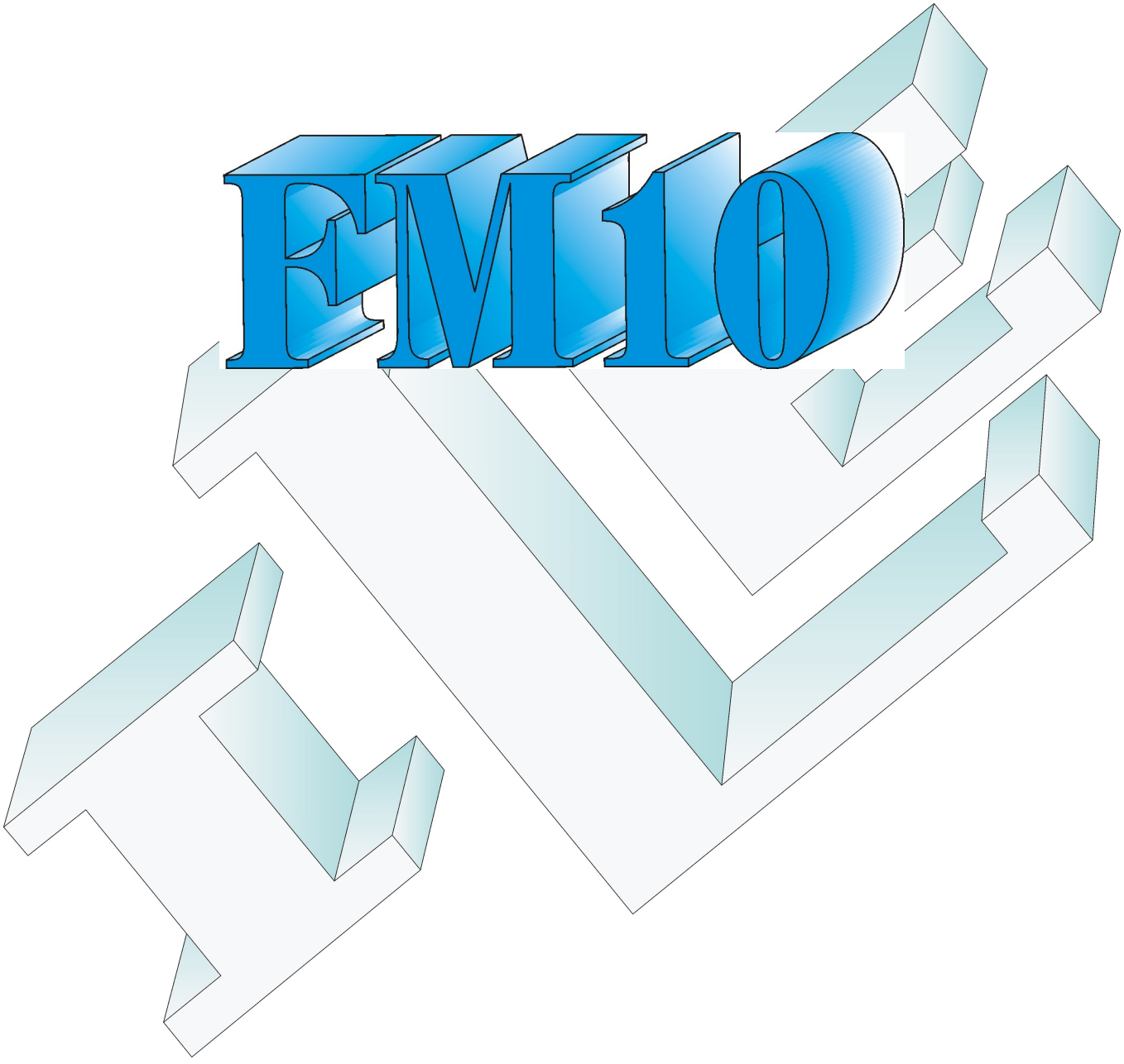
NOTES OF OPERATION OF DEVICE



Index

INTRODUCTION

The devices FM10 is used on circular looms for the production of fabrics for the control of quality of the produced cloth.
The three fundamental functions developed by the tool consist in the block of the machine under the three following conditions:

- if reached the programmed number of holes,
- in the eventuality of presence of holes of big dimensions,
- when a dropped stitches is found (lack or breakup of a needle)

There are then other auxiliary functions for the control of the quality and the quantity:

- total calculation of holes and dropped stitches
- delay of the stop of the machine in comparison to the place of the defect .
- choice of the language
- limitation of the access to the tool through password.

The device FM10 can use one or two optic heads to check a greater area of fabric.

COMPONENTS AND ACCESSORIES:

The tool is composed of the followings parts:

- Main unit with microprocessor, display, keyboard and lights based system of visualization for errors (suitable as “leds”).
- one or two optics head for the control of the fabric (different formats available)
- Couple magnetic sensor and magnet for the control of the turns of the machine. If two optic heads are used there have to be connected two magnetic sensors with magnet.

Note : The couple magnetic sensor and magnet it is essential to be able to realize the dropped stitches control .

BASIC INSTRUCTIONS FOR THE EMPLOYEE ÁT THE LOOM

The tool checks the presence of imperfections on the cloth:

- It turn on all the leds on the left for the 'hole' type error
- It turn on all the leds on the right for the 'tears' or dropped stitches error

On the display at the left the word ‘MAGN ' appears in correspondence of the detection of the magnetic sensor pulse.
When the tool stop the machine , the error condition is explained on display and through the lighting of the relative leds and particularly:

- the error of reaching the planned number of small holes cause the flash of first three leds at left of the tool (2 greens and a red)
- the error of presence of a big hole cause the lighting of all the five leds on the left (2 greens and 3 red)
- the error of 'tears' or dropped stitches cause the lighting of all 4 leds on the right (2 greens and 2 red)
- error of sensibility too high for tears through lighting of all 4 the leds of left.

Once that the error has been detected and the machine stopped, the employee can remove it and reset the tool through the pressure of the key ‘R '. Then he can proceed to the restart the machine.

Pressing the 'R' key for 5 continuous seconds the tool is disarmed. Such condition is visualized on display and the tool doesn't perform any control anymore.
To return to the normal operation is enough to maintain pressed the same button for other 5 seconds.

DETAILED INSTRUCTIONS

The tool is endowed with various pages that allow to plan all the necessary parameters for a correct operation.
The various pages are flowed in sequence using the special key 'Page' having the sketch of the pages; it is always possible to return to the initial page pressing the key 'R' (Reset).
Generally the key '+' related to the holes it allows to change the parameter showed in the actual page.

Here following the description of the various pages, where the pages can be recognized rom the present writing on the superior line of the display.
Note that this description refers to the simplest situation which is without password foreman, described subsequently.

Page	*Description*
Initial	The sensibility to holes and dropped stitches is normally suitable on the display through two numbers between 1 and 100 placed in the inferior line of the display: • to the left the sensibility to the holes • to the right the sensibility to the dropped stitches. Such sensibilities can be modified through 2 couples of keys '- 'and '+, sets in proximity of the aforesaid numbers. When the tool uses two optic heads there are the two sensibilities above described for the optic head 1 and others two for the optic head 2. On the display they are alternatively shown; for some seconds sensibilities appear to holes and dropped stitches for the optic head 1, then for some seconds sensibilities appear to holes and dropped stitches for the optic head 2. The writing "FT.1" or "FT.2" that it appears to the right aloft in the display it points out us of what head we are seeing the sensibilities. For greater visibility the writing "FT.2" it is flashing. The keys '+' and '- they act on the head visualized in the moment in which they are pressed. There is then the key 'J ' that it allows to enable or to disable the jump of the discarded initial needle. When the jump is enabled the message 'Jump ' appear in the inferior line of the display, this immediately implicates the skip of the control of the zones of fabric following to the magnetic sensor . If the present message is then 'No J. ' , the whole fabric is checked. A 'Magn ' appears to the left in correspondence of the magnetic sensor pulse. The presence of an asterisk '* in the superior line it points out that the input from the magnetic sensor is active, or that the magnet is close to the magnetic sensor.

Page	*Description*
OPTICAL HEAD	It allows to plan the number of holes of small dimensions to count before stopping the machine. Choice happens through the keys '+ and '- 'related to the error hole.
HOLES AMOUNT	It visualizes the total number of holes that have caused the stop of the machine. Such number accumulates that due to the survey of holes of big dimensions with that due to the attainment of the quantity of holes of small dimensions planned into the preceding page. The number can be reset by the 'R ' key.
STOP FOR LITTLE HOLES	It visualizes the total number of machine stop for little holes . The number can be reset by the 'R ' key.
LADDERS AMOUNT	It visualizes the total number of machine stop dropped stitches. The number can be reset by the 'R ' key.
STOP DELAY FT.1 o FT.2	In the case of machine stop (caused by survey of error) it delays the stop of the machine in percentage on the duration of the last noticed turn. Enter the percentage with '-' and '+' keys.
NEEDLE JUMP LENGHT	In this page it is possible to specify the duration of the jump of needle that effects after received the signal by the magnet. During such jump the control of the fabric is suspended, so that possible lacks of needles foreseen in the fabric doesn't cause a block. The value 9 are the maximum duration (100ms) while 1 are the minimum duration (11ms). The value 2 correspond to 22ms, and so following.
RELAY WORK MODE	Here you chooses if during the block of the machine the output relay is closed or open. This page is available only on some versions of the product.
NEEDLE ERROR	It allows to select if during the stop due to dropped stitches the output relay is always active or intermittent. This can help to recognize the stop due to broken needle.
MODE OF OPTICAL HEAD CONTROL	it selects the way of control of presence of the optical head, in other words how it is verified that the optical head is present and regularly active: mode 0: no control on the signal from the optic head . mode 1: during every whole rotation it owes us to be at least a green led turned on on the needles or on the holes, otherwise the machine is stopped. mode 2: during every whole rotation they owe us to be at least two green leds turned on on the needles or on the holes, otherwise the machine is stopped.
OPTICAL HEAD SENSIBILITY	It selects the high or low sensibility of the optic head.
USE 1 (OR 2) OPTICAL HEADS	Here the number of connected optical head is specified.
SPEAK ENGLISH/ITALIANO..	Imposes the language (English or Italian or French). To application other languages can be included. The maximum number of present languages simultaneously in the tool cannot exceed the number of 3.

FOREMAN PASSWORD

The password foreman serves to limit the access to the pages of formulation of the tool.
If the password is trained then the initial page is always on top while to visualize the other pages the password is required.

To specify and to train the password, act as it follows:

1. While the tool is turned on and display the initial page, unplug the connector of the optic head and insert the key of password furnished with the tool.

2. Then is displayed the page for insertion of new password. The password is a decimal number of 3 digit . The left key '+' (Holes) increase the number pointed by the blinking cursor . The left key '-' move the blinking cursor to next digit. Pressing the key page the password is memorized and the writing 'new inserted password is visualized..

3. Unplug the key of password so the tool brings him to the initial page and the password is memorized.

In fact the password is trained if different from '000.' Then to disable the password just input a new password equal to '000.'

The tool is furnished with password of default planned to '000, such password allows the unconditional access to all the pages.

When the password is trained, pressing the key 'page' make the tool require the password :

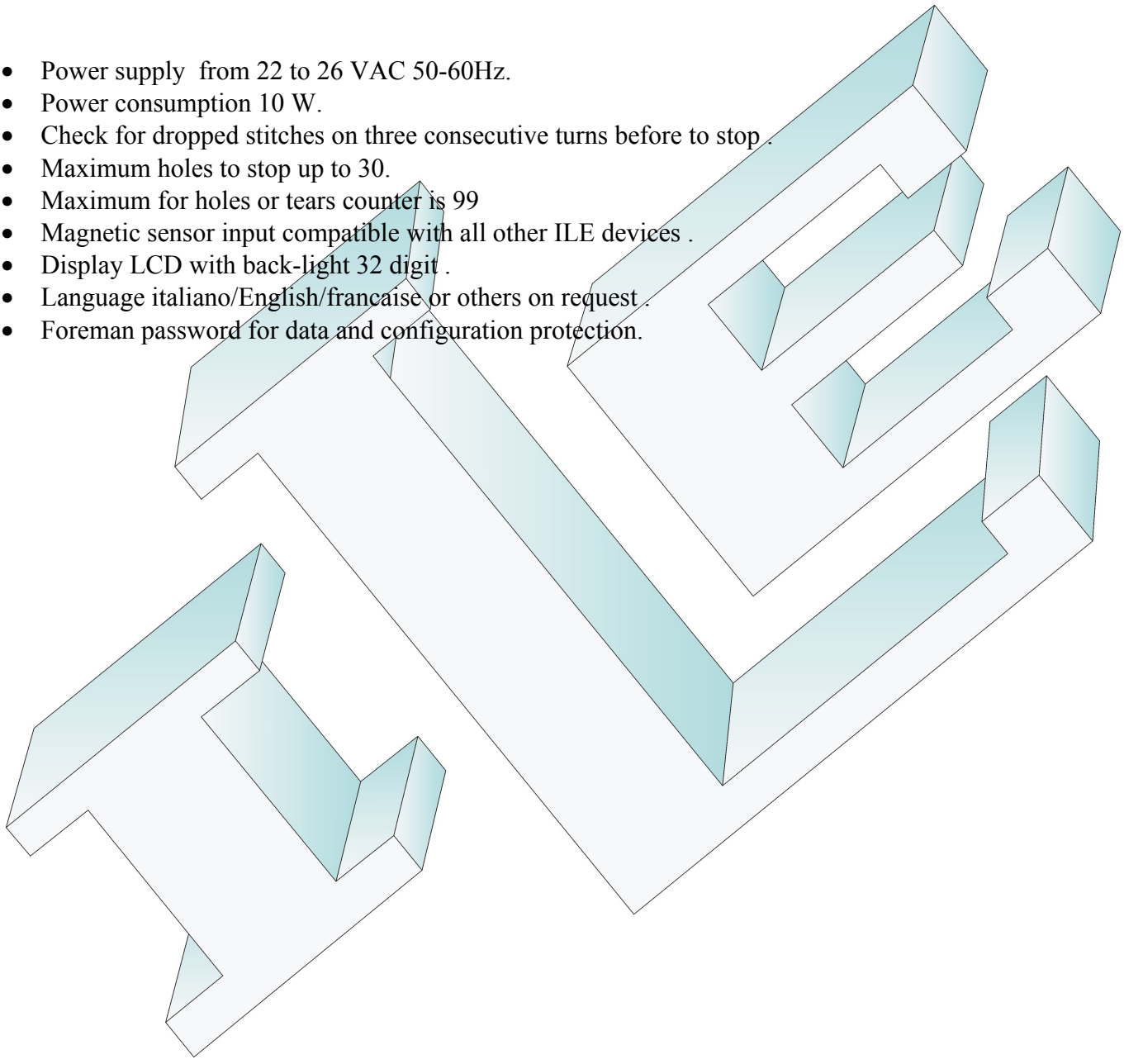
To insert the password use the same keys described above . Pressing the key page, the tools goes to the following pages if the password is correct.

When the password is trained, there are one or two new pages :

Page	*Description*
LOCK KEYS +,- WITH PASS. ?	In the initial page the keys + and- allow to regulate the sensibility of the optical head for holes and tears. If it is wanted that such keys are protected with password, to specify 'Yes' in this page. In such case the initial page serves only to read such values, and the page described below is used for modifying them.
SENSIBIL MODIF FT.1	It allows to modify the sensibility to holes and dropped stitches shown on the display through two numbers between 1 and 100 placed on the inferior line; to the left the sensibility to the holes, to the right the sensibility to the dropped stitches. Such sensibilities can be modified through the 2 couples of keys '- 'and '+, placed near the aforesaid numbers. This one is for optical head 1.
SENSIBIL MODIF. FT.2	As the preceding page, but for the optical head 2.

TECHNICAL CHARACTERISTICS

- Power supply from 22 to 26 VAC 50-60Hz.
- Power consumption 10 W.
- Check for dropped stitches on three consecutive turns before to stop .
- Maximum holes to stop up to 30.
- Maximum for holes or tears counter is 99
- Magnetic sensor input compatible with all other ILE devices .
- Display LCD with back-light 32 digit .
- Language italiano/English/francaise or others on request .
- Foreman password for data and configuration protection.



INSTRUCTION FOR MAIN UNIT INSTALLATION

1. Choose a position for the main unit that is firm and visible. Unscrew the two screw placed on the sides, and separate the front panel of the tool from the hull in black metal, making slip downward the front panel . Put aside the Front panel, handle with care. .
2. Fix the black metal hull to the select place, avoiding leaning screw toward the inside of the tool. Clean possible metallic shavings due to the workmanship, and insert again the front panel in the metallic hull. Fix the front panel with the screw previously removed.
3. Plug the power supply cable to the main unit, and connect the wires according to the suitable instructions placed down here and at manual end.
4. Go to sections related to optic head and magnetic sensor installation.
5. Remember that the couple magnet 2 and magnetic sensor 2 serve only if two optic heads are used.

Conductor	Function	Connection
Brown	power supply input -	to the 0V of the transformer of the services of the loom
Red with fuse	power supply input +	to the 24V of the transformer of the services of the loom
Yellow	connection to GND	to protection earth (PE) or ground
Green	magnetic sensor 1 input	To a wire of the first magnetic sensor. The other wire of the magnetic sensor must be connected to the GND , yellow thread.
Orange	magnetic sensor 2 input	To a wire of the second magnetic sensor. The other wire of the magnetic sensor must be connected to the GND , yellow thread.
Blue with fuse	Stop output relay +	Note 1
Bianco	Stop output relay +	Note 1

Note 1 : the “Stop output relays” are the two pins of a contact of relay, selectable NC or NA through the pages of the tool. Such contact of the relay doesn't have inside connections to the tool, and it is isolated therefore from GND and from any other signal. Use to stop the machine .

INSTRUCTIONS FOR THE ASSEMBLAGE OF THE OPTIC HEAD

1. The optic head has a black plastic front with a transparent window, as visible in the following image, and a plastic cork on the back. Mount one or two sleighs of metal on the optic head so that sticks out of around two millimeters from the front. Then mount the optic head with the sleighs in contact with the fabric, so that the front of the head is firmly two millimeters apart from the cloth.

2. The head must be placed on top, next to the needles, where the fabric is formed. It is generally fixed on the yarn guide. The transparent window of the front , visible in the following image, has to be parallel to the defects of the fabric as the dropped stitches. Mainly the head is placed standing in portrait (not landscape), exactly as in the image.

3. If the head is very near to the needles, only the lower sleigh is necessary.
4. Check that the fans don't make to tremble the cloth at their passage. This could cause some stop not necessary.
5. At this point it is advisable to install the magnetic sensor as described in the following pages .

INSTRUCTIONS FOR ASSEMBLY OF MAGNETIC SENSOR

Note : the magnetic sensor is used to detect dropped stitches or ladders and to make the jump of the discarded needle. Without the magnetic sensor then the better functions are not available.

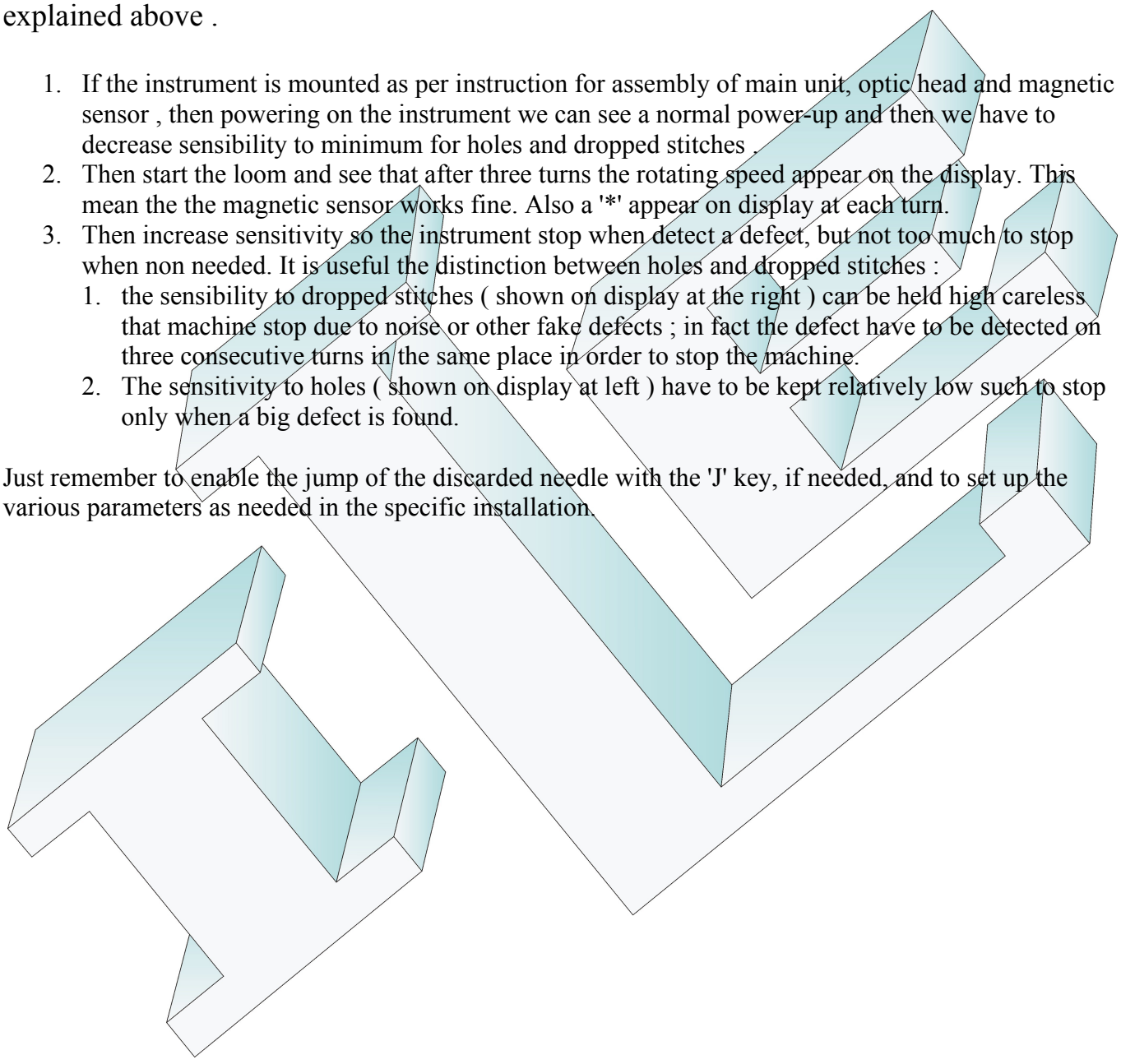
1. If you have to make the jump of the discarded needle, place the loom in a position that the discarded needle is placed about 1cm before the middle of the optic head. With the loom in that position mount paired the magnetic sensor and magnet .
2. Mount the magnetic sensor in a firm place, protected from bumps. Place the magnet on the rotating part of the loom so to activate the magnetic sensor at each turn. The distance between magnetic sensor and magnet should be around 4 mm .
3. The above instructions are necessary be able to effect the jump of discarded needle, which happen immediately after received the signal from the magnetic sensor. During such jump the control of the fabric is suspended, so that programmed lacks of needles foreseen in the fabric doesn't cause a stop. Remember to enable the jump with 'J' key if needed.
4. The magnetic sensor has to be connected one wire to Ground and the other one to green wire of power supply cable.
5. If the jump of the discarded needle is not necessary then it is not important the position where magnetic sensor and magnet coincides related to optic head position. It is enough if they match on each turn. The magnetic sensor is always used for the dropped stitches / ladder detection.
6. If two optic head are used, then there have to be two couples of magnetic sensor and magnet.
7. The first magnetic sensor have to be mounted as above explained.
8. Then place the loom in a position that the discarded needle is placed about 1cm before the middle of the second optic head. With the loom in that position mount paired the second magnetic sensor and magnet .
9. Take care to avoid that the two magnet interfere each other,and keep some centimeters between the routes of the two magnets.
10. The second magnetic sensor has to be connected one wire to Ground and the other one to orange wire of power supply cable.
11. Also for the second magnet if the jump of the discarded needle is not necessary then it is not important the position where magnetic sensor and magnet coincides related to optic head position. It is enough if they match on each turn.

INSTRUCTIONS FOR REGULATION OF INSTRUMENT

Note : before to regulate the instrument follow and check the mounting instruction explained above .

1. If the instrument is mounted as per instruction for assembly of main unit, optic head and magnetic sensor , then powering on the instrument we can see a normal power-up and then we have to decrease sensibility to minimum for holes and dropped stitches .
2. Then start the loom and see that after three turns the rotating speed appear on the display. This mean the the magnetic sensor works fine. Also a '*' appear on display at each turn.
3. Then increase sensitivity so the instrument stop when detect a defect, but not too much to stop when non needed. It is useful the distinction between holes and dropped stitches :
    1. the sensibility to dropped stitches (shown on display at the right) can be held high careless that machine stop due to noise or other fake defects ; in fact the defect have to be detected on three consecutive turns in the same place in order to stop the machine.
    2. The sensitivity to holes (shown on display at left) have to be kept relatively low such to stop only when a big defect is found.

Just remember to enable the jump of the discarded needle with the 'J' key, if needed, and to set up the various parameters as needed in the specific installation.



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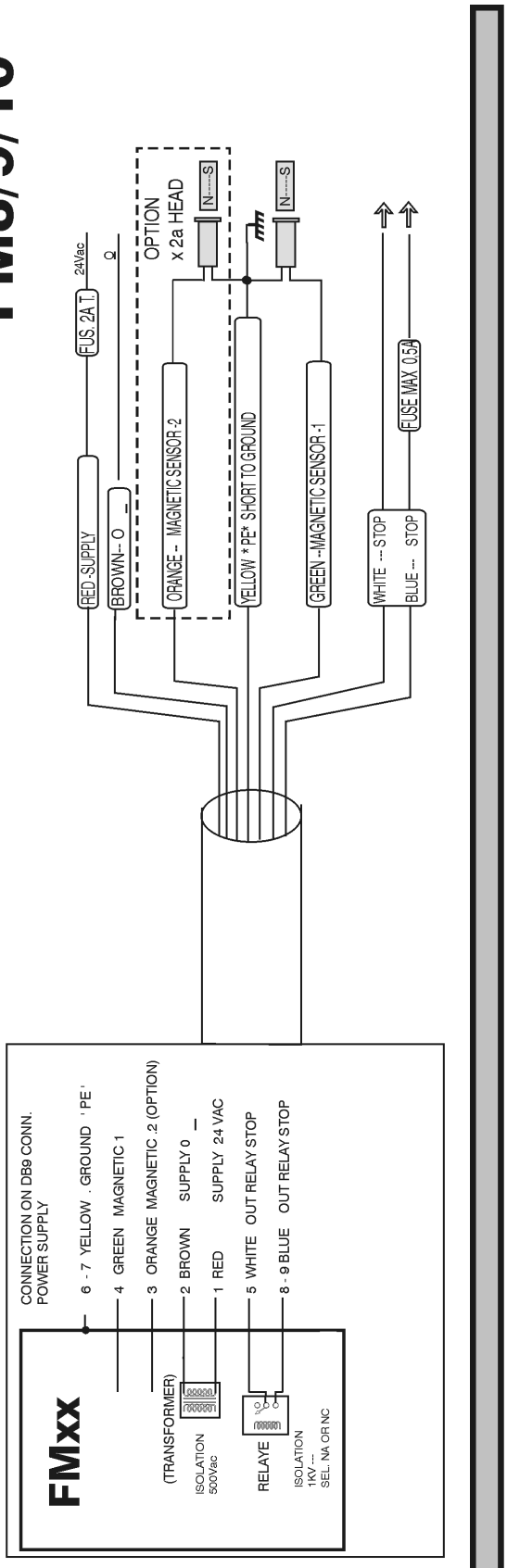

SUGGESTED CONNECTION FOR OLD MACHINES
(NOT COMPLIANT WITH NEW STANDARD)