

echo100

**COMPUTER FOR THE MANAGEMENT OF BOOMS
WITH AIR SLEEVE**



CE

46700200

Software rel. 1.0.x

INSTALLATION, USE AND MAINTENANCE

LEGEND OF SYMBOLS

	= Generic danger
	= Warning

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This manual is an integral part of the equipment to which it refers and must accompany the equipment in case of sale or change of ownership. Keep it for any future reference; ARAG reserves the right to modify product specifications and instructions at any moment and without notice.

MANUAL FOREWORD AND USE

This manual provides instructions to assemble, connect and set the device.
Any other information is provided in specific sheets to be used exclusively by the installer, containing specific information of each model.

MANUAL USE MODES

The section of this manual dedicated to the installation contains information for installers. For this reason we have used technical terms without providing explanations which would be necessary for end users only.

THE INSTALLATION MUST BE CARRIED OUT BY AUTHORIZED AND SKILLED PERSONNEL ONLY.

RESPONSIBILITY

The installer must carry out workmanlike installations and ensure to the end user the perfect operation of the whole system both with ARAG components only and other brands' components.

ARAG always recommends using its components to install control systems.

The installer will be held responsible for any malfunction if he decides to use other brands' components even without actually changing the system parts or harness.

The compatibility check with components and accessories of other manufacturers shall be carried out by the installer.

If the device or the ARAG components installed together with other brands' components get damaged because of what stated above, no direct or indirect warranty will be provided.

1 PRODUCT DESCRIPTION

The equipment you have purchased is a device allowing to display and manage the rotation speed of the fan for air sleeve, acting on a hydraulic proportional valve directly from the cabin of the farming machine it is installed in.

2 RISKS AND PROTECTIONS BEFORE ASSEMBLY


All installation works must be done with battery disconnected, using suitable tools and any individual protection equipment deemed necessary.

 **Use ONLY clean water for treatment tests and simulations: using chemicals during simulated treatment runs can seriously injure persons in the vicinity.**

3 INTENDED USE

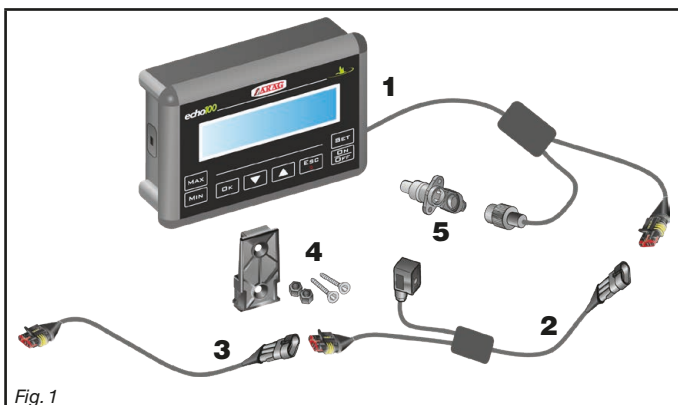
 This device is designed to work on agricultural machinery for spraying and crop spraying applications. The equipment is designed and built in compliance with UNI EN ISO 14982 standard (Agricultural and forestry machinery - Electromagnetic compatibility - Test methods and acceptance criteria), harmonized with EMC Directive - 2014/30/EU.

4 PRECAUTIONS

- 
- Do not aim water jets at the equipment.
 - Do not use solvents or fuel to clean the case outer surface.
 - Do not clean equipment with direct water jets.
 - Comply with the specified power voltage (12 VDC).
 - In case of voltaic arc welding, remove connectors from the device and disconnect the power cables.
 - Only use ARAG genuine spare parts and accessories.

5 PACKAGE CONTENT

The table below indicates the components that you will find in the package:



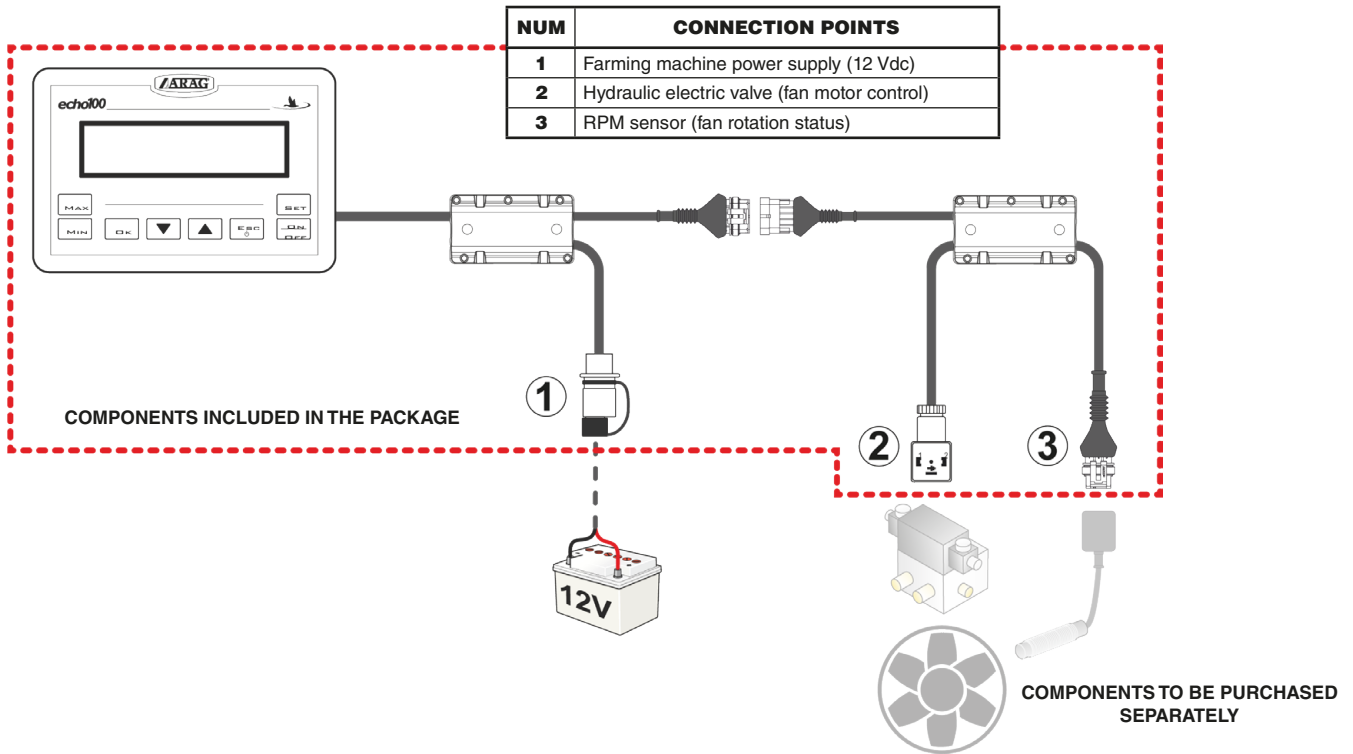
Legend:

- 1 ECHO 100 (power cable included)
- 2 Sensor and valve connection cable
- 3 Sensor connection cable (7.5 m)
- 4 Fixing kit
- 5 Power supply connector

Fig. 1

6 POSITION ON FARMING MACHINE

6.1 Diagram for connection



6.2 Positioning

• ECHO 100 must be placed in the control cabin of the farming machine. Observe the following precautions:



- Do NOT install the device in areas where it would be subjected to excessive vibrations or shocks, to prevent any damage or accidental use of the control keys;
- Install the device in a visible position within easy reach by hand; bear in mind that the device should not obstruct the operator's freedom of movement or block his/her view.



Consider all necessary connections of the device, the cable length, and make sure there is enough space for connectors and cables.

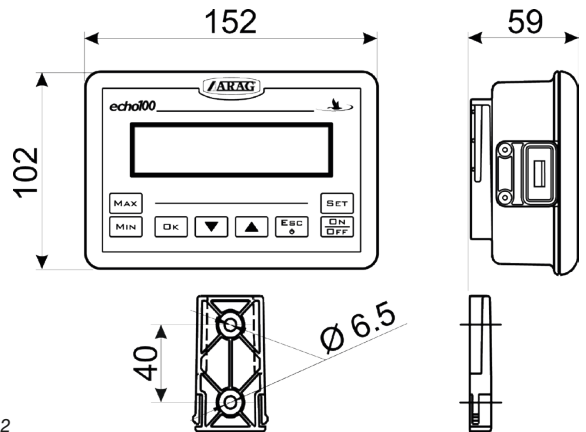


Fig. 2

6.3 Bracket fixing

The device must be mounted after having fixed the bracket at the desired location (the previous paragraph shows the bracket drilling template).

The bracket must be slid out of the device seat (A, Fig. 3) and fixed using the supplied screws (B).

Make sure the bracket is securely mounted, fit the device on it, and push it until it locks in place (C).

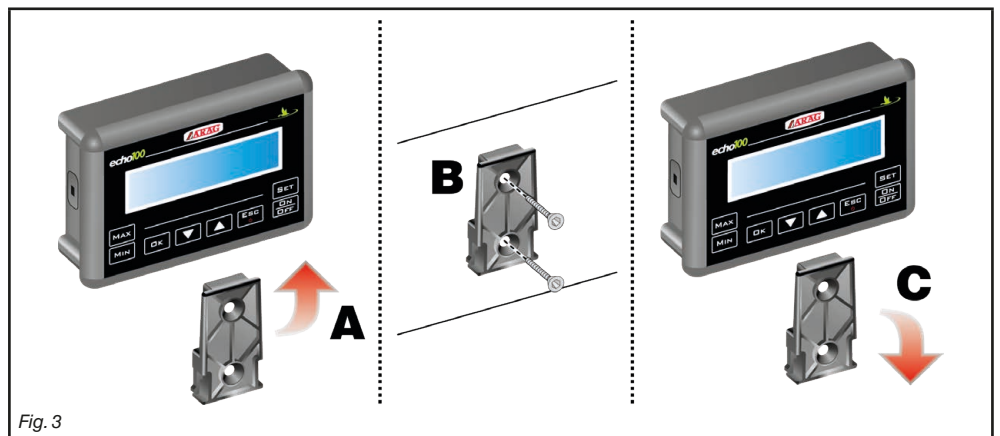


Fig. 3



WARNING: ECHO 100 must be fastened by means of the supplied bracket only, using suitable screws. OTHER FASTENING METHODS ARE NOT ALLOWED. ARAG is not liable for any damage to the equipment, persons or animals caused by failure to observe the above instructions.

7 WIRING CONNECTIONS

- Only use ARAG harnesses suitable for ECHO 100.
- Take care not to break, pull, tear or cut the cables.
- Use of unsuitable cables not provided by ARAG automatically voids the warranty.
- ARAG is not liable for any damage to the equipment, persons or animals caused by failure to observe the above instructions.

7.1 General precautions for a correct harness position

- **Securing the cables:**
 - secure the harness so that it does not interfere with moving parts;
 - route the harnesses so that they cannot be damaged or broken by machine movements or twisting.
- **Routing the cables to protect against water infiltrations:**
 - the cable branches must ALWAYS be facing down (Fig. 4).



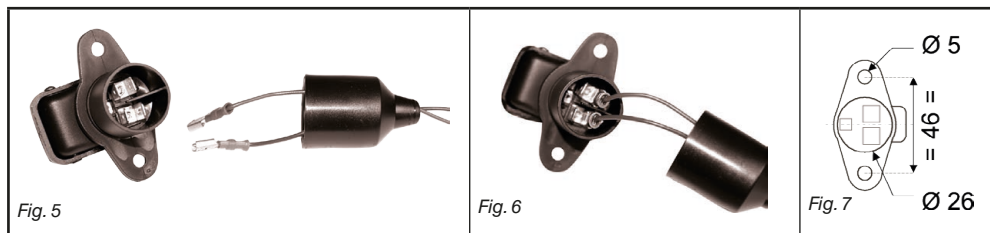
Fig. 4

- **Fitting the cables to the connection points:**
 - Do not force the connectors by pushing too hard or bending them: the contacts may be damaged and device operation may be compromised.

 Use **ONLY** the cables and accessories indicated in the catalog, having technical features suitable for the use to be made of them.

7.2 Power supply connection

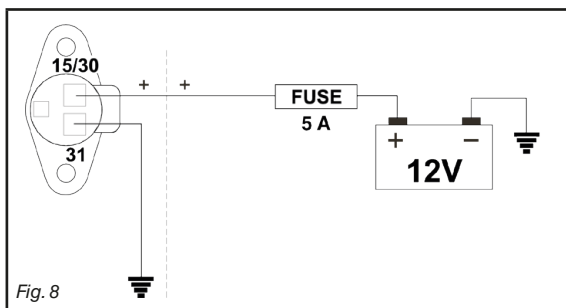
The power connector must be directly connected to the battery of the farming machine;
Fig. 7 shows the drilling template of the power connector.



WARNING:
To avoid short circuits, do not connect the power cables to battery before the installation is completed.
Before powering up the device, make sure the battery voltage is as specified (12 Vdc).

ECHO100 is directly supplied by the battery of the farming machine (12 Vdc): ALWAYS switch on the system through the device, and then remember to switch it off using the specific key on the control panel.

If ECHO100 remains on for a long time with machine off, the tractor battery could run flat: in case of prolonged breaks of the machine with engine off, make sure the device is off, too.



The power source must be connected as indicated in Fig. 8: **the device must be directly connected to the farming machine battery. Do NOT connect the device to key-operated switch (15/54).**
The power circuit shall ALWAYS be protected by a 10 A fuse like the ones for automotive applications.
All cables connected to the battery shall have a minimum cross-section of 2.5 sq. mm.

8 ACCESSORIES

8.1 Pendrive (not included)

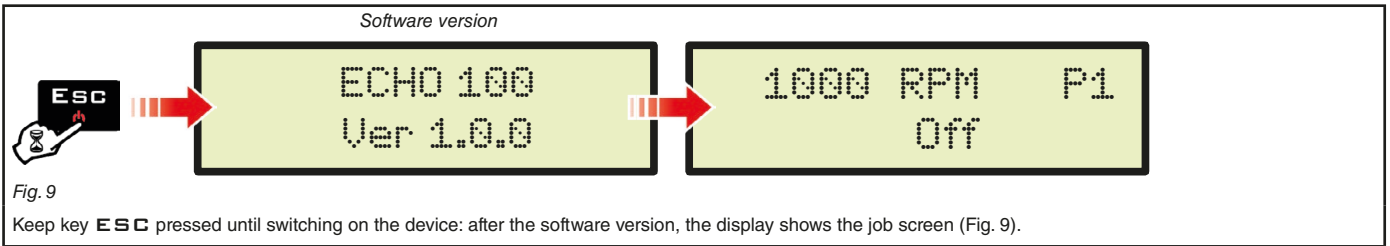
The pendrive may be used to exchange data with ECHO100.

Before using the pendrive, format it in FAT 32 mode; make sure that it is not protected and can be read by the system. Most pendrives with up to 2 Gb memory are compatible.

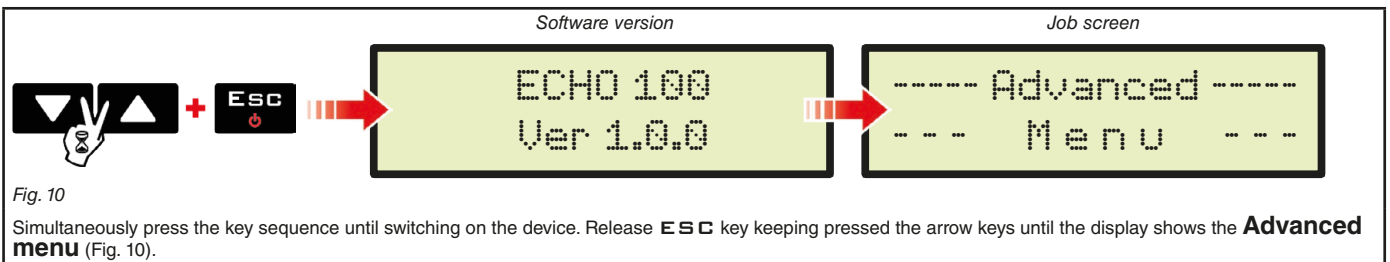
9 SETUP

9.1 Turning ON / OFF

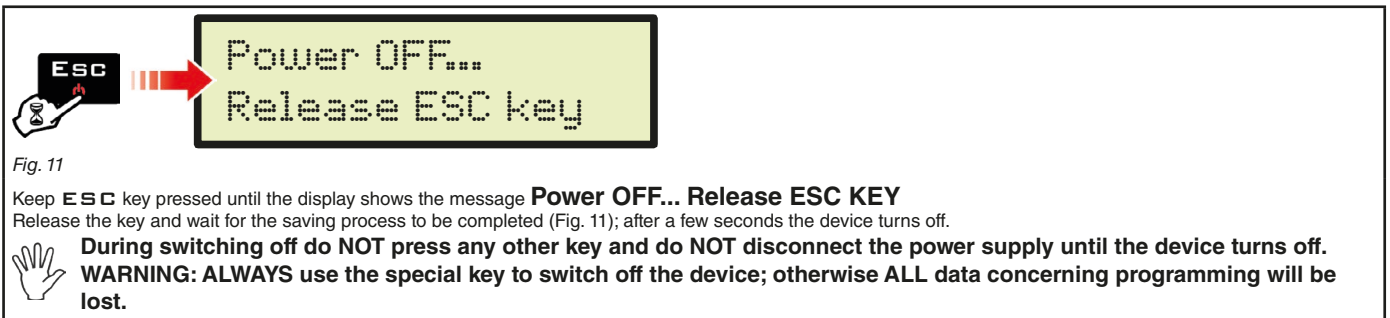
• Ordinary switching on



• Switching on to activate the advanced setup



• Switching off



9.2 Use of keys for setup

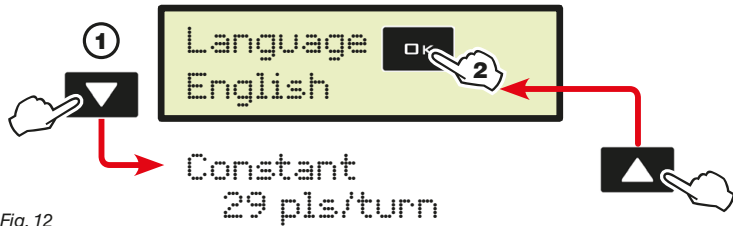


Fig. 12

1 Press the arrow keys in succession to move across the menu items (▼ next item, ▲ previous item); the selected item will be displayed (Fig. 12).

2 Press **OK** to access the menu: during set-up, a cursor blinks on the display (Fig. 13).

DATA SELECTION



Fig. 13

When it is about a simple selection of data, the display shows the active value (Fig. 13):

3a Press the arrow keys in succession to select another value (▲ next value, ▼ previous value); the selected value will be displayed.

4a Confirm with **OK**.

*Quick scrolling: keep one of the arrow keys pressed.
Exit without confirming the change: press **ESC**.*

ACCESS TO A SUBMENU

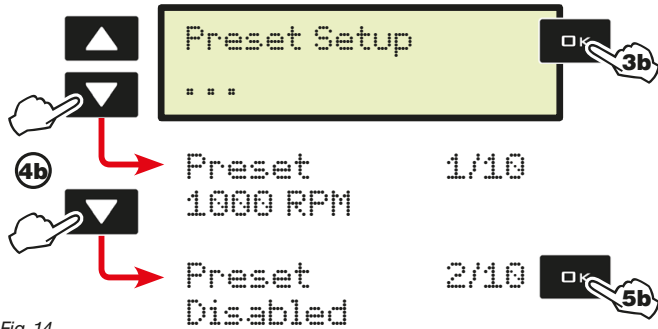


Fig. 14

If there is a sub-menu, the display shows three dots "..." (Fig. 14):

3b Press **OK** to access the sub-menu.

4b Press repeatedly to toggle from one item to another of the sub-menu (▲ next item, ▼ previous item); the selected item will be displayed.

5b Click **OK** to access the selected item.

*Quick scrolling: keep one of the arrow keys pressed.
Press **ESC** to go back to the previous level of the menu.*

ENTERING A NUMERICAL VALUE

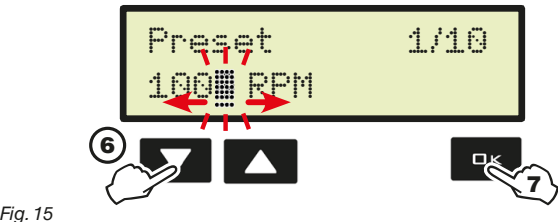


Fig. 15

6 Press in succession to change the value selected by the cursor (▲ increase, ▼ decrease).

7 Press **OK** to confirm the data.

*Quick increase / decrease: keep one of the arrow keys pressed.
Exit without confirming the change: press **ESC**.*

Below is a summary of key functions during setup.

		Menu item scrolling or Data increase/decrease		Confirms access to menu or data change		Quits the menu or the data change		Par. 9.2
--	--	---	--	--	--	-----------------------------------	--	----------

10 ADVANCED SETUP

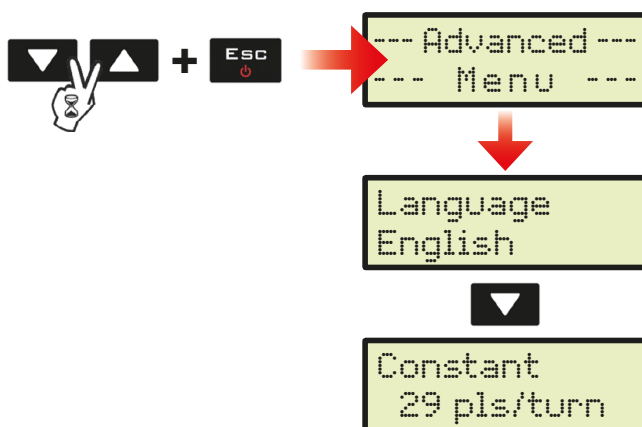
The computer can be set-up with all the data required to ensure a correct configuration of the device.
This operation must be done once only, when installing the computer.

10.1 Tests and checks before programming

Before proceeding with device programming, check the correct installation of all components, the connection to the power supply and to the components. The wrong connection to the system or the use of components other than the specified ones might damage the device or its components.

10.2 Access to the Advanced menu (with device OFF)

- Simultaneously press the key sequence until switching on the device.
- Release **ESC** key by keeping the arrow keys pressed until the menu is displayed.



- **Language:**
set the language of displayed messages among the available ones: Italian, English, Spanish, German, French, Russian.
- **Constant:**
set the number of pulses detected by the sensor per revolution of the air sleeve fan.



Menu item scrolling or
Data increase/decrease



Confirms access to menu
or data change



Quits the menu or
the data change



Par. 9.2

10.3 Access to the User Menu (with device ON)

Keep the **OK** key pressed until the menu is displayed:

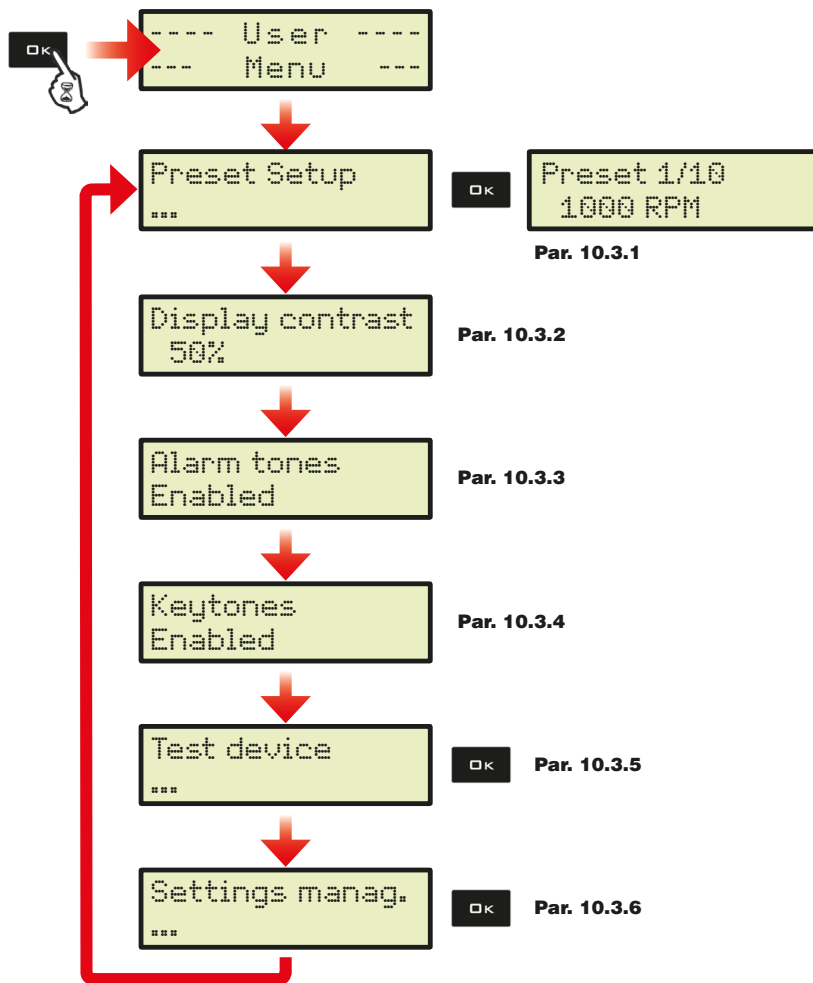


Fig. 16

10.3.1 Preset Setup

Allows setting 10 different types of programs, each one defining the RPM value necessary for fan management.

- Access the **Preset Setup** menu.
- Select the program number.
- Press **OK** to access the modification of the selected program.
- Enter the desired value.

Every press of the arrow keys corresponds to a change of 100 rpm (▲ increases / ▼ decreases).

10.3.2 Display contrast

Allows adjusting the display contrast.

10.3.3 Alarm tones:

It allows ENABLING/DISABLING the relevant alarm tones.

10.3.4 Keytones

It allows ENABLING/DISABLING the relevant keytones.

10.3.5 Test device (tests are reading-only data):

• Display operation test

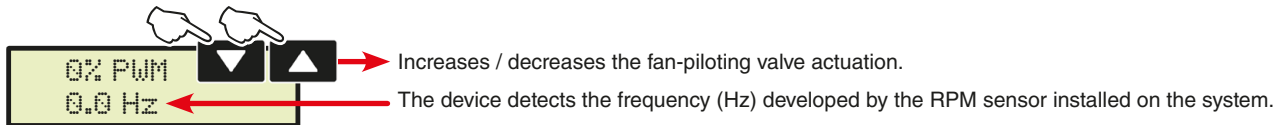
Turns on all the display points to test their correct operation.

• Battery voltage

Displays the supply voltage.

• Test PWM

Allows testing the correct operation of the hydraulic circuit and of the relevant fan-piloting valve.



• Keyboard

Press the keys to view the relevant item (▲ ▼ and **ESC** cannot be tested).

MAX = **MAX KEY**, **MIN** = **MIN KEY**, **OK** = **OK KEY**, **ON/OFF** = **ON/OFF KEY**, **SET** = **SET KEY**).

• SW Version

Displays software version.

10.3.6 Settings manag.:

Device settings can be loaded or saved on a pendrive so as to reconfigure the device if necessary, solve problems or configure another ECHO 100 without repeating all operations manually.

To use the menu items insert the pendrive in the suitable slot.



Once installation is completed, and you checked machine correct operation, we recommend you to store the whole configuration onto pendrive.

• Save

Allows saving the device configuration on the pendrive: then it will be possible to load it any time it is necessary to repeat the same settings.

- Select **Save** and press **OK**. The confirmation message **Ok SETUP.BIN** is displayed once the saving process is completed.

- Press **ESC**.

SAVING ALARMS

USB not found: pendrive not inserted.

Error: no more space available on the pendrive. Delete files from the memory and try saving again.

If the problems persist, please contact the Service Center.

File not found: the **SETUP.BIN** configuration has not been saved on the pendrive.

• Load

Allows selecting a configuration file saved on the pendrive and setting the device again.



WARNING: BY LOADING IN THE DEVICE THE SETUP.BIN FILE CONTAINED IN THE PENDRIVE, ALL SETTINGS CARRIED OUT SO FAR WILL BE LOST.

- Select **Load** and press **OK**. The confirmation message **Ok SETUP.BIN** is displayed once the configuration process is completed.

- Press **ESC**.

CONFIGURATION ALARM:

USB not found: pendrive not inserted.



Menu item scrolling or
Data increase/decrease



Confirms access to menu
or data change



Quits the menu or
the data change



Par. 9.2

12 MAINTENANCE / DIAGNOSTICS / REPAIRS

12.1 Troubleshooting

FAULT	DISPLAYED ERROR OPERATION ERROR DETECTED	CAUSE	REMEDY
The display does not switch on	--	No power supply Device is OFF	Check power supply connection (par. 6.1) Press the ON key
Displayed error	Battery Voltage	Power supply voltage is below 9 V	Check power supply voltage
Hydraulic valve controls take no effect	--	The valve is not connected	Check electric connection Connect connector Replace the connecting cable (par. 6.1)
		No power supply to valve	Check electric connection Check valve operation, as described in par. 10.3.5 Test device > Test PWM: work on the PWM value, checking the actuation of the fan-piloting valve
The display does not show the RPM value The set RPM value cannot be reached	Attention!	Valve is not connected and fan is not moving	Check electric connection Connect connector Replace the connecting cable (par. 6.1)
		No power supply to valve	Check valve electric connection and operation
		Problem on the oil-hydraulic circuit	Contact machine manufacturer to have the oil-hydraulic circuit checked
		Wrong programming of the RPM target value	Check programming (par. 10.3.1 - 11.1.1)
		No signal coming from the RPM sensor	Check connections to RPM sensor Check RPM sensor installation Check RPM sensor operation, as described in par. 10.3.5 Test device > Test PWM: work on the PWM value, checking that RPM sensor develops a frequency due to fan movement

12.2 Cleaning rules

- Clean only with a soft wet cloth.
- DO NOT use aggressive detergents or products.
- Do NOT clean the device with direct water jets.

13 TECHNICAL DATA

• **Advanced menu**

Data	Description	Min.	Max.	UOM	DEFAULT	Other values that can be set / Notes
Language	Display language	--	--	--	English	English, Italian, German, French, Russian
Constant	Phonic wheel constant	1	1000	pls/turn	29	--

pls = pulse

• **User menu**

Data	Description	Min.	Max.	UOM	DEFAULT	Other values that can be set / Notes
Preset Setup	Select a job that can be set	1	10	--	5	--
	RPM type	100	9900	RPM	1000 1500 2000 2500 3000	--
Display contrast	Contrast adjustment	0	100	%	50	--
Alarm tones	Alarm tones enabling / disabling	--	--	--	Enabled	Disabled
Keytones	Keytones enabling / disabling	--	--	--	Enabled	Disabled

13.1 Technical data

Description	
Display	Alphanumeric LCD 2 lines x 16 characters, backlit
Power supply voltage	11 ÷ 14 Vdc
Consumption (valves excluded)	300 mA
Operating temperature	0°C ÷ 60 °C +32°F ÷ +140 °F
Digital inputs	for open collector sensors: max 2000 imp/s
Weight	800 g - ECHO 100
Protection against polarity inversion	•
Protection against short-circuit	•

14 END-OF-LIFE DISPOSAL

Dispose of the system in compliance with the established legislation in the country of use.

15 GUARANTEE TERMS

1. ARAG s.r.l. guarantees this apparatus for a period of 360 days (1 year) from the date of sale to the client user (date of the goods delivery note).
The components of the apparatus, that in the unappealable opinion of ARAG are faulty due to an original defect in the material or production process, will be repaired or replaced free of charge at the nearest Assistance Center operating at the moment the request for intervention is made. The following costs are excluded:
 - disassembly and reassembly of the apparatus from the original system;
 - transport of the apparatus to the Assistance Center.
2. The following are not covered by the guarantee:
 - damage caused by transport (scratches, dents and similar);
 - damage due to incorrect installation or to faults originating from insufficient or inadequate characteristics of the electrical system, or to alterations resulting from environmental, climatic or other conditions;
 - damage due to the use of unsuitable chemical products, for spraying, watering, weedkilling or any other crop treatment, that may damage the apparatus;
 - malfunctioning caused by negligence, mishandling, lack of know how, repairs or modifications carried out by unauthorized personnel;
 - incorrect installation and regulation;
 - damage or malfunction caused by the lack of ordinary maintenance, such as cleaning of filters, nozzles, etc.;
 - anything that can be considered to be normal wear and tear;
3. Repairing the apparatus will be carried out within time limits compatible with the organizational needs of the Assistance Center.
No guarantee conditions will be recognized for those units or components that have not been previously washed and cleaned to remove residue of the products used;
4. Repairs carried out under guarantee are guaranteed for one year (360 days) from the replacement or repair date.
5. ARAG will not recognize any further expressed or intended guarantees, apart from those listed here.
No representative or retailer is authorized to take on any other responsibility relative to ARAG products.
The period of the guarantees recognized by law, including the commercial guarantees and allowances for special purposes are limited, in length of time, to the validities given here.
In no case will ARAG recognize loss of profits, either direct, indirect, special or subsequent to any damage.
6. The parts replaced under guarantee remain the property of ARAG.
7. All safety information present in the sales documents regarding limits in use, performance and product characteristics must be transferred to the end user as a responsibility of the purchaser.
8. Any controversy must be presented to the Reggio Emilia Law Court.

16 EU DECLARATION OF CONFORMITY

The declaration of conformity is available at the website www.aragnet.com, in the relevant section.

Only use genuine ARAG accessories or spare parts to make sure manufacturer guaranteed safety conditions are maintained in time. Always refer to the internet address www.aragnet.com.

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