Electronic Controller for Compressor Racks

XC807M - XC811M
XC907M - XC911M

Instructions Manual

INDEX

1. GENERAL WARNING

1.1 ⚠️ Please read before using this manual

- This manual is part of the product and should be kept near the instrument for easy and quick reference.
- The instrument shall not be used for purposes different from those described hereunder. It cannot be used as a safety device.
- Check the application limits before proceeding.

1.2 ⚠️ Safety Precautions

- Check the supply voltage is correct before connecting the instrument.
- Do not expose to water or moisture: use the controller only within the operating limits avoiding sudden temperature changes with high atmospheric humidity to prevent formation of condensation
- Warning: disconnect all electrical connections before any kind of maintenance.
- The instrument must not be opened.
- In case of failure or faulty operation send the instrument back to the distributor or to "DIXELL s.r.l." (see address) with a detailed description of the fault.
- Consider the maximum current which can be applied to each relay (see Technical Data).
- Ensure that the wires for probes, loads and the power supply are separated and far enough from each other, without crossing or intertwining.
- Fit the probe where it is not accessible by the end user.
- In case of applications in industrial environments, the use of mains filters (our mod. FT1) in parallel with inductive loads could be useful.

2. General description

The XC800M and XC900M series are thought to manage both compressors and fans in a condensing system such as a pack.

The compressors can be simple, multistage or with different capacities.

Control is by means of a neutral zone or proportional band and is based on the pressure or temperature sensed in the LP suction (compressors) and HP (condenser) circuits. A special algorithm balances the run hours of the compressors to distribute the work load uniformly.

The controllers can convert both LP and HP pressures and display them as temperatures.

The front panel offers complete information on the system's status by displaying the suction and condenser pressure (temperatures), the status of the loads, possible alarms or maintenance conditions.

Each load has its own alarm input that is able to stop it when activated. To guarantee the total system's safety, there are also two inputs for low and high pressure switches: when these are activated, the system is stopped.

The XC900M series controllers are equipped with an infrared output, that is IRDA compatible. It can transmit to a printer, the instrument's parameters, a list containing the last 10 alarms and a graph with the suction and condenser values, as well as the percentage of loads engaged.

By means of the HOT KEY the controller can be easy programmed at power on.

The controller can be connected to the XJ500, controlling and monitoring system, thanks to the RS485 output, using the standard ModBus RTU protocol.

2.1 Models and features

	XC807M	XC811M	XC907M	XC911M
Probe inputs				
Suction (4÷20mA or NTC)	●	●	●	●
Condensing (4÷20mA or NTC)	●	●	●	●
Alarm inputs (line voltage)				
Low pressure-switch	●	●	●	●
High pressure-switch	●	●	●	●
Digital alarm inputs	7	11	7	11
Display				
Suction display (4 green digits)	●	●	●	●
Condensing display (4 red digits)	●	●	●	●
Output relays				
Loads (8A)	7	11	7	11
Alarms (8A)	2	2	2	2
Logger				
Alarms (last 10 alarms)	●	●	●	●
Data (pressures, loads)	-	-	●	●
Infrared Section				
Present	-	-	●	●
RS485 serial output				
Present	●	●	●	●
Hot key for programming				
Present	●	●	●	●

3. First installation

At first installation, it's necessary the following:

1. **Set the internal Real Time Clock (RTC)**
2. **Select the kind of gas.**
3. **Set the range of the pressure probes.**

In the following paragraph a short cut for the above operations.
Chapters **4.4 Programming (compressors and fans)** and **5 List of parameters** will show in detail these operations.

3.1 How to set the Real Time Clock

At power on, if the back up battery is exhausted, the **A11L** message is shown. This means that the internal clock has to be set.

How to do
1. Push once the **"PRG"** key of compressor section. The message "**oPr**" will be shown.
2. Push the **UP** key. The parameter **Pri= minutes** will be shown.
3. Push the **SET** key and enter the value with the **UP** and **DOWN** keys.
4. Push the **SET** key to confirm the value. Next parameter will be displayed.
5. Repeat the actions described at points 3 and 4 for the following parameters:
   - **HoUr: hour** (0÷23)
   - **dAy: day of the month** (0÷31)
   - **ndAy:**: **day of the week** (**Sun=**Sunday, **Mon**= Monday, **tuE** = Tuesday, **UEd** = Wednesday, **tHu** = Thursday, **Frd** = Friday, **SAt** = Saturday).
   - **Mnth: month**(1÷12)
   - **yAr: year** (2000÷2099)

3.2 How to set the kind of gas

The controller has memorised the relation between temperature and pressure for some gases. The pre-set gases are:
   - **r22** for the USA,
   - **r404** for other countries.

If another gas is used, act as in the following:
1. Push twice the **PRG** key of compressor section. The message "**CnF**" will be shown.
2. Push the **UP** key. The parameter **CPnu** will be shown.
3. Select the **FtyP, kind of gas,** parameter.
4. Push the **SET** key to see the value. Select the gas among the following: **r22=** R22**; r404=**R404A**; 507=**R507**; 134=**134**; r717=** ammonia.
5. Push the **SET** key to confirm the value. Next parameter will be displayed.

NOTE: after having modified this parameter, when the controller exits the programming phase, it is automatically switched off and on.

3.3 How to set the range of the pressure probes

The configuration menu of the suction and condensing sections contains 2 parameters for setting the pressure probe range:

PA04: Adjustment of read out corresponding to 4mA
PA20: **Adjustment of read out corresponding to 20mA**

Practically these parameters has to be set with the start and end scale of the probe range.

WARNING: set a value correspondent to **absolute pressure**. If the transducer measures relative pressure increase the range of 1 bar.

   E.I. PP07 relative pressure transducer, range -0.5÷7.0 bar. PA04=0.50; PA20=8.00.

   PP30 relative pressure transducer, range: 0÷30bar. P04=1.00; P20=31.00.

How to do:
1. Push twice the "**PRG"** key of compressor section. (Act the same for fan section). The message "**CnF**" will be shown.
2. Push the **UP** key. The parameter **CPnu** will be shown.
3. Select the **PA04, adjustment of read out corresponding to 4mA,** parameter.

4. Push the **SET** key to see the value. set the lower value of the probe range (lower value +1 if the probe detects relative pressure).
5. Push the **SET** key to confirm the value. The **PA20: adjustment of read out corresponding to 20mA** parameter will be displayed.
6. Set the higher value of the range (higher value +1 if the probe detects relative pressure).
7. Push the **SET** key to confirm the value. Next parameter will be displayed.

3.4 How to set the kind of display: relative or absolute pressure

After setting the probe range by means of the PA04 and PA20 parameters, it's possible to select if the absolute or relative pressure has to be displayed.

The controller is pre-set for RELATIVE PRESSURE displaying.

If the **absolute pressure** has to be displayed, act as in the following:

1. Push once the **"PRG"** key of compressor section. The message "**oPr**" will be shown.
2. Push the **UP** key. The parameter **Pri=** minutes will be shown.
3. Select by pushing the **UP** key the **rELP** parameter.
4. Push the **SET** key to see the value.
5. Set the **AbS** value and push the **SET** key to confirm it.

EXIT: Push the **PRG** key or wait 30s.

4. User interface
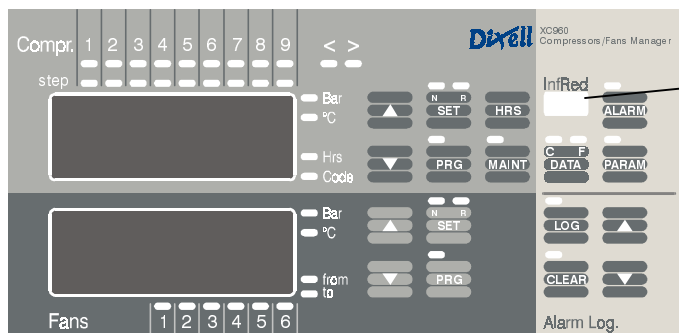
Present only on the XC907M and X911M

The front panel of the instruments is divided in 4 parts with different colours. Each part manages an his own function. the following sketch shows the functions:

COMPRESSORS	INFRA RED
FANS	ALARMS

4.1 Compressors Section
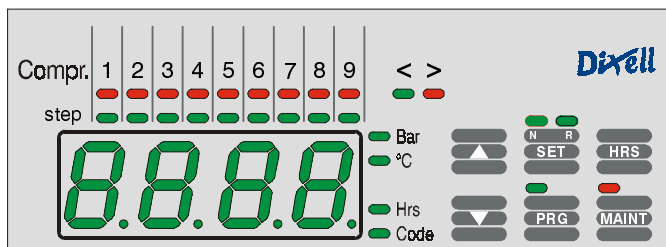
Keys

1. **Up**

It scrolls the parameter codes or increases the value of the displayed variable. Holding it pressed will increase the speed.

2. **Down**

It scrolls the parameter codes or decreases the value of the displayed variable. Holding it pressed will increase the speed.

3. **Set**

To display and modify the set point of the suction section. It displays the normal and reduced set point in °C and bar.
To modify the value use the Up and DOWN keys.
If the **N** or **R** led is flashing, it means that the displayed set point is not active.

4. **Prog**

To access the programming mode. By pressing once the operative parameters (oPr) are entered, by pressing twice the configuration (cnF) parameters are entered. To exit the programming mode press the **Prog** key again.

5. **MAINT**

Used for displaying the state of loads: "available" or "in maintenance". It is also used for the fans.

6. **HRS**

Used for displaying the loads run times. It is also used for the fans.

4.2 Fans section

4.2.1 Displaying
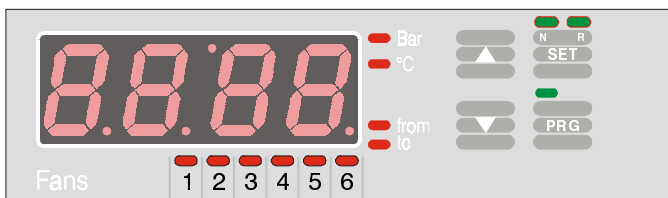
4.2.2 Keys

1. **Up**
   It scrolls the parameter codes or increases the value of the displayed variable. Holding it pressed will increase the speed.

2. **Down**
   It scrolls the parameter codes or decreases the value of the displayed variable. Holding it pressed will decrease the speed.

3. **Set**
   To display and modify the set point of the condensing section. It displays the normal and reduced set point in °C and bar.
   If the **N** or **R** led is flashing, it means that the displayed set point is not active.
   To modify the value use the Up and DOWN keys.

4. **Prog**
   To access the programming mode. By pressing it once the operative parameters (oPr) are entered, by pressing it twice the configuration (cnF) parameters are entered. To exit the programming mode press the key again.

4.3 Displaying, setting and modifying the normal and reduced set point (sections compressors and fans)

 WARNING: before setting the target set points for the first time, check and, if necessary, modify the type of freon (par. FtyP) and the default unit of measurement (par. dEU) for compressors and fans

PROCEDURE
1.   Set the kind of freon (FtyP par. of configuration)

2. **Set the measurement unit (dEU par. of operative).**
3. **Check and if necessary modify the set point limits (LSE and HSE par.).**

NOTE: the reduced set point is enabled by means of internal clock or digital input.

1. Press the "**SET**" key.
2. The normal set point will be displayed in the measurement unit pointed out from the led (°C or bar).
3. If the normal set is operating the "N" led is lighted, otherwise the "N" led blinks.
4. To modify the value use the "UP" & "DOWN" keys
5. To change the measurement unit press the "**SET**" key again.
6. To select the reduced set point, press the "**SET**" key again. (if it is operating the "R" led is lighted, otherwise the "R" led blinks).

To exit: press the "**SET**" key till the "N" and "R" LED's are turned off or wait for the Exit time out (30 s).

4.4 Programming (compressors and fans)

1. Press the "**PRG**" key (section compressors or fans) once for selecting the operative parameters (oPr); twice for the configuration parameters (CnF).
2. Press the "**UP"** key and the first parameters will be displayed.
3. Press the "**SET"** key to see the value, use the " **UP"** and "**DOWN**" keys to modify the value.
4. By pressing the "**SET"** key again the new value will be recorded and the label of the next parameter will be shown.

To exit: press the "**PRG**" key or wait for the exit time out (30 s).

4.4.1   Security code input.

The security code prevents not qualified personnel from modifying parameters.
This feature is enabled if the parameter PSo (operative parameters) or PSc (configuration parameters) is different from zero.

1. Press the "**PRG**" key (section compressors or fans) once for selecting the operative parameters (oPr); twice for the configuration parameters (CnF).
2. Press the "**UP"** key: the "PASS" message will be displayed.
3. Press the "**SET"** key: the "0" number will be displayed.
4. Insert the security code by using the **UP** and **DOWN** keys.
5. Confirm it by pressing the **SET** key.
6. If the security code is correct the first parameters will be displayed, otherwise the set value keeps on being displayed. Press the UP key again to restart the procedure..

4.5 How to display the status of the outputs

1. Press the "MAINT" key
2. The LED's of the first output start blinking and the compressor display shows the following messages:
   - onLn = output enabled
   - oFLn = output disabled
   for compressor with more steps the LED's linked to the compressor (red) and the valves (green) blink together.
3. To see the status of the following output press the UP key.
4. **To exit**: press the MAINT key or wait for 30 sec.

4.6 How to disabled an output during a maintenance session.

1. Press the "MAINT" key
2. The LED's of the first output start blinking and the compressor display shows the following messages:
   - onLn = output enabled
   - oFLn = output disabled
   for compressor with more steps the LED's linked to the compressor (red) and the valves (green) blink together.
3. Select the output by pressing the UP key.
4. Hold pressed the "CLEAR" key for more than 2 sec: the displayed message will change: onLn →oFLn or oFLn →onLn).**To exit**: press the MAINT key or wait for 30 sec.

4.6.1   Output disabled signalling.

If an output is disabled his led (red and green) blinks.

4.6.2   Regulation with some outputs disabled.

If some outputs are disabled they don't take part to the regulation, so the regulation goes on with the other outputs.

4.7 Displaying running hours of loads

The controller memorises the running hours of each load.
To see how long a load has been working follow this procedure:
1. Press the "HRS" key
2. The HRS led of the compressors display starts flashing together with the LED's of the first output. The compressors display shows the running hours of the first compressor.
3. For compressors with more steps the LED's linked to the compressor (red) and the valves (green) blink together.
4. To see the running hours of the following load press the UP key.
5. **To exit**: press the HRS key or wait for 30 sec.

4.7.1   How to reset the running hours of a load.

1. Press the HRS key.
2. Select the load by pressing the UP key.
3. Hold pressed the CLEAR key (alarm section) till the display shows zero.

4. Repeat the operation for other loads
5. **TO EXIT**: press the HRS key or wait for 30 sec without pressing any key.

4.8 Alarm section

4.8.1 User interface

Alarm Log.

- **Log**

  By pressing this key the alarm menu is entered. Press the UP and DOWN keys to see the alarms happened.

- **Up**
  Scroll the alarm list.

- **Down**
  Scroll the alarm list

- **Clear**
  This button has several properties linked to the time that is hold pressed and the menu of the instrument:
  Standard operating mode
  1. Silence the buzzer during an alarm condition
  2. Hold pressed for more than 2 seconds switch off the alarm relay during an alarm condition
  3. **In the alarm menu:**
     a. Hold it pressed for more than 2 seconds for erase the displayed alarm.
     b. Hold it pressed for more than 10 seconds for erase the whole alarm list.
  4. **In the "running hours" menu:**
     a. Hold it pressed for more than 2 seconds for erase the displayed working hours.
  5. **In the "status of outputs" menu:**

a. Hold it pressed for more than 2 seconds for change the status of the shown output. From off to on and viceversa

4.9 Infrared section (only for XC911M and XC907M)

XC960
Compressors/Fans Manager

InfRed

ALARM

C   F
DATA   PARAM
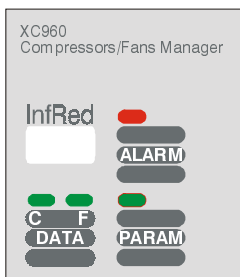
ALARM
- **Alarm.**
  For printing the alarm list

C   F
DATA
- **Data**
  For printing the behaviour of pressure and status of outputs.
  a. Press it once to print the compressors.
  b. Press it twice to print the fans
  c. Press it three time and then hold pressed the CLEAR key for some seconds to erase the data.
  d.

PARAM
- **Parameters**
For printing the list of parameters (fans and compressors)

4.10 How to print

4.10.1 Logged alarms printing

Press the Alarm key

4.11 Printing layout

```
            Dixell – XC 911M
                 Alarm List

Code        From            To

ALXY  hh.mm gg/mm      active*
ALXX  hh.mm gg/mm  hh.mm gg/mm
-------  ---------  --------  ---------  --------
-------  ----------  --------  ---------  --------

Index
AL01   Alarm description
------   ---------------  -------
```

* still present alarm

4.11.1 Parameters list printing

Press the "**Param**" key

4.11.2 Printing layout

```
            Dixell – XC 911M
               Parameter List

Type: Compressor (Opr)

Label          Value      M.U. Range
Pri             54        min   0 –59

Type: Compressor (Cnf)
Label          Value      M.U. Range

CpnU            3          num   1 - 9
-------           --------  ---------
-------           --------  ---------
```

4.12 Data printing: course of pressure and loads activation

4.12.1 Printing of suction and condensing data.

Press once the "**Data**" key to print the behaviour of suction pressure and the compressors' activation.

Press twice the "**Data**" key to print the behaviour of condensing pressure and fans activation.

4.12.2 Data reset.

1. Press three times the DATA key, LED's C and F over the key start flashing, together with the CLEAR key led.
2. Press the CLEAR key by 10s.
3. The LED's stop flashing and the data are erased.

5. List of parameters

Parameters are divided into 2 groups:

- **configuration parameters:** for plant settings
- **operational parameters:** for the standard functioning of the plant

5.1 Configuration parameters - compressor section

WARNING: after having modified one of these parameters the controller automatically switches off and on to load the new map.

5.1.1 Plant dimensioning and type of regulation.

By means of these parameters the plant can be dimensioned according to the number and type of compressors and the number of steps for each one.

CpnU: **Compressor Number**: number of compressor present in the plant. (1-9 for XC811M e XC911M; 1-7 for XC807M, XC907M).

CtyP: **Compressor type**: it selects if the compressors have the same power (homogeneous) or not.

0 = **compressor with different capacities**: in this case the regulation is neutral zone.

1 = **homogeneous**: the regulation can be neutral zone or proportional band.

2 = screw compressors the regulation can be neutral zone or proportional band.

CPst: **Compressor Steps**: present only if

CtyP=1: compressor homogeneous or CtyP = 2 screw compressors (**1-9** for XC811M e XC911M; **1-7** for XC807M, XC907M).

It is equal to the numbers of compressor valves plus one. NOTE: with 2 compressors (CPnU=2), each with 3 steps (CPSt=3), the relays have to be connected as below:
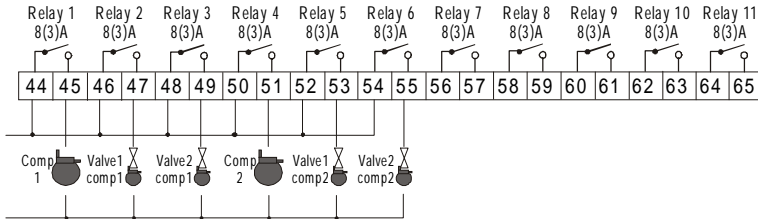
PC1 ..PC9 Power of compressor 1...9: for setting the power of single compressors. Available only if CtyP=0. The power is identified by a value (range 1÷255) proportional to the capacity of single compressor.

E.I. 3 compressors with following capacity: 10, 20, 40 HP. The parameters have to be set in these way: PC1=10, PC2=20, PC3=40.

rTy: **Type of regulation (see par. 7 Type of regulation)**

db = neutral zone,　　**Pb** = proportional band.

nCPC Master compressor enabling (no, yES) When this function is enabled the first compressor is always started before the other ones and is switched off last. Other loads operate according to the parameter Sty. With Sty=F in fixed sequence, with Sty = rot according to the running hours. This function can be used with both homogeneous and different power compressors.

SEtS Set crossing (sensitive) function (no, yES) When this function is enabled the regulation algorithm turns on a load when the pressure coming from the "lower out band" reaches the set point or turns off a load when the pressure coming from the "upper out band" reaches the set point. If disabled the regulation starts only when the pressure (temperature) is out of the dead band.

Sty: **Activation: type of sequence**

rt = rotation: this algorithm distributes the working time between the various loads to ensure even run times.

F = fixed sequence: the compressors are enabled and disabled in fixed sequence: first, second etc.

FtyP: **Freon Type**: set the kind of freon used in the plant

r22 = R22; **r404**= R404A ; **507**= R507; **134**=134; **r717**=r717 (ammonia)

5.1.2 Suction probe configuration

Pbc: Probe selection. Cur = 4 ÷ 20 mA probe; **ntc =** NTC probe.

PA04: Adjustment of read out (present only if Pbc=Cur). corresponding to **4mA** input signal, given by the suction probe (0 ÷31 bar or 0÷450 PSI or 0÷3100KPA)

Warning: set a value correspondent to absolute pressure. If the transducer measures relative pressure increase the range of 1 bar.

See also par. **3.3 How to set the range of the pressure probes**

E.I. PP07 relative pressure transducer, range -0.5÷7.0 bar. PA04=0.5 (-0.5+1); PA20=8.0 (7+1).

PP30 relative pressure transducer, range: 0÷30bar. PA04=1; PA20=31.

PA20: **Adjustment of read out** corresponding to **20mA** input signal, given by the suction probe (0 ÷ 31.0 bar or 0÷450 PSI or 0÷3100KPA)) **SEE THE WARNING FOR PA04**.

CAL: **Suction probe calibration** (-1.00÷1.00 bar; -10.0÷10.0°C or -20÷20 PSI/°F or -100÷100 KPA)

5.1.3 Others inputs configuration

SEP: **Polarity of Low pressure-switch alarm** (terminals 5-6)

0=alarm with voltage absence; **1**= alarm with voltage presence

rSIP: **Reduced set input polarity** (terminals 13-14)

0=reduced set enabled with open circuit; **1**= reduced set enabled with closed circuit

LLI: Liquid level input polarity (terminals 6-8)

0=alarm with voltage absence;   **1**= alarm with voltage presence

ALIP: Alarm input for compressors and fans polarity

0=alarm with voltage absence;   **1**= alarm with voltage presence

StPP: valve outputs polarity: polarity of the outputs for capacity valves. It determines the state of the relays associated with the capacity valves (only for homogeneous and stepped-capacity compressors):

0=valve enabled with open contact;   **1**= valve enabled with closed contact.

oFF   oFF function enabling (no/yES) By setting oFF=yES the controller is IMMEDIATELY switched off. The flashing message OFF is displayed.

To **TURN ON** again the controller hold pressed the SET key of compressor sections for some seconds

5.1.4 Security code

PSc: **Security code** to access the configurations parameters. (0÷255). With "0" the security code is disabled

5.2 Operative parameters - compressors section

5.2.1 Date and time

Pri: **Minutes** set (0÷59)

HoUr .   **Hour** set (0÷23)

DAY: **Day** set (0÷31)

ndAy Day of the week   ((**Sun**=Sunday; **Mon**=Monday; **tuE**=Tuesday; **Ued**=Wednesday; **thu**=Thursday; **Frd**=Friday; **SAt**=Saturday);

Mont Month (0÷12)

YAr   Year (2000 ÷ 2099)

5.2.2 Measurement unit and regulation type

dEU: **Default measurement unit for displaying (bar**=bar; **°C**=°C or **KPA**=KPA; **°C**=°C or **PSI**=PSI; **°F**=°F according to the version)

NOTE: The **dEU** parameter sets the measurement unit also for these parameters: **Pbd, LSE, HSE, LAL, HAL**. **After modifying this parameter check the set point and the parameters Pbd, LSE, HSE, LAL, HAL.**

Pbd: **Proportional band or neutral zone width** (0.10÷5.00bar/0.5÷30°C or 1÷80PSI/1÷50°F or 10÷500KPA/0.5÷30°C)

The band (or zone) is symmetrical compared to the target set point, with extremes: set+Pbd/2 ... set-Pbd/2. The measurement unit depends on the dEU par.

onon: **Minimum time between 2 following switching ON of the same compressor** (0÷255 min).

oFon: **Minimum time between the switching off of a compressor and the following switching on**. (0÷255min). *Note: usually onon is greater than oFon.*

Cdn: **don and doF equal** for all the compressors.

 YES: don and doF equal for all the compressors:

 no: don and doF different for each compressor. In this case there are as don1, don2... and doF1, doF2... as the compressors are.

don1: Time delay between the insertion of the first compressor and the following one. (It is present only if Cdn=no) (0÷255 sec)

…….

don9: Time delay between the insertion of the ninth compressor and the following one. (It is present only if Cdn=no) (0÷255 sec)

doF1:**Time delay between the switching off of the first compressor and the following one**. (It is present only if Cdn=no) (0÷255 sec)

……

doF9: Time delay between the switching off of the ninth compressor and the following one. (It is present only if Cdn=no) (0÷255 sec)

don: **Time delay between the insertion of two different compressors**. (It is present only if Cdn=yES) (0÷255 sec)

doF: **Time delay between switching off of two different compressors**. (It is present only if Cdn=yES (0÷255 sec)

donF: **Minimum time a stage stays switched ON** (0÷255 s)

FdLy: **"don" delay enabled also for the first call.** If enabled, the triggering of the step is delayed for a "don" value, respect to the call. (**no** = "don" not enabled; **yES**="don" enabled)

FdLF "**doF" delay enabled also for the first switching off**. It enables the "doF" delay between the request of a release and the actual switching off.

 (**no** = "doF" not enabled; **yES**="doF" enabled)

odo: **Regulation delay on start-up:** (0÷255s) on switching ON the instrument starts working after the time delay imposed in this parameter.

5.2.3 Operating and reduced set point

LSE: **Minimum set point**: The measurement unit depends on dEU parameter. It sets the minimum value that can be used for the set point, to prevent the end user from setting incorrect values.

HSE: **Maximum set point**: The measurement unit depends on dEU parameter. It sets the maximum acceptable value for set point.

StrS: **Start time reduced set.** (0÷23 h) Starting time for reduced set point operation time interval.

SPrS: **Stop time reduced set** (0÷23 h) Stopping time for the reduced set point operation time interval.

RSd1 Reduced set point enabling for Sunday (no= reduced set disabled; **yES**= reduced set enabled)

....

RSd7 Reduced set point enabling for Saturday (no= reduced set disabled; **yES**= reduced set enabled) **NOTE:** RSd1=Sunday, RSd2=Monday ... Rsd7=Saturday.

5.2.4 Alarms

Uaro: Measurement unit for the Aro parameter: (**min** = minutes; **HrS** = hours)

Aro: **Alarm override** it is the period following the silencing of an alarm during which the alarm signalling is disabled. After this time if the alarm condition lasts the relay and the buzzer are enabled again. (0÷255m/h 0=always on; 255=always disabled)

PAo: Alarm probe exclusion at power on. it is the period starting from instrument switch on, before an alarm probe is signalled. (0÷255 min). During this time if the pressure is out of range all the compressor are switched on.

LAL: **Low pressure (temperature) alarm**: The measurement unit depends on dEU parameter. It's always subtracted to the set point. When the value **SET-LAL** is reached the A03C alarm is enabled, (possibly after the **tAo** delay time).

HAL: **High pressure (temperature) alarm**: The measurement unit depends on dEU parameter. It's always added to the set point. When the value SET+HAL is reached the A04C alarm is enabled, (possibly after the **tAo** delay time).

tAo: **Low and High pressure (temperature) alarms delay**: (0÷255 min) time interval between the detection of a pressure (temperature) alarm condition and alarm signalling.

Ser: Service request: (1÷9999 hours) number of running hours after that the "A14C" maintenance call is generated.

PEn: Low pressure-switch intervention numbers: (0÷15 with 0 the manually unlocking is disabled) It is referred to the terminals 5-6. If the low pressure-switch is enabled PEn times in the PEI interval, the controller is locked. **Only the manually unlocking is possible**. See also the alarms table at paragraph 12. Every time the pressure-switch is enabled all the compressor are turned off.

PEI: Pressure-switch interventions time (0÷15 min) Interval, linked to the Pen parameter, for counting interventions of the low pressure-switch..

CPP: compressor management with faulty probe (A01C)

    0 = maintaining the resource entered at the moment of the failure

    1 =entering the resources established by means of SPr or PoPr parameters.

SPr: **number of steps engaged with faulty probe**. (0÷CpnU) It's used only if CtyP=1.

PoPr: **capacity engaged with faulty probe** (0÷255) It's used only if CtyP=0.

5.2.5 User interface

rELP Suction pressure displaying:

    AbS = absolute pressure;

    rEL = relative pressure, in this case the absolute value is decreased according to the version by 1.02bar or 14 PSI ac

Loc: **keyboard lock: no** = keyboard enabled; **yES** = keyboard lock

dLI   Data logger interval for recording(1÷60 sec) only for XC900M series

Adr: **Compressors address** (1 –247) It is used in monitoring system.

PSo: **Security code for operative parameters** (0÷255; with 0 the security code is disabled)

Ptb   **Parameter table code**: readable only.

rEL   **Software release** for internal use.

5.3 Configuration parameters - fans section

WARNING: after having modified one of these parameters the controller automatically switches off and on to load the new map.

5.3.1 Plant dimensioning

nFn: **Number of fans** used in the plant. (1-6 for XC811M e XC911M; 1-4 for XC807M, XC907M).

5.3.2 Condensing probe configuration

Pbc: Probe selection. Cur = 4 ÷ 20 mA probe; **ntc =** NTC probe.

PA04:   **Adjustment of read out corresponding to 4mA** (present only if Pbc=Cur). input signal, given by the suction probe (0 ÷30 bar or 0÷435 PSI or 0 ÷3000 KPA)

Warning: set a value correspondent to absolute pressure. If the transducer measures relative pressure increase the range by 1 bar.

E.I. PP30 relative pressure transducer, range: 0÷30bar. PA04=1; PA20=31.

PA20: **Adjustment of read out** corresponding to **20mA** input signal, given by the suction probe (0 ÷ 40.0 bar or 0÷580 PSI or 0 ÷ 4000 KPA) SEE THE WARNING IN PA04.

CAL: **Condensing probe calibration** (-1.00÷1.00bar; -10.0÷10.0 °C or -20÷20°F/PSI or -100÷100KPA)

5.3.3 Others inputs configuration

SEP: **Polarity of high pressure-switch alarm** (terminals 6-7)

0=alarm with voltage absence; **1**= alarm with voltage presence

5.3.4 Security code

PSc: **Security code** to access the configurations parameters. (0÷255). With "0" the security code is disabled

5.4 Operative parameters - fans section

5.4.1 Fans management

dEU: **Default measurement unit for displaying**

(according to the version **bar**=Bar; **°C**=°C or **PSI**=PSI; **°F**=°F or **KPA**=KPA; **°C**=°C)

The dEU parameter sets the measurement unit also for these parameters: **Pbd, LSE, HSE, LAL, HAL**. **After modifying this parameter check the set point and the parameters Pbd, LSE, HSE, LAL, HAL.**

Pbd: **Proportional band zone width** (00.10÷5.00bar/0.5÷30°C or 1÷80PSI/1÷50°F or 0.5÷30°C/10÷500 KPA).

Set the dEU par. and the target set point before setting this parameter. The band is symmetrical compared to the target set point, with extremes: set+Pbd/2 ... set-Pbd/2. The measurement unit depends on the dEU par.

don: **Time delay between the insertion of two different fans**. (0÷255 sec)

doF: Time delay between switching off of two different fans. (0÷255 sec)

rot: **Fans rotation**: **no**= fixed sequence: the fans are enabled and disabled in fixed sequence: first, second etc.

yES = rotation: this algorithm distributes the working time between the various fans to ensure even run times.

5.4.2 Set point

LSE: **Minimum set point**: Sets the minimum value that can be used for the set point, to prevent the end user from setting incorrect values. The measurement unit depends on the dEU parameter.

HSE: **Maximum set point**: Sets the maximum acceptable value for set point. The measurement unit depends on the dEU parameter.

5.4.3 Alarms

LAL: **Low pressure alarm**: The measurement unit depends on the dEU parameter. It's always referred to set point When the value SET-LAL is reached the A03F alarm is enabled, (possibly after the **tAo** delay time).

HAL: **High pressure alarm**: The measurement unit depends on the dEU parameter. It's always referred to the set point. When the value SET+HAL is reached the A04C alarm is enabled, (possibly after the **tAo** delay time).

tAo: **Low and High pressure alarms delay**: (0÷255 min) time interval between the detection of a pressure alarm condition in the fans section and alarm signalling.

PEn: High pressure-switch intervention numbers: (0÷15 with 0 the manually unlocking is disabled) if the high pressure-switch is enabled PEn times in the PEI interval, the controller is locked. **It can be unlocked only manually**. See paragraph 12. Every time the pressure-switch is enabled all the compressors are turned off and all the fans are turned on.

PEI: Pressure-switch interventions time (1÷15 min) Interval, linked to the PEn parameter, for counting interventions of the high pressure-switch..

FPP: fans management with faulty probe (A01F)

0 = maintaining the resource entered at the moment of the failure

1=entering the resources established by means of FPr parameter.

FPr: **Number of fans engaged with faulty probe**. (0÷nFn).

5.4.4 Serial address and Security code

Adr: **Fans address** (1 –247) It is used in monitoring system.

PSo: **Security code** to access the operating parameters. (0÷255). With "0" the security code is disabled

5.5 Relations amount parameters

Parameter	**CtyP**	
Value	**Displayed**	**Hidden**
CtyP = 0	Cp1, ..., CPx, PoPr	CPSt, rty e sty, SPr.
CtyP = 1	CPSt, rty e sty, SPr	Cp1, ..., CPx, PoPr

where x is CPnu value

Parameter	**Cdn**	
Value	**displayed**	**hidden**
Cdn = 0	don, doF	don1....donx, doF1...doFx
Cdn = 1	don1....donx, doF1...doFx	don, doF

where x is Cpnu value

6. How to use the HOT KEY

6.1 How to program a hot key from the instrument (upload)

1. Program one controller with the front keypad.
2. When the controller is <u>ON</u>, insert the "**Hot key**" and push **UP** key of compressor section; the "**uPL**" message appears followed a by flashing **"End"**
3. Push "**SET**" key and the **End** will stop flashing.
4. Remove the **"Hot Key"**.

NOTE: the "**Err**" message is displayed for failed programming. In this case push again ▲ key if you want to restart the upload again or remove the "**Hot key**" to abort the operation.

6.2 How to program an instrument using a hot key (download)

1. Turn OFF the instrument.
2. Insert a **programmed "Hot Key" into the 5 PIN receptacle** and then turn the Controller ON.
3. Automatically the parameter list of the **"Hot Key"** is downloaded into the Controller memory, the "**doL**" message is blinking followed a by flashing **"End".**
4. After 10 seconds the instrument will restart working with the new parameters.
5. Remove the **"Hot Key"**..

NOTE the message "**Err**" is displayed for failed programming. In this case turn the unit off and then on if you want to restart the download again or remove the "**Hot key**" to abort the operation.

7. Type of regulation

7.1 Dead band

This kind of regulation is available for all kinds of loads. The neutral zone (Pbd) is symmetrical compared to the target set point, with extremes: set+Pbd/2 ... set-Pbd/2. If the pressure (temperature) is inside this zone the controller maintains the same number of loads switched on and off, without changing anything.

When the pressure (temperature) go out from the zone, regulation starts. If the pressure is greater than SET+Pbd/2, the loads are switching on with timing given by parameters: don and doF. (don1÷don9, doF1÷doF9 if Cdn=no).

A load is turned on only if the his safety times **onon, oFon, donF** are over.

Regulation stops when the pressure (temperature) come back into the neutral zone.

In the following a simplify exemplum that explains the regulation in neutral zone for compressor homogeneous with 1 step for each compressors. The safety times onon, oFon and donF are not considered. In the real regulation the a load is entered or turned off only if these times are over.

NOTE
1. The regulation algorithm turn on a load when the pressure coming from the "lower out band" reaches the set point.
2. The regulation algorithm turns off a load when the pressure coming from the "upper out band" reaches the set point.

Ex. **Dead band control, compressors with same capacities, 1 step for each compressor.**
In this example:

CPnu = 3 number of compressors
CtyP = 1 homogeneous compressors;
CPSt = 1 one step for each compressor;
rty = db dead band regulation
Sty = rot rotation
FdLy = no "don" delay not enabled at first calling after an equilibrium condition.
dLF = no "doF" delay not enabled at first calling after an equilibrium condition.
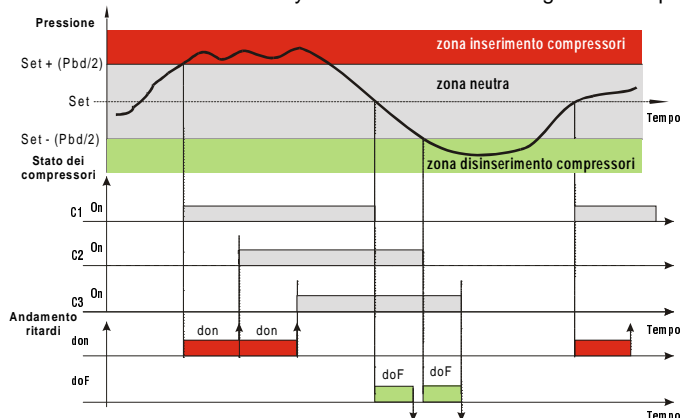
7.2 Proportional Band

The regulation band (Pbd) is divided into as many parts as there are stages according to the following formula:

 # step = CPnu x CPSt. (number of compr. x num. of steps).

The numbers of stages switched ON is proportional to the value of the input signal: when this distances itself from the target set point and enters the various bands, the compressors are switched ON, to be then turned OFF when the signal brings near the set point.

In this way if the pressure is greater than regulation band, all the compressors are on, if the pressure (temperature) is lower than the regulation band all the compressors are off.
Naturally also for this regulations all the delays (don and doF) safety times (onon, oFon and donF) are valid.

Regulation according to the running hours
The algorithm switch on and off the loads according to the running hours of each load. In this way the running hours are balanced.

Example

Cpnu = 4	number of compressors
CtyP = 1	homogeneous compressors.
CPSt = 1	one step for each compressors.
rty = Pb	proportional band regulation
Sty = rot	fixed sequence
FdLy = 0	"don" delay at first call not enabled.
dLF= 0	"doF" delay at first call not enabled.
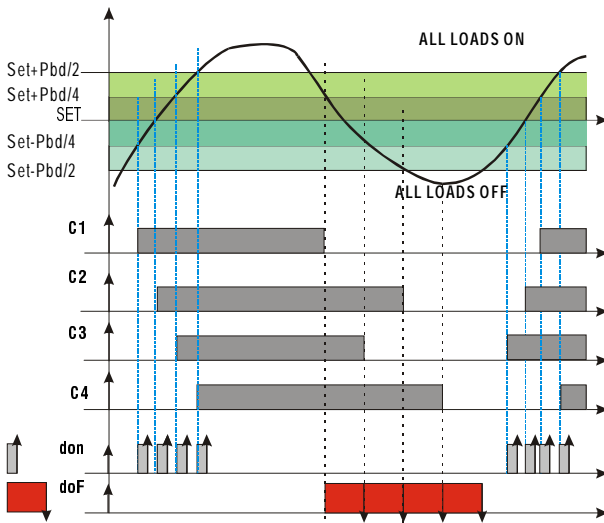
This draw highlights the doF time: the loads are in fact turned off only when the doF time is over.

8. Screw compressors

Screw compressors have an their own algorithm to change the capacity engaged.

8.1 Capacity variation

As for the step compressors, the opening of the valves changes the capacity of compressors. The difference is given from the number of valves engaged. Screw compressors have always 1 valve or no valves engaged.

The following tables shows how the capacities changes according to the opening and closing of the valves for screw compressor with 4 steps, with StPP=0 valves work with voltage or StPP=1: valves work without voltage.

However the kind of regulation depends on the **CtyP** parameter, while the number of step depends on the **CPSt** parameter.

StPP = 0: valve active when energised

Capacity %	Compressor Relay (44-45)	Valve 1(25%) Relay (46-47)	Valve 2 (50%) Relay (48-49)	Valve 3 (75%) Relay (50-51)
25%	CLOSED	CLOSED	OPEN	OPEN
50%	CLOSED	OPEN	CLOSED	OPEN
75%	CLOSED	OPEN	OPEN	CLOSED
100%	CLOSED	OPEN	OPEN	OPEN

StPP = 1 valve active when energised

Capacity %	Compressor Relay (44-45)	Valve 1(25%) Relay (46-47)	Valve 2 (50%) Relay (48-49)	Valve 3 (75%) Relay (50-51)
25%	CLOSED	OPEN	CLOSED	CLOSED
50%	CLOSED	CLOSED	OPEN	CLOSED
75%	CLOSED	CLOSED	CLOSED	OPEN
100%	CLOSED	CLOSED	CLOSED	CLOSED

9. Mounting & installation

The instruments are suitable only for internal use. They are panel mounted, hole dims 135x69 mm, and fixed with the supplied clips.
The ambient operating temperature range is between 0÷55°C.
Avoid locations subject to heavy vibration, corrosive gases or excessive dirt. The same applies to the probes. Ensure ventilation around the instrument.

10. Electrical connections

The instruments are provided with disconnectable screw terminal blocks to connect cables with a cross section up to 2,5 mm^2.
Before connecting cables make sure the power supply complies with the instrument's requirements. Separate the input connection cables from the power supply cables, from the outputs and the power connections. **Do not exceed the maximum current allowed on each relay**, in case of heavier loads use a suitable external relay.

10.1 Probes connection

Pressure probe (4 - 20 mA): respect the polarity. If using terminal ends be sure there are no bear parts which could cause short circuiting or introduce noise disturbance at high frequencies. To minimise the induced disturbances use shielded cables with the shield connected to earth.

Temperature probe: it is recommended to place the temperature probe away from direct air streams to correctly measure the temperature.

11. RS485 serial link

All models can be integrated into the monitoring and alarm system XJ500 using the RS485 serial port. They use the standard ModBus RTU protocol, so they can be fitted in a system integrator using this protocol.

The controller has 2 serial addresses first one for compressor section, second one for fan section. To completely monitor both sections the values of the 2 addresses have to be different.

If the Adr parameters have the same value the status of the fans is not monitored.

12. Technical features

Housing: plastic self extinguishing V0.

Case: 144x72 mm; depth 100 mm.

Mounting: panel mounting 135x69cut out

Number of configurable outputs: 11 relay 8A 250Vac

Number of compressor outputs: XC811M, XC911M: 9(max)
        XC807M, XC907M: 7(max)

Number of fans outputs: XC811M, XC911M: 6(max)
        XC807M, XC907M: 4(max)

Type of compressors: simple, multi-stage, different power

Regulation Inputs: 2 x Pressure Probe 4-20 mA or NTC Probe

Type of refrigerant: R22, R134a, R404a,R507

Reduced set Input: 1, voltage free

Compressor alarm inputs: 11, line voltage, connected to the loads

Safety Pressure switch inputs: 2 line voltage, low and high circuit

Global Alarm output: 1 relay 8A 250Vac

Liquid level alarm input: 1, line voltage

Alarm logger: the last 10 alarm conditions are stored and displayed

Data logger: pressure and loads over the last days are memorised. (XC911M, XC907M)

Transfer of data, parameters and alarms: via Infrared system (XC911M, XC907M)

Easy programming: via hot- key

Communication Protocol: Standard ModBus RTU, full documented

Operating temperature: 0÷55°C

Storage temperature: -30÷85 °C

Resolution: 1/100 Bar for suction , 1/10 Bar for condensing

Accuracy: better than 1% of F.S.

RTC back up battery: up to 48h

13. Alarm list

Usually alarm conditions are signalled by means of:
1. Activation of alarm relays (terminals 1-2 are closed)
2. Buzzer activation
3. Message on proper display
4. Log of alarm, hour, data and duration.

The table at paragraph 13.3

13.1 Types of alarms and signalling managed

13.1.1 *Pressure switch alarm, suction and condensing sections*

Terminals
Low pressure switch input: 5-6, high pressure switch input:6-7.
Parameters
SEP: It establishes if the input is activated by supplying (SEP=1) or by opening (SEP=0) the terminals.
Actions
Every time the inputs are activated all the compressors are switched off. The instrument restart the standard operating mode when the input is disabled. If there are PEn activation in the PEi time, only manual resetting is allowed, by pressing the CLEAR key for 3s or by turning off and on the instrument.

13.1.2 *Compressors and fans safeties alarm.*

Terminals
The terminals (from 22 to 43) really used depends on the number of loads. The protections regarding the compressors and fans are connected to these inputs. If one of these protections is enabling (E.I. for lack of oil or overheating, etc,) the corresponding load is turn off.
Parameters
ALIP: It establishes if the input is activated by supplying (ALIP=1) or by opening (ALIP=0) the terminals.
Actions
Every time one input is activated the corresponding output is turned off. The instrument restart the standard operating mode when the input is disabled.

13.1.3 *Probe failure alarm*

It is generated by failure in the probe of suction or condensing.
Suction probe parameters

CPP: compressor management with faulty probe (A01C)

> **0** = maintaining the resource entered at the moment of the failure

> **1** = entering the resources established by means of SPr or PoPr parameters.

SPr: **number of steps engaged with faulty probe**. (0÷CpnU) It's used only if CtyP=1.

PoPr: **capacity engaged with faulty probe** (0÷255) It's used only if CtyP=0.

Condensing probe parameter
FPP: fans management with faulty probe (A01F)

0 = maintaining the resource entered at the moment of the failure

1=entering the resources established by means of FPr parameter.

FPr: **Number of fans engaged with faulty probe**. (0÷nFn).

13.1.4 High and low pressure (temperature) alarms (depending on parameters)

This alarm signals that the pressure (temperature) is out of limits established by parameters LAL and HAL.

The **tAo** parameter set the delay between alarm condition and alarm signalling.

Action

The alarm is signalled with standard action. The outputs are unchanged.

13.1.5 Clock data lost

It happens when the instrument is turned on for the first time or stays off more than the duration of the back up battery.

Action

Restore the clock data by means of the Pri, Hour; dAy, ndAy, Mont, YAr parameters.

13.2 Alarm muting

Press the "CLEAR" button to silence the buzzer during an alarm condition.

Hold pressed for more than 2 seconds switch off the alarm relay during an alarm condition

13.3 Alarm conditions – summary table

Code	Description	Cause	Action	Reset
Er0L	Low pressure-switch alarm	Low pressure switch input enabled (terminals 5-6)	– All compressors are turned off. Fans unchanged.	**Automatically** (if the number of activation are less than PEn in the PEi time) when the input is disable. - The compressors restarts working according to the working algorithm. **Manually** (if PEn activation happened in the PEi time) When the input is disable: a. hold pressed the Clear key for 3s or b. turn off and on the instrument.. - The compressors restarts working according to the working algorithm.

Code	Description	Cause	Action	Reset
Er0H	High pressure switch alarm	High pressure switch input enabled (terminals 6-7)	- All compressors are turned off. - All fans are turned on.	**Automatically** (if the number of activation are less than PEn in the PEi time) when the input is disable. - Compressors and fans restart working according to the working algorithm. **Manually** (if PEn activation happened in the PEi time) When the input is disable: - hold pressed the Clear key for 3s or - turn off and on the instrument.. Compressors and fans restarts working according to the working algorithm.
A01C	Suction probe failure alarm	Probe failure or out of range	– The compressors are activated according to the CPP, SPr or PoPr parameters.	**Automatically** as soon as the probe restarts working.
A01F	Condensing probe failure alarm	Probe failure or out of range	– The fans are activated according to the FPP and FPr parameters.	**Automatically** as soon as the probe restarts working.
A02C	Compressor safeties alarm	Safeties compressor input activation. NOTE: with step compressors 1 input for each compressor has to be used.	– the corresponding compressor is turned off. (with step compressors all relays referred to the input are disabled).	**Automatically** as soon as the input is disabled.
A02F	Fan safeties alarm	Safeties fan input activation.	– The corresponding output is disabled	**Automatically** as soon as the input is disabled.
A03C	Minimum pressure (temperature) alarm compressors section	Suction pressure or temperature lower than SET-LAL value	– signalling only	**Automatically:** as soon as the pressure or temperature reaches the (Set-LAL+ differential) value. (differential = 0.3bar or 1°C)
A03F	Minimum pressure (temperature) alarm fans section	Condensing pressure or temperature lower than SET-LAL value	– signalling only	**Automatically:** as soon as the pressure or temperature reaches the (Set-LAL+ differential) value. (differential = 0.3bar or 1°C)

| Code	Description	Cause	Action	Reset
A04C	**Maximum pressure (temperature) alarm compressors section**	Suction pressure or temperature higher than SET+HAL value	– signalling only	**Automatically:** as soon as the pressure or temperature reaches the (Set + HAL - differential) value. (differential = 0.3bar or 1°C)
A04F	**Maximum pressure (temperature) alarm fans section**	Condensing pressure or temperature higher than SET+HAL value	– signalling only	**Automatically:** as soon as the pressure or temperature reaches the (Set + HAL - differential) value. (differential = 0.3bar or 1°C)
A05	**Liquid level alarm**	Input (6-8) enabled	– signalling only	**Automatically** as soon as the input is disabled
A11F	**Clock failure alarm**	Problem on RTC board	– signalling only With this alarm the activation by RTC of the reduced set point and the alarm log are not available.	**Manually:** it is necessary to replace the RTC board.
A11L	**Clock data lost**	The clock back up battery is exhausted	– signalling only – With this alarm the activation by RTC of the reduced set point and the alarm log are not available.	**Manually:** set the data and the hour by means of the following parameters: Pri, Hour; dAy, ndAy, Mont, YAr
A13L	**EEPROM data not valid**	EEPROM data out of limits	– signalling only	**Automatically:** values are set inside the limits
A13F	**EEPROM failure alarm**	EEPROM problem	The instrument is locked	**Manually:** replace the EEPROM
A14C	**Compressors maintenance alarm**	A compressor has worked for the hour set in the SEr parameter	- signalling only	**Manually:** reset the running hour of the compressor (see par. 4.6)
A14F	**Fans maintenance alarm**	A fan has worked for the hour set in the SEr parameter	- signalling only	**Manually:** reset the running hour of the fan (see par. 4.6)

14. Wiring connections

14.1 Digital inputs and outputs

1 - 2: **ALARM RELAY**: normally open, it's close when alarm happens or the instrument is switched OFF.
3 - 4: **Safety relay:** normally open, it's close when the instrument looses the control or is switched OFF

5 - 6 Low pressure-switch input: input at the same voltage of loads. The input is activated by supplying (SEP=1) or by opening (SEP=0) the terminals.

7 - 6 High pressure-switch input: input at the same voltage of loads. The input is activated by supplying (LLI=1) or by opening (LLI=0) the terminals.

6 - 8 Liquid level input: input at the same voltage of loads. The input is activated by supplying the terminals.

9 - 10 Terminals supply.

13 - 14 Reduced set input: free voltage input. The input is activated by closing (rSIP=1) or by opening (rSIP =0) the terminals.

14- 15: Suction NTC probe input (PbC=ntc)

14- 16: Condensing NTC probe input (PbC=ntc)

15 - 17: Suction 4÷20mA probe input (PbC=Cur)

16 - 17: Condensing 4÷20mA probe input (PbC=cur)

18-19-20: Outputs for serial RS485 .

22 – 43 Digital inputs for safeties of compressors and fans. When an d. i. is activated, the corresponding output is switched OFF.

44 – 65 Relay configurable outputs for compressors and fans. The compressors are always allocated before the fans starting from left to right.

E. I. Cpnu=4 FnF=3 The terminals 44-45 are for the first compressor; 46-47 are for the second compressor; 48-49 are for the third compressor; 50 - 51 are for the fourth compressor; 52-53 are for the first fan; 54-55 are for the second fan; 56-57 are for the third fan.

15. Parameters – Default values

Label	XC807M XC907M °C (°F)	XC811M XC911M °C (°F)	Description	Range (°C/bar)	Range (°F/PSI)	Range (°C/KPA)
Set_N	-18,0 (0)	-18,0 (0)	Normal Set point; suction section	LSE÷HSE	LSE÷HSE	LSE÷HSE
Set_R	-18,0 (0)	-18,0 (0)	Reduced Set point; suction section	LSE÷HSE	LSE÷HSE	LSE÷HSE
Set_N	35,0 (90)	35,0 (90)	Normal Set point; condensing section	LSE÷HSE	LSE÷HSE	LSE÷HSE
Set_R	35,0 (90)	35,0 (90)	Reduced Set point; condensing section	LSE÷HSE	LSE÷HSE	LSE÷HSE

Configuration parameters - compressors section

Label	XC807M XC907M °C (°F)	XC811M XC911M °C (°F)	Description	Range (°C/bar)	Range (°F/PSI)	Range (°C/KPA)
CPnU	4	7	Compressor Number		0÷9	
CtyP	1	1	Compressor type		0÷2	
CPSt	1	1	Compressor Step		1÷9	
PC1[1]	0	0	Power of compressor 1		0÷255	
PC2[1]	0	0	Power of compressor 2		0÷255	
PC3[1]	0	0	Power of compressor 3		0÷255	
PC4[1]	0	0	Power of compressor 4		0÷255	
PC5[1]	0	0	Power of compressor 5		0÷255	
PC6[1]	0	0	Power of compressor 6		0÷255	
PC7[1]	0	0	Power of compressor 7		0÷255	
PC8[1]	-	0	Power of compressor 8		0÷255	

Label	XC807M XC907M °C (°F)	XC811M XC911M °C (°F)	Description	Range (°C/bar)	Range (°F/PSI)	Range (°C/KPA)
PC9[1]	-	0	Power of compressor 9	0÷255		
rty	db	db	Type of regulation: neutral zone or proportional band	db= neutral zone; Pb= proportional band		
Ncpc	no	no	Master compressor enabling	no, yES		
SEtS	no	no	Set crossing (sensitive) function	no, yES		
Sty	rt	rt	Sequence type	rt= rotation; F= fix sequence		
FtyP	r404 (r22)	r404 (r22)	Freon Type	r22= R22; r404= R404a; 507= R507; 134=134, r717		
PbC	cur	cur	Type of probe (NTC - Current)	Cur= 0÷20mA; ntC=NTC		
PA04[2]	0,5bar/ 7PSI/50kPA	0,5bar/ 7PSI/50kPA	4mA readout (compressors)	0.00÷31.00bar	0÷450 PSI	0÷3100 KPA
PA20[2]	8,0bar/ 116PSI/ 800kPA	8,0bar/ 116PSI/ 800kPA	20mA readout (compressors)	0.00÷31.00 bar	0÷450 PSI	0÷3100 KPA
CAL	0	0	Probe Calibration (compressors)	-1.00÷1.00bar; -10.0÷10.0°C	-20÷20 PSI/°F	-100÷100KPA -10.0÷10.0°C
SEP	1	1	Low pressure-switch polarity	0 =enabled without voltage; 1 =enabled with voltage.		
rSIP	1	1	Reduced set input polarity	0 = enabled by opening; 1 =enabled by closing		
LLI	1	1	Liquid level input polarity	0 =enabled without voltage; 1 =enabled with voltage.		
ALIP	1	1	Alarm input for compressors and fans polarity	0 =enabled without voltage; 1 =enabled with voltage.		
StPP	1	1	Valve outputs polarity	0 =enabling by opening the relay; 1 = enabling by closing the relay		
OFF	no	no	OFF function enabling	no, yES		
PSc	0	0	Security code for configuration parameters (compressors)	0÷255 (0=no security code)		

Operative parameters - compressors section

Label	XC807M XC907M °C (°F)	XC811M XC911M °C (°F)	Description	Range (°C/bar)	Range (°F/PSI)	Range (°C/KPA)
PrI	-	-	Minutes	1÷59		
HoUr	-	-	Hours	0÷23		
dAy	-	-	Day of month	1÷31		
ndAY	-	-	Day of week	**Sun**=Sunday; **Mon**=Monday; **tuE**=Tuesday; **Ued**=Wednesday; **thu**=Thursday; **Frd**=Friday; **SAt**=Saturday		
Mnth	-	-	Month	0÷12		
YAr	-	-	Year	2000÷2099		
dEU	°C (°F)	°C (°F)	Displaying measurement unit	bar= bar, °C=celsius	PSI=PSI °F=°F	PAS=KPA °C=celsius
Pbd	4.0 (10)	4.0 (10)	Regulation band width (compressors)	0.10÷5.00bar; 0.1÷30°C	1÷80PSI 1÷50°F	10÷500KPA; 0.1÷30°C
OnOn	5	5	Minimum delay between 2 switching on of the same compressor	0÷255m		
OFOn	2	2	Delay between the switching off and on of the same compressor	0÷255m		
Cdn	YES	YES	don and doF equal for all the compressors	no, YES		
don1[3]	15	15	Time delay between the insertion of the compressor 1 and the following one	0÷255s		

Label	XC807M XC907M °C (°F)	XC811M XC911M °C (°F)	Description	Range (°C/bar)	Range (°F/PSI)	Range (°C/KPA)
don2[3]	15	15	Time delay between the insertion of the compressor 2 and the following one		0÷255s	
don3[3]	15	15	Time delay between the insertion of the compressor 3 and the following one		0÷255s	
don4[3]	15	15	Time delay between the insertion of the compressor 4 and the following one		0÷255s	
don5[3]	15	15	Time delay between the insertion of the compressor 5 and the following one		0÷255s	
don6[3]	15	15	Time delay between the insertion of the compressor 6 and the following one		0÷255s	
don7[3]	15	15	Time delay between the insertion of the compressor 7 and the following one		0÷255s	
don8[3]	-	15	Time delay between the insertion of the compressor 8 and the following one		0÷255s	
don9[3]	-	15	Time delay between the insertion of the compressor 9 and the following one		0÷255s	
doF1[3]	5	5	Time delay between the switching off of the compressor 1 and the following one		0÷255s	
doF2[3]	5	5	Time delay between the switching off of the compressor 2 and the following one		0÷255s	
doF3[3]	5	5	Time delay between the switching off of the compressor 3 and the following one		0÷255s	
doF4[3]	5	5	Time delay between the switching off of the compressor 4 and the following one		0÷255s	
doF5[3]	5	5	Time delay between the switching off of the compressor 5 and the following one		0÷255s	
doF6[3]	5	5	Time delay between the switching off of the compressor 6 and the following one		0÷255s	
doF7[3]	5	5	Time delay between the switching off of the compressor 7 and the following one		0÷255s	
doF8[3]	-	5	Time delay between the switching off of the compressor 8 and the following one		0÷255s	
doF9[3]	-	5	Time delay between the switching off of the compressor 9 and the following one		0÷255s	
don	15	15	Time delay between the insertion of two different loads		0÷255s	
doF	5	5	Time delay between switching off of two different compressors		0÷255s	
donF	15	15	Minimum time a stage stays ON		0÷255s	
FdLy	no	no	"don" delay enabled also for the first request		no, YES	
FdLF	no	no	doF delay enabled also for the first switching off		no, YES	
odo	20	20	Regulation delay with power on		0÷255s	
LSE	-40.0 (-40)	-40.0 (-40)	Minimum set point: with PbC = Cur / with PbC = ntc	PA04÷HSE; -50°C÷HSE	PA04÷HSE; -58°F÷HSE	PA04÷HSE; -50°C÷HSE
HSE	10,0 (50)	10,0 (50)	Maximum set point: with PbC = Cur / with PbC = ntc	LSE÷PA20; LSE÷110 °C	LSE÷PA20 LSE ÷ 232 °F	LSE÷PA20; LSE÷110 °C
StrS	0	0	Reduced set point start time		0÷23h	
SPrS	0	0	Reduced set point stop time		0÷23h	
rSd1	no	no	Enabling reduced set on Sunday		no, YES	
rSd2	no	no	Enabling reduced set on Monday		no, YES	
rSd3	no	no	Enabling reduced set on Tuesday		no, YES	
rSd4	no	no	Enabling reduced set on Wednesday		no, YES	
rSd5	no	no	Enabling reduced set on Thursday		no, YES	
rSd6	no	no	Enabling reduced set on Friday		no, YES	

Label	XC807M XC907M °C (°F)	XC811M XC911M °C (°F)	Description	Range (°C/bar)	Range (°F/PSI)	Range (°C/KPA)
rSd7	no	no	Enabling reduced set on Saturday	no, YES		
UAro	Hours	Hours	Measurement unit for the Aro parameter	min, Hours		
Aro	255	255	Temporary alarm silencing	0÷255m/h		
PAo	30	30	Alarm probe delay at power on	0÷255m		
LAL	15.0 (60)	15.0 (60)	Minimum pressure alarm (compressors)	0.01÷30.00bar 0.1÷100°C	1÷300 PSI / 1÷200 °F	1÷3000KPA 0.1÷100°C
HAL	20.0 (60)	20.0 (60)	Maximum pressure alarm (compressors)	0.01÷30.00bar 0.1÷100°C	1÷300 PSI / 1÷200 °F	1÷3000KPA 0.1÷100°C
tAo	20	20	Low and High pressure (temperature) alarms delay	0÷255m		
SEr	9999	9999	Running hours for maintenance	1÷9999h		
PEn	5	5	Max number of pressure-switch activation	0÷15		
PEI	15	15	Pressure-switch interventions time	0÷15m		
CPP	1	1	Compressor management with faulty probe	0 = Outputs on when alarm happens; 1 = Outputs according to. SPr or PoPr parameters		
SPr	2	2	Number of on compressors with faulty probe	0÷CPnU		
PoPr[1]	0	0	Capacity engaged with faulty probe	0÷255		
rELP	rEL	rEL	Suction pressure displaying: relative or absolute	AbS= absolute pressure; rEL=relative pressure		
Loc	no	no	Keyboard lock	no, YES		
dLI[4]	0	0	Sample rate for data logging	0÷255s (0=no recording)		
Adr	1	1	Serial address	1÷247		
PSo	0	0	Security code for operative parameters (compressors)	0÷255 (0=security code disabled)		
Ptb	-	-	Parameter table	-		-
rEL	1.4	1.4	Software release	-		-

Configuration parameters –Fans section

Label	XC807M XC907M °C (°F)	XC811M XC911M °C (°F)	Description	Range (°C/bar)	Range (°F/PSI)	Range (°C/KPA)
nFn	3	4	Number of fans	0÷6 (0=condensing section disabled)		
PbC	Cur	Cur	Kind of probe for condensing section	Cur= 4÷20mA; ntC=NTC		
P04[2]	1bar/14PSI/ 100kPA	1bar/14PSI/ 100kPA	4mA readout (fans)	0.00÷30.00bar	0÷435 PSI	0÷3000KPA
P20[2]	31bar/ 450PSI/ 3100kPA	31bar/ 450PSI/ 3100kPA	4mA readout (fans)	0.00÷40.00 bar	0÷580 PSI	0÷4000 KPA
CAL	0	0	Condensing probe calibration	-1.00÷1.00bar; -10.0÷10.0°C	-20÷20 PSI/°F	-100÷100KPA -10.0÷10.0°C
SEP	1	1	High pressure-switch polarity	0 =enabled without voltage; 1 =enabled with voltage.		
PSc	0	0	Security code for configuration parameters (fans)	0÷255(0=security code disabled)		

Operative parameters – Fans section

Label	XC807M XC907M °C (°F)	XC811M XC911M °C (°F)	Description	Range (°C/bar)	Range (°F/PSI)	Range (°C/KPA)
dEU	°C	°C	Default measurement unit for condensing section	bar= bar, °C=celsius	PSI=PSI °F=°F	PAS=KPA °C=celsius
Pbd	4.0 (10)	4.0 (10)	Regulation band width (fans)	0.10÷5.00bar; 0.1÷30°C	1÷80PSI 1÷50°F	10÷500KPA; 0.1÷30°C

Label	XC807M XC907M °C (°F)	XC811M XC911M °C (°F)	Description	Range (°C/bar)	Range (°F/PSI)	Range (°C/KPA)
don	15	15	Time delay between the insertion of two different fans	0÷255s		
doF	5	5	Time delay between switching off of two different fans	0÷255s		
rot	YES	YES	Fans rotation enabling	no= fix sequence, YES= with rotation		
LSE	10,0 (50)	10,0 (50)	Minimum set point: with PbC = Cur with PbC = ntc	P04÷HSE; -50°C÷HSE	P04÷HSE; -58°F÷HSE	P04÷HSE; -50°C÷HSE
HSE	60 (140)	60 (140)	Maximum set point with PbC = Cur with PbC = ntc	LSE÷P20; LSE÷110 °C	LSE÷P20 LSE ÷232 °F	LSE÷P20; LSE÷110 °C
LAL	20,0 (60)	20,0 (60)	Minimum pressure alarm (fans)	0.01÷30.00bar 0.1÷100°C	1÷300 PSI / 1÷200 °F	1÷3000KPA 0.1÷100°C
HAL	20,0 (60)	20,0 (60)	Maximum pressure alarm (fans)	0.01÷30.00bar 0.1÷100°C	1÷300 PSI / 1÷200 °F	1÷3000KPA 0.1÷100°C
tAo	20	20	Low and High pressure (temperature) alarms delay	0÷255m		
PEn	5	5	Max number of pressure-switch activation	0÷15		
PEI	15	15	Pressure-switch interventions time	0÷15m		
FPP	1	1	Fans management with faulty probe	0 = fans on when alarm happens; 1 = Fans according to par. FPr		
FPr	2	2	Number of fans with faulty probe	0÷nFn		
rELP	rEL	rEL	Condensing pressure displaying: relative or absolute	AbS= absolute pressure; rEL= relative pressure		
Adr	1	1	Serial address	1÷247		
PSo	0	0	Security code for operative parameters (fans)	0÷255(0=esclusa)		

1 Visible only if CtyP=0

2 Visible only if PbC=Cur

3 Visible only if Cdn=no

4 Present only in XC907M, XC911M