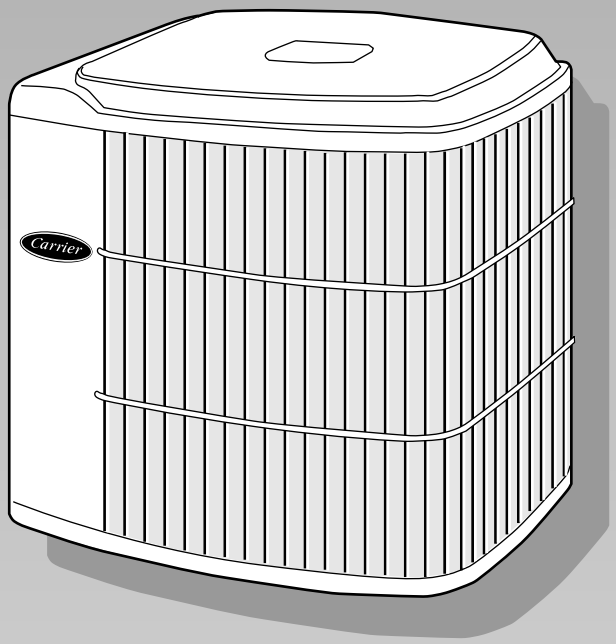
Carrier

38 TUA



Mod. 38TUA
024 - 036 - 048 - 060

COOLING ONLY SPLIT SYSTEM OUTDOOR UNITS
Installation, operation and maintenance instructions

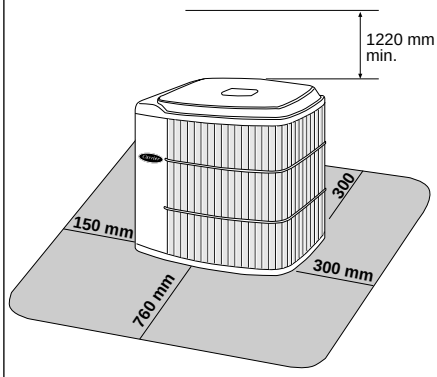
Safety considerations

Installation, start up and service should be only done by trained qualified installers due to system pressure and electrical components. When working on equipment observe precautions in the literature, on tags, stickers and labels attached to equipment and any other safety precautions that apply. Follow all safety codes, wear safety glasses and work gloves; when brazing wear protection equipment and have a fire extinguisher ready.
Use care in handling, rigging and setting down bulky equipment.

WARNING:
Before installing, modifying, or servicing system, main electrical disconnect switch must be in the OFF position. Lock out and tag switch with a suitable warning label.

Installation

- Service area



- Inspect the shipment. Check to see if it has been damaged or if there are missing parts. In case of damage or missing parts, a claim must be made immediately to the company responsible for shipment.

- Ensure that the characteristics of the available power supply agree with the electrical data on the unit nameplate.

Siting the unit

- If conditions or local codes require the unit be attached to pad, tiedown bolts should be used and fastened through knockouts provided in unit base pan. Refer to unit mounting pattern to determine base pan size and knockout hole location.

- When installing, allow sufficient space for airflow clearance, wiring, refrigerant piping, and service.
  Position so water, snow, or ice from roof or eaves cannot fall directly on unit.

- On rooftop applications, locate unit 150 mm above roof surface. Where possible, place unit above a load-bearing wall. Arrange supporting members to adequately support unit and minimize transmission of vibration to building. Consult local codes governing rooftop applications.

NOTE:
In multiple installations maintain a distance of 610 mm between outdoor units for correct air flow.

Replace indoor AccuRater® piston

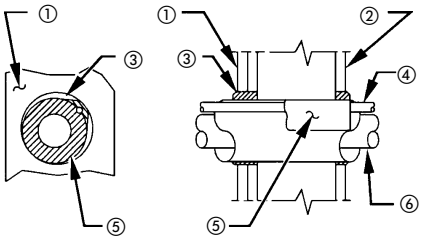
Check indoor coil piston to see if matches the required piston shown on unit rating label. If it does not match, replace indoor coil piston with piston shipped with this unit. The piston shipped with outdoor unit is correct for any approved indoor unit combination.

CAUTION:
Remove indoor coil piston if unit is to be installed on system with a TXV metering device.

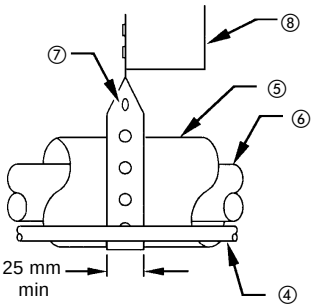
Installation

- **Piping installation**

A



B



Make piping connections

- Outdoor units may be connected to indoor sections using accessory tubing package or field supplied refrigerant grade tubing of correct size and condition.
- For tubing requirements beyond 15 m make the correct sizing.
- Leave some slack between the structure and the unit to absorb vibration.
- When passing refrigerant tubes through the wall, seal the opening with RTV or other pliable silicon-based caulk.
- Avoid direct lineset contact with water pipes, ductwork, floor joists, wall studs, floors, and walls.
- Do not suspend refrigerant tubing from joists and studs with a rigid wire or strap which comes in direct contact with the tubing.
- Ensure the tubing insulation is pliable and completely surrounds the vapour tube.
- When necessary, use hanger straps which are 25 mm wide and conform to the shape of the tubing insulation.
- Isolate the hanger straps from the insulation by using metal sleeves bent to conform to the shape of the insulation.
- If refrigerant tubes or indoor coil are exposed to atmospheric conditions for longer than 5 minutes, they must be evacuated to 500 μ to eliminate contamination and moisture in the system.
- Run refrigerant tubes as directly as possible by avoiding unnecessary turns and bends. Pipes must be suspended so that they do not damage their insulation and they do not transmit any vibration to structure.

NOTE:
Avoid contact between tubing and structure.

A Through the wall

B Suspension

① Outdoor wall
② Indoor wall
③ Caulk
④ Liquid tube
⑤ Insulation
⑥ Vapour tube
⑦ Hanger strap
(around vapour tube only)
⑧ Joist

CAUTION:
To prevent compressor damage, do not bury more than 900 mm of refrigerant tubing. If any tubing is buried, provide 150 mm vertical rise at service valve. If longer tubing is buried, the refrigerant could migrate into the ground (as this is colder) when the unit is shut down; this can cause liquid slugging at thecompressor restart.

- Outdoor unit contains correct system refrigerant charge for operation with indoor unit of the same size when connected by 4.5 m of field-supplied or factory-accessory tubing. Check refrigerant charge for maximum efficiency.

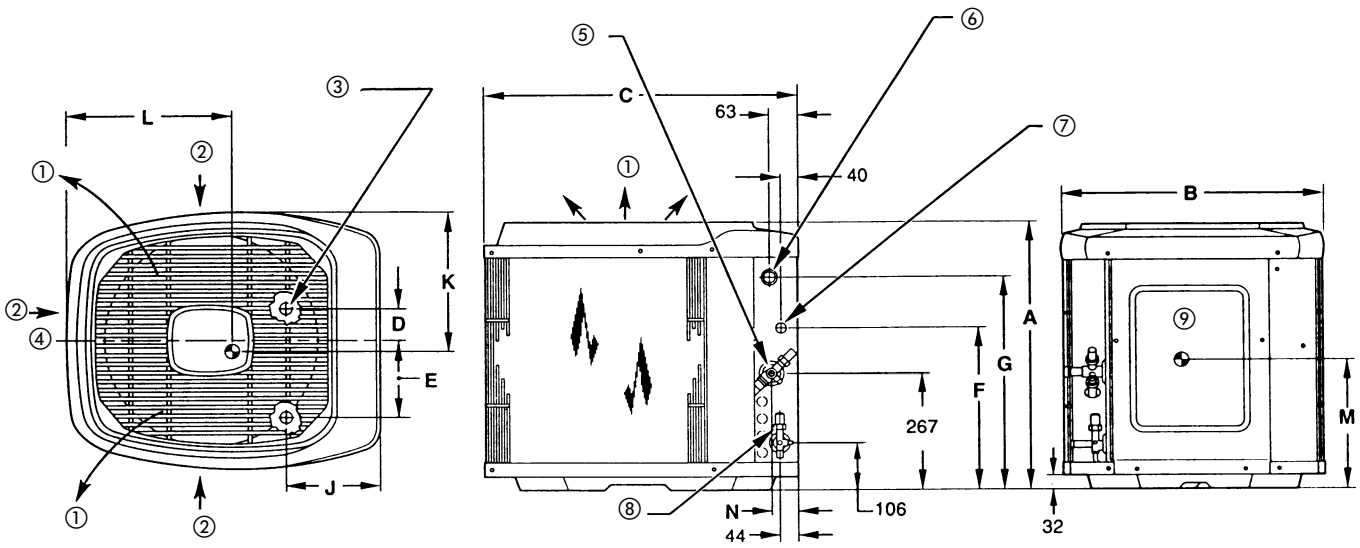
- Connect tubing to fittings on outdoor unit vapour and liquid service valves.

WARNING:
During brazing operation on piping to valves, unit painting must be protected. To prevent damage to service valves, wrap them with wet cloth or use a heat sink material.

- Service valves are closed from factory and ready for brazing. After wrapping the service valve with a wet cloth, the tubing set can be brazed to the service valve using either silver bearing (better) or non-silver bearing brazing material.

- Refrigerant tubing and indoor coil are now ready for leak testing. This check should include all field and factory joints.

Dimensions



① Air discharge
② Air inlet
③ 3/8" (9.5 mm) diameter tiedown knockouts (2) places in basepan
④ CL, center line
⑤ H Ø vapour line connection
⑥ Field power supply connection 7/8" (22 mm) diameter hole with 1 1/8" (29 mm) diameter knockout and 1 3/8" (35 mm) diameter knockout
⑦ Field control supply connection 7/8" (22 mm) diameter hole
⑧ 3/8" (9.5 mm) diameter liquid line connection
⑨ Access panel

Dimensions

UNIT	Series	Power supply		A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	J mm	K mm	L mm	M mm	N mm	Shipping weight (kg)
38TUA 024	0	X	O	706.4	571.5	698.5	71.5	176.2	546.1	555.6	15.9	208	304.8	371.5	279.4	60.3	65.8
38TUA 036	0	X	X	706.4	762	887.4	101.6	247.7	393.7	555.6	19.1	208	412.8	260.4	285.8	74.6	99.8
38TUA 036	1	X	X	706.4	762	887.4	101.6	247.7	393.7	555.6	19.1	208	412.8	260.4	285.8	74.6	108.9
38TUA 048	0	X	X	858.8	762	887.4	101.6	247.7	546.1	708	22.2	208	425.5	266.7	342.9	74.6	111.6
38TUA 048	1	X	X	858.8	762	887.4	101.6	247.7	546.1	708	22.2	208	425.5	266.7	342.9	74.6	116.1
38TUA 060	0	O	X	1011.2	762	887.4	101.6	247.7	698.5	860.4	22.2	208	425.5	266.7	381	74.6	137.4
		230/1/50	400/3/50														

X = Yes
O = No

Unit	Support plate min. dimension (mm)
024	508 × 685.8
036, 048, 060	660.4 × 812.8

NOTES:
1. For unit cooling operation: minimum outdoor temperature allowed 13°C, maximum 52°C.
2. Series designation is the 13th position of model number.
3. Centre of gravity ⊕

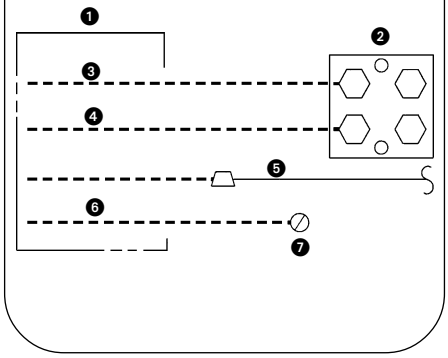
Refrigerant connections and recommended liquid and gas tube diameters

	Liquid		Gas	
Unit size	connection diameter	tube diameter	connection diameter	tube diameter
38TUA 024	3/8" – 9.53 mm	3/8" – 9.53 mm	5/8" – 15.88 mm	5/8" – 15.88 mm
38TUA 036	3/8" – 9.53 mm	3/8" – 9.53 mm	3/4" – 19.05 mm	3/4" – 19.05 mm
38TUA 048	3/8" – 9.53 mm	3/8" – 9.53 mm	7/8" – 22.23 mm	7/8" – 22.23 mm
38TUA 060	3/8" – 9.53 mm	3/8" – 9.53 mm	7/8" – 22.23 mm	1 1/8" – 28.58 mm

NOTES:
1. Tube diameters are for lengths up to 15 m. For tube sets over 15 m, consult Carrier.
2. Do not apply capillary tube indoor coils to these units.

Electrical connections

- Line power connectionsa



- Be sure field wiring complies with local and national fire, safety, and electrical codes, and voltage to system is within limits shown on unit rating label. Contact local power company for correction of improper voltage.
- See unit rating label for recommended circuit protection device.

NOTES:

- Operation of unit on improper line voltage or voltage imbalance exceeding 2% constitutes abuse and is not covered by Carrier guarantee.
- Install branch circuit disconnect per local codes of adequate size to handle unit starting current. Locate disconnect within sight from and readily accessible from unit per local codes.
- Use copper wire for all connections.
- The unit cabinet must have an uninterrupted or unbroken ground to minimize personal injury if an electrical fault should occur.
  Failure to follow this warning can result in an electric shock, fire, or death.
- Remove access panel and control box cover to gain access to unit wiring. Extend wires from disconnect through power wiring hole provided and into unit control box.
- Size wires per local codes, but not smaller than minimum wire size shown on unit rating label.
- Connect ground wire to ground connection in control box for safety. Connect power wiring to contactor as shown in figure.

1. Switch according to local codes
2. Contactor
3. Field power wiring
4. 3 phase only
5. Blue
6. Field ground wiring
7. Ground lug

Electrical data

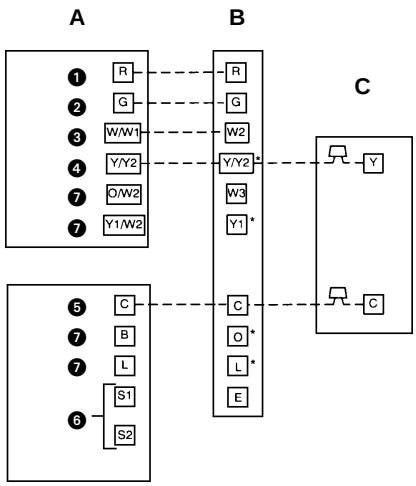
Unit	Nominal voltage V-ph-Hz	Operation voltage range * Min	Max	Compressor RLA	LRA	Fan FLA	MCA
38TUA 024-70	230-1-50	253	207	15.0	72.5	0.6	19.4
38TUA 036-70	230-1-50	253	207	14.7	102.0	1.6	19.9
38TUA 036-71	230-1-50	253	207	26.4	129.0	1.6	34.6
38TUA 048-70	230-1-50	253	207	19.2	140.0	1.6	25.6
38TUA 048-71	230-1-50	253	207	32.1	169.0	1.6	41.7
38TUA 036-90	400-3-50	440	360	6.4	46.5	0.7	8.7
38TUA 036-91	400-3-50	440	360	8.2	49.5	0.7	10.9
38TUA 048-90	400-3-50	440	360	8.0	66.5	0.7	10.7
38TUA 048-91	400-3-50	440	360	10.0	62.0	0.7	13.2
38TUA 060-90	400-3-50	440	360	9.5	73.0	0.7	12.6

Legend:
***** Accettable limits within which the unit works properly. Outside these limits the unit may be damaged.
RLA Rated load current, A
LRA Locked rotor current, A
FLA Full load current, A
MCA Minimum circuit current, A

NOTE: Control circuit is 24V for all units and needs an external voltage source.

Connection of the automatic control

- Typical connection thermostat - indoor unit - outdoor unit



- Route 24 V control wires through control wiring grommet and connect to brown and blue pigtails in unit splice box. Use furnace transformer, fan-coil transformer, or accessory transformer for control power, 24 V/40 VA minimum. Calculate transformer total load: if the existing transformer is not enough, change it for a transformer of increasing capacity or split the total load on 2 transformers.
- Use cables of 1.5 mm^2 size, coloured in accordance with local codes, insulated for temperatures higher than 35°C. If the thermostat is located at a distance that needs more than 30 m of tubes, use 2 mm^2 cables in order to avoid an excessive voltage drop.

NOTE:
Use of available 24 V accessories may exceed the minimum 40 VA power requirements. Determine total transformer loading and increase the transformer capacity or split the load with an accessory transformer as required.

A AC Thermostat (cooling only)
B FB4A indoor unit
C 38TUA outdoor unit

❶ Live 24 V
❷ Ventilation
❸ First stage heating
❹ First stage cooling
❺ Common 24 V
❻ Outdoor air temperature sensor connection
❼ Not available

Terminals marked with * are not present on all indoor units.

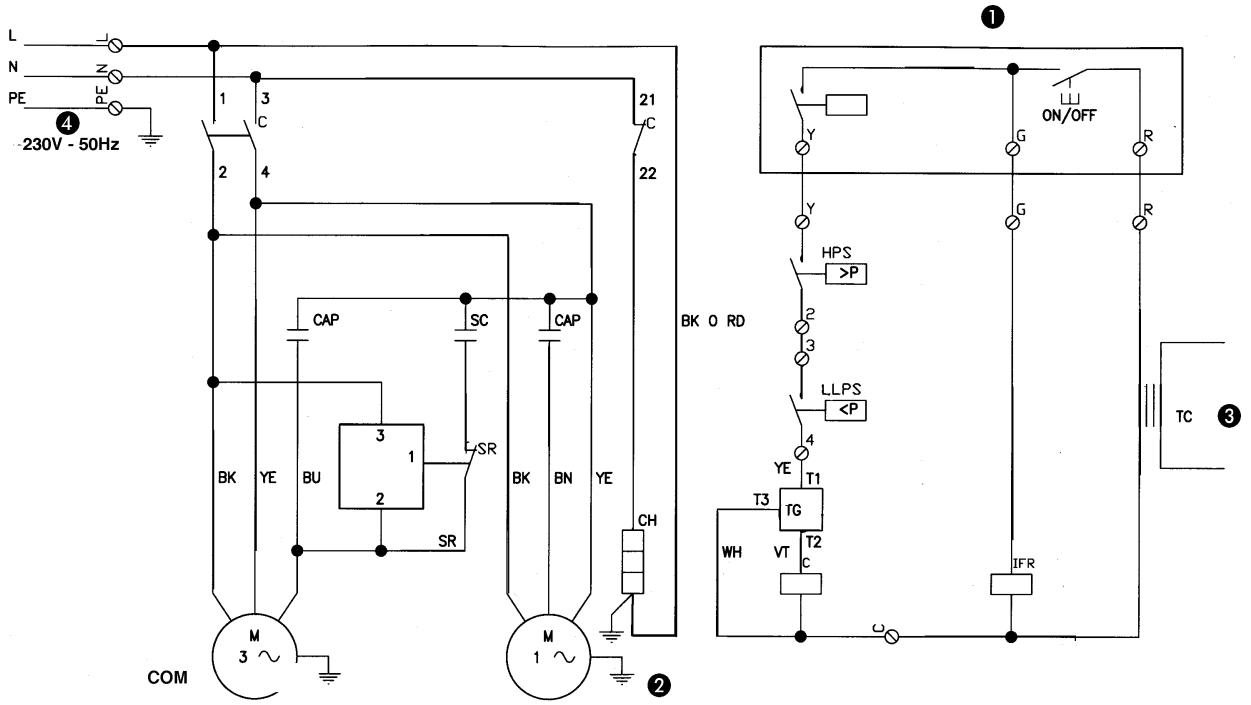
Compressor crankcase heater
When equipped with a crankcase heater, energize heater a minimum of 24 hours before starting unit. To energize heater only, set thermostat to OFF position and close electrical disconnect to outdoor unit. A crankcase heater is required if the refrigerant tubing is longer than 15 m.

Install electrical accessories

Refer to the individual instructions packaged with the kit or accessory when installing.

Wiring diagrams

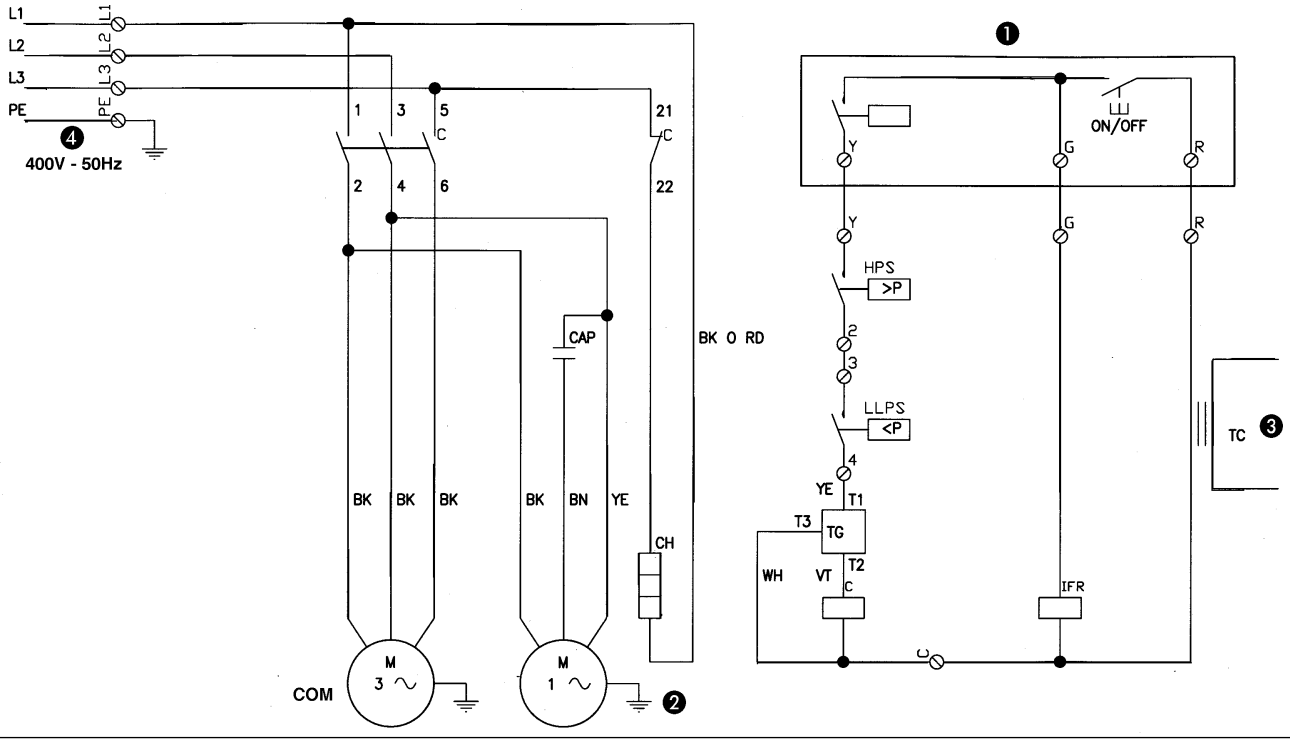
38TUA 024, 036, 048 - 230/1/50



NOTES:

1 Symbols are electrical representation only.
2 Compressor and fan motor furnished with inherent thermal protection
3 To be wired in accordance with local codes.
4 Use copper conductors only.
5 Connection for typical cooling only
6 If any of the original wires, as supplied, must be replaced, use the same or equivalent wire.
7 Check all electrical connections inside control box for tightness.
8 Do not attempt to operate unit until service valves have been opened.
9 Do not rapid cycle compressor. Compressor must be off 3 minutes to allow pressures to equalize between high and low side before starting.
10 The HPS lead is connected to T1 if LPS is not used.
11 Three phase compressor motor protected under primary single phasing conditions.

38TUA 036, 048, 060 - 400/3/50



Wiring diagrams

Wiring diagram legend

BK	black
BU	blue
BN	brown
RD	red
WH	white
YE	yellow
VT	violet

❶	Room thermostat
❷	Fan coil esterno
❸	24V Power supply
❹	Power supply

C	Compressor contactor
CAP	Capacitor
CH	Crankcase heater
COMP	Compressor
HPS	High pressure switch
IFR	Indoor fan relay
LPS	Low pressure switch
SC*	Start capacitor
SR*	Start relay
TC	Transformer
TG	Time guard

* may be factory or field installed.

Start-Up

To prevent compressor damage or personal injury, observe the following:

- Do not overcharge system with refrigerant.
- Do not operate unit in a vacuum or at a negative pressure.
- Do not disable low-pressure switch.
- In scroll compressor applications dome temperatures may be hot.
- In 3-phase application, incorrect phasing will cause reverse rotation, resulting in elevated noise levels, eqalized pressures and reduced current draw. Correct by reversing power connection L1 and L2 on contactor.
- Back seating service valves are not equipped with Schrader valves. Fully back seat (counter clockwise) valve stem before removing gage port cap.
- Front seating service valves are equipped with Schrader valves.

CAUTION:
Do not vent refrigerant to atmosphere. Recover during system repair or final unit disposal.

- Fully back seat (open) liquid and vapour tube service valves.
- Unit is shipped with valve stem(s) front seated and caps installed. Replace stem caps after system is opened to refrigerant flow (back seated). Replace caps finger-tight and tighten additional 1/6 turn with wrench.
- Close electrical disconnects to energize system.
- Set room thermostat at desired temperature. Be sure set point is below indoor ambient temperature.
- Set room thermostat at COOL and fan switch at FAN or AUTO, as desired. Operate unit for 15 minutes. Check system refrigerant charge.
- Factory charge is shown on unit rating label.
  Adjust charge by following procedure shown on Superheat Charging Tables located on unit information plate.

Maintenance

For continued high performance and to minimize possible equipment failure, periodic maintenance MUST be performed on this equipment.
Below are some operations that can be carried out at regular intervals:

- Outdoor coil cleaning
- Indoor unit filter cleaning
- Elecrical connection tightening
- Control of refrigerant charge
- Cleaning unit internally
- Checking of switch contact status

For any extraordinary maintenance, consult an authorized Carrier dealer.

Troubleshooting chart

A series of possible faults is related below, as well as the probable causes and suggested solutions. In the event of a unit malfunction, it is always advisable to disconnect the power supply and ascertain the cause.

(**Symptom** / Cause / REMEDY)

Compressor does not run:

- Connections are wrong or broken:
  CHECK AND REMEDY.
- Thermostat not set correctly:
  CHECK THERMOSTAT AND ROOM TEMPERATURE.
- Mains power supply failure:
  CLOSE MAIN SWITCH.
- Gas leakage (LPS open):
  REMEDY AND CHARGE THE UNIT.
- Motor burn out:
  DETERMINE THE CAUSE AND REMEDY.
- Motor seized or open protection:
  DETERMINE THE CAUSE AND REPLACE.
- (Single phase) unit capacitor failure:
  CHECK AND REPLACE.
- Broken switch:
  REPLACE.
- Defective fuse:
  REPLACE.

Compressor cycles on and off continuously:

- Empty circuit (LPS operation):
  CHECK THE LEAKAGE, REMEDY AND CHARGE THE UNIT.
- Dirty outdoor coil (HPS operation):
  CLEAN.
- Fan not working (HPS operation):
  CHECK AND REPLACE.
- Compressor thermal protection intervention:
  CHECK REFRIGERANT CIRCUIT AND COMPRESSOR INSULATION.

If the above actions fail to solve the problem, please contact your local Carrier Agent.

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