

OPERATION MANUAL



Producent / Producer / Производитель

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BUSBAR PROCESSING STATION SH800PLC (GOLD / PLATINUM)

#VSH800PLC240913

**Thank you for buying our product.
Before using this equipment, please carefully read user and maintenance
manuals.**

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* ERKO has the right to introduce construction modifications due to equipment modernization.



ISO 9001
ISO 14001



Before using this equipment, please read user and safety manuals.

The equipment can be used only with Al and Cu rails.

1. BASIC INFORMATION

1.1 TECHNICAL DESCRIPTION

SH800PLC is a busbar processing station with electronic measurement of the angle and the distance from the edge of the hole and front busbar rails, equipped with a touch panel.

Basic traits to ensure efficient and accurate work are:

- Possibility to drive the bending angle in the range of 0-90° (bending accuracy1°).
- Built-in measurement bar for positioning of the rail being processed within an accuracy 0,1mm.
- Precise regulation of the height of the hole cutting head (accuracy of↑0,1mm, ↓0,2mm).
- Making round and oval holes without burrs.
- Rail cutting without distortion or burr with measurement bar for positioning within an accuracy of 0.1 mm.
- Process control using the footswitch, in the case of the cutter using the manual switch (footswitch is inactive).
- Built-in reliable hydraulic drive.

1.2 PURPOSE

The SH 800PLC machine can be used for cutting, hole punching, bending, offsetting, inserting nuts in copper and aluminum rails with sizes up to 12x125mm. Additional external output completed by coupling hydraulic supplies power to other operating heads / tools manufactured by the company ERKO.

1.3 TECHNICAL DATA

Station weight (PLATINUM version)	390kg
Max dimensions L x W x H	1400 x 850 x 1420
Max table dimensions	2030 x 715
Working pressure	630 bar
Working pressure on the head outlet	630 bar
Power supply	3x400/230 V 50 Hz, 1,4kW
Control	24V DC
Plug supply	16A 400V 3P N+E IP44(PCE

	015-6v)
Protection degree	IP40
Busway machining (Cu, Al) (thickness X width)	12 x 125 mm
Bending range	0+90°
Work temperature	5+40°C

1.4 ACCESSORIES

Standard accessories:

Standard versions of the SH800PLC station		SH800PLC-GOLD SH_800PLC2-3F	SH800PLC-PLATINUM SH_800PLC3-3F
Accessories	Code		
An insert for precise bending (built-in encoder)	SH 401PLC-E	+	+
Rail cutter	SH 405	+	+
Cut rail length gauge	SH 415PLC	o	+
Rail offsetting insert	SH 406PLC	+	+
Additional side tabletop	SH 408PLC	o	+
Extended length measurement (range from 0 to 1020)	SH 418PLC	o	+
Round hole cutter (dimensions as per catalogue)	SH 403	o	o
Oval hole blanking die (dimensions as per catalogue)	SH 404	o	o
Rectangular hole blanking die (dimensions chosen by the customer)	SH 409	o	o
Insert for forcing in nuts	SH 407	o	o
Additional busbar support	SH 408	o	o

+ standard accessories

o additional accessories ordered individually by a customer

Tools supported by external output:

Full range of tools supported by SH800PLC is included in ERKO catalog. Catalog available on the website: www.erko.pl

Most customers choose the tools to work with the output of the external position for SH800PLC:	
GU 120	Head for clamping dies on cables 10 – 120 mm ² , reforming sector conductors
GU 300	Head for clamping dies on cables 10 – 300 mm ² , reforming sector conductors



GO 300	Head for clamping dies on cables 6 – 300 mm ² , reforming sector conductors
GU 625	Head for clamping terminals on cables 300 – 625 mm ²
GW	Head for punching holes in switching cabinets
GC 50N	Head for cutting cable conductors
GC 100	Head for cutting cable conductors
GL 6	Assembly rail cutter
GLP	Assembly rail cutter
HSK 5010	Bender for axial bending (propeller like) Al and Cu busbars
HGP 5010	Bender for lateral bending AL and Cu busbars
HSE 100	Flexible busbar processing station
GZ 300	Head for clamping dies on cables 6 – 300 mm ² , reforming sector conductors

2. MAINTENANCE AND OPERATION RECOMMENDATION

2.1 MACHINE INSTALLATION

- The station should be positioned on hard and even foundation, so that it will securely lean on all four wheels. **Operation of the station on an unadapted foundation may result in accelerated wear and in some cases can be a cause of a defect or destruction of the station.**
- Block the brakes of the station wheels.
- Connect the equipment to the electrical power supply. Network parameters should comply with the applicable standards.

In order to work properly, station type SH800PLC requires five-line electrical network - L1, L2, L3, N, PE in any sequence of phases. When connecting the station phase sequence is not important. For four-line network it is necessary to bridge PE and N lines in the supply socket.

2.2 BASIC FUNCTIONS

2.2.1 ARRANGEMENT OF ACTUATORS AND CONTROL

- Q1 Switch used for starting the station.
- Q2 Emergency stop switch.
- Q3 Foot switch acts as an operational switch-key.
- Q4 The button acts as a switch operating the guillotine.
- Q5 Switch „RESET” serves as a test of the safety system.
- L1 A white signaling lamp used for signaling correct power supply.
- LCD panel with a touch screen allows to operate the device.
- S1 Body height regulating crank.
- S2 Bumper ruler for measurement of the processed rail length.
- G1 Socket JACK 6,3 is used for external interfacing.

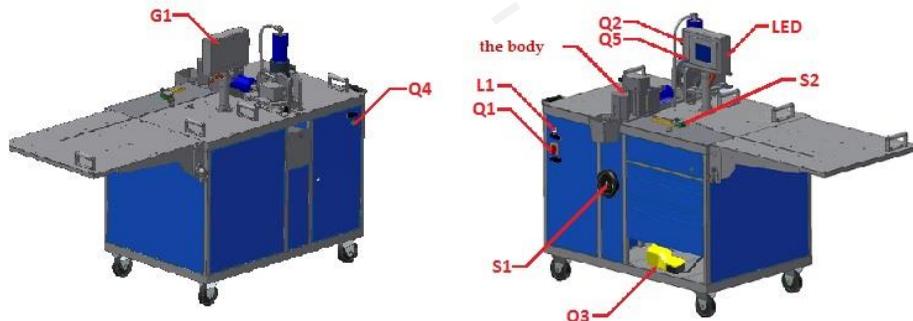


Fig.1

2.2.2 STARTING THE UNIT AND LOGGING OPERATOR FOR WORK

NOTE: Graphic operation panel is subject to change, depending on the version of the software.

In order to start the station, switch on the main switch Q1 to position I. Switching Q1 will start charging software and device testing. Then a screen (Fig. 2) will appear on the panel screen, once it's been touched logging screen (Fig. 3) will appear. In order to log in please touch white box with stars. After pressing the box the numeric keypad will come up (Fig. 4), write down operational password and press ENTER. If you enter wrong password error window will appear (Fig. 5). In such situation, once the message disappears, press on the operator field with stars one more time (Fig. 3) and enter the correct password confirming it by pressing "ENTER". After a successful login, you will see a message about the need to control safety system through the "RESET" (Fig. 6). After pressing the "RESET" the station ready for operation.

PROGRAMMING OPERATIONAL CODE:

Set default password for the operator not subject to modification: 159,

Set default password to reset the position of the measuring system not subject to modification: 1231.



Fig.2



Fig.3



Fig.4



Fig.5



Fig.6

In the case of other error or lack of the above mentioned messages, turn off the main switch Q1 position, wait about 15 seconds and start again the station. If this does not give the desired effect, contact your service provider.

2.2.3 CHANGING THE LANGUAGE OF INTERFACE

To change the user interface language:

- turn on the power for the station
- log in according to point 2.2.2.
- press the button „MENU” located in the upper left corner of the panel (Fig. 7) (button „MENU” is available in each window)
- press the button „LANGUAGE” (Fig. 8)
- select the language by touching appropriate flag on the screen (Fig. 9)



Fig. 7

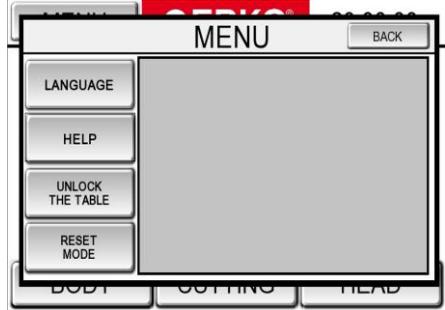


Fig. 8



Fig.9

2.3 FUNCTION TYPES

The basic functions available in the station SH800PLC are:

- Body** –launches a feature that allows the execution of the bending operation, weaning, punching and pressing nuts in the rails.
- Cutting** –launches a feature that allows the execution of the cutting rails.
- Head** –launches a feature that enables the power supply via external hydraulic line heads.



Fig. 10

2.3.1 BODY FUNCTION

After pressing the button „**BODY**” the window on the control panel will come up aligned with the currently installed hardware. The views of individual windows shown in figures represent drawings:

- Fig. 11 shows the menu for punching and pressing nuts (this is also the default display window when there is no equipment installed)
- Fig. 12 shows the menu for bending rails
- Fig. 13 shows the menu for offsetting

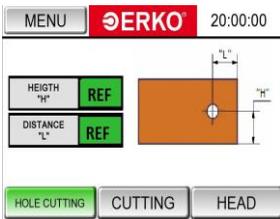


Fig. 11

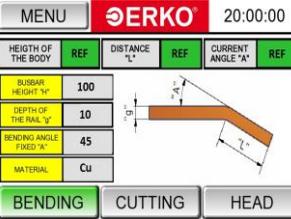


Fig. 12

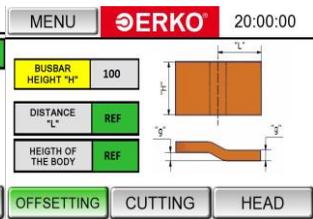


Fig. 13

Depending on the displayed window, it is necessary to find points of reference linear encoders. Implementation of the above mentioned steps signals the change in green fields with the inscription REF into numerical values, which indicate the current ruler.

Finding reference points:

HEIGHT OF THE RAIL „H” – REF – to find a reference point turn the knob S1 downwards and / or upwards. The operation should be completed when you see the red arrow pointing up or down, or the word "OK" on a green background (Fig. 14-16).

DISTANCE „L” – REF – to find a reference point of the ruler, move the slider bumper S2 from the body to the end of the table. The operation should be completed by the emerge of numerical values of the current position of the ruler (Figure 14-16)

CURRENT ANGLE „A” – REF – to find a reference point of encoder, bend lever angle measurement, the liner must be connected to the assembly socket. The operation should be completed by the appearance of the angle. (Fig. 15)

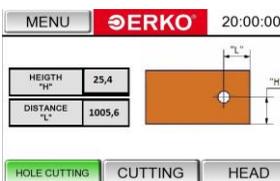


Fig. 14

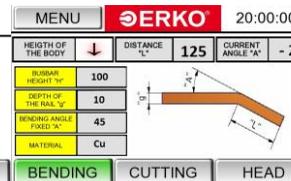


Fig. 15

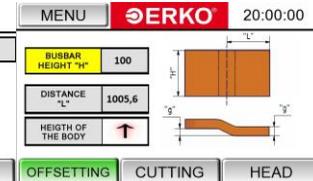


Fig. 16

After completing all the actions the station is fully ready to work.

Note: If you use only the feature HEAD search reference point is not necessary.

2.3.1.1 HOLE PUNCHING FUNCTION

After going to the function "BODY", in the case where there is no equipment in the body, punching function is the default function. For proper execution of drilling operation straight positioning of the body and ruler is required in accordance with the requirements of the operator.

- a) **To adjust the distance between the hole center and the rail edge.**
Adjustment of the distance from the bottom center of the hole edge of the rail is carried out by turning S1 (Fig. 1). H field displays the current position of the body.
- b) **To adjust the distance between the hole center and the right rail edge.**
By using the slider S2 there is a possibility to set the center of the hole distance from the right edge of the rail. Move the slider to stop and lock the S2 to the desired distance. The offset value is displayed in the L.

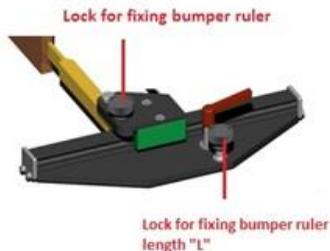


Fig. 17

A sample view of the panel after the above steps is shown in Fig. 14

2.3.1.2 BENDING FUNCTION

In order to enable bending function, go to the menu "BODY", then equip the body with stamp and measuring pad. After installing the stamp the panel will display a window where you will need to define reference points of Encoder (Fig. 12). Follow the procedure set out in section 2.3.1

For the proper implementation of the bending operation positioning of the body, ruler and other parameters in accordance with the requirements of the operator are required.

- a) **To enter the rail width.**
In order to determine the bar width you should enter the editing of values by pressing the button located next to the yellow box called "HEIGHT BAR" H "" (the default value displayed is the dimension that was used



during the last bend). Using the displayed numeric keypad, enter a width of the bent rail. Confirm editing by pressing the button "ENTER" (Fig. 18-19).



Fig. 18

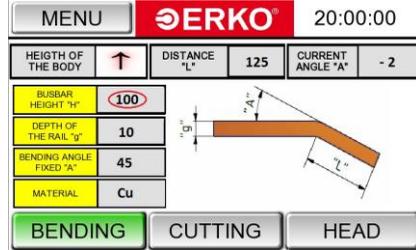


Fig. 19

b) To enter the thickness of the rail.

In order to determine the thickness of the rail you must enter the editing of the values by pressing the button located next to the yellow box called "RAIL THICKNESS "g"" (the default value displayed is the dimension that was used during the last bend). Using the displayed numeric keypad, enter the value for the thickness of the curved rails, then confirm by pressing the button "ENTER" (Figure 20-21).



Fig. 20

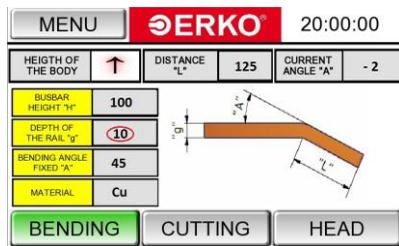


Fig. 21

c) To enter the desired bending angle.

In order to determine the bending angle you must enter the editing of the value by pressing the button located next to the yellow box called "ANGLE BENDING REFERENCE "A"" (the default value displayed is the dimension that was used during the last bend). Using the displayed numeric keypad, enter a value of the bending angle. Confirm editing by pressing the button "ENTER" (Figure 22-23).



Fig. 22

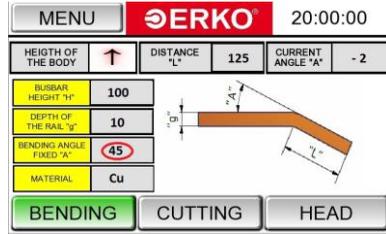


Fig. 23

d) Determination of the material being bent.

To change the type of material being bent, press the button next to the yellow box called "MATERIAL". Each button press changes the type of material between the AL (aluminum) and CU (copper). (Fig. 24-25)

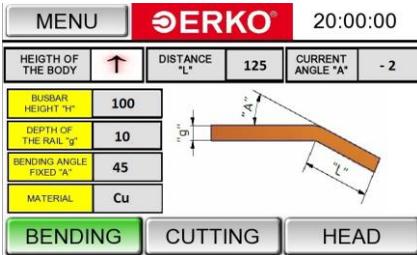


Fig. 24

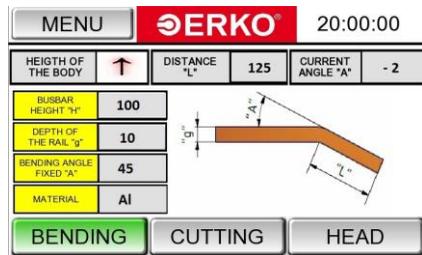


Fig. 25

e) To adjust the body height in relation to the rail.

After determining the width of the rail there is a need to set the height of the body, which is done by turning S1. **It is required for the width of the rail to coincide with the center of the bending punch.** The arrow in the field "BODY HEIGHT" (Fig. 26 and Fig. 27) indicates whether to raise or lower the body. The correct setting of the body is signaled by the change of the arrow symbol to the communicator "OK" (Fig. 28).

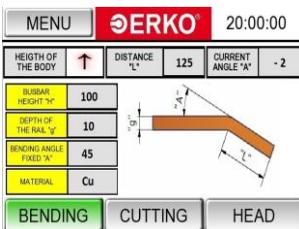


Fig. 26

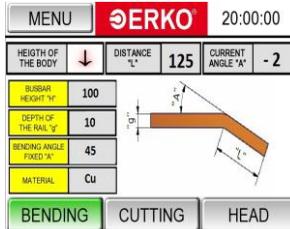


Fig. 27

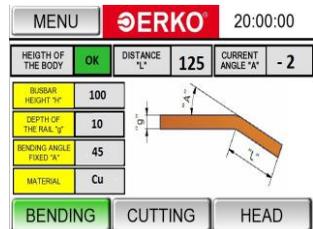


Fig. 28



f) Setting the bending center distance from the edge of the rail.

Use the slider S2 in order to be able to adjust the distance from the axis of bending to the right edge of the rail. Move the slider to stop and lock the S2 to the desired distance. The offset value is displayed in the field "L".

Note: Connecting and disconnecting the communication cable of the bending inserts (SH401PLC-E) is only allowed when the power of the station is in position off. If you need removing the measuring insert frequently, it must be placed in the set aside field (Fig.63) without disconnecting the communication cable. Supplied with the station the insert is calibrated with the program. If there is a need to replace insert the cartridge needs to be recalibrated. To do this, contact an authorized service center.

Supplied with the station, the insert is calibrated with the program. If there is a need to replace the insert, it needs to be recalibrated. To do this, contact an authorized service.

2.3.1.3 OFFSETTING FUNCTION

To enable offsetting function, go to the menu "BODY", then put the inserts into to the station. After installing the insert the front panel will display a window in which you will need to define reference points of the linear encoders. Follow the procedure in Section 2.3.1.

For the proper performance of the offsetting operation it is necessary to set the position of the station (depending on the height of the rail), linear encoders and offsetting values in accordance with the requirements of the operator.

- **Determination of the width of the rail.**

In order to determine the bar width please enter the editing of values by pressing the button located next to the yellow box called "HEIGHT BAR" H "" (the default value displayed is the dimension that was used during the last offsetting). Using the numeric keypad displayed, enter the width value of the rail being offset.

Please approve the editing by pressing the button „ENTER” (Rys. 29-30).

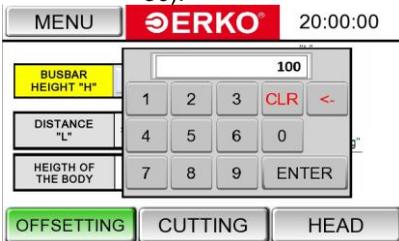


Fig. 29

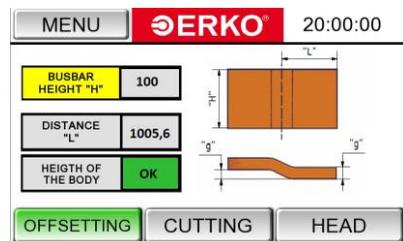


Fig. 30

- **Setting up the height of the station relatively to the rail.**

After determining the width of the track it is required to set the height of the body. Setting the height of the body relatively to the rail is carried out using the knob S1. **It is required that the width of the rail coincides with the center of the offsetting insert.** Arrow in the "BODY HEIGHT" (Fig. 31 and Fig. 32) indicates whether to raise or lower the station. The correct station setting is signaled by the conversion of the arrow symbol to the "OK" (Fig 33).



Fig. 31



Fig. 32



Fig. 33

- **Setting the offsetting from the right edge of the rail.**

With the use of the slider S2 it is possible to adjust the distance from the axis of the offsetting to the right edge of the rail. Move the slider to stop and lock the S2 to the desired distance. The offset value is displayed in the L.

2.3.2 CUTTING FUNCTION

To enable cutting function, press the button "CUT" in the main menu. Window appears in which you must define the reference point of encoder for the length of the rail being cut.

To find the reference point, set the bumper width bar located on the station (Fig. 34). Then put a rail on the rolls, between the bumpers on the guillotine station, center with the knob and lock the with the clamp located on one of the bumpers (rail should slide snugly over buffers) (Fig. 35).

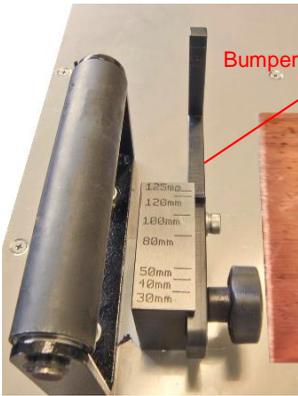


Fig. 34

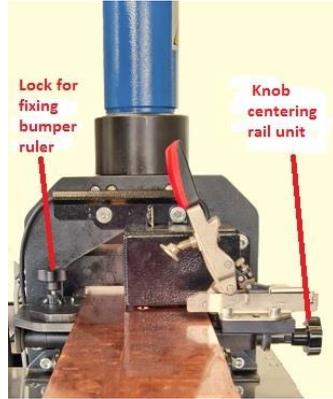


Fig. 35

Lock for fixing bumper width

Insert the rail into the roller encoder and move it until you replace the green window with "REF" on to the window of a numerical value. (Fig. 36-37)

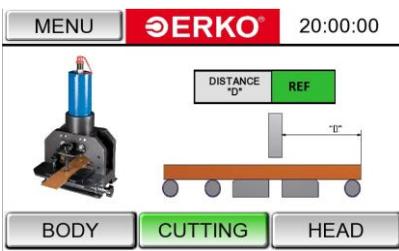


Fig. 36

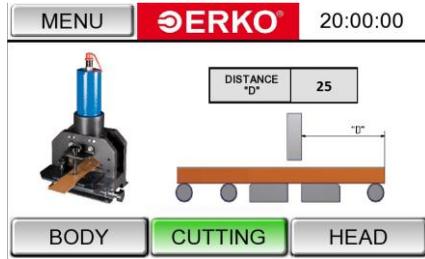


Fig. 37

2.3.3 NUTS INSERTING FUNCTION

The station has the possibility to supply external tools connected to the hydraulic line. Additionally, a plug socket jack 6.3 is installed for connecting an external tool to control the station in the operator panel case. In most cases it enables interruption of the cycles of external tools under certain conditions asked by the operator.

Switching on the function is enabled by selecting the option "HEAD" from the main menu. This option starts the control function of the hydraulic oil supply pressure of the hose coupling completed. Fig 38 shows the "HEAD" menu.

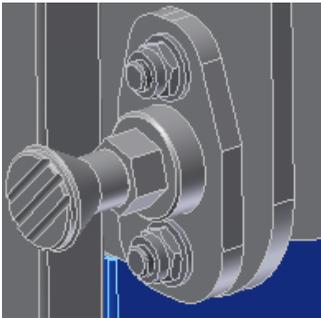


Rys. 38

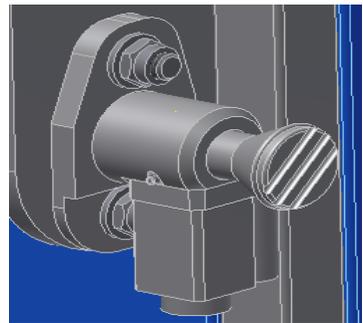
2.3.4 FOLDING AND UNFOLDING ADDITIONAL DESKTOP

In order to unfold the additional countertop the below should be performed:

- unlock the mechanical bolt (Fig.39). To do this, pull the handle portion of the bolt and rotate the latch 90°. In this position the bolt is protected.



Rys. 39



Rys. 40

- Press the "MENU" button in the upper left corner of the panel (the button "MENU" is available in each window)
- press the button "FOLDING TABLE TOP" on the operator panel (button slows top locking pin for 4 seconds. Fig. 40)
- pull electronic bolt, lift the top into working position and make sure that there was a securing of the countertop by electronic bolt
- lock the countertop by mechanical bolt in the reverse order of electronic locking. When locking you may need a slight elevation of the tabletop

In order to fold the countertop the below should be performed:

- fold extended ruler to the fundamental position (if any comes out),
- unlock the mechanical bolt (Fig.39). To do this, pull the handle portion of the bolt and rotate the latch 90° In this position the bolt is protected.



- press the "MENU" button in the upper left corner of the panel (the "MENU" button is available in each window)
- maintaining the tabletop press "FOLDING TABLE TOP" on the operator panel (button slows top locking pin for 4 seconds and is only active when the "extended ruler" is in the principal position)
- pull electronic bolt and lower the table to the rest position
- mechanical deadbolt lock top acting in the reverse order of locking.
- lock the countertop by mechanical bolt in the reverse order of electronic locking.

Note: The station has secure folding function, but absolutely do not try to fold the table top, if the "extended ruler" is not in the principal position. Doing so may damage the scale. The extra table top is available as an option in a series SH800PLC GOLD or PLATINUM SH800PLC standard series. Extended ruler is only available with extra table top.

2.3.5 HELP

SH800PLC is equipped with the feature "HELP". Thanks to it the user at any time can validate the work performed by each other preparatory and production activities to ensure correct operation. Help is based on the windows with the described slides.

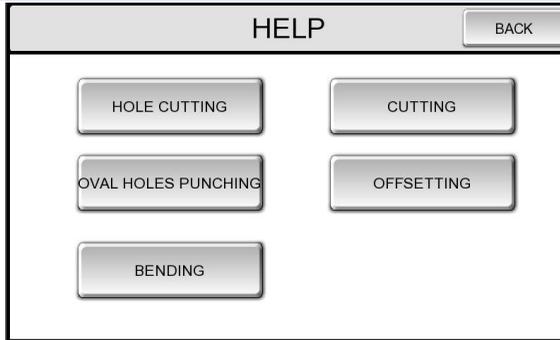
In order to use the feature the below should be performer:

- turn on the power of the station
- log on by point 2.2.2
- Press the "MENU" button in the upper left corner of the panel (the "MENU" is available at any time during operation)
- press the "HELP" button on the left side of the "MENU" control panel (Figure 41)



Rys. 41

- select the function of the station, which is concerning the topic of the support (Fig. 42)



Rys. 42

- in order to move to the next photo, press the "NEXT" button at the bottom of the screen (Slide 1)
- in order to return to the previous photo, press the "BACK" button in the lower left corner of the screen (Slide 2)
- in order to return to the "HELP" window, click on the "BACK" button in the lower right corner of the screen (Slide 3)

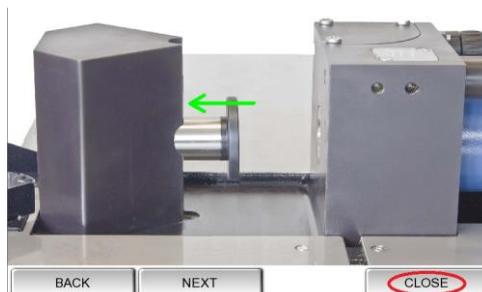
The instructions pattern using the example of hole punching:



Slajd 1



Slajd 2



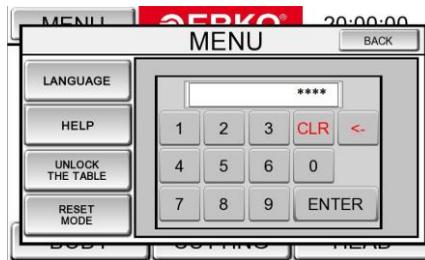
Slajd 3

2.3.6 RESETTING MEASURING SYSTEM

Resetting the system in order to calibrate the measuring elements of the station. Calibration can be subjected to various scales depending on the needs.

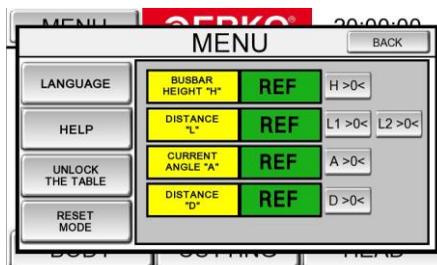
2.3.6.1 CALIBRATION OF THE LENGHT FOR THE BUSBAR BEING CUT (meter „RULER „D””)

- Prepare a rail with a length of at least 1500mm. Measure and mark the rail section with a length of 1000 mm.
- Start the station according to the section 2.2.2
- Proceed in accordance with section 2.3.2
- Press the "MENU" button in the upper left corner of the panel (the "MENU" panel is available at any time during operation)
- Press the "MODE RESET" button in the lower left corner of the front "MENU" panel
- The numeric keypad will appear (Figure 43) where you must enter the password to reset (reset password is 1231), then confirm with "ENTER" button.



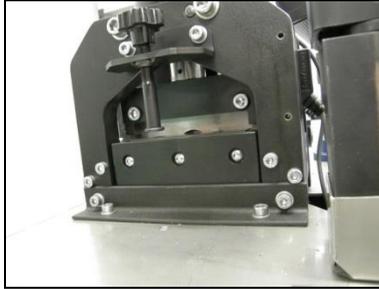
Rys. 43

- The device proceeds to resetting mode (Fig.44)



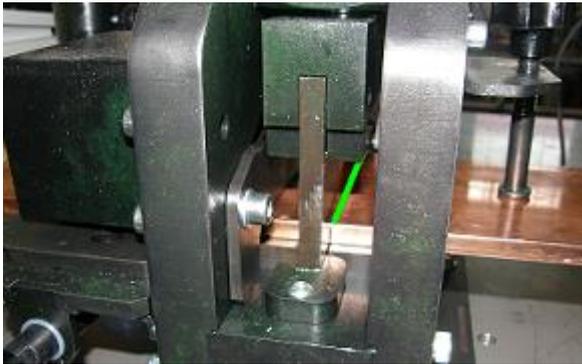
Rys. 44

- Press the Q4 button and wait until the moving blade stops in the lower position (Fig. 45).



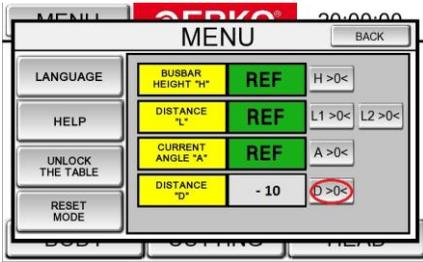
Rys. 45

- Slide the prepared in advance rail under the roll, then push it to the knife. The rail must have marked the length of 1 meter from the side of the knife.
- Release the footswitch and wait until the complete withdrawal of the knife to the upper position.
- Slide the 1000mm length rail (marked value on the rail should coincide with the edge of a knife from the end of the rail as shown (Fig. 46)



Rys. 46

- Hold the rail, so it doesn't move (handle is helpful– Fig. 48) and Press D button on the panel AT the height of counter D (Fig. 47).



Rys. 47



Rys. 48

- Check compatibility value of indications on the panel with physical length of the cutting rail. Therefore pull the rail to any value, lockup it by handle so rail will not displace and check the correctness of a measuring instrument indications. If the indications are overlap, calibration has been made correctly.

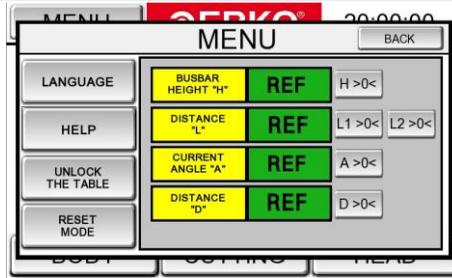
2.3.6.2 CALIBRATION OF THE INSERT FOR THE BENDING ANGLE MEASUREMENT (meter „CURRENT ANGLE „A””)

- Start the station according to the section 2.2.2
- Proceed in accordance with section 2.3.2
- Press the "MENU" button in the upper left corner of the panel (the "MENU" panel is available at any time during operation)
- Press the "MODE RESET" button in the lower left corner of the front "MENU" panel
- The numeric keypad will appear (Figure 43) where you must enter the password to reset (reset password is 1231), then confirm with "ENTER" button.



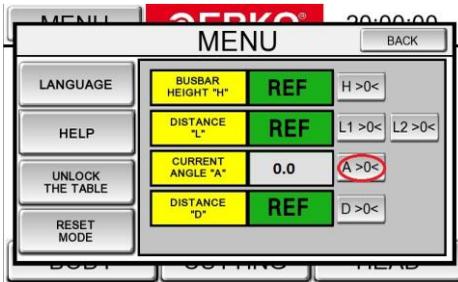
Rys. 43

- The device proceeds to resetting mode (Fig.44)

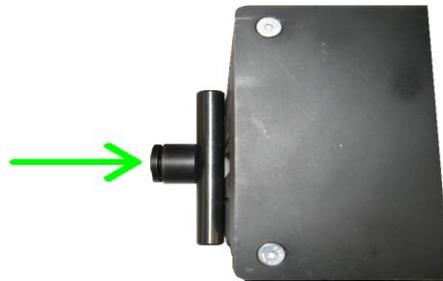


Rys. 44

- Using a flat element, set levers parallel to the measuring insert body (Figure 50) Hold the immobilized levers on the panel by pressing A button at the height of the meter A (Slide 49).



Rys. 49



Rys. 50

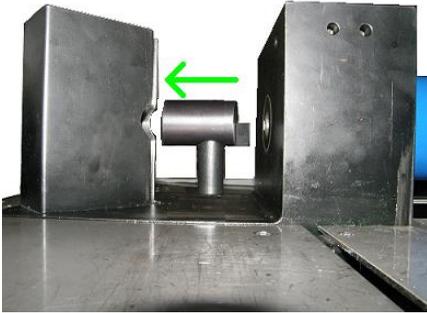
- After calibration and stand-off distance of a flat element from inserts, the value displayed on the panel assume negative value other than zero. This is caused by the preliminary voltage if the measuring lever.
- With the aim of verification correctness of calibration the measuring insert put against Flat element and check if indicated value on the panel is 0.

NOTE: In case of replacement of the bending insert, it must be parameterized with the software of station. In order to do so, you should contact with an authorized ERKO service

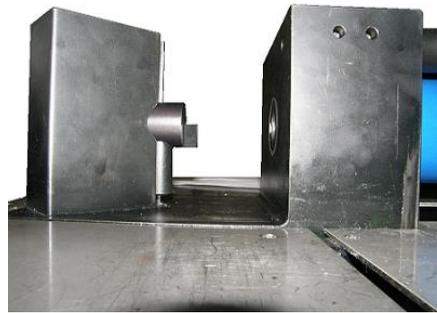
2.3.6.3 CALIBRATION OF THE LENGHT MEASUREMENT RULER (meter „LENGHT „L””)

Calibration of the lenght measurement ruler L1

- Start the station according to the section 2.2.2
- Proceed in accordance with section 2.3.1.1
- Arm the body with the insert to the calibration (Figure 51-52)

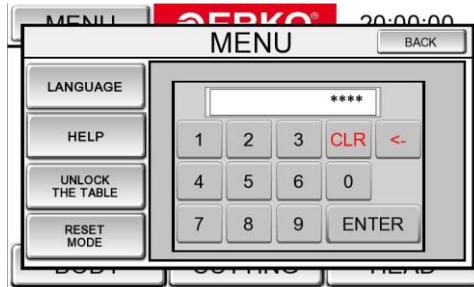


Rys. 51



Rys. 52

- Press the "MENU" button in the upper left corner of the panel (the "MENU" panel is available at any time during operation)
- Press the "MODE RESET" button in the lower left corner of the front "MENU" panel
- The numeric keypad will appear (Figure 43) where you must enter the password to reset (reset password is 1231), then confirm with "ENTER" button
-



Rys. 43

- The device proceeds to resetting mode (Fig.44)

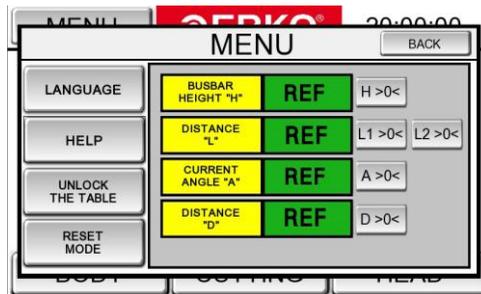


Fig. 44

- Push the measuring stop to the plane of calibration insert (Fig. 53). Hold the immobilized stop and press L1 on the panel located at the height of the window "DISTANCE "L" (Fig. 54)

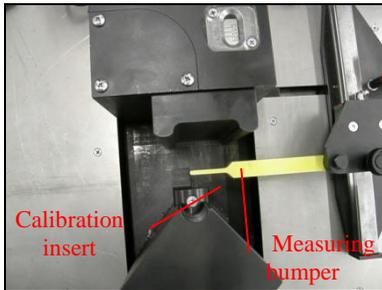


Fig. 53

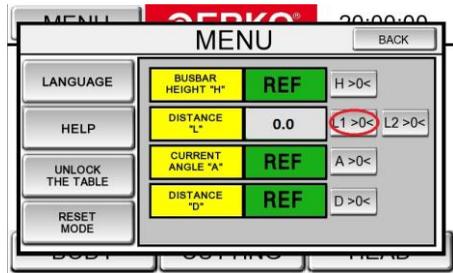


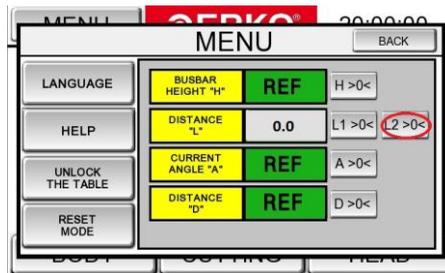
Fig. 54

- In order to check correctness of the calibration measurement ruler, press bumper to the plane of the calibration insert. Displayed value on the operator panel should be 0.

Calibration of the length measurement ruler 2 (for the Platinum and Gold version with additional busbar support and additional measurement ruler)

Before calibration measurement ruler L2 the station should be prepared as per below:

- Unfold additional tabletop side 2.3.4.
- Slide measurement ruler to feel resistance, then assertively push it to the tabletop that is unfold (the unlock of the moving measurement ruler should be noticeable).
- Move the ruler to the noticeable block (numerical value appears on the operator panel next to the window „DISTANCE „L”).
- Set up front of the bumper at distance of one meter from plane of the calibration insert and press L2 button at the height of the window "DISTANCE „L” (Fig. 55)

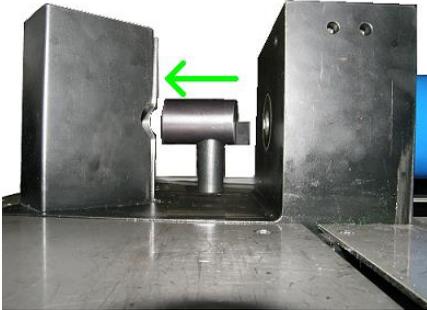


Rys. 55

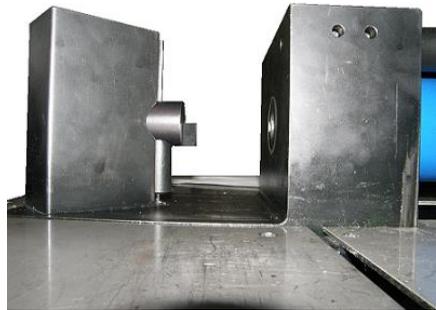
- In order to check correctness of the calibration measurement ruler, press bumper to the plane of the calibration insert. Displayed value on the operator panel should be 0.

2.3.6.4 CALIBRATION OF THE BODY HEIGHT (meter „RAIL HEIGHT„H”)

- Start the station according to the section 2.2.2
- Proceed In accordance with section 2.3.1.1
- Arm the body with the insert to the calibration (Fig. 51-52)



Rys. 51



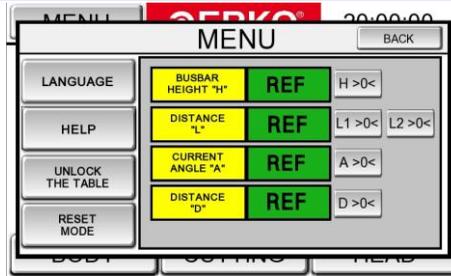
Rys. 52

- Press the "MENU" button in the upper left corner of the panel (the "MENU" panel is available at any time during operation)
- Press the "MODE RESET" button in the lower left corner of the front "MENU" panel
- The numeric keypad will appear (Figure 43) where you must enter the password to reset (reset password is 1231), then confirm with "ENTER" button



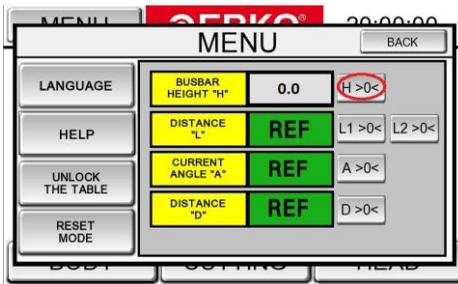
Rys. 43

- The device proceeds to resetting mode (Fig.44)



Rys. 44

- The body must be lowered by handwheel S2 in the position so that plane of calibration insert is below the table top of station.
- At the tabletop, above the plane of calibration insert place a flat element.
- Lift up the body by handwheel S1 until the plane of calibration insert is contact with flat element, set on the tabletop (Fig. 57), then press H button at the high of window "RAIL HEIGH „H" (Fig. 56)



Rys. 56



Rys. 57

2.4 TECHNOLOGY

2.4.1 HOLE PUNCHING

NOTE: During cutting holes in aluminum rails, there is a need to grease the Stamp with HHS 2000 oil. The lubricant is available for purchase at ERKO.

ROUND HOLES

- If the station has been just installed, follow steps according to the section 2.3.1
- Arm the station with the right die and insert and set up according to the section 2.3.1.1



- Insert the rail into the space between the die and stamp and slide the rail to the plane of die and head of S2 bumper.
- Press and hold the foot switch Q3 to start the punching cycle. After the operation piston rod returns to the initial position. To repeat the operation release the foot switch and press it again.
- Release the foot switch during the cycle can cause interruption of the operation and return movement of the piston rod to start position.

NOTE: Due to the specific control of the hydraulic system after termination of the process, the delay can be observed at the initiation of the next working cycle. The delay time is around 3 seconds.

OWAL AND SQUARE HOLES

- If the station has been just installed, follow the steps according to the section 2.3.1
- Arm the station with the right punch and insert, then set up according to the section 2.3.1.1
- Put the set up bolt according Fig. 58

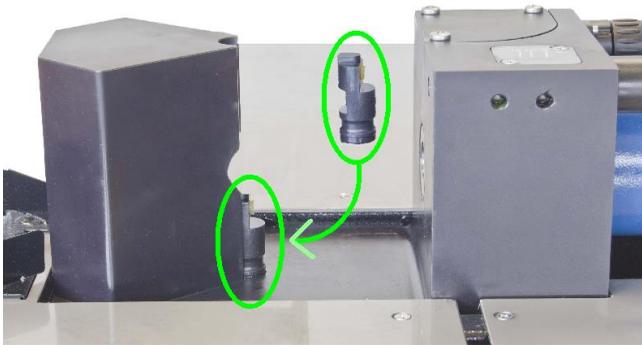


Fig. 58

- Install suitable dies matching the set up bolt (Fig. 59-60)

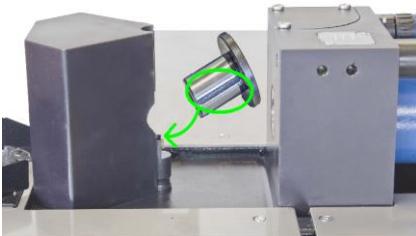


Fig. 59

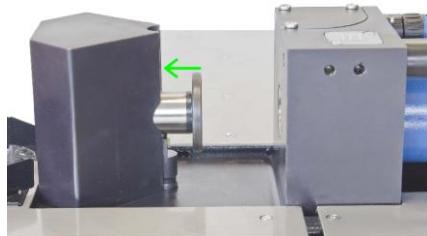


Fig. 60

- Install hole punching stamp to the body matching socket punch with seat in the piston rod (Fig. 61)

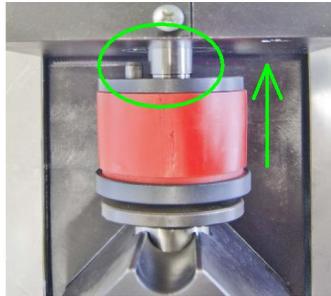


Fig. 61

- Insert the rail into the space between die and stamp. Slide rail to the plane of the die and front of S2 bumper.
- Press and hold the foot switch Q3 to start punching cycle. After the operation piston rod returns to the initial position. To repeat the operations release the foot switch and press it again.
- Release of the foot switch during the cycle causes interruption of the operation and return movement of the piston rod to the start position.

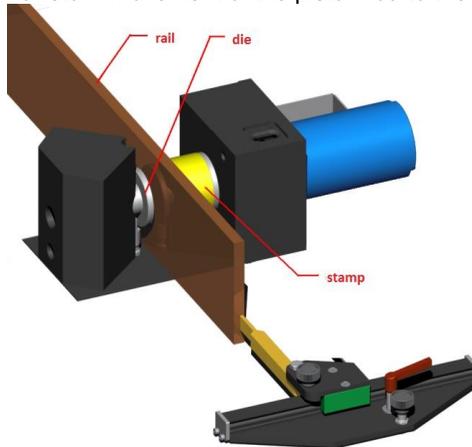


Fig. 62

NOTE: Due to the specific control of the hydraulic system after termination of the process, the delay can be observed at the initiation of the next working cycle. The delay time is around 3 seconds.

Typical sizes of hole punches

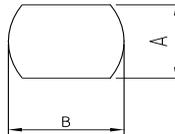
Round hole punches

Symbol	Diameter [mm]	For screw M
SH403 6,6	∅ 6,6	6
SH403 8,5	∅ 8,5	8
SH403 11	∅ 11	10
SH403 13	∅ 13	12
SH403 17	∅ 17	16
SH403 21	∅ 21	20

SH403 hole punches of any diameter in the range of ∅ 6,6 mm to the ∅ 21 mm are available on request

Oval hole punches

Symbol	Dimension A [mm]	Dimension B [mm]	For screw M
SH404 8,5-12	8,5	12	8
SH404 11-16	11	16	10
SH404 13-18	13	18	12
SH404 17-21	17	21	16



Other sizes of oval hole punches SH404 available on request, with the condition that $B/A < 2$. Minimum sizes of hole punches 8,5-12, and maximum must be described of the circle with a maximum diameter of 21 mm.

2.4.2 BENDING

- If the station has been just installed, follow the steps according to the section 2.3.2
- Arm the station with the right punch and insert, then set up according to the section 2.3.1.2
- Insert the rail into the space between the die and stamp and slide the rail to the plane of die and head of S2 bumper.
- Press and hold the foot switch Q3 to start the punching cycle. After the operation piston rod returns to the initial position. To repeat the operation release the foot switch and press it again.

- Release the foot switch during the cycle can cause interruption of the operation and return movement of the piston rod to start position.

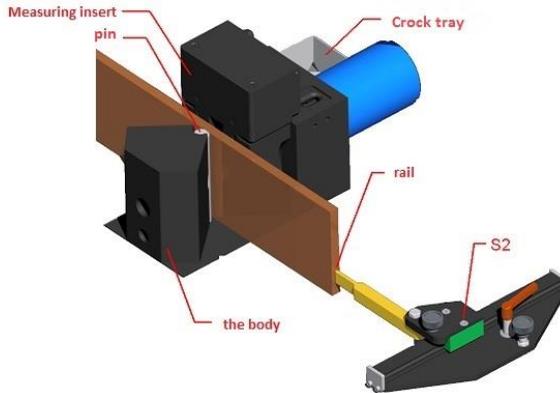


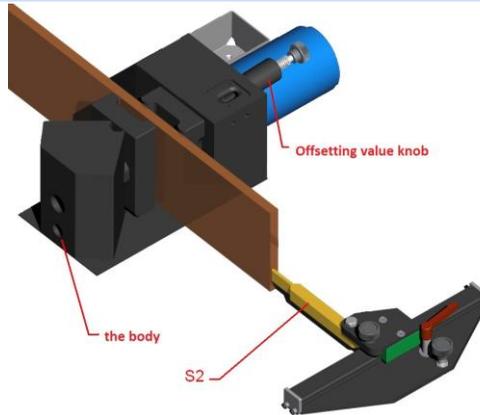
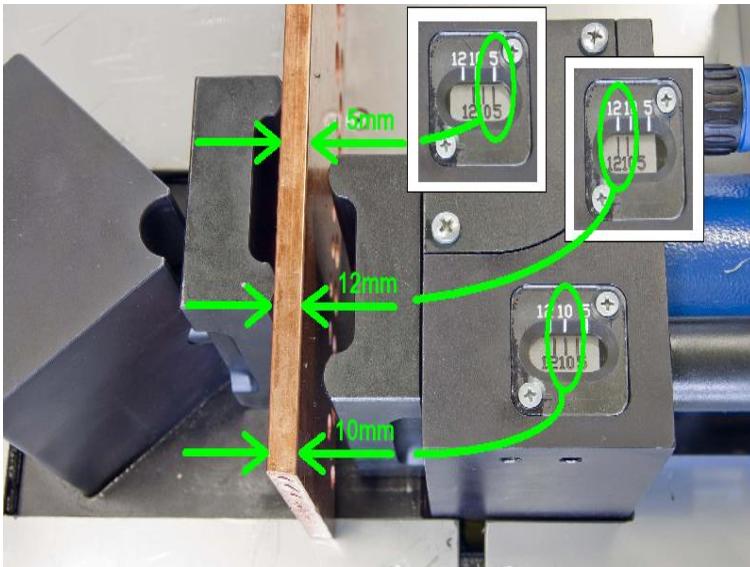
Fig. 63

NOTE: Due to the specific control of the hydraulic system after termination of the process, the delay can be observed at the initiation of the next working cycle. The delay time is around 3 seconds.

2.4.3 OFFSETTING

- If the station has been just installed, follow the steps according to the section 2.3.1
- Arm the station with the right punch and insert, then set up according to the section 2.3.1.3
- Set the offsetting value by using the knob (Fig. 64). Selected values can be seen in the window at the body (lines corresponding to the thicknesses of the rail should be in line – Fig. 65)
- Insert rail into the space between offsetting inserts and slide the rail to the insert from the operator side to the front of bumper.
- Press and hold the foot switch Q3 to start the punching cycle. After the operation piston rod returns to the initial position. To repeat the operation release the foot switch and press it again.
- Release the foot switch during the cycle can cause interruption of the operation and return movement of the piston rod to start position.

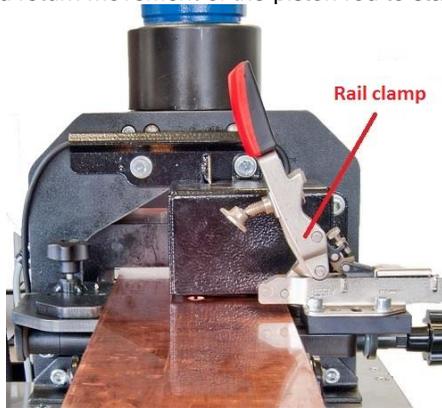
NOTE: Offsetting can only be done on the cylindrical parts of the insert, do not allow rails to lean against the flat part of the insert.

**Fig. 64****Fig. 65**

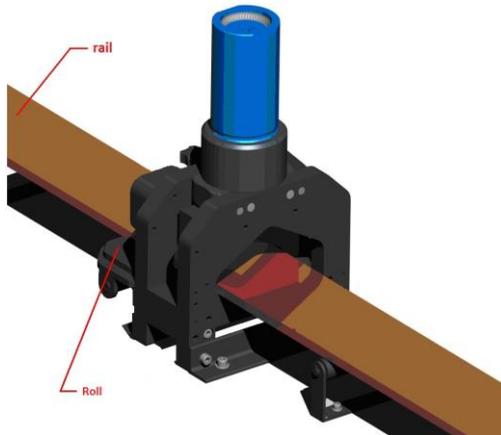
NOTE: Due to the specific control of the hydraulic system after termination of the process, the delay can be observed at the initiation of the next working cycle. The delay time is around 3 seconds.

2.4.4 CUTTING

- If the station has been just installed, follow section 2.2.2 and then follow section 2.3.2.
- Press the button Q4 and wait until movable knife stops in the lower position.
- Push the rail to the knife from the pressing side.
- Release the button Q4 (this will reset measuring system).
- Move the rail to the desired distance and lock with the clamp.
- Press and hold Q4 button to start the cutting.
- Release the foot switch during the cycle can cause interruption of the operation and return movement of the piston rod to start position.



Rys. 66



Rys. 67

2.4.5 WORK WITH EXTERNAL HEAD

- If the station has been just installed, follow the steps in the section 2.2.2.
- In the main menu press the button „HEAD”
- Connect the pressure conduit to the outer head.
- Press foot switch Q3 in order to start the cycle of the head.
- Release the foot switch to stop operation – working element of the head will automatically return to the start position.

NOTE: Do not remove the head during the work. The head and conduit should be disconnect after complete return of the working head element to the starting position. After disconnecting the head and conduit, put the cover on the quick coupling release.

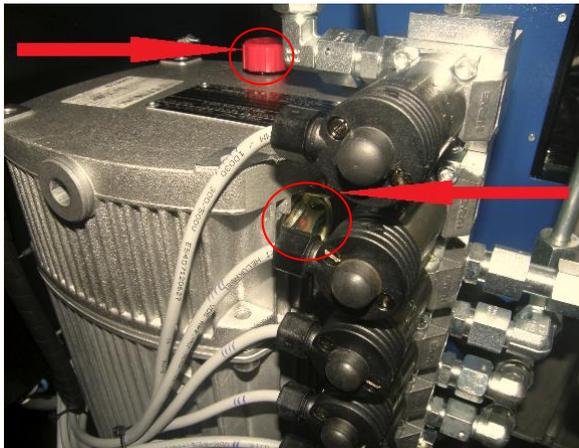
2.5 MAINTENANCE AND OPERATION RECOMENDATIONS

The station should be cleaned every day – this considerably affects its durability. Maintain order at the work place. This will limit mechanical damage. Drawers are used to store accessories of station. Drawers should not be overloaded (store heavy tools, rail sections, etc.)

Change oil should be done in terms mentioned on the section 2.6.4 by qualified personnel. Improper oil change may result in difficulties obtaining accuracy during bending.

Replenishing hydraulic oil should be done by the operator once needed. If there are no noticed leaks, control of oil level should be carried every 0,5 months. Correct oil level and filler plug on Fig. 68

Filler
plug



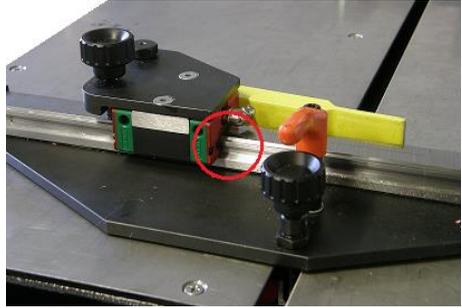
Correct
oil
level

Rys. 68

Lubrication of the station body lifting screw and linear guide trolleys acquired in the body, ruler length and the bumper. Lubricate with grease according to needs not less than once every six months. Lubrication points shown in Fig. 69 - 70.



Rys. 69



Rys. 70

Diagnostic of equipment malfunction

Problem	Cause	Solution
1. The power supply control lamp is not lit after the machine is switched on	a. No power supply. b. Absence of 1 phase c. Voltage drop to 175 V/phase	Check the source of power
2. The machine switches off during operation	a. Phase decay on the engine b. The engine fuse action c. Power decay	Check the source of power and engine fuse
3. Loud pump operation without servo-motor stickout	a. electrical valve defect	Contact the service
4. Loss of reference points	Permanent or temporary absence of communication between the encoders and the controller	Restart the station and look for them again Contact the service
5. Incorrect readings on the control panel	Disturbed communication between the executive elements and the control panel	Restart the station. Contact the service

2.6 HYDRAULIC UNIT

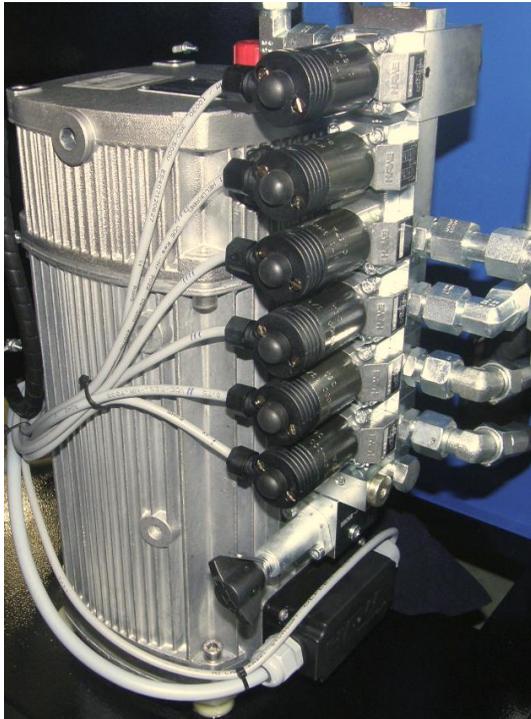
2.6.1 INTRODUCTION

Read the below TECHNICAL SPECIFICATION before starting the hydraulic generator. Only personnel trained for safety policy and familiar with the construction and operation principles are authorized to operate the generator.

2.6.2 TECHNICAL DATA

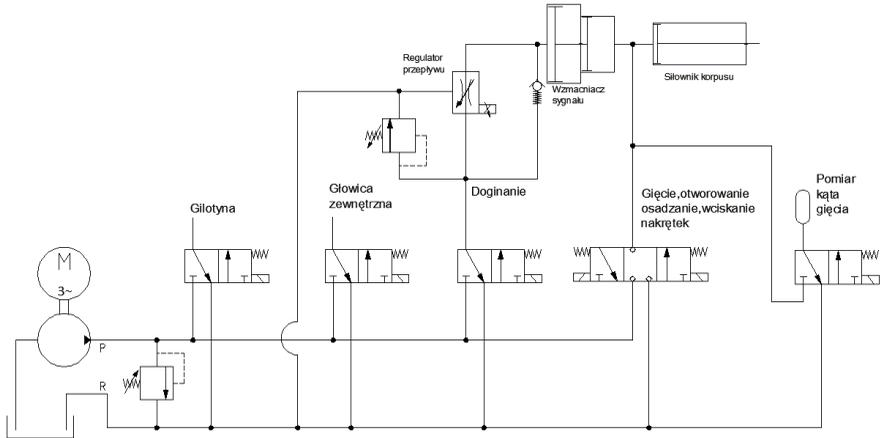
- supply voltage 3x230/400 V, 50 Hz
- power 1,1kW
- work type S3 40%
- maximum pressure 630 bar
- nominal capacity 1,33 l/min
- control 24 V DC
- working medium L-HM-22
- tank volume ok. 5 dm³

2.6.3 UNIT CONSTRUCTION



Rys. 71

Oil tank, hydraulic pump and electric motor are located inside the compact housing of feeder. Overflow and distribution valves are installed on the housing of the feeder. Oil level glass sight is located in the housing and the oil plug with venting is located on the top of feeder.



2.6.4 OPERATION AND MAINTENANCE

- Before starting work please check the oil level. Sight glass should be filled with oil up to half.
- After finishing work, switch off the electrical supply with the “Main switch” Q1 and disconnect the supply of the entire equipment.
- During maintenance work electrical power supply should be switched off and the hydraulic system should be unloaded.
- The supply generates high pressures. Any pressure leak may result in unexpected consequences. Take special precautions when operating the equipment.
- **Upon releasing the seals the operator loses the guarantee for the entire hydraulic system.**
- The maximum working pressure was set by the manufacturer at the overflow valve at 630 bar and is not subject to adjusting throughout the operation period (sealed).
- Particular attention should be paid to possible oil leaks. If any, remove them immediately.
- The oil should be changed every 12 months. Oils should be in conformity with DIN 51524 part 1 to 4, class HLP or ISO 6743/4 class HM, of the viscosity ISO VG 22,32. Hydrol® L-HM 22 is recommended.
- **Oils available at ERKO: package of 1dm³- order code OLEJ_HYDR_1, package of 5 dm³ – order code OLEJ_HYDR_5.**
- A tank cleanliness check, tank washing, oil change and hydraulic system inspections are recommended every 12 months by service personnel.
- Maintaining oil purity and periodical oil changes have a great effect on the durability of the hydraulic unit and considerably prolong their performance and reliability. Required oil purity: class 9 (recommended class 8) according to the NAS 1638 norm.
- Remove air from the pump after an oil refill. To do so, start up the pump with short cycles (2 sec.) until the equipment servomotor sticks out to the maximum position.



First, with no system load. Then, gradually increase the load until the maximum working pressure is obtained (oil overflows over the overflow valve) and the pump is working evenly and quietly. In the case of a power unit loud and uneven work and no power, the air removal operation should be repeated. Skipping this procedure will prevent obtaining proper working pressure level and in extreme situations will result in pump seizure.

- When operating the station, check the system tightness every day and regularly remove any leaks of oil and check its level in the tank.
- In the case of a power unit failure, switch off electrical power supply and contact your specialized service. Repairs within the guarantee period can only be carried out by the manufacturer or authorized representatives.
- Protect the equipment against the influence of weather factors, corrosion, contamination and mechanical damage.

From the first start of the station, after one year or when it reaches the number of working cycles established by the producer, the panel during each start will be displayed for 60 second with the message of necessary service control (Fig. 72). When message disappears, the station can be use.

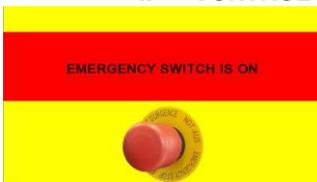


Rys. 72

NOTE: The station can only work at the temperatures specified by producer (according section 1.3). Working with other temperatures in extreme situations can cause damage of hydraulic power supply.

2.7 CONTROL MESSAGES

I. CONTROL MESSAGE „EMERGENCY SWITCH IS ON



This message informs, that Q2 button is switch on. To return to the menu, pull Q2 button out to basic position. Following that window with information about control of security system by the “RESET” button appears. After pressing “RESET” button station is ready for work.

II. CONTROL MESSAGE „HIGH OIL TEMPERATURE”



When this message displayed, stop the station immediately and wait until oil temperature decreases (this time may be different, depending on the environment temperature)

NOTE: In case of frequent appearance of this message please contact your service.

III. CONTROL MESSAGE „ERROR. POWER FAILURE”



When this message appears, switch off the station using the main Q1 button and check following:

- is the station plug properly connected
- is the main socket property connected to the network
- are network parameters consistent with the current standards

NOTE: Power requirements are described in section 1.3 and 2.1.

IV. CONTROL MESSAGE „ERROR. WRONG TOOL IN A BODY”



This message informs about incorrectly matched parts to the body (e.g. hole punching die with bending measuring insert). Replacing tools to the correct set cause return to work menu.

V. CONTROL MESSAGE ABOUT CALIBRATION



This message informs of the need for calibration of the measuring systems. Calibration is described in section 2.3.6.

VI. CONTROL MESSAGE „SET UP THE HEIGHT OF THE BODY”



This message informs of the need for changing the height of the body. In this case, use the knob S1 until the message disappears.



2.8 WORK SAFETY AND HYGIENE MANUAL

1. The SH800PLC can be operated by an employee who is of age, who has read the operation manual and has been trained in safety procedures for the station.
2. Proper positioning of the operating elements should be checked prior to starting the SH800PLC machining station.
3. The equipment can be operated only when at full technical performance.
4. Prior to starting up check the following:
 - Condition of the electrical system
 - oil level in the hydraulic supply
 - Condition of mobile elements
 - Condition of hydraulic unit
5. Electrical power should be disconnected during daily checks and repairs in order to prevent accidental machine starting.
6. Personnel should wear adequate protective gear while operating the equipment.
7. The SH800PLC station should only be used for its intended use.
8. Prevent debris collection around the machining station. In case of high dust concentration, cover the equipment.
9. **Starting the equipment while performing any maintenance (assembly, disassembly, positioning the machined materials) is forbidden.**
10. **Switch the generator on only after making sure that the preparation has been finished and there is no danger of damaging the equipment or wounding any body parts.**

2.9 SERVICING

ERKO provides full service both during and after the guarantee period.

2.10 DISPOSAL

After the end of the exploitation period, utilize or recycle the particular elements of this equipment according to the regulations in force.

“Zgodnie z przepisami Ustawy z dnia 29 lipca 2005r. o ZSEiE zabronione jest umieszczanie łącznie z innymi odpadami zużytego sprzętu oznakowanego symbolem przekreślonego kosza. Użytkownik, chcąc pozbyć się sprzętu elektronicznego lub elektrycznego, jest obowiązany do oddania go do punktu zbierania zużytego sprzętu.

Powyższe obowiązki ustawowe zostały wprowadzone w celu ograniczenia ilości odpadów powstałych ze zużytego sprzętu elektrycznego i elektronicznego oraz zapewnienia odpowiedniego poziomu zbierania, odzysku i recyklingu. W sprzęcie nie znajdują się składniki niebezpieczne, które mają szczególnie negatywny wpływ na środowisko i zdrowie ludzi.”

3. TERMS AND CONDITIONS OF THE GUARANTEE

Dear Customer,

Thank you for buying our product. We would like to inform you that we offer a 12-month guarantee for the product that you have purchased, starting on the day of purchase. The guarantee includes removing any faults free of charge, provided that they have been caused by manufacture of technical defects of the product and that the device has been used according to its purpose and to the requirements laid down in the operation manual. Please refer to the detailed conditions of guarantee mentioned in the Guarantee Card.

3.1. This Guarantee presents the obligation of the manufacturer, hereinafter referred to as Guarantor, to remove free of charge any physical defects of the device, originating within 12 months of the date of purchase.

3.2. This guarantee card, together with the product in question and a copy of the purchase receipt (invoice), is a proof of the guarantee rights. The Guarantor demands that a copy of the purchase receipt (invoice) be presented when the complaint is to be considered.

3.3. This guarantee does not include the tools in which damage occurred due to:

- improper or negligent operation, contrary to the purpose of the device or as a result of the user's lack of skill,
- mechanical damage to the product, resulting from improper storage, transport or failure to follow the required maintenance procedures,
- mechanical damage to the product, resulting from overloading and the defects caused by it,
- natural wear resulting from normal operation of a tool,
- repairs done by unauthorised persons,
- maintenance and/or repair done by the user, which resulted in the damage,
- force majeure (downpour, fire, flood, atmospheric discharge, etc.),
- using spare parts other than original ones or using materials other than those recommended by the manufacturer,

intended for use with the device,

3.4. This guarantee does not cover the following: operations related to the assembly, start-up, maintenance, those provided for in the instruction manual, which should be performed by the user, at his own cost.

3.5. The rights resulting from this guarantee do not entitle the user to claim compensation for any lost profits or damage incurred due to the defect of the device.



3.6. The manner of removing the defect shall be chosen by the Guarantor, who can repair the damage either by replacing the faulty part or by replacing the whole device. Regardless of the manner of removing the defect, the guarantee continues and is extended by the time that the defect is removed by the Guarantor. Should the device or its part be replaced or repaired, the guarantee period restarts in relation to the device or its part, as applicable.

3.7. If the complaint is accepted, the Guarantor undertakes to repair the device or its faulty part within 14 days of the date of reporting the defect. If, owing to its difficulty, the repair is extremely labour consuming or if any parts have to be ordered abroad, the period shall be extended accordingly, the Guarantor shall make every effort to remove the defect within the shortest time possible, not exceeding 30 days from the day of making the complaint.

3.8. The Guarantor shall establish the detailed terms and conditions of guarantee in the Guarantee Card. The buyer signs the conditions, which is proof of accepting the conditions and results in concluding the relevant agreement by the parties.

3.9. Should the device be resold during the guarantee period, the guarantee rights shall be transferred to the new buyer.

The user shall lose the guarantee rights in the following cases:

- if any entries or corrections are found to have been made in the Guarantee Card by an unauthorised person,
- if the Guarantor or the Seller finds that any alterations and/or adjustments have been made which are not provided for in the operation manual,
- if the tools were used after the defect became visible.

Complaint procedure:

1. If a complaint is made, the user has to deliver the faulty device together with this Guarantee Card, a copy of the

purchase receipt and a short description of the defect, in the original package.

2. The user shall deliver the faulty product at his own cost and risk to the place of purchase or to the authorised service of ERKO.

3. The user declares that he will deliver the clean and complete device.

4. If the complaint is accepted, ERKO shall deliver the repaired device to the original place of purchase or, if agreed upon, to another location, at its own cost.

Service center address you will find on www.erko.pl

4. GUARANTEE CARD

*Distributor's stamp	*Date of purchase, seller's stamp and signature	
*Name of the device-Type	*Serial number	*KJ
SH800PLC (GOLD / PLATINUM)		

* The guarantee card is valid only if the marked fields are filled in!

GUARANTEE REPAIRS

Date of receipt	Date of the repair	Description of the repair, replaced parts	Stamp of service, signature

* I have read the terms and conditions of the guarantee

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 Customer's signature