

IBAIONDO

CRB

AUTOMAT

Touch Screen



**COMPRESSOR CONTROLLED
PRESSURIZATION SYSTEM**

PLENTZIA BIDEA, 3 BILLELA AUZOTEGIA
48100 MUNGLIA- SPAIN

CRB AUTOMAT

Description

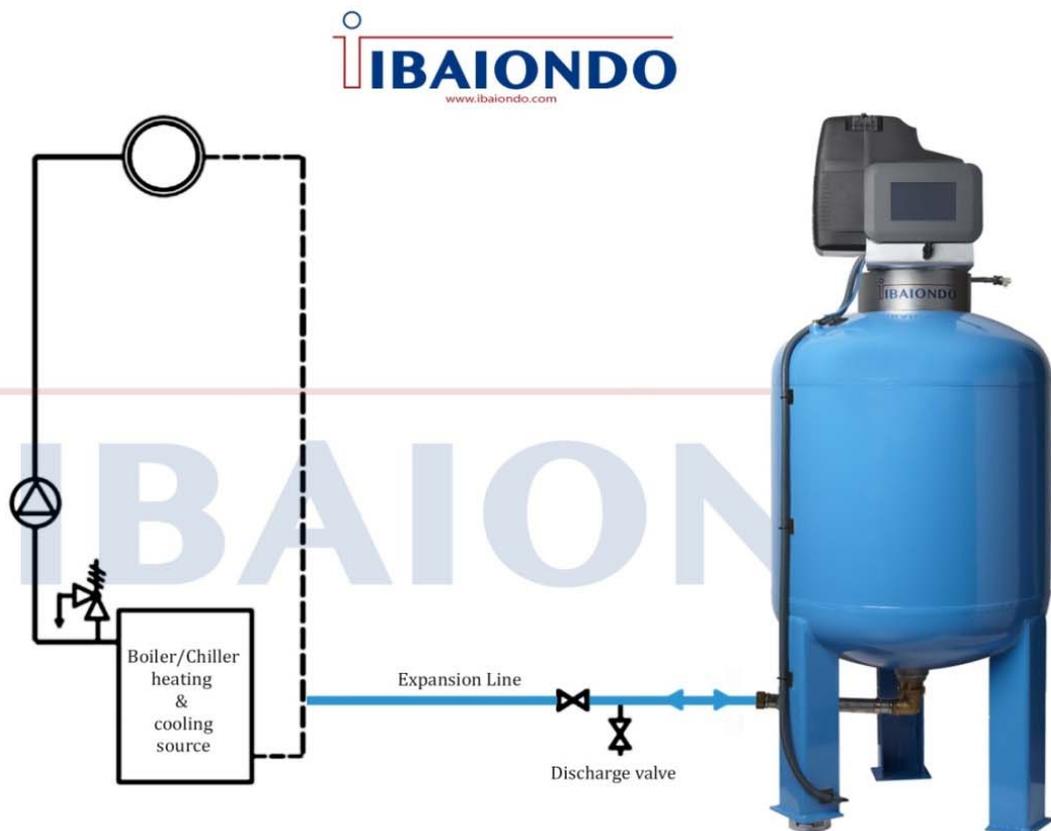
Compressor controlled pressurization units, classified as a dynamic pressurization system for heating and cooling water systems. It requires an auxiliary power source for its operation.

They are controlled by a compressor and allow to maintain steady pressure in the system, by compensating volumetric changes suffered by the fluid, as a consequence of temperature variations in the system.

CRB AUTOMAT is formed mainly by a control unit (Compressor & controller) and an expansion vessel. Expansion tank is fitted with a bladder to divide the vessel between air and water side.

CRB AUTOMAT provides the following safety features:

- *Optimization of pressure maintenance.*
- *Reduced corrosion damage due to oxygen removal.*
- *No direct intake of air thanks to a regulation of the pressure maintenance.*
- *No circulation issues caused by free bubbles in the water system.*



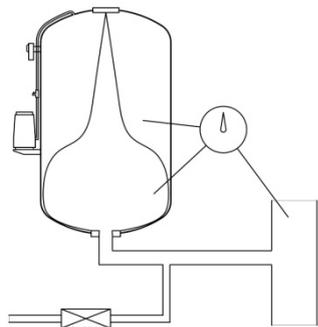
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Application

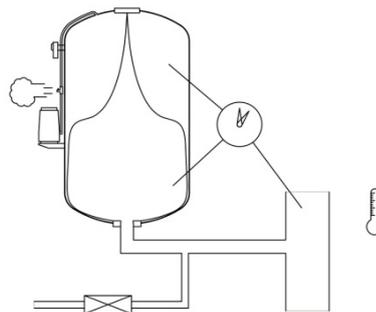
Increases and decreases in water volume are continuous in heating and cooling systems due to temperature variation. When temperature raises, the pressure in the system increases. As a consequence water level in water side of the expansion vessel changes. That increase is absorbed by the expansion vessel. Pressure differences in air side is showed in display.

On one hand, pressure sensor measures air pressure and transmit to the control unit. Control unit compares the measured value with the programmed nominal value and if the pressure increases, the solenoid valve will be activated to reduce the pressure until reaching set values.

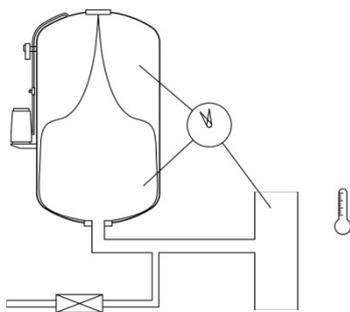
On the other hand, when temperature in system drops, pressure in the air side change. Control unit compares the measured value with the operative or set point pressure value and if pressure decreases the compressor will be activated until reaching set values.



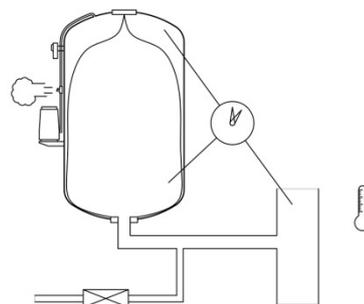
A. Temperature increase
Unit contains a small amount of water. Unit is in rest



B. Temperature increase
Water volume and pressure system rises. Controller responds to this by discharging air from the vessel and as a result, the expansion water flows into the bladder.



C. Full power
By storing increasing amounts of water in the vessel, controller keeps pressure system at a constant level. When system has warmed up completely, vessel will be operating at almost its maximum capacity.



D. Cooling down
When water volume and thus pressure system decreases, controller will respond by increasing the air pressure in the vessel with displacement of water back into the subsystem as a result. This restores equilibrium in pressure system.

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Overview CRB AUTOMAT



- N° Accessories
- 1 Compressor
 - 2 Control unit
 - 3 Water side purgure
 - 4 Air connection
 - 5 Valves support
 - 5.1 Safety valve
 - 5.2 Solenoid valve
 - 5.3 Anti-return valve
 - 5.4 Pressure sensor
 - 6 Air pipe between vessel and anti-return valve
 - 7 Steel expansion vessel
 - 8 Sticker
 - 9 Bladder
 - 10 Cable duct
 - 11 Flexible hose to the system
 - 12 Level sensor - load cell

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Overview CRB AUTOMAT

Compressor Air supply

When water in the system is heated, pressure in the system rises. If the nominal pressure at the controller is exceeded, the solenoid valve opens and discharges air from the vessel. It allows water to flow into the expansion vessel and the water pressure within the system drops up to nominal pressure.

As water cools, water pressure in the system drops. If pressure in the system drops below the nominal pressure, compressor delivers air into the expansion vessel up to reach the nominal pressure

Expansion vessel Compressor controlled expansion vessel.

It allows to maintain steady pressure in the system, compensating volumetric changes suffered by the fluid, as a consequence of temperature variations in the system.

The air side of the expansion vessel and the load cell are connected to vessel control unit.

Load cell

It measures the water level inside the expansion vessel. If water level rises over a limit occurs "high water level alarm"

If water level drops below a limit, occurs "Low water level alarm"



Control unit-Touch screen

Pressure system integrated control

It includes compressor, 7" touch screen control unit with solenoid valve, antireturn valve, safety valve and pressure sensor.

Solenoid valve opens and discharges air from the vessel.

Antireturn valve avoids air going in an opposite direction.

Pressure sensor displays continuous pressure in the system.

Safety valves protects expansion vessel.

Replaceable bladder

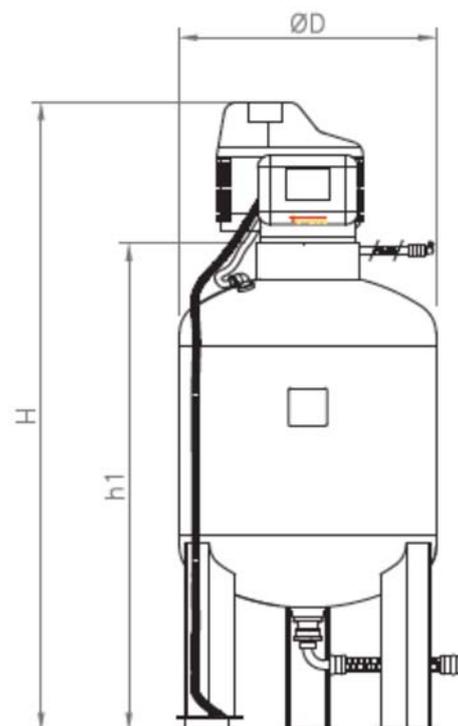
Bladder stores water. It allows to divide air side from the water side

Flexible connection R1" for the expansion line

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Main features

- Automatic expansion vessels for pressure maintenance in heating and cooling systems
- Replaceable bladder according to EN13831 (non-potable)
- Upper membrane purge
- Control unit for regulating water pressure and volume. Includes:
 - 7" color touch screen for control of the system
 - Standard compressor with max. operative pressure of 8 Bar. Oil free.
 - Power supply 220V / 50Hz single phase
 - Weight cell with cable and connector for connection to the control unit
 - Pressure sensor 4-20 mA
 - Solenoid valve with silencer
 - Backflow valve
 - Pneumatic safety valve
 - Top screwed flange for inspection
- External finish in blue RAL-5012
- Manufactured in accordance with Directive 2014/68 / EU
- Optional: Automatic water replenishment (Auto filling kit)
- Optional: RS-485, Ethernet
- Bottom condensate drain valve
- Water connection by flexible hose R1 "G.H.
- (*) 10 Bar Compressor, consult factory



TYPE	200 CRB AUTOMAT	300 CRB AUTOMAT	500 CRB AUTOMAT	700 CRB AUTOMAT
Product code	04022427	04035427	04050427	04070427
Weight	70 Kg	85 Kg	150 Kg	192 Kg
Max. Work. Pressure	6 Bar	6 Bar	6 Bar	6 Bar
Volume	200 Liter	300 Liter	500 Liter	700 Liter
Diameter	600 mm	600 mm	700 mm	800 mm
Height	1.225 mm	1.475 mm	1.795 mm	1.955 mm
Connection	R1"	R1"	R1"	R1"
Bladder	Replaceable	Replaceable	Replaceable	Replaceable
Permissible Oper. Temp.	70°C	70°C	70°C	70°C
Noise level	52 dB	52 dB	52 dB	52 dB
Voltage	220 V	220 V	220 V	220 V
Electrical output	0.75Kw	0.75Kw	0.75Kw	0.75Kw
Frequency	50 Hz	50 Hz	50 Hz	50 Hz
Power supply	Plug	Plug	Plug	Plug
Compressor	F114-8Bar	F114-8Bar	F114-8Bar	F114-8Bar

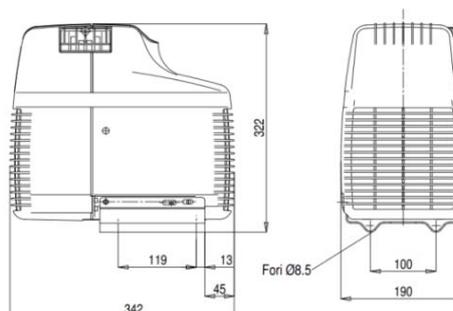
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Spare parts

Compressor



<i>l/min</i>	<i>CFM</i>	<i>m³/h</i>	<i>Bar</i>	<i>psi</i>	<i>HP</i>	<i>KW</i>	<i>Min⁻¹</i>	<i>LxPxH mm</i>	<i>Kg</i>
105	3.7	6,3	8	116	1	0,75	1.450	340x185x315	10



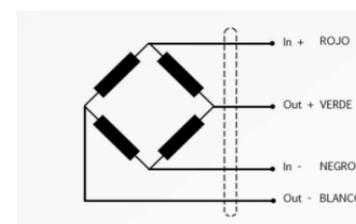
Control unit



Control unit-Touch screen (2)

- 7" Touch screen - colour display
- Electronic board
- ABS Box for electronic hosting
- Permanent display of the operating parameters in the system
- Pressure & Volume
- Graphic user interface
- Integrated control of system pressure
- Evaluation and storage of the most important data
- Interfaces:
 - RS-485
 - Ethernet

Load cell



Valves



Anti-return valve

To avoid air returning from the vessel

Safety valve

Protects from the excessive pressure

Solenoid valve

Opens if the pressure has increased from operative pressure

Pressure Sensor

Detect the pressure in the vessel

Air pipe

Air pipe between compressor and vessel distributor

Load cell-Level sensor

Allows determining the filling level

Technical data

Supply: 5...15V

Signal Out: 0-10 mV

Sensitivity: 2 mV/V±1%

Wire length: 4 meters

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Control unit

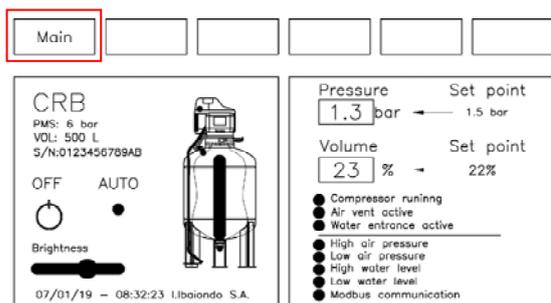
The control unit includes the following parts:

- ABS Box for electronic hosting
- 7" Touch screen
- Electronic board

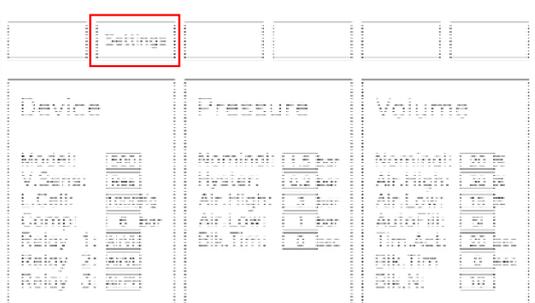
Touch screen

7 "color touch screen. The operating data of the system are entered through the touch screen. There are 6 different screens through which you can navigate by entering an access code.

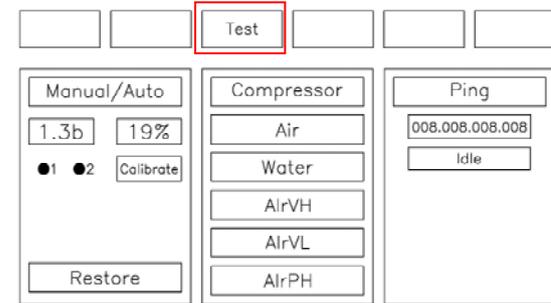
MAIN	SETTINGS	TEST	COMM	EVENT	INFO
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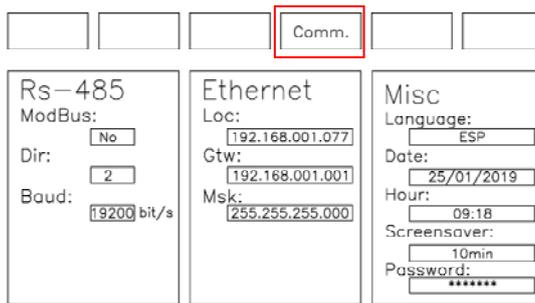
Main screen showing CRB status, pressure (1.3 bar), volume (23%), and system logs.



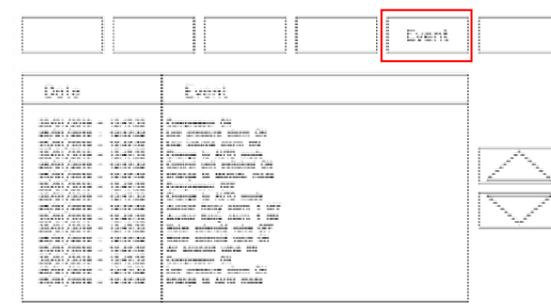
Settings screen for configuring Device, Pressure, and Volume parameters.



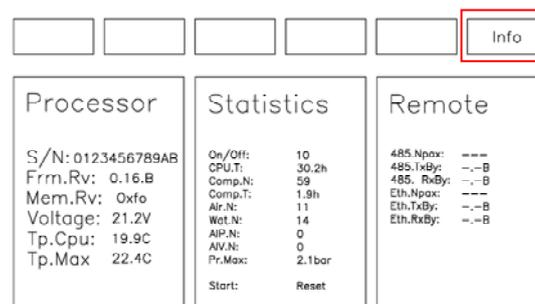
Test screen for Manual/Auto control, Compressor (Air, Water, AlrVH, AlrVL, AlrPH), and Ping tests.



Comm. screen for configuring Rs-485 and Ethernet network settings.



Event screen displaying a log of system events with date and description.



Info screen showing Processor details, Statistics, and Remote connection info.

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Control unit

Electronic board

The electronic board include de following elements:

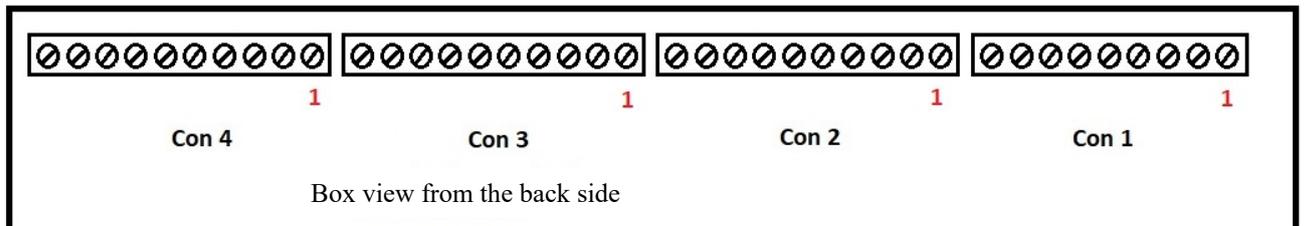
- Terminals for 230Vac power input
- Magnetothermic protection 10A serie C
- Microcontroller for the management and control of the equipment
- Relay for the activation of the 230Vac 10A compressor with function check
- Relay for the activation of the air solenoid valve 230Vac 10A with function check
- Relay for the activation of the 230Vac 10A automatic filling solenoid valve with function check
- Voltage alarm relay of 230Vac 10A potential-free
- Pressure alarm relay 230Vac 10A potential-free
- Analog input 4 - 20 mA of pressure measurement
- Analog input 4 - 20 mV of volume / weight measurement (load cell)
- Pressure output 4 - 20 mA mirror of the pressure input
- Volume output 4 - 20 mA mirror volume / weight input
- Connection with the touch screen
- RS485 connection
- Ethernet connection
- Lithium battery for the maintenance of the hour

Connectors

- Connector for the power supply (phase, neutral and ground)
- DB9 connector for RS45 communication is connected (A, B, GND)
- RJ45 female connector for Ethernet port
- Connector of double row of 30 contacts whose connections are:
 - 01: Analogue In Pressure -> +24V_{DC}
 - 02: Analogue In Pressure -> A
 - 03: Analogue In Pressure -> B
 - 04: Analogue In Volume/Weigth -> +24V_{DC}
 - 05: Analogue In Volume/Weigth -> A
 - 06: Analogue In Volume/Weigth -> B
 - 07: Analogue Out Pressure -> V_{ref}
 - 08: Analogue Out Pressure -> A
 - 09: Analogue Out Pressure -> B
 - 10: Analogue Out Volume/Weight -> V_{ref}
 - 11: Analogue Out Volume/Weight -> A
 - 12: Analogue Out Volume/Weight -> B
 - 13: Digital In Water -> Signal
 - 14: Digital In Water -> Ref (GND)
 - 15: Auxiliar In -> Signal
 - 16: Auxiliar In -> Ref (GND)
 - 17: Pressure alarm Out -> A
 - 18: Pressure alarm Out -> B
 - 19: Volume/Weight alarm Out -> A
 - 20: Volume/Weight alarm Out -> B
 - 21: Alarm Out CPU -> A
 - 22: Alarm Out CPU -> B
 - 23: Auxiliar Out-> A
 - 24: Auxiliar Out-> B
 - 25: Compressor out -> Phase
 - 26: Compressor out -> Zero
 - 27: Solenoid valve air Out -> Phase
 - 28: Solenoid valve air Out -> Zero
 - 29: Solenoid valve autofilling -> Phase
 - 30: Solenoid valve autofilling -> Zero

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Connectors (control unit):



Connector 1

1. Ground
2. Phase
3. Neutral
4. COMPRESSOR Phase
5. COMPRESSOR Neutral
6. SOLENOID VALVE Air OUT phase
7. SOLENOID VALVE Air OUT neutral
8. Water IN Phase
9. Water IN AGUA neutral

Connector 3

1. LOAD CELL (-)
2. LOAD CELL (A)
3. LOAD CELL (B)
4. LOAD CELL (+)
5. Pressure IN 4/20 mA (+)
6. Pressure IN 4/20 mA (S)
7. Pressure. IN 4/20 mA (-)
8. Volume IN 4/20 mA (+)
9. Volume IN 4/20 mA (S)
10. Volume IN 4/20 mA (-)

Connector 2

1. Auxiliar relay AUX 1 A
2. Auxiliar relay AUX 1 B
3. Auxiliar relay AUX 2 A
4. Auxiliar relay AUX 2 B
5. Auxiliar relay AUX 3 A
6. Auxiliar relay AUX 3 B
7. DIGITAL IN 2 +
8. DIGITAL IN 2 -
9. DIGITAL IN 1 +
10. DIGITAL IN 1 -

Connector 4

1. Volume OUT 4 /20 mA (+)
2. Volume OUT 4 / 20 mA (S)
3. Volume OUT 4 / 20 mA (-)
4. Pressure OUT 4 / 20 mA (+)
5. Pressure OUT 4 / 20 mA (S)
6. Pressure OUT 4 / 20 mA (-)
7. GND
8. RS 485 GND
9. RS 485 B
10. RS 485 A

Connector 5

Ethernet

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Pre-Comissioning

Determine the position of the expansion vessel. It must be placed on a level ground or surface, or failing that, proceed to level it correctly, in order to ensure the proper functioning of the vessel. It is important to do this correctly so that the volume sensor can detect a third of the weight of the vessel and therefore, indicate the correct volume. *If the delivery includes more than one vessel, the "secondary" vessel does not have a volume sensor.*

Check that the data collected on the sticker attached to the expansion vessel are in accordance with the purchase specification and they are suitable for installation. Before proceeding with installation, make sure that the volume of the expansion vessel has been calculated by authorized personnel, technical staff has an appropriate profile and training in the facilities of this type of equipments. The local regulations for the operation of the expansion vessels must be considered. The installation and operation must be carried out in accordance with good practices by professional installers and authorized technical personnel.

The expansion vessel must be installed in an enclosure protected from the weather with necessary dimensions to facilitate the inspection of the vessel from all parts, being the control unit, air filling valve, the connection sleeve to the installation and label accessible. It should be located in the boiler room, well ventilated and with an ambient temperature of 5 to 40 ° C. Check that there is enough space around the vessels and the pressure maintenance unit to facilitate future maintenance and service work. It is not allowed to isolate any part of the equipment.

Make sure that the equipment has no marks, dents or signs of tampering.

Do not place any valve whose closing may unintentionally cancel the operation of the expansion vessel. It is recommended to install traps and / or air separators to avoid air accumulation.

Avoid direct radiation on the expansion vessel to protect the membrane from possible excesses of temperature.

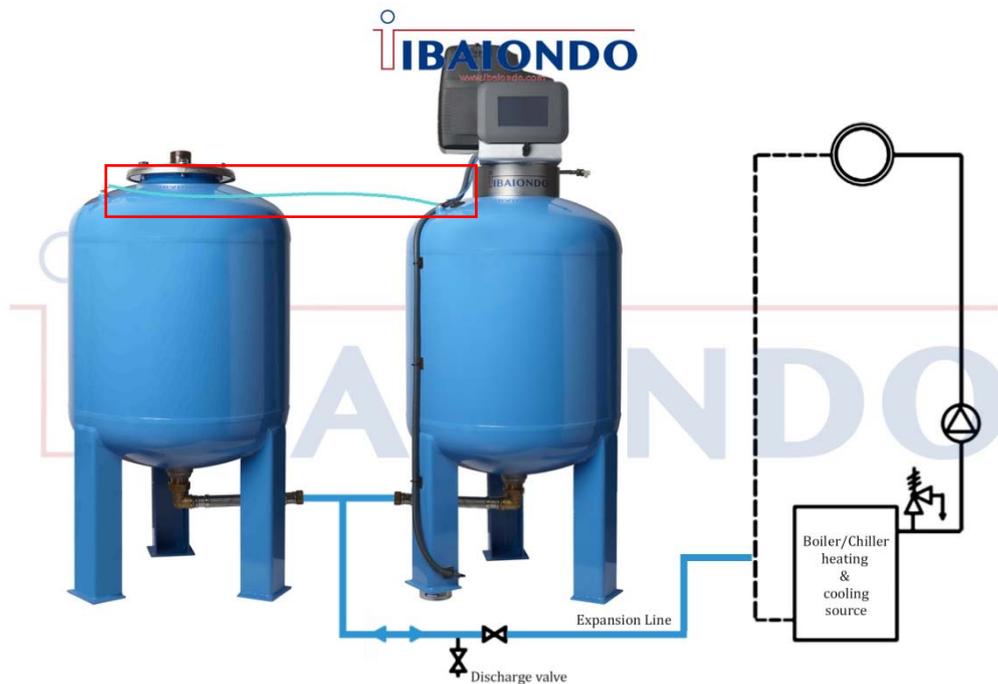
Attention: The pipes must be dimensioned and installed in accordance with the specific requirements according to local and national regulations. Remember that the connection of pipes or equipment with the system may cause additional stress to the device. Ensure a stress-free installation of the pipe connections between the expansion vessel and the system.

In closed heating systems, a warning should be visible next to the expansion vessel to indicate people who are in danger because they are near surfaces with high temperatures.

Mounting air hose: If the equipment includes an extra or secondary vessel, mount the T-tube supplied with the hose set, in the main vessel and the elbow coupling in the sleeve located in the upper part of the secondary vessel (air side). If it is necessary to cut the connecting air hose of the two vessels, main and secondary use a sharp knife. If is used other ripping tool, plastic chips can be appear and can enter in solenoid valve or other sensitive places and cause unnecessary operating anomalies.

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Attention: If using a secondary expansion vessel in addition to the primary vessel, make sure that all vessels have the same type and dimensions.



Being the valve that connects the expansion vessel with the closed heating system closed, install the expansion vessel to the heating / cooling system using the flexible hose with elbow supplied. The angled end of the flexible hose is screwed into water connection of the expansion vessel located in the lower part of the vessel and the straight part of the flexible hose to the heating system.

Being closed the water passage valve between vessel al heating system, check that the manual air bleed valve on the top of the vessel is closed through the hose fitted on the top cover. Also check that the valve in the lower part of the tank (condensation water) is closed. It is preferable to fill the system with the valve closed. Commissioning is easier when the vessel is empty.

Before proceeding to parameterize the control unit, confirm that:

- The tank is empty of water.
- The heating system is completely filled with water.
- The control unit is connected to the expansion vessel.
- The water connections of the tanks to the system of facilities are established.
- The valves for emptying the tanks are open.
- The electrical connection has been created in accordance with applicable national and local regulations.

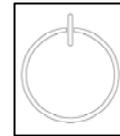
CRB AUTOMAT

Comissioning

Plug the connector to provide power (230 V) to the controller.

If this is the first time the control unit is used, you will be asked to calibrate the touch screen through 3 points.

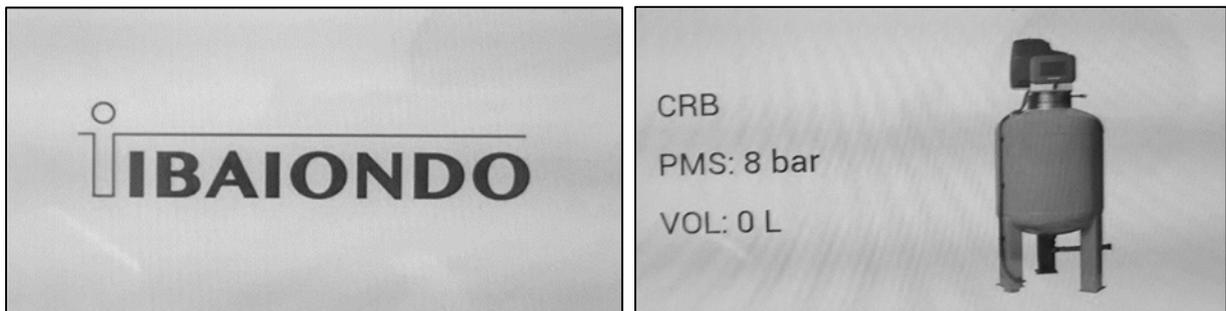
Once calibrated, the following symbol appears in the screen



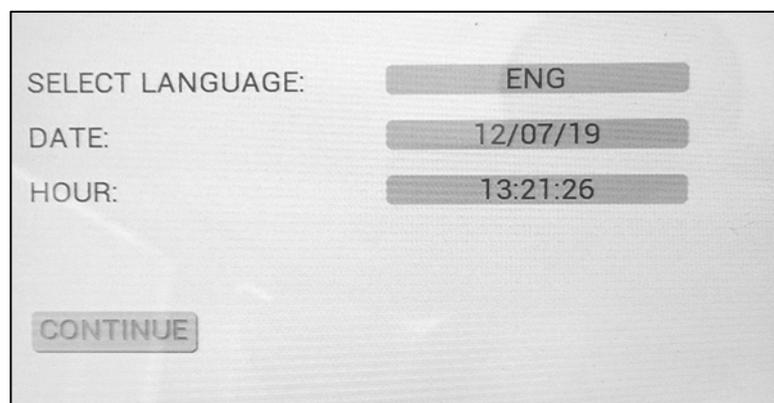
Once calibrated, the following symbol appears in the screen

Press the power icon (stand-by) for 2 seconds to start the unit.

The unit systematically goes through two initial screens.



The first time the unit is turned on, the LANGUAGE, DATE and HOUR SELECTION screen is accessed. By default the starting language is English.



To select the language, click on the grid to the right of LANGUAGE SELECTION and select the desired language from SPANISH (ESP), ENGLISH (ENG), SWEDISH (SE) and FRENCH (FRA).

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In addition, if desired, data such as,

- DATE: Click on the grid to the right of DATE. A keyboard emerges that allows you to enter the date in DDMMYY format (DayMayYear). It is validated by pressing the ENTER button.

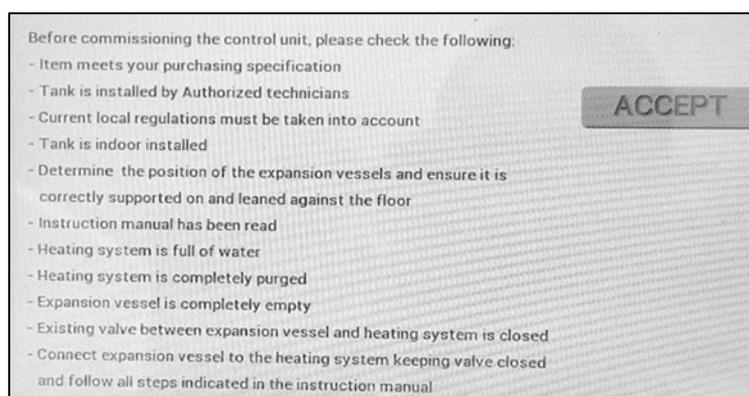
- TIME: Press on the grid to the right of TIME, A keyboard emerges that allows you to enter the date in HHMMSS format (HourMinuteSeconds). It is validated by pressing the ENTER button.

Once the previous values have been adjusted press the CONTINUE key.

If you are in the LANGUAGE SELECTION screen and do not press the touch screen in 5 minutes, the unit will go directly to the MAIN screen. If you need to select the language again, you must turn off the control unit. To do this, on the MAIN screen, press the stand-by icon, the power off button will appear in the center of the MAIN screen. Press for 2 seconds to turn off the unit. To turn the control unit back on, press the Stand-by icon for 2 seconds.



After setting the language of the unit and pressing the CONTINUE key, the following CHECK LIST screen is accessed, where a list of checks to be confirmed is displayed, before proceeding to adjust the parameters of the control unit. Once the list is checked, press the ACCEPT key and continue with the configuration of the unit.



If you are on the CHECK LIST screen and do not press the touch screen in 5 minutes, the unit will go directly to the MAIN screen. If you need to go through this CHECK LIST list again, you must turn off the control unit. To do this, on the MAIN screen, press the stand-by icon, the power off button will appear in the center of the MAIN screen. Press for 2 seconds to turn off the unit. To turn on the control unit again, press the Stand-by icon for 2 seconds. Once the ACCEPT key has been pressed, the screen called MAIN of the unit is accessed.

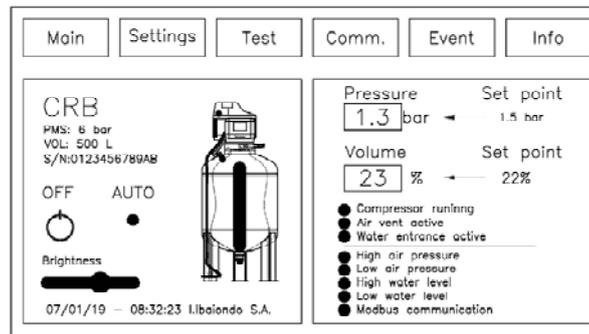
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The control unit has 6 menus (Password 1861 configurable at client's choice).

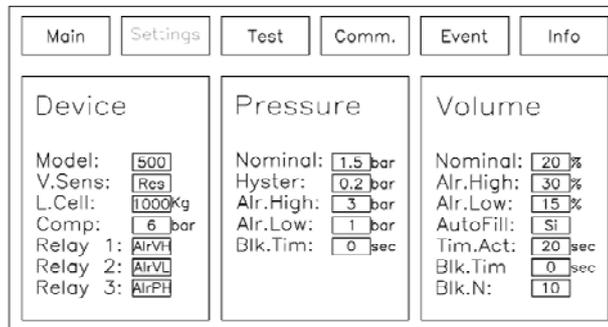
<i>Main</i>	<i>Settings</i>	<i>Test</i>	<i>Comm</i>	<i>Event</i>	<i>Info</i>
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To move or to modify the unit's parameters, a password is required. **The default password is 1861** press ENTER.

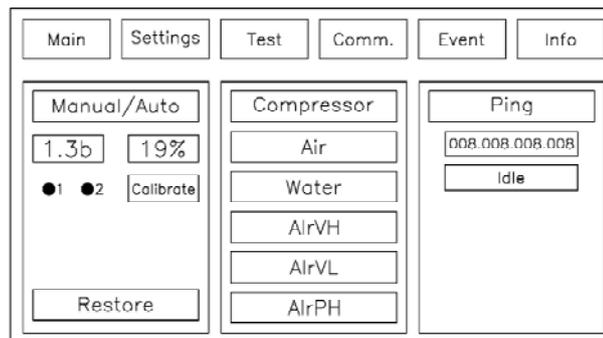
Main: Shows in general the data of the selected model, setpoint values of the device as well as the status of the alarms.



Settings (see units of measure): Divided into 3 sections. **DEVICE**, referring to the selection of the model to be installed. **PRESSURE**, referring to the configuration of the air part of the equipment (compressor). **VOLUME**, referring to the water part of the equipment (Load cell).



Test. Calibration of the Load cell, as well as manual check of the operation of the components associated with the unit (compressor, air solenoid valve, automatic filling, as well as alarms).



CRB AUTOMAT

Comm. RS-485 and Ethernet communications configuration. Language selection and password change.

Main	Settings	Test	Comm.	Event	Info
Rs-485 ModBus: <input type="text" value="No"/> Dir: <input type="text" value="2"/> Baud: <input type="text" value="19200"/> bit/s		Ethernet Loc: <input type="text" value="192.168.001.077"/> Ctw: <input type="text" value="192.168.001.001"/> Msk: <input type="text" value="255.255.255.000"/>		Misc Language: <input type="text" value="ESP"/> Date: <input type="text" value="25/01/2019"/> Hour: <input type="text" value="09:18"/> Screensaver: <input type="text" value="10min"/> Password: <input type="text" value="*****"/>	

Event. It shows with date and time the events generated throughout the operation of the equipment. (Maximum 250 events)

Main	Settings	Test	Comm.	Event	Info
Date		Event			
25/01/2019 - 12:47:32		Compressor ON			
25/01/2019 - 12:47:32		Low pressure alarm ON			
25/01/2019 - 12:47:32		Low volume alarm ON			
25/01/2019 - 12:47:32		Change to AUTO mode			
25/01/2019 - 12:47:32		Control unit switched ON			
25/01/2019 - 12:47:32		Change to MANUAL mode			
25/01/2019 - 12:47:32		Compressor OFF			
25/01/2019 - 12:47:32		Change to AUTO mode			
25/01/2019 - 12:47:32		Auxiliar Relay alarm 1 OFF			
25/01/2019 - 12:47:32		Auxiliar Relay alarm 1 ON			
25/01/2019 - 12:47:32		Water solenoid valve OFF			
25/01/2019 - 12:47:32		Water solenoid valve ON			
25/01/2019 - 12:47:32		Air solenoid valve ON			
25/01/2019 - 12:47:32		Compressor ON			
25/01/2019 - 12:47:32		Low pressure alarm ON			
25/01/2019 - 12:47:32		Change to AUTO mode			

Info. Shows the different processor parameters for information

Main	Settings	Test	Comm.	Event	Info
Processor S/N: 0123456789AB Frm.Rv: 0.16.B Mem.Rv: 0xfo Voltage: 21.2V Tp.Cpu: 19.9C Tp.Max: 22.4C		Statistics On/Off: 10 CPU.T: 30.2h Comp.N: 59 Comp.T: 1.9h Air.N: 11 Wat.N: 14 AIP.N: 0 AIV.N: 0 Pr.Max: 2.1bar Start: Reset		Remote 485.Npax: --- 485.TxBy: --,B 485. RxBy: --,B Eth.Npax: --- Eth.TxBy: --,B Eth.RxBy: --,B	

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Language selection: For it, access to COMM Menu. Once COMM menu is selected, is need to enter the PASSWORD. Press ENTER to validate access.

In the MISC section of the COMM menu



- LANGUAGE: Click on the box below the language and select the desired language between SPANISH (ESP), ENGLISH (ENG), SWEDISH (SE) and FRENCH (FRA).

If you also want to establish,

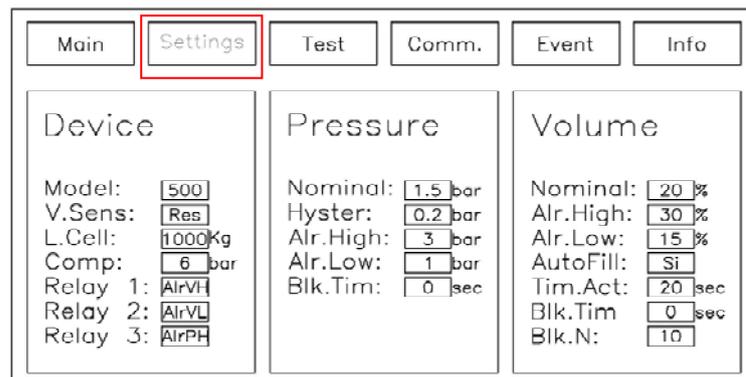
- DATE: Click on the box below DATE and enter the desired date in DDMMYY format (*DayMonthYear*). It is validated by pressing ENTER button.

- TIME: Press on the box below TIME, enter desired time in HHMMSS format (*HourMinuteSecond*). It is validated by pressing ENTER button.

- SCREENSAVER: If you wish to set a time for activation of the SCREENSAVER, press on the box below the SCREENSAVER, the keyboard appears and the desired time for activation is entered. Time between 1 minute and 60 minutes. 0 (Zero) means SCREENSAVER disabled. It is validated by pressing ENTER button.

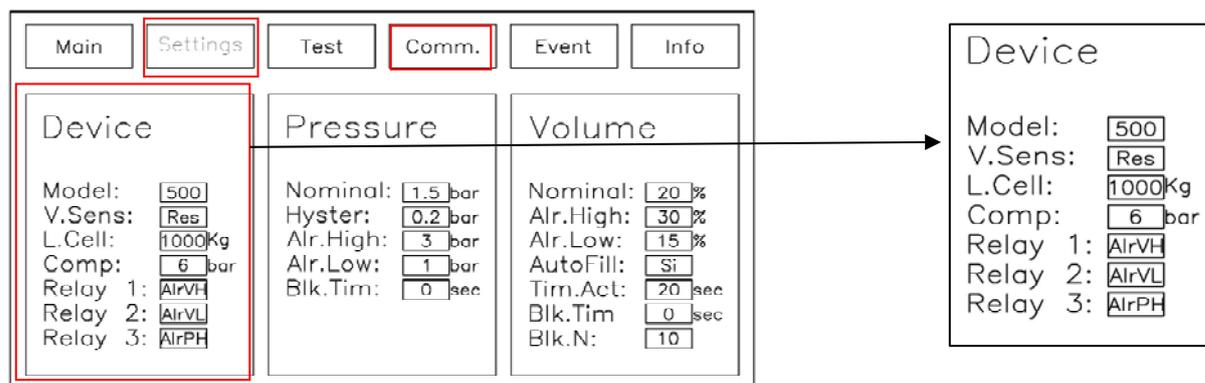
Expansion vessel: For it, access to SETTINGS Menu. Once SETTINGS menu is selected, is need to enter the PASSWORD. Press ENTER to validate access.

SETTINGS menu is divided into 3 sections, DEVICE, PRESSURE and VOLUME



CRB AUTOMAT

Device: Configuration of the values corresponding to the selected expansion vessel model.



The screenshot shows the 'Settings' tab of the CRB AUTOMAT configuration interface. The 'Device' section is highlighted with a red box. The 'Device' section contains the following configuration options:

Parameter	Value
Model:	500
V.Sens:	Res
L.Cell:	1000 Kg
Comp:	6 bar
Relay 1:	AirVH
Relay 2:	AirVL
Relay 3:	AirPH

The 'Pressure' and 'Volume' sections are also visible, showing various alarm and timing parameters.

- MODEL: Click on the box MODEL, enter the desired model between, 200, 300, 500, 700, 1000, 1400, 2000, 3000, 5000, 200x2, 300x2, 500x2, 700x2, 1000x2, 1400x2, 2000x2, 3000x2 and 5000x2. By default the chosen model is "NoDef" (Not Defined).

- V.SENS: Click on the box V.SENS, enter the desired type of VOLUME SENSOR between RES (Resistive) and 4-20mA. By default the chosen V.SENS is RES.

- L.CELL: Click on the box T.CELL, enter the the admissible weight of the load cell. The values to select 500 Kg / 1000 Kg. By default the chosen load cell is 500 Kg.

- COMP: Click on the box COMP, enter the desired type of compressor. The possible values: 6/8 bar. By default the chosen compressor is 6 Bar.

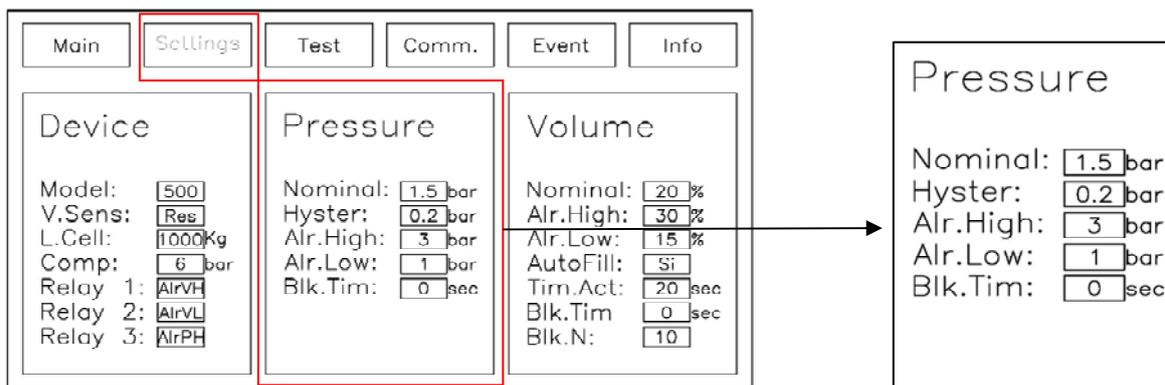
- RELAY 1: Press on the box RELAY 1, enter the desired type of alarm from the following options: NoDef, HIGH AIR PRESSURE (ALrPH), LOW AIR PRESSURE ALARM (ALrPL), HIGH WATER VOLUME ALARM (AlrVH), LOW WATER VOLUME ALARM (AlrVL), VOLUME ALARM (AIVol), PRESSURE ALARM (AIPrs), COMPRESSOR ALARM (ALCmp), AUTOMATIC FILLING ALARM (AIAut), MANUAL ALARM (AIMan). By default the chose alarm is "NoDef".

- RELAY 2: Press on the box RELAY 2, enter the desired type of alarm from the following options: NoDef, HIGH AIR PRESSURE (ALrPH), LOW AIR PRESSURE ALARM (ALrPL), HIGH WATER VOLUME ALARM (AlrVH), LOW WATER VOLUME ALARM (AlrVL), VOLUME ALARM (AIVol), PRESSURE ALARM (AIPrs), COMPRESSOR ALARM (ALCmp), AUTOMATIC FILLING ALARM (AIAut), MANUAL ALARM (AIMan). By default the chose alarm is "NoDef".

- RELAY 3: Press on the box RELAY 3, enter the desired type of alarm from the following options: NoDef, HIGH AIR PRESSURE (ALrPH), LOW AIR PRESSURE ALARM (ALrPL), HIGH WATER VOLUME ALARM (AlrVH), LOW WATER VOLUME ALARM (AlrVL), VOLUME ALARM (AIVol), PRESSURE ALARM (AIPrs), COMPRESSOR ALARM (ALCmp), AUTOMATIC FILLING ALARM (AIAut), MANUAL ALARM (AIMan). By default the chose alarm is "NoDef".

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Pressure: Configuration of the values corresponding to the air side of the chosen expansion vessel.



- **NOMINAL:** Value of the nominal pressure or compressor stop pressure. Press on the box and enter the value of the desired **NOMINAL PRESSURE**, between values from **MIN 0.5 bar** to **MAX 5.0 bar**. It is validated by pressing **ENTER** button. By default the selected **NOMINAL** value is 1.5 bar.

Adjustment of pressurization values,

*Adjustment of pressurization values,
NOMINAL PRESSURE \geq $PST / 10 + 0.6$ Bar
 being, **PST** the static height of the system in wmc.*

It must be ensured that the maximum operating pressure of the expansion vessel indicated on the sticker attached to the tank is never exceeded.



- **HYSTER.:** Pressure difference in **BAR** below which the compressor starts up until reaches the **NOMINAL** pressure value or pressure difference above which the air solenoid valve is activated to expel air from the expansion vessel until reaching the **NOMINAL** pressure. Click on the box and enter desired **HYSTERESIS** value, between values from **MIN 0.1 bar** to **MAX 1.0 bar**. It is validated by pressing **ENTER** button. By default, the selected **HYSTER** value is 0.0 bar.

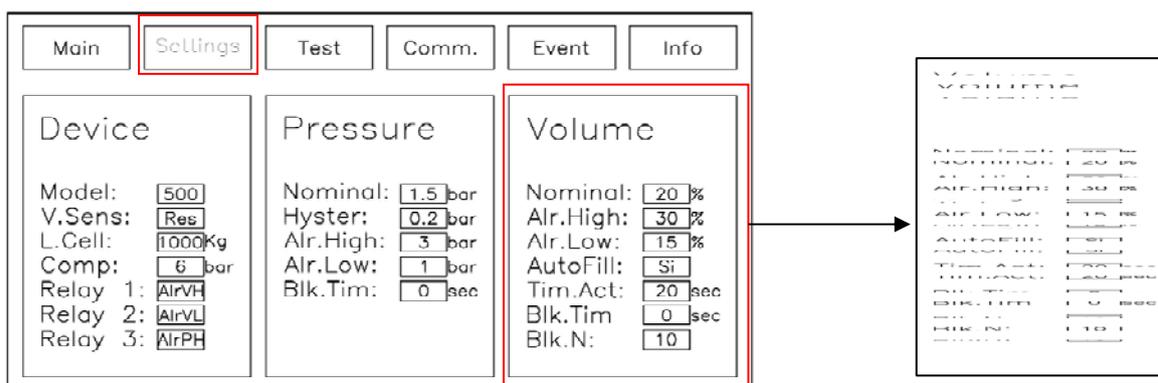
- **ALARM HIGH:** Value of the pressure from which the LED on the **MAIN** screen is activated in red color, not at all by high pressure. Optionally, **RELAY1**, **RELAY2**, **RELAY3** can be used as a configuration of this type of array to enable monitoring. The Screensaver in case of activation, will do in **RED FLASHING**. Click on the box and enter the value of the desired **ALARM HIGH** value, between values 0.5 bar to 5.0 bar. It is validated by pressing the **ENTER** button. By default the selected **ALARM HIGH** value is 5.9 bar.

- **ALARM LOW:** Value of the pressure from which the LED on the **MAIN** screen is activated in red color, giving rise to an alarm due to low pressure. Optionally, **RELAY1**, **RELAY2**, **RELAY3** can be used as a configuration of this type of array to enable monitoring. The Screensaver in case of activation, will do in **RED FLASHING**. Click on the box and enter the value of the desired **ALARM LOW**, between value from 0.5 bar to 5.0 bar. It is validated by pressing the **ENTER** button. By default the selected **NOMINAL** value is 1.0 bar.

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- **BLK.TIM:** Value in seconds of the compressor **BLOCKING TIME**. By compressing the selected time the compressor will stop giving rise to a monitoring alarm in case of selection in any of the RELAY1, RELAY2, RELAY3. The Screensaver in case of activation, will do in RED FLASHING. Press on the box and enter the value of COMPRESSOR BLOCKING, between values from 0 seconds to 999 seconds. It is validated by pressing the ENTER button. By default, the selected value is 0 sec.

Volume: Configuration of the values corresponding to the water side of the chosen expansion vessel.



- **NOMINAL:** Value of the **NORMAL** volume of water of in %. Click on the box and enter the value of the desired **NOMINAL VOLUME**. Values from MIN 20% to MAX 80%. It is validated by pressing the ENTER button. By default, the selected **NOMINAL** value is 30%.

- **ALARM HIGH:** Value of the volume of water, from which the LED on the MAIN screen is activated in red color, due to **HIGH WATER VOLUME**. The RELAY1, RELAY2, RELAY3 can be used as a configuration of this type of array to enable monitoring. The SCREENSAVER in case of activation, will do in RED FLASHING. Click on the BOX and enter the value of **ALARM HIGH WATER VOLUME**, between the values from MIN 1% to MAX 99%. It is validated by pressing the ENTER button. By default, the **ALARM HIGH** value selected is 99%.

- **ALARM LOW:** Value of the volume of water, from which the LED on the MAIN screen is activated in red color, due to **LOW WATER VOLUME**. The RELAY1, RELAY2, RELAY3 can be used as a configuration of this type of array to enable monitoring. The SCREENSAVER in case of activation, will do in RED FLASHING. Click on the BOX and enter the value of **ALARM LOW WATER VOLUME**, between the values from MIN 1% to MAX 99%. It is validated by pressing the ENTER button. By default, the **ALARM LOW** value selected is 1%.

- **AUTOFILLING:** Click on the box and select YES or NO.

- **TIME ACTIVATION:** If **AUTOFILL** is selected YES, the **TIME ACTIVATION** will be the activation time in seconds for the **AUTOFILLING** activation once it is activated with **ALARM LOW**. Click on the box and enter the value of the desired **TIME ACTIVATION**, between value from 1 sec up to 60 secs. It is validated by pressing the ENTER button.

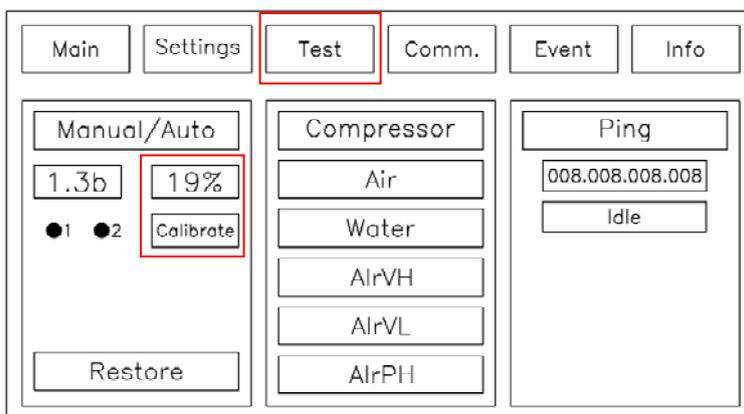
- **BLK.TIM:** Value in minutes of the **LOCKOUT TIME** for the **AUTOFILL** of water. If value zero (0) means **OFF**. (**BLK. TIM:** If the **AUTOFILL** once is activated above the **BLK.TIM** the **AUTOFILL** will be blocked, and the control unit will go to **MANUAL MODE**).

- **BLK.N:** Number of activations of the **AUTOFILLING** of water for its blocking. If value zero (0) means **OFF**. (**BLK. N:** If **AUTOFILL** is activated in one hour (1 hour), a number of times above **BLK. N**, **AUTOFILL** will be blocked, and the control unit will go to **MANUAL MODE**).

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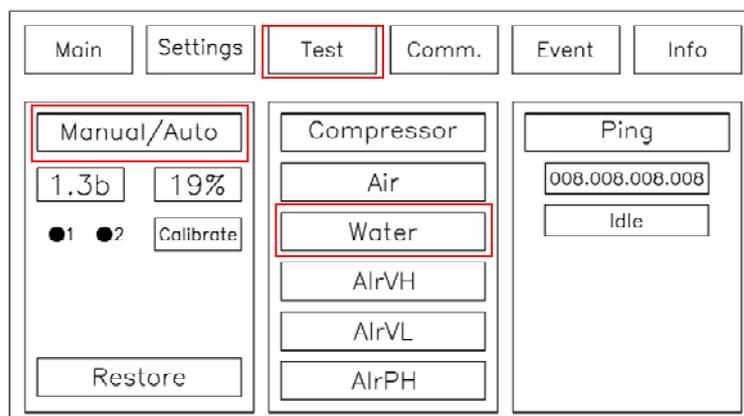
Installed the tank correctly, supported uniformly on the three legs of the tank and completely empty of water / air, the calibration of the weight cell is established. It is important to do this correctly so that the volume sensor can detect a third of the weight of the vessel and therefore, indicate the correct volume.

Calibration of the load cell: For it, access to TEST Menu. Once TEST menu is selected, is need to enter the PASSWORD. Press ENTER to validate access. Press CALIBRATE. At that moment 0% appears, the weight cell that will later indicate the volume of water in the tank is calibrated.



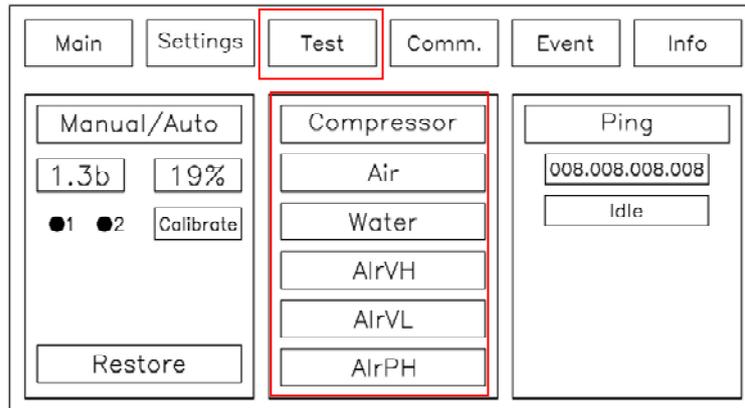
After choosing the filling mode, the closing valve will be opened, allowing the water to pass from the installation to the expansion vessel until % value is monitored through the display in the VOLUME line (%) on the touch screen. With the filling of water, there will be an increase in pressure that may cause the opening of the solenoid valve on the air side to reduce the pressure. Therefore, during filling it is appropriate to open the manual air purge valve located at the top of the vessel at the same time and thus be able to evacuate the unnecessary air located inside the bladder (Water side). Close the air valve when water starts to flow out. When % value is reached, close filling valve.

If there is automatic filling, you can proceed as follows,

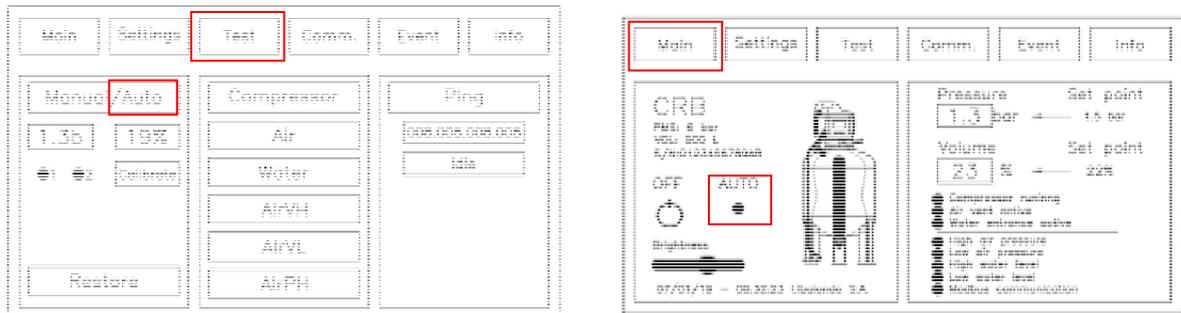


CRB AUTOMAT

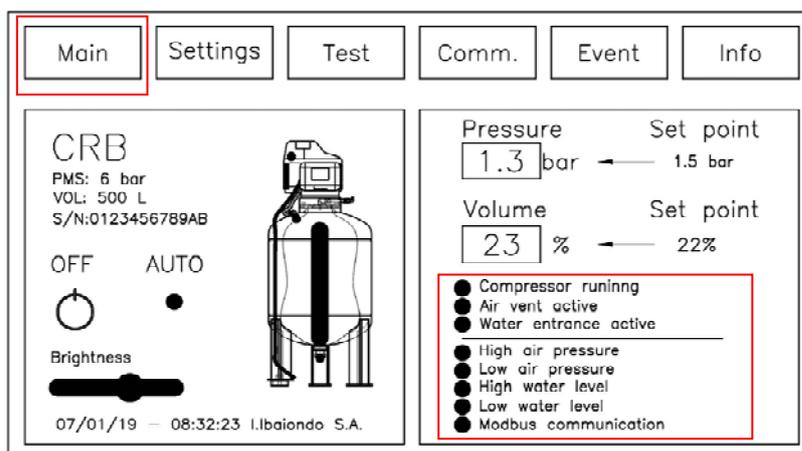
In menu TEST, it can also check the functioning of compressor, air solenoid valve, autofilling, and three alarms below RELAY 1, RELAY 2 and RELAY 3.



Once tested, the MANUAL button is pressed and the vessel will go into AUTO mode.



Through the MAIN screen, you can check the operation of the unit as well as the status of the indicated alarms. In the event that an alarm is active, the corresponding LED will light up.



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In the event that the touch screen is not activated in the course of the time set for the SCREENSAVER, and during that time if alarm is activated, the screensaver will be shown in flashing red.

EVENTS. All events or incidents generated during the operation of the unit will be reflected with date and time in the following screen.

Main	Settings	Test	Comm.	Event	Info
Date	Event				
25/01/2019 - 12:47:32	Compressor ON				
25/01/2019 - 12:47:32	Low pressure alarm ON				
25/01/2019 - 12:47:32	Low volume alarm ON				
25/01/2019 - 12:47:32	Change to AUTO mode				
25/01/2019 - 12:47:32	Control unit switched ON				
25/01/2019 - 12:47:32	Change to MANUAL mode				
25/01/2019 - 12:47:32	Compressor OFF				
25/01/2019 - 12:47:32	Change to AUTO mode				
25/01/2019 - 12:47:32	Auxiliar Relay alarm 1 OFF				
25/01/2019 - 12:47:32	Auxiliar Relay alarm 1 ON				
25/01/2019 - 12:47:32	Water solenoid valve OFF				
25/01/2019 - 12:47:32	Water solenoid valve ON				
25/01/2019 - 12:47:32	Air solenoid valve ON				
25/01/2019 - 12:47:32	Compressor ON				
25/01/2019 - 12:47:32	Low pressure alarm ON				
25/01/2019 - 12:47:32	Change to AUTO mode				

RS-485, if optionally you want to make a communication via R-485, you must access the COMM menu and proceed to activate it YES.

Main	Settings	Test	Comm.	Event	Info
Rs-485 ModBus: <input type="checkbox"/> No Dir: <input type="text" value="2"/> Baud: <input type="text" value="19200"/> bit/s		Ethernet Loc: <input type="text" value="192.168.001.077"/> Gtw: <input type="text" value="192.168.001.001"/> Msk: <input type="text" value="255.255.255.000"/>		Misc Language: <input type="text" value="ESP"/> Date: <input type="text" value="25/01/2019"/> Hour: <input type="text" value="09:18"/> Screensaver: <input type="text" value="10min"/> Password: <input type="text" value="*****"/>	

In the case that it is required to analyze data corresponding to the processor, maneuvering statistics for example of the compressor as well as remote communications, the INFO Menu will be accessed.

Main	Settings	Test	Comm.	Event	Info
Processor S/N: 0123456789AB Frm.Rv: 0.16.B Mem.Rv: 0xfo Voltage: 21.2V Tp.Cpu: 19.9C Tp.Max: 22.4C		Statistics On/Off: 10 CPU.T: 30.2h Comp.N: 59 Comp.T: 1.9h Air.N: 11 Wgt.N: 14 AIP.N: 0 AIV.N: 0 Pr.Max: 2.1bar Start: Reset		Remote 485.Npax: --- 485.TxBy: --B 485.RxBBy: --B Eth.Npax: --- Eth.TxBy: --B Eth.RxBBy: --B	

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Maintenance

Maintenance must be carried out exclusively by authorized personnel.

The equipment is designed and built for a long service life and high operational safety with minimum maintenance and care. However, we recommend performing the following operational controls at least once a year to prevent and prevent unnecessary operational anomalies. This is also especially important for the validity of the agreed liability requirements and guarantee commitments.

Check that the equipment works with the correct operating pressure.

Check that the fluid volume of the vessel is correctly adapted to the relevant operation.

Low temperature in the installation, for example in summer: presentation of volume between 25% and 50%.
Higher temperature, for example in winter: volume presentation between 50% and 75%

Check that the coupling hoses and couplings are tight.

Carefully open the condensation tap to empty any condensation water. It accumulates after a while on the air side at the bottom of the container because the atmospheric air supplied by the compressor contains a certain amount of moisture. It is totally normal that between a small amount of water

Periodic reviews must be carried out in accordance with the provisions of the Pressure Equipment Regulations (REP).

As spare parts, only the original components of the expansion vessel manufacturer can be used

Operation control

The compressor is activated frequently and for short intervals. The container is filled with fluid. The membrane or bladder completely fills the container inside and, therefore, there is almost no space left on the air side. Empty the container until the volume drops to approximately 60%. During emptying the compressor will start and run at increasingly longer intervals, which is totally normal.

No air or fluid comes out of the condensation water tap. The container contains a lot of fluid, which can cause the inner membrane to act as a gasket that covers the connection of the condensate drain valve. It is not really a fault. Wait for the content in the container to decrease before emptying.

The pressure in the installation does not match the operating pressure shown in the pressure maintenance unit. The container is completely filled with fluid. The hose coupling in the upper part of the container is blocked because the membrane inside acts as a seal against the coupling.

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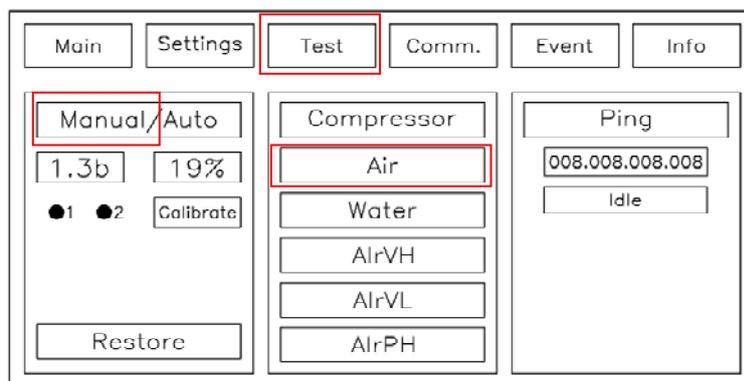
It means that the equipment does not communicate with the installation. Empty the container (up to approximately 60%). Then the membrane is compressed and "opens" the communication between the container and the unit. Now, the pressure in the installation and the pressure shown in the pressure maintenance unit are equal again.

When the condensation water is emptied on the air side, water does not stop flowing even if the tap has been open for several minutes. The membrane is damaged and therefore is not watertight, so fluid can flow out of the air side. As a first step: Empty the container, at least up to 40%. The equipment can continue to work for a short time, but the membrane should be changed as soon as possible. The pressure maintenance unit is probably intact and can be preserved. However, it is necessary to change the membrane.

Caution

The pressure vessel contains compressed air with an overpressure of up to 6 Bar. It is therefore important to periodically check the operation of the pneumatic safety valve in the pressure maintenance unit.

Before performing service actions and starting work, the pressure must be relieved to ensure that the pressure vessel is completely depressurized. The safest procedure to depressurize is to do it manually, causing the opening of the air solenoid valve. For this, it is necessary,



The solenoid valve is kept open by pressing the "Air" button. The container is completely discharged when the pressure on the display is zero and the air outlet has completely ceased. To perform larger service measures that require an internal examination, all fluid must also be emptied.

The pressure maintenance unit contains electrical components (compressor, solenoid valve and control unit) with a single-phase voltage of 230V - 50Hz. Therefore, before carrying out any work on the container, it is necessary to completely disconnect the voltage unit, by unplugging the grounded plug from the socket or by cutting off the power with the safety switch connected.

For security it is important to carry out regulatory controls, such as inspection of the installation and recurrent inspection. Normally these inspections are carried out by an accredited body.

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Reception of material

Control on arrival: Check immediately that the equipment corresponds to the order and that all the components are in perfect condition and that the correct instructions for use have been attached. It is especially important to check the pressure vessel to detect possible deformations that could affect its resistance. If defects or damage are found, contact the manufacturer immediately.

In the pressure vessel there is a manufacturing plate containing all the necessary data. Check that these data are consistent with the specification and that they are suitable for installation. In the pressure maintenance unit there is also a manufacturing plate containing all the necessary data. It is also important to verify that these data agree with the specification and that they are suitable for installation.

Handling

Proceed with extreme care when handling the equipment; especially when using lifting implements. The pressure vessel has, as standard, lifting eyebolts for easy handling. On one of the legs of the container there is mounted a volume transducer foot and on the other two legs there are adjustable machine feet. When moving laterally, it is important not to subject any machine foot to unnecessary shear stresses, which could easily damage them. Handle the pressure maintenance unit placed in the packaging to the mounting location.

CRB AUTOMAT



COMPRESSOR CONTROLLED PRESSURIZATION SYSTEM