目录

~~BOZZA~~

P1P51FC20 - 001 : Operation

1. Information

Release

This document is integrally valid except for errors or omissions.

Release	Description	Date
1.0	New manual.	11/07/13

2. Hmi

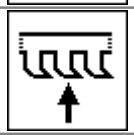
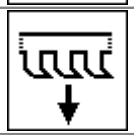
Conventions adopted

The conventions adopted for the whole operator interface are:

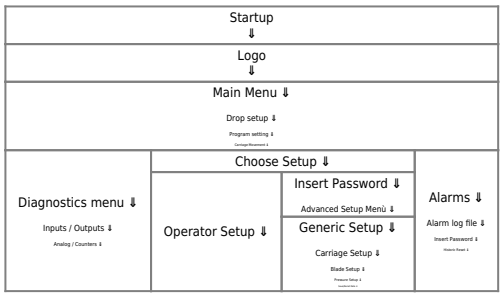
- The red-coloured (yellow-coloured in the set-up) values can be modified by the operator. To modify them, you can touch them to set them in the Entry state and use the virtual keyboard to enter the data, followed by the key  to confirm.
- Some parameters ensure a choice between two or more settings. To select the required setting use the key  .

Function keys:

The function keys are enabled in each page.

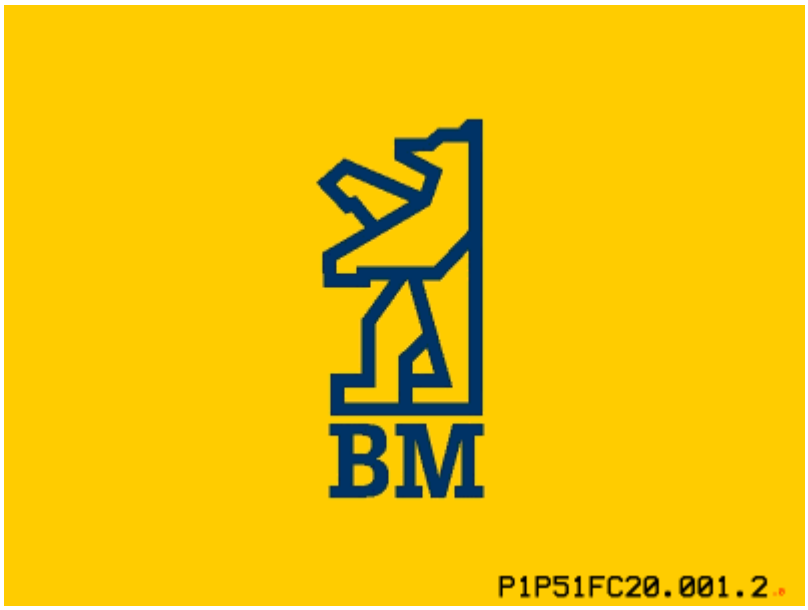
Key	*Icon*	*Description*	*Led*
F1		**MANUAL / AUTOMATIC SELECTOR.** Press to pass from the manual state to the automatic one and vice versa.	**Machine state** **OFF :** machine in manual. **BLINK :** in automatic – automatic cycle off **ON :** in automatic – automatic cycle on.
F2		**START / STOP WORK CYCLE.** Press to activate or deactivate the cutting cycle.	**State of cutting cycle** **OFF:** cutting cycle off **ON :** cutting cycle on
F3		**JOG FORWARD CARRIAGE AXIS.** Press to move the carriage forward	Not used
F4		**JOG BACKWARD CARRIAGE AXIS.** Press to move the carriage backward	Not used
F5		**JOG UP BLADE AXIS.** Press to move the blade up.	Not used
F6		**JOG DOWN BLADE AXIS.** Press to move the blade down.	Not used

Sailing among the visualizations



Start page

The logo page is displayed for 5 seconds, then the main page is automatically displayed.



Common parts

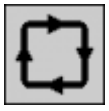
Machine state

The machine state is always displayed in the upper left side:

 : machine in ALARM

 : machine in MANUAL

: machine in AUTOMATIC - work cycle OFF

 : machine in AUTOMATIC - work cycle ON

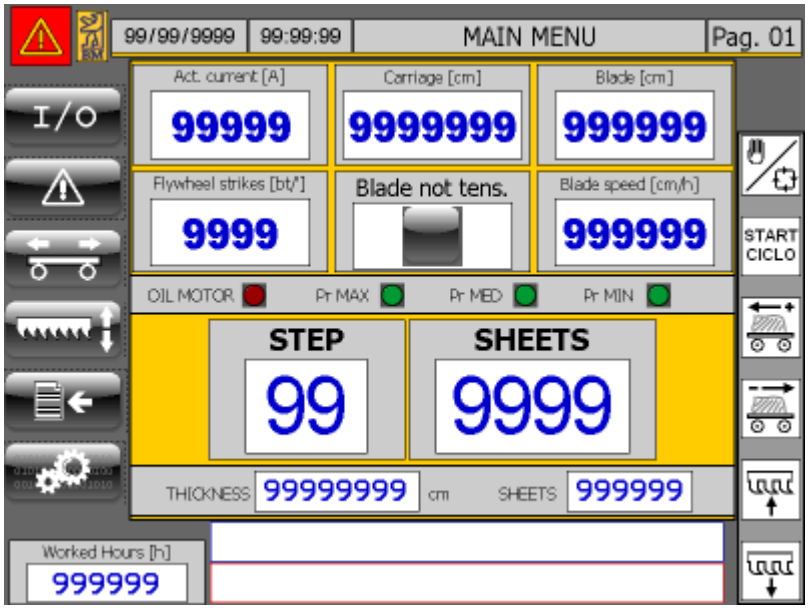
Date, time, page

Each page indicates the current date and time (which can be set in the general setup) and is clearly identifiable by a title and a progressive number.

Latest alarm

A field on a white background with a red outline, located on the bottom side of the page indicates, in case of machine in alarm, the latest emergency occurred. To display the full list or the log list from the latest reset, access the specific section.

Main menu



The left side of the page displays the keys to be pressed to pass to the other pages of the project:

 : access to the DIAGNOSTICS pages

 : access to the ALARMS pages

 : access to the CARRIAGE MOVEMENT page

 : access to the DROP SETTING page

 : access to the PROGRAMS SETTING page

 : access to the SETUP pages

The middle side of the page indicates:

On the upper side:

- **ABSORBED CURRENT [A] :** the instantaneous current which is absorbed by the flywheel motor during the cutting phase. In setup you can set a maximum threshold to generate an excessive effort alarm;
- **CARRIAGE [cm] :** the position of the Carriage axis;
- **BLADE [cm] :** the position of the Blade axis;
- **FLYWHEL STROKES [bt/'] :** the strokes per minute of the flywheel;
- **DROP SPEED [cm/h] :** the movement speed of the Blade axis displayed in centimeters/hour.

At the middle of the page there is the button to activate the tensioning of the blade with the relevant message about the state and below the led signals of the states of the output of oil control unit and the three pressure switches of the tensioning levels of the blade.

Below there is the indication about any set automatic cycle: the number of the step used and the number of the slabs that have been cut for that step. Below there is a line that indicates the programmed step that is working in that moment for the automatic cycle.

The bottom of the page displays:

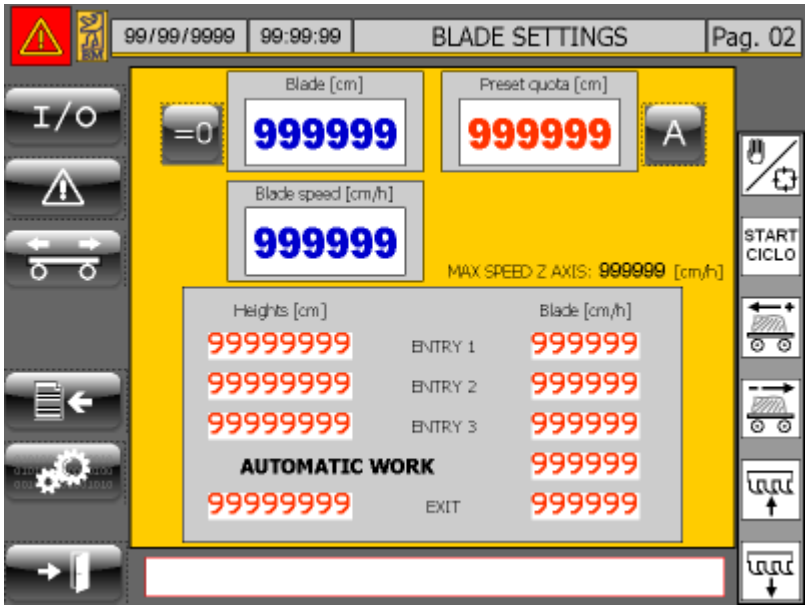
- **WORK HOURS [h] :** total of the work hours of the machine. The machine is considered as working when the flywheel motor is on.

Warnings

The bottom side, in the white field with a blue outline, displays the messages of the system which do not require a stop in case of alarm:

Message	Description	Resolution
Switch on the blade motor	At the automatic cycle start it was detected that the blade motor is not running.	Switch on the motor.
No water pressure	At the automatic cycle start it was detected no pressure in the water circuit	Check any leaks Check that I2 = ON
Number of cuts> block dimension	After leaving the automatic cycle programming page, it was detected that the set number of cuts is higher than the dimension of block.	Check the validity of the data entered in the PROGRAM SETTING page.
Raise data set error	After leaving the drop setting page it was detected that the setting of the entry 5 is not correct	Verify and correct the data
Lowering quota error	After leaving the drop setting page it was detected that the sum of the set entries exceeds the total cutting value	Check the validity of the data entered in the DROP SETTING page.
Step or number of slabs is null	After leaving the automatic cycle programming page, it was detected that in a step of the program one of the two data has been set to 0.	Check the validity of the data entered in the PROGRAM SETTING page.
Null speed has been set	After leaving the drop setting page it was detected that a null speed was associated to an entry value	Check the validity of the data entered in the DROP SETTING page.
Null automatic speed	After leaving the drop setting page it was detected that the AUTOMATIC WORK data was set to 0	Check the validity of the data entered in the DROP SETTING page.
Automatic cycle ended	Message that signals the automatic cycle has ended	
Pre-set in progress	The device is searching the zero quota and the preset quota	
Default data restore	The default restore procedure has been carried out.	

Drop setup



 : return to the MAIN MENU page.

This page sets the entry speed of the blade into the material to be cut during the automatic cycle.

Blade [cm]	Instantaneous position of the Blade axis expressed in centimetres.
Drop speed [cm/h]	Instantaneous speed of the Blade axis expressed in centimetres/hour.
	Press for 7 seconds to reset the position of the blade axis.
Preset quota [cm]	Height value of the blade axis which is used to calculate the heights of the various entry speeds which are set in the bottom side. Arrival value of the blade axis lifting at the end of each cut. It is important to be sure that this value is actually higher than the maximum height of the block, to avoid that the carriage starts moving when the blade is still inside the block
	Press to learn the pre-set value of the blade axis. Before any automatic cycle it is recommended to set the blade to a safety value above the block and learn the relevant pre-set value through this key

You can set 3 different heights (**ENTRY 1, ENTRY 2 and ENTRY 3**) during the entry of the blade into the block and associate a different drop speed to each of them.

- **Height [cm]** : INCREMENTAL value during which the drop speed set in Speed [cm/h] is activated
- **Speed [cm/h]** : drop speed of the blade axis used for the associated height.

AUTOMATIC WORK : at the end of the space used for the entry of the blade into the block, the remainder of the lowering uses the speed that was set in this parameter.

USCITA : Space of cutting end.

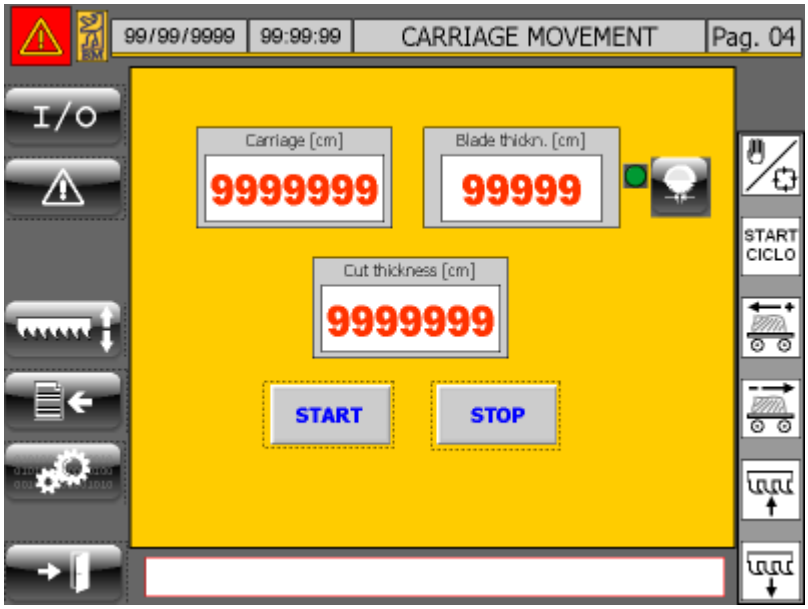
Example: You want to set a pre-set value of 100 and three Heights of 10 (with speed A), 20 (with speed B) and 30 (with speed C). Besides the automatic work is set at speed D and an exit 5 with speed E.

When the automatic cycle starts the machine will perform the first 10 cm at speed A, the second 20 cm at speed B and the next 30 cm at speed C. The other 35 cm (100 – Entry 1 – Entry 2 – Entry 3 – EXIT) will be performed at speed D.

The last 5 will be performed at speed E. At the end of the downward movement the blade moves up again with maximum speed.

NB. You can enter a Height equal to 0 but you cannot associate a null Speed to a Height.

Carriage Movement

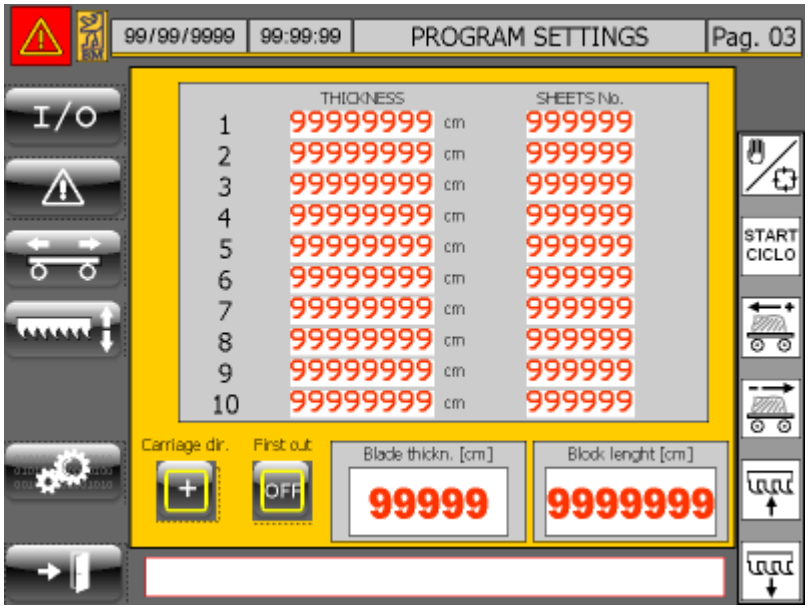


 : return to the MAIN MENU page

In this page you can reset the value of the Carriage and use the semi-automatic positioning function.

Carriage [cm]	Instantaneous position of the axis of the Carriage expressed in centimetres.
Blade thickness [cm]	Thickness of the cutting blade expressed in centimetres.
	Press to enable/disable the correction of the positioning value of the Carriage with the thickness of the cutting blade. An associated led indicates if the correction is present (ON) or is not (OFF).
Target value [cm]	Movement value of the axis of the Carriage. This positioning is more accurate than the jog functions of the axis. The entered value is meant as the INCREMENTAL movement of the axis..
START	Press the START button to start the positioning of the carriage at the set value.
STOP	Press the STOP button anytime if you want to stop the positioning of the Carriage axis.

Program setting



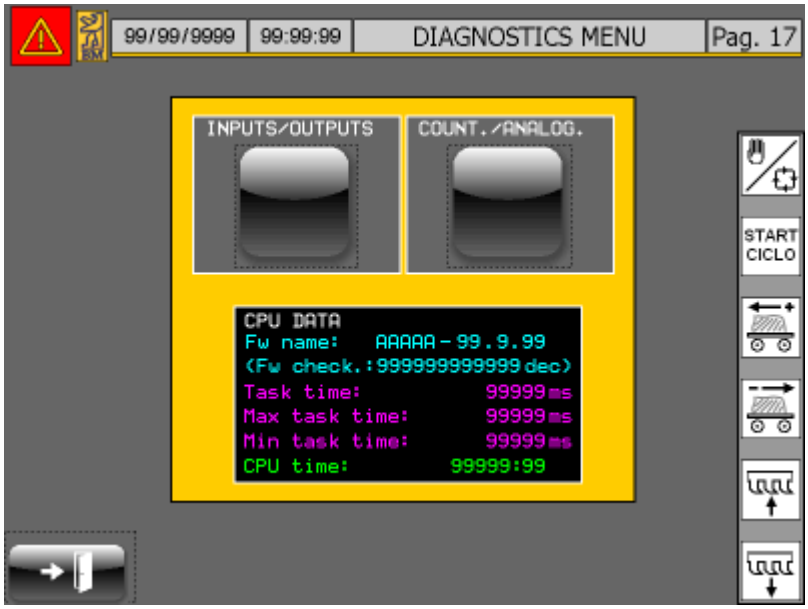
 : return to the MAIN MENU page

In this page you can program the automatic cycle.

The program ensures to enter at most 10 steps each with a thickness of the slab to be obtained and the number of slabs to be cut.

THICKNESS	Dimension in centimetres of the required blade thickness.
SLABS QUANTITY	Number of slabs to be cut at each step of the program.
Carriage direction	Movement direction of the carriage axis at the end of each cut:  : the Carriage moves clockwise  : the Carriage moves counter-clockwise
Trimming	Enabling / Disabling of the trimming cut:  : trimming cut disabled  : trimming cut enabled
Blade thickness [cm]	Thickness of the cutting blade expressed in centimetres
Block length [cm]	Length of the block to be cut expressed in centimetres. This information is used to control the accuracy of the automatic program. If the total thickness of all the programmed cuts exceeds the dimension of the block, the system gives a warning signal displayed in the Main Menu.

Diagnostics menu



Through this screen you can access the various available diagnostics sections:

1 - Digital inputs and outputs diagnostics

2 - Counting and analog output diagnostics

There is also some information about:

Fw name : firmware present in the device and related checksum;

Task time : average time of the CPU cycle with indications about the scanning **Maximum Time** and **Minimum Time**;

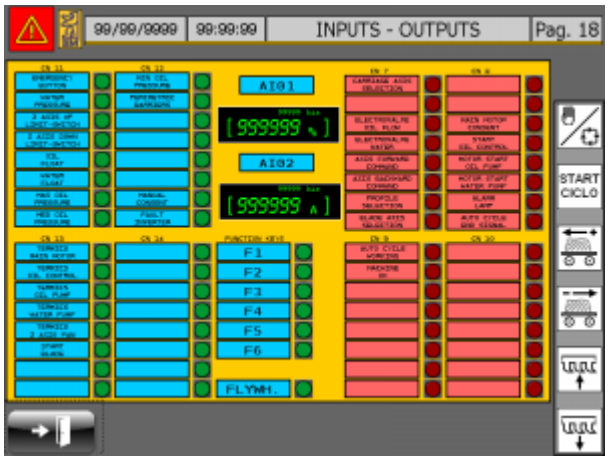
CPU time : total time since the CPU has been in the RUN state (hh:mm)

 : return to the MAIN MENU page

Inputs and outputs diagnostics

By pressing the “INPUTS / OUTPUTS” key you can display the following screen, which shows the states of each digital input and outputs and of the two analog inputs.

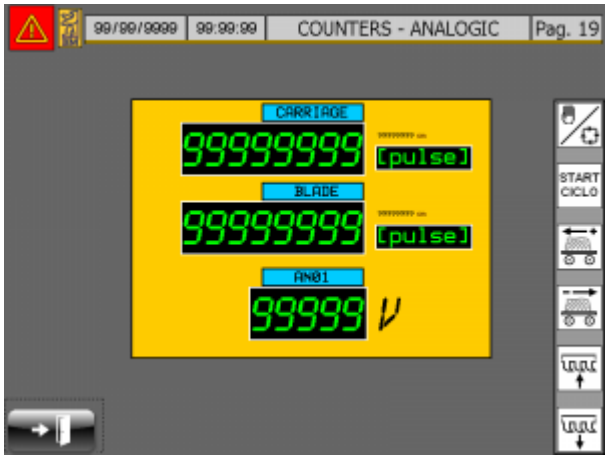
For each analog input it displays the value in bit and the resulting value after the scaling.



Counting and analog diagnostics

By pressing the “COUNT. / ANALOG” key you can display the following screen, which shows the counting of the encoder of the axis drop and the value of the analog output used.

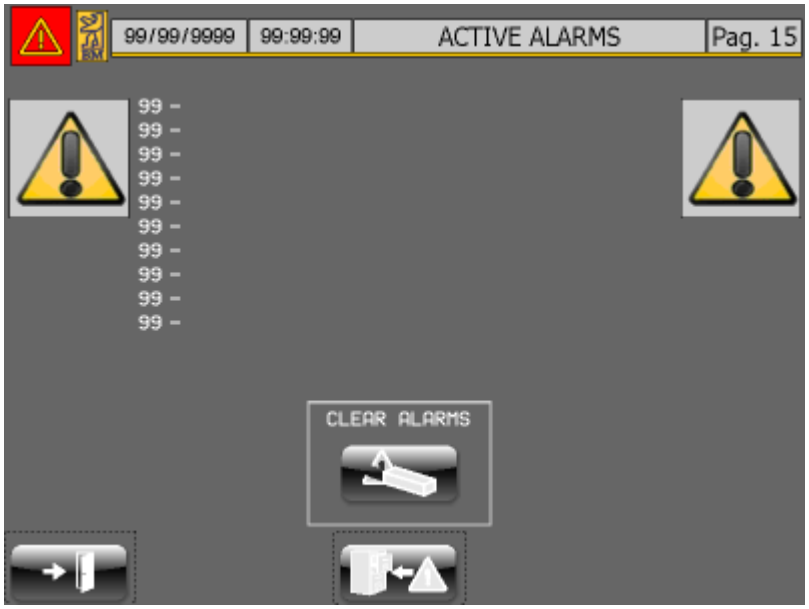
The counting is displayed in **encoder pulses** and, in smaller dimensions, the counting value in **measurement unit**.



 : return to the DIAGNOSTICS MENU page

Alarms

If the key  is pressed in the main menu (or in any other screen which presents it), the following page is displayed:



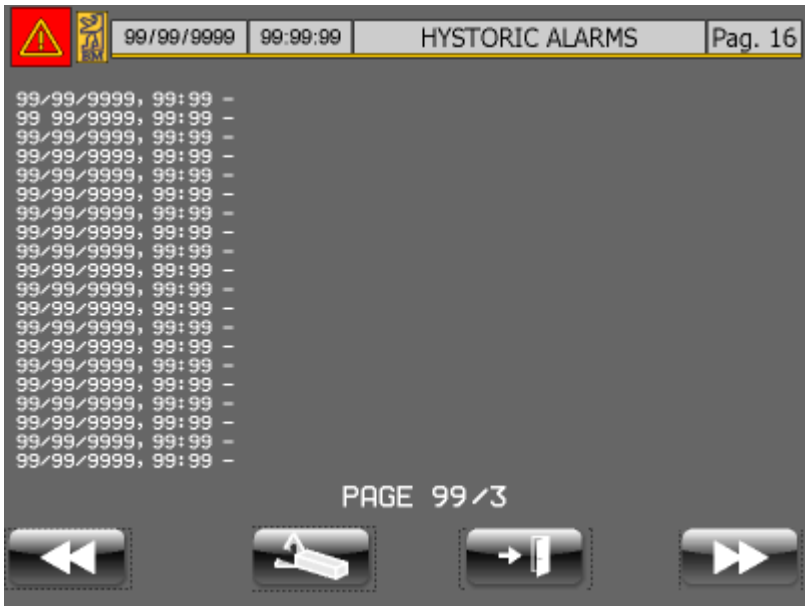
By pressing the key  the alarms are cancelled. If there are no alarms, after 2 seconds the exit out of this page will occur automatically.

Alarm list

Alarm	Reason	Resolution
Mushroom emergency button	Manual emergency	control the emergency mushroom button
Counting error on lower blade limit switch	The difference between the registered counting and the actual counting at the end of the cut on the lower limit switch exceeds the maximum deviation.	control : * encoder skidding * encoder quality * limit switch quality * limit switch movement
Counting error on upper blade limit switch	The difference between the registered counting and the actual counting at the end of the automatic cycle on the upper limit switch exceeds the maximum deviation.	
		The valve could be closed.
Water pressostat anomaly	No cooling water is detected	-
Oil float anomaly	Input I5 = OFF	-
Water float anomaly Interrupted barriers	Input I6 = OFF Something interrupted the chain of entry I11.	-
overload cutout of the frame motor	Input I16 = ON	Control the motor associated to the thermics or the operation state of the thermics.
overload cutout of control unit motor	Input I17 = ON	
overload cutout of the oil pump	Input I18 = ON	
overload cutout of the water pump	Input I19 = ON	
overload cutout of the drop fan	Input I20 = ON	
Break of encoder of Carriage axis	The axis encoder does not work properly	-
Break of encoder of Blade axis		-
Over-current of blade axis	The blade motor has absorbed a current value which is higher than the threshold	-
Stroke-counter out of the tolerance value	The stroke-counter has detected a difference of strokes/min higher than the set tolerance	-
Minimum oil pressure	When the flywheel motor is active, the oil pressure input is minimum I9 = ON	-
Carriage encoder disturbed	The encoder has received pulses as long as the axis was stationary.	-
Blade encoder disturbed		-

By pressing the key  you can go to the alarm log file.

Alarm log file



The alarm log file can contain at most 60 registrations. It is a FIFO log file, therefore when the log file is full and another alarm is registered, the oldest in the list is removed.

It is important that the date and time in the set-up are correctly set, so that the diagnostics operations on the alarm are carried out as quickly and accurately as possible.

 : scrolls backward the pages of the alarm log file;

 : scrolls forward the pages of the alarm log file;

 : return to the ALARMS page

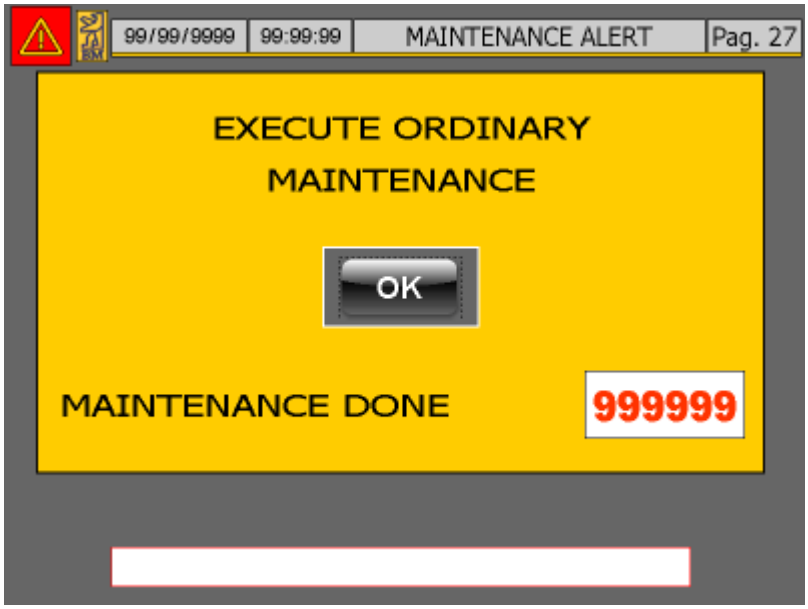
 : passage to the removal page of the alarm log file. This page is password-protected. The code to enter it is **485000**.

Maintenance

The machine is provided with a very important alert regarding ordinary maintenance.

Indeed it requires, every 200 working hours of the fly-wheel motor, a general control described in the mechanical characteristics manual provided with this manual.

After 200 working hours, the following alert will be displayed at any start-up of the fly-wheel motor:



Press the 

key to confirm the display.

To reset its display you need to enter a maintenance performed code.

Contact the mechanical service by BM S.r.l. to perform the operation. For this alert you do not need to perform the maintenance to keep on working. However it is recommended to perform the intervention for it as soon as possible.

3. Operation

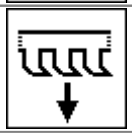
Manual

In the manual state the only allowed movements are the jog ones of the two axes.

The manual state is indicated by icon:  and by the led of the F1 key which must be off.

To move the axes in jog, make sure that the device is not in the alarm state.

NB. the Carriage cannot be moved if the flywheel motor is running.

F3		**JOG FORWARD AXIS CARRIAGE.** Press to manually move forward the Carriage.
F4		**JOG BACKWARD AXIS CARRIAGE.** Press to manually move backward the Carriage.
F5		**JOG UP BLADE AXIS.** Press to manually move upward the blade.
F6		**JOG DOWN BLADE AXIS.** Press to manually move downward the blade.

Single cut

Procedure to perform a cut in “MANUAL SINGLE CUT” mode

1	Make sure that the device is not in the alarm state, and that it is in the MANUAL state, signalled by icon:  and by the led of the F1 key which must be off.
2	Manually move the axes Blade and Carriage in the starting point of the cut to be performed.
3	Press and hold the tensioning button located at the middle of the MAIN MENU page
4	

This situation is signalled in the MAIN MENU page with the string located in the middle of the page: **TENSIONED BLADE**|

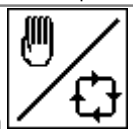
5	To start the flywheel motor press the white START button located at the panel front under the terminal.
6	To start the single cut press the F2 key. 

In the Single Cut procedure the blade starts from the value in which it is and goes down to 0 (bench level) or to the lower blade limit switch with a speed regulated by the potentiometer located at the front of the operator panel.

Once the 0 value, or the lower blade limit switch, has been reached, the main motor stops and the blade remains at the reached value.

Automatic Cut

Premise: To correctly perform the automatic works, it is required to follow a precise order of operations, as shown in the following list:

1	Make sure that the device is not in the alarm state.
2	Take the block loaded on the Carriage to the required position.
3	Lower the blade to the starting measure.
4	Press and hold the tensioning button located at the middle of the MAIN MENU page
5	The tensioning procedure ends when the machine reaches the medium pressure. This situation is signalled in the MAIN MENU page with the string located in the middle of the page: **TENSIONED BLADE**
6	To start the flywheel motor press the white START button located at the panel front under the terminal
7	Press the F1 button  to set the machine to the AUTOMATIC state. The related led starts flashing to signal the automatic state with the stationary cycle. It is also signalled by icon  .
8	Wait until the flywheel strokes have reached the measure indicated in the set-up.
9	To start the automatic cycle press the F2 key. 

To stop the automatic work anytime, press the STOP button located on the panel front under the terminal or the F2 key.

When the automatic cycle is started again, the program asks if it must re-start from the beginning, by resetting what was done until then, or continue the previous cycle.

After the natural end of the automatic cycle the blade goes to the uppermost position and the program is automatically reset.