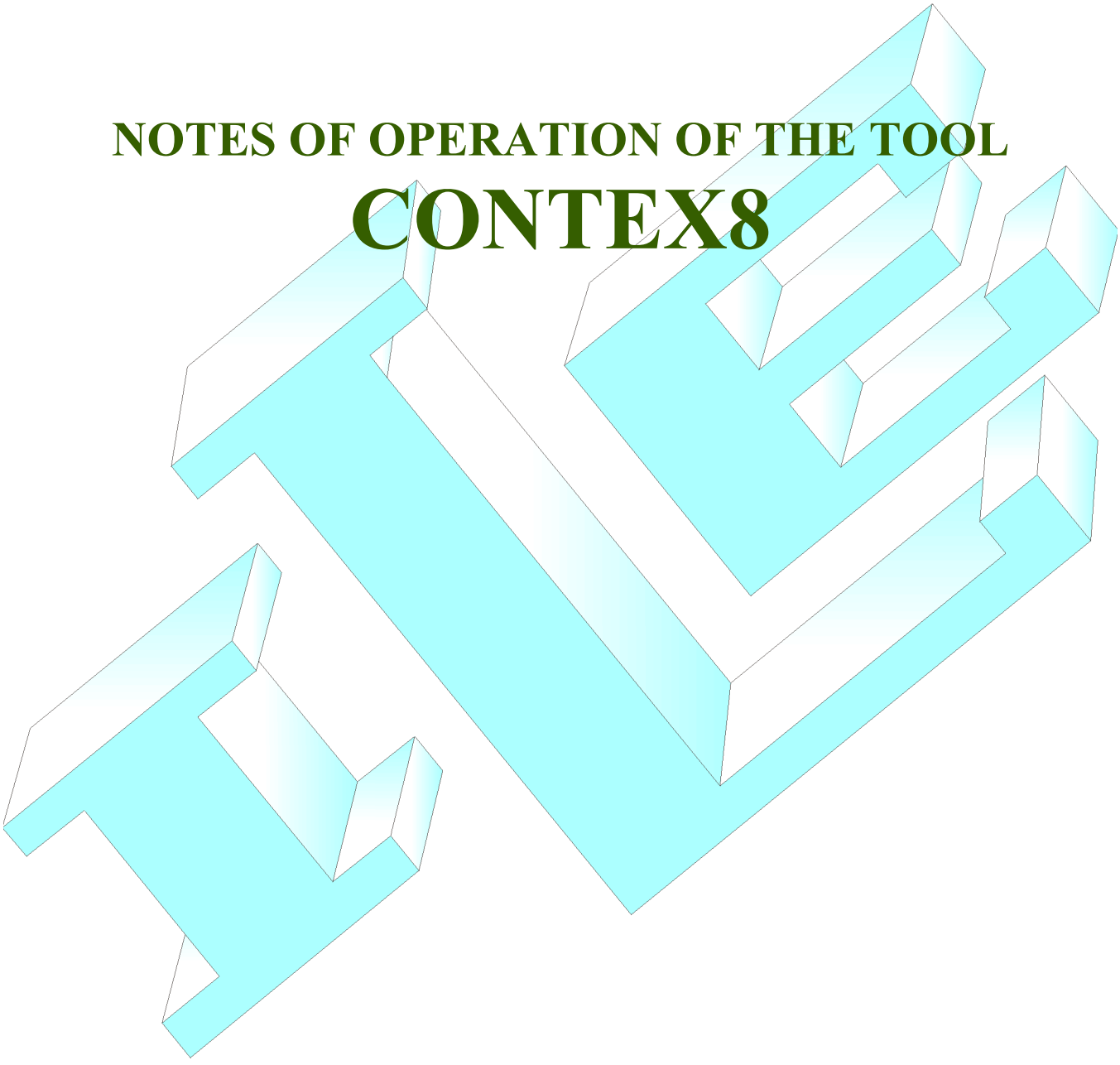
NOTES OF OPERATION OF THE TOOL

CONTEX8



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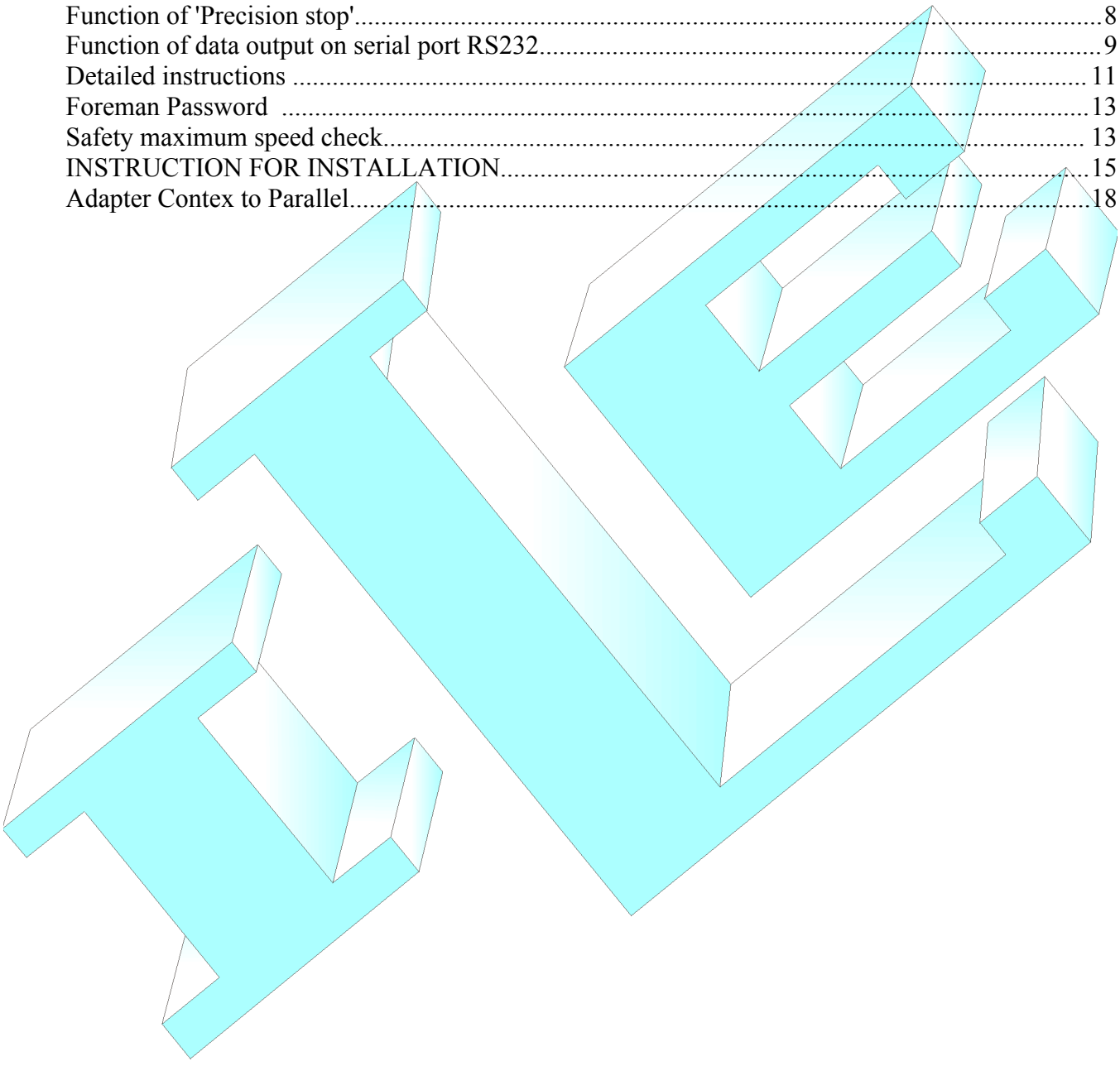

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Introduction

The instrument Contex8 is used on circular knitting machines for counting the turns of the roll and includes important functions:

- It measures the yarns absorbed by the feeders (LFA function) .
- It checks that the yarns consumption match the reference value +- allowed tolerance and stop machine in case of mismatch.
- It notices the times of workmanship of the machine.
- Precision stop of the position of the roll produced with adjustable delay.
- Control of the speed trimer allow to slow down the machine for the precision stop.
- Six default messages can be raised from the machine to inform about the causes of more common stop causes.
- Data output on serial port RS232.

The device is composed of:

- Main unit (controller) with keyboard and display.
- Couple Magnet - magnetic Sensor to notice the turns of the loom.
- Up to 5 sensors for LFA function composed by Couples Magnet - Sensory magnetic to measure the yarns consumption from the feeders.

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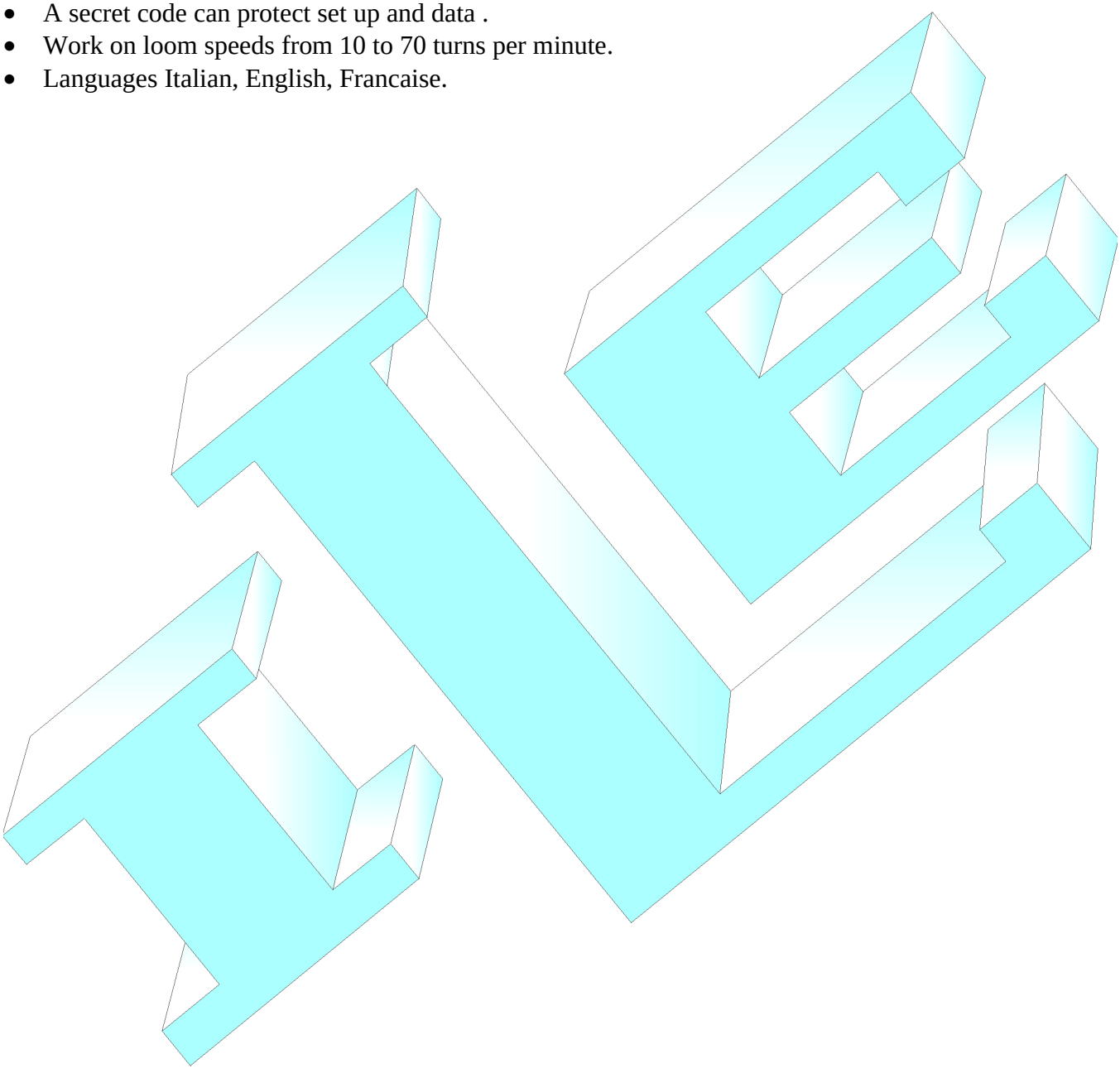
Some technical characteristics

- Power supply voltage 24VAC.
- Power consumption 4W.
- Service Output 2A 250V.
- A secret code can protect set up and data .
- Work on loom speeds from 10 to 70 turns per minute.
- Languages Italian, English, Francaise.



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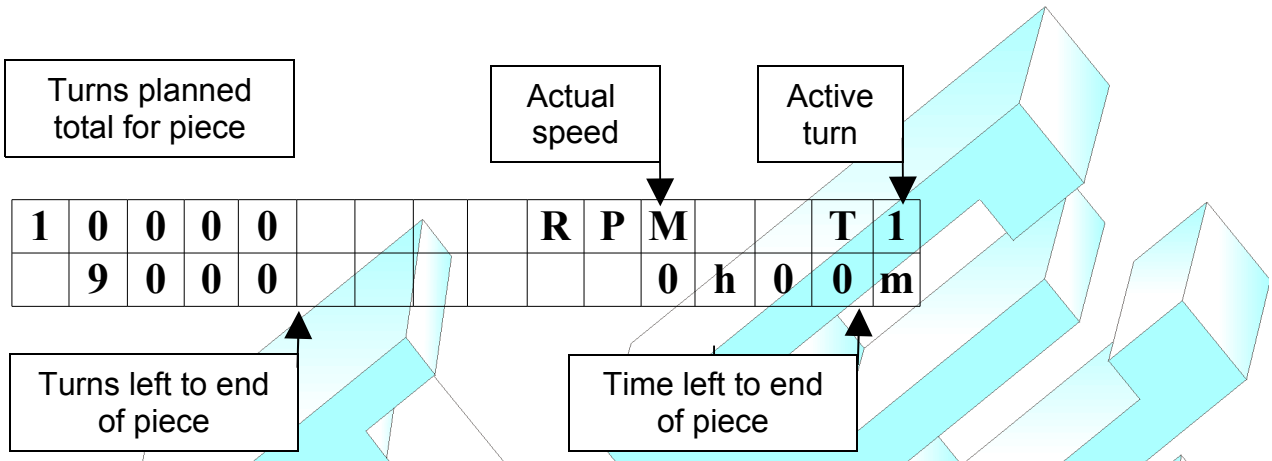
Main unit

The messages on the display change according to the state of operation and the selected page.
Message shown after power-on , without pressing any key, is called 'initial page' and it looks like the following example:



Other information are exposed in the following detailed description of the pages.

The principal functions of the keys are the followings:

- Key 'Page' , at the left , is used to show the next page on display .
- Key 'Shift' , is used to change the working shift T1,T2...T5 , and other functions page dependent.
- Key '→' used to enter data on as described later.
- Key '+' used to enter data on as described later.
- Key 'production', is used to show pages related with LFA function of yarns consumption measure.
- Key 'Reset' restore the instrument to normal state after a stop, or clear data or other functions as described later.

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More details on 'initial page'

As mentioned above , the message shown after power-on , without pressing any key, is called 'initial page' and it looks like the following example:

1	**0**	**0**	**0**	**0**					**R**	**P**	**M**			**T**	**1**
	9	**0**	**0**	**0**							**0**	**h**	**0**	**0**	**m**

In this page there are the information more used :

- the number of turns planned for the piece, shown to the left top, in this example 10000.
- the remaining number of turns for the piece, shown under to the left, in this example 9000.
- the assigned working shift, shown the right top, in this example T1.
- the actual speed, shown in the center top, in this example 'RPM'
- the estimated time to end the piece at current speed ,shown at right bottom, in this example 0h00m.

This page is used for the device as a counter: write here the number of turns of the piece ; then the counter decreases the number of turns at every effected turn, stopping the machine when the number reaches Zero.

To write the number of turns to act this way:

1. To press for a long time the key 'Reset' until a digit flashes..
2. Pressing the key '+' this digit is increased.
3. Pressing the key '→' it shift to another digit
4. When the wanted number is seen press the key 'Reset', the number selected is loaded in the counter.

Pressing for a long time the key let appears the symbol '%'. This points out that the percentage control on the consumption LFA is enabled. To disable it press for a long time still it the key ' '.

Such control can be suspended for 10 turns simultaneously pressing the keys 'Reset' + 'Shift', the suspension of the control is pointed out by the symbol (%) for 10 turns.

Then display show the writing 'At' in the inferior line when the device receives in input the special signal of 'activity'; this informs that the machine is turning. It is required that this signal is present to the device when the machine turns, and only when it turns.

There is also a '*' in the upper line of the display when the instrument receive signal from the magnetic sensor. The Key 'Shift' changes the working shift to the next of T1, T2, T3, T4, T5.

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Function of measure of the absorbed yarns (LFA)

This function counts the meters of yarns furnished by the feeders in a turn of the machine. The number shown in the special page is updated every 5 turns of the machine and the maximum shown number is 99 meters and 99 centimeters. The '*' that appears in the display points out that the corresponding magnetic sensor is active.

The instrument reads up to 5 feeders of which the first 4 are suitable for feeders type MPF20 or MPF10 or MPF--L; the last visualized feeder 'P5' is made for the feeder 'MER-C10' used for the Lycra.

You can choose among two ways to see the quantity of absorbed yarns:

1) in the classical visualization the display show absorbed meters and centimeters for a turn of the loom , where the maximum shown number is 9999 centimeters which is 99 meters and 99 centimeters.
When this visualization is used, near to the number there is a 'Cm' or 'In' to point out the unity of measure, it depends on the choice of use centimeters or inches.

2) in the so-called 'advanced visualization' or 'for 100 needles' it is showed the yarns absorbed for 100 needles , where the maximum shown number is 9990 centimeters or 99 meters and 90 centimeters. The shown number often contains a decimal, for instance 7,5 centimeters for 100 needles.
When this visualization is used, close to the number there are 'Cm/K' or 'In/K' based on the unity of measure choose between centimeters or inches. In other words, the measured consumption is divided by the hundreds of needles and then shown on the display.

To choose between classical visualization or “for 100 needles” there is a special page called 'Needles Number ' used to write/point out the number of needles present in the machine. Such number of 4 digits can be zero, in such case the classical visualization is used. If instead such number is among 100 and 9999 the page 'LFA' show the “for 100 needles” or advanced visualization.
A number of needles smaller then 100 is considered as 0.

As a rule of thumb the device is sent with a number of needles equal to zero so it uses the classical visualization.

The instrument can memorize the measured value as a reference value , and then check that the consumption doesn't change too much from such reference value; the value of reference and the allowed tolerance can be planned through the special pages relative to the LFA function.
Reference and Tolerance control is enabled at the followings conditions:

- Planned tolerance is greater of 0%; note that there is a specific tolerance for each trace from P1 to P5.
- In the initial page tolerance has been enabled pressing for a long time the key ; in this case there is the symbol '%.
- The value of reference is different from '0.'

The control of the tolerance is performed on the average of 5 turns and it attends some turns to the starting.

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Function of 'Precision stop'

The couple 'magnetic sensor and magnet' for turns have to be installed ; it is used by the counter to count the developed turns and then stop the machine in the precise point in which the magnet coincides with the sensor.

This is obtained by progressively decreasing the speed of the machine when there are 2 turns left at the end of the piece.

To such purpose the device has two special outputs that must be connected to the trimmer of the speed as described on connection pages .

Besides this, at the end of the last turn the stop can be further delayed as planned in the special page 'End piece delay.

Function of 'default messages'

The device comes with six default messages, useful to signal the causes of more common stop.

Such messages appear on the display when the correspondent auxiliary input is activated.

Here are the messages:

MESSAGE	*CORRESPONDING INPUT*
24 VOLT LACK	AUX 1
YARN FEEDER INLET OR OUTLET	AUX 2
ALARM NEEDLE DETECTOR	AUX 3
OPTIC SCANNER ALARM HOLE	AUX 4
OIL LEVEL AIR PRESSURE	AUX 5
ALARM DOOR OPEN	AUX 6

The auxiliary inputs AUX1 ..5 accept voltages between 16 and 24VAC/DC and the message is activated in presence or lack of tension, as programmed in special page.

While the message is shown it is possible to operate with the Contex as normal; pressing a key the message is cleared and visualization returns normal for some seconds, so that it is possible to operate as of usual. After a while the message is shown again until the input is active.

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Function of data output on serial port RS232

The collected data are put on serial port RS232 every second, updated at the time of the send. The format is readable on terminal ASCII set for 19200,n,8,1, no flow control. The string of data appear as the underlying example:

"%S- 352- 352- 352- 352- 950-Cm-0000-NNNN-NNNNNN-T5- 143-39.5-10000- 9758"

The fields are separate from the character '-. Here to follow one detailed exposure of the fields and their meaning:

Data	Char number	Values	Progressive index	Comment
beginning	1	%	0	
march (activity)	1	A , S	1	A= activity,S = Stop
-	1		2	
LFA1	4	0...9999	3	
-	1		7	
LFA2	4	0...9999	8	
-	1		12	
LFA3	4	0...9999	13	
-	1		17	
LFA4	4	0...9999	18	
-	1		22	
LFA5	4	0...9999	23	
-	1		27	
Unit of measure	2	In, Cm	28	
-	1		30	
Needle number	4	0...9999	31	
-	1		35	
Stop LFA	1	N, L	36	N = normal L= Stop for LFA
Stop Piece	1	N, P	37	N = normal P= Stop for Piece
Stop Magnet	1	N,T	38	N = normal T= Stop for lack of turns
Stop Activity	1	N,A	39	N = normal A= Stop for lack of activity
-	1		40	
AUX1	1	N, 1	41	N = low 1= high, active
AUX2	1	N, 2	42	
AUX3	1	N, 3	43	
AUX4	1	N, 4	44	
AUX5	1	N, 5	45	
AUX6	1	N, 6	46	
-	1		47	
Working shift	2	T1,T2,T3,T4,T	48	

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		5		
-	1		50	
Turn work.shift	5	0...99999	51	
-	1		56	
speed	4	0...99.9	57	
-	1		61	
Piece turns	5	0...99999	62	
-	1		67	
Turns left	5	0...99999	68	
	1	0x0A	73	
	1	0x0D	74	

Additionally to how much above stated, if an auxiliary input is active, is also sent every second a line containing the message related to the active input, that always begins with the character '$'.
For example if the auxiliary input entry is 1, it will appear on seriale the string:

"$24 VOLT LACK"

Magnetic sensor and Magnet used to notice the turns of the loom

Install the sensor on a firm part of the loom, in protected position from the bumps. Place the magnet on a rotating part in such position to activate the sensor every turn of the loom. The distance between sensor and magnet has to be from 2 to 4 mm.

Attention to the obligatory polarity of the magnet, and that the support is not vibrations subject!
The cable of the sensor finishes with some threads to connect to the back terminal block of the device, as described in the special chapter.
If the sensor is correctly installed it will be noticed on the display the appearance of the character '* to the conclusion of every turn, and the display will show the correct speed.

Sensory for measure of the absorbed yarns (LFA)

Install a couple sensor - magnet for LFA on every feeder of which is wanted to measure the consumption, following the instructions of the section 'installation.' The sensor must be connected to the back terminal block of the device, which receives the impulses and it calculates the consumption of yarns.

Up to 5 sensory LFA can be connected to the main unit , or the main unit has 5 input for sensory LFA. The inputs for sensor LFAs from P1 to P4 are suitable for sensory placed on feeders type MPF20 or MPF10 or MPF--L; the last entry 'P5' it is suitable for sensory placed on feeder 'MER-C10' used for the Lycra.

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Detailed instructions

The device 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' first to the left having the sketch of the pages; it is possible to return to the initial page flowing all the pages.

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

Page	*Description*
Initial one	Here there are shown the information more used. This page is already described in detail in the chapter 'initial page of the central unity.' Pressing the key 'Page' he passes to the following page.
WORK DATA T1	The device counts the turns and the worked time adding these data to the total one of the active shift‘, which is the shift T1,T2... shown in the initial page. In this page the data are seen for the shift 1. It is to notice that the worked time is counted only when the machine is turning , when the device receives the signal of Activity; in such condition appears 'At' in the initial page. To reset the data to press the key ‘Reset '.
WORK DATA Tx	As the preceding page for the shift from 2 to 5 following.
TOTALIZER	This page shows the total one counted of turns and times of worked time. These data cannot be cleared.
DISPLAY LFA IN	In this page it is chosen whether to visualize the quantity of absorbed yarns in centimeters or thumbs. The key '+' it changes the option.
NEEDLE NUMBER	In this page it show the number of present needles in the machine. If it is desired to read the data of LFA related to 100 needles then write here the correct number of needles, otherwise leave it to '0.' Read the section 'Function LFA' for more details' . To modify the number to press the key '+' that it will also serve for increasing the flashing digit, the key '→' it passes to other digit. At the end press the key 'Page' to confirm and to pass over.
PATCH SETUP	In this page it is possible to specify if the reload of the counter can be done by whoever or if it require the foreman password. The password and use is described in special chapter. The key '+' it changes the option.
AT PIECE END DELAY..	In this page can be specified a delay to be used at the end of the piece , useful for the precision stop. Such 'Timer' it begins to count after the last impulse of the turns magnet , and it stops the machine when it reaches zero. Varying such delay the machine can be stopped in the wanted point.

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Page	*Description*
AUX. INPUT ENABLE...	This page allows to enable the default messages, which will be shown when required from the electric circuit of the machine by the auxiliary inputs, as exposed in the relative chapter. The page allows to plan for every auxiliary entry the following possibilities: 'N' it points out that the corresponding auxiliary input is inactive. 'H' it points out that the corresponding auxiliary input is active when it is 'High' or voltage is applied on the input. 'B' it points out that the corresponding auxiliary input is active when it is 'Low' or there is no applied voltage. To change press the key '+' that it will also serve for changing the flashing option, the key '→' skip to other input. At the end press the key 'Page' to confirm and to pass over.
LFA1=	In this page (obtained pressing the key when in the initial page) it is shown the quantity of yarns absorbed by the feeder connected to the input P1. Such measure can be in centimeters, Inch, or reported to 100 needles, as exposed in the chapter of the Function LFA. In the inferior Line it is visible the reference value assumed for the optional percentage control . This page also allows to set up the reference value, and to specify the tolerance to use on such value. • Pressing the key '+' appear the flashing cursor and such flashing number be modified pressing the key '+' • To pass to other digit press the key '→' • When tolerance is set to the desired value press key 'Page' to confirm. Pressing the key 'Page' the shown value is assumed as reference value. One 'P' appear to point out this. Pressing the key goes to other LFA traces .
LFA 2..5	As above but for the other LFA traces named P2... P5

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Foreman Password

The foreman password serves to limit the access to the set-up pages of the device.
If the password is trained, the initial page is shown as usual but the password is required for the other pages .
If the password is trained then it is required also when pressing the key ; if correctly introduced it proceeds as usual with the pages LFA, if the password is wrong then the pages LFA are shown but it is not possible to vary the tolerances or the reference value.

To choose and enable the password, to act as it follows:

1. After power on , effect a short circuit among the two inputs of the device labeled as 'PASS.'
2. Then appears the page 'CHOOSE PASSWORD.' The password is a decimal number of 3 digits. With the key '+ the flashing number is increased while the key '→' goes to the following digit. Pressing the key page the device brings him to the initial page and the password is memorized. The password is enabled if different from '000.'

In fact the password is trained only if different from '000.' Then to disable the password protection choose the password '000.' The device is furnished with password of default planned to '000, such password it allows the unconditional access to all the pages.

When the password is trained, pressing the key 'page' cause the password request :

To insert the password use the keys described above. Pressing the key 'page', the instrument proceeds to the following pages if the password is correct.

When the password is trained, the page of the shift data collected changes as here described:

Pagina	*Descrizione*
PASSWORD T1:	The device counts the turns and the worked time adding these data to the total one of the active shift , which is the shift T1..T5 shown in the initial page. In this example the data are seen for the shift 1. To notice that the worked time is counted only when the machine is turning, in other words when the device receives the signal of Activity; in such condition appears 'At' in the initial page. To reset the data press the key 'R '. Also in this page a password can be planned , that will be required to make T1 active. To specify a password press the key '+', that will serve also for increasing the flashing digit, the key '→' goes to other digit. Press the key 'Page' to confirm the password.
PASSWORD Tx	As the preceding page but for the shift from 2 to 5 .

Safety maximum speed check

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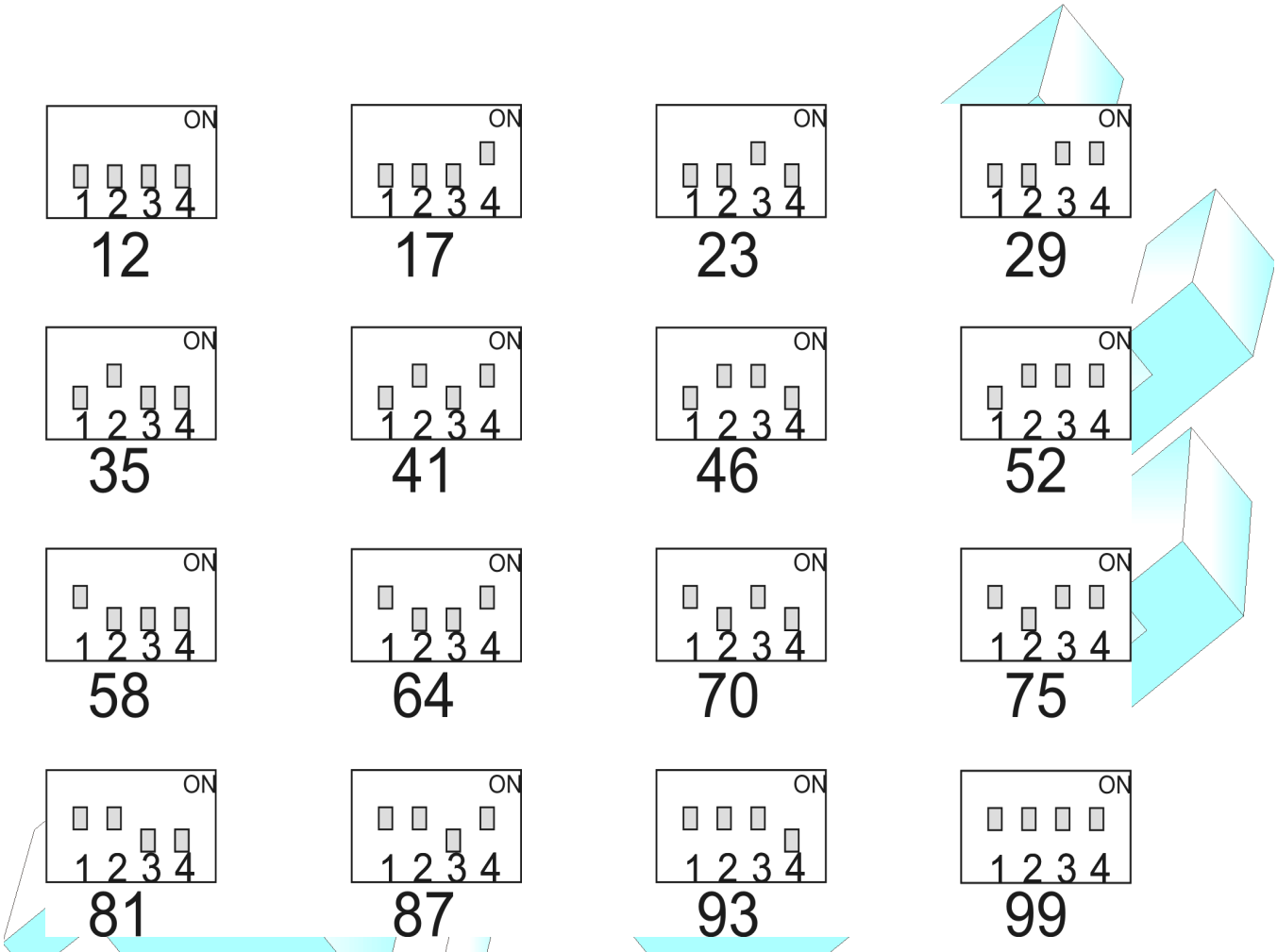
As stated by Europeans normative on the safety, the instrument has to stop the machine and give an error message “speed” if the speed of the machine (in turn per minute) exceed a safety limit .

Such limit is preset through some dip-switches placed inside the device and accessible removing the back panel ; please make this only when power is off**.** Based on the configuration assumed by the four dip-switches the instrument show the limit speed at power on of the device, according to the following table :



It is up to the system integrator to set the dip-switch at the proper value for each textile machine .

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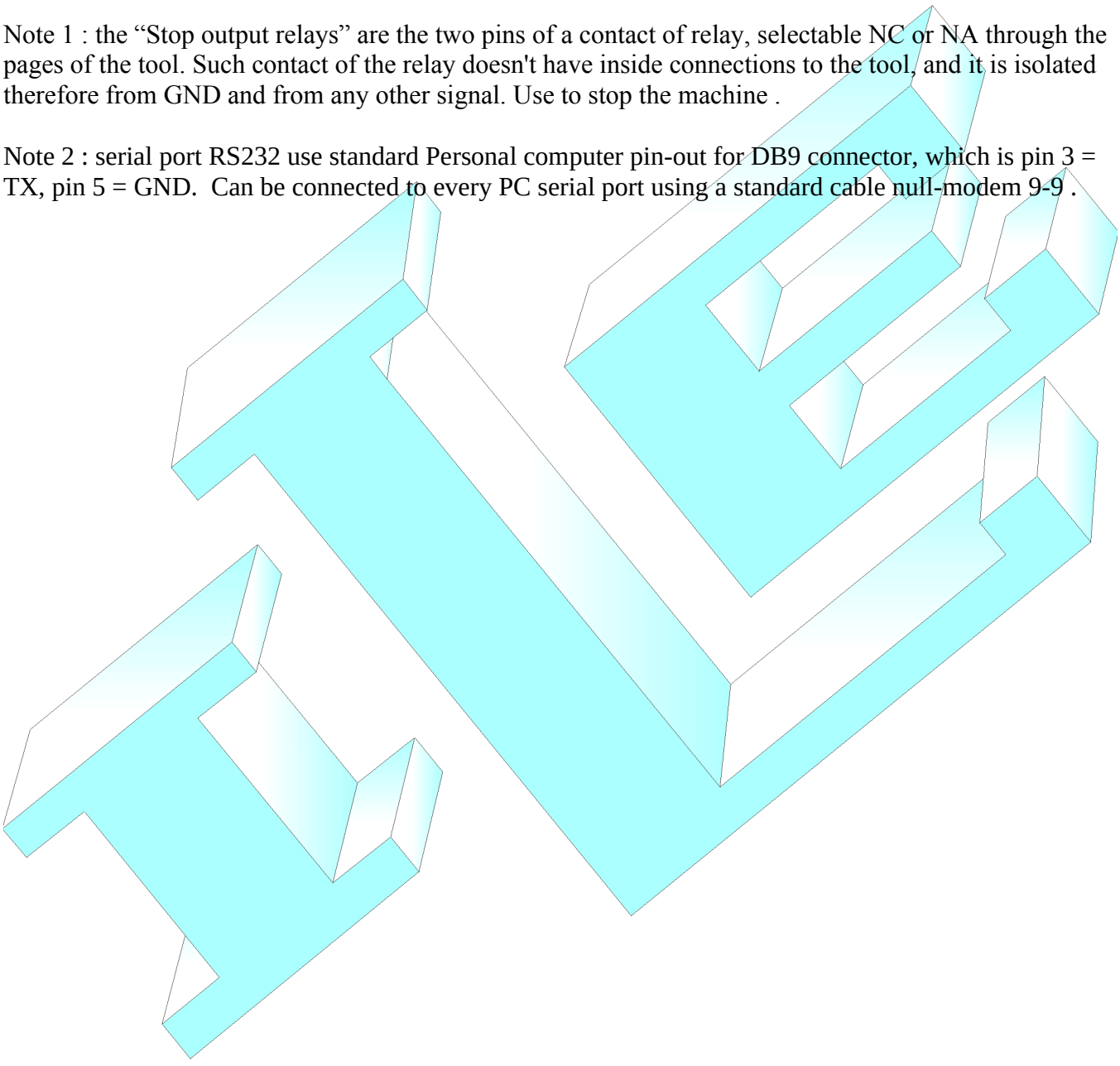
INSTRUCTION FOR INSTALLATION

Follow the scheme of the connections on the following page.

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 .

Note 2 : serial port RS232 use standard Personal computer pin-out for DB9 connector, which is pin 3 = TX, pin 5 = GND. Can be connected to every PC serial port using a standard cable null-modem 9-9 .



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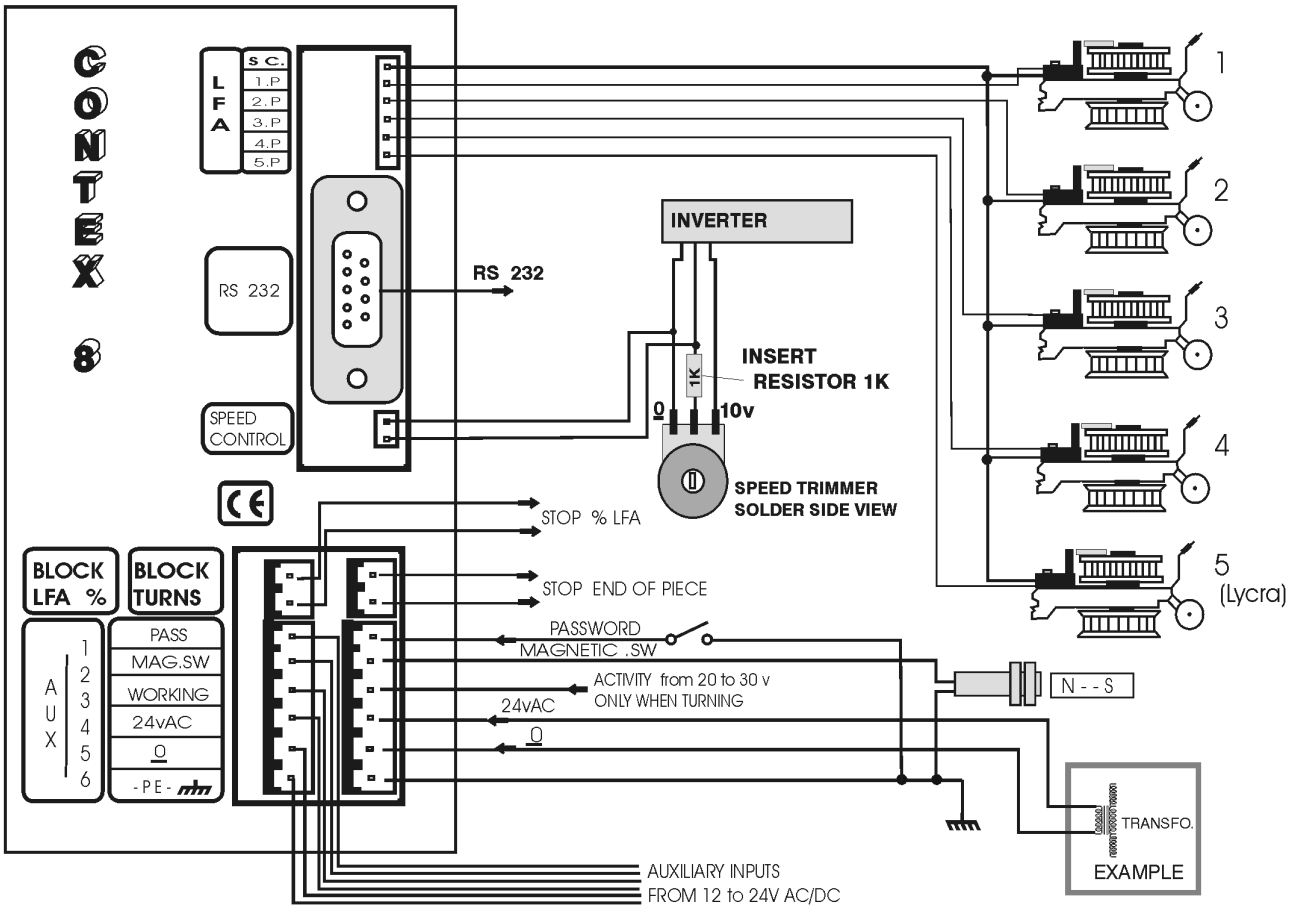
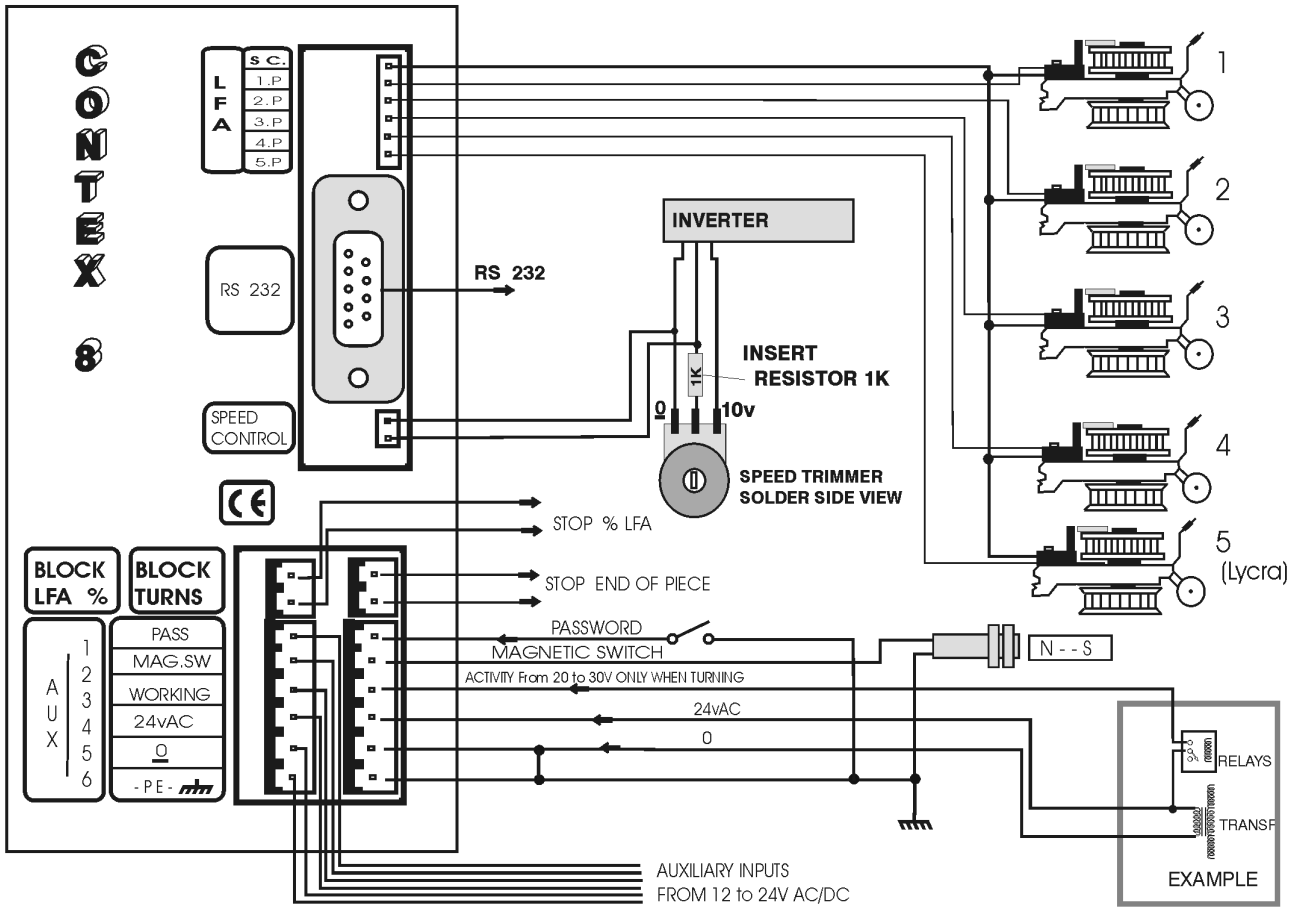
SUGGESTED CONNECTIONS





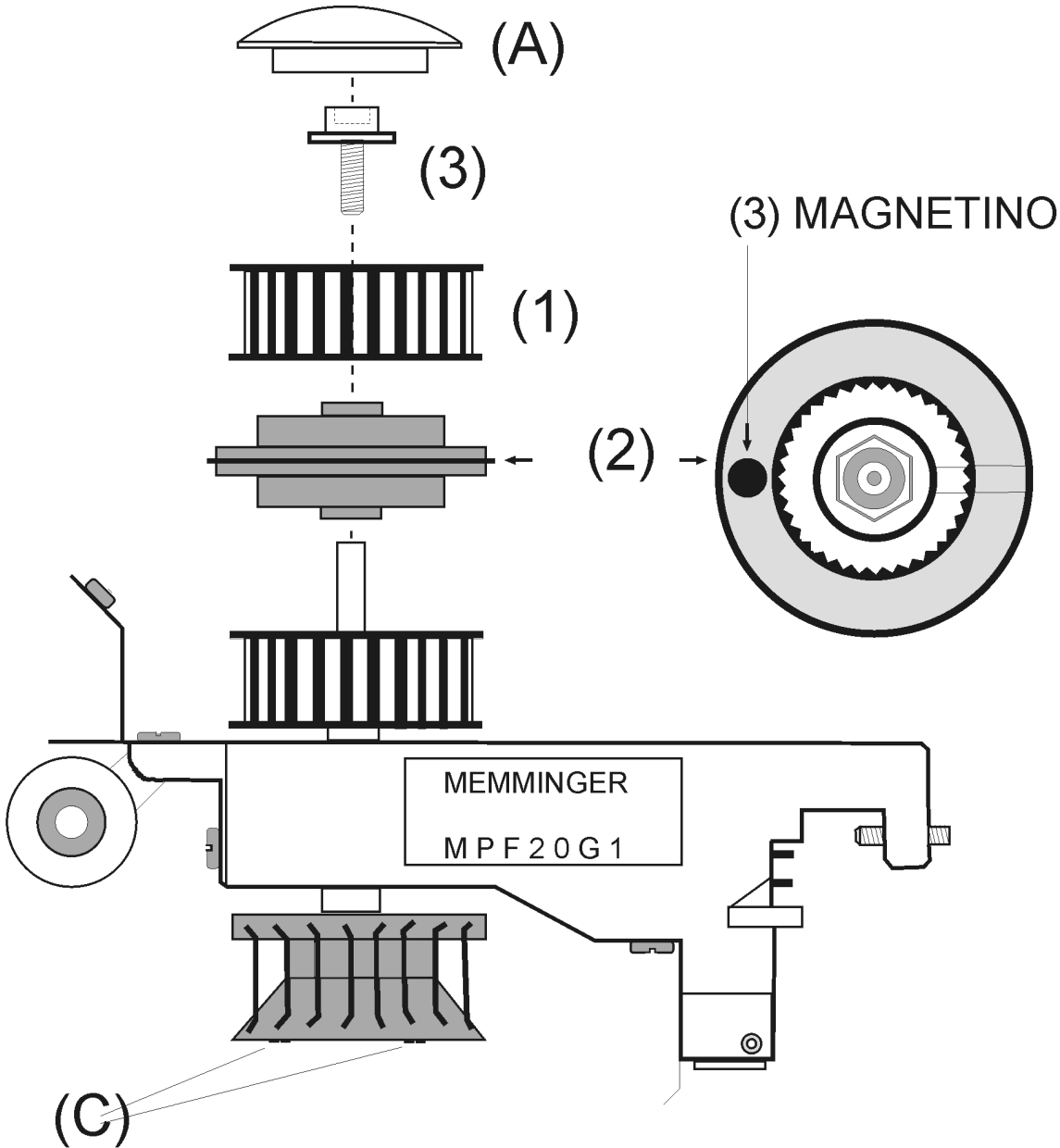
SUGGESTED CONNECTIONS FOR OLD TYPE MACHINES

ILE laboratori elettronica-Udine

MAGNETIC SENSOR INSTALLATION ON " MPF20 "

Remove lower cover releasing screw (C).
Remove upper pressure-hold cover (A).
Hold lower block ,with grip of 13 mm.
Remove screw and upper ring (B) using a grip of 5mm.

Remove the first wheel (1).
Remove second black wheel (2).
On this black wheel, make a hole large 6.5mm , plug into the magnet and fix with glue. (3)
Remount all .



Adapter Contex to Parallel

The adapter 'Contex Parallel' receives the information on the state of the textile machine from the serial port RS232 of the Contex8 and it brings such information on 24 digital signals placed on the output connector .

The active state of the signal is pointed out by the low level (low electric level) of the output and lighting of the relative led.

Each output has a meaning as explained below :

Output	Information
1	Textile Machine turning
2	Lack of activity signal
3	Lack of power supply 24V
4	Feeders alarm on input or output
5	stop from broken needle detectors
6	stop from auxiliary devices
7	Lack of oil or air
8	Textile machine doors open
9	Stop for out of LFA tolerances
10	stop for end of piece
11	Lack of signal from turns magnetic sensor
12	
13	
14	
15	Built-in test – serial port receive correct messages
16	Built-in test – serial port receive data
17	Speed bit0
18	Speed bit1
19	Speed bit2
20	Speed bit3
21	Speed bit4
22	Speed bit5
23	Speed bit6
24	Power supply present

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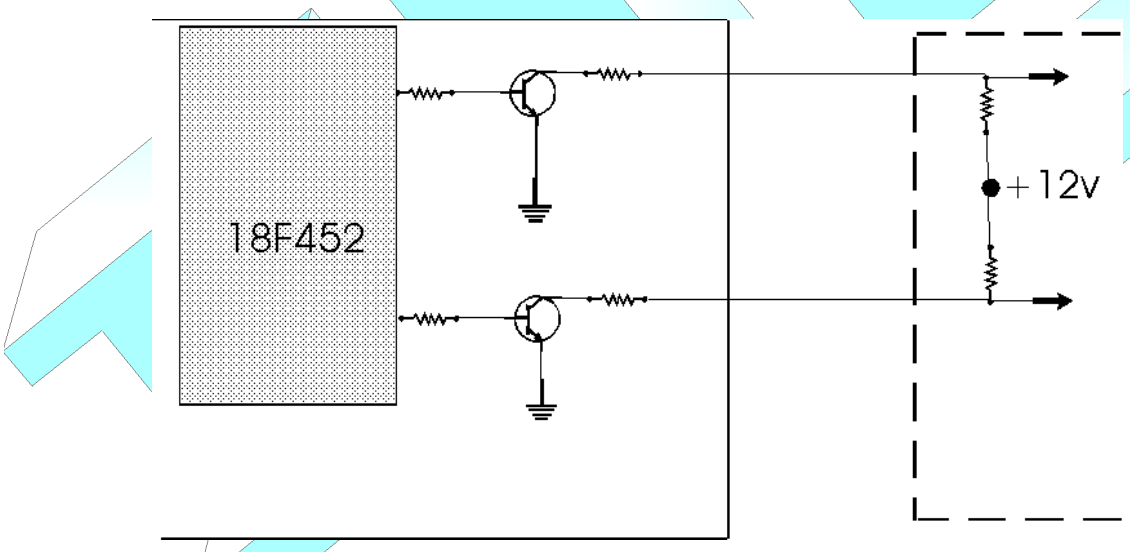
The output labeled 'speed0-*6'* (pins 17-23) show the turning speed value in hexadecimal .
Look at the examples in table below :

Turns per minute	***Coded output***						
	pin. 23	pin. 22	pin. 21	pin. 20	pin. 19	pin. 18	pin. 17
5	0	0	0	0	1	0	1
10	0	0	0	1	0	1	0
25	0	0	1	1	0	0	1
40	0	1	0	1	0	0	0
85	1	0	1	0	1	0	1

The two pins at the beginning of the connector labeled with 'M' are connected to Ground.
Outputs are open-collector stile as follows :



Maximum current is 100mA , maximum voltage is 16V.

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