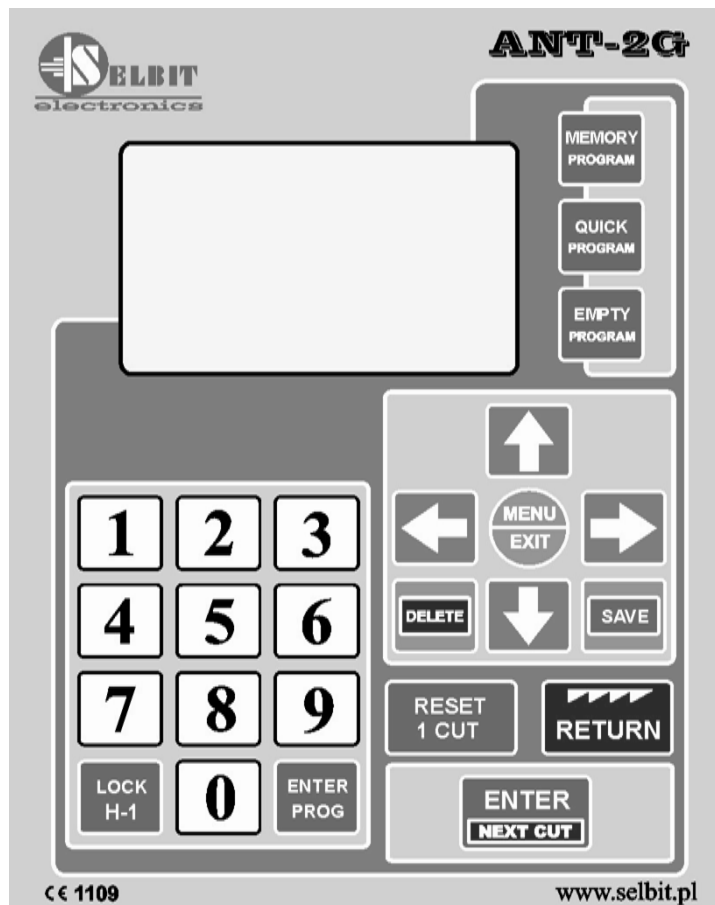


# ANT-2G

## AUTOMATIC CUT THICKNESS CONTROLLER FOR 2-HEAD BANDSAWING MACHINE



### INSTALLAOR AND USER MANUAL

## (1) Controller Installation and Connection

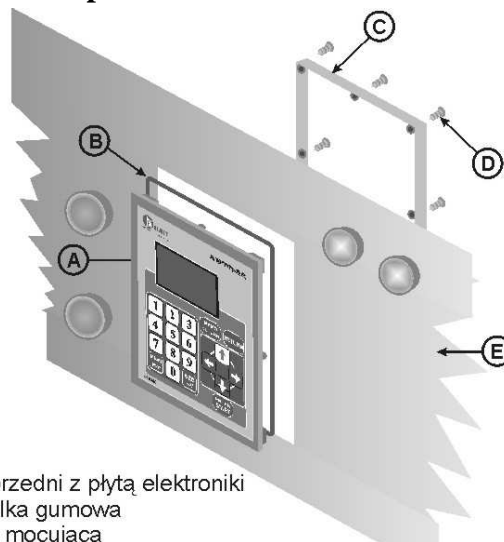
**In installation of the controller, one must follow the instructions stated in this manual.**

Before installation in the control panel (fig. 1), it is necessary to cut a rectangular hole with dimensions 175 x 140 mm. The hole should be made accurately, so that the rubber seal of the control panel will fit tightly on the whole length. Possible irregularities left after the cutting ought to be flattened with a small file and protected from corrosion with a high-quality paint or lacquer.

If there is not enough free space on the control panel to install the controller, it can be installed in any location as an additional, stand-alone device (fig. 2).

**Fig. 1 – installation of the controller in the control panel of the machine**

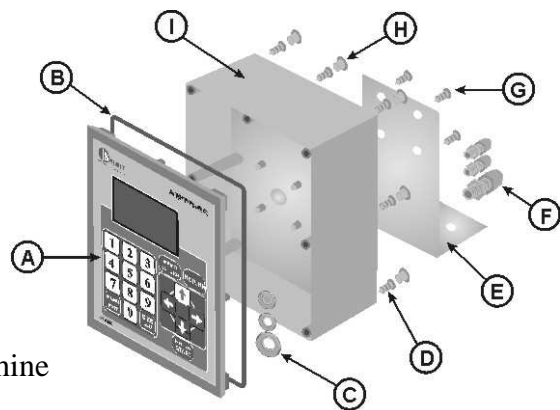
- A – front panel with electronics board
- B – rubber seal
- C – installation frame
- D – frame and panel fixing screws (8 units, 4.1 x 12 mm)
- E – Machine control panel with a cut out 175 x 140 mm hole



- A - Panel przedni z płytą elektroniczną
- B - Uszczelka gumowa
- C - Ramka mocująca
- D - Wkręty mocujące ramkę z panelem ( 8 szt. - 4,1 x 12 mm )
- E - Pulpit sterujący maszyny z wyciętym otworem 175 x 140 mm

**Fig. 2 – installation of the controller as a stand-alone device**

- A – front panel with electronic board
- B – rubber seal
- C – nut for the PG chokes
- D – screw fixing back of the case (6 units, 4.1 x 10 mm)
- E – Installation element (because of the different type of machines, the set does not contain this element)
- F – PG chokes for introduction of the cables
- G – Screws fixing the case to a support or the machine (4 units, 4.1 x 10 mm)
- H – hole plugs for the holes of fixing screws
- I – back of the case



- A - Panel przedni z płytą elektroniczną
- B - Uszczelka gumowa
- C - Nakrętki mocujące dławiki PG
- D - Wkręty mocujące tył obudowy ( 6szt. - 4,1 x 12 mm )
- E - Element mocujący ( ze względu na różne typy maszyn komplet nie zawiera tego elementu )
- F - Dławiki PG do wprowadzenia przewodów
- G - Wkręty mocujące obudowę do wspornika lub maszyny ( 4 szt. 4,1 x 10 mm )
- H - Zaślepki wciskane w otwory śrub mocujących
- I - Tył obudowy

When the controller is installed as a stand-alone device, one can after the installation screw it directly on the machine with 4 units of 4.1 x 10 screws included in the set, or, if necessary, make an additional installation element, which after screwing it on to the case will serve as a distance support.

## (2) Electrical installation



### **CAUTION!**

**Because of the risk of electric shock, all connections shall be performed only when the machine is disconnected from power. The best way to do that is to turn off the main switch of the machine.**

All connections should be done with double-insulated cables, intended for controlling devices powered from 230V AC network. The cables which enter the case ought to be round, with the diameter adjusted to the chokes installed in the back of the case. Endings of the cables should be cleaned and have sleeves, or be tinned before screwing. This is important for correct and fail-safe operating of the controller in the future. In order to assure correct and fail-safe operation, the wiring ought to be performed in accordance with the following instructions. Incorrect wiring can result in disturbing the work of the controller, and thus impeding its operation.



**The machine, in which the controller is installed, should have operational limit switches, and feed contractors ought to have a blockade preventing both of them to be turned on at once!**

## (3) Installation of the TSS-8/24 power transformer

The TSS-8/24 230/24V power transformer included in the set ought to be installed in the power supply cabinet of the machine.

The transformer is intended for a standard TSS-35 fixing rail, commonly used in electric machines. The location of the transformer ought to be maximally away from other electric elements (electrical converters, contractors, other transformers). It is important, because otherwise electromagnetic noise may penetrate the electronic system of the controller through the transformer.

The cables providing 230V power should be connected to the transformer clamps marked as **PRI 230V**. **The transformer should be installed in the circuit which includes neither contractor inductors nor an inverter.**

**230V power cables ought to be laid as far from other cables in the cabinet as possible.**

The cables transmitting power to the electronic board should be connected to the transformer clamps marked as **SEC 24V**. Similarly as in the previous connection, these cables ought to be laid as far from other cables as possible, including the 230V cables powering the transformer. Length of the power cables (24V) should be adequate to the location of the controller.

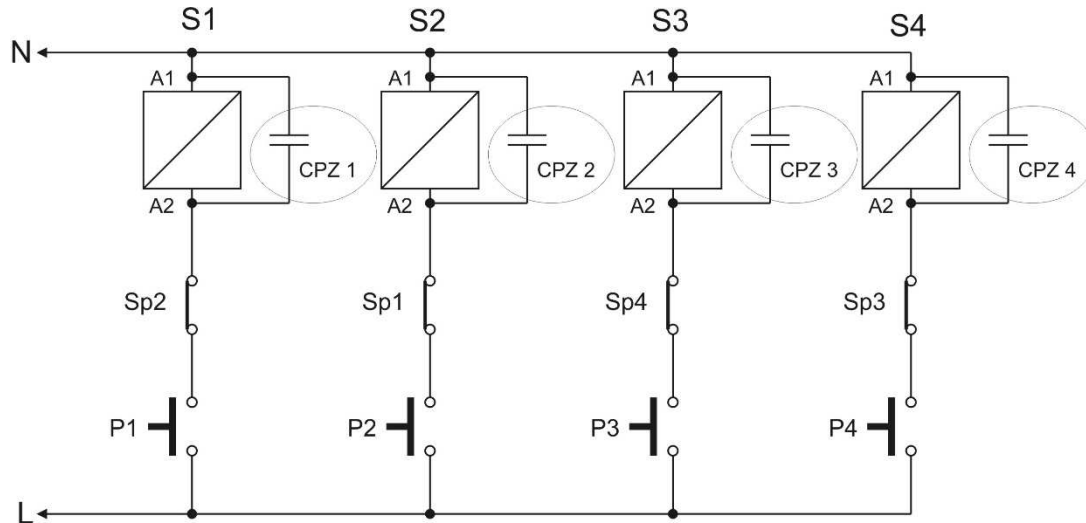
The cables going from the **SEC 24V** transformer clamps should in the final stage of the installation be connected to controller board clamps marked as **PWR**.

## (4) Installation of the interference suppressors (CPZ)

Interference suppressors **CPZ (WX1P 224M 440V)** included in the set prevent excessive emission of the electromagnetic noise, which is generated when the contractors installed in

the machine are operating. Their proper installation is crucial for correct work of the controller.

CPZ suppressors ought to be connected parallel to the inductors of the contractors which control the upward-downward move of each of the two heads of the machine (H1, H2), according to the following picture:



CPZ1-4 kondensatory WX1P 224M 440V

S1, S2, S3, S4 - cewki styczników załączających ruch głowic H1 i H2

CPZ 1-4 – WX1P 224M 440V suppressors

S1, S2, S3, S4 – inductors controlling the movement of heads H1 and H2

### **(5) Installation of the encoders in the machine heads**

**During an installation of the magnetic or rotating encoders, you should remember that the encoder henceforth marked as H1 should be installed on the head located as the first one topwise (the higher saw), and the encoder henceforth described as H2 – to the head located as the first one looking from the level of the machine track (the lower saw).**

#### **Installation of the linear magnetic encoder MSK-320 and magnetic tape MB-3200.**

The magnetic measuring tape consists of two elements, each of which has a layer of self-adhesive tape.

The first part, thicker one, is to be stuck on a smooth, flat, and straight surface (after it has been carefully cleaned and degreased with acetone or alcohol).

During the sticking, one should remove only part of the foil protecting the glue, then stick the first part, starting from the top. Then, gradually, one should remove further pieces of the foil, while sticking the freed piece of the tape to the surface.

A rubber roller might be used for pressing after the sticking, to provide a better pressure. The tape should be stuck carefully, to avoid any bulges and stick the tape **exactly straight**. After sticking the first part, protecting steel tape ought to be stuck on the top of the tape, with the same precautions as in the case of the first sticking. Both tapes should be stuck exactly one on top of another. MSK 320 sensor with a cable should be installed on a non-moving part of the machine (with respect to the controller), so there will be no movements of the cable which may lead to its damage. **When the sensor is installed in the moving position, its cable must be protected with moving rails preventing bending of the cable.**

The sensor ought to be fixed with two screws going through the case in such a way that it will be exactly **1 to 1.5 mm** above the tape, in a parallel position.

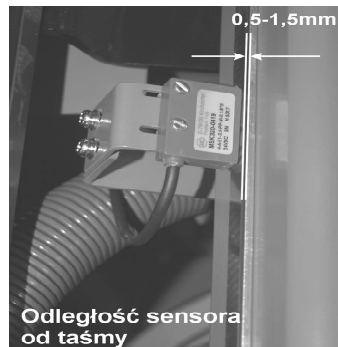
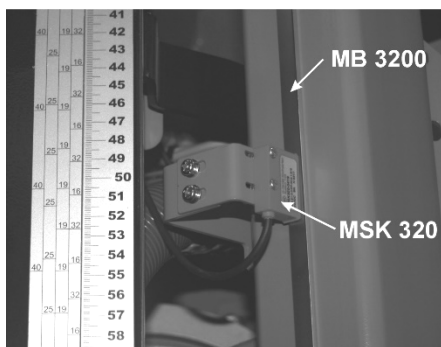
**In laying the sensor cable, it is important to put the cable as far away from the other cables and electric devices. The tape, above which the sensor is moving, cannot be located close to any source of magnetic field (magnets, electromagnets) before, during and after installation. Otherwise, it may be damaged!**

The surface of the tape ought to be regularly cleaned from dust and dirt with a soft brush. It is prohibited to hit the tape or the sensor. The sensor should be installed in a position in which the sticker **SCALE SIDE** is pointing towards the magnetic tape.

**Both the sensor and tape should be installed in such a way that in performing the whole movement, the sensor constantly remains in the range of the tape located below.**

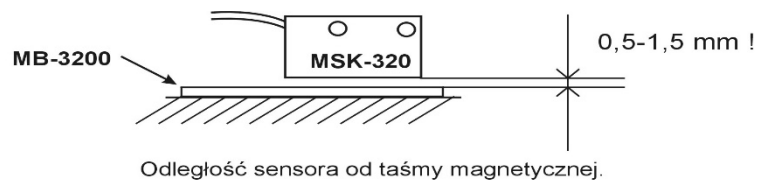
**Special attention should be put to stability of the sensor and tape installation, to prevent vibrations of these elements while they are at work.**

### The manner of the magnetic sensor and tape installation

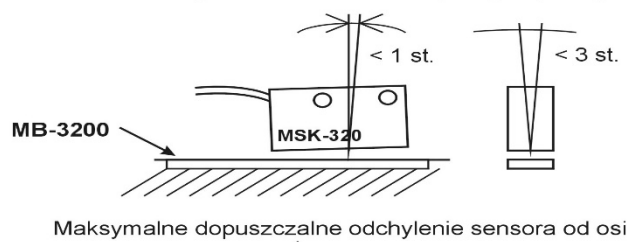


Distance of the sensor and tape

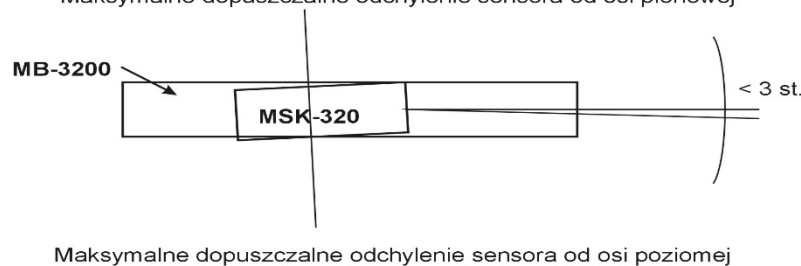
Distance of the sensor and magnetic tape



Maximal allowed tilt of the sensor and the vertical axis

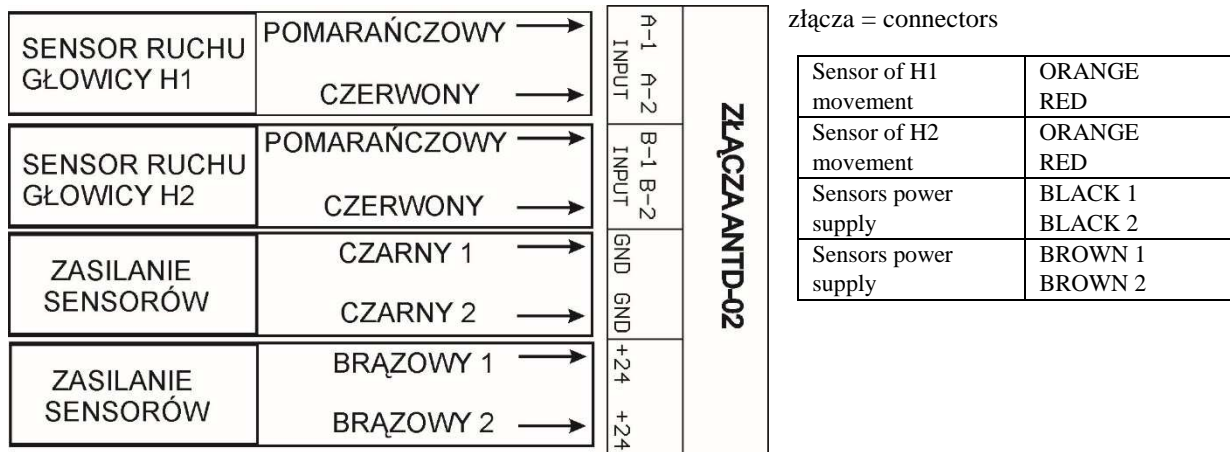


Maximal allowed tilt of the sensor and the horizontal axis



Magnetic sensor of heads H1 and H2 movements should be connected as presented in the figure below.

When the controller is turned on for the first time, it might be necessary to invert the direction of counting in one or both sensors. It is done in accordance with the description of the first launch, by switching places of **orange and red** sensors.



### Connecting of the sensors MSK – 320 to ANT 2G connectors

#### (5a) Rotating encoder installation

**If rotating encoder is being installed (for the machines with a saw moving with a trapezoidal screw), it should be done as follows:**

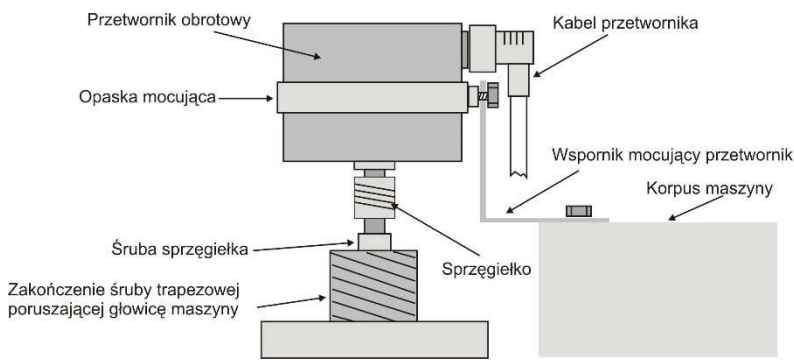
Rotating encoder transforms rotating movement of the screw which moves the head into electric impulses contrived to the controller. The number of impulses per rotation of the screw depends on its pitch. This dependency is presented in Table 1.

The trapezoidal screw moving the machine head should have free one end, so it will be possible to drill a hole to screw in the clutch of the encoder.

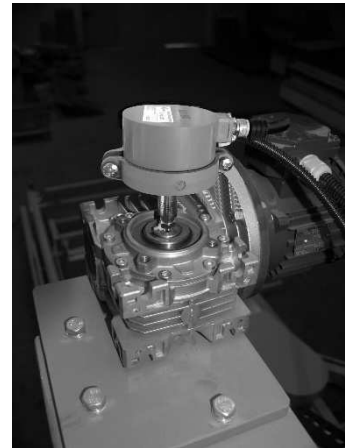
In most bandsawing machines available on the market, this free end of the screw is located on the top.

The hole should be drilled exactly centrically. Otherwise, the installed encoder may sway, what can result in its damage. After drilling the hole of ca. 15 mm depth, it should be tapped with M8 tap. Now, the encoder can be fixed with a fixing band included in the set (fig. 4). The band should be fixed on the machine with a support which, given the differences in mechanical constructions available on the market, must be supplied by the client. Fig. 4a presents as typic look of the encoder installed on the top end of a trapezoidal screw.

**Fig. 4**



**Fig. 4a**



**Table 1**

Screw Pitch (mm/r)	Encoder type	Divider
3	Rotating 42 imp / min	28
4	Rotating 42 imp / min	21
5	Rotating 50 imp / min	20
6	Rotating 48 imp / min	16
7	Rotating 42 imp / min	12
8	Rotating 48 imp / min	12
9	Linear MSK 320 + MB 320	5
10	Rotating 50 imp / min	10
Chain Bandsawing Machine	Linear MSK 320 + MB 320	5

The data presented in the table should be used to check the controller parameters

SENSOR RUCHU GŁOWICY H1	BIAŁY →	A-1 INPUT	ZŁĄCZANIE TD-02	A-1	A-2
	CZARNY →				
SENSOR RUCHU GŁOWICY H2	BIAŁY →	INPUT	ZŁĄCZANIE TD-02	GND	GND
	CZARNY →				
ZASILANIE SENSORÓW	NIEBIESKI 1 →	GND	ZŁĄCZANIE TD-02	GND	GND
	NIEBIESKI 2 →				
ZASILANIE SENSORÓW	BRAZOWY 1 →	GND	ZŁĄCZANIE TD-02	GND	GND
	BRAZOWY 2 →				

Sensor of H1 movement	WHITE BLACK
Sensor of H2 movement	WHITE BLACK
Sensors power supply	BLUE 1 BLUE 2
Sensors power supply	BROWN 1 BROWN 2

### Connection of the rotating encoder cables to ANT-2G connections

During the first launch of the controller, it might be necessary to change the direction of counting for one or both encoders. It is done in accordance with the description of the first launch by switching places of the **white and black** encoder.

The rotating encoder cables should be lied away from other electric cables. Through fixing it with fixing bands it is introduced to the location where the controlled will be installed.

**Caution! The encoder cable must be screwed tight, to ensure in turn the proper tightness of the connection!**



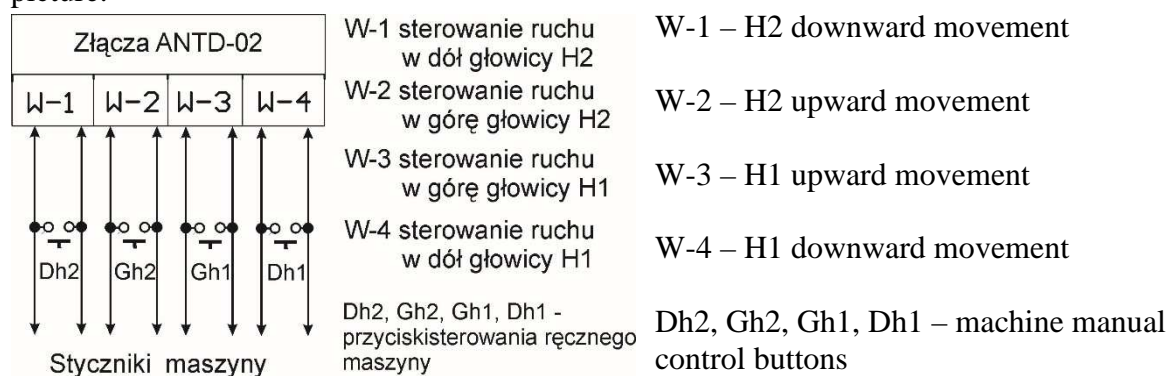
**Caution! Incorrect cable connection will result in a serious damage to the encoder.**

### **(6) Connecting the cables controlling the contractors**

Buttons controlling the up- and downwards movement of the heads, which the machine should have installed in the factory, ought to be of the clasping type, without sustaining (i.e. they should clasp the junctions while pressed on, and unclench when the button is released). To the buttons in the machine control panel which control the movement of the head, one should connect a wire which consists of four pairs of cables, with double, round insulation, with a diameter small enough to put them through the bigger choke in the back of the case of the controller. Two pairs of cables should be connected parallel to the clamps of the upward and downward movement of head 1 buttons, and the other two, analogously, should be connected to the clamps of the buttons of head 2. It is important to remember to put the sleeves or tinthe junctions. The cables should have different colours, what will facilitate their further correct connection to the right clamps on the controller board. **The cables ought to be laid away for other electric cables and lead to a place where the controller panel will be located.**

**The machine in which the controller is installed should have operational limit switches and feed contractors of up- and downward movement ought to be prevented from both being turned on at once!**

The cables connecting the contractors ought to be connected according to the following picture:



### **The manner of connecting the contractors control**

After all the connections, one can screw in the controlled case.

Before fixing the front panel into the back of the case or control panel, one ought to check whether rubber seal is located in the channel intended for it on in the edge. It is important, because it prevents dirt from getting into the case.

After putting the panel in the back of the case, it should be screwed in with six 4.1 x 12 fixing screws included in the set. Before final installation of the controller and screwing it on the machine, it is recommended to check the correctness of operating in accordance with the next section of this manual – **“first launch of the controller”**. After ensuring that the controller



has been connected correctly and operates as described, one can put in the hole plugs into the holes for screws and screw the controller on the machine.

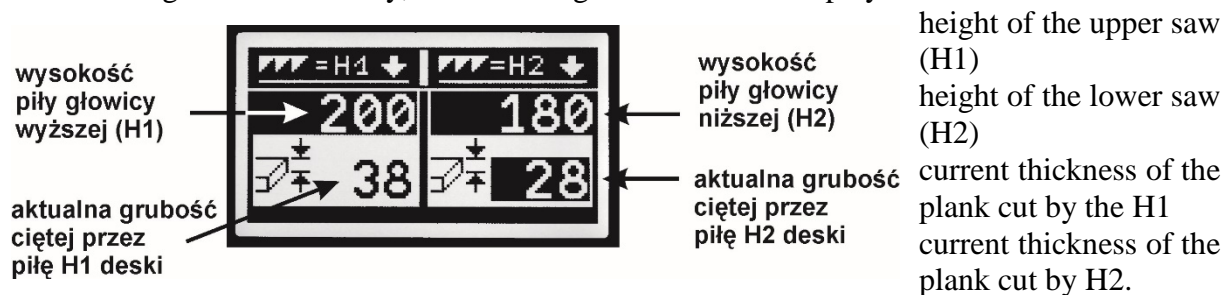
Installation of the controller in the control panel is analogous. The only difference is that the front panel is screwed from behind with a plastic frame through the sheet metal of the panel case.

After screwing, one should gently pull the cables going out of the PG chokes, to remove the abundant amount of them from the case (you should not pull them strongly not to damage their connection to the clamps in the controller), and then screw the external caps of the PG chokes, which seal the hole through which the cables go out.

Now, when the controller is installed as a stand-alone device, it can be screwed on the machine or support with four 4.1 x 10 fixing screws, screwing them into four holes intended for that in the back of the controller case.

### (7) First launch of the controller

After turning on the electricity, the following main screen is displayed.



If the controller displayed the main screen correctly, we can proceed to the next step – checking the input divider.

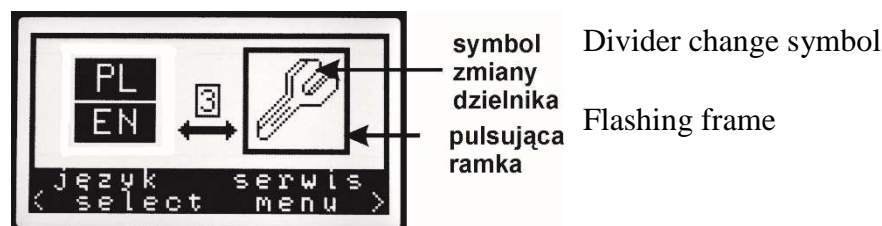
### (8) Checking the input divider

Depending on which encoder cooperates with the controller, correct value of the input divider should be introduced.

In the case of linear encoders **MSK-320** co-operating with magnetic tape **MB-3200**, the value of the input divider is **5!**

In the case of rotating encoders the correct value ought to be checked in the table (Table 1 in Section 5a), depending on the encoder type and pitch of the machine screw.

To check or modify the divider value, you have to press the button marked as **Menu/Exit**. The connector will display the first menu chart. The modification of input divider can be done in the third chart. To change between the charts, keep pressing briefly the button with an arrow pointing right until the flashing frame locks on the icon of a wrench, as on the picture below:



Pushing the button with a righthand arrow results in moving the frame onto the next element displayed on the screen. The number of the menu chart is always located between two displayed symbols. Analogously, pushing the left-hand arrow button moves the frame to the previous symbol.

When the frame locks onto the wrench symbol, you should press **Enter** button. Then, the controller asks for a 3-digit access code. The menu is password-protected to prevent accidental change of the divider value. You should introduce the code **1-2-3** with a numpad and press **Enter** again. Now, the controller displays the divider modification screen. On the top, there is an old value of divider, and below, on the rectangular, black background, the new value to be set. After introducing the correct value, you should push **Save** button to confirm the modification.

**After setting the new divider value, one should check whether the direction of counting for the H1 and H2 encoders is correct.**

To do that, push **Menu/Exit** button and go to the main screen.

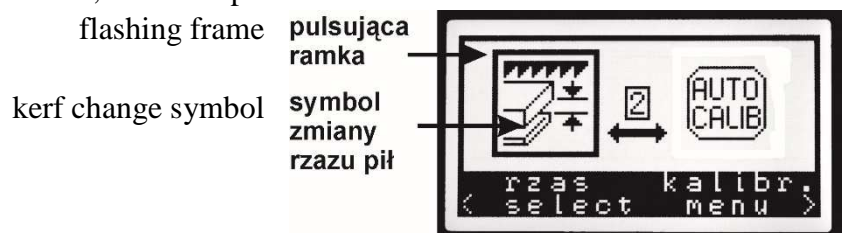
Now, using the heads manual control buttons, you should move the upper head (H1) upwards, simultaneously looking at the H1 height displayed on the main screen. **During the upward movement**, the displayed height should be **increasing**. Now, you should manually move the head downwards and check whether the displayed height is **decreasing**.

Analogously, check the H2 head. If the direction of counting is improper, you should switch places of the impulse cables of the encoder from the head in which counting is incorrect, **according to the description in the section concerning installation of the encoders (5 or 5a)**.

After checking whether the encoders count correctly, we can proceed to the next step – setting the kerf of saws H1 and H2. To do that, you should again enter the menu by pressing the button **Menu/Exit** and go to menu charter 2.

### (9) Setting the kerf of saws H1 and H2

The kerf of the saws can be set in charter 2, as on the picture below:



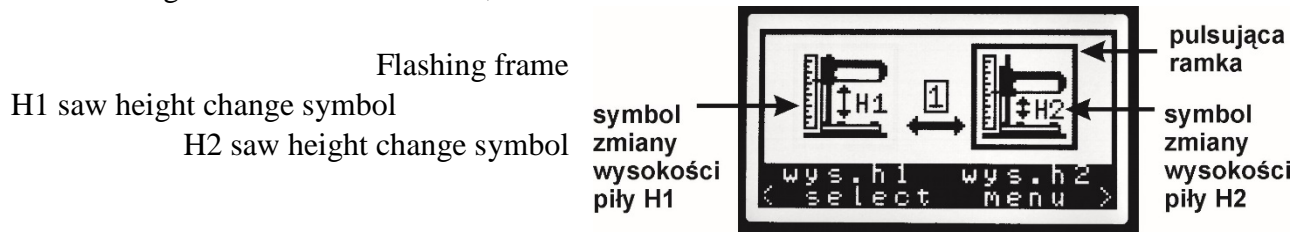
When the frame locks onto the kerf change symbol, press **Enter** button. As in the case of the divider, the current value is displayed on the top, and the new value to be set – below. In setting the kerf, you should remember that it should be specified accurately to the first decimal. For instance, the kerf value **2.2 mm** is set by pushing 2 and immediately after that 2 again, and the value **2 mm** is set by pushing 2 and immediately after that 0.

After setting the correct kerf value, press **Save** button to accept the change.

Once the kerf is set, we can proceed to the next step – setting the real height of saws H1 and H2.

### (10) Setting the real height of saws H1 and H2

The real height is set in menu chart 1, as below:



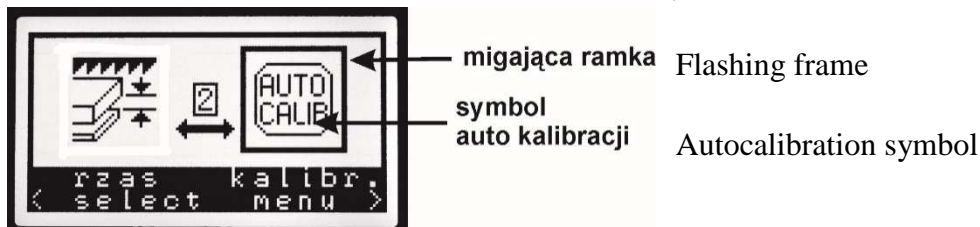
When the frame locks on the symbol of H2 height, press **Enter**. As in the case of the divider, presently set height is displayed on the top and the new value – below. Once you read on the auxiliary mechanical measuring tool the actual height of the lower saw (H2), write in this value to the controller (**the value ought to be specified in full mm, without decimals; if the saw is not set on full mm, before specifying the value you should correct its height with manual controls**). You must remember that the correct height setting depends on accurate calibration of the auxiliary, mechanical measuring tools, which every head of the machine ought to have.

Once you introduced the height of H2 saw, press **Save** button to confirm the changes. Repeat the same procedure for height of the other saw, H1 (the higher saw).

The last element of launching the controller is configuring it to mechanical parameters of the machine (autocalibration).

### (11) Autocalibration of heads H1 and H2

The autocalibration can be done in the menu chart 2, as below.



To do the calibration correctly, you must first set the height of the higher saw (H1) to ca. **140 mm** over the track and height of the lower saw (H2) to ca. **120 mm** over the track.

After the heads are set, make sure that operation of the machine will generate no danger for any person nearby, and press **Enter**.

The controller begins autocalibration procedure, making two downwards movements of heads H1 and H2, and then 6 upward movements. During the calibration, the controller displays intended calibration values for each head in turn, then confirms correctness of the calibration and displays a notification that you should press **Enter**.

If during the procedure one of the heads will reach the limit switches, it will result in stopping the calibration and displaying a notification about an emergency situation.

After the calibration is finished, the controller is ready to work.

### (12) Utilisation of the controller

To ensure maximal accuracy in work of the controller, you should conform to the following directions:

- Autocalibration of the heads ought to be done at least once a week and every time there is a change of temperature or a replacement in the elements of the head mechanical propulsion system. Moreover, it should be performed after each lubrication of the propulsion screws.
- Each time before starting the work on the machine, you must check whether the height of the saws H1 and H2 displayed on the screen match their real height.
- You have to maintain correct set type of saws H1 and H2, so the real kerf left by the saws matches the value displayed in the controller.

### (13) Using the controller for cutting in the regular mode

The regular mode is available directly after launching of the controller, and it can be used to measure the cut the top-down cut. To begin regular cut, first, once the new log is loaded, you have to manually move the first saw (H1) to the height of the first cut from the top (shaving). Then, the controller automatically goes into the first cut mode and signals it by displaying bars representing thickness of the plank H1 and text **H1 MANUAL!**, as it is presented on the picture below (if needed, you can go back from the first cut menu by pressing **Reset 1 cut** button).



After the saw is set into the shaving position, you should specify the thickness of plank on the right side of the display (**saw H2**) and press **Enter**. The controller will move the saw H2 to the specified position. Head H2 will be aligned to the height of H1, **head H1 in the first cut makes no movement!** The only exception is a situation when the operator will go back from the first cut menu by pressing the **Reset 1 cut** button. In this case, both heads will perform positioning movement in accordance with the set values.

When the text “**pozycjonowanie piły**” (**positioning the saw**) will disappear, you can begin to cut the log.

Once the cut is finish, you should remove the cut material and press **Return**. The controller will move the lower saw H2 slightly upwards, what allows to return safely both heads to their initial position, ready for performing the next cut. When head H2 is upward lifted in the return mode, bars are displayed in the location where previously the height of H2 was displayed, as depicted below.



When both heads have returned to their initial position, you can set different required thickness of planks, now for both heads (the dimension selected for setting is indicated with

the black, rectangular background). To change the menu for setting the planks dimensions, press buttons with arrows (righthand arrow (H2) and lefthand arrow (H1)).

Once the dimensions are set, press **Enter**, and the controller will position the saws for the next cut. After the cut is done, press **Return** as before and return the saws to their initial positions.

After pressing **Return** and lifting the saw, you can exit the return mode **by pressing Return again**.

**If the setting are too high to be implemented**, the controller will display an appropriate message. Then, you should press **Enter** and reconfigure the settings accordingly. The controller, depending on the way in which the dimensions are overdue, can either display a message describing the maximal values for both heads (e.g. – max 2 x 18 mm, i.e. the sum of the settings may not exceed 36 mm), or if both dimensions are overdue, then it suggests executing only the dimension set for the upper saw H1, but by the lower saw H2.

### **(13a) Upper head (H1) blockade**

The controller can temporarily block the head H1. You can do it by pressing and holding for about 2 s **Lock H1** button. Before you lock the head, you should lift it so it will not interrupt the operation of the other head (H2).

After turning the blockade on, the controller displays for a moment a symbol of a crossed out head, and then in the main menu a **key symbol** in H1 description and a dash where the thickness of H2 plank is displayed. From now on, the controller controls only head **H2** (the lower one) and all thickness settings concern only this head, until you remove the blockade of H1. When H1 remains under blockade, it is not possible to enter the H1 thickness menu with lefthand arrow. If you try it nonetheless, the controller will display a message informing that H1 is under blockade.

If you want to release the H1 blockade, press and hold the **Lock H1** button for 2 s as well. Once the blockade is removed, the controller displays a confirmation message and returns to the 2-head mode.

### **(14) Cutting with the bottom-up program**

You can use the controller to set the bottom-up cut, for instance after reversing the log, with the “up to H1 saw height” method.

**To use this programme, first you have to lift the saw H1 (the upper one) to the level of the first cut topwise (shave). It is necessary, because the controller needs to automatically calculate all positions up to H1 saw height.**

Using this cutting programme, you can divide the material into the requested dimensions in three basic modes: empty, fast, and recovered from memory.

You should choose **empty program** if you want to set a one-off cut program for a given log, or if you set the program for multiple use which you will later save in the controller memory.

You should choose **quick program** if you want to divide the log quickly into equal dimensions, without a need to specify particular positions.

You should choose **memory program** if you want to reuse a program you have previously saved in memory.

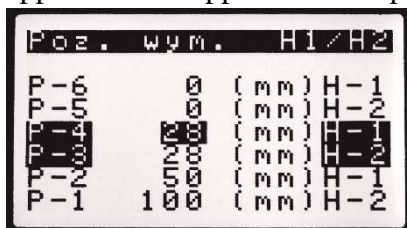
Preparation to use bottom-up program starts from **manual** moving the upper saw (**H1**) to the position of the first cut topwise (shave). All cut positions will be calculated up to this position of H1 saw.

After setting the saw, press the button with the chosen program. Then, the controller will display a menu with positions and their dimensions.

### Memory program

In the case of rerunning the program stored in memory, the positions calculated **up to the height of H1 saw** by the program are displayed. The last position within the range is marked with **black background**. When the program is executed, text **“pattern calculated”** is displayed.

To check the real height of the heads in the calculated pattern, press **Enter**. Then, the controller moves both saws to the calculated positions. At this moment you can enter modifications, either change existing positions or adding new ones. Going to **upper** or **lower** positions is done with buttons with **upward** and **downward** arrows, respectively. The controller always cuts **with two saws**, so there are always two positions active (e.g. **P-3, P-4**). Active settings (which you can modify at the moment) is also displayed on the black background. If you add new positions to the previously set ones, the controller will inform you that the height of the program is overdue with respect to the H1 saw height by displaying a flashing message “przekroczona H1” (H1 overdue) on the top of the display. When you modify lower positions, e.g. going from P-3, P-4 to the pair P-1, P-2, you have to remember to return to the previous position (using the buttons with arrows) before pressing **Enter**. So, in the aforementioned example if you want to **modify settings for P-1, P-2**, you have to return to the **position P-3, P-4**. Each time you press **Enter**, what results in setting the heads H1 and H2 on positions, the controller displays an information that the program is ready for final approval. The approval is not possible unless you press **Enter**.



Poz.	wym.	H1/H2
P-6	0	(mm) H-1
P-5	0	(mm) H-2
P-4	20	(mm) H-1
P-3	20	(mm) H-2
P-2	50	(mm) H-1
P-1	100	(mm) H-2

The display of the controller during setting of the program

If the program is adequate for a given log, you can approve it by pressing **Enter prog.** Button. The controller confirms execution of the program and shows a message: **“program gotowy, Enter rozpocznij, Exit wyjscie”** (The program is ready. Press Enter to execute or Exit to cancel.).

To commence the cut according to the program, press **Enter**. The controller displays a screen with positions that are currently being cut. You can now cut the log, put off the material, press **Return**, go back to the beginning of the cut and press **Enter** to make another one. The controller positions the saws for the line of the next cut and display currently set positions. This way you cut all the positions in the program. After **P-1, P-2** reach their final positions,

the controller displays “**end of the program**” message. You can exit the program pressing **Menu/Exit** button or pressing **Enter** twice (first pressing results in showing a message about finishing the program to avoid unintentional use, and the second takes you out of the cutting program).

**During modification, “Memory program” can be saved to memory by pressing Save button or deleted by pressing and holding for 2 s the button with a lefthand arrow.**

### **Quick program**

To use quick program, first you have to set the saw on the level of the first cut topwise (shave).

This kind of program is used for quick division of the log into a series of identical dimensions. To enter this mode, press **Quick program**. The controller displays a message, asking to specify the dimension – specify it and press **Enter**. Further operation activities are identical as in the abovementioned program – memory program. As in the case of memory program, you can add and modify positions, approving and executing the program is also identical.

**During modification, “Quick program” can be saved to memory by pressing Save. Remember that if you do so, it will overwrite the previous program used as “Memory program”!**

### **Empty program**

To use this program, you should set the saw as in the previous programs. This program differs from the others in the way of arranging. After executing the program by pressing **Empty program** button, the controller displays a screen with all positions set to 0 and the starting positions are **P-1, P-2**. Now, you should specify one by one required positions, starting from the bottom. You should remember that there always **have to be two specified positions**. During specifying positions, when their sum exceeds the height of the saw, the controller will display a message “H1 overdue”, as in the case of previous programs. The way of modification, approval and execution is identical as in the previous programs.

**During modification, “Empty program” can be saved to memory by pressing Save. Remember that if you do so, it will overwrite the previous program used as “Memory program”!**

### **Using the programs when H1 is blocked**

When the head H1 (the upper one) is blocked by pressing the **Lock H1** button, you can use **Memory program, Quick program, and Empty program** as previously described. The only difference is that only **one saw (H2, the lower one) will be used. Thus, in this case you do not have to specify two positions.** The other rules concerning use of the program remain the same as in the case of two saws. In the case of **Memory program**, saving the program does not result in changing the program for both saws. **Programs for one saw and two saws are stored independently in memory.**

### **Utilisation advices**

**Caution! Working temperature of the controller is between -10 to +45° C.**



To preserve best cut parameters, it is recommended to perform autocalibration at least **two times a week**, according to the instructions in Section 11: **Autocalibration of heads H1 and H2**.

**Before commencing the cut, you have to check whether the height of the saws displayed on the ANT-2G screen match the height indicated by mechanical measurement of the machine.**

If there is a mismatch, the correct height should be specified into the controller. The procedure is described in Section 10: **Setting the real height of saws H1 and H2**.

**You must not press the controller keyboard with hard objects or press them too strong, as it may cause its irreversible damage.**

When the keyboard is dirty, you can apply popular cleaning measures, just remember not to press too hard membrane buttons. Pressing them too hard may result in their damage, and in turn, need to replace the whole keyboard.

**The controller cannot be put into a risk of flooding, direct contact with water or other liquids.**



**If a certain movement cannot be performed for the reasons independent of the controller (operation of the limit switch, encoder or controlling connections damage), the controller holds the movement and displays respective information messages: movement stopped, no impulses. When you press Enter, the controller will be reset.**

### **EMC Compatibility**

ANT-2G controller conforms to the current norms concerning electromagnetic compatibility (EMC).

ANT-2G controller should be installed and configured in accordance with national and European norms. It is a responsibility of the fitters of the machine electric control system, who must conform to the EMC directive.

ANT-2G controller must be considered as a part of the system, it is not a stand-alone machine ready to use, according to the European directives (Machines Directive and EMC compatibility directive). It is responsibility of the final user to assure that these standards are met.

The product and its accessories described in this manual can be changed and modified many times, both from technical point of view and from the perspective of utilisation.

Their description by no means can be treated as a contract.