Operation and Maintenance Handbook

Register Control model

TAJ 200

External connection set-up type: _____

Serial number: _____

Handbook number: _____

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5.4	Handbook	Technical Dept.	Tec. Man.	M022000	51	7/2/2007

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GENERAL INFORMATION

Precautions

Proper understanding of the information and instructions in this manual is essential for the proper use of the electronic equipment.
The electronic equipment owner and operator may carry out work on the electronic equipment only within the limits of their responsibilities and only if properly trained.
The electronic equipment operator must be properly trained in the electronic equipment mechanisms and functioning.
The purchaser of the electronic equipment must ensure that electronic equipment operators are thoroughly trained and have read and understood all the information and precautions provided in documents related to the electronic equipment.
Irrespective of the proper safety steps taken, the owner and electronic equipment operator must at all times be aware of the risks involved in working with the electronic equipment.
The reliability and proper performance of the electronic equipment is guaranteed only by the use of original spare parts.
The electronic equipment owner is liable for any modifications carried out.
The electronic equipment was designed and built with mechanical and electrical safety devices for the protection of the electronic equipment operator and user.
The user is responsible for maintaining the electronic equipment in perfect working order, throughout its operating life.

Example of symbols

Instructions are shown with this symbol.
Failure to follow these instructions may cause injury or health problems.

Instructions about electric plant are shown by this symbol.
Failure to follow these instructions may lead to injury or health problems.

Instructions given in the handbook with these symbols are the main instructions of the proper installation, functioning, storage and decommissioning of the electronic equipment. For safe and proper management of the electronic equipment throughout its working life, these instructions should be carried out at all times. Read the operations and maintenance handbook. Be careful of heated parts.

Precautions

Read the documents accompanying the electronic equipment thoroughly: this will enable you to get the most out of the electronic equipment and to work safely and reliably.
The following instructions refer to the standard model operating in normal conditions.
Failure to carry out the instructions in this handbook, improper use or modifications to the electronic equipment, which are not authorised by the manufacturer, shall make all forms of guarantee null and void and the manufacturer shall not be liable for any damage or injury to persons or animals.

Information on precautions and specific warnings

Make sure the materials specified in the delivery note correspond to the materials actually delivered, and that they are not damaged.
Warning: never run the electronic equipment in precarious conditions or unsuitable locations, even for a brief period.

Aim of the handbook

This handbook was drawn up for the purpose of illustrating to all electronic equipment users, as clearly and thoroughly as possible, all the information required for the installation, operation and maintenance of the electronic equipment from commissioning to decommissioning and disassembly.

All emergency procedures are also listed, covering normal operating conditions and foreseeable accidents.

This handbook was written for electronic equipment users and all those who may either use the electronic equipment or give instructions about its use.

N.B. important: The handbook does not replace the experience and technical training of personnel. It is intended as a guidebook to help personnel run and maintain the electronic equipment properly.
Before operating the electronic equipment, please consult all the instructions and documents supplied with the electronic equipment.
The handbook and all supplementary documents are an integral part of the product and should be kept safely in a nearby location for consultation throughout the working life of the electronic equipment.
No part of this documentation may be reproduced without the permission of the manufacturer.

Structure of the manual

The handbook consists in a single volume with electronic equipment descriptions, plus enclosures with figures for the proper interpretation and implementation of instructions required for electronic equipment operation and maintenance.
The text specifies the regulations applicable to the operation of the electronic equipment. Electronic equipment users must consult these regulations wherever required in order to ensure full compliance.
In addition to providing technical information, the handbook also includes general installation regulations, fine-tuning and instructions for routine and extraordinary maintenance, as well as information about how to identify spare parts.

Modifications and integration

In line with the policy of continuous product improvement, details of the electronic equipment and data in the documentation may be changed by the manufacturer without notice.
Any modifications, improvements or updates to subsequent electronic equipments produced by the manufacturer do not imply an obligation to carry out similar modifications to the electronic equipment supplied, nor that the electronic equipment or the handbook are in any way inadequate.
Some specialist products, identified by code numbers, may make the information in the handbook out of date (wherever possible the handbook will be updated with supplementary information).

Zelo Elettronica may update the handbook whenever he sees fit by sending the electronic equipment users new documents, which must be kept with the handbook.

Manufacturer's Identification

Manufacturer's identification data are shown on the electronic equipment plate at the rear of the electronic equipment.

Electronic equipment identification data

Electronic equipment identification data are given on the electronic equipment plate at the rear of the electronic equipment.

Example of electronic equipment data plate

Electronic equipment type	*TAJ 200*
Serial number	*(manufacturing serial number combined with year)*
Year of manufacture	*(manufacturing serial number combined with year)*
Volt power voltage	*110 or 230 tol. +/- 8%*
Watt power	*50 / 200*
Hertz frequency	*50/60*

Example of serial number
nn-yy the electronic equipment serial number for the year of manufacture

Metal parts and components

Steel
Aluminium
Electrical components with individual CE marking
Self-extinguishing electric cables
Electronic components

CE marking

The CE marking is shown on the electronic equipment plate together with the manufacturer's identification and electronic equipment data.

List of enclosed documents

Unless otherwise requested, documents include the operation and maintenance handbook, the commissioning report and the declaration of compliance.

Electronic equipment use

The electronic equipment described in this handbook is for use in the printing industry.
The electronic equipment should not be used personally or on moist environments.

Personnel using the electronic equipment

This manual contains information required for the proper use of the electronic equipment in compliance with regulations governing electronic equipment use.
Personnel using the electronic equipment must be properly trained and have experience with this type of electronic equipment.
The manager responsible for electronic equipment operation must not place the electronic equipment at the disposal of the company until personnel have been properly trained and have read and understood this handbook (including training in the field, if necessary).
Understanding of, and full technical compliance with, the **safety instructions** and **danger warnings** in this handbook are prerequisites for the safe installation, operation and maintenance of the electronic equipment.
Only "qualified personnel" have the necessary understanding and expertise to translate safety instructions and warnings into the proper steps top be taken, as specified in the handbook.
Use, handling, installation, operation, maintenance, repair and decommissioning of the product must be carried out only by specialist personnel with the necessary qualifications, and provided with the proper tools and instruments after consulting this handbook and all other documents provided with the electronic equipment.

Design Purpose


The electronic equipment was designed to regulate the register of printing machine.
The standard model was designed for use in environments with the following features:
clean, without moisture, without inflammable or mechanically aggressive substances.
For electronic equipments other than the standard models see the specific operating instructions.

Improper use


The standard model is not suitable for:
- operation at different voltages
- in the presence of water or mechanically or chemically aggressive substances
- use outside the specified range of temperatures
- locations defined as those with risk of explosion, unless fitted with proper safety circuits and devices
- in moist locations or above the specified altitude
- in areas of electromagnetic interference

Warning: make sure the electronic equipment also complies with local regulations

Standard packing

The electronic equipment is usually delivered in cardboard boxes with internal polythene protection. The packing cases are padded with cardboard and polythene.
Warning: Do not throw the packing away but dispose of it in compliance with local regulations.

Customised packing

If necessary, or requested, the electronic equipment can be packed in a wooden crate for sea or air transport.
Instructions for removing the standard packing
Remove the plastic and cardboard padding.
Warning: Do not throw the packing away but dispose of it in compliance with local regulations.

Instructions for removing customised packing

Wooden crates should be opened with suitable tools.
The crate can be recycled or re-used.
The unit can be taken out of the crate by removing the plastic or cardboard and the securing nuts; the base supports can be recycled or reused.
Warning: Do not throw the packing away but dispose of it in compliance with local regulations.

Transportation, hoisting, handling, goods-in

The product should be handled carefully using suitable hoisting equipment and harness, in compliance with safety regulations.
Hoist the electronic equipment in the box or on the supports used for transportation.
Use a harness and make sure it is stable during hoisting.
During all handling operations wear individual protection devices (such as gloves and boots or others as required).
For manual handling, two people are required.
Warning: Do not throw the packing away but dispose of it in compliance with local regulations.

Storage

Keep the product in a dry place, away from dust.
Make sure the unit is properly balanced and cannot slip or tip.
Store at a temperature between 0° and 70° C.
Warning: make sure the unit is kept away from the effects of weather and is properly covered.

Maintenance

Before storing after use, clean and check the electronic equipment.

Limits of supply

The unit is supplied in a container for free-standing or a built-in container suitable for fitting the electronic equipment to the printing machine. The electronic equipment must be placed so that all its controls are visible.
Warning: Remove the electronic equipment guards before installation on other electronic equipments or plant.
Accessories are supplied separately or directly on the electronic equipment, if requested.

TECHNICAL FEATURES

General electronic equipment description

The electronic equipments described in this handbook include a mark-to-cylinder system enabling the control of the cut, web-fold, perforation and insetting of the printing machine.
The electronic equipment is fitted with a metallic structure for direct use or use with another printing electronic equipment or regulation centre, to reach the design purpose of the electronic equipment.

When requested, accessories and equipment can be supplied with various degrees of protection, or as special fittings, applications or set-ups.
See the technical documents for further information.
If installed in compliance with the instructions in this handbook and the drawings provided, the electronic equipment is noiseless.

Dimensions and weights

Overall electronic equipment dimensions after assembly are:

Model	Height in Millimetres	Width in Millimetres	Depth in Millimetres
Free standing	280	175	260
Built-in	266	200	255

The weight of the electronic equipment after assembly is:

Model	With accessories Kg	Without accessories Kg	Remarks
Free standing	6.125 *	5.500	*with scanning head
Built-in	4.125 *	3.500	*with scanning head

Power supply

Alternating 230 V power must be used (110 V on request), at a frequency of 50 /60 Hz.
Different power ratings can be used.

Power

The max. power consumption for all models is 50 W / 200W

Max. speed of moving parts

The electronic equipment has no moving parts.

Environmental conditions: limits

For standard models: temperature from 5 to 55 °C, max. relative humidity 70%. Notify any other conditions.

Electronic equipment tests

After assembly the regulation control electronic equipment is commissioned in the factory by ***Zelo Elettronica.***
The complete unit is tested and characteristic data measured in simulated operation.

Accessories

Some accessories are supplied, depending on the installation type. Others can be supplied on request. Special accessories are only supplied on request.
Accessories include:
- alarm on the customer's equipment (to be specified)

GENERAL SAFETY REGULATIONS

General precautions

Before carrying out any operation with the electronic equipment make sure the power cable is not in the socket and that systems are not enabled.
During all operations act in compliance with safety and accident prevention regulations as well as regulations for the safeguarding of the environment, as specified in this handbook or more severe standards implemented locally.
The regulation control electronic equipment does not have parts, which may heat dangerously to the touch; in cases of overheating or fire, do not use water to cool or extinguish flames.
For safety reasons and to comply with the warranty conditions, the electronic equipment should not be used if faulty or performing irregularly.
The installation should ensure that people, animals and objects cannot come into accidental contact with the electronic equipment.
Control and maintenance procedures should be put in place in order to cope with any electronic equipment fault or service problem.

Safety devices on the electronic equipment

All parts of the electronic equipment are protected against accidental contact from outside.
Any parts which may come into contact with the outside world have low power rating.
Output cables are low voltage (0-12 V with direct current) for control signals, and the output cable for motor control can be supplied at 230V on request.

INSTALLATION INSTRUCTIONS

General requirements

Warning: always check that the electric plant and mechanical parts are working properly and are set properly.
In addition:

- in cases where the installation is in a closed room, make sure the room is properly ventilated to prevent a rise in temperature which might damage the electronic equipment;
- make sure the unit is installed in a place where it can be inspected easily.

Equipment required for electronic equipment assembly

Normal mechanical and electrical tools and instruments are required for installation purposes.

Surface required

The electronic equipment must be properly bedded into a strong, level support with holes for built-in installation.

Mechanical connections

Make sure all items have been secured properly.

Checking correct assembly

Make sure the electronic equipment is properly embedded.
Fit any guards required by safety regulations.

Electrical connections and information

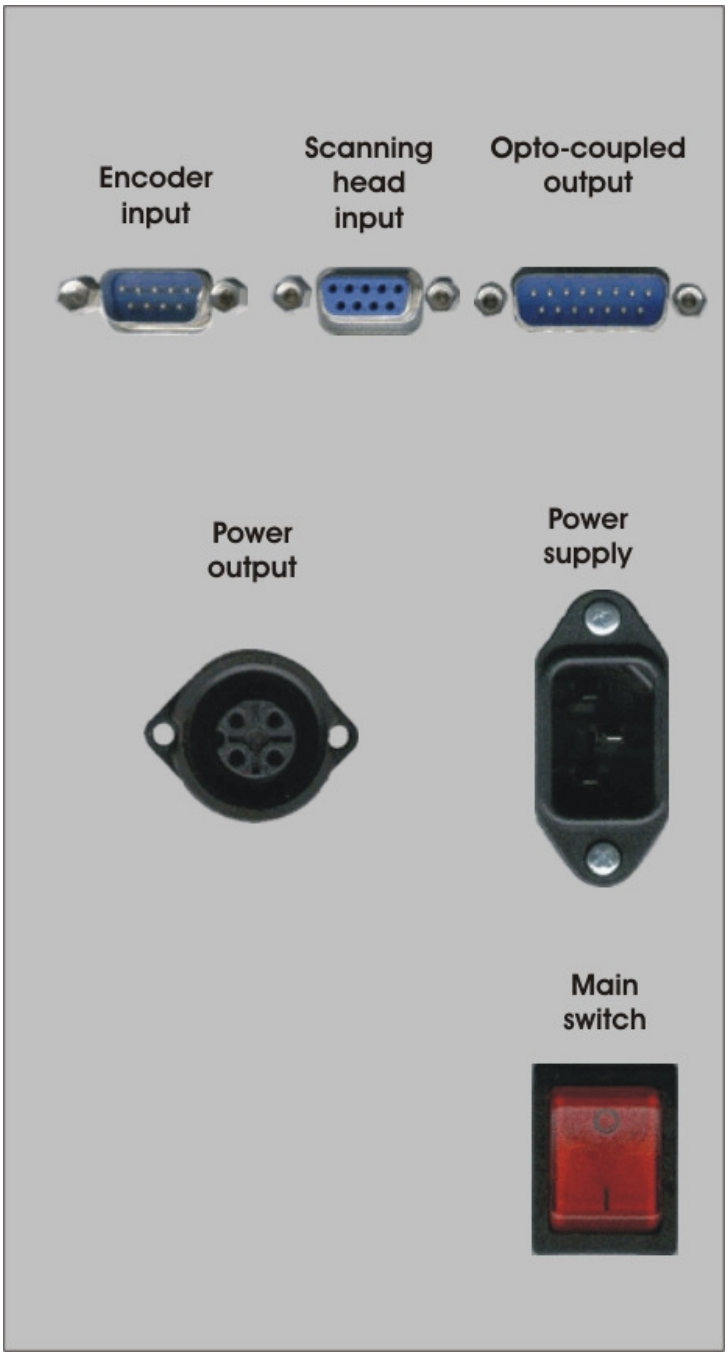
Warning: cut the power before carrying out any work on electric plant

Electrical connections must be carried out by a qualified electrician in compliance with accident prevention and safety regulations, and after consulting the electrical plant diagrams in the handbook and control board wiring diagrams in the enclosures.
All yellow-green earth wires must be earthed before any other wires are connected, and must be the last to be disconnected on disassembly.
The ends of wires and cables must not be moist or dangle in moist areas.

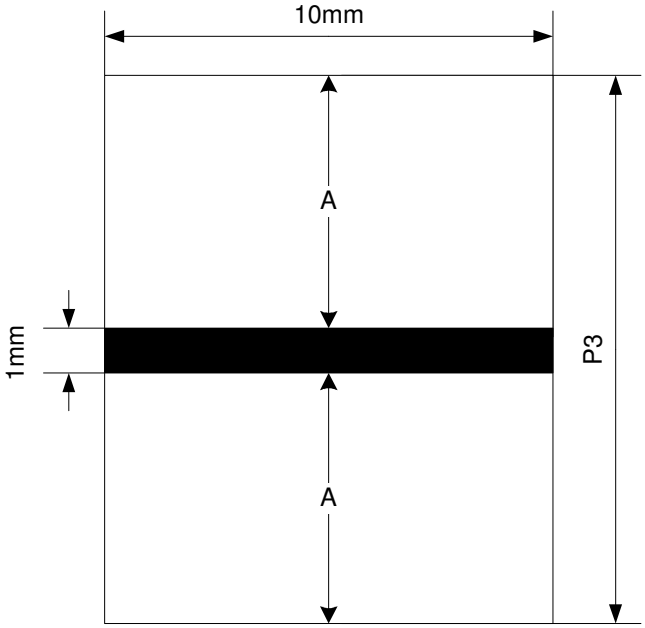
Supply Voltage

Warning: Make sure the frequency and voltage specified on the electronic equipment plate correspond with mains values.

Back Panel


Encoder input
Scanning head input
Opto-coupled output
Power output
Power supply
Main switch

***TAJ 200 MC* Register Mark**



P3:	Register control working area. It should be at least equal to Gate Width parameter (PR).
A:	Free printing area
Length:	10 millimeters
Height:	from 1 to 10 millimeters

REGULATING AND FINE TUNING

Controls to carry out when first starting up and on subsequent start-ups.

After installation, the product does not require special regulation. However, on first start-up:

- check that the application complies with the measurements shown on the electronic equipment plate (see technical and sales documents)
- check mechanical fittings
- check electrical connections
- make sure the warning lights come on.

Electric equipment.

Make sure the control board meets statutory requirements for accident prevention and that it also meets local protection requirements.

START-UP

Introduction

Do not start up the electronic equipment if all the safety devices required by statutory regulations have not been fitted.

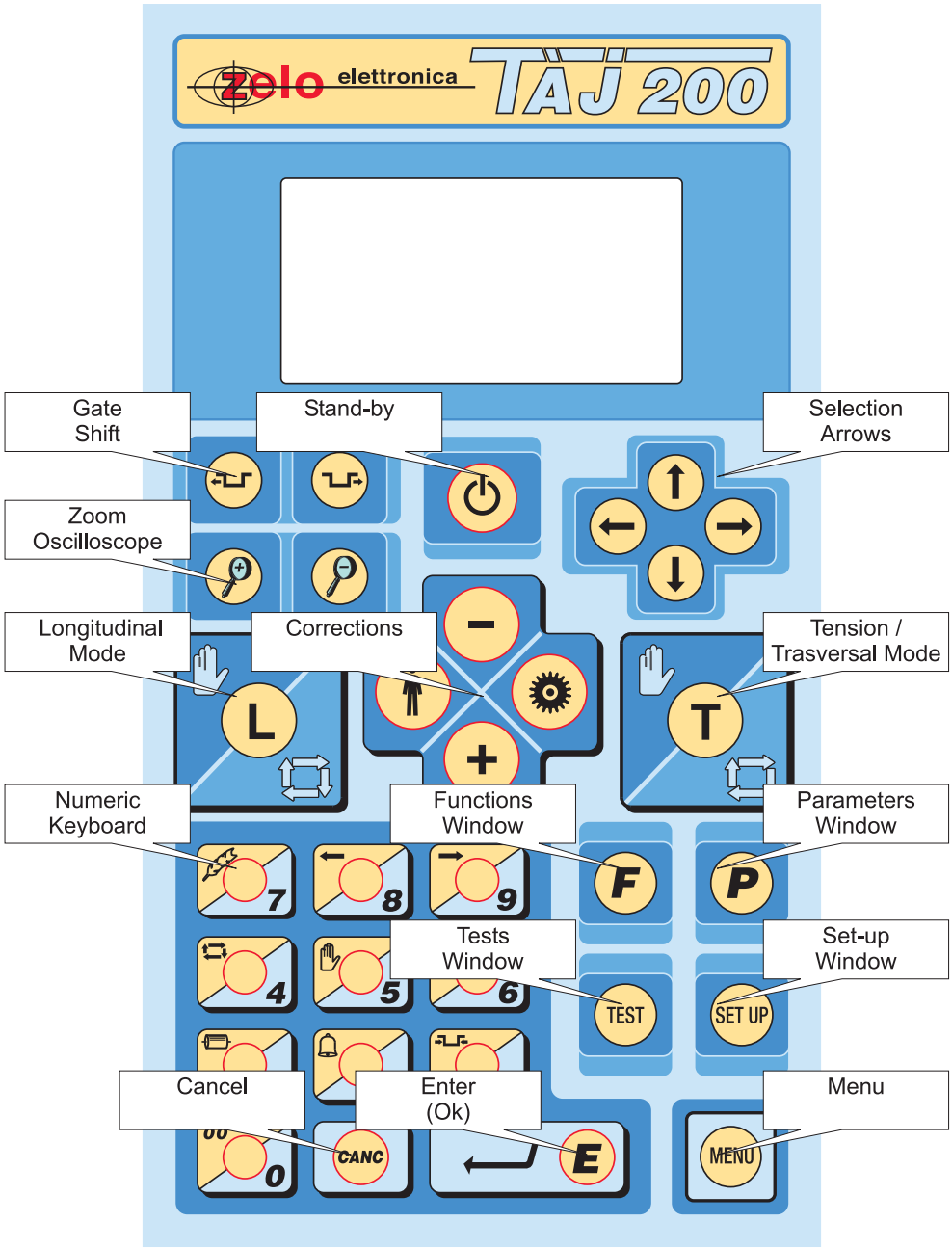
Getting the electronic equipment ready

Make sure the mechanical parts have been fitted properly and that the electronic equipment is installed in a stable position on the work surface or on the electronic equipment where it is fitted (built-in type).
Make sure the electrical connections have been carried out properly and that the electronic equipment is earthed.
Make sure personnel working close to the electronic equipment and the electronic equipment to which it is fitted are at a safety distance before starting up the printing machine.

Start-up

To start up, switch the switch on the rear panel to "***ON***" (I).
Warning: if the electronic equipment does not start up, do not make repeated attempts to start it. This could cause damage.
Find and correct the fault.
If the electronic equipment does not function properly, see the section headed "Troubleshooting". To shut down, switch to "***OFF***" (O) on the rear panel.

FRONT PANEL


Zelo elettronica
TAJ 200
Gate Shift
Stand-by
Selection Arrows
Zoom Oscilloscope
Longitudinal Mode
Corrections
Tension / Trasversal Mode
L
T
Numeric Keyboard
Functions Window
Parameters Window
F
P
Tests Window
Set-up Window
TEST
SET UP
Cancel
Enter (Ok)
Menu
CANC
MENU

Introduction

The touch key shows the operator to insert the information and parameters of the electronic equipment while the display, besides showing them, also show all the phases that the register produces.

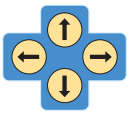
It's important to notice, that the numeric keys ( to ) have a secondary function that can be access pressing before the keys  ,  ,  ,  or  .

Meaning of the controls

Stand-By:
it disables register control and turn off the display
Warning: tension will remain inside the register control.

Longitudinal working mode:
it enables or disables the corrections for longitudinal register

Transversal/Tension working mode: (if installed)
it enables or disables the corrections for transversal or tension register



Selection arrows:
it allows to change the selection in menu windows.

Enter / Ok:
- in menu window, it allows to enter in the selected menu
- in value window, it allows to confirm the inserted value
- in setup window, it allows to confirm the inserted value

Cancel / Esc:
- in menu window, it allows to exit from the current window
- in value window, it allows to exit without any change
- in setup window, it restores the changed parameter with the original value

Advance:
it corrects the longitudinal register, in advance

Retard:
it corrects the longitudinal register, in retard

Trasmission / + Paper: (if installed)
- if transversal register control is installed, it corrects the transversal register, towards the transmission/gear
- if tension register control is installed, it inserts more paper in press (decreasing the tension)

Operator / - Paper: (if installed)
- if transversal register control is installed, it correct the transversal register, towards the operator
- if tension register control is installed, it insert less paper in press (increasing the tension)

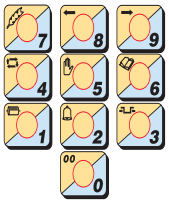
Functions menu:
it allows to enter in functions window

Parameters menu:
it allows to enter in parameters (of the current job) window

Tests menu:
it allows to enter in tests window

Setup menu:
it allows to enter in setup (of the whole ***TAJ 200*** machine) window

Main menu:
it allows to enter in the main menu window, where you can access to every screens of ***TAJ 200***



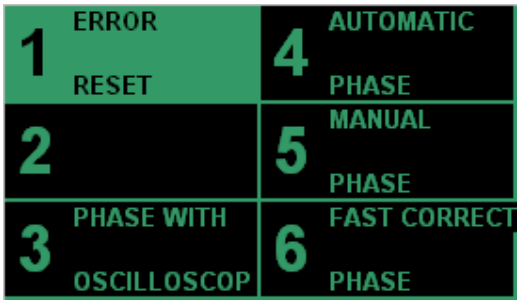
Numeric Keyboard:
- in the menu window, it allows to enter directly to the desired menu
- in the value window, it allows to insert the new value for the selected parameter
- in the setup window, it allow to insert the new value for the selected parameter

Gate Shift:
during the oscilloscope visualization, they allow to left/right shift the gate (or symmetrical move the signal)

Zoom In / Zoom Out:
during the oscilloscope visualization, they allow to zoom in or zoom out the visible area (2 cylinder revolution are visible at minimum zoom)

FUNCTIONS - "F" KEY

Pressing F, you can access to the screen below:



Here, continuing to press the key F, you can navigate among the possible functionality.

Pressing E key, you execute the selected operation.

As an alternative, you can press F key, followed by the number (1, 2, 3, 4, 5, 6) of the required functionality.

Function F1: Error Reset

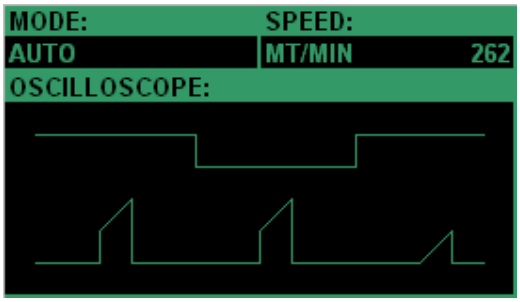
F, 1 This function allows resetting the error visible on display.

Function F2:

F, 2 Not used.

Function F3: Phase with oscilloscope

F, 3 This function, available only when press is running (speed>0), allows entering in oscilloscope screen:



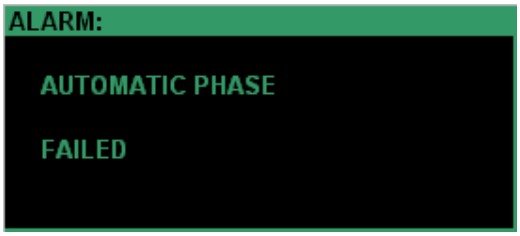
In this screen you can see 2 signals: the first one (top) shows the reading window (also called ***gate***), the second one (bottom) shows the signal read by the scanning head.

Using the , keys , you can zoom in/out the visible window of the cylinder

Using the , keys, you can left/right shift the gate (symmetrically moves the signal) in order center it above the requested mark. To confirm the new position, press the key. If you want to reset the error, you have to press the , keys.

Function F4: Automatic phase

, This function, available only when press is running (speed>0), enables the automatic research of register marks along the paper.
In case of this error:



you have to repeat the functionality. If, also in this case, you receive an error, you have to check the scanning head position (the arrow have to point the center of the register mark)
In case of this error:

the register control has found two marks in the gate. ***TAJ 200*** will work using the first one, but in case of big error, you can have "strange" behaviors. If it's possible, don't use ***TAJ 200*** on double marks.

Function F5: Manual Phase

 , This function, available only when press is stopped (speed==0), memorize the angular position of the cylinder respect to the register mark on web. In order to use this functionality in the right way, please follow the procedure:
Stop the press
Positioning the reference mark under the scanning head's light.

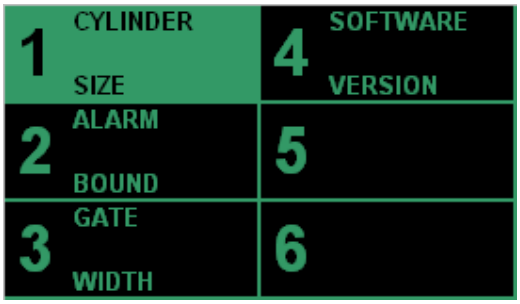
Go to the ***TAJ 200*** console and press  , keys. The selected mark will be used as reference for the register control.

Function F6: Fast correction phase

 , This function is used during **cold seal application**. After the automatic change of the reel, the register mark can be lost. Using this function, the register control ***TAJ 200*** will send to PLC the command to speed-up the register correction.
On display you can see the oscilloscope screen until the register mark will enter in gate. Once it's done, the ***TAJ 200*** will return in standard register control mode.

PARAMETERS - "P" KEY

Pressing  , you can access to the screen below:



Here, continuing to press the key  , you can navigate among the possible parameters.

Pressing  key, you execute the selected operation.

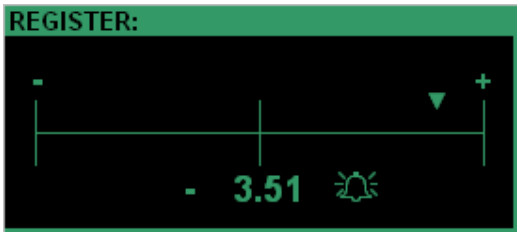
As an alternative, you can press  key, followed by the number ( ,  ,  ,  ,  , ) of the required parameter.

Parameter P1: Cylinder size

 ,  This parameter is the cylinder size (circumference) in millimeters.

Parameter P 2: Alarm bound

 ,  This parameter is the error threshold (in hundredths of millimeters). Once it's over-passed the alarm icon (bell) will be shown on display. If requested TAJ 200 can also enable the alarm output (opto-couplet or static relays).



Parameter P: Gate Width

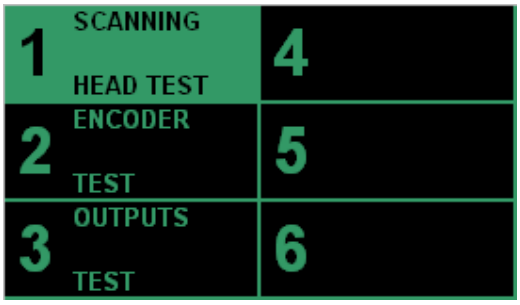
 , This parameter is the width of the reading window of the scanning head (in millimeters).

Parameter P: Software Version

 , This function allows knowing the software version of the two electronic boards installed on ***TAJ 200***. In case of problem, where you have to call the technical assistance, please take note of these numbers.

TESTS - "TEST" KEY

Pressing  , you can access to the screen below:



Here, continuing to press the key  , you can navigate among the possible tests.

Pressing  key, you execute the selected operation.

As an alternative, you can press  key, followed by the number ( ,  ,  ,  ,  , ) of the required test.

Test T1: Test Scanning head

 ,  This test, available when press is running (speed > 0), checks the scanning head, its amplifier and the connection cable.

Test T2: Test Encoder

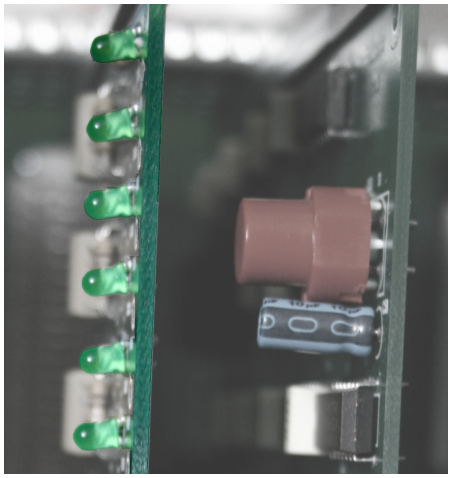
 ,  This test, available when press is running (0<speed<60mt/min) , checks the encoder and the connection cable.

Test T3: Test Outputs



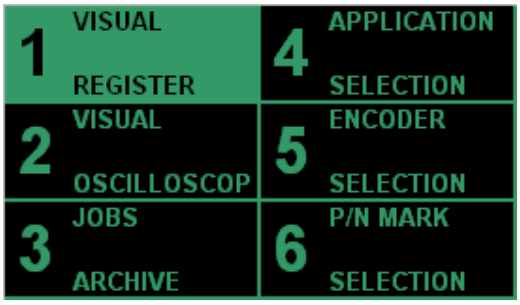
This test checks the ***TAJ 200*** outputs, turning off every outputs and then enabling once at time for about one second.

1) Advance	(first green 3mm led From the bottom of the console)
2) Retarde	(2nd led)
3) Traverse / + Paper / - Tension	(3rd led)
4) Operator / - Paper / + Tension	(4th led)
5) Alarm	(5th led)
6) Additional Function (Cold Seal)	(6th led)



MENU - "MENU" KEY

Pressing  , you can access to the screen below:



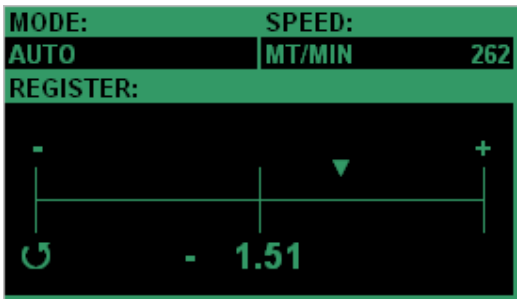
Here, continuing to press the key  , you can navigate among the possible menus.

Pressing  key, you execute the selected operation.

As an alternative, you can press  key, followed by the number ( ,  ,  ,  ,  , ) of the required menu.

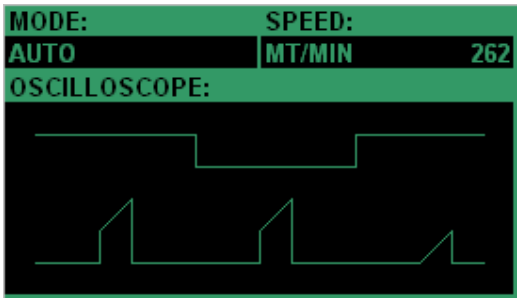
Menu M1: Visual Register

 ,  This menu allows visualizing the register error (standard visualization).



Menu M2: Visual Oscilloscope


This menu allows visualizing the oscilloscope.



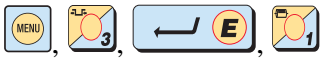
In this screen you can see 2 signals: the first one (top) shows the reading window of the scanning head (also called ***gate***), the second one (bottom) shows the signal read by the scanning head.

Menu M3: Jobs archive

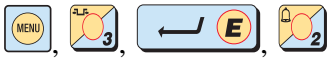

This menu allows entering in job management submenu.

This function is available on the press where cylinder is positioned for each job in the same encoder position.

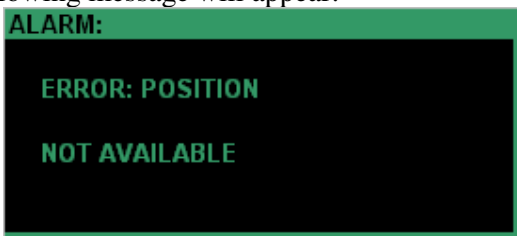
Submenu M3.1: Jobs archive – Save Job


This sub-menu allows saving all the job parameter in a permanent memory. Till 1000 jobs can be saved.

Submenu M3.2: Jobs archive – Load Job



This sub-menu allows loading all the job parameter in from the selected permanent memory to the current in use. Only memory slot saved before can be loaded, otherwise the following message will appear:



Menu M4: Application selection

In case ***TAJ 200*** is in ***TWIN*** configuration (two applications installed on the same console), this menu allows accessing to the submenu for the choice of the application. Press 

or 

for the selection of the application for the current job.

Menu M5: Encoder selection

In case ***TAJ 200*** is in ***TWIN*** configuration (two applications installed on the same console) and two encoders are required, this menu allows accessing to the submenu for the choice of the encoder. Press 

or 

for the selection of the encoder for the current job.

Menu M6: P/N mark selection

In case ***TAJ 200*** is configuration with optic fiber scanning head, this menu allows accessing to the submenu for the choice of the kind of mark to use. Press 

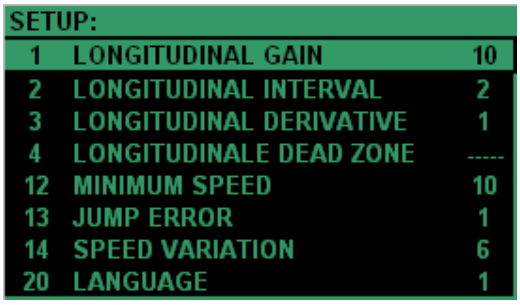
or 

for the selection of kind of mark (positive= dark mark on light background, negative = light mark on dark background) for the current job.

SET-UP - "SETUP" KEY

Pressing 

, you can access to the screen below:



Here, continuing to press the key 

, you can navigate among the possible parameters.
Pressing the numeric keys 

you can directly insert the new value for the selected parameter. Using the 

key, you confirm and save the new value, while pressing 

key, the old value is restored.

Depending on the ***TAJ 200*** configurations, a subset of parameters will be visible and changeable:

1- Longitudinal Gain (value from 1 to 99)
The value entered determines the correction time at equal error.

2- Longitudinal Interval (value from 1 to 99)
It's the number of copies between the point of correction and the scanning head positioning point.

3- Longitudinal Derivative (value from 1 to 255)
It adjusts the actual derivative.

4- Longitudinal Dead Zone (value from 0 to 100 millimeter/100)
It makes the register less sensitive to the backlash of the printing machine.

5- Longitudinal Motor Speed (value from 0 to 255 tenths of millimeter/second)

The value entered determines the longitudinal motor speed used to calculate the correction time.

6- Transversal Gain (value from 1 to 99)
The value entered determines the correction time at equal error.

7- Transversal Interval (value from 0 to 255)
It's the number of copies between the point of correction and the reading head positioning point.

8- Transversal Dead Zone (value from 1 to 100)
It makes the register less sensitive to the backlash of the printing machine.

9- Transversal Motor Speed (value from 1 to 255 tenths of millimeter/second)
The value entered determines the transversal motor speed used to calculate the correction time.

10- Tension Gain (value from 0 to 255)
From the value 0 to 99 it gives a correction proportional to the error, whereas from the value 100 to 255 it gives an impulse of 1ms for every unit above the value 99.

11- Tension Interval (value from 0 to 255)
The value entered corresponds to the number of consecutive corrections in the same direction to be awaited before the tension command output is activated.

12- Minimum Speed (value from 1 to 255 meter/minute)
Below the set value, the register does not make the corrections even if the automatic is inserted. Therefore, if the insertion speed set is too high with respect to the printing machine speed, the wording "***Low Speed***" will appear on the display.

13- Jump Error (value from 0 to 9)
If the register mark is damaged or modified, for example by ink stains or creases in the paper with subsequent anomalous reading, the register does not do any kind of correction up to the number of copies set.

14- Speed Variation (value from 0 to 14)
It excludes the correction when the printing machine speeds up or slows down. The value entered determines the intervention threshold: the lower the value, the more sensitive it is to variations in speed.
Intervention is shown with the message "***acceleration***" or "***deceleration***".
When the set value is "0", exclusion is inactive.
15- Reference Mark (value from 1 to 10)

The inserted value, used in Mark-To-Mark configuration (color register control), is the index of the mark to use as reference

16- Mark Position in Mark-To-Mark configuration (color register control) (value from 1 to 10)
The inserted value, used in Mark-To-Mark configuration (color register control), is the index of the mark of the color to control.

17- Mark shape (value from 0 to 3)
You can choose 4 different shapes for register marks:
0- triangle with operator diagonal
1- triangle with transmission diagonal
2- longitudinal line.
3- dot (only on ***TAJ 200*** configuration with motorized scanning head)

18- Reversal Corrections (value from 0 to 1)
If the value entered corresponds to 0, correction is of the normal type; if the value entered corresponds to 1, the correction is reversed.

19- Auto-Register after F4 (value from 0 to 1)
If the inserted value is 0, the ***TAJ 200*** works in standard mode: after "***Automatic Phase***" functionality (***F4***) is called, the ***TAJ 200*** register control is in manual mode: no correction output is enabled. If the value is 1, after ***F4***, ***TAJ 200*** will start to correct the error in proportional mode.

20- Language (value from 1 to 5)
Language of the ***TAJ 200*** user interface:
1-Italian, 2-English, 3-French, 4-Spanish, 5-German

24- Zoom Error (value from 1 to 10)
Scale of the error indicator in the visual register screen (standard screen)

29- Empty area in F4 (value from 0 to 600)
Empty area in millimeters that the "***Automatic Phase***" looks for before and after the register mark. If it's set to 0, the ***TAJ 200*** chooses automatically the best value to use (half gate).

CORRECTION KEYS

In order to switch to longitudinal automatic register control, you have to press this key.

On display, the following message 

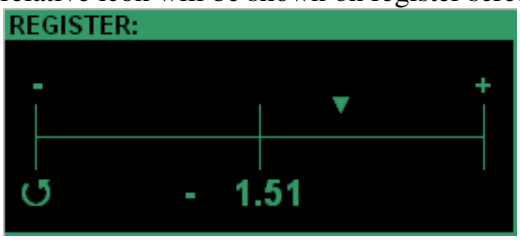
will appear, or otherwise in case of ***TAJ 200*** configured with transversal register control or tension control, the following message will be shown 

.
To switch to manual the longitudinal register control, press another time the same key.

In manual:

Pressing the  key, it's possible to move the longitudinal motor in "retard"

Pressing the  key, it's possible to move the longitudinal motor in "advance".
In both the situation, the relative icon will be shown on register screen.



In automatic:

Pressing the  key, it's possible to move the mark reference (ideal) position towards "retard" of the inserted value (in millimeter/100)

Pressing the  key, it's possible to move the mark reference (ideal) position towards "retard" of the inserted value (in millimeter/100)
In both the situation in the register screen, you can notice that the error will be changed adding the inserted value. The **TAJ 200** register control will automatically applies the correction to clear the error.

If TAJ 200 is configured to have transversal or tension register control, you can press this key to switch to automatic.

In this case, you can see on display one of the following messages: 

or 

.
To switch to manual the transversal/tension register control, press another time the same key.

In manual:

If transversal register control is active, pressing the  key, it's possible to move the transversal register motor towards "operator".

If transversal register control is active, pressing the  key, it's possible to move the transversal register motor towards "transmission".

If tension register control is active, pressing the  key, it's possible to reduce the quantity of paper inserted in press, increasing the tension.

If tension register control is active, pressing the  key, it's possible to increase the quantity of paper inserted in press, decreasing the tension.
In every cases, the relative icon will be shown on register screen.

In automatic:

If transversal register control is active, pressing the  key, it's possible to move the mark reference (ideal) position towards "operator" of the inserted value (in millimeter/100)

If transversal register control is active, pressing the  key, it's possible to move the mark reference (ideal) position towards "transmission" of the inserted value (in millimeter/100)

In both the situation in the register screen, you can notice that the error will be changed adding the inserted value. The **TAJ 200** register control will automatically applies the correction to clear the error.

If tension register control is active, the  ,  keys are disabled.

HOW TO USE TAJ 200

1. Turn on the ***TAJ 200*** and position the scanning head far from artificial light and so that the reference arrow is in line with the register marks.
2. Set/Check the circumference of the cylinder in millimetres (pressing  ,  keys).
3. Set/Check the size of gate (pressing  ,  keys).
4. Take the printing machine up to a speed above the minimum speed set in setup menu (check pressing  key, line12).
5. Execute the automatic phase (pressing  ,  keys) and check that the message "Automatic Phase done" appears on screen.
6. On display will appear the value of the error in millimeters/100 referred to the center of the gate.
7. Switch the ***TAJ 200*** register control in automatic mode, pressing the  key**.**
8. If during the automatic phase you receive the message "Automatic phase failed" or "No print", the ***TAJ 200*** is not able to find a correct mark. It can due to a wrong scanning head position, or the mark has some anomaly in the printing phase (nick definition, incorrect distance of marks on plate, etc.)
9. The message "Low Speed" indicates that the register control insertion speed is too high in respect to speed of the press, therefore it is necessary to increase the press speed, or decrease the speed value entered in the "Setup" menu.

ERROR MESSAGES

No Print

Scanning head is not able to recognize any mark signal in is reading window (gate).

Low Speed

The message “Low Speed” indicates that the register control insertion speed is too high in respect to speed of the press, therefore it is necessary to increase the press speed, or decrease the speed value entered in the “Setup” menu. The register control disables any correction while the message is present.

Automatic phase failed

In case of error during the Automatic Phase functionality. It can due to a wrong scanning head position, or the mark has some anomaly in the printing phase (nick definition, incorrect distance of marks on plate, etc.)

Cylinder size (P1) not acceptable

In case of the inserted cylinder size value is not acceptable for ***TAJ 200***. The register control disables any correction while the message is present.

Double mark

Two signal/mark are present in scanning head reading window.

Gate width (P3) not acceptable

In case of the inserted gate width value is not acceptable for ***TAJ 200***. The register control disables any correction while the message is present.

Acceleration

The press is speeding-up (sensitivity adjustable from parameter 14 of setup menu). The register control disables any correction while the message is present.

Deceleration

The press is speeding-down (sensitivity adjustable from parameter 14 of setup menu). The register control disables any correction while the message is present.

Scanning head test failed

Scanning head test is failed: check if scanning head light is present and it's pointed on a printed paper.

Encoder Test Failed

Encoder test is failed: check the wires.

To cancel every error, press the 

key.

POSITIVE/NEGATIVE SWITCH ON SCANNING HEAD

Classic scanning head

- Scanning head with switch on P position
  The scanning head reads black mark on white paper.
- Scanning head with switch on N position
  The scanning head reads white mark on black paper.

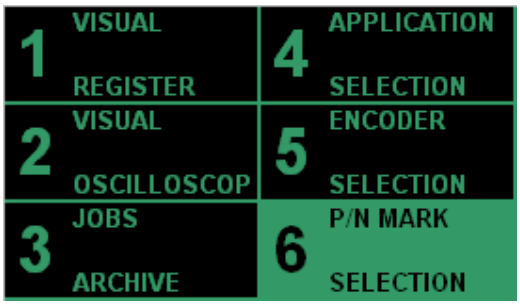
Optic-fiber scanning head

- ***Serial number < 139-06***
  - Scanning head with switch on P position
    The scanning head reads black mark on white paper.
  - Scanning head with switch on N position
    The scanning head reads white mark on black paper.

- ***Serial number > 139-06***

Pressing 

, you can access to the screen below:



Pressing 

, you can access to the sub-menu for the selction of the mark's kind.

Pressing 

, you can select positive mark (dark mark on light background), otherwise, pressing 

, you can choose negative mark (light mark on dark background).

ROUTINE AND EXTRAORDINARY MAINTENANCE

Warning: cut the power before carrying out any maintenance activity

Routine maintenance and repairs must only be carried out by specialist personnel.
Extraordinary maintenance and large-scale repairs must only be carried out by an authorised workshop.

Carry out operations in a clean and dry environment, following the normal rules of good practice.

Nature and frequency of checks and operations to be carried out by the plant user

Check the electrical connections before each use
Warning: Maintenance and the replacement of parts must be carried out in the factory by qualified personnel.

Safety precautions concerning each operation

If the electronic equipment does not need to be disassembled:
1) make sure the printing machine ***cannot*** start up or move accidentally;
2) make sure the power is cut;
3) check that the electronic equipment ***TAJ 200*** is stable;
4) take care to remove parts and place them safely

Operations to be carried out by specialist personnel and repair workshops

1) Remove the protection;
2) Disassemble the electronic equipment;
3) Replace worn or damaged parts;
4) Reassemble the unit as described below.

TROUBLESHOOTING

Fault	***Probable causes***	***Remedy***
The electronic equipment does not switch on	No power	Make sure the electronic equipment is plugged in
The general switch is not on	No power Bulb blown	Make sure the electronic equipment is plugged in Replace the switch
	Faulty fuse	Check the cause and replace the fuse
The words “no signal mark” are displayed	No head light	Make sure the head light is on
	Faulty wiring	Check the outer wiring of the reader head
	Scanning head in wrong position compared to reference mark	Make sure the regulation mark is opposite the arrow on the upper part of the reader head.
	Lack of white or free space around the setting mark	Check for white or free space around the setting mark
	The encoder slips during regulation	Check for slippage
	Faulty encoder wiring	Check the wiring
	Faulty paper tension regulation	Check the paper tension (above insetter and cold seal systems ……)
	Artificial light is near the scanning head	Position the scanning head far from artificial lights or turn of the light.
“Automatic phase” is not possible	Encoder not connected	Connect the encoder
	No setting mark	Check for setting mark
	No scanning head light	Check for light
	Faulty electrical connections	Check external scanning head wires
	Faulty scanning head position in connection with the reference mark	Make sure the mark is opposite the arrow on the upper part of the reader head.

Fault	***Probable causes***	***Remedy***
	Artificial light is near the scanning head	Position the scanning head far from artificial lights or turn of the light.
The print setting is maintained for a period then the words “no signal mark” are displayed	Encoder slip	Check encoder slippage
	Faulty paper tension	Check the paper tension (above all on return printer and cold seal systems ……)
The displayed error is not eliminated by corrective action.	Print error is greater than the ability of the regulation control to correct	Switch to manual. See if adjusting the paper tension can correct the error.
The value on the display continue to rise slowly despite corrective action	Print error is greater than the ability of the regulation control to correct	Switch to manual. See if adjusting the paper tension can correct the error.
The correction lights come on but the print is not properly set	Electronic control of the motor correction unit is showing a fault	Switch to manual. Press the advance/retard pushbuttons (when the electronic equipment is on) for a few seconds to adjust the regulation
	Wiring can be faulty	Execute the outputs test and, using a voltmeter check that the signal is present at the motor inputs.
N.B.: If the electronic equipment continues to have faults after carrying out the above actions, shut down and contact Customer Service		

REPLACING SPARE PARTS

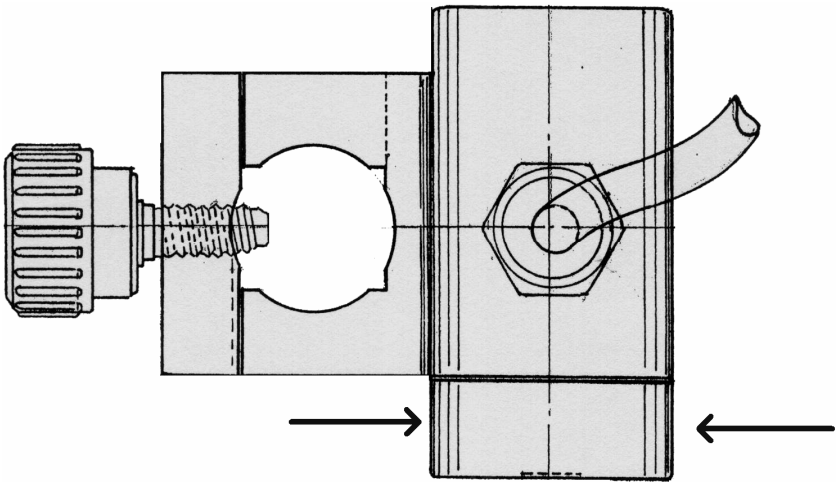
Replacement of spare parts procedure

To prevent the loss of any form of warranty or manufacturer's liability, only use original spare parts for repairs.
To order spare parts, provide ***Zelo Elettronica*** or the authorised workshop with the following data:

1) complete model number;
2) date and/or serial number;
3) name and reference number of the item specified in section 1 of this handbook or in technical catalogues;
4) the number of items required.

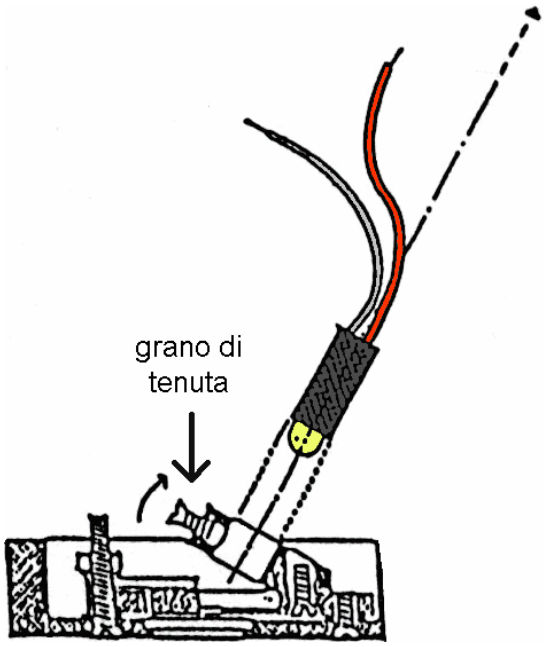
Lamp replacement in scanning head

A) Screw off 4 fixing screw and remove the optically assembly from the scanning head.

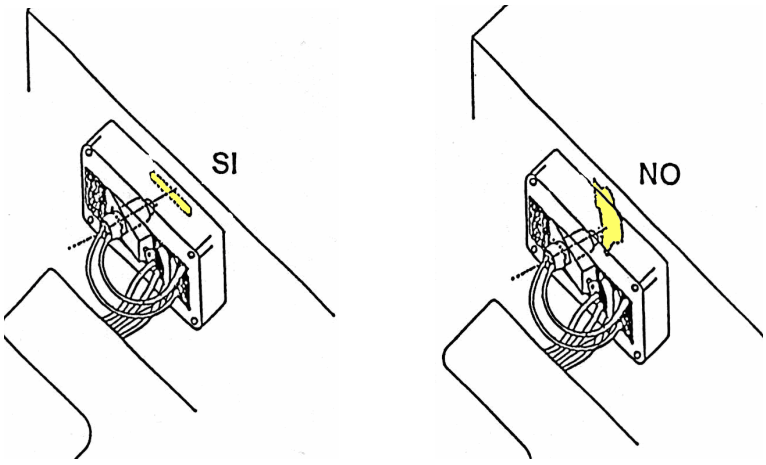


B) Unsolder the lamp wires.
C) Memorize the correct position of the lamp, in order to mount the new one in the same position

D) Loose the lamp screw



E) Remove the lamp
F) Put in the support the new lamp, pay attention to put it in the same position where the old one was.
G) Tighten - thoughtlessly - the lamp screw
H) Solder the wires
I) Before to remount the scanning head, approach (about 5 mm) the optical assembly (of the side where the spot come out) to a parallel plan, for the examination of the reflected light line.



Push the lamp until the lamp bulb touches the bottom, then turn the lamp until to obtain a correct light as indicated in the figure above. In case on the lamp bulb holder

tube there is a reference line, the reference line should coincide with the center line of the bulb holder tube lam screw.

J) Tighten - thoughtlessly - the lamp screw

List of spare parts

TAJ 200 spare parts are listed below:

- 1-channel scanning head for ***TAJ 200***
- Light bulb for 1-channel scanning head for ***TAJ 200***
- Amplifier and conversion box for optic fibres scanning head for ***TAJ 200***
- Front keyboard with VFD display for ***TAJ 200***

LUBRICATION

The electronic equipment ***TAJ 200*** has no moving parts and does not require lubrication.

DOWN TIME

If the electronic equipment ***TAJ 200*** is left to stand without working for a few days, before start-up check the mechanical and electrical connections.
For further information see the section on storage and handling.

DECOMISSIONING AND DISASSEMBLY

When disassembling and disposing of the electronic equipment, the user must comply fully with local industrial waste regulations and the instructions in this handbook.

WARRANTY

Equipment manufactured by us is guaranteed for one year against manufacturing defects and faulty materials.

The warranty includes free repair of the electronic equipment in the Zelo Elettronica laboratories, including the repair of all manufacturing defects and faulty parts, within the 12-month period following delivery, provided the electronic equipment is properly installed and used.

Expenses to and from the laboratory specified by us and other expenses (for example for temporary export) are borne exclusively by the purchaser.

The warranty shall be null and void in cases of tampering with the electronic equipment, modification or repair by unauthorised personnel.

The warranty does not include improper use, damage from outside sources or faults unrelated to manufacture such as faulty installation and/or rust.

The manufacturer is not liable for direct or indirect damages or loss of profit arising from claims against one of our electronic equipments, even if repaired by us under warranty.

In cases in which a technician is requested on the customer's premises:
* the warranty shall include labour and the replacement of materials
* the warranty shall not include travel time and expenses (mileage, air tickets, motorway toll fees, taxis, etc.) or board and lodging, which shall be paid by the customer.
Any disputes arising shall be governed by the Lodi Court.

Specifically, the electronic equipment user is reminded that rights under warranty are maintained only if all the instructions in this handbook and enclosures are followed and if best mechanical engineering, electrical and electronic practice is used for the proper functioning of the electronic equipment.
Faults arising from improper installation or rust are not covered by warranty.
To obtain warranty rights, the electronic equipment must be inspected by us or by an authorised centre before use.
Failure to follow all the instructions given in product documentation shall make the warranty null and void.