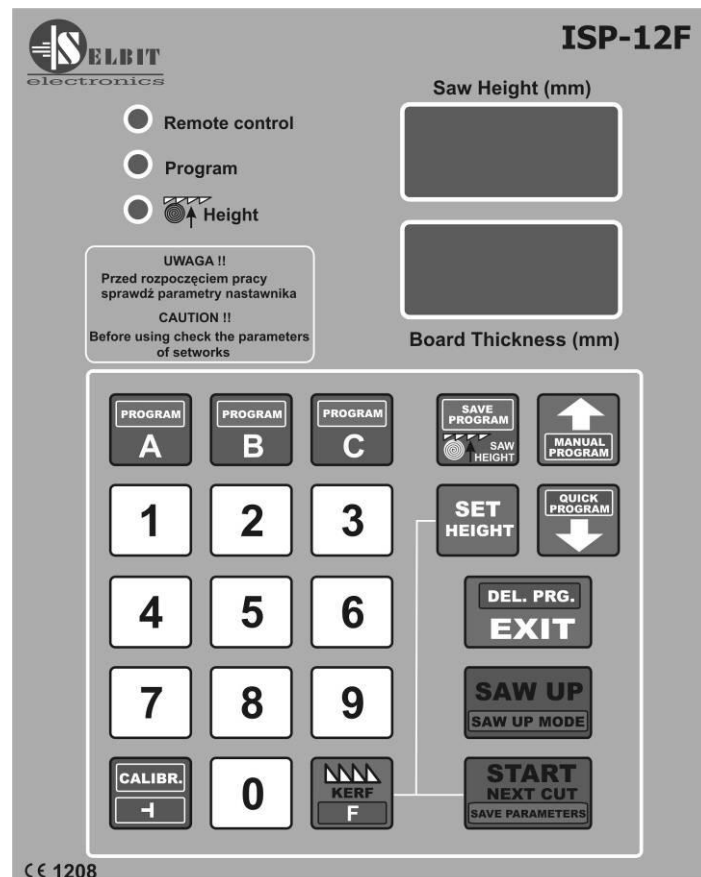


# MANUAL HANDBOOK

## Automatic thickness controller for sawing frame machines

### ISP – 12F



Automatic thickness controller ISP-12F is designed to be mounted on the sawing frame machine.

Before assembly and start please read this handbook manual carefully, instructions provided help you in correct mounting and operating of our product.

## Content:

- Chapter 1 – Mounting and connections
- Chapter 2 - First start
- Chapter 3 – Checking controller's parameters
- Chapter 4 – Quick access buttons A, B, C
- Chapter 5 – Normal mode cutting (board after board)
- Chapter 6 – Normal mode cutting without board taking out
- Chapter 7 – Manual mode cutting (manual program)
- Chapter 8 – Automatic saw mode (quickprogram)
- Chapter 9 – Program saw mode (A, B, C)
- Chapter 10 - Operating order
- Chapter 11 – EMC Approval
- Chapter 12 – Possible errors and solutions

## CHAPTER 1

### Mounting and controller's connections

During controller's mounting is advised to follow this instructions correctly.

#### Point - 1

Before mounting in the main board (fig. 1) please cut off rectangle hole 175 x 140 mm. This hole should be made carefully thus rubber sealing is adjoined to the from panel. Eventually any irregularity created after incorrect cutting out please smooth them using small metal file and protect it by anti-corrosion painting. If on the main panel is no place to mount controller, it is possible to add it as separate device (fig. 2).

*Figure 1. Controller mounting on the main board.*

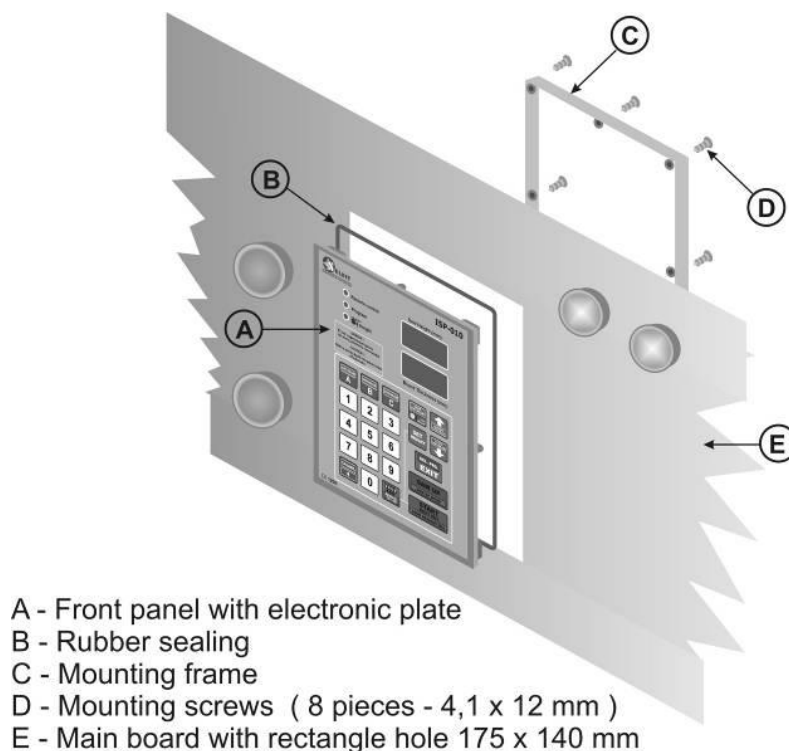
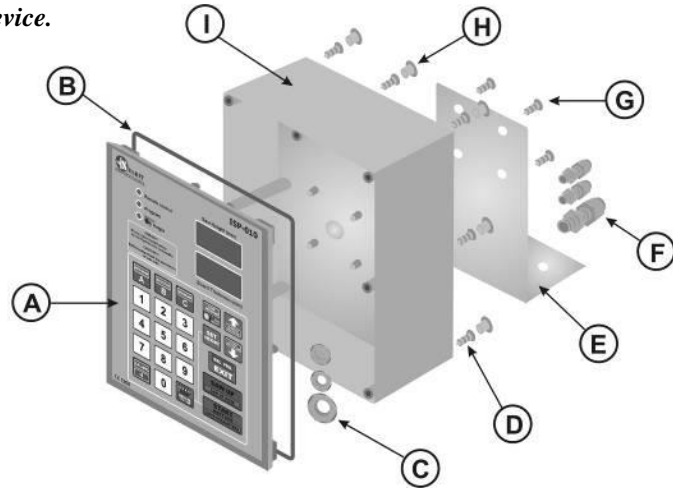


Figure 2. Mounted controller as separate device.



- A - Front panel with electronic plate
- B - Rubber sealing
- C - Fixing nuts for cable gland
- D - Back frame mounting screws ( 6 pieces - 4,1 x 12 mm )
- E - Mounting element (because of the variety of machines kind it is not included into the product)
- F - Cable gland
- G - Mounting screws ( 4 pieces 4,1 x 10 mm )
- H - Hole cap
- I - Back casing

In case of controller mounting as a separate device it is possible after its assembly to attached it to the machine's frame using 4 added screws for this purpose. In another case please made special fixing for mounting the controller which can be used as a distance support as well (fig. 2, E element).



### Electric montage

### CAUTION !

**During electrical assembly there is a possibility of a electric shock thus all actions should be made while electric power is off. For this purpose please turn off machine's main electric switch!!!**

**All cable connections should be made using special wires with double insulation oriented for use of the electric devices powered by 230V alternating current. Cables should be rounded with diameter suitable into holes in the controller back casing accordingly. Tips of the cables should be cleaned and special quill should be used or tips should be covered by thin tin layer. Please follow this instructions very carefully especially electric connections should be made according to provided instructions. It is required for correct and failure-free controller operating.**

**Machine where the controller is mounted should be equipped in well working head saw ending switchers and contactors of the up and down feeding should be protected to be on at the same time !!!**

## Point - 2

### Power transformer TSS-8/24 assembly

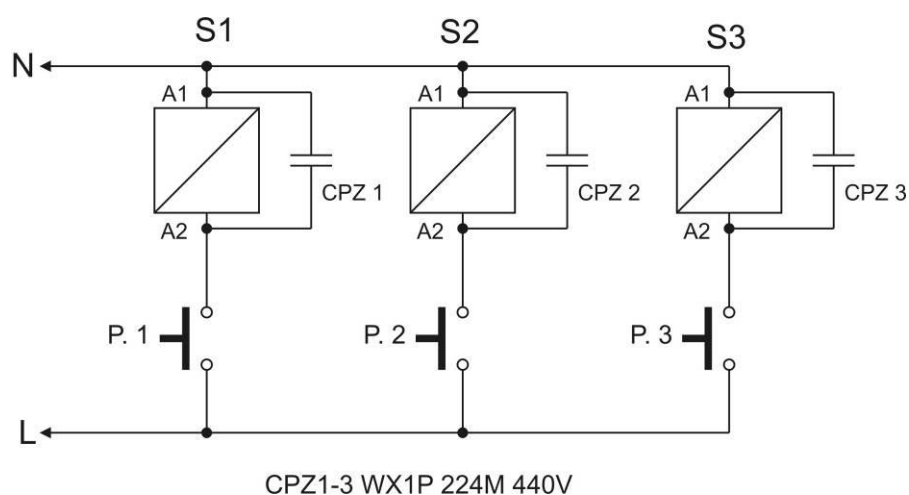
In power cubicle added power transformer TSS-8/24 needs to be mounted. Mounting is designed for well known and used holding bus TSS-35. Please place the transformer as far as possible from other electrical elements ( e.g. frequency changer, contactors, other transformers). It is important because of the electromagnetic interference which may disturbing controller's electronics. Please connect to the connections marked as PRI power supply of 230V. For power supply please choose this phase of electric supply of the machine which is not connected to the any inductions coils, contactors or inverters. 230V supply cables should be placed as far as it is possible form other cables in the power cubicle. To the transformer's clips marked as SEC 24V please connect wires which feed electronic plate of the controller. Analogically please place this wires as far as it is possible from other power cables, especially from 230V which powered the transformer. Length of the cables (24V) should be chosen accordingly to the place where the controller is mounted.

## Point – 3

### Choke CPZ mounting

Anti-disturbance choke CPZ (**WX1P 224M 440V**) added in the controller kit is designed to protect from any other electromagnetic disturbance made by other electrical devices mounted on the frame machine saw. Its correct mounting is decisive for correct controller operating. Those CPZ outputs should connected in parallel to the contactors' coil. CPZ should be connected with contactor's coil of the down feeding, up feeding and barker contactor separately (if the sawing frame machine is equipped with barker).

*Fig. 3 Choke CPZ constructions and connections*

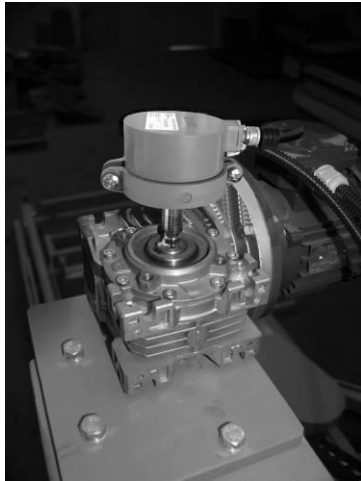


## Point -4

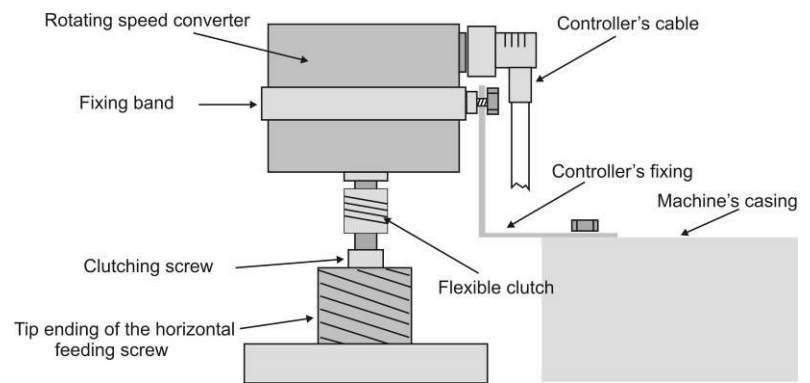
### **Rotating encoder mounting**

Added rotating encoder is designed to convert rotation of the head saw feeding screw for electrical impulses. Number of the impulses depends on screw pitch and this relation describes table 1. In most of the frame sawing machines this screw has got free tip where the encoder can be installed. Please make a concentric hole in the screw and mount encoder's clutch. Please make sure that this hole is concentric otherwise it can cause swinging and eventually incorrect encoder working and its damage. Please make hole around 15 mm and create thread M8. Next mount encoder using fixing band (fig.4). The band should be attached to the special fixing which because of the variety of the frame sawing machines should be created individually. Example of the encoder mounting is shown at the photo 4a below.

*Photo 4a. Example of the necoder mounting.*



*Fig. 4 Encoder mounting ex ample.*



**Table 1**

<b>Screw pitch [mm./obr.]</b>	<b>Encoder type [imp./rotation]</b>	<b>Devider</b>
<b>3</b>	<b>Rotating 42</b>	<b>28</b>
<b>4</b>	<b>Rotating 42</b>	<b>21</b>
<b>5</b>	<b>Rotating 50</b>	<b>20</b>
<b>6</b>	<b>Rotating 48</b>	<b>16</b>
<b>7</b>	<b>Rotating 42</b>	<b>12</b>
<b>8</b>	<b>Rotating 48</b>	<b>12</b>
<b>9</b>	<b>Linear MSK320 + MB3200</b>	<b>5</b>
<b>10</b>	<b>Rotating 50</b>	<b>10</b>
<b>Chain sawing frame machine</b>	<b>Linear MSK 320 + MB 320</b>	<b>5</b>

**Data from table 1 should be used during procedure of checking the controller's parameters.**

Cable connection of the encoder should be routed as far as it is possible from other electrical cables. Using special clip bands lead it to the place where the controller is mounted.

## **Point – 5**

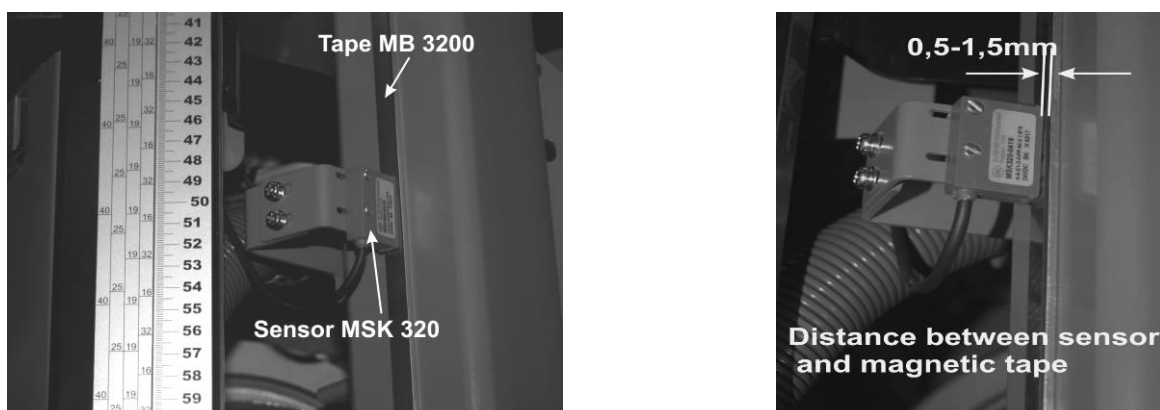
### **Linear magnetic encoder mounting (version for chain sawing frame machines)**

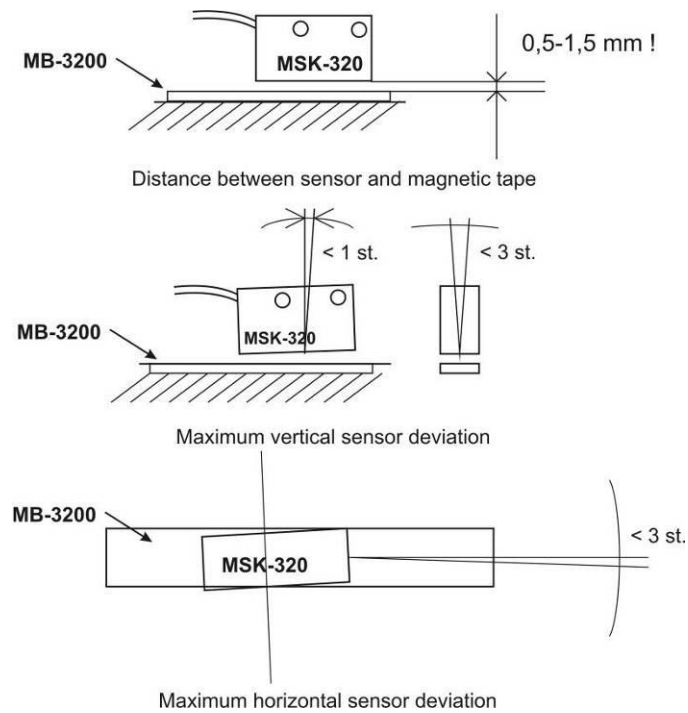
In case of saw head fed with chain the linear magnetic encoder MSK-3200 needs to be used. It works together with magnetic tape MB-3200.

The magnetic tape contains two parts which contains with self-adhesive layer. First, thicker part please place on the smooth and flatten surface (please clean the surface carefully before sticking the tape using acetone or spirit). During sticking please get unstuck only small part of the tape on the tip and stick it to the surface. Next get unstuck rest of the tape slowly sticking it to the surface simultaneously. During sticking please use rubber roll to create bigger adhesive pressure. Please stick the tape very careful and try to not create any air bulging and notice to stick it straight. Next please stick the second part of the magnetic tape – steel protection strip using the same proceeding as above. Both tapes should be stuck in one line laying on each other creating two layers. Sensor MSK-3200 should be mounted on not moveable part of the machine (according to the controller) to not create any cable movements which can cause its damage. In case of mounting sensor on moveable part please protect cable from its non-controlled damage leading it in a special portable buses. Sensor should be mounted with two screws in a way that the magnetic tape should be in a 1 to 1,5 mm distance and in parallel with it. Please notice during leading the cable to place it as far as it is possible from other cables. Please do not place any sources of the magnetic field next to the magnetic tape during, before and after mounting. It may cause it serious damage and incorrect working of the controller. Please clean the surface of the tape from time to time with sift brush.

Please do not hit sensor or the tape. The sensor should be mounted in that way thus text SCALE SLIDE is faced on the magnetic tape side. The sensor and the tape should be mounted in a such way that during feeding sensor “is above” the tape in all range. Please notice the stability of the tape and the sensor during normal operating.

*Fig. 5 Sensor and magnetic tape mounting example*





## **Point 6**

### **Installation of the up and down electronic feed limit switches.**

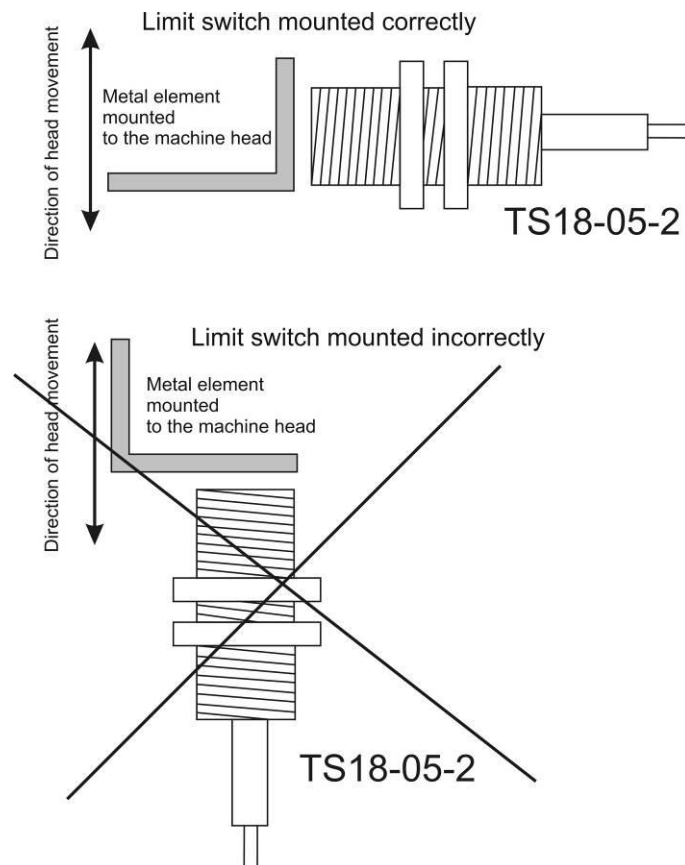
Head movement limit switches are required for the correct operation of the adjuster. The set includes 2 pcs of electronic magnetic limit switches type TS18-05P-2 Highly.

These are typical contactless sensors that respond to the approach of a metal element marking the maximum movement of the machine head. These sensors should be mounted into pre-made holes, using mounting nuts supplied with the sensor. The function of metal elements activating the limit switch can be provided by angles attached to the moving part of the head passing the face of the sensor at a distance of 2–4 mm. When routing the cable from the limit switches, make sure that they are as far away as possible from other cables and power devices.

Remember that there is a specific time interval between the moment the limit switch is activated until the head stops, depending on the mechanical inertia of the machine. During that time, the head passes a certain distance, therefore it is not possible to mount the sensor in such a way that the activating metal element interferes with the location of the sensor (Figure 6). It is also necessary to provide for the possibility of changing (adjusting) the mounting place of the metal element activating the limit switch so as to adjust the switch-off point of the drive during the start-up of the adjuster.

Instead of electronic limit switches, you can also use good quality mechanical limit switches with NC terminals, connecting them to the adjuster as shown in **Figure 8**.

**Figure 6**



**Electrical connections of external components to the adjuster.**

**Before connecting the wires, it is absolutely necessary to turn off the power supply of the converter and the ISP-12F adjuster!**

**Connection of control inputs of the frequency converter**

For connection, use an 8-core screened control cable with a cross-section adapted to the connection terminals.

The isolated ends of the individual conductors should be tightened in collets appropriate for the given cross section; the use of collets improves electrical contact and prevents breaks in connections. The screen (braid) of the cable should be connected to the connection **only from the side of the frequency converter!**

**Connection of cables from the adjuster to the converter should be made according to the following description:**

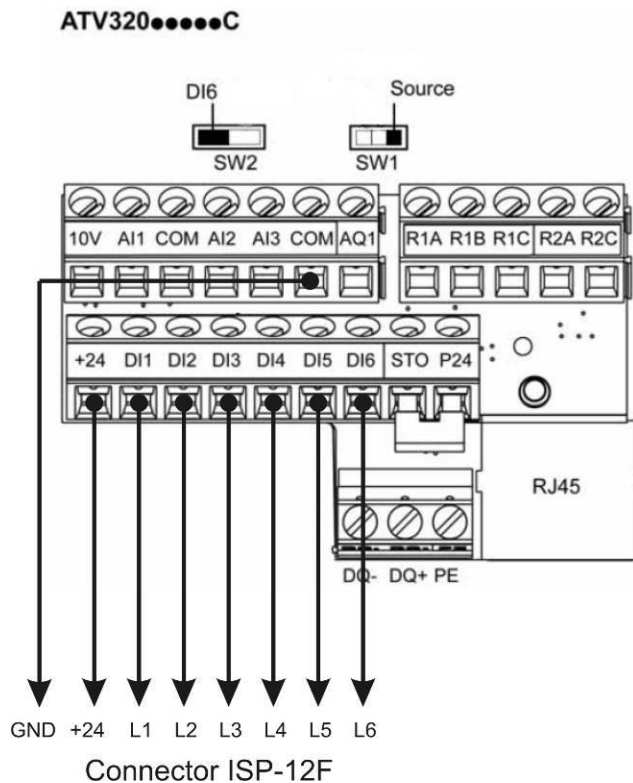


**Connector of the adjuster Connections of the frequency converter  
ISP-12F (PWR CONVERTER ATV 320 3\*380V)**

+24 -----	+24
GND (-24V) -----	COM
L6 -----	DI6
L5 -----	DI5
L4 -----	DI4
L3 -----	DI3
L2 -----	DI2
L1 -----	DI1

**The screen (braid) - COM connect only from the side of the inverter!**

**Figure 7  
Connection of electrical terminals of the ATV 320 converter**



**Prepared cables connections and casing assembly of the controller.**

Please connect power cable TS 8/24 (SEC,12 V), (with prepared cables' tips) to the junction marked as PWR on the controller's main plate.

**Rotating encoder's connection:**

Encoder cables please connect with junctions marked ENCODER as follow:

- brown cable with (+24) plus controller's connection
- blue cable with (GND) minus controller's connection
- white cable with (IN-1) connection
- black cable with (IN-2) connection.

### Magnetic encoder's connection MSK-320 in chain sawing frame machine:

Magnetic encoder cables please connect with junctions marked ENCODER as follow:

- brown cable of MSK-320 with controller's junction marked as (+24) plus
- black cable of MSK-320 with controller's junction marked as (GND) minus
- red cable of MSK-320 with controller's junction marked as IN-1
- orange cable of MSK-320 with controller's junction marked as IN-2



**CAUTION!!!**

**Incorrect connection of the rotating or magnetic encoder may cause its serious damage!!**

### Connection of TS18-05P-2 electronic limit switches:

Connect the limit switch restricting the downward movement to the MPS-DWN connector of the adjuster:

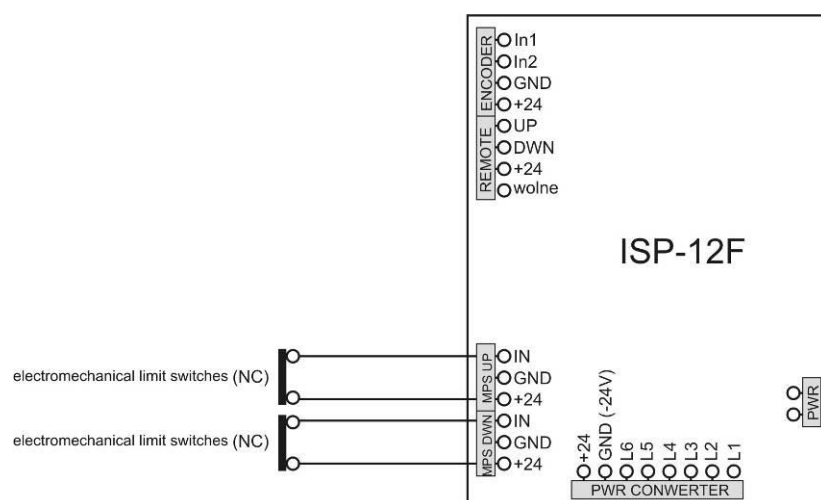
- brown to connector +24
- blue to connector GND
- black for connector IN

Similarly, connect the limit switch restricting the upward movement, this time to the MPS-UP connector.

Instead of electronic you can use electromechanical switches and connect them as shown in the figure.

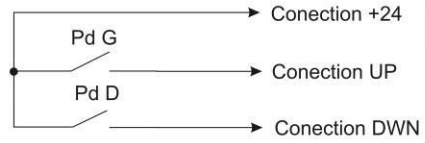
**Figure 8**

### Wiring diagram for electromechanical limit switches



**Figure 9**

**Wiring diagram for manual remote control buttons**



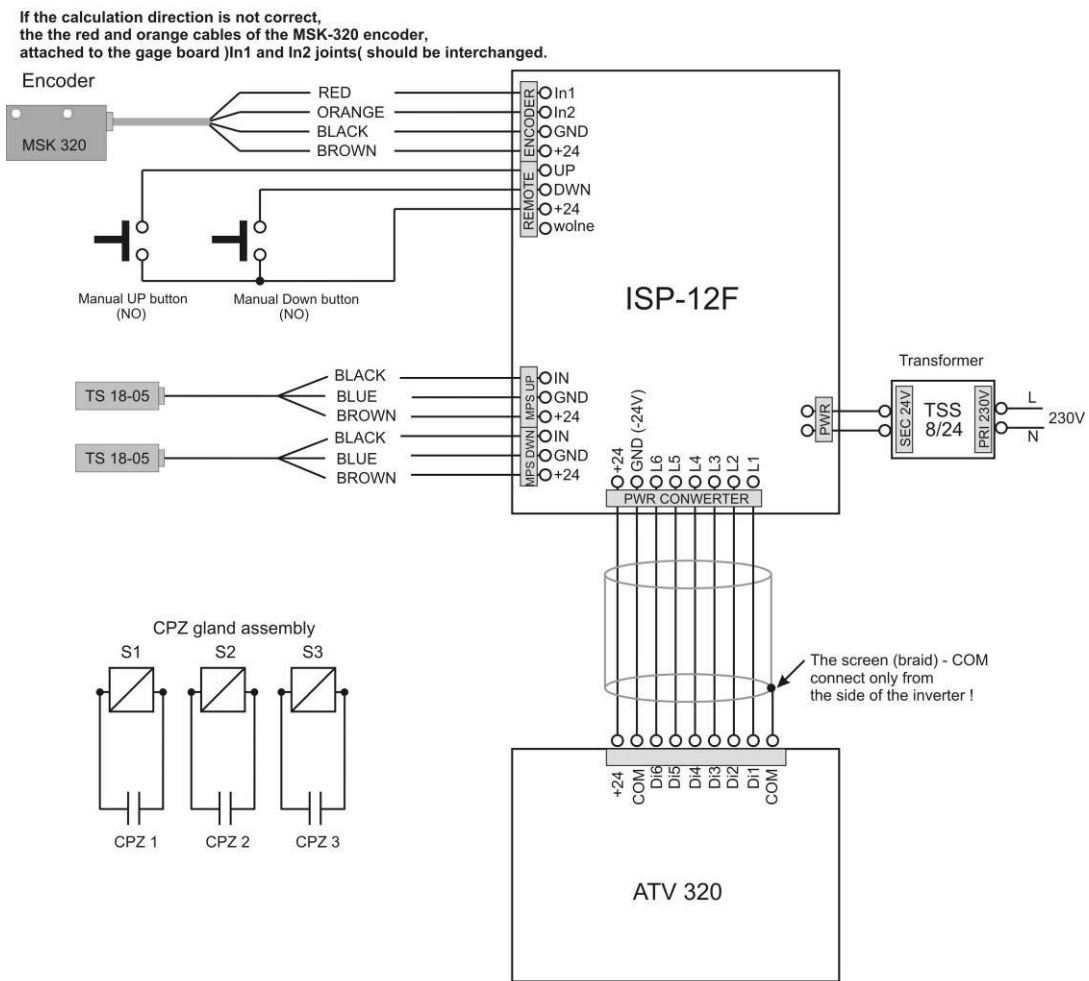
Pd G - manual buttons Up  
Pd D - manual buttons Down

REMOTE connector ISP 12F

**Figure 10**

**Block diagram for MSK 320 magnetic encoder**

block diagramfor MSK 320 sensor



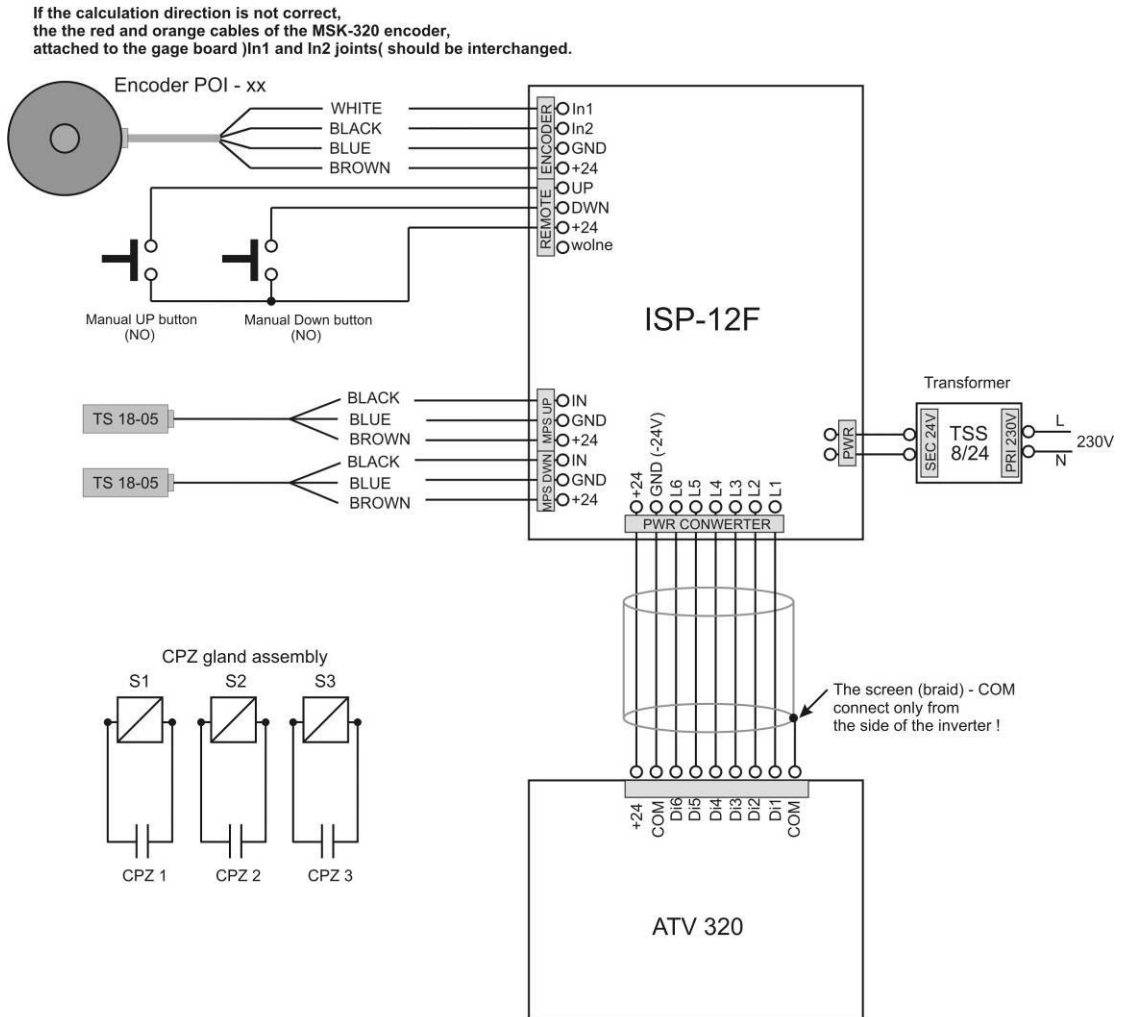
Li1 = 0 and Li2 = 0 this STOP ATV 320

Direction input		Speed		Choice of speed	Function for ATV-320	Frequency
Li1-Dwn	Li2-UP	Li3	Li4			
+24V	0V	+24V	+24V	Fast down	SP4	>=50Hz
0V	+24V	+24V	+24V	Fast UP	SP4	>=50Hz
0V	+24V	+24V	0V	Not used	SP2	--Hz
+24V	0V	0V	+24V	Slow down	SP3	10Hz
0V	+24V	0V	+24V	Slow UP	SP3	10Hz

**Figure 11**

**Block diagram for rotary encoder**

block diagram for for rotary encoder



Li1 = 0 and Li2 = 0 this STOP ATV 320

Direction input		Speed		Choice of speed	Function for ATV-320	Frequency
Li1-Dwn	Li2-UP	Li3	Li4			
+24V	0V	+24V	+24V	Fast down	SP4	>=50Hz
0V	+24V	+24V	+24V	Fast UP	SP4	>=50Hz
0V	+24V	+24V	0V	Not used	SP2	--Hz
+24V	0V	0V	+24V	Slow down	SP3	10Hz
0V	+24V	0V	+24V	Slow UP	SP3	10Hz

Next step after creating all of the connections is assembly of the controller's casing. Before connecting from panel with the back side please check if the rubber sealing is in the special groove. It is important in regarding sealing and protecting controller's main electronic plate from any contamination. After put the from panel in together with the back side please screw casing using included six screws 4,1x12. Before mounting the controller on the machine it is recommended to checking of proper controller's operating according to "first start" chapter (2). After checking of the controller's proper operating please use safety plugs in the places where screws are and mount the controller on the machine. Controller's mounting in the main machine's board is analogical, there is only one difference that front panel is screwed from the inside with plastic frame and main panel casing. After all mounting please carefully pull out cables which go out at the back side of the controller's casing to reduce their unnecessary length in the inside. Please be careful to not destroy any connection. After this operation please screw PG choke to create proper sealing. Next step, in case the controller as a separate devise, please mount it using four 4,1x10 screws on the sawing frame machine. Screws should go though four holes in the back casing created for this purpose.

## Chapter 2

### First-time start-up

**Some of the converter settings must be adapted to your drive before operation (parameters of the head feed motor, moment of inertia of the drive and related acceleration and deceleration ramp times).**



**Attention!**

**The configuration of the adjuster requires basic technical knowledge related to the practical application of the said devices and should be performed by a person with appropriate professional qualifications.**

**Correct configuration requires the exact programming sequence K1-K9!**

**Programming the frequency converter.**



**Attention!**

**Programming of the frequency converter parameters should be performed while it is turned on but not executing control commands and the display shows the message "rdy"**

**The time parameters of the acceleration and deceleration ramp should be selected depending on the weight of the moving parts of the machine head drive and the travel speed of the drive.**

**In order to optimize the stopping time of the head, appropriate brake resistors should be used, matching the performance of the frequency converter.**

**When determining ramp times, make sure that they are not too small in relation to the machine's inertia.**

A too short stopping time may cause an overload of the converter (exceeding the maximum feedback voltage on the capacitors), which will cause the converter to stop operating and display an appropriate error message.

To enter the menu, press the rotary knob of the ATV 320 converter while the “rdy” message is being displayed, then turn the knob to select a further menu. Use the knob to change the value of the set parameter and press to save the changes.

When the function value in the menu is changed, the LEDs on the display start to flash and the changed value is confirmed by pressing the knob.

To exit a menu, press the ESC button next to the knob.

If the ATV 320 frequency converter is supplied with the adjuster, some parameters are already pre-set. In such a case, only the function parameters marked in grey should be modified.

If the converter is not supplied with the adjuster, a full configuration of functions should be made, as described in all tables!

**(K-1) Setting of electrical parameters of the drive:**

Input by: ConF – FULL – Sin -

Function	Value	Description of the function
bFr	(from the motor name plate)	Motor rated frequency (Hz)
UnS	(from the motor name plate)	Motor rated voltage (V)
nCr	(from the motor name plate)	Motor rated current (A)
Frs	(from the motor name plate)	Motor rated frequency (as above) (Hz)
nSP	(from the motor name plate)	Rated engine speed (rpm/min)
tFr	= > 50Hz	Maximum output frequency (Hz)
nPr	(from the motor name plate)	Motor rated power (kW)
tUn	No	Auto tuning engine inactive
itH	(from the motor name plate)	Motor thermal current (A)
ACC	Optimal selection for the speed and inertia of the machine	Converter acceleration ramp time (s) <b>Attention! Define the ramp time after activating the adjuster</b>
dEC	Optimal selection for the speed and inertia of the machine	Converter deceleration ramp time (s) <b>Attention! Define the ramp time after activating the adjuster</b>
LSP	0.0	Minimum speed (Hz)
HSP	<= from the value set in the function tFr	Maximum speed (Hz)

### (K-2) Setting of electrical parameters of the drive (continued)

Input by: ConF – FULL – drC -

Function	Value	Description of the function
Ctt	UUC	Voltage vector control

### (K-3) Configuration of control inputs

Input by: ConF – FULL – I-O -

Function	Value	Description of the function
tCC	2C	2-wire control
tCt	trn	Status change is required to trigger the input
Frd	LII	Terminal DI1 triggers downward motion (forward)
rrS	LI2	Terminal Di2 triggers upward movement (backward)

### (K-4) Configuration of control inputs (continued)

Input by: ConF – FULL – Fun – PSS -

Function	Value	Description of the function
PS2	LI3	Terminal DI3 triggers the set speed
PS4	LI4	Terminal DI4 triggers the set speed
SP2	10	Second set speed (not used)
SP3	10	Frequency of free movement to position (Hz)
SP4	= &gt; from the value set in the function tFr	Frequency of fast motion (Hz)

### (K-5) Configuration of control inputs (continued)

Input by: ConF – FULL – Fun – LPO-

Function	Value	Description of the function
SAF	LI6	Terminal DI6 – limit switch down
SAr	LI5	Terminal DI5 – limit switch up
SAL	LO	Triggering with a low logic state from limit switches
PAS	rnP	Type of stop after a signal from limit switches (ramp)
dSF	Std	Type of stop (standard)
nSTP	nO	Limit switch operation memory (off)

### (K-6) Configuration of control inputs (continued)

Input by: ConF – FULL – I-O – L1 do L6 -

Function	Value	Description of the function
L1d to L6d	1	Delay of the input lines DI1 to DI6 (ms)

### (K-7) DC current braking configuration.

Input by: ConF – FULL – Fun – AdC

Function	Value	Description of the function
AdC	yES	DC current braking is on

### (K-8) DC current braking configuration (continued)

Input by: ConF – FULL – Set –

Function	Value	Description of the function
tdC1	0.5	DC braking time after stopping (s)
SdC1	< rated current	DC braking current value (A)



#### Attention!

Due to the phenomenon of mechanical head lowering during vibrations occurring in the cutting process, the recommended option is to install a drive brake with an electromagnetic release.

The application of this solution keeps the head fixed in position during the entire cutting process.

To control the brake release, use the **R2A R2C** relay output and program it as described

### (K-9) Configuration of the brake (electromagnetic release).

Input by: ConF – FULL – Fun – bLC

Function	Value	Description of the function
bLC	r2	The R2 relay controls the release
bIP	nO	Impulse of the direction of rotation – no
Ibr	0.0	Brake release current (A)
brt	0.00	Time needed to mechanically release the brake (set a different value if necessary [s])
bEn	Auto	Brake frequency threshold
bEt	0.00	Mechanical brake engage time (set a different value if necessary [s])



For any additional information, please refer to the operating instructions of the ATV 320 converter manufacturer.

After fine-tuning of the parameters and checking the correctness of the operation of the adjuster cooperating with the converter, save the configuration made to the ATV 320 memory so that it can be quickly restored if necessary.

Custom settings should be saved in the converter memory in **configuration number 2(Str2 – CFG2)**

**Configuration number 1(CFG1)** contains pre-set settings supporting the ISP-12F adjuster but does not contain drive parameter values; it is only used for the **initial configuration**.

### Saving your custom configuration in the converter memory (Str2):

rdy – ConF – FCS –

Function	Value	Description of the function
Fry-	ALL	When the message ALL is displayed, press the knob so that the two vertical bars on the right side of the display <b>are displayed at the top and then press ESC</b>
SCSI	Str2	Selected configuration set number 2. Press the knob and hold for > 3s until the dots on the display stop flashing

The configuration that is currently loaded into the converter cannot be selected for saving. For example, if the converter is currently operating using the configuration number 1, then you can only select configuration number 2 or restore factory settings (InI).

### Recovering a previously saved configuration from the machine's memory, (CFG2):

rdy – ConF – FCS –

Function	Value	Description of the function
FCSI	CFG2	Selected restore factory configuration
Fry-	ALL	When the message ALL is displayed, press the knob so that the two vertical bars on the right side of the display <b>are displayed at the top and then press ESC</b>
GFS	YES	After changing the message to YES, press and hold the knob for > 2s until the dots on the display stops flashing

If the converter is supplied with the ISP-12F adjuster, you can restore the initial configuration as described above by selecting the CFG1 name in the FCSI function.

### Restoring factory settings of the ATV 320 converter

If necessary, you can restore the factory settings (it does not include the initial configurations for the ISP-12F adjuster)

After restoring the factory settings, set all the required parameters according to the operating instructions!

**Restore factory configuration of the converter:  
rdy – ConF – FCS –**

Function	Value	Description of the function
FCSI	INI	Selected restore factory configuration
Fry-	ALL	When the message ALL is displayed, press the knob so that the two vertical bars on the right side of the display <b>are displayed at the top and then press ESC</b>
GFS	YES	After changing the message to YES, press and hold the knob for > 2s until the dots on the display stops flashing

**After correct configuration of the converter, check the operation of the ISP-12F adjuster**

**Start-up of the ISP-12F adjuster**

To check the correctness of connections, follow the steps below:

- After switching on the power supply, check whether the message ISP 12F is displayed. If not, check the TSS 8/24 transformer connections and try again.
- After the ISP 12F message disappears, press the button of the manual control of the head **downwards** and check whether the head moves **down**; if the head moves in the opposite direction (up) **change positions of two out of three phase wires feeding the head engine**.
- Press and hold for a moment the “down” button of the manual control of the head on the machine desktop. During manual lowering of the head, pay attention to whether the dimension displayed in the “Saw Height” window decreases along with the downward movement of the head. Similarly, by pressing the “up” button of the manual control of the head, the dimension in the “Saw Height” window should increase along with the upward movement of the head. If the counter malfunctions, i.e. the displayed value decreases when the head is moved up and increases during the downward movement, swap the black and the white wire (in the case of a rotary encoder) or the red and the orange wire (if the MSK-320 magnetic encoder is used), (ENCODER, terminal In1, In2) and check the operation of the counter again. Checking the correctness of counting is very important; if the counting direction is not correct, the adjuster will not operate.

**Finally, check that the limit switches limiting the movement of the head up and down operate correctly. Limit switches should be fine-tuned to ensure safe stopping of the head in extreme positions when reaching the full speed (test approach motion should be at least 100 mm); when the movement stops, the adjuster displays the message “dn STOP” or “UP STOP”, depending on the limit switch activated.**

**After activating the adjuster, the ATV 320 converter acceleration and deceleration ramp time should be carefully selected (Table K-1, setting the electrical parameters of the drive, ACC and Dec function).**

**The appropriate selection of ramp times should ensure the fastest possible acceleration from the 0Hz frequency to the maximum operating frequency, as well as the fastest possible release from the maximum operating frequency to 0Hz. The deceleration ramp time must be selected so that even in the most adverse conditions, stopping the drive does not cause the converter to enter emergency mode due to excessive voltage generated at the motor terminals.**

**The optimal operation of the deceleration ramp ensures the use of braking resistors in this type of positioning applications.**



**Limit switches as well as their triggers should be properly mounted and tightened as it affects their operation!**

**If the verification of connections according to the description above has been completed successfully, you can proceed to the next stage of the start-up (Chapter 3).**

## **CHAPTER 3**

### **Controller's parameters checking**

To use those instructions it is required to check pitch of the feeding screw. Please measure it and write it down below:

***Pitch screw in this machine is ..... Mm***

Next, please check type of the encoder mounted on this machine at the end of the screw (photo 4a). Encoder's type is marked on its casing and shows impulses to rotation ratio generating. Please note this number below:

***Encoder's impulses to rotation ratio mounted on this machine is ..... imp/rot.***

Next, using table 1 from point 4 of this instruction check which divider is correct for this sawing frame machine. Example: for pitch screw 7 mm and encoder's impulses to rotation ratio 42 imp/rot. divider read from the table is 12.

After checking this values please note it below:

***Divider (table 1) .....***

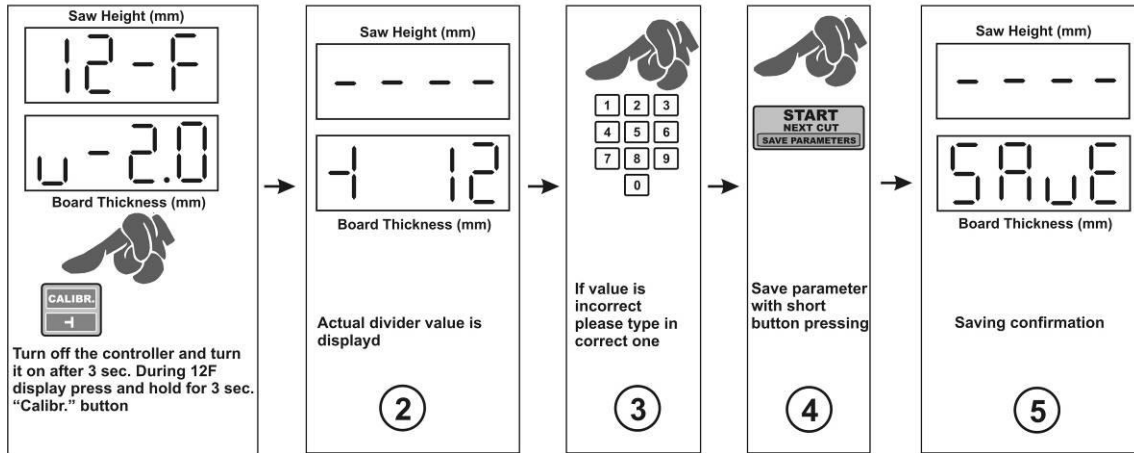
**If the controller is mounted on the chain sawing frame machine thus divider according to the table 1 is 5.**

**For checking all controller's parameters, please follow points 1...5 below.**

#### **1- Input divider checking**

For checking input divider value please turn on the controller and during the ISP 12F is displayed please press "Clibr." button. The controller display in "Board Thickness" window divider symbol at the left side and its value at the right one. Please compare read value with value which should be provided from the table 1. If the value is not correct, please type in required one and save it to the controller's memory pressing "Start/Next Cut" button. Text "Save" should be shown.

Proceedings of checking and eventually changing input divider correct value

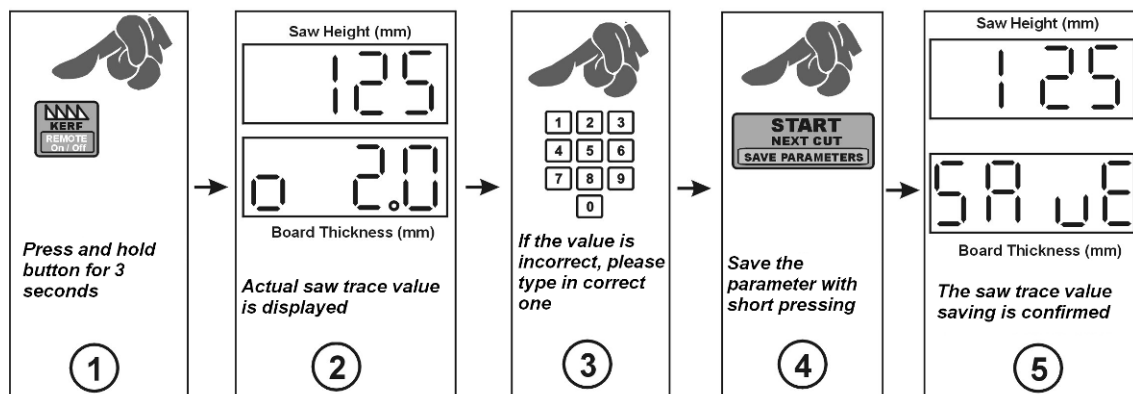


**Please notice that after setting up the input divider it is needed to follow next starting instructions otherwise the controller will not work properly.**

**2 – Saw trace value checking**

To check and eventually change the value of the saw trace please hold for 3 seconds button with saw symbol. The symbol of the saw trace and its value will be displayed. Now there is a possibility to check and eventually change this value depends on the saw type used. Typing in the saw trace please notice that the value is round off to one place after the come. Example: if you want to type 2 mm first press 2 button and then 0. On the screen 2.0 value will be displayed. After checking and eventually changing the value of the saw trace to save it to the controller's memory pressing "Start/Next Cut" button. Text "Save" should be shown.

Proceedings of chcking and eventually changing the saw trace value



### 3 – real saw height settings

Please check if the mechanical scale (millimeter scaled strip with saw height indicate needle) is scaled correctly, thus shows real head saw height above the main track of the machine. It will help with checking rest of the parameters later on.

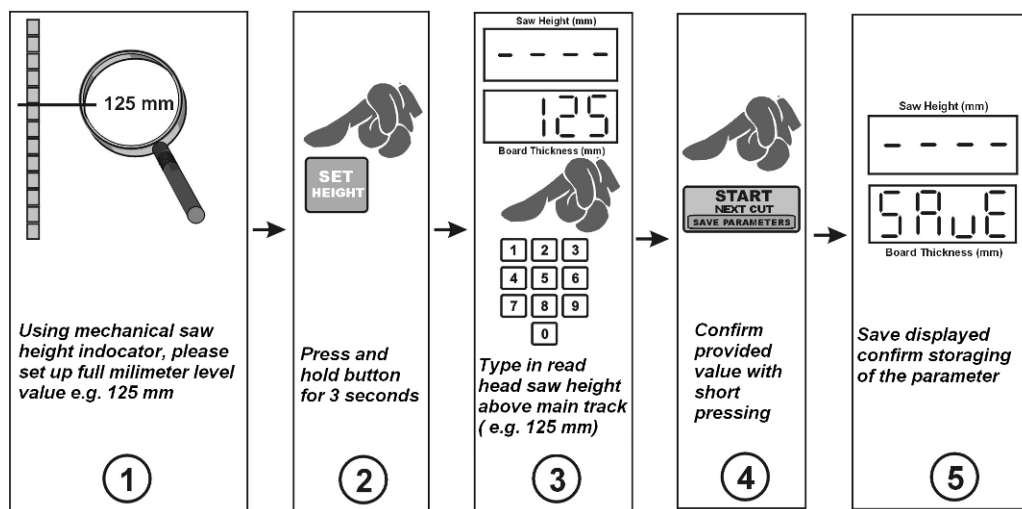


**Correct height indicator is important for correct controller's calibration.**

When the indicator is scaled correctly please set up manually full millimeter value of the head saw, read it correctly and save it into controller's memory as follow:

Press and hold "Set Height" button for 3 seconds and on the upper display dashes will be displayed. Next please type in the read actual saw height value using numeric keyboard. Please type the value briskly because with longer pause controller end this operation. If there will be a mistyping in providing the real value, please wait 3 seconds and start again. Please type in value as follow: e.g. for giving 125 mm press 1-2-5 buttons. Next please storage the parameter shortly pressing "Start/Next Cut". The save sign will confirm operation.

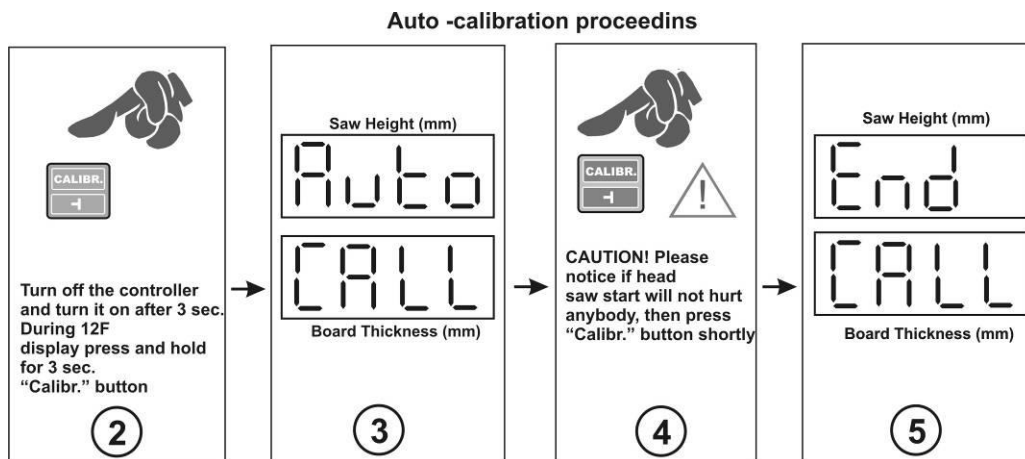
#### **Real head saw height above main track settings**



### 4 –Auto-calibration (fine-tuning of the adjuster to the mechanical parameters of the machine)

Press and hold the "Calibr." button for about 3s. The display will show "Auto Call"; now check whether it is safe to start the head in the auto-calibration movement. If the activation of the head does not endanger the safety of persons in the vicinity, press the "Calibr." button. The adjuster will perform automatic calibration movements; the number of movements may vary depending on the design of the machine.

After completing the calibration movements, the adjuster will turn off the head drive and the display will show the "End Call" message, confirming the correct completion of auto-calibration.



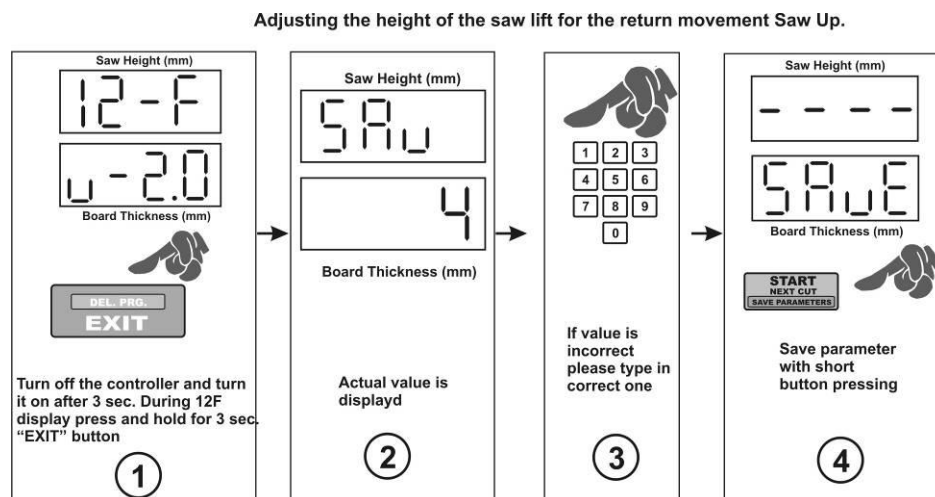
Because of the changes of the sawing frame machine's mechanical parameters which depend on variety of factors such as temperature, frictions factors etc. it is recommended to use auto-calibration at least twice a week.

### 5 – Adjusting the height of the saw lift for the return movement Saw Up.

After pressing the “Saw Up” button, the ISP-12F adjuster lifts the saw over the cut material to allows it to return safely to the beginning of the processed material.

**The lifting height of the saw in normal mode can be modified as follows:**

- Turn off the power supply of the adjuster and after approx. 3s, turn it on again.
- While the 12-F symbol is lit, press and hold the EXIT key.
- the “SAV” message appears on the upper display, while the lower shows the currently entered value (default = 4).
- If you want the saw to move higher in normal mode, enter a different value between 1 and 100.
- Approve the new value by pressing the START button for a moment.



**ATTENTION! The actual height of the saw lift always slightly exceeds the value selected for the lifting function due to the mechanical inertia of the machine stop. For example, the value entered = 4 can mean an actual lifting height of = 10mm. This should be taken into account and adjusted if necessary.**

The adjuster also has the ability to program 2 **modes of saw return height** above the material during cutting: after using the “Saw UP” button, LO and HI modes.

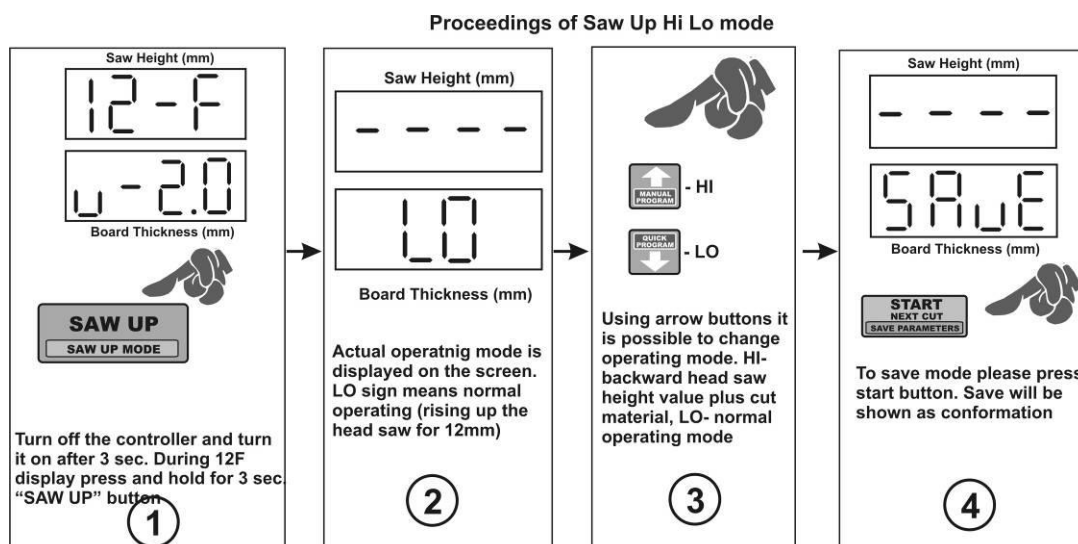
In normal mode (LO), after pressing the “Saw UP” button, the adjuster lifts the saw to a fixed height set in the function described above, over the material being cut. In this mode, before returning the head to the beginning of the track, remove the cut board.

In the second available mode (HI), after pressing the “Saw UP” button, the adjuster lifts the saw by 12 mm plus the last cut dimension. In this mode, after cutting another board, you can return the head to the beginning of the track without removing the cut board.

**The default setting is factory-programmed in normal mode (LO).**

To change or check the operating mode, follow the steps below:

- Turn off the power supply of the adjuster and after approx. 3s, turn it on again.
- While the 12-F symbol is lit, press and hold the “Saw UP” button for approx. 3 s.
- the current operating mode is shown on the upper display. The message “LO”, meaning a fixed head lift in the “Saw UP” function by approx. 12 mm, or the message “HI”, meaning lifting the head in the “Saw UP” function by the value equal to the sum of the currently displayed cutting dimension and the fixed height equal to 12 mm.
- Change the mode using the arrow keys.
- The parameter is saved after pressing “Start/Next Cut”.



**After the above operations have been carried out correctly, the adjuster is ready for use.**

## **Practical application of the adjuster**

**The ISP-12F adjuster offers the option to duplicate the “Saw UP” and “Start/Next Cut” buttons using the manual control buttons (remote mode).**

**The remote mode is activated automatically after confirming the cutting program and indicated by a LED marked “Remote Control”.**

**In normal mode, activating the manual control causes the head to move in the selected direction until disconnected by pressing the button. During the cutting program, the buttons operate in the same way as the “Saw UP” and the “Start/Next Cut” buttons, respectively. It is possible to manually activate and deactivate the remote mode, using the “kff (F)” button while the cutting program is on.**

### **Controller’s practical use**

**Controller takes into account trace of the saw, cutting thickness displayed on the screen is real cutting value of produced material. Next instructions describes cutting methods available in this controller.**

## **CHAPTER 4**

### **Desired cutting values under A, B, C buttons**

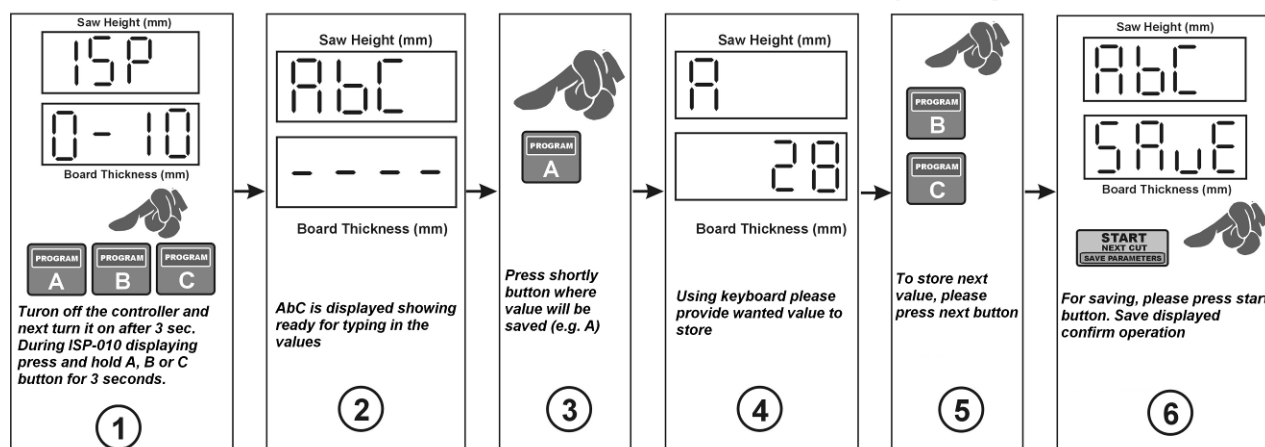
On the controller’s panel there are three A, B, C buttons available. Please press one of them shortly and there is a possibility to storage cutting value under each those buttons.

To storage often use cutting value in one of the button follow:

- reboot the controller
  
- while ISP-12F is displaying press one of the A, B, C button and there will be abc text and dashes shown on the screen
- next, please press again one of the button where the value will be saved, name of the value is shown (A, B or C)
- type in the value and eventually press next button to store next cutting value
- After desired values save them using “Start/Next Cut button”. “Save” confirm operation.



**Desired cutting values under A, B, C buttons proceedings**



## CHAPTER 5

### Normal mode cutting (board by board)

Cutting in this mode is the most simply one. In this mode please make measurement and divide log from the top on separate boards. To make it, please set up the head saw on the level of first cut. Cut it and take away scraped material and then press „Saw UP” button which will cause rising up the head saw above the log for save backward at the beginning of the track. Now there is a possibility to change displayed thickness of the next material cut (Board Thickness) using the keyboard or use shown value without any change. After this operation, please press shortly “Start/Next Cut” button. Controller sets up the head saw on the required level. Next, please make a cut and then, analogically, take away scraped material from the track and press “Saw UP” button and return at the beginning of the main track. While the controller set up the head saw, there is a possibility to provide/ change thickness value of the next cut.

## CHAPTER 6

### Normal mode cutting without board taking out

Cutting in this mode starts from rising up the head saw above all log’s length. It is a level which the saw will be raised up to after every time the button “Saw UP” will be pressed and thanks to this operation there will be no need to taking out cut boards after each cutting. Next step is to press shortly “Saw Height” button. When the head saw is being installed on the return level “Height” text is displayed. Next set up manually the level of the first cut then cut analogically like in the board by board method. Every cutting operation when the “Saw UP” button is pressed, the head saw is being raised up on the initial level. To erased this level please press shortly “Saw Height” button.

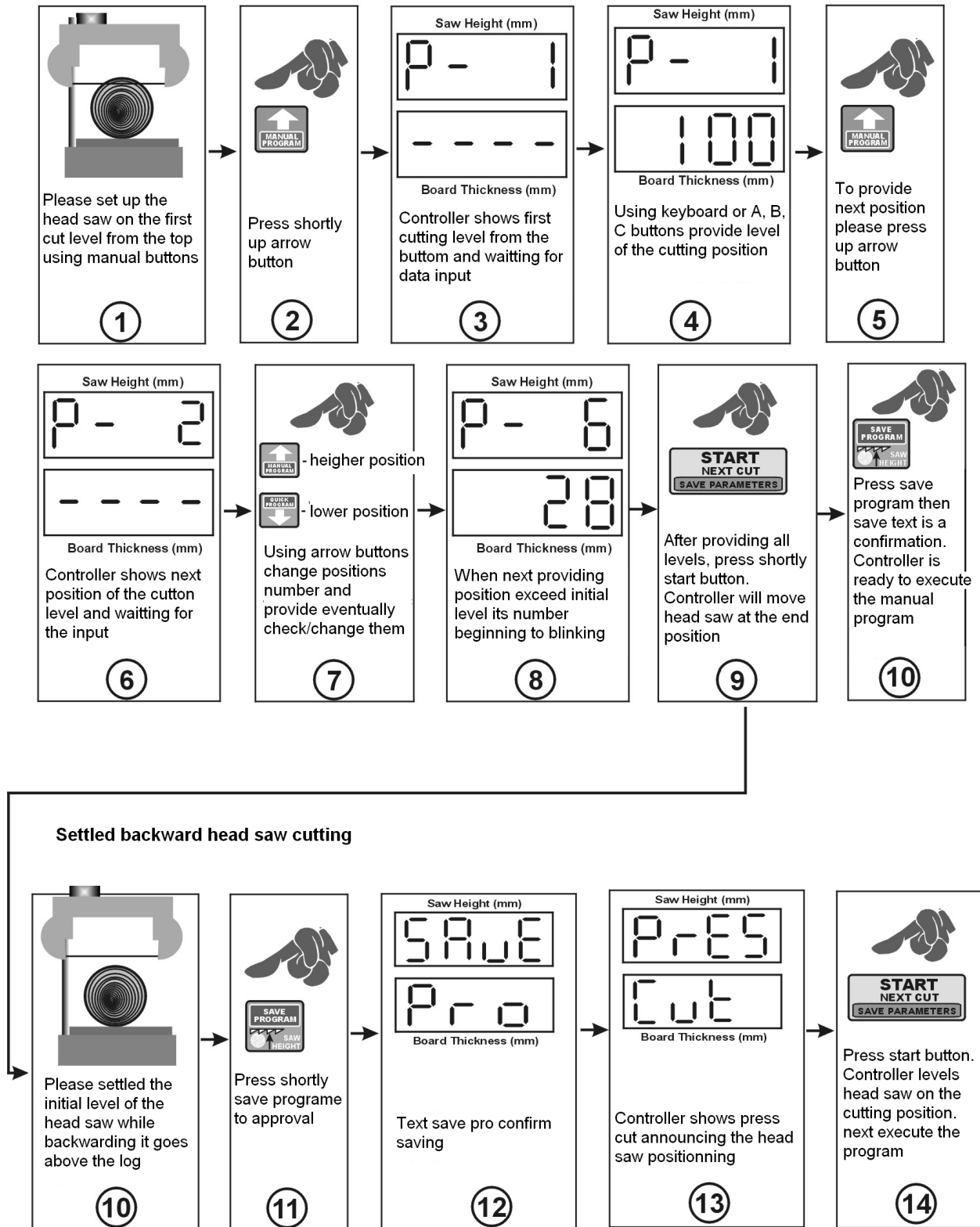
## CHAPTER 7

### Manual mode cutting

Cutting in this mode enable arranging own cutting program using “board by board” method. Programming goes from the position 1 (first cutting level from the bottom) through programmed cutting levels and ends on the actual head saw height.

Reaching this final level is shown as a position blinking on the display which overlaps settled height. One program is used for cutting one log and is not stored in the controller’s memory. To program the controller for own cutting mode, please follow the instruction below. Set up the head saw on the top of the log (level of the last cutting). Then press shortly “Manual Program” and “Program” led is on and controller displays “Str Pro” and then position number 1 and waits for data input (position 1 from the bottom). After providing above value please use up arrow button and provide position number 2. Continue to provide all required position of the cutting. When provided values exceed head saw level, provided position number when it is happening will be blinking. At any moment during manual programming there is a possibility of leveling the head saw using “start/Next Cut” button. After providing all levels for own cutting program and we don’t want to use settled backward head saw height (mode where cut board is taking away from the log after each cutting operation) we can save program pressing shortly “Save Program”. When we want to use settled backward head saw height (cutting without board taking away after each operation) please settle the head saw on the required level just after the programming but before saving and then press “Save Program” button. It causes automatically backward head saw height to be stored (led “Height” is on) and the controller shows “Press Cut” on the display announcing that head saw is not on the first cut level. Next please press “Start/Next Cut” and controller sets up the saw on the first cut level and now the cutting process starts in manual mode.

## MANUAL PROGRAM cutting operation proceedings



If you want to use settled backward head saw height (without taking out boards after each cutting after step 9 follow proceeding above

## CHAPTER 8

### Quick program mode

Using this mode you can easily and automatically divide laying log on the required cut dimension. Basic for dividing is provided dimension and its actual value is shown in the window "Board Thickness". Using this dimension the controller counts number of the boards available till the saw height. It gives the possibility of quick programming from any dimension provided by user before.

While using this mode the dimension can be easily change and user can use many positions and the controller each time counts the new number of boards available from actual head saw position. To use this quick program follow instructions below.

Set up the head saw on the top of the log (position of the first cut). Press shortly "Quick Program" button, the led is on and text "Str Pro" is displayed and then the nearest available cut positions is displayed as well.

Now the lower positions can be changed, fit them to the requirements or position the head saw using "Start/Next Cut" button. Trial without positioning of the head saw is automatically rejected by the controller and text "Pres Cut" is displayed.

During providing the changes on the each positions, those which can not be fit into are rejected by the controller.

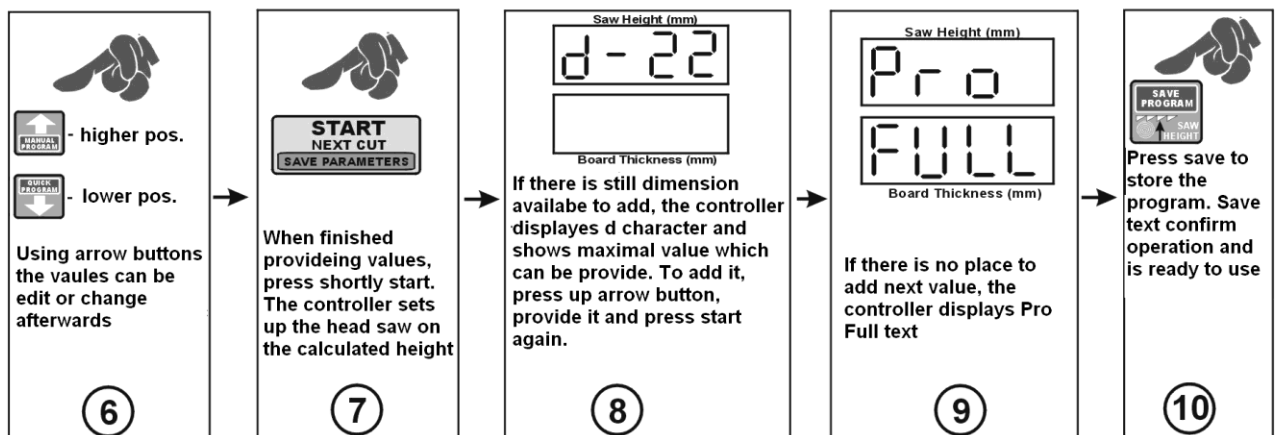
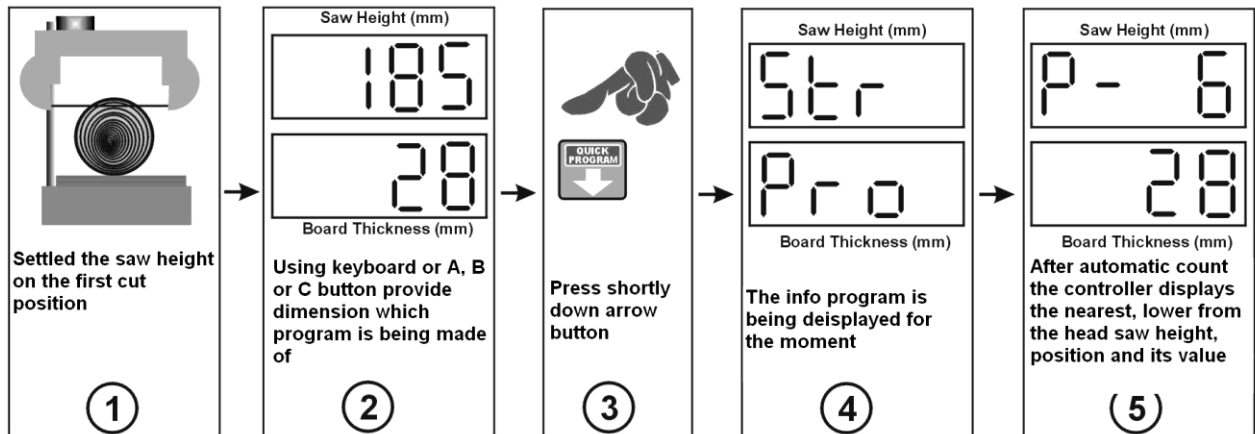
If changes on the positions (lower positions) allows to add new one to the program, the controller adds them automatically.

After programming, please position the head saw using "Start/Next Cut" button. The controller sets up the head saw automatically up to counted positions, if there is a possibility of adding any positions, the controller display d character and just next to it shows the maximal dimension available to add.

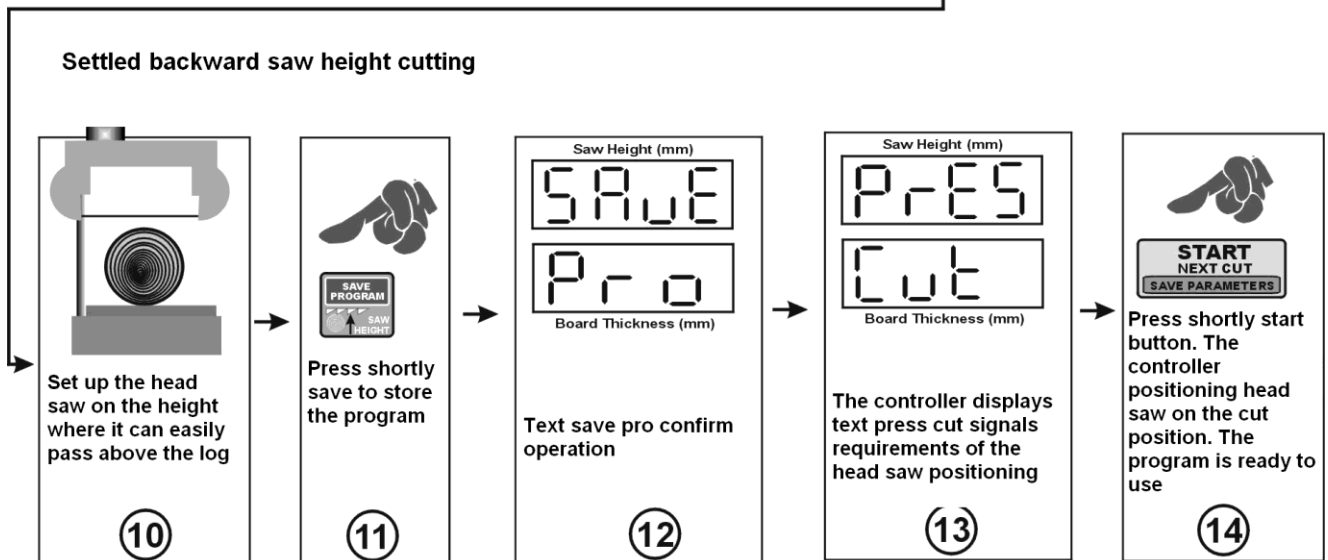
If it is required to add cut dimension, please using up arrow button go to upper position and provide new value from the range provided by the controller. Providing bigger dimension which exceed the saw height it is signal by displaying "Pro Full" text while position the head saw using "Start/Next Cut" button.

If the new positions was added, next it is possible to position the head saw again and save program using "Save Program" button or before saving set up the head saw on the backward height and then save the program (if it is required to use the settled backward saw height as it is in case manual program). If the tip dimension is not being used, please save the program without providing it.

## QUICK PROGRAM proceedings



## Settled backward saw height cutting



If you want to use settled backward head saw position (without taking out boards after each cutting) after 9 step follow proceeding introduced above

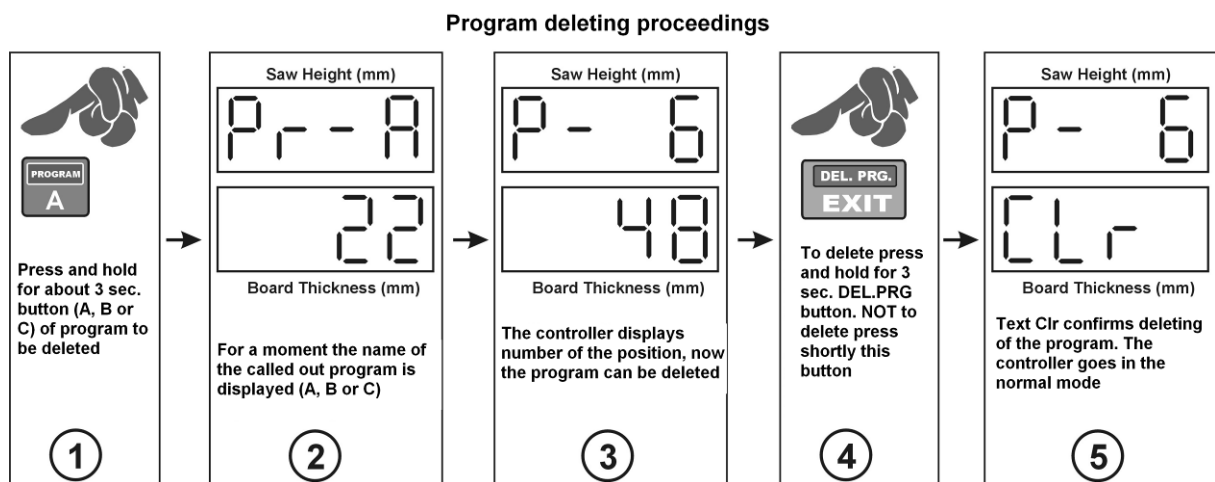
## CHAPTER 9

### Cutting using program made before (A, B, C)

The controller gives the possibility to create three cutting programs and storage them into its memory. This option allows for quick call out programs with very often used values thus shortage of the cutting program. Those programs are named A, B and C.

To use own created program which fulfil your requirements first after holding call out program needs to be deleted after holding A, B or C buttons.

To delete program first use A, B or C (holding for a while) to call it out. When the number is displayed, please press and hold "Exit Delete" button and the text "Clr" confirms this operation and controller goes to normal mode of working.

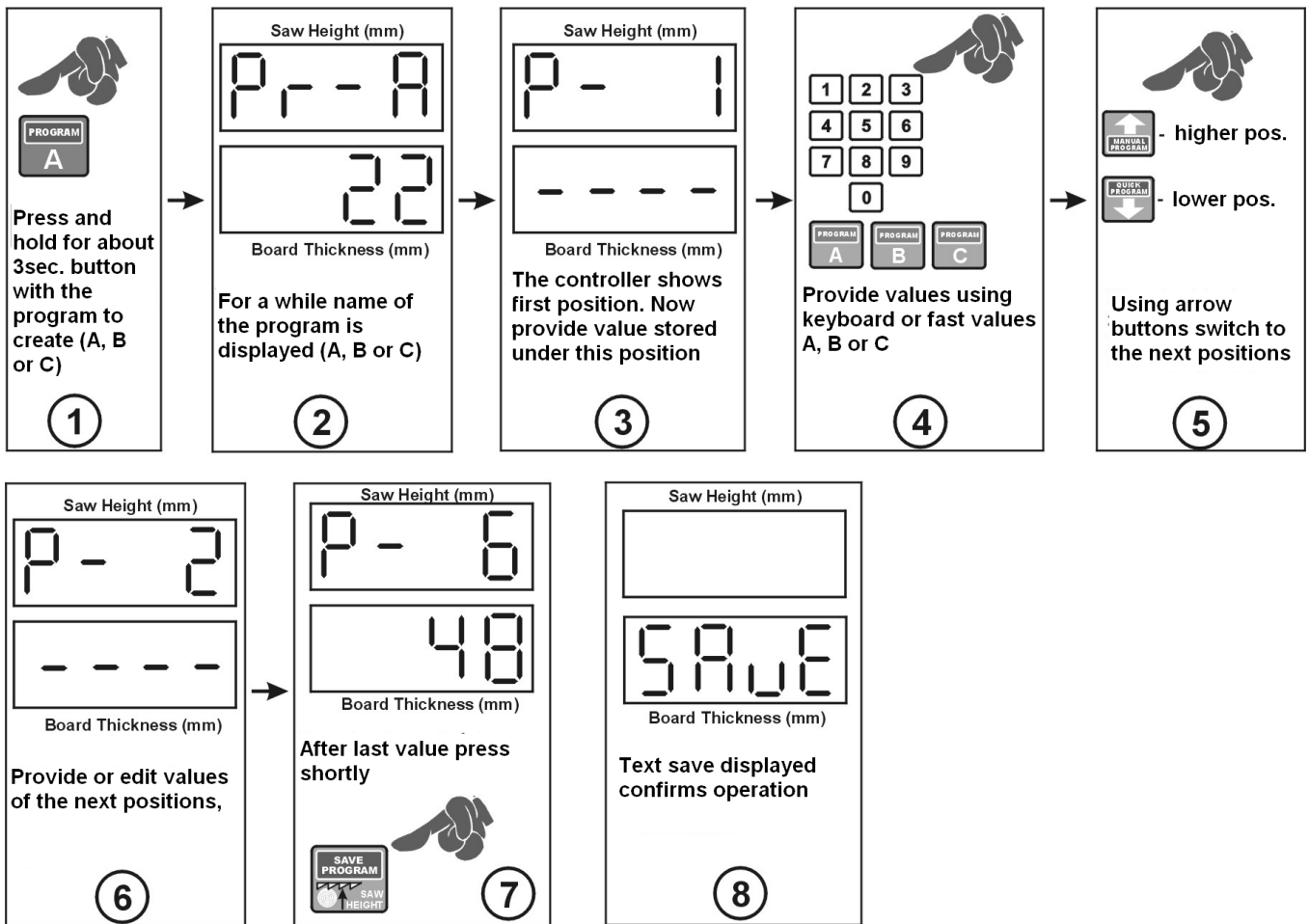


### Creating own cutting program

To create new program in place of the deleted one call it out and after displaying position number 1 with dashes displayed underneath provide dimensions for 1 to 60. After providing, save the program pressing "Save Program" button.

If all of the 60 position are not used, the controller automatically overwrite them with last provided position. Overwriting causes eventually fitting to bigger diameter of the log than predicted by the operator.

### Creating own cutting program (A, B or C)



**CAUTION! Program can be only created after deleting previous, saved one!**

### Using own created cutting programs (A, B C)

To call out the program press and hold A, B or C button. After calling out the proceedings is the same like in case of the quick program.

Changes of the value in any positions during executing the actual program are not saved, there are used only in the actual program thus after next call out the program is not changed.

## CHAPTER 10

### Operation recommendation

For having maximal good parameters of the cutting it is recommended to use auto-calibration at least twice a week. Auto-calibration proceedings are in details described in the point 3 of the chapter 3 “Auto-calibration (controller’s checking in with technical parameters of the sawing frame machine where its mounted)”. Before starting of the operation the “Saw Height” displayed needs to be checked and compared with the real head saw position. In case of the any divergence it needs to be corrected according to the procedure shows in the point 4 of the chapter 3 “real saw height settings”.

Do not press the keyboard using hard or sharp objects, it can cause irreversible damages. In case of the dirty keyboard, please use only proper medium to clean it up. Please remember to not press to hard membrane buttons. Pressing to hard of the buttons can cause damages and eventually exchange of the hole keyboard. The controller should not be exposed direct on getting wet with rain, water or any other fluids.

## CHAPTER 11

### EMC Approval

Controller ISP-12F is approved and fulfil all requirements concerning electromagnetic norms according to EMC. The controller ISP-12F should be set up and installed according to European and domestic norms. Responsible for adjusting the controller is person who set up the electric and control system on the sawing frame machine. It needs to be under EMC regulations. The controller need to be concern as a component of the sawing frame machine, it is not a separate machine or electronic device according to European directive (machine directive and electromagnetic compatibility directive).

The assembler of the controller ISP-12F is responsible for fulfil all those directives. Product and equipment described within this instruction can be modify as from technical as operational point of view. This written description – handbook manual can not be consider as a contract.

## CHAPTER 12

### Possible problems and how to remove them

#### **1 The adjuster does not illuminate when the power supply is switched on.**

Action:

- Check the connection of the power transformer.

#### **2 During manual control of the head, the adjuster displays:**

Action:

- enter the correct distance of the head from the track level (Chapter 3, Section 4)



#### **3 Discrepancies in the machined dimensions**

Action:

- Perform the auto-calibration procedure (Chapter 3, Section 3).
- Check the value of the saw cut (Chapter 3, Section 2).

#### **4 The adjuster does not stop the automatic movement or the saw is misadjusted**

Action:

- Check and (if necessary) correct the value of the input divider (Chapter 3, Section 1).
- Check and (if necessary) correct the value of the cut entered in the adjuster (Chapter 3, Section 2).
- Perform the auto-calibration procedure (Chapter 3, Section 3).

#### **5 During the automatic movement, the adjuster disconnects the drive and displays:**





Action:

- Check the condition of the rotary encoder coupling that connects the encoder to the screw of the machine.
- Check the connections of the encoder to the adjuster board.
- In the case of the MSK-320 encoder, check the fastening and the distance of the encoder from the magnetic tape.
- Check the connections of the control outputs of the adjuster with further electrical installation of the machine and the frequency converter.

**6 During auto-calibration, the adjuster stops the automatic movement and displays the following message:**

Action:

- Action as described above.



**7 The movement has been stopped, the adjuster displays the message or**

Action:

- Check whether the limit switch has been activated.
- Check that there is no open circuit in the limit switch connections.

