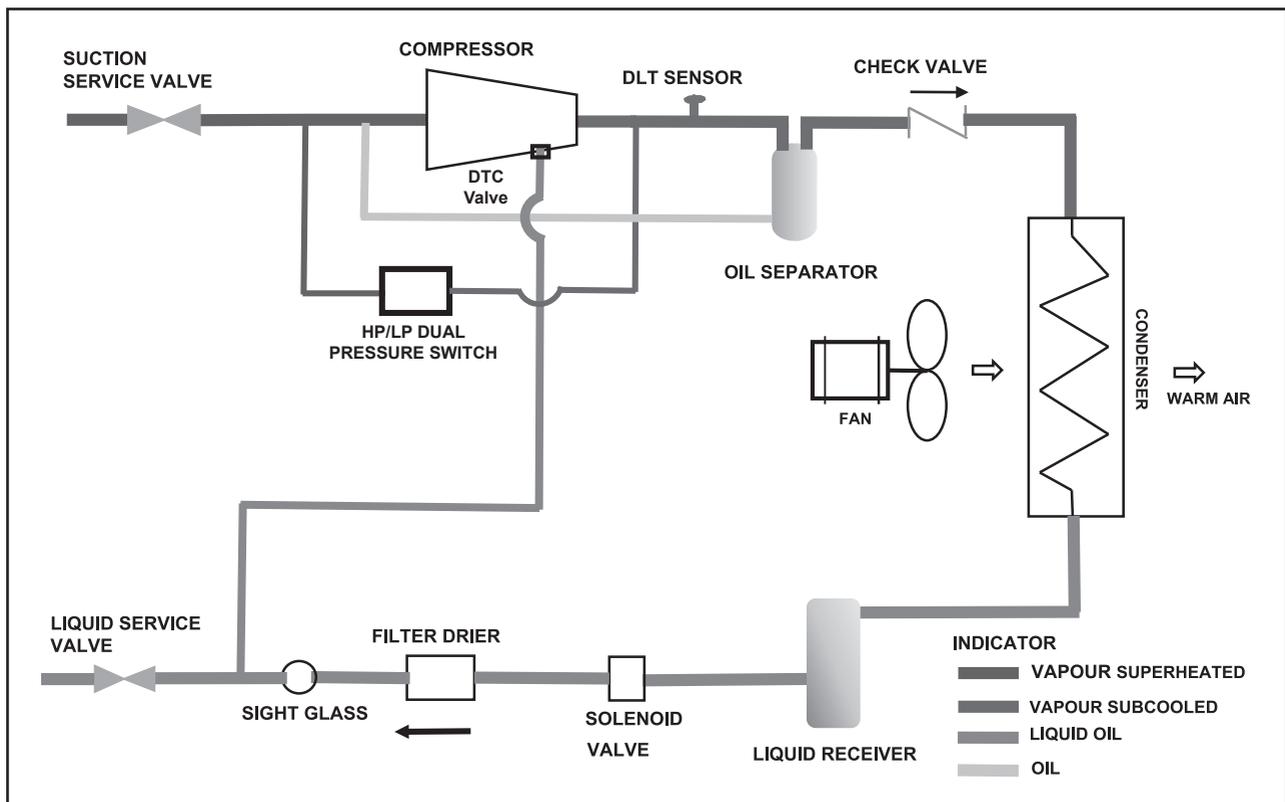
4/6 HP LT : CCLS0400ARY16, CCLS0600ARY16



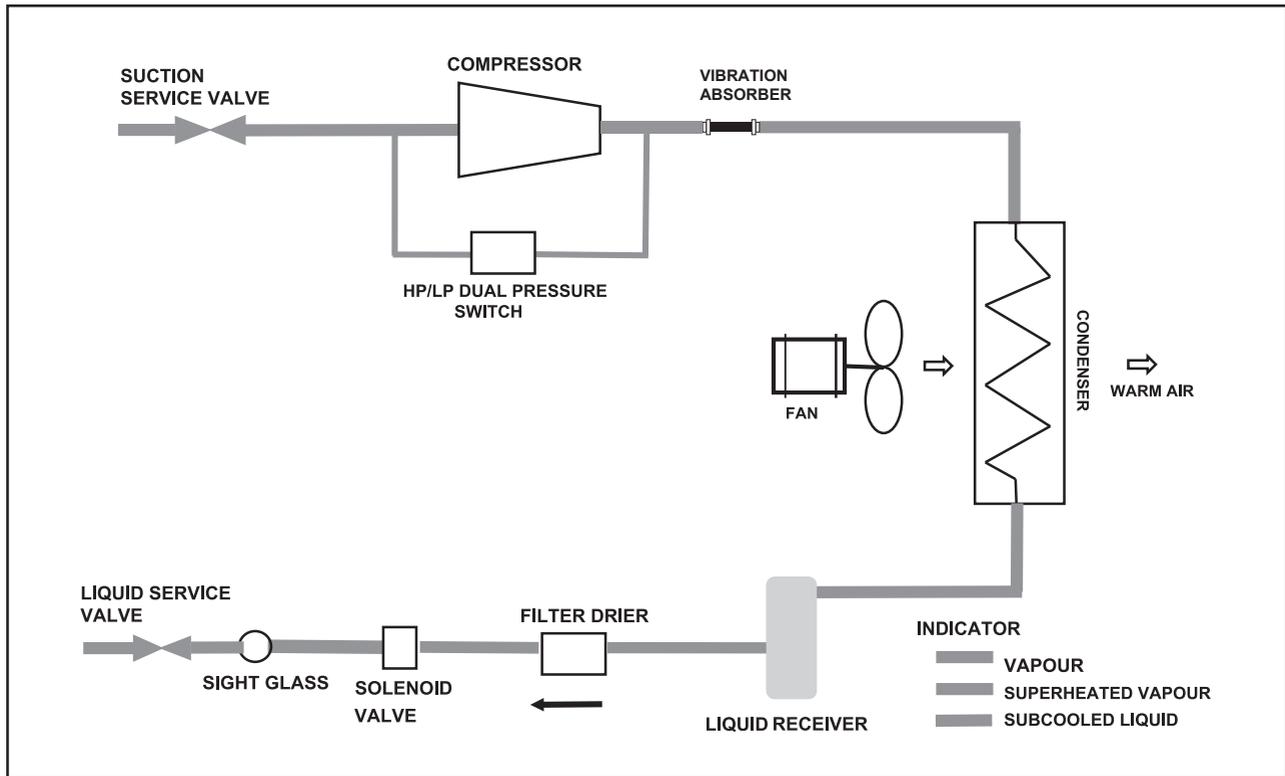
8/10 HP MT : CCMS0800ARY16, CCMS1000ARY16



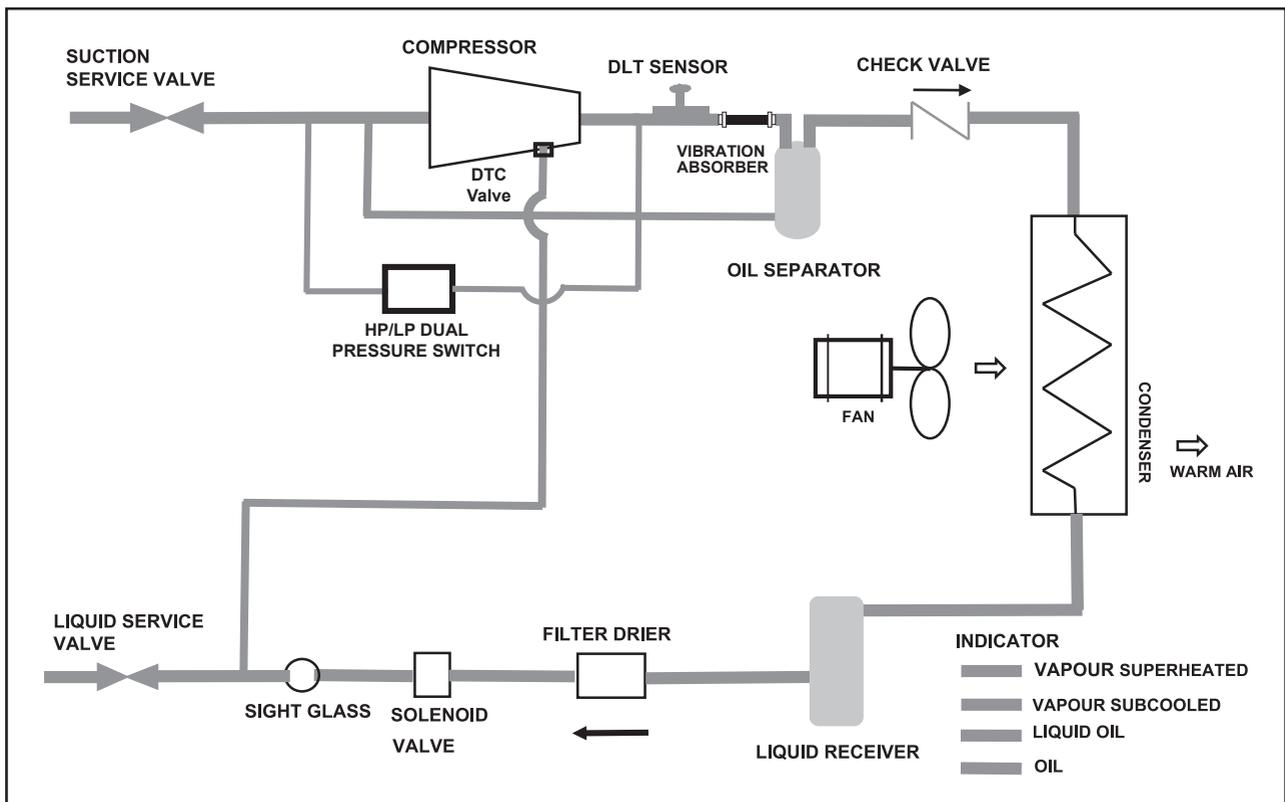
8/10 HP LT : CCLS0800ARY16, CCLS1000ARY16



12/14 HP MT : CCMS1200ARY16 , CCMS1400ARY16

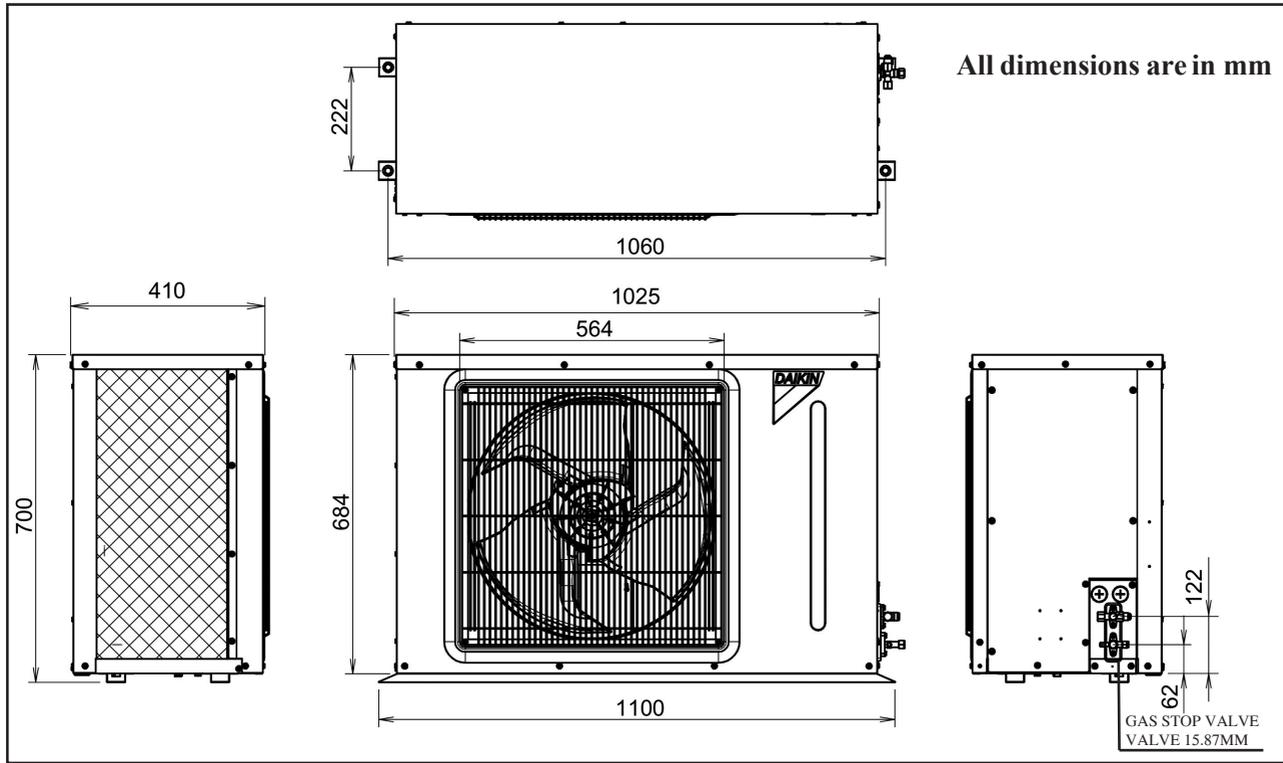


12/14 HP LT : CCLS1200ARY16 , CCLS1400ARY16

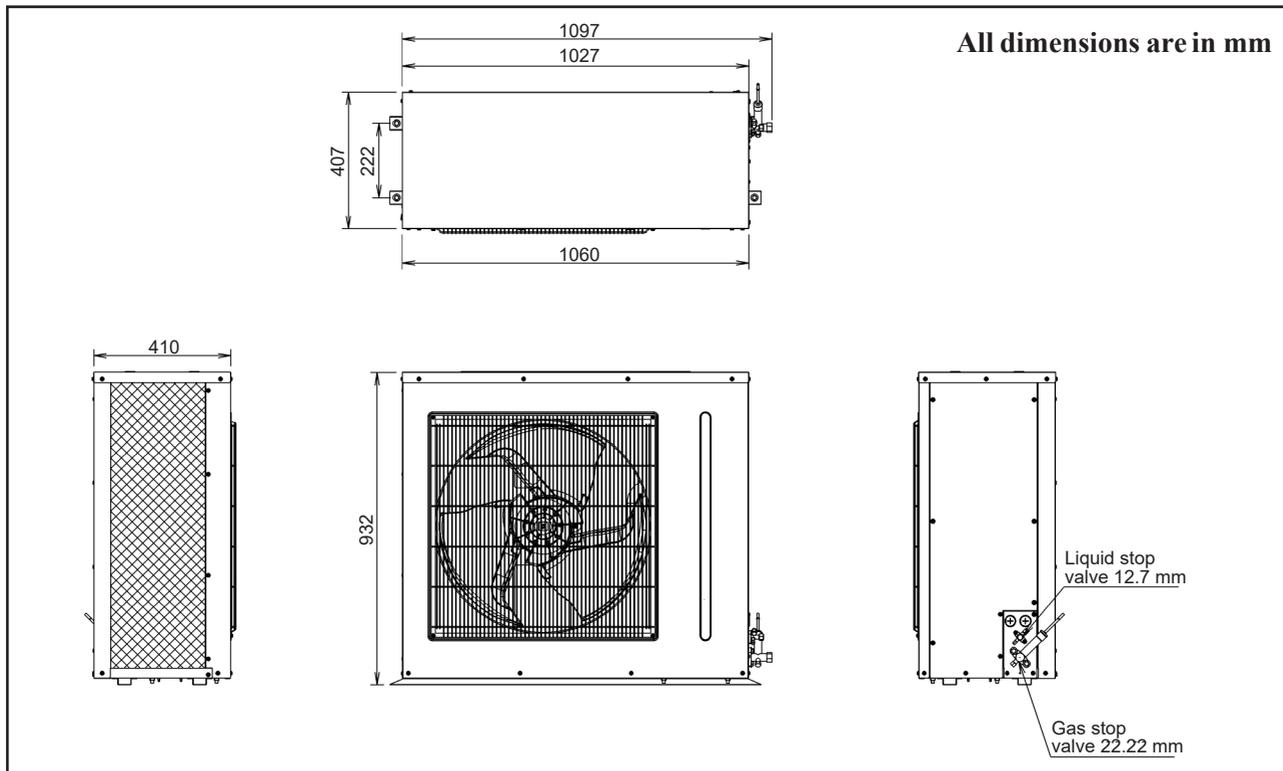


6. Outside Drawings

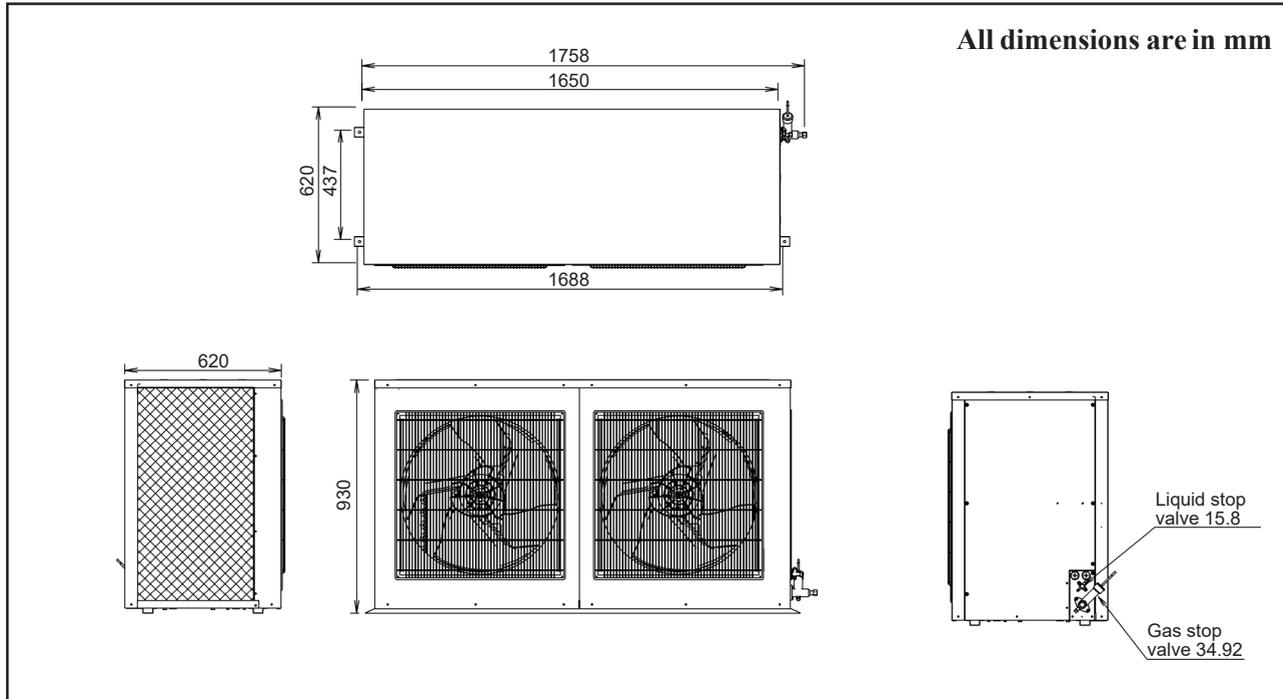
2/3HP MT/LT: CCMR0200ARY16, CCLR0200ARY16
CCMR0300ARY16, CCLR0300ARY16



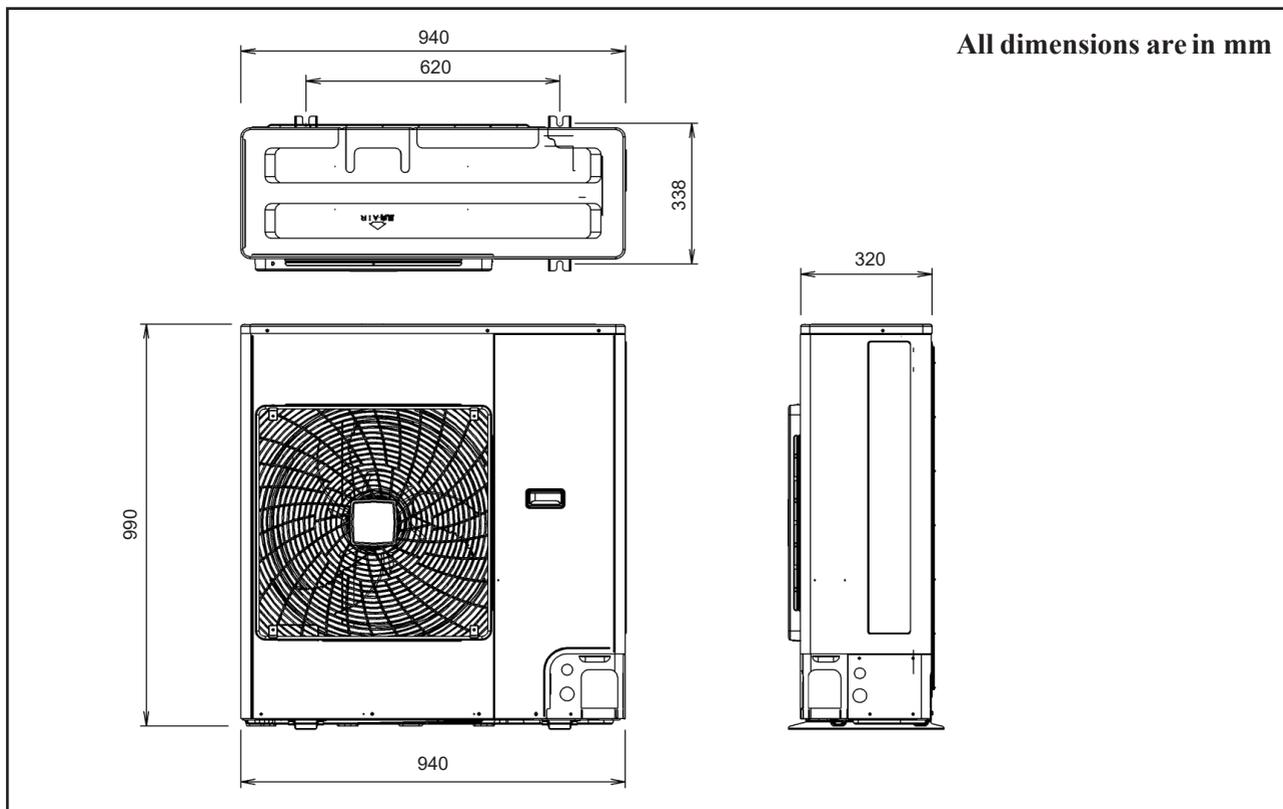
4/6HP MT/LT, 6HP HMT : CCMS0400ARY16, CCLS0400ARY16, CCMS0600ARY16,
CCLS0600ARY16, CCHMS0600ARY16



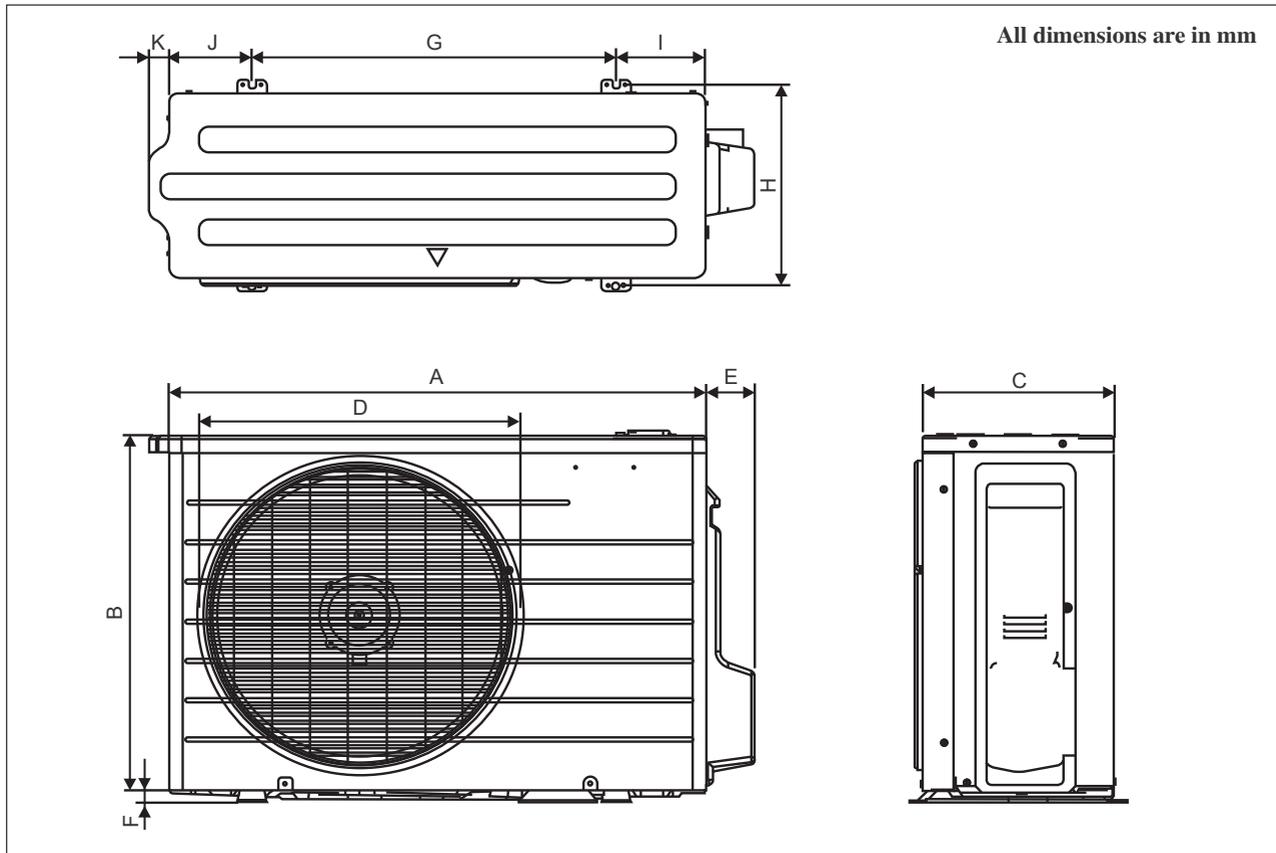
**8/10/12/14 HP MT/LT : CCMS0800ARY16, CCLS0800ARY16, CCMS1000ARY16, CCLS1000ARY16
CCMS1200ARY16, CCMS1400ARY16, CCLS1200ARY16, CCLS1400ARY16**



4HP HMT : CCHMS0400ARY16



1.5HP HMT : CCHMX0150AV16



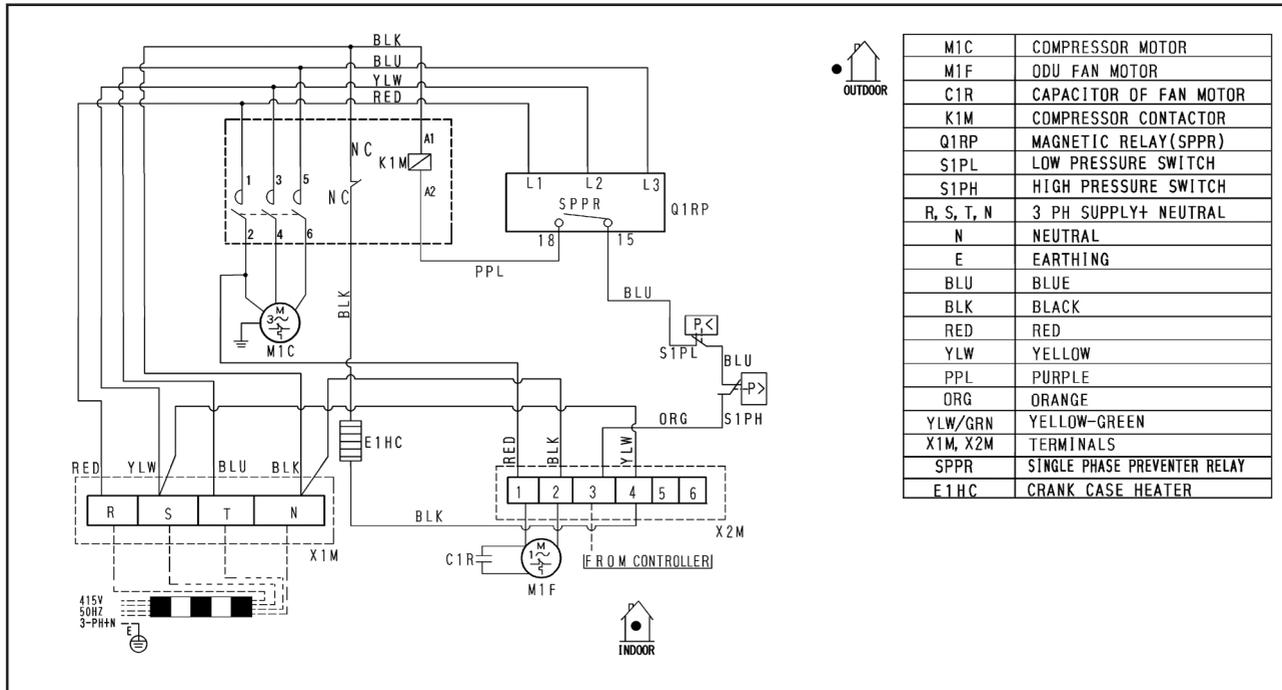
Dimension Model	A	B	C	D	E	F	G	H	I	J	K
1.5HP	845	575	302	505	77	20	573	326	140	131	30

7. Wiring Diagram

Important Note: All wiring and connections to the condensing unit must be made in accordance to the local codes.

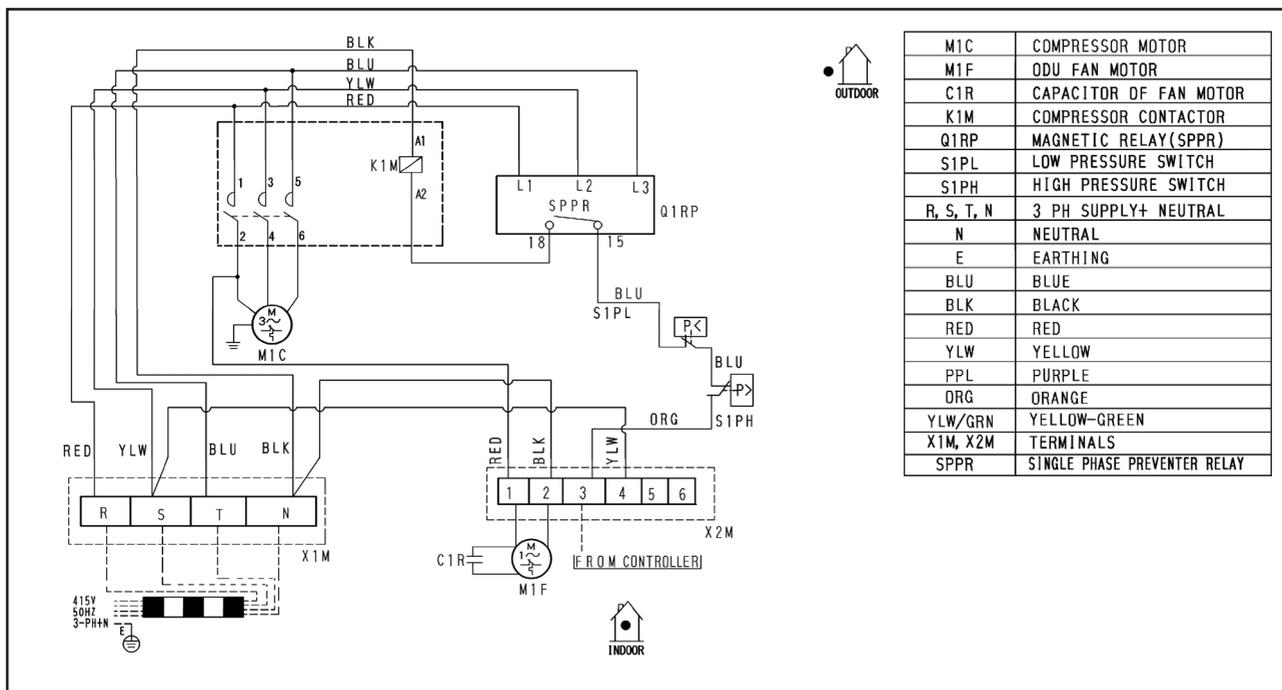
2/3/4/6 HP - MT/LT (415V/3ph/50Hz)

CCMR0200ARY16, CCLR0200ARY16, CCMR0300ARY16, CCLR0300ARY16,
CCMS0400ARY16, CCLS0400ARY16, CCMS0600ARY16, CCLS0600ARY16

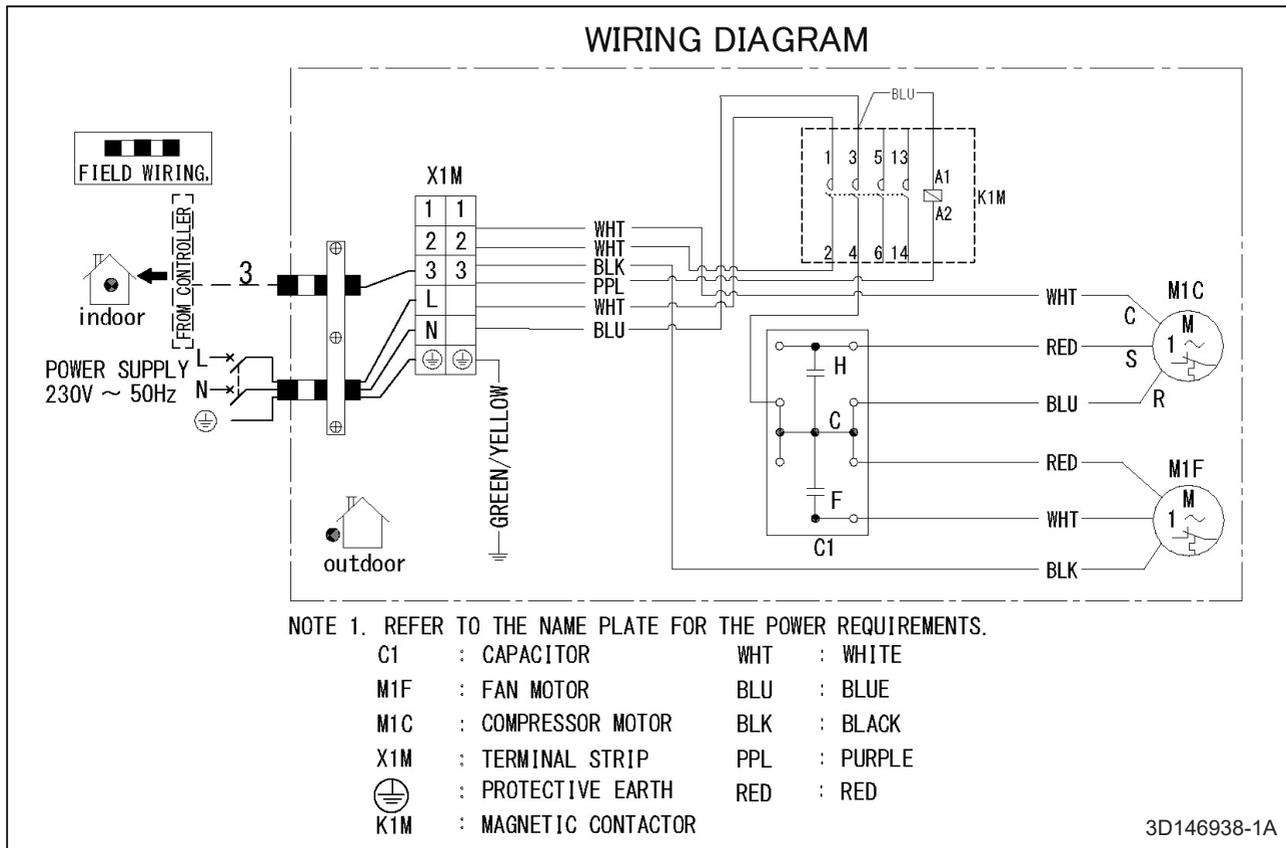


4HP - HMT(415V/3ph/50Hz)

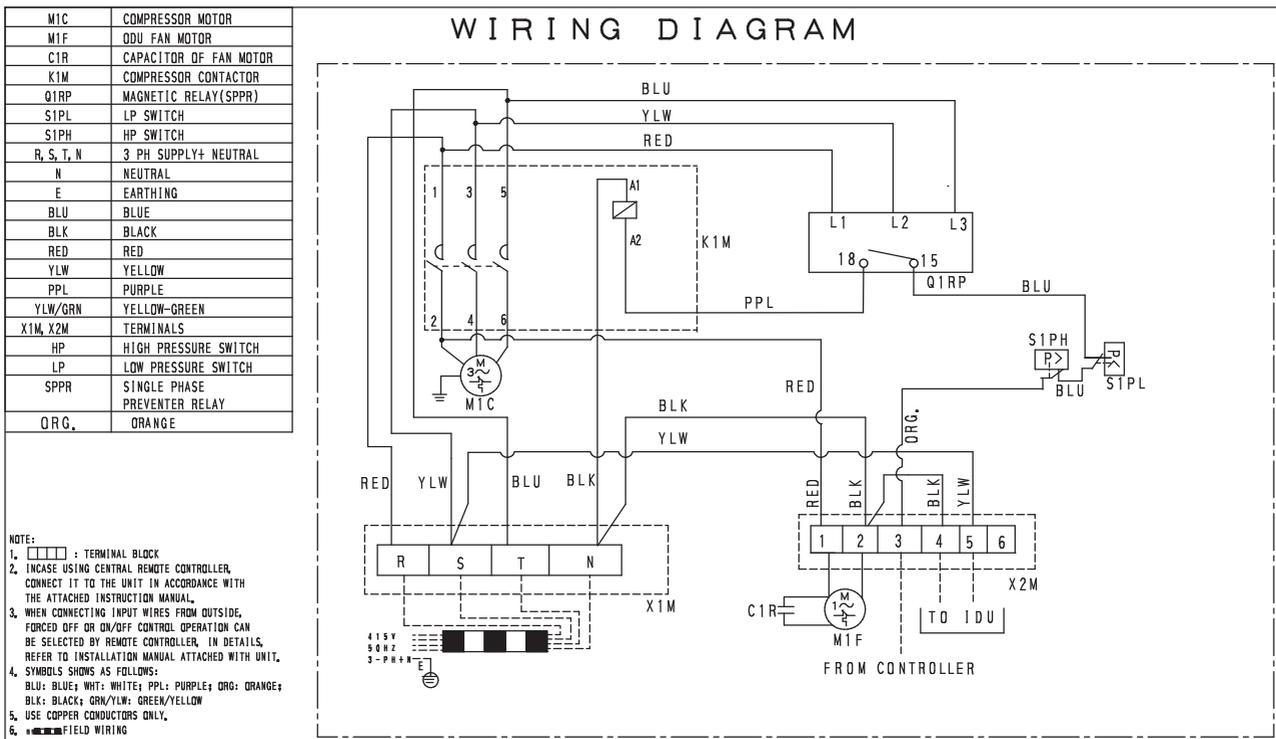
CCHMS0400ARY16



1.5 HP HMT - CCHMX0150AV16 (230V/1ph/50Hz)

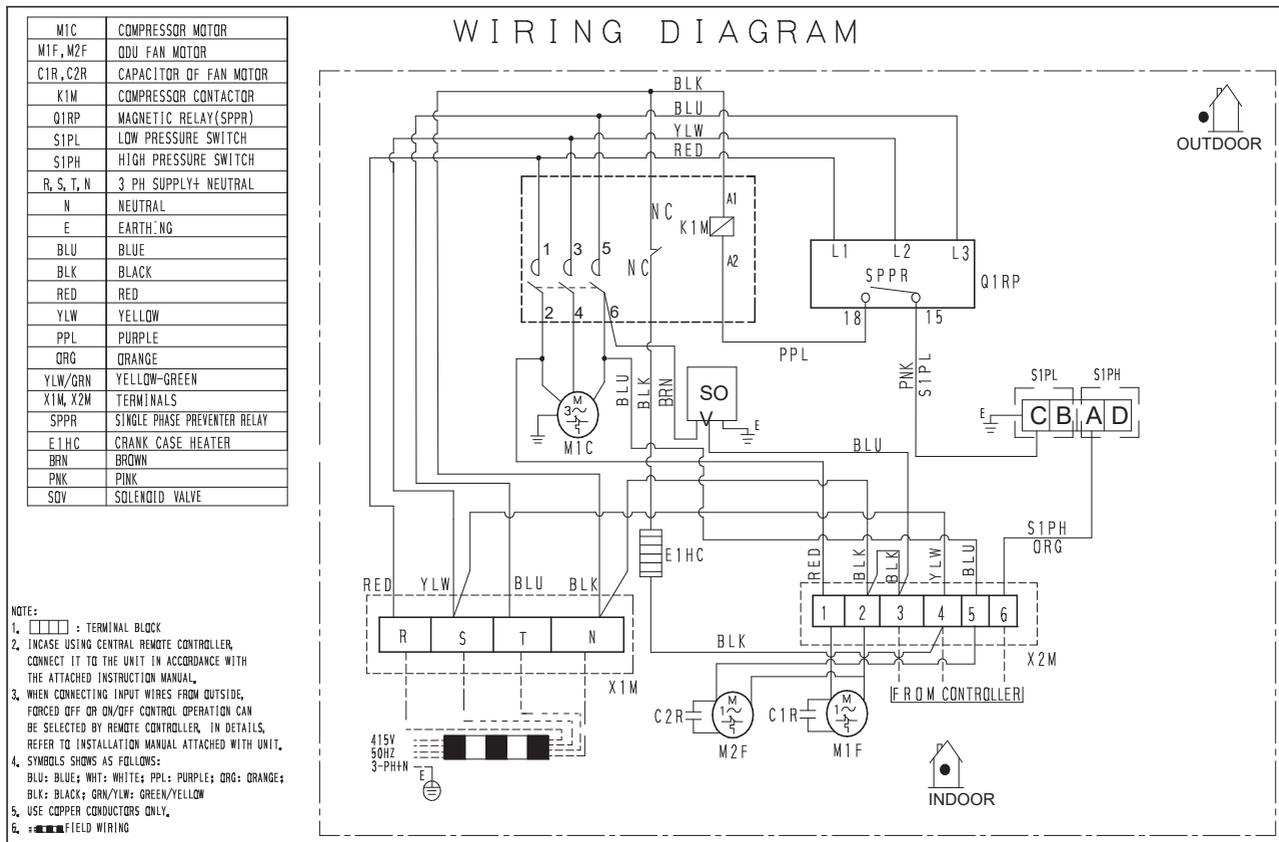


6 HP HMT - CCHMS0600ARY16 (415V/3ph/50Hz)



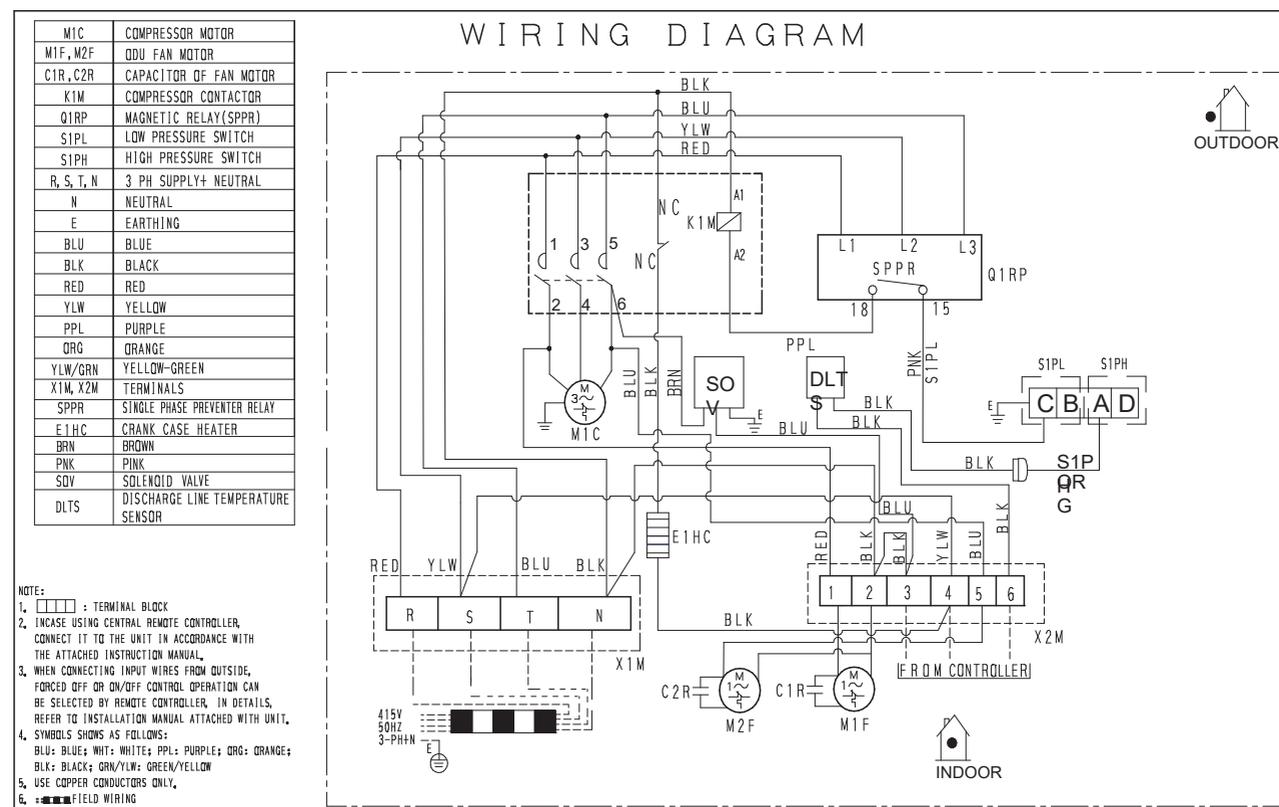
8/10/12/14 HP - MT (415V / 3ph / 50 Hz)

CCMS0800ARY16 , CCMS1000ARY16 , CCMS1200ARY16 , CCMS1400ARY16



8/10/12/14 HP - LT (415V / 3ph / 50 Hz)

CCLS0800ARY16 , CCLS1000ARY16 , CCLS1200ARY16 , CCLS1400ARY16



8. Safety and Health

Important Note

Only qualified specialists could carry out the installation, maintenance and commissioning of the system. To avoid potential injury, use care when working around coil surfaces or sharp edges of metal cabinets. All piping and electrical wiring should be installed in accordance with all applicable codes, ordinances and local by-laws.

General Information

Before Installation

- Ensure the units received are the correct models for the intended application.
- Ensure the refrigerant, voltage and MWP are all suitable for the proposed application.
- Check there is no damage to the units. Any damage should be advised to the supplier immediately.
- Check that the proposed equipment locations are suitable and provide adequate support for the weight of the units.

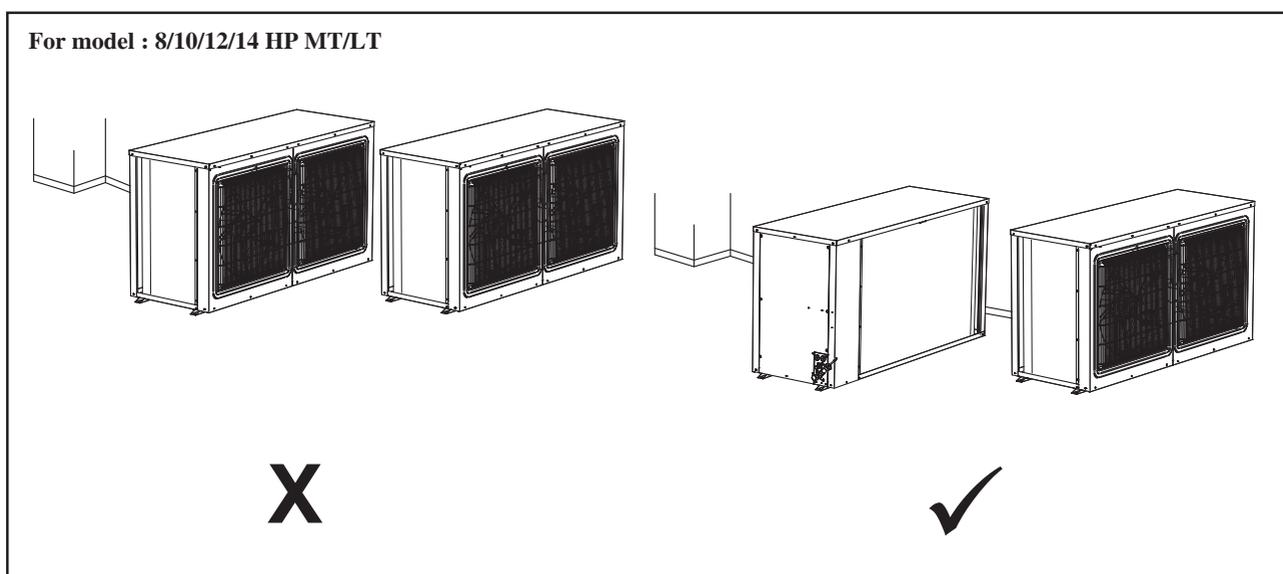
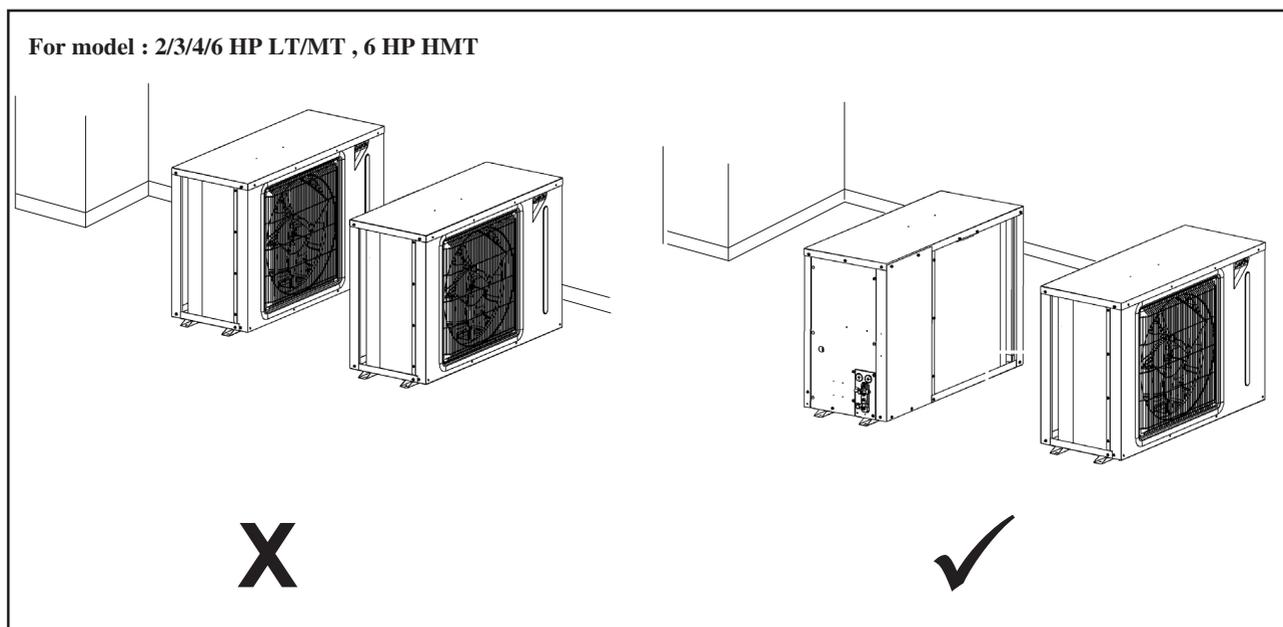
During Installation and subsequent maintenance

- Installation and maintenance are to be performed only by qualified personnel who is familiar with local codes and regulations, and experienced with this type of equipment.
- The condensing unit is delivered with a protective nitrogen holding charge for MT & LT units and with R32 in HMT unit and R410A in 6 HP HMT unit.
- If lifting equipment is required, ensure that it is suitable for purpose certificated and that the operatives are qualified to use it.
- Safe working methods are identified and operatives have suitable Personal Protective Equipment (PPE).
- Ensure the working area has adequate ventilation during brazing procedures.
- The units contain moving machinery and electrical power hazards, which may cause severe injury or death. Disconnect and shut off power before installation or service of the equipment.
- Refrigerant should not be released into the atmosphere. Proper evacuation, recovery, handling and leak testing procedures must be observed at all times.
- Units must be earthed and no maintenance work should be attempted prior to disconnecting the electrical supply.
- The electrical covers and fan guards must remain fitted at all times.
- Use of the units outside of the design conditions and the application for which the units were intended may be unsafe and be detrimental to the units, regardless of short or long term operation.
- The condensing units are not designed to withstand loads or stresses from other equipment or personnel. Such extraneous loads or stress may cause failure/leak/injury.
- A suction accumulator is assembled in the units. It offers protection against refrigerant flood back during operation and also against off-cycle migration by adding internal free volume to the low side of the system.
- Additionally we recommend liquid receiver installation in units with scroll compressors for better saturated liquid in the system.
- Tests must be conducted to ensure the amount of off-cycle migration to the compressor does not exceed the compressor's charge limit.
- Wherever possible the system should be installed to utilize a pump down configuration.
- After installation, the system should be allowed to run for 3-4 hours. Above 9kgs of refrigerant charge, additional 15ml of oil per kg of refrigerant charge should be added in MT models.
- No additional oil required in LT models.

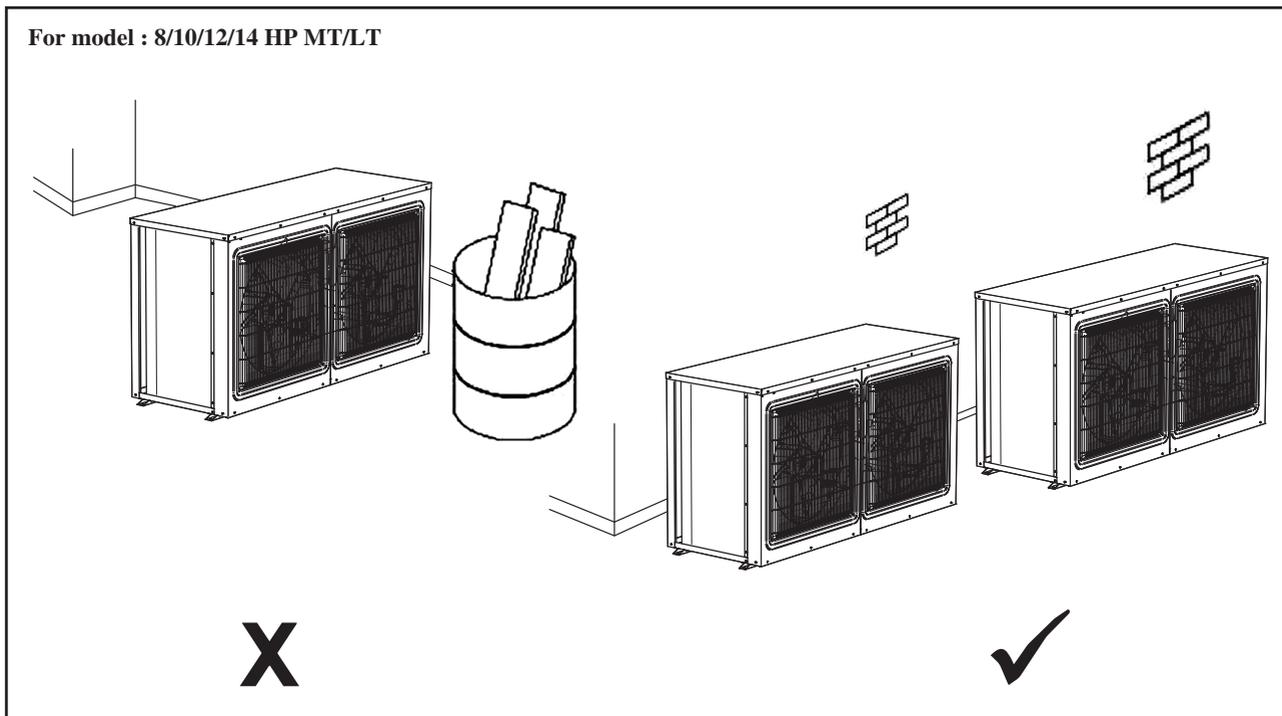
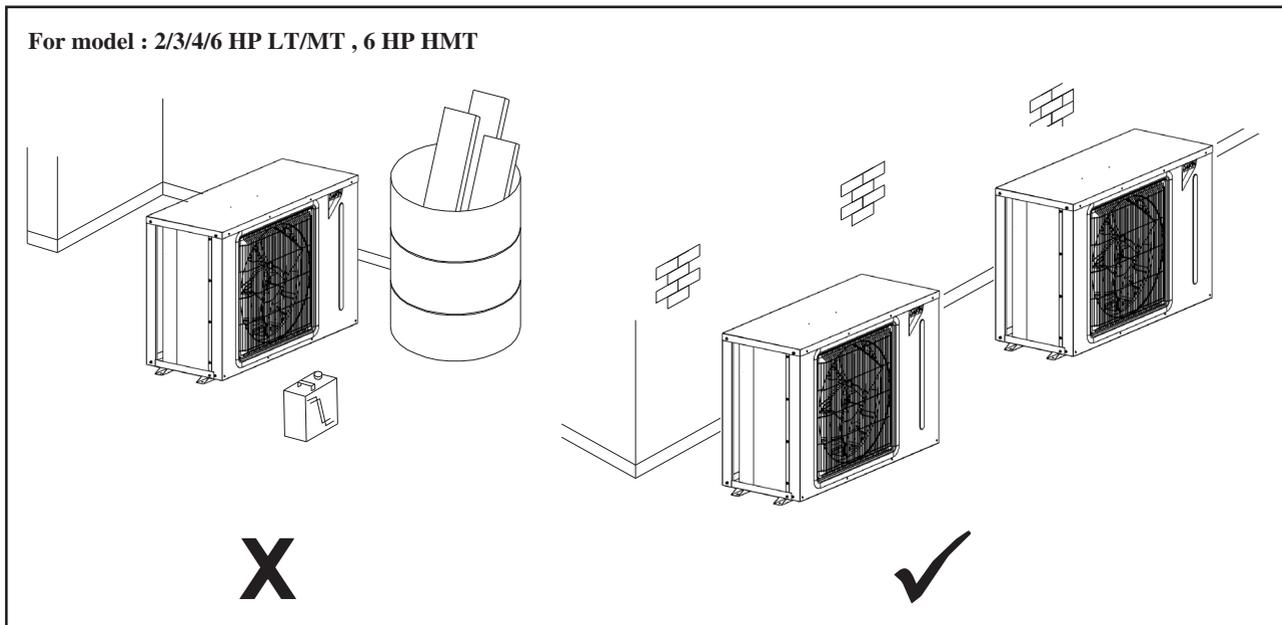
9. Installation & Commissioning

9.1 Unit site location

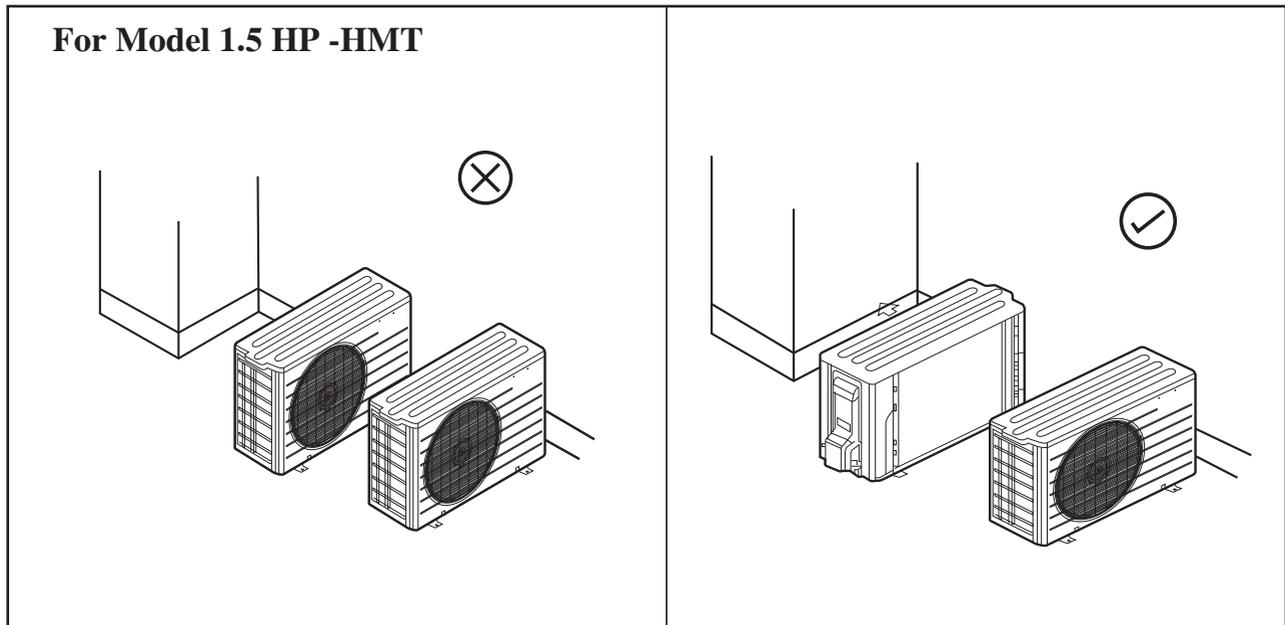
- In order to achieve maximum cooling capacity, the installation location for the condensing unit should be carefully selected.
- Install the condensing unit in such a way that hot air ejected by the condensing unit cannot be drawn in again (short circuit of hot discharge air). Allow sufficient space for maintenance around the unit.



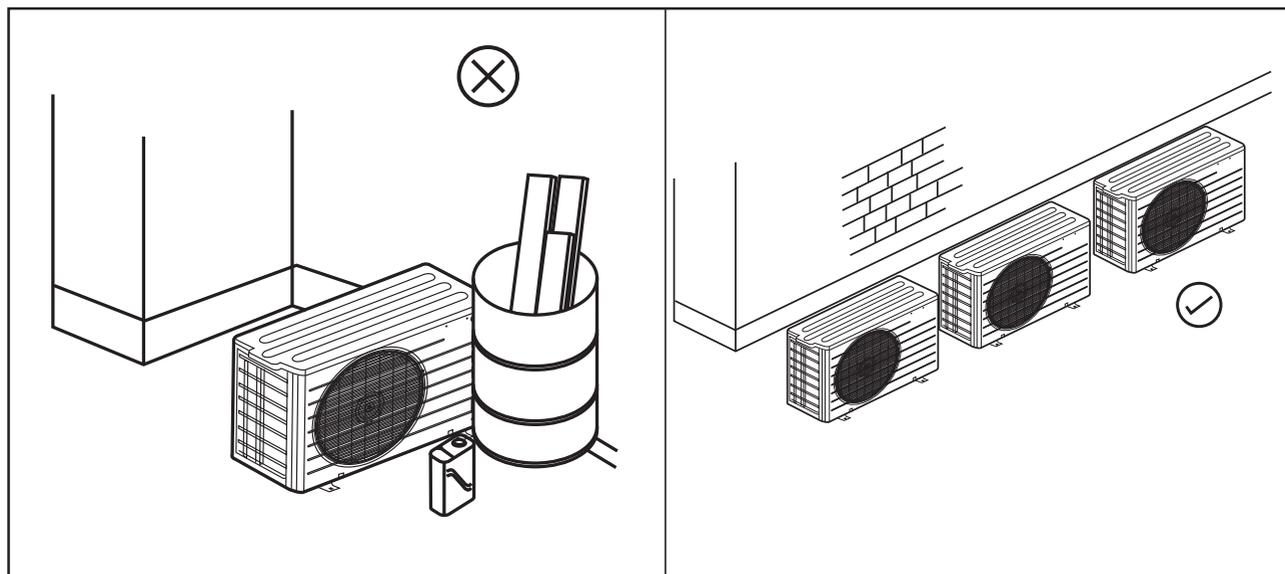
- Ensure that there is no obstruction to air flow into or out of the unit. Remove obstacles which block air intake or discharge.



- The location must be well ventilated, so the unit can draw in and distribute plenty of air thus lowering the condensing temperature.
- To optimize the unit running conditions, the condenser coil must be cleaned at regular intervals.
- The unit must be level in all directions.

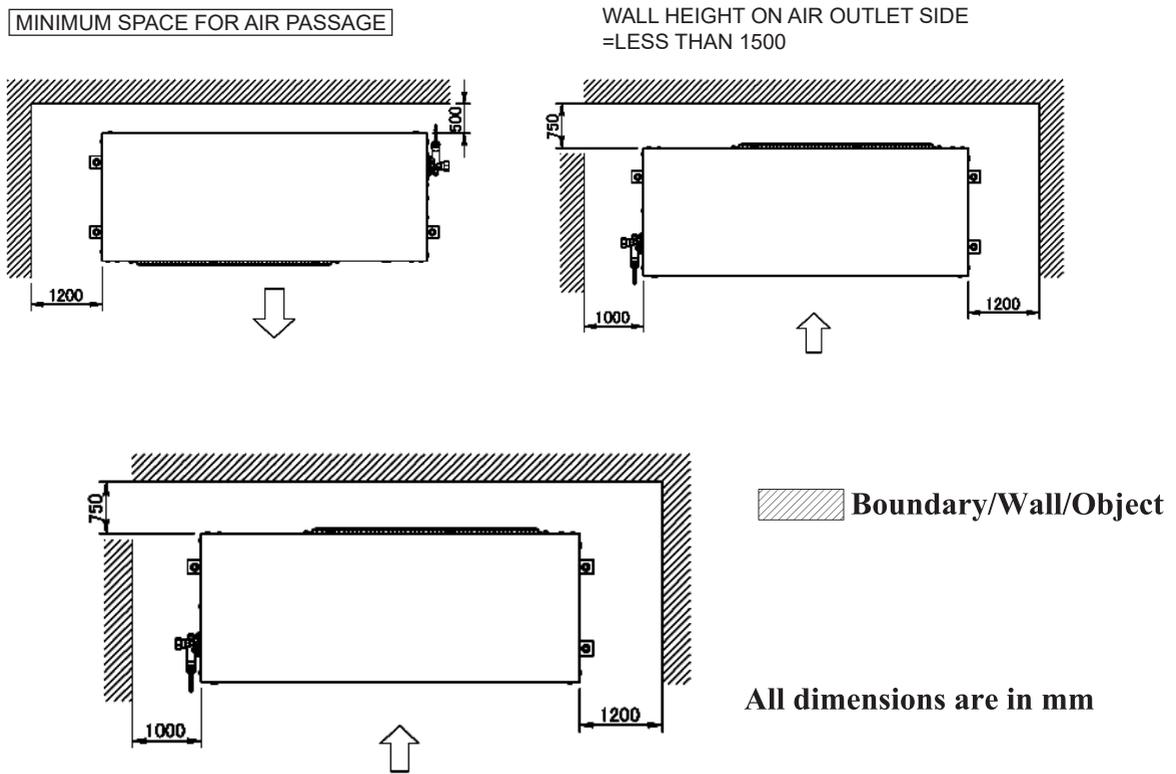


- Ensure that there is no obstruction to air flow into or out of the unit. Remove obstacles which block air intake or discharge.



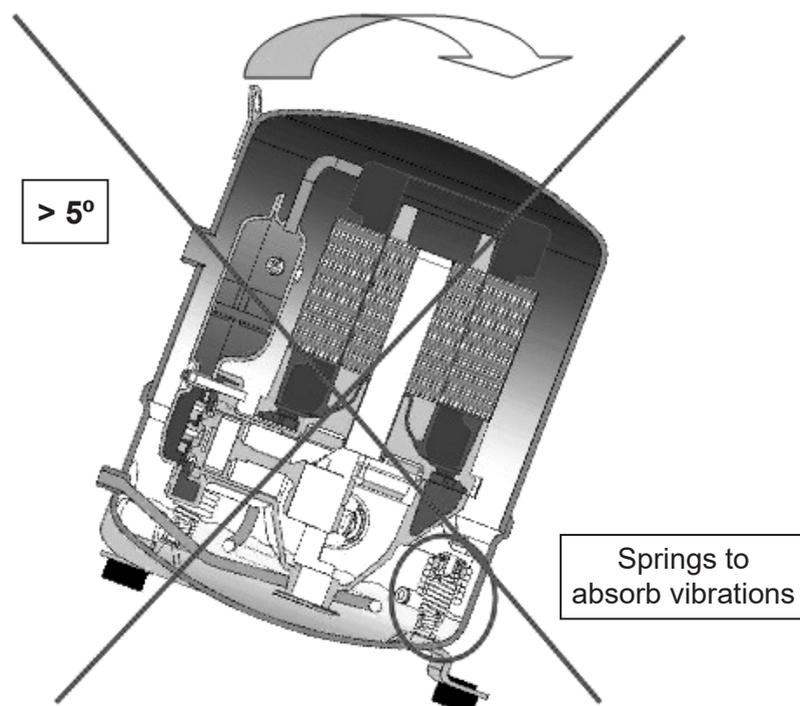
9.2 Installation clearances

- The installation location should allow sufficient space for air flow and maintenance around the unit.



9.3. Compressor handling

To ensure compressor reliability, the condensing unit together with the compressor must not tilt greater than an angle of 5° . Otherwise, the internal part of the compressor can offset from the housing springs and produce abnormal sound and vibration.



9.4. Field piping

Important Note

Pipe sizing should only be determined by qualified personnel. All local codes of practice must be observed in the installation of refrigerant piping.

To ensure satisfactory operation and performance, the following points should be noted for field piping arrangements:

- Pipework routes must be as simple and as short as possible.
- Avoid low points on pipework where oil can accumulate.
- Suction gas velocity must be sufficient to ensure good oil return.
- Use only clean, dehydrated refrigeration grade copper tube with long radius bends.
- Avoid flare type connections and take great care when brazing. Use only silver alloy rods.
- Run braze without over filling to ensure there is no leakage into the tube.
- To prevent oxidation, blow oxygen free nitrogen through pipework when brazing.
- Install insulation on all suction lines and on all pipes penetrating walls or passing through hot areas.
- Adequately support all pipe work at a maximum of 2 metre intervals.
- In vertical pipework, the use of U-trap and double suction risers is often required. These suction risers must always be fitted with a U-trap at the bottom and a P-trap at the top and never be higher than 4m unless a second U-trap system is fitted.
- Suction pipework should slope gently back towards the unit to assist oil return to the compressor. A fall of approximately 2cm per metre of pipework is acceptable.
- Liquid lines should be sized to ensure a full supply of liquid refrigerant to the expansion device. Careful attention should be paid to sizing of liquid lines on large risers (above 6m).
- Piping length less than 25m is highly recommended. An additional oil might be required if piping length exceeds 20m or with many oil traps. Normally quantity of top up oil required should not exceed 2% of the total refrigerant charge.
- Maximum allowable length of piping is 20m and maximum allowable elevation is 10 m in 1.5HP HMT model.
- Correct line sizing will minimize the pressure drop and maintain sufficient gas velocity for proper oil return.

Important Note

One of the main factors affecting equipment reliability and compressor service life is refrigeration circuit contamination. During installation, circuit contamination can be caused by:

- Brazing & Welding Oxides
- Filings & Particles from de-burring pipework
- Brazing Flux
- Moisture & Air

9.5 Pressure testing

- It is recommended to use inert gas such as nitrogen for pressure testing.
- The pressure differential between the high and low side of the compressor should not exceed 30 bar (435 psig).
- Test pressures are : 23 bar (334 psig) on the Low Side
28 bar (405 psig) on the High Side

9.6 Leak detection

- Make sure that all isolation valves throughout the system are fully open.
- Perform a leak detection using compatible refrigerant or pressurize nitrogen, detected by leak detector for the applied refrigerant.
- Never use CFC or HCFC refrigerants for leak detection of HFC systems.
- Leak detecting additives shall not be used as they may affect the lubricant properties.

9.7 Evacuation & Charging

Important Note

Moisture prevents proper functioning of the compressor and the refrigeration system. Ensure that a good quality vacuum pump is used to pull a minimum vacuum of 250 microns (0.33 mbar).

Once pressure testing has been completed, the system can now be evacuated to remove air and any moisture from the piping. This can be done as follows:

- As MT and LT are precharged with N₂, ensure any nitrogen charge is safely released from the system.
- Connect a gauge manifold to the connections on the service valves of the condensing unit.
- Connect a vacuum pump and vacuum gauge to the system.
- Ensure all gauge manifold and service valves are open as required.
- Evacuate the system until vacuum is below 250 microns (0.33 mbar).

Note: A triple evacuation procedure is recommended for all new systems or where moisture is suspected

- Once the system is isolated and the vacuum pump is switched off, any rise in pressure indicates that either there may be a leak in the system or moisture is still present. In this case, recheck the system for leaks, repair as necessary, and then restart the evacuation procedure. Once completed satisfactorily, the vacuum pump and vacuum gauge can be removed.
- At this point, the refrigerant charge can be added to the system as required. Refrigerants must be charged in the liquid phase. Charging of liquid into the suction side of the system should ONLY be done with a metering device. Use calibrated weighing scales to record the amount of refrigerant added to the system.

- For standard pipe length (7.5m), an initial charge need to be added as per below table:-

Model	Initial Refrigerant Charge R404A (Kg)
CCMR0200ARY16	2.5
CCMR0300ARY16	3
CCMS0400ARY16	4
CCMS0600ARY16	4
CCLR0200ARYT6	3
CCLR0300ARY16	3
CCLS0400ARY16	4
CCLS0600ARY16	4
CCMS0800ARY16	6
CCLS0800ARY16	6
CCLS1000ARY16	6
CCMS1000ARY16	6
CCMS1200ARY16	8
CCMS1400ARY16	8
CCLS1200ARY16	8
CCLS1400ARY16	8

- CCHMS0400ARY16 unit is precharged with 4kg of R32 gas for standard pipe length.
- CCHMX0150AV16 unit is precharged with 1.2 kg of R32 gas for standard pipe length.
- CCHMS0600ARY16 unit is precharged with 4.3 kg of R410A gas for standard pipe length.

9.8 Electrical

Important Note

The mains electrical supply to the condensing unit must be via a suitable motor rated circuit breaker or fuse.

Condensing units require 415 volt / 3 phase / 50Hz supply, both of which must include a Neutral and an Earth. These systems are not suitable for any other supply voltages (other than a deviation of +/- 10% of the above values) and are not suitable for 60Hz supplies.

Mains cable type and sizing must be selected for the particular application and the electrical installation should confirm to the current local standards.

- Cables to the condensing unit should wherever possible be routed through the cable glands supplied on the rear of the units.
- Connect the mains supply to the units as per the wiring diagrams on *page 12*.

To gain access to the electrical box, turn off the power supply, remove the screws from the service plate. The electrical box is located behind the electrical box cover. Remove the screws in the electrical box cover to access components.

Important Note

There must be no more than 12 compressor starts per hour. A higher number reduces the service life of the compressor. There is no minimum off time for scroll compressors, as they start unloaded. However, consideration should be given to ensuring an adequate minimum run time to ensure proper oil return.

9.9 Pre start-up checks

Before starting the condensing unit the following checks should be carried out as a minimum:

- Check electrical supply is correct and all connections are sound.
- All moving parts are free and guards fitted.
- Compressor oil level satisfactory.
- Overload set correctly.
- Valves in correct operating position.
- Initial refrigerant charge.
- Gauge manifold connected to both low and high sides of system.

9.10 Running the unit

- Run the unit and check compressor and condenser fan operation.
- Check system pressures and temperatures, gas charge and running currents of motors to ensure correct operation.
- Check compressor superheat.
- Check compressor oil level and adjust as necessary.
- Carry out final leak test and ensure all panels/covers are fitted and screws tightened.
- Log all information along with the system model and serial numbers for future reference.
- Ensure that the customer / responsible person is provided with basic operating instructions and where electrical isolators are situated in case of emergency.

Important Information!

Compressor operation

Scroll compressors are designed to run only in one direction. Three phase scroll compressors however can run in either direction depending on the connection of the three phases to the unit. Correct rotation can be determined by a drop in suction pressure and a rise in discharge pressure when the compressor is energized. Running the compressor for a short period of time in reverse direction will have no negative impact but prolonged running in reverse direction may cause premature failure. *To reverse the rotation on a three phase scroll compressor, simply swap connection of any two of the three compressor phases and recheck operating pressures.*

To prevent reverse rotation, a single phase protector relay is already assembled in the units.

Vacuum operation:

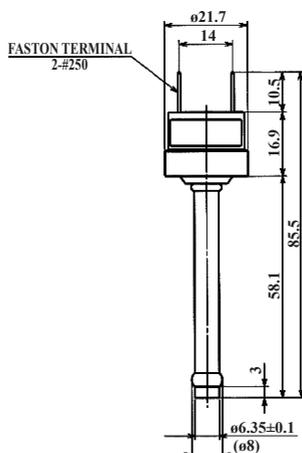
Do not operate compressors in a vacuum condition, as this will cause the compressor to overheat very quickly causing premature failure.

System charge:

Ensure an adequate liquid charge has been introduced to the high side of the system before starting to ensure a minimum operating pressure on the suction side is maintained, otherwise overheating of the scrolls and subsequent damage may occur.

9.11 Safety pressure switch settings (Applicable Model : 2/3/4/6 HP LT/MT)

The pressure switch fitted to CCU model condensing units are auto reset type and automatically get activated to prevent damage to compressor.



9.11.1 High pressure safety

The high pressure safety switch shuts the compressor down if the discharge pressure exceed the values shown in the following table.

Model	For 2/3/4/6 HP LT/MT	For 4 HP HMT	For 6 HP HMT
Refrigerant	R404A	R32	R410A
Cut Out (bar g)	28	41	41.7
Cut Out (psi g)	406	595	605

9.11.2 Low pressure safety

The low pressure safety switch protects the compressor against deep vacuum operation, a potential cause of failure due to internal arcing and also operation outside the compressor limits.

The low pressure safety cut out should never be set below the settings as shown in the following table.

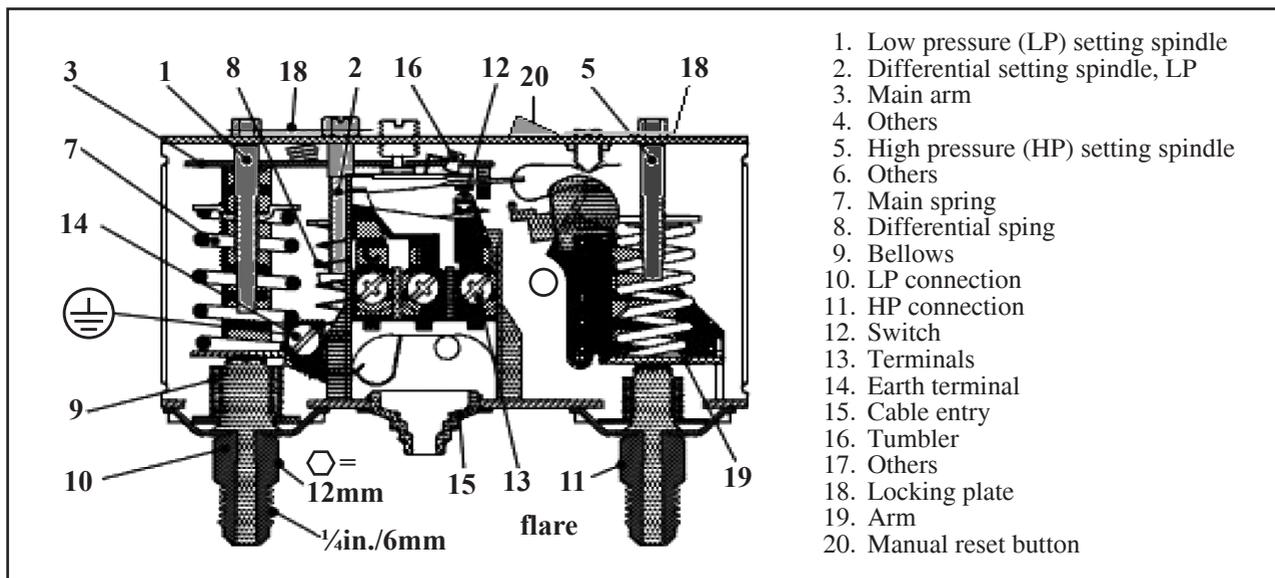
Refrigerant	R404A		R32	R410A
Application	M*	L*	HM*	HMT*
Cut Out (bar g)	1.7	0.5	4.13	4.1
Cut Out (psi g)	24.6	7.2	60	60

* M: Medium temperature; L: Low temperature; HM: High-Medium

The low pressure switch cut out pressure is the setting of cut in minus the differential compressor.

9.12 Safety pressure switch settings (Applicable Model : 8/10/12/14 HP MT/LT)

The pressure switch fitted to 8/10/12/14 HP MT/LT model condensing units with auto reset for Low Pressure and manual reset for High Pressure is **NOT** factory preset. **BOTH THE LP AND HP SWITCH SETTINGS MUST BE ADJUSTED TO SUIT THE APPLICATION BEFORE STARTING THE UNIT.** Be sure that the high pressure setting does not exceed the receiver's maximum service pressure.



9.12.1 Setting adjustment

High pressure side

Range: Turning the adjusting screw (5) clockwise will increase the cut-out pressure setting. Turning the adjusting screw anti-clockwise will decrease the cut-out pressure setting.

Differential: The differential setting is fixed so the cut-in will vary with the cut-out setting.

Low pressure side

Range: Turning the range adjusting screw (1) clockwise will decrease the cut-in pressure setting. Turning the range adjusting screw anti-clockwise will increase the cut-in pressure setting.

Differential: Turning the differential adjusting screw (2) clockwise will increase the differential pressure setting. Turning the differential adjusting screw anti-clockwise will decrease the differential pressure setting.

9.12.2 High pressure safety (Manual reset)

The high pressure safety switch shuts the compressor down if the discharge pressure exceed the values shown in the following table. The high pressure switch can be set to lower values depending on the type of refrigerant, application and ambient conditions.

Unit Type	Series 8/10 HP	Series 12/14 HP
Refrigerant	R404A	R404A
Cut Out (bar g)	27.7	27.7
Cut Out (psi g)	402	402

9.12.3 Low pressure safety (Auto reset)

The low pressure safety switch protects the compressor against deep vacuum operation, a potential cause of failure due to internal arcing and also operation outside the compressor limits.

The low pressure safety cut out should never be set below the settings as shown in the following table.

Unit Type	Series 8/10 HP		Series 12/14 HP	
Refrigerant	R404A		R404A	
Application	M*	L*	M*	L*
Cut Out (bar g)	2	0.1	2	0.1
Cut Out (psi g)	29	1.5	29	1.5

*M: Medium Temperature; L: Low Temperature

The low pressure switch cut out pressure is the setting of cut in minus the differential.

Important Note

There must be no more than 12 compressor starts per hour. A higher number of starts reduce the service life of the compressor. If necessary, use an anti-short-cycle timer in the control circuit. It is recommended minimum 2 minutes run in time and 3 minutes idle time for each start and stop of the compressor. The compressor may run in shorter interval during pump down cycle.

9.13 Wiring

The unit must be isolated from power supply prior to installation. In order to ensure the safety of the installation and its smooth operation, it is necessary to:

- Verify the installation is compatible with the wiring diagram.
- Select the motor circuit breaker by using the maximum continuous current. Refer *Section 3*
- Size the wiring for the connection (power and control circuit) according to the properties of the installed unit.
- Protect and earth the electrical power supply.
- Carry out electrical connections according to the norms of the respective country.
- Secure the cable from touching hot parts and sharp edges with cable clamps.
- Close the electrical box after completion of the wiring.

9.14 Commissioning of the Condensing Unit

Make sure all isolation valves are fully open before starting the system for the first time. The shut off valve on the condensing unit could be found on outlet of liquid receiver, inlet and outlet of condensing unit.

10. Checklist

- Check all electrical termination and circuits.
- Check the service valves are fully open.
- Check compressor oil level.
- Check the pressure switch for right settings.
- Ensure fan motor and fan blades are installed properly.
- Observe the system pressures during the charging and initial operation process.
- Continue to charge the system until sight glass is clear.
- Check the compressor's discharge and suction pressure, ensure it is working within the operating range.
- Check condenser fan, ensure warm air blowing off.
- Check evaporator blower, ensure discharge air is cool.
- Check suction superheat and adjust expansion valve to prevent liquid flood back to the

11. Service and Maintenance

Important Note

Warning! – Disconnect the main electrical supply before servicing or opening the unit

Warning! – Ensure there is no refrigerant in refrigerant circuit before dismantling

The condensing units are designed to give long life operation with minimum maintenance. However, they should be routinely checked and the following service schedule is recommended under normal circumstances:

The removal of the top, side and front panels ensures that all parts are accessible.

1. Compressor – Inspect at regular intervals

- Check for refrigerant leaks on all joints and fittings.
- Check mountings for tightness and wear.
- Check operation of crankcase heater.
- Check electrical connections.
- Ensure that no abnormal noise or vibration is detected during test run.
- Check the compressor oil levels and top up if required. The oil level should be visible at least half way up the sight glass.

2. Condenser Fan Motor & Blade – Clean and inspect at regular intervals

- Check for abnormal noise, vibration and fan imbalance.
- Ensure that the fan motor is clean and spins freely.
- Check that the condenser fan blade is clean and free from restriction and damage/imbalance.
Note: The Fan Motor is pre-lubricated and factory sealed so no maintenance required.

3. Condenser Coil – Clean and inspect at regular intervals.

- Check and remove the dirt and debris between the fins using a suitable chemical coil cleaner.
- Check and remove any obstacles which may hinder the airflow through the condenser coil.

4. Controls

- Check settings and operation of pressure switches.
- Check overload setting.

5. Power Supply – Inspect at regular intervals.

- Check the running current and voltage for the condensing unit.
- Check the electrical wiring and tighten the wires onto the terminal blocks if necessary.

6. Remote/ Controller

- Controller does not come as an accessory with the unit. Customer need to purchase any compatible controller (Emerson, Danfoss, Carel , Subzero etc.) as per their requirements.
- For information regarding controller wiring, setup, operation, error codes etc., please refer the information manual of the respective controller.

7. Refrigerant Charge

- Check the refrigerant charge by ensuring that the system is operating correctly, the pressures are as expected and that the liquid line sight glass shows a full bore of liquid refrigerant.
- Carry out a full leak test.

8. Unit decommissioning and disposal

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

12. Trouble Shooting

The following are some guidelines to troubleshoot some common failure of condensing unit. Consult to qualified specialists before taking any corrective action.

Failure	Possible Causes
Fan does not work	<ul style="list-style-type: none"> • Improper wiring • Fan motor faulty
Compressor does not start	<ul style="list-style-type: none"> • Improper wiring • Defective contactor or coil • System stopped because of tripping of safety device. • Defective start/run capacitor • Compressor faulty
Insufficient cooling	<ul style="list-style-type: none"> • Low refrigerant charge • Condenser coil dirty • Obstacle blocking air inlet/outlet • Improper thermostat setting

Important Note

Warning! – Immediately shut off power of the unit if there is any event of accident or breakdown.



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PROTECT THE ENVIRONMENT FROM E-WASTE (GUIDELINES)

Meaning of E-waste under E-Waste (Management) Rules,2022 (E-waste Rules)
 -Waste electrical and electronic equipment, whole or in part of reject from their manufacturing and repair process, which are intended to be discarded.

Our product is RoHS compliant.



Don't dump Electrical and Electronic Products in Garbage Bins

DO'S & DONT'S

DO'S	
Run and maintain the air conditioner as per the instructions given in the operation / instruction manual	✓
Ensure that an authorised person repairs your air conditioner	✓
Call our local authorised dealer or our toll free number to dispose your air conditioner	✓
Contact an authorised dealer in case of installation or de-installation	✓
Consult our local authorised dealer or our toll free number on the life span of the air conditioner	✓

DONT'S	
Do not try to repair your air conditioner on your own	✗
Do not sell or dispose your air conditioner or parts to an unauthorised Kabbadi wala / Scrap Dealer / Ragpickers	✗
Do not dismantle your air conditioner on your own	✗
Do not get your air conditioner or any parts repaired by an unauthorised person	✗
Do not dispose off the E-waste in landfills	✗
Do not use the air conditioner as furniture after its use	✗

Customer Contact Center : 011-4031 9300/1860-180-3900
For further information visit us at www.daikinindia.com

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