

## INSTALLATION



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This document gives the correct rules to follow in order to correctly install the VIENTO 200 / 300 / 350 units.

## SAFETY FIRST



### MANDATORY BEFORE ANY ELECTRICAL OPERATION:

- DISCONNECT THE VEHICLE BATTERY:
  - First remove the battery ground (-)
  - then remove the positive battery (+)

### PERSONAL PROTECTIVE EQUIPMENT

- Always use adequate personal protective equipment before doing anything on this refrigerant unit.

## BODYBUILDER RECOMMENDATIONS



- Drain hose from the evaporator to the outside must have an angle to insure water to be drained out.
- A descent of 10 cm minimum must be applied between evaporator drain water hoses and the hoses inside the body (picture page 36).



1. Unpack the box contents in your warehouse.



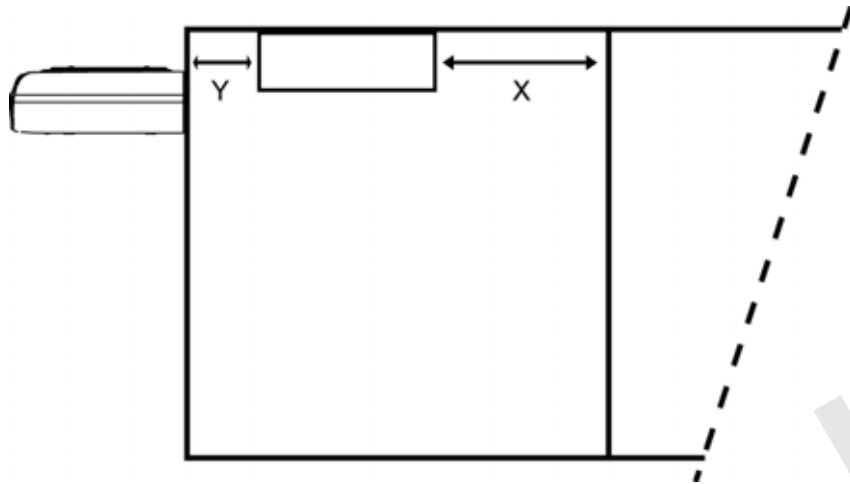
**KEEP THE DOCUMENT DELIVERED WITH THE UNIT !**

2. Unpack the box.

3. Check if the box content corresponds to the bill of material on the packaging.

- Condenser
- Evaporator
- Mounting kit
- Cab command

In the event of any abnormality (missing, damaged part or part number etc), fill in the form "Advance Warning, DOA, Claim"



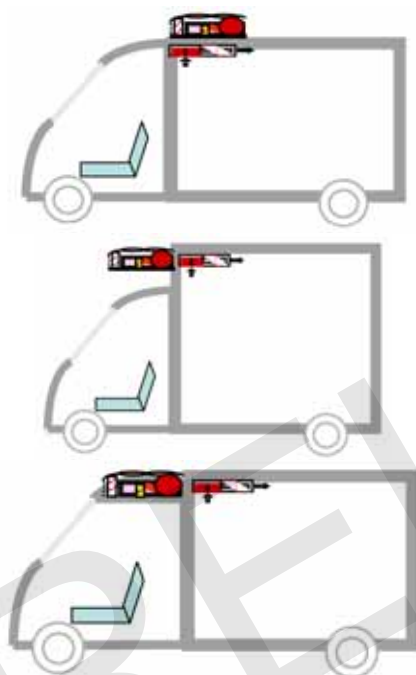
- Take care not to obstruct the air intakes on the evaporator section and the ventilation ducts.
- For any mobile partition installation, contact our Technical Department or refer to the following chart:

MODELS	Evaporator	X	Y
Viento 200	MXS 600	500 mm	150 mm
	MXS 850		
Viento 300	MXS 850		
	MXL 850		
Viento 350	MXS 1100	1000 mm	
	MXL 1100		



## RECOMMENDATIONS

- Before box preparation and unit installation commences, protect the vehicle roof and the refrigeration box floor (cover, cardboard...).

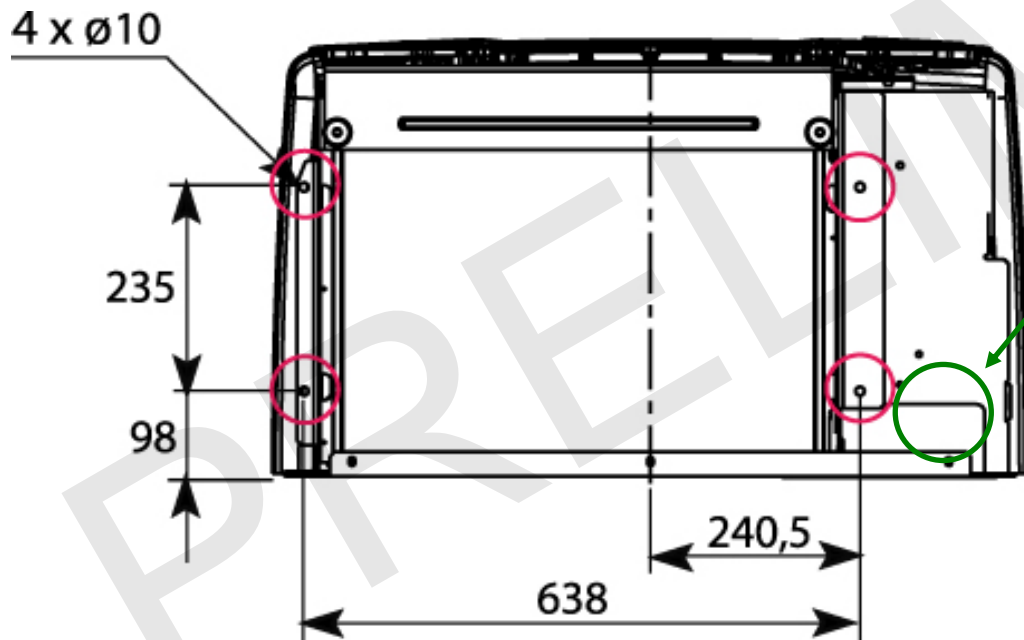


There are 3 possibilities to fit the unit:

- Roof top
- Nosemount
- Roof cut mounting



1. Present the drilling template – not supplied - (refer to the bodybuilder drawing)
2. Mark out the 4 fixing holes and the electrical harness and hoses hole
3. Drill the fixing holes.
  - drill  $\varnothing 10$  mm
4. For roof top mounting: drill a hole  $\varnothing 80$  mm to pass hoses and harnesses.







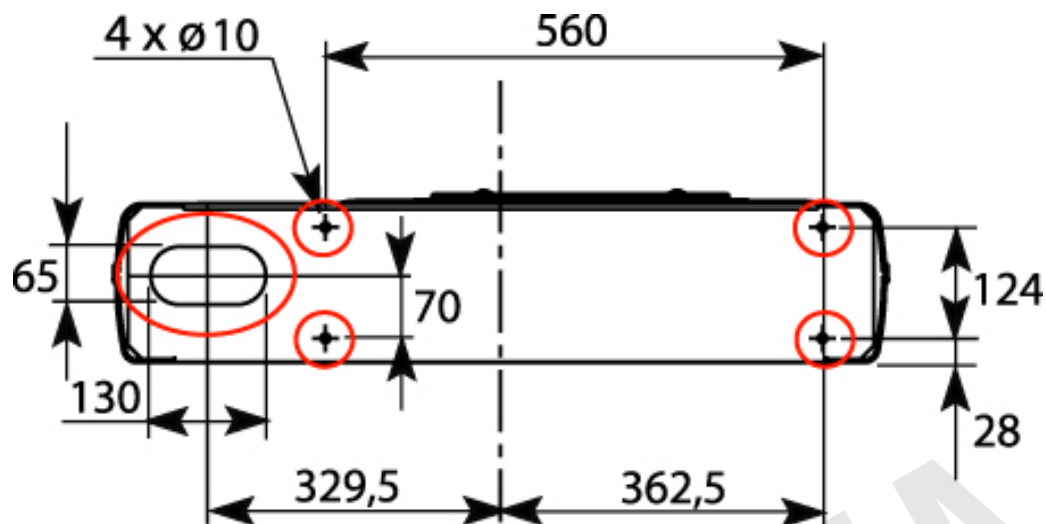
5. Install the 4 silent blocks:

- put silicone to waterproof on the bottom.
- put silicone to waterproof on the 4 screws before to install the host unit.



6. To pass harnesses and hoses between condenser and evaporator, drill the electrical harness and hoses hole.

- Roof cut mounting : on vertical face of the vehicle
- Roof top mounting: on the roof of the body (refer to bodybuilder drawing)



1. Present the drilling template – not supplied (refer to the bodybuilder drawing)
2. Mark out fixing and electrical harness and hoses holes.
3. Drill the fixing holes  
- drill  $\varnothing 10$  mm
4. Drill the electrical harness and hoses hole.



## NOTE :

- The drilling depends on the evaporator you have to install.
- Let a **minimum space of 150 mm** between the box wall and the rear of the evaporator.

1. Mark the fixing holes for the evaporator (refer to the bodybuilder drawing).

If needed, use the fixing material adapted to reinforcement done by the bodybuilder.

If you don't have reinforcement, you will have to use mushrooms (refer to section "Mushrooms" page 16).



- If body reinforced, install the insert using the adapted tool (manual or pneumatic).



2. Drill the electrical harness and hoses hole inside the box.

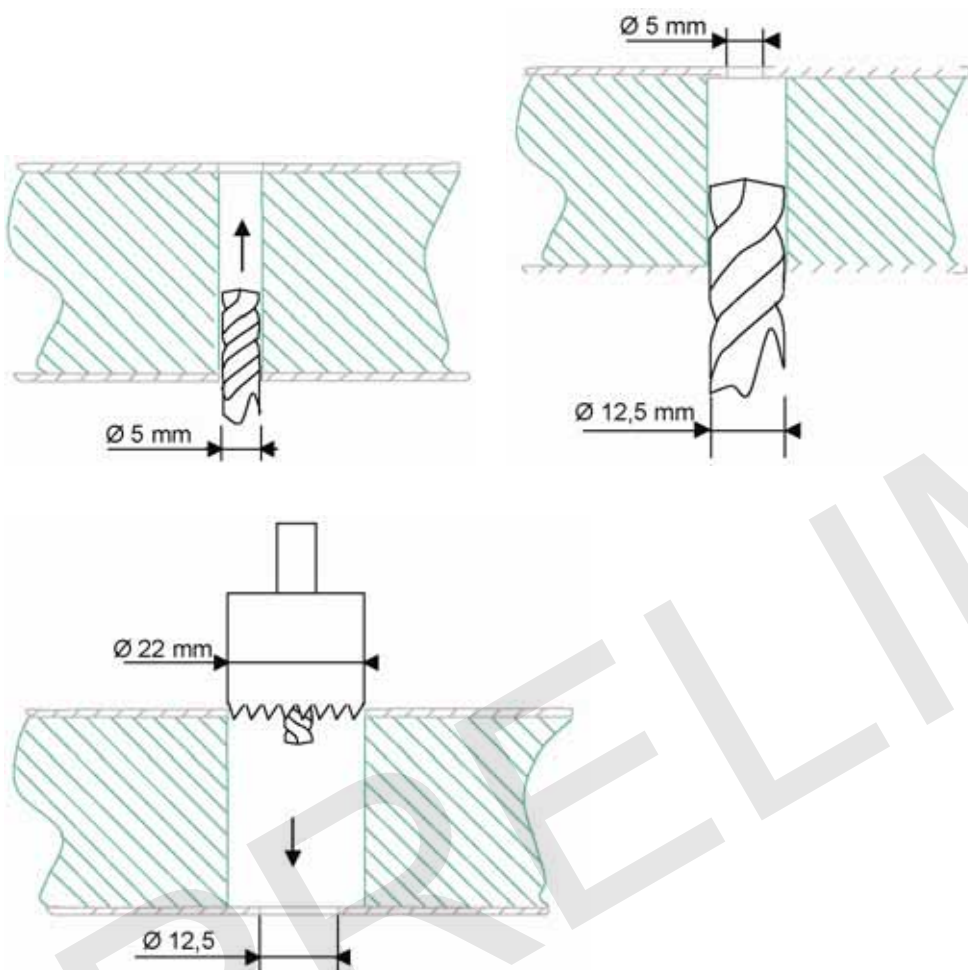


1. If body is not prepared to pass harnesses, refrigerant and water drain hoses, drill the hose inside body.



## RECOMMENDATIONS

A descent of **MINIMUM 100 mm** must be applied between the drain water hoses pipe and the hoses inside the body to help to drain water out.



1. **From box inside**, drill 4 holes  $\varnothing 5$  mm in the roof through and through (drill of minimum size 140mm)
2. Countersink with a drill  $\varnothing 12,5$  mm the 4 tapping drill holes realized at the previous step.



### RECOMMENDATIONS

Take care not to damage the  $\varnothing 5$  mm drilling of the box external skin.

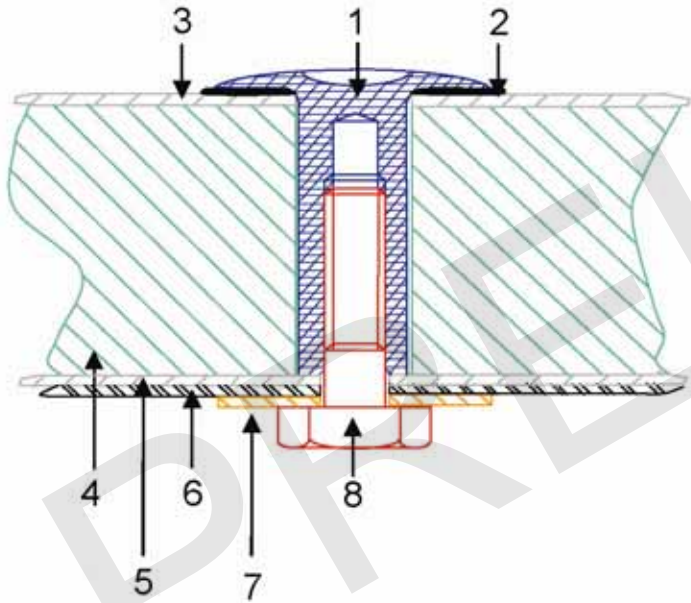
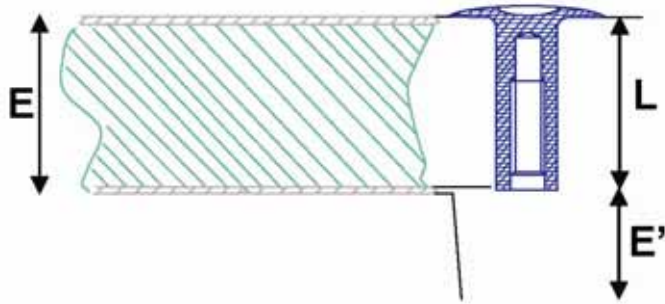
3. **From box outside**, countersink with a circular slitting saw  $\varnothing 22$  mm.



### RECOMMENDATIONS

Take care not to damage the  $\varnothing 12,5$  mm drilling of the box internal skin.



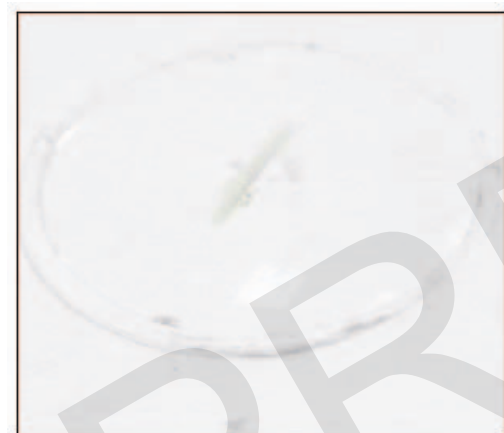


4. Measure the roof thickness.
5. Adjust the mushroom length (L) to the roof thickness minus the internal skin thickness ( $E - E'$ )

- L: mushroom length
- E: roof thickness
- E': internal skin thickness

## Mushroom in place

1. mushroom
2. silicon gasket
3. skin of external box
4. polyurethane foam
5. skin of internal box
6. evaporator upper side
7. washer
8. screw M12



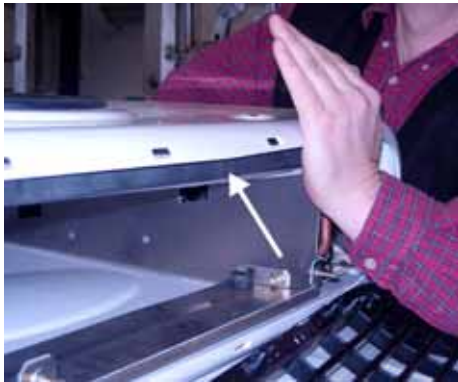
1. Apply silicon on the internal side of the mushroom head.
2. Put mushrooms in holes previously realized in box roof.

3. With a mallet, slightly crush the silicon gasket.
4. Follow silent block installation. Take care to clean silent block surface for a better sticking/water proof ness.



## 1. Remove the grill:

- remove the 4 fixing nuts
- remove the front grill



2. Remove the top cover:

- remove the 5 fixing screws.
- push the cover and remove it.



**GOOD**



**BAD**

1. Insert the top cover.



## RECOMMENDATIONS

Make sure that both sides of the top cover are well engaged as described on the pictures.

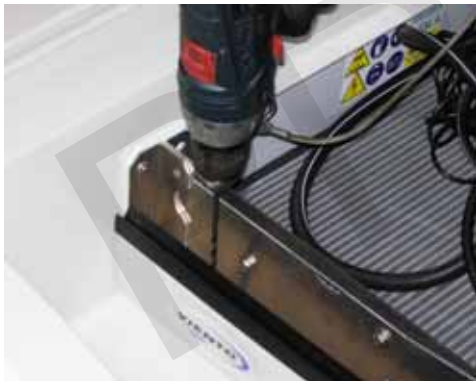
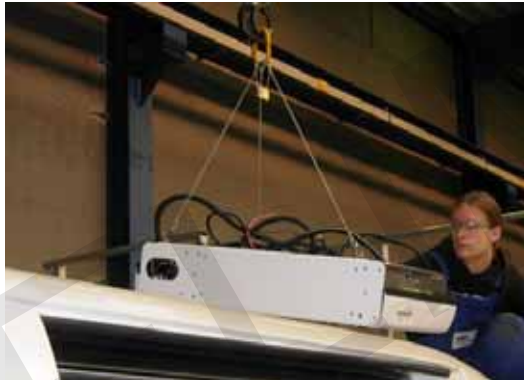


## RECOMMENDATIONS

Make sure that the pins of the front grill are well engaged into the bottom and top covers.

2. Put the front grill in place.
3. Tie the 4 nuts of the front grill.  
Tie the 5 screws of the top cover.

4.



5. Roof top and roof cut mounting installation:

- Drill the 4 fixing holes  $\varnothing$  10 mm in the bottom cover of the unit.

6. Nosemount installation:

- Use the 4 fixing holes at the rear of the frame (refer to "Box preparation/Drilling/Nosemount – page11)

7. Using the lifting device (P/N 07-60110-00) put the unit in place on the 4 silent blocks.

8. Roof top and roof cut mounting installation:

- Fix the unit with the 4 silent blocks and bolts delivered in the packaging.

9. Nosemount installation:

- Fix the unit with the 4 bolts.



1. Remove the two side panels.
2. Using the adapted tool, put the evaporator facing the fixing holes previously drilled.
3. Check the minimum distance between the rear of the evaporator and the box is correct (refer to the chart p6)
4. Tighten the screws.





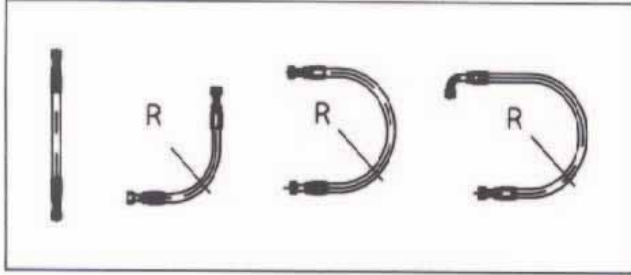
### RECOMMENDATIONS

- For a good functioning of refrigeration circuit, refrigeration hoses must be **clean and dry**.
- Hoses must be stocked in a dry area, with less variation in temperature as possible and sheltered from moisture.
- **The two ends MUST ABSOLUTELY been blocked with tight caps** to avoid any internal damages or condensation until their connection into the circuit.

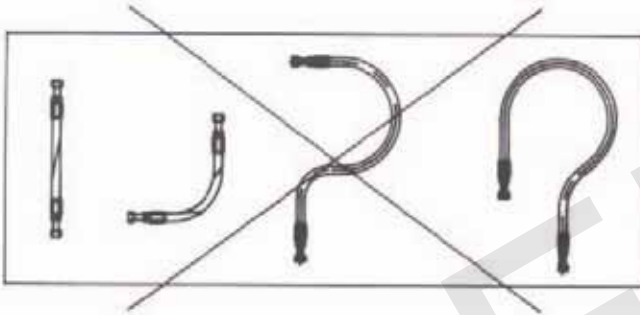


- To fit hoses and electrical harnesses, use as much as possible RSGU clamps.
- To protect hoses and electrical harnesses, use adequate rubber funnels to avoid cutting with metallic corners.

### Right installation



### Wrong installation



- Do not twist or curve the hose.
- Keep enough length to avoid length variation when the pipes are under pressure.
- Pipes length can vary between -2% to +4%.
- Using elbows and fittings make easier installations, assist accessibility and increase hoses/pipes life.
- Always insure that minimum radius is respected. Provide a radius as big as possible to avoid constriction.

Minimum curve radius	
Module 6	80 mm
Module 8	95 mm
Module 10	110 mm
Module 12	130 mm



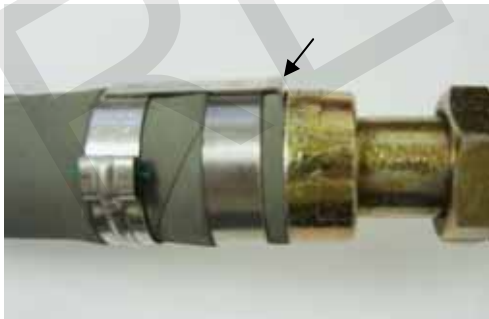
## Tools requested



1. Cut the hose at the right length with appropriate tool.
2. Put POE oil on the connector on fitting.



3. Widen hose clearance with adapted tool before to insert double-clic clamp.
4. Insert double-clic clamp on the hose.



5. Lubricate the fitting.

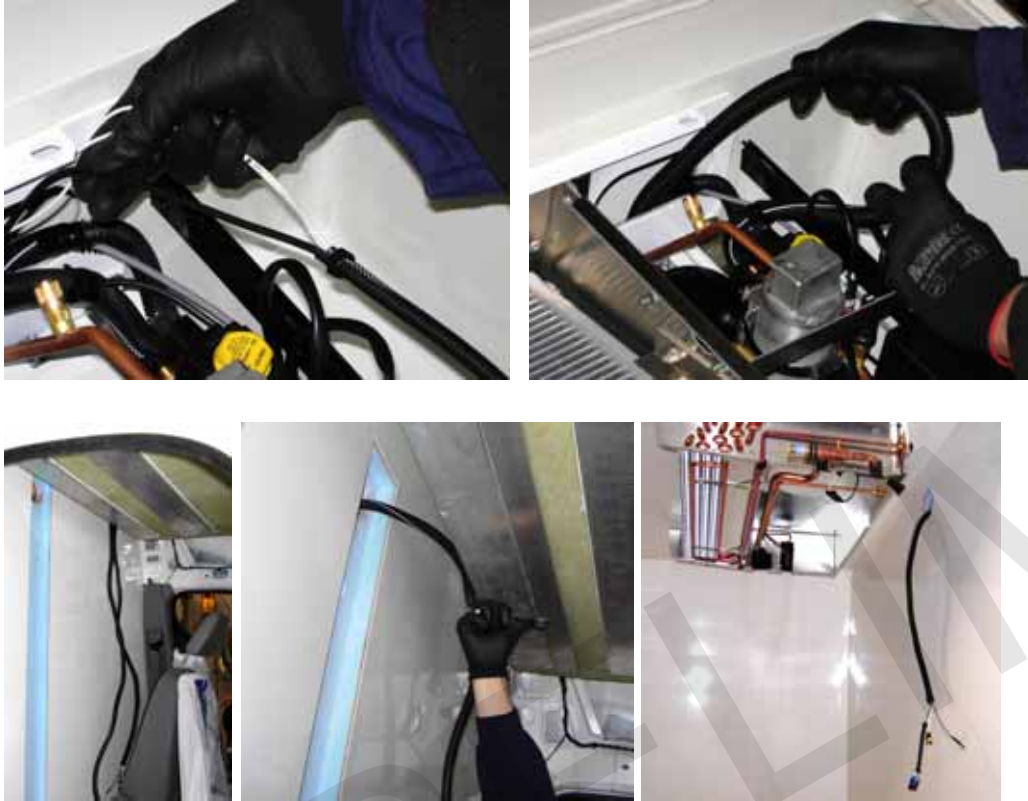
6. Don't forget to remove the hose cap.

7. Insert connector in the hose.

8. Crimp the double-click clamp with appropriate crimping tool.

Example of a good preparation

The clamp gauge (arrow) is set between the hose and the fitting stop. The clamp bands are perpendicular with the fitting and hose.



1. Run the electrical harnesses and ignition cable inside the vehicle body.



2. Run refrigeration hoses inside the vehicle body.
3. Run the drain water hose inside the vehicle body.



### RECOMMENDATIONS

- Always mark off the hot gas line (both sides of the hose) in order to avoid the confusion with the liquid line hose.
- Remove caps from the hoses **JUST** before connecting in order to avoid too much moisture in the circuit.



## RECOMMENDATIONS

- Always check that O-ring is still in place. If O-ring is missing, put a new one in place.

4 hoses have to be connected on the unit:

- Oil return line
- High pressure line
- Liquid line
- Hot gas line



4. Connect the OIL RETURN HOSE to the oil separator (lower fitting) to the compressor.
5. Connect the HIGH PRESSURE LINE to the oil separator (upper fitting) to the compressor.





6. Remove the Hot Gas valve (HGV) solenoid to connect the HOT GAS LINE hose easily.
7. Connect the HOT GAS LINE fitting to the Hot Gas valve.
8. Re-install the Hot Gas valve solenoid.



9. Connect the LIQUID LINE HOSE to the filter drier.



## RECOMMENDATIONS

45° fitting recommended if lateral outlet needed.

GENERALLY, use the appropriate fitting depending on the installation.



10. Attach regularly all hoses, harnesses with plastic tie-wraps.



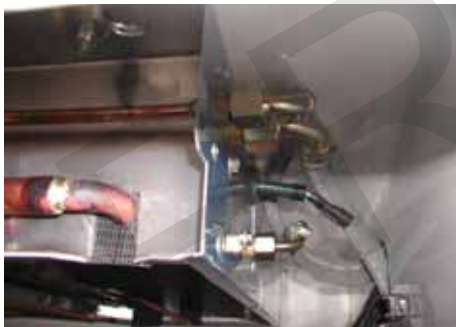
3 hoses have to be connected to the evaporator :

- **Suction pressure hose:** from the CRP valve outlet ( $\varnothing 16$  – module 12) to the compressor.
- **Liquid line hose:** from the expansion valve through the heat exchanger ( $\varnothing 8$  – module 6) to the host unit.
- **Hot gas line:** from the defrost element inlet ( $\varnothing 8$  – module 6) to the host unit.

1. Run hoses and harness through the hole.

- Suction line
- Liquid line
- Hot gas line
- Fan motor wires
- RAT cable
- Injection valve if so equipped

2. Prepare hoses as described in section "Unit hoses / Preparation - p27".



3. Install fitting and connect the SUCTION PRESSURE LINE hose ( $\varnothing 16$  – module 12) to outlet of the CPR valve.

4. Install fitting and connect the HOT GAS LINE hose -with red label ( $\varnothing 8$  – module 6) to the drain pan serpentin inlet.

5. Install fitting and connect the LIQUID LINE ( $\varnothing 8$  – module 6) to the Thermostatic Expansion Valve inlet (through the heat exchanger).

6. Attach all hoses with plastic tie-wraps.

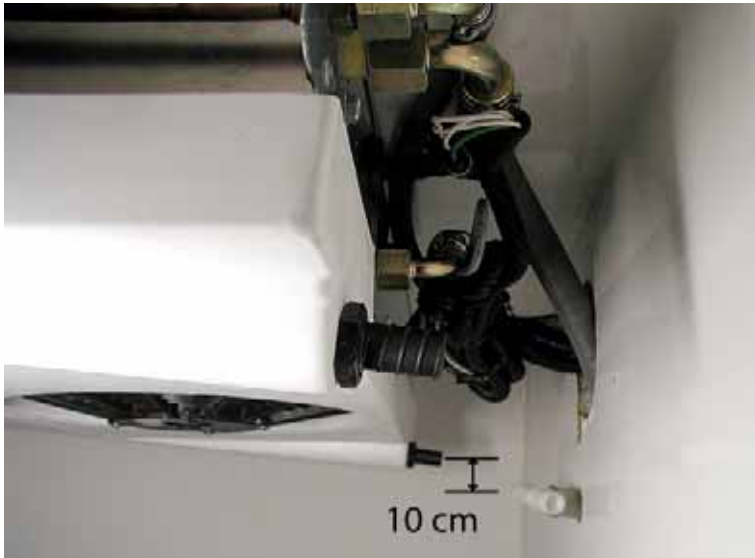


7. With the  $\varnothing 6$  clamp, install the RAT sensor.



8. Connect together evaporator fan connectors.

9. Put the bottom skin in place.



10. Put the drain water pipe in place.



## RECOMMENDATIONS

A descent of **MINIMUM 100 mm** must be applied between the drain water hoses pipe and the hoses inside the body to help to drain water out.



11. Connect the drain water hoses between drain water pipes and evaporator water tubes.

12. Fix tie-wrap sockets to maintain drain tubes in the right position.

13. Insulate the two holes with silicone.

14. Install the two evaporator sides.



### RECOMMENDATIONS

**Before drilling the floor, check the location of fuel tank, harness and/or tubes.**

1. Drill a hole in the cab floor (behind driver or passenger seat – depends on battery location).



### RECOMMENDATIONS

**Protect the hole (ex: armoured hose) to avoid harness and hoses damage.**

2. Run water drain hose through the floor.
3. Run battery cable through the floor.
4. Run the refrigeration hose.
5. Run the cab command and ignition cable to the dashboard.

Install a capping (not supplied) to cover the hoses and harness.



**NOTE:** For cab command harness fitting, refer to the vehicle mounting kit instructions.

1. Route the cab command harness to the vehicle dashboard.



### RECOMMENDATIONS

- Protect or move the harness away from metallic corners of the chassis.
- Avoid connecting the harness to/or in contact with heating source.
- Avoid connecting the harness to parts that may cause vibrations.





2. Fit the cab command (in specified location).



### RECOMMENDATIONS

- Take care not to pierce any harness or hoses within the dashboard.
- If the cab command is built into the dashboard, fit it as far as possible from the heating ducts.
- Maximum temperature of exposure: 70°C (158°F)
- The cab command **MUST NOT** be located behind the screen (T° too high and obstruction of windscreen).



### MANDATORY BEFORE ANY ELECTRICAL OPERATION.

**DISCONNECT THE VEHICLE BATTERY:** Remove the battery ground (-), the positive battery (+) and lock-out.

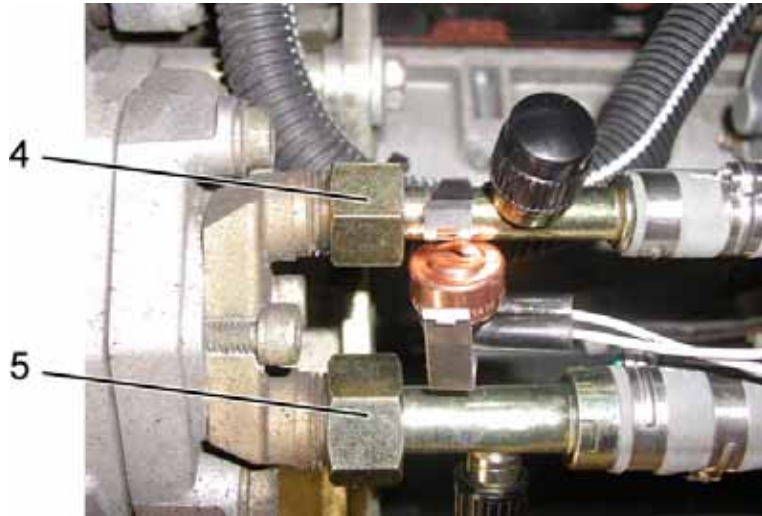


1. Move along hoses and battery harness to the compressor and vehicle battery.
2. Attach regularly the harness with plastic tie-wraps and base tie-wraps onto the chassis.
3. Insulate the hole with silicon.



### RECOMMENDATIONS

- Protect or move the harness away from metallic corners of the chassis.
- Avoid connecting the harness to/or in contact with heating source.
- Avoid connecting the harness to parts that may cause vibrations.
- Do not secure the unit harness to the vehicle harness or piping
- Avoid drilling the vehicle frame.



4. Connect the HIGH PRESSURE HOSE.

5. Connect the SUCTION PRESSURE HOSE.

6. Connect the OIL RETURN HOSE if available (under the compressor).



7. Install injection thermostat on the compressor High pressure line fitting with the clamp.



## RECOMMENDATIONS

Take care to place correctly the thermostat in order to have a good contact with the fitting.

8. Fit injection thermostat wires and compressor clutch wires in a retractable sleeve.
9. Insert terminals in the injection thermostat.



10. Protect the wires with sleeve.



11. Maintain all cables with plastic tie-wraps.



1. Route the ignition cable to the vehicle fuse box.
2. Connect the white wire onto the fuse holder supplied in the mounting kit (1A).
3. Refer to the corresponding mounting kit instruction to connect the +12Vdc ignition live.

Install the 80 amps fuse holder as closed as possible from the 12 Vdc battery.

Cut the battery harness to the required length.



4. Connect the fuse.
5. Put grease on the fuse holder connections.
6. Connect the + battery (red). Crimp the terminal with adapted crimping tool.



7. Install the 80 amps fuse in the fuse holder.
8. Install protection cap on the fuse.



9. Connect unit ground (-) to the vehicle chassis.
10. Re-connect the ground (-) of the vehicle battery.



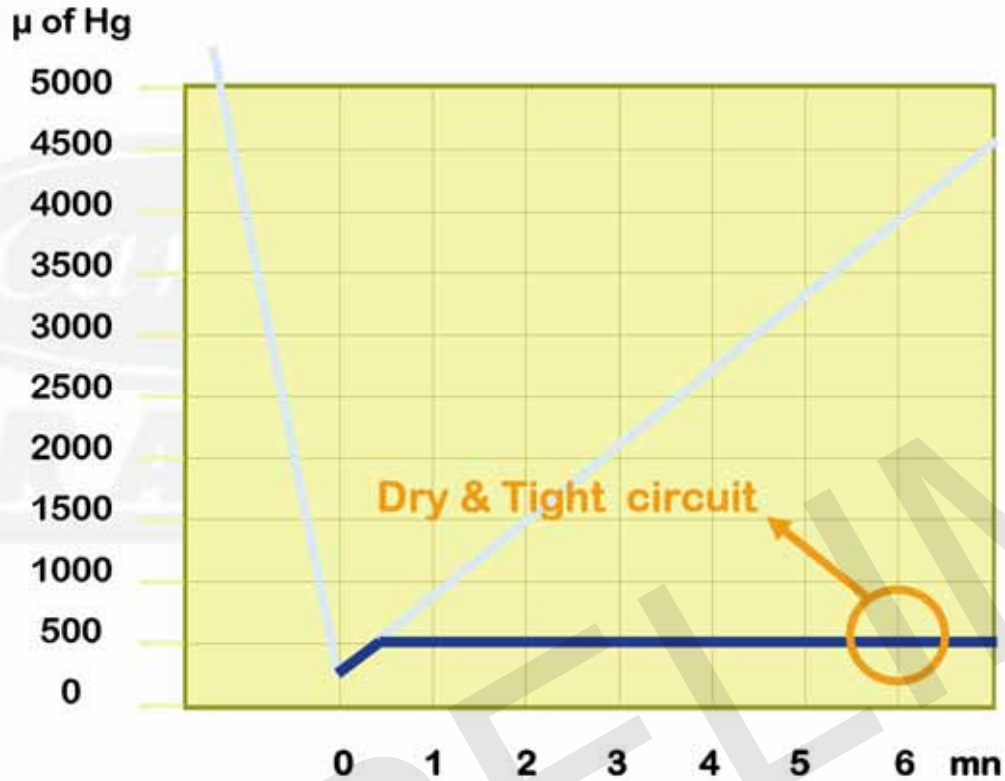


## REQUIREMENT

- 1 vacuum pump
- 1 manifold gauges (4 connections)
- 1 vacuummeter

## To check gas leak

1. Install manifold gauges on the compressor side.
2. Connect the vacuum pump to the manifold gauges.
3. Start the vacuum pump and vacuum for 15 mn: to remove the air in the circuit.
4. After 15mn, stop the vacuum pump.
5. Connect the nitrogen to the manifold gauges.
6. Put 15 bar (219 psi) in the circuit.
7. Use bubbles water on all refrigeration fittings
8. No bubbles formation means that the circuit is tight.



## To vacuum the circuit

1. Remove the nitrogen.
2. Start the vacuum pump.
3. Apply "Triple evacuation" process (refer to refrigeration training module)
4. Stop the vacuum pump.
5. Check if vacuum is complete with vacuumeter. (refer to refrigeration training module)



## REQUIREMENT

- 1 manifold gauges (4 connections)
- 1 refrigerant cylinder
- 1 scale - minimum precision requested: 5%

### After vacuum, charge the circuit

1. Install the manifold gauges on "Free Schrader" fitting located inside the condenser on the high pressure line.
2. Place refrigerant cylinder on scale and connect charging line from cylinder to manifold.
3. Purge charging line at inlet manifold.
4. Note the weight of refrigerant cylinder. **Be sure that the unit is stopped during this operation.**
5. Open liquid valve on refrigerant cylinder and allow the liquid refrigerant to flow into the unit until the correct weight of refrigerant has been added as indicated by weight scale.

6. When refrigerant cylinder weight (scale) indicates that the correct charge has been added, close the manifold valves.

Refrigerant charge	
Viento 200	0.85 Kg $\pm$ 5%
Viento 300	1 Kg $\pm$ 5%
Viento 350	1,1 Kg $\pm$ 5%

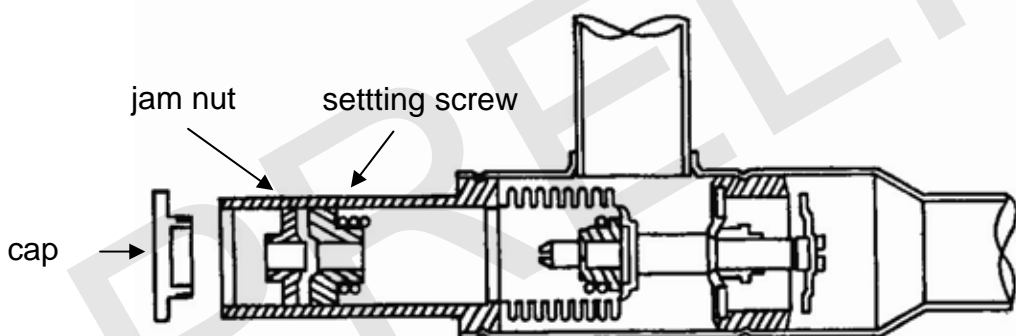


The Compressor Regulation valve is a device designed to regulate the flow of refrigerant returning to the compressor from the evaporator, this ensures correct capacity for the unit.

The Compressor Regulation valve also reduces the load on the compressor during start-up & whilst in operation which is why it is important it is correctly set-up on commissioning.

#### Adjustment has to be done:

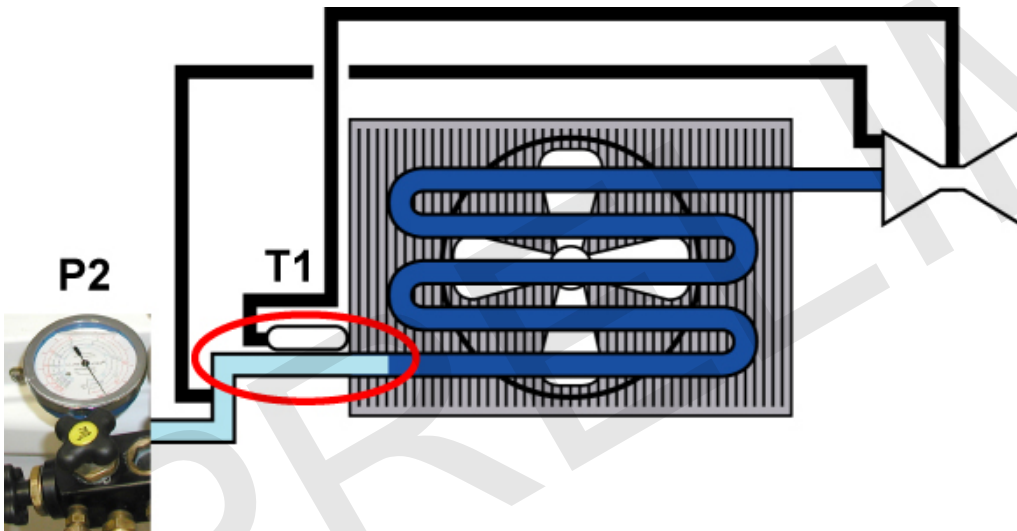
- Road operation
- Heat or defrost mode
- Compressor speed at 2400 rpm



1. Connect manifold to CPR fitting.
2. Start the unit in Heating or Defrost mode.
3. Check compressor speed: 2400 rpm.
4. Remove CPR cap.
5. Adjust CPR to get gauge pressure value with hexagonal socket head wrenches (n°8) :
  - To raise the suction pressure : turn the setting screw clockwise
  - To lower the suction pressure: turn the setting screw counterclockwise.

CPR adjustment			
	R134a	R404A	
Viento 200	3 bar	2.7 bar	
Viento 300	2.2 bar	LA 1,85 bar	HA 1.25 bar
Viento 350	2.8 bar	LA 3.4 bar	HA 1,8 bar

6. When the setting has been adjusted, tighten the jam nut securely against the setting screw to prevent any movement of the setting screw due to vibrations in the unit.
7. Replace the cap.



The Thermo Expansion valve is a precision device designed to meter the flow of refrigerant into an evaporator in exact proportion to the rate of evaporation of the refrigerant in the evaporator.

The Thermo Expansion valve can control the refrigerant gas leaving the evaporator at a pre-determined superheat.

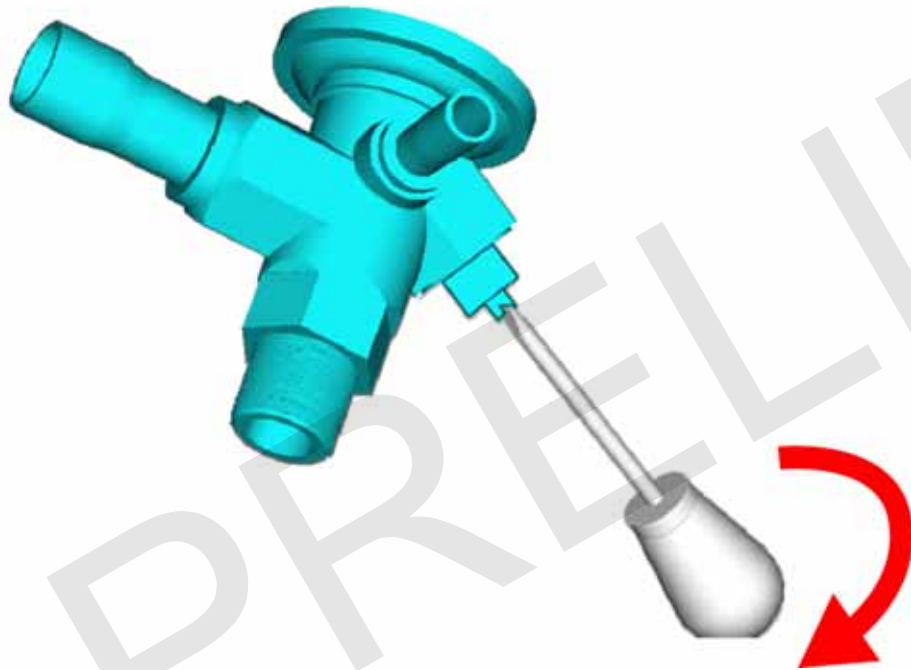
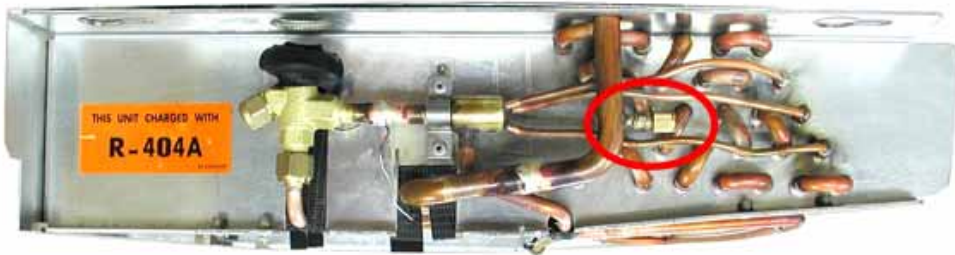
The superheat is the temperature difference between T1 (Temperature measured at remote bulb location) and P2 (Evaporation temperature of the last liquid drop).

- T1 : Temperature at remote bulb location
- P2 : Evaporator outlet pressure
- S : Superheat

# Operation & Service Manual



Installation   Commissioning   Settings   TXV setting



1. Connect manifold to evaporator outlet fitting.
2. Install a sensor on the expansion valve bulb location.
3. Run the unit on **COOLING** mode.

4. Correct superheat:
  - Turn anti-clockwise to increase flow & decrease superheat
  - Turn clockwise to decrease flow and increase superheat.

TXV adjustment	
Viento 200	8°C at box temperature 0°C (14.4°F at box T° : 32°F)
Viento 300	4°C at box temperature -20°C (7.2°F at box T° : -4°F)
Viento 350	