www.abenergy.it

ABE_300
BIOGAS CHILLER

Operating Instructions


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FRIGO DEUMIDIFICAZIONE GAS ANALISI
ABE_300
0125_10
1 A
230 VAC
50 Hz
IN
OUT

Le denominazioni di altri prodotti menzionati in questa documentazione possono essere marchi il cui uso da parte di terzi può violare i diritti di proprietà.

INDEX

Dear customer,

before starting work, please read this manual!
It contains warnings and important data, compliance with which will guarantee the availability of equipment, making you achieve savings on maintenance costs. Thus, the use of this equipment will be greatly facilitated and get reliable measurement results.

Note

We suggest you contact our factory especially before you use the unit for new applications, such as in research and development.

1.1 General warnings

Decrypts the product in this manual has left the factory in a perfect condition and safe, it can be used only in the manner described by the manufacturer.
And secure the perfect working fridge for this assumes that the transport is appropriate, that the storage and installation are performed in a workmanlike manner and that the use and maintenance are carried out with due diligence.

This manual contains the information necessary for use in accordance with the intended uses described herein from the fridge. It is open to qualified technical personnel, who received specific training or have the relevant knowledge in the field of metrology, engineering controls and regulations.

If you want more information, or special problems arise which are not treated fairly extensively in this manual, you seek the necessary clarification to our factory.

1.2 Instructions for using this manual

This manual describes how to set up, use and perform maintenance.
It is recommended to observe in particular the text of warnings and notes.

1.3 Warnings

The safety concerns and warnings are intended to prevent risks to life and health of users and maintenance personnel or to prevent the occurrence of material damage.
In this manual these warnings are highlighted by the concepts of signaling defined below.
They are also marked with the warning at the point where they appear.

Attention

It means that there will be death, serious injury to persons and / or considerable damage to property, unless you take precautionary measures.

Warning

It means that there may be death, serious injury to persons and / or considerable damage to property, if you do not take precautionary measures.

Attention

With warning triangle means that light injury can occur if not taken precautionary measures.

Attention

Without warning triangle indicates that damage may occur if not taken precautionary measures.

Warning

Means that future cases or situations may not want if not observed the corresponding warning.

1.4 Used in accordance with intended uses

The product described in this manual has been developed, manufactured, tested and documented in compliance with safety standards in force.
If you meet the standards described relating to the handling and safety concerns in relation to the design, installation, operation in accordance with the intended use and maintenance, product normally does not come any danger regarding damage to property or to ' physical integrity of persons.
This equipment has been manufactured in a way that is guaranteed safe isolation between the primary and secondary circuits.

Function safely and without errors of this device also requires a careful fixation, storage as well as operation and careful maintenance.

Warning

This unit operates by electricity.
The opening of the refrigerator make available certain parts of the apparatus that may be under dangerous tension.
Therefore, only suitably qualified personnel may initiate actions on this unit.

1.5 Qualified person

If assistance is not qualified on the fridge or failure to follow instructions given in this manual, there may be serious injury to persons and / or considerable damage to property.
Therefore, only authorized personnel to initiate actions on this unit.

For qualified personnel in the sense of safety concerns reported in this manual or the product itself are:

• Persons acting as employees are familiar with the design concepts of security in automation technology.

• Or people as operators have been trained in the use of devices of automation technology and are aware of the contents that relate to the use of this manual.

• Or people as workers put into service and / or maintenance is trained to enable the repair of such devices in automation technology, or who have permission to perform the commissioning, preparation land and marking of electrical circuits and devices / systems in accordance with safety standards.

1.6 Notes concerning the guarantee

Please note that the contents of this handbook is neither part of an agreement, promise or legal relationship or previous pre-existing, or that is intended to modify the content. All commitments made by A. B. Energy S.r.l. resulting from their purchase contract, which also governs the complete and exclusive warranty valid. These contractual provisions in respect of guarantees are neither extended nor limited by the exposures in this manual.

1.7 Notes relating to the provision

Their allocation is given in accordance with the contract of sale valid on shipping documents attached to the supply.

When opening the package, please observe the instructions and warnings on the packaging material.
Verify the completeness and integrity of the supply.

Keep the packaging material for a possible return.
You will find the form provided in Section 9.1.

1.8 Rules and provisions

Where possible, for the specification and the production of this unit, was based on harmonized European standards.

In case of use of this product outside the scope of these rules and regulations must be complied with the rules and provisions in force in the country of the operator.

1.9 Declaration of Conformity

The fridge ABE_300 conforms to the following relevant provisions of the EC.

ABE_300 The fridge is in line with the EC Directive 89/336/EEC "Electromagnetic Compatibility".

The fridge ABE_300 is provided for the use of industrial fields.

The fridge ABE_300 is in line with the EC Directive 89/336/EEC "Low Voltage".

According to the above mentioned EC directives to the declarations of conformity are kept available to the competent authorities at:

A.B.ENERGY S.R.L.
VIA AMENDOLA, 340
13836 COSSATO (BI)

2.0 Safety concerns

Warning

Certain parts of this unit are under dangerous tension.

Warning

The device should not work at a risk of explosion.
Mixtures of explosive gases shall not be measured.

If the sample gas introduced appliance may contain flammable components above the lower explosion limit (UEG) must grant the security measures required by the relevant experts.

Warning

In measurements of poisonous gas or aggressive, it may happen that due to a defect in pipes dell'ermeticità gas accumulates THE APPLIANCE amount of gas sample.
To prevent any danger of explosion or poisoning, the equipment must be flushed with inert gas (eg nitrogen).
The gas expelled through the wash, to be collected with the help of a suitable device and through a discharge pipe disposed ecologically.

2.1 Fittings for gas and flow pattern inside

How fitting for gas is a tube with 6 / 4 mm.

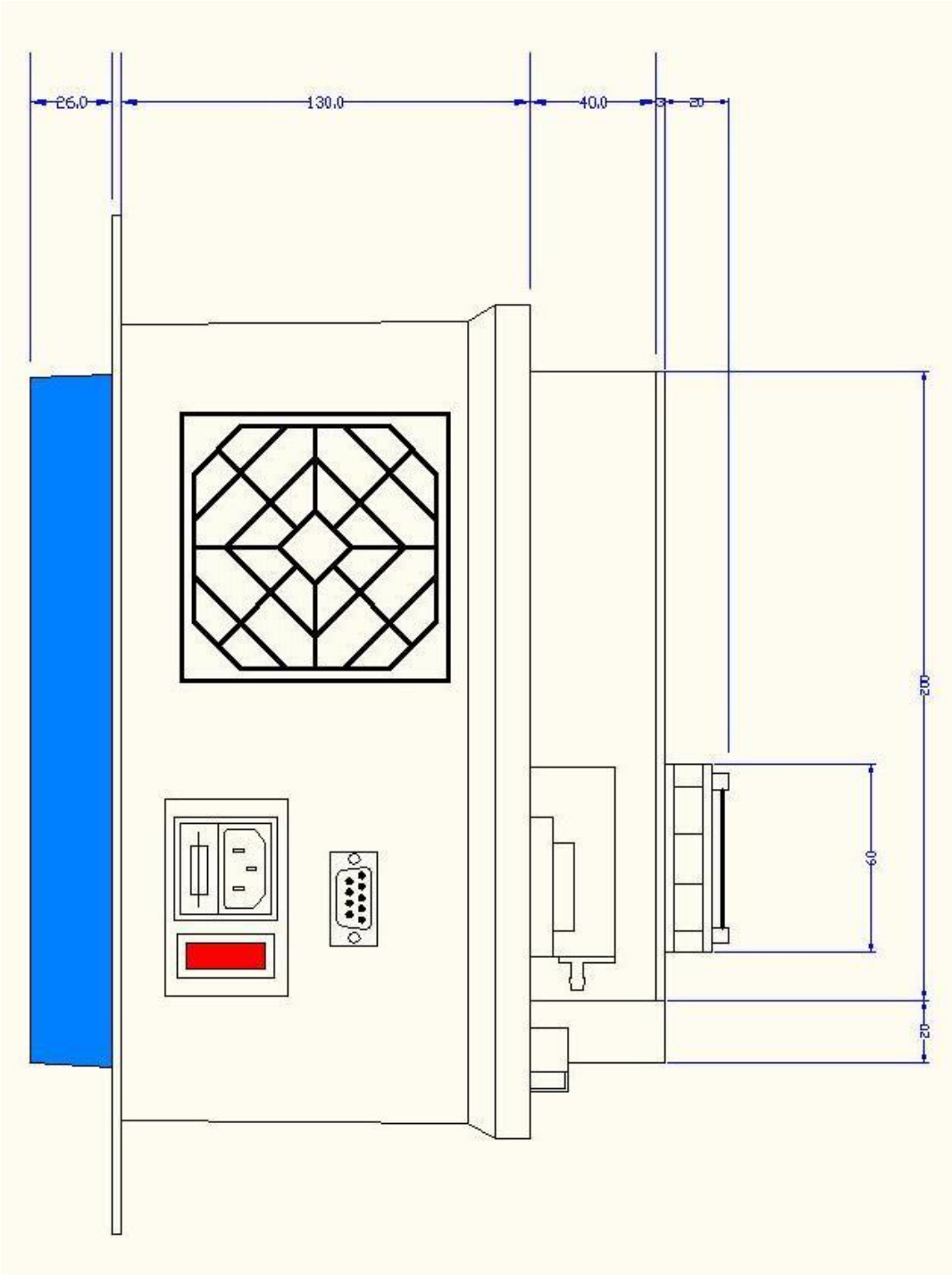
For connection of hoses or pipes external hard you have to choose a suitable material for the gas sample.

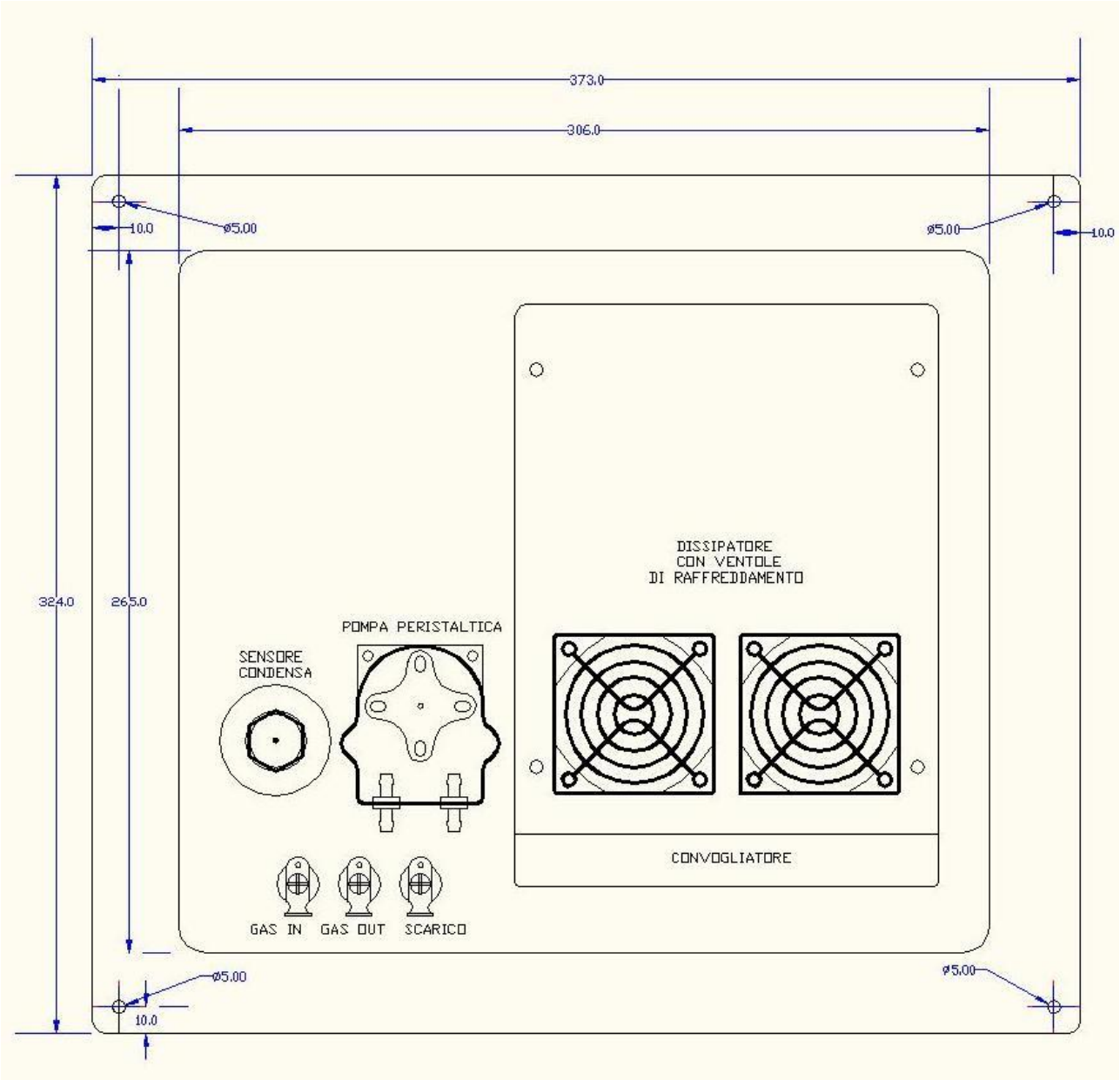
3.1 Key Features

ABE_300 fridge for biogas. The ABE_300 is used for:

- Cool the sample gas or biogas.
- Separation by lowering the temperature of the gas condenses to 2 ° C.
- Condensate drain through a peristaltic pump.
- Clean the gas through a filter.
- Humidity output control device and alarm generator (control unit with integrated analysis of external sensor).

3.2 Dimension




373.0
306.0
10.0
ø5.00
ø5.00
10.0
324.0
265.0
DISSIPATORE
CON VENTOLE
DI RAFFREDDAMENTO
POMPA PERISTALTICA
SENSORE
CONDENSA
CONVOGLIATORE
GAS IN
GAS OUT
SCARICO
ø5.00
10.0
ø5.00

3.3 Installation

The key dimensions of the refrigerator are shown on the drawings earlier.

Warning

It 'necessary to maintain a free space for the ventilation of ABE_300 fridge in correspondence with the cooling fan.
This area should never be less than 50 mm.

Warning

The installation site must be protected from weathering, the temperature must never fall below 0 ° C and not exceed 50 ° C.

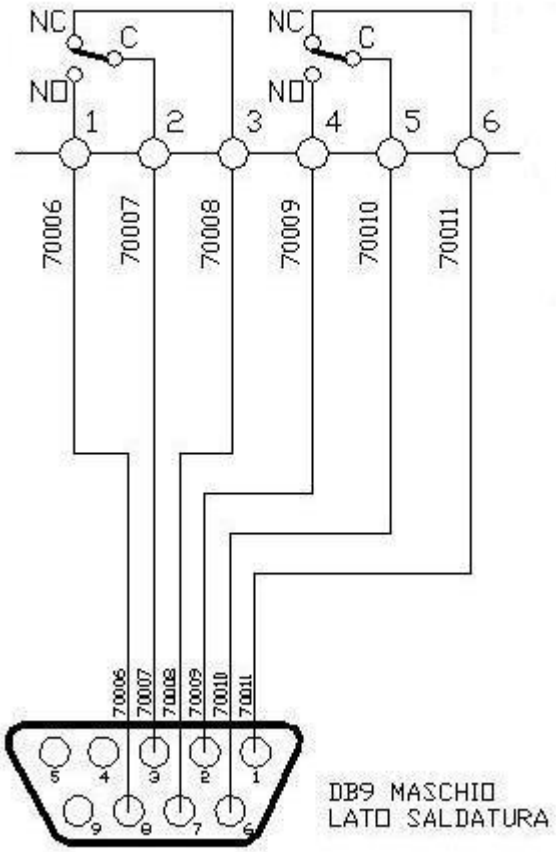
Warning

To prevent condensation, the tubing connecting the gas sample between sampling and the entry of gas into the fridge ABE_300 must have specific heating if the room temperature was very low.

3.4 Operation of the Fridge

The gas sample must be sent into the entrance of the fridge name "GAS", it flows in a circuit dedicated to the treatment.
Thanks to stabilized temperature circuit at a temperature settings by configure (factory setting is 2 degrees Celsius) the cooling water vapor condenses on it.
The condensate is separated from the gas and is collected in a tank and ejected through peristaltic pump.
The process gas leaves the fridge from the "GAS OUT" exit, meanwhile the condenses come out from the “SCARICO” exit.
The refrigerator can operate either in depression or in pressure.

3.5 Alarm contact



The terminal block the reporting of failures is configured as follows:

<u>CONDENSA ALARM</u>

PIN 3 COMUNE

PIN 8 CONTACT NO

PIN 7 CONTACT NC

<u>FRIDGE ALARM</u>

PIN 6 COMUNE

PIN 2 CONTACT NO

PIN 1 CONTACT NC

4.0 Structure and characteristics

FRIDGE ABE_300

- **SCREEN**

LCD Large ¼ VGA (320 * 240 pixels).
Backlit screen, high brightness, ability to vary the contrast.
High level of brightness, ability to vary the contrast.
Allows simultaneous viewing of all data in the fridge in numerical form and graphic (trend).

- **KEYBOARD**

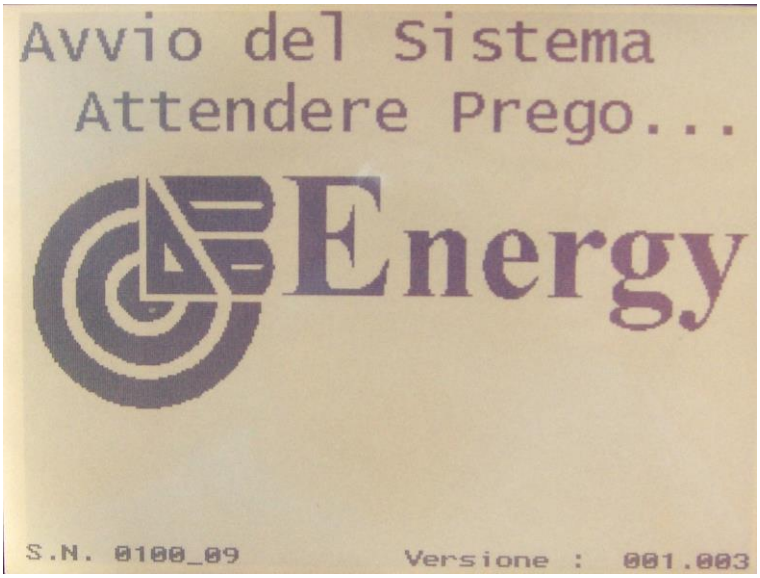
Membrane keyboard, alphanumeric most special functions (buttons embossed pressure crushes a "bubble" of stainless steel by producing the sensation of key).
Through it is possible the local management of all the features of the equipment.

Power Connector

The fridge start and red light comes on by pressing the red button on the right side.

POWER CONNECTOR

The system displays the startup screen of the system and starts the initialization phase that lasts about five seconds, as this stage will automatically switch to the main screen.



WARM UP

4.1 Function keys

Pressing the F1 key displays the main screen.

Pressing the F2 key you can display different data in graphic format (trend).

All variables are handled by the refrigerator stored in its internal memory and can support up to 4600 samples.

By pressing F3 you view the page for the password (Password: 123456).

After typing the correct password, you access the configuration menu of the fridge.

Pressing F1 leads to the screen for configuring the system.
By pressing F2 you access the screen for the configuration of analog inputs.
Pressing F4 to access various screens to configure the temperature of the gas.

Pressing ESC returns to main screen.

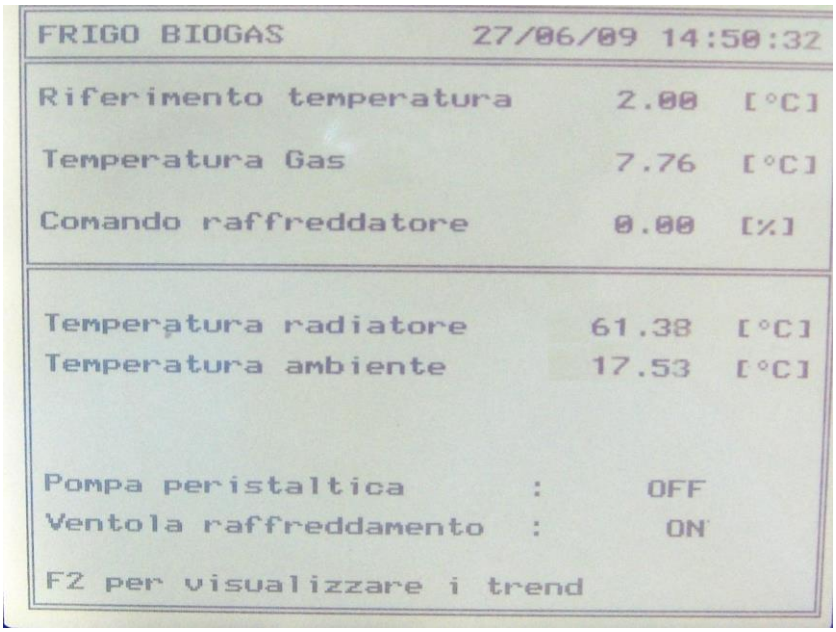
Pressing the PUMP, while viewing a configuration page will be loaded the window to save the changes.

Press the ENTER button to confirm. If the fridge is in alarm, press the button to reset.

Press the ESC button to exit the configuration window.

If the fridge is in alarm, press the Del button to temporarily disable the errors and return to the main page. If the alarms were not resolved after two minutes will reload the page errors.

4.2 Main screen



MAIN SCREEN

The main screen which are displayed in numerical form, all the variables read by the system.

(1) The first line in the upper right displays the date and time.
The internal clock works even when the fridge is switched off, constantly updating the date.

(2) The reference value of temperature (in degrees Celsius).

(3) The instantaneous value of the exit gas temperature (in degrees Celsius).

(4) The control of the cooler (in percentage).

(5) The value of the temperature of the radiator (in degrees Celsius).

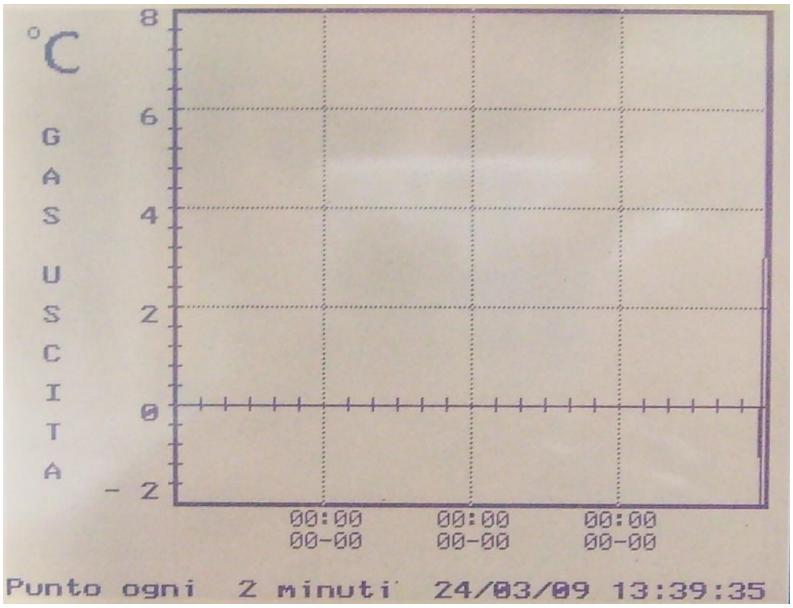
(6) The value of temperature (in degrees Celsius).

(7) The state of the peristaltic pump (OFF - ON)

(8) The state of the cooling fan (OFF - ON)

4.3 Trend

Pressing the F2 key you can display different data in graphic format (trend).



TREND

All variables are handled by the refrigerator stored in its internal memory and can support up to 4600 samples.

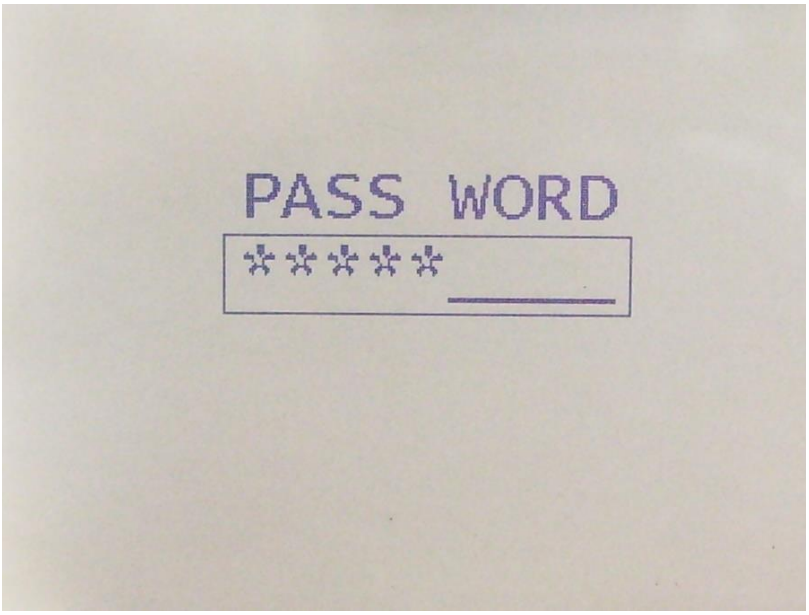
Pressing the keys under the symbol up or down you change the variable to display (temperature gas output, percentage of control, ambient temperature, radiator temperature).

Each screen displays a single variable at a time.
Each point shown represents a sampling stored.

Pressing the keys with the arrow symbol to the left or right, change the days displayed (shifts in time the x-axis), each time the button "left" displays the data in the previous screen.

4.4 Screen password

Pressing the F3 key will display the following screen



PASSWORD

Password: 123456

Inserting the right code is passed immediately in the first configuration page.
There are pages of configuration depending on the version.

Once inside the configuration you can move from page to page using keys F1 F2 F4.

To exit setup and return to the display pages just press the ESC key.

Save data

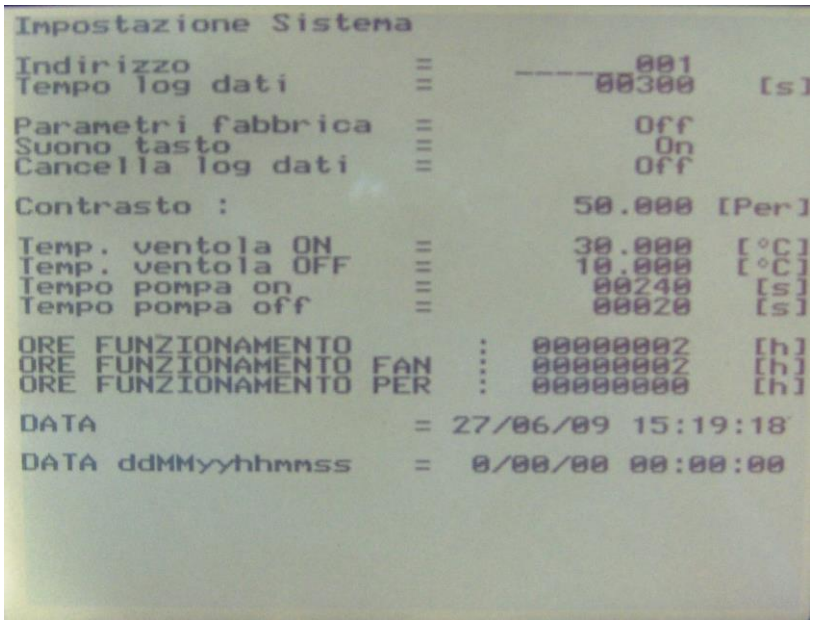
Within the pages of all configuration changes that are inserted (except the clock configuration) are stored only on the temporary memory that is lost at shutdown of the equipment.

To save the new values entered permanent press PUMP; in this way are recorded on a permanent all changes.

KEY PUMP

4.5 Configuration

From the main screen by pressing F3 you access the password page, enter the password and press F1 to bring up the following screen.



SYSTEM SETUP

• Address: If you have multiple devices on the network can be assigned an identification number to the device (option is not used for ABE_300).

• Time log data: Indicates (in seconds) how often new data is stored.

• Parameters Factory allows users to restore all the parameters of the refrigerator factory, if not saved will be maintained until the shutdown of the refrigerator.

• Key Sound: Specifies whether the "BIP" generated when pressing the buttons is active or not, change this parameter to select the sound key and enter 1 (ON) to activate the BIP or 0 (OFF) to disable it.

• Delete log data: allows the deletion of all log data stored.

Selecting the CLEAR LOG DATA parameter and inserting the value 1 (ON), proceed with the deletion of data in memory, once this has completed the parameter value is automatically returned to 0 (OFF).

• Contrast: indicates the contrast value on the screen (value between 0 and 100%).

When you see the main screen you can adjust the contrast of the display using the arrow keys up and down.

• Fan ON Time: Indicates how long the fan must remain on (in seconds).

• Time fan OFF: Indicates how long the fan must remain turned off (in seconds).

• Weather pump ON: Indicates how long the peristaltic pump to remain on (in seconds).

• Weather pump OFF: Indicates how long the peristaltic pump must be turned off (in seconds).

• Hours operation: Indicates the operating hours of the fridge.

• Fan operating hours: Indicates the hours of operation of the cooling fan.

• Ore function peristaltica: Select from the hours of operation of peristaltic pump.

• Date: The date and time set, selecting the DATA you can reset the date and time correct by the new data in the format (ddMMyyhhmmss).

For example if you are the 10:30:00 on 10 November 2009 write 101109103000 and press ENTER.

4.6 Analog input

The card has 8 analog converter operated by a high-resolution (24 bit) and programmable gain between 1 and 64. The first 2 channels have an input buffer amplifier made with a high-isolation and gain, the six channels feature a next input buffer gain one negative in common with inputs connected to the earth.

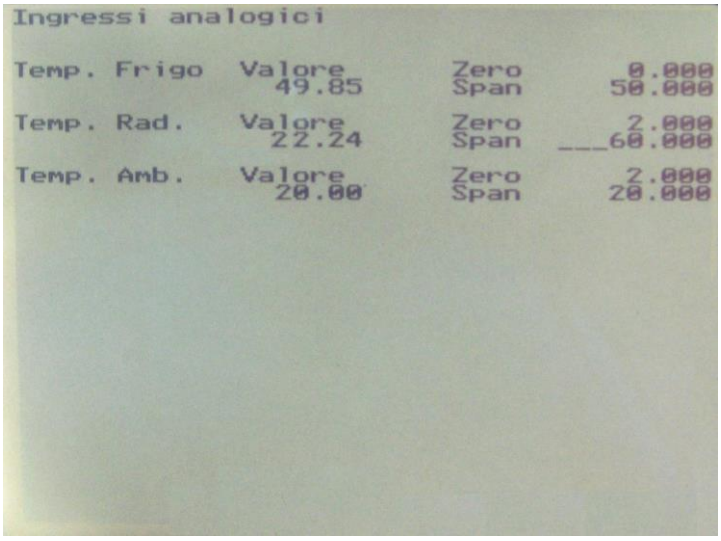
Analog input calibration

The calibration of the fridge ABE_300 should be directed to the staff of the company at least 1 time each year.

Instrumentation required for the calibration of analog inputs:

1. Stabilized voltage source of 0 to 5 volts.
2. Digital multimeter

From the main screen by pressing F3 you access the password page, enter the password and press F2, the following screen.



ANALOG INPUT

Position by using the "up" and "down" the value you want to change the number in this disappears and is replaced with a series of dashes, write the new value and press "Enter" the new value is acquired.

The significance of the various fields for each sensor input is given below:

• Low value: Indicates the value of zero (in engineering terms) of the measuring range desired for the channel.

• High value: indicates the value of span (in engineering terms) of the measuring range desired for the channel.

• Value read: displays the value read at the moment (read-only variable).

4.7 How to calibrate analog input

For the calibration of each channel to proceed with the following steps:

1. Connect the analogue input signal to zero take on zero value of the channel to write the value of zero.

2. Press the left arrow to capture and combine the reading with the value introduced by the converter.

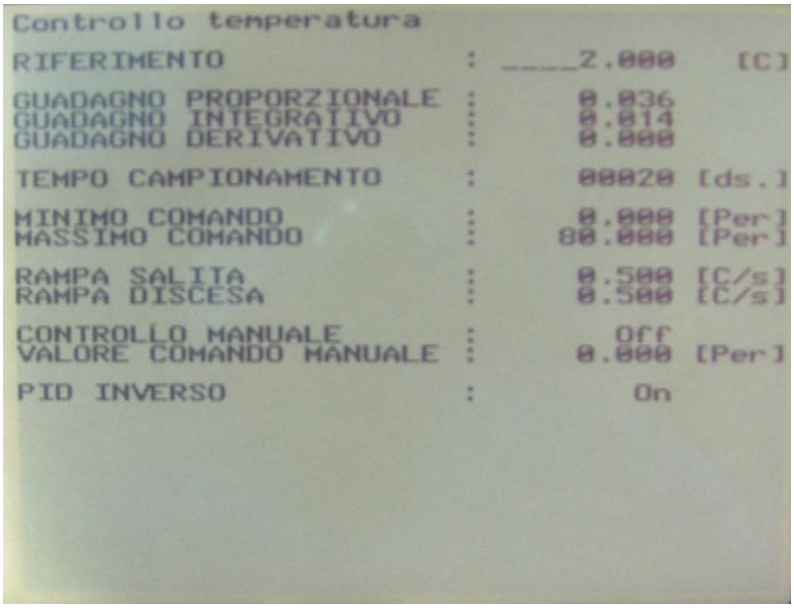
3. Connect the analogue input signal span bring the value of the channel span to write the value of span.

4. Press the left arrow to capture and bind the value read from the converter with the given span of introduced.

5. Press the fan to store the changes in non-volatile memory and confirm by pressing 2 times the enter key.

4.8 Configuration PID temperature

From the main screen by pressing F3 you access the password page,
introduce the password (123456) and press F4, the following screen appears.



SCREEN PID TEMPERATURE

• Reference: value of temperature that you want to have on the bottom plate.

• Proportional Gain: parameter of the PID control of temperature.

• Gain additional: parameter of the PID control of temperature.

• Derivative Gain: parameter of the PID control of temperature.

• Time of sampling: sampling time of PID control.

• Minimum Steering: minimum of PID.

• Maximum Steering: maximum of PID.

• Ramp slope: ramp of the PID.

• Ramp discasa: ramp down of the PID.

• Manual: enables or disables manual control.

Write 1 (ON) and to enter to enable manual control, writing in the manual control command value (0 - 100%) that you want to have. Write 0 to disable the manual control (OFF).

• Reverse PID: Writing 1 (ON) and to enter to enable the PID reverse. Write 0 (OFF) to disable the PID reverse.

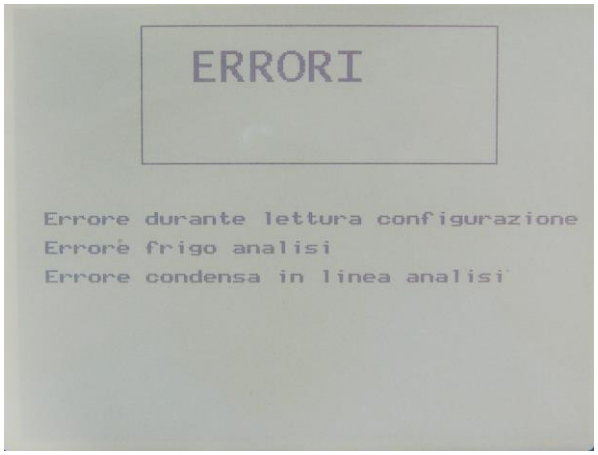
4.9 Errors screen

If the mini detects an alarm immediately displays the error window with the list of all active alarms at the moment.

The window of errors can be displayed even with the pressure of the F4 key from the main screen.

Pressing the "DEL" temporarily disables the display of this page and return to the main screen (eg to change the parameters).

If the error is not resolved within 2 minutes the system automatically repeats this page.



ERRORS SCREEN

Here is the list of possible errors:

• Error reading configuration
• Error analysis fridge
• Error analysis condenses the line

5.0 Power

POWER

The fridge ABE_300 is powered at 230 volts, power cord included.

The protection of the local electric refrigerator ABE_300 is charged to the customer.

For protection of the refrigerator, next to the power outlet is a fuse 6 A.

The length of the power line for the electrical protection must not exceed 3 meters.

To completely disconnect the refrigerator from the power supply remove the plug from the power supply.

6.0 Specification

Operational temperature	0 °C / 50 °C
Operational pressure	-500 / +500 mBar
Weight	8,5 Kg

6.1 Maintenance

Attention

Working with toxic gases must be ensured that the workplace can not rise to a harmful concentration on health.
In case of improper connection of the gas may rise to the danger of accidents due to toxic gases, combustible or explosive.

Attention

Components and electronic modules in this equipment must be protected against electrostatic charges and discharges.
For this reason, extensive protective measures should be taken wherever they are manufactured, tested, transported and installed.

Check monthly:

- The state and the proper functioning of the refrigerator ABE_300.
- The cleaning of the fridge and the cooling fan filter.
- The cleaning of pipes and fittings for gas.

Do not clean the pipes connected to the refrigerator with compressed air at a pressure of 500 mbar.

In the case of condensation in the gas circuit to clean the pipes, unscrew the hex cap behind the refrigerator and dry the electrodes.

7.0 Reshipment

The refrigerator should be shipped in original packaging. If the package no longer exists, the equipment should be wrapped in plastic film and then packed in a box lined with shock-proof material.

In case of shipping, the equipment should also be packed in a polyethylene film having a thickness of 0.02 mm and sealed airtight, with the addition of a desiccant. Also for this mode of shipment, the container is lined with a layer of tar paper on both sides.

In case of return under warranty, please attach the certificate of guarantee.

7.1 Addresses for forwarding

Technical assistance

For technical assistance contact the following numbers:

Tel: +39 015 9842253
Fax: +39 015 9233243
info@abenergy.it

Repairs

For rapid identification and elimination of the causes of incidents
Please send the equipment to the following address.

A.B.ENERGY S.R.L.
VIA AMENDOLA 340
13836 COSSATO (BI) ITALY

Tel.: +39 015 9842253
Fax: +39 015 9233243

EC DECLARATION OF CONFORMITY

A.B.Energy S.r.L.

Via Amendola, 340 13836 COSSATO (BI) Italia

AS MANIFACTURER

DECLARE

UNDER OUR SOLE RESPONSABILITY

THAT EQUIPMENT OF SERIES ABE-1000

AND RELATED ACCESSORIES,
TO WHICH THIS DECLARATION RELATES,
APPLIED UNDER CONDITION SUPPLIED IN THE USER'S MANUAL,
CONFORMS TO THE FOLLOWING STANDARDS OR NORMATIVE DOCUMENTS:

EN 61000-4-2 (1995-03)	Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 2: Electrostatic discharge immunity test. Basic EMC Publication.
EN 61000-4-3 (1996-09)	Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 3: Radiated, radio-frequency, electromagnetic field immunity test.
EN 61000-4-4 (1995-03)	Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 4: Electrical fast transient/burst immunity test. Basic EMC Publication.
EN 61000-4-6 (1996-07)	Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 6: Immunity to conducted disturbances, inducted by radio-freuquency fields.

FOLLOWING THE PREVOSIONS OF ELECTROMAGNETIC COMPATIBILITY DIRECTIVE

89/336/EEC AND SUBSEQUENT AMENDMENTS 92/31/EEC, 93/68/EEC AND 93/97/EEC.

Cossato, 04/05/2006

Andrea Ing. Baroni

A.B.Energy S.r.L.