AIR CONDITIONER COACHBUS - CITY BUS

CC 305 - CC 335 - CC 355

Owner's Manual
Warranty Certificate

Rev.02 - October 2019
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Valeo

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OBSERVATION: to get the best air conditioner performance we recommend that you read this manual carefully before starting operation.
Keep this manual with your vehicle for reference.

VALEO Climatização do Brasil - Veículos Comerciais S/A offers a full line of equipment for bus air conditioning systems for vans, micro and midi buses, commuter, articulated, coaches and double-deckers.

Air conditioning system that is modern and high quality, the products of VALEO Climatização do Brasil - Veículos Comerciais S/A have been developed looking for comfort and tranquility to passengers that uses the public transport.

However, you need to take care to assure a good use and operation of the air conditioning system, and then you can obtain a better performance of its technology resources.

It is mandatory to do the preventive and corrective maintenance procedures, they must be accomplished by experts or dully technicians. Looking for improving and updating the refrigeration technical teams, this manual describes the fundamentals of our air conditioning system based on the most important thermodynamic formulas.

You can find operation instructions of VALEO Climatização do Brasil - Veículos Comerciais S/A air conditioning too, besides it advises you to follow technical procedures of adequate preventive maintenance obeying environmental and safety rules.

Frequent training for technical team make them able to get right diagnosis from equipment (appliances) to accomplish the servicing.

correctly with quality and responsibility, assuring to the whole fleet a perfect operation of VALEO Climatização do Brasil - Veículos Comerciais S/A equipment.

Warrant Terms

VALEO Climatização do Brasil - Veículos Comerciais S/A warrants its products for one year in accordance with the terms listed below:

1 - The warranty will be valid for the period above specified, counting from the date when the equipment is installed in keeping with the warrant certificate, even after the property there of has ben transfered.

2 – Should the equipment be installed by a third part, VALEO Climatização do Brasil - Veículos Comerciais S/A warrant only the product and not its instalations.

3 - During the stipulated period, the warranty completely covers the workmanship and spare parts used to repair defects duly identified as being:
premature failure of material and components defects used on its manufacture.

4 - Only a techinician from the VALEO Climatização do Brasil - Veículos Comerciais S/A authorized network of services is qualified to repair the defects coverd under the warranty.

5 - The warranty approval is subject to the technical analysis of the defects shown in the components and operational conditions to which the equipment has been subjected.

6 - No claims will be accepted if the vehicle is still in use after the defect is found, even if there is lack of pieces, delay in transportation or any other such incident.

7 - The Warrant Loses its Validity

a) If the installation or use of the product is not in accordance with the VALEO Climatização do Brasil - Veículos Comerciais S/A technical recommendations.

b) If the product suffers any damage caused by improper use, neglect, accident, failures caused by external agents and even lack of maintenance (see owner's manual) or services performed by unqualified person.

c) If the warranty certificate and/or the serial number of the product are adulterated, overwritten or damaged.

d) If defects or unsatisfactory performance are caused by the use of non original spare parts and in disagreement with the technical specifications from VALEO Climatização do Brasil - Veículos Comerciais S/A.

8 - The Warranty Does Not Cover

a) Displacement of the bus for repairing of the equipment. In case the customer requests to be attended in the same place where products is operating, the collection or not of the visitation charge will be the criterion of the authorized service provider.
b) The attending to the consumer, free or paid, in cities that do not have authorized services providers. So the expenses with displacement are the sole responsibility of the owner.
c) Lack of proper preventive maintenance, as described in the preventive maintenance item in this manual.
d) Replacement of bearings, belts, filters in general and lubricating oil, since they are considered items of natural wear.
Bearings, belts and alternators have limited warranty as follows:

- Bearings in general = 60,000km or 1 year, whichever occurs sooner.
- Belts in general = 20,000km or 3 months, whichever occurs sooner.
- Alternators = 1 year with no mileage limit, however, respecting the conditions established in these warranty terms and the manufacturer's technical specifications.

e) Loss or loss of profits caused by the stoppage of the vehicle due to non-operation of the equipment.

- Preventive Maintenance Frequency Check List

WEEKLY	1 - Clean or change the return air filter.
	2 - Check out the belt stretchiness condition and compressor with alternator alignment, observing the wear and tear of them.
	3 - Check the water level of the radiator reservoir. See note (*)
MONTHLY	1 - Accomplish the weekly check list.
	2 - Clean the condenser capillary tube coil (Apply only water and neutral non-aggressive soup to cooper and aluminum). See note (**)
	3 - Check if the evaporator hatches are closed to avoid air intake into the equipment.
	4 - Check the refrigerant charge: wait 15 minutes, it has to flow through the liquid display without bulb formation.
	5 - Check the compressor oil level: wait 15 minutes, it must be 3/4 up to 1/4 full at oil display.
	6 - Test the equipment operation functions: cool / fan (high and low speed) / heat / dry (air renewing) modes.
	7 - Lubricate the components of the compressor support. It includes articulation (elbows), axles, bushing and pulleys, if necessary.
	8 - Operate the heating system (if any) for at least 30 minutes.
TRIMESTRAL	1 - Accomplish the monthly check list.
	2 - Measure the exhaust suction pressure, temperature and suction line condition.
	3 - Check the tightening of alternator potency cables fuses in general, electric board and start motor.
	4 - Measure the condenser and evaporator fan flow consumption (check their air outflow).
	5 - Measure the electromagnetic clutch coil.
	6 - Measure the Voltage and Current from alternator.
SEMESTER	1 - Accomplish the trimestral check list.
	2 - Clean the evaporator capillary tube coil (Apply only water and neutral non-aggressive soup to cooper and aluminum). See note (**)
	3 - Clean the evaporator drain.
	4 - Check out the oil retainer felt of the compressor sealing part.
	5 - Look carefully, if there is any leakage at coupling spots: oil leakage, refrigerant leakage.
	Check if there are any loose, free, damaged, broken, worn parts, rusty, melting, cracked or bad fractioning to the bus body.
YEARLY	1 - Accomplish the semester check list.
	2 - Test the compressor efficiency at 1500 RPM.
	3 - Make notes about the compressor oil pressure at 1000 RPM.
	4 - Check the opening and closing pressures of high and low pressure switches.
	5 - Check the screws or bolts that attach the compressor support and equipment, checking the right torque.
	6 - Clean the air conditioning body getting rid of any dust/scrap at components: evaporator, condenser, clutch compressor, alternator, alternator, relay and control board. See note (**)

IMPORTANT: If you do not accomplish the preventive maintenance check list as above, it implies to total or partial loss of warranty coverage.
The actions of preventive maintenance written in this manual have been based on normal conditions. Just in case of environment contaminated and bad weather conditions, then you must do the maintenance more frequent.

NOTES (*): if necessary, fill it in with water and additives, follow the recommendations of the OEM Body Builder.

(**): when cleaning using water, protect electrical and electronic components to prevent damage.

- Refrigerant Gas R134a

VALEO Climatização do Brasil - Veículos Comerciais S/A products apply for R 134a. The se of different type of gas, low quality or from unknown brands will cause low performance from the refrigeration and damage the equipment components.

ATTENTION: under no circumstances, refrigerant cannot be spoiled at the atmosphere.

- Dry Filter

We recommend that you shall preventively change the drier filter every 3 years. Just in case, you need to refill in the equipment with gas, we recommend you replace to a new filter to extinguish any dirt out of the system.

- Compressor Sealing Part

In order to avoid leakage at the sealing part of the compressor due to lack of lubrication, then the air conditioning must be working at cool mode for at least 15 minutes, once every 15 days.
The sealing part is lubricated by the compressor oil and in its normal operation allows a small leakage of 0.05 ml per hour under operation.
Check frequently the reservoir and/or felt then remove the excess of it.
Dispose the old oil as your Country regulations and laws.

- Heating system

We recommend that you enable the heating system frequently (once a month) to prevent the buildup of solid system particles that lodge in the hot air shutoff valve seat.

IMPORTANT: check reservoir water level. If necessary, fill it in with water and additives, follow the recommendations of the OEM Body Builder.

- Oil

We recommend you that you shall preventively change the air system oil every two years or 10.000 working hours, whatever becomes first.

- Ducts

The cleaning of the air ducts must be done every tree months, it can be earlier, depending on: the frequency of operation of the air conditioning system, quantity of passengers and resistivity of the environment where it is driven. This cleaning is the responsibility of the vehicle owner´s only, he is in charge of this cleaning in order to offer good air quality to his passengers.

NOTE: ducts are components of the bus body.

- Pulley Belts

In order to increase the lifetime of the belts, the strength/stretchiness must be as low as possible, but working, not leaving them skidding without any friction. Too low stretchiness on the pulley belts can cause overheat and too much skidding, causing early break.
Too much stretched belts diminish their lifetime and from roll bearing and from sleeves, this problem can cause engine interior and compressor damage.
After changing the belts, check their stretchiness back again after 48 working hours.
It is recommended not use different brands. Install assemblies with the same diameter/length of the series and do not apply new belts beside old ones. Putting the assembly into action without one or two belts for a long time can cause a damage inside the “v” groove of the pulley. It will cause wear in that “v” groove, so the new belt may not be stretched accordingly.

SAY NO TO RECONDITIONED PARTS

The application of reconditioned parts will diminish the air conditioning efficiency, will overcharge the electric system causing early brake of the compressor and set a fire!

IMPORTANT: the vehicle owner must do preventive maintenance actions. If you do not do the preventive maintenance as described in this chapter, it implies you lose partially or full warranty coverage.

ATTENTION: Just in case a problem happens in the refrigeration system, then it must be repaired in an authorized shop or qualified professional.
If a third party installs the equipment, VALEO Climatização do Brasil - Veículos Comerciais S/A, guarantees only the product, not the installation of it.

The following items are in charge of the OEM Plant (Bus Body Builder).

- **Driver's evaporator:**
Problems with any driver's air conditioning component, leakage, bad working or operation.
IMPORTANT: lclean the return filter of the driver's air conditioning, at least, once a week.

- **Tubes, hoses, drains and wiring harness:**
Bad attachment. Leakage at connections and welding points. Damages due to frictioning / chassis and components frictioning or bad installed.

- **Alternator/Compressor Support:**
Excess or lack of torque at attaching screws/bolts. Assembly is out of project designs. Pulleys are not aligned, excess or lack of stretchiness at the belts and pulleys.
- **Gas Charge Process:**

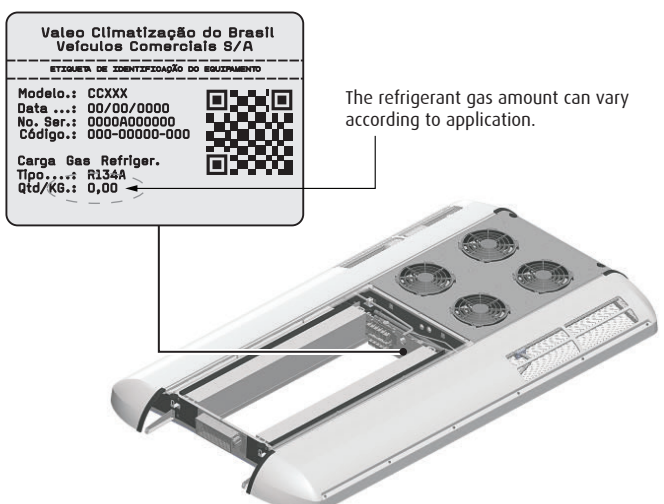
Leakage test procedure. Vacuum process and refrigerant gas charge.

Note: in case the installation is bad, VALEO Agent Authorized Service Net will have to call the OEM Plant first, then get an authorization to do the service, print and issue the Invoice of repairs.

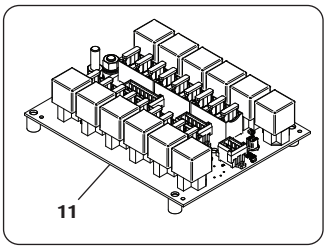
Identification Tag

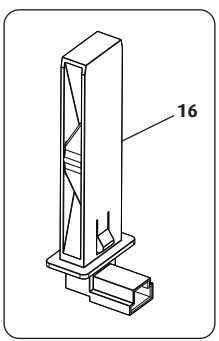
It is very important, when you need to ask for spare parts or after sales parts, and similar ones, customer must identify the model of the air conditioning, telling the series number, model and manufacturing date.
This information can be found in the Air Conditioning Warranty Certificate and ID tag.

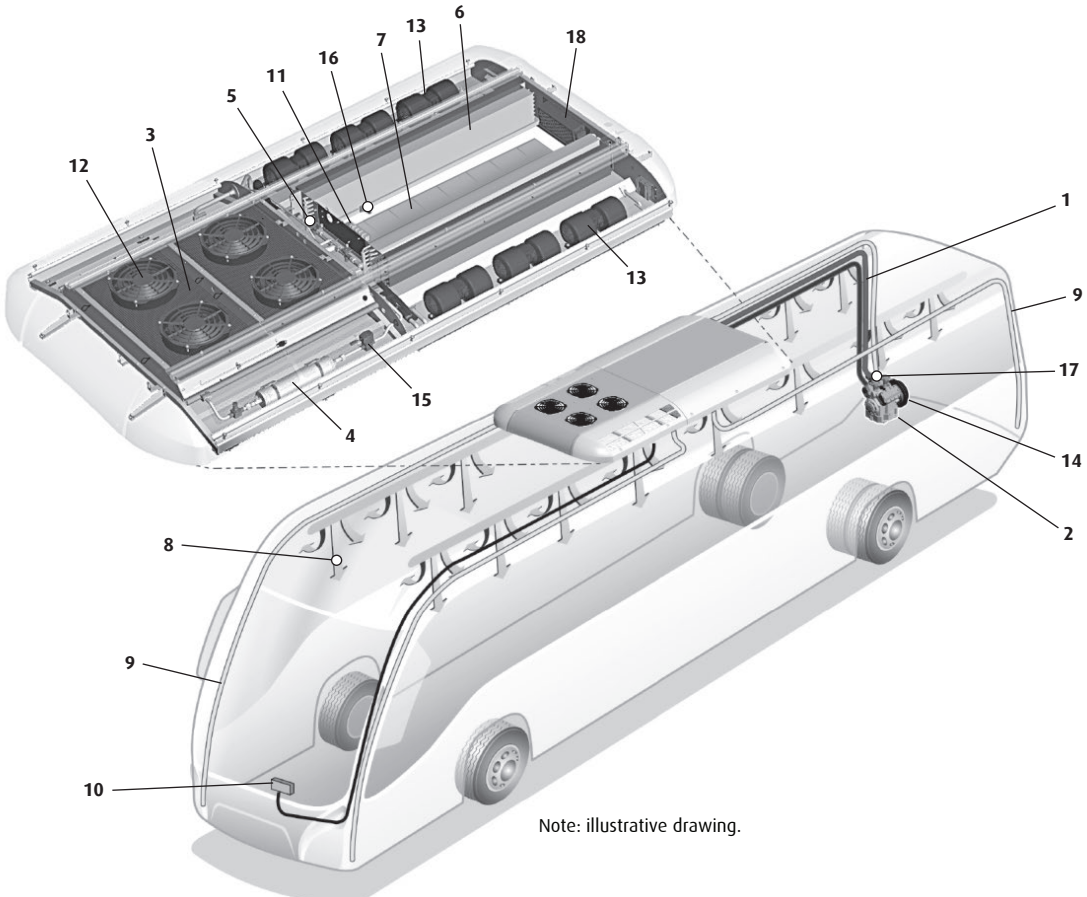
Application information regarding to: series and bus body model, series and chassis model are very important to identify which parts the equipment carries. In order to identify the bus body and chassis, you need to check the bus body builder manual.



Operating the Air Conditioner







Note: illustrative drawing.

MECHANIC SYSTEM

1 Refrigerant Fluid

It is inside the air conditioning equipment, inside the system. It works absorbing the heat from the interior / room of the vehicle, at the evaporator, and then it goes to the condenser where the heat is thrown to the outside. VALEO Climatização do Brasil - Veículos Comerciais S/A, products apply refrigerant R134a, according to the Protection Environmental Law.

2 Compressor

When it is working, the compressor sucks the refrigerant fluid from evaporator at gaseous state and under low pressure, compressing it, so temperature and pressure increase, then the compressor puts it into the condenser.

3 Condenser

Its main goal is dissipate the heat out, which was absorbed by the refrigerant fluid along the refrigeration system.
At the condenser, the overheat refrigerant fluid is sent to outside losing its force, changing from gaseous state to liquid state.

4 Drier filter

Tiene la finalidad de retener impurezas y/o humedad que pueda haber en el sistema impidiendo que lleguen en la válvula de expansión.

5 Expansion Thermostatic Valve

Valve hinders the refrigerant inlet that comes from de condenser at high pressure and its goal is adjust the refrigerant gas flow that passed by the evaporator looking for making the pressure steady and temperature at the capillary tubes output.

MECHANIC SYSTEM

6 Evaporators

Now at evaporators, the refrigerant fluid, at low pressure, turns from liquid to gaseous state, absorbing the interior heat of the vehicle in this process.

7 Air filter

Air return filter retains impurities from air avoiding any block of dirt at evaporator capillary tubes and coil.

8 Air circulation

Air being cooled by the evaporator, then it follows to the bus interior through fans.

9 Drain

It is a way to get the condensed moisture from evaporator tubes from the condensed tray to putting out.

ELECTRIC SYSTEM

10 Controller

It is installed in the instrument panel, it offers to the driver to set-point of temperature, to see by display the interior temperature, offering full climatic control inside de bus.
Set-point: it is the temperature the driver wishes to set inside the vehicle for passengers.

11 Relay Board

Relay board has the controller controls, condenser fan control, evaporator control and compressor control.

ELECTRIC SYSTEM

12 Condenser Fan

Condenser fan and the compressor will only work at "Cool Mode".

13 Evaporator Fan

Evaporator fans are working at cool and fan modes, fans can be set in two speeds.
Sped control can be manual or automatic.

14 Compressor Operation

It is started up by the vehicle engine though a pulley-and-belt system and put into action by an electromagnetic clutch when air conditioning is operating at "Cool Mode".

15 Solenoid Valve

Solenoid valve is applied to stop refrigerant flow through a line. It is a closing valve controlled remotely and under electric operation.

16 Temperature Sensor

The interior temperature is measured by the temperature sensor placed at the air return spot.

17 Pressure Switches

Pressure switches are electric devices that monitor the air conditioning equipment operation pressure. Every time a strong change happens from the NORMAL temperature, they turn off the compressor immediately to avoid break.
Observation: pressures are always monitored, even if the air conditioning is turned off.

18 Air refrechment

This permits the entry of the exernal in order to expel unwanted odors and impurities from the vehicle.

1- SBU 400-410 Controllers

The SBU400 and SBU410 controllers are systems designed to control HVAC components (heating, ventilation, cooling). In buses, for example, for ceiling air conditioning systems, it is composed of control parts installed on the panel (control device such as human-machine interface) and a relay board.

Controllers are available in basic (SBU400) and full (SBU410) versions. In the basic version, the control element allows the user to control the air conditioning system with cooling functions.

The full version has an optional heating function in addition to those standard ones provided and can be cooling and ventilation. The controller for cooling function can operate automatically. For this, the user simply has to set the desired room temperature and turn on the air conditioner.

The operation described above applies to the following air conditioning systems:

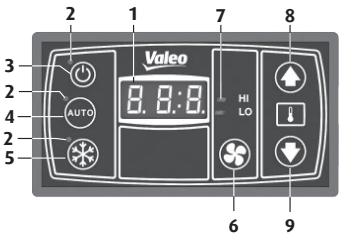
SBU400:
- Air conditioning system (AC)

SBU410:
- air conditioning system (AC)
- with cooling and ventilation (VAC) function
- with cooling and heating (HAC) function
- with heating, ventilation and air conditioning (HVAC) function

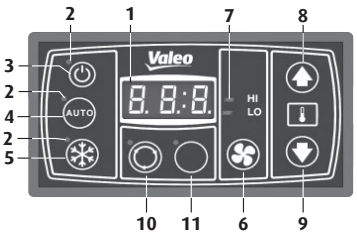
1.1- Control Panel Description

The SBU400 and SBU410 AC controllers have basically the same components. See below Functions and description.

SBU400



SBU410



Item	Description	Function
1	Display	Current room temperature and an error warning.
2	Status light	It shows an enabled function (red status light on means it is enabled).
3	On/off button	ON and OFF switch from control panel.
4	Auto button	Evaporator Fan Automatic Start Up.
5	AC button	Enable or Disable the cooling function.
6	Evaporator fan speed button	Evaporator Fan Manual Speed Control.
7	Evaporator fan speed display	It shows the current speed of evaporator fans.
8	Temperature desired UP (set-point) button	You can INCREASE the right temperature you want to leave into the room.
9	Temperature desired DOWN (set-point) button	You can DECREASE the right temperature you want to leave into the room.
10	Ventilation button	On and OFF the recirculation function.
11	Free button	Free.

1.2- Operation Instructions

Note: SBU410 is shown to show several versions in general.

• Enabling/Disabling Standby Mode

- Standby: if the alternator warning lamp signal (KL.61) is disabled (this indicates that the vehicle or air-conditioner alternator is operating correctly and the battery voltage at the terminal plug can be measured), then system will be in standby mode. ON / OFF button status LED lights up in red.

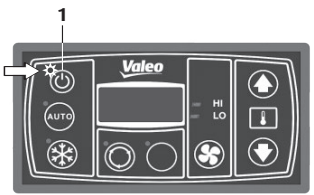
in Standby

- Enable: press button (1).
The status led for the ON/OFF button goes out. The return (back) temperature will appear when starting the controller for the first time. The AUTO mode and AC button are enabled, so it is controlling the speed of the evaporator fans automatically.

Display after enabling

Attention: if the return (back) temperature is below the desired room temperature, then the device enables the heating system automatically (SBU410 only) and outputs to the floor convector solenoids.

- Disable: press button (1).
The Compressor and fans are immediately disabled (the same will occur if the KL.61 signal is enabled). If the KL.61 signal is disabled, the device goes into Standby and the ON / OFF button status light illuminates red.



1.3- Auto Mode

Note: when device is started up, auto starts ON (Its status light becomes ON).

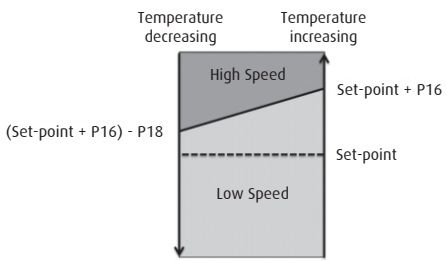
• Enabled

Press button (2) when the status light is OFF. Auto mode will start and the corresponding status light will become on.

Note: when you enable Auto mode, then system controls evaporator fans automatically. Pressing the Auto button again, then it shuts off the evaporator fans automatically.

Before and after Auto Mode Enabling.

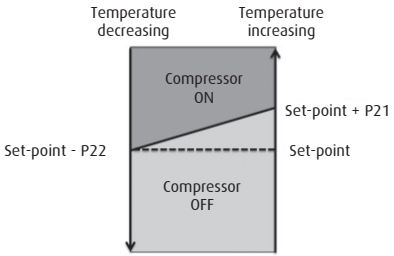
Automatic ventilation is controlled by the Set Point along with P16 and P18 parameters, according to table below.



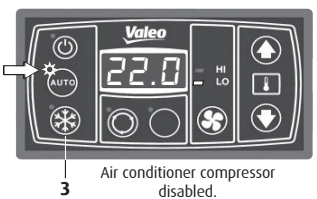
At Heating Mode, the evaporator speed is always LOW.

1.4- ON/OFF Air Conditioner Compressor

Note: after product start up and at Cooling Mode, the condenser fans run for 10 seconds, so just then the air conditioner compressor is enabled.



- OFF: press button (3) if the status light is on. If the compressor is ON, the status light will flash for 1 minute, indicating the compressor status change from ON to OFF. The cooling function is disabled then.



Air conditioner compressor disabled.

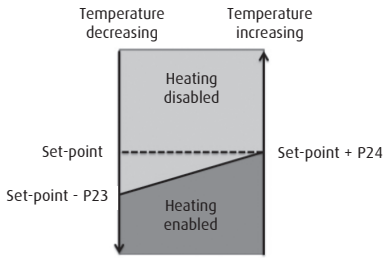
- ON: press button (3). Air conditioning compressor is enabled and turns ON if necessary, and if minimum waiting time is kept (see following note). The cooling function is switched ON again.

Compressor Mode/Auto Enabled.

Note: the air conditioner compressor must be turned OFF, at least 1 minute before it can be turned ON again.
If the AC button is pressed during this time, the device reschedules the air conditioner compressor start up for one 1 minute again (the AC button flashes). The air conditioner compressor runs for at least 1 minute before shutting down. If it is disabled directly after enabling, it will continue to operate for 1 minute (the AC button flashes).

1.5- Heating Mode

Heating Mode is controlled by set-point and parameters P23 and P24, according to table below:



Note: heating mode controls every floor convector and SBU400 ones too.

1.6- Desired temperature level SET POINT

Note: temperature can be adjusted between 17°C and 28°C through 0.5°C gaps.

Press button (4) to Increase temperature + 0.5 °C.

Temperature UP.

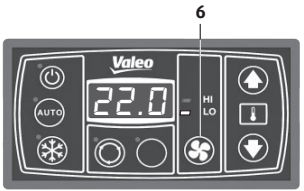
Press button (5) to Increase temperature - 0.5 °C.

Temperature DOWN.

1.7- Evaporator fan speed configuration

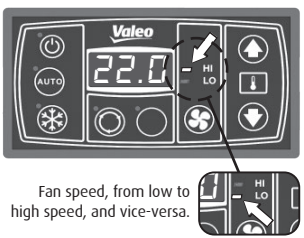
Note: if the evaporator fan speed is changed manually, the automatic fan control mode will turn OFF. The desired room temperature (set point) value is kept the same.

Press button (6).
Auto Mode is disabled.



Press button (6).
• Press it once: fan speed increases one step higher (from low to high speed).

• Press it again: fan speed turns from high speed to low speed.



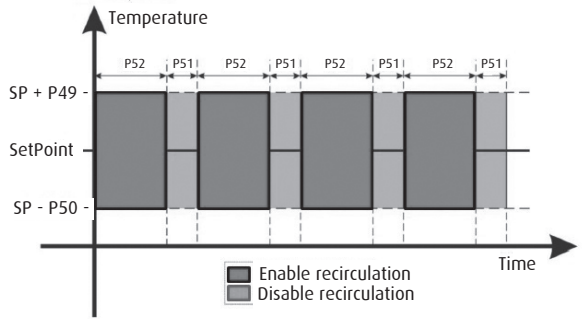
Fan speed, from low to high speed, and vice-versa.

Note: if the Auto button is pressed, the auto mode turns ON again. Then fans will turn on again automatically.

1.8- Enabling / Disabling the ventilation function

When the ventilation function is disabled (7), this allows external air to get into the vehicle. Function enabling may be automatic and will depend on internal temperature and parameters P49 and P50.
If the return temperature is out of range (between SP + P49 and SP - P50) shown in the table below, ventilation will remain enabled (no external air inlet).
In this condition, if the function is manually enabled by the key, ventilation will remain disabled for the time set in parameter P20.

If the internal temperature is within the range, ventilation will remain cycling between active and inactive, during the time gaps saved in P52 and P51, respectively, as shown in the table below.



If the status light above the ventilation button does not light, the function is disabled and the ventilation valve is open, allowing air to get in.

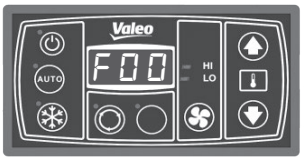
Active ventilation function.

Open ventilation valve.

1.9- Faults (errors)

• Display Failure

Note: if there is a fault, the display goes between Set point and the error codes. The desired temperature will be displayed for 5 seconds and the error series (s) occurring will be displayed for 2 seconds each. If an error has been eliminated, it will no longer be displayed.



Display failure.

Error	Component	Cause	Solution
F00	Low or High Pressure Switch	Refrigerant gas level is wrong. Press switch is faulty. Expansion valve is faulty. Condenser is blocked or faulty.	Change the press switch and/ or compressor. Check the condenser fans. Check the refrigerant gas level. Look for any leaks. Change the expansion valve.
F01	Feed source (relay board)	Feed input is out of limit: 12V: <10V >16V 24V: <20V >32V	Check the wiring harness. Change the relay board.
F02	Feed source (control panel)	Feed input is out of limit: 12V: <10V >16V 24V: <20V >32V	Check the wiring harness. Change the relay board.
F03	System type	No recognition, no link.	Change the controller.
F04	Return (back) temperature sensor	Ground short circuit trouble between pins.	Check the wiring harness. Change the sensor.
F05	Return (back) temperature sensor	Ground short circuit trouble between pins.	Check the wiring harness. Change the sensor.
F06	Duct temperature sensor (SBU410)	Power (+) short circuit or trouble between sensor.	Check the wiring harness. Change the sensor.

Error	Components	Cause	Solution
F07	Duct temperature sensor (SBU410)	Ground short circuit trouble between pins.	Check the wiring harness. Change the sensor.
F08	EEPROM	No access from EEPROM.	Change the controller.
F09	Motor water measuring valve (SBU410)	It can not be adjusted at the right pressure.	Check the wiring harness. Change the motor.
F10	Compressor clutch coupling	F00 has appeared for 3 times or more.	See F00.

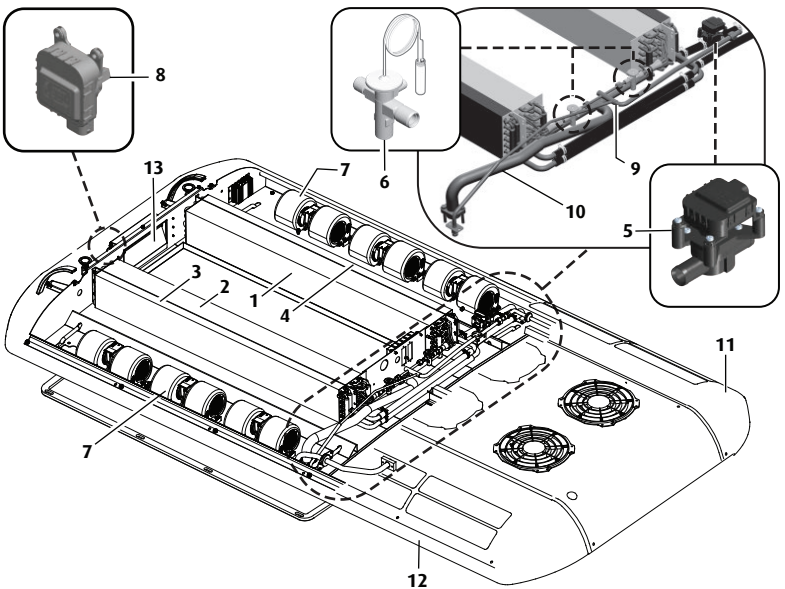
2- Technical Data Sheet

		CC305	CC335	CC355
AIR CONDITIONING	Model	**CC305**	**CC335**	**CC355**
	Cooling capacity	108.000 BTU/h	120.000 BTU/h	136.500 BTU/h
	Heating Capacity (Optional)	40kW	40kW	40kW
COOLING GAS	Type	R134a	R134a	R134a
	Quantity (*)	4,3 Kg	4,3 Kg	4,3 Kg
EVAPORATOR	Model of blowers	Centrífugal	Centrífugal	Centrífugal
	Quantity of blowers	4	6	6
	Air flow (free blowing)	4.400 m^3/h	6.600 m^3/h	6.600 m^3/h
	Nominal current	36 A	54 A	54 A
CONDENSER	Model of blowers	Axial	Axial	Axial
	Quantity of blowers	3	3	4
	Air flow (free blowing)	8.700 m^3/h	8.700 m^3/h	11.600 m^3/h
	Nominal current	26 A	26 A	34 A
COMPRESSOR	Model (alternative type)	Bock FK40 560	Bock FK40 655	Bock FK40 655
	Displacement	554 cm^3	650 cm^3	650 cm^3
	Maximum rotation allowed	3.500 RPM	3.500 RPM	3.500 RPM
	Lubricating oil (027-00002-000)	2 Liters	2 Liters	2 Liters
CLUTCH	Type	Eletromagnetic	Eletromagnetic	Eletromagnetic
	Tension	24 V	24 V	24 V

(*) The quantity of refrigerant gas can vary according to the application and installation.
When you have defrost, add 1kg more in the amount of refrigerant.

2.1- Evaporator Components

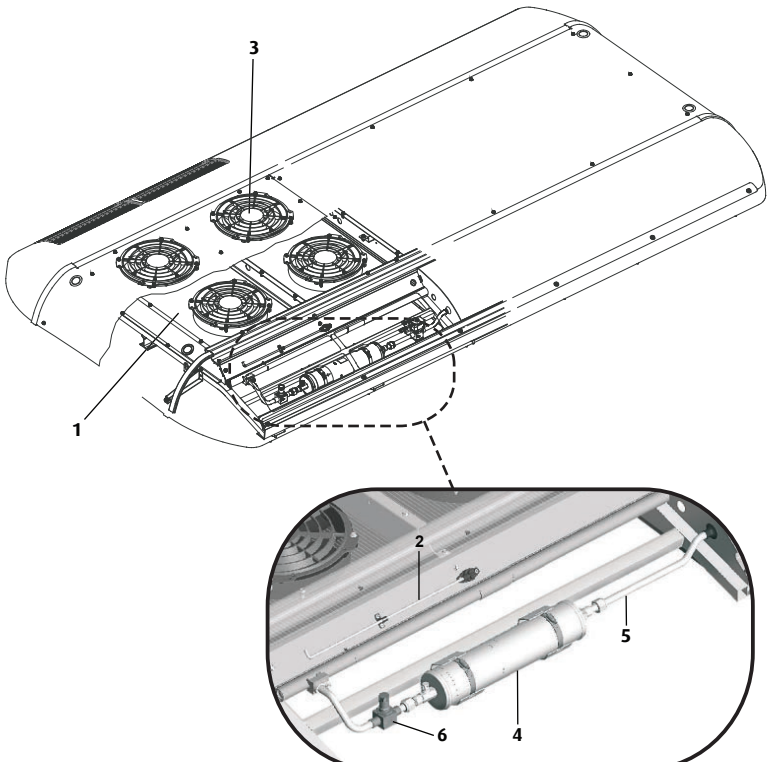
NOTE: visit www.reparts.com.br to consult the complet parts catalog.



Item	Code	Description	Qty.
1	006-00134-005	Left Evaporator Coil - CC355	1
	006-00138-001	Left Evaporator Coil - CC305 / 335	1
2	006-00135-005	Right Evaporator Coil - CC355	1
	006-00139-001	Right Evaporator Coil - CC305 / 335	1
3	006-00152-001	Right Heating Coil	1
4	006-00153-001	Left Heating Coil	1
5	012-00055-000	Hot Water Valve - Optional	1
6	012-00081-000	Expansion Valve	2
7	021-00014-000	Radial Fan 24V - with Carbon Brush	Variable
8	022-00010-000	24V Air Renewal Motor - Optional	1
9	031-00573-000	Liquid Line Tube Set with Defroster	1
10	031-00590-000	Evaporator Suction Tube Set	1
11	034-00367-001	Left Condenser / Evaporator Cover	1
12	034-00368-001	Right Condenser / Evaporator Cover	1
13	041-01445-000	Air Renewal Set - Optional	1

2.2- Condenser Components

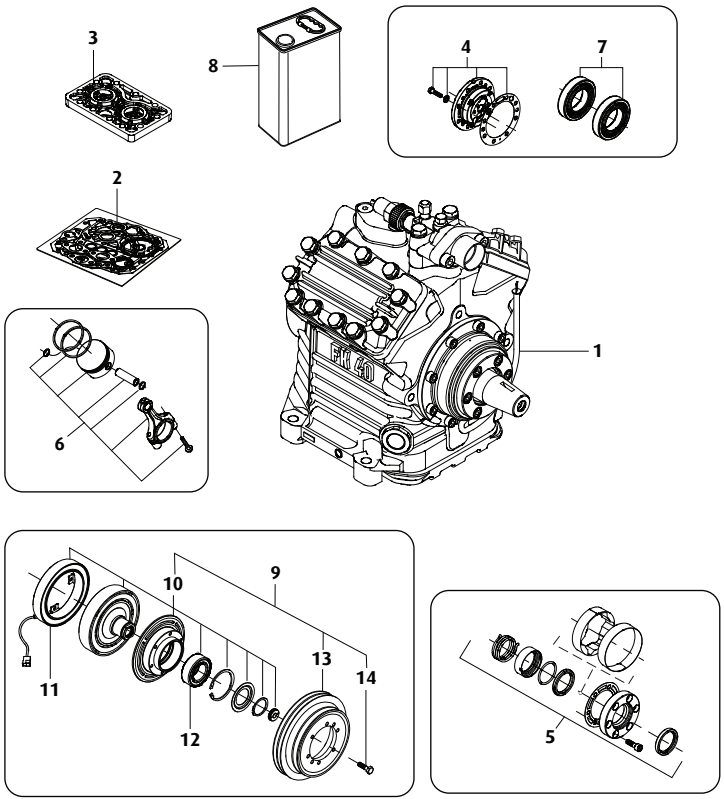
NOTE: visit www.reparts.com.br to consult the complet parts catalog.



Item	Code	Description	Qty.
1	006-00165-000	MPHE Condenser Coil	1
2	018-00039-001	Maintenance Rod	2
3	021-00015-000	Axial Fan 24V - with Carbon Brush	Variable
4	038-00039-000	Liquid Tank / Dryer Filter / Display	1
5	042-01384-001	Tank Tube Set X Evaporator Tubing	1
6	042-01362-000	MPHE Tank Coil Tube Set	1

2.3- Compressor Components - BOCK FKX 40/655K

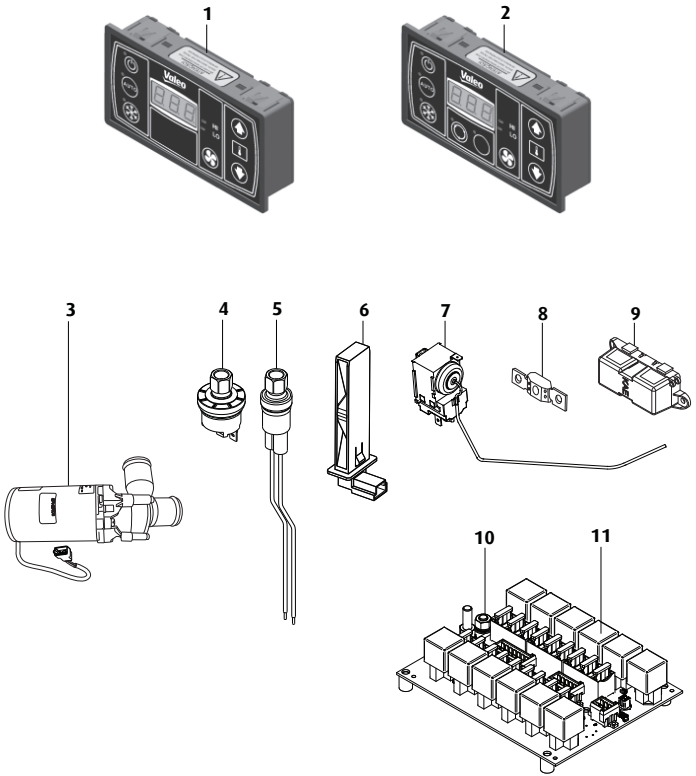
NOTE: visit www.reparts.com.br to consult the complet parts catalog.



Item	Code	Description	Qty.
1	014-00195-000	BOCK FKX40/655K Compressor	1
2	014-00197-000	Compressor Sealing Gaskets Set	1
3	014-00198-000	Compressor Valve Board Set	2
4	014-00199-000	Compressor Oil Pump	1
5	014-00200-000	Compressor Sealing Kit	1
6	014-00201-000	BOCK FKX40 Piston Assembly	4
7	014-00202-000	Compressor Roll Bearing	2
8	027-00002-000	Compressor Oil	2
9	041-00226-000	Compressor Clutch Assembly	1
10	041-00457-000	Clutch Kit without Pulley	1
11	029-00052-000	Magneto	1
12	029-00008-000	Ball Roller Bearing	1
13	014-00097-000	Pulley 2A/2B	1
14	017-00104-000	Bolt M12 x 40	1

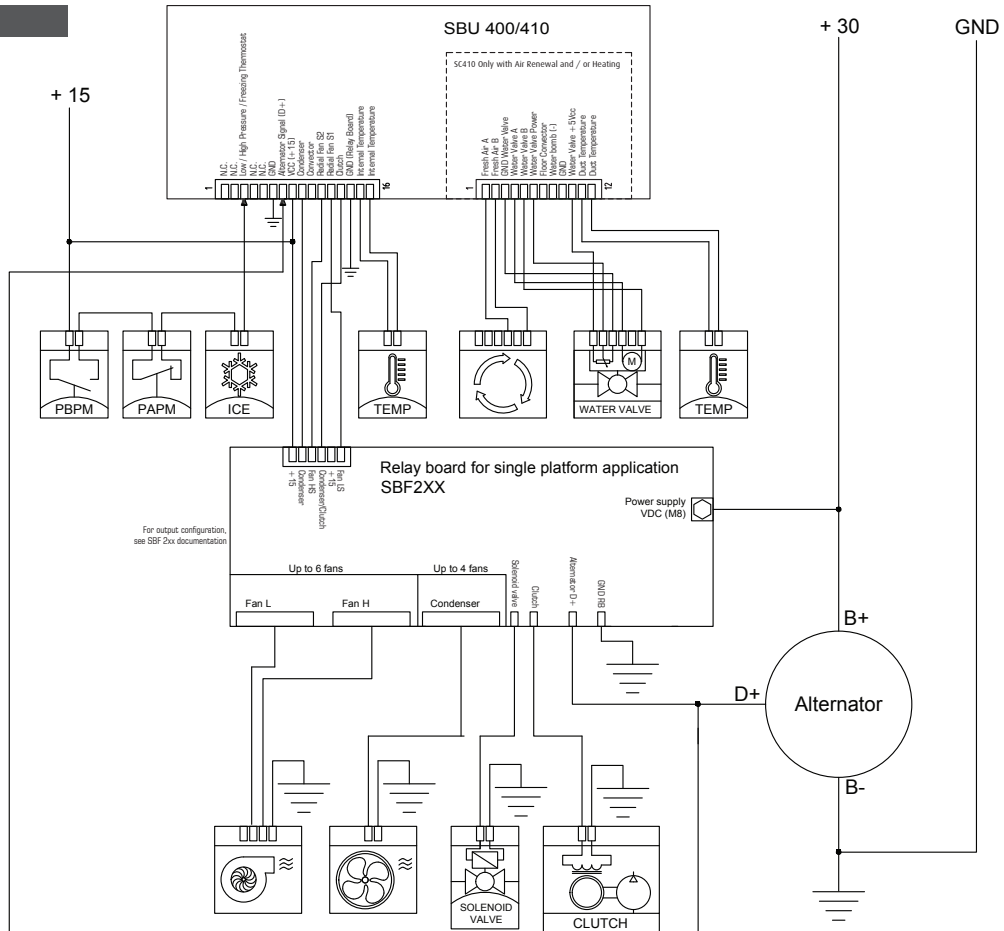
2.4- Electric Components

NOTE: visit www.reparts.com.br to consult the complet parts catalog.

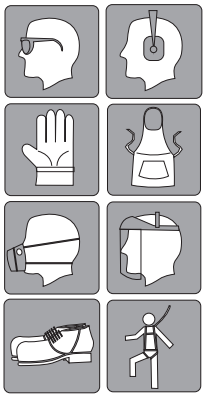


Item	Code	Description	Qty.
1	See Note (*)	**SBU-400 Refrigeration Air Conditioning Controller**	1
2	See Note (*)	**SBU-410 Air Conditioning Controller with Heating**	1
		SBU-410 Air Conditioning Controller with Renewal	1
3	004-00135-000	**24V Water Pump**	1
4	010-00018-000	**High Pressure Switch**	1
5	010-00019-000	**Low Pressure Switch**	1
6	See Note (*)	**EPCOS 3K Temperature Sensor**	1
7	010-00016-000	**Anti-Freeze Thermostat (Temperature Switch)**	1
8	008-00025-000	**125A Fuse**	1
9	015-00031-000	**Fuse Holder**	1
10	See Note (*)	**Electric Control Board 24V**	1
11	See Note (*)	**Relay**	1

3- SBU400/410 Controller



4- Safety Precaution



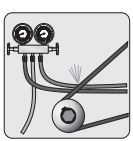
1- Personal Protection:

Air conditioning systems offers chemic, mechanic and electric risks.

It is mandatory to wear IPE (Individual Protection Equipment), picture 1 to protect yourself from refrigerant gas, refrigerant oil, battery acid, waste launched, engine high temperature and noise.

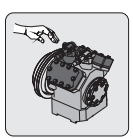
2- High Pressure:

The refrigerant in liquid state and high pressure causes a potential risk. When the refrigerant is sprayed to natural air, it can cause serious injuries to eyes and skin.



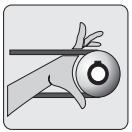
3- Hoses:

Check if manometer hoses are in good conditions, when holding them; stay far from belts, pulleys and hot surfaces.



4- Hot Surface:

The compressor discharges, exhaust pipes and other engine components can be extremely hot.



5- Rotation Components:

The fans, pulleys and belts are not visible under certain conditions. Special care must be taken when putting your hands near them.

6- Welding:

Welding must be done carefully; it causes burns and spray toxic gases out. Provide ventilated places to do it.

7- Toxic Gases:

The refrigerant gas along with flame becomes into toxic gases and can cause very serious breathing illness. Take special care in closed places, if gases scape somehow (leakage) and then it can cause no toxygen in the air.

Other Care:

- When handling and going up and down stairs, ladders and platforms, you can slide or they can break.
- Wear a seat belt always when working over 1.5m high.
- Never apply heat in recipients or pressured lines.
- Never operate the equipment if discharge service valve is closed.
- The refrigeration oil can cause irritation to your skin and eyes.
- Check if every screw are long enough and right tight.

- **Components that are not in good conditions must be replaced by new ones due to safety reasons.**

5- Product Discard

Concerned about sustainability at Valeo Climatização do Brasil - Veículos Comerciais S/A guides its customers and its authorized service network to discard products in an environmentally sound and safe manner.

Proper disposal of the product or components at the end of their useful life will contribute with the preservation and pollutinon reduction of the environment, creating economic growth through the Reverse Logistics Program.

According to Law 12,305 / 2010, the environmentally adequate destination of components (parts, oil, refrigerant) is required.

It is the responsibility of all to ensure that products and components are sent to appropriate treatment to companies approved by the environmental agencies.

For more information about our Reverse Logistics Program, please see our website: **http://www.valeo-thermalbus.com/br**

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