

HOD®
INDUSTRIAL
SOLUTIONS

ANKH



INSTALLATION, OPERATION AND MAINTENANCE MANUAL

REV. 1.2 – 05/10

1. INDEX

| | |
|---|-----------|
| 1. INDEX | 2 |
| 2. CERTIFICATION | 4 |
| 3. DISMANTLING | 5 |
| 4. WARNINGS | 6 |
| 4.1 INTRODUCTION | 6 |
| 4.2 PURPOSE | 6 |
| 4.3 FONT CHARACTERS AND HEADING LAYOUT | 6 |
| 5. PRESENTATION | 8 |
| 6. PREPARATION AND INSTALLATION | 10 |
| 6.1 PACKING LIST | 10 |
| 6.2 SAFETY NORMS | 11 |
| 6.3 SUGGESTED USE OF THE MACHINE | 11 |
| 6.4 PACKING, TRANSPORT AND STORAGE | 11 |
| 6.5 INSTALLATION | 12 |
| <i>Machine stabilisation</i> | 14 |
| 6.5.1 ASSEMBLY OF THE SIDE SHELF | 15 |
| <i>Fastening of the side shelf</i> | 15 |
| 6.5.2 FRONT VIEW | 16 |
| 6.5.3 REAR VIEW | 17 |
| 6.6 OPERATING CONDITIONS | 18 |
| 6.7 POWER SUPPLIES | 18 |
| 7. DESCRIPTION OF CONTROLS | 19 |
| 7.1 BASIC FUNCTIONS | 19 |
| 7.1.1 SWITCHING ON PRESETTER | 19 |
| 7.1.2 VISUALISER MODE | 21 |
| 7.1.3 CONNECTING S'PRINT-S LABELLING MACHINE | 24 |
| 7.1.4 CONNECTION TO GENERIC RS232 PRINTER | 26 |
| 7.1.5 LABELS PRINTING | 27 |
| 7.1.6 TOOLINGUP SOFTWARE INTERFACING | 28 |
| 7.2 CONTROL PANEL | 29 |
| 7.2.1 706 control panel | 29 |
| 7.2.2 CONTROL PANEL OF THE MACHINE | 30 |
| 8. MEASURING | 31 |
| 8.1 FOREWORD | 31 |
| 8.2 MEASURING WITH 506V | 31 |
| 8.2.1 FOCUSING OF IMAGE | 32 |
| 8.2.2 SETTING MENU 506V | 33 |
| 8.2.3 MEASUREMENT ON FIXED GRID | 34 |
| 8.2.4 AUTOCOLLIMATION | 36 |
| 8.2.5 PARTICULAR CASES OF COLLIMATION | 37 |
| 8.2.6 SETTING OF ANALOGICAL/DIGITAL VISUALIZATION | 38 |
| 8.2.7 TOOL PROFILE PHOTOGRAPH | 39 |
| 8.3 GEOMETRIC CALCULATION | 40 |
| 8.3.1 AUTOMATIC ANGLE MEASUREMENT | 41 |
| 8.3.2 INCLINATION ANGLE OF A STRAIGHT LINE | 42 |
| 8.3.3 CHECK OF ANGLES WITH 506V | 43 |
| 8.3.4 DISTANCE BETWEEN TWO POINTS | 44 |
| 8.3.5 AUTOMATIC CIRCLES MEASUREMENT | 45 |
| 8.3.6 RADIUS CHECKING WITH 506V | 47 |
| 8.3.7 CIRCLE PASSING THROUGH FIVE POINTS | 51 |
| 8.4 INSPECTION MODE | 52 |
| 9. MOVEMENTS | 54 |
| 9.1 AXES MOVEMENTS | 54 |
| 9.1.1 RAPID ADJUSTMENT | 54 |

| | |
|---|-----------|
| 9.1.2 MICROMETRICAL ADJUSTMENT | 54 |
| 9.2 SPINDLE FUNCTIONS..... | 55 |
| 9.2.1 ROTATING SPINDLE SUBSTITUTION | 55 |
| 9.2.2 SPINDLE BRAKE..... | 56 |
| 9.2.3 SPINDLE INDEX (OPTION)..... | 56 |
| 9.2.4 TOOLHOLDER CLAMPING | 57 |
| 10. MACHINE ORIGINS..... | 58 |
| 10.1 NC MACHINE ORIGINS | 58 |
| 10.2 DEFAULT MACHINE..... | 59 |
| 10.3 ENTERING, ENABLING, CHANGING AND DELETING A CN MACHINE SOURCE..... | 61 |
| 10.2 ACTIVATION, MODIFICATION AND CANCELLATION OF A CN MACHINE ORIGIN | 68 |
| 11. TOOLS SET..... | 71 |
| 11.1 INTRODUCTION | 71 |
| 11.2 CREATION AND MEASUREMENT OF A TOOL SET | 71 |
| 11.3 TOOLS SET MODIFICATION | 75 |
| 11.4 TOOL CANCELLATION AND TOOLS SET | 76 |
| 11.5 LABELS PRINTING..... | 77 |
| 12. MACHINE PARAMETERS | 78 |
| 12.1 FOREWORD..... | 78 |
| 12.2 PARAMETERS LIST | 79 |
| 12.3 SOFTWARE STOP LAYOUT | 81 |
| 13. MAINTENANCE | 83 |
| 13.1 ROUTINE MAINTENANCE..... | 83 |
| 13.1.1 SPINDLES, ADAPTERS, RESETTNG GAUGES LUBRICATION..... | 83 |
| 13.1.2 CONTROL PANEL CLEANING 706..... | 83 |
| 13.1.3 CLEANING 506V | 83 |
| 13.1.4 COMPRESSED AIR FILTERS CLEANING AND VACUUM CLAMPING ASPIRATION..... | 83 |
| 14. TROUBLE SHOOTING..... | 84 |
| 14.1 FOREWORD..... | 84 |
| 14.2 PROBLEMS, CAUSES AND SOLUTIONS | 84 |
| PROBLEM: the tool presetter does not switch on..... | 84 |
| PROBLEM: Axes don't respond to the displacement movement | 84 |
| PROBLEM: One or more axes don't execute the complete run or they stop | 84 |
| CAUSE: badly set out software stops..... | 84 |
| PROBLEM: Axis Z goes on in fits and starts while it is moving up | 84 |
| PROBLEM: an axis stops and/or goes on in fits and starts | 84 |
| PROBLEM: the index key doesn't work..... | 85 |
| PROBLEM: Axes calculation is incorrect but produces repeated measurements..... | 85 |
| PROBLEM: Calculation is incorrect and the measurements are not repetitive..... | 85 |
| PROBLEM: Axes counting does not take place. | 85 |
| PROBLEM: How to update the software of digital read-out | 85 |
| PROBLEM: The autocollimation gives different measurements on different points of screen. | 85 |
| 15. DIAGRAM..... | 86 |
| 15.1 ELETTRICAL DIAGRAM | 86 |
| 15.2 PNEUMATIC DIAGRAM | 87 |

2. CERTIFICATION

The manufacture, *ELBO CONTROLLI i.e.*, under its own responsibility

DECLARES THAT:

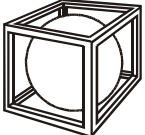

The ANKH presetters is conforms to safety standards where enforceable.

- 2006/42/CE
harmonized standards EN ISO 12100-1, EN ISO 12100-2
- 2004/108/CE
harmonized standards EN61326-1, EN55011 ISM (group 1, class A),
EN61000-3-2, EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4,
EN61000-4-5, EN61000-4-6, EN61000-4-11
- 2006/95/CE
harmonized standards EN60950-1, EN60204-1

as shown in the test reports enclosed to our technical brochure..

MEDA, 18/01/2008

Massimiliano Tasca
General Manager

| | | |
|---|--|--|
|  | ELBO CONTROLLI S.r.l. |  |
| | Via S. Giorgio, 21 20036 Meda (MI) Italia | |
| Modello / Model | <input type="text"/> | |
| Numero seriale / SN | <input type="text"/> | |
| Anno costruzione / Year | <input type="text"/> | |
| Tensione / Voltage | <input type="text"/> | |
| Corrente / Current | <input type="text"/> | |
| Massa / Weight | <input type="text"/> | |

Information relating to this presetter is listed on the rating plate stamped on the back of the machine as shown above.

3. DISMANTLING**Information obligations to the users****DISPOSAL OF WASTE MATERIALS**
INFORMATION FOR PROFESSIONAL USERS
- VALID IN EUROPEAN COMMUNITY ONLY -

According to the 2002/95/CE, 2002/96/CE and 2003/108/CE Directives, relative to reduction in the use of hazardous substances in electrical and electronic apparatus, as well as to disposal of waste materials.

The symbol of a crossed box applied on the apparatus indicates that at the end of its useful life the product must be collected separately from other waste materials.

The separate waste collection of the apparatus which has reached the end of its useful life is organized and managed by the national dealer.

The user who desires to get rid of the present apparatus must therefore contact the national dealer and follow the given instructions.

Suitable separate waste collection for then sending the cast-off apparatus for recycling, treatment and environmentally friendly disposal, contributes towards preventing any possible negative effects on the environment and on health and encourages the reuse and recycling of the materials the apparatus is made up of.

Unauthorised disposal of the product by the user will lead to payment of the administrative sanctions in force in the country where it is put on the market.

4. WARNINGS

4.1 INTRODUCTION

This operation and maintenance manual, concerning the ANKH Tool presetters should be considered as an integral part of the apparatus and therefore it should be kept with care for future references.

All the procedures and information contained in the manual cannot be a substitute for the end user's adequate tool presetting experience, but they provide the necessary information for the correct and proper use of the ANKH tool presetters.

Unauthorized equipment handling, non-compliance of instructions, or improper or incorrect use may lead to unforeseen results for which *ELBO CONTROLLI S.r.l.* declines all civil or criminal liability.

ELBO CONTROLLI S.r.l. reserves the right to modify at any time the tool presetter and the operator's manual without prior notification on account of the continuous technical updating of the product in pursuit of the Company strategy aimed at perfecting presetting technology of tools measurement and presetting and at customer satisfaction.

All suggestions for improvements of the apparatus or manual are welcome either by fax or letter to our head office.

4.2 PURPOSE

The aim of the manual is to allow the ANKH Tool Presetters operator to become acquainted with the machine operating directions, routine and non-routine maintenance and the proper operating procedures and to show all the required necessary actions from the presetter's introduction until disposal.

Implement only the allowed use and the configuration reported, approved by *ELBO CONTROLLI S.r.l.*; any other use or configuration is not recommended, as it may compromise the tool's proper functioning and/or its safety. This manual does not replace the experience and the technical expertise of the personnel involved in the use of the Presetter machine and is to be considered as a guide at all times.

This manual must be read following the chapters in their logical order, because the repeated information is explained in full the first time it appears, afterwards it is only mentioned because it constitutes knowledge already acquired.

4.3 FONT CHARACTERS AND HEADING LAYOUT

This manual is sub-divided into chapters which contain homogeneous information, each chapter is identified by a title in the following font character:

X. FIRST CHAPTER

Each chapter is identified by a title in the following text format:

X.X FIRST PARAGRAPH

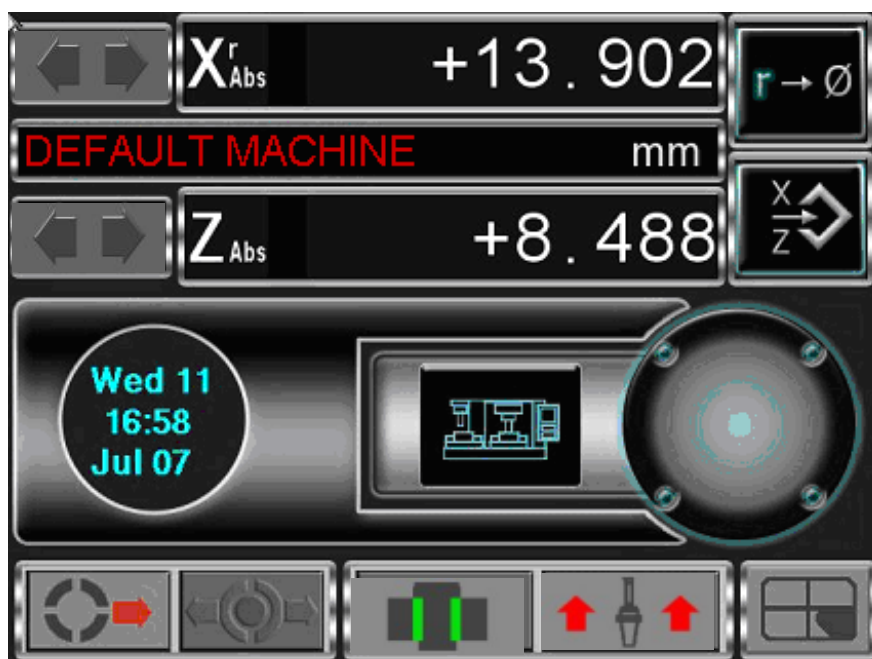
The operation or maintenance procedures are identified by:

☒ Procedure

Then the characters will identify the procedures:

- step 1
- step 2
-
- step 4

The message shown on the LCD *function display* will appear in the following way



Notes or instructions are identified using the following format:

☒ *Note or instruction of particular interest.*

5. PRESENTATION

First we would like to take this opportunity to thank you for your purchase of Elbo Controlli's ANKH Presetters. You will certainly have great satisfaction using the ANKH *ELBO CONTROLLI* Tool presetters and you'll increase the profitability of your NC machines.

Presetters ANKH have been manufactured in compliance with ergonomics and simplicity principles, and offer outstanding technological solutions. The mechanical systems, electronics and software deal with tool measurement and pre-adjustment. The 506V camera vision system, designed by ELBO CONTROLLI, is used to collect measurement data both automatically and manually.

The good value for money and the precision of measurements make ANKH one of a kind.

FEATURES

- Step-by-step motors servo control the axes movements and dispose of two modes: quick (2.5 m/min) and micrometric (positioning accuracy 0.8 μm) mode.
- Micrometric movements (electronic handwheels) are used to collimate the tool profile and to acquire the measurement. The automatic clearance recovery system is patented.
- Spindle body with double ball retainer. Patented interchangeable spindle (run-out error < 2 μm). Patented universal shank locking system. Rotation brake. Angular index.
- Base and column made of natural granite. The low thermal inertia of the material assures non-deformability in time and the possibility to directly install the machine in the workshop.
- Camera system for measuring and inspection procedures. C-MOS sensor, punctiform and toroidal red light double illuminator. Telecentric optic system with low F/Number.
- LCD touch panel display and software on a LINUX platform for a quick and easy operation of the machine and measuring functions.
- TOOLINGUP software for post processing and tool table management. An intuitive, flexible and powerful software which allows adapting the format of the measured values to those of a CNC for their subsequent transmission.

TECHNICAL FEATURES

- Z600 Measuring range: diameter max. 600 mm (radius 300 mm); height max. 600 mm
Z800 Measuring range: diameter max. 600 mm (radius 300 mm); height max. 800 mm
- Machine structure in stainless steel offering high mechanical and long life, floor mounted with adjustable supports in non-deformable steel.
- Base and column made of natural granite: linearity max error 2 $\mu\text{m}/\text{Mt}$ – certification with Taylor Hobson res. 1 $\mu\text{m}/\text{Mt}$. electronic millesimal level.
- ISO / BT / HSK / VDI..... etc. Interchangeable rotating spindle-holder (to be specified) max run-out error < 2 μm .
- Double vault arc prismatic slideways : n°2 X axis slideways, n°1 Z axis slideway.
- Double re-circulating ball bearing slides, lubricated for life - X axis=3, Z axis=2 - (preloading slides/slideways: P/H class).
- Spindle index in four angular positions: 0°-90°-180°-270° (option).
- Universal mechanical tool clamping. The clamping system recognizes the type of pull-stud and clamps it without having to interchange and adjust the clamping collets. The operation is guaranteed for the pull-studs manufactured under the production standards. If the pull-stud is not in accordance with the production standards it's needed to verify the proper functioning.

Standards pull-studs are those defined by the following production standards:

- MAS 403 BT
- DIN 7388-2B
- DIN 69872-A/B
- JBS ½
- ISO A-B 7388
- ANSI B 5.50 (CAT).
- Pneumatic-mechanic braking of the spindle-holder rotation with radial compensation of the clamping force: no axis angular run error.
- Constant load Archimedean spiral spring (as opposed a mass counter-balance system).
- Vision-system for tool measuring and cutting inspection including:
 - TFT screen - colours \square 212 x 160 mm, magnifications about 35X.
 - C-MOS sensor – Framed image area 6,4 x 4,8 mm VGA System.
- Machine operator interface through:
 - TFT 5,7" colour Touch Screen.
 - Technology with FLASH® 32 bit microprocessor.
 - LINUX operating system.
 - Data storage on SD card.
- Software standard:
 - CNC machine origin management and adapters.
 - Tool list creation and/or single tool.
 - Automatic change of CNC machine origin allocation.
 - TOOLINGUP to manage:
 - tools set and Post Processor universal generator.
 - magnetic chip code-holders (Balluff for example, hardware not included).
 - multi-cutting tools.
- Equipaggiamento ottico
 - Telecentric lens.
 - Doublet lenses at low F/Number in order to eliminate the error of the clearness circle.
 - Episcopic illuminator with ring lens and red leds; diasopic illuminator with red, puntiform light led.
- ELBO CONTROLLI Linear Transducers in optical glass type SLIDE 371 certified HP laser
 - Axes resolution: X= 1 μ m, Z= 1 μ m.
- Anti-dust cover provided for when not in use.

OVERALL DIMENSIONS

- Length: 1850 mm
- Height: 1960 mm
- Depth: 687 mm
- Weight: 340 kg

6. PREPARATION AND INSTALLATION**6.1 PACKING LIST**

Before proceeding with preparation and installation, check that the tool presetter packaging contains the following components:

TOOL PRESETTER

☐ ANKH

ROTATING SPINDLE

☐ ISO 30

☐ ISO 40

☐ ISO 45

☐ ISO 50

☐ HSK 63

☐

☐

☐

RESETTING GAUGES

☐ ISO 30

☐ ISO 40

☐ ISO 45

☐ ISO 50

☐ HSK 63

☐

☐

☐

REDUCERS

☐ ISO VDI

☐ altro

MINI-LABELLING MACHINE ☐

LABELS ☐

FEEDER**OPERATION MANUAL****TEST REPORT****WARRANTY****DUST COVERS**

Checked by.....

6.2 SAFETY NORMS

The personnel involved with the ANKH Tool Presetter are not required to use any particular protection, however they must be informed of the following potential dangers:

- In particular conditions of measurement of the vertical axis, the 506V illuminator can be at a height, which can be head butted in case the machine is used without the necessary attention.
- We recommend carrying out the manipulation of tools carefully and, if necessary, protecting one's hands because tools are sharp and may be dangerous

☒ *The person responsible for employee safety should train the people required to use the tool presetter, by imposing the reading of this manual.*

6.3 SUGGESTED USE OF THE MACHINE

The ANKH Tool Presetters is an instrument to preset and measure the tools surveying their dimensions along the X-Z-axes, in accordance with the axes definition of the machine using the above-mentioned tools. The measurable tools are to be compatible with the presetter spindle; any attempt to adapt the tool presetter spindle taper without using the appropriate adapters supplied by *ELBO CONTROLLI S.r.l.* is to be considered improper use.

The maximum weight of the tool to be measured should be no more than 50 kg.

Any other use is to be considered improper and compromising the operator's safety.

☒ *The ANKH Tool Presetter is to be handled by a single person in conditions of tested and controlled efficiency, in respect of all procedures described in this manual.*

6.4 PACKING, TRANSPORT AND STORAGE

The instrument must be handled inside its proper case, which prevents from normal mechanical stresses.

Stated outside the packaging are the shipping instructions, particularly the specified total weight, transport position and using symbols, vulnerability to atmospheric agents and the need to handle with care.

Keep the original packing and use it for further transportation of the instrument.

Tool presetter transportation is to be carried out by qualified carriers able to grant the correct handling of the transported goods, observing the following precautions:

- Lift only with trolleys or pallet jacks.
- Do not bump, throw, drop, roll, or drag the case.
- Do not overcharge the packing by piling more than three cases.
- Avoid exposure to atmospheric agents.
- Maintain the prescribed transportation position.

The storage environment must fall within the following environmental conditions:


- Safe from the atmospheric agents
- Temperature between -10 and 50 °C.
- Relative humidity between 20% and 95% without condensation.

6.5 INSTALLATION

After the machine has been transferred to the installation site, the unpacking procedure shall be followed with reference to the attached sheet. As for packing, the reverse procedure shall be followed.

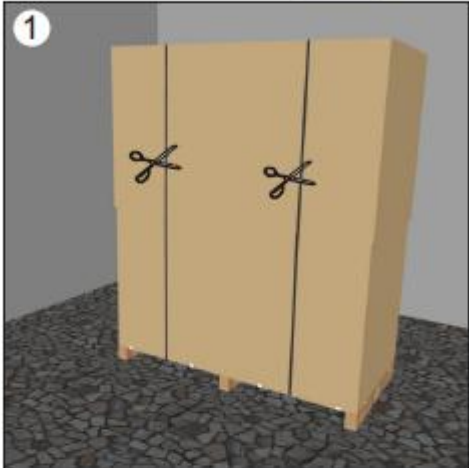
ISTRUZIONI DISIMBALLAGGIO PRESET ANKH

ANKH PRESET UNPACKING INSTRUCTIONS



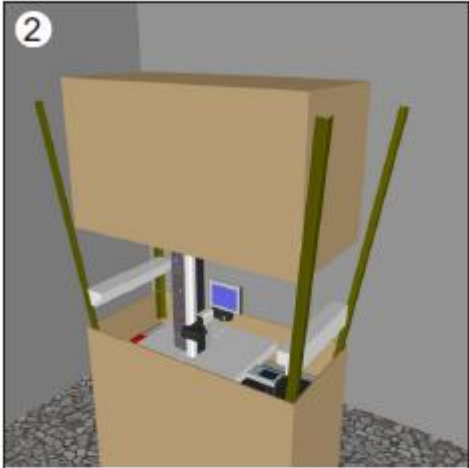
APPARECCHIATURE ELETTRONICHE PER MACCHINE UTENSILI

1



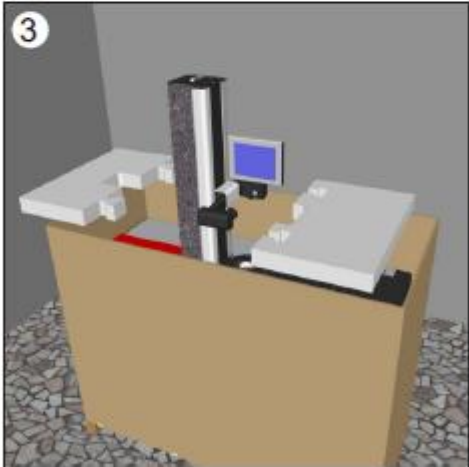
Tagliare la reggia di sicurezza
Cut the safety band strap.

2



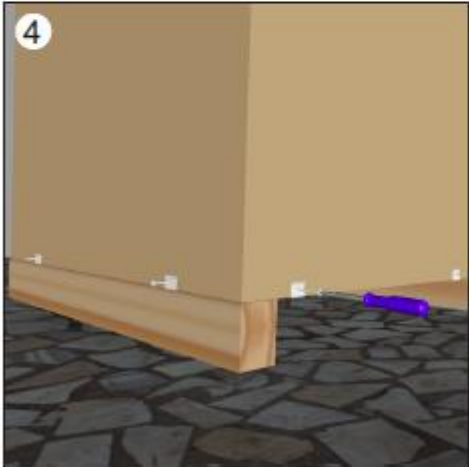
Rimuovere il coperchio e i montanti di sostegno.
Remove the top and the supporting posts.

3




Rimuovere i bloccaggi colonna.
Remove the column locking.

4



Svitare le viti che fissano l'imballo alla base.
Unscrew the screws fastening the boxing to the base.

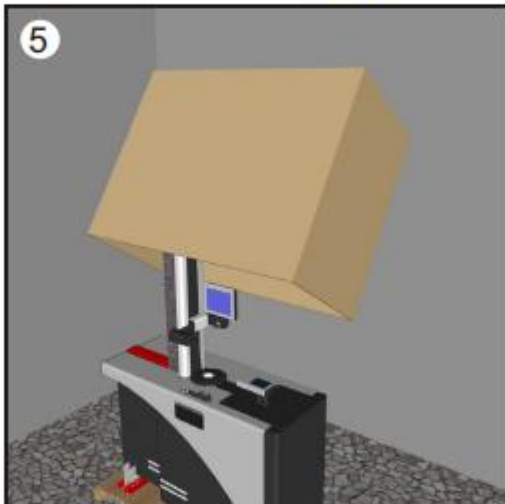
Segue
Following



ISTRUZIONI DISIMBALLAGGIO PRESET ANKH ANKH PRESET UNPACKING INSTRUCTIONS



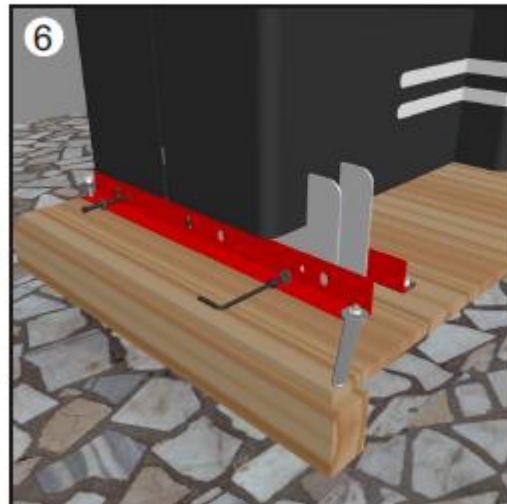
ELBO CONTROLLI s.r.l.
APPARECCHIATURE ELETTRICHE PER MACCHINE UTENSILI



5

Togliere l'imballo sfilandolo verso l'alto.

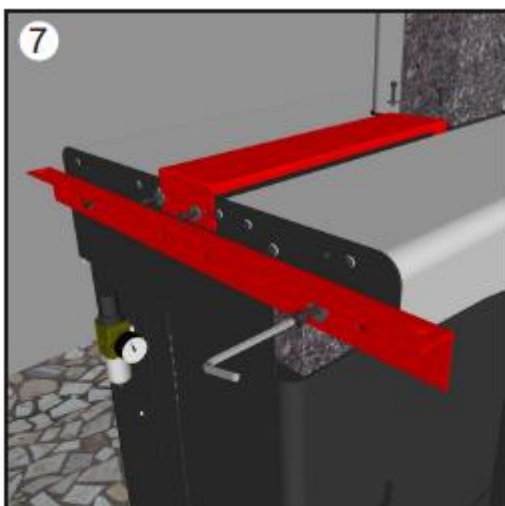
Take the boxing off.



6

Svitare le viti che fissano le staffe di trasporto al pallet e alla macchina.

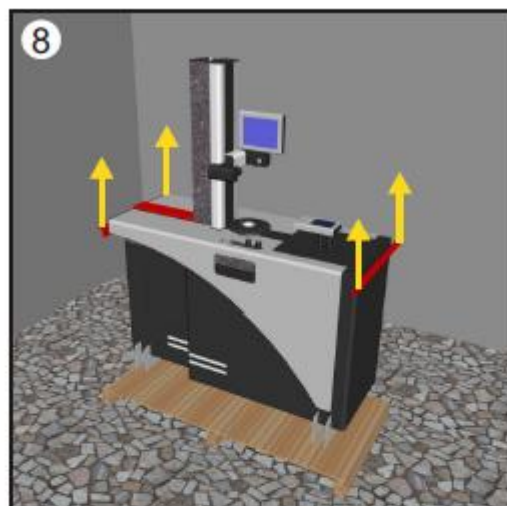
Unscrew the screws fastening the transport brackets to the machine.



7

Fissare le staffe di trasporto alla parte superiore della base macchina.

Fix the transport brackets to the upper side of the machine base.



8

Sollevare la macchina attaccandosi agli appositi punti indicati dalle frecce.

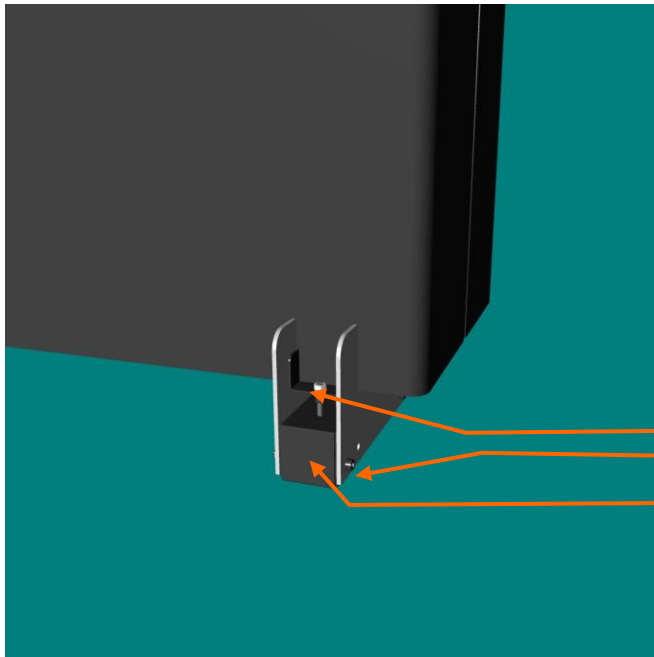
Lift the machine, by the suitable points indicated by the arrows.

ATTENZIONE

Dopo aver posizionato la macchina rimuovere la staffa di bloccaggio della colonna, vedi figura 7

WARNING

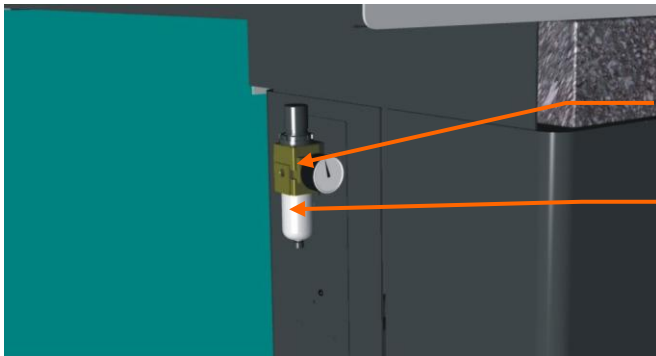
After positioning the machine remove the column fixing bracket, see figure 7

✕ Installation procedure**Machine stabilisation**

Position the machine over a flat and levelled surface ($\pm 1.5 \text{ cm / m}$); in case of oscillations, regulate the specific adjustable foot; proceed as follows: loosen the fixing screw in the adjustable foot; rotate the counter dowel until making the machine stable; fasten the adjustable foot and lock it by using the specific fixing screw.

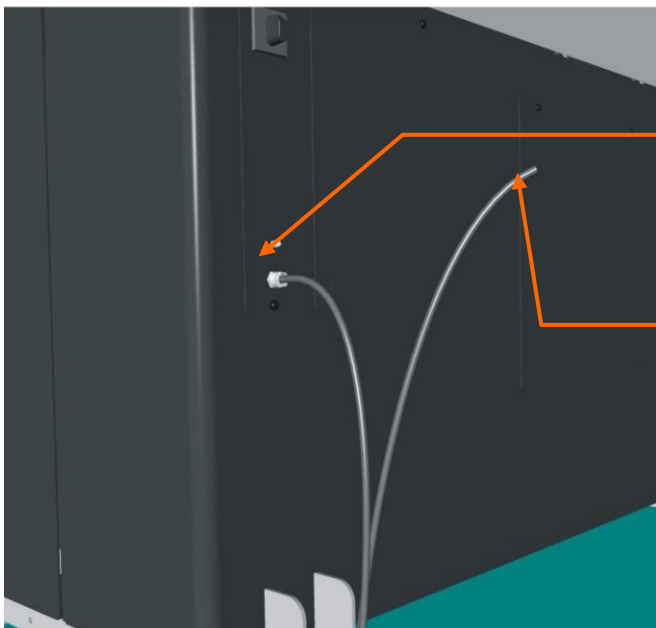
counter dowel
fixing screw
Adjustable foot

Presetter shall be located in an area free of vibrations that might have effects on the machine stability.

**Machine pneumatic connection**

Connect the presetter to the compressed air system and set the feed pressure between 5 and 6 bar

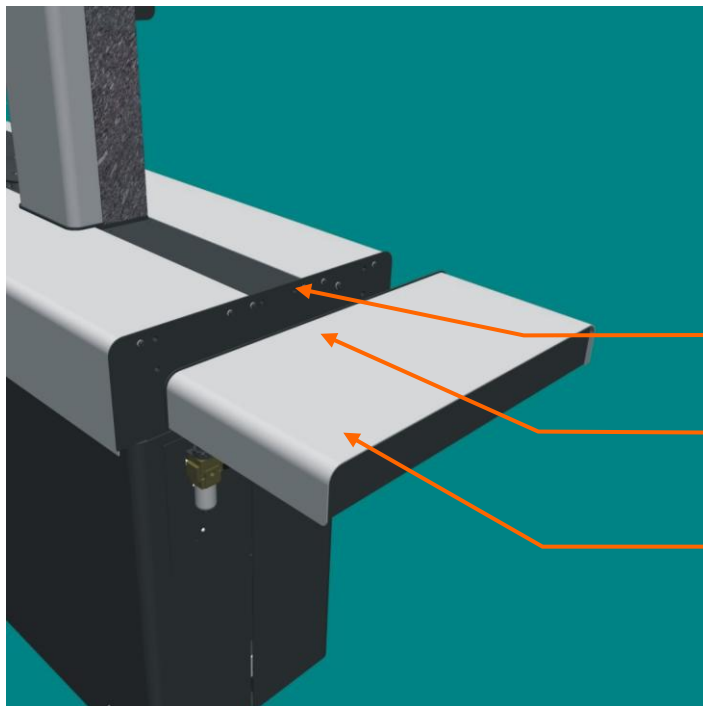
Compressed air impurities collection vessel

**Machine electrical connection**

Connect the presetter to the earthed system by making use of a yellow/green conductor minimum section 1,5 sqmm, fixed on the provided terminal.

Connect the presetter to the electricity transmission grid by inserting the plug into the 115-230 Vac mains socket.

6.5.1 ASSEMBLY OF THE SIDE SHELF



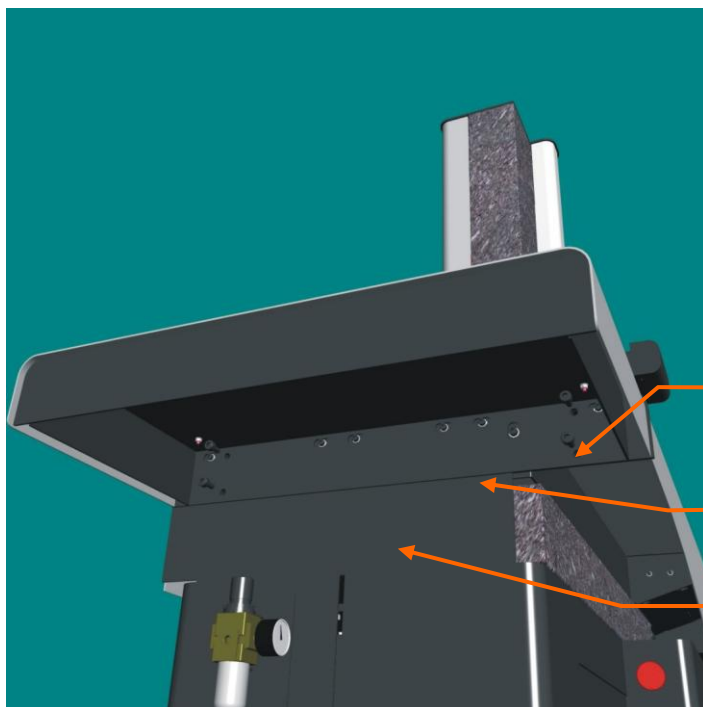
Assembly of the side shelf

Install the side shelf by laying it to the machine. Be careful to introduce the projections of the screws into the housings, which are to be found in the head of the side shelf.

machine

projections of the screws

side shelf



Fastening of the side shelf

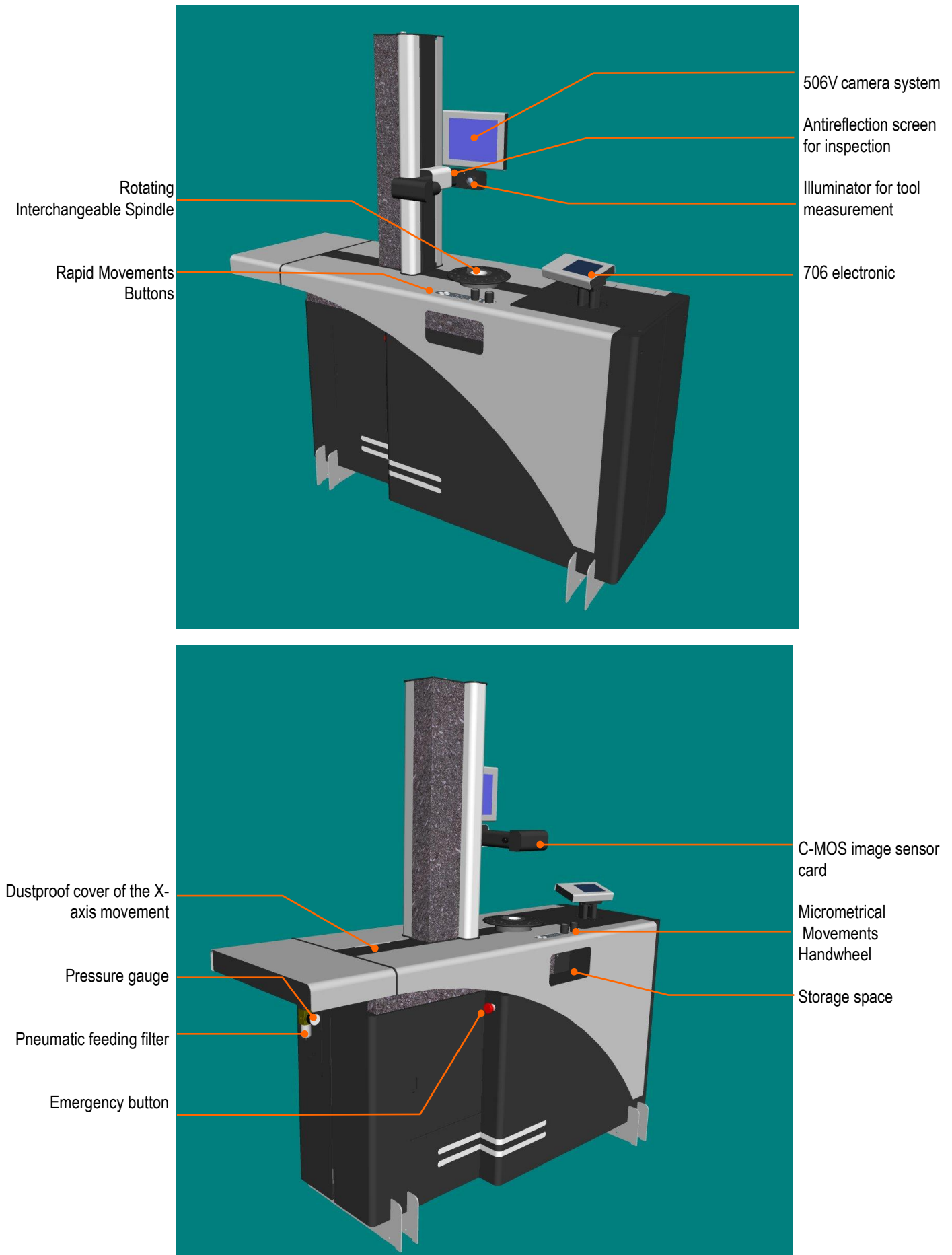
Fasten the side shelf to the machine by using 4 screws (VTCE M8X20), which have been previously removed from the packing. Introduce the screws into the specific holes of the side shelf, and then fasten the screws into the bushings that are to be found in the machine supporting structure.

4 VTCE M8X20 screws

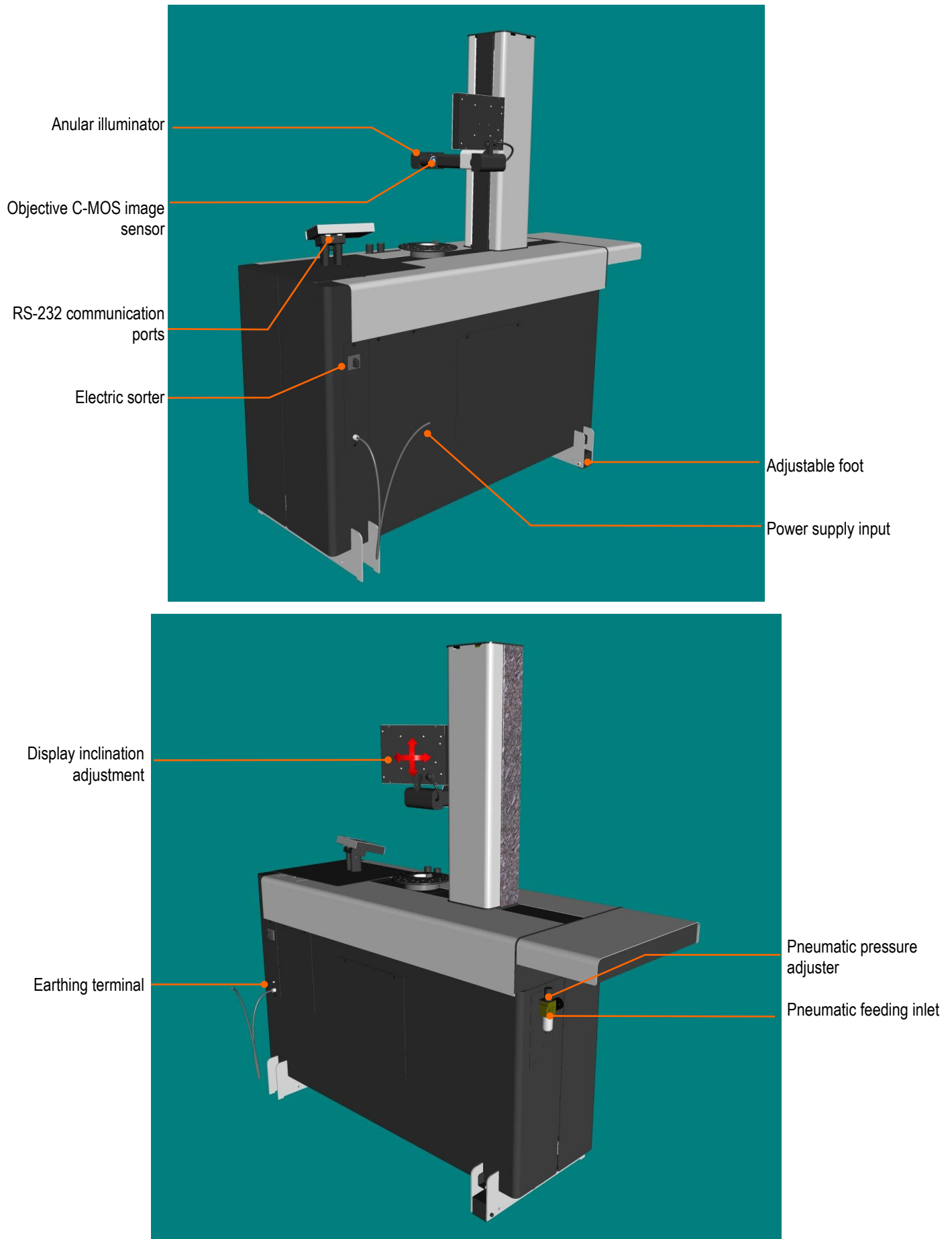
side shelf

machine supporting structure

6.5.2 FRONT VIEW



6.5.3 REAR VIEW



6.6 OPERATING CONDITIONS

As the presetter is a precision instrument, it shall be positioned in a trouble free site (free from dusts and/or air corrosive substances, excessive vibrations, violent ranges of temperature), safe from sunrays direct illumination and far from windows and skylights. It shall be positioned preferably in rooms with diffused artificial lighting and a space for working facilitating measurement takings.

The instrument does not generate acoustic emissions, apart from the sound of the pneumatic solenoid valves exhaust, when they are activated by the key panel, lower than the limit of 70 dB A.

The recommended climatic conditions are as follows:

- Temperature between 10 and 40 °C.
- Safe from the atmospheric agents
- Relative humidity between 20% and 95% without condensation.

☒ *The best performance is obtained in an environment with a constant temperature.*

6.7 POWER SUPPLIES

Electrical Circuit: The Presetter is fed 24 volt by direct current through an external feeder to be connected to the electric grid 115/230V AC, 50/60Hz, 75W.

Pneumatic circuit: the presetter requires compressed air at a pressure included between 5 and 6 bars.

7. DESCRIPTION OF CONTROLS**7.1 BASIC FUNCTIONS****7.1.1 SWITCHING ON PRESETTER**

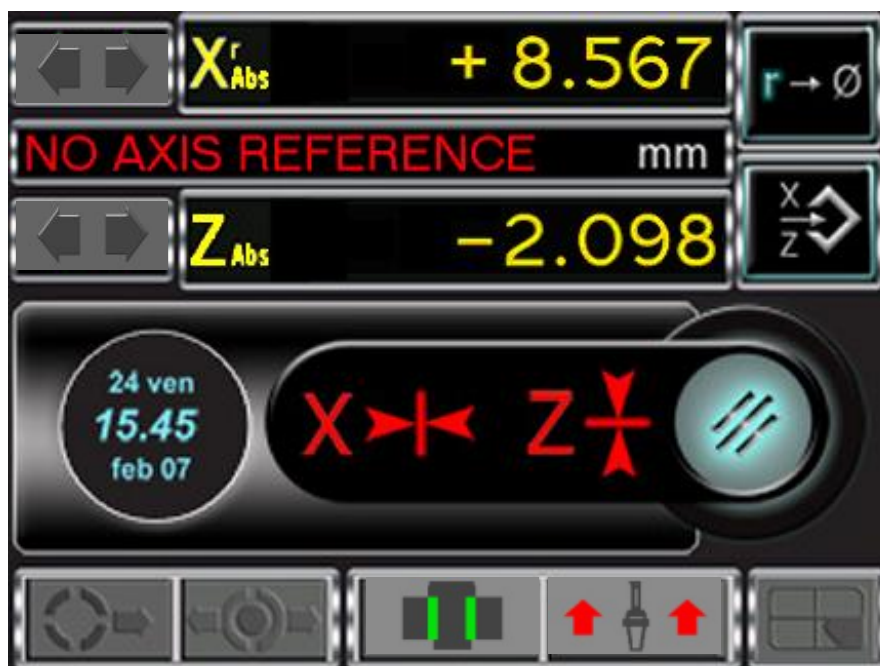
Insert the 24Vdc power supply jack in the socket on the rear panel to switch on the presetter; then insert the power supply plug in the socket (115-230Vac) and activate the power-up switch located on the rear of the machine.

After two seconds, the time required to execute the auto diagnostics, the LCD display will show:

In this moment it's possible to read the software revision number, important for discovering anomalies or deciding about possible updates.



The following window will be initially displayed:





and the zero axes references will turn red

In these conditions all functions and all keys are active. The axes counters are yellow and the inscription NO AXIS REFERENCE will be displayed in the machine origins window to indicate that no linear transducers zero setting were achieved.

Move X and Z axes until the zero references will be found on the corresponding optical scales

For instance, if X and then Z are moved, the following sequence will be displayed when the zero scale will be achieved



to indicate that both axes have achieved the reference zero scale.

At this time the wording NO AXIS REFERENCE shall be replaced by DEFAULT MACHINE that accounts for a fictitious machine source by which measurements shall be possible if stored machine sources lack.

For DEFAULT MACHINE settings, see paragraph 9.2 on machine sources.

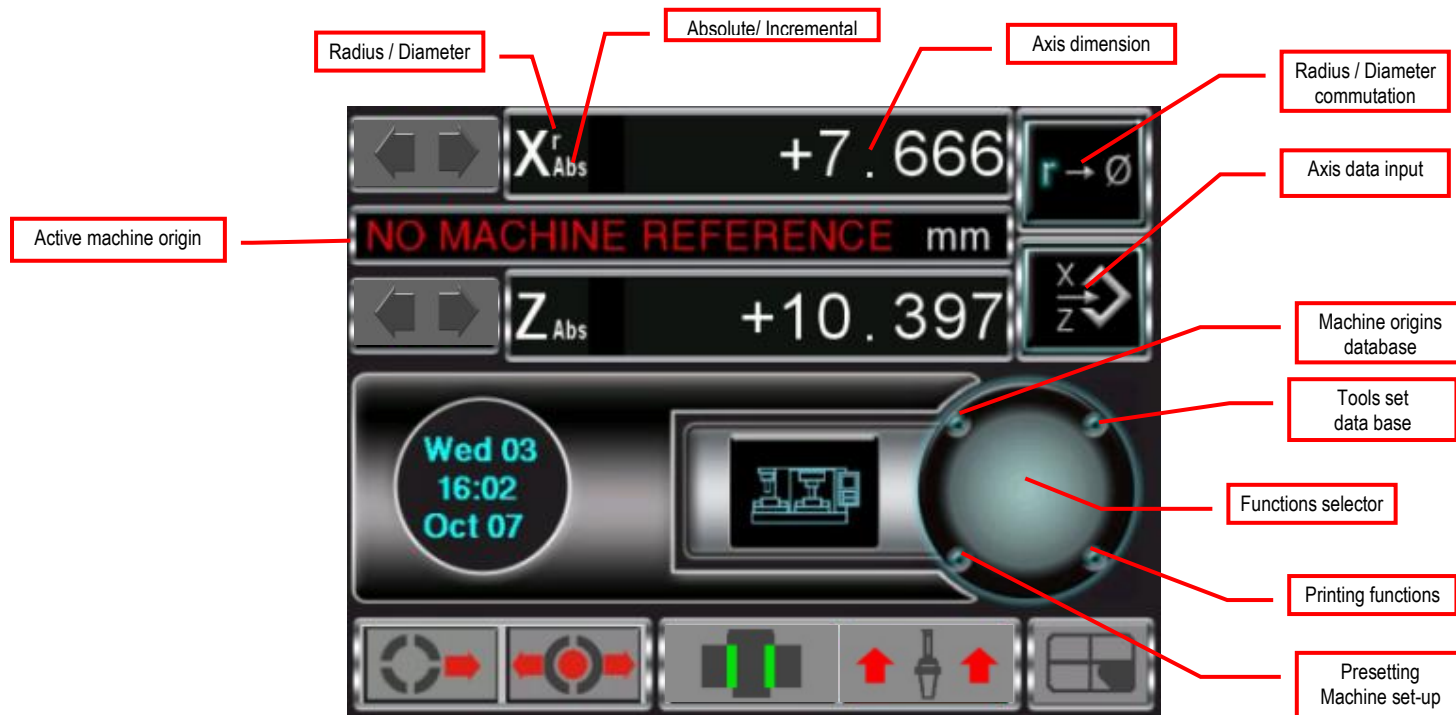


It is possible to key ESC to omit the axes resetting function. In this case, it will not be possible to gain access to MACHINES DATA BASE and TOOLS DATA BASE.

- ☑ *If the visualiser 706 has been switched off by pushing the switch-off button, on the parameters menu (Paragraph 8) it is possible to switch on the equipment by pushing on any part on the screen; if the switching on is made on a different date from switching off, it will be necessary to repeat the research of the zero axes and set again the machine origin.*
- ☑ *In case of mechanical maintenance or technical assistance on the detection system, the reference zero point will be shifted. Then it will be necessary to repeat the origin preset operations of the machine described under paragraph 9.1 "CN MACHINE ORIGINS"*

7.1.2 VISUALISER MODE

Right after having found the references, the 706 electronic equipment is arranged in visualiser mode. The dimensions visualiser window (see the image below) displays the X and Z axes position, by indicating if the dimension of the X axis is expressed as Radius or as Diameter, the number of active machine origin and finally is the position indicated is an absolute dimension or an temporary incremental resetting.



Instructions on how to change X axis setting from radius to diameter, how commute the dimension displayed from absolute to incremental and on how manually setting a value to be displayed on X and Z axes are reported below.

☒ X axis radius/diameter commutation procedure



The “default” position depends on the machine origin setting.

Push the key to commute from radius to diameter and vice versa in relation to indications displayed on the X axes; symbols invert at each pressure and the following possibilities will be displayed on the X axis:





☒ Absolute/incremental commutation and X and Z axes resetting procedures



Select the axes data input key to display the following window




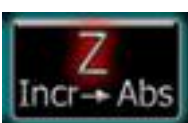
Push one or both the  and  keys to commute the measures of the corresponding axis from Absolute to Incremental.

The dimension display will reset and the axis name will be sided by the red inscription “Incr”; the pushed key will also turn red.



The dimensions values on the commuted axis remain white because the measure is incremental and starts from a definite point; the machine origin remains visible as it will be still valid when the axis reset to the absolute value.



Push again the  and  keys to set the axis to the absolute value referred to the active machine origin of the reference period; keys turn light blue and the axis name will be sided by the with inscription “Abs”.

☒ Dimension setting procedure on X and Z axes

With reference to the previous procedure, after having pushed the Abs/Incr button, the key WRITE




will be activated for three seconds. Push this key during this time-scale to display a digital keyboard which enables inserting a value relative to the selected axis



Push the confirmation key to set the value to the selected axis. Also in this case, the axis will be sided by the red inscription “Incr” and the commutation key will turn red as indicated for Z axis in the window below.



Push again key  to set the axis to the absolute value referring to the active machine origin of that moment; the key will turn light blue, the axis name will be sided again by the Abs white inscription and the dimension referring to the active origin.

7.1.3 CONNECTING S'PRINT-S LABELLING MACHINE

A mini labelling machine S'PRINT-S might be connected to the electronic equipment 706 by connecting it to the serial port on the rear of the electronic equipment itself and marked by the symbol

COM 1



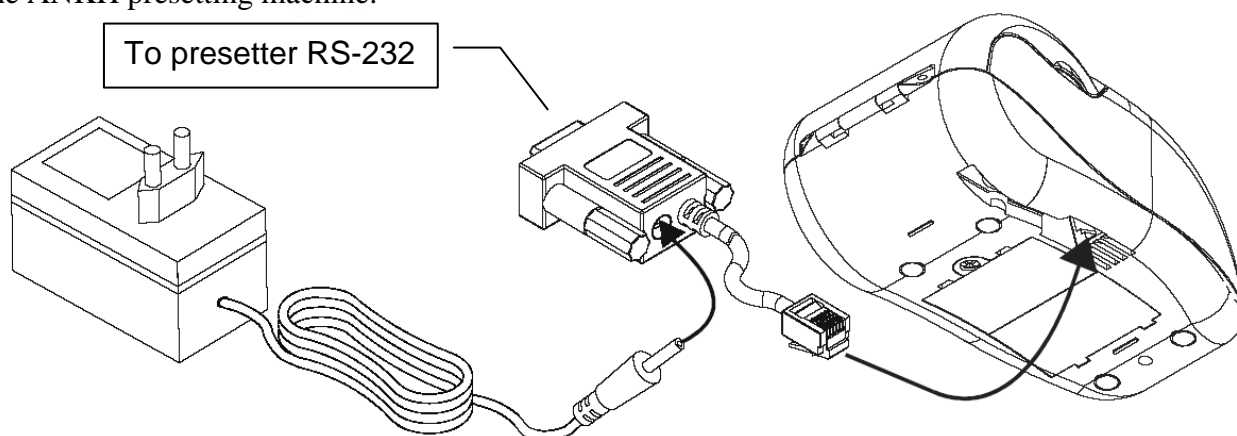
☒ Procedure on connecting and using S'PRINT-S labelling and printing machine

The s'Print-S printer has been arranged in factory to work only with the pre-punched labels included in the packing.

The printing step between one label and the following one is automatically recognized thanks to an optical sensor that identifies the black markers (step-label) on the roll.

For this reason it is not possible to use the standard label rolls or the thermal paper without having to modify the pre-defined parameters.

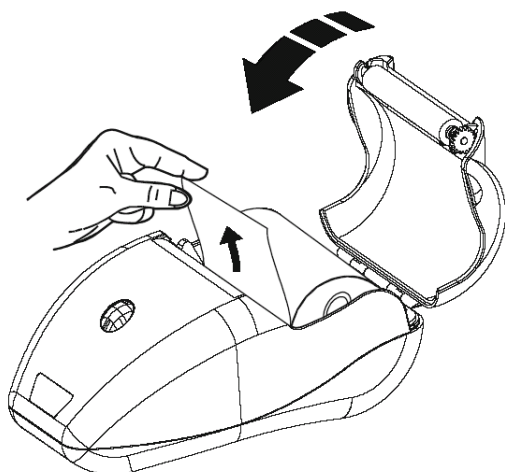
The label printer **s'Print-S** can be connected directly to the RS-232 serial communication port -COM1- of the ANKH presetting machine.



Insert the RJ11, phone type, into the seat under the printer.

Connect the s'Print-S printer directly to the COM1 communication port of the presetting machine using the D-type 9 poles connector coming from the printer. To feed the printer, insert the feeder plug behind the D-type 9 poles connector (see the picture) and insert the feeder into the power point.


Open the printer cap and insert the label roll, after having removed the closure adhesive and the first three /four labels

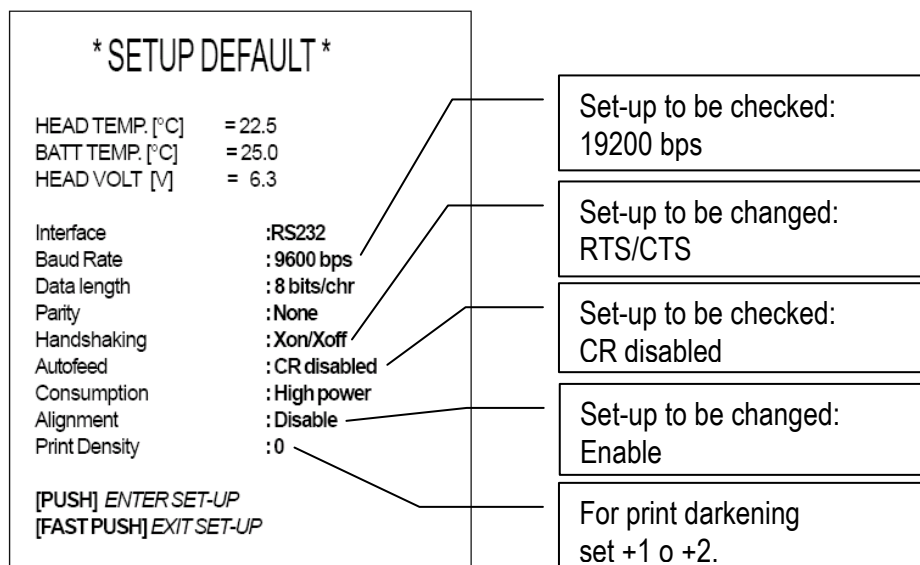


☒ Procedure on resetting S'PRINT-S labelling and printing machine

In case of printer malfunctioning, verify always the set up exactness, that could have changed owing to electrical phenomena of the feeder net.

To enter the configuration, disconnect the feeder from the power point , wait some seconds, so


keeping pressed the button  , insert it again feeding the printer, when the set-up report print starts, leave the button:




The printer's configurable parameters are:

- **Baud Rate:** 38400, 19200, 9600^D, 4800, 2400, 1200, 600.
- **Data length:** 7, 8^D bits/car.
- **Parity:** None^D, even or odd.
- **Handshaking:** XON/XOFF^D or Hardware.
- **Autofeed:** CR deactivated^D or CR activated.
- **Consumption:** Low power, High power^D
- **Alignment:** Disable^D, Enable.
- **Print density:** -2, -1, 0^D, +1, +2.

Verify and if necessary reset the right set ups following the instructions that will be printed each time: to

change the set-ups, press the  key and hold it pressed until the roll starts (long press for >1 sec.); the

single set-ups will be now printed and it will be possible to change them with a short pressing the  key, or confirming them with a long pressing.

In case of a set up error, it is necessary to start again the procedure.

At the end the printer will show the current set-ups that must be:

```

*****
* CUSTOM Engineering *
* Strada Berettine, 2 *
* 43010 Fontevivo *
* (Parma) Italy *
* http://www.custom.it *
*****
* s'print - S *
* FW rel. 1.41 *
*****

SETUP DEFAULT 24 Col.:

HEAD TEMP. [°C] = 25.0
ALIM. TEMP. [°C] = 47.5
HEAD VOLT [ V ] = 6.8

Interface : RS232
Baud Rate : 19200 bps
Data Length: 8 Bits/chr
Parity : None
Handshaking: RTS/CTS
Autofeed : CR Disabled
Consumption: High power
Print Mode : Normal
Alignment : Enabled
Print Dens.: + 2

[PUSH] : ENTER SET-UP
[FAST PUSH] : EXIT

```

The printer will hold these set-ups forever so it will not be necessary to change them anymore.

For information not specified in this document, please refer to the relevant training manuals; the printer manual is available on-line: www.custom.it.

In case the printer doesn't print any label or prints incomprehensible characters, verify the set-up as shown at the beginning of this note.

7.1.4 CONNECTION TO GENERIC RS232 PRINTER

Starting with software version V3.2, electronic 706, can connect to COM1 any RS232 serial printer.

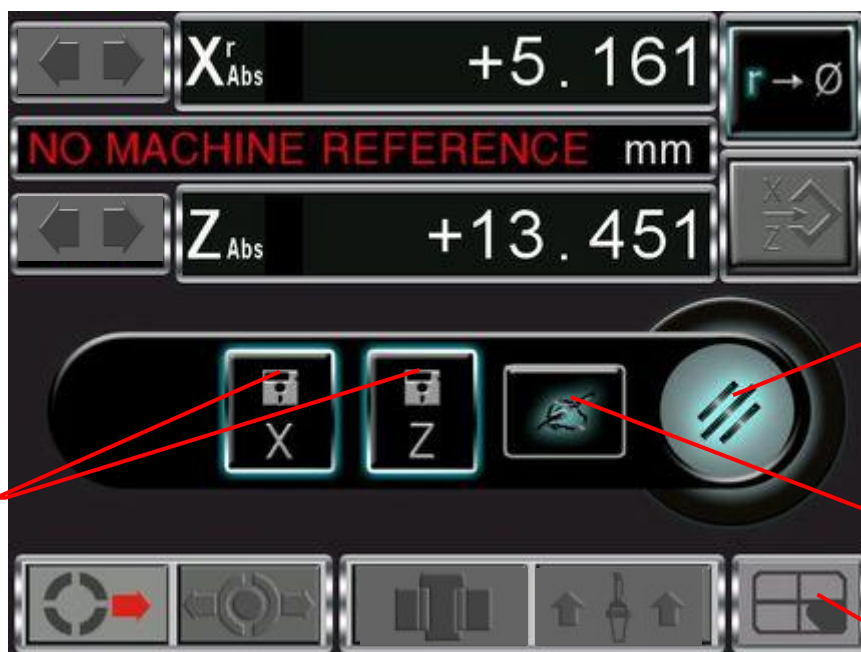
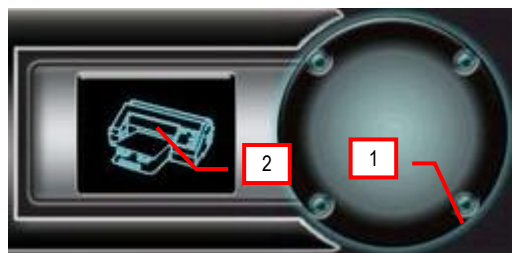
Setting to "YES" the parameter BASIC PRINTER (see charter 8 – Machine parameters), the printed data will always be the same: the code for alignment/label jump and double height characters of the mini-printer S'PRINT will be deleted.



The default setting "NO" allow to connect the mini-printer S'PRINT-S.

7.1.5 LABELS PRINTING

Then it will be possible to quickly print a label upon a tool's measurement:


Activate the printing mode (1) by means of the functions selector, then key (2) to enter the relative functions.



When the following window is displayed, move the tool's axes until the tool's measure on the X axis is collimated; key , then collimate Z measure and key ; (it is possible to print even one axis only).





Key  to display the alphanumeric keyboard that will allow entering a text to be printed on the label.

Push the confirmation key to obtain the following printing:

123456ELBO 16:30 250907


NOTE

Xr-100.782 Z-100.880

Moreover, click on the camera functions to perform radius and angles calculations, to acquire its values and print it on the label. As for radius and angles calculation procedures, please refer to chapter 8.

7.1.6 TOOLINGUP SOFTWARE INTERFACING

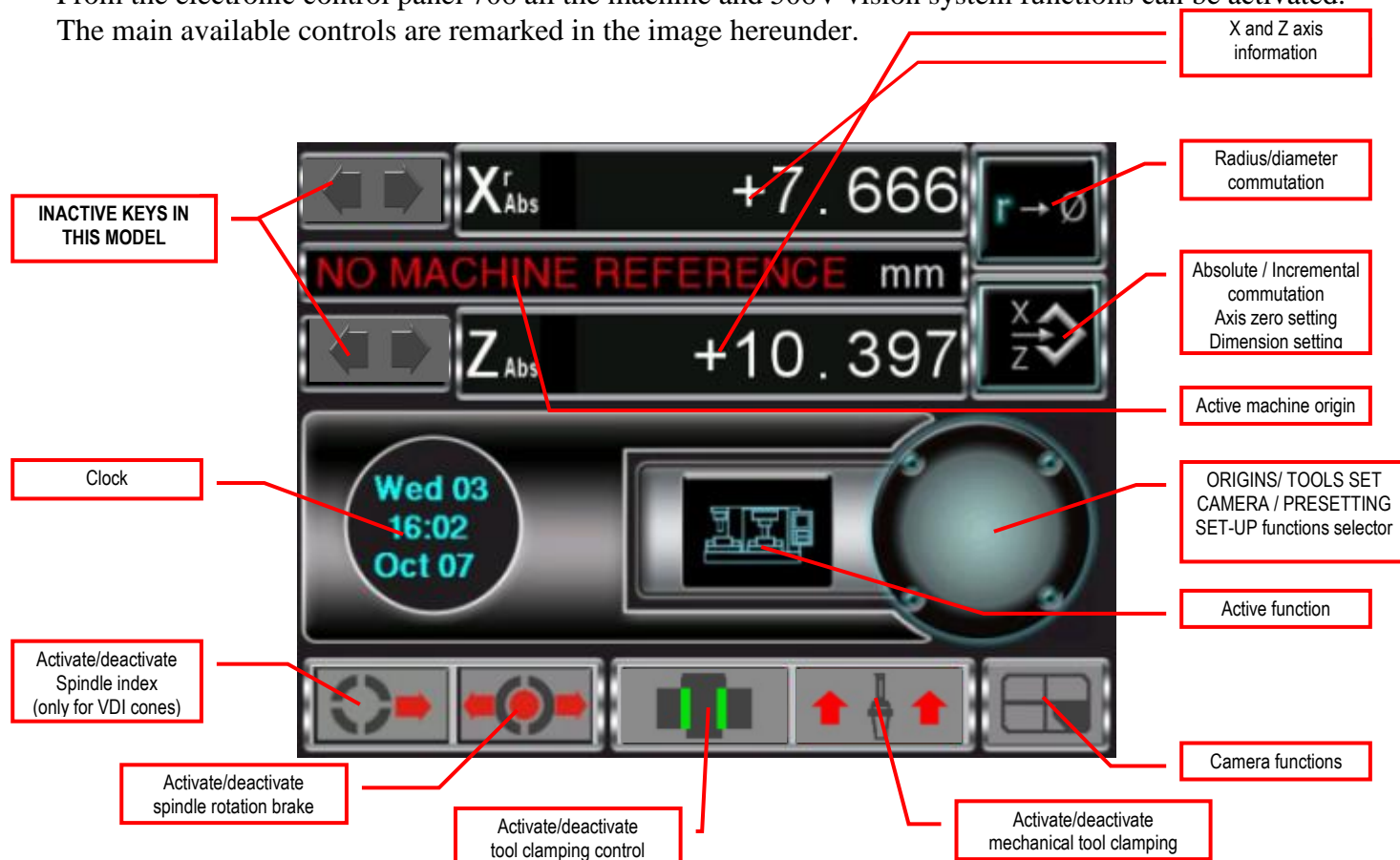


Through the other serial port marked by the symbol  it will be possible to connect the machine to a personal computer and manage the functions through the TOOLINGUP SOFTWARE provided with the presetter. Please refer to the Toolingup user manual for the connection and operation manual.

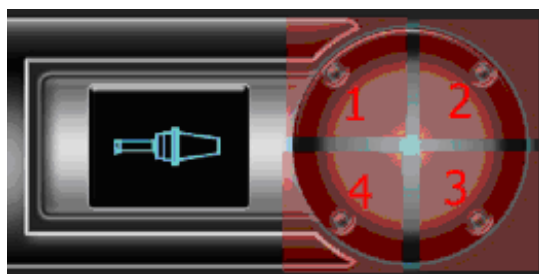
7.2 CONTROL PANEL

7.2.1 706 control panel

From the electronic control panel 706 all the machine and 506V vision system functions can be activated. The main available controls are remarked in the image hereunder.



The key for machine functions selection is structured as follows:



the selector knob is divided into 4 areas; it is possible to commute among the several icons giving access to the hereunder explained functions by passing the finger with a circular movement or by simply touching them.



1 - Machine tool Data Base (par.10) 2 - Tools Data Base (par.11)

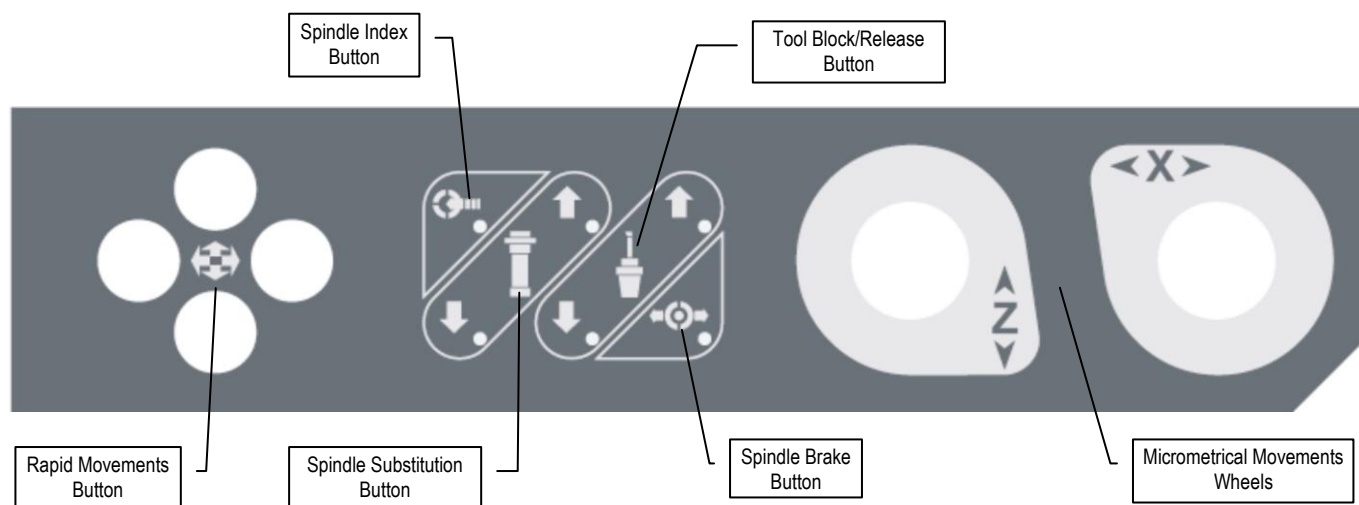


3 - Print option (par.7.1.3) 4 – Machine parameters (par.12)

After having selected the desired function from the menu, click on the corresponding icon to open the submenu, to be detailed further on this text.

7.2.2 CONTROL PANEL OF THE MACHINE

The control panel in the machine is used to activate machine functions about spindle and axes movements.



Spindle keys (brake, index, spindle replacement, and tool locking/unlocking operation) can be activated both in the electronics panel 706 and in the machine control panel by means of the relevant icons/warning lights, which change their status in both panels at the same time. Paragraph 9, which deals with handling operations, will describe the functionalities of the aforesaid keys.

8. MEASURING

8.1 FOREWORD

The measuring is the operation to identify the cross from which takes the measure.

ANKH is equipped with 506V, the industrial vision system, designed entirely for the inspection and measure /pre-adjustment without tool contact.

8.2 MEASURING WITH 506V

The principle is the same of that one of profile optical projectors: a collimated light source throws a profile tool between the two elements on an image sensor C-MOS through a suitable purpose of restarting.

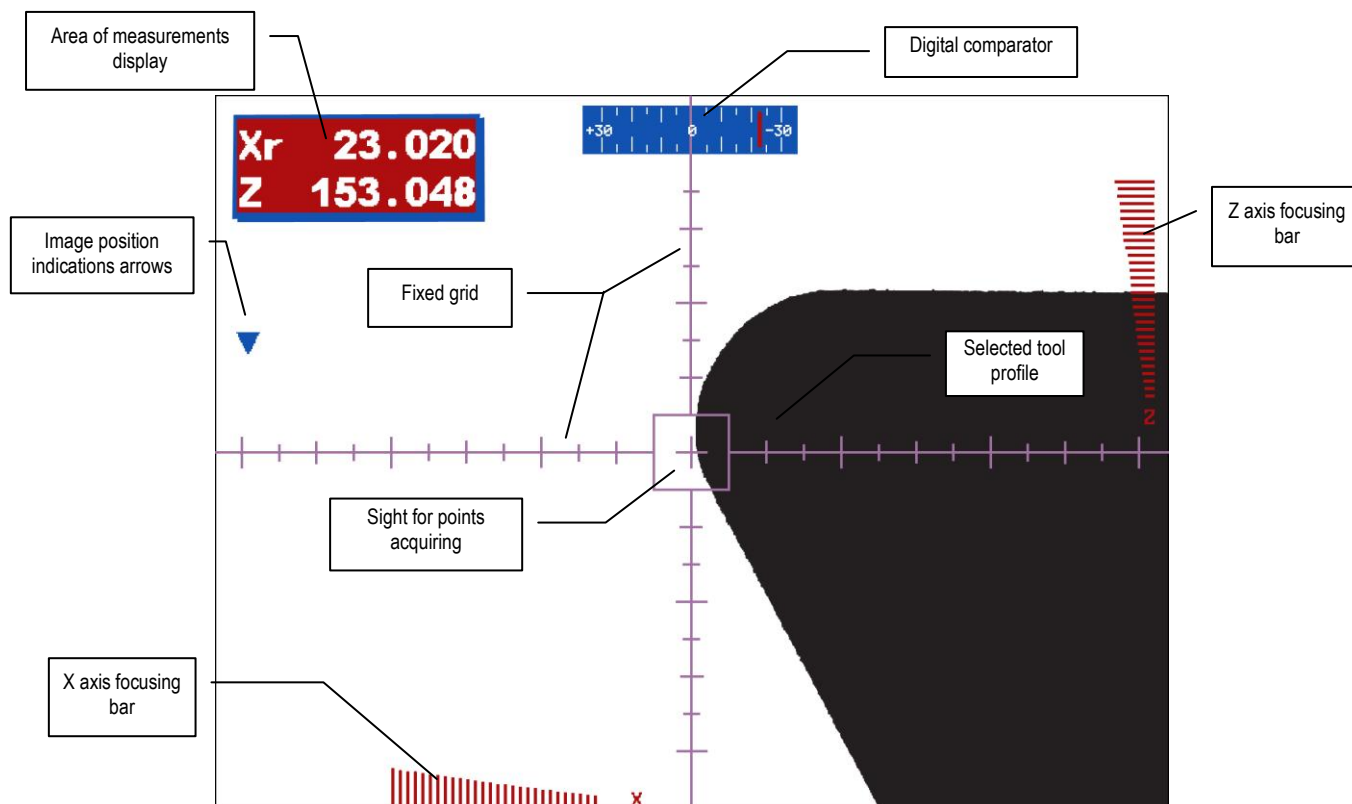
The tool profile captured by the image sensor, is displayed in real time (25 frame/sec) on a LCD colour screen of 6,4" diagonal; the total viewing area is about 6.4 mm. X 4.8 mm. To make taking of the measurement easier, it is possible to choose the digital representation with the maximum contrast (white/black), an alternative to the taken analogical image (greys scale). Furthermore 506V is equipped with two bars for the focusing control of image, one takes the focus of X axis measurement's point, the other one for the Z axis, helping the operator to find out easily the point of maximum tangency of tool.

Like projectors, angles and radii may be measured too, and the tool and reticle profiles may be compared directly on the screen.

But the real advantage is the elimination of the measure subjectivity typical of optical systems, which makes measures objective and repetitive.

506V can analyse the sharp tool and find its measurement points on the profile with a 1µm definition. The operator can decide to measure on the central fixed grid with the visualized analogical comparators on screen, automatically obtaining a measurement, in real time from the sum between the coordinates of central grid and the relative position of the image.

In both cases the measurements are continuously shown on screen, in order to have all the necessary information in the same location.



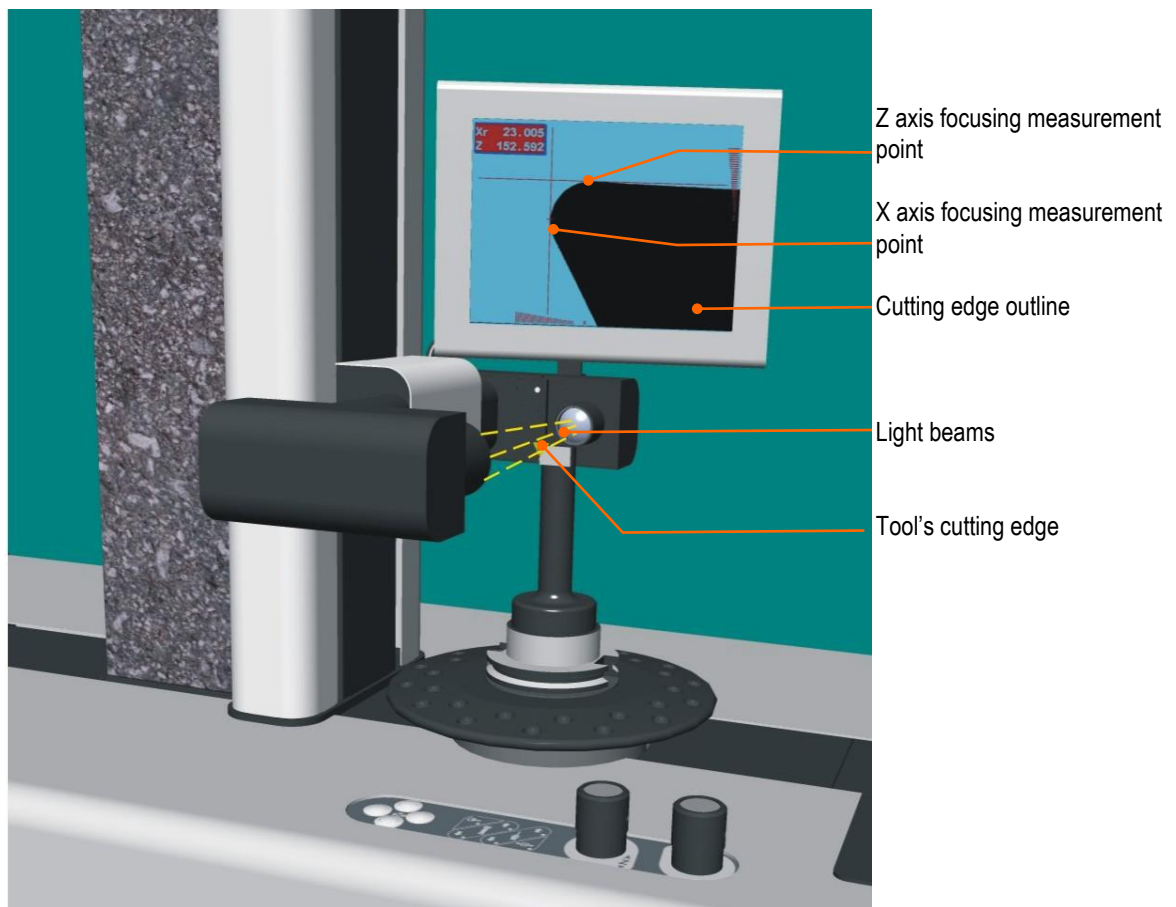
8.2.1 FOCUSING OF IMAGE

With 506V the measurements are taken like those with an optical profile projector; it is necessary to frame the tool's profile on the screen, bringing it inside the light beam through the rapid and fine adjustments.

Before measuring rotate the spindle to search for the point with the best image focusing.

The screen always shows two control rods for the focusing of the image (one for each axis); just rotate the sharp until the higher value on the axis rod concerned is reached, to obtain the best focusing.

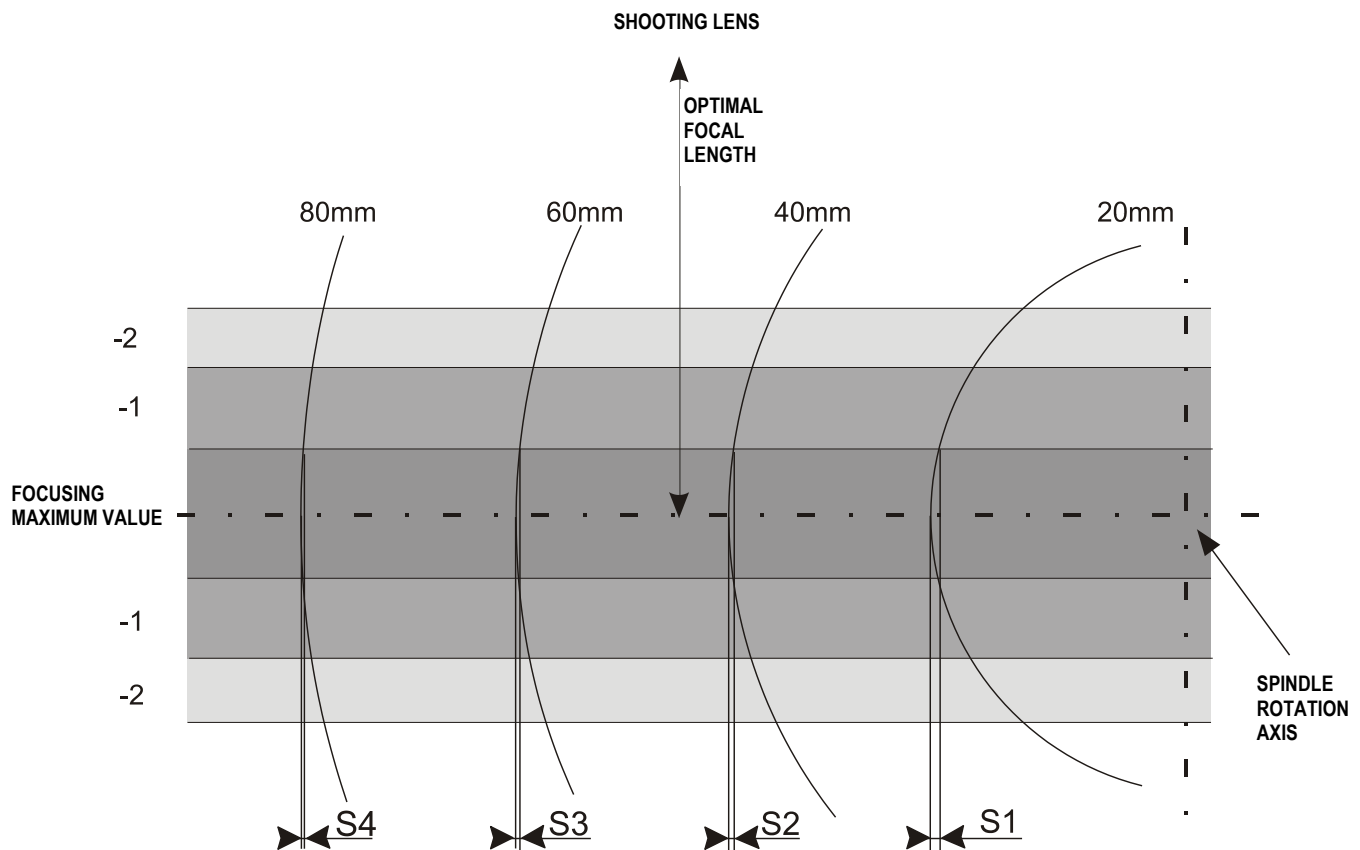
☒ *The dimension that the 506V takes as reference are those ones concerning X and Z measurement points. Look at the following picture.*



The control rods of the focusing give information concerning the sharpness of the image in the measurement points indicated in the picture; different indications (in the maximum value) between different tools, or different sharps of the same tool can be obtained. This varies according to the wear degree, or to the lip relief angle.

For a proper measurement the highest value, shown by the peak indicator on each rod, shall be reached. Don't forget that the point where we have to measure is that one relative to the maximum tangency of tool, and that the focusing is necessary only to facilitate the research; in fact the **maximum tangency will be always in correspondence with the maximum value of focusing**. This also means that, in the range of the maximum value of focusing, a residue of measure incorrectness determined by the radius of the measured tool is included.

The following picture shows the relationship between the focusing value (index of the distance of the tool from the shooting lens) and the maximum tangency of the tool (index of the angular position of the tool against the spindle rotation axis).




The residue of measure incorrectness (S1, S2, S3, S4) clearly depends on the radius of the tool measured and corresponds approximately to 0.01 mm, for tools with a 20 mm radius, while it is lower than 0,001 mm. for tool radiuses exceeding 80 mm.

On the basis of these considerations we repeat the necessity to always reach the best obtainable focus, eventually finding the maximum tangency on the fixed grid as described previously in the paragraph 8.2.3.

8.2.2 SETTING MENU 506V



The access to 506V setting functions is performed from the main window by pushing the key ; the setting menu 506V presents a higher priority compared to all the other functions of visualiser 706: when it is activated, all the other functions remain frozen until setting completion.



This is the main window that will be displayed; the several working modes of the 506V vision system are detailed hereunder.

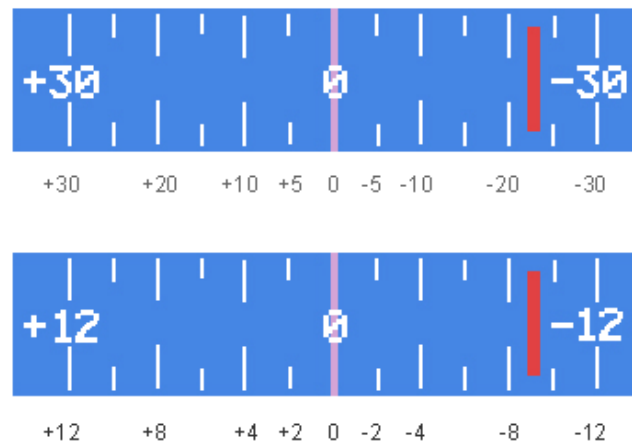
8.2.3 MEASUREMENT ON FIXED GRID



506V offers two possibilities of measurement: on fixed grid or with autocollimation.

The measurements on fixed grid use the same techniques of an optical projector of profiles: you have to shift with fine movement the axes of machine until you bring the tool's profile in tangency with the central grid of screen.

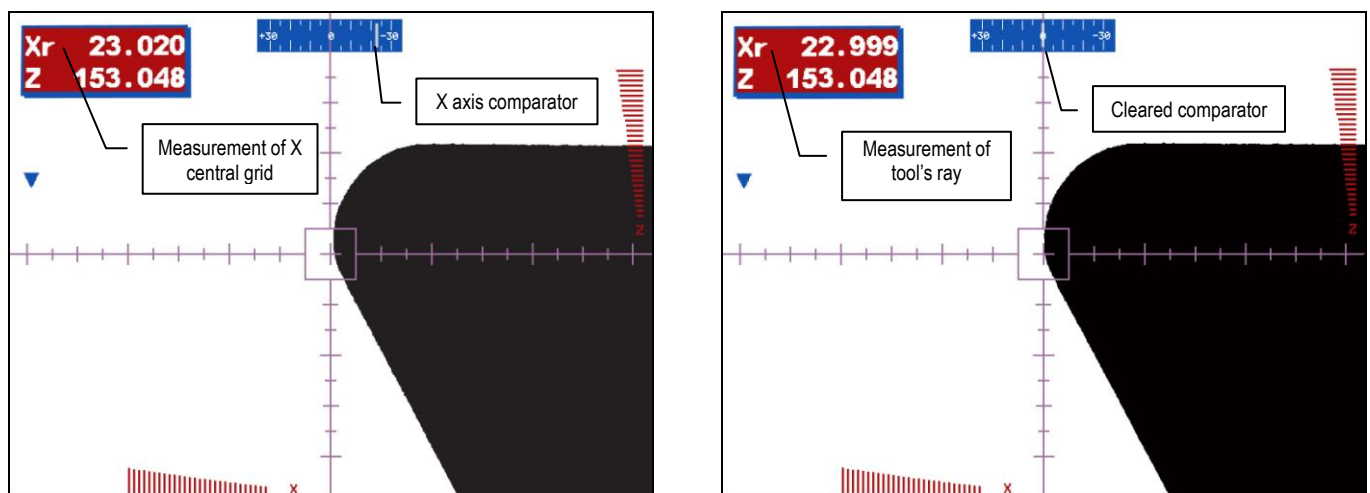
The measurement with a profile projector is influenced by the capacity of operator to recognize the best focusing of image and its tangency with a serigraphic line (which covers the image) on the projection screw; it means that it is a subjective measurement. The same operation with 506V allows everyone to get the same result, since the image's profile is analysed electronically, and the measure is underlined on the scale of an analog comparator, visualized on screen. The analog scale allows taking the measurement as if you were using a traditional mechanical hand comparator; it appears when the image is in proximity of central grid and has a resolution of 1 μm and an excursion of 60 μm : $\pm 30 \mu\text{m}$ in relation with the central grid.

Axis X analogue comparator (with a scale in μm or mils/10).

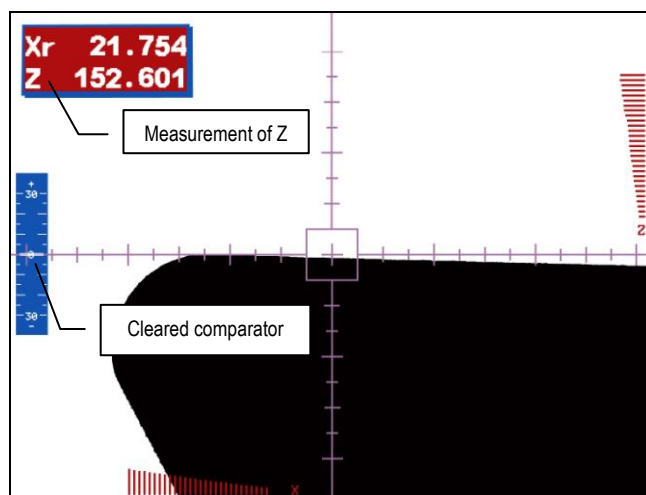
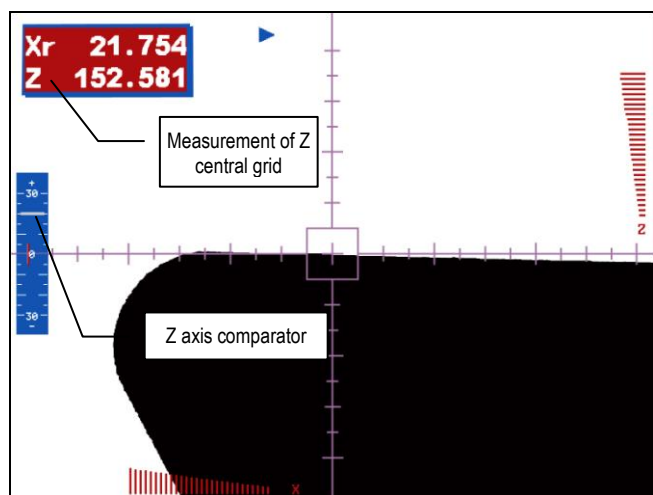
The other advantage is the possibility of quickly measuring the tool without any imprecision (par. 8.2.1).

☒ Procedure of collimation on fixed grid

- Set the tool on screen (rapid movement)
- Check that the tool's edge is without any dust, any debris or any other impurity, which could modify the result of measure.
- Focus the image, on the axis, which is intended to be the measured, by rotating the spindle.
- Bring the image in proximity of the grid, making the analog comparator appear.
- Research the point's maximum tangency by rotating the spindle and observing the analog comparator.
- Collimate the image with the grid, clearing the analogical comparator (fine adjustment).



X axis collimation



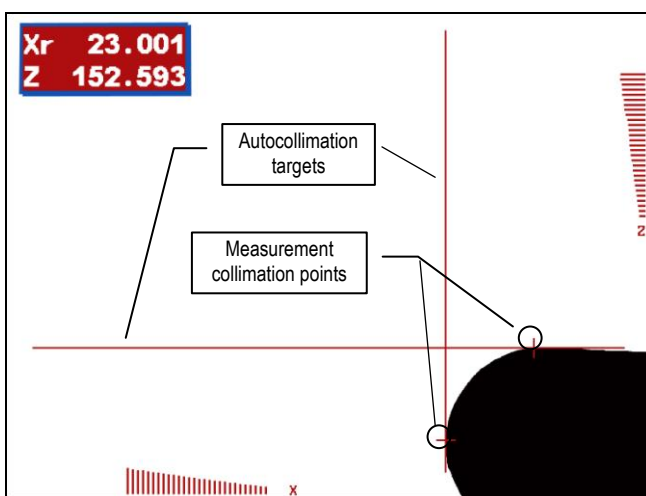
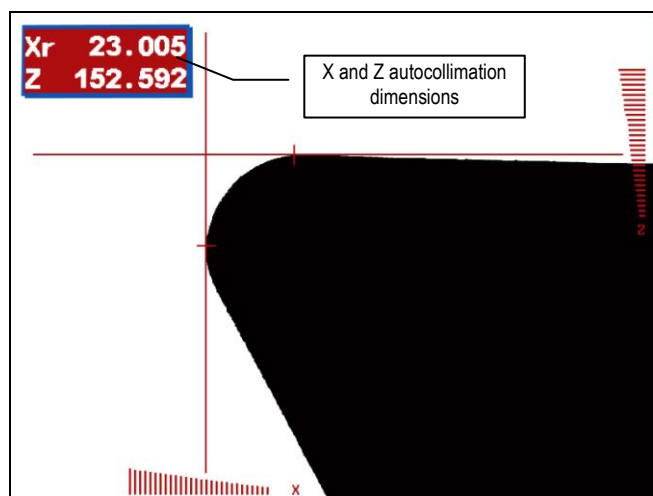
Z axis collimation

8.2.4 AUTOCOLLIMATION



With autocollimation it is not necessary to bring the image in collimation in a fixed point of screen; in fact it is enough to set the tool in the visual area of screen so that 506V can measure it.

Obviously, being able to measure on the whole vision area does not exclude the need to focusing the image and search for the maximum tangency to obtain correct measurements. With the self-collimation the measurement results from the algebraic sum between the relative position of the image displayed and the position of the central reticle: by observing the pictures of the previous paragraph - i.e. the picture concerning the collimation of axis Z - we can see that the tool measurement should have been deducted without resetting the comparator. In fact it was enough to sum up the measurement of central grid (152,581) with that one of analog comparator (+0,02), to get the tool's final measure 152,601 as found out at the end of collimation. In reality the movement of the analog comparator is not limited to 60 μ m, but covers all the visual area, about 6,4 mm x 4,8 mm, allowing 506V to do the algebraic sum and to visualize its result on screen in real time.

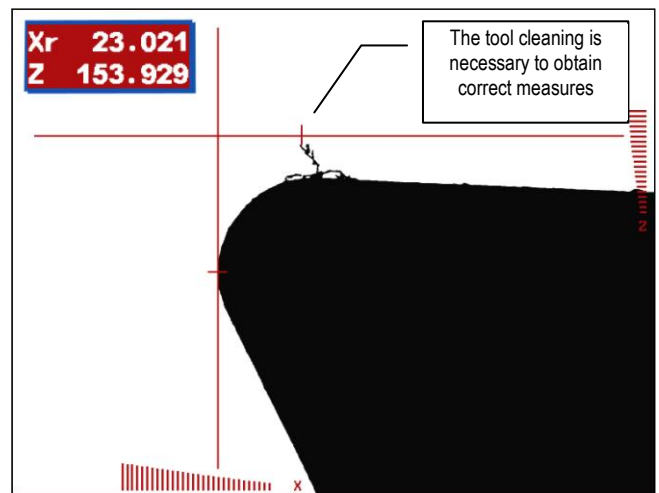


Autocollimation in different points of screen

We can observe the images of the measurement of the same tool, we had used for the measurement on fixed grid: you can note the presence of little differences in the dimensions, which have been relieved automatically in the different points of screen. This is due to the working tolerances of the lenses and of the illuminator, as well as to other optical, electronic and mechanical factors. By using this measurement system an increase of the uncertainty margin of the measurement shall be expected in the order of millimetre hundredth. This is the limit of the measurements carried out with the self-collimation, which allows faster and easier measures, but involves an increased tolerance against the measurement carried out on the fixed reticle. This shall be considered according to the typology of the tool measured and of the class of precision required by the working.

☒ Procedure of collimation with autocollimation

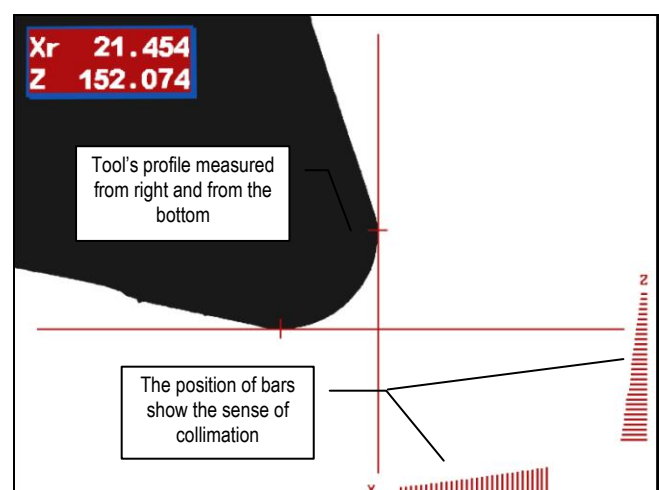
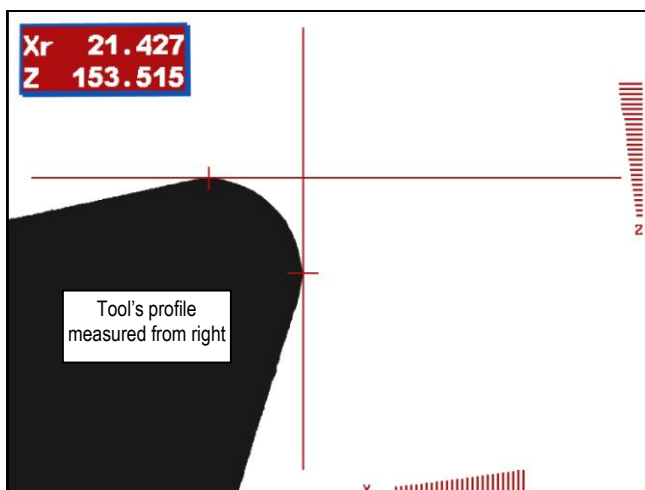
- Set the tool in the screen (rapid movement)
 - Make sure the tool's edge is without any dust, shavings, or any other impurity, which could modify the result of measurement
 - Focus the image on the axis of measurement and always rotate the spindle, check numerically that the measurement you have taken expresses the maximum tangency of tool. Always clean the tool.
- ☑ When "NO OBJECT" appears, it means that it is not possible to do measurements with autocollimation (ex.:because nothing is set) and the visualized dimensions indicate the position of machine axes
- ☑ While working with auto-collimation, the digital read-out 706 displays the same dimensions of 506V and not the axes' movement; this condition is pointed out by blinking asterisks next to the dimensions.



8.2.5 PARTICULAR CASES OF COLLIMATION

506V is able to recognize automatically the orientation of the tool and to measure it from left to right for X axis and from above or from below for Z axis.

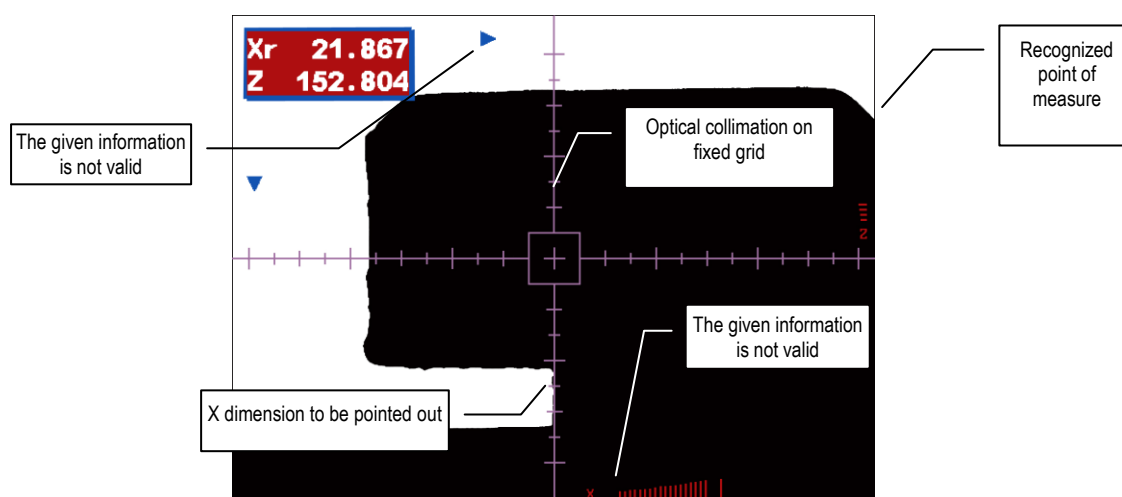
The operator has to do nothing: once the tool is set, the system analyses the image and sets up the suitable sense of collimation. The priority is given to measurements from left for X axis and from the top for Z axis: it means that with two valid measurements for X axis, only the left one will be considered.



Logically it is always possible to choose between autocollimation and collimation on fixed reticle: in both cases 506V will automatically detect the tool's side to be measured.

Besides, it is possible to recognize the active collimation sense by observing the position of the focusing bars, they actually move according to the adopted measuring sense.

Despite 506V is able to recognize and measure the oriented tool's profile, in many cases the concerned measurement can be performed neither automatically nor with the support digital comparator. This happens when the point to be measured is internal compared to the tool's profile (see image).



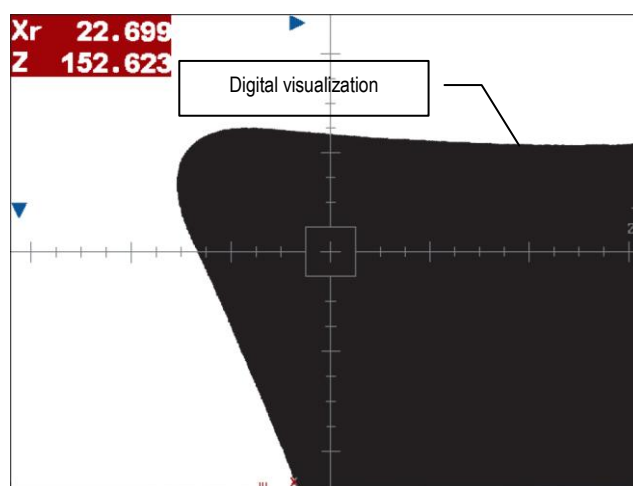
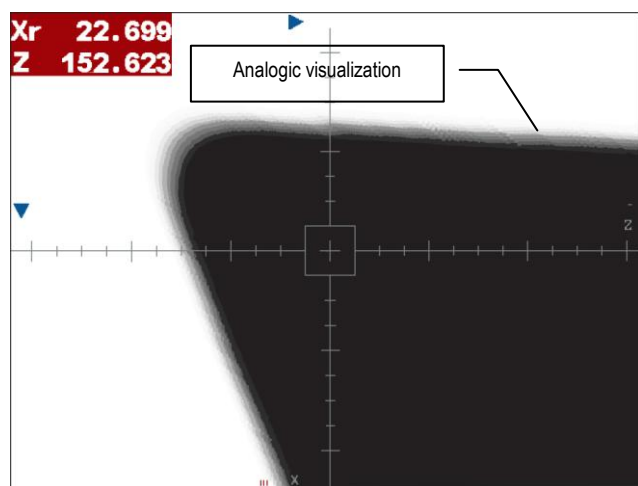
In these cases the measurement must be done manually using the instrument like a profiles' projector. For this reason, focusing is recommended, observing the measurement's point in analog (the indication of the focusing bar is not correct since it is referring to the recognized measurement's point); so set to the digital visualization, find the maximum tangency and collimate optically the point of measurement with the fixed grid.

8.2.6 SETTING OF ANALOGICAL/DIGITAL VISUALIZATION



The 506V allows us to change the visualization of the image on screen from analog (scale of greys) to digital (white and black).

It is particularly useful during the operation of manual collimation of points, for example in the geometric calculations, for a better perception of image's edge.



Display in analogue and digital modality (the sharp is out of focus lens to emphasize the difference).

- ☒ *The modes of visualization on screen doesn't influence in any way the tool's measurement by 506V, neither in fixed grid not in autocollimation mode.*

8.2.7 TOOL PROFILE PHOTOGRAPH



Thanks to 506V pictures of tool profiles can be created and kept on the screen .

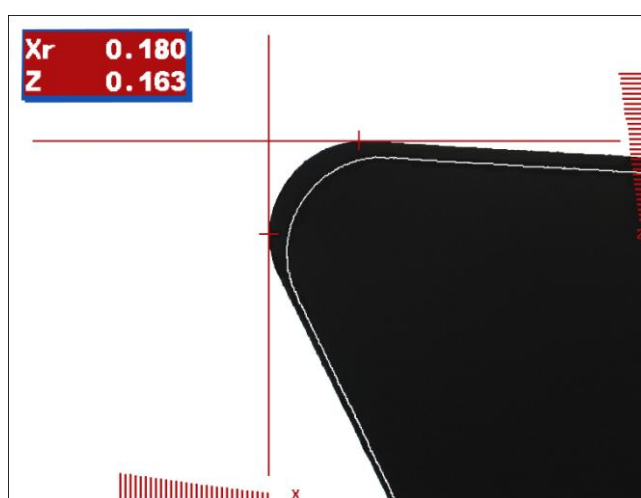
This function is extremely useful as we may use the photo of the cutting edge to adjust the following ones on the insert tool, or simply to control their alignment.

Actually, it is not a real photo, otherwise visualizing the next cutting edges would give rise to troubles; so the framed tool profile only is displayed.



To take photos, recall the 506V menu by keying

By using the photo together with autocollimation and incremental dimensions, the difference between the cutting edges may be measured immediately (see picture).



Tool profile picture

We may take more than one photo and visualize them simultaneously on the screen.



To erase all the photos from the screen, recall the 506V menu by pushing key

☒ *The photos will disappear too if the operating mode of the 506V changes. (for example, from fixed reticle to autocollimation).*

8.3 GEOMETRIC CALCULATION

This chapter deals with the description of the geometric calculations supplied by the electronic equipment 706; for each function, the procedure to be followed for measurement takings is described..

Each function allows the math calculation of the geometric element chosen passing through the points indicated. The calculation precision is defined in eight-figure decimals: its result approximation is always beyond the third decimal figure (1/1000).

Any mistakes noticed depend on incorrectness in the choice and in the point detection or on tools' shape mistakes.

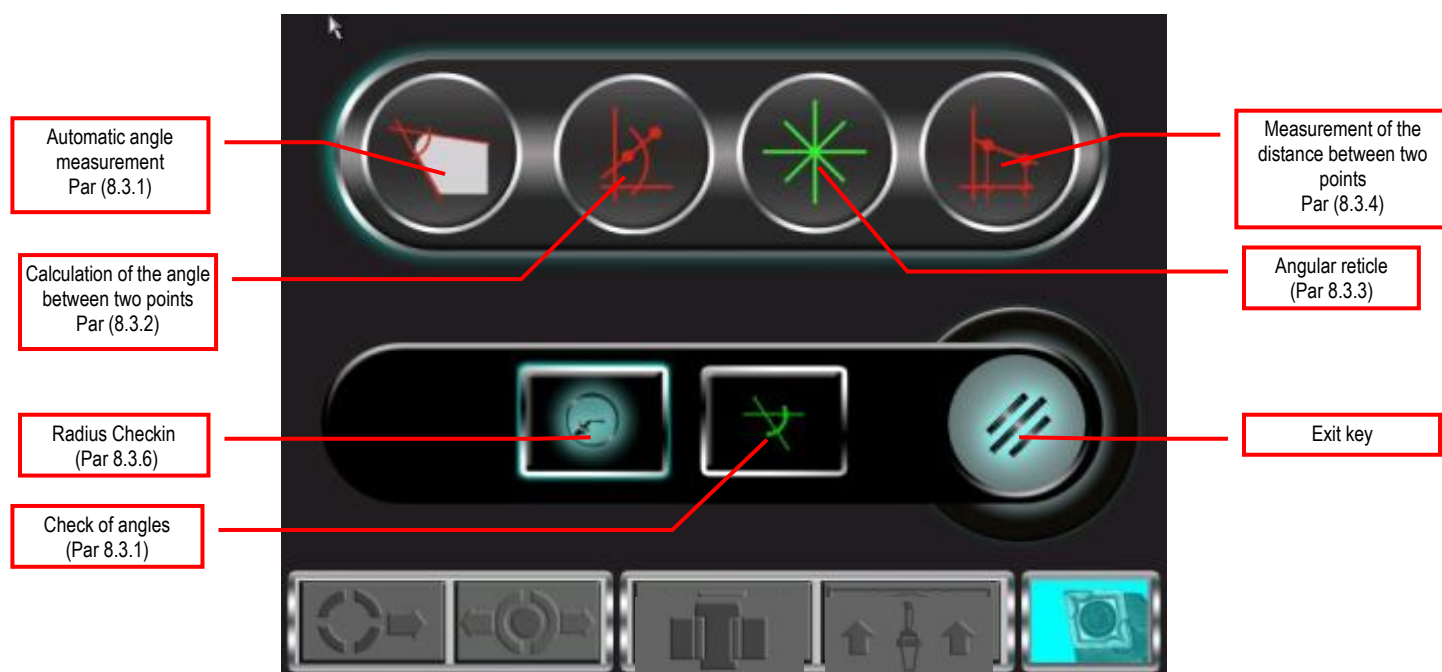
Here are some important recommendations for a calculation result as precise as possible:

- Always choose the two points close to the ends of the geometric element to be calculated, in the case of the circle choose the three remaining, at uniform distances from the two ends;
- Each point to be detected shall be positioned on the optical axis of the presetter; that is, it shall be focused. In the case of an angular mill, for instance, the angle we shall measure is positioned along the helicoidal part of the tool. First of all, the spindle shall be rotated to focus the mill part chosen, and then detect the point. The operator shall carry out this operation subjectively, as the focusing indications supplied by 506V are valid only for the collimation points (see par. 8.2.1), and not for the point we want to detect for the calculation;
- To better appreciate the focusing of the point to detect, it is recommended to operate in analogue modality;

The spindle rotation for the focusing of the points to detect is necessary not only for the mills, but also for tools with inserts having a lip relief angle.



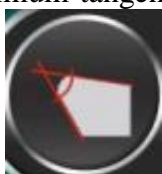
To gain access to the geometric calculations mode just key ; the following window will be displayed



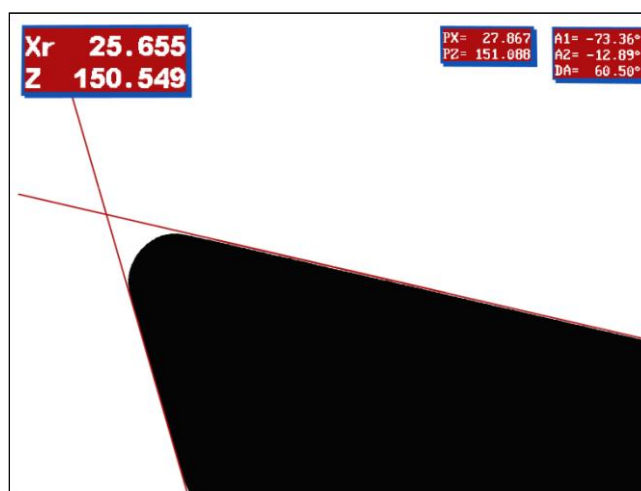
8.3.1 AUTOMATIC ANGLE MEASUREMENT

This function allows identifying and measuring automatically the inclination of two lines on the framed profile. Visualizing the coordinates of their node is also possible. When the function is activated, it works in real time. This means the profile is constantly examined, thus it is up to the operator to decide if data are exact or not. Like autocollimation, the operator has to make the visualized image as clear as possible in order to measure it: focusing and cleaning it from dust and sharpening remains, framing it correctly.

In this case, all aspects are more important, since the automatic angle measurement affects the whole profile and not only the maximum-tangency points.



To activate the function, key 506V will point out the values surveyed and will outline the angles by describing the profile-tangent lines. Should two angles (A1, A2) be detected, Twinvision will point out the angle between the two lines (DA) and the coordinates (PX, PZ) relative to the node.





☒ Automatic angle measurement procedure

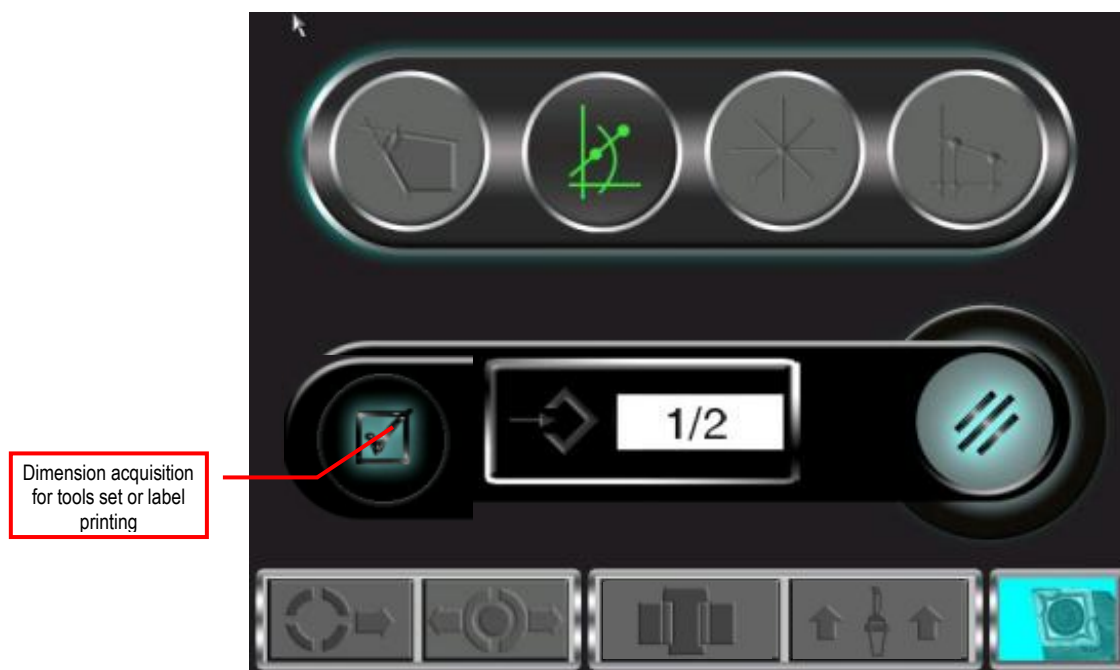
- Frame the tool on the screen (fast movement); if necessary, use the micrometric movement to visualize the largest possible share of the section regarding the angle;
- Focus the part affected by the measurement: the focusing bars are eliminated, otherwise they would give rise to wrong reading for the majority of measurements, because they work on the maximum-tangency point;
- Clean carefully the whole tool profile involved in the measurement;
- Should the result be unsatisfactory, check the tool for thorough cleaning, then try to rotate lightly the spindle and/or perform short movements.

☒ 506V identifies lines longer than 1 mm only.



☒ Should one line not involved in the measurement be identified, move the axes of the machine, by taking the undesired line out of the field of view.

8.3.2 INCLINATION ANGLE OF A STRAIGHT LINE

This function calculates and displays the angle inclination of a straight line passing through two points.



Dimension acquisition
for tools set or label
printing


Key camera  on the main menu, then the radius and angles measuring key ; key



to acquire two points required for the calculation;

The operator will be required to collimate in sequence the two points on the concerned segment,



convalidating each point with key ; finally, 706 calculates the value of the described angle and it will be displayed.

The indicated angle refers to the cartesian axis X+, Z+ and ranges between $\pm 180^\circ$, the result is expressed in degrees, tenths, hundredths and thousandths of degree.

If a tools set is being measured or a label is being printed, it will be possible to directly acquire the



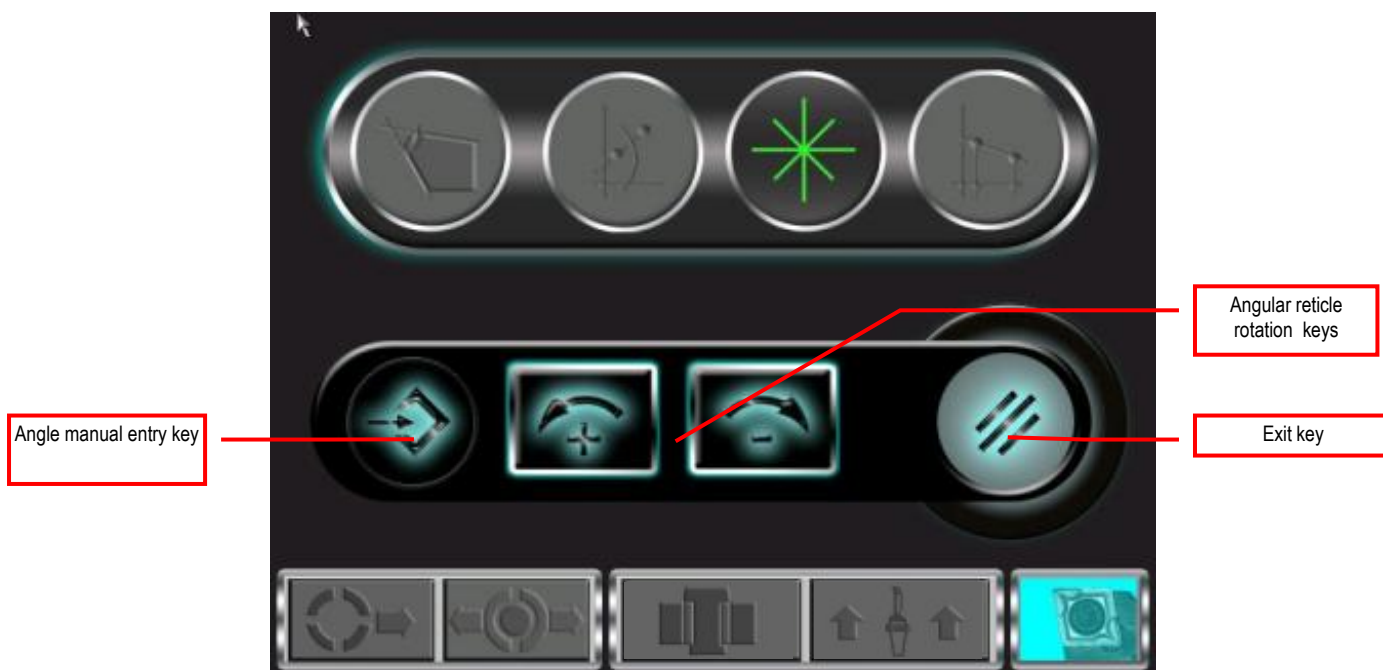
dimension with key


8.3.3 CHECK OF ANGLES WITH 506V


It will be possible to display and rotate an angular reticle combined with the fixed reticle. By collimating the axes of this reticle with the tool's profile, the inclination of a straight line will be read on the goniometer (i.e. lip relief angles, tools dislodgements, etc.).

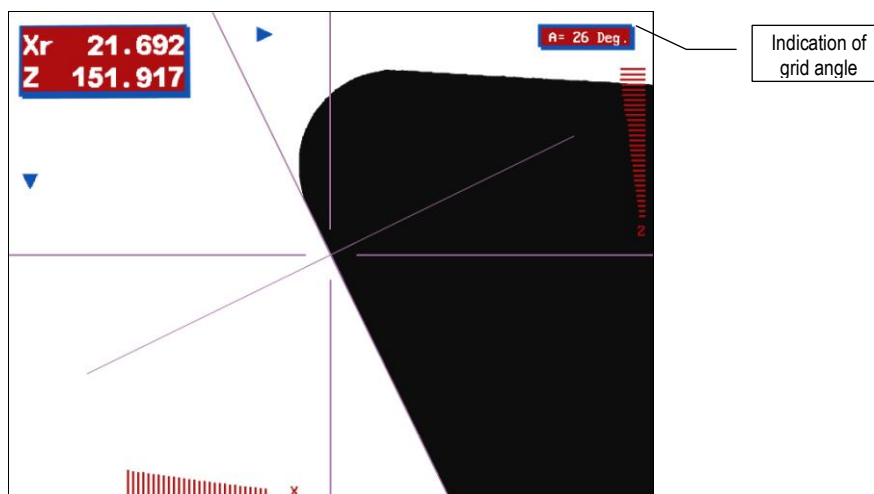


To display the angular reticle, key ; the following window will be displayed



Push keys  to rotate the reticle clockwise or anticlockwise by one degree.

Otherwise, key  to directly set the desired angle in the digital keyboard displayed.
To remove the angular reticle from the screen, zero degrees shall be set..




Display of angular grid for optical check of tools




8.3.4 DISTANCE BETWEEN TWO POINTS


This function allows the calculation and the visualization of the linear distance (diagonal) between two points indicated.


The points used to calculate the distance must be collimated optically with the sight of the fixed reticle; the aided-take of the 506V point is disabled.



Dimension acquisition for tools set or label printing

Key camera , on the main menu and then the radius and angles measuring key ; key  to acquire the two points required for the calculation; the operator will be required to collimate in sequence the two points on the concerned segment,

convalidating each point with key ; 706 calculates the value of the described angle and it will be displayed.

If a tools set is being measured or a label is being printed, it will be possible to directly acquire the dimension with key .

8.3.5 AUTOMATIC CIRCLES MEASUREMENT

This function enables identifying and automatically calculating the radius in the framed profile as well as displaying the value.

When the function is activated, it will work in real time. This means the profile is constantly examined, thus it is up to the operator to decide if data are exact or not. Like autocollimation, the operator has to make the visualized image as clear as possible in order to measure it: focusing and cleaning it from dust and sharpening remains, framing it correctly.

In this case, all aspects are more important, since the automatic angle measurement affects the whole profile



and not only the maximum-tangency points.



To activate the function, key

506V will point out the value surveyed and will outline the radius of the circle pointed out by outlining its circumference.




Automatic circle measurement procedure

- Frame the tool on the screen (fast movement); if necessary, use the micrometric movement to visualize the largest possible share of the section regarding the radius;
- Focus the part affected by the measurement: the focusing bars are eliminated, otherwise they would give rise to wrong reading for the majority of measurements, because they work on the maximum-tangency point;
- Clean carefully the whole tool profile involved in the measurement;
- Should the result be unsatisfactory, check the tool for thorough cleaning, then try to rotate lightly the spindle and/or perform short movements.

8.3.6 RADIUS CHECKING WITH 506V



Click on the key  to pass to radius checking procedures; the following window will be displayed



506V offers two methods of control and measurement for the radiuses (radius passing through 5 points see par. 8.3.7).

The first system, equivalent to profile projectors', allows displaying a circular reticle; the radius may be measured by fitting the tool profile and circumference arches in the reticle,. This method permits very quick determination of standardized inserts radii.



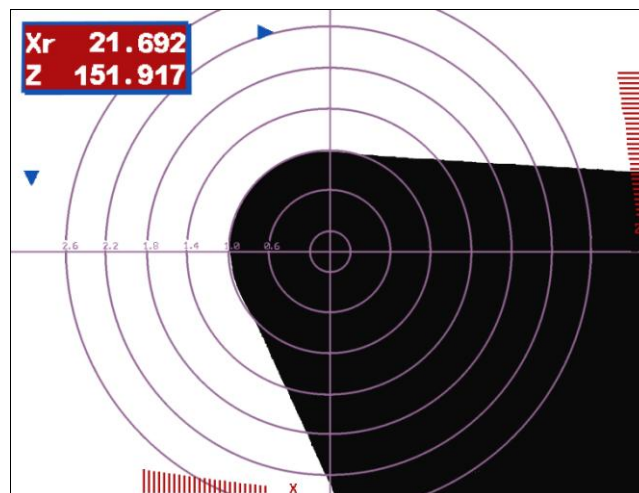
Recall menu 506V by keying  to display the circular reticle



This window, enabling to modify the diameter of the screen ed circles (4 combinations) at each pressure




of the keys thus increasing or decreasing the dimension, will be displayed. Obviously, the reticle scale, expressed in mm or mils, is updated according to the measurement unit set on the visualiser.




Optical check of rays with circular grid

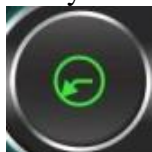
The second method allows drawing circles or settable-radius arches (maximum radius: 50 mm) on the screen. Then, they may be zoomed/reduced and rotated until they adjust to the tool profile that is to be measured; choosing the arch concerned in order to visualize the central coordinates is also possible. Therefore, this system allows taking fast graphic measurements, in particular with radius cutters, where the tool must be rotated to check its profile (because of the helix). The operator only needs to check that the part of the profile that is in focus as the tool is rotated keeps tangent to the arch on the screen .



To display the circular reticle, key ; four circles or arches will be drawn on the screen (according to the active radius) and the following window will be displayed on the electronic equipment 706




Every time you key , the radius will be increased or decrease by 0,05 mm.; key



to display the digital keyboard to allow directly setting the radius value to be displayed.

To adjust the angle to the part of profile to be checked, the four circles on the screen may be rotated.




Key , then every time you key



the arches angle is rotated by one degree.



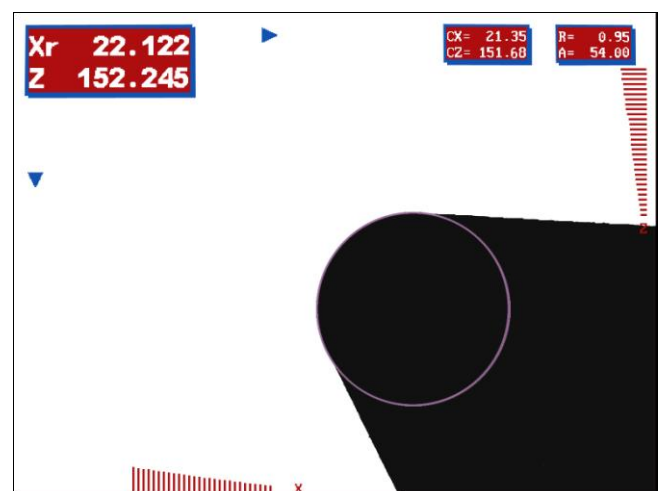
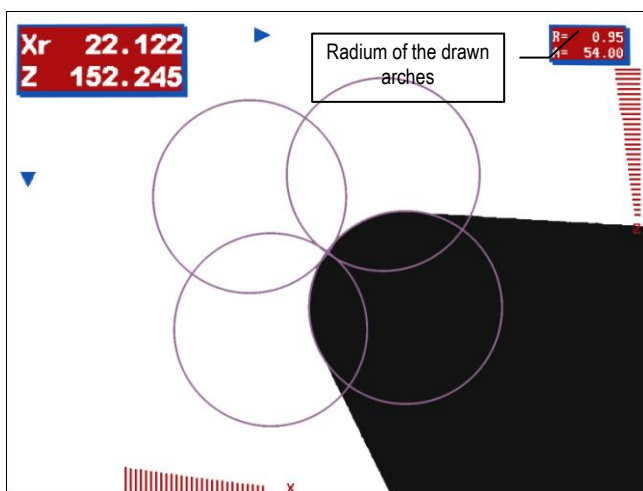
In this case too, key  to set directly the value of the angle..



To visualize one circle arch only, key ; Anytime you key, the chosen arch will be changed and



the central coordinates will be visualized. To restore the four arches, key .



Optical monitoring of radiuses with mobile circular reticle

Radius control procedure

- Frame the tool on the screen (fast movement);
- Focus the image;
- Move the axes into the central point of the arch whose radius is to be measured, is in the centre of the fixed reticle;

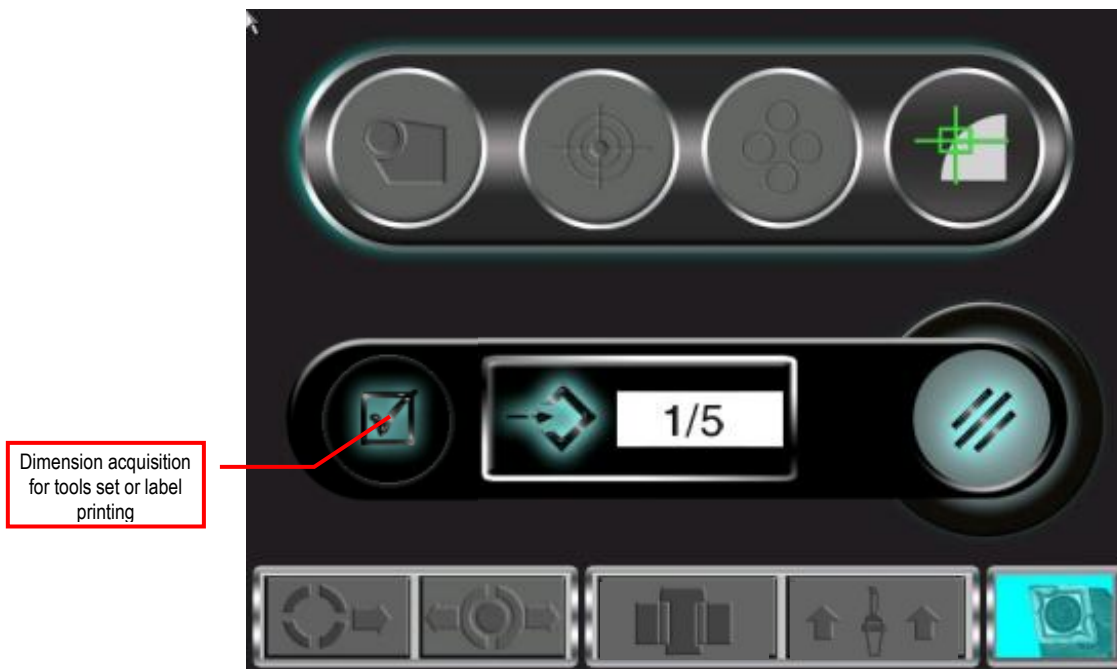
- Then, adjust radius and angle into the drawn arch and the framed shape overlap;
- Erase the useless arches to visualize the coordinates of the centre.



☒ *Note: the coordinates of the centre of the arch, are real-time updated based on the position of the arches; therefore, they will be valid once the 506V configuration menu is disabled.*



8.3.7 CIRCLE PASSING THROUGH FIVE POINTS


This function calculates and displays the radius of a circle passing through five unaligned points. The five-point (as opposed to the three-point) system enhances measuring accuracy, and is particularly useful in the case of shaped tool measurements, which are difficult to evaluate using the circular grid.

☒ *To reduce errors in calculation, choose five points as far as possible.*




Key camera  on the main menu and then the radius and angles measuring key  and

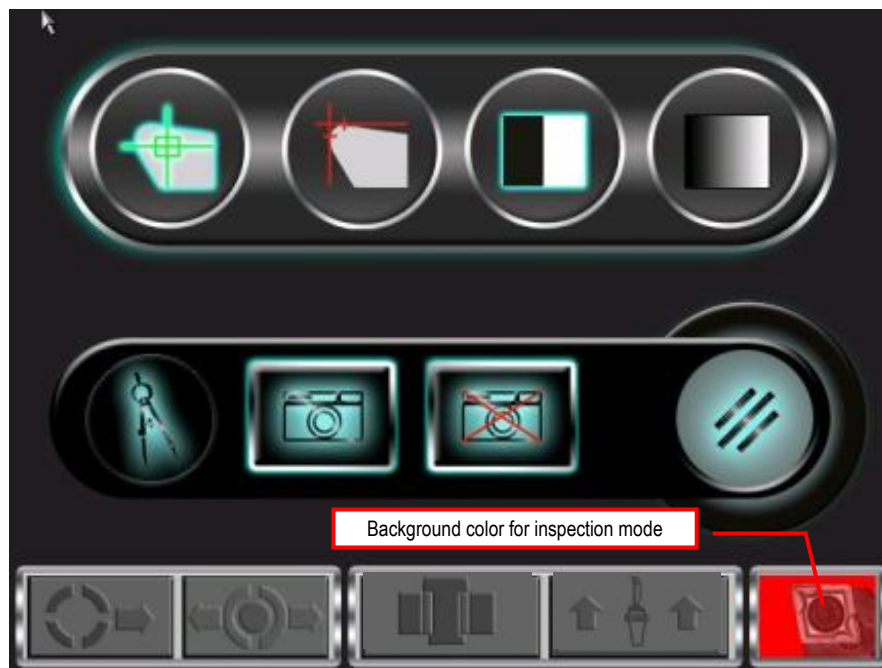
the radius measuring key ; then key  to start the points acquisition sequence. The operator will be required to collimate in sequence five points on the concerned circumference arch,

convalidating each point with key ; finally 706 will calculate the radius value described and it will be displayed.

If a tools set is being measured or a label is being printed, it will be possible to directly acquire the

dimension with key .

8.4 INSPECTION MODE



Besides the measurement modes, 506V can display the surface of the sharp to detect possible anomalies.

Obviously, also “manual” measurements of the particular displayed can be taken, by using the fixed, angle, circular reticle, or the vertical limbs. The photography function can also be used, to stress differences on multi-cutting tools.

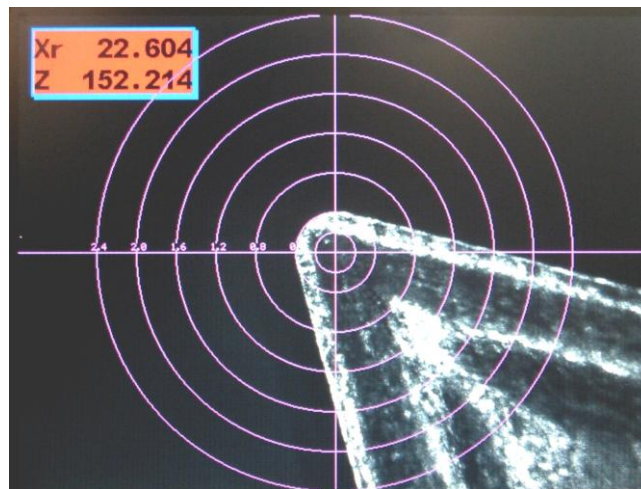
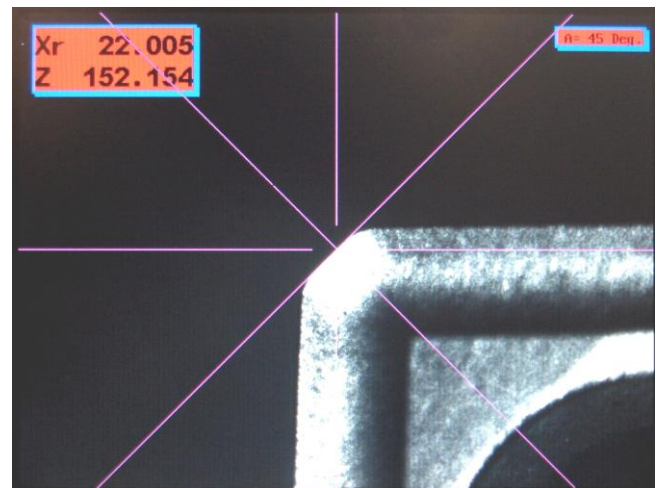
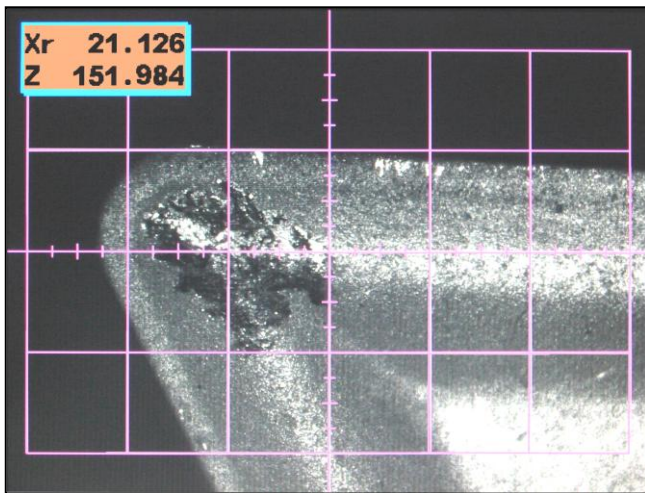
The automatic measurement functions and the focusing indication, which need an image as hard as possible of the tool profile to work (diascopic), are inhibited. To start the inspection mode, just clockwise rotate the potentiometer located on the 506V vision system arm; 506V will commute the visualization switching off the source of diascopic light and switching on the annular episcopic lighting.

By using the same potentiometer the intensity of the lighting can be adjusted to obtain the proper degree of hardness of the particular framed. As a matter of fact, the tools are often very reflective; thus, dose the quantity of light used and slightly rotate the position of the spindle proves to be necessary to examine the surface.

To make this operation even easier, 506V allows the modification of the complementary colour of the black in the representation on the screen : the choice ranges from white, yellow, red and blue. In this way any micro defects of the sharp checked, are emphasized.

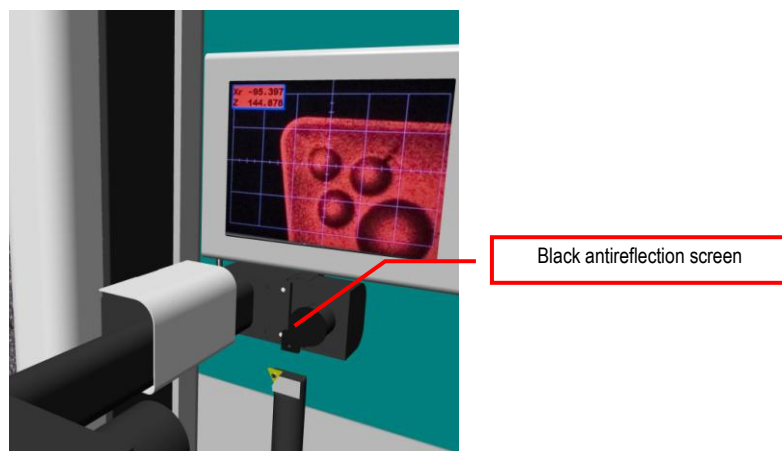
To modify the colour used in inspection mode, push in sequence the key until the desired colour will be selected.





The pictures show examples of tools inspected and of the various reticles that can be selected.
To go back to collimation/measure, completely rotate the potentiometer anti-clockwise.

- ☒ If the image background colour is too light, it is possible to rotate the black antireflection screen of 90°.



9. MOVEMENTS

9.1 AXES MOVEMENTS

Axes movements are servo controlled with step by step motors and have two operating speeds: rapid and micrometric adjustment. Rapid adjustment is used to place the tool in the field of vision and to distance itself at the end of the measuring, while fine adjustment is used for the tool profile and measurement acquisition.

9.1.1 RAPID ADJUSTMENT

To move the machine in rapid movement mode, press the appropriate button to the required moving direction: the axis will move at a speed of 1000 mm/min. while the button is pressed or until the stop point is reached.

Since every axis movement is independent, it is also possible to contemporarily move the axes in order to reach the tool measuring zone quickly.

In addition, when the measure has been taken, an automatism is also present, able to facilitate the moving away of the axis from the machine spindle: keeping the positive direction buttons (X+e/o Z+) pressed for 2 second, the axis will move away reaching the positive stop point.



☒ *The positive axis stops are active only after the research of the zero points of reference; consequently, before this operation, it is possible to reach the mechanical stops axis also with the rapid adjustments. In this case the engine acts as electromagnetic clutch (recognizable from its characteristic sounds), avoiding any kind of damages to the mechanical parts.*

9.1.2 MICROMETRICAL ADJUSTMENT

After framing the tool profile with rapid adjustment, it is possible to centre the measure points precisely using of the electronic wheels.

Operating on the two wheels (one per axis), it is possible to get a 0,5 mm movement for each wheel turning, that allows the easy axis positioning with a 1µm precision.

The moving direction are pointed out on the control panel serigraphy.

☒ *The micrometrical movements are active beyond the stop points defined for the rapid adjustment: this allows the exploitation of the whole axis mechanical course (till the clutch intervention).*

9.2 SPINDLE FUNCTIONS

All functions that are listed in this paragraph can be activated both in the electronics panel 706 and in the machine control panel; furthermore, the relevant lights will turn on at the same time in both panels.

9.2.1 ROTATING SPINDLE SUBSTITUTION

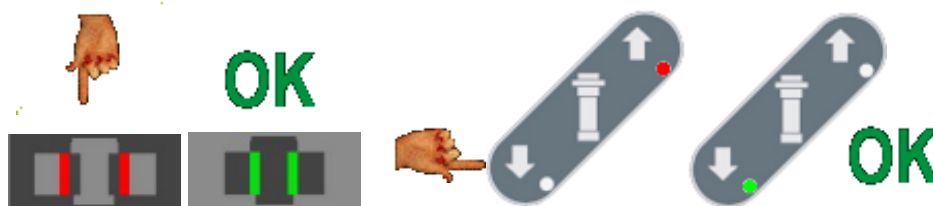
In case of the availability of different spindles, please follow these instructions for the substitution:

Procedure for the Rotating Spindle Substitution

- Move the column in a position to facilitate the spindle disassembly operation: axis X completely to the left; axis Z completely on the top.
- Remove the tool from the spindle and deactivate the brake and the index;
- To unlock the spindle, you must press the spindle locking/unlocking key, which is to be found in the electronics 706, or rather the up arrow in the machine control panel. When the icon in the electronics 706 turns red, it means that the spindle has been unlocked, and the warning light in the unlocking key turns red; now, you can remove the rotary spindle upwards by keeping it parallel to the column;



- Clean the extracted spindle and lubricate the rectified parts with antioxidant liquid (i.e. Chesterton 775), before placing it in an appropriate place;
- Clean the replaced spindle;
- introduce the new spindle into the preset spindle body; be careful to introduce it by keeping it parallel to the column, rotate it until you hear the click for the introduction into the housing. After that, press the spindle locking/unlocking key in the electronics 706 or the down arrow in the machine control panel; wait until the warning light in the key turns green.



- In case you dispose of adapters only and different rotating spindles are not available, follow next procedure.

 The rotary spindle replacement pushbutton automatically disconnects the spindle index and the brake.

Procedure for the Spindle Adapters Substitution

- Remove, if present, another adapter, clean and lubricate the ground parties with antioxidant liquid (i.e. Chesterton 775), and lay it in a safe place;
- Clean the spindle and the new adapter.
- Insert the adapter into the spindle.

9.2.2 SPINDLE BRAKE

The machine is equipped with spindle-holder rotation's manual pneumomechanical brake with radial compensation of the pulling force



When the key is in the default position in the electronics 706, it has a clear background and means that the function is not active; the arrow is red and the direction means that the spindle-holder brake is at rest; the led in the machine control panel is red coloured.



If you press the key in the electronics 706, the background will switch to dark, meaning that the function is active with the green arrow and the direction, which specify that the spindle-holder brake is operating. If you press the key in the machine control panel, it will have the same function and the relevant signalling led will turn green.

After that, if you press one of the above-mentioned keys, the spindle brake will go back to the rest position and the relevant warning lights will turn red once more.

☒ *The spindle rotation brake disconnects the pushbuttons for the activation of the spindle index.*

9.2.3 SPINDLE INDEX (OPTION)

The spindle index can be activated if the active origin concerns a machine set, as a lathe, and enables orienting and mechanically clamping the spindle in four different positions every 90°



When the key is in the default position in the electronics 706, it has a clear background and means that the function is not active; the arrow is red and the direction means that the index centring device is at rest; the led in the machine control panel is red coloured.



If you press the key in the electronics 706, the background will switch to dark, meaning that the function is active with the green arrow and the direction, which specify that the index centring device is operating. If you press the key in the machine control panel, it will have the same function and the relevant signalling led will turn green.

After that, if you press one of the above-mentioned keys, the index centring device will go back to the rest position and the relevant warning lights will turn red once more.

☒ *If you previously activated the spindle rotation brake, the index function cannot be activated.*

- ☑ *Warning: the spindle index pushbutton to be found in the machine control panel will always be active, even in case there is no spindle index option or if the machine is not configured as a lathe.*

9.2.4 TOOLHOLDER CLAMPING

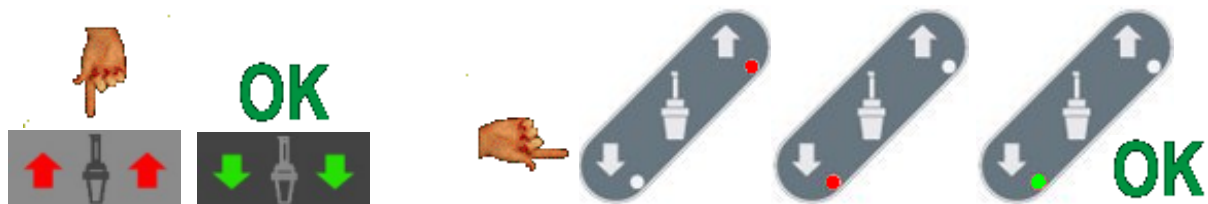
In order to achieve a higher precision level during tool measurement it is possible to activate the toolholder clamping.

Ankh presets are equipped with universal tool locking systems with mechanical coupling.

☒ *Procedure for tool clamping/release*

- Clean the preset spindle cone and the tool connectio cone, then insert the tool in the spindle.
- To lock the tool, you must press the tool locking key in the electronics 706 or the down arrow in the machine control panel; in the electronics 706 the icon immediately turns green, while the warning light in the key of the machine control panel turns red, meaning that the locking cycle has started.
- When the aforesaid warning light becomes green, tool locking has been performed.

- ☑ *If, after some seconds, the warning light in the machine control panel keeps red, check the air pressure in the pressure gauge (par 6.5.2).*



- Vice versa, to perform the unlocking operation, you must press the tool unlocking key in the electronics 706 or the up arrow key in the machine control panel; in this case, the icon will turn red, like the warning light in the key of the machine control panel, which means that the tool has been unlocked and you can remove it from the spindle.



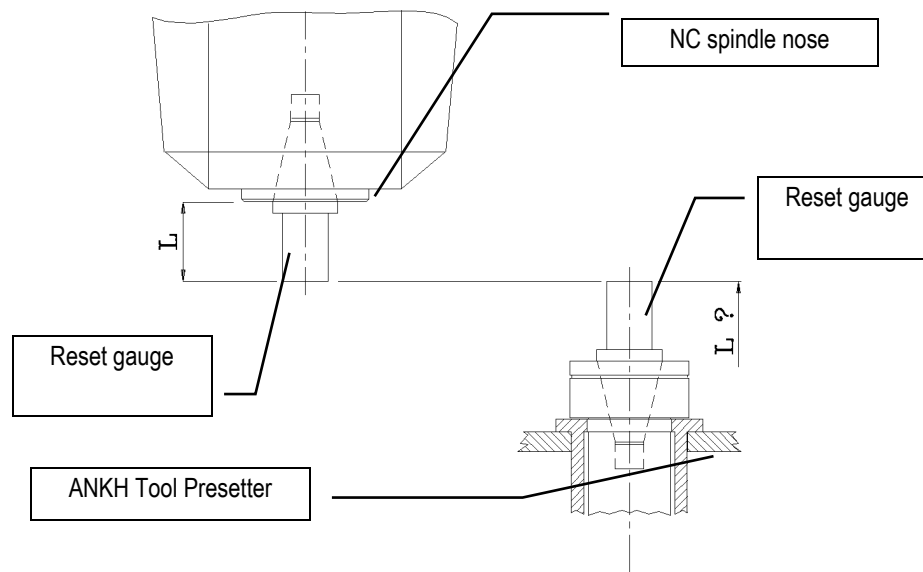
- ☑ *The tool clamping stops the spindle substitution button*

10. MACHINE ORIGINS

10.1 NC MACHINE ORIGINS

In case of tool measurement operations, there are no particular problems in the X axis radial measurements, but a conventional reference point must be established for length (Z axis) measurements. When a tool radius or diameter is measured, the zero point will always be located on the tool, though the situation is quite different for length measurements. For this reason, the tool presetter must be reset on the same point for the Z axis of this NC (absolute machine zero point, spindle nose, etc.).

The simplest method is to measure a master gauge or a reference tool directly on the NC machine. The dimension is then transferred to the tool presetter. The radius and length measurements set on the machine will then be shown on the screen ..



A more efficient system is to use the same origin given by the length marked on the reset gauge, for all of the machines having the same spindle intersection.

The electronic equipment 706 gives freedom of choice in which system to use in order to express the length on axis Z, and includes in preset functioning the self learning of the origins for each machine or group of machines according to the system applied.

It is possible to specify for each machine either as radius or as diameter, the unit of measure and also the counting direction or the exchange of the single axes (settings which are particularly useful for measuring lathe tools). All the settings stored for each machine become active simultaneously with the origin shifting, that is every time they are recalled, and thus avoiding any possible error.

10.2 DEFAULT MACHINE

As described in paragraph. 6.4.1, after having switched on the machine and acquired reference zero points for axes X and Z, the Preset enables a fictitious machine source called "DEFAULT MACHINE".

The parameter for this source is set by the user through the steps indicated below allowing the user to perform measurements without storing any machine sources on digital controls.

☒ **Warning:** "DEFAULT MACHINE" is always shown in the list of machine sources and cannot be edited or deleted.

☒ DEFAULT MACHINE Setting Procedure

To set DEFAULT MACHINE parameters, follow the procedure relating to absolute/incremental switching described in paragraph 6.4.2.

Insert into the spindle holder a sample tool of which the radius and length are known.




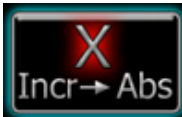
Press the absolute/incremental switching button to show the following screen



Axes selection keys

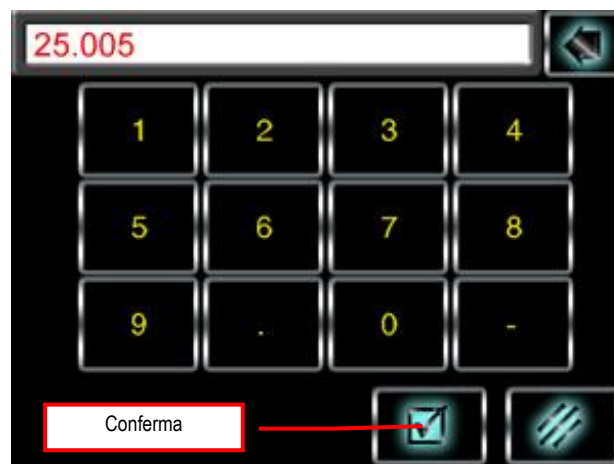
Axis Height Setting

Uscita

Press the  button, which will turn red and enable the  button for axis X height setting.



By pressing that button, the numeric pad will be shown and the user will be able to enter the sample tool radius height.



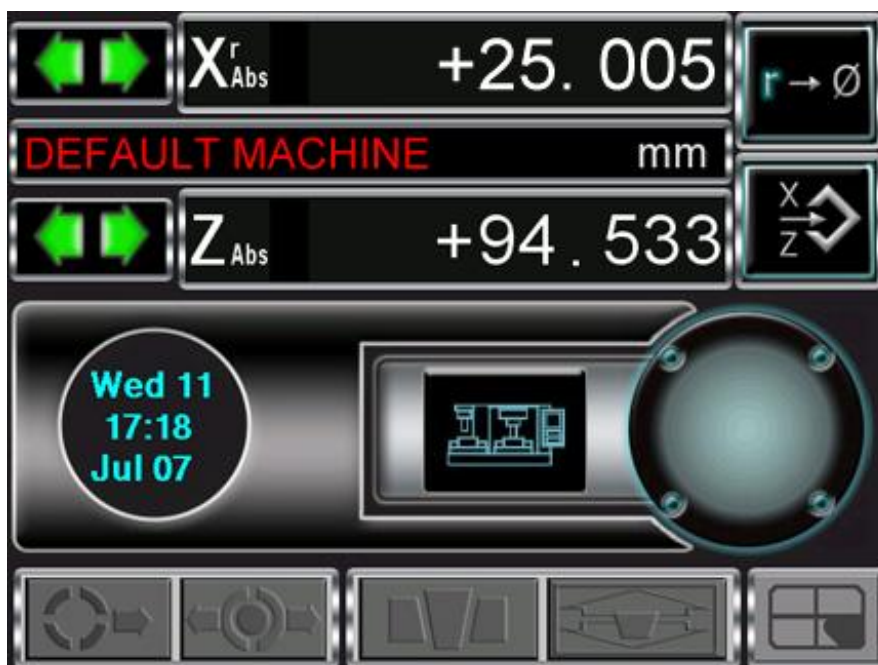
Press the validation button, then repeat the same procedure for axis Z by entering the sample tool height length.



The DEFAULT MACHINE setting is completed. By pressing the exit button, you will go back to the main screen and be able to use all measurement functions.

The DEFAULT MACHINE will keep the stored heights until a new setting procedure is carried out.

☒ *Warning: Only if DEFAULT MACHINE is selected, axes will continue to show the height in the absolute, rather than incremental, mode.*

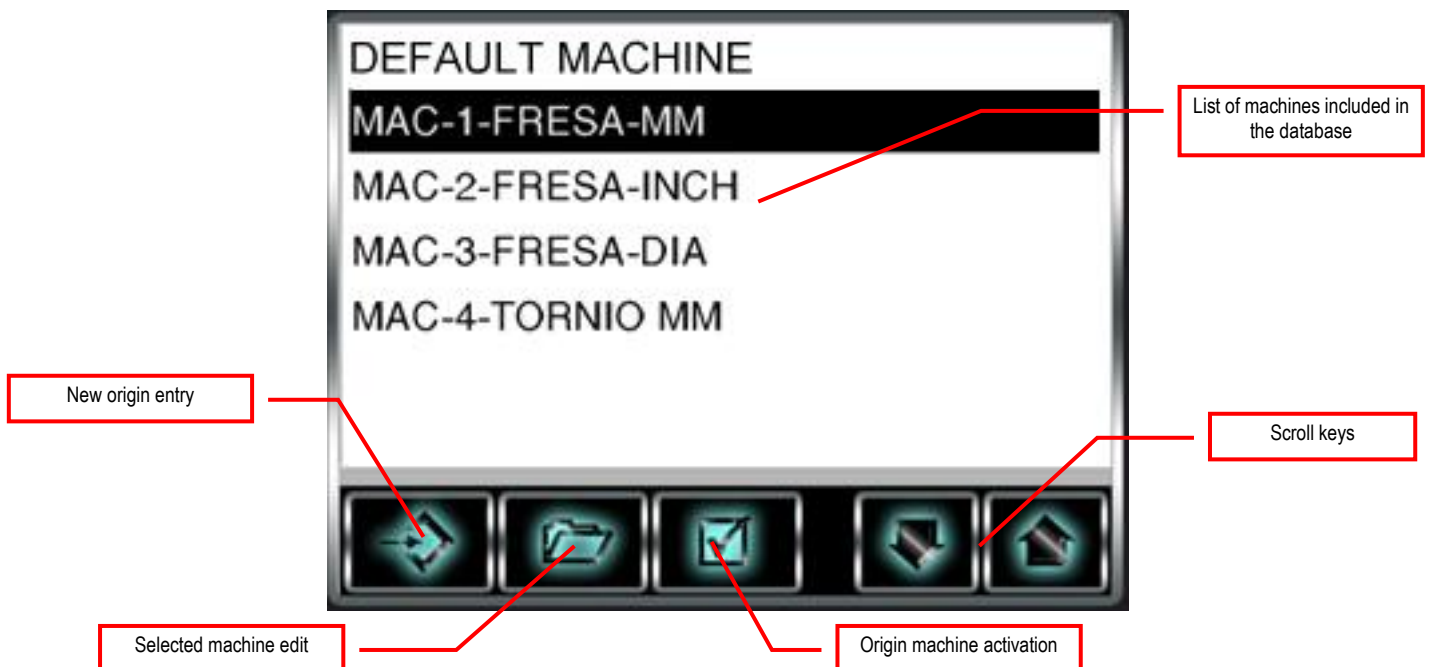
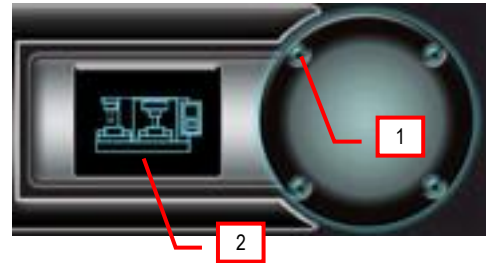


10.3 ENTERING, ENABLING, CHANGING AND DELETING A CN MACHINE SOURCE

✗ Procedure to preset the NC machine origins

To define a new machine origin proceed as follows:

- Insert a master gauge, previously measured on the NC machine, in the tool presetter spindle.
- activate the machine origins mode
(1) by means of the functions selector, then gain access to the machines database (2);
- The list of the machines already defined will be displayed. In case 706 has no zero references, such research will be automatically activated (par. 7.1.1);



- Push the new origin entry key to display the password request window, after its correct entry, the following window will be displayed:



- push on the machine name field and enter the correct machine's name through the alphanumerical keyboard that will be displayed, then press the confirmation key;

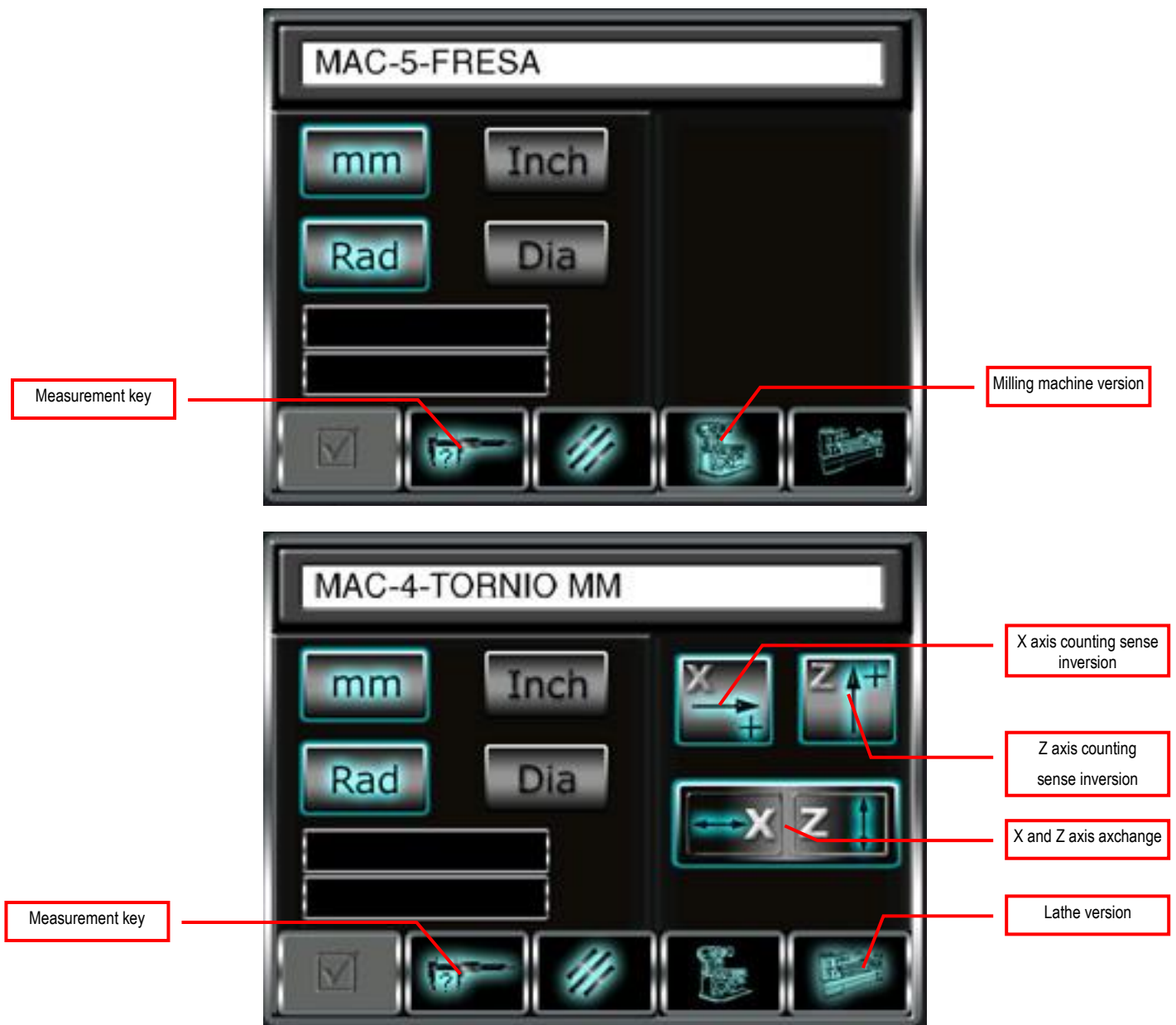


- now the previous window will be displayed again with the entered machine name and it will be possible to select “mm/Inch”, “Rad/Dia” and “Mill/lathe ” options according to requirements.

If the machine type we have chosen is “Lathe”, two more options will be available, allowing inverting the counting direction of single axes and to exchange X axis with Z axis. After the above said modes



have been set, press the measurement key to perform the calibration of our machine origin.



- As far as X axis is concerned, the software offers two options: carry out measurement on our reference gauge, or import the default machine origin recorded by Elbo Controlli during machine testing (recommended).



- By selecting the factory origin the inscription FACTORY X will be displayed and the acquisition of the axis Z measure will be set as shown above.



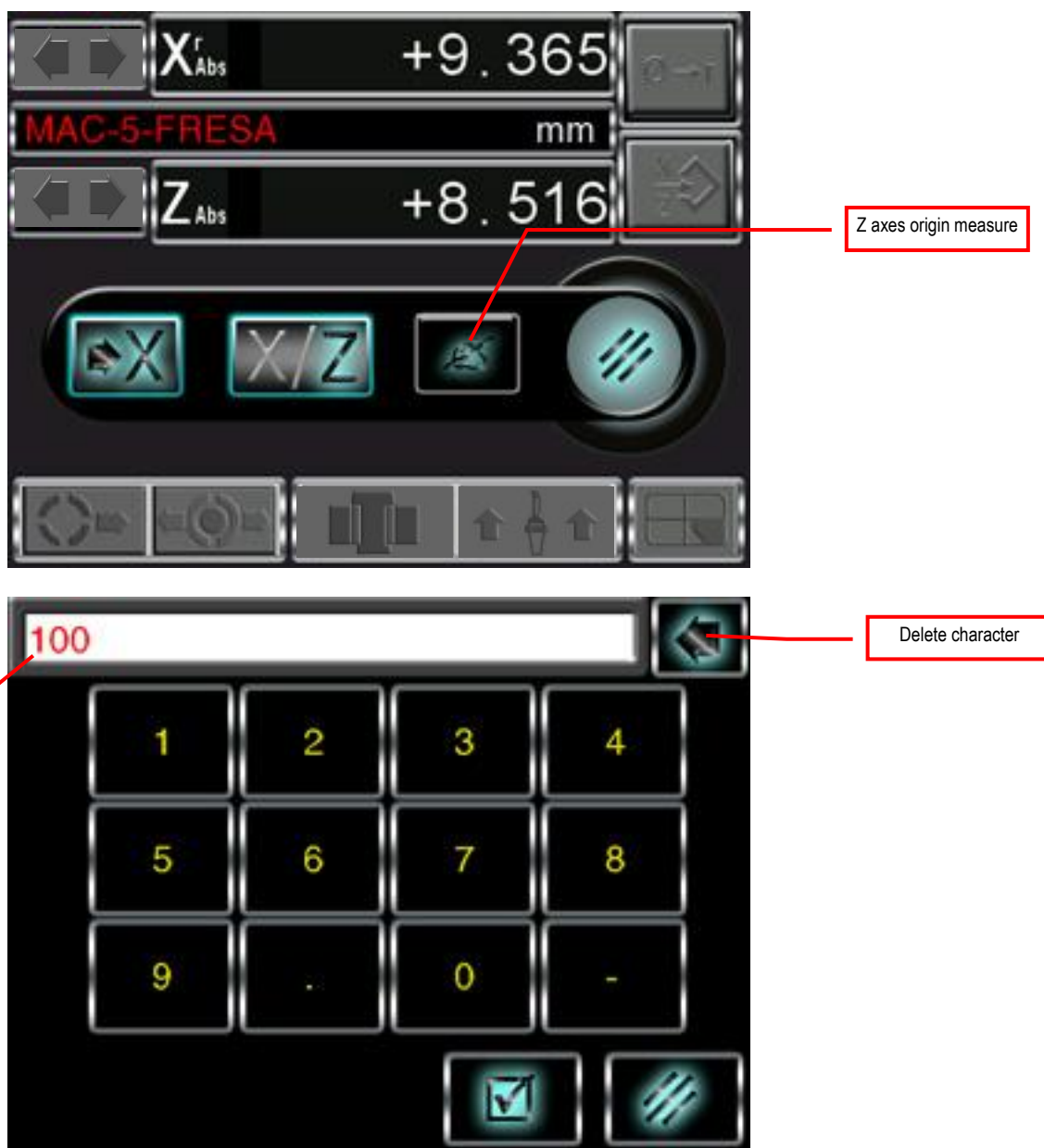
- In order to acquire the reference gauge measure, press the X axis origin measure key, enter the radius by means of the numeric keyboard and press the confirmation key.



- In the following window the software requires to bring the X axis in collimation with the centre of the reticle (it is necessary to have previously performed the tool or the reference gauge focusing), then press the confirmation key that will be displayed, as the OK green inscription, only when the camera is within a range of 10 μm from the zero value



- As indicated in the following windows, the operation shall be repeated for the axis Z , following the same sequence:






Now reference dimensions are recorded and the following windows will be displayed whether an origin for milling machine or lathe is concerned





Key  to quit the machines menu, to restore the electronic equipment in visualiser mode; please note that the origin just created have been set as an active machine. If the axes have not been moved after the gauge measurement, dimensions will coincide with those defined too.

☒ *Warning: as for a machine origin recording, it is important to acquire the values of both axes, while during the modification it will be possible to perform the correction of only one axis .*

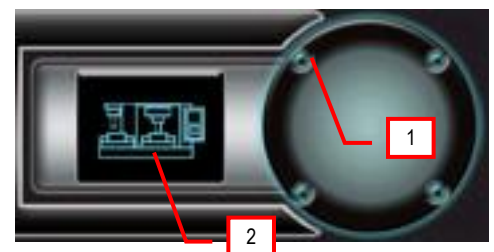
10.2 ACTIVATION, MODIFICATION AND CANCELLATION OF A CN MACHINE ORIGIN

At this stage, all the machines origins, where the tools to be measured are to be used, have been recorded in the tool presetter memory.

For their proper measurement the relevant machine origin shall be activated. Follow the following procedure.



☒ Procedure to activate a NC machine origin


- by means of the functions selector, activate the machine origin mode (1), then gain access to the machines database(2).



- The list of already defined machines will be displayed. If 706 does not have the zero references, their research will be automatically activated (par. 7.1.1).



Select with the keys   the machine whose origin must be recalled; Once the cursor


underlines the selected machine, press .

The main window will be displayed again. The screen dimensions, regarding the requested machine, will be immediately updated. This machine will be pointed out in the special dimensions display screen. Consequently, all measurements will be valid only for the number of activated NC machine.

Procedure to edit or delete a machin origin

To measure a new machine origin or to delete it, the following procedure shall be adopted:

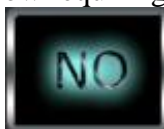
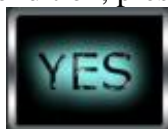
By means of the scrolling keys, select the machine to be modified or deleted, like in the previous window,

then key EDIT ; to gain access to the above said functions the password is required, then the alphanumeric keyboard will be displayed to enable entering it; after having entered the correct password, the following window will be displayed



Press the measurement key to repeat the machine origins acquisition procedure explained in the previous paragraph.

The cancellation of a machine origin is possible only if no related Tools set exist; after having checked this condition, press the cancellation key; a window requiring confirmation will be displayed;



select YES to cancel the machine, select NO to go back to the previous window.



☑ *Warning : see paragraph 11.4 for Tools set cancellation.*

11. TOOLS SET

11.1 INTRODUCTION

ANKH allows the storage of the measurements taken and their organization into different lists: the "tool sets". A tool set is a set including all the tools necessary to do a particular job on an assigned machine.

If, for example, a DRW0123 piece to be processed needs one milling-machine for roughing, one for finishing, drilling and boring; these four tools will constitute the drw0123 "set" in the 706 machine memory and it will be possible to use the same corrector number used by the NC in its "part-program", as to have an absolute data correspondence to avoid possible errors.

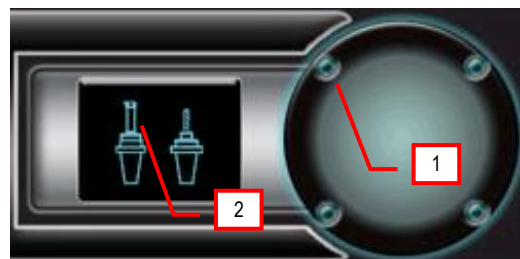
11.2 CREATION AND MEASUREMENT OF A TOOL SET

It's not necessary that the creation and measurement procedures are executed at the same time, as a matter of fact the set could be defined first and manually assembled second and then measured. In this case, refer to the next paragraph.

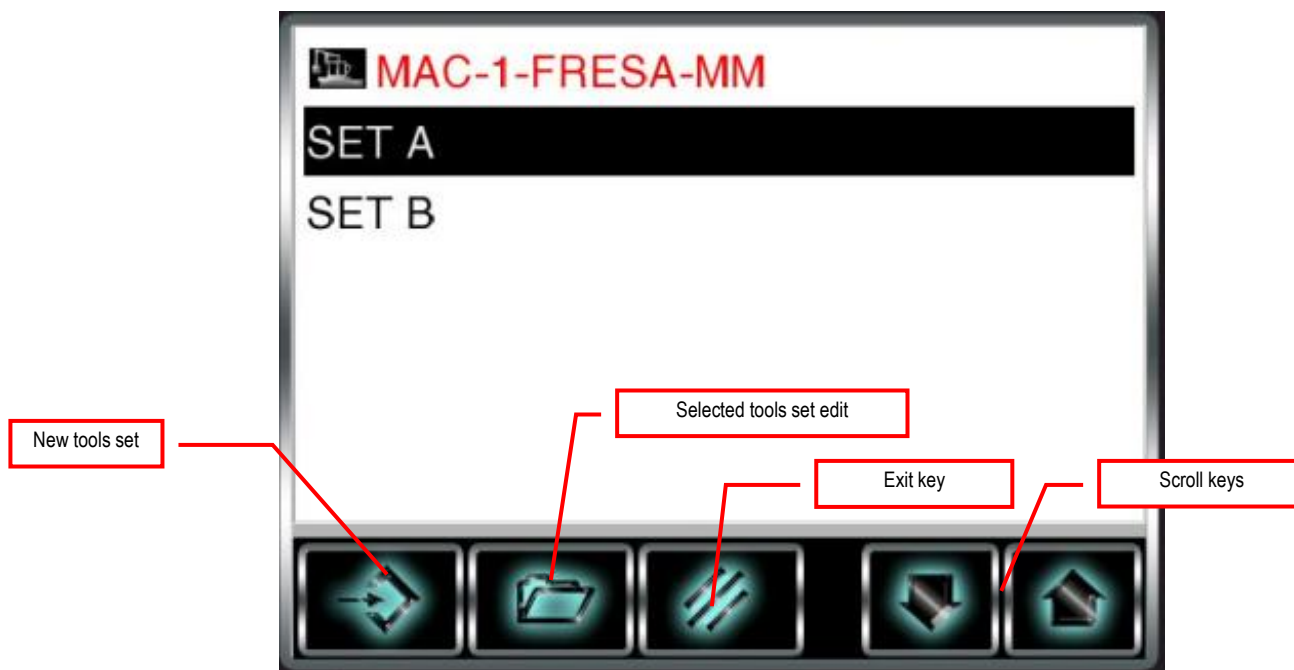
To define and measure a new tool set, proceed as follows:

Procedure for a tool set making and measurement


- By means of the functions selector activate Tools set (1) mode, then gain access to the tools database (2).

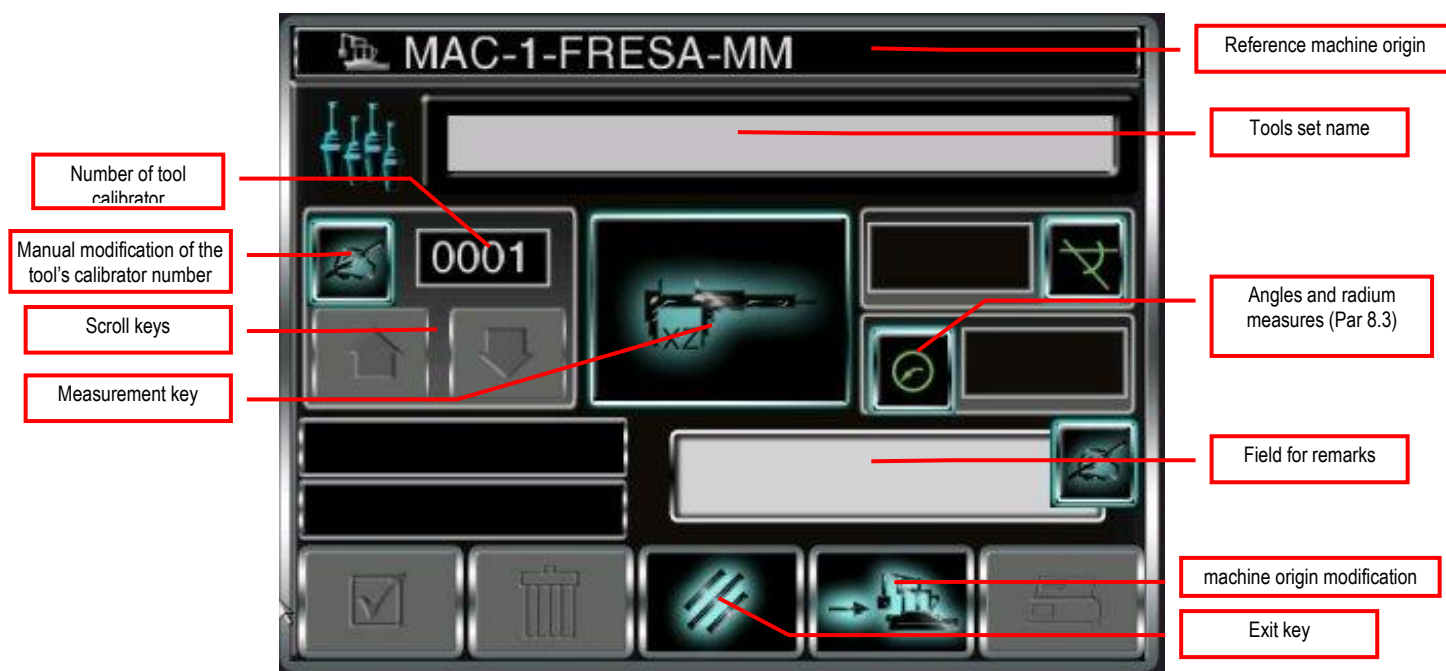


- The following new window will be displayed, indicating the machine to which the tools set will be assigned and, if available, the list of tools set already assigned to the machine. Position in the machine origin field to scroll the list of existent origins with the arrow keys, until the one desired will be selected. If a 706 does not have zero references, their research will be automatically activated (par. 7.1.1).






Press key  to create the new tools set for the selected machine.



First, press on the Tools set name field to display the alphanumeric keyboard enabling us enter the Set name.

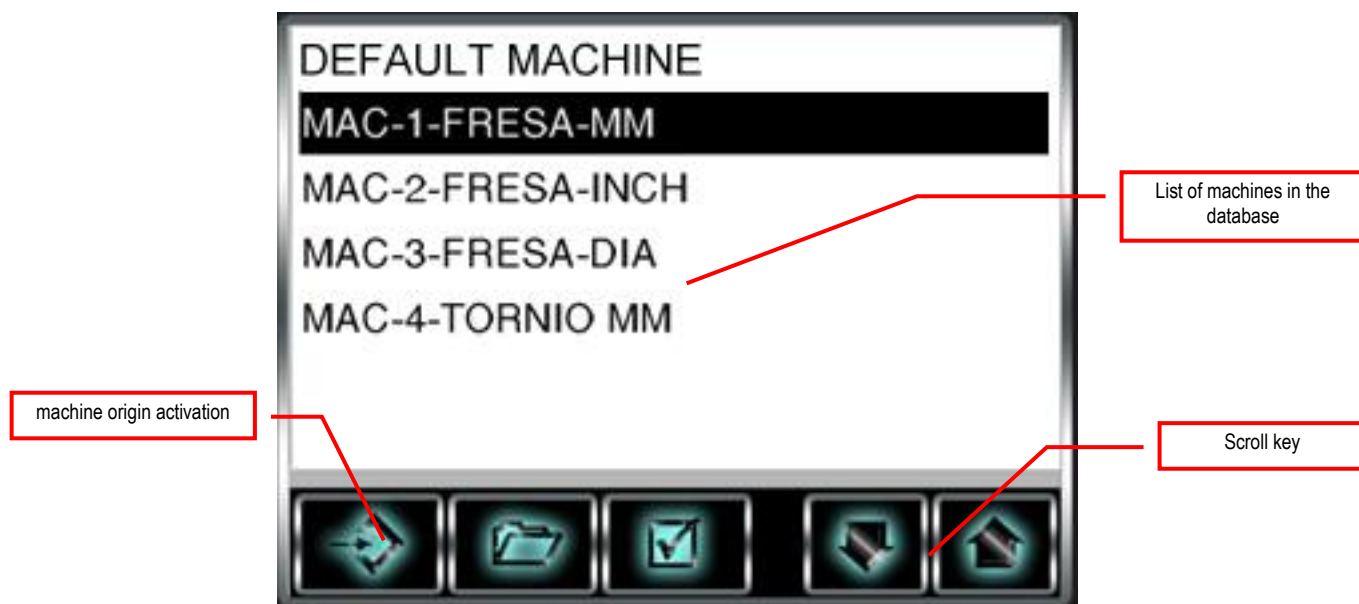
Subsequently, enter the tool's calibrator desired number, (the machine will always propose the first free


number after the highest value calibrator), by pressing the modification key  and writing it on the screen digital keyboard.


Now it is necessary to check whether the machine origin activated is correct; if not, the correct one shall



be selected by pressing the key  and selected in the list to be displayed.



It is possible to add some remarks by pressing key  and to write them by means of the alphanumeric keyboard displayed, then the following window will be displayed and it will be possible to



measure the first tool by pressing key .



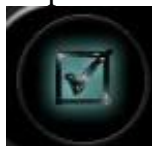
The following window will be displayed, enabling checking the procedure's correctness; actually the active machine origin and the reference measurement unit will be displayed, as well as the indication of the tool's radius or diameter measurement (the last setting inherited by default by the machine origin can be edited while measuring).

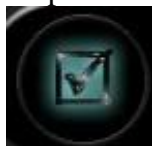




Collimate the measure on the concerned axis and press the relative key  or ; now the measure has been acquired and it is ready to be transferred to the tool's page.

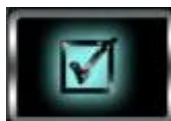
Obviously it is possible to acquire the measure of both axes before going back to the tool's page by

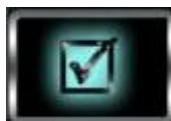


pressing key  that will be displayed after the acquisition of the first measurement or to cancel



the measurement by pressing key .



Press key  to save the tools set and the first tool included in it, the following window will be displayed



11.3 TOOLS SET MODIFICATION

It's possible to modify the tool set by adding, deleting, or measuring the tools or changing the name and/or the machine assignation.

To modify a tool set proceed as follows:


☒ Procedure for modification of the tools set

To edit a tool already entered, just position on the tool by pushing on the scrolling keys




, then perform a new measurement or update the fields filled in, by following the described previously described instructions concerning the first tool's entry.



To enter a new tool, key  and, as already indicated, assign the calibrator, fill in the remarks field, carry out measurement and save data.




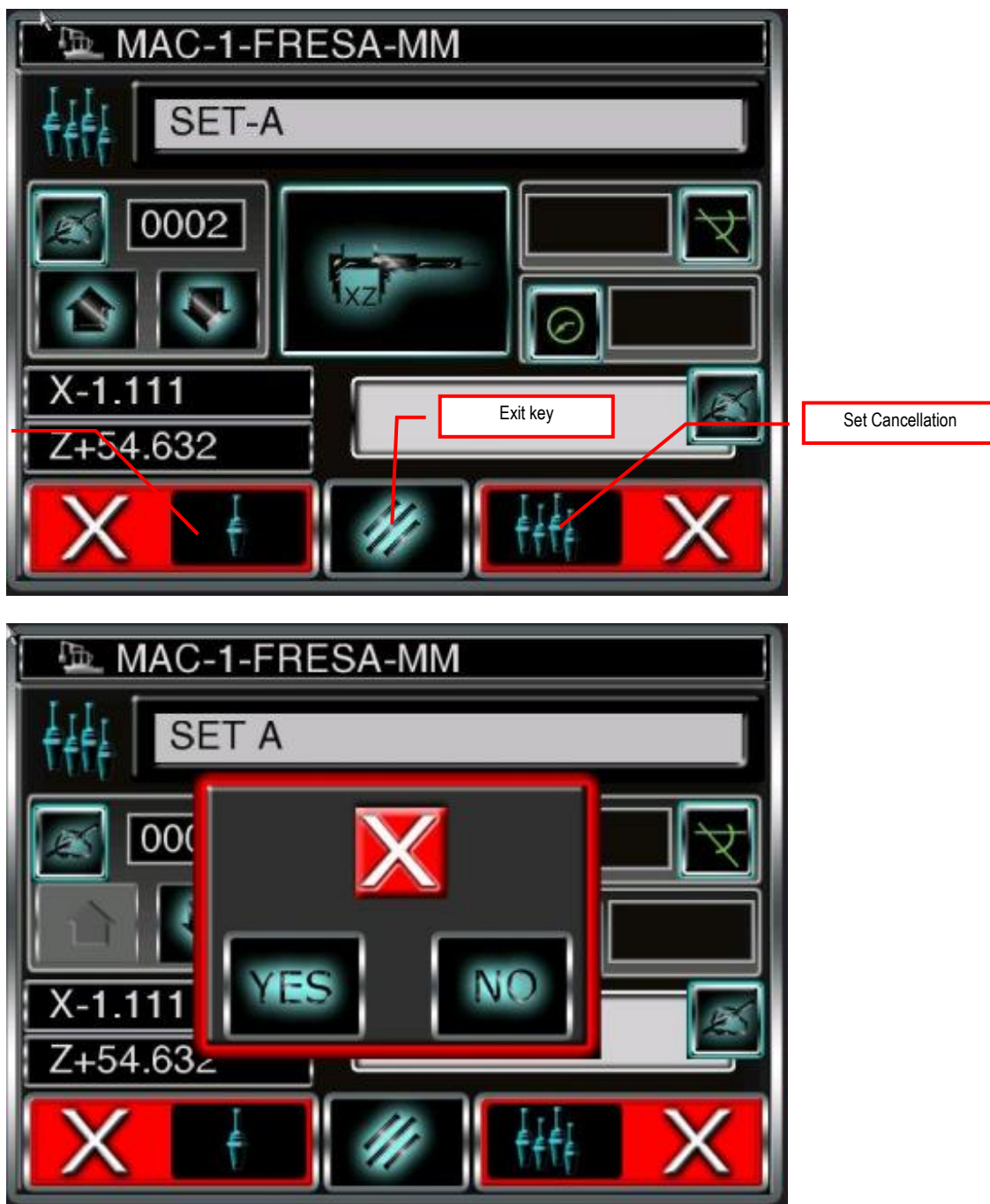
Key  to allow assigning again, at any moment, the whole set to a new machine origin without asking for a new tools measurement and converting the measurement system from inches to millimetres, if necessary.

☒ **Warning:** the sets measured for milling machines shall not be assigned to machine origins for lathe and vice versa .

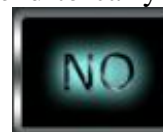
11.4 TOOL CANCELLATION AND TOOLS SET



Key  offers the user two options: the currently selected tool's cancellation or the cancellation of the whole set of tools in which we are operating. Press this key to display the following window



If the key has been mistakenly pressed or if the operator does not intend to carry out the operation, a



confirmation request will allow cancelling the operation by pressing . Otherwise, if key




is pressed it will not be possible to go back and the selected tool or set will be definitively deleted.

11.5 LABELS PRINTING

If a mini labelling machine S'PRINT-S is connected to Your presetter, it will be possible to transfer the measurements detected on adhesive labels.



To print the label, after having measured and recorded the tool record measurements, key . The information will be printed in the following format:

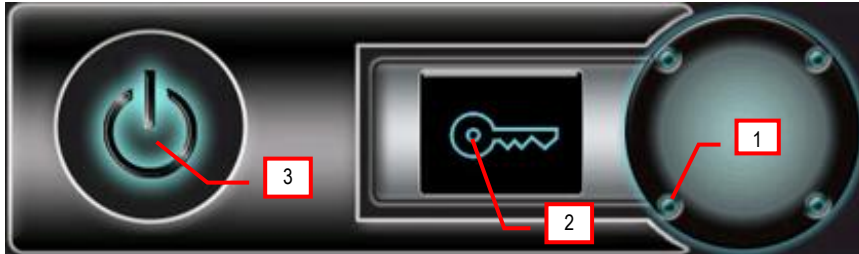
```
ELBO          16:42 250907
MACHINE
SCS
T1 A-28.94 R4.96
NOTE
Xr-100.156   Z-100.885
```

☒ *Printed values are exclusively those stored in the tool record*

12. MACHINE PARAMETERS

12.1 FOREWORD

The machine parameters are specific data allowing the presetted electronic equipment to adapt to all conditions of use, by modifying the eventual instrument measurement compensation and 506V configuration.



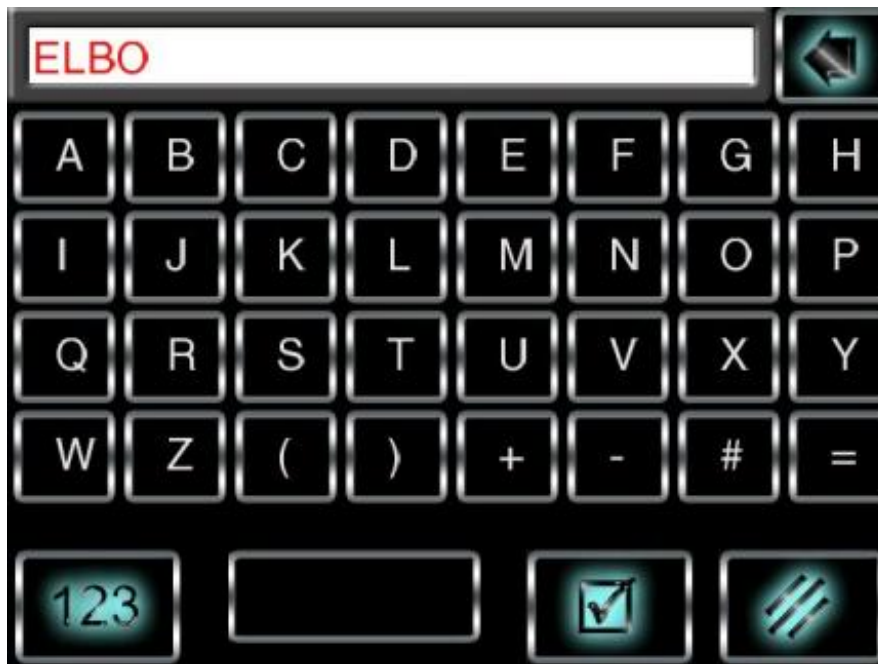
By means of the functions selector, activate the machine parameters mode (1), then gain access to the parameters list (2).

In this mode the electronic equipment shall be set in stand-by mode by means of the switch-off key (3), while to reactivate it just touch any point of the screen. After turning on, it will be necessary to repeat the axes null seeking operation, as well as to reset machine origin.



If the digital clock is displayed at 3-second intervals, it means that the machine has not been turned off by using the master switch, but it is in stand-by mode.

After having pushed the parameters key, the alphanumeric keyboard will be displayed to enable entering the access code which protects the parameters from non-intentional modifications;



If the correct access code is entered, which is ELBO by default, the following window will be displayed:



☒ *Some parameters have factory settings and are not accessible by the user.*

12.2 PARAMETERS LIST

Single parameters and relative settings are hereunder detailed:

1. LABEL

This inscription is displayed on the labels printing and can be personalised by the final user.

To change it, key value change: the alphanumeric keyboard will be displayed enabling entering a personalised text (max 10 signs).

2. BASIC PRINTER (starting from software version V 3.2)

Setting “YES” the value of this parameter, it is possibile to connect to serial port COM1 any kind of RS232 printer.

The value set by the manufacturer is “NO” and allow to connect the mini-printer S’PRINT-S.

3. DATE (dd-mm-yy)

This is the date displayed on the clock of the main window and it can be personalised by the final user.

To change it, key value change: the digital keyboard will be displayed enabling entering the correct date (factory settings).

4. TIME (hh-mm)

It is the time displayed on the clock of the main window end it can be personalised by the final user.

To change it, key value change: the digital keyboard will be displayed enabling entering the correct time (factory settings).

5. PASSWORD

It is the password required in all protected operation modes (i.e. machine parameters, origins, etc.). The factory setting is “ELBO”.

To change it, key value change: the alphanumeric keyboard will be displayed enabling entering a personal password (max 24 signs).

- ☒ *Warning: do not forget the password, or the whole presetter memory will need to be replaced to gain new access to those menus requiring the access code.*

6. INSPECTION COLOR (1,2,3,4)

It is the default background colour of 506V vision system when the inspection mode is used and it can be personalised by the final user. The factory setting is "2-BLUE".

To change it, push the value change key repeatedly: the following values will follow each other:

1-YELLOW 2-BLUE 3-RED 4-WHITE

7. CAMERA CALIBRATION

It displays calibration values of 506V vision system and it can not be changed by the final user.

- ☒ *These parameters adapt the effective 506V optical magnification to the machine displacement. Actually each vision system has unique specific values, determined by lenses processing, by mechanical tolerances of lens and supports, to be provided with the measure of the displacement to give origin to correct automatic measurements. The calibration operation is carried out in the factory and shall be repeated in case of 506V replacement, or if the whole 706 memory is cancelled. It is possible to manually calculate and enter the values, though the automatic calibration cycle is more convenient*

Es. X 1.035585 Z 1.036715

- ☒ *If the vision system is replaced, the "Service" will be charged for carrying out calibration.*

8. LINEAR COMPENSATION

It displays values eventually set for axes linear compensation and it can not be personalised by the final user.

- ☒ *If it is used at a temperature not corresponding to 20°C, or further to accidental impacts, it might be necessary to correct the measures detected by the preset to restore them to the correct value. To this purpose, it is possible to change the two compensation parameters for X and Z axis that correct the mistake by acting as multiplier of the detected measure.*

Es. X 1.000000 Z 1.000000

9. FACTORY X

It is a very important parameter as it represents the exact value of the machine origin for X axis detected at the factory with certified reference gauges. Therefore it is recommended to use it during the machine origin creation procedure, though the final user can make use of his reference tools reset. The final user can not change it.

Es. X 25000 SYSX -102455

- ☒ *Warning: if the detection system of the X axis is removed for technical assistance reasons, this value will be calibrated again by the service.*

10. BRAKE

It indicates if the machine is equipped with spindle rotation brake and the value is set at the factory. The final user can not change it.

11. INDEX

It indicates if the machine is equipped with spindle index on four positions; the value is set at the factory, it can not be changed by the final user and it only refers machines provided with spindle type VDI.

12. VACUUM

It indicates if the machine is provided with vacuum sensor for checking the tool's clamping via software; the value is set at the factory, the final user can not change it.

13. CLAMPING

It indicates if the machine is equipped with mechanical tool clamping; the value is set at the factory, the final user can not change it.

14. DEFAULT MEASURING UNIT

It indicates the default measurement unit used by the system; it can vary from millimetres to inches and it can be changed during measurement operations.

To change it, key value change: MM and INCH will alternate.

15. SET ZERO SEARCH AFTER STANDBY (starting from software version V 2.2)

Used at the factory during the machine testing phase, it can not be used by the final user.

16. MOTOR INTERFACE (starting from software version V 2.3)

Used to identify the machines with motor-driven axis displacement; parameters are factory set, cannot be changed by the final user and are not available for Sethy-version machines..

17. VACUUM TOOL CLAMPING (starting from software version V 2.6)

Indicates the type of tool clamping; parameters are factory set and cannot be changed by the final user.

18. MOTOR TOOL CLAMP (starting from software version V 3.1)

Utilized to identify machines with Motorized Clamping System; the value is set by the manufacturer, it is not possible to modify it and it's not available on Ankh machines.

12.3 SOFTWARE STOP LAYOUT

Even if it is not one of the set dates in the pages referring to the machine parameters, it is anyway a characteristic data for every machine and it must consequently be set on the basis of its effective performances.

The software stops define the positions at the end of the axis runs, beyond which the rapid adjustments are inhibited due to the mechanical limit closeness.

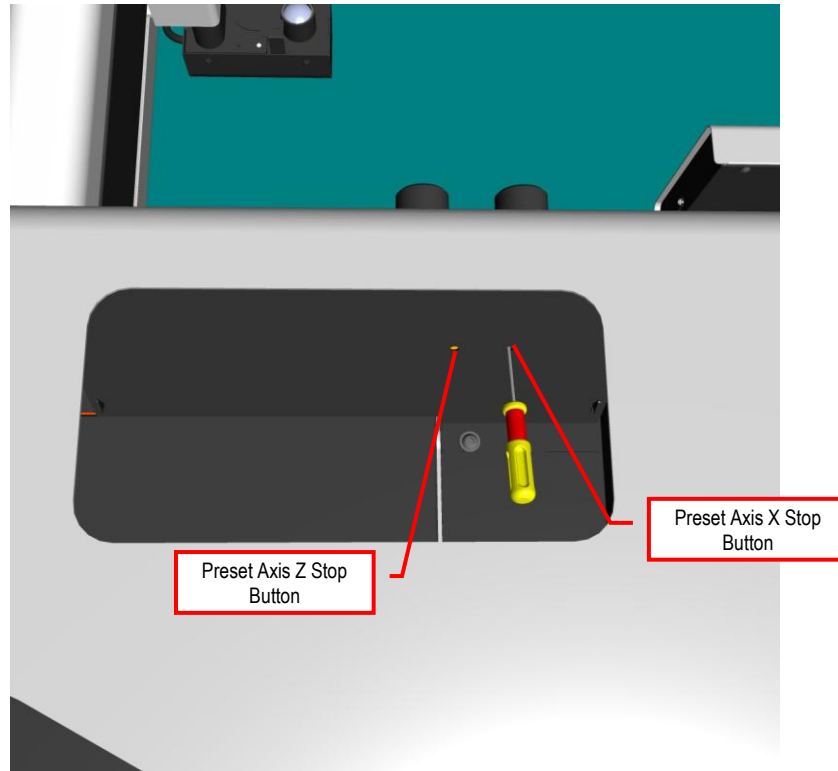
In order to take advantage of the hole working run, it is possible to use the micrometrical adjustments that allow arrival till the mechanical limit that is where the motor begins to work as electromagnetic clutch avoiding any kind of harmful stress to the sliding parts.

The same protection also works when, turning on the machine, the stops are deactivated due to the fact they have no references (zero points/crosses) and consequently it is possible to reach the mechanical limit run by rapid adjustment.

In order to avoid the clutch intervention, the stops will start their action as soon as the zero points will be recognized.

The software stops are prefixed; consequently in normal conditions no user intervention is required; but in the case of needing to limit the machine run or after some maintenance interventions with the components substitution, a newset up would be necessary.

To set up the software stops position it is necessary to have reached the reference points, then position the axis on a new stop (normally at about 1 mm from the mechanical limit), finally press the setup button of the required axis, entering for instance an hexagonal key in the hole placed on the lower side of the control panel corresponding to the micrometrical wheel. (see picture)



In case the stop starts before having reached the desired point, it is possible to keep pressing the button to exclude and move the axis rapidly.

Once the desired position has been reached, it is sufficient to release the button in order to set the new stop.

☒ *The software axis stops are respectively one positive and one negative in relation to the Point Zero Position taken as reference.*

13. MAINTENANCE

13.1 ROUTINE MAINTENANCE

The presetter does not need any specific maintenance, however we suggest the following maintenance.

13.1.1 SPINDLES, ADAPTERS, RESETTING GAUGES LUBRICATION

To maintain perfect efficiency and to grant long term precision it is wise to clean and lubricate these basic preset parts at every substitution and before replacing them in a proper place.

Concerning the spindle, which is often alone and is always positioned on the preset, it is necessary to clean only the rectified visible parts; at least at the end of the working shift, in order to preserve them from oxidation.

For every lubricating operation we suggest you use special antioxidant products, such as the Chesterton 775 or something similar.

13.1.2 CONTROL PANEL CLEANING 706

As for the control panel cleaning 706 it is recommended to make use of a clean cloth, dampened with proper degreasers (do not make use of abrasive products and solvents).

13.1.3 CLEANING 506V

Like the panel, even 506V must be cleaned with a clean cloth and a suitable degreaser (no solvents or abrasive products). For the optical parts (lenses and light) it is recommended to use antistatic cloth, eventually dampening the surface with spray or detergent liquids that are safe for optical lenses..

13.1.4 COMPRESSED AIR FILTERS CLEANING AND VACUUM CLAMPING ASPIRATION

Check periodically the pneumatic system filter placed on the back of the preset and corresponding to the compressed air connection tube (see Par. 6.5 Figure) and, when required, operate the valve in order to blow off any condensation, which could be formed in the transparent cap. When it is necessary to clean the filter, disconnect the pneumatic feed and unscrew the transparent cap; then, by using gasoline or another kind of solvent, disassemble and clean the filtering piece. Dry it by compressed air blowing, before reallocating it in its seat..

14. TROUBLE SHOOTING

14.1 FOREWORD

This chapter is dedicated to solving the most common problems that arise during the use of the tool presetter. Each problem is associated with a series of checks to be carried out and corrective actions. The list obviously cannot contain all possible problems and their solutions; if necessary, consult your local distributor.

14.2 PROBLEMS, CAUSES AND SOLUTIONS

PROBLEM: the tool presetter does not switch on.

CAUSE: *general power supply failure.*

SOLUTION: check the connection with the external power supply circuit;
check any external switches and/or fuses and, if damaged, replace them

CAUSE: *Tool presetter power supply failure.*

SOLUTION: check the power cord connection on the back panel of the presetter (see installation 6.5);
Check the feeder working measuring if there is the 24 Volt voltage exit; repeat the test when the presetter is linked. If in this case too the voltage is of 24Vol, please contact for Assistance..

PROBLEM: Axes don't respond to the displacement movement

CAUSE: *emergency button pressed*

SOLUTION: release the emergency button rotating it counterclockwise.

CAUSE: *wrong software stops*

SOLUTION: switch off the preset disconnecting the feeding plug from the back panel; wait for some seconds and switch on the preset reinsert the feeding-plug. If the axes start to move, execute a new software stops setting procedure. stops setting. (vedi par. 12.3).

CAUSE: *control panel keyboard broken down*

SOLUTION: check the movements by the use of the micrometrics control: if this results normal please contact the Technical Assistance for component substitution

PROBLEM: One or more axes don't execute the complete run or they stop

CAUSE: *badly set out software stops*

SOLUTION: repeat the software stops setting. Procedure par. 12.3

PROBLEM: Axis Z goes on in fits and starts while it is moving up

CAUSE: *broken counterweight spring*

SOLUTION: remove the column carter, check the counterweight spiral spring is broken and contact the Technical Assistance to substitute the piece. In case the defect doesn't depend on the spring, clean and lubricate the screw as explained in the following point.

PROBLEM: an axis stops and/or goes on in fits and starts

CAUSE: *broken measuring system*

SOLUTION: check the displacement calculation on the display if it doesn't count, contact the technical assistance for the piece substitution. Maybe it is possible to use the micrometrical adjustments in order to understand if the movement is correctly calculated.

CAUSE: *Lubrication missing on the screw feed*

SOLUTION: remove the protection carter of the interested axis, clean the screw eliminating the dirtiness accumulation by the use of a sodden solvent cotton cloth; then lubricate the length of the screw using a sliding oil such as Magna 68's Castrol or equivalent. Move up and down the axis many times along the run till the defect disappears and in order to get an homogeneous lubrication.

PROBLEM: the index key doesn't work

CAUSE: *Lack of pneumatic feeding or too low a pressure.*

SOLUTION: Supply the preset with compressed air 5÷6 BAR.

CAUSE: *Solenoid or electronic valve damaged.*

SOLUTION: Verify the functioning of the pilot lamp of the tool lock/unlock button, and contact the technical service assistance for the component replacement.

PROBLEM: Axes calculation is incorrect but produces repeated measurements

CAUSE: *The linear compensation machine parameter is wrong*

SOLUTION: Contact technical service assistance

PROBLEM: Calculation is incorrect and the measurements are not repetitive

CAUSE: *Due to an impact, the 506V fixed reticle is no more parallel to the axis of the machine.*

SOLUTION: see next problem

CAUSE: *Detection system or electronic equipment 706 damaged*

SOLUTION: see next problem

PROBLEM: Axes counting does not take place.

CAUSE: *Detection system or electronic equipment 706 damaged*

SOLUTION: If the defect affects both the axis, the trouble is likely to concern the electronic equipment 706; otherwise, the failure is due to the measurement system or to the cables. Contact the technical service assistance for the component replacement.

CAUSE: *Owing to a lack of feeding during data storage, memory content may alter.*

SOLUTION: see next problem

PROBLEM: How to update the software of digital read-out

CAUSE: *Installation of new options and/or updated functions*

SOLUTION: For the operation it is necessary to have a personal computer to be connected to the COM1 door of 706 digital read-out.

Download from Internet www.elbocontrolli.it the necessary software for updating, following the site's instructions; connect PC to presetter and follow the instructions, which will appear on screen.

PROBLEM: 506V doesn't switch on

CAUSE: *electronics in stand -by*

SOLUTION: press any 706 key

PROBLEM: The autocollimation gives different measurements on different points of screen.

CAUSE: *Uncorrect calibration.*

SOLUTION: check the calibration parameter and contact the technical assistance.

CAUSE: *506V fixed reticle is not parallel to the axis of the preset.*

SOLUZIONE: see the following point.

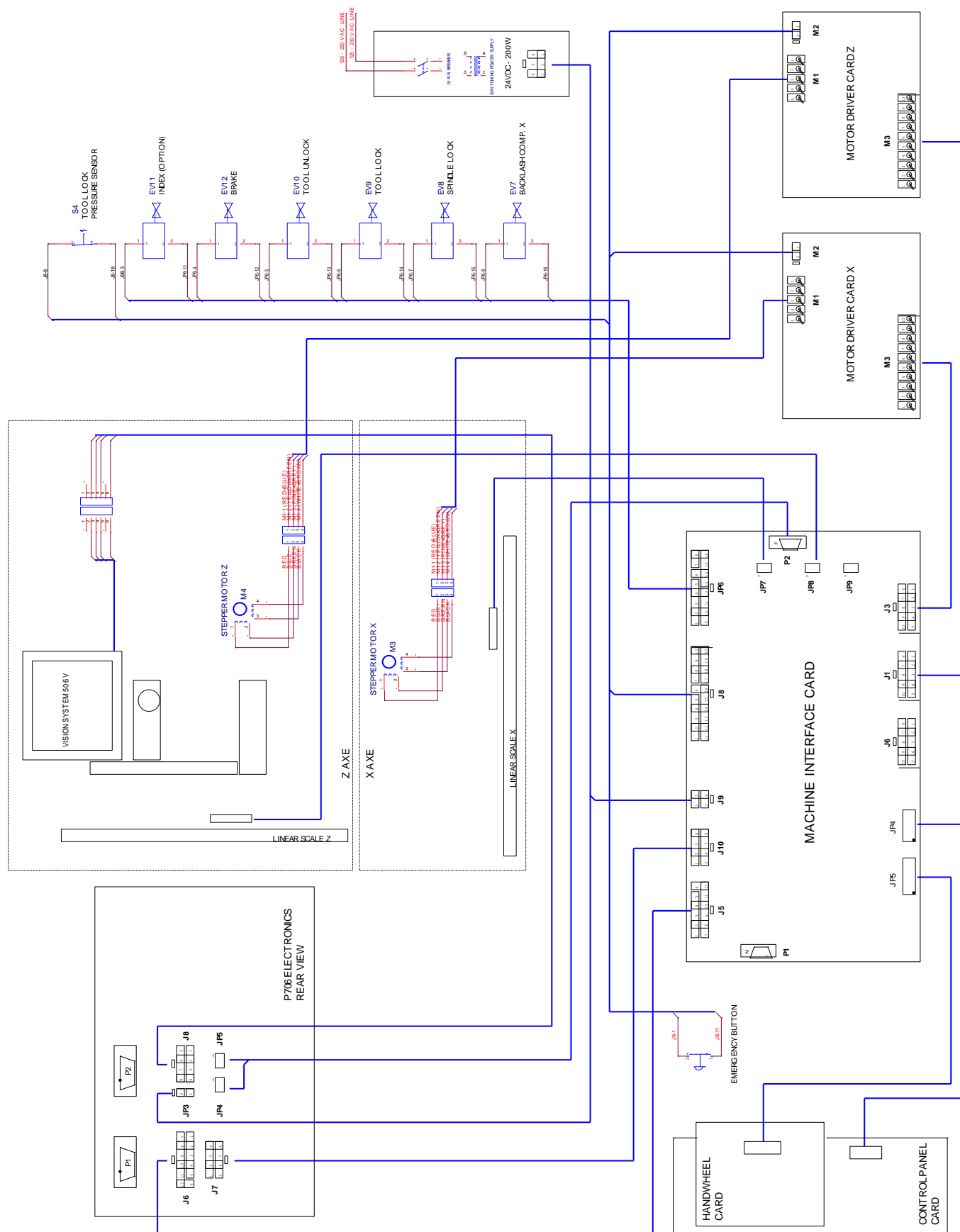
PROBLEM: 506V fixed grid is not parallel to preset axes and/or the image's focus is not at the point of maximum tangency of tool.

CAUSE: *Possibly the 506V was jarred, thus moving the 506V out of position.*

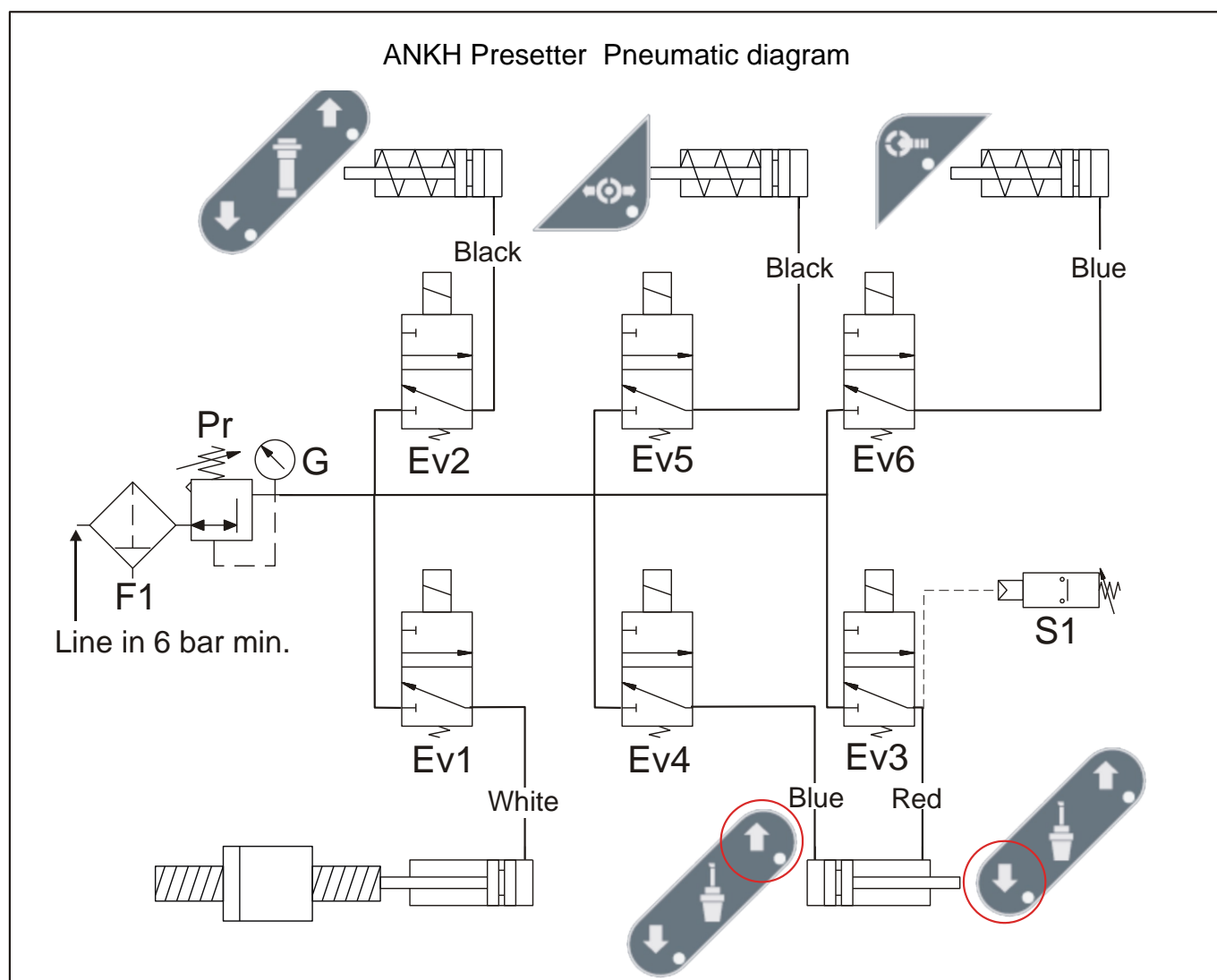
SOLUTION: Verify the mechanical integrity of the support and the fixing of all the optical components, then contact the technical assistance service

15. DIAGRAM

15.1 ELETTRICAL DIAGRAM



15.2 PNEUMATIC DIAGRAM



EV1: Micrometrical

EV2 : Spindle change

EV3 : Tool holder clamping

EV4 : Tool holder release

EV5 : Spindle brake

EV6 : Spindle index

F1: Main air filter

Pr: Pressure regulator

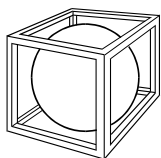
G : Pressure gauge

S1 : Pressure sensor (Pressure switch)

The information and specifications contained in this manual are subject to change without prior notice.

No part of this manual may be reproduced, in any way or form, without the written consent of

ELBO CONTROLLI s.r.l.
Via S Giorgio, 21
20036 Meda (MI) ITALY



January 2008
May 2010 - Rev 1.2



www.hod-industrial.hu

HÓD Industrial Solutions Kft.

tel: +36 23 920 940, +36 23 920 941

fax: +36 23 920 945

e-mail: info@hod-industrial.hu

