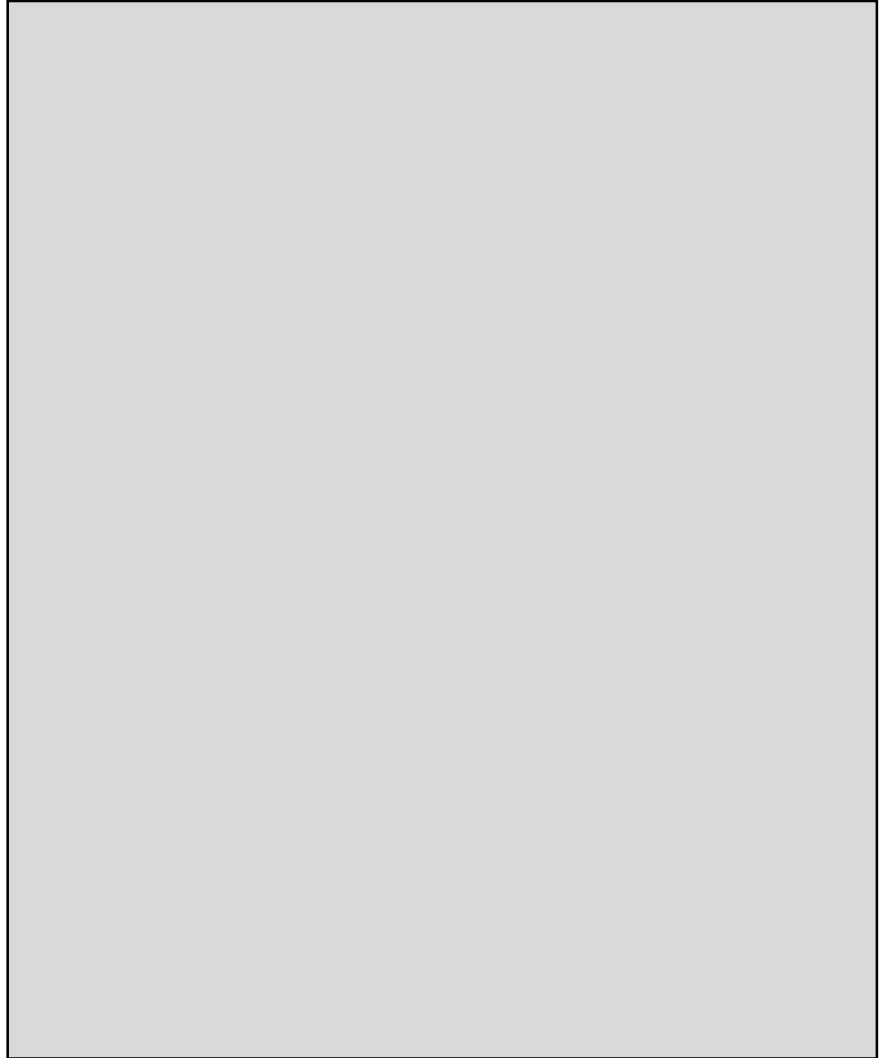




Console Undercelling



## **Installation and Service Manual 42 LS**



**"ENGLISH/ESPAÑOL"**

**NOTA : Las Instrucciones en Español Empiezan en la Página 20.**

## 1. INTRODUCTION

*This manual is addressed to CARRIER authorized and properly trained installers with the purpose of helping in installation and maintenance procedures.*

*It is important to stress that any repairs or services can be dangerous if accomplished by unauthorized personnel. Only authorized staff trained by CARRIER should install, start up and give any maintenance to the equipment mentioned on this manual.*

*If after the reading, shall you still need additional information just get in contact with us!*

## 2. NOMENCLATURE

42 LS A 18 22 6 C W

EVAPORATING UNIT

CONSOLE MODULE & UNDERCEILING UNIT

IDENTIFICATION IN  
THE PROJECT CHANGES (VERSION)

12 = 12.000 BTU/h	18 = 18.000 BTU/h
24 = 24.000 BTU/h	30 = 30.000 BTU/h
36 = 36.000 BTU/h	42 = 42.000 BTU/h
48 = 48.000 BTU/h	60 = 60.000 BTU/h

WS - WIRED REMOTE CONTROL  
WITH AIR SWEEP  
W - WIRED REMOTE CONTROL  
L - WIRELESS REMOTE CONTROL

C - COOLING  
Q - COOLING AND HEATING

NOMINAL FREQUENCY 6 - 60 Hz  
5 - 50 Hz

NOMINAL TENSION 22 - 208/230V

### 3. SAFETY INSTRUCTIONS

The new indoor units 42 LS were projected to offer you a safe and reliable service when operated within the specifications foreseen in project.

However, due to this same conception, aspects regarding installation, start up and maintenance should be strictly observed.

#### WARNING

- \* Always maintain the fire extinguisher close to the working place. Check the extinguisher periodically to certify it is completely loaded and working perfectly.
- \* When working in the equipment always observe the safety warnings in the labels attached to the units.
- \* Always follow all the applicable norms of safety and use clothes and equipment of personal protection. Wear gloves and protection glasses when handling the units or the system refrigerant.

#### WARNING

- \* Verify the weights and dimensions of the units (see item 13) to guarantee an appropriate and safe handling.
- \* Learn how to handle the oxyacetylene equipment safely. Leave the equipment in the vertical position inside the vehicle and also in the working place.
- \* Use dry nitrogen to pressurize and to check the system for leaks. Use a good regulator. Be careful not to exceed 200 psig of test pressure in the rotary compressors.
- \* Before working in any one of the units always turn off the power supply unplugging the indoor unit from the wall outlet.
- \* Never introduce the hands or any other object inside the units while the fan is working.

### 4. RECEPTION AND INSPECTION OF THE UNITS

- \* To avoid damages during handling or transport, don't remove the unit's packing until arrive to the defined place of installation.
- \* Prevent strings, chains or other devices from touching the units.

#### WARNING

- \* Never lift or carry the evaporator unit by the plastic side parts. Hold it on the metal parts, as shown on figure 1.

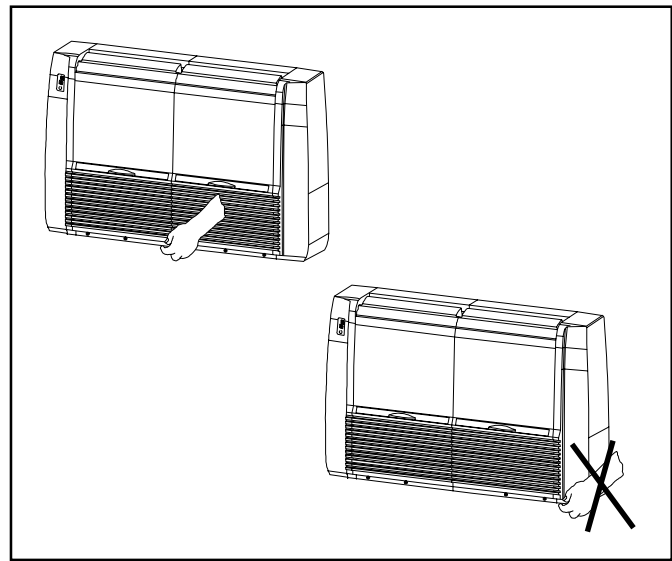


FIGURE 1 - HANDLING OF 42 LS UNITS.

- \* Observe the limit of suitable piling up indicated in the units' packing.
- \* Don't shake the outdoor unit during transportation nor incline more than 15° in the vertical.
- \* Avoid exposing the machine labor accidents, seeing to it that it is immediately carried to the installation site or a safe place.
- \* When removing the units from the package and removing the expanded polystyrene protections don't discard them immediately because they may be useful eventually as protection against dust, or other noxious agents until the building and/or installation is complete and system ready to operate.

### 5. INSTALLATION

#### 5.1 USEFUL TIPS

First, consult the norms or codes applicable to the installation of the equipment in the selected place, to make sure the system is in accordance to them.

Make also a careful planning of the unit location to avoid interference with any type of existing (or planned) facilities, such as electrical installation, water piping, sewer, etc.

Install the units so that they are free from any type of obstruction from the taking of return air or airflow.

Choose places with enough clearance for repairs or services of any kind and also to make the piping easier (copper tubes that interconnect the units, electrical wiring and drain).

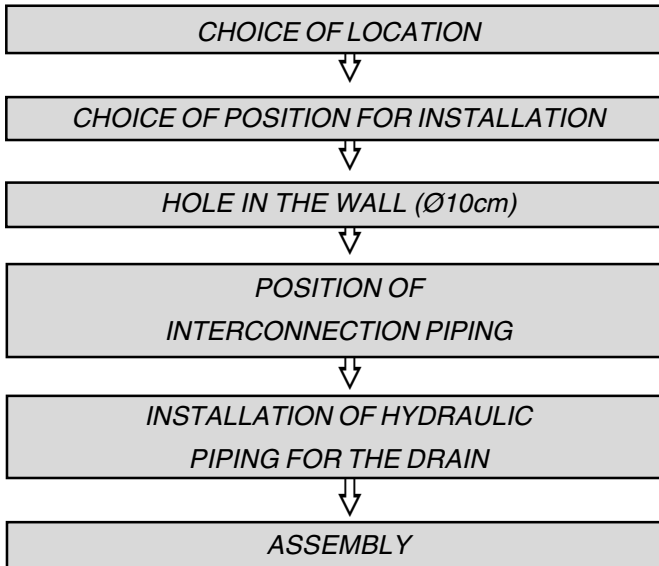
Remember that the units should be leveled after their installation.

Verify if the external place is free of dust or other particles that might obstruct the condenser coil.

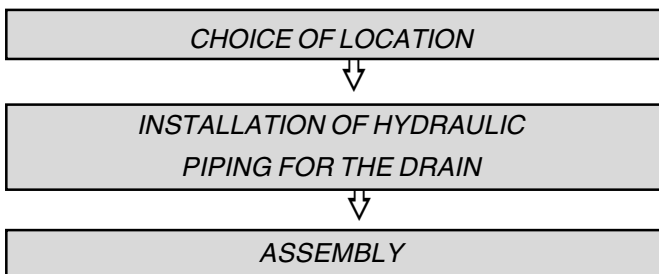
It is indispensable that the indoor unit possesses hydraulic line for drainage of the condenser. This hydraulic line should not have a diameter less than 1/2" and should have, right after the exit, a siphon to guarantee a perfect fall and isolation of air. At the start up, this siphon should be filled in with water to avoid taking air from the drainage line. The drainage in the outdoor unit is indispensable only when installed in the high and causing leak risk.

## 5.2 BASIC PROCEDURES FOR INSTALLATION

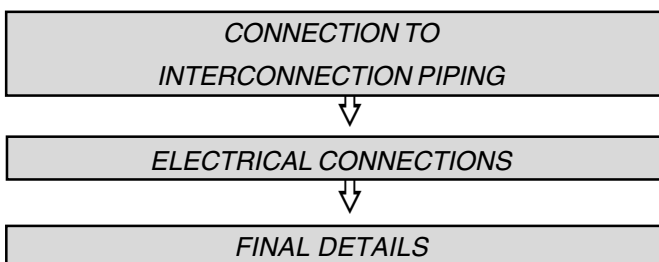
### \*INDOOR UNIT 42 LS



### \*OUTDOOR UNIT 38RC/38RQ/38NX/38NW/38MS/38CK/38YC/38HC/38QC/38HD/38QD



### \*INTERCONNECTION



## 5.3 EVAPORATING UNIT INSTALLATION

### 5.3.1 - GENERAL RECOMMENDATIONS

Before installing, read this instructions carefully to get familiar with the unit's features. Sizes and weights can be found on item 14 on this manual. The following rules apply to all installations.

- Plan the units' placement carefully to avoid occasional interference with any existing (or planned) installations, such as electrical installation, water piping, drain, etc.
- Install the unit so that it is free from any type of obstruction on the air flow, both on the air outflow and air intake.
- Choose an installation place with enough clearance for maintenance and general repair.
- The place should allow for the passage of piping (system pipes, electric wires and drain).
- The unit should be leveled after installation.

### 5.3.2 - POSITIONING

- The unit should only be installed horizontally Underceiling, vertically on the floor (console mode) or on the wall (see fig. 4 and 5)
- The unit comes with two (2) brackets for Underceiling or on the wall installation. There is also a brace for assembly of the remote control.
- Fig. 20 indicates the positioning of the screws on the brackets.
- Install the brackets (figure 3) underceiling by using the screws, nuts and washers.
- The unit should be positioned so as to distribute the air flow uniformly in the room.

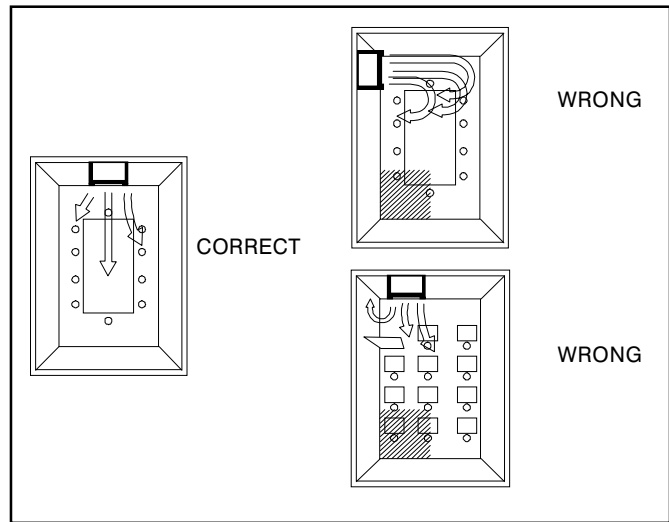


FIGURE 2 - EVAPORATING UNIT POSITION IN ROOM

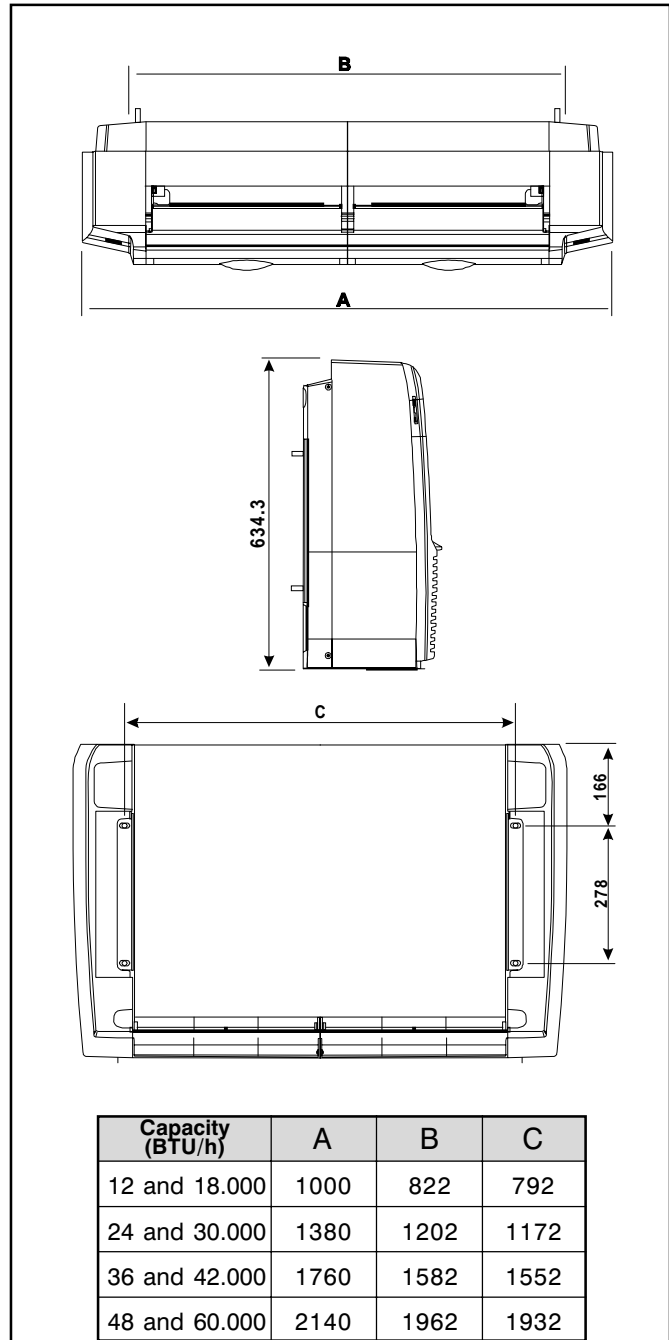


FIGURE 3 - SIZES FOR EVAPORATING UNIT INSTALLATION

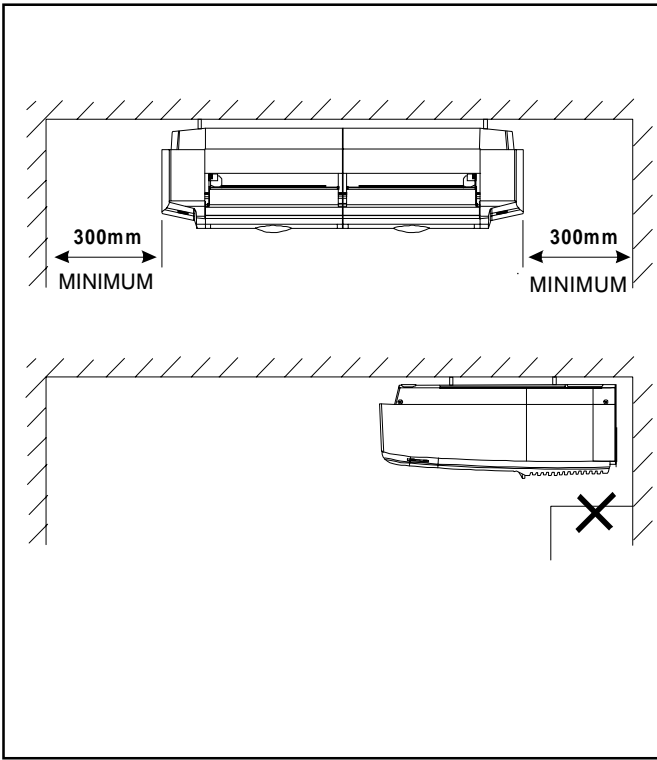


FIGURE 4 - UNDERCEILING INSTALLATION

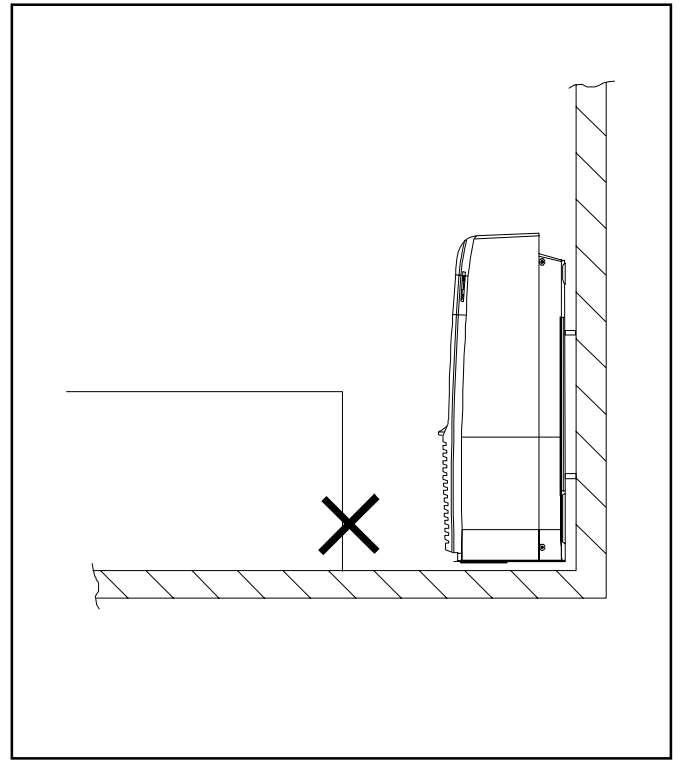


FIGURE 5 - CONSOLE ASSEMBLY (ON THE FLOOR)

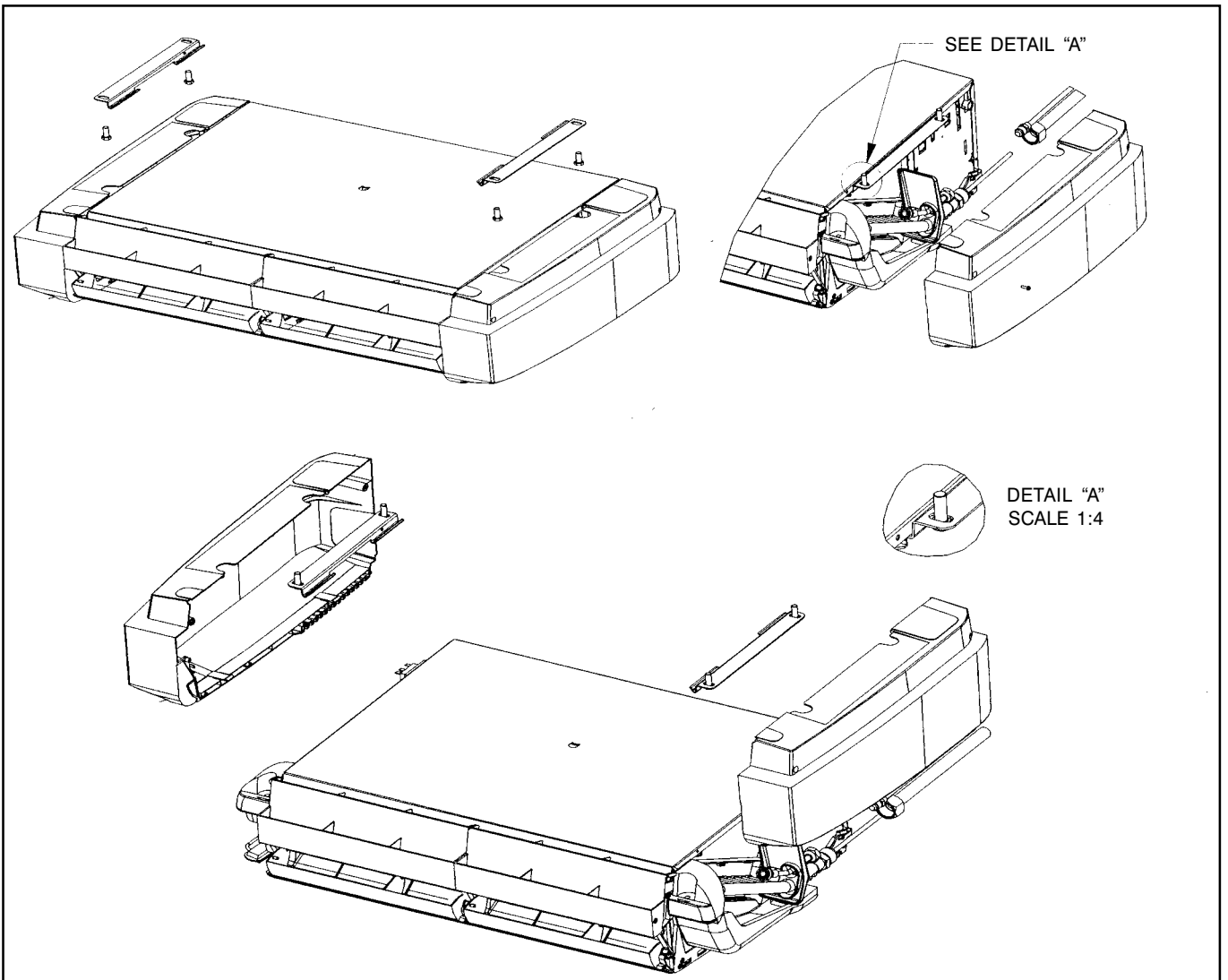


FIGURE 6 - BRACKET ASSEMBLY

### 5.3.3 - CONDENSATE DRAIN

According to the type of installation (console or under ceiling), there are two positions on the side plastic parts where the drain and interconnection pipes must pass through. The following picture shows where the cover must be broken.

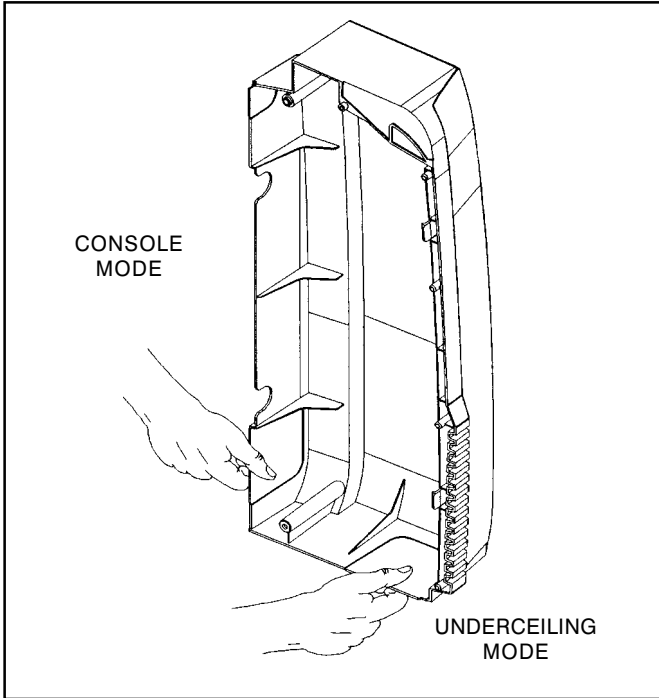


FIGURE 7 - POSITION WHERE COVERS MUST BE BROKEN

- Make sure that the unit is leveled, with a slight slant towards the drain so as to assure a proper draining.
- Connect the 1/2" PVC piping to the drain connection (Figure 8).
- The unit uses drain by gravity. The drain pipes should have declivity, though. Avoid scenarios like the ones indicated on Fig. 9.

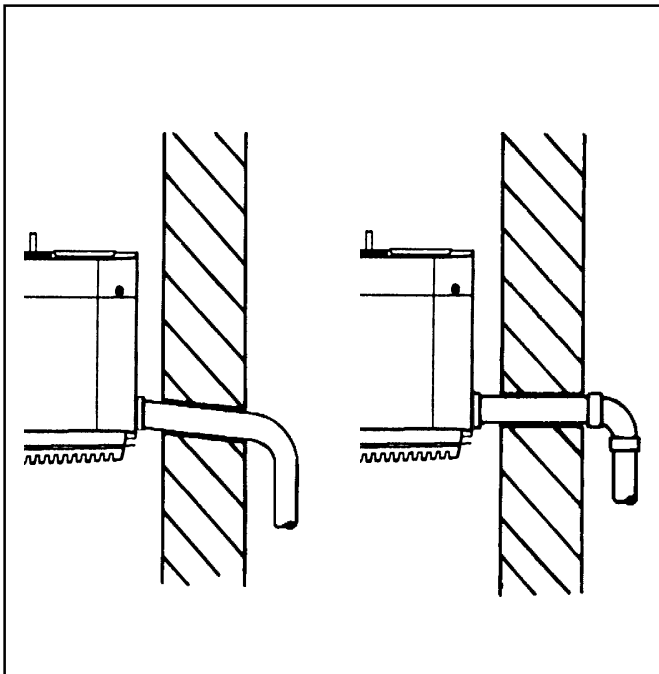


FIGURE 8

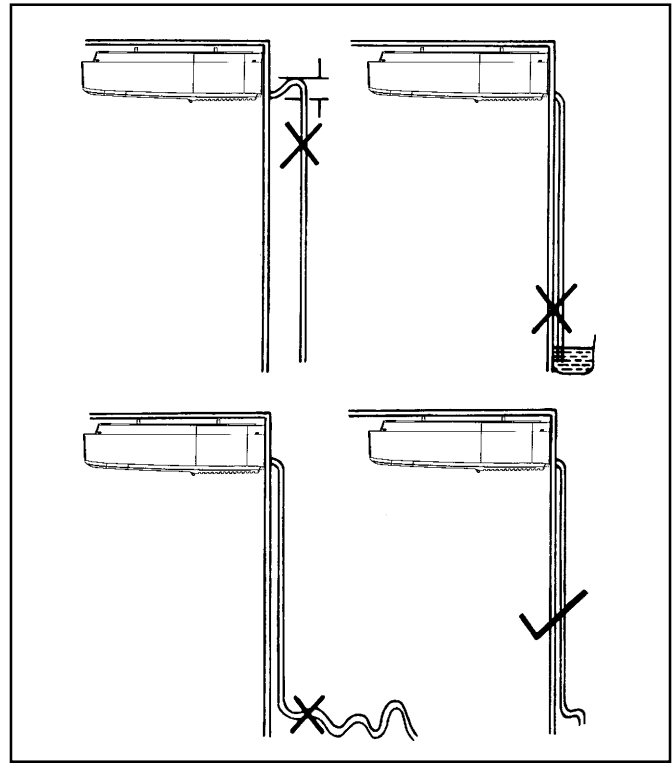


FIGURE 9 - INEFFECTIVE DRAINING SCENARIO

#### **⚠ WARNING**

*When connecting the PVC hose to the machine, do not do it with sudden movements or too much force, as this may cause leaks. If necessary, heat the PVC before connecting it or use a flexible hose.*

## 6. INTERCONNECTION PIPING

### 6.1. SUSPENSION AND FIXATION OF INTERCONNECTION PIPES

Always try to fasten the interconnection piping in a convenient way through brackets or porches, preferably both together.

Seal them with circular neoprene bushing and then pass finish ribbon around.

Test all the welded and flared connections looking for leaks (maximum tested pressure: 200 psig). Use pressure regulator in the Nitrogen cylinder. If necessary, pass the electric interconnection by the copper tube, as shown on Figure 10.

### 6.2. EVACUATION OF INTERCONNECTION PIPING

The outdoor unit is shipped with enough refrigerant charge for use in a system with interconnection piping up to 3m, that is, charge for the outdoor unit, charge for the indoor unit and the necessary charge for an interconnection piping up to 3m. Since the interconnection pipes are provided in the field, you should proceed with the evacuation of the lines and of the indoor unit. The access points are the service valves close to the outdoor unit.

The valves come shut from the plant to retain the refrigerant in the outdoor unit.

To do the evacuation, maintain the valve shut and connect one side of the manifold hose to the vent's valve and the other to the vacuum pump. It is recommended to proceed the evacuation through both connections of the service valves simultaneously. The range to be reached should stay between 250 and 500 microns.

OBS: After doing the evacuation, add positive pressure with R-22 so that the vacuum is broken (see fig. 4).

For all the necessary information about diameter, charge and connections, see topics 14 and 15.

#### **⚠ CAUTION**

*Never carry liquid in the suction service valve. Whenever you want to do it, use the service valve of the liquid line.*

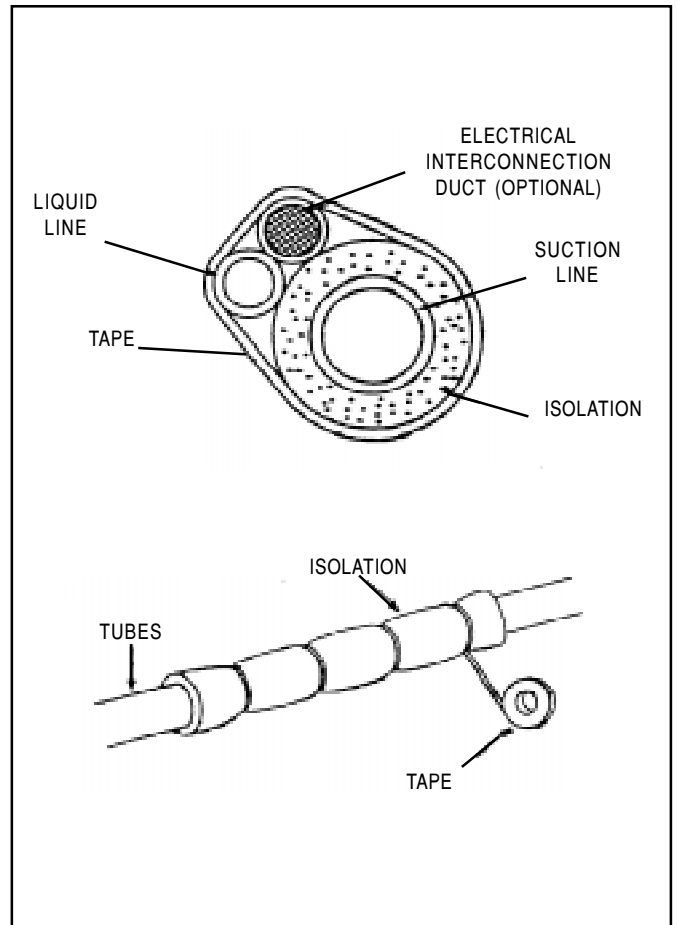


FIGURE 10 - INTERCONNECTION PIPES

To proceed with the refrigerant charge, just maintain the service valve in the original position (shut) and connect the manifold hose to the vent (valve Schrader) of the service valve.

OBS: Do not forget to purge the air from the hose.

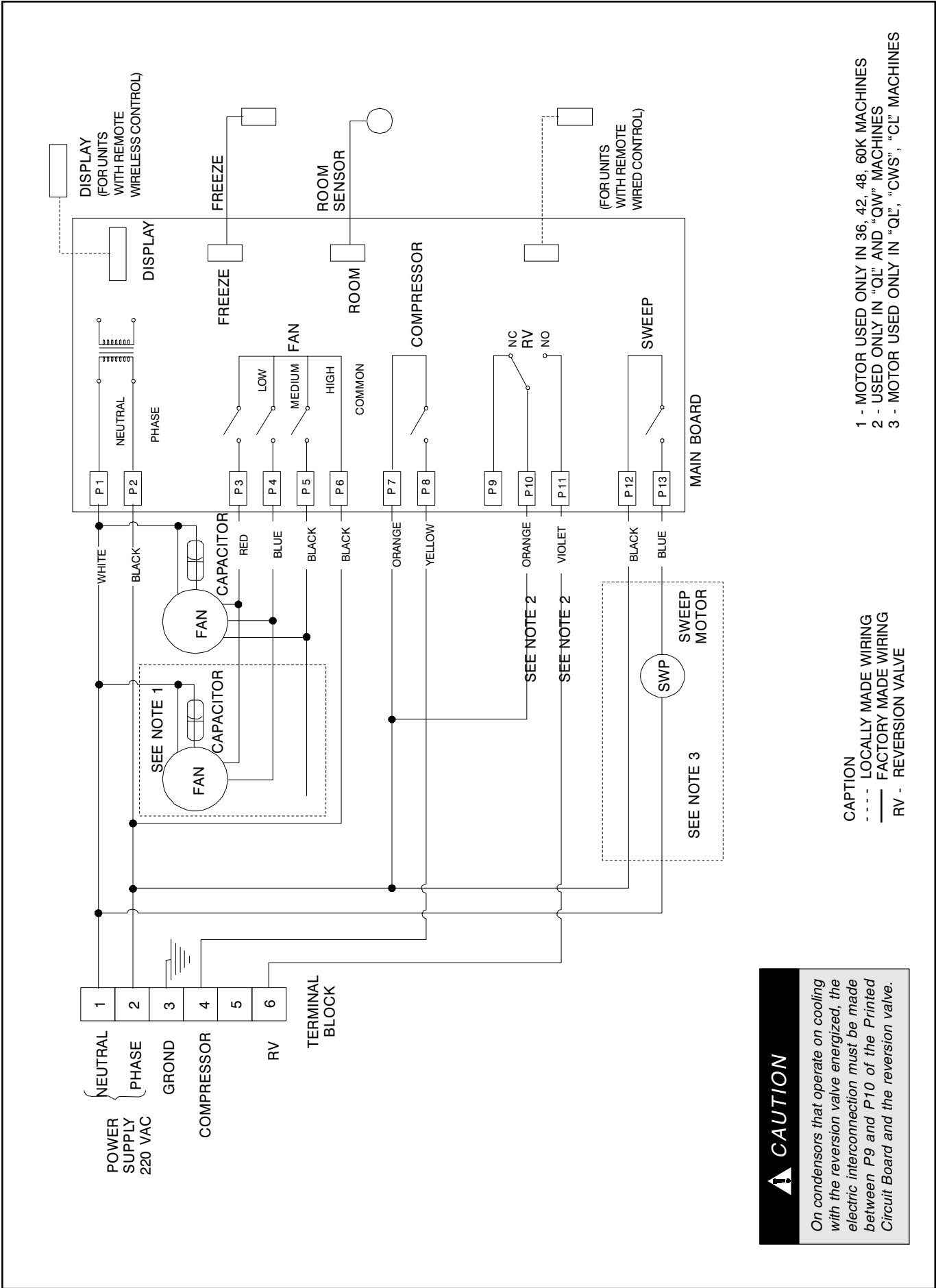
#### **⚠ WARNING**

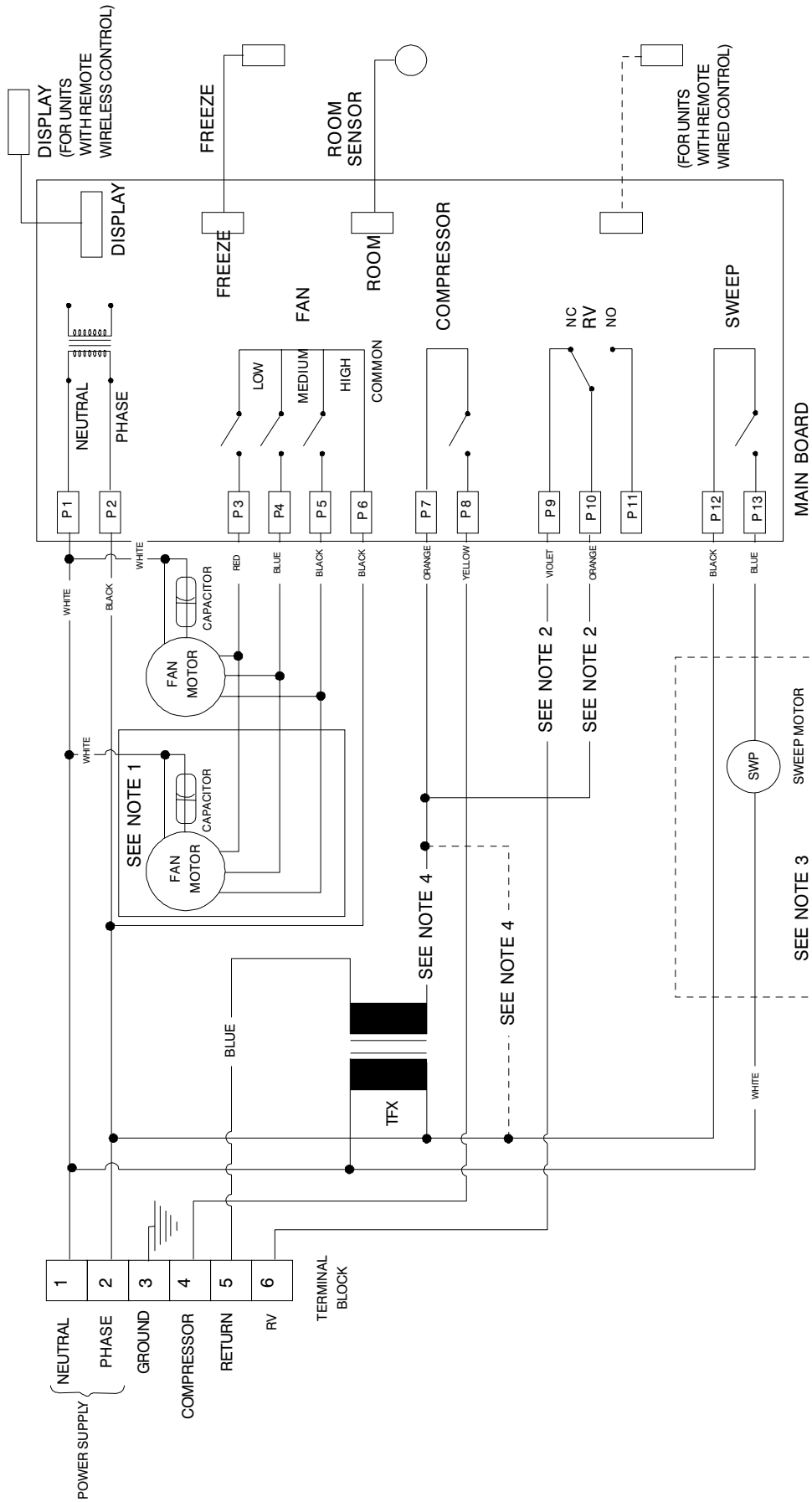
*Before turning on the equipment and after completing the refrigerant charge (if necessary), open the service valves close to the outdoor unit.*



# 7 - ELECTRIC INTERCONNECTIONS

## 7.1 - 42 LS COMMAND 220 V ELECTRIC CHART





- 1 - MOTOR USED ONLY IN 36, 42, 48, 60K MACHINES
- 2 - USED ONLY IN "QL" AND "QW" MACHINES
- 3 - MOTOR USED ONLY IN "QL", "CWS", "CL" MACHINES
- 4 - WHEN USING 38NX/NW/RQ/RQ CONDENSERS IT IS NECESSARY TO DISCONNECT THE ORANGE CABLE(S) FROM THE TRANSFORMER AND CONNECT IT (THEM) TO TERMINAL 2 ON THE TERMINAL BLOCK

**CAPTION**  
 - - - - - LOCALLY MADE WIRING  
 - - - - - FACTORY MADE WIRING  
 TFX - 220/24 V TRANSFORMER  
 RV - REVERSION VALVE

**CAUTION**  
 On condensers that operate on cooling with the reversion valve energized, the electric interconnection must be made between P9 and P10 of the Printed Circuit Board and the reversion valve.

## 8. INITIAL START - UP

Before turn the unit on, check the conditions above and the following items:

- \* Verify the appropriate fixation of all the electrical connections;
- \* Make sure there is no refrigerant leakage;
- \* Make sure the power supply is compatible with the electrical characteristics of the unit;
- \* Make sure the compressors can move freely on the vibration insulators of the outdoor unit;
- \* Make sure that all the service valves are in the correct operation position;
- \* Make sure the area around the outdoor unit is free of any obstruction in the taking or discharge of the airflow;
- \* Make sure to have a perfect drainage and no blockage in the drain's hose of the unit;
- \* When the outdoor temperature is too low, there will be a risk of freezing the indoor unit if the operation speed was adjusted to the minimum condition (cooling mode).

### CAUTION

*The fan motors of the units are lubricated in the plant. Don't lubricate when installing the units. Before turning on the motor, make sure the propeller or turbine fan is not loose.*

## 9. COOLING SYSTEM

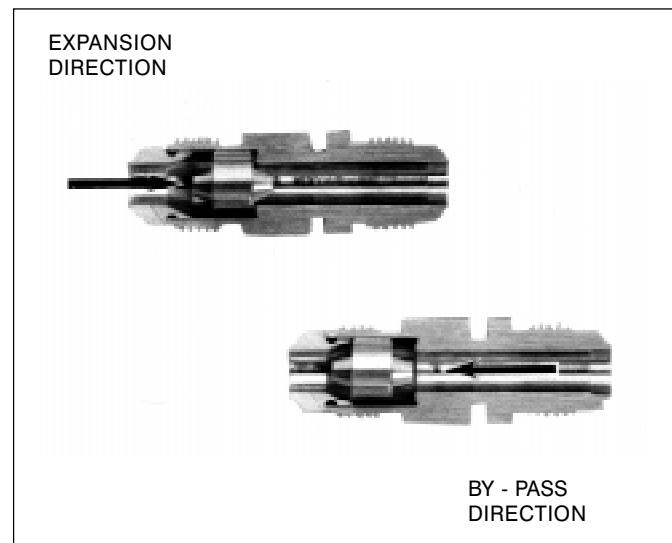
### 9.1 - EXPANSION SYSTEM

The evaporator units are factory-equipped with a system for refrigerant gas expansion called piston.

As shown below, this system has a small piece with a fixed, calibrated, easily removable hole inside a nipple to connect a 3/8" flare nut on the liquid line.

The piston application properties include a more accurate refrigerant gas flow into the evaporator compared, for instance, with the capillary system. Besides, pistons are easy to handle.

On reverse cycles (heating and cooling), the piston system requires a by-pass system, that is, two pieces are placed inside the nipple, one performing the expansion process and the other as a by-pass and vice-versa according to the gas flow direction (cooling or heating mode).



## 10. MAINTENANCE

### 10.1 GENERALITIES

#### CAUTION

*Before executing any maintenance services turn off the power that feeds the unit through the indoor unit.*

To avoid unnecessary repair services, check the following points carefully:

- \* Is the unit correctly connected to the main power, with the entire manual and/or automatic devices of control/protection of the circuit appropriately connected, without any interruptions such as: burned fuse, open switches, etc.?
- \* Is the thermostat correctly adjusted for the desired conditions?
- \* Is the fan's switch button in the correct position?

### 10.2 PREVENTIVE MAINTENANCE

**CLEANING** - Clean the outdoor unit with a soft brush, if necessary use also a vacuum cleaner to remove the dirt. After this operation, use a comb for fins, upwards, in order to smooth then out. The dust accumulation obstructs and reduces the airflow resulting in capacity loss.

Clean the casings with a flannel or soft cloth soaked in warm water and neutral soap. **DO NOT USE** solvents, carbon tetrachloride, waxes containing solvent or alcohol to clean the plastic parts.

**WIRING** - Check all the cables looking for deterioration and all the electrical connections for squeeze and corrosion.

**ASSEMBLAGE** - Make sure the units are installed firmly.

**CONTROLS** - Make sure that all the controls are working correctly and that the units operation is normal. Vibrations can cause undesirable noises.

**DRAIN** - Verify blockages or creases in the drain's hose. This can cause an overflow in the base pan and consequent leakage of the condensed water.

### 10.3 CORRECTIVE MAINTENANCE

It should be done in situations where a component obstructs the perfect operation of one or both the units.

On these occasions, it is necessary to consult the wiring diagrams fixed in the units.

### 10.4 DETECTION OF LEAKAGE

When there is suspicion leakage on the cooling mode, you should proceed as follows:

In case there is still enough pressure of refrigerant in the system, you may go straight to the detection the leakage through one of the processes indicated below.

If, however, the residual pressure is too low, a nitrogen cylinder should be connected to the system (use one of the service valves existent in the units).

Then, pressurize the unit up to 200 psig. Depending on the method to be used, a small amount of refrigerant should be added to the system. Add refrigerant first, then the Nitrogen.

#### 10.4.1 METHODS DETECTION

##### \* *Electronic Detector (refrigerant + Nitrogen)*

Search the leakage, passing the sensor of the unit close to the connections, welding and other possible leak points. Use low speed when moving the sensor. The equipment emits a sound or a luminous sign when passing by the leak point.

##### \* *Halide - Light Detector (refrigerant + Nitrogen)*

Similar procedure to the previous one, but in this case the sensor is replaced by a hose that is connected to a flame. Upon reaching a halogen refrigerant (R11, R12, R22, etc.) this flame turns green.

#### CAUTION

*Do not inhale the resulting gases from the refrigerant burn because they are highly toxic.*

##### \* *Solution of water and soap*

Prepare a solution with soap or detergent and spread it on the connections, welds and other possible leak points.

Wait at least 1 minute to check where a bubble may form.

#### CAUTION

*When in external environment, the wind can make the search difficult. A very poor soap solution is also inadequate because it won't form bubbles.*

##### \* *Method of Immersion*

The Method of Immersion in tank could be used for inspection in separated components of the unit (especially coils). In this case, the component should be pressurized to 200 psig.

#### WARNING

*Do not mistake air bubbles between the fins for leakage.*

## 10.4.2 REPAIRING THE LEAKAGE

After locating the leakage, mark the place appropriately and remove the pressure of the system by eliminating the refrigerant and/or Nitrogen, which might exist.

Prepare to do the welding (use Phoscopper weld or silver weld), proceeding it with passage of Nitrogen inside the tube (during the welding and at low pressure), avoiding the formation of oxides inside the tube.

Make sure the repair was successful, pressurizing and testing the unit again.

## 10.5 PROCEDURE OF VACUUM AND REFRIGERANT CHARGE

### 10.5.1 DEHYDRATION

Every system that has been exposed to the atmosphere should be properly dehydrated. That is possible if we accomplish appropriate evacuation.

To make a proper evacuation, it is necessary to have a VACUUM PUMP (not compressor) and a vacuum gauge.

The procedure is the following:

- \* First the access points to the system must be defined. Use the service valves in the outdoor unit on both the drop and the discharge sides (liquid line). That is, high-pressure valve connected to the piping of smaller diameter and the low-pressure valve connected in the piping of larger diameter.
- \* Only then is it possible to evacuate the system.

Basically, we can do in two ways:

#### \* Method of Dilution

Turn on the vacuum pump and make the vacuum in the pump (valve 1 shut - fig. 18).

Open valve 1 and let the system evacuate until it reaches at least 500 microns. To obtain the measure, close valve 1 and open valve number 2, allowing the vacuum gauge to feel the system pressure. After reaching 500 microns, isolate the vacuum pump and open valve 3, letting the Nitrogen in to break the vacuum. Isolate the Nitrogen cylinder.

Purge the Nitrogen through the connection that links the copper passage to valve 3.

Repeat the procedure at least twice, doing in the last stage the third evacuation.

At the end of this process, at least 200 microns should be obtained.

### CAUTION

*Never disconnect the copper tube of valve 3; just loosen the connection to purge the Nitrogen*

In order to obtain a precise reading of vacuum one should isolate the vacuum pump from the system. Close valve 1 and wait about 5 to have a precise measure. If the reading doesn't

remain steady either the system still contains humidity or there must be a leakage. Always verify all the connections (points 1, 3 and valves).

#### \* High Vacuum Method

It is applied with a vacuum pump capable to reach vacuum lower than 200 microns in only one evacuation.

Proceed as follows:

1. Turn on the vacuum pump, then open valve 1 (fig 19). Later on, isolate the vacuum pump and open the valve.
2. When a reading lower than 200 microns is obtained (try to reach the lowest possible value), the vacuum procedure will have been completed.

### WARNING

*The pump oil should be replaced periodically in order to guarantee the vacuum efficiency.*

### 10.5.2 REFRIGERANT CHARGE

After evacuating the system appropriately, close the valves of the manifold and isolate the vacuum pump, the vacuum gauge and the Nitrogen cylinder.

To do the refrigerant charge, replace the Nitrogen cylinder shown in Fig. 18 with a refrigerant cylinder. Purge the hose that links the cylinder to the service valve.

Open the service valve which gives access to the refrigerant cylinder and then the high-pressure valve of the manifold.

To load the system appropriately, verify in the identification labels of the units the amount of refrigerant that should be added to the system (see item 6.4 of this manual).

Remember that the charge varies according to the interconnection piping length of the units.

With the system shut down, load the refrigerant in liquid form through the service valve of liquid line (smaller diameter).

For help, use a scale (if not using a graduate cylinder). Allow at least 10 minutes before turning the unit back on.

Close the discharge valve of the manifold, open the suction valve and with the system in operation complete the charge with refrigerant in gas form (between 5% and 20% the total). Check in the scale the refrigerant weight added to the system. When the charge is complete close the suction valve of the manifold, disconnect the suction and discharge hoses. Close the cylinder valve.

The charge procedure will be complete.

**Note:** The total refrigerant charge is the sum of the charges of the indoor and outdoor units plus the interconnection piping. See item 13 for estimated charge values.

## 10.6 INTERNAL CLEANING OF THE SYSTEM

The burn of an electrical motor is recognized by the characteristic smell. When a motor of a hermetic compressor burns, the stator winding seal forms carbon and acid mud, in this case, clean the refrigerant circuit before installing a new compressor. Install a new capillary tube and outdoor condenser filter.

## 10.7 REFRIGERANT WITHDRAWAL

If for any reason there is need to remove/lose refrigerant, the service valves of these units allow to remove refrigerant from the system into the outdoor unit.

*Procedure:*

Step 1: Connect manifold hoses to the vents of the outdoor unit service valves.

Step 2: Close the service valve of 1/4" liquid line.

Step 3: Turn on the unit in cooling mode until that the system pressure reaches 2 psig. Then, close the service valve of the suction line 3/8 " so that the refrigerant gas remains withdrawn.

## 10.8 GENERAL CARE

- \* Maintain the casing and the grills as well as the area around the unit as clean as possible.
- \* Periodically clean the coils with a soft brush. If the fins are too dirty, use a jet of compressed air or water at low pressure in the opposite direction of the airflow. Be careful not to damage the fins.
- \* Verify the tightness of the connections, flanges and other fixations, preventing the occurrence of vibrations, leakage or noises.
- \* Make sure that the insulation of the metallic parts and pipes are in the correct place and in good conditions.

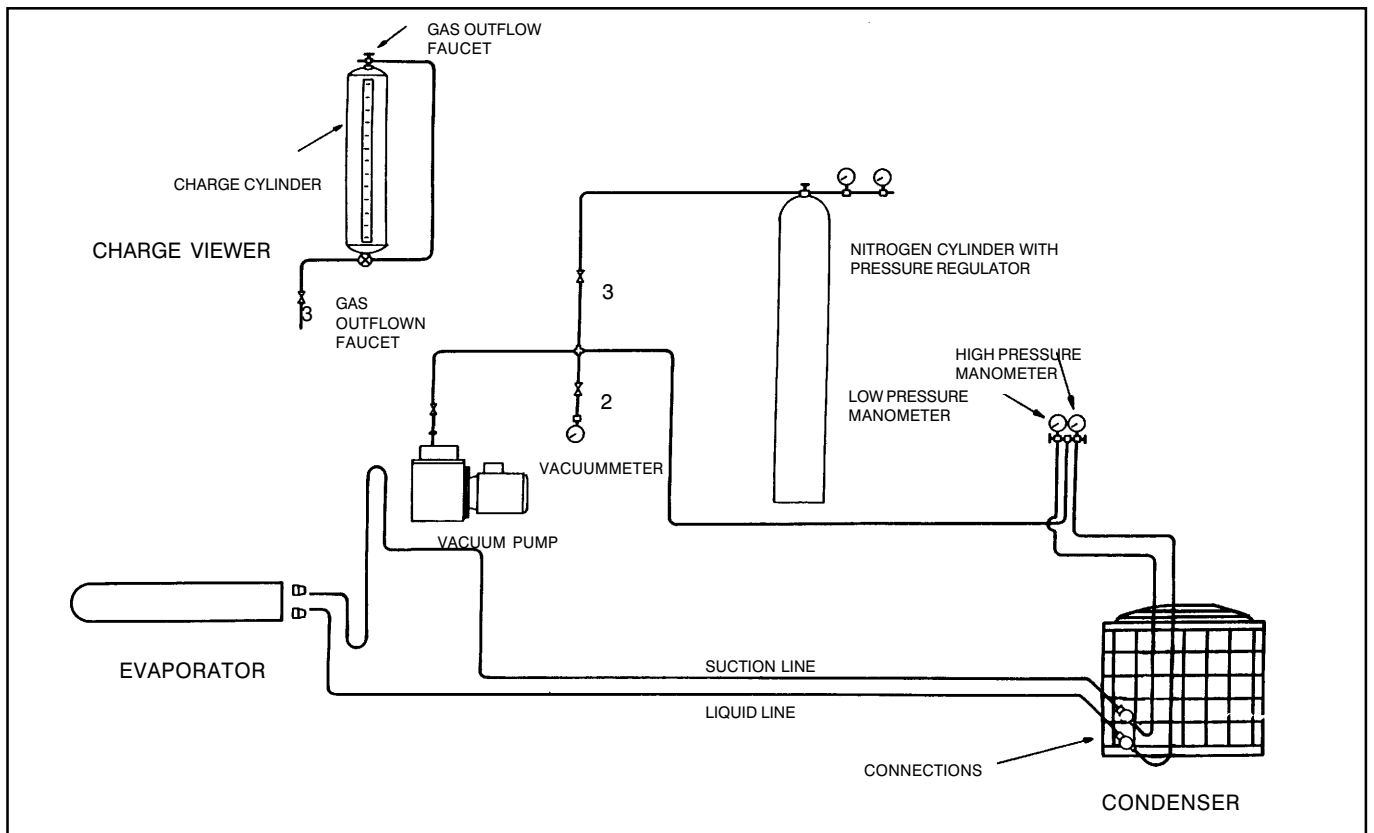


FIGURE 11 - CHART FOR OBTAINING VACUUM AND FOR REFRIGERANT CHARGING.

## 11. TROUBLESHOOTING GUIDE

Table guide of possible occurrences in the air conditioning equipment, with the possible causes and the corrections to be done.

OCCURENCE	POSSIBLE CAUSES	SOLUTIONS
<i>Compressor and motors of the outdoor and indoor units work but the room is not efficiently refrigerated.</i>	<i>Thermal capacity of the unit is insufficient for the room.</i>	<i>Evaluate the thermal load and instruct the customer to change the unit to another model of higher capacity, if necessary.</i>
	<i>Incorrect or bad installation.</i>	<i>Check the installation place observing height, location, sun rays in the outdoor unit, curtains in front of the unit etc.. Reinstall the unit.</i>
	<i>Leakage of gas.</i>	<i>Detect the leakage, repair it and reset the unit.</i>
	<i>Coil obstructed with dirt.</i>	<i>Remove obstructions from the indoor and outdoor units</i>
	<i>Low operation voltage.</i>	<i>Voltage supplied below the minimum tension</i>
	<i>Compressor without compression.</i>	<i>Replace the compressor.</i>
	<i>Low fan speed.</i>	<i>Check the capacitor phase of the fan motor and the fan motor itself, replacing it if necessary.</i>
	<i>Filter and/or capillary tube obstructed.</i>	<i>Replace the filter and capillary. In this case the indoor unit generally gets blocked with ice.</i>
	<i>Thermostat and switch button.</i>	<i>Adjust the thermostat and the switch correctly, according to instructions of the owner's guide.</i>
	<i>Service valve shut or partially shut.</i>	<i>Open the valve(s).</i>
<i>Compressor doesn't work</i>	<i>Power cord unplugged or with bad contact.</i>	<i>Place the power cord appropriately in the power supply.</i>
	<i>Low or high voltage.</i>	<i>See item 7.2. An automatic stabilizer with potency in Watts appropriate for the unit can be used.</i>
	<i>Defective switch button/remote control.</i>	<i>Use an ohmmeter to detect the defect. If necessary, change the switch button/remote control.</i>
	<i>Defective Thermostat.</i>	<i>Replace the thermal protector.</i>
	<i>Blocked compressor.</i>	<i>Proceed the compressor's start up, according to instructions in the Service Manual of the Training Section (AT-MS-B-03/89), in case it doesn't work, replace it.</i>
	<i>Overloaded circuit causing a breakdown on tension.</i>	<i>The unit should be connected to an exclusive wall receptacle.</i>
	<i>Excess of refrigerant.</i>	<i>Check it and purge if necessary.</i>
	<i>Defective thermal protector of the compressor (open).</i>	<i>Replace the thermal protector.</i>
	<i>Incorrect electrical connections or broken wires.</i>	<i>Check the wiring, repair or replace it. See the unit's wiring diagram.</i>

<b>OCCURENCE</b>	<b>POSSIBLE CAUSES</b>	<b>SOLUTIONS</b>
<i>Fan motors don't work</i>	<i>Power cord unplugged or with bad contact.</i>	<i>Place power cord appropriately in the power supply.</i>
	<i>Defective fan motor.</i>	<i>Proceed the direct start up of the fan motor, in case it doesn't work, replace it.</i>
	<i>Defective Capacitor.</i>	<i>Use an ohmmeter to detect the defect and if necessary, change the capacitor.</i>
	<i>Defective switch button/remote control.</i>	<i>Use an ohmmeter to detect the defect, if necessary change the switch button/remote control.</i>
	<i>Incorrect electrical connections or broken wires.</i>	<i>Check the wiring, repair or replace it. See the unit's wiring diagram.</i>
	<i>Propeller or blower wheel loose or blocked</i>	<i>Check, fastening it correctly.</i>
<i>Compressor doesn't operate on heating mode</i>	<i>Defective solenoid of reversing valve (burned).</i>	<i>Replace the solenoid.</i>
	<i>Defective defrost thermostat (open).</i>	<i>Replace the reversing valve.</i>
	<i>Defective switch button/remote control.</i>	<i>Use an ohmmeter to detect the defect. If necessary, change the switch button/remote control.</i>
	<i>Incorrect connections or broken wires.</i>	<i>Check the wiring, repair or replace it. See the unit's wiring diagram.</i>
	<i>Thermostat button settled on cooling.</i>	<i>Adjust the thermostat correctly.</i>
<i>Evaporator bloked by ice.</i>	<i>Bloked piston.</i>	<i>Start the unit again, opening the nipple. It is advisable to clean the components with liquid R22 or R-11 jets.</i>
	<i>Leakage of gas.</i>	<i>Eliminate the leakage and change all the refrigerant.</i>
<i>Excessive noise during the operation.</i>	<i>Gaps in the axis/bearings of the fan motors.</i>	<i>Replace the fan motor.</i>
	<i>Vibrating piping.</i>	<i>Check the place where the noise comes from and eliminate it.</i>
	<i>Loose parts.</i>	<i>Check and wedge or fix them correctly.</i>
	<i>Broken internal suspension's spring of compressor.</i>	<i>Replace the compressor.</i>
	<i>Propeller or blower wheel uneven or broken.</i>	<i>Replace it.</i>
	<i>Incorrect installation.</i>	<i>Improve installation (reinforce the pieces that have fragile structure).</i>
	<i>Normal.</i>	<i>Teach the customer.</i>



## 12. SCHEDULE OF PREVENTIVE MAINTENANCE

ITEM	SERVICES DE SCRIPTON	FREQUENCY		
		A	B	C
1º	<i>General inspection in the equipment installation, short circulation of air, distribution of the airflow of the units, blockage in the entrance and exit of air from the outdoor unit, exposure to thermal load.</i>			*
2º	<i>Check electrical installation.</i>	*		*
3º	<i>Wash and dry the air filter.</i>	*		
4º	<i>Measure tension and operation current and compare then to the nominal one.</i>	*		
5º	<i>Measure tension with blocked rotor and watch for tension decrease till the protector turns off.</i>		*	
6º	<i>Check tightness of all the electrical terminals of the units, avoiding possible bad contacts.</i>	*		
7º	<i>Check dirt obstruction and kneaded fins.</i>	*		
8º	<i>Check possible blockages or creases in the drain hose.</i>	*		
9º	<i>Clean of the casings.</i>		*	
10º	<i>Measure temperature differentia.</i>	*		
11º	<i>Check for gaps in the axis of the electrical motors.</i>	*		
12º	<i>Check positioning, fixation and evening of the propeller or blower wheel.</i>	*		
13º	<i>Check thermostat operation, switch button.</i>	*		
14º	<i>Measure balance pressures</i>		*	
15º	<i>Measure operation pressures</i>		*	

Frequency code: A - monthly B - quartely C - twice a year

### 13. TECHNICAL FEATURES

MODELS		42LSA12	42LSA18	42LSA24	42LSA30
NOMINAL CAPACITY (BTU/h)		12000	18000	24000	30000
SUPPLY (V-Ph-Hz)		208/230-1-60	208/230-1-60	208/230-1-60	208/230-1-60
FULL CHARGE CURRENT	MOTOR	0,6	0,7	0,83	0,79
FULL CHARGE CURRENT	MOTOR	100	130	160	160
START-UP CURRENT	MOTOR	ND	1,31	1,48	1,57
BREAKER		10	15	15	20
REFRIGERANT		R - 22			
EXPANSION SYSTEM (PISTON)		# 41 COOLING/HP	# 52 COOLING & 45 HP	# 52 COOLING & 51 HP	# 61 COOLING/HP
NET WEIGHT (KG)		16,5	22	28,5	28,5
SIZES 42 (mm) LxAxP		1000 X635 X265	1000 X 635 X 265	1380 X 635 X 265	1380 X 635 X 265
DRAIN DIAMETER (IN)		1/2"			
FAN	TYPE	CENTRIFUGAL			
	QUANTITY	02	02	02	02
	OUTFLOW (m³/h)	578	850	1215	1255
FINS	SURFACE AREA (m²)	0,18	0,18	0,28	0,28

MODELS		42LSA36	42LSA42	42LSA48	42LSA60
NOMINAL CAPACITY (BTU/h)		36000	42000	48000	60000
SUPPLY (V-Ph-Hz)		208/230-1-60	208/230-1-60	208/230-1-60	208/230-1-60
FULL CHARGE CURRENT	MOTOR	1,5	1,7	1,7	1,7
FULL CHARGE CURRENT	MOTOR	320	360	360	300
START-UP CURRENT	MOTOR	1,9	ND	2,62	2,62
BREAKER		20	25	25	ND
REFRIGERANT		R - 22			
EXPANSION SYSTEM (PISTON)		# 68 COOLING/HP	# 74 COOLING & 72 HP	# 81 COOLING & 78 HP	# 88 COOLING & 84 HP
NET WEIGHT (KG)		39,5	39,5	47	47
SIZES 42 (mm) LxAxP		1760 X635 X265	1760 X 635 X 265	2140 X 635 X 265	2140 X 635 X 265
DRAIN DIAMETER (IN)		1/2"			
FAN	TYPE	CENTRIFUGAL			
	QUANTITY	04	04	04	04
	OUTFLOW (m³/h)	1761	1827	2167,5	2167,5
FINS	SURFACE AREA (m²)	0,38	0,38	0,47	0,47

### 14. GENERAL INSTALLATION TIPS

CAPACITY BTU/h	SUCTION CONNECTIONS DIAMETER	LIQUID CONNECTIONS DIAMETER
	42LS	42LS
12K	1/2"	3/8"
18K	5/8"	3/8"
24K	5/8"	3/8"
30K	3/4"	3/8"
36K	3/4"	3/8"
42K	7/8"	3/8"
48K	7/8"	3/8"
60K	7/8"	3/8"

\* FOR GREATER LENGTHS THAN THE INDICATED ONES, CONSULT CARRIER.

\* UNITS AND EVAPORATORS HAVE FLARE-NUT TYPE VALVES.

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