OUTLINE AND DIMENSIONS

Indoor Unit

All dimensions are in mm / (in)

Outdoor Unit (SL-CR series)

<table>
<thead>
<tr>
<th>MODEL</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>SL 30CR /40CR /50CR</td>
<td>1030</td>
<td>850</td>
<td>400</td>
<td>390</td>
<td>414</td>
<td>827</td>
<td>72</td>
<td>196</td>
<td>91</td>
<td>488</td>
<td>448</td>
<td>141.5</td>
<td>746.5</td>
<td>82</td>
</tr>
</tbody>
</table>
Sharp edges and coil surfaces are potential locations which may cause injury hazards. Avoid from being in contact with these places.

**Caution**

Les bords coupants et les surfaces du refroidisseur tubulaire présentent un risque de blessure. Mieux vaut éviter le contact avec ces endroits.

**Avertissement**


**Vorsicht**

Per preservarsi da eventuali ferite, evitare di toccare gli spigoli affilati e la superficie dei serpentina.

**Cautela**

Per los Bordes afilados y la superficie del serpentín pueden producir lesiones. Evite tocarlos.

Острые края и поверхности змеевиков являются потенциальными местами нанесения травм. Остерегайтесь контакта с этими местами.

**Осторожно**

This product is subjected to Waste of Electrical and Electronic Equipment Regulations (WEEE Regulations). The waste product shall be separately collected by specific collection and treatment centre. Please refer to local authority for these centres. This is only applicable to European Union countries.

**NOTICE**

Ce produit est soumis à la réglementation concernant les déchets des équipements électriques et électroniques (réglementation DEEEE). Le déchet doit être collecté séparément par un centre de collecte et de traitement spécifique. Veuillez vous référer aux autorités locales pour connaître ces centres. Ceci est uniquement applicable aux pays de l'Union Européenne.


Questo prodotto è soggetto alle disposizioni RAEE (Rifiuti di apparecchiature elettriche ed elettroniche). Il prodotto da smaltire verrà ritirato da un centro incaricato del ritiro e smaltimento. Per conoscere il nome del centro pertinente, contattare le autorità locali. Questa disposizione è valida solamente i paesi dell’U.E.

Este producto está sujeto a las Regulaciones del Equipamiento Eléctrico y Electrónico en materia de desechos (Regulaciones WEEE). El producto dañado será retirado por separado por el centro específico de colección y tratamiento. Por favor remítase a las autoridades locales de estos centros. Esto es solamente aplicable a los países de la Unión Europea.

Процесс утилизации данного продукта регулируется правилами по утилизации отходов электroteхнического и электронного оборудования (WEEE Regulations). Такие отходы должны заниматься специальный центр по сборке и обработке отходов. За информацией о таких центрах, обращайтесь к местным властям. Эти правила применяются только в странах Европейского Союза.
This manual provides the procedures of installation to ensure a safe and good standard of operation for the air conditioner unit. Special adjustment may be necessary to suit local requirements.

Before using your air conditioner, please read this instruction manual carefully and keep it for future reference.

VERTICAL FAN COIL UNIT
SPLIT TYPE AIR CONDITIONER

MODEL

HEAT PUMP

VF30AR / MVF030AR
VF30BR / MVF030BR
SL30CR / MLC030CR

VF40AR / MVF040AR
SL40CR / MLC040CR

VF50AR / MVF050AR
SL50CR / MLC050CR

VF60AR / MVF060AR
SL60CR / MLC060CR
Before installing the air conditioner unit, please read the following safety precautions carefully.

⚠️ Warning

- Installation and maintenance should be performed by qualified persons who are familiar with local code and regulation, and experienced with this type of appliance.
- All field wiring must be installed in accordance with the national wiring regulation.
- Ensure that the rated voltage of the unit corresponds to that of the name plate before commencing wiring work according to the wiring diagram.
- The unit must be GROUNDED to prevent possible hazard due to insulation failure.
- All electrical wiring must not touch the refrigerant piping, compressor and any moving parts of the fan motors.
- Confirm that the unit has been switched OFF before installing or servicing the unit.

⚠️ Important

DO NOT INSTALL OR USE THE AIR CONDITIONER UNIT IN A LAUNDRY ROOM.

⚠️ Caution

Please take note on the following important points when installing.

- Do not install the unit where leakage of flammable gas may occur.
  - If gas leaks and accumulates at the surrounding of the unit, it may cause fire ignition.
- Ensure that the drainage piping is connected properly.
  - If the drainage piping is not connected properly, it may cause water leakage which will dampen the furniture.
- Do not overcharge the unit.
  - This unit is factory pre-charged. Overcharge will cause over-current or damage to the compressor.
- Ensure that the unit panel is covered back after service or installation.
  - Unsecured panel will cause unit to operate noisily.
• This vertical fan coil unit is designed for indoor installation only.
• This fan coil unit must be installed in such a way that no short circuit of cool air discharge.
• This unit can be placed on the floor or any flat platform. The base also can be screwed on top a platform or direct on the floor. But it is recommended to place rubber isolator for this type of installation.
• Ensure that there is enough space for all service areas. Refer to the diagrams below for guide.
• Do not locate the drainage system at any point above the unit drain connection.
• Duct flange holes are provided for securing the ducting for air discharge.
INSTALLATION OF THE OUTDOOR UNIT

The outdoor unit must be installed such that there is no short circuit of the discharge air or obstruction to smooth air flow. Respect the installation clearance. Select the coolest possible place where intake air should not be higher than the outside temperature (maximum 45°C). Ensure that there are no obstruction of air flow into or out of the unit. Remove obstacles which block air intake or discharge.

The location must be well-ventilated, so that the unit can draw in and distribute plenty of air thus lowering the temperature.

A place capable of bearing the weight of the outdoor unit as well as isolating noise and vibration.

A place protected from the direct sunlight. Use an awning for protection if necessary.

The installation location must not be susceptible to highly concentrated dust, oil, salt or sulfide gas.

Note:- If the obstacle is higher than 2 m or if there is any obstruction at the upper part of the unit allow more space than indicated in the table above.

REFRIGERANT PIPING

Maximum Pipe Length And Maximum Number Of Bends

When the pipe length becomes too long, both the capacity and reliability drop. As the number of bends increases, system piping resistance to the refrigerant flow increases, thus lowering the cooling capacity. As a result, compressor reliability will be affected. Always choose the shortest path and follow the recommendation as tabulated below:

<table>
<thead>
<tr>
<th>Indoor Unit Coupling Outdoor Unit</th>
<th>VF30AR SL30CR</th>
<th>VF40AR SL40CR</th>
<th>VF50AR SL50CR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Length, A (m)</td>
<td>35</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>Maximum Elevation, B (m)</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Maximum No. of Bends</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Liquid Valve Size (in)</td>
<td>3/8</td>
<td>3/8</td>
<td>3/8</td>
</tr>
<tr>
<td>Gas Valve Size (in)</td>
<td>5/8</td>
<td>3/4</td>
<td>3/4</td>
</tr>
</tbody>
</table>
Piping Works And Flaring Technique

Do not use contaminated or damaged copper tubing. If any piping, evaporator or condenser had been exposed or had been opened for 15 seconds or more, vacuum the system. Generally, do not remove plastic, rubber plugs and brass nuts from the valves, fittings, tubings and coils until it is ready for connection.

If any brazing work is required, ensure that the nitrogen gas is passed through piping and joints while the brazing work is being done. This will eliminate soot formation on the inside walls of the copper tubings.

Cut the pipe stage by stage, advancing the blade of pipe cutter slowly. Extra force and deep cut will cause more distortion of pipe and therefore extra burr.

Remove burrs from cut edges of pipes with a remover as shown in Fig. R. This will avoid unevenness on the flare faces which will cause gas leak. Hold the pipe on top position and burr remover at lower position to prevent metal chips from entering the pipe.

Insert the flare nuts mounted on the connection parts of both indoor and outdoor unit, into the copper pipes. The exact length of pipe protruding from the face of the flare die is determined by the flaring tool.

Fix the pipe firmly on the flare die. Match the centers of both the flare die and the flaring punch, and tighten flaring punch fully.

Piping Connection To The Units

Align the center of the piping and sufficiently tighten the flare nut with fingers. Finally, tighten the flare nut with torque wrench until the wrench clicks. When tightening the flare nut with the torque wrench, ensure that the direction for tightening follows the arrow on the wrench.

The refrigerant pipe connection are insulated by polyurethane (ARMAFLEX type or similar).

<table>
<thead>
<tr>
<th>Ø Tube, D</th>
<th>A (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inch</td>
<td>mm</td>
</tr>
<tr>
<td>1/4&quot;</td>
<td>6.35</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>9.52</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>12.70</td>
</tr>
<tr>
<td>5/8&quot;</td>
<td>15.88</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>19.05</td>
</tr>
</tbody>
</table>

Pipe Size, mm (in) | Torque (Nm)
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6.35 (1/4)</td>
<td>18</td>
</tr>
<tr>
<td>9.53 (3/8)</td>
<td>42</td>
</tr>
<tr>
<td>12.7 (1/2)</td>
<td>55</td>
</tr>
<tr>
<td>15.88 (5/8)</td>
<td>65</td>
</tr>
<tr>
<td>19.05 (3/4)</td>
<td>78</td>
</tr>
</tbody>
</table>

Fig. R

Cutting Copper Tube

Copper Tube

Remove Burr

Swaging Block

Copper Tube

Flare Joint

Flared Tube

Indoor Piping

Flare Nut

Spanar

Torque Wrench
Caution

Ensure the color of wires of the outdoor unit and the terminal markings are same to the indoor unit respectively.

Heat Pump Units, VF 30/40/50 AR

<table>
<thead>
<tr>
<th>Model</th>
<th>VF 30AR</th>
<th>VF 40AR</th>
<th>VF 50AR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coupling Outdoor Unit</td>
<td>SL 30CR</td>
<td>SL 40CR</td>
<td>SL 50CR</td>
</tr>
<tr>
<td>Rated Voltage range**</td>
<td>220V–240V /1Ph /50Hz</td>
<td>380V–415V /3Ph /50Hz</td>
<td></td>
</tr>
<tr>
<td>Recommended Fuse/MCB*</td>
<td>A</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>Power supply cable size*</td>
<td>mm²</td>
<td>2.5</td>
<td>4.0</td>
</tr>
<tr>
<td>Number of conductors</td>
<td></td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Interconnection cable size*</td>
<td>mm²</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Number of conductors</td>
<td></td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

** The appropriate voltage range should be checked with data label on the unit.

MCB - Miniature Circuit Breaker

IMPORTANT:

* The figures shown in the table are for information purpose only. They should be checked and selected to comply with the local or national codes of regulations. This subject to all type of installation and conductors used.

The electrical power must be provided with protection devices (circuit breaker or fuse) with double pole separation system (phase + neutral) with minimum contact gap of 3mm.

VF 30 AR - SL 30 CR

The terminal block diagram shows the correct connections for the outdoor coil sensor and interconnection cable. The power supply cable is marked with 220 - 240 VAC 1 PHASE 50Hz.
The electrical power must be provided with protection devices (circuit breaker or fuse) with double pole separation system (phase + neutral) with minimum contact gap of 3mm.

**Caution**

Ensure that the colors of wires on the outdoor unit and the terminal markings are the same as the indoor unit respectively.
Purging The Piping And The Indoor Unit

Except the outdoor unit which is pre-charged with refrigerant R22, the indoor unit and the refrigerant connection pipes must be nitrogen purged because the air that contain moisture remaining in the refrigerant cycle may cause malfunction to the compressor.

The outdoor unit is equipped by two 3 ways refrigerating connecting valves. The gas valve is the larger one while the small one is the liquid valve. Both valves are supplied with service port valve for connection to a pressure gauge.

- Remove the caps from the valve and the service port.
- Connect the center manifold gauge with the vacuum pump.
- Connect the manifold gauge to the service port of the 3 ways valve.
- Start the vacuum pump. Check the low pressure manifold gauge until it indicate 0.9 bar. The evacuation time varies with each vacuum pump capacity but generally in half an hour.

- Close the manifold valve and stop the vacuum pump.
- On the outdoor unit, open the suction and liquid valve (anti clockwise) with 4 mm key for hexagon sacked screw.
- The air conditioner unit is ready for start.
- If the reading is close to 0, the refrigerant circuit must be evacuated (by vacuum pump) and charged (R22) again.
The refrigerant is pre-charged in the outdoor unit. If the piping length is less than 7.6 m, additional charge after vacuuming is not necessary. When the piping length is more than 7.6 m, use the table below.

### ADDITIONAL CHARGE

**Check Refrigerant Leak**

Check with refrigerant detector whether there is a leak on the flare type connection of the indoor unit and outdoor unit. Hints: After operation for sometime, check if there is oil traces, if yes, there is a leak.

**Additional Charge Operation**

This operation must be done by using gas cylinder and a precise weighing machine obligatorily. The additional charge is top up into the outdoor unit by suction valve via service port.

- Remove the service valve plug.
- Connect the low pressure manifold to the suction service port, center manifold to the cylinder tank and close the high pressure manifold (see figure).
- Purge all the flexible hose with refrigerant gas.

**Additional Charge in Gram (Heat Pump Unit)**

<table>
<thead>
<tr>
<th>Model</th>
<th>10 m</th>
<th>20 m</th>
<th>30 m</th>
<th>35 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>VF 30 AR</td>
<td>120</td>
<td>620</td>
<td>1120</td>
<td>1370</td>
</tr>
<tr>
<td>VF 40 AR</td>
<td>120</td>
<td>620</td>
<td>1120</td>
<td>1370</td>
</tr>
<tr>
<td>VF 50 AR</td>
<td>120</td>
<td>620</td>
<td>1120</td>
<td>1370</td>
</tr>
</tbody>
</table>
OVERALL CHECKING

Ensure the following, in particular:-
1) The unit is mounted solidly and rigid in position.
2) Piping and connections are leak proof after charging.
3) Proper wiring has been done.

- Test run:
  1) Conduct a test run after refrigerant leakage test.
  2) Watch out for the following:-
     a) Is the electric plug firmly inserted into the socket?
     b) Is there any abnormal sound from unit?
     c) Is there smooth drainage of water?

STANDARD OPERATING CONDITION

Heat Pump

- Check that:
  1) Outdoor unit fan is running, with warm air blowing out of the unit during cooling mode and cool air during heating mode.
  2) Indoor blower is running and discharge cool air during cooling mode and hot air during heating mode.
  3) The remote controller incorporates a 3 minute delay in the circuit. Thus, it requires about 3 minutes before the outdoor unit can start up.

⚠️ Warning

- Disconnect from the main power supply before servicing the air conditioner unit.
- DO NOT pull out the power cord when the power is ON. This may cause serious electrical shocks which may result in fire hazard.
### SERVICE AND MAINTENANCE

<table>
<thead>
<tr>
<th>Service Parts</th>
<th>Maintenance Procedures</th>
<th>Period</th>
</tr>
</thead>
</table>
| Indoor Air Filter             | 1. Remove any dust adhered on the filter by using a vacuum cleaner or wash in lukewarm water (below 40°C) with neutral cleaning detergent.  
                                 2. Rinse well and dry the filter before placing it back onto the unit.  
                                 3. Do not use gasoline, volatile substances or chemical to clean the filter. | At least once every 2 weeks.  
                                 More frequently if necessary. |
| Indoor Unit                   | 1. Clean any dirt or dust on the grille or panel by wiping it using soft cloth soaked in lukewarm water (below 40°C) with neutral detergent solution.  
                                 2. Do not use gasoline, volatile substances or chemical to clean the indoor unit. | At least once every 2 weeks.  
                                 More frequently if necessary. |
| Condensate Drain Pan & Pipe   | 1. Check its cleanliness and clean it if necessary.                                       | Every 3 months.               |
| Indoor Fan                    | 1. Check for any abnormal noise.                                                         | When necessary.               |
| Indoor/Outdoor Coil           | 1. Check and remove any dirt clogged between the fins.                                   | Every month.                  |
|                               | 2. Check and remove any obstacles that hinder air flowing into and out of the indoor/outdoor unit. | Every month.                  |
| Power Supply                  | 1. Check the voltage and current of the indoor and outdoor unit.                         | Every 2 months.               |
|                               | 2. Check the electrical wiring for any faulty contacts caused by loose connections, foreign matters, etc. Tighten the wires onto the terminal block if necessary. | Every 2 months.               |
| Compressor                    | 1. No maintenance needed if the refrigerant circuit remain sealed. However, check for any refrigerant leaks at all joints and fitting. | Every 6 months.               |
| Compressor Oil                | 1. The compressor oil is factory-precharged. It is not necessary to add any oil if the circuit remains sealed. | No maintenance required.     |
| Fan Motor Oil                 | 1. All motor pre-lubricated and sealed at factory.                                       | No maintenance required.     |

⚠️ **Caution**

Do not operate any heating apparatus too close to the air conditioner unit. This may cause the plastic panel to melt or deform as a result of the excessive heat.
When any malfunction of the air conditioner unit is noted, immediately switch off the power supply to the unit. Check the following fault conditions and causes for some simple troubleshooting tips.

<table>
<thead>
<tr>
<th>Fault</th>
<th>Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The compressor does not start operate after 3 minutes from starting the air conditioner unit.</td>
<td>- Protection against frequent starting. Wait for 3 to 4 minutes for the compressor to start operate.</td>
</tr>
</tbody>
</table>
| 2. The air conditioner unit does not operate. | - Power failure, or the fuse need to be replaced.  
- The power plug is disconnected.  
- It is possible that your delay timer has been set incorrectly.  
- If the fault persist after all these verifications, please contact the air conditioner unit installer. |
| 3. The air flow is too low. | - The air filter is dirty.  
- The doors or windows are open.  
- The air suction and discharge are clogged.  
- The regulated temperature is not high enough. |
| 4. The remote control display is dim. | - Battery flat.  
- The batteries are not place correctly. |
| 5. Discharge air flow has bad odor. | - Odors may be caused by cigarettes, smoke particles, perfume etc. which might have adhered onto the coil or filter. |
| 6. Condensation on the front air panel of the indoor unit. | - This is caused by air humidity after an extended long period of operation.  
- The set temperature is too low, increase the temperature setting and operate the unit at high fan speed. |
| 7. Water flowing out from the air conditioner unit. | - Check the drain pan and drain pipe. |

If the fault persists, please call your local dealer / serviceman for help.
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