EC

6

708

EC 6-708

Digital controller for refrigerating power plant management

Operating instructions

ENGLISH

File ec6708_eng_v1.01.pdf

IMPORTANT:

The use of this new instrument is easy; but for safety reasons, it is important read these instructions carefully before the installation or before the use and follow all additional informations.

It is very important keep these instructions with the instrument for future consultations.

SUMMARY

WHAT IS THE USE

EC 6-708 is a digital controller studied for refrigerating power plant management up to eight compressors/condenser fans which basic characteristics are the setting of the user to associate to every relay output (condenser fans, compressor or choking valve), to subject the compressors activation to the compressors powers and to the compressors total working hours, to read and to control the suction probe and the condensing quantity (pressure/temperature); besides, the instrument is provided with twelve digital inputs configurable to interact on the relay outputs activity and with one analog output associated to the condenser fans.

In factory the instrument gets preset to accept at the measure inputs 2 wires 4-20 mA pressure transducers/PTC probes (these last for the condensing probe only).

EC 6-708 is available in the 160 x 90 mm (6.29 x 3.54 in., 9 DIN modules) case and it is studied for DIN standard rail installation.

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INSTALLATION

EC 6-708 was studied for DIN EN 50022 standard rail installation according with DIN 43880 norms (see the chapter *Dimensional data and installation* on the page 50).

Additional informations

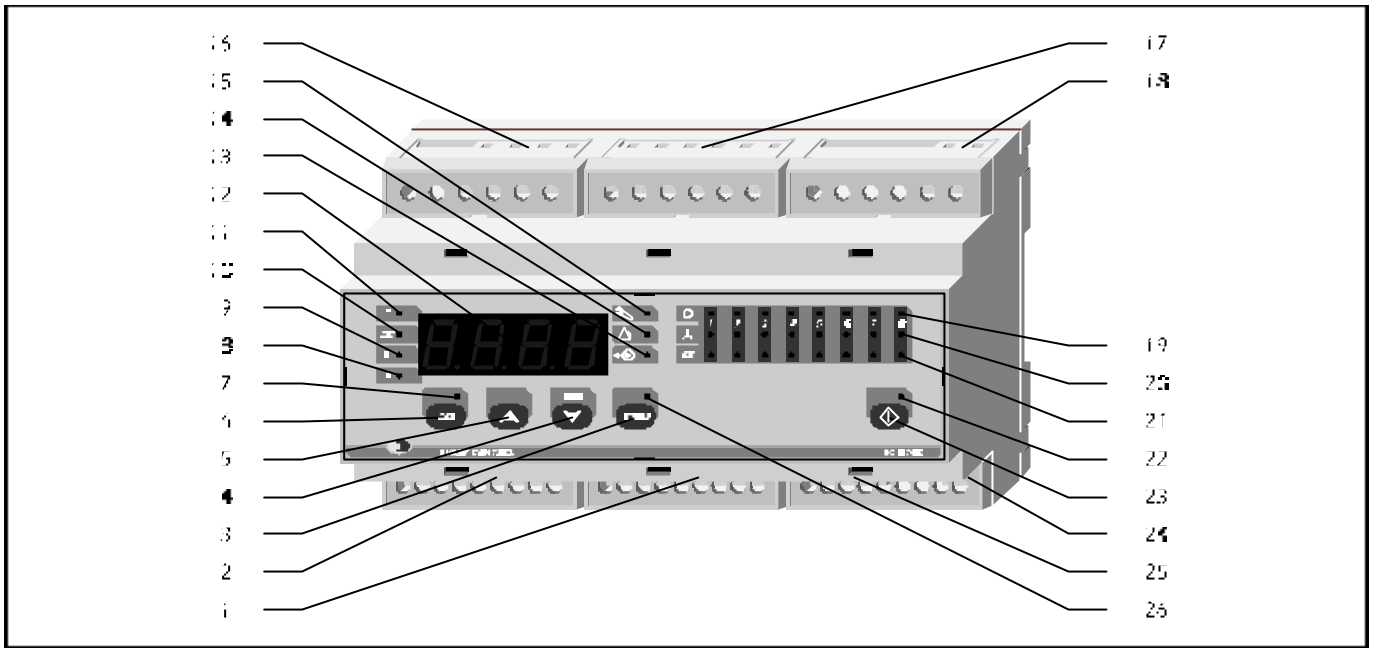
- *verify if the using conditions (ambient temperature, humidity, etc.) are within the limits indicated by the builder (see the chapter Technical data on the page 52)*
- *install the instrument in a location with a suitable ventilation, to avoid the internal overheating of the instrument*
- *do not install the instrument near surfaces that can to obstruct the air-grating (carpets, covers, etc.), heating sources (radiators, hot air ducts, etc.), locations subject to direct sunlight, rain, humidity, excessive dust, mechanical vibrations or bumps, devices with strong magnetos (microwave ovens, big speakers, etc.)*
- *according with the safety norms, the protection against possible contacts with electrical parts and parts protected with functional insulation only must be ensured through a correct installation procedure of the instrument; all parts that ensure the protection must be fixed so that they can not be removed if not with a tool.*

ELECTRICAL CONNECTION

EC 6-708 is provided with seven screw terminal blocks for cables up to 2,5 mm² (0.38 in.²) located on the instrument frontal panel (see the chapter *Electrical connection* on the page 51).

Additional informations

- *if the instrument is brought from a cold to a warm location, the humidity may condense inside the instrument; wait about an hour before supply the instrument*
- *verify if the operating power supply voltage, electrical frequency and power of the instrument correspond to the local power supply (see the chapter Technical data on the page 52)*
- *do not supply more instruments with the same transformer*
- *if the instrument is installed on a vehicle, its power supply must be derived directly from the battery of the vehicle*
- *give the instrument a protection able to limit the current absorbed in case of failure*
- *the instrument remains connected to the local power supply as long as the terminals 115 and 118 are derived to the local power supply, even if the instrument is apparently turned off*
- *give the relay outputs a protection able to protect them against short circuit and overload*
- *do not try to repair the instrument; for the repairs apply to highly qualified staff*
- *if you have any questions or problems concerning the instrument please consult Every Control (see the chapter Builder data on the page 54).*



TERMINAL BLOCKS

1 screw terminal block for cables up to 2.5 mm² (0.38 in.²) for the connection
- to the condenser fans safety digital input
- to the upper condensing quantity digital input
- to the lower pressure digital input
- to the measure inputs

2 screw terminal block for cables up to 2.5 mm² (0.38 in.²) for the connection
- to the user associated to the output K1 ... 8 locking digital inputs
- to the freon level digital input

16 screw terminal block for cables up to 2.5 mm² (0.38 in.²) for the connection
- to the outputs K5, K6, K7 and K8 (for condenser fans, compressors or choking valves management)

17 screw terminal block for cables up to 2.5 mm² (0.38 in.²) for the connection
- to the outputs K1, K2, K3 and K4 (for condenser fans, compressors or choking valves management)

18 screw terminal block for cables up to 2.5 mm² (0.38 in.²) for the connection
- to the power supply

24 screw terminal block for cables up to 2.5 mm² (0.38 in.²) for the connection
- to the analog output

25 screw terminal block for cables up to 2.5 mm² (0.38 in.²) for the connection
- to the outputs Al1 and Al2 (for instrument locking and alarms management).

KEYS

3 menu key ; it permits
- to turn out from the users total working hours counter cleaning procedure
- to turn out from the manual power steps loading/unloading procedure
- to gain access to the configurator and Operator Menu configuration parameters setting procedure
- to turn out from the configurator and Operator Menu configuration parameters setting procedure
- during the configurator, operator and User Menu configuration parameters setting procedure, to select a configuration parameters family

4 down key ; it permits
- during an alarm, to silence the buzzer
- during the users total working hours counter cleaning procedure, to clear the counter
- during the manual power steps loading/unloading procedure, to unload a power step
- during the working setpoint setting procedure, to decrease the working setpoint value
- during the configurator, operator and User Menu configuration parameters setting procedure, to select a configuration parameter
- during the configurator, operator and User Menu configuration parameters setting procedure, to decrease a configura-

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tion parameter value

5 up key ; it permits
- during the manual power steps loading/unloading procedure, to load a power step
- during the working setpoint setting procedure, to increase the working setpoint value
- during the configurator, operator and User Menu configuration parameters setting procedure, to select a configuration parameter
- during the configurator, operator and User Menu configuration parameters setting procedure, to increase a configuration parameter value

6 set key ; it permits
- during the manual power steps loading/unloading procedure, to display a power step status
- during the users total working hours counter cleaning procedure, to display a user total working hours
- to display the working setpoint value
- during the configurator, operator and User Menu configuration parameters setting procedure, to display a configuration parameter value

23 ON STAND-BY key ; it permits
- to turn on the instrument
- to turn off the instrument
- to turn out from the configurator and Operator Menu configuration parameters setting procedure.

LED

7 set LED; it indicates
- if it flashes, that a working setpoint setting procedure or a configurator or operator or User Menu configuration parameter modification procedure is running

8 minutes LED ; it indicates
- if it is turned on, that the unit of measure of the displayed quantity is the minute

9 hours LED ; it indicates
- if it is turned on, that the unit of measure of the displayed quantity is the hour

10 bar LED ; it indicates
- if it is turned on, that the unit of measure of the displayed quantity is the bar or that the displayed quantity is a pressure

11 Celsius degree LED ; it indicates
- if it is turned on, that the unit of measure of the displayed quantity is the Celsius degree or that the displayed quantity is a temperature

13 data LED ; it indicates
- if it flashes, that a data transmission in a serial network with EVCOBUS protocol communication managed by a master (for instance a Personal Computer) is running

14 alarm LED ; it indicates
- if it flashes, that an alarm is active

15 service LED ; it indicates
- if it is turned on, that an user has exceeded the number of total working hours enough to signal the request of service

19 compressor/choking valve associated to the output K1 ... 8 LED; it indicates
- if it is turned on, that the user associated to the output K1 ... 8 is a compressor or a choking valve
- if it flashes, that a count of a disabling time to the compressor associated to the output K1 ... 8 activation is running

20 condenser fans associated to the output K1 ... 8 LED; it indicates
- if it is turned on, that the user associated to the output K1 ... 8 is a condenser fans

21 power step or condenser fans associated to the output K1 ... 8 status LED; it indicates
- if it is turned on, that the power step associated to the output K1 ... 8 is loaded or that the condenser fans associated to the output K1 ... 8 is activated
- if it flashes during an alarm, that the user associated to the output K1 ... 8 locking digital input is active

22 ON STAND-BY LED; it indicates
- if it is turned on, that the instrument is in the status STAND-BY

26 menu LED; it indicates
- if it is turned on, that a configurator or Operator Menu configuration parameters setting procedure is running.

DISPLAYS

12 display; it permits to display
- during an alarm, the alarm code
- the pressure read by the suction probe
- during the users total working hours counter cleaning procedure, the user total working hours
- during the manual power steps loading/unloading procedure, the power step status
- during the working setpoint setting procedure, the working

setpoint value

- during the configurator, operator and User Menu configuration parameters setting procedure a configuration parameter label
- during the configurator, operator and User Menu configuration parameters setting procedure a configuration parameter value.

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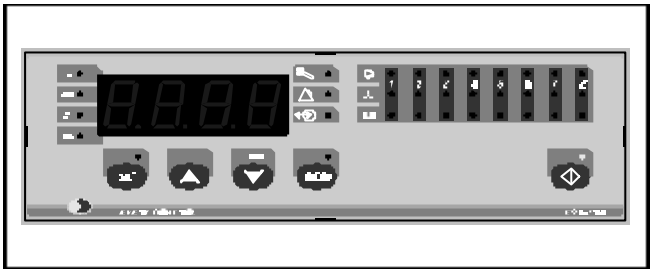
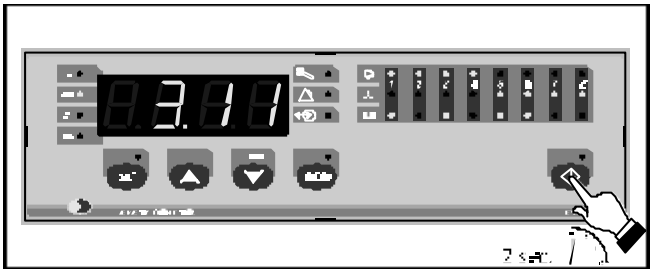
SETTINGS TO EXECUTE BEFORE THE USE

To adjust the instrument to the power plant characteristics, it is important to execute some settings before the use:

a) after supplied the instrument verify if the instrument is in the status STAND-BY (during the status STAND-BY the display and the LED are turned off, except the ON STAND-BY LED)



b) if the instrument is in the status ON keep pushed for two seconds at least the ON STAND-BY key (passed two seconds the instrument moves to the status STAND-BY)



c) set the working setpoint value (the working setpoint establishes the suction pressure associated to the compressors; see the chapter *Working setpoint* on the page 24)

d) set the parameters tyP1 ... 8 value (the parameters tyP1 ... 8 establish the users to associate to the outputs K1 ... 8)

e) set the parameters Po 1 ... 8 value (the parameters Po 1 ... 8 establish a proportion among the compressors powers)

the parameters tyP1 ... 8 and Po 1 ... 8 belong to the Configurator Menu; see the chapter *Configurator Menu* on the page 25

f) set the parameters /A6 and /A7 value (the parameters /A6 and /A7 establish the lower and the upper end of scale for 4-20 mA input of the suction transducer)

g) set the parameter /5P value (the parameter /5P establishes where to display the decimal point)

h) set the parameter /bE value (the parameter /bE establishes the kind of condensing probe that the instrument must recognize)

i) if the condensing probe is a 2 wires 4-20 mA pressure transducer set the parameters /b6 and /b7 value (the parameters /b6 and /b7 establish the lower and the upper end of scale for 4-20 mA input of the condensing transducer)

j) if the condensing probe is a PTC probe set the parameter / t value (the parameter / t establishes the unit of measure with which the temperature gets displayed)

k) set the parameter r 0 value (the parameter r 0 establishes the “neutral zone” value of the suction pressure regulator)

l) if a compressor at least is choked set the parameter r C value (the parameter r C establishes the kind of choking valve that the instrument must manage)

m) set the parameter F 0 value (the parameter F 0 establishes the proportional band width of the condenser fans regulator)

n) set the parameter F 1 value (the parameter F 1 establishes the condensing quantity value to which the instrument activates the condenser fans)

o) set the parameter F A value (the parameter F A establishes the condenser fans functioning)

the parameters /A6, /A7, /5P, /bE, /b6, /b7, / t, r 0, r C, F 0, F 1 and F A belong to the User Menu; see the chapter *User Menu* on the page 32.

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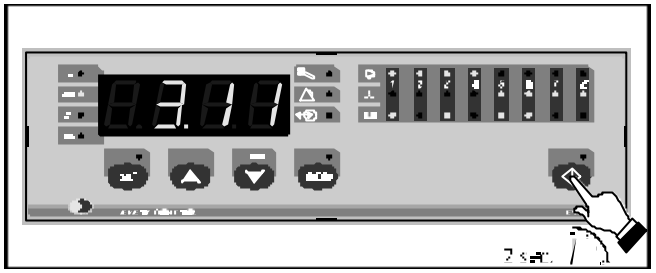
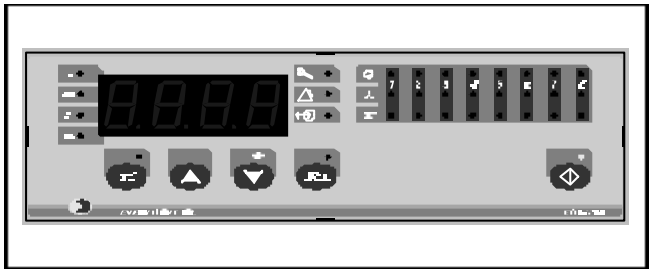
PRELIMINARY INFORMATIONS

After derived the connections (see the chapter *Electrical connection* on the page 51), the instrument reproposes the last setting stored.

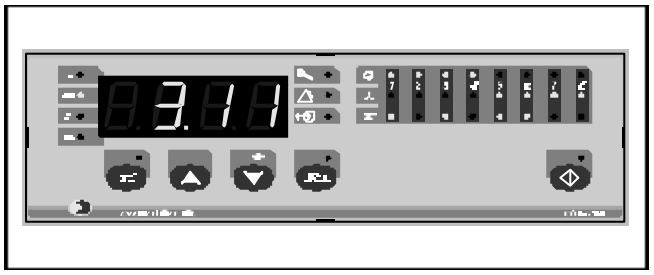
Keeping pushed for two seconds at least the ON STAND-BY key the instrument turning on (status ON) or turning off (status STAND-BY), except during the setting procedures.



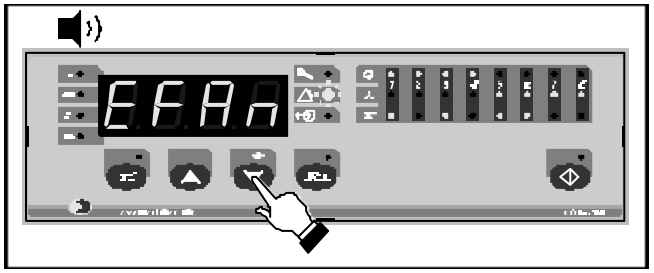
During the status STAND-BY the display and the LED are turned off, except the ON STAND-BY LED, all relay outputs are forced to the status OFF, except the output AI1 and the analog output signal is 4 mA or 0 V.



During the status ON, in the course of the normal functioning the instrument displays the pressure read by the suction probe.



If an alarm should be active the instrument displays the alarm code flashing, for instance "EFAn", the buzzer utters an intermittent beep, the alarm LED flashes and the output AI1 gets activated (see the paragraph *Alarms* on the page 46); pressure on the down key during an alarm permits to silence the buzzer but does not modify the outputs AI1 and AI1 status.

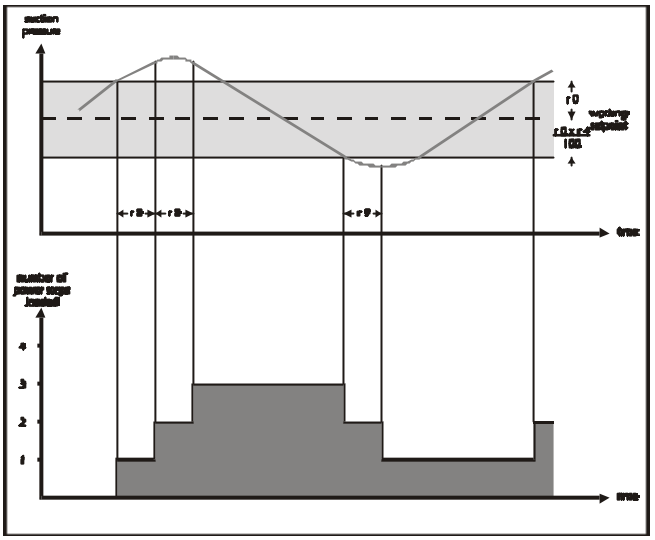


SUCTION PRESSURE REGULATION

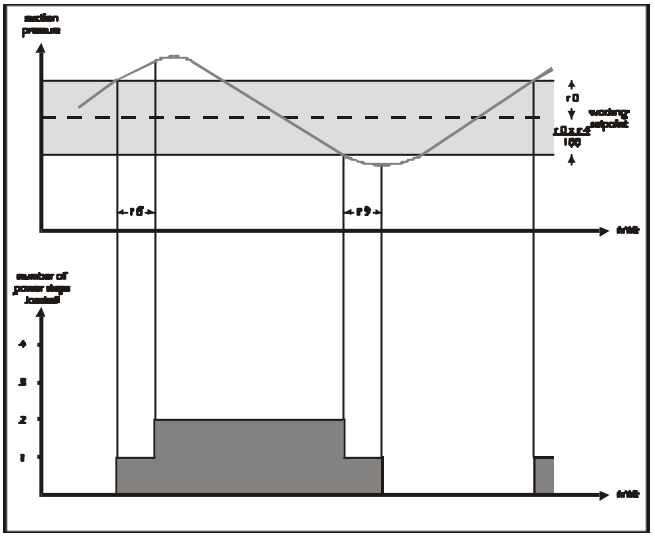
Suction pressure regulation happens through the compressors.

The instrument activates the compressors (it loads power steps) with sequence when the pressure read by the suction probe rises above the working setpoint of the "neutral zone" value and it deactivates them (it unloads power steps) in sequence when the pressure read by the suction probe falls below the working setpoint of the "neutral zone" value.

The parameter r A establishes the kind of regulating action that the instrument must manage: it is function of the pressure read by the suction probe (in this case when the pressure read by the suction probe is above/below the working setpoint of the "neutral zone" value the instrument loads/unloads power steps) ...



or function of the pressure read by the suction probe and of the direction of the pressure read by the suction probe (the same action saw in the previous case but when the pressure read by the suction probe is above/below the working setpoint of the "neutral zone" value and it is going towards the "neutral zone" the instrument does not load/unload power steps).



The instrument automatically computes which compressor to activate

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or deactivate according with the protections, the powers and the working hours of the compressors.

Speaking of suction pressure regulation

- the parameter Hr 1 ... 8 permits to display the total working hours of the user associated to the output K1 ... 8
- the parameter tyP1 ... 8 establishes the user to associate to the output K1 ... 8
- the parameter Po 1 ... 8 establishes a proportion among the compressors powers

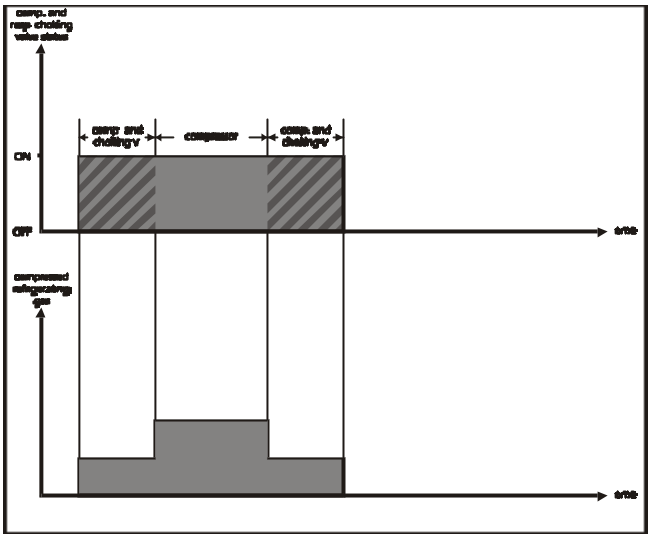
the parameters Hr 1 ... 8, tyP1 ... 8 and Po 1 ... 8 belong to the Configurator Menu; see the chapter *Configurator Menu* on the page 25

- the parameter r 0 establishes the "neutral zone" value
- the parameter r 4 establishes the percentage of "neutral zone" value to apply below the working setpoint
- the parameter r 8 establishes the minimum time interval that pass from the moment in which the instrument loads a power step to the moment in which the instrument loads the following power step
- the parameter r 9 establishes the minimum time interval that pass from the moment in which the instrument unloads a power step to the moment in which the instrument unloads the following power step
- the parameter r A establishes the kind of regulating action that the instrument must manage
- the parameters C 0, C 1 and C 2 permit to set the instrument to protect the compressors against overloads due to several starts repeated in a short time (see the paragraph *Compressors protection* on the page 10)
- the parameter C 6 establishes the number of power steps loaded during a suction probe failure alarm (see the paragraph *Alarms* on the page 46)
- the parameter C 7 establishes the number of running working hours of a power step enough to request the power step unloading
- the parameter C H establishes the number of total working hours of a power step enough to signal the request of service (see the paragraph *Alarms* on the page 46)

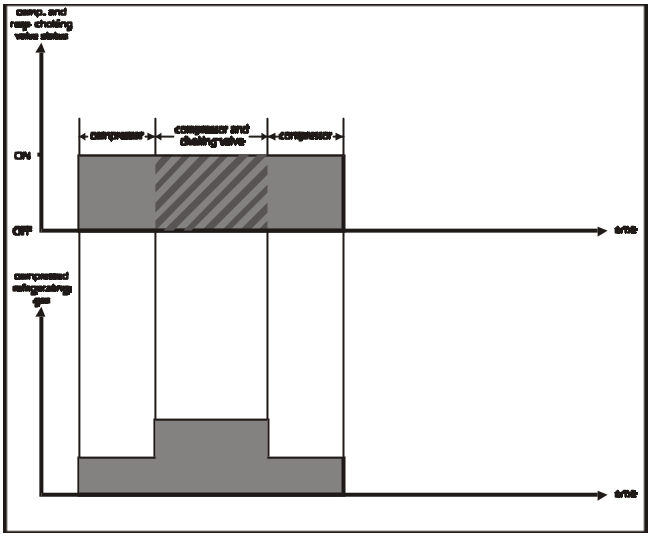
the parameters r 0, r 4, r 8, r 9, r A, C 0, C 1, C 2, C 6, C 7 and C H belong to the User Menu; see the chapter *User Menu* on the page 32.

If the compressor is choked the respective choking valve will be associated to the following relay output (for instance if the compressor to choke is associated to the output K1, the respective choking valve must be associated to the output K2).

The parameter r C establishes the kind of choking valve that the instrument must manage: NC choking valve (in this case the instrument loads a power step activating at the same time the compressor and the respective choking valve and it loads another power step deactivating the choking valve) ...



... or NO choking valve (in this case the instrument loads a power step activating the compressor and it loads another power step activating the choking valve).



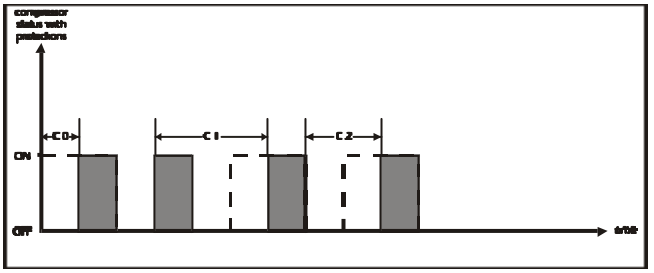
Speaking of choked compressors

- the parameter r C establishes the kind of choking valve that the instrument must manage

the parameter r C belongs to the User Menu; see the chapter *User Menu* on the page 32.

COMPRESSORS PROTECTION

Some parameters permit to set the instrument to protect the compressors against overloads due to several starts repeated in a short time



Speaking of compressors protection

- the parameter C 0 establishes the time that disables the compressor activation from the moment in which the instrument gets supplied
- the parameter C 1 establishes the time that disables the compressor activation from the moment of the previous compressor activation
- the parameter C 2 establishes the time that disables the compressor activation from the moment of the previous compressor deactivation

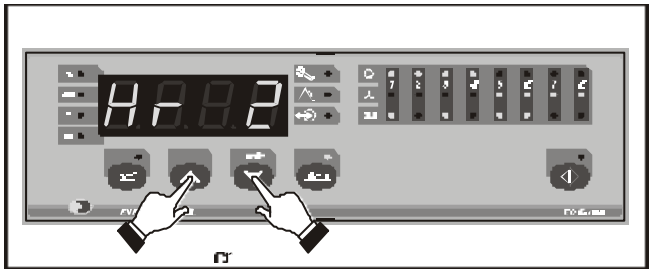
the parameters C 0, C 1 and C 2 belong to the User Menu; see the chapter *User Menu* on the page 32.

USERS TOTAL WORKING HOURS COUNTER CLEANING

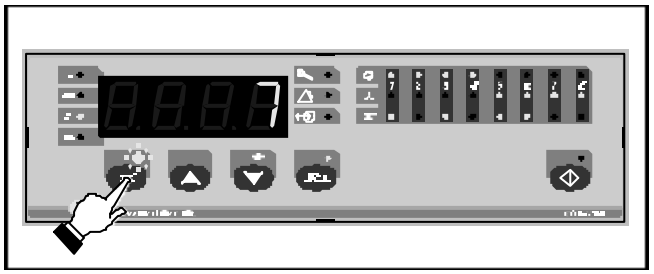
To gain access to the users total working hours counter cleaning procedure:

a) gain access to the second level of the configurator or Operator Menu (see the chapter *Configurator Menu* on the page 25 or the chapter *Operator Menu* on the page 29)

b) push and release over and over the up or the down key as long as the instrument displays the label of the desired user (for instance to clear the counter of the total working hours of the user associated to the output K2 select the label Hr 2)

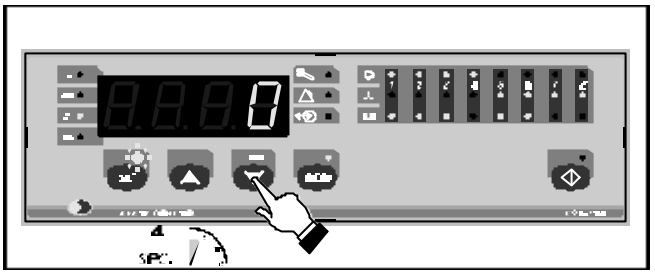


c) push and release the set key (to the release of the set key the instrument displays the actual value, for instance 7 and the set LED flashes to indicate that a configuration parameter modification procedure is running; passed four seconds without operated with the keys the instrument automatically turns out from the configuration parameter modification procedure).

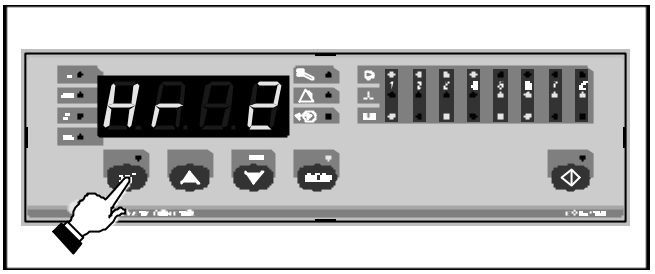


To clear the counter:

d) keep pushed for four seconds at least the down key (passed four seconds the instrument displays 0)



e) after the modification push and release the set key (to the release of the set key the instrument displays the label Hr 2 again).



To turn out from the users total working hours counter cleaning procedure:

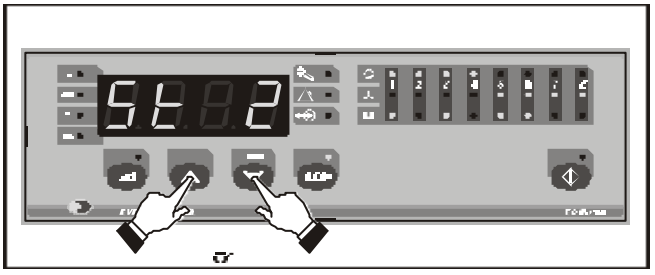
f) repeat the passage n or n' of the chapter *Configurator Menu* on the page 25.

MANUAL POWER STEPS LOADING/UNLOADING

To gain access to the manual power steps loading/unloading procedure:

a) gain access to the second level of the Operator Menu (see the chapter *Operator Menu* on the page 29)

b) push and release over and over the up or the down key as long as the instrument displays the label of the desired power step (for instance to load/unload the power step associated to the output K2 select the label St 2)



c) push and release the set key (to the release of the set key the instrument displays the actual status, for instance OFF and the set LED flashes to indicate that a configuration parameter modification procedure is running; passed four seconds without operated with the keys the instrument automatically turns out from the configuration parameter modification procedure).

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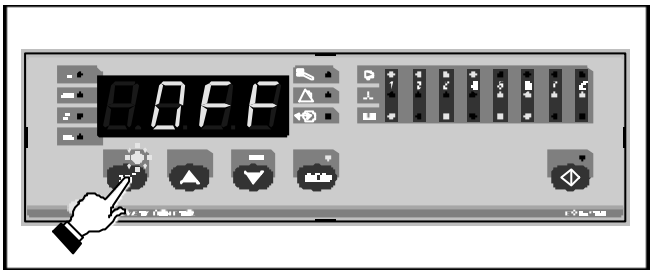
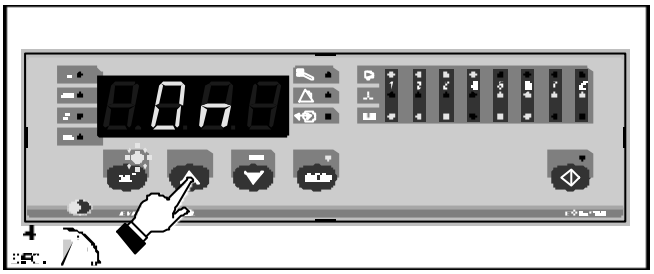


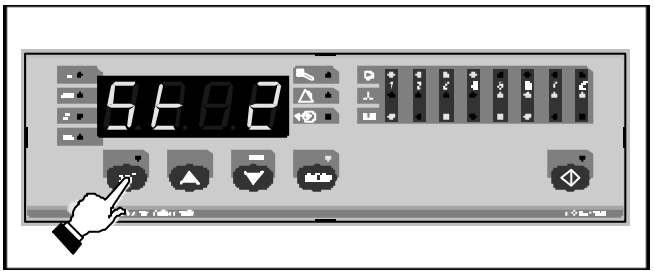
To load/unload manually the power step:

d) if the actual status of the power step is OFF keep pushed for four seconds at least the up key (passed four seconds the instrument displays On, the new status of the power step) ...



d') ... if the actual status of the power step is ON keep pushed for four seconds at least the down key (passed four seconds the instrument displays OFF, the new status of the power step)

e) after the modification push and release the set key (to the release of the set key the instrument displays the label St 2 again).



To turn out from the manual power steps loading/unloading procedure:

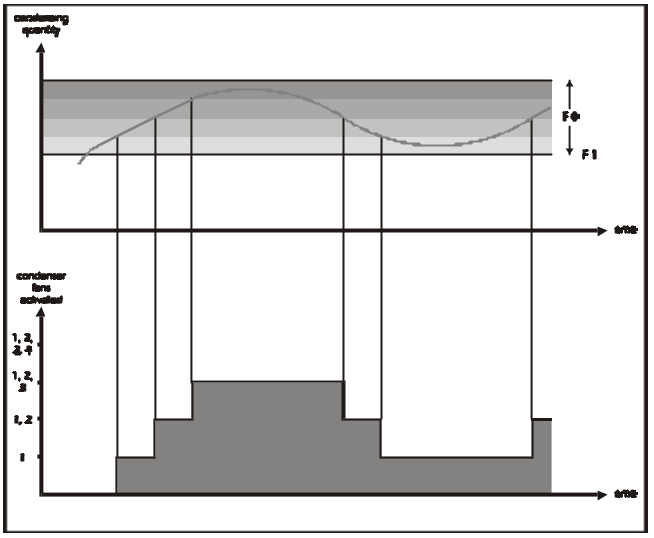
f) repeat the passage n or n' of the chapter *Configurator Menu* on the page 25.

Additional informations

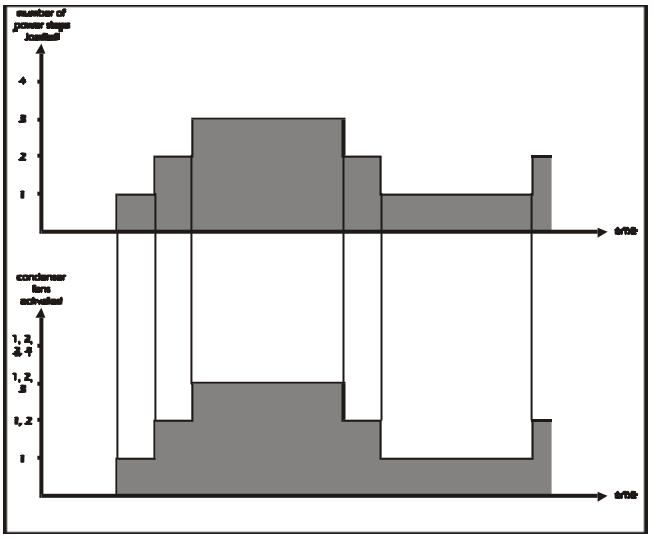
- *the manual unloading of the power step of a choked compressor gives the unloading of the power step of the respective choking valve.*

CONDENSING QUANTITY REGULATION

Condensing quantity regulation happens through the condenser fans. The parameter F A establishes the condenser fans functioning: it is function of the quantity read by the condensing probe (in this case the instrument automatically divides the proportional band in equal fractions according with the number of relay outputs associated to the condenser fans, for instance 4, it activates the condenser fans with sequence every time the quantity read by the condensing probe rises above the condenser fans activation setpoint of a fraction of proportional band and it deactivates them with sequence when the quantity read by the condensing probe falls below the value to which the activation happened of a fraction of proportional band) ...



... or function of the power steps loading/unloading (in this case a power step loading/unloading gives the automatic activation/deactivation of a condenser fans).



The parameter F d establishes the method used by the instrument to compute which condenser fans to activate or deactivate: with fixed sequence (in this case if the users associated to the outputs K5, K6, K7 and K8 are condenser fans, the instrument activates them beginning from that associated to the output K5 and it deactivates them with the reversal method) or balancing the total working hours (in this case the instrument activates the condenser fans with sequence beginning from that with the lower number of total working hours and it deactivates them with the reversal method).

Speaking of condensing quantity regulation

- the parameter Hr 1 ... 8 permits to display the total working

hours of the user associated to the output K1 ... 8

- the parameter tyP1 ... 8 establishes the user to associate to the output K1 ... 8

the parameters Hr 1 ... 8 and tyP1 ... 8 belong to the Configurator Menu; see the chapter *Configurator Menu* on the page 25

- the parameter Pb F permits to display the quantity read by the condensing probe

the parameter Pb F belongs to the Operator Menu; see the chapter *Operator Menu* on the page 29

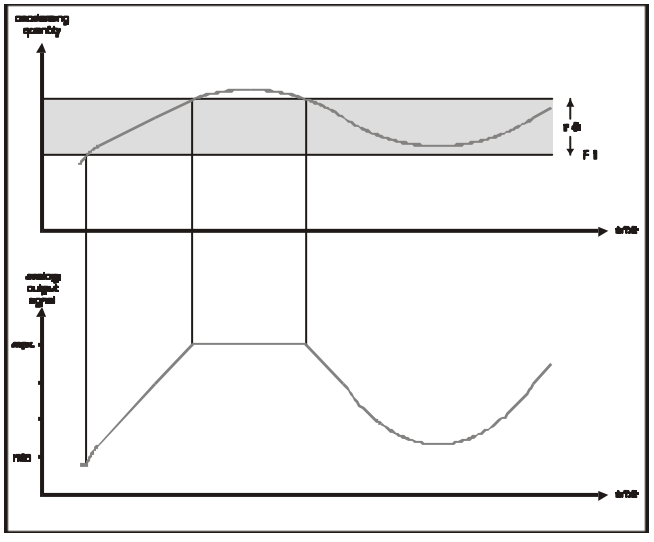
- the parameter / t establishes the unit of measure with which the temperature gets displayed
- the parameter /bE establishes the kind of condensing probe that the instrument must recognize
- the parameter F 0 establishes the proportional band width
- the parameter F 1 establishes the condensing quantity value to which the instrument activates the condenser fans
- the parameter F A establishes the condensing fans functioning
- the parameter F d establishes the method used by the instrument to compute which condenser fans activate/deactivate
- the parameter F H establishes the number the total working hours of a condenser fans enough to signal the request of service (see the paragraph *Alarms* on the page 46)

the parameters / t, /bE, F 0, F 1, F A, F d and F H belong to the User Menu; see the chapter *User Menu* on the page 32.

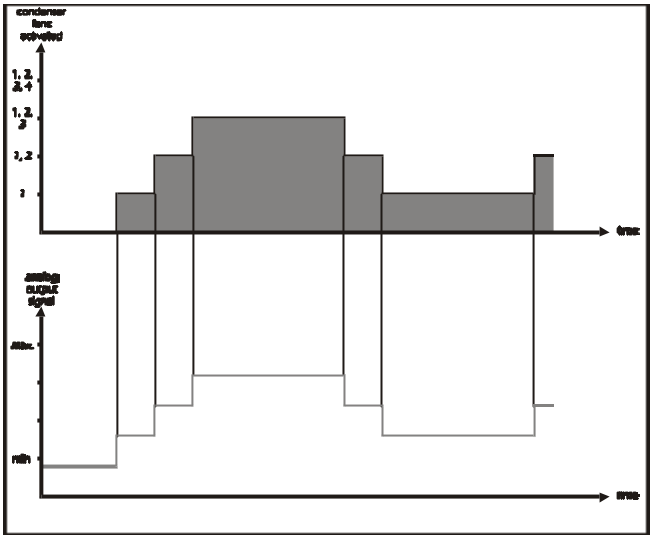
ANALOG OUTPUT

The 4-20 mA or 0-10 V analog output is associated to the condenser fans.

The parameter F A establishes the condenser fans functioning and then the analog output functioning: it is function of the quantity read by the condensing probe (in this case the analog output signal is proportional to the error between the condenser fans activation setpoint and the quantity read by the condensing probe in every point of the proportional band) ...



... or function of the power steps loading/unloading (in this case the analog output signal is proportional to the number of condenser fans activated on the number of relay outputs associated to the condenser fans, for instance 4).



Speaking of analog output

- the parameter outF permits to display the percentage of the analog output signal

the parameter outF belongs to the Operator Menu; see the chapter *Operator Menu* on the page 29

- the parameter F 0 establishes the proportional band width
- the parameter F 1 establishes the condensing quantity value to which the instrument activates the condenser fans
- the parameter F A establishes the condenser fans functioning

the parameters F 0, F 1 and F A belong to the use Menu; see the chapter *User Menu* on the page 32.

DIGITAL INPUTS

The instrument is provided with twelve digital inputs configurable to interact on the relay outputs activity.

Activating the user associated to the output K1 ... 8 locking digital input the instrument activates the user associated to the output K1 ... 8 locking digital input alarm (see the paragraph *Alarms* on the page 46).

Activating the freon level digital input the instrument activates the freon level digital input alarm (see the paragraph *Alarms* on the page 46).

Activating the condenser fans safety digital input the instrument activates the condenser fans safety digital input alarm (see the paragraph *Alarms* on the page 46).

Activating the upper condensing quantity digital input the instrument activates the upper condensing quantity digital input alarm (see the paragraph *Alarms* on the page 46) and it increases an upper condensing quantity alarms counter as long as the number of upper condensing quantity alarms enough to give the instrument locking gets reached (the increasing of the upper condensing quantity alarms counter gets given also by the upper condensing quantity alarm activation; see the paragraph *Upper condensing quantity alarm* on the page 15); to unlock the instrument turn off and turn on again the instrument.

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Activating the lower pressure digital input the instrument activates the lower pressure digital input alarm (see the paragraph *Alarms* on the page 46) and it increases a lower pressure alarms counter as long as the number of lower pressure alarms enough to give the instrument locking gets reached (the increasing of the lower pressure alarms counter gets given also by the lower pressure alarm activation; see the paragraph *Lower pressure alarm* on the page 14); to unlock the instrument turn off and turn on again the instrument.

Speaking of digital inputs

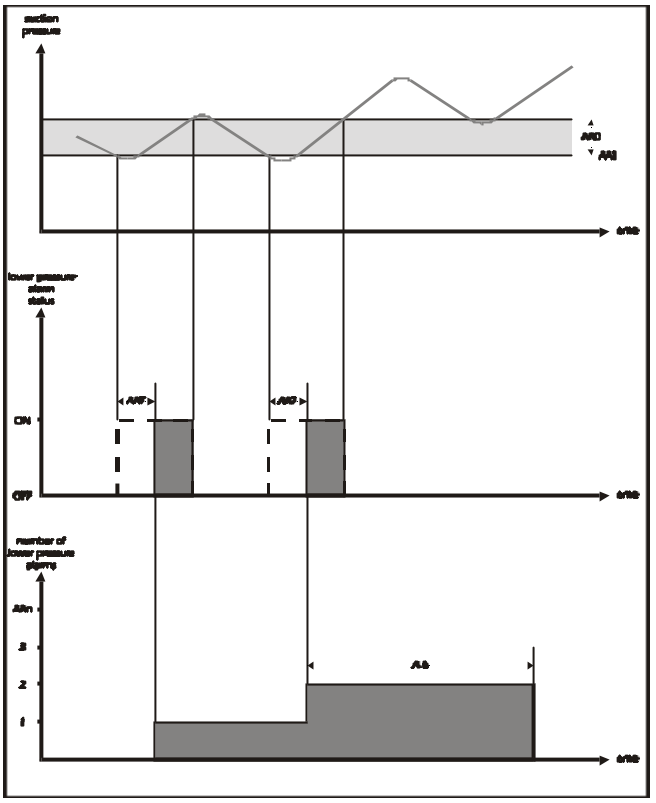
- the parameter i1P establishes the kind of contact of the user compressor associated to the output K1 ... 8 locking digital inputs
- the parameter i2P establishes the kind of contact of the user condenser fans associated to the output K1 ... 8 locking digital inputs
- the parameter i5P establishes the kind of contact of the freon level digital input
- the parameter i6P establishes the kind of contact of the condenser fans safety digital input
- the parameter i7P establishes the kind of contact of the upper condensing quantity digital input
- the parameter i8P establishes the kind of contact of the lower pressure digital input
- the parameter AAn establishes the number of lower pressure alarms enough to give the instrument locking
- the parameter ACn establishes the number of upper condensing quantity alarms enough to give the instrument locking
- the parameter A 6 establishes the time that must pass from the moment of a previous alarms counter increasing in order that the counter get cleared

the parameter i1P, i2P, i5P, i6P, i7P, i8P, AAn, ACn and A 6 belong to the User Menu; see the chapter *User Menu* on the page 32.

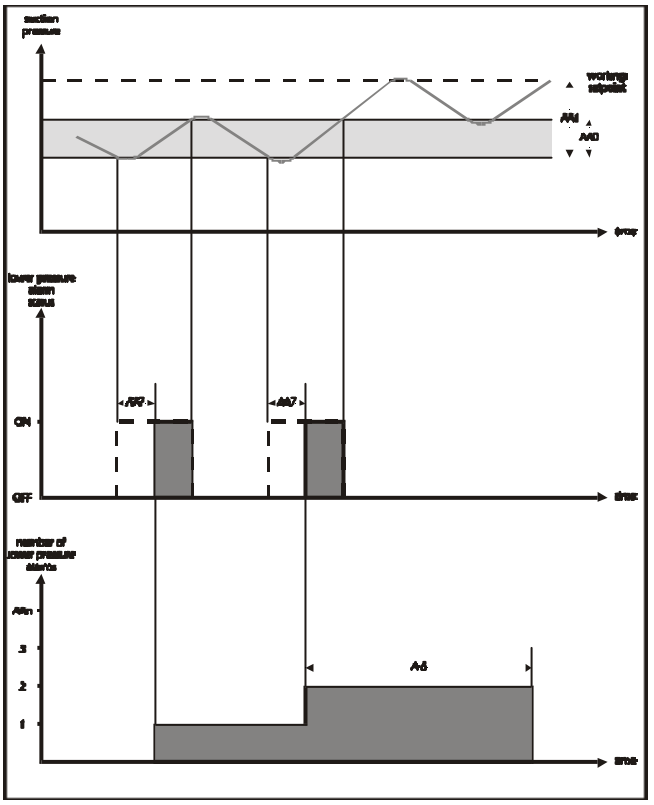
LOWER PRESSURE ALARM

When the pressure read by the suction probe falls below the alarm setpoint the instrument activates the lower pressure alarm (see the paragraph *Alarms* on the page 46) and it increases a lower pressure alarms counter as long as the number of lower pressure alarms enough to give the instrument locking gets reached (the increasing of the lower pressure alarms counter gets given also by the lower pressure digital input activation; see the paragraph *Digital inputs* on the page 13); to unlock the instrument turn off and turn on again the instrument.

The parameter AA4 establishes the kind of lower pressure alarm that the instrument must manage: the lower pressure alarm never gets activated, absolute lower pressure alarm (in this case the instrument activates the lower pressure alarm when the pressure read by the suction probe falls below the alarm setpoint) ...



... or lower pressure alarm relative to the working setpoint (in this case the instrument activates the lower pressure alarm when the pressure read by the suction probe falls below the working setpoint of the alarm setpoint value).



Speaking of lower pressure alarm

- the parameter i8P establishes the kind of contact of the lower

pressure digital input

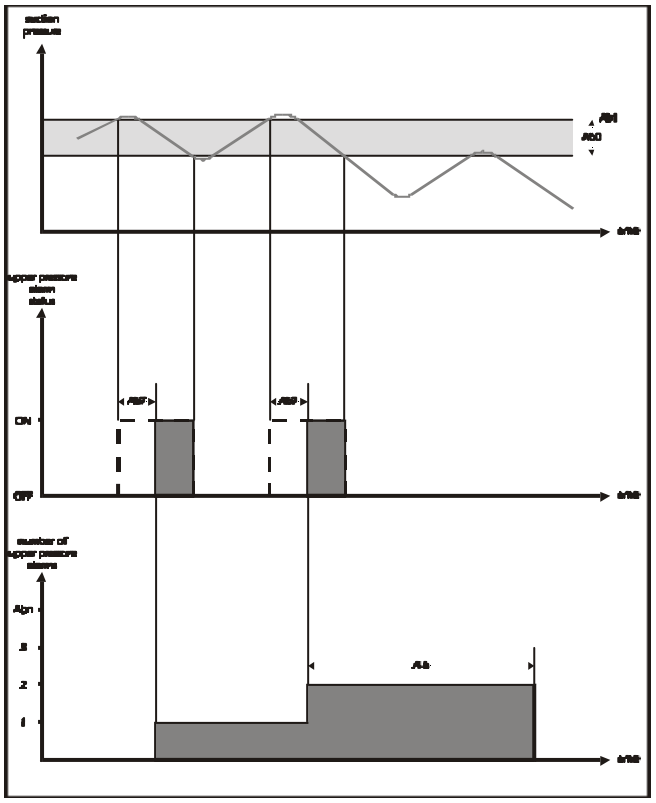
- the parameter AA0 establishes the hysteresis (differential) relative to the alarm setpoint
- the parameter AA1 establishes the alarm setpoint value
- the parameter AA4 establishes the kind of lower pressure alarm that the instrument must manage
- the parameter AA7 establishes the time that disables a lower pressure alarm activation from the moment in which the lower pressure alarm happens
- the parameter AAn establishes the number of lower pressure alarms enough to give the instrument locking
- the parameter A 6 establishes the time that must pass from the moment of a previous alarms counter increasing in order that the counter get cleared

the parameters i8P, AA0, AA1, AA4, AA7, AAn and A 6 belong to the User Menu; see the chapter *User Menu* on the page 32.

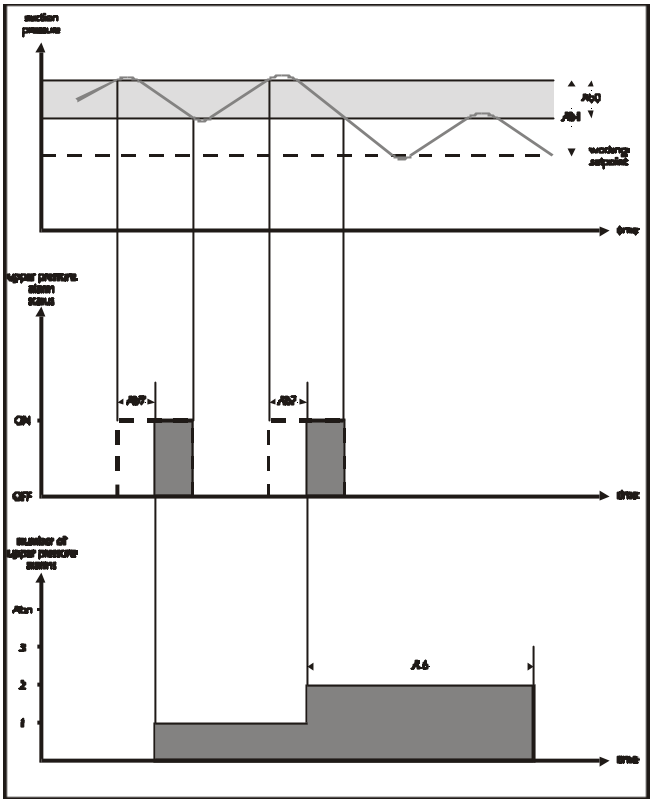
UPPER PRESSURE ALARM

When the pressure read by the suction probe rises above the alarm setpoint the instrument activates the upper pressure alarm (see the paragraph *Alarms* on the page 46) and it increases an upper pressure alarms counter as long as the number of upper pressure alarms enough to give the instrument locking gets reached; to unlock the instrument turn off and turn on again the instrument.

The parameter Ab4 establishes the kind of upper pressure alarm that the instrument must manage: the upper pressure alarm never gets activated, absolute upper pressure alarm (in this case the instrument activates the upper pressure alarm when the pressure read by the suction probe rises above the alarm setpoint) ...



... or upper pressure alarm relative to the working setpoint (in this case the instrument activates the upper pressure alarm when the pressure read by the suction probe rises above the working setpoint of the alarm setpoint value).



Speaking of upper pressure alarms

- the parameter Ab0 establishes the hysteresis (differential) relative to the alarm setpoint
- the parameter Ab1 establishes the alarm setpoint value
- the parameter Ab4 establishes the upper pressure alarm that the instrument must manage
- the parameter Ab7 establishes the time that disables an upper pressure alarm activation from the moment in which the upper pressure alarm happens
- the parameter Abn establishes the number of upper pressure alarms enough to give the instrument locking
- the parameter A 3 establishes the time that disables an upper pressure alarm activation from the moment of the instrument start
- the parameter A 6 establishes the time that must pass from the moment of a previous alarms counter increasing in order that the counter get cleared

the parameters Ab0, Ab1, Ab4, Ab7, Abn, A 3 and A 6 belong to the User Menu; see the chapter *User Menu* on the page 32.

UPPER CONDENSING QUANTITY ALARM

When the quantity read by the condensing probe rises above the alarm setpoint the instrument activates the upper condensing quantity alarm (see the paragraph *Alarms* on the page 46) and it increases an

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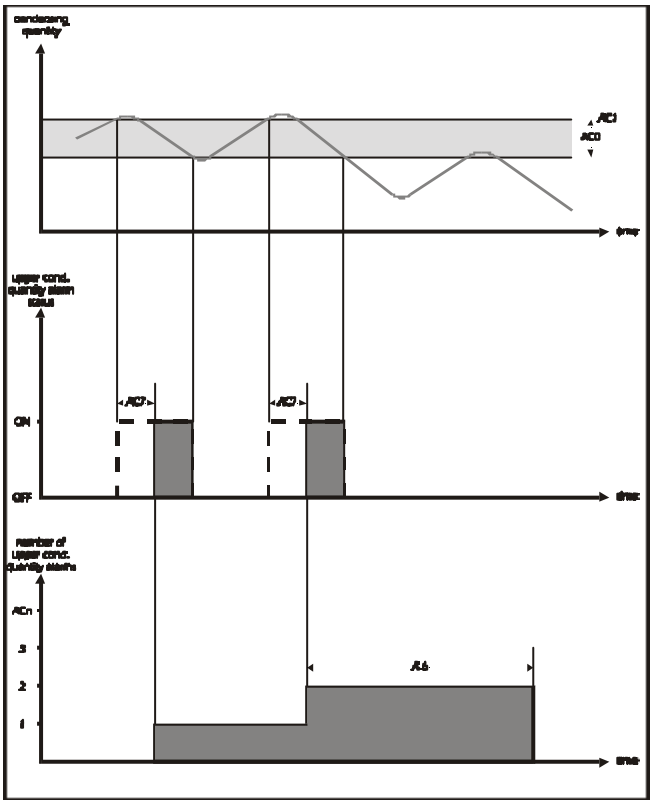
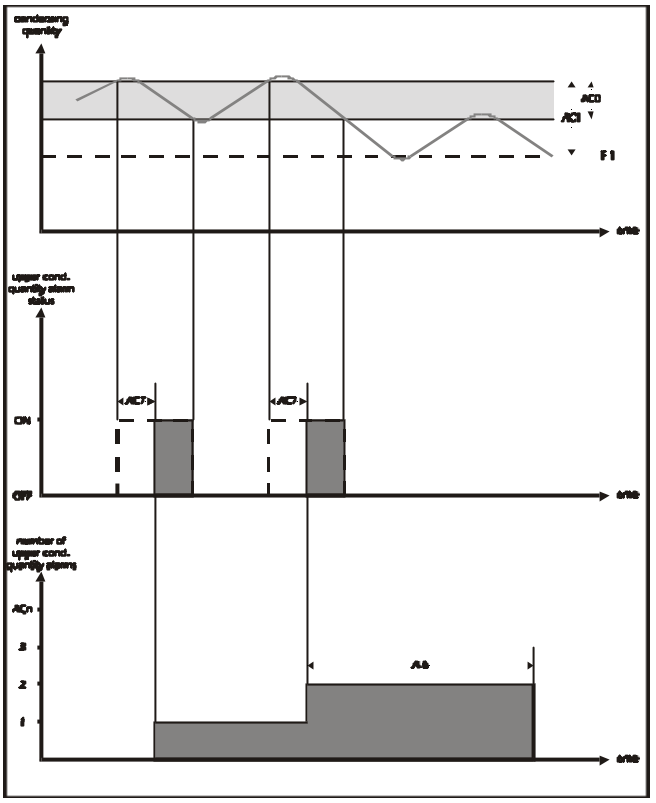
upper condensing quantity alarms counter as long as the number of upper condensing quantity alarms enough to give the instrument locking gets reached (the increasing of the upper condensing quantity alarms counter gets given also by the upper condensing quantity digital input activation; see the paragraph *Digital inputs* on the page 13); to unlock the instrument turn off and turn on again the instrument.
The parameter AC4 establishes the kind of upper condensing quantity alarm that the instrument must manage: the upper condensing quantity alarm never gets activated, absolute upper condensing quantity alarm (in this case the instrument activates the upper condensing quantity alarm when the quantity read by the condensing probe rises above the alarm setpoint) ...



... or upper condensing quantity alarm relative to the setpoint established with the parameter F 1 (in this case the instrument activates the upper condensing quantity alarm when the quantity read by the condensing probe rises above the condenser fans activation setpoint of the alarm setpoint value).



Speaking of upper condensing quantity alarm

- the parameter i7P establishes the kind of contact of the upper condensing quantity digital input
- the parameter AC0 establishes the hysteresis (differential) relative to the alarm setpoint
- the parameter AC1 establishes the alarm setpoint value
- the parameter AC4 establishes the kind of upper condensing quantity alarm that the instrument must manage
- the parameter AC7 establishes the time that disables an upper condensing quantity alarm activation from the moment in which the upper condensing quantity alarm happens
- the parameter ACn establishes the number of upper condensing quantity alarms enough to give the instrument locking
- the parameter A 6 establishes the time that must pass from the moment of a previous alarms counter increasing in order that the counter get cleared

the parameters i7P, AC0, AC1, AC4, AC7, ACn and A 6 belong to the User Menu; see the chapter *User Menu* on the page 32.

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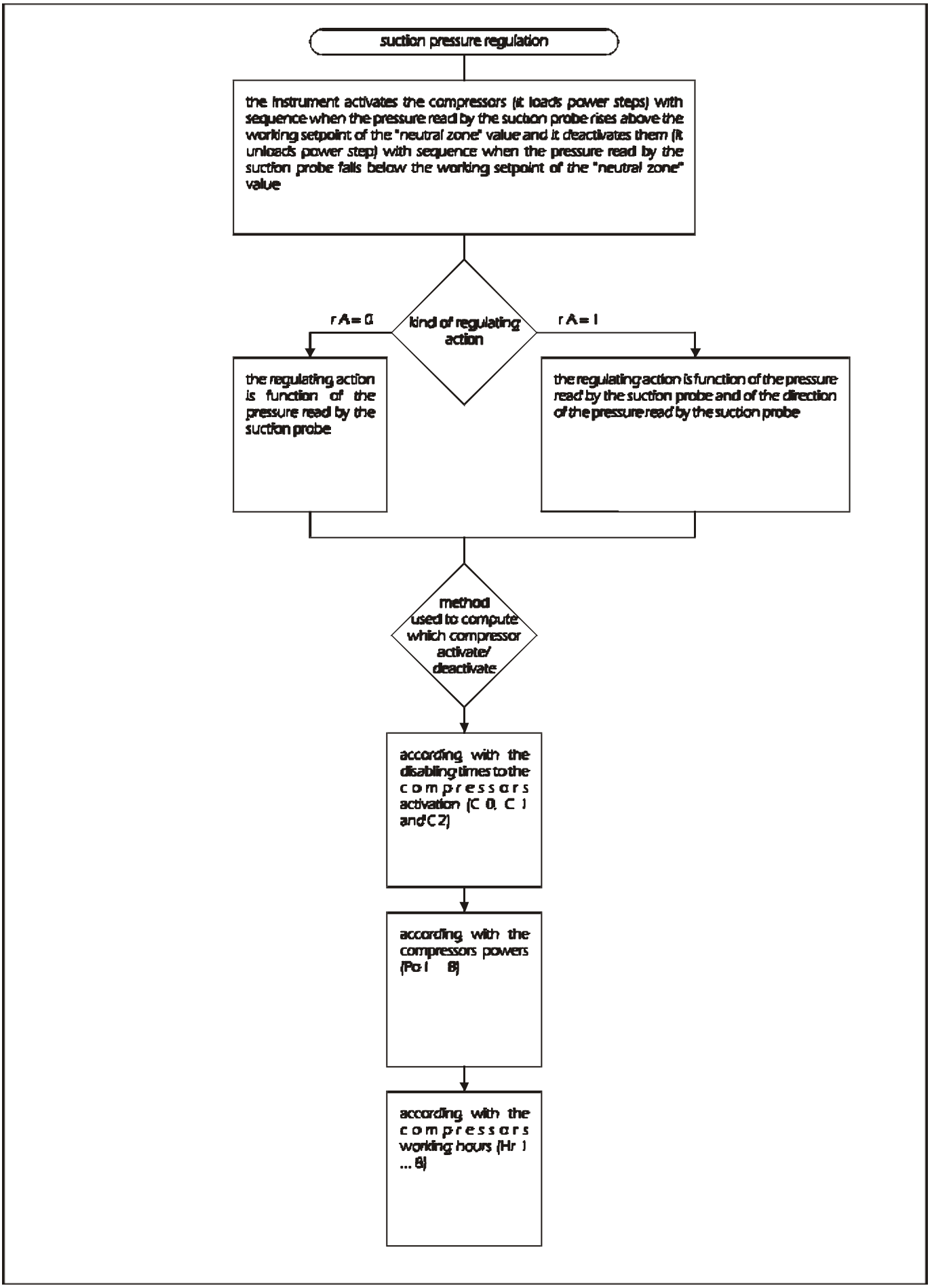
Summarizing flowchart



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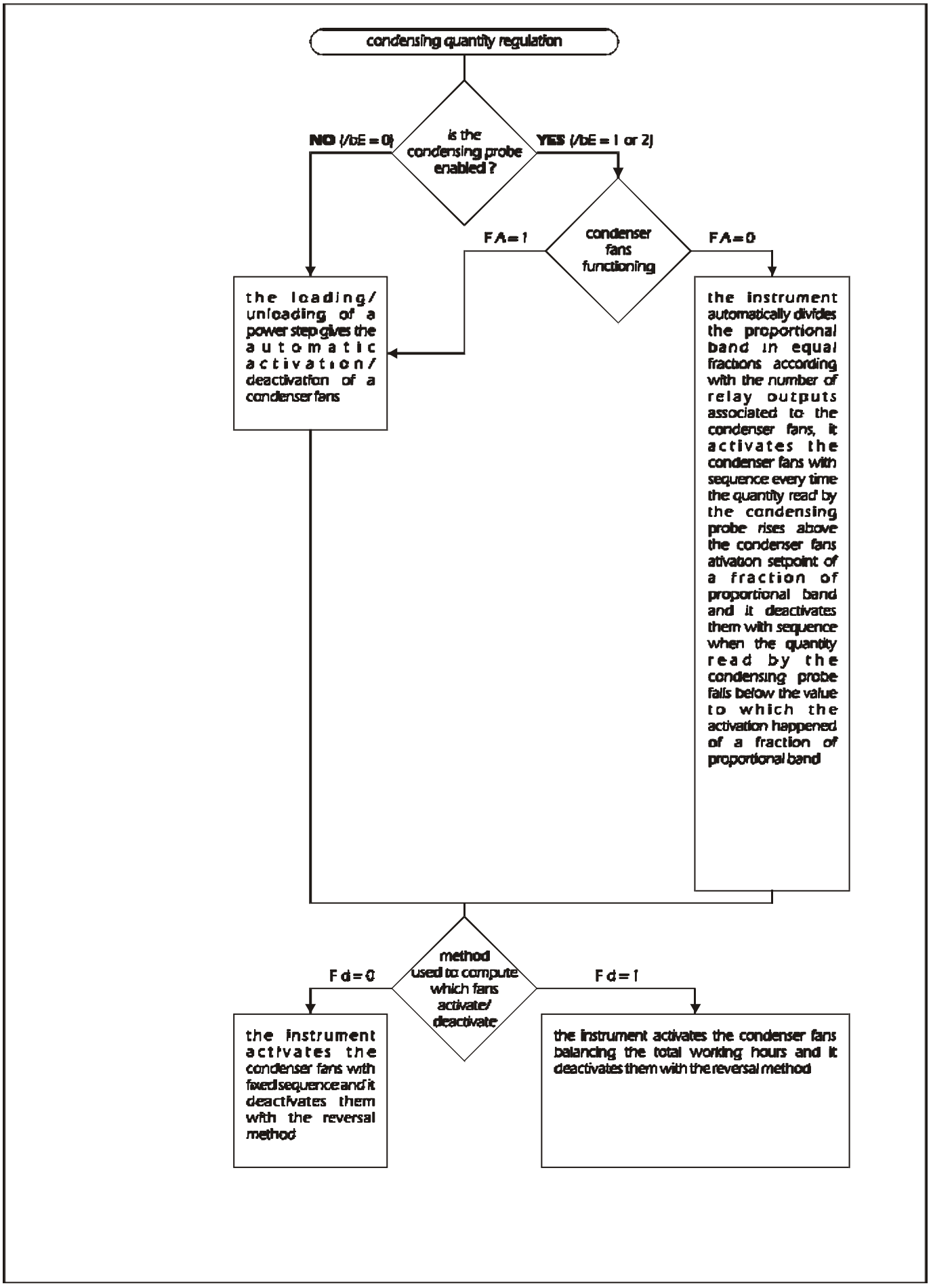

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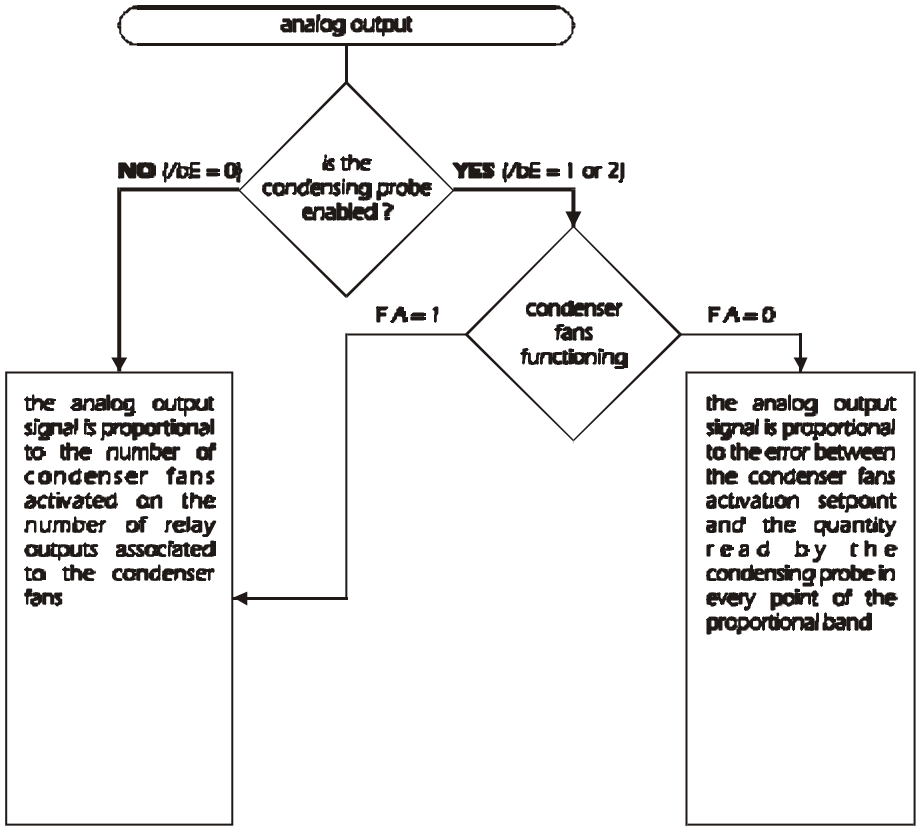
Summarizing flowchart



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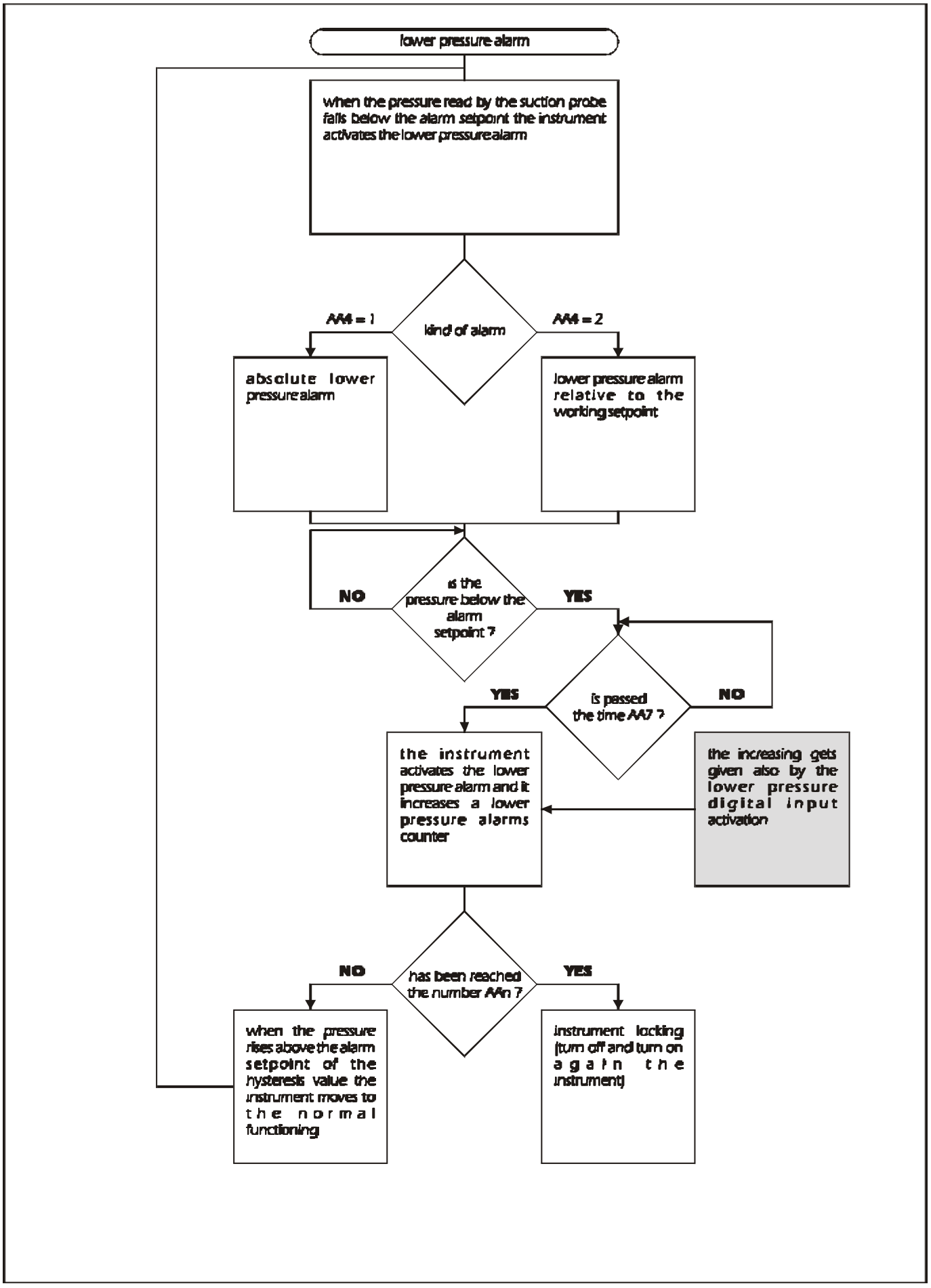

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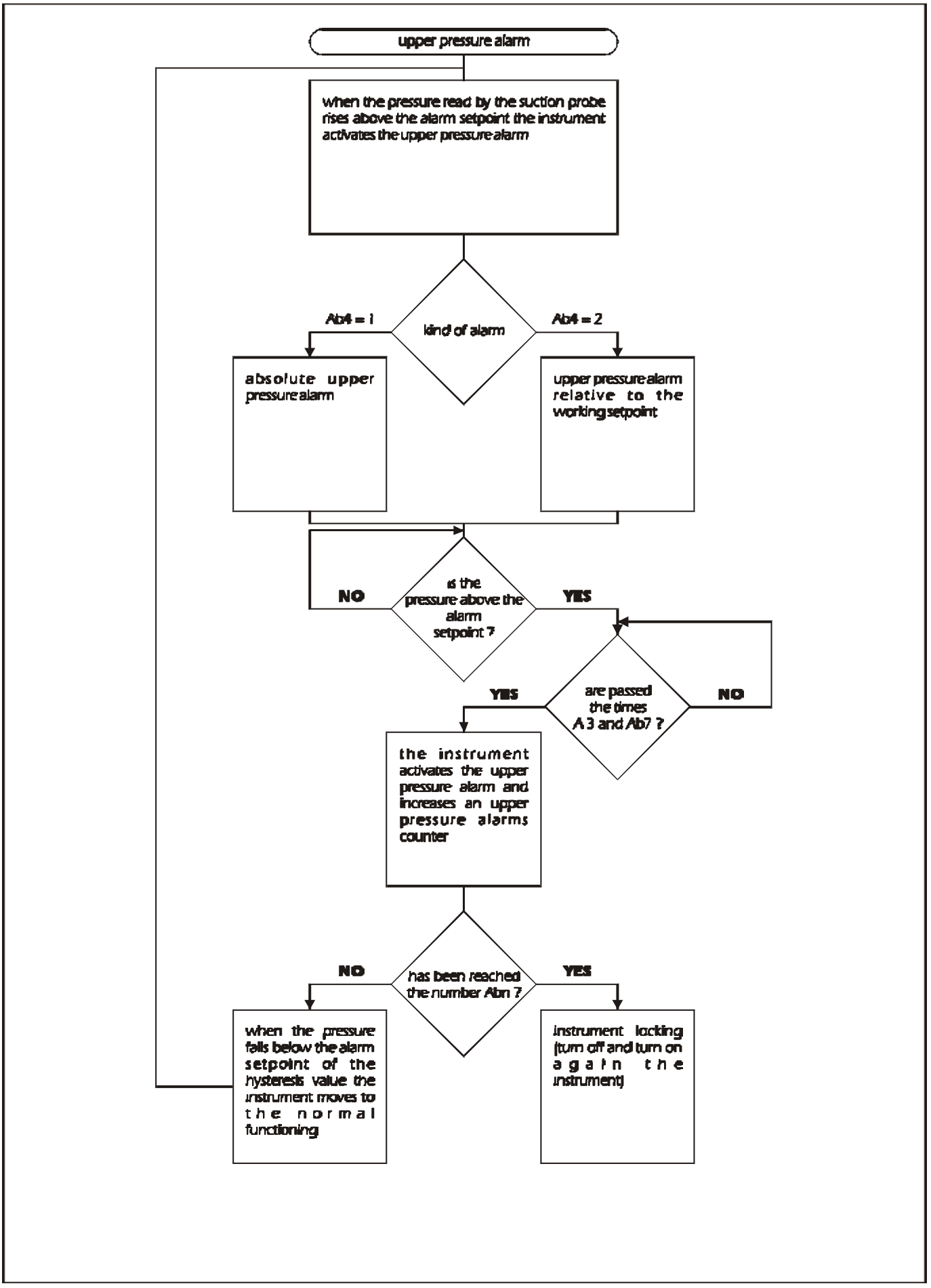
Summarizing flowchart



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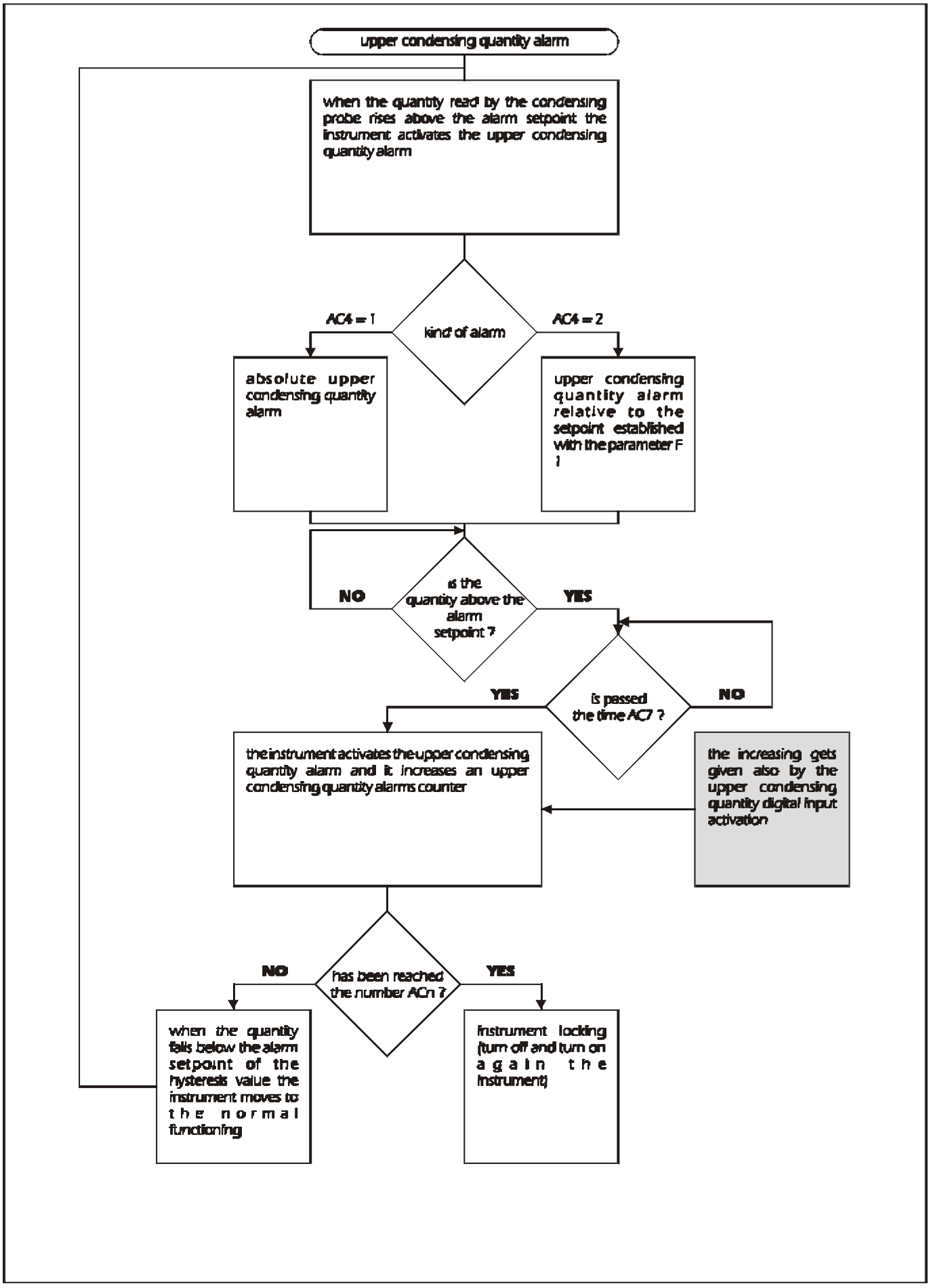

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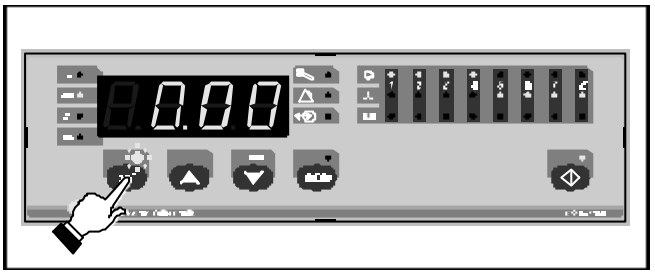
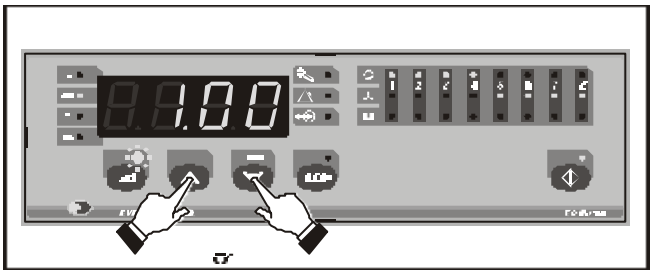
WORKING SETPOINT SETTING (WORKING SUCTION PRESSURE)

To modify the working setpoint value:

a) push and release the set key (to the release of the set key the instrument displays the actual value, for instance 0.00 bar, the compressors/choking valves and condenser fans associated to the outputs K1 ... 8 LED turning on to indicate the actual user-relay output configuration and the set LED flashes to indicate that a working setpoint setting procedure is running; passed four seconds without operated with the keys the instrument automatically turns out from the working setpoint setting procedure)



b) push and release over and over the up or the down key within four seconds as long as the instrument displays the desired value, for instance 1.00 bar (keeping pushed the up or the down key the value gets increased or decreased more quickly)



c) after the modification push and release the set key (to the release of the set key the instrument turns out from the working setpoint setting procedure).

Additional informations

- *during a corrupted memory data alarm the access to the working setpoint setting procedure is refused (see the paragraph Alarms on the page 46)*
- *the working setpoint value gets stored in a non volatile memory even if a lack of power supply happens.*

WORKING SETPOINT

LABEL	MIN.	MAX.	U.M.	WORKING SETPOINT
	r 1	r 2	(3)	working setpoint

Notes

- *the parameters r 1 and r 2 belong to the User Menu; see the chapter User Menu on the page 32*
- *the symbol (3) indicates that the unit of measure depends from the parameter /5P and from the parameters /A6 and /A7 (the parameters /5P, /A6 and /A7 belong to the User Menu; see the chapter User Menu on the page 32).*

working setpoint

It establishes the suction pressure associated to the compressors.
For further informations about the working setpoint meaning see the paragraph *Suction pressure regulation* on the page 9.

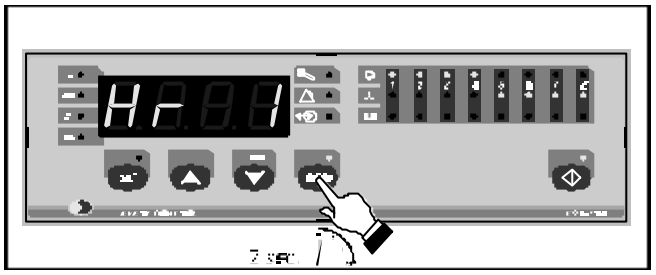
CONFIGURATION PARAMETERS SETTING

Configurator Menu configuration parameters are arranged on two levels, to protect the most tricky settings against undesirable violations and they are arranged in families that can be recognized through the initial letter of the label.

To gain access to the first level:

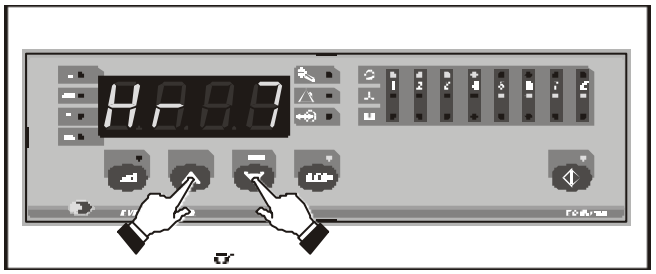
a) verify if the instrument is in the status STAND-BY (repeat the passages a and b of the chapter *Before the use* on the page 8)

b) keep pushed for two seconds at least the menu key (passed two seconds the instrument displays the label Hr 1, the menu LED turning on and the compressors/choking valves and condenser fans associated to the outputs K1 ... 8 LED turning on to indicate the actual user-relay output configuration).



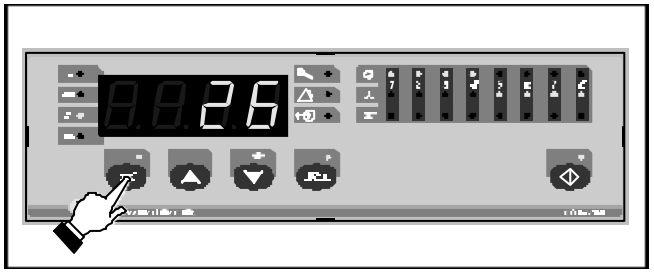
To select a parameter of the first level:

c) push and release over and over the up or the down key as long as the instrument displays the label of the desired parameter, for instance Hr 7.

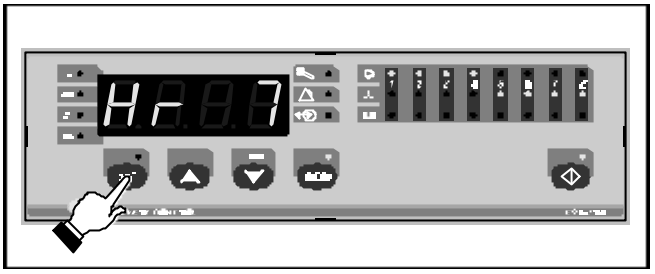


To display the parameter value:

d) push and release the set key (to the release of the set key the instrument displays the actual value, for instance 26, the set LED and the hours LED turning on to indicate respectively that the value can not be modified and that the unit of measure of the displayed quantity is the hour; passed four seconds without operated with the keys the instrument automatically turns out from a configuration parameter display procedure)

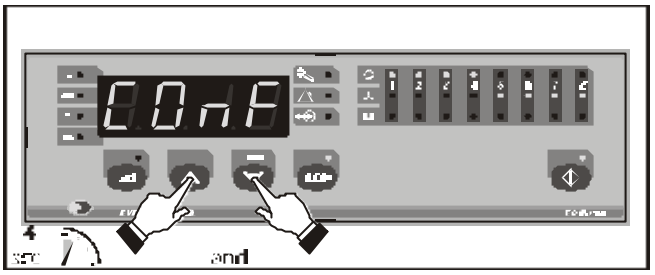


e) after the display push and release the set key (to the release of the set key the instrument displays the label Hr 7 again.

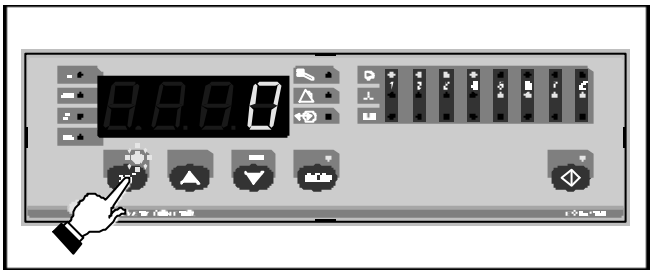


To gain access to the second level:

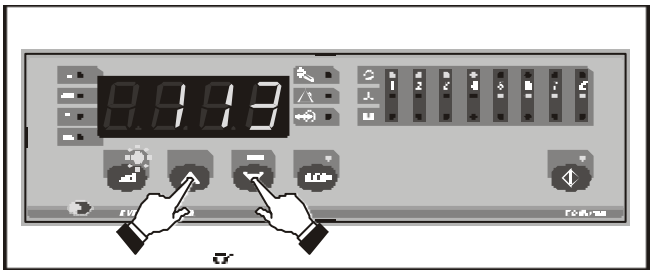
f) from the passage b keep pushed at the same time for four seconds at least the up and the down keys (passed four seconds the instrument displays the label ConF)



g) push and release the set key (to the release of the set key the instrument displays the actual label value, for instance 0 and the set LED flashes to indicate that a configuration parameter modification procedure is running; passed four seconds without operated with the keys the instrument automatically turns out from a configuration parameter modification procedure)



h) push and release over and over the up or the down key within four seconds as long as the instrument displays 113 (keeping pushed the up or the down key the value gets increased or decreased more quickly)



i) after the modification push and release the set key (to the release of the set key the instrument displays Hr 1, the label of

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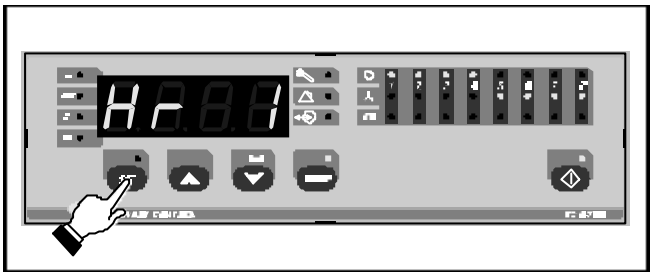
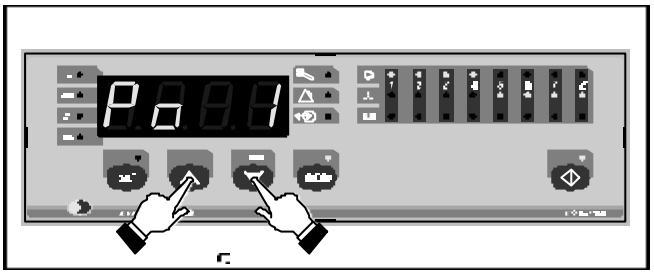
the first parameter of the second level).



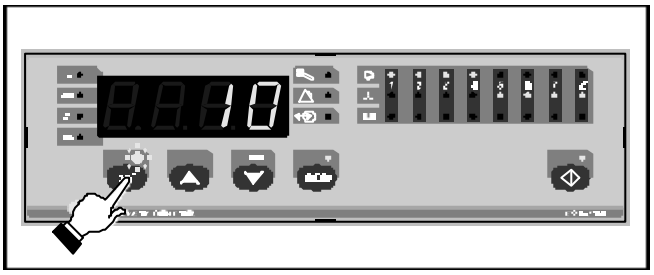
To select a parameter of the second level:

j) repeat the passage c as long as the instrument displays the label of the desired parameter, for instance Po 1.

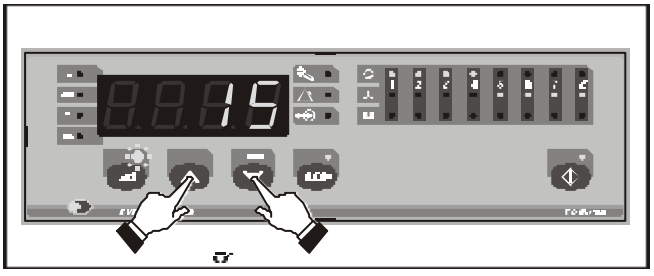


To modify the parameter value:

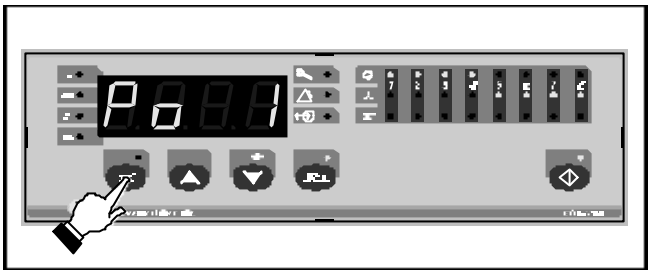
k) push and release the set key (to the release of the set key the instrument displays the actual value, for instance 10 and the set LED flashes to indicate that a configuration parameter modification procedure is running; passed four seconds without operated with the keys the instrument automatically turns out from the configuration parameter modification procedure)



l) push and release over and over the up or the down key within four seconds as long as the instrument displays the desired value, for instance 15 (keeping pushed the up or the down key the value gets increased or decreased more quickly)

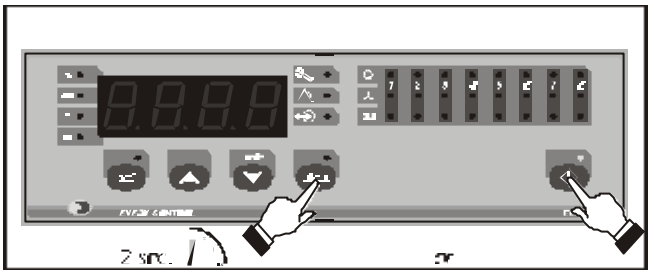


m) after the modification push and release the set key (to the release of the set key the instrument displays the label Po 1 again.



To turn out from the Configurator Menu configuration parameters setting procedure:

n) keep pushed for two seconds at least the menu key or the ON STAND-BY key (passed two seconds the display and the LED turning off, except the ON STAND-BY LED) or ...



n') ... or do not operate with the keys for sixty seconds at least (passed sixty seconds the display and the LED turning off, except the ON STAND-BY LED).

Additional informations

- *during a corrupted memory data alarm the access to the Configurator Menu configuration parameters setting procedure is refused (see the paragraph Alarms on the page 46)*
- *the parameters value gets stored in a non volatile memory even if a lack of power supply happens.*

CONFIGURATOR MENU CONFIGURATION PARAMETERS

To make easy the configuration parameters consultation of this Menu, we have provided to divided it in families.

LABEL	MIN.	MAX.	U.M.	USERS TOTAL WORKING HOURS COUNTER
Hr 1	----	----	hour	total working hours of the user associated to the output K1 (1)
Hr 2	----	----	hour	total working hours of the user associated to the output K2 (1)
Hr 3	----	----	hour	total working hours of the user associated to the output K3 (1)
Hr 4	----	----	hour	total working hours of the user associated to the output K4 (1)
Hr 5	----	----	hour	total working hours of the user associated to the output K5 (1)
Hr 6	----	----	hour	total working hours of the user associated to the output K6 (1)
Hr 7	----	----	hour	total working hours of the user asso-

				ciated to the output K7 (1)
Hr 8	----	----	hour	total working hours of the user associated to the output K8 (1)

Notes

- *the symbol (1) indicates that the parameter is available both to the first and to the second level*
- *to clear the users total working hours counter see the paragraph Users total working hours counter cleaning on the page 11.*

Hr 1 total working hours of the user associated to the output K1

It permits to display the total working hours of the user associated to the output K1.

Hr 2 total working hours of the user associated to the output K2

It has the same significance of the parameter Hr 1.

Hr 3 total working hours of the user associated to the output K3

It has the same significance of the parameter Hr 1.

Hr 4 total working hours of the user associated to the output K4

It has the same significance of the parameter Hr 1.

Hr 5 total working hours of the user associated to the output K5

It has the same significance of the parameter Hr 1.

Hr 6 total working hours of the user associated to the output K6

It has the same significance of the parameter Hr 1.

Hr 7 total working hours of the user associated to the output K7

It has the same significance of the parameter Hr 1.

Hr 8 total working hours of the user associated to the output K8

It has the same significance of the parameter Hr 1.

LABEL	MIN.	MAX.	U.M.	OPERATOR MENU PASSWORD
OPEr	-999	9999	----	Operator Menu password (2)

Notes

- *the symbol (2) indicates that the parameter is available to the first level only.*

OPEr Operator Menu password

It is the password who permits to gain access to the second level of the Operator Menu.

LABEL	MIN.	MAX.	U.M.	USER-RELAY OUTPUT CONFIGURATION
tyP1	undF	CHo	----	user to associate to the output K1
tyP2	undF	CHo	----	user to associate to the output K2
tyP3	undF	CHo	----	user to associate to the output K3
tyP4	undF	CHo	----	user to associate to the output K4
tyP5	undF	CHo	----	user to associate to the output K5
tyP6	undF	CHo	----	user to associate to the output K6
tyP7	undF	CHo	----	user to associate to the output K7
tyP8	undF	CHo	----	user to associate to the output K8

tyP1 user to associate to the output K1

It establishes the user to associate to the output K1, as indicated:

undF = no user associated
FAn = condenser fans
CP = compressor
Cho = choking valve.

tyP2 user to associate to the output K2

It has the same significance of the parameter tyP1.

tyP3 user to associate to the output K3

It has the same significance of the parameter tyP1.

tyP4 user to associate to the output K4

It has the same significance of the parameter tyP1.

tyP5 user to associate to the output K5

It has the same significance of the parameter tyP1.

tyP6 user to associate to the output K6

It has the same significance of the parameter tyP1.

tyP7 user to associate to the output K7

It has the same significance of the parameter tyP1.

tyP8 user to associate to the output K8

It has the same significance of the parameter tyP1.

LABEL	MIN.	MAX.	U.M.	COMPRESSORS POWER MANAGER
Po 1	1	15	----	power of the compressor associated to the output K1
Po 2	1	15	----	power of the compressor associated to the output K2
Po 3	1	15	----	power of the compressor associated to the output K3
Po 4	1	15	----	power of the compressor associated to the output K4
Po 5	1	15	----	power of the compressor associated to the output K5
Po 6	1	15	----	power of the compressor associated to the output K6
Po 7	1	15	----	power of the compressor associated to the output K7
Po 8	1	15	----	power of the compressor associated to the output K8

Po 1 power of the compressor associated to the output K1

It is significant exclusively if the parameter tyP1 has value CP or Cho, it establishes a proportion among the compressors powers (for instance

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if the power of the compressor associated to the output K1 is 4 HP and the power of the compressor associated to the output K2 is 1 HP, set the parameter Po 1 to 8 and the parameter Po 2 to 2.

Po 2 power of the compressor associated to the output K2

It has the same significance of the parameter Po 1.

Po 3 power of the compressor associated to the output K3

It has the same significance of the parameter Po 1.

Po 4 power of the compressor associated to the output K4

It has the same significance of the parameter Po 1.

Po 5 power of the compressor associated to the output K5

It has the same significance of the parameter Po 1.

Po 6 power of the compressor associated to the output K6

It has the same significance of the parameter Po 1.

Po 7 power of the compressor associated to the output K7

It has the same significance of the parameter Po 1.

Po 8 power of the compressor associated to the output K8

It has the same significance of the parameter Po 1.

CONFIGURATION PARAMETERS SETTING

Operator Menu configuration parameters are arranged on two levels, to protect the most tricky settings against undesirable violations and they are arranged in families that can be recognized through the initial letter of the label.

To gain access to the first level:

a) repeat the passage b of the chapter *Configurator Menu* on the page 25.

To select a parameter of the first level:

b) repeat the passage c of the chapter *Configurator Menu* on the page 25.

To display the parameter value:

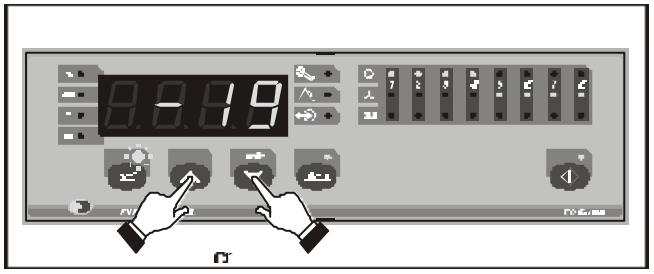
c) repeat the passages d and e of the chapter *Configurator Menu* on the page 25.

To gain access of the second level:

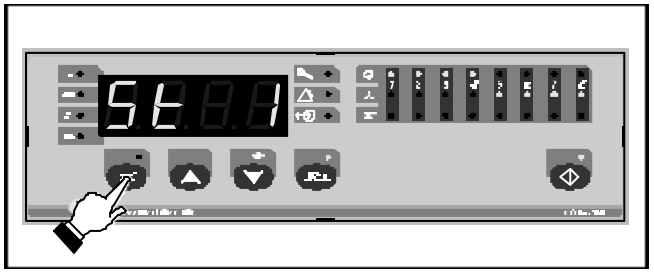
d) repeat the passage c of the chapter *Configurator Menu* on the page 25 as long as the instrument displays the label OPEr

e) repeat the passage g of the chapter *Configurator Menu* on the page 25.

f) push and release over and over the up or the down key as long as the instrument displays the value established with the parameter PPP (keeping pushed the up or the down key the value gets increased or decreased more quickly: the parameter PPP belongs to the Operator Menu and it establishes the Operator Menu password, normally it is -19; see the chapter *User Menu* on the page 32)



g) after the modification push and release the set key (to the release of the set key the instrument displays St 1, the label of the first parameter of the second level).



To select a parameter of the second level:

h) repeat the passage c of the chapter *Configurator Menu* on the page 25 as long as the instrument displays the label of the desired parameter.

To modify the parameter value:

i) repeat the passages k, l and m of the chapter *Configurator Menu* on the page 25.

To turn out from the Operator Menu configuration parameters setting procedure:

j) keep pushed for two seconds at least the menu key or the ON STAND-BY key.

Additional informations

- *during a corrupted memory data alarm the access to the Operator Menu configuration parameters setting procedure is refused (see the paragraph Alarms on the page 46)*
- *the parameters value gets stored in a non volatile memory even if a lack of power supply happens.*

OPERATOR MENU CONFIGURATION PARAMETERS

To make easy the configuration parameters consultation of this Menu, we have provided to divided it in families.

LABEL	MIN.	MAX.	U.M.	USERS STATUS
St 1	OFF	On	----	status of the user associated to the output K1
St 2	OFF	On	----	status of the user associated to the output K2
St 3	OFF	On	----	status of the user associated to the output K3
St 4	OFF	On	----	status of the user associated to the output K4
St 5	OFF	On	----	status of the user associated to the output K5
St 6	OFF	On	----	status of the user associated to the output K6
St 7	OFF	On	----	status of the user associated to the output K7
St 8	OFF	On	----	status of the user associated to the output K8

Notes

- *to load/unload manually the power steps see the paragraph Manual power steps loading/unloading on the page 11.*

St 1 status of the user associated to the output K1

If the parameter tyP1 has value FAn, it permits to display the status of the condenser fans associated to the output K1.

If the parameter tyP1 has value CP or Cho, it permits to display the status of the power step associated to the output K1.

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St 2 status of the user associated to the output K2

It has the same significance of the parameter St 1.

St 3 status of the user associated to the output K3

It has the same significance of the parameter St 1.

St 4 status of the user associated to the output K4

It has the same significance of the parameter St 1.

St 5 status of the user associated to the output K5

It has the same significance of the parameter St 1.

St 6 status of the user associated to the output K6

It has the same significance of the parameter St 1.

St 7 status of the user associated to the output K7

It has the same significance of the parameter St 1.

St 8 status of the user associated to the output K8

It has the same significance of the parameter St 1.

LABEL	MIN.	MAX.	U.M.	USERS TOTAL WORKING HOURS COUNTER
Hr 1 ... 8				total working hours of the user associated to the output K1 ... 8

It has the same significance of the family Hr of the Configurator Menu; see the chapter *Configurator Menu* on the page 25.

LABEL	MIN.	MAX.	U.M.	OPERATOR MENU PASSWORD
OPEr	-999	9999	----	Operator Menu password

It has the same significance of the parameter OPEr of the Configurator Menu; see the chapter *Configurator Menu* on the page 25.

LABEL	MIN.	MAX.	U.M.	COMPRESSORS POWER MANAGER
Po 1 ... 8				power of the compressor associated to the output K1 ... 8

It has the same significance of the family Po of the Configurator Menu; see the chapter *Configurator Menu* on the page 25.

LABEL	MIN.	MAX.	U.M.	USERS RUNNING WORKING HOURS COUNTER
t r1	----	----	hour	running working hours of the user associated to the output K1
t r2	----	----	hour	running working hours of the user associated to the output K2
t r3	----	----	hour	running working hours of the user associated to the output K3
t r4	----	----	hour	running working hours of the user associated to the output K4
t r5	----	----	hour	running working hours of the user associated to the output K5
t r6	----	----	hour	running working hours of the user associated to the output K6
t r7	----	----	hour	running working hours of the user associated to the output K7
t r8	----	----	hour	running working hours of the user associated to the output K8

t r1 running working hours of the user associated to the output K1

It permits to display the running working hours of the user associated to the output K1 from the moment of the previous user activation.

t r2 running working hours of the user associated to the output K2

It has the same significance of the parameter t r1.

t r3 running working hours of the user associated to the output K3

It has the same significance of the parameter t r1.

t r4 running working hours of the user associated to the output K4

It has the same significance of the parameter t r1.

t r5 running working hours of the user associated to the output K5

It has the same significance of the parameter t r1.

t r6 running working hours of the user associated to the output K6

It has the same significance of the parameter t r1.

t r7 running working hours of the user associated to the output K7

It has the same significance of the parameter t r1.

t r8 running working hours of the user associated to the output K8

It has the same significance of the parameter t r1.

LABEL	MIN.	MAX.	U.M.	ALARM CODES READING
ALAr	----	----	----	alarms code reading

ALAr alarm codes reading

If an alarm should be active, it permits to display the alarm code flashing.

LABEL	MIN.	MAX.	U.M.	PROBES READING
Pb r	----	----	(3)	suction probe reading
Pb F	----	----	(4)	condensing probe reading (5)

Notes

- *the symbol (3) indicates that the unit of measure depends from the parameter /5P and from the parameters /A6 and /A7 (the parameters /5P, /A6 and /A7 belong to the User Menu; see the chapter User Menu on the page 32)*
- *the symbol (4) indicates that the unit of measure depends from the parameter /bE (the parameter /bE belongs to the User Menu; see the chapter User Menu on the page 32): if the condensing probe is a 2 wires 4-20 mA pressure transducer the unit of measure depends from the parameters /5P, /b6 and /b7 (the parameters /5P, /b6 and /b7 belong to the User Menu; see the chapter User Menu on the page 32), if the*

condensing probe is a PTC probe the unit of measure depends from the parameter / t (the parameter / t belongs to the User Menu; see the chapter User Menu on the page 32)

- *the symbol (5) indicates that during the status ON the parameter is available both to the first and to the second level.*

Pb r suction probe reading

It permits to display the pressure read by the suction probe.

Pb F condensing probe reading

It permits to display the quantity read by the condensing probe.

LABEL	MIN.	MAX.	U.M.	ANALOG OUTPUT READING
outF	0	100	%	analog output reading (5)

Notes

- *the symbol (5) indicates that during the status ON the parameter is available both to the first and to the second level.*

outF analog output reading

It permits to display the analog output signal percentage.

For further informations about the parameter outF meaning see the paragraph *Analog output* on the page 13.

LABEL	MIN.	MAX.	U.M.	CONDENSER FANS REGULATOR
F 1	F 6	F 7	(4)	condenser fans activation setpoint (5)

Notes

- *the parameters F 6 and F 7 belong to the User Menu; see the chapter User Menu on the page 32*
- *the symbol (4) indicates that the unit of measure depends from the parameter /bE (the parameter /bE belongs to the User Menu; see the chapter User Menu on the page 32): if the condensing probe is a 2 wires 4-20 mA pressure transducer the unit of measure depends from the parameters /5P, /b6 and /b7 (the parameters /5P, /b6 and /b7 belong to the User Menu; see the chapter User Menu on the page 32), if the condensing probe is a PTC probe the unit of measure depends from the parameter / t (the parameter / t belongs to the User Menu; see the chapter User Menu on the page 32)*
- *the symbol (5) indicates that during the status ON the parameter is available both to the first and to the second level.*

F 1 condenser fans activation setpoint

It has significance exclusively if the parameter /bE has value 1 or 2 and if the parameter F A has value 0, it establishes the condensing quantity value to which the instrument activates the condenser fans and it is referred to the condensing probe.

The parameter /bE and F A belong to the User Menu; see the chapter *User Menu* on the page 32.

For further informations about the parameter F 1 meaning see the paragraph *Condensing quantity regulation* on the page 12.

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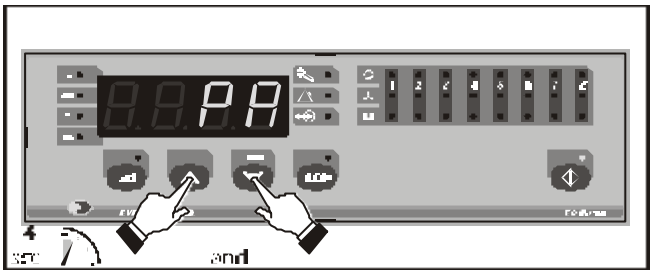
CONFIGURATION PARAMETERS SETTING

User Menu configuration parameters are arranged on two levels, to protect the most tricky settings against undesirable violations and they are arranged in families that can be recognized through the initial letter of the label.

To gain access to the first level:

a) keep pushed at the same time for four seconds at least the up and the down keys (passed four seconds the instrument displays the label PA).



To select a parameter of the first level:

b) repeat the passage c of the chapter *Configurator Menu* on the page 25.

To modify the parameter value:

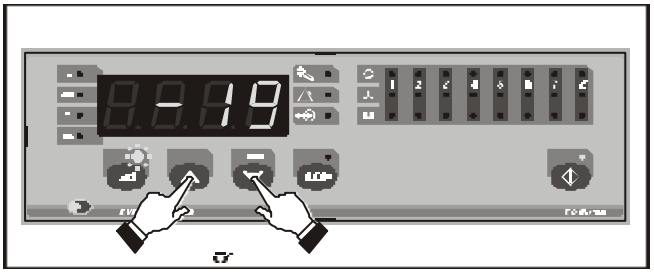
c) repeat the passages k, l and m of the chapter *Configurator Menu* on the page 25.

To gain access to the second level:

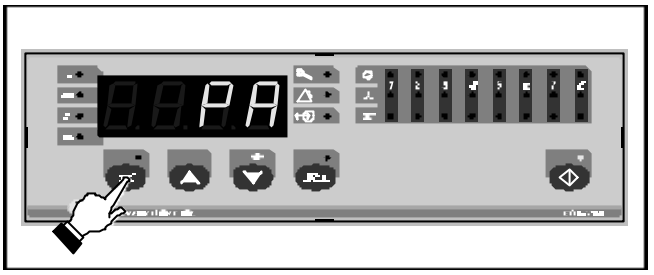
d) repeat the passage c of the chapter *Configurator Menu* on the page 25 as long as the instrument displays the label PA

e) repeat the passage g of the chapter *Configurator Menu* on the page 25

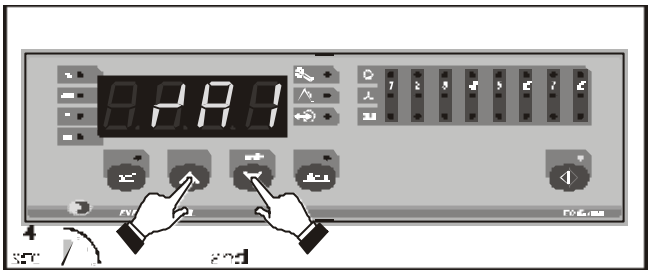
f) push and release over and over the up or the down key within four seconds as long as the instrument displays -19 (keeping pushed the up or the down key the value gets increased or decreased more quickly)



g) after the modification push and release the set key (to the release of the set key the instrument displays the label PA again)



h) keep pushed at the same time for four seconds at least the up and the down key (passed four seconds the instrument displays /A1, the label of the first parameter of the second level).



To select a parameter of the second level:

i) repeat the passage c of the chapter *Configurator Menu* on the page 25 as long as the instrument displays la label of the desired parameter.

To modify the parameter value:

j) repeat the passages k, l and m of the chapter *Configurator Menu* on the page 25.

To turn out from the User Menu configuration parameters setting procedure:

k) keep pushed at the same time for four seconds at least the up and the down keys or do not operate with the keys for sixty seconds at least.

Additional informations

- *during a corrupted memory data alarm the access to the User Menu configuration parameters setting procedure is refused (see the paragraph Alarms on the page 46)*
- *the modification of the parameter /bE value has not immediate effect; to obtain this effect, after the modification disconnect and connect again the instrument to the local power supply*
- *the modification of a parameter value which unit of measure is the hour or the minute or the second has not immediate effect; to obtain this effect it must not be executed during the course of the value*
- *the parameters value gets stored in a non volatile memory even if a lack of power supply happens.*

USER MENU CONFIGURATION PARAMETERS

To make easy the configuration parameters consultation of this Menu,

we have provided to divided it in families.

LABEL	MIN.	MAX.	U.M.	USER MENU PASSWORD
PA	-999	9999	----	User Menu password (2)

Notes

- *the symbol (2) indicates that the parameter is available to the first level only.*

PA User Menu password

It is the password who permits to gain access to the second level of the User Menu.

LABEL	MIN.	MAX.	U.M.	MEASURE INPUTS
/A1	-999	999	(3)	suction probe calibration (1)
/b1	-999	999	(4)	condensing probe calibration (1)
/ 2	0	6	----	digital filter
/ t	0	1	----	temperature unit of measure
/5P	0	3	----	pressure decimal point position
/bE	0	2	----	kind of condensing probe
/A6	-999	9999	point	lower end of scale for 4-20 mA input (it coincides with the minimum calibration value of the suction transducer)
/A7	-999	9999	point	upper end of scale for 4-20 mA input (it coincides with the maximum calibration value of the suction transducer)
/b6	-999	9999	point	lower end of scale for 4-20 mA input (it coincides with the minimum calibration value of the condensing transducer)
/b7	-999	9999	point	upper end of scale for 4-20 mA input (it coincides with the maximum calibration value of the condensing transducer)
/U	0	1	----	kind of analog output (only for devices with analog output in current)

Notes

- *the symbol (1) indicates that the parameter is available both to the first and to the second level*
- *the symbol (3) indicates that the unit of measure depends from the parameter /5P and from the parameters /A6 and /A7 (the parameters /5P, /A6 and /A7 belong to the User Menu; see the chapter User Menu on the page 32)*
- *the symbol (4) indicates that the unit of measure depends from the parameter /bE (the parameter /bE belongs to the User Menu; see the chapter User Menu on the page 32): if the condensing probe is a 2 wires 4-20 mA pressure transducer the unit of measure depends from the parameters /5P, /b6 and /b7 (the parameters /5P, /b6 and /b7 belong to the User Menu; see the chapter User Menu on the page 32), if the condensing probe is a PTC probe the unit of measure depends from the parameter / t (the parameter / t belongs to the User Menu; see the chapter User Menu on the page 32).*

/A1 suction probe calibration

It establishes a threshold to add algebraically to the signal coming from the suction probe (for instance to correct the signal).

/b1 condensing probe calibration

It is significant exclusively if the parameter /bE has value 1 or 2, it establishes a threshold to add algebraically to the signal coming from the condensing probe (for instance to correct the signal).

/ 2 digital filter

It establishes a time constant to apply to the signals coming from the measure inputs, as indicated:

0 = 0 sec.
1 = 0.4 sec.
2 = 1.2 sec.
3 = 3.0 sec.
4 = 8.0 sec.
5 = 19.8 sec.
6 = 48.0 sec.

/ t temperature unit of measure

It is significant exclusively if the parameter /bE has value 2, it establishes the unit of measure with which the temperature gets displayed, as indicated:

0 = the unit of measure is the Fahrenheit degree
1 = the unit of measure is the Celsius degree.

/5P pressure decimal point position

It establishes where to display the decimal point when a pressure gets displayed, as indicated:

0 = the decimal point gets not displayed
1 = the decimal point gets displayed on the dozens display
2 = the decimal point gets displayed on the dozens hundreds
3 = the decimal point gets displayed on the dozens thousands.

/bE kind of condensing probe

It establishes the kind of condensing probe that the instrument must recognize, as indicated:

0 = the condensing probe is disabled
1 = 2 wires 4-20 mA pressure transducer
2 = PTC probe.

If the parameter /bE has value 0, a power step loading/unloading gives the automatic activation/deactivation of a condenser fans.

/A6 lower end of scale for 4-20 mA input (it coincides with the minimum calibration value of the suction transducer)

It establishes the lower end of scale for 4-20 mA input and it must coincide with the minimum calibration value of the suction transducer.

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/A7 upper end of scale for 4-20 mA input (it coincides with the maximum calibration value of the suction transducer)

It establishes the upper end of scale for 4-20 mA input and it must coincide with the maximum calibration value of the suction transducer.

/b6 lower end of scale for 4-20 mA input (it coincides with the minimum calibration value of the condensing transducer)

It is significant exclusively if the parameter /bE has value 1, it establishes the lower end of scale for 4-20 mA input and it must coincide with the minimum calibration value of the condensing transducer.

/b7 upper end of scale for 4-20 mA input (it coincides with the maximum calibration value of the condensing transducer)

It is significant exclusively if the parameter /bE has value 1, it establishes the upper end of scale for 4-20 mA input and it must coincide with the maximum calibration value of the condensing transducer.

/U kind of analog output (only for devices with analog output in current)

It sets the kind of analog output, as indicated:

0 = 0-20 mA

1 = 4-20 mA.

LABEL	MIN.	MAX.	U.M.	SUCTION PRESSURE REGULATOR
r 0	0.001	999	(3)	"neutral zone" (1)
r 1	-999	9999	(3)	minimum working setpoint programmable (1)
r 2	-999	9999	(3)	maximum working setpoint programmable (1)
r 4	0	100	%	percentage of "neutral zone" to apply below the working setpoint
r 5	0	1	----	locking of the working setpoint and of the condenser fans activation setpoint modification
r 8	0.10	40.00	min,sec	loading time (1)
r 9	0.10	40.00	min,sec	unloading time (1)
r A	0	1	----	kind of regulating action (1)
r C	0	1	----	kind of choking valve
r E	0	2550	----	increase (percentage) of the "neutral zone" (parameter r 0) given by the activation of the input by-pass regulation
r F	0	4.00	h,min	maximum time the activation of the input by-pass regulation has effect

Notes

- *the symbol (1) indicates that the parameter is available both to the first and to the second level*
- *the symbol (3) indicates that the unit of measure depends from the parameter /5P and from the parameters /A6 and /A7 (the parameters /5P, /A6 and /A7 belong to the User Menu; see the chapter User Menu on the page 32).*

r 0 "neutral zone"

It establishes the "neutral zone" value.

For further informations about the parameter r 0 meaning see the paragraph *Suction pressure regulation* on the page 9.

r 1 minimum working setpoint programmable

It establishes the minimum working setpoint programmable; the instrument automatically verifies if the value established with the parameter r 1 is below the maximum working setpoint programmable established with the parameter r 2.

r 2 maximum working setpoint programmable

It establishes the maximum working setpoint programmable; the instrument automatically verifies if the value established with the parameter r 2 is above the minimum working setpoint programmable established with the parameter r 1.

r 4 percentage of "neutral zone" to apply below the working setpoint

It establishes the percentage of "neutral zone" value to apply below the working setpoint.

For further informations about the parameter r 4 meaning see the paragraph *Suction pressure regulation* on the page 9.

r 8 loading time

It establishes the minimum time interval that pass from the moment in which the instrument loads a power step to the moment in which the instrument loads the following power step, except what established with the disabling times to the compressors activation.

For further informations about the parameter r 8 meaning see the paragraph *Suction pressure regulation* on the page 9.

r 9 unloading time

It establishes the minimum time interval that pass from the moment in which the instrument unloads a power step to the moment in which the instrument unloads the following power step.

For further informations about the parameter r 9 meaning see the paragraph *Suction pressure regulation* on the page 9.

r A kind of regulating action

It establishes the kind of regulating action that the instrument must manage, as indicated:

0 = the regulating action is function of the pressure read by the suction probe (for instance when the pressure read by the suction probe is above/below the working setpoint of the "neutral zone" value the instrument loads/unloads power steps)

1 = the regulating action is function of the pressure read by the suction probe and of the direction of the pressure read by the suction probe (the same action saw in the previous case but when the pressure read by the suction probe is above/below the working setpoint of the "neutral zone" value and it is going towards the "neutral zone" the instrument does not load/unload

power steps).

For further informations about the parameter r A meaning see the paragraph *Suction pressure regulation* on the page 9.

r C kind of choking valve

It establishes the kind of choking valve that the instrument must manage, as indicated:

0 = NC choking valve

1 = NO choking valve.

For further informations about the parameter r C meaning see the paragraph *Suction pressure regulation* on the page 9.

r E increase (percentage) of the "neutral zone" (parameter r 0) given by the activation of the input by-pass regulation

It sets the increase (percentage) of the "neutral zone" (parameter r 0) when one activates the input for by-pass regulation (the instrument will automatically increase the "neutral zone" applied over the working setpoint; for example, set 100 % to double the value).

r F maximum time the activation of the input by-pass regulation has effect

It sets the maximum time the activation of the input by-pass regulation has effect; as soon as this time passes, the instrument will automatically recover the normal operation, even is the input is activated; if the parameter has value 0, the instrument will consider 99 min).

LABEL	MIN.	MAX.	U.M.	COMPRESSORS PROTECTION
C 0	0.00	40.00	min,sec	disabling time to the compressor activation from the instrument start
C 1	0.00	40.00	min,sec	disabling time to the compressor activation from the previous activation
C 2	0.00	40.00	min,sec	disabling time to the compressor deactivation from the previous activation
C 6	0	8	----	number of power steps loaded during a suction probe failure alarm
C 7	0	255	hour	number of running working hours of the power step enough to request the unloading
C H	0	9999	hour	number of total working hours of the power step enough to signal the request of service (1)

Notes

- *the symbol (1) indicates that the parameter is available both to the first and to the second level.*

C 0 disabling time to the compressor activation from the instrument start

It establishes the time that disables the compressor activation from the moment in which the instrument gets supplied.

For further informations about the parameter C 0 meaning see the paragraph *Compressors protection* on the page 10.

C 1 disabling time to the compressor activation from the previous activation

It establishes the time that disables the compressor activation from the moment of the previous compressor activation.

For further informations about the parameter C 1 meaning see the paragraph *Compressors protection* on the page 10.

C 2 disabling time to the compressor activation from the previous deactivation

It establishes the time that disables the compressor activation from the moment of the previous compressor deactivation.

For further informations about the parameter C 2 meaning see the paragraph *Compressors protection* on the page 10.

C 6 number of power steps loaded during a suction probe failure alarm

It establishes the number of power steps loaded during a suction probe failure alarm, except what established with the parameters r 8 and r 9 and except what established with the disabling times to the compressors activation (see the paragraph *Alarms* on the page 46).

C 7 number of running working hours of the power step enough to request the unloading

It establishes the number of running working hours of a power step enough to request the power step unloading (for instance, when the conditions will permit it, the instrument will unload at first the power step who will have the number of running working hours established with the parameter C 7).

C H number of total working hours of the power step enough to signal the request of service

It establishes the number of total working hours of a power step enough to signal the request of service (see the paragraph *Alarms* on the page 46).

LABEL	MIN.	MAX.	U.M.	CONDENSER FANS REGULATOR
F 0	0.001	255	(4)	proportional band (1)
F 1	F 6	F 7	(4)	condenser fans activation setpoint (1)
F 6	-999	9999	(4)	minimum condenser fans activation setpoint programmable (1)
F 7	-999	9999	(4)	maximum condenser fans activation setpoint programmable (1)
F A	0	1	----	condenser fans functioning
F d	0	1	----	method used to compute which condenser fans activate/deactivate
F H	0	9999	hour	number of total working hours of the condenser fans enough to signal the request of service (1)

Notes

- *the symbol (1) indicates that the parameter is available both to the first and to the second level*
- *the symbol (4) indicates that the unit of measure depends from the parameter /bE (the parameter /bE belongs to the User Menu; see the chapter User Menu on the page 32): if the condensing probe is a 2 wires 4-20 mA pressure transducer*

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the unit of measure depends from the parameters /5P, /b6 and /b7 (the parameters /5P, /b6 and /b7 belong to the User Menu; see the chapter User Menu on the page 32), if the condensing probe is a PTC probe the unit of measure depends from the parameter / t (the parameter / t belongs to the User Menu; see the chapter User Menu on the page 32).

F 0 proportional band

It is significant exclusively if the parameter /bE has value 1 or 2 and if the parameter F A has value 0, it establishes the proportional band width.

For further informations about the parameter F 0 meaning see the paragraph *Condensing quantity regulation* on the page 12.

F 1 condenser fans activation setpoint

It has the same significance of the parameter F 1 of the Operator Menu; see the chapter *Operator Menu* on the page 29.

F 6 minimum condenser fans activation setpoint programmable

It is significant exclusively if the parameter /bE has value 1 or 2 and if the parameter F A has value 0, it establishes the minimum condenser fans activation setpoint programmable; the instrument automatically verifies if the value established with the parameter F 6 is below the maximum condenser fans activation setpoint programmable established with the parameter F 7.

F 7 maximum condenser fans activation setpoint programmable

It is significant exclusively if the parameter /bE has value 1 or 2 and if the parameter F A has value 0, it establishes the maximum condenser fans activation setpoint programmable; the instrument automatically verifies if the value established with the parameter F 7 is above the minimum condenser fans activation setpoint programmable established with the parameter F 6.

F A condenser fans functioning

It establishes the condenser fans functioning that the instrument must manage, as indicated:

0 = the condenser fans functioning is function of the quantity read by the condensing probe (the instrument automatically divides the proportional band established with the parameter F 0 in equal fractions according with the number of relay outputs associated to the condenser fans, it activates the condenser fans with sequence every time the quantity read by the condensing probe rises above the setpoint established with the parameter F 1 of a fraction of proportional band and it deactivates them with sequence when the quantity read by the condensing probe falls below the value to which the activation happened of a fraction of proportional band)

1 = the condenser fans functioning is function of the power steps loading/unloading (a power step loading/unloading gives the automatic activation/deactivation of a condenser fans).

For further informations about the parameter F A meaning see the paragraph *Condensing quantity regulation* on the page 12.

F d method used to compute which condenser fans activate/deactivate

It establishes the method used by the instrument to compute which condenser fans activate/deactivate, as indicated:

0 = the instrument activates the condenser fans with fixed sequence and it deactivates them with the reversal method (for instance if the users associated to the outputs K5, K6, K7 and K8 are condenser fans, the instrument activates them beginning from that associated to the output K5 and it deactivates them with the reversal method)

1 = the instrument activates the condenser fans balancing the total working hours and it deactivates them with the reversal method (for instance the instrument activates the condenser fans with sequence beginning from that with the lower number of total working hours and it deactivates them with the reversal method).

F H number of total working hours of the condenser fans enough to signal the request of service

It establishes the number of total working hours of a condenser fans enough to signal the request of service (see the paragraph *Alarms* on the page 46).

LABEL	MIN.	MAX.	U.M.	DIGITAL INPUTS
i1P	0	1	----	kind of contact of the user compressor associated to the output K1 ... 8 locking digital inputs
i2P	0	1	----	kind of contact of the user condenser fans associated to the output K1 ... 8 locking digital inputs
i4P	0	1	----	input configuration (freon level or by-pass regulation)
i5P	0	1	----	kind of contact of the input freon level/ by-pass regulation
i6P	0	1	----	kind of contact of the condenser fans safety digital input
i7P	0	1	----	kind of contact of the upper condensing quantity digital input
i8P	0	1	----	kind of contact of the lower pressure digital input

i1P kind of contact of the user compressor associated to the output K1 ... 8 locking digital inputs

It is significant exclusively if the parameter tyP1 ... 8 has value CP, it establishes the kind of contact of the user compressor associated to the

output K1 ... 8 locking digital inputs, as indicated:

0 = NO contact

1 = NC contact.

The parameters tyP1 ... 8 belong to the Configurator Menu; see the chapter *Configurator Menu* on the page 25.

For further informations about the parameter i1P meaning see the paragraph *Digital inputs* on the page 13.

i2P kind of contact of the user condenser fans associated to the output K1 ... 8 locking digital inputs

It is significant exclusively if the parameter tyP1 ... 8 has value FAn, it establishes the kind of contact of the user condenser fans associated to the output K1 ... 8 locking digital inputs, as indicated:

0 = NO contact

1 = NC contact.

The parameters tyP1 ... 8 belong to the Configurator Menu; see the chapter *Configurator Menu* on the page 25.

For further informations about the parameter i2P meaning see the paragraph *Digital inputs* on the page 13.

i4P input configuration (freon level or by-pass regulation)

It establishes the configuration of the input, as indicated:

0 = freon level

1 = by-pass regulation.

i5P kind of contact of the input freon level/by-pass regulation

It establishes the kind of contact of the input, as indicated:

0 = NO contact

1 = NC contact.

i6P kind of contact of the condenser fans safety digital input

It has the same significance of the parameter i5P

i7P kind of contact of the upper condensing quantity digital input

It has the same significance of the parameter i5P

i8P kind of contact of the lower pressure digital input

It has the same significance of the parameter i5P

LABEL	MIN.	MAX.	U.M.	LOWER PRESSURE ALARM
AA0	0.001	255	(3)	hysteresis (differential)
AA1	-999	9999	(3)	alarm setpoint
AA4	0	2	---	kind of alarm
AA7	0.00	4.15	min,sec	disabling time to the lower pressure alarm activation
AAn	0	15	----	number of lower pressure alarms enough to give the instrument locking

Notes

- *the symbol (3) indicates that the unit of measure depends from the parameter /5P and from the parameters /A6 and /A7 (the parameters /5P, /A6 and /A7 belong to the User Menu; see the chapter User Menu on the page 32).*

AA0 hysteresis (differential)

It is significant exclusively if the parameter AA4 has value 1 or 2, it establishes the hysteresis (differential) relative to the setpoint established with the parameter AA1.

For further informations about the parameter AA0 meaning see the paragraph *Lower pressure alarm* on the page 13.

AA1 alarm setpoint

It is significant exclusively if the parameter AA4 has value 1 or 2, it establishes the pressure below which the lower pressure alarm gets activated according with the modality established with the parameter AA4 and it is referred to the suction probe.

For further informations about the parameter AA1 meaning see the paragraph *Lower pressure alarm* on the page 13.

AA4 kind of alarm

It establishes the kind of lower pressure alarm that the instrument must manage, as indicated:

0 = the lower pressure alarm never gets activated

1 = absolute lower pressure alarm

2 = lower pressure alarm relative to the working setpoint.

For further informations about the parameter AA4 meaning see the paragraph *Lower pressure alarm* on the page 13.

AA7 disabling time to the lower pressure alarm activation

It is significant exclusively if the parameter AA4 has value 1 or 2, it establishes the time that disables a lower pressure alarm activation from the moment in which the lower pressure alarm happens.

For further informations about the parameter AA7 meaning see the paragraph *Lower pressure alarm* on the page 13.

AAn number of lower pressure alarms enough to give the instrument locking

It establishes the number of lower pressure alarms enough to give the instrument locking.

If the parameter AAn has value 0 the instrument locking never happens.

The increasing of the lower pressure alarms counter gets given also by the lower pressure digital input activation.

For further informations about the parameter AAn meaning see the paragraph *Lower pressure alarm* on the page 13.

LABEL	MIN.	MAX.	U.M.	UPPER PRESSURE ALARM
Ab0	0.001	255	(3)	hysteresis (differential)
Ab1	-999	9999	(3)	alarm setpoint
Ab4	0	2	---	kind of alarm
Ab7	0.00	4.15	min,sec	disabling time to the upper pressure alarm activation
Abn	0	15	----	number of upper pressure alarms enough to give the instrument locking

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Notes

- *the symbol (3) indicates that the unit of measure depends from the parameter /5P and from the parameters /A6 and /A7 (the parameters /5P, /A6 and /A7 belong to the User Menu; see the chapter User Menu on the page 32).*

Ab0 hysteresis (differential)

It is significant exclusively if the parameter Ab4 has value 1 or 2, it establishes the hysteresis (differential) relative to the setpoint established with the parameter Ab1.

For further informations about the parameter Ab0 meaning see the paragraph *Upper pressure alarm* on the page 15.

Ab1 alarm setpoint

It is significant exclusively if the parameter Ab4 has value 1 or 2, it establishes the pressure above which the upper pressure alarm gets activated according with the modality established with the parameter Ab4 and it is referred to the suction probe.

For further informations about the parameter Ab1 meaning see the paragraph *Upper pressure alarm* on the page 15.

Ab4 kind of alarm

It establishes the kind of upper pressure alarm that the instrument must manage, as indicated:

0 = the upper pressure alarm never gets activated

1 = absolute upper pressure alarm

2 = upper pressure alarm relative to the working setpoint.

For further informations about the parameter Ab4 meaning see the paragraph *Upper pressure alarm* on the page 15.

Ab7 disabling time to the upper pressure alarm activation

It is significant exclusively if the parameter Ab4 has value 1 or 2, it establishes the time that disables an upper pressure alarm activation from the moment in which the upper pressure alarm happens.

For further informations about the parameter Ab7 meaning see the paragraph *Upper pressure alarm* on the page 15.

Abn number of upper pressure alarms enough to give the instrument locking

It establishes the number of upper pressure alarms enough to give the instrument locking.

If the parameter Abn has value 0 the instrument locking never happens.

For further informations about the parameter Abn meaning see the paragraph *Upper pressure alarm* on the page 15.

LABEL	MIN.	MAX.	U.M.	UPPER CONDENSING QUANTITY ALARM
AC0	0.001	255	(4)	hysteresis (differential)
AC1	-999	9999	(4)	alarm setpoint
AC4	0	2	---	kind of alarm
AC7	0.00	4.15	min,sec	disabling time to the upper condensing quantity alarm activation
ACn	0	15	----	number of upper condensing quantity alarms enough to give the instrument locking

Notes

- *the symbol (4) indicates that the unit of measure depends from the parameter /bE (the parameter /bE belongs to the User Menu; see the chapter User Menu on the page 32): if the condensing probe is a 2 wires 4-20 mA pressure transducer the unit of measure depends from the parameters /5P, /b6 and /b7 (the parameters /5P, /b6 and /b7 belong to the User Menu; see the chapter User Menu on the page 32), if the condensing probe is a PTC probe the unit of measure depends from the parameter / t (the parameter / t belongs to the User Menu; see the chapter User Menu on the page 32).*

AC0 hysteresis (differential)

It is significant exclusively if the parameter /bE has value 1 or 2 and if the parameter AC4 has value 1 or 2, it establishes the hysteresis (differential) relative to the setpoint established with the parameter AC1.

For further informations about the parameter AC0 meaning see the paragraph *Upper condensing quantity alarm* on the page 15.

AC1 alarm setpoint

It is significant exclusively if the parameter /bE has value 1 or 2 and if the parameter AC4 has value 1 or 2, it establishes the condensing quantity value above which the upper condensing quantity alarm gets activated according with the modality established with the parameter AC4 and it is referred to the condensing probe.

For further informations about the parameter AC1 meaning see the paragraph *Upper condensing quantity alarm* on the page 15.

AC4 kind of alarm

It is significant exclusively if the parameter /bE has value 1 or 2, it establishes the kind of upper condensing quantity alarm that the instrument must manage, as indicated:

0 = the upper condensing quantity alarm never gets activated

1 = absolute upper condensing quantity alarm

2 = upper condensing quantity alarm relative to the setpoint established with the parameter F 1.

For further informations about the parameter AC4 meaning see the paragraph *Upper condensing quantity alarm* on the page 15.

AC7 disabling time to the upper condensing quantity alarm activation

It is significant exclusively if the parameter /bE has value 1 or 2 and if the parameter AC4 has value 1 or 2, it establishes the time that disables an upper condensing quantity alarm activation from the moment in which the upper condensing quantity alarm happens.

For further informations about the parameter AC7 meaning see the paragraph *Upper condensing quantity alarm* on the page 15.

ACn number of upper condensing quantity alarms enough to give the instrument locking

It establishes the number of upper condensing quantity alarms enough to give the instrument locking.
If the parameter ACn has value 0 the instrument locking never happens.
The increasing of the upper condensing quantity alarms counter gets given also by the upper condensing quantity digital input activation.
For further informations about the parameter ACn meaning see the paragraph *Upper condensing quantity alarm* on the page 15.

LABEL	MIN.	MAX.	U.M.	PRESSURE ALARMS DISABLING
A 3	0.00	4.15	h.,min	disabling time to the upper pressure alarm activation from the instrument start
A 6	0.00	4.15	h.,min	time required to clear the pressure alarms counters

A 3 disabling time to the upper pressure alarm activation from the instrument start

It is significant exclusively if the parameter Ab4 has value 1 or 2, it establishes the time that disables an upper pressure alarm activation from the moment of the instrument start.

A 6 time required to clear the pressure alarms counters

It is significant exclusively if the parameters AAn, Abn and ACn have values different to 0, it establishes the time that must pass from the moment of a previous pressure alarms counter increasing in order that the counter get cleared.
For further informations about the parameter A 6 meaning see the paragraph *Lower pressure alarm* on the page 14, the paragraph *Upper pressure alarm* on the a page 15 and the paragraph *Upper condensing quantity alarm* on the page 15.

LABEL	MIN.	MAX.	U.M.	CONNECTION IN A SERIAL NETWORK WITH EVCOBUS PROTOCOL COMMUNICATION
L 1	1	15	----	instrument address
L 2	0	7	----	instrument group
L 4	0	3	----	baud rate

L 1 instrument address

It establishes the address to which the instrument (slave) answers when it is connected to a serial network with EVCOBUS protocol communication managed by a master (for instance a Personal Computer).

L 2 instrument group

It establishes the group to which the instrument (slave) answers when it is connected to a serial network with EVCOBUS protocol communication managed by a master (for instance a Personal Computer).

L 4 baud rate

It establishes the speed with which the data get transmitted in a serial network with EVCOBUS protocol communication, as indicated:

0 = 1,200 baud
1 = 2,400 baud
2 = 4,800 baud
3 = 9,600 baud.

LABEL	MIN.	MAX.	U.M.	OPERATOR MENU PASSWORD VALUE
PPP	-999	9999	----	Operator Menu password value

PPP Operator Menu password value

It establishes the value of the password who permits to gain access to the second level of the Operator Menu.

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CONFIGURATOR MENU CONFIGURATION PARAMETERS

LABEL	MIN.	MAX.	U.M.	DEF.	USERS TOTAL WORKING HOURS COUNTER
Hr 1	----	----	hour	----	total working hours of the user associated to the output K1 (1)
Hr 2	----	----	hour	----	total working hours of the user associated to the output K2 (1)
Hr 3	----	----	hour	----	total working hours of the user associated to the output K3 (1)
Hr 4	----	----	hour	----	total working hours of the user associated to the output K4 (1)
Hr 5	----	----	hour	----	total working hours of the user associated to the output K5 (1)
Hr 6	----	----	hour	----	total working hours of the user associated to the output K6 (1)
Hr 7	----	----	hour	----	total working hours of the user associated to the output K7 (1)
Hr 8	----	----	hour	----	total working hours of the user associated to the output K8 (1)

LABEL	MIN.	MAX.	U.M.	DEF.	OPERATOR MENU PASSWORD
OPEr	-999	9999	----	0	Operator Menu password (2)

LABEL	MIN.	MAX.	U.M.	DEF.	USER-RELAY OUTPUT CONFIGURATION
tyP1	undF	Cho	----	CP	user to associate to the output K1
tyP2	undF	Cho	----	CP	user to associate to the output K2
tyP3	undF	Cho	----	CP	user to associate to the output K3
tyP4	undF	Cho	----	CP	user to associate to the output K4
tyP5	undF	Cho	----	FAn	user to associate to the output K5
tyP6	undF	Cho	----	FAn	user to associate to the output K6
tyP7	undF	Cho	----	FAn	user to associate to the output K7
tyP8	undF	Cho	----	FAn	user to associate to the output K8

LABEL	MIN.	MAX.	U.M.	DEF.	COMPRESSORS POWER MANAGER
Po 1	1	15	----	10	power of the compressor associated to the output K1
Po 2	1	15	----	10	power of the compressor associated to the output K2
Po 3	1	15	----	10	power of the compressor associated to the output K3
Po 4	1	15	----	10	power of the compressor associated to the output K4
Po 5	1	15	----	----	power of the compressor associated to the output K5
Po 6	1	15	----	----	power of the compressor associated to the output K6
Po 7	1	15	----	----	power of the compressor associated to the output K7
Po 8	1	15	----	----	power of the compressor associated to the output K8

Notes

- *the symbol (1) indicates that the parameter is available both to the first and to the second level*
- *the symbol (2) indicates that the parameter is available to the first level only.*

OPERATOR MENU CONFIGURATION PARAMETERS

LABEL	MIN.	MAX.	U.M.	DEF.	USERS STATUS
St 1	OFF	On	----	----	status of the user associated to the output K1
St 2	OFF	On	----	----	status of the user associated to the output K2
St 3	OFF	On	----	----	status of the user associated to the output K3
St 4	OFF	On	----	----	status of the user associated to the output K4
St 5	OFF	On	----	----	status of the user associated to the output K5
St 6	OFF	On	----	----	status of the user associated to the output K6
St 7	OFF	On	----	----	status of the user associated to the output K7
St 8	OFF	On	----	----	status of the user associated to the output K8

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LABEL	MIN.	MAX.	U.M.	DEF.	USERS TOTAL WORKING HOURS COUNTER
Hr 1	----	----	hour	----	total working hours of the user associated to the output K1 (1)
Hr 2	----	----	hour	----	total working hours of the user associated to the output K2 (1)
Hr 3	----	----	hour	----	total working hours of the user associated to the output K3 (1)
Hr 4	----	----	hour	----	total working hours of the user associated to the output K4 (1)
Hr 5	----	----	hour	----	total working hours of the user associated to the output K5 (1)
Hr 6	----	----	hour	----	total working hours of the user associated to the output K6 (1)
Hr 7	----	----	hour	----	total working hours of the user associated to the output K7 (1)
Hr 8	----	----	hour	----	total working hours of the user associated to the output K8 (1)

LABEL	MIN.	MAX.	U.M.	DEF.	OPERATOR MENU PASSWORD
OPEr	-999	9999	----	0	Operator Menu password (2)

LABEL	MIN.	MAX.	U.M.	DEF.	COMPRESSORS POWER MANAGER
Po 1	1	15	----	10	power of the compressor associated to the output K1
Po 2	1	15	----	10	power of the compressor associated to the output K2
Po 3	1	15	----	10	power of the compressor associated to the output K3
Po 4	1	15	----	10	power of the compressor associated to the output K4
Po 5	1	15	----	----	power of the compressor associated to the output K5
Po 6	1	15	----	----	power of the compressor associated to the output K6
Po 7	1	15	----	----	power of the compressor associated to the output K7
Po 8	1	15	----	----	power of the compressor associated to the output K8

LABEL	MIN.	MAX.	U.M.	DEF.	USER RUNNING WORKING HOURS COUNTER
t r1	----	----	hour	----	running working hours of the user associated to the output K1
t r2	----	----	hour	----	running working hours of the user associated to the output K2
t r3	----	----	hour	----	running working hours of the user associated to the output K3
t r4	----	----	hour	----	running working hours of the user associated to the output K4
t r5	----	----	hour	----	running working hours of the user associated to the output K5
t r6	----	----	hour	----	running working hours of the user associated to the output K6
t r7	----	----	hour	----	running working hours of the user associated to the output K7
t r8	----	----	hour	----	running working hours of the user associated to the output K8

LABEL	MIN.	MAX.	U.M.	DEF.	ALARM CODES READING
AlAr	----	----	----	----	alarms code reading

LABEL	MIN.	MAX.	U.M.	DEF.	PROBES READING
Pb r	----	----	(3)	----	suction probe reading
Pb F	----	----	(4)	----	condensing probe reading (5)

LABEL	MIN.	MAX.	U.M.	DEF.	ANALOG OUTPUT READING
outF	0	100	%	----	analog output reading (5)

LABEL	MIN.	MAX.	U.M.	DEF.	CONDENSER FANS REGULATOR
F 1	F 6	F 7	(4)	12.00	condenser fans activation setpoint (5)

Notes

- *the symbol (1) indicates that the parameter is available both to the first and to the second level*
- *the symbol (2) indicates that the parameter is available to the first level only*
- *the symbol (3) indicates that the unit of measure depends from the parameter /5P and from the parameters /A6 and /A7 (the parameters /5P, /A6 and /A7 belong to the User Menu; see the chapter User Menu on the page 32)*

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- *the symbol (4) indicates that the unit of measure depends from the parameter /bE (the parameter /bE belongs to the User Menu; see the chapter User Menu on the page 32): if the condensing probe is a 2 wires 4-20 mA pressure transducer the unit of measure depends from the parameters /5P, /b6 and /b7 (the parameters /5P, /b6 and /b7 belong to the User Menu; see the chapter User Menu on the page 32), if the condensing probe is a PTC probe the unit of measure depends from the parameter / t (the parameter / t belongs to the User Menu; see the chapter User Menu on the page 32)*
- *the symbol (5) indicates that during the status ON the parameter is available both to the first and to the second level.*

USER MENU CONFIGURATION PARAMETERS

LABEL	MIN.	MAX.	U.M.	DEF.	USER MENU PASSWORD
PA	-999	9999	----	0	User Menu password (2)

LABEL	MIN.	MAX.	U.M.	DEF.	MEASURE INPUTS
/A1	-999	999	(3)	0.00	suction probe calibration (1)
/b1	-999	999	(4)	0.00	condensing probe calibration (1)
/ 2	0	6	----	1	digital filter
/ t	0	1	----	1	temperature unit of measure
/5P	0	3	----	2	pressure decimal point position
/bE	0	2	----	1	kind of condensing probe
/A6	-999	9999	point	-0.50	lower end of scale for 4-20 mA input (it coincides with the minimum calibration value of the suction transducer)
/A7	-999	9999	point	7.00	upper end of scale for 4-20 mA input (it coincides with the maximum calibration value of the suction transducer)
/b6	-999	9999	point	0.00	lower end of scale for 4-20 mA input (it coincides with the minimum calibration value of the condensing transducer)
/b7	-999	9999	point	30.00	upper end of scale for 4-20 mA input (it coincides with the maximum calibration value of the condensing transducer)
/U	0	1	----	0	kind of analog output (only for devices with analog output in current)

LABEL	MIN.	MAX.	U.M.	DEF.	SUCTION PRESSURE REGULATOR
r 0	0.001	999	(3)	0.20	“neutral zone” (1)
r 1	-999	9999	(3)	0.00	minimum working setpoint programmable (1)
r 2	-999	9999	(3)	7.00	maximum working setpoint programmable (1)
r 4	0	100	%	100	percentage of “neutral zone” to apply below the working setpoint
r 5	0	1	----	0	locking of the working setpoint and of the condenser fans activation setpoint modification
r 8	0.10	40.00	min,sec	0.10	loading time (1)
r 9	0.10	40.00	min,sec	0.10	unloading time (1)
r A	0	1	----	1	kind of regulating action (1)
r C	0	1	----	0	kind of choking valve
r E	0	2550	----	100	increase (percentage) of the “neutral zone” (parameter r 0) given by the activation of the input by-pass regulation
r F	0	4.00	h,min	0.10	maximum time the activation of the input by-pass regulation has effect

LABEL	MIN.	MAX.	U.M.	DEF.	COMPRESSORS PROTECTION
C 0	0.00	40.00	min,sec	0.10	disabling time to the compressor activation from the instrument start
C 1	0.00	40.00	min,sec	0.00	disabling time to the compressor activation from the previous activation
C 2	0.00	40.00	min,sec	0.10	disabling time to the compressor activation from the previous deactivation
C 6	0	8	----	0	number of power steps loaded during a suction probe failure alarm
C 7	0	255	hour	0	number of running working hours of the power step enough to request the unloading
C H	0	9999	hour	1000	number of total working hours of the power step enough to signal the request of service (1)

LABEL	MIN.	MAX.	U.M.	DEF.	CONDENSER FANS REGULATOR
F 0	0.001	255	(4)	2.00	proportional band (1)
F 1	F 6	F 7	(4)	12.00	condenser fans activation setpoint (1)
F 6	-999	9999	(4)	0.00	minimum condenser fans activation setpoint programmable (1)
F 7	-999	9999	(4)	30.00	maximum condenser fans activation setpoint programmable (1)
F A	0	1	----	0	condenser fans functioning
F d	0	1	----	0	method used to compute which condenser fans activate/deactivate
F H	0	9999	hour	9999	number of total working hours of the condenser fans enough to signal the request of service (1)

LABEL	MIN.	MAX.	U.M.	DEF.	DIGITAL INPUTS
i1P	0	1	----	0	kind of contact of the user compressor associated to the output K1 ... 8 locking digital inputs
i2P	0	1	----	0	kind of contact of the user condenser fans associated to the output K1 ... 8 locking digital inputs
i4P	0	1	----	0	input configuration (freon level or by-pass regulation)
i5P	0	1	----	0	kind of contact of the input freon level/by-pass regulation
i6P	0	1	----	0	kind of contact of the condenser fans safety digital input
i7P	0	1	----	0	kind of contact of the upper condensing quantity digital input
i8P	0	1	----	0	kind of contact of the lower pressure digital input

LABEL	MIN.	MAX.	U.M.	DEF.	LOWER PRESSURE ALARM
AA0	0.001	255	(3)	0.01	hysteresis (differential)
AA1	-999	9999	(3)	0.00	alarm setpoint
AA4	0	2	----	0	kind of alarm
AA7	0.00	4.15	min,sec	0.00	disabling time to the lower pressure alarm activation
AAn	0	15	----	0	number of lower pressure alarms enough to give the instrument locking

LABEL	MIN.	MAX.	U.M.	DEF.	UPPER PRESSURE ALARM
Ab0	0.001	255	(3)	0.01	hysteresis (differential)
Ab1	-999	9999	(3)	0.00	alarm setpoint
Ab4	0	2	----	0	kind of alarm
Ab7	0.00	4.15	min,sec	0.00	disabling time to the upper pressure alarm activation
Abn	0	15	----	0	number of upper pressure alarms enough to give the instrument locking

LABEL	MIN.	MAX.	U.M.	DEF.	UPPER CONDENSING QUANTITY ALARM
AC0	0.001	255	(3)	0.01	hysteresis (differential)
AC1	-999	9999	(3)	0.00	alarm setpoint
AC4	0	2	----	0	kind of alarm
AC7	0.00	4.15	min,sec	0.00	disabling time to the upper condensing quantity alarm activation
ACn	0	15	----	0	number of upper condensing quantity alarms enough to give the instrument locking

LABEL	MIN.	MAX.	U.M.	DEF.	PRESSURE ALARMS DISABLING
A 3	0.00	4.15	h,min	0.00	disabling time to the upper pressure alarm activation from the instrument start
A 6	0.00	4.15	h,min	0.00	time required to clear the pressure alarms counters

LABEL	MIN.	MAX.	U.M.	DEF.	CONNECTION IN A SERIAL NETWORK WITH EVCOBUS PROTOCOL COMMUNICATION
L 1	1	15	----	1	instrument address
L 2	0	7	----	0	instrument group
L 4	0	3	----	1	baud rate

LABEL	MIN.	MAX.	U.M.	DEF.	OPERATOR MENU PASSWORD VALUE

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User Menu configuration parameters

PPP	-999	9999	----	-19	Operator Menu password value

Notes

- *the symbol (1) indicates that the parameter is available both to the first and to the second level*
- *the symbol (2) indicates that the parameter is available to the first level only*
- *the symbol (3) indicates that the unit of measure depends from the parameter /5P and from the parameters /A6 and /A7 (the parameters /5P, /A6 and /A7 belong to the User Menu; see the chapter User Menu on the page 32)*
- *the symbol (4) indicates that the unit of measure depends from the parameter /bE (the parameter /bE belongs to the User Menu; see the chapter User Menu on the page 32): if the condensing probe is a 2 wires 4-20 mA pressure transducer the unit of measure depends from the parameters /5P, /b6 and /b7 (the parameters /5P, /b6 and /b7 belong to the User Menu; see the chapter User Menu on the page 32), if the condensing probe is a PTC probe the unit of measure depends from the parameter / t (the parameter / t belongs to the User Menu; see the chapter User Menu on the page 32)*
- *the symbol (5) indicates that during the status ON the parameter is available both to the first and to the second level.*

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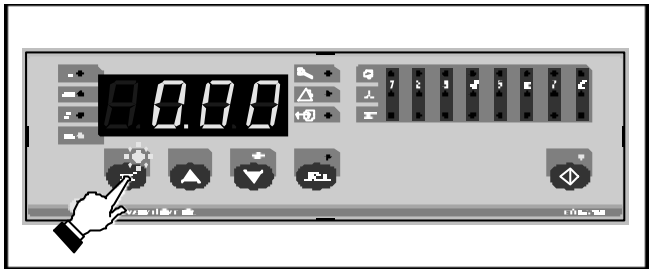
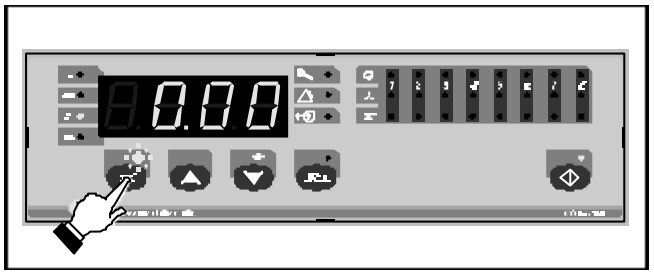
SIGNALS

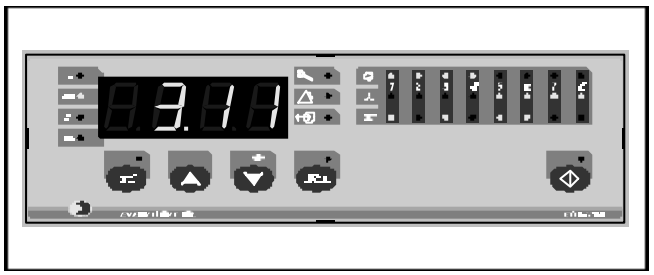
If the minutes LED is turned on it means that the unit of measure of the displayed quantity is the minute.



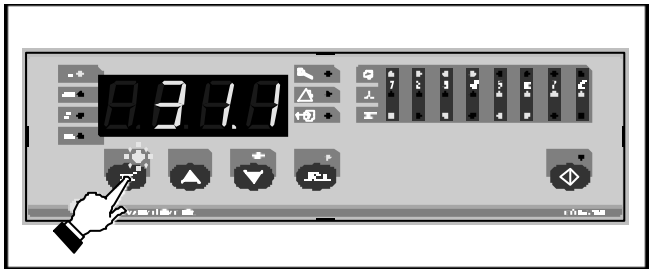
If the hours LED is turned on it means that the unit of measure of the displayed quantity is the hour.



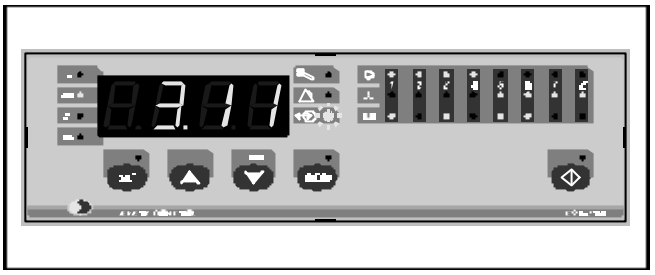
If the bar LED is turned on it means that the unit of measure of the displayed quantity is the bar or that the displayed quantity is a pressure.



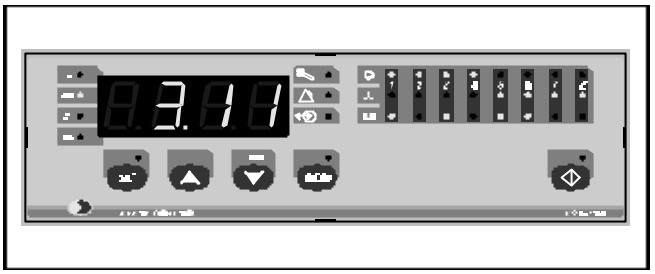
If the Celsius degree LED is turned on it means that the unit of measure of the displayed quantity is the Celsius degree or that the displayed quantity is a temperature.



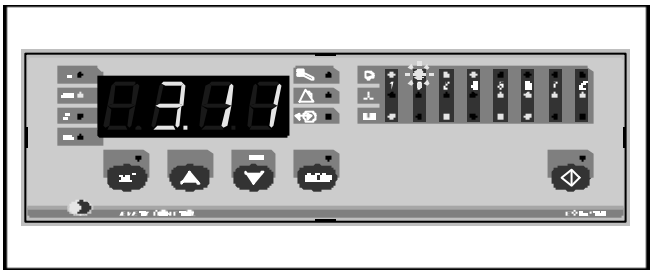
If the data LED flashes it means that a data transmission in a serial network with EVCOBUS protocol communication managed by a master (for instance a Personal Computer) is running



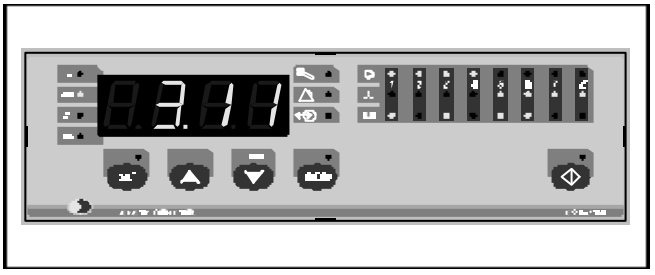
If the compressor/choking valve associated to the output K1 ... 8 LED is turned on it means that the user associated to the output K1 ... 8 is a compressor or a choking valve.



If the compressor/choking valve associated to the output K1 ... 8 LED flashes it means that a count of a disabling time to the compressor associated to the output K1 ... 8 activation is running; see the parameters C 0, C 1 and C 2 (the parameters C 0, C 1 and C 2 belong to the User Menu; see the chapter *User Menu* on the page 32).



If the condenser fans associated to the output K1 ... 8 LED is turned on it means that the user associated to the output K1 ... 8 is a condenser fans.



If the power step or condenser fans associated to the output K1 ... 8 status LED is turned on it means that the power step associated to the output K1 ... 8 is loaded or that the condenser fans associated to the output K1 ... 8 is activated.

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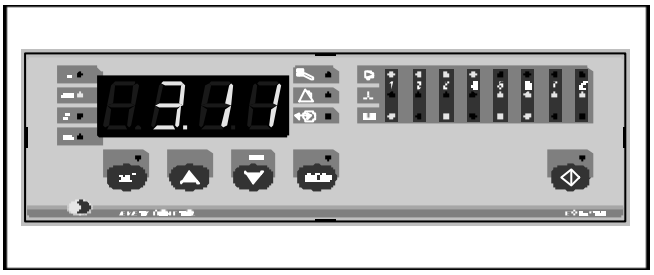
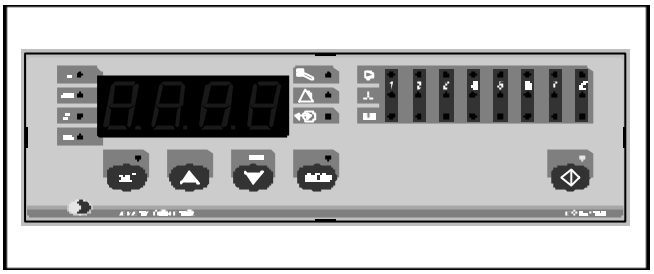
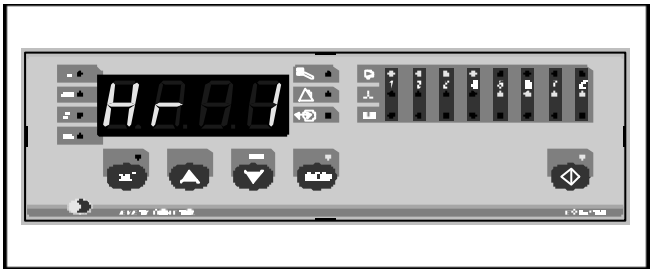


If the ON STAND-BY LED is lit it means that the instrument is in the status STAND-BY; if it flashes , the input by-pass regulation will be active.



If the menu LED is turned on it means that a configurator or Operator Menu configuration parameters setting procedure is running.

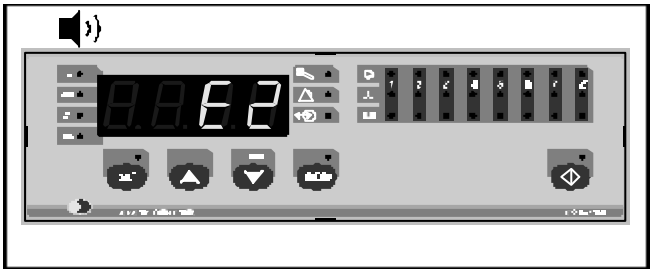


ALARMS

If the instrument displays the indication "E2" flashing and the buzzer utters an intermittent beep (corrupted memory data alarm) it means that

- there is a corruption of the configuration data in the memory (disconnect and connect again the instrument to the local power supply: if when the power supply recovers the alarm does not disappear the instrument must be replaced).

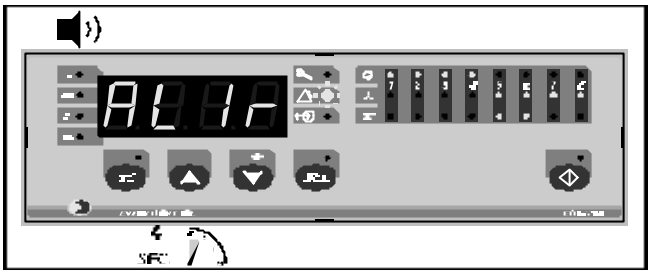
During this alarm the access to the setting procedures is refused, the outputs K1 ... 8 get forced to the status OFF, the output Al1 gets deactivated and the output Al1 gets activated.



If the instrument displays the indication "AL1r" for four seconds (or the indication "AL1r" flashing for four seconds), the buzzer utters an intermittent beep and the alarm LED flashes (instrument locking) it means that

- there was a number of lower pressure alarms enough to give the instrument locking and, if the indication is flashing, that the pressure read by the suction probe is below the alarm setpoint again (turn off and turn on again the instrument, see the parameters AA0, AA1, AA4, AAn and i8P: the parameters AA0, AA1, AA4, AAn and i8P belong to the User Menu; see the chapter *User Menu* on the page 32).

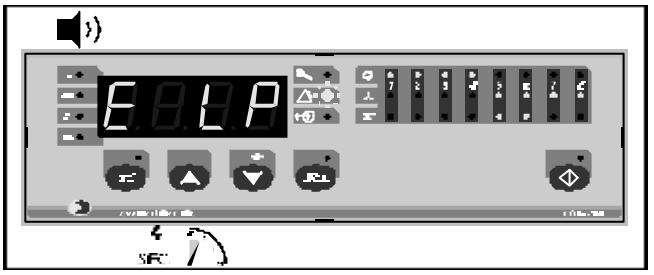
During this alarm all power steps get unloaded, the output Al1 gets deactivated and the output Al1 gets activated.



If the instrument displays the indication "E LP" flashing for four seconds, the buzzer utters an intermittent beep and the alarm LED flashes (instrument locking) it means that

- there was a number of lower pressure digital input alarms enough to give the instrument locking (turn off and turn on again the instrument, see the parameters AA0, AA1, AA4, AAn and i8P: the parameters AA0, AA1, AA4, AAn and i8P belong to the User Menu; see the chapter *User Menu* on the page 32).

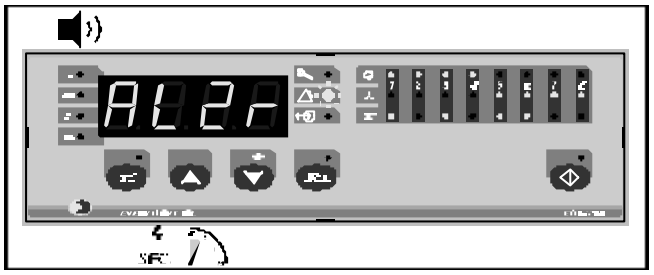
During this alarm all power steps get unloaded, the output Al1 gets deactivated and the output Al1 gets activated.



If the instrument displays the indication "AL2r" for four seconds (or the indication "AL2r" flashing for four seconds), the buzzer utters an intermittent beep and the alarm LED flashes (instrument locking) it means that

- there was a number of upper pressure alarms enough to give the instrument locking and, if the indication is flashing, that the pressure read by the suction probe is above the alarm setpoint again (turn off and turn on again the instrument, see the parameters Ab0, Ab1, Ab4 and Abn: the parameters Ab0, Ab1, Ab4 and Abn belong to the User Menu; see the chapter *User Menu* on the page 32).

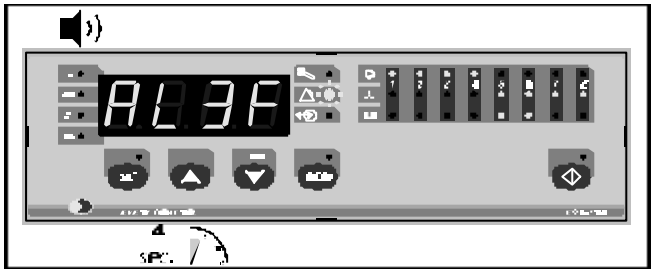
During this alarm the output Al1 gets deactivated and the output Al1 gets activated.



If the instrument displays the indication "AL3F" for four seconds (or the indication "AL3F" flashing for four seconds), the buzzer utters an intermittent beep and the alarm LED flashes (instrument locking) it means that

- there was a number of upper condensing quantity alarms enough to give the instrument locking and, if the indication is flashing, that the quantity read by the condensing probe is above the alarm setpoint again (turn off and turn on again the instrument, see the parameters AC0, AC1, AC4, ACn and i7P: the parameters AC0, AC1, AC4, ACn and i7P belong to the User Menu; see the chapter *User Menu* on the page 32).

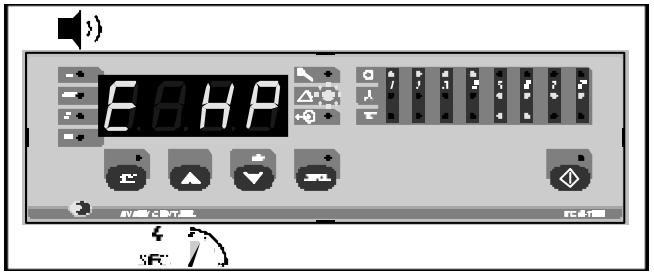
During this alarm all power steps get unloaded, the output Al1 gets deactivated and the output Al1 gets activated.



If the instrument displays the indication "E HP" flashing for four seconds, the buzzer utters an intermittent beep and the alarm LED flashes (instrument locking) it means that

- there was a number of upper condensing quantity digital input alarms enough to give the instrument locking (turn off and turn on again the instrument, see the parameters AC0, AC1, AC4, ACn and i7P: the parameters AC0, AC1, AC4, ACn and i7P belong to the User Menu; see the chapter *User Menu* on the page 32).

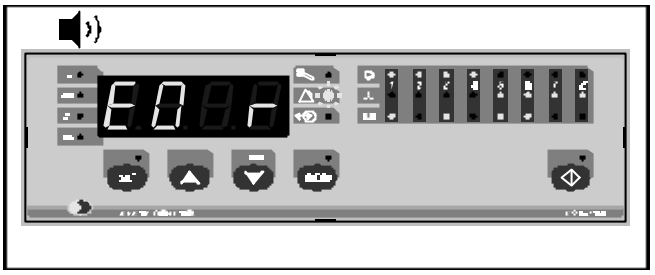
During this alarm all power steps get unloaded, the output Al1 gets deactivated and the output Al1 gets activated.



If the instrument displays the indication "E0 r" flashing, the buzzer utters an intermittent beep and the alarm LED flashes (suction probe failure alarm) it means that

- the kind of connected suction probe is not proper (verify the kind of connected suction probe)
- the suction probe is faulty (verify the suction probe integrity)
- there is a mistake in the instrument-suction probe connection (verify the instrument-suction probe integrity)
- the pressure read by the suction probe is outside the limits permitted by the suction probe in use (verify that the pressure near the suction probe be inside the limits permitted by the suction probe in use).

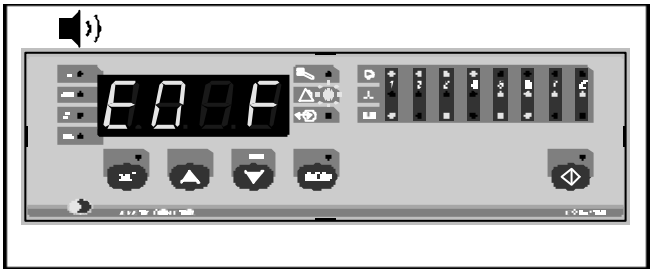
During this alarm the number of power steps established with the parameter C 6 gets loaded (the parameter C 6 belongs to the User Menu; see the chapter *User Menu* on the page 32), the output Al1 gets deactivated and the output Al2 gets activated.



If the instrument displays the indication "E0 F" flashing, the buzzer utters an intermittent beep and the alarm LED flashes (condensing probe failure alarm) it means that

- the kind of connected condensing probe is not proper (see the parameter /bE: the parameter /bE belongs to the User Menu; see the chapter *User Menu* on the page 32)
- there is one of the faults saw in the previous case but referred to the condensing probe.

During this alarm a power step loading/unloading gives the automatic activation/deactivation of a condenser fans, the output Al1 gets deactivated and the output Al2 gets activated.



If the instrument displays the indication "E i1 ... 8" flashing, and the buzzer utters an intermittent beep, the alarm LED and the power step or condenser fans associated to the output K1 ... 8 status LED flash (user associated to the output K1 ... 8 locking digital input alarm) it means that

- the user associated to the output K1 ... 8 locking digital input is activated (deactivate the user associated to the output K1 ... 8 locking digital input, see the parameters i1P and i2P: the parameters i1P and i2P belong to the User Menu; see the chap-

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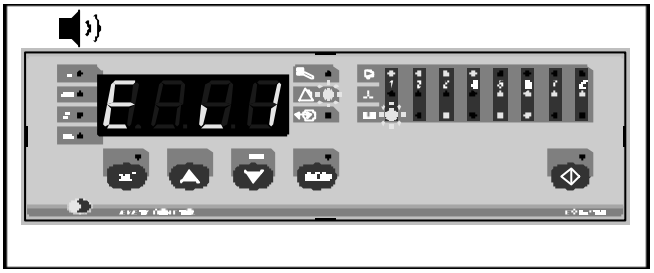
ter *User Menu* on the page 32).

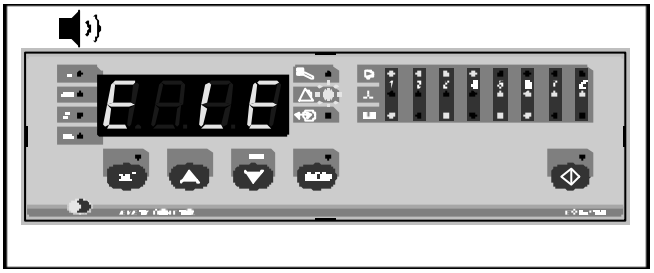
During this alarm the user associated to the output K1 ... 8 gets forced to the status OFF and the output Al2 gets activated.



If the instrument displays the indication "E LE" flashing, the buzzer utters an intermittent beep and the alarm LED flashes (freon level digital input alarm) it means that

- the freon level digital input is active (deactivate the freon level digital input, see the parameter i5P: the parameter i5P belongs to the User Menu; see the chapter *User Menu* on the page 32).

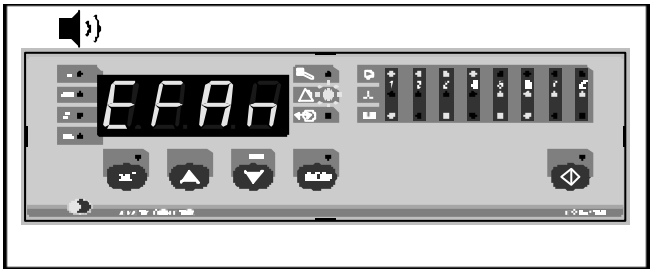
During this alarm the output Al2 gets activated.



If the instrument displays the indication "EFAn" flashing, the buzzer utters an intermittent beep and the alarm LED flashes (condenser fans safety digital input alarm) it means that

- the condenser fans safety digital input is active (deactivate the condenser fans safety digital input, see the parameter i6P: the parameter i6P belongs to the User Menu; see the chapter *User Menu* on the page 32).

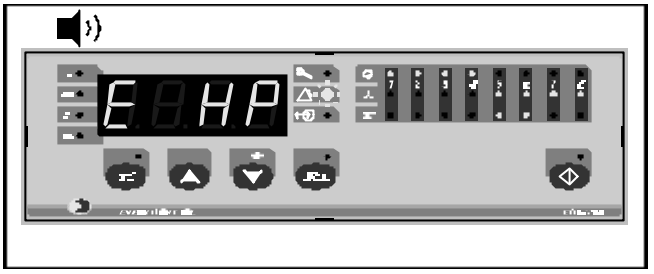
During this alarm the output Al2 gets activated.



If the instrument displays the indication "E HP" flashing, the buzzer utters an intermittent beep and the alarm LED flashes (upper condensing quantity digital input alarm) it means that

- the upper condensing quantity digital input is active (deactivate the upper condensing quantity digital input, see the parameter i7P: the parameter i7P belongs to the User Menu; see the chapter *User Menu* on the page 32).

During this alarm all power steps get unloaded, the output Al1 gets deactivated and the output Al2 gets activated.



If the instrument displays the indication "E LP" flashing, the buzzer utters an intermittent beep and the alarm LED flashes (lower pressure digital input alarm) it means that

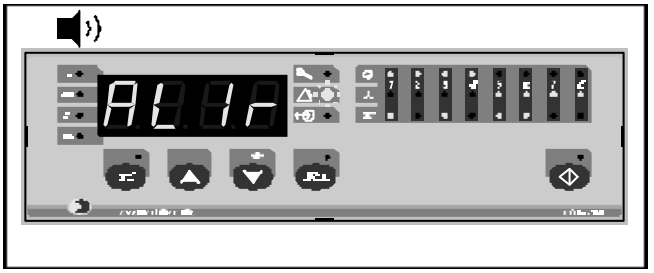
- the lower pressure digital input is activated (deactivate the lower pressure digital input, see the parameter i8P: the parameter i8P belongs to the User Menu; see the chapter *User Menu* on the page 32).

During this alarm all power steps get unloaded, the output Al1 gets deactivated and the output Al2 gets activated.

If the instrument displays the indication "AL1r" flashing, the buzzer utters an intermittent beep and the alarm LED flashes (lower pressure alarm) it means that

- the pressure read by the suction probe is below the alarm setpoint (see the parameters AA0, AA1 and AA4: the parameters AA0, AA1 and AA4 belong to the User Menu; see the chapter *User Menu* on the page 32).

During this alarm all power steps get unloaded and the output Al2 gets activated.

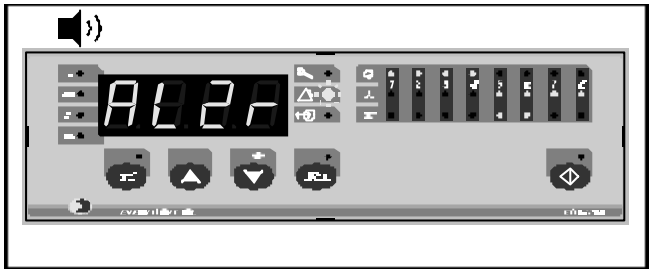


If the instrument displays the indication "AL2r" flashing, the buzzer utters an intermittent beep and the alarm LED flashes (upper pressure alarm) it means that

- the pressure read by the suction probe is above the alarm setpoint (see the parameters Ab0, Ab1 and Ab4: the parameters Ab0, Ab1 and Ab4 belong to User Menu; see the chapter

User Menu on the page 32).

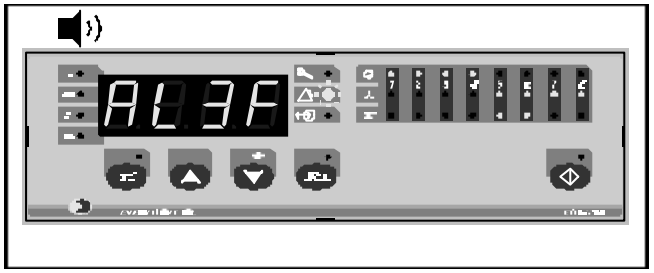
During this alarm the output Al1 gets deactivated and the output Al2 gets activated.



If the instrument displays the indication "AL3F" flashing, the buzzer utters an intermittent beep and the alarm LED flashes (upper condensing quantity alarm) it means that

- the quantity read by the condensing probe is above the alarm setpoint (see the parameters AC0, AC1 and AC4: the parameters AC0, AC1 and AC4 belong to the User Menu; see the chapter *User Menu* on the page 32).

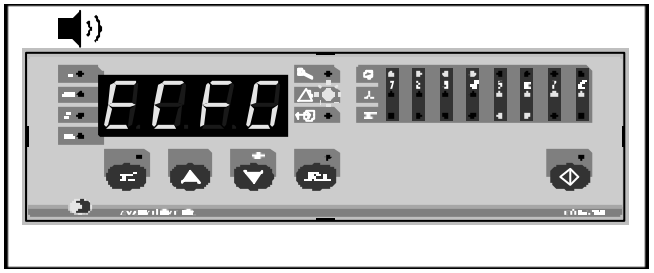
During this alarm all power steps get unloaded and the output Al2 gets activated.



If the instrument displays the indication "ECFG" flashing, the buzzer utters an intermittent beep and the alarm LED flashes (user-relay output configuration failure alarm) it means that

- a choking valve is associated to a condenser fans or to another choking valve (see the parameters tyP1 ... 8: the parameters tyP1 ... 8 belong to the Configurator Menu; see the chapter *Configurator Menu* on the page 25).

During this alarm all power steps get unloaded, the output Al1 gets deactivated and the output Al2 gets activated.

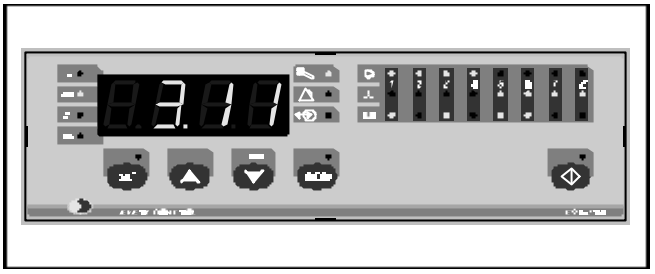


If the service LED is turned on (service alarm) it means that

- an user has exceeded the number of total working hours enough to signal the request of service (see the parameters C H and F H: the parameters C H and F H belong to the User Menu; see the chapter *User Menu* on the page 32).

Inactive.

To clear the users total working hours counter see the paragraph *Users total working hours counter cleaning* on the page 11.



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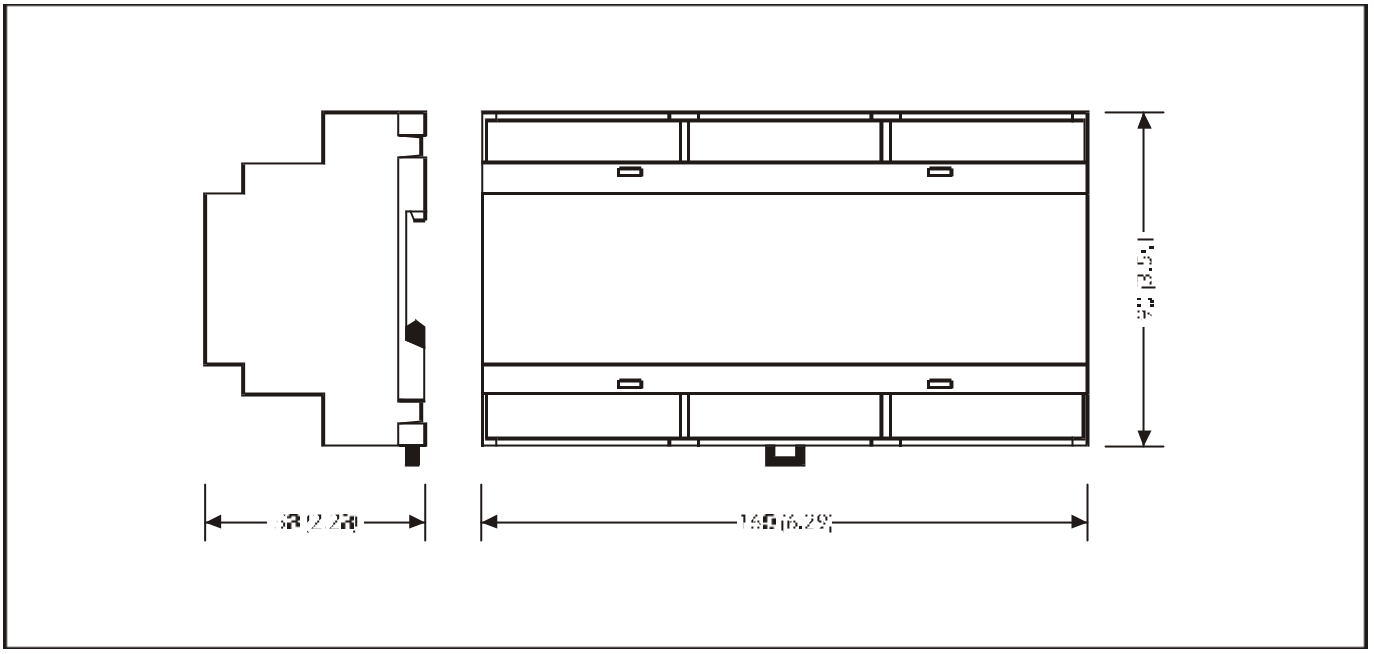
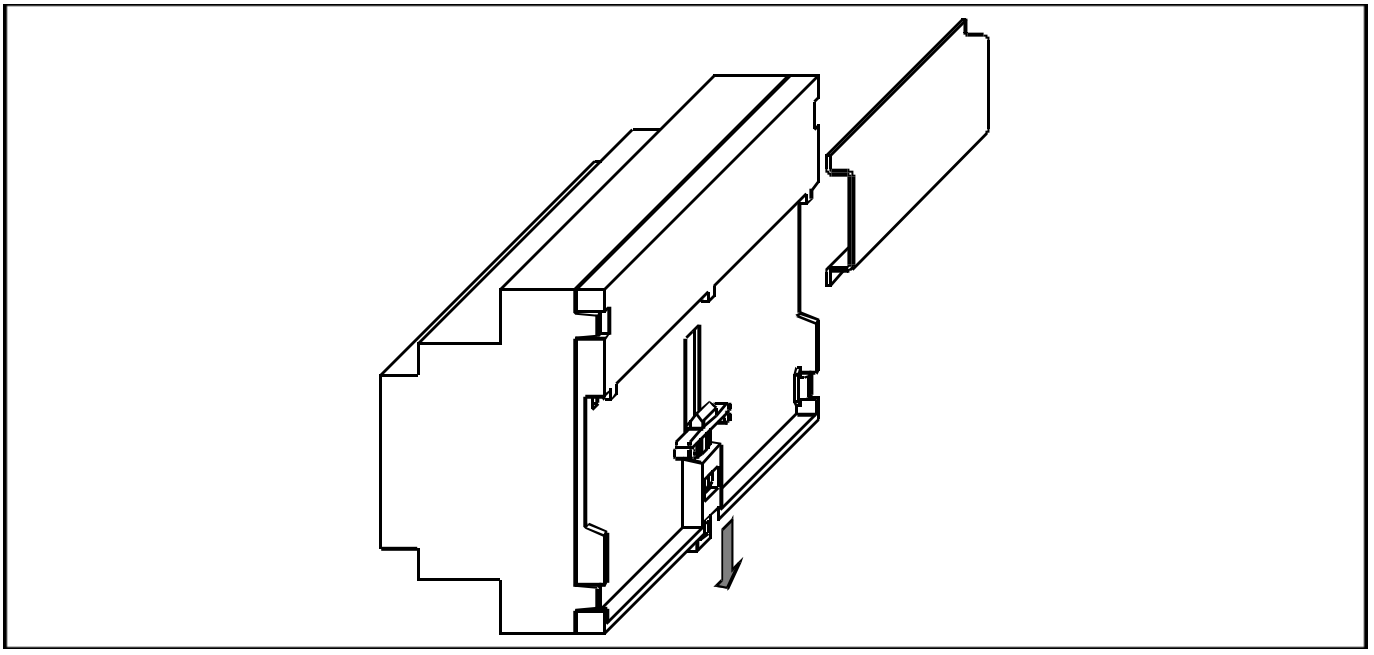
OVERALL DIMENSIONS

The dimensions are expressed in millimetres and inches (half-scale drawing).



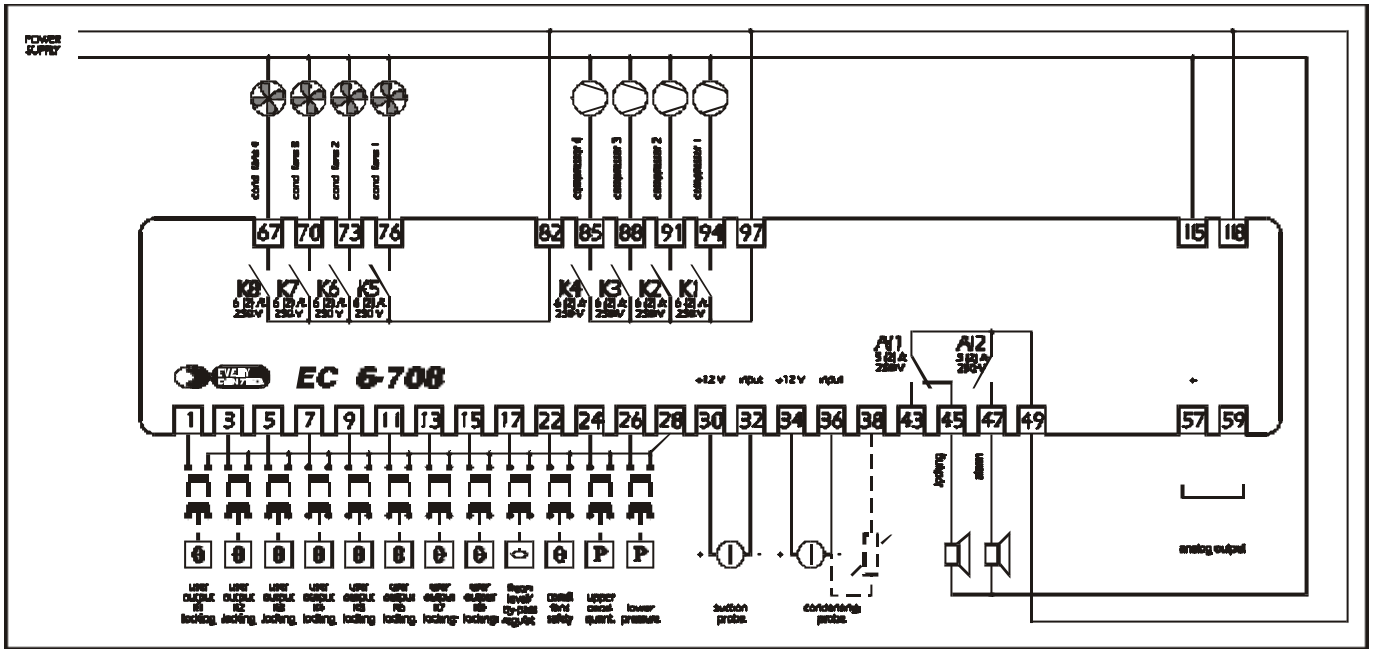
INSTALLATION

The fixing system suggested by the builder is on DIN EN 50022 standard rail according with DIN 43880 norms (half-scale drawing).



CONNECTIONS TO DERIVE

Instance of typical application.



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TECHNICAL DATA

Case
Plastic grey (PPO), self-extinguishing.

Size
160 x 90 x 58 mm (6.29 x 3.54 x 2.28 in., 9 DIN modules).

Installation
On DIN EN 50022 standard rail installation according with DIN 43880 norms.

Type of protection
IP 40.

Connections
Screw terminal blocks with pitch 7.5 mm (0.29 in., power supply and relay outputs for condenser fans/compressors/choking valves) for cables up to 2.5 mm² (0.38 in.²), screw terminal blocks with pitch 5.08 mm (0.2 in., inputs, relay outputs for instrument locking and alarms management and analog output) for cables up to 2.5 mm² (0.38 in.²).

Ambient temperature
From 0 to +60 °C (+32 to +140 °F, 10 ... 90 % of not condensing relative humidity).

Power supply
230 Vac, 50/60 Hz, 6 VA.

Insulation class
II.

Alarm buzzer
Incorporated.

Measure inputs
2 (suction and condensing probe) configurable for 2 wires 4-20 mA pressure transducers (Ri 56 Ohm)/PTC probes (these last for the condensing probe only); at terminals 30 and 34 +12 V (+30 %, -20 %) are available to supply the transducers.

Digital inputs
12 (5 V, 1 mA) of which eight user associated to the output K1 ... 8 locking configurable to interact on the outputs K1 ... 8 status and for NO or NC contact, one freon level configurable for NO or NC contact, one condenser fans safety configurable for NO or NC contact, one upper condensing quantity configurable to interact on the instrument status and for NO or NC contact and one lower pressure configurable to interact on the instrument status and for NO or NC.

Working range
Configurable.

Setting range
All the working range.

Resolution
Configurable.

Display
4-digit display 12.5 (0.49 in.) high red LED display with automatic decimal point and sign, relay outputs status indicators, instrument status indicators, programming status indicators, unit of measure of the displayed quantity indicators.

Outputs
ten relay outputs of which eight 6 (2) A @ 250 Vac relays configurable to manage up to ½ HP @ 250 Vac compressors/condenser fans (NO contact), one 5 (2) A @ 250 Vac relay for instrument locking management (change-over contact), one 5 (2) A @ 250 Vac relay for alarms management (NO contact) and one 4-20 mA or 0-10 V analog output associated to the condenser fans (the maximum load that can be connected is 200 Ohm).

HOW TO ORDER

Instrument name
EC 6-708.

Desired measure input
I	for 2 wires 4-20 mA pressure transducers/PTC probes.

Desired power supply
220	230 Vac.

Suffix
S0 01	0-20 or 4-20 mA analog output,
S1 01	0-10 V analog output.

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TEMPERATURE

TO CONVERT	INTO	MULTIPLY BY
Celsius	Fahrenheit	F = [(C x 9) / 5] + 32
Celsius	Kelvin	K = C + 273.15
Celsius	Rankine	R = [(C + 273.15) x 9] / 5
Fahrenheit	Celsius	C = [5 x (F - 32)] / 9
Kelvin	Celsius	C = K - 273.15
Rankine	Celsius	C = [(R x 5) / 9] - 273.15
Fahrenheit	Kelvin	K = [5 x (F + 459.67)] / 9
Fahrenheit	Rankine	R = F + 459.67
Kelvin	Fahrenheit	F = [(K x 9) / 5] - 459,67
Rankine	Fahrenheit	F = R - 459.67
Kelvin	Rankine	R = (K x 9) / 5
Rankine	Kelvin	K = (R x 5) / 9

PRESSURE

TO CONVERT	INTO	MULTIPLY BY
atmosphere	N/m^2	1.01325×10^5
bar	N/m^2	10^5
cm H_2O (+4 °C, +39 °F)	N/m^2	98.0638
dine/cm^2	N/m^2	0.1
Kgf/cm^2	N/m^2	98,066.5
lb.f/$ft.^2$	N/m^2	47.8803
lb.f/$in.^2$ (psi)	N/m^2	6,894.7572
mm Hg (0 °C, +32 °F)	N/m^2	133.322
pascal	N/m^2	1
torr (0 °C, +32 °F)	N/m^2	133.322

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BUILDER DATA

Every Control S.r.l.
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Phone 0039-0437-852468 (a.r.) Fax 0039-0437-83648
info@everycontrol.it
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To be careful

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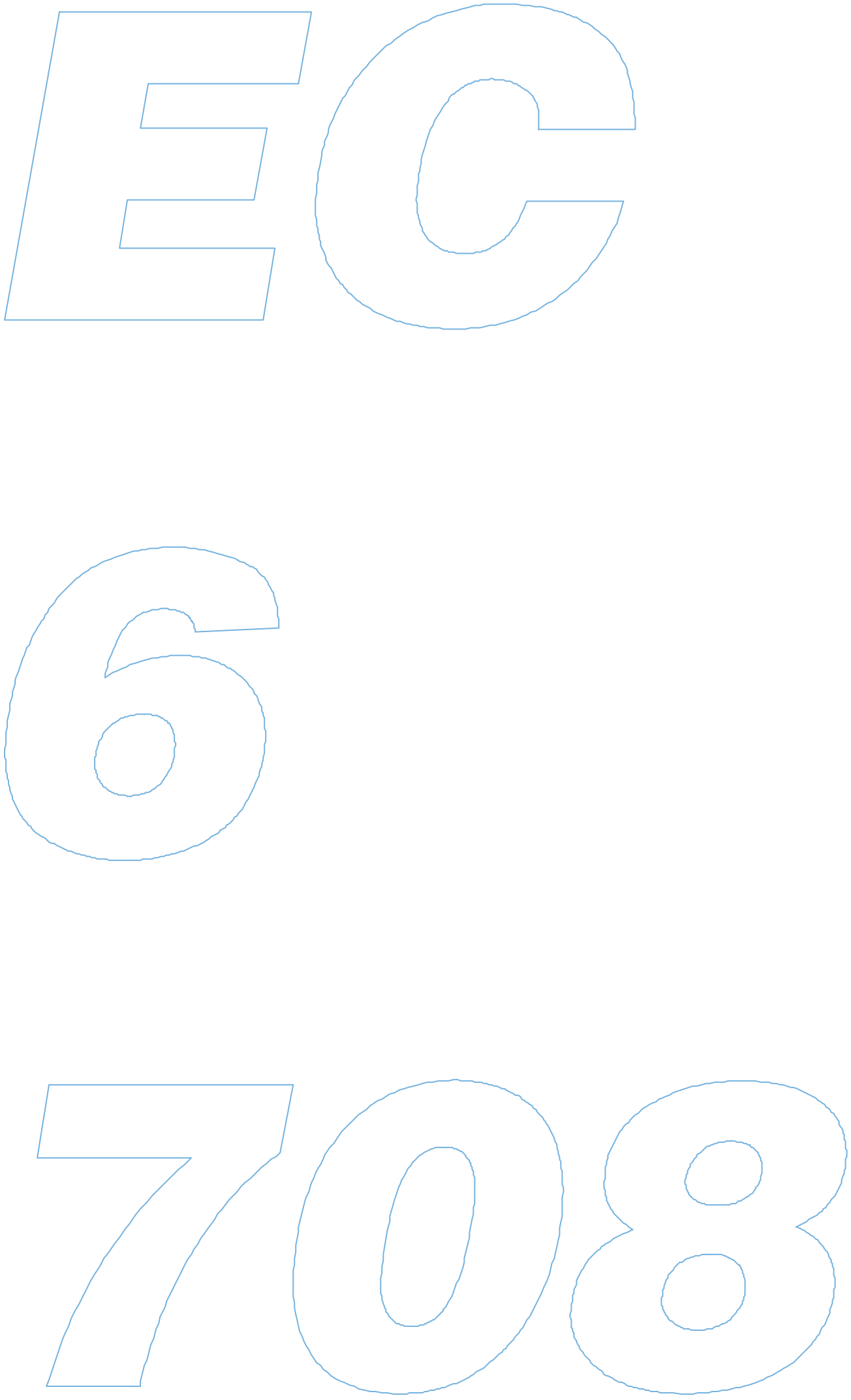
EC
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