USE AND PROGRAMMING HANDBOOK

FREQUENCY INVERTER FOR AN ELECTRIC PUMP

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1. WARNINGS

The following symbols, accompanied by the words: “Danger”, “Warning”, indicate the potential hazard resulting from failure to observe the associated warning, as specified below:

DANGER
RISK OF ELECTRIC SHOCK

Failure to observe this warning may result in electric shock

DANGER

Failure to observe this warning may cause personal injury and/or damage to property

WARNING

Failure to observe this warning may cause damage to the pump, the unit or the system

- **CAUTION:**
  Make sure the pumps are fully primed before you start them.

- **CAUTION:**
  The control panel must be connected by a qualified electrician in compliance with the electrical regulations in force.

- **CAUTION:**
  The electric pump or the motor and the panel must be connected to an efficient grounding system in compliance with the electrical regulations locally in force.

- **CAUTION:**
  Ground the unit before carrying out any other operation.

- **CAUTION:**
  The electric pump or the motor can start up automatically.

- **CAUTION:**
  As a general rule, always disconnect the power supply before proceeding to carry out any operation on the electrical or mechanical components of the unit or system.

2. OVERVIEW

The purpose of this manual is to provide the necessary information for the proper installation, use and maintenance of SC/1-TA. The user should read this manual before operating the unit. Improper use may cause damage to the machine and lead to the forfeiture of the warranty coverage. Always specify the model identification code and the construction number when requesting technical information or spare parts from our Sales and Service department. The instruction and warnings given below concern the standard version; refer to the sale contract documentation for modifications and special version characteristics. For instructions, situations and events not considered in this manual or in the sale documents, please contact our customer service.

Our units must be installed in sheltered, well-ventilated, non-hazardous environments and must be used at a maximum temperature of +40°C and minimum of -5°C.

3. HANDLING

DANGER

WARNING

The panel must be handled with care, as falls and knocks can cause damage without any visible external signs.

If for any reason the unit is not installed and starter immediately after it has reached its destination it must be stored properly. The external packaging and the separately packed accessories must remain intact, and the whole must be protected from the weather, especially from freezing temperatures, and from any knocks or falls.

PRELIMINARY INSPECTION: after you have removed the external packaging, visually inspect the control panel to make sure it has suffered no damage during shipping.
If any damage is visible, inform a FOURGROUP dealer as soon as possible, no later then five days from the delivery date.

FOURGROUP S.r.l. shall not be liable for any damage caused or suffered by the unit as a result of its unauthorised or improper use.

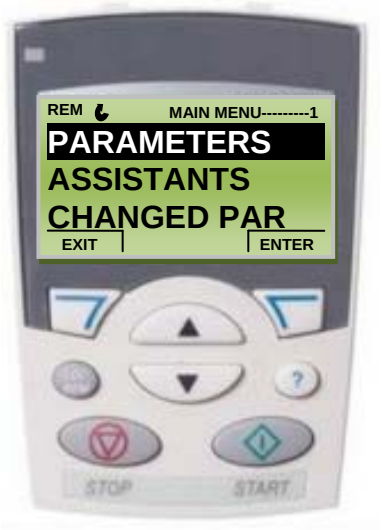
4. PROGRAMMING THE ABB-ACS INVERTER WITH THE PANEL ASSISTANT

-Position the AUT-0-MAN selector switch on “0” 

and the keypad should display

-Enter the programming menu and press “MENU” 

-The following will be displayed on the keypad:

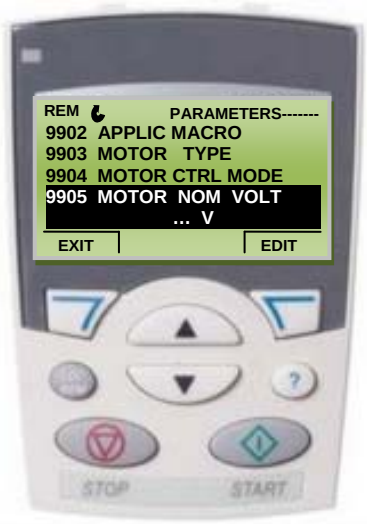


-Press “ENTER”  and the keypad should display:

-With the up  arrow select the family
“-99 START UP DATA-“ the keypad should display:

-Press “SELECT”  and the keypad should display:

-With the down  arrow select the parameter
“9905 MOTOR NOMINAL VOLTAGE“ and the keypad should display:

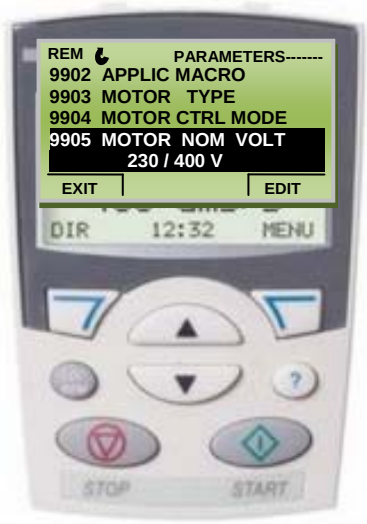


-Press “EDIT”  and check that the correct power voltage (Volt) of the motor appears on the keypad.

Ex. motor 230V

Ex. motor 400V

- To change the value press the up or down arrows 
  Set the required value and press “SAVE” 
  and the keypad should display:

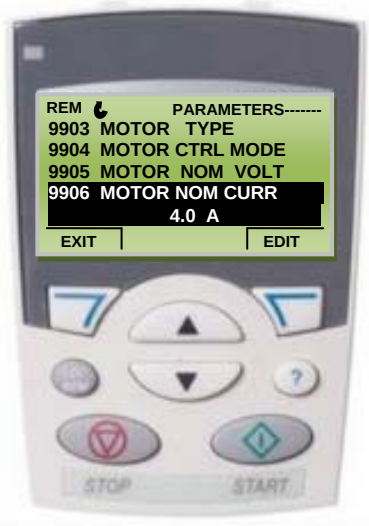


-With the down  arrow select the parameter
“9906 MOTOR NOMINAL CURRENT“ and the keypad should display:

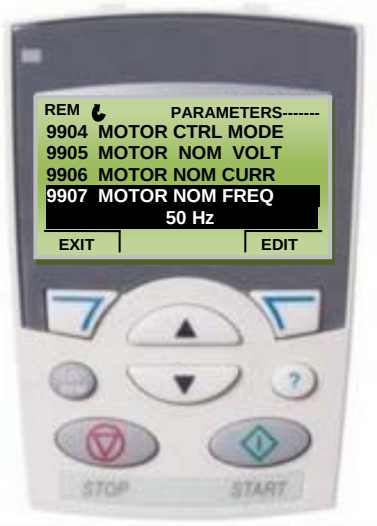
-Press “EDIT”  and check that the correct absorption current (A) of the motor appears on the keypad.

<u>Example 4A motor:</u>

- To change the value press the up or down arrows 
  Set the required value and press “SAVE”  and the keypad should display:



-With the down  arrow select the parameter
“9907 MOTOR NOMINAL FREQ.“ and the keypad should display:



-Press “EDIT”  and check that the correct nominal frequency (Hz) of the motor appears on the keypad.

<u>Example 50Hz motor:</u>

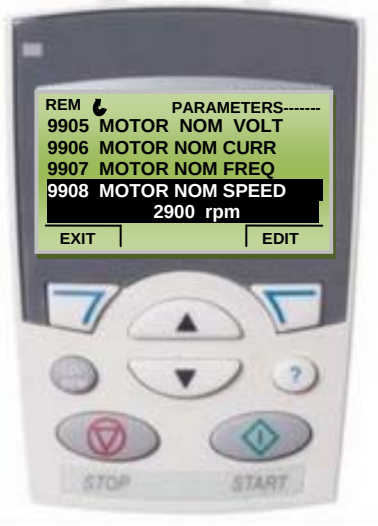
- To change the value press the up or down arrows 
  Set the required value and press “SAVE”  and the keypad should display:

-With the down  arrow select the parameter
“9908 MOTOR NOMINAL SPEED“ and the keypad should display:

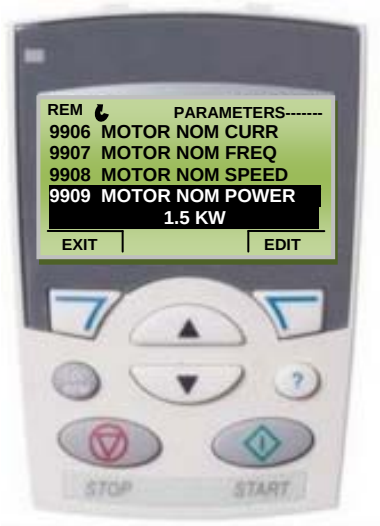
-Press “EDIT”  and check that the correct rpm (rpm o min^{-1}) of the motor appears on the keypad.

<u>Example 2900rpm motor:</u>

- To change the value press the up or down arrows 
  Set the required value and press “SAVE”  and the keypad should display:



-With the down  arrow select the parameter
“9909 MOTOR NOMINAL POWER“ and the keypad should display:



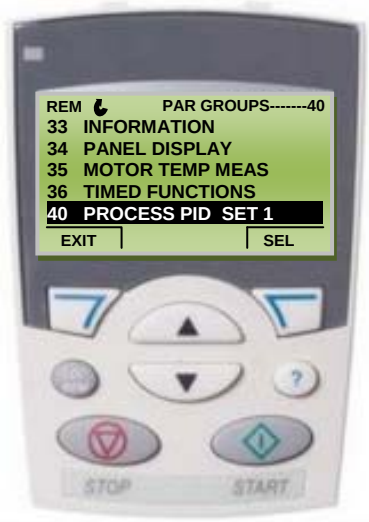
-Press “EDIT”  and check that the correct nominal power (KW) of the motor appears on the keypad.

<u>Example 1.5Kw motor:</u>

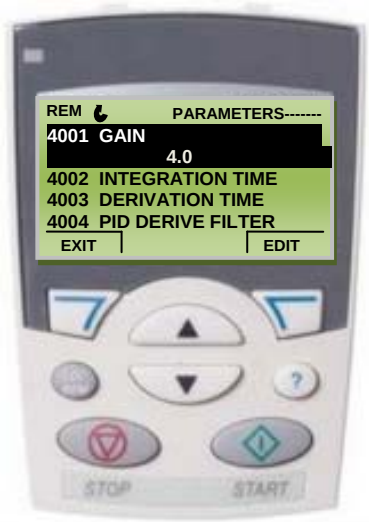
- To change the value press the up or down arrows 
  Set the required value and press “SAVE”  and the keypad should display:

-Press the “EXIT” key once  to return to the list of families and the keypad should display:

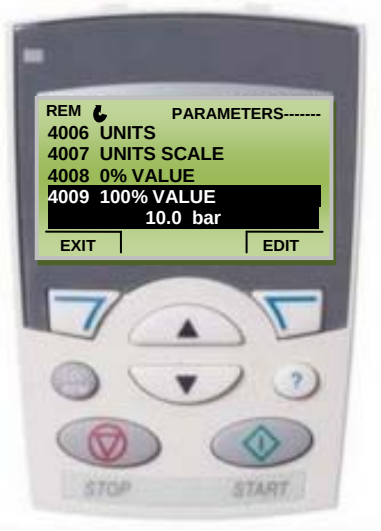
-With the down  arrow select the family “40 PID SET1 CHECK“ and the keypad should display:



-Press “SELECT”  and the keypad should display:



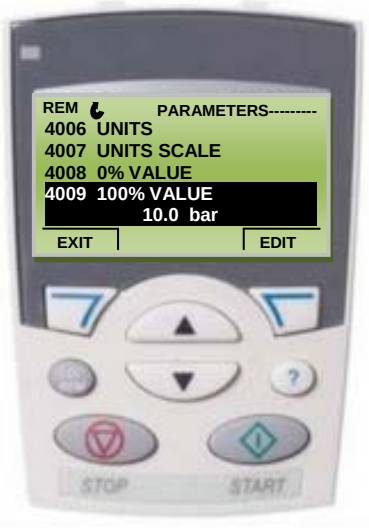
-With the down  arrow select the parameter “4009 100% VALUE“ and the keypad should display:



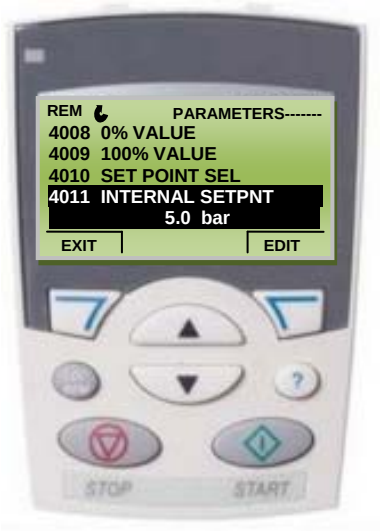
-Press “WRITE”  and on the keypad use the arrows  to change the parameter according to the maximum range of the pressure sensor (bar).

Example 0-10bar sensor:

-To save the modified parameter press “SAVE”  and the keypad should display:



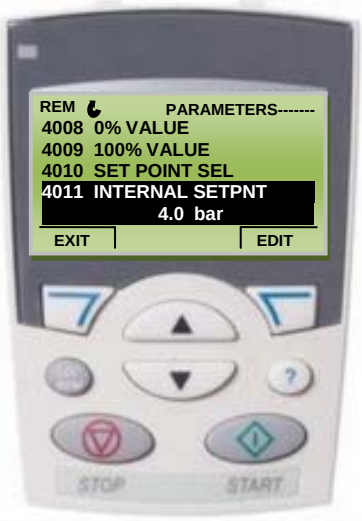
-With the down  arrow select the parameter
“4011 INTERNAL SET POINT “ and the keypad should display:



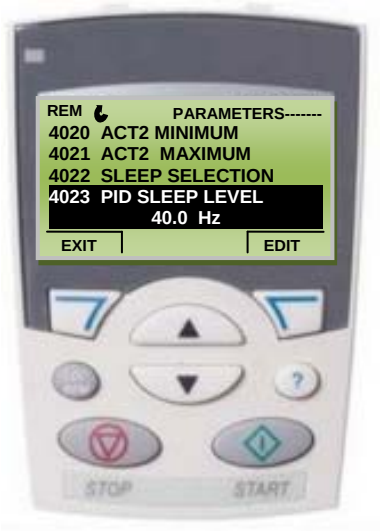
-Press “EDIT”  and on the keypad use the arrows  to change the parameter according to the nominal pressure (bar) to be maintained in the system.

Example 4bar pressure:

-To save the modified parameter press “SAVE”  and the keypad should display:

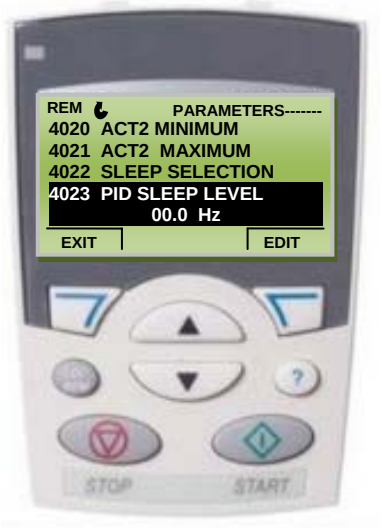


-With the down  arrow select the parameter “4023 PID SLEEP LEVEL“ and the keypad should display:



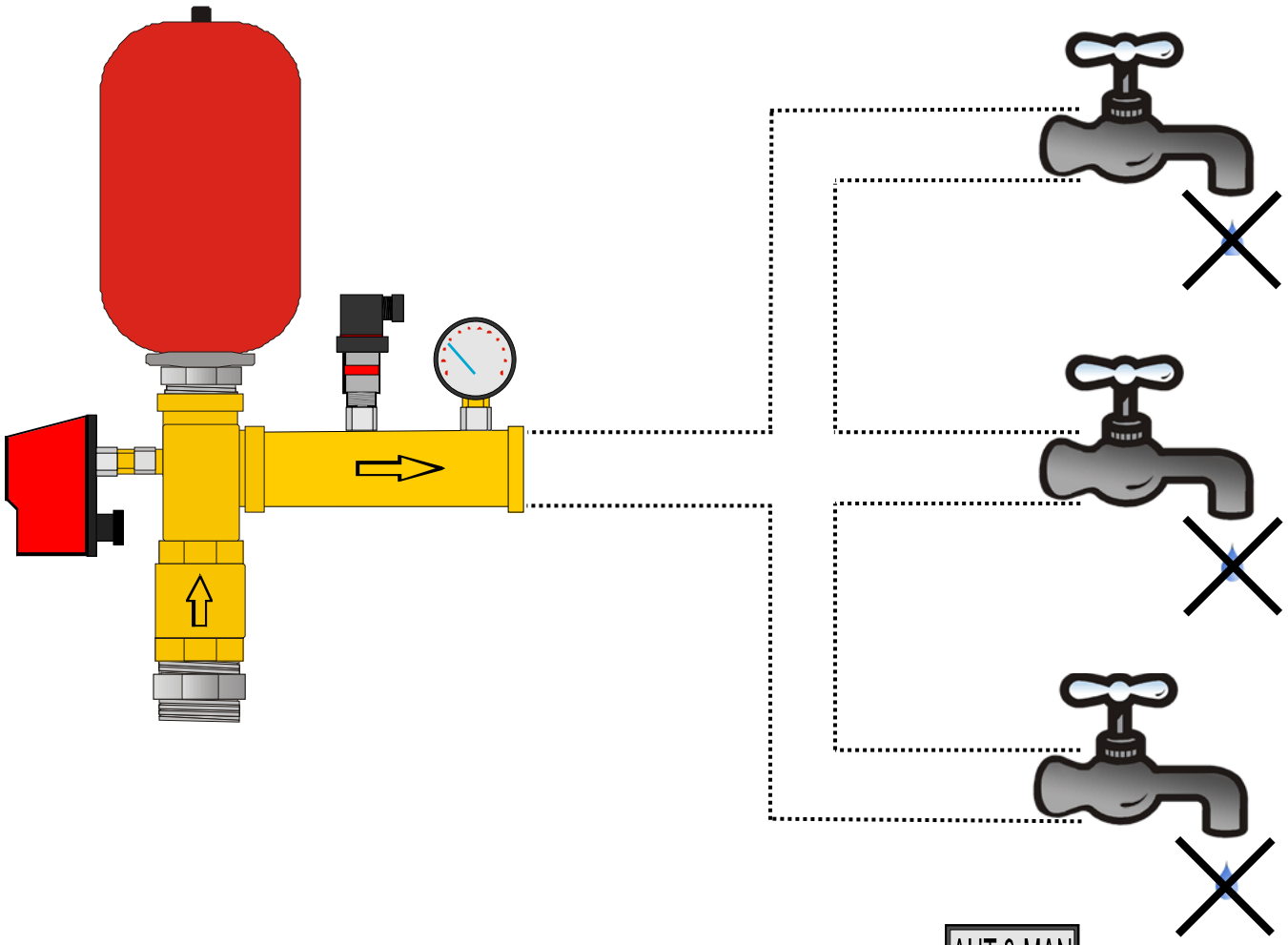
-Press “EDIT”  and on the keypad use the arrows  to change the parameter to a frequency of 00.0Hz and the keypad should display:

-To save the modified parameter press “SAVE”  and the keypad should display:



-Press “EXIT” three times  to return to the first page and the keypad should display:

- Close all utilities to pressurise the entire hydraulic system.



-Position the AUT-0-MAN selector switch on “AUT” 

and check that the Hz value increases on the keypad

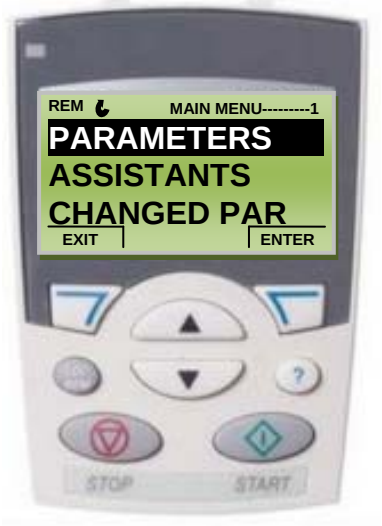
-Check on the keypad that the value reaches the nominal pressure set previously (in this case 4bar as set for parameter 4011) and that the keypad displays:

-Once the system reaches the nominal pressure and therefore is entirely pressurised allow the pump to run for about one minute;
-Check that the system's frequency value stabilises (in this case 35Hz).

-Position the AUT-0-MAN selector switch on "0" 

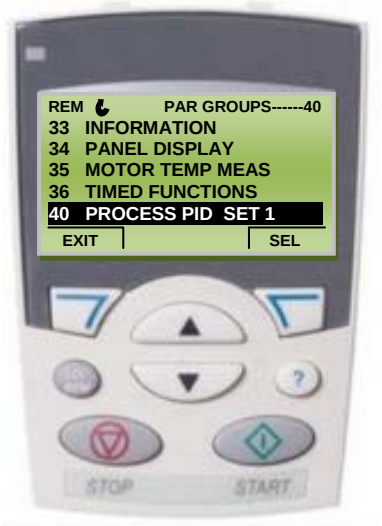
and the keypad should display:

-Enter the programming menu and press “MENU” 
-The following should be displayed on the keypad:

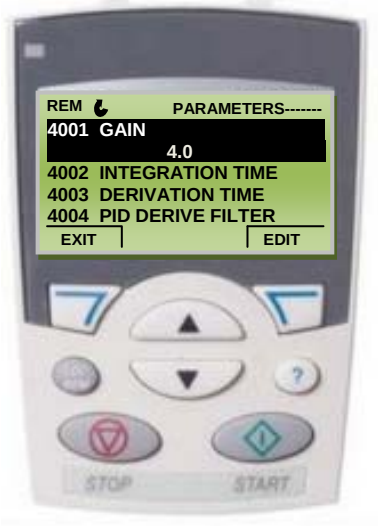


-Press “ENTER”  and the keypad should display:

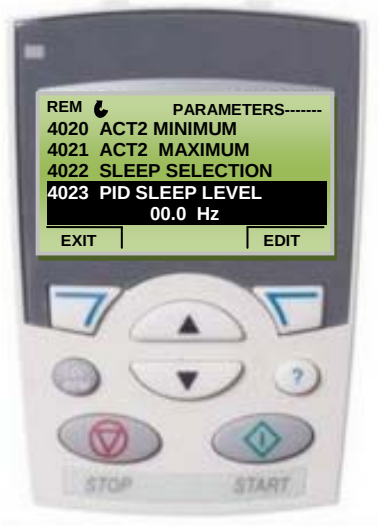
-With the down  arrow select the family
“40 PID SET1 CHECK“ and the keypad should display:



-Press “SELECT”  and the keypad should display:

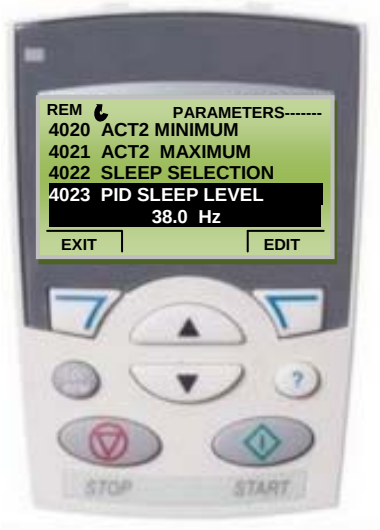


-With the down  arrow select the parameter “4023 PID SLEEP THRESHOLD“ and the keypad should display:



-Press “WRITE”  and on the keypad use the arrows  to change the parameter to a frequency 2 or 3Hz higher than the previous reading (in this case 35Hz+3Hz=38) see page 16 (second step) and check that the keypad displays:

-To save the modified parameter press “SAVE”  and the keypad should display:



-Press “EXIT” three times  to return to the first page and the keypad should display:

-The system is ready for use.

N.B. : TO WORK CORRECTLY THE SYSTEM MUST BE IN REMOTE MODE (REM top left).

Press the LOC/REM key to switch from REMOTE (REM) to LOCAL (LOC) and vice versa.
When the inverter is in LOC mode all automatisms are excluded and the inverter will remain in stand-by even if the pressure goes down.
PRESS the LOC/REM key once to switch the system back to REMOTE (REM).

CAUTION!!! RESETTING PROGRAMMING FUNCTION (contact the technical office before carrying out the operation)

1. Position the **SA1** selector of the "**AUT-0-MAN**" control on "**0**".
2. Use the "**loc rem**" key of the acs control to switch from "remote" to "**local**" control ("**loc**" will appear on the top left of the display).
3. Press "**SELECT**", scroll using the ↑,↓ arrows to display "**backup par**".
4. Press "SELECT" to select.
5. Scroll using the ↑,↓ arrows to display "unload all to acs".
6. Confirm again with "**SELECT**" and wait for the acs programming to reset (during the procedure the display will show the loading % of programming)
7. The display will show "parameter download operation successful". Press ok.
8. Press "EXIT" twice to return to the main page.
9. Use the "Loc Rem" key on the panel to switch the acs control to remote for standard operation ("rem" will appear on the top left of the display.)

5. EMERGENCY PRESSURE SWITCH – DRY RUNNING PROTECTION AND SENSOR CONNECTION

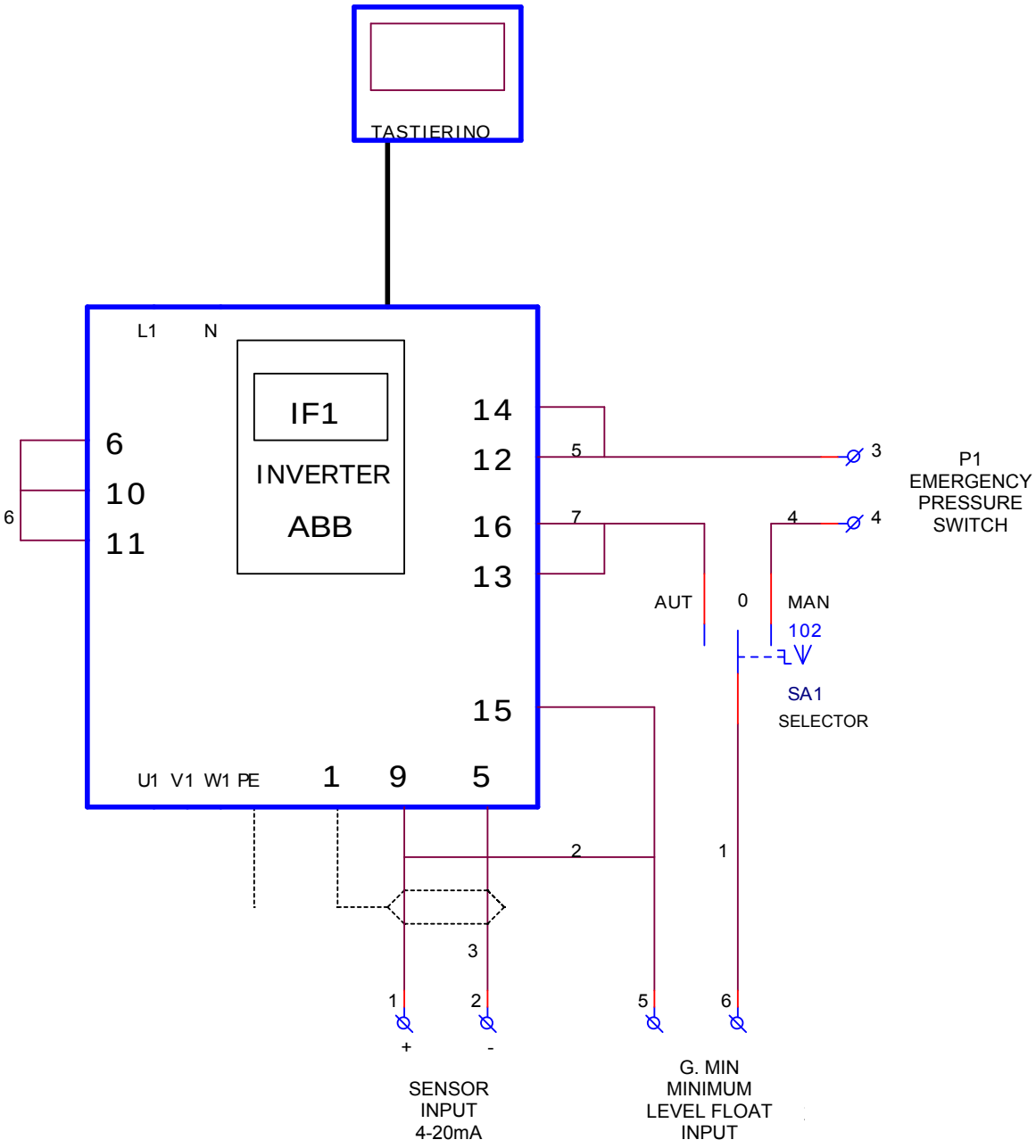
DANGER
RISK OF ELECTRIC SHOCK

WARNING

The Easy inverter and EcoEasy panel series are all equipped with an input for the emergency pressure switch. In case of malfunction, if the panel is connected to an emergency pressure switch this guarantees the uninterrupted operation of the system. After having detected the malfunction of the analogue pressure sensor by positioning the “Aut – 0 – Man” selector switch on “Man” the inverter will be controlled by the contact of the emergency pressure switch. The system will operate in acceleration and braking ramp mode at fixed speed of 50Hz (the frequency control adjustment of the analogue pressure sensor will not be available) according to the state of the emergency pressure switch (closed contact = pump running; open contact = pump in stop mode). This system guarantees the uninterrupted operation of the system even if the analogue pressure sensor is not present (e.g. when being repaired or replaced).

The Easy inverter and EcoEasy panel series also feature an input for the connection of a minimum level float/consent. This input can be used to connect a float or consent to dry running of the pump (closed contact = pump operation enabled; open contact = pump operation disabled).

The following wiring diagram, which is merely indicative, shows the position of the emergency pressure switch and minimum level float/consent in the inverter's control logic:



INDICATIVE WIRING DIAGRAM:

TERMINALS 1-2 : ANALOGUE PRESSURE SENSOR INPUT

TERMINALS 3-4 : EMERGENCY PRESSURE SWITCH INPUT

TERMINALS 5-6 : MINIMUM LEVEL FLOAT TO PREVENT DRY RUNNING

TELEMECANIQUE SENSOR CONNECTIONS

MOD. XML–G010D21 4-20mA

BLUE WIRE: SENSOR NEGATIVE CONNECTION
BROWN WIRE: SENSOR POSITIVE CONNECTION

N.B. SEE CONNECTION DIAGRAM ON THE SENSOR AND/OR INSTRUCTIONS SUPPLIED WITH THE SENSOR

DANFOSS SENSOR CONNECTIONS

MOD. MBS 3000 4-20mA

POSITIVE (+) SUPPLY: PIN1
NEGATIVE (-) COMMON: PIN2

N.B. SEE CONNECTION DIAGRAM ON THE SENSOR AND/OR INSTRUCTIONS SUPPLIED WITH THE SENSOR

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