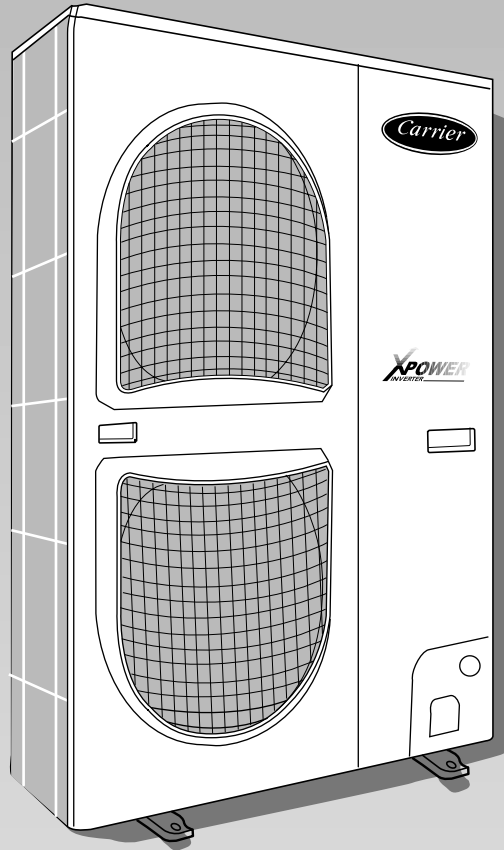




**38VYX110/38VYX130**

**XPOWER**  
INVERTER



**R-410A**

**INSTALLATION MANUAL**

# 38VYX110/38VYX130 R-410A

## Heat pump split system outdoor units

For operation and maintenance instructions of this unit as well as installation instructions of the indoor unit, refer to the relevant manuals.

### Contents

	Page
Precautions for safety .....	2
Accessory and refrigerant .....	3
Selection of installation .....	3/4
Refrigerant piping .....	5
Evacuating .....	9/10
Electrical connections .....	10
Final installation checks .....	11/12

### ATTENTION INSTALLERS AND SERVICE TECHNICIANS! AIR CONDITIONER WITH R-410A – QUICK REFERENCE GUIDE

- R-410A refrigerant operates at 50%-70% higher pressures than R-22. Be sure that servicing equipment and replacement components are designed to operate with R-410A.
- R-410A refrigerant cylinders are pink.
- R-410A refrigerant cylinders have a dip tube which allows liquid to flow out with the cylinder in a vertical position with the valve at the top.
- R-410A systems should be charged with liquid refrigerant. Use a commercial type metering device in the manifold hose in order to vaporize the liquid refrigerant before it enters in the unit.
- A vacuum pump is not enough to remove moisture from oil.
- Oils absorb moisture rapidly. Do not expose oil to atmosphere.
- Never open system to atmosphere while it is under vacuum.
- When the system must be opened for service, break vacuum with dry nitrogen.
- Do not vent R-410A into the atmosphere.
- Use only Carrier matching indoor units (Table I).

**Table I**

Heat pump models	Cassette "40KQV"	Satellite "40SQV"	Power supply
38VYX 110	110	110	220÷240V ~ 50Hz
38VYX 130	130	130	
—	—	—	
—	—	—	

## General information

### Precautions for safety

The unit must be installed according to the national plant-engineering standards.

- Read this "PRECAUTIONS FOR SAFETY" carefully before Installation.
- The precautions described below include the important items regarding safety. Observe them without fail.
- After the installation work, perform a trial operation to check for any problem.  
Follow the Owner's Manual to explain how to use and maintain the unit to the customer.
- Turn off the main power supply switch (or breaker) before the unit maintenance.
- Ask the customer to keep the Installation Manual together with the Owner's Manual.

### CAUTION:


**This air conditioner adopts the new HFC refrigerant (R410A) which does not destroy ozone layer.**

The characteristics of R410A refrigerant are ; easy to absorb water, oxidizing membrane or oil, and its pressure is approx. 1.6 times higher than that of refrigerant R22.

Accompanied with the new refrigerant, refrigerating oil has also been changed.

Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigerating oil does not enter the refrigerating cycle.

To prevent charging an incorrect refrigerant and refrigerating oil, the sizes of connecting sections of charging port of the main unit and installation tools are charged from those for the conventional refrigerant. Accordingly the exclusive tools are required for the new refrigerant (R410A).

- Connect indoor and outdoor units with field-supplied copper pipes by means of flare connections. Use insulated seamless refrigeration grade pipe only, (Cu DHP type according to ISO1337), degreased and deoxidized, suitable for operating pressures of at least 4200 kPa and for burst pressure of at least 20700 kPa. Under no circumstances must sanitary type copper pipe be used.  
Moreover, do not use the existing piping because there are problems with pressure-resistance force and impurity in it.
- **Check that the impedance of the mains power supply is in conformance with the unit power input indicated in the electric data (EN 61000-3-11).**
- **This unit complies with low-voltage (EEC/73/23) and electro-magnetic compatibility (EEC/89/336) directives.**
- This appliance must be connected to the main power supply by means of a switch with a contact separation of at least 3 mm.  
**The installation fuse (25A D type  ) must be used for the power supply line of this conditioner.**

### WARNING:

- Ask an authorized dealer or qualified installation professional to install/maintain the air conditioner. Inappropriate installation may result in water leakage, electric shock or fire.
- Turn off the main power supply switch or breaker before attempting any electrical work. Make sure all power switches are off. Failure to do so may cause electric shock.
- Connect the connecting cable correctly. If the connecting cable is connected in a wrong way, electric parts may be damaged.
- When moving the air conditioner for the installation into another place, be very careful not to enter any gaseous matter other than the specified refrigerant into the refrigeration cycle.  
If air or any other gas is mixed in the refrigerant, the gas pressure in the refrigeration cycle becomes abnormally high and it may cause pipe burst and injuries on persons.
- Do not modify this unit by removing any of the safety guards or by passing any of the safety interlock switches.
- Exposure of unit to water or other moisture before installation may cause a short-circuit of electrical parts. Do not store it in a wet basement or expose to rain or water.
- After unpacking the unit, examine it carefully for possible damage.
- Do not install in a place that might increase the vibration of the unit.
- To avoid personal injury (with sharp edges), be careful when handling parts.

- Perform installation work properly according to the Installation Manual.  
Inappropriate installation may result in water leakage, electric shock or fire.
- When the air conditioner is installed in a small room, provide appropriate measures to ensure that the concentration of refrigerant leakage occurred in the room does not exceed the critical level.
- Install the air conditioner securely in a location where the base can sustain the weight adequately.
- Perform the specified installation work to guard against an earthquake.  
If the air conditioner is not installed correctly, accidents may occur due to the falling unit.
- If refrigerant gas has leaked during the installation work, ventilate the room immediately.  
If the leaked refrigerant gas comes in contact with fire, noxious gas may generate.
- After the installation work, confirm that refrigerant gas does not leak. If refrigerant gas leaks into the room and flows near a fire source, such as a cooking range, noxious gas might generate.
- Electrical work must be performed by a qualified electrician in accordance with the Installation Manual.  
Make sure the air conditioner uses an exclusive power supply. An insufficient power supply capacity or inappropriate installation may cause fire.
- Use the specified cables for wiring and connect them firmly to the terminals.  
To prevent external forces applied to the terminals from affecting the terminals.
- Be sure to provide grounding. Do not connect ground wires to gas pipes, water pipes, lightning rods or ground wires for telephone cables.
- Conform to the regulations of the local electric company when wiring the power supply.  
Inappropriate grounding may cause electric shock.
- Do not install the air conditioner in a location subject to a risk of exposure to a combustible gas.  
If a combustible gas leaks, and stays around the unit, a fire may occur.


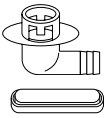
### Required tools for installation work

- Philips screw driver
- Cutter drill (65 mm)
- Spanner
- Pipe cutter
- Cutter
- Reamer
- Gas leak detector
- Meter
- Thermometer
- Volt-ohm-milliammeter
- Electro circuit tester
- Hexagonal wrench
- Flare tool
- Pipe bender
- Water level
- Metal saw

### R410A (Special requirement)

- Manometer for pressure measuring  
(Charge hose : R410A special requirement)
- Vacuum pump  
(Charge hose : R410A special requirement)
- Torque wrench:
  - 1/4 (17 mm) 16 N•m (1,6 kgf•m)
  - 3/8 (22 mm) 42 N•m (4,2 kgf•m)
  - 1/2 (26 mm) 55 N•m (5,5 kgf•m)
  - 5/8 (15,9 mm) 120 N•m (12,0 kgf•m)
- Copper pipe gauge adjusting projection margin
- Vacuum pump adapter

**Table II: Accessory and Installation Parts**

Outdoor unit Installation manual x 1		Drain nipple Waterproof rubber cap	
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### Refrigerant Piping

- Piping kit used for the conventional refrigerant cannot be used.
- Use copper pipe with 0.8 mm or more thickness for Ø 9,52 mm.
- Use copper pipe with 1.0 mm or more thickness for Ø 15,87 mm.
- Flare nut and flare works are also different from those of the conventional refrigerant. Take out the flare nut attached to the main unit of the air conditioner, and use it.

**Table III: Length of refrigerant**

Length of refrigerant pipe connected to indoor/outdoor units.	Refrigerant addition
20 m or shorter: <b>for all units</b>	Do not add refrigerant at installation site
<sup>(1)</sup> from 20 m to 50 m	Add 40 g of refrigerant for every meter of pipe beyond 20 m

**NOTES: Caution at addition of refrigerant**

<sup>(1)</sup> When the total length of refrigerant pipe exceeds 20m, add 40g/m. The pipe total maximum length is 50 m. (Max. amount of additional refrigerant is 1200g.). Charge the refrigerant accurately. Overcharge may cause a serious trouble of compressor..

**Table IV: Operating limits <sup>(1)</sup>**

<b>Cooling (2)</b>	Maximum conditions	outdoor temperature 43°C indoor temperature 32°C d.b.; 23°C w.b.
	Minimum conditions	outdoor temperature -5°C indoor temperature 21°C d.b.; 15°C w.b.
<b>Heating (2)</b>	Maximum conditions	outdoor temperature 24°C d.b.; 18°C w.b. indoor temperature 27°C d.b.
	Minimum conditions	outdoor temperature -15°C d.b.
<b>Mains power supply</b>	Nominal single-phase voltage Operating voltage limits	220÷240V ~ 50Hz <b>min. 198V – max. 264V</b>

**Notes:** 1. Data referred to the outdoor unit only.  
2. According to prEN14511.

**WARNING:**

During heat pump operation unit will undergo several defrost cycles to eliminate ice that might possibly collect on the outdoor unit in very low ambient temperatures. In these cycles, fan speed will automatically reduce and cannot be varied until defrost cycle is completed.

d.b. - dry bulb;      w.b. - wet bulb

## Selection of installation

### Air purge

- For air purge, use a vacuum pump.
- Do not use refrigerant charged in the outdoor unit for air purge. (The refrigerant for air purge is not contained in the outdoor unit.)

### Electrical cabling

- Be sure to fix the power cables and indoor/outdoor connecting cables with clamps so that they do not contact with the cabinet, etc.

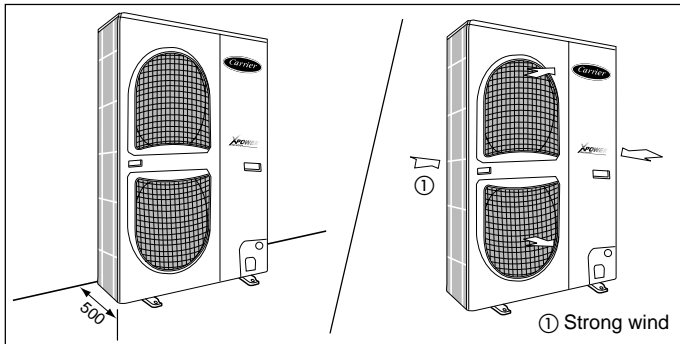
## Selection of installation

### Installation Place

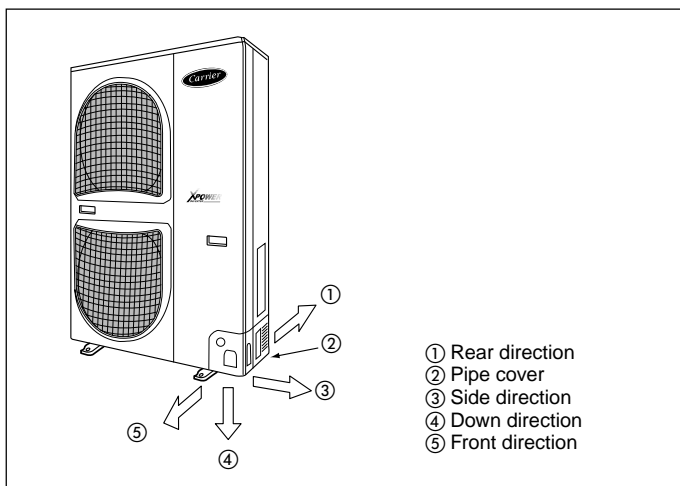
- A place which provides a specified space around the outdoor unit.
- A place where the operation noise and discharged air are not given to your neighbors.
- A place that is not exposed to a strong wind.
- A place that does not block a passage.
- When the outdoor unit is installed in an elevated position, be sure to secure its feet.
- There must be sufficient space for carrying in the unit.
- A place where the drain water does not make any problem.
- If the unit is installed in areas where heavy snowfalls may occur, it is necessary to raise its level at least 200 mm above the usual snow level.
- The support must be suitable for the unit weight.

### CAUTION:

- Install the outdoor unit at a place where discharge air is not blocked.
- When an outdoor unit is installed in a place that is always exposed to a strong wind like a coast or on a high storey of a building, secure a normal fan operation by using a duct or a wind shield
- When installing the outdoor unit in a place that is constantly exposed to a strong wind such as the upper stairs or rooftop of a building, apply the windproof measures referring to the following examples.
- Install the unit so that its discharge port faces the wall of the building. Keep a distance 500 mm or more between the unit and the wall surface.
- Supposing the wind direction during the operation season of the air conditioner, install the unit so that the discharge port is set at right angle to the wind direction.
- Installation in the following places may result in some troubles. Do not install the unit in such places below.
  - A place full of machine oil.
  - A place full of sulphuric gas.
  - A place where high-frequency radio waves are likely to be generated as from audio equipment, welders, and medical equipment.

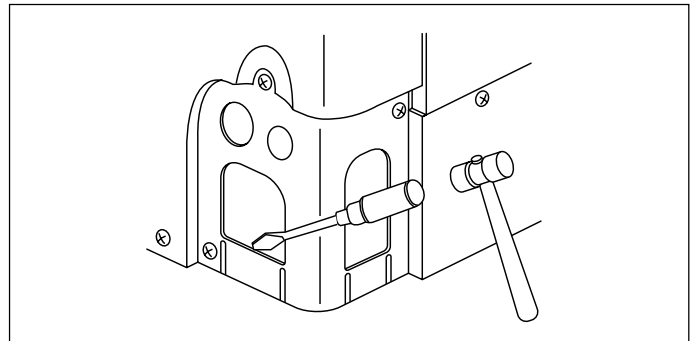


### Cover knockout for pipe connection



### Knockout procedure

- The indoor/outdoor connecting pipes can be connected to 4 directions.  
Take off the knockout part of the pipe cover in which pipes or wires pass through the base plate.
- As shown in the figure, do not remove the pipe cover from the cabinet so that the knockout hole can be easily punched. To knock out, punch the 3 connected parts with a screwdriver and remove the pipe cover by hand.
- After marking the knockout hole, remove the burr and mount the attached protective bush and guard material for pass-through part in order to protect pipes and wires.
- After connecting the pipes, be sure to mount the pipe cover. The pipe cover is easily mounted by cutting off the slit at the lower part of the cover.

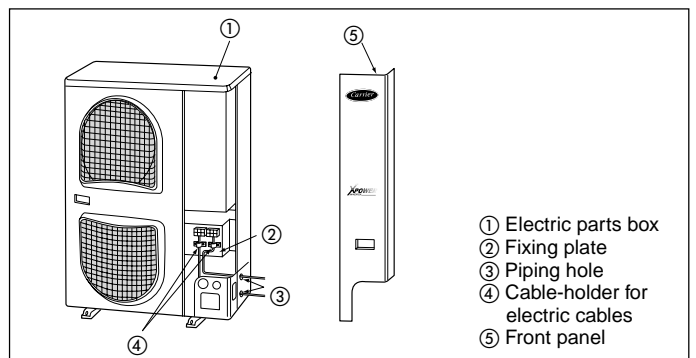
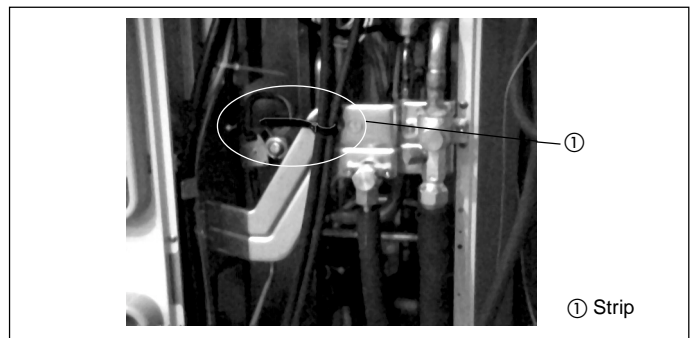


### How to remove the front panel

1. Remove screws of the front panel.
2. Pull the front panel downward.

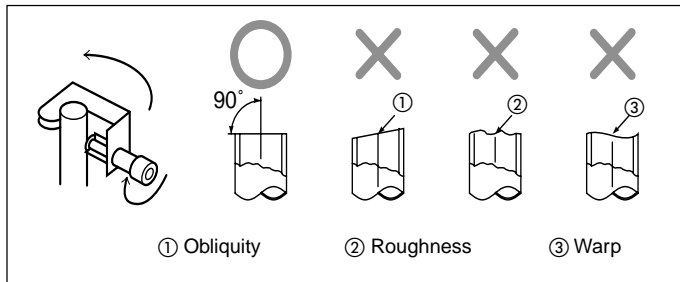
Removing the front panel, the electric parts appear at the front side.

- The power supply cables can be inserted into the pipe holes. Enlarge the pipe holes if they are too small.
- The power supply cable and the indoor/outdoor connecting cable must be fixed by means of the strip on the connection fixing bracket so that they are not in contact with the compressor and the hot pipes.  
To ensure good tensile strength, the electric cables must be fastened using the cable-holder on the plate.



### Flaring

1. Cut the pipe with a pipe cutter.

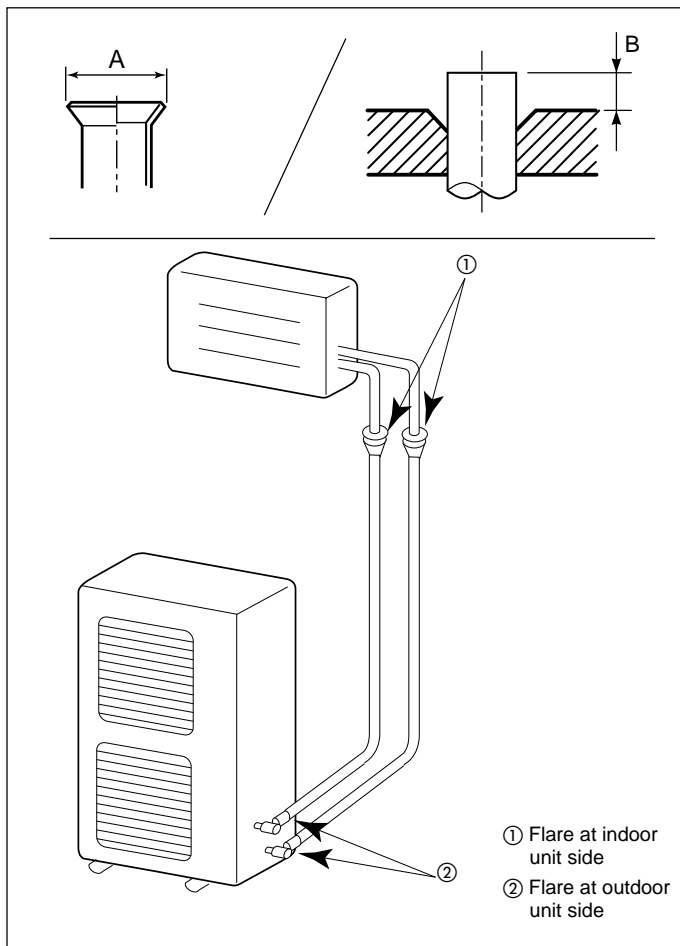


2. Insert a flare nut into the pipe, and flare the pipe.  
As the flaring sizes of R410A differ from those of refrigerant R22, the flare tools newly manufactured for R410A are recommended.

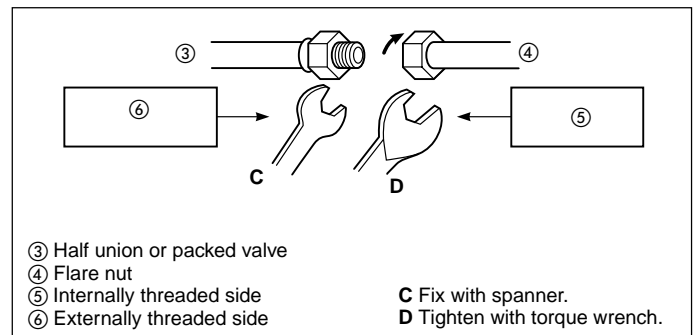
**Table V: Pipe outer diameter**

Outer dia. of copper pipe	A <sup>+0</sup> / <sub>-0,4</sub> mm	
	R410A	R22
9,52	13,2	13,0
15,87	19,7	19,4

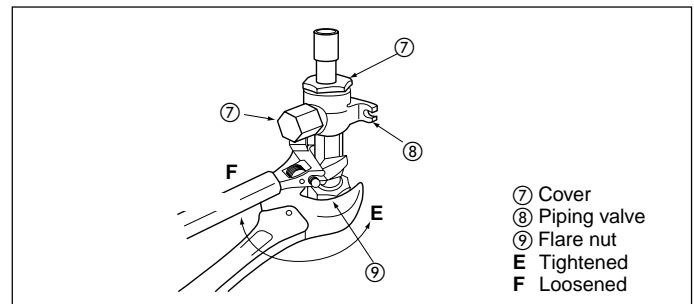
• In case of flaring for R410A with the conventional flare tool, pull it out approx. 0.5 mm more than that of R22 to adjust to the specified flare size.  
The copper pipe gauge is useful for adjusting projection margin size.



Align the centres of the connecting pipes and tighten the flare nut as strong as possible with your fingers.  
Then fix the nut with a spanner and tighten it with torque wrench as shown in the figure.



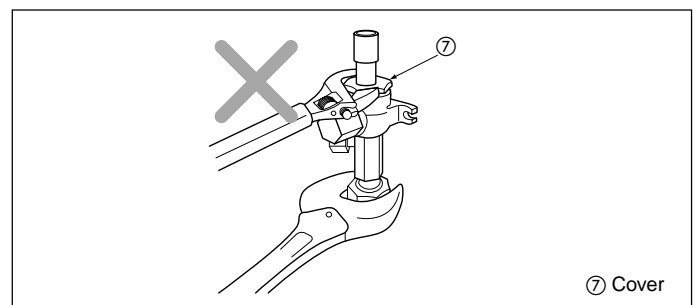
• As shown in the figure, use two spanners to unscrew or tighten the valve flare nut, at gas side.  
If using a single spanner, the nut cannot be tightened with necessary tightening torque.  
On the contrary, use a single spanner to loosen or tighten the flare nut of the valve at liquid side.



### REQUIREMENT:

1. Do not put the spanner on the cap. The valve may be broken.
2. If applying excessive torque, the nut may be broken according to some installation conditions.

• After the installation work, be sure to check gas leak of connecting part of the pipes with nitrogen.



• Pressure of R410A is higher than that of R22 (Approx. 1.6 times).  
Therefore, using a torque wrench, tighten the flare pipe connecting sections which connect the indoor/outdoor units at the specified tightening torque.  
Incomplete connections may cause not only a gas leak, but also a trouble of the refrigeration cycle.

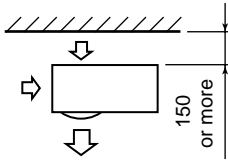
### IMPORTANT:

**Do not apply refrigerating machine oil to the flared surface.**

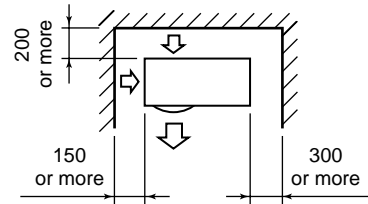
## Minimum clearances

### Obstacle at rear side Upper side is free

Single unit installation

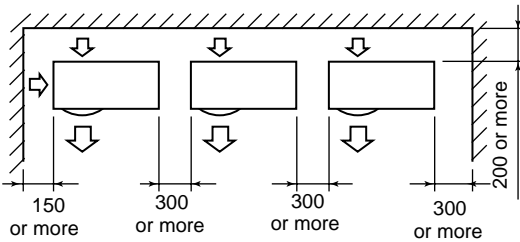


Obstacles at both right and left sides.



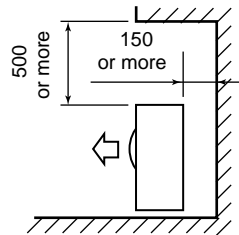
- The height of the obstacle should be lower than the height of the outdoor unit.

Serial installation of two or more units



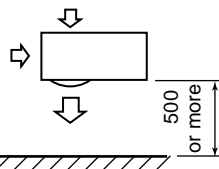
- The height of the obstacle should be lower than the height of the outdoor unit.

### Obstacle at rear side Obstacle also at the upper side

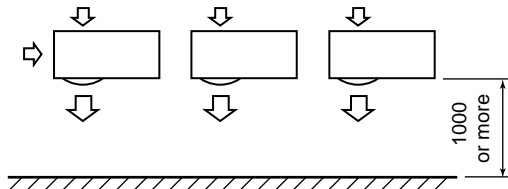


### Obstacle at front side Upper side is free

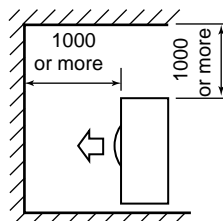
Single unit installation



Obstacles at both right and left sides.



### Obstacle at front side Obstacle also at the upper side



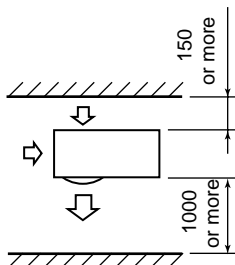
**Minimum clearances**

**Obstacles at both front and rear sides  
Standard installation**

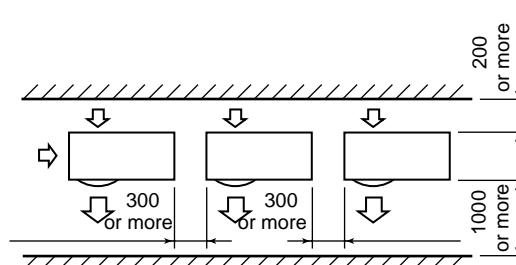
Open the upper side and both right and left sides.

The height of obstacle at both front and rear side, should be lower than the height of the outdoor unit.

**Single unit installation**



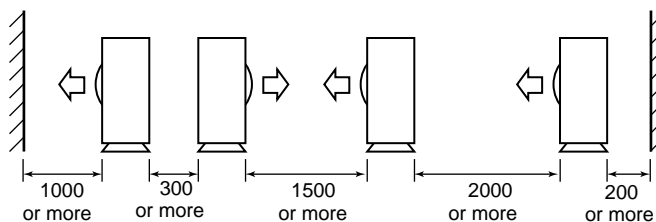
**Serial installation of two or more units**



**Serial installation at front and rear sides  
Standard installation**

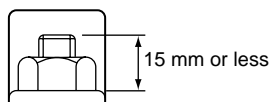
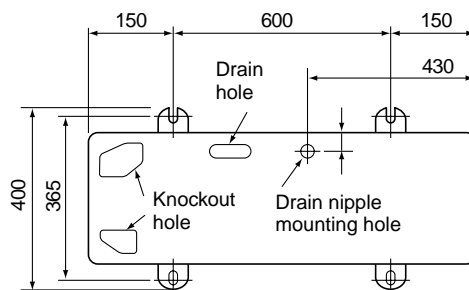
Open the upper side and both right and left sides.

The height of obstacle at both front and rear side, should be lower than the height of the outdoor unit.



**Installation**

**38 VYX 110-130**



- Set the out margin of the anchor bolt to 15mm or less..

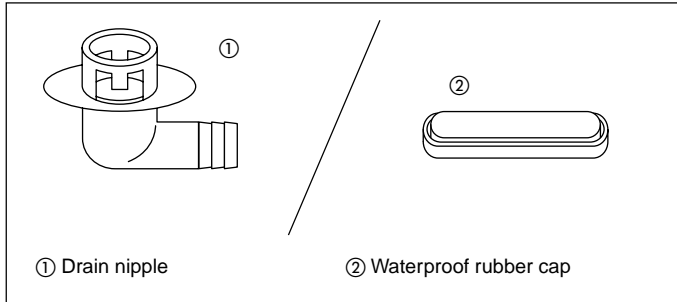
- Before installation, check strength and horizontality of the base so that abnormal sound does not generate.

- According to the following base diagram, fix the base firmly with the anchor bolts.  
(Anchor bolt, nut: M10 x 2 pairs)

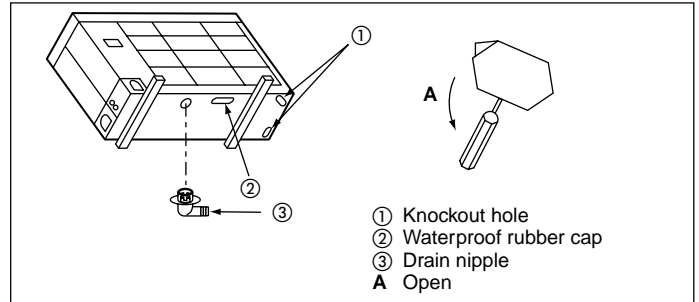


# 38VYX110/38VYX130 **R-410A**

## Installation



- In case of draining through the drain hose, attach the following drain nipple and the waterproof rubber cap, and use the drain hose (Inner diam.: 16mm) sold on the market. And also seal the screws securely with silicone material, etc. so that water does not drop down. Some conditions may cause dewing or dripping of water.



- When there is a possibility of freezing of drain at the cold district or a snowfall area, be careful for drainage ability of drain. The drainage ability increases when a knockout hole on the base plate is opened. (Open the knockout hole to outside using a screwdriver, etc.)

**Table VI: Optional Installation Parts**  
(local procure)

	Parts name	Q'ty
A	Refrigerant piping Liquid side: $\varnothing$ 6,35 mm o $\varnothing$ 9,52 mm Gas side: $\varnothing$ 12,7 mm o $\varnothing$ 15,9 mm	Each one
B	Pipe insulating material (polyethylene foam, 6 mm thick)	1
C	Putty, PVC tapes	Each one

**CAUTION:**  
**IMPORTANT FOR POINTS BELOW FOR PIPING WORK**

1. Keep dust and moisture away from inside the connecting pipes.
2. Tightly connect the connection between pipes and the unit.
3. Evacuate the air in the connecting pipes using VACUUM PUMP.
4. Check gas leak at connected points.

**Table VII: Piping connection**

Capacity rank	Liquid piping		Gas piping	
	Outer diameter	Thickness	Outer diameter	Thickness
38 VYX 110-130	$\varnothing$ 9,52	0,8	$\varnothing$ 15,9	1,0

**Table VIII: Air Purge**

Capacity rank	Max. connecting pipe length (m)	Height difference (m)		Hexagonal wrench size
		Outdoor unit higher than indoor unit	Outdoor unit lower than indoor unit	
38 VYX 110-130	50	30	15	4 mm

- This air conditioner can be installed up to the connecting pipe length and height difference in the following table.

## Evacuating

### Air Purge

With respect to the preservation of terrestrial environment, adopt "Vacuum pump" for air purge (Evacuate air in the connecting pipes) when installing the unit.

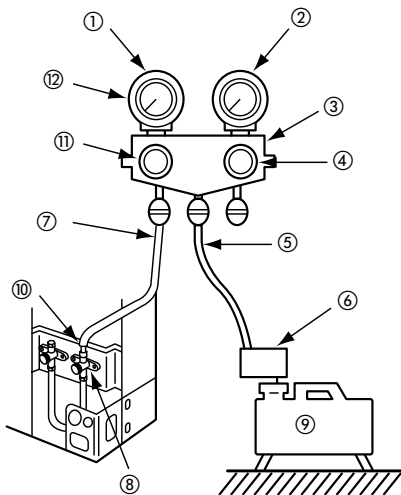
- Do not discharge the refrigerant gas to the atmosphere to preserve the terrestrial environment.
- Use a vacuum pump to discharge the air (nitrogen, etc.) remained in the set. If the air remains, the capacity may decrease.

For the vacuum pump, be sure to use one with backflow preventer so that the oil in the pump does not backflow into the pipe of the air conditioner when the pump stops. (If oil in the vacuum pump is put in an air conditioner including R410A, it may cause trouble on the refrigeration cycle.)

### Vacuum pump

- As shown in the right figure, connect the charge hose after the manifold valves are closed completely.
- Attach the connecting port of the charge hose with a projection to push the valve core (setting pin) to the charge port of the set.
- Open handle Low fully.
- Turn ON the vacuum pump.<sup>(\*)</sup>
- Loosen the flare nut of the packed valve (Gas side) a little to check the air passes through.<sup>(\*\*)</sup>
- Tighten the flare nut again.
- Execute vacuuming until the compound pressure gauge indicates  $-101\text{kPa}$  ( $-76\text{cmHg}$ ).<sup>(\*)</sup>
- Close handle Low completely.
- Turn OFF the vacuum pump.
- Leave the vacuum pump as it is for 1 or 2 minutes, and check the indicator of the compound pressure gauge does not return.
- Open fully the valve stem or the valve handle. (First, at liquid side, then gas side)
- Disconnect the charge hose from the charge port.
- Tighten valve and caps of the charge port surely.

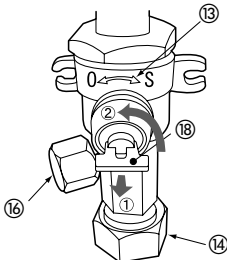
### 38VYX110 - 38VYX130



- ① Compound pressure gauge
- ② Pressure gauge
- ③ Manifold valve
- ④ Handle Hi (Keep fully closed)
- ⑤ Charge hose (For R410A only)
- ⑥ Vacuum pump adapter for counter-flow prevention (For R410A only)
- ⑦ Charge hose (For R410A only)
- ⑧ Packed valve (Gas side)
- ⑨ Vacuum pump
- ⑩ Service port (Valve core (Setting pin))
- ⑪ Handle Lo
- ⑫  $-101\text{kPa}$  ( $-76\text{cmHg}$ )
- ⑬ Valve unit
- ⑭ Flare nut
- ⑮ Valve rod
- ⑯ Charge port
- ⑰ Push in handle.
- ⑱ Handle

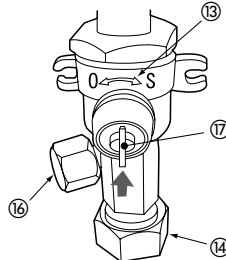
Pull out the handle and using cutting pliers, etc. turn it counterclockwise by  $90^\circ$ . (Open fully)

### Close

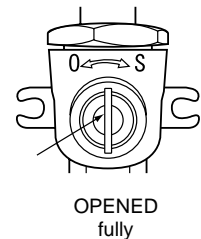
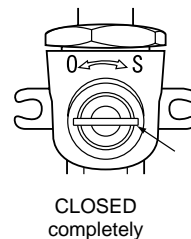


Flexible charge pipe (only for R410A)  
 Vacuum pump adapter for counter-flow prevention (only for R410A)  
 Flexible charge pipe (only for R410A)

### Open



### Handle position



\*1. Use the vacuum pump, vacuum pump adapters, and gauge manifold referring to the manuals attached to each tool before using them. For the vacuum pump, check oil is filled up to the specified line of the oil gauge.  
 \*2. While the air is purged, check again that the connecting port of charge hose, which has a projection to push the valve core, is firmly connected to the charge port.

## Evacuating

### Valve handling precautions

Size	∅ 9,52	33 a 42 N•m (3,3 a 4,2 kgf•m)
	∅ 15,87	20 a 25 N•m (2,0 a 2,5 kgf•m)
Service connection		14 a 18 N•m (1,4 a 1,8 kgf•m)

- Open the valve stem or the handle until it strikes the stopper. It is unnecessary to apply further force.
- Securely tighten the cap with a torque wrench.
- Cap tightening torque


## Electrical connections

### • Make refrigerant connections before electrical connections.

When disconnecting, disconnect electrical connections before refrigerant connections.

### IMPORTANT:

**Make ground connection prior to any other electrical connections.**

Model	38VYX110	38VYX130
Power supply	220÷240 V Single phase 50Hz	
Maximum running current	22 A	22,8A
Installation fuse rating	25 A (type D  )	
Power cable	H07 RN-F (245 IEC 57) 2,5 mm <sup>2</sup>	

**All field electrical connections are the responsibility of the installer.**

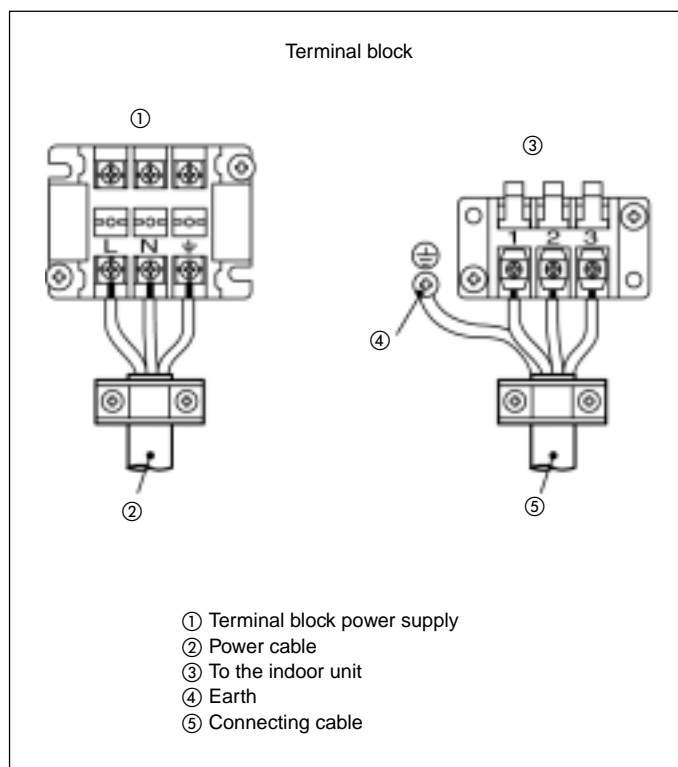
### WARNING:

- Wrong wiring may cause a burn-out to some electrical parts.
- Be sure to use the cord clamps attached to the product.
- Do not damage or scratch the conductive core and inner insulator of power and inter-connecting cables when peeling them.
- Be sure to comply with local regulations of the cable from outdoor unit to indoor unit.  
(wire size and cabling method etc.)
- Use the power and Inter-connecting cables with specified thickness, specified type and protective devices required.

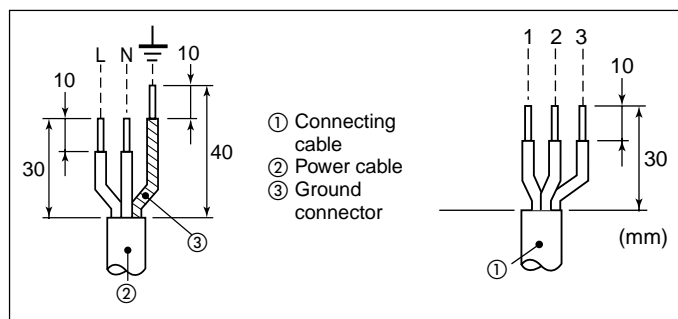
1. Connect the connecting cable to the terminal as identified with their respective numbers on the terminal block of indoor and outdoor unit.


- The indoor - outdoor unit interconnecting wires must be A07 RN-F type (245 IEC 57) or higher, with synthetic rubber insulation with Neoprene coating, according to EN 60335-2-40 codes.
- The mains supply connecting cable for 38VYX units, must be H07 RN-F type (245 IEC 57) or higher, with synthetic rubber insulation with Neoprene coating, according to EN 60335-2-40 codes.  
**Refer to the indoor unit installation manual for sizing of the power supply wires.**

2. For inter connecting cable, do not use a wire jointed to another on the way.  
Use wires long enough to cover the entire length.



### Power cable and connecting cable



- The installation fuse (25A D type ) must be used for the power supply line of this air conditioner.
- Incorrect/incomplete wiring might cause an electrical fire or smoke.
- Prepare the exclusive power supply for the air conditioner.
- Ensure that mains supply connection is made through a switch that disconnects all poles, with contact gap of a least 3 mm.

## Final installation checks

### Check and Test Operation

For R410A, use the leak detector exclusively manufactured for HFC refrigerant (R410A, R134a, etc.).

- The conventional leak detector for HCFC refrigerant (R22, etc.) cannot be used because its sensitivity for HFC refrigerant lowers to approx. 1/40.
- Pressure of R410A is approx. 1.6 times higher than that of R22.  
If installation work is incompletely finished, a gas leakage may occur when pressure rises during operation.  
Therefore, be sure to test the piping connections for leakage.

- Check gas leakage at the flare nut connections, valve stem cap connections and service port cap fittings with a leak detector or soap water.

### Useful Functions

#### Self-Diagnosis by LED Indication

Troubles of the outdoor unit can be diagnosed by LED indications on the cycle control P.C. board of the outdoor unit. Utilize them for various checks.

For the check by remote controller of the indoor unit, refer to the Installation Manual of the outdoor unit.

Before a check, confirm each bit of the DIP switch is set to OFF position.

### LED indication and code checking

LED indication	Cycle control P.C. board				Cause
	LED indication				
	D800	D801	D802	D803	
D800 O: Red D801 O: Yellow D802 O: Yellow D803 O: Yellow  ◇: Flashing ●: Off ○: On	○	●	●	●	Heat exchanger sensor (TE) error
	●	●	○	●	Suction sensor (TS) error
	○	○	●	●	Hot gas discharge sensor (TD) error
	●	○	●	○	High-pressure protection error
	●	○	●	●	Outdoor air temperature sensor error (TO)
	○	○	○	●	Outdoor motorised fan error DC
	○	●	●	○	Communication error between IPDU (Abnormal stop)
	●	○	●	○	High-pressure release operation
	●	○	○	●	Discharge temp. error: hot gas is too high
	○	○	●	○	EEPROM error
	●	●	○	○	Communication error between IPDU (Normal stop)
	◇	●	●	●	G-Tr short-circuit protection
	●	◇	●	●	Detect circuit error
◇	◇	●	●	Current sensor error	
●	●	◇	●	Comp. lock error	
◇	●	◇	●	Comp. break down	

## Final installation checks

### Installation/Serviceing Tools








#### Changes in the product and components

In the case of an air conditioner using R410A, in order to prevent any other refrigerant from being charged accidentally, service port

diameter of the outdoor unit control valve (3 way valve) has been changed. (1/2 UNF 20 threads per inch)

- In order to increase the pressure resisting strength of the refrigerant piping flare processing diameter and size of opposite side of flare nuts has been changed. (for copper pipes with nominal dimensions 1/2 and 5/8)

**Table: New tools for R410A**

New tools for R410A	Applicable to R22 model	Changes
Gauge manifold	X 	As pressure is high, it is impossible to measure by means of conventional gauge. In order to prevent any other refrigerant from being charged, each port diameter is changed.
Charge hose		In order to increase pressure resisting strength, hose materials and port size are changed (to 1/2 UNF 20 threads per inch). When purchasing a charge hose, be sure to check the port size.
Electronic balance for refrigerant charging	O 	As pressure is high and gasification speed is fast, it is difficult to read the indicated value by means of charging cylinder, as air bubbles occur.
Torque wrench (nominal diam. 1/2, 5/8)	X 	The size of opposite sides of flare nuts have been increased. Incidentally, a common wrench is used for nominal diameters 1/4 and 3/8.
Flare tool (clutch type)	O 	By increasing the clamp bar's receiving hole, strength of spring in the tool has been improved.
Gauge for projection adjustment	- -	Used when flare is made with using conventional flare tool.
Vacuum pump adapter	O 	Connected to the conventional vacuum pump. It is necessary to use an adapter to prevent vacuum pump oil from flowing back to the charge hose. The charge hose connecting part has two ports-one for conventional refrigerant (7/16 UNF 20 threads per inch) and one for R410A. If the vacuum pump oil (mineral) mixes with R410A a sludge may occur and damage the equipment.
Gas leakage detector	X 	Exclusive for HFC refrigerant.

- Incidentally, the "refrigerant cylinder" comes with the refrigerant designation (R410A) and protector coating in the U.S.'s ARI specified rose color (ARI color code: PMS 507).
- Also, the "charge port and packing for refrigerant cylinder" require 1/2 UNF 20 threads per inch corresponding to the charge hose's port size.



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The manufacturer reserves the right to change any product specifications without notice.

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