CNC Technology, spol. s.r.o.

SPACESAVER 2220

CNC LATHE BARFEEDER

v027-95001

INSTALLATION, OPERATION
AND MAINTENANCE MANUAL

Before starting the work with the barfeeder pay attention to the following instructions:

With regard to continuous improving of barfeeders it is possible that the illustrations and descriptions provided in this manual can differ in details from the delivered equipment. When working with electric circuits follow the regularly updated diagrams in this manual. If you find diagrams attached to this manual, please use them, because they contain changes which have not yet been addressed in the printed copy of the manual sent to you.

The barfeeder enables the simplest and safest feeding of bars into the spindles of standard CNC lathes.

Some common workshop practices do not meet the labour safety principles and should be checked or revised according to the following recommendations. The barfeeder operator should observe the labour safety principles. Furthermore the operator should ensure that the machine is installed by a specialist, and should carry out regular inspection of the barfeeder functions and condition.

Before starting the work with the barfeeder read carefully the following instructions:

- Before barfeeder operation or maintenance, read carefully both this Manual and the attached supplementary information. Make sure that you have understood everything well.
- Make sure that the barfeeder is properly set, aligned with the lathe and fastened to the ground.
- Do not work with the equipment which has not been properly installed, checked and prepared for operation and is not regularly maintained.
- Do not remove any safety plates and labels with signs or warnings, and follow the instructions shown on them.
- Do not slacken screw joints which are secured by paint.
- Do not work with the equipment which produces excessive noise, heat or vibration. In your own interest call immediately attention of the personnel responsible for the barfeeder operation and maintenance to the problem.
- Make sure that the machine is properly grounded in accordance with valid standards.
- Disconnect the machine from electric power supply before any repair or maintenance.
- Do not touch electric control or power parts until they are disconnected from electric power supply.
- Do not touch electric equipment by wet hands or while you are standing in a moist environment.
- Electric equipment of the barfeeder can only be repaired by an authorized person.
- Replace the fuses only by the fuses of the same rating and type as those which have been installed by the manufacturer.
- Keep the space around the machine dry, clean and properly lighted.
- Have suitable extinguishers ready at work with flammable substances.
- Remove turnings and all other waste, especially flammable one, from the barfeeder regularly.
- Do use flammable or toxic substances instead of cleaning agents.
- Do not change the connection or function of safety switches, indicators and fuses, and do not short-circuit or otherwise by-pass this equipment.
- Before the use the barfeeder remove all parts and tools from the barfeeder and its vicinity, in particular from the vicinity of its moving parts.
- If the machine has been out of service for a longer time, check the machining program, part clamping and setting of the barfeeder parameters before fully automatic operation of the lathe with the barfeeder.

- Do not remove or unlock safety guards during barfeeder operation.
- Do not remove or add bars while the barfeeder is running.
- Do not wear rings, bracelets, watches, too free clothing etc at work with the barfeeder. Long hair should be protected by a suitable cap.
- Do try to stop or slow down the barfeeder by your own hands.
- Accessories, which were not delivered by the manufacturer within the basic shipment, must be checked thoroughly by authorized personnel in installation.
- Be especially careful close to unprotected moving parts, in particular in their initial setting. Beware of sharp edges of parts.
- Use only hammers with a soft head (if you must use the hammer).
- Observe operating limits of the equipment given in the specification.
- Use spindle insert to ensure correct position of the bar in the lather spindle.
- Do not process the bars exceeding the length of the lathe spindle/spindle insert.
- Make sure that the channel is empty before loading a bar from the table into the channel.
- Always set the parameter #101 with a sufficient margin to eliminate contact of the pusher with the rotating spindle
- Set a minimum value of the parameter #300. Too high feeding force overloads both the barfeeder and the lathe.
- Before start of the work make sure that all safety circuits are active.
- Check where all Stop and Total Stop pushbuttons are located.
- Prior to activation of the automatic cycle make sure that all required functions are properly set and that all controls are set to correct position.

Observe labour safety principles!!!

TABLE OF CONTENTS

List of Figures **7**
IDENTIFICATION OF INSTRUCTIONS **8**
Conditions of guarantee **9**
1 Description **10**
1.1 General description **10**
1.2 Application **10**
1.3 Concept **11**
1.4 Technical specification **11**
1.5 Process description **16**
1.6 Installation **16**
1.7 Identification and serial number **17**
2 Transport and unpacking **18**
3 Installation **20**
3.1 Preparation before installation **20**
3.2 Barfeeder alignment **21**
3.2.1 General 21
3.2.2 Presetting the height and side position 21
3.3 Electrical connection **25**
4 Operation **26**
4.1 Primary prerequisites **26**
4.1.1 Putting into operation, anchoring, alignment 26
4.1.2 Safety of operation 26
4.1.3 Attendance 26
4.2 Working procedures **26**
4.3 Bar guiding **27**
4.4 Bar feeding **28**
4.5 Installation or replacement of spindle insert (at change of the bar diameter) **28**
4.6 Setting the loading channel position (at change of the bar diameter) **28**
4.7 Setting the magazine position (at change of the bar diameter) **29**
4.8 Pusher **30**
4.9 Barfeeder control **31**
4.9.1 Mechanical controls 31
4.9.1.1 Mode Switch (S3) 31
4.9.2 Software controls 32
4.9.2.1 Basic Screens of the Program 33
4.9.2.2 Overview of Soft Keys and Lamps 35
4.9.2.3 Power OFF Screen 37
4.9.2.3.1 User Levels and Their Meaning 37
4.9.2.4 Manual Mode 39
4.9.2.4.1 Move to Zero Position 39
4.9.2.4.2 Barfeeder Motions 39
4.9.2.5 Auto Mode 40
4.9.2.5.1 Automatic Cycle Start 40
4.9.2.5.2 Automatic Cycle Termination 40
4.9.2.5.3 Refilling Bars in the Magazine 40
4.9.2.5.4 Lathe Operation Without Barfeeder 40
4.9.2.6 Statistics 41
4.9.2.6.1 Counters 41
4.9.2.7 Settings 41
4.9.2.7.1 Real time 41

4.9.2.8 Alarm History....42
4.10 Barfeeder parameters....43
4.10.1 Parameters....43
4.10.1.1 Parameter Selection....43
4.10.1.2 Parameter Types and Their Setting....44
4.10.1.2.1 Parameters of List Type....44
4.10.1.2.2 Parameters of Position Type....44
4.10.1.2.3 Parameters of Other Type....44
4.10.2 Operator parameters....45
4.10.2.1 Setting of the Loading Mechanism....46
4.10.2.1.1 #111 – Bar Dimension....47
4.10.2.1.2 #013 – Bar Profile....47
4.10.2.2 #006 – Language....47
4.10.2.3 #010 – Push Mode....48
4.10.2.4 #100 – End of Bar....49
4.10.2.5 #101 – Pusher Retract Position....50
4.10.2.6 #102 – Collect Face Position....50
4.10.2.7 #105, #106 – First and Second Feeding Length....51
4.10.2.8 #107 – New Bar Face Position....51
4.10.2.9 #113 – Second EOB....51
4.10.2.10 #300 – Feeding Force....52
4.10.2.11 #301 – Retract Delay....52
4.10.3 Service parameters....53
4.10.3.1 #000 –Automatic Mode....53
4.10.3.1.1 Automatic....54
4.10.3.1.2 Simulation....54
4.10.3.1.3 Test....56
4.10.3.1.4 Calibration....57
4.10.3.2 #001 – Feeding on M-code....57
4.10.3.3 #002 – End of Bar Timing....58
4.10.3.4 #004 – Stat/Dyn Mcode....58
4.10.3.5 #005 – Invert Chuck Open Signal....58
4.10.3.6 #007 –K4 Relay....59
4.10.3.7 #009 – Factory Reset....59
4.10.3.8 #103 – Barfeeder Stroke....60
4.10.3.9 #104 – Global Channel Offset....60
4.10.3.10 #108 – Material Switch Position....61
4.11 How to program a lathe with the barfeeder....62
4.11.1 Feeding to stopper....62
4.11.2 Feeding to position....63
4.11.3 Parameter setting example....64
5 Maintenance....66
5.1 Routine maintenance....66
5.2 Error messages....67
5.3 Electrical equipment....72
5.3.1 arrangement and meaning of switches....72
5.3.2 PLC A (CP1E)....73
5.3.2.1 CP1E LED status....73
5.3.3 Battery....74
5.3.4 Interface description....75
5.3.5 Diagnostics....77
5.3.6 Wiring diagrams....77
6 Installation report....78

LIST OF FIGURES

Fig. 1.1 - Main Dimensions of the Barfeeder – Axial Retraction Mechanism..... 14
Fig. 1.2 - Main Dimensions of the Barfeeder – Radial Retraction Mechanism..... 15
Fig. 1.3 - Nameplate..... 17
Fig. 2.1 - Barfeeder Lifting and Seating..... 19
Fig. 3.1 - Setting the Height and Side Position..... 21
Fig. 3.2 - Setting Kit..... 22
Fig. 3.3 - Barfeeder Anchoring..... 24
Fig. 3.4 - Electrical Connection..... 25
Fig. 4.1 - Bar Guiding in the Spindle Insert..... 27
Fig. 4.2 - Bar Feeding..... 28
Fig. 4.3 - Magazine Position Setting..... 29
Fig. 4.4 - Pusher Dismantling and Mounting..... 30
Fig. 4.5 - Control Panel..... 31
Fig. 4.6 - Linear Operator Parameters..... 45
Fig. 4.7 - Setting of parameter #100 - End Of Bar..... 49
Fig. 4.8 - Example of cut off the bar face..... 64
Fig. 5.1 - Routine Maintenance..... 66
Fig. 5.2 - Arrangement of Electrical Elements..... 72
Fig. 5.3 - PLC A..... 73

IDENTIFICATION OF INSTRUCTIONS

- Important instructions are emphasized in this manual as follows:

DANGER

Failure to observe these instructions can result in injury of the operator.

WARNING

Failure to observe these instructions can result in damage to the barfeeder or the lathe.

NOTICE

Other important instructions

- Parameter numbers are identified as #xxx in this manual, where xxx is the parameter number.

CONDITIONS OF GUARANTEE

If not stated otherwise in the contract concluded between the buyer and the manufacturer, the barfeeder manufacturer provides the guarantee for the Spacesaver SS2210 according to the following table.

Guarantee period	Conditions of guarantee
1 year from dispatch	Provided the customer himself installs the barfeeder.
2 years from installation (max. 2.5 years from dispatch)	Provided the barfeeder is installed by the manufacturer or by other person authorized by the manufacturer. Furthermore, immediately after installation such person must fill in the record of installation of the barfeeder, see the last page of this manual, and send it to the manufacturer. Otherwise the guarantee is valid for 1 year from dispatch.

The guarantee does not cover the parts that are subject to ordinary wear and tear such as plastic guide bushing of the pusher etc., and the failures caused by not performing regular maintenance see Chapter 5.1. Furthermore, the guarantee does not cover the bending or other mechanical damage to the pusher caused by excessive feeding force, pusher clamping in the collet, pusher jamming between the spindle insert or by other eventual operator's error. Guarantee repair or barfeeder installation does not cover additional training of the operator and resetting the barfeeder or other activities which have already been carried out within proper installation and which have been documented in the installation record. The manufacturer reserves the right to deem these additional acts ordinary service action.

1 DESCRIPTION

1.1 GENERAL DESCRIPTION

The barfeeder SS2220 has been designed for work with any type of CNC lathe equipped with a suitable interface. The length of the bars is limited by the length of the lathe spindle (with a clamping cylinder and clamping device). As the barfeeder does not touch any rotating part of the lathe or rotating bar, it is possible to utilize full range of operating speed of the lathe. Barfeeder design enables automatic loading and feeding of bars into the lathe with minimum built-up area required. Barfeeder setting up and programming is easy and fast.

Bars must be guided by the spindle insert in the lathe. The remnant of the bar, from which it is not possible to make a part, is forced by the barfeeder into the lathe workspace, with no additional equipment needed.

The barfeeder is designed for work with round, hexagonal and square bars. For feeding of non-circular cross section bars the lathe must be equipped with a spindle orientation.

1.2 APPLICATION

Barfeeders of SS2220 series provide:

Functions
Cheap and effective automation of operation of any CNC lathe
Workspace saving thanks to side storage and loading of bars
Automatic loading of a new bar after processing of the previous bar
Precise work at high speed of the lathe spindle unaffected by the barfeeder
Processing of bars of imperfect shape or dimensions
Bar feed against the lathe stopper
Bar feed to a programmed position (without stopper) - option

Barfeeders SS2220 are not suitable for twin-spindle lathes, which uses the second spindle for material feeding. For such technology it is recommended to use e.g. barfeeder SS2500 or any other model suitable for twin-spindle lathes.

For detailed information contact the barfeeder seller or manufacturer.

1.3 CONCEPT

The barfeeder SS2220 is a powerful machine with a long service life and minimal maintenance required. Its simple operation and functions facilitate work even to less skilled workers.
The barfeeder is controlled by means of the control panel in the right part of the machine. There is an E-Stop pushbutton for emergency stop on the control panel. In the left part of the barfeeder frame there is a Q1 switch.
Bars are loaded in the magazine. Loading of bars into the lathe is ensured by a loading channel, splitter and a flag with a pusher.
On the rear side of the frame there are connectors X1, X2 for barfeeder interconnection with the lathe. It is also possible to install there a magazine for spindle inserts.

1.4 TECHNICAL SPECIFICATION

Application
For all CNC lathes equipped with a suitable interface

Scope of application	**Bar dimension**
Bar of round cross section	6 to 67 mm
Bar of hexagonal cross section	8 to 58 mm
Bar of square cross section	8 to 47 mm

Bar weight	
Maximum weight of the loaded bar	45 kg

Bar length	
Minimum length of the bar handled by the barfeeder	200 mm
Maximum length of the bar handled by the barfeeder	1525 mm

Actual max. length of the bar is limited by the length of the spindle (with clamping cylinder and clamping device).

Magazine capacity depending on the bar diameter	
6 bars	∅ 67 mm
The number of bars limited by the table capacity	∅ 6 mm

Total weight of all bars on the table must not exceed 250 kg.

Pusher stroke	
Design stroke	1665 mm
Working stroke	1660 mm
Maximum distance of the clamping device face from the pusher point in back position	1655 mm

Technology of bar handling

The bar is centred in the lathe spindle by spindle inserts, and shifted by the pusher to a stopper in the tool head.

Spindle speed

Depending on lathe design and quality of spindle insert.

Bar preparation

No specific requirements for bar preparation.

Bar straightness

Bar must freely go into the user selected spindle insert.

Bar loading cycle

approx. 20 to 30 s

Setting time at change of bar diameter

Max. 1 minute at change to other diameter + time of lathe spindle insert replacement

Color design

Light Grey

Weight

approx. 360 kg

Packaging	
Transport dimensions	length 2230 x width 1150 height 1230 mm length 2230 x width 1150 height 1395 mm (long legs)

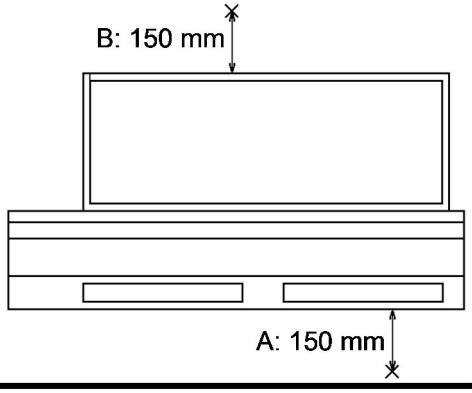
Barfeeders are sealed in plastic sheet and transported on non-returnable pallets or in boxes. Pallet weight is approx. 35 kg, the weight of the whole box approx. 170 kg.

Electrical equipment	
Power supply	200/230/400 VAC, 50/60 Hz, 400 VA
Power circuits	200 VAC, 24 VDC
Logic circuits	24 VDC, 5 VDC

Batteries	PLC	HMI
Durability	approx. 5 years at 25°C	approx. 5 years at 25°C
Data backup time at switching off (1)	max. 50 days	max. 100 days
Recharging time to 100% capacity	96 hours	96 hours

(1) The values apply to batteries charged to 100% capacity.

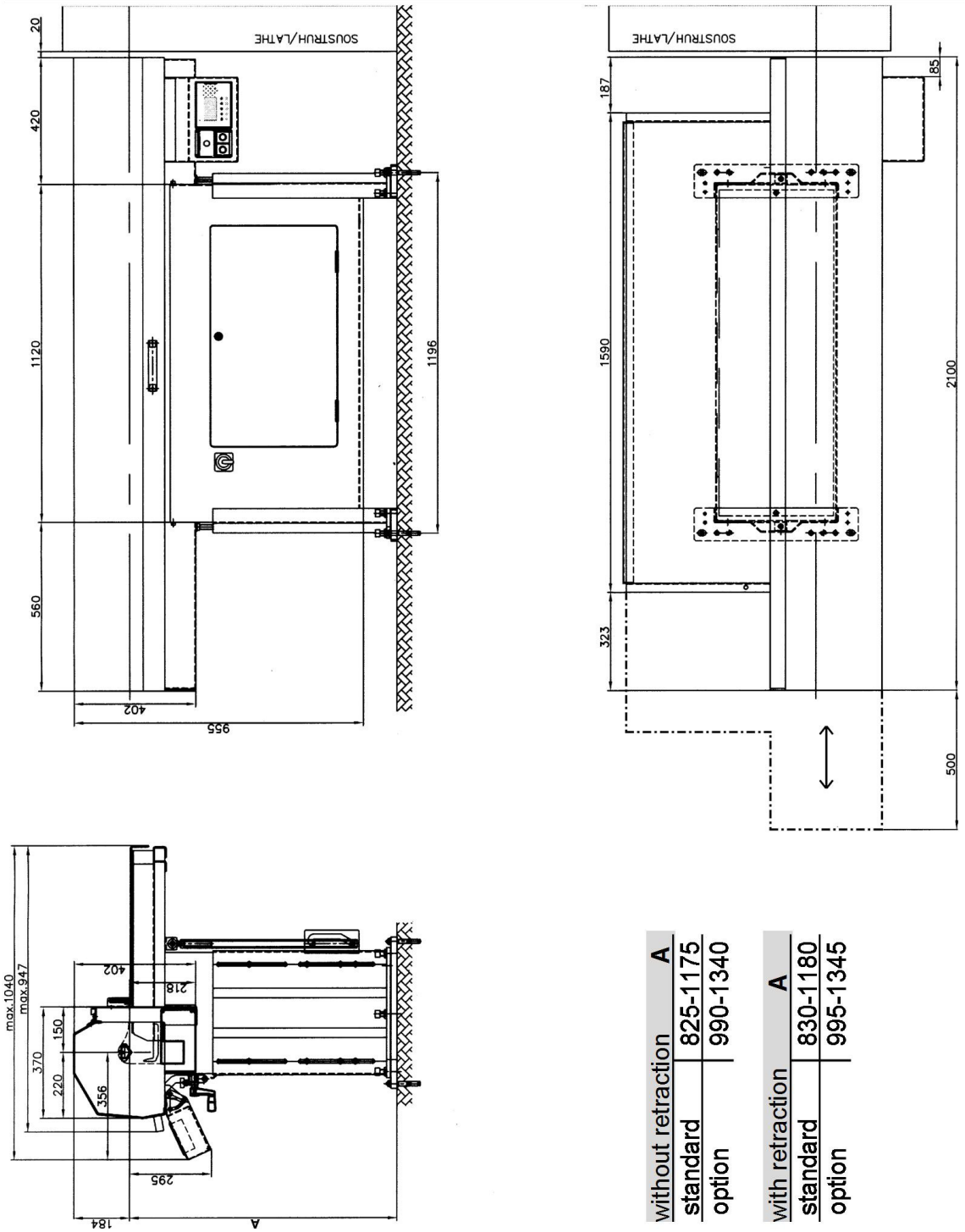
Noise emission



The values have been stated in accordance with ČSN EN ISO 4871 and basic standard ČSN EN ISO 11201.

	A		B	
	w/o bars	with bars	w/o bars	with bars
Measured emission level of sound pressure A, P_{pAd} at the operator workplace (dB)	67	69	68	71
Uncertainty, K_{pA} (dB)	4	4	4	4

Main dimensions of the barfeeder– axial retraction mechanism

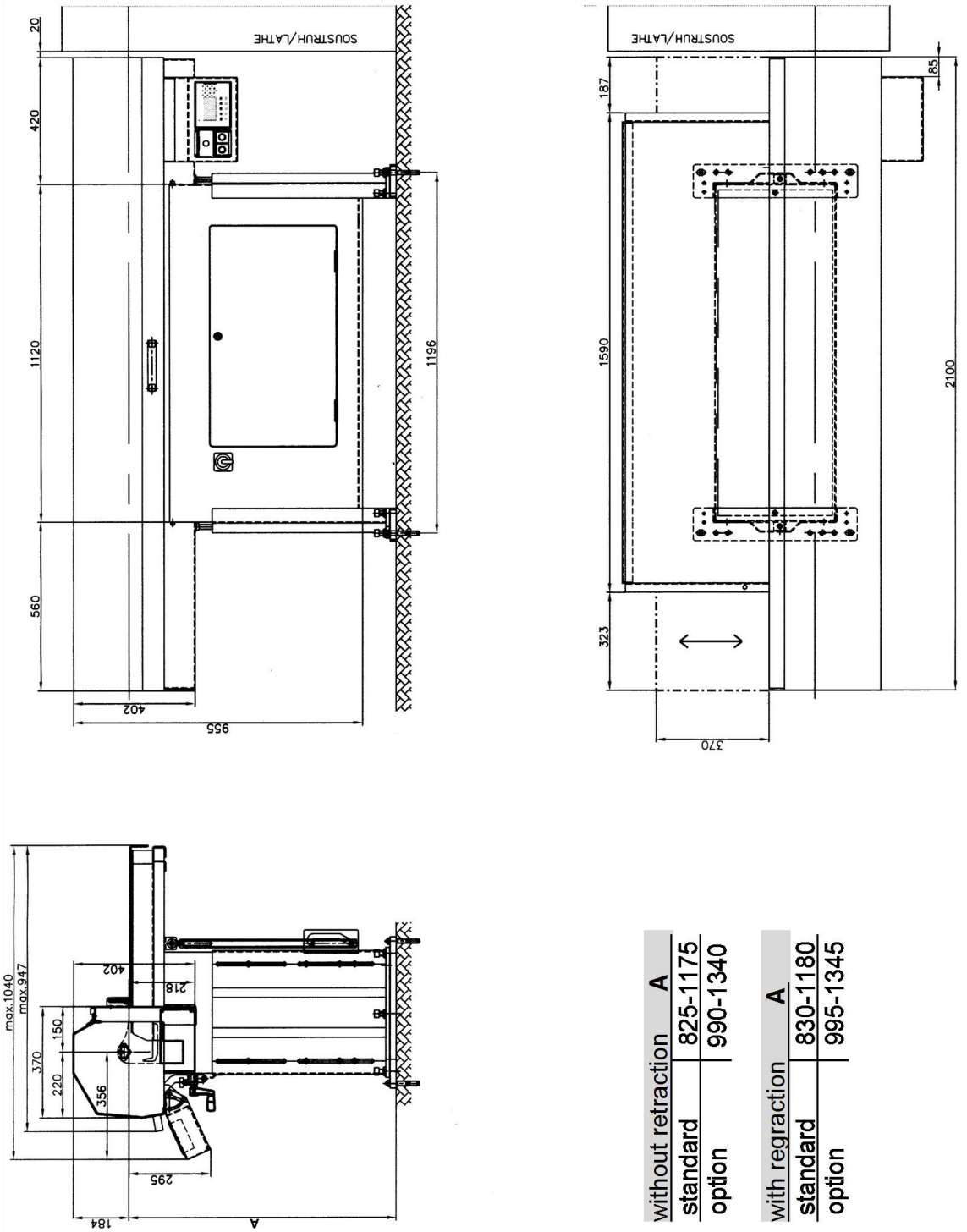


without retraction	A
standard	825-1175
option	990-1340

with retraction	A
standard	830-1180
option	995-1345

Fig. 1.1 - Main Dimensions of the Barfeeder – Axial Retraction Mechanism

Main dimensions of the barfeeder– radial retraction mechanism



without retraction	A
standard	825-1175
option	990-1340

with regraction	A
standard	830-1180
option	995-1345

Fig. 1.2 - Main Dimensions of the Barfeeder – Radial Retraction Mechanism

1.5 PROCESS DESCRIPTION

SS2220 barfeeder feeds bars into the lathe as follows:

- The channel takes a bar from the magazine, lifts it to the lathe spindle axis level, and waits in the position to the remnant ejection command.
- The lathe opens the clamping device, and sends the first M-code (for bar remnant ejection).
- The flag shifts the bar into the spindle and after it returns to back limit position.
- The channel moves to the lower limit position and the pusher is tilted to the spindle axis.
- The barfeeder pushes the bar by the pusher through the open clamping device 1mm in front of the clamping device (ejects the remnant), and terminates the first M-code.
- The lathe sends the second M-code.
- Barfeeder pushes the bar by the pusher against the stopper in the tool head or to a required position in front of the clamping device, and terminates the second M-code.
- The clamping device closes, and the pusher returns.
- The lathe machines the piece.
- Next bar feed is executed, when the spindle stops, clamping device opens, and M-code is sent.
- If the bar length is insufficient to make another part, the barfeeder sends the End of Bar signal. The signal is tested by the lathe program which issues a command to eject the remnant of the bar and load a new bar.

1.6 INSTALLATION

It is recommended to carry out installation by the manufacturer's technicians or by persons authorized by the manufacturer. Prior to installation, check the items specified in the packing list, and verify whether suitable interface has been installed on the lathe for the barfeeder with the magazine.

1.7 IDENTIFICATION AND SERIAL NUMBER

Serial number of the barfeeder is shown on the nameplate fastened under the magazine.

Fig. 1.3 - Nameplate

2 TRANSPORT AND UNPACKING

Barfeeders are sealed in plastic sheet and transported on pallets or, exceptionally, in wooden boxes (see Chapter 1.4). They are fastened by screws to the box bottom/pallet.

NOTICE

The manufacturer will bear no responsibility for any damage caused by transportation or unpacking at absence of the manufaturer's technician or at variance with the following procedure.

Unpacking

- Put the box/pallet behind the lathe to the place where the barfeeder is to be installed.
- If the barfeeder is in the box, remove the cover and sides of the box.
- Remove the plastic sheet.
- Check whether the shipment is in order and complete (according to the packing list attached to the Manual).
- Lift the barfeeder by high-lift truck with forks under the lower part of the casing. If it is difficult to slide the forks under the barfeeder, increase the height of the barfeeder pusher axis, see Chapter 3.2.2.

WARNING

Lift the barfeedeer only under the lower part of the frame. Do not damage protruding vertical guide of the loading mechanism. Never lift the barfeedeer in other way, otherwise you could damage it.

- Put the barfeeder on the rear side of the lathe as shown in Fig. 2.1. The distance between the rear side (rear end) of the lathe spindle and front cover of the barfeeder should be as small as possible. The gap between the barfeeder cover and lathe cover must not exceed 20 mm or it is necessary to disable insertion of the hand palm between the barfeeder and the lathe.

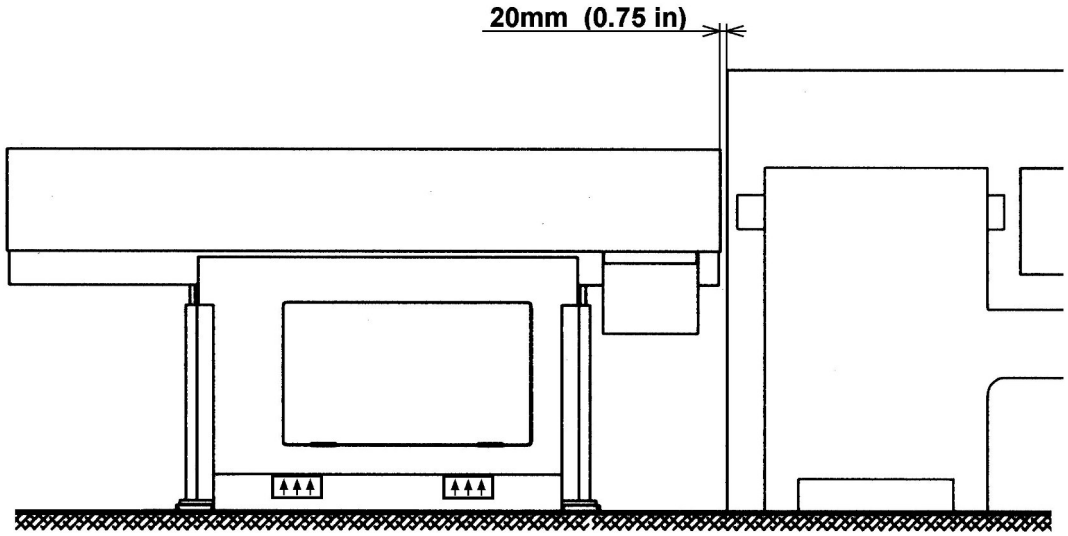


Fig. 2.1 - Barfeeder Lifting and Seating

In unpacking check the completeness of standard accessories.

Standard accessories of the barfeeder SS2220	
Type	**Quantity**
anchor bolts	4
washers under anchor bolts	4
setting kit	1
table setting speeder	1
barfeeder setting wrench (speeder)	1
user manual	1
pusher with fixed point ∅10 mm	1

See the packing list for complete list of the delivered accessories.

3 INSTALLATION

3.1 PREPARATION BEFORE INSTALLATION

It is appropriate for easy and quick installation that the installation and the first startup of the barfeeder should be carried out by the manufacturer's technician or by a person authorized by the manufacturer. It is in the user's interest to ensure presence of the barfeeder operation and maintenance staff during installation in order for them to be familiarized with the principles of the barfeeder use in collaboration with the lathe. Furthermore, it is necessary to prepare and check the following items before installation.

1. Lathe

- The lathe should be anchored to ground to eliminate its eventual motion in relation to the barfeeder.
- The lathe must be equipped with a suitable electric interface for the barfeeder with a magazine.
- The lathe must have automatic clamping device (a collect or chuck).
- If functional check of the barfeeder is required on a real part, the lathe must be prepared for the part production with debugged NC program, and must be equipped with necessary tools.
- The lathe must be free on the installation day. Neither production nor program debugging can take place on it.

If you want to feed bars to a programmed position (without stopper) it is necessary that the clamping device clamps the material by motion of the pull tube backwards (from the lathe to the barfeeder).

2. Spindle inserts

It is the user's responsibility to ensure centring spindle inserts for the bars to be machined on the lathe in start of production. Some lathe manufacturers deliver these inserts within accessories. You can find detailed information on the spindle inserts in Chapter 4.3.

3. Bar stock for testing

The user must prepare a bar stock for the trial run of the barfeeder in installation (cut the bars to an appropriate length).

4. Foundations

Barfeeder foundations must be of high-quality concrete. Barfeeder legs shall be fastened in the concrete by anchor bolts. The foundations must provide sufficiently strong connection of the lathe and the barfeeder without transfer of vibration.

3.2 BARFEEDER ALIGNMENT

3.2.1 GENERAL

Barfeeder alignment with regard to the lathe is the most important installation step and must be carried out as thoroughly as possible. The time spent by this process is negligible compared to possible damage to the lathe or the barfeeder in wrong alignment.

Proper alignment of the barfeedeer is important for its trouble-free run.

Observe prescribed distances in installation, see Fig. 2.1.

3.2.2 PRESETTING THE HEIGHT AND SIDE POSITION

- Install the pusher see Chapter 4.8.
- Slacken 4 locking screws 3.1/3 and the lock nut 3.1/1 securing the set screw on each leg.
- Using 6 screws 3.1/5 and 4 studs 3.1/4, align the barfeeder into horizontal position to compensate unevenness of the floor and to eliminate barfeeder twisting. Tighten the screws.
- Set the barfeeder roughly into correct position by means of the set screw 3.1/2, crank 3.1/6 and horizontal displacement of the whole barfeeder (including the pad 3.1/8). Pusher axis should be approximately aligned with the lathe spindle axis.
- Continue the setting according to the following chapter.

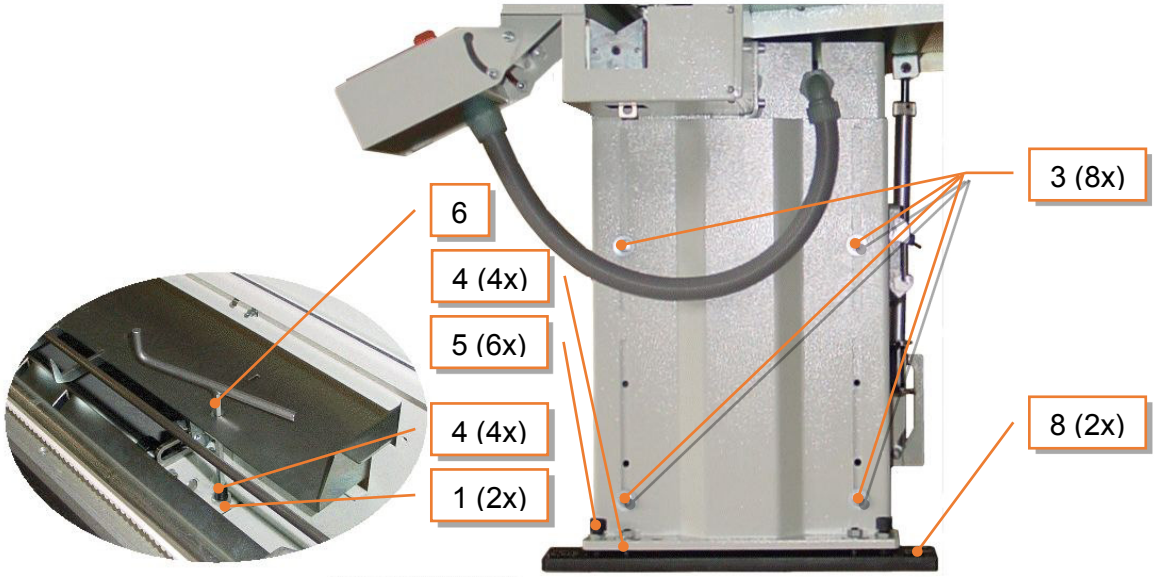


Fig. 3.1 - Setting the Height and Side Position

Geometric alignment with the lathe

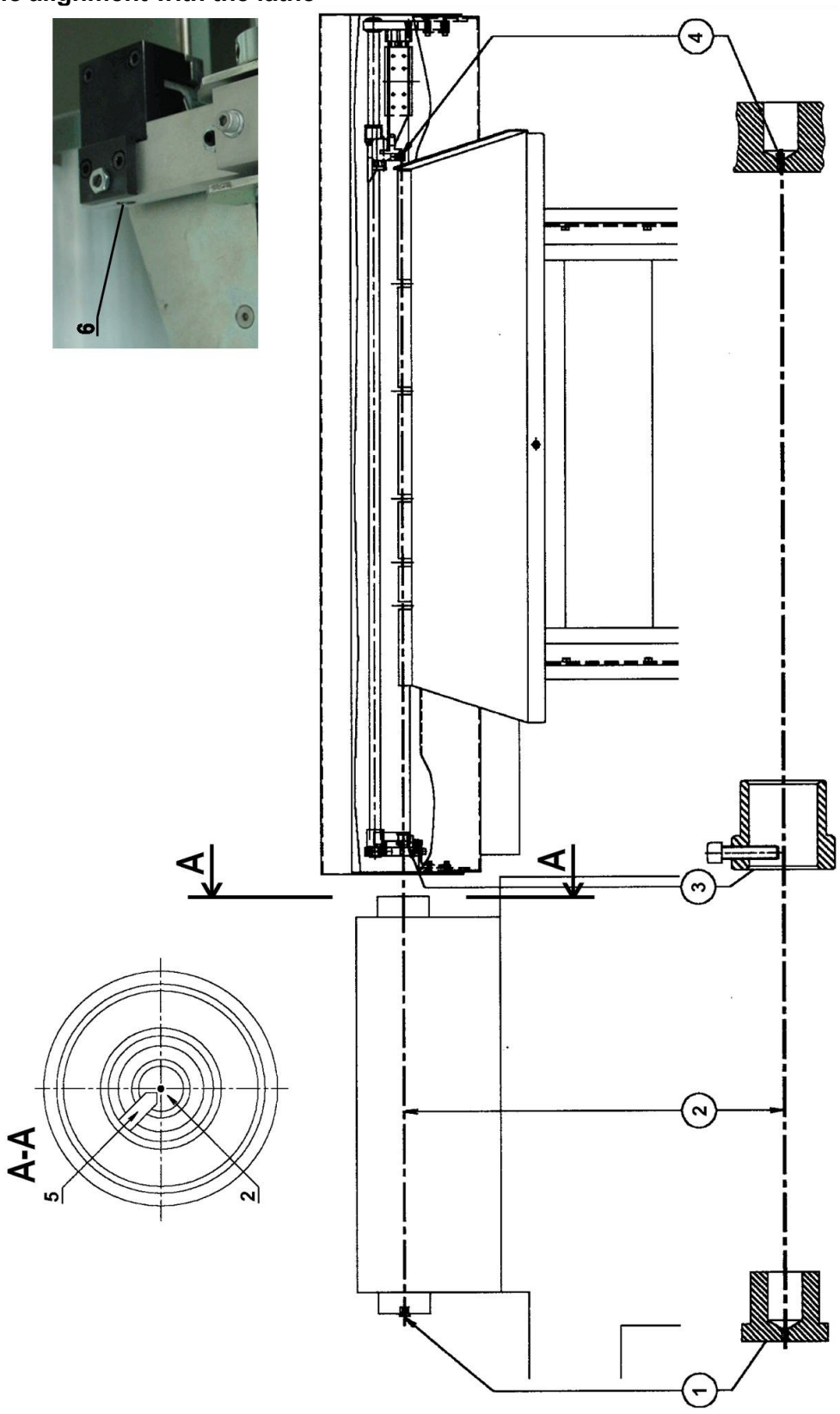


Fig. 3.2 - Setting Kit

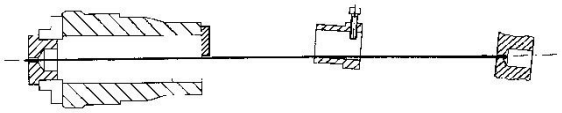
a) Preparation

- Dismantle the pusher.
- Install setting jigs, see Fig. 3.2.
  1. Part 3.2/1 into the clamping device of the lathe.
  2. Part 3.2/3 into the front grip of the pusher.
  3. Part 3.2/4 into the rear grip of the pusher.
- Pull the string 3.2/2 through sleeves 3.2/4, 3.2/3 and 3.2/1, and secure it by knot in the part 3.2/4.
- Fix the flag (pusher) in the back position by screw 3.2/6.
  Tighten the string to approx. 50 kg, and fasten it on the front part of the spindle to sleeve 3.2/1, using, for example, a clamp, locking pliers or a suitable grip.
- Place the centring plate 3.2/5 (not included in the delivery) on the rear part of the lathe to a place where the string runs. You can make the plate e.g. from paste-board, and fasten it by means of a magnet. Set the plate towards the spindle centre.

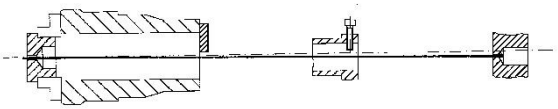
b) Presetting before anchoring

Perform all vertical and horizontal adjustments needed for the alignment of the barfeeder and the lathe by changing the barfeeder position (changing the position and height of the front and rear leg).
To achieve correct height, use the set screws 3.1/2. Lateral alignment shall be made by shifting the barfeeder on the floor. The centring shall be assessed by centring the string against the revolving spindle with the plate 3.2/5, and against the revolving centring sleeve 3.2/3.
First adjust the rear part of the barfeeder and then the front part (closer to the lathe). The change of the rear part of the barfeeder affects significantly the front part position.
Final position tolerance should be ±0.2 mm.

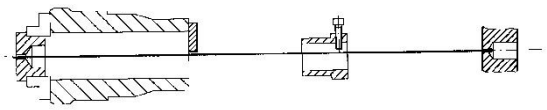
1. Check that the string touches no obstacle.



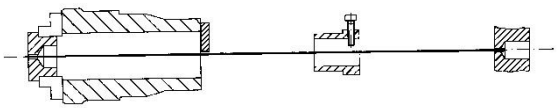
2. Perform rough alignment of the barfeeder.



3. Centre the string on the rear face of the spindle by moving the rear legs, and recheck that the string does not touch anything.



4. Centre the string on the front face of the barfeeder pusher bracket by shifting the front legs, and recheck that the string does not touch anything.



5. Tighten the screws you have slackened, see Chapter 3.2.2. Check whether the string has been centred within the specified tolerance. Repeat steps 3-5, if need be.

c) Anchoring

After proper alignment, fasten the Barfeeder to the ground by means of expansion anchor screws (2 per each leg).

- Drill holes according to dimensions of the delivered anchor screws. The holes must be sufficiently deep. The screws must not seat on the bottoms of the holes.
- Insert the screws in the holes, and tighten them properly.

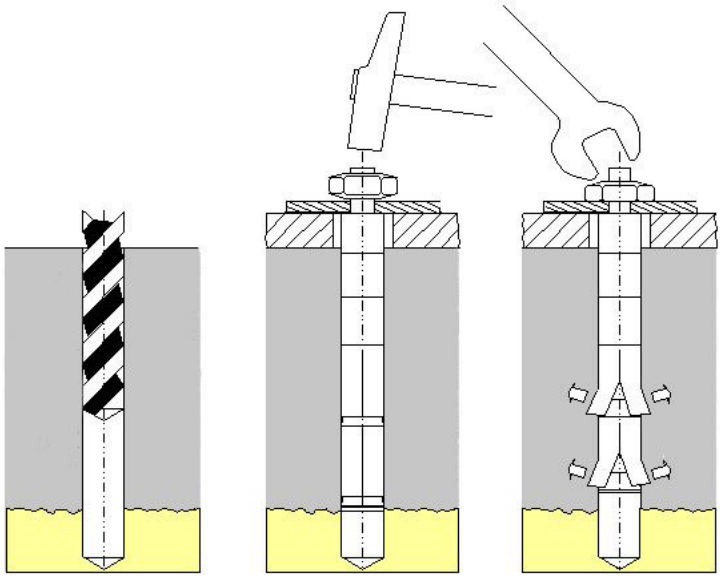


Fig. 3.3 - Barfeeder Anchoring

d) Final alignment

- It is possible that small position corrections will be necessary to finish the barfeeder alignment. Repeat the procedure described in p. b), but move with the barfeeder only on the fastened leg pad 3.1/8.
- After alignment, tighten all screws and lock nuts (connection of the leg with the pad and vertical alignment) and recheck the barfeeder alignment. Final alignment tolerance should be ±0.2 mm.
- After the alignment, dismantle the setting kit and store it for eventual future use.

3.3 ELECTRICAL CONNECTION

- Interconnect the barfeeder and lathe interfaces.
- Set the barfeeder transformer to proper supply voltage.
- Install fuses F1, F2 of proper values see Chapter 5.3.6.

Some types of lathes use a single cable harness for both power and communication conductors, while other types use two separate harnesses. The barfeeder connection can be modified accordingly.

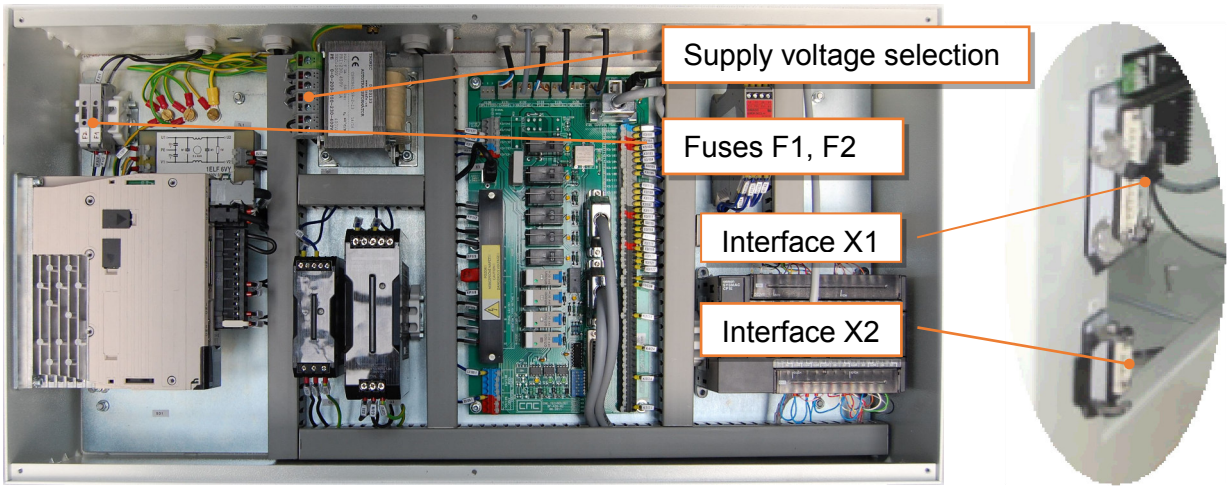


Fig. 3.4 - Electrical Connection

4 OPERATION

4.1 PRIMARY PREREQUISITES

4.1.1 PUTTING INTO OPERATION, ANCHORING, ALIGNMENT

The barfeeder must be thoroughly installed according to Chapter 3.

4.1.2 SAFETY OF OPERATION

Interface and safety circuits between the lathe and the barfeeder must be properly connected and checked. The manufacturer bears no responsibility for the barfeeder operation, it the barfeeder and lathe interconnection is not carried out in accordance with the interface drawing.

4.1.3 ATTENDANCE

Perfect knowledge of the lathe and the barfeeder is necessary both from the viewpoint of proper function of the whole system and its safe attendance.

4.2 WORKING PROCEDURES

At change of workpiece parameters:

At change of the bar diameter:
Change the spindle insert.
Select the correct bar, see the parameter #013 and #111.
Change the length of the pusher retract position, see the parameter #101
In significant change of the bar diameter it may be also necessary to:
Change the pusher size.
Set the feeding force, see the parameter #300.
At change of the part length:
Set the end of bar, see the parameter #100.
At change of jaws, change of clamping device type, change of pusher length:
Set the distance of the clamping device from the barfeeder, see the parameter #102.

4.3 BAR GUIDING

Bars are guided by the spindle insert in the lathe. The insert ensures bar centring in the spindle. The insert should be made of a seamless steel tube.

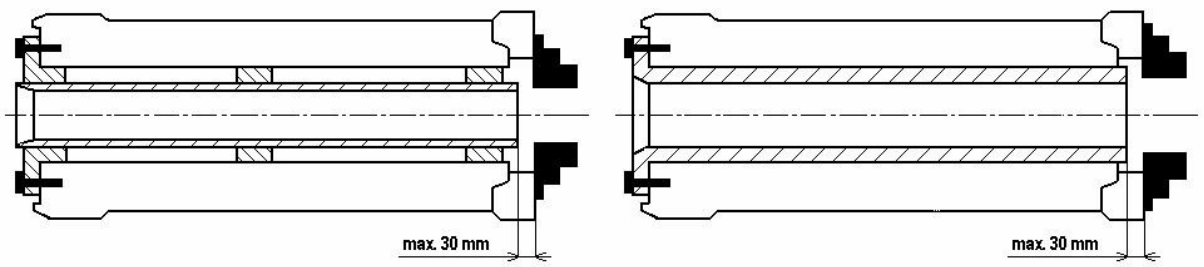


Fig. 4.1 - Bar Guiding in the Spindle Insert

Spindle insert	
Insert diameter	bar diameter + (0.5 to 2.5) mm
Insert/spindle misalignment	max. 0.1 mm
Insert bevel	min. 3x30°
Pulled bar straightness	max. 0.5 mm/m
Clearance between the insert face and clamping device	max. 30 mm

4.4 BAR FEEDING

Bars are fed by the pusher to a preset stopper which is as a rule fixed in the lathe tool head. In feeding the barfeeder always acts on the bar by a force maximum value of which is set in the parameter #300.

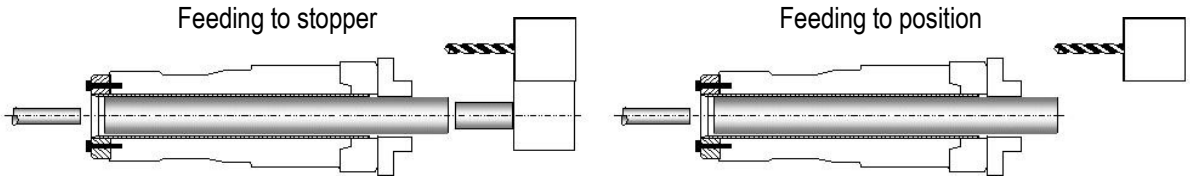


Fig. 4.2 - Bar Feeding

4.5 INSTALLATION OR REPLACEMENT OF SPINDLE INSERT (AT CHANGE OF THE BAR DIAMETER)

The user shall ensure appropriate spindle inserts, see Chapter 4.3.

How to replace the spindle insert

- Switch the barfeeder to the manual mode, and move the channel into the position where neither the channel nor the pusher will obstruct the access to the spindle.
- Release the spindle insert and put it out in the direction to the barfeeder.
- Push the new insert into the lathe spindle, and fix it.

4.6 SETTING THE LOADING CHANNEL POSITION (AT CHANGE OF THE BAR DIAMETER)

See the parameters #013 and #111.

4.7 SETTING THE MAGAZINE POSITION (AT CHANGE OF THE BAR DIAMETER)

To ensure proper separation of individual bars in loading, the magazine position in relation to the loading channel must be set correctly.

How to set the magazine position

- Best of all, insert at least two bars into the magazine, and set a required angle using the leg 4.3/1.
- In manual mode, move the loading mechanism so that the channel is close under the stops 4.3/4.
- Release the lock screw 4.3/2 and by means of the crank 4.3/3 set the magazine to such position that the channel in upward motion takes only one bar from the magazine.
- Secure the magazine position by the lock screw 4.3/2, and try the loading in the manual mode.

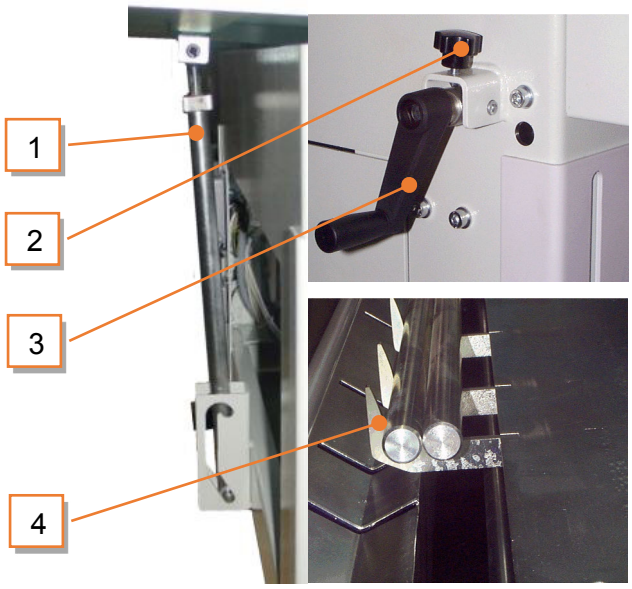


Fig. 4.3 - Magazine Position Setting

4.8 PUSHER

Barfeeders SS2220 are delivered with the following pushers.

Pusher	Bar ∅	Option
∅ 6 mm with fixed point	6 – 15 mm	✓
∅ 10 mm with fixed point	12 – 67 mm	×
∅ 18 mm with fixed point	30 – 67 mm	✓

How to replace the pusher

- Release 2 fixing screws 4.4/2 in the pusher lock, and pull the pusher 4.4/1 out from the front sleeve 4.4/3.
- Replace the bush 4.4/3 in the front holder of the pusher by the bush corresponding to the new pusher diameter.
- Insert the new pusher in the front bush, put the rear holder to the pusher lock, and tighten the screws 4.4/2.
- Check or set the parameter #102.

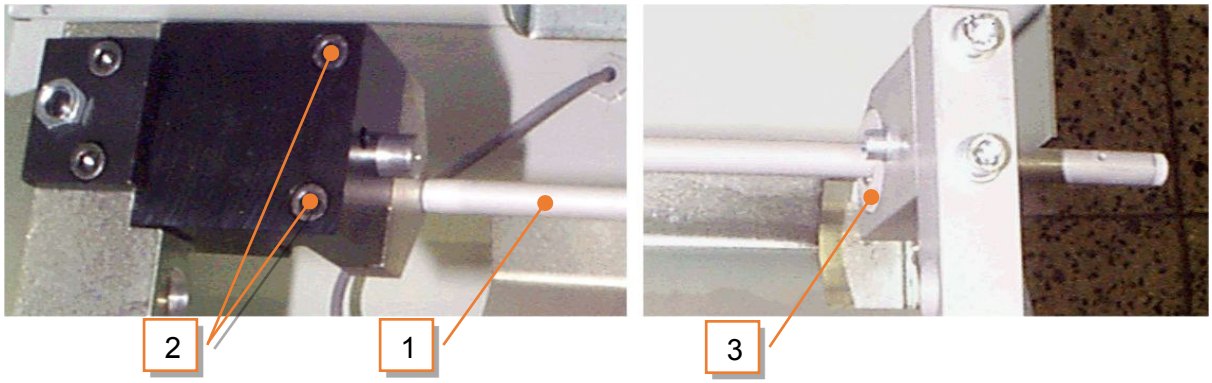


Fig. 4.4 - Pusher Dismantling and Mounting

4.9 BARFEEDER CONTROL

All controls of the barfeeder SS2220 are on the control panel.

Fig. 4.5 - Control Panel

4.9.1 MECHANICAL CONTROLS

Mechanical controls are located in the left part of the control panel, and are used for the control of safety elements of the barfeeder.

- Emergency Stop button (S1)
- Mode switch (S3)

4.9.1.1 MODE SWITCH (S3)

Mode switch allows for work in the manual mode even with the cover open, which facilitates the barfeeder adjustment by the operator.

Position	Meaning
AUT	If the switch is in AUT position, it is possible to run the Barfeeder in automatic cycle. If the cover is open, the barfeeder sends error A16. In this position of the switch it is not possible to work in the manual mode.
MAN	If the switch is in MAN position, it is possible to open the cover and work with the barfeeder in the manual mode. Automatic cycle is locked in this case.

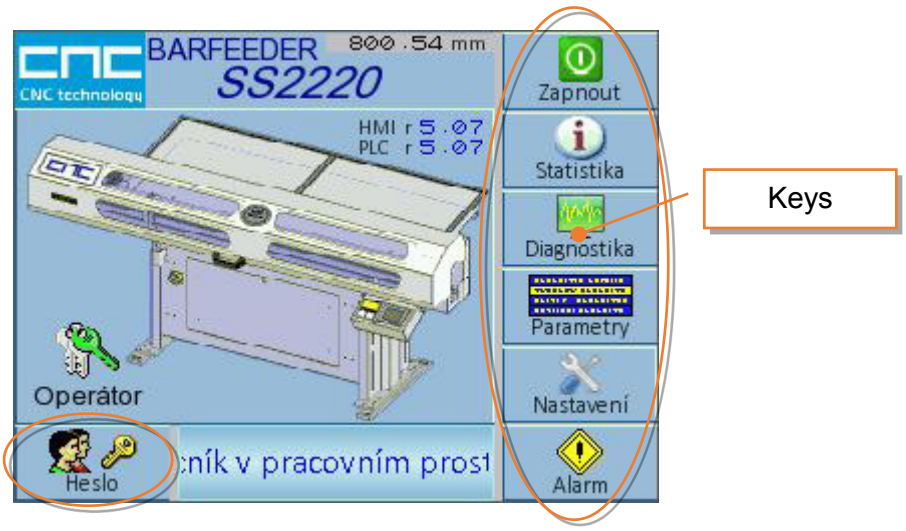
DANGER

Warning!

If the mode switch is in MAN position, the barfeeder can move even with the cover open. Be especially careful when operating the barfeeder in the manual mode.

Your inattention can result in your injury!!!

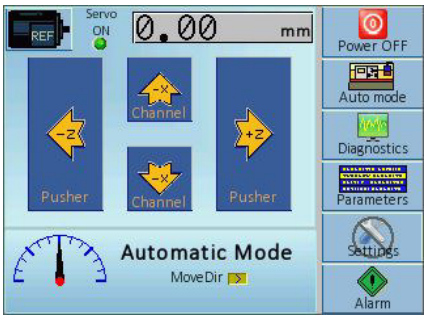
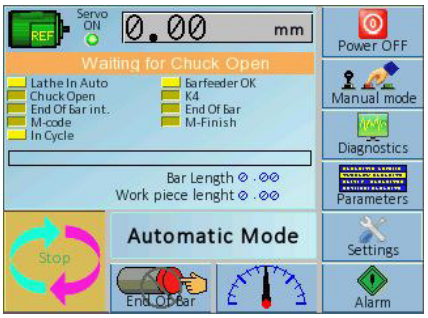
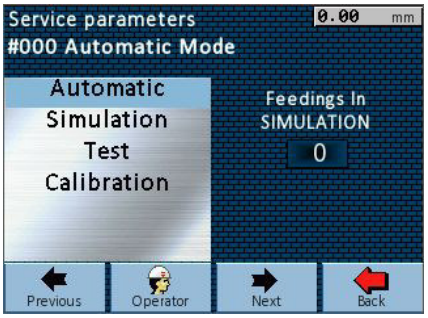
4.9.2 SOFTWARE CONTROLS

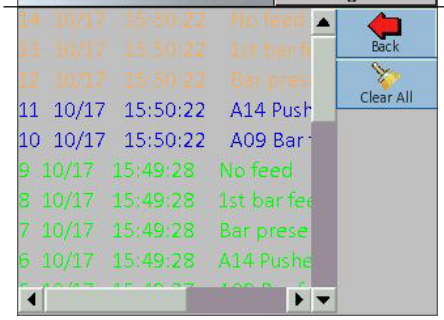


The control panel of the barfeeder (hereinafter only HMI) is equipped with a touch display. Various soft keys are displaced on the display. To activate a required function it is necessary to touch the relevant key by a finger or by any not sharp object.

4.9.2.1 BASIC SCREENS OF THE PROGRAM

The barfeeder control is divided into the following basic screens.

Screen	Description
	***Power OFF*** To get to the ***Power OFF*** screen, press the barfeeder switch Q1, or E-stop button, or the key on the other screens. If the key is pressed, the power circuits of the barfeeder are disconnected, and the barfeeder sends relevant error message to the lathe.
	***Manual Mode*** It is possible to move the barfeeder by means of arrow keys.
	***Auto Mode*** The barfeeder can be operated in the automatic cycle.
	***Parameters*** It is used for barfeeder parameter setting.
	***Statistics*** Barfeeder load information and other statistical functions.

Screen	Description
	***Settings*** It is used for changing parameters of HMI.
	***Alarm History*** It is used for view all historical barfeeder movements and alarms.

4.9.2.2 OVERVIEW OF SOFT KEYS AND LAMPS

The following table contains the comprehensive overview of soft keys of the control program.

Key	Name	Meaning
	***Power ON***	Switching the barfeeder power circuits on. Without switching on it is not possible to operate the barfeeder.
	***Power OFF***	Switching the barfeeder power circuits off. After switching off, the barfeeder will send an error to the lathe .
	***Manual Mode***	Changeover to ***Manual Mode*** screen.
	***Auto Mode***	Changeover to ***Auto Mode*** screen.
	***Parameters***	Changeover to ***Parameters*** screen.
	***Diagnostics***	Presentation of barfeeder diagnostics.
	***Statistics***	Changeover to ***Statistics*** screen.
	***Settings***	Changeover to ***Settings*** screen.
	***Password***	Change of user level see Chapter 0.
	***Zero position***	Actuation of search for zero position of the feeding motor M1 (Z axis) see Chapter **Error! Reference source not found.**.
	***Channel***	Move of the channel to upper or lower limit position see Chapter **Error! Reference source not found.**.
	***Pusher***	Pusher move back or forward see Chapter **Error! Reference source not found.**.
	***Run/Stop***	Start/stop of the barfeeder run in the automatic cycle see Chapter **Error! Reference source not found.**.
	***Calibration***	Setting the calibration mode of the material switch B34 see Chapter **Error! Reference source not found.**.
	***End Of Bar***	End Of Bar simulation see Chapter 4.10.3.1.2.
	***Pause***	Suspension of the motion program in PLC. Only for the manufacturer's purposes.
	***Step***	After pressing the  key, PLC always executes one step in the motion program. Only for the manufacturer's purposes.

Key	Name	Meaning
	*Set*	Setting current time see Chapter **4.9.2.7.1**.
	*Previous*	Move to previous parameter see Chapter 4.10.1.
	*Next*	Move to next parameter see Chapter 4.10.1.
	*Operator*	Display of operator (technological) parameters see Chapter 4.10.1.
	*Service*	Display of service parameters see Chapter 4.10.1.
	*Teach*	Copying current position of the flag (Z axis) to currently edited linear parameter see Chapter **4.10.1.2.2**.
	*Back*	Return to previous window.
	*Clear Alarm*	Reset of all active alarms.
	*Alarm History*	Changeover to *Alarm History* screen.

4.9.2.3 POWER OFF SCREEN

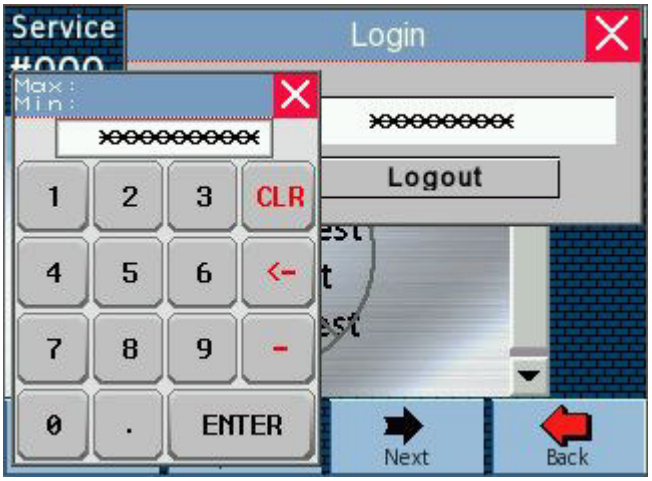
To get to the ***Power OFF*** screen, press the barfeeder switch Q1, or E-stop button or the key on the ***Power ON*** screen. If the key is pressed, the power circuits of the barfeeder are disconnected, and the barfeeder sends relevant error message to the lathe.

4.9.2.3.1 USER LEVELS AND THEIR MEANING

Level	Password	Meaning
OPERATOR	no password	The ***OPERATOR*** level is so called permanent level i.e. after the barfeeder restart just the ***OPERATOR*** level is always activated. This means that the user always has only the operator's rights following the barfeeder switching on. The ***OPERATOR*** level is not protected by a password. The ***OPERATOR*** is entitled to read all parameters of the barfeeder, however he can edit only the parameters relating to technology (operator parameters).
SERVICE	4268	The ***SERVICE*** level is intended for setting the barfeeder interface behavior for given lathe and other parameters not related to the manufacturing technology. The ***SERVICE*** has at the same time all rights of the ***OPERATOR*** level.
SETUP	manufacturer only	The ***SETUP*** level is the highest level. It is used for reset of selected statistical data and blocking of keys and . ***SETUP*** is intended only for the barfeeder manufacturer.

4.9.2.3.1.1 Changing User Level

- In the screen ***Power OFF***, press  .
- Enter the ***SERVICE*** password and confirm it. Entering a wrong code will result in the return to the ***OPERATOR*** level.



WARNING

Common user should not change the service parameter setting. These parameters have been set and recorded by the serviceman who install the barfeeder. Their set values ensure optimal cooperation between the barfeeder and the lathe. Consult eventual change of these parameters with the vendor or the manufacturer first.

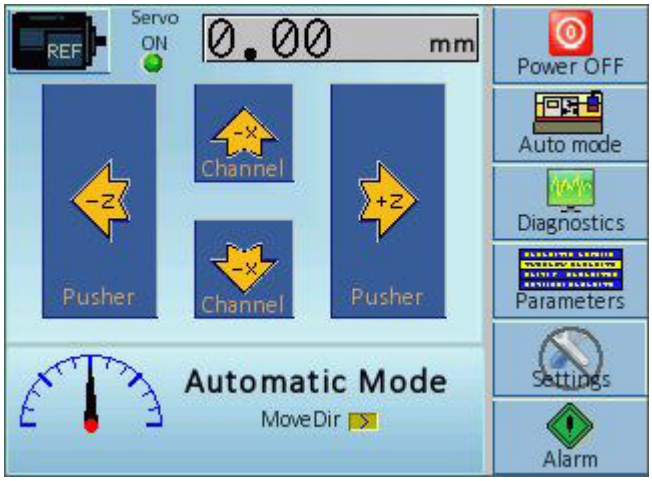
DANGER

Improper selection of service parameters can cause wrong function of the lathe interface!!!

4.9.2.4 MANUAL MODE

The ***Manual Mode*** is always accessed by pressing the key .

Manual Mode allows barfeeder motions by means of the arrow keys. This is also intended for moving to Zero position.



4.9.2.4.1 MOVE TO ZERO POSITION

Always after the barfeeder switching on, first it is necessary to go to a zero position. If the barfeeder does not know the zero position, the key motor is black. If the zero position is known, the key motor is green.

How to go to a zero position

- First make sure that the barfeeder loading mechanism is in the lower limit position. Otherwise shift the flag by hand into the back limit position, and, in the manual mode move the loading mechanism into the basic position by means of .
- In the manual mode press the key , which will initiate the move to Zero position. The motion can be terminated any time by pressing the again.
- After successful search the flag will stop in the back limit position, and the key motor will change its colour to green. This indicates the successful arrival in the Zero position.

4.9.2.4.2 BARFEEDER MOTIONS

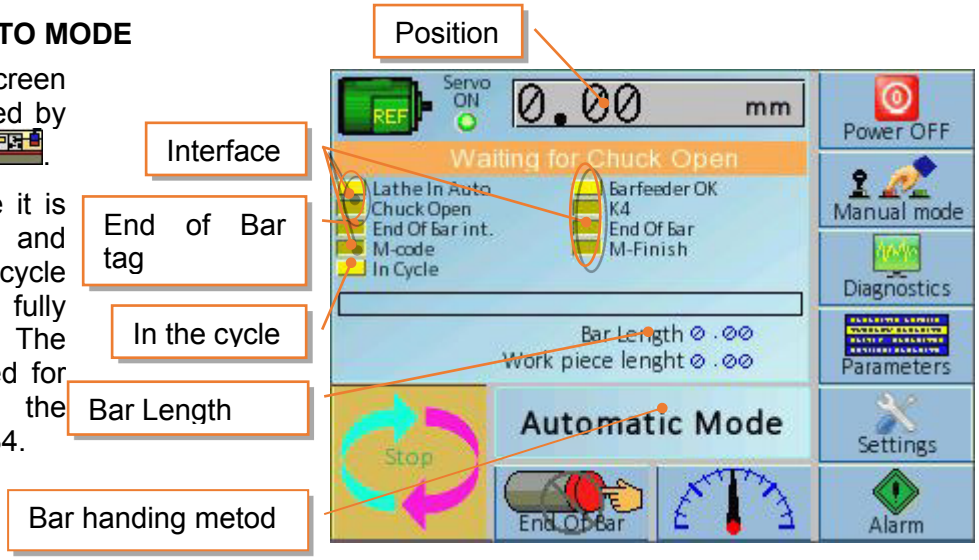
In the manual mode with S3 key switch in MAN position it is possible to move with the flag and the loading mechanism using the arrow keys. Horizontal motion of the flag is only enabled when the loading mechanism is in the lower limit position or in a position corresponding to the selected bar size see the parameters #013 and #111. The loading mechanism can only be moved if the flag is in the back limit position. The barfeeder moves as long as the relevant key is pressed and the moving part is not in its limit position.

In the manual mode in the forward motion of the flag (toward the lathe) the barfeeder exerts only a limited force. This force corresponds to the value of the parameter #300. Consequently, if a bar to be fed is inserted into the barfeeder, it is possible in the manual mode to check the feeding force value which is set in the parameter #300.

4.9.2.5 AUTO MODE

The *Auto Mode* screen is always accessed by pressing the key .

In the Auto Mode it is possible to start and stop the working cycle of the barfeeder fully automatically. The mode is also used for calibration of the material switch B34.



4.9.2.5.1 AUTOMATIC CYCLE START

- Before starting up the lathe with the barfeeder check whether the barfeeder is in its basic position (the loading mechanism in the lower limit position and the pusher in the back limit position).
- Go with the lathe to the Zero position and perform preparatory actions finished by clamping.
- Switch over the barfeeder to *Auto Mode* and press . The barfeeder will go to Zero position (if it is not known). After it, it slides the pusher in the spindle to measure the length of eventual bar clamped in the lathe. Finally, it moves the pusher to position see the parameter #101.
- Using the Reset, cancel the barfeeder alarm on the lathe, if any.
- Search relevant technological program in the lathe, switch over the lathe into the Auto Mode, and start the technological program.

4.9.2.5.2 AUTOMATIC CYCLE TERMINATION

The run of the lathe with the barfeeder can be terminated as follows:

- By finishing the part on the lathe and pressing the key on the barfeeder.
- By processing of all bars from the barfeeder magazine (the barfeeder indicates the error no. A09).

4.9.2.5.3 REFILLING BARS IN THE MAGAZINE

Refill material in the magazine only with automatic cycle switched off (completed). Otherwise error no. A16 could be notified.

4.9.2.5.4 LATHE OPERATION WITHOUT BARFEEDER

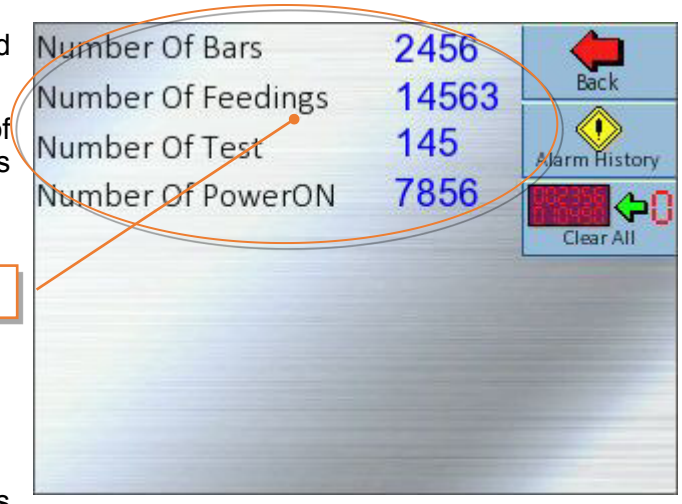
Lathe operation is possible without the barfeeder provided the power part of the barfeeder is connected and the flag is in the back limit position. In this case the barfeeder does not send error message to the lathe.

DANGER Some lathes can "disconnect" the barfeeder and ignore its signals. This function enables barfeeder switching off by the Q1 switch without causing a lathe error. In this case however the lathe ignores the barfeeder signals, and therefore there is a risk in any barfeeder handling that the pusher can get into contact with the rotating spindle and be damaged!

4.9.2.6 STATISTICS

The ***Statistics*** screen is always accessed by pressing the key .

Statistics contains various service data of the barfeeder operation. This screen is not important for common user.



4.9.2.6.1 COUNTERS

Counters show the numbers of various working cycles of the barfeeder.

How to reset counters

- Change user level to ***SERVICE***.
- Reset the counters by pressing the key .
- Cancel the ***SERVICE***.

4.9.2.7 SETTINGS

The ***Settings*** screen is always accessed by pressing the key .

On this screen you can set real time, timeout for backlight of HMI, level of backlight, auto logoff from higher security level than Operator and turn on or off beeping.
Also you can turn on automatic logoff timeout that logout user from higher user level to the lowest.
Button „Option“ is used for enabling additional function of the barfeeder. This button works only on Power OFF state of the barfeeder.
Button „Cal“ is used for calibration of touch panel.

4.9.2.7.1 REAL TIME

How to set real time

- Change user level to ***SERVICE***.
- Go to ***Settings*** screen by pressing key .
- Touch value you want to change.
- Cancel the ***SERVICE***.

4.9.2.8 ALARM HISTORY

The ***Alarm History*** screen is always accessed by pressing the key  from ***Statistics*** screen.

On this screen you can see all alarms and barfeeder moves active and past.
Active alarms are blue, active moves are orange and all alarms and moves from past are green.

4.10 BARFEEDER PARAMETERS

Barfeeder operation is controlled by parameters, which are divided into the following groups:

- Operator Parameters 
- Service Parameters 

Operator Parameters are the parameters, which are directly dependent on the selected machining technology.

Service parameters depends on the type of barfeeder, lathe and their interface.

4.10.1 PARAMETERS

Using the ***Parameters*** screen it is possible to work with all parameters of the barfeeder.

4.10.1.1 PARAMETER SELECTION

All parameters of the barfeeder have unique numbers assigned, according to which the parameters are arranged in the list of parameters. In the list always either operator parameters or service parameters are displayed. Using buttons ⬅, ➡ you can move to the next or previous parameter.

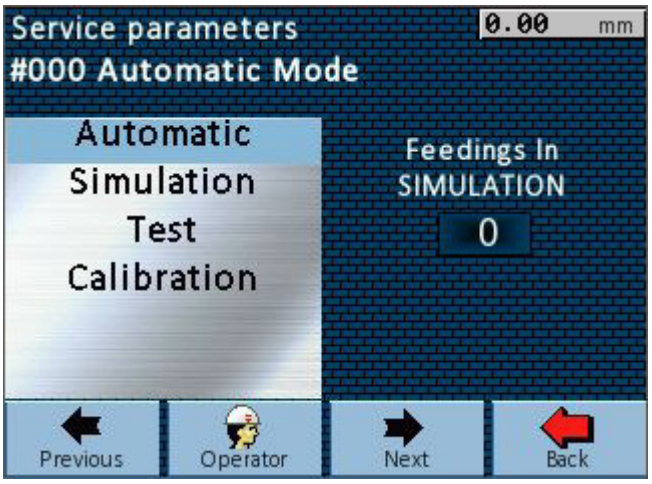
Fast select of parameter

- Touch name of the parameter for the opening fast select screen.

4.10.1.2 PARAMETER TYPES AND THEIR SETTING

4.10.1.2.1 PARAMETERS OF LIST TYPE

The parameters of list type are enumerative parameters #000 to #099.

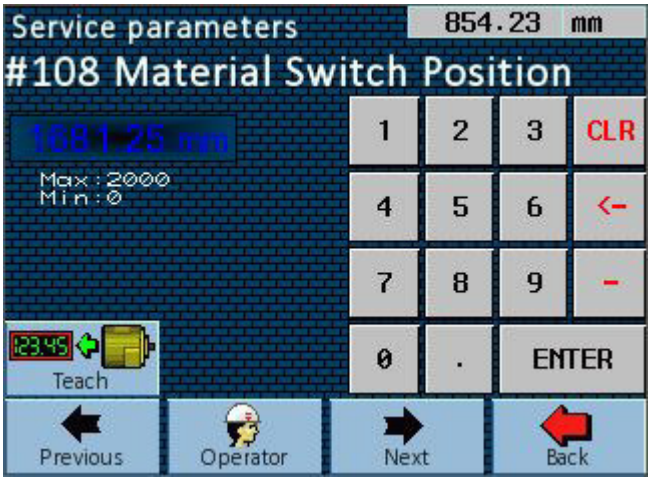


How to change the value of the list type parameter

- Select the value by clicking on relevant value (line) in the list of values of the parameter.

4.10.1.2.2 PARAMETERS OF POSITION TYPE

Parameters of position type are numeric parameters #100 to #199, which express certain position or length. These parameters can be entered both in mm and inches.



How to change the value of the position type parameter

- Touch on current value of the parameter to change it.
- Confirm it by “ENTER” button.
- For some of these parameters it is possible to use the key  . After pressing the key the parameter takes over the current value of the flag position. This can be used, for example, in the setting of the parameter #101, #102 etc.
  If this key is not available, the parameter either does not support it or it is necessary first to go to zero point.

4.10.1.2.3 PARAMETERS OF OTHER TYPE

Parameters of other type are other nonlinear numeric parameters #300 to #399.

How to change the value of the other type parameter

- Enter the requested value, and confirm it by “ENTER” button.

4.10.2 OPERATOR PARAMETERS

Operator parameter setting is directly dependent on the part production technology in the lathe. The following figure shows linear operator parameters.

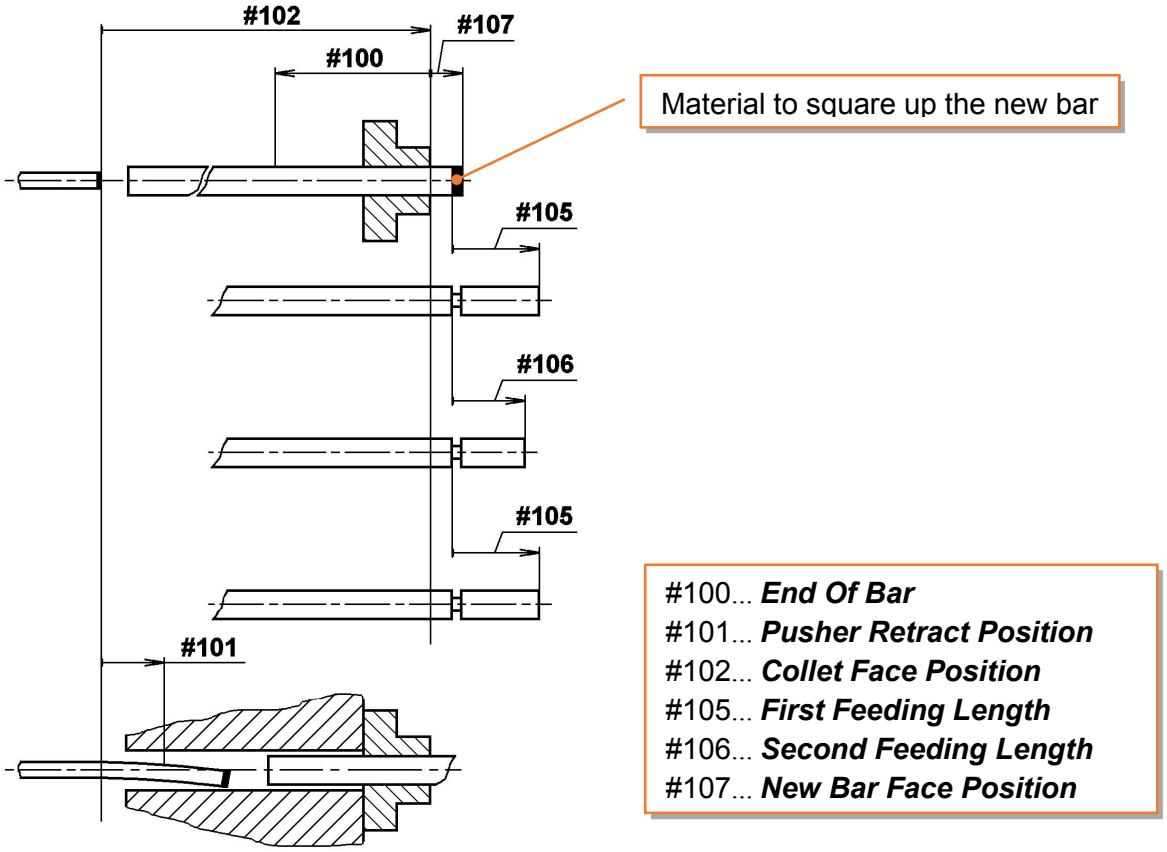


Fig. 4.6 - Linear Operator Parameters

4.10.2.1 SETTING OF THE LOADING MECHANISM

The barfeeder loads the bars from the magazine into the lathe by moving the channel from down upwards so that the axis of the bar lying in it is aligned with the axis of the lathe spindle. During this movement one bar is loaded by the channel from the magazine into the channel. Thus the barfeeder must move the bar depending on bar size and shape to various positions to align the bar in the channel with the axis of the lathe spindle.

Target positions of the channel (X axis) are calculated by the barfeeder from the data stored in parameters #013 and #111.
The above calculated channel position is offset in relation to the zero position of the channel by ***Global Channel Offset*** (#104).
Thus it is possible to state that final target position of the channel is the total of specific channel position calculated on the basis of values stored in #013 and #111 and parameter #104.
The meaning of parameters #104 is described in relevant chapter see further.

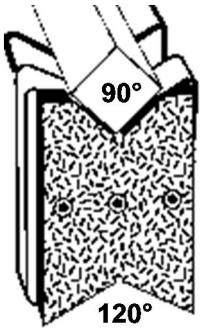
4.10.2.1.1 #111 – BAR DIMENSION

Parameter #111 sets the dimension of the bar of given section, which is set in parameter #013.

If you want to load a non-circle bar (hexagon, square), enter the diameter of inscribed circle of the bar section in #111. For example, for hexagon or square of 30 mm enter #111=30 mm. Do not forget to set the parameter #013 correctly.

4.10.2.1.2 #013 – BAR PROFILE

Parameter #013 sets a profile of the loaded bar.

#013	Description	
Circle	For round and hexagonal bars. If you want to load round or hexagonal bars, it is necessary to turn over the orienting block at the channel end (on the lathe side) with 120° cutout up.	
Square	For square bars. If you want to load square bars, it is necessary to turn over the orienting block at the channel end (on the lathe side) with 90° cutout up.	

The bars of non-circle sections will always be oriented in their pushing into the lathe spindle (in their pass through the orienting block) in such a way that they will always stand on one of their edges see the figure above.

4.10.2.2 #006 – LANGUAGE

Parameter #006 sets the language of the barfeeder user interface. Change of the parameter #006 is implemented immediately.

#006
English
Czech
Russian
Germany

4.10.2.3 #010 – PUSH MODE

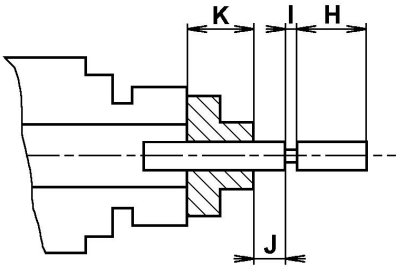
Parameter #010 sets forth the way of bar feeding into the lathe.

#010	Description
Stopper	The barfeeder will feed the bar to the lathe stopper, on which it may exert the maximum force stored in the parameter #300.
Position	The barfeeder will feed the bar to a set position (#105, #106, #107). In feeding to Position it can apply up to 100% force on the bar independently on setting of the parameter #300.

For editing the parameter #010 is required to activate option for feeding on position.

4.10.2.4 #100 – END OF BAR

Using the parameter #100 the barfeeder checks the bar length in the lathe and decides whether the bar is or is not sufficiently long to manufacture a part.



H..... part length with squarring allowance
I ..... cut-off tool length
J ..... safety zone (is not a part of the parameter #100)
K..... minimum clamping length

#100 = H + I + K

Fig. 4.7 - Setting of parameter #100 - End Of Bar

Parameter #100 is formed by the following components:

Longest feed length (H + I)..... mostly the part length with squaring allowance + cut-off tool width
Minimum clamping length (K).... mostly the length of clamping device jaws

The remnant length ranges between:

Minimum remnant length..... K + J
Maximum remnant length..... K + J + I + H

DANGER

Actual length of the remnant is always dependent on the length of the machined bar. The remnant length can be minimized by suitable length of the loaded bars.

Do not reduce the remnant length by shortening the parameter #100!!! Shortening the parameter #100 means a reduction of the minimum clamping length!!!

4.10.2.5 #101 – PUSHER RETRACT POSITION

By appropriate setting of the parameter #101 it is possible to reduce the bar feeding time.

In forward motion into the lathe, the pusher sags by effect of its own weight. Consequently, it touches the spindle insert and the rotating spindle could damage it. Parameter #101 sets such extension of the pusher from the back position, at which the pusher reliably cannot touch the spindle insert.

If the parameter #101 > 0 (e.g. 400 mm), the feeding will take place as follows:
The barfeeder feeds the bar and moves back by 50 mm. If the pusher moves more than 400 mm from its back position, the barfeeder will move back to the position set in the parameter #101 (400 mm).

Set the parameter #101 with a sufficient safety distance from the pusher contact with the spindle insert to avoid pusher accident!!!

If it is necessary to go with the pusher from the lathe spindle, enter the pusher retract position 0 mm.

4.10.2.6 #102 – COLLECT FACE POSITION

Parameter #102 sets the distance of the clamping device (collet) face from the barfeeder (from the end of the pusher in the back position).

How to set parameter #102

- Remove the bar from the lathe spindle, and make sure that the loading mechanism is in the lower limit position (pusher is in the spindle axis).
- If Zero position is not known, go to it.
- Find the parameter #102.
- Move the pusher by hand to approx. 10 mm in front of the clamping device. After it, take a straight solid object and push the pusher back to ensure that its point is aligned with the face of the clamping device.
- Using the key  , copy the actual position of the flag into the parameter #102. The value of the parameter #102 is set by it.

The value of the parameter #102 must be checked at replacement of the clamping device or its jaws and in change of the pusher (pusher length).

4.10.2.7 #105, #106 – FIRST AND SECOND FEEDING LENGTH

Parameters #105 and #106 set the length, by which the barfeeder will move the bar in feeding to ***Position*** (#010).

The barfeeder differs between ***First Feeding Length*** (#105) and ***Second Feeding Length*** (#106), which alternate as follows depending on the values entered in them.

#105	#106	Description
0 mm	0 mm	The barfeeder always arrives to the bar position and there it stops. The bar will always be "fed" by 0 mm.
30 mm	0 mm	If #106=0, it is ignored. At each feeding the barfeeder feeds the bar by 30 mm.
30 mm	30 mm	At each feeding the barfeeder feeds the bar by 30 mm.
30 mm	50 mm	At each odd feeding after the automat startup or after the bar replacement the barfeeder feeds the bar by 30 mm. At each even feeding by 50 mm. The driver controlling the feeding order is reset after the automat startup and after replacement of the bar. The new bar will first always be fed by the ***First Feeding Length***.
0 mm	50 mm	At each odd feeding the barfeeder only arrives to the bar position. At each even feeding it feeds the bar by 50 mm.

4.10.2.8 #107 – NEW BAR FACE POSITION

Parameter #107 sets for the length, by which the new bar will be moved in front of the clamping device in the ***Position mode*** (#010).
If you want to move the new bar 27 mm in front of the face of the clamping device, enter the value 27 mm in the parameter #107.

4.10.2.9 #113 – SECOND EOB

Setting of the parameter #113 is same as parameter #100 but is active only if Second Feeding Length is active too see Chapter 4.10.2.7.

Parameter #113 is active only if value of the parameter #106 is bigger than zero and the parameter #010 is set to Position.

4.10.2.10 #300 – FEEDING FORCE

Parameter #300 sets forth a maximum force, by which the barfeeder will push the bar against the stopper, slide the new bar in the spindle lathe, eject the bar remnant, and go forward (toward the lathe) in the manual mode.

Select the value of parameter #300 adequate to the pusher diameter.
Too big value can cause damage to pusher ∅ 6 mm!!!

4.10.2.11 #301 – RETRACT DELAY

Parameter #301 states how long after the clamping the barfeeder is to push on the bar (or remain with the bar at position). This function is very important for precise feeding, because it compensates time advance of the Clamping Device Closed before the actual clamping of the material in the clamping device of the lathe. This parameter is as a rule set between 0.5 and 1 s.
If there is a high clearance between the jaws of the clamping device and the bar, the barfeeder can go out of the spindle before the bar is clamped. This can be eliminated by increasing the value of the parameter #301.

Increasing the value of the parameter #301 extends the time which is necessary for feeding.

4.10.3 SERVICE PARAMETERS

Service parameters are parameters which do not relate to the method of part making in the lathe. These parameters influence the timing of the interface signals, user interface and other important features of the barfeeder.

Common user should not change the service parameter settings. The parameters have been set by the serviceman who installed the barfeeder in such a way that the cooperation between the barfeeder and the lathe is optimized to maximum possible extent.

Consult eventual change of these parameters with the machine vendor or manufacturer first.

Improper selection of service parameters can cause an irreversible loss of all parameters set by the user or wrong function of the lathe interface!!!

4.10.3.1 #000 –AUTOMATIC MODE

Parameter #000 sets the basic mode of barfeeder operation after the startup of the automatic cycle. The barfeeder distinguishes 4 basic work modes. Only normal automatic mode is used for machining. The other modes are only intended for servicemen of the manufacturer and the vendor. These modes shall not be used for machining!

#000	Meaning
Automatic	Normal automatic mode for machining.
Simulation	Mode for testing of the barfeeder installed at the lathe.
Test	Mode for barfeeder running-in in production.
Calibration	Mode for calibration of the material switch B34.

4.10.3.1.1 AUTOMATIC

Only this mode of the barfeeder operation is used for bar loading and feeding for their further processing in the lathe. After successful installation of the barfeeder and testing of the lathe/barfeeder set it is necessary to activate the normal automatic mode (if not already activated) before barfeeder handing over to the user.

Activation of the normal automatic mode

Normal automatic mode is so called permanent automatic mode of the barfeeder i.e. this mode is always activated automatically (independently of the operator) after the barfeeder switching on. Therefore, to activate the normal automatic mode it is sufficient to simply switch the barfeeder off and on.

4.10.3.1.2 SIMULATION

Simulation mode is used for the testing of the newly installed barfeeder at the lathe without the need of feeding an actual bar. By the simulation it is possible to test mutual compatibility of the barfeeder and lathe interfaces.

In this mode the barfeeder responds to the commands from the lathe in the same way as in the normal automatic mode, while respecting all settings of the interface in the service parameters. End of Bar is activated by the operator independently of the length of the pusher stroke.

In the *Simulation* mode, avoid barfeedeer contact with the bar!!!

If it is necessary to have a bar clamped in the lathe in course of simulation, set the parameter #102 in such a way that the pusher cannot get into contact with the bar! At the same time the barfeeder should be able to move the pusher. Optimum value is 500 mm.

To test the barfeeder functionality it is necessary to write a test program which will simulate machining in the lathe.

Example of the lathe test program (without tool head motions)

N10	Spindle stop	
N20	End of Bar test	If End of Bar, go to block N200
N100	Open Clamping Device	**Section for bar feeding**
N110	Feeding command (M-code)	The barfeeder goes to position #102.
N120	Close Clamping Device	The barfeeder returns.
N130	Dwell 2 s	Dwell for safe retraction of the pusher.
N140	Go to block N300	
N200	Open Clamping Device	**Section for bar replacement**
N210	Ejection command (M-code)	Barfeeder goes to position #102
N220	Dwell approx. 1 s	Barfeeder loads a new bar
N230	Command to feed a new bar (M-code).	Barfeeder goes to position #102.
N240	Close Clamping Device	Barfeeder returns.
N250	Dwell 2 s	Dwell for safe retraction of the pusher
N300	Spindle start	**Simulation of machining**
N310	Dwell 5 s	
N320	Go to program start	

DANGER

Attention!

In the *Simulation* mode the barfeeder can also work with the open cover (the mode switch S3 can be in MAN position)**!!!**

Your inattention can cause your injury!!!

Start of *Simulation*

- Change the user level to ***SERVICE*** and set the parameter #000 to ***Simulation***.
- Enter the number of feedings in the field ***Feedings in Simulation*** *(Feedings In Simulation)*.

Feedings in Simulation *(Feedings In Simulation)*	**Meaning**
= 0	End of bar must be simulated by the operator manually by pressing the relevant key.
> 0	End of bar is simulated by the barfeeder automatically after execution of the specified number of feedings (without operator's intervention).

- Put the barfeeder into the basic position the automatic cycle starts from. The pusher must be in the lower rear position.
- In the ***Power ON*** screen, press to start the barfeeder.
- After simulation of bar measurement by the barfeeder, start the test program in the lathe. The barfeeder now moves the pusher forward (#102) and back to simulate bar feeding.

End of Bar simulation

If you want to simulate End Of Bar, press the key  in the ***Power ON*** screen or wait until the barfeeder simulates the end of bar depending on the value set in the field ***Feedings in Simulation*** *(Feedings In Simulation).*
Now the barfeeder will behave in bar feeding in the same way as if there really were a short bar in the lathe. Therefore it sends the End of Bar signal to the lathe, and simulates bar replacement by its motions. The program in the lathe goes to the block N200 and controls the barfeeder during replacement of the bar.

4.10.3.1.3 TEST

Test is particularly used for the barfeeder running-in.

After start of this mode the barfeeder moves the pusher forward to the position saved in the parameter #102. After it, it returns, waits 5 seconds, moves the loading mechanism to the position corresponding to the selected bar see #013 and #111, moves the flag into front limit position see #103, returns the flag, moves the loading mechanism to basic position, and repeats the whole cycle.

Attention!

In the *Test* mode the barfeeder can also work with the open cover (the mode switch S3 can be in MAN position)!!!

Your inattention can cause your injury!!!

Start of *Test*

- Change the user level to ***SERVICE*** and set the parameter #000 to ***Test***.
- Put the barfeeder into the basic position the automatic cycle starts from. The pusher must be in the lower rear position.
- In the ***Power ON*** screen, press  to start the barfeeder.

4.10.3.1.4 CALIBRATION

The material switch B34, by means of which the length of bars fed into the lathe is measured, is installed in the front part of the channel (on the lathe side). The barfeeder must know the switch position with regard to the origin of the coordinate system. For this purpose the material switch calibration function is used. The position of the material switch is stored in the parameter #108..

How to calibrate the material switch

- In the parameters #013 and #111, set the bar ∅ 6 mm or other bar of as small diameter as possible as the current bar. At the same time set the parameter #000=***Calibration***.
- Use  to go with the channel to the upper limit position.
- Now hold  until the flag reaches the front limit position. In forward motion the flag must activate the diaphragm of the material switch. In this way the barfeeder measures the switch distance from the origin of the coordinate system, and saves it in parameter #108.
- Return the barfeeder in the basic position (rear down), and return original values in the parameters #013 and #111.

When to calibrate the material switch

The material switch must always be calibrated after any modification/maintenance of the barfeeder such as replacement or modification of the switch diaphragm or of the B34 switch which may result in possible change of the switch position relatively to its zero position.

Do not write in the parameter #108 directly, but always use the material switch calibration function. Only this function will ensure precise setting of the parameter #108.

4.10.3.2 #001 – FEEDING ON M-CODE

Parameter #001 determines whether the barfeeder is to begin the feeding only at the clamping device opened or to wait to a special command sent from the lathe.

#001	Description
OFF	The barfeeder feeds only at the clamping device opened. The barfeeder begins to feed as soon as the lathe opens the clamping device. The barfeeder terminates the feeding as soon as the lathe closes the clamping device. Mcode is required only when barfeeder loads a new bar and on first feeding.
ON	The barfeeder feeds to a special command (M-code) sent from the lathe. The barfeeder begins to feed the bar after receipt of the M-code. If the bar is moved to a stopper (to a set position), the barfeeder signs off the M-code using the M-code end signal (M-fin), and continues to push the bar to the stopper (remains in the position) as long as the clamping device is open in the lathe.

4.10.3.3 #002 – END OF BAR TIMING

Parameter #002 sets forth a method of sending the End of Bar signal to the lathe at presence of a short bar in the lathe.

#002	Description
Short	End of Bar is only sent, if the clamping device is closed. This timing is the most frequently used timing of the End of Bar signal.
Long	End of Bar is sent to the lathe as soon as the barfeeder detects a short bar in the lathe. The signal is reset by the leading edge of termination of the second M-code (M-fin signal) at the bar replacement. Thus the signal is active from the moment of detection of the end of bar to the moment of completion of the bar replacement.
Mazak	End of Bar is sent to the lathe only if the EOB M-code is active.
Standard	End of Bar is sent to the lathe as soon as the barfeeder detects a short bar in the lathe. The signal is reset by the leading edge of M-code for ejection.
Double	End of Bar is only sent if the condition for sending of ***Long*** end of bar is fulfilled and at the same time the M-fin signal is not sent. ***Long*** End of Bar signal is thus interrupted if the M-fin signal is sent. This signal is designed for the lathes which drop the M-code at absence of the End of Bar signal. These lathes are not able to send the M-code, if the barfeeder does not signal End of Bar. The barfeeder signs off the M-code by interruption of the end of bar, and its restart enables the lathe to send the second M-code at the bar replacement. In particular this can be true for Boley or Schaublin lathes. In this case however it is not possible to feed on M-code, but also on clamping device open see the parameter #001.

4.10.3.4 #004 – STAT/DYN MCODE

Parameter #004 sets type of Mcode.

#004	Description
Static Mcode	The lathe must cancel the M-code signal on the basis of leading edge of M-fin.
Dynamic Mcode	The lathe must cancel the M-code signal immediately after sending it.

4.10.3.5 #005 – INVERT CHUCK OPEN SIGNAL

Parameter #005 sets the logic of the open clamping device.

#005	Description
OFF	Clamping device is open, if the signal is ON. The clamping device is closed, if the signal is OFF.
ON	Clamping device is open, if the signal is OFF. Clamping device is closed, if the signal is ON.

4.10.3.6 #007 –K4 RELAY

Parameter #007 sets the meaning of the reserve relay of the K4 interface.

#007	Description
Off	K4 relay is inactive permanently.
TopCutInterlock	***TopCutInterlock*** signal is activated by trailing edge of the EOB M-code or by leading edge of the Clamping Device Open signal, if the barfeeder detects End of Bar. It is reset by the trailing edge of the second M-code at the bar replacement. This signal is used on older Mazak lathes (M640T), wherein it locks repeated jump to a subprogram in End of Bar test (M69).

4.10.3.7 #009 – FACTORY RESET

Using the parameter #009, you can call the function that resets all important parameters and cycle counters. This function is used in production for initial setting of all important values.

Be especially careful in eventual use of the reset function. Changes made by the reset function are extensive and irreversible!

#009	Description
No Reset	
Reset	Reset function saves initial values in all parameters see the table.

Parameter	Value
#000	***Automatic***
#001	***ON***
#002	***Short***
#005	***OFF***
#006	***English***
#007	***OFF***
#009	***No Reset***
#010	***Stopper***
#013	***Circle***
#100	0 mm
#101	30 mm
#102	500 mm
#103	1750 mm
#104	128 mm
#105	0 mm
#106	0 mm
#107	0 mm
#108	1 mm
#111	6 mm
#300	20 %
#301	1 s

4.10.3.8 #103 – BARFEEDER STROKE

Parameter #103 states a maximum working stroke of the barfeeder flag. The maximum working stroke of the barfeeder flag must be shorter than the travel done by the flag from the back limit position to the front limit position. An optimal difference of these two lengths is approx. 2 to 3 mm.

Usual value of the parameter #103

approx. 1750 mm

4.10.3.9 #104 – GLOBAL CHANNEL OFFSET

Parameter #104 sets the offset of the channel position in relation to the position of the channel reference switch B31. The barfeeder should be set in such a way that the value of this parameter is approx. 128 mm.
When installing the barfeeder, always check correct setting of this parameter, see below.

How to set the parameter #104

- Change the user level to ***SERVICE***.
- Prepare a straight bar, and install a spindle insert of a suitable diameter in the lathe.
- In the parameters #013 and #111 set the selected bar, see the paragraph above.
- Insert the bar into the channel, and by means of  in the ***Power ON*** screen move the channel to upper limit position. The channel must stop itself. Only after it you can release the key  .
- Estimate the difference between the bar axis position and the spindle axis position, and change the value set in the parameter #104 by this difference.
- Using the key  move the channel to the lower limit position and back to the upper limit position.
- Check the bar position in relation to the spindle position, and make another correction of the parameter #104, if need be.

In this way you have changed (moved) target positions of the channel for all bars (not only for the bar selected by you), which can be entered into parameters #013 and #111.

After barfeeder installation, the correction of the parameter #104 must always be made. The correction should also be made after handling the channel reference switch B31.

If the user has not a suitable spindle insert and bar at installation of the barfeeder, he should make the correction himself later on.

If the correction of the parameter #104 is omitted, the loading mechanism will not lift bars precisely into the spindle axis, and the user will have to enter other dimensions of the bar section that the dimensions of the actually loaded bar.

4.10.3.10 #108 – MATERIAL SWITCH POSITION

Parameter #108 states the distance of the material switch B34 from the barfeeder Zero position.

Usual value of the parameter #108

approx. 1682 mm

Use the material switch calibration function for precise setting of the parameter #108, see Chapter 4.10.3.1.4

4.11 HOW TO PROGRAM A LATHE WITH THE BARFEEDER

There are many ways of programming a lathe with the Spacesaver barfeeder. Generally, the End of Bar test should be before feeding in the program to ensure that an arbitrarily long bar can be clamped in the lathe at start of the automatic cycle.

4.11.1 FEEDING TO STOPPER

If end of bar is not reached, the barfeeder pushes the bar to the stopper in the tool head. The arrival at the end of bar initiates the bar replacement subprogram.

Main program (feeding)

1. Tool head departure to the tool replacement position
2. Alignment of the tool head stopper with the spindle axis
3. Spindle stop
4. End of bar test (at end of bar, jump to subprogram for new bar loading)
5. Stopper arrival in front of the cut-off bar
6. Clamping device opening
7. M-code (barfeeder pushes the bar to the stopper)
8. Stopper departure to the machining position (the barfeeder continues pushing the bar to the stopper)
9. Clamping device closing (the barfeeder returns)
10. Dwell for pusher retraction to the rear position
11. Tool head departure to the tool replacement position
12. Technological program
13. Jump to program start

Subprogram (new bar loading)

100. Spindle positioning (necessary for non-circular sections)
101. Clamping device opening
102. M-code (the barfeeder ejects the rest by the new bar – new bar 1 mm in front of the clamping device)
103. 1 s dwell for separation of M-codes
104. Stopper arrival in front of the clamping device
105. M-code (the barfeeder pushes the new bar to the stopper)
106. Stopper departure to the position for new bar squaring
107. Clamping device closing (the barfeeder returns)
108. Dwell for pusher retraction to the rear position
109. Tool head departure to the tool replacement position
110. Tool replacement
111. New bar squaring
112. Tool head departure to the tool replacement position
113. Stopper selection
114. Return from the subprogram to line 5

4.11.2 FEEDING TO POSITION

If end of bar is not reached, the barfeeder moves the bar by a pre-programmed feeding length. The end of bar initiates the bar replacement subprogram.

Main program (feeding)

1. Tool head departure to safe position
2. Spindle stop
3. End of Bar test (at end of bar the jump to subprogram for new bar loading)
4. Clamping device opening
5. M-code (the barfeeder moves the bar see #105, #106)
6. Clamping device closing (the barfeeder returns)
7. Dwell for pusher retraction to the rear position
8. Technological program
9. Jump to program start

Subprogram (new bar loading)

100. Spindle positioning (necessary for non-circular sections)
101. Clamping device opening
102. M-code (the barfeeder ejects the rest by the new bar – new bar 1 mm in front of the clamping device)
103. 1 s dwell for separation of M-codes
104. M-code (the barfeeder moves the new bar in front of the clamping device, see #107)
105. Clamping device closing (the barfeeder returns)
106. Dwell for pusher retraction to the rear position
107. Tool replacement
108. New bar squaring
109. Tool head departure to safe position
110. Return from the subprogram to line 4

Activating option of feeding to position is required.

4.11.3 PARAMETER SETTING EXAMPLE

Example – Single feeding

Task:
Produce a part long 15 mm from the bar ∅ 50 mm. Allowance for bar squaring after feeding is 0.3 mm, the width of the cut-off tool is 3 mm. Minimum clamping length is 30 mm.
Let us suppose that cutting off will take place 10 mm in front of the clamping device. As bar ends are of bad quality (curved), we will first cut off the new bar face by 1.5 mm.

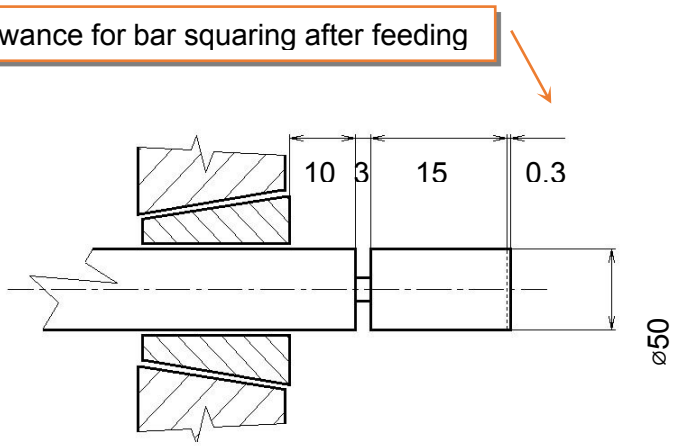


Fig. 4.8 - Example of cut off the bar face

Barfeeder feeding to the lathe stopper		
Parameter	**Value**	**Note**
#100	48.3 mm	48.3 = 15 + 3 + 0.3 + 30
#101	???	Depends on the pusher sag.
#300	40 %	---
#010	***Stopper***	---
#105	18.3 mm	The parameter is used for display of remaining number of feedings of the bar (i.e. remaining number of parts).
#106	0 mm	Parameter is not used.
#107	0 mm	Parameter is not used.
#102	???	Specific distance to the clamping device face.
#301	1 s	Usual value.
#013	***Circle***	---
#111	50 mm	---

Barfeeder feeding to position		
Parameter	**Value**	**Note**
#100	48.3 mm	48.3 = 15 + 3 + 0.3 + 30
#101	???	Depends on the pusher sag.
#300	40 %	---
#010	***Position***	---
#105	18.3 mm	The parameter is used for display of remaining number of feedings of the bar (i.e. remaining number of parts).
#106	0 mm	---.
#107	11.5 mm	11.5 = 10 + 1.5
#102	???	Specific distance to the clamping device face.
#301	1 s	Usual value.
#013	***Circle***	---
#111	50 mm	---

5 MAINTENANCE

5.1 ROUTINE MAINTENANCE

Weekly
Remove eventual dirt from the barfeeder.

Monthly	
11	Clean the profile, guide bars and guide rollers. Grease guide bars with grease LV2.
12	Apply machine oil on the bearings of the pusher tilting.
13	Clean and oil the pusher lock bar and pin.

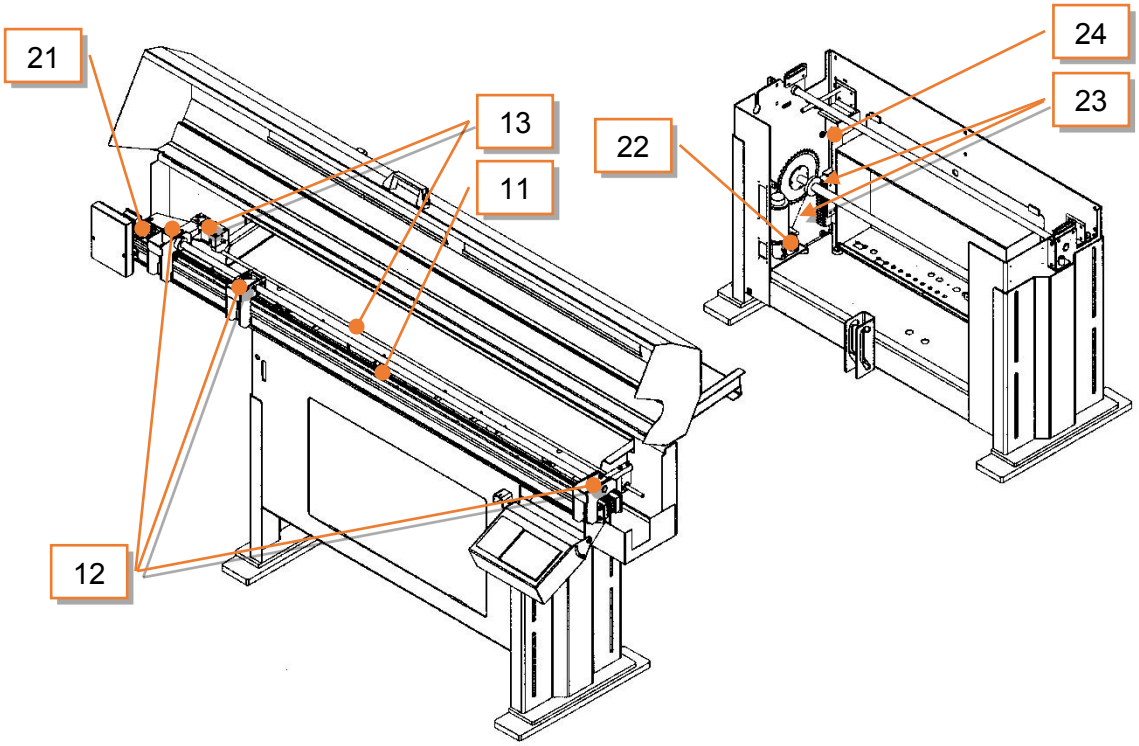


Fig. 5.1 - Routine Maintenance

Every two months	
21	Check the tightening of the toothed belt of the horizontal unit.
22	Check the loading mechanism chain tension.
23	Spray chain oil on the chain of the loading mechanism. Grease the gears of the loading mechanism with grease LV2.
24	Clean vertical guide of the loading mechanism.

5.2 ERROR MESSAGES

If the barfeeder evaluates certain situation as an error status, an error message is displayed on the control panel.

The barfeeder differentiates 2 error types – yellow-black and red-black ones.

The errors in the red-black box are the errors induced by the feeding motor drive These errors are displayed only in English. Consult eventual recurrence of these errors with the manufacturer.

The errors in the yellow-black box are error states of the barfeeder induced by the program running in PLC. These errors are described in the following table.

The error can be cleared by the key „Clear Alarm“ see the picture. Certain errors cannot be cleared by the key „Clear Alarm“. They disappear after removal of their cause. The key hides the error in the lower right corner, where or is displayed. The error can be displayed again by pressing the or .

PLC status

All error messages contain a PLC status. This number shows the error number and program status at the moment of error occurrence. Knowledge of this value can significantly help in solving eventual problem. In error consulting the manufacturer may ask for the status value.

Error no.	**Text**
Cause	**Corrective Action**
001	***EMERGENCY STOP pushbutton***
E-Stop pushbutton is pressed on the barfeeder or on the lathe.	Release all E-Stop pushbuttons, eventually switch on the lathe power supply. If the error persists, check the emergency stop circuits, condition of RDY LED on PLC see 5.3.2.1 and functionality of K21 relay.
002	***Barfeeder cover is open***
Barfeeder cover is open, and at the same time the key S3 is in AUT position.	Close the cover or turn the key to MAN position. If the error persists, check the function of the cover switch B38 and the key S3.
003	***Bad X axis target position***
Channel target position is out of range.	Enter correct dimension and section of the bar (#111, #013), eventually check the value in parameter #104.
005	***Channel is not down***
Channel does not stand on the reference switch B31.	Check the function of the switch B31, or the function of channel motion (X axis).

Error no.	Text
Cause	**Corrective Action**
006	***Lathe is not in auto mode***
If the barfeeder works in automatic mode (it feeds, replaces or measures the length of the bar on the basis of EOB M-code), the lathe must be in automatic mode.	Ensure that the lathe is continuously in the automatic mode in course of feeding, replacement and measurement of the length of the bar. Depending on interface this signal is often replaced by the signal from the door of the lathe workspace. In this case do not open the door.
009	***Bar failed to load***
Magazine is empty. If the bar has been loaded and inserted in the spindle, probably the material switch B34 is not calibrated.	Add material in the magazine and renew automatic operation. If the problem persists, calibrate material switch B34. Minimum bar length workable by the program is 5 mm.
010	***Material switch error***
The signal of the material switch B34 was not changed during calibration or was in logic zero before start of pushing a new bar in the lathe spindle.	Check the function of the material switch B34 and the function of its diaphragm. In stand still the switch must be connected.
012	***Load mechanism timeout***
Channel or splitter motion was not completed in time limit of 8 seconds.	Check whether a mechanical obstacle prevents the loading mechanism from motion. Otherwise check the function of K11, K22 and K23 relays on PCB. Furthermore, check the source G3, motors M2 and M3 and their cables.
013	***Flag is not back***
Flag was not in its back limit position in channel motion.	Check the function of the reference switch B33.
014	***Pusher at work space***
The pusher got in feeding to stopper in the lathe work space (in front of the clamping device), or the calculated target position of the pusher lies in the workspace.	Check the setting of parameters #100 and #102, or #105, #106 and #107 in feeding to position. In ***Part Stop*** (#011) check the setting of parameters #102 and #110.
015	***Key S3 not in AUT position***
Key S3 is not in AUT position during active automatic mode of the barfeeder.	If automatic mode is active, do not switch over the key S3.
016	***Magazine cover is open***
Magazine cover must be closed during the active automatic mode of the barfeeder.	If the cover is closed, check the function of the switch SQ32. If you want to refill material into the magazine, complete the machining of relevant part in the lathe (stop machining at the program end). Then add bars and restart the lathe.

Error no.	Text
Cause	**Corrective Action**
017	***M-code is not finished***
In the automatic mode the barfeeder monitors the lathe reaction to the M-fin signal. If the lathe does not terminate M-code in 3 seconds after the end of M-fin signal, the barfeeder sends this error message. If the barfeeder cannot separate (distinguish) 2 successive M-codes, it may also send this error message.	Check that the lathe reacts correctly to the M-fin signal sent from the barfeeder (relay K7). After sending the M-code from the lathe the program must wait on the block with the M-code until the barfeeder sends M-fin signal (relay K7) to the lathe, which will cancel the M-code. The lathe must cancel the M-code signal on the basis of leading edge of M-fin. Only after it it can go to the next block in the technological program. If you need to send 2 M-codes in succession to the barfeeder, insert a dwell of at least 0.2 s between them.
018	***Program reset by user***
Program was terminated by the operator by means of the key . This error message is not induced by any error status. It serves only for not continuing machining by the lathe, when the operator cancels the automatic cycle.	Delete this message.
019	***Bar is too long***
The length of the bar does not match the technology. The bar is too long. The barfeeder must be able to go back by at least 50 mm after bar clamping. In ejecting the rest of the bar by a new bar it must be at least 12 mm.	Check the length of the bar. The bar should not be longer than the length of the lathe spindle and the clamping device and the clamping cylinder. If the bar length meets the above condition, probably some of the parameters #102, #107, #110 is set incorrectly depending on technology. Also material switch B34 can be calibrated wrongly.
020	***MOV1 Timeout***
Measurement of bar length in the spindle was not completed in time limit of 15 seconds.	The length measurement is performed by a limit torque, see #300. Check the value of this parameter (if it is not too small). Also check that the pusher lock does not seize anywhere in pusher motion.
021	***Chuck open error***
Unexpectedly closed clamping device during bar feeding or replacement.	Ensure that the clamping device is open during bar replacement. Clamping device must be also open for the whole time of M-code in feeding.
022	***Chuck close error***
Clamping device opened during measurement of the length of the bar clamped in the lathe. There was a risk of uncontrollable extension of the bar into the lathe workspace.	Ensure that the clamping device is closed during measurement of bar length after start of the automatic mode and during EOB M-code.

Error no.	Text
Cause	**Corrective Action**
024	***New bar load timeout***
Maximum permitted time of flag forward motion was exceeded in sliding a new bar in the lathe spindle (max. 25 s).	Check the bar for straightness. Curved bar may seize in the spindle insert. Check that the bar goes correctly in the clamping device of the lathe. Check the value of parameter #300. Check the value of parameter #103.
025	***Sliding error***
Barfeeder is not in correct working position, or lock screws of the sliding mechanism are not tightened properly.	Move the barfeeder into working position, and fix it by lock screws. The sliding mechanism position switch B35 must be active.
028	***Channel position error***
Tolerance of channel stopping at the required position was exceeded. Relay K22 is probably defective.	Replace the relay K22 on PCB, and repeat the channel motion. If the problem persists, contact the service.
033	***No reference***
No reference.	Go to Zero Position see chapter 4.9.2.4.1.
034	***Key S3 not in MAN position***
Key S3 not in MAN position during manual mode of the barfeeder.	Turn the key S3 to the MAN position.

Error no.	Text
Cause	**Corrective Action**
035	***EMERGENCY STOP***
The operator pressed E-Stop pushbutton. Emergency stop could also be caused by a serious error.	If the operator did not press the E-Stop pushbutton, check the RDY LED on MP2310 see Chapter 5.3.2.1, the state of servodrive SD1 and the function of relay K21 on PCB.
040	***Servo drive alarm***
Drive SD1 of the motor M1 sent error. If the drive has not been recovered, it is possible to read the drive error directly on the drive SD1.	---
041	***Flag switch B33 error***
Switch B33 (NC) is deactivated (OFF) even when the flag is out of it.	Check functionality of the switch B33 (NC).
042	***Channel load move failed***
The channel went 1.2 s upward and B31 (NC) is still OFF, or counter preload failed.	Check functionality of the switch B31 (NC). If the error recurs, call the service.
043	***Channel is already down***
If a request exists for channel downward motion (-X), and switch B31 (NC) is OFF.	If the channel is down and the error was initiated by pressing  , this is normal state. If the channel is not down, check functionality of the switch B31 (NC).
044	***M code of at MFin***
Mfin was sent during inactive M code.	---
047	***Overload in Position mode***
Drive SD1 of the motor M1 was overload in position mode.	Check value of the parameter #300. Bar can be curved and jam in spindle insert.

5.3 ELECTRICAL EQUIPMENT

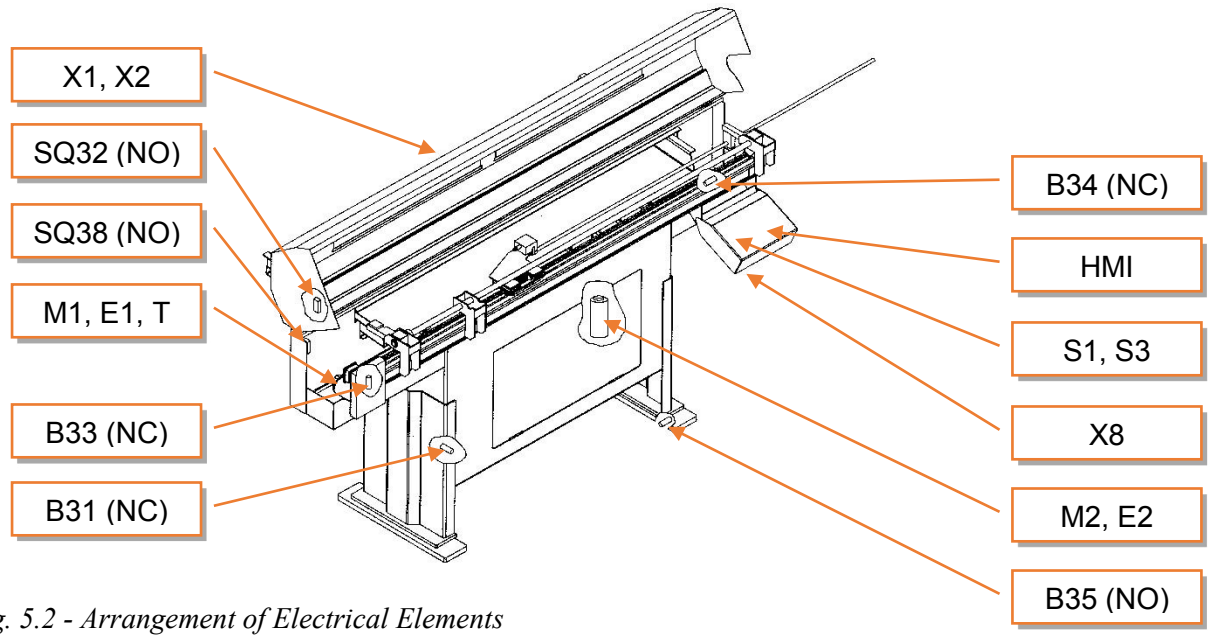


Fig. 5.2 - Arrangement of Electrical Elements

5.3.1 ARRANGEMENT AND MEANING OF SWITCHES

Switch	Text	Description
SQ38 (NO)	Cover switch	Closed, if the cover is closed.
B31 (NC!!!)	Loading mechanism down	Closed, if the channel of the barfeeder is not in lower limit position. The switch is NC!!!
SQ32 (NO)	Magazine opened	Closed, if the magazine cover is closed.
B33 (NC!!!)	Flag back	Closed, if the flag is not in rear limit position. The switch is NC!!!
B34 (NC!!!)	Material missing	Closed, if the switch diaphragm is not in idle state (no bar is lying on the diaphragm). The switch is NC!!!
B35 (NO) (option)	Barfeeder position OK	Closed, if the barfeeder is in working position on the rails.

5.3.2 PLC A (CP1E)

Fig. 5.3 - PLC A

5.3.2.1 CP1E LED STATUS

LED		Description
POWER	green	It lights in normal state
RUN	green	It lights, if program runs in PLC (normal state).
ERR/ALM	red	It lights or is flashing in case of an alarm or error.
COMM	red	It lights, if serial link is communicating.
INH	red	It lights, if bit for disabling all output is active.
PRPHL	red	It lights, if USB is communicating.
BKUP	red	It lights, if program is backup to the Flash memory.

5.3.3 BATTERY

In the barfeeder control panel there is a rechargeable battery to ensure backup of the barfeeder parameters. If the battery is low, the control panel sends error “RAAA051 Low battery”. In this case leave the barfeeder switched on until the battery is recharged, see information about battery life in Chapter 1.4.

After expiration of the assumed battery life, it is desirable to replace it preventively, even if the battery status indicator does not indicate end of battery life. Thus you avoid eventual complications.

How to replace the battery

- Contact the service.

5.3.4 INTERFACE DESCRIPTION

You can find the diagram of standard interface connection in Chapter 5.3.6.

The method of barfeeder connection to the lathe may differ depending on the lathe manufacturer. These differences mostly reflect in different connection of the connecting cable between the barfeeder and the lathe. You can get the recommended diagram of interconnection of the both machines from the manufacturer on demand.

Barfeeder power supply	
Single-cable interface	X1/1, X1/2, X1/PE
Twin-cable interface	X2/1, X2/2, X2/PE

Signals from the lathe to the barfeeder

The signals from the lathe to the barfeeder should be implemented by contacts of relays or switches on the lathe side. The signals are supplied with 24 VDC from the barfeeder (X1/14).

Text	Interface	Description
Lathe E-stop	X1/10-X1/11 X1/12-X1/13	---
Lathe in AUTO	X1/15	Signal is active - lathe in automatic mode (barfeeder function enabled) Signal is inactive - barfeeder function disabled This signal enables the barfeeder operation in the automatic cycle. The signal is a precondition for bar feeding and loading in the automatic cycle. In fact, it is a lathe safety signal, which informs the barfeeder that its automatic operation has been enabled by the lathe. This signal can be replaced by the signal of the lathe workspace door closing. The barfeeder can then work in the automatic mode only if the lathe door is closed.
Clamping device opened	X1/16	Signal is active - Clamping device is open Signal is inactive - Clamping device is closed The meaning of this signal can be inverted, see the parameter #005.
M-code	X1/17	Signal is active - request to perform an action is sent Signal is inactive - standstill This signal is used as a command for bar feeding, ejection, new bar feeding into the lathe workspace, etc. M-code should be sent from the lathe as a permanent signal, on which bases the barfeeder performs an action. After completion of the action the M-code is deactivated by the lathe on receipt of the End of M-code signal from the barfeeder.

Signals from the barfeeder to the lathe

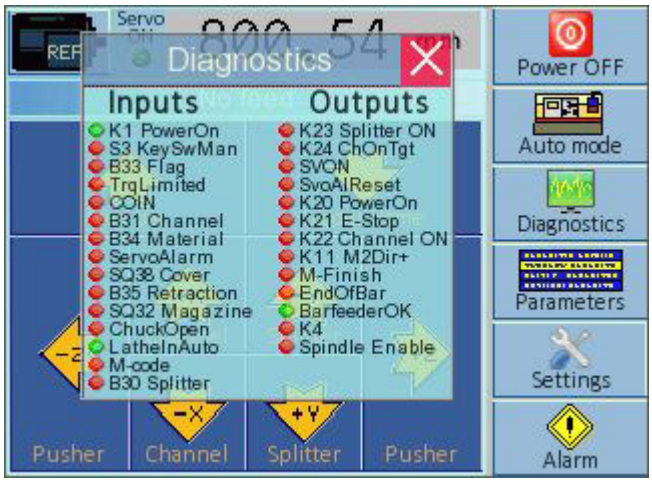
The signals from the barfeeder to the lathe are implemented by relay contacts in the barfeeder. The signals should be supplied with 24 VDC from the lathe (X1/19).

Text	Interface	Description
Barfeeder E-stop	X1/6-X1/7 X1/8-X1/9	---
Barfeeder OK	X1/20	Signal is active K2 is closed - the barfeeder without error Signal is inactive K2 is open - the barfeeder signals an error If the barfeeder does not run in the automatic cycle, K2 is closed, if the safety relay K1 is closed and the flag is in the back limit position. This enables lathe operation without the barfeeder.
K4	X1/24	Signal is active K4 is closed Signal is inactive K4 is open K4 relay is a reserve relay of the interface. Its meaning can be set in the parameter #007. Under normal circumstances the relay is always open (disconnected).
End of Bar (EOB)	X1/21	Signal is active K5 is closed - End of Bar reached (the bar is short) Signal is inactive K5 is open - enough material The End of Bar signal is usually sent to the lathe after completion of feeding (clamping) at which the End of Bar was evaluated, and deactivated by subsequent opening of the clamping device (for ejection). Precise timing of this signal varies depending on the lathe type and interface. The method of End Of Bar timing is set in the parameter #002.
End of M-code (M-fin)	X1/22	Signal is active K7 is closed - end of M-code Signal is inactive K7 is open - standstill By this signal, the barfeeder informs the lathe that the action the barfeeder began to perform on the basis of M-code has been completed. Thus the lathe can deactivate the M-code and continue program execution.

5.3.5 DIAGNOSTICS

Diagnostics of the barfeeder provides the user with an overview of the barfeeder PLC inputs and outputs and some other data.

The diagnostics is activated by pressing the key , and closed by another pressing the key .



5.3.6 WIRING DIAGRAMS

CNC Technology, spol. s.r.o.
Evropská 423/178
160 00 Praha 6
Phone. +420 224 362 720
+420 224 362 711
Fax.. +420 233 090 450
+420 224 362 722
Web.. www.cnctech.cz Email.. cnctech@cnctech.cz

Make	**Barfeeder**
Type	SS2220
Manufacturer (company)	CNC Technology, spol. s.r.o.
Power supply	200-300-400 VAC
Control voltage	24 VDC
Degree of protection	IP 4x

Documentation number:	A27
Version No.:	1.12
Date of creation:	15. 5. 2013
Date of last change:	16. 7. 2014
Creator:	Ondřej Škorňa

Number of pages 12

Table of contents

Page	Page description
1	Title page
2	Table of contents : 1 - 12
3	Power
4	Inputs
5	Outputs
6	Servopack
7	Safety Module Contol panel
8	Interface I/O
9	Standard Interface
10	Sensors
11	Cabinet
12	Parts list : E0440-0034 - e3630-0006

8.0

X1

1 2 PE

L N PE

Black Blue Green/Yellow

-C.S1

1 3

-S1 F

Main switch

2 4

-U1

1

1 1

-F1 Fuse

-F2 Fuse

2 2

U1 V1

-Z1

Noise Filter

PE PE

U2 V2

-U2

1

400V 230V 200V 0V

-G1

Autotransformer

PE

200V 0V

-U3

1

F1;F2 - GT4A (200-230VAC)
F1;F2 - GT2A (400VAC)

X136:
X137:

USB-B

3 4 2 1

7.3 / -SD1-HWBB

-C.X105

Red Green Black White

-A1
Servopack
SGDV-1R6A01A

-CN8

3 4 5 6

U V W GND

-CN2

1 2 3 4 5 6

L1 L2 L1C L2C GND2

PE

-C.M1

Red White Blue Green/Yellow

-C.E1

White Brown Yellow Green Red Grey

-MA1
SGMJV-02AAA61
Servodrive

-X1M

1 2 3 4

U V W PE

M 3 ~

200 W

-X1E

1 2 3 4 5 6

Encoder

G

5 3 1 6 4 2

-PCB
Board I/O

-XP1

1 2 3 4 5 6 7 8 9 10 11 12

Black

x2 U x1

Varistor
-VR1

Relay Contact
-KA11

Relay Contact
-KA19

3 4

7.3

Relay Contact
-KA18

3 4

7.4

Relay Contact
-KA23

Relay Contact
-KA22

-X3:131 -X3:132

-X3:134 -X3:133

-X3:141 -X3:142

-X100.25
4.2

-X100.24
4.3

6.3 -X104.8

6.4 -X104.9

-X3

129.1 129.2 129.3

130.1 130.2 130.3 130.4

Blue

Voltage converter
-DC1

+24V 0V24 +5V 0V5

U

+5V 0V5

0VDC 4.0

24VDC 4.0

-X136

AM26LS32

1 2 3 4

10 9 11

-X137

AM26LS32

1 2 3 4

14 15 13

-C.M2

Brown Blue

-C.E2

Red Black Green White

-M2

-X2M

1 2

Motor 24VDC with gear
-M

M

79t/min, 12pls

-X2E

3 8 7 2

Encoder

G

8 3 7 2

-G3
Power Supply

N L PE

V+ V-

OMRON
S8VK-G12024

24VDC 0VDC

PE

-U5

1

-G2
Power Supply

N L PE

V+ V-

OMRON
S8VK-G06024

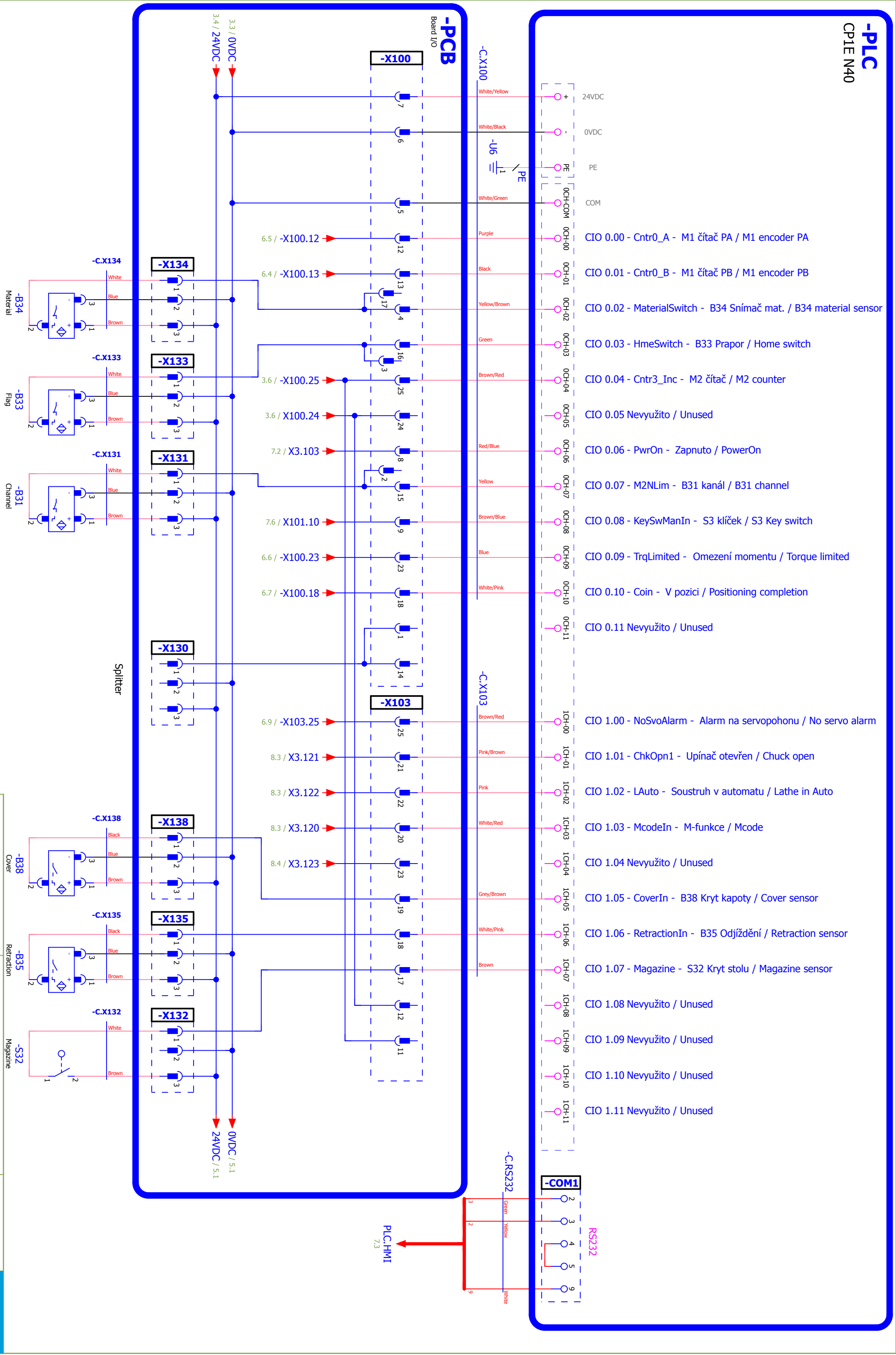
24VDC 0VDC

PE

-U4

1

-X3 = Interface
-XP1 = Power


-PCB
Board I/O
-PLC
CP1E N40
-X100
-C.X100
-U6
PE
3.4 / 24VDC
3.3 / 0VDC
White/Yellow
White/Black
White/Green
24VDC
0VDC
PE
COM
6.5 / -X100.12
6.4 / -X100.13
3.6 / -X100.25
3.6 / X100.24
7.2 / X3.103
7.6 / X101.10
6.6 / -X100.23
6.7 / -X100.18
Purple
Black
Yellow/Brown
Green
Brown/Red
Red/Blue
Yellow
Brown/Blue
Blue
White/Pink
0CH-COM
0CH-00
0CH-01
0CH-02
0CH-03
0CH-04
0CH-05
0CH-06
0CH-07
0CH-08
0CH-09
0CH-10
0CH-11
CIO 0.00 - Cntr0_A - M1 čítač PA / M1 encoder PA
CIO 0.01 - Cntr0_B - M1 čítač PB / M1 encoder PB
CIO 0.02 - MaterialSwitch - B34 Snímač mat. / B34 material sensor
CIO 0.03 - HmeSwitch - B33 Prapor / Home switch
CIO 0.04 - Cntr3_Inc - M2 čítač / M2 counter
CIO 0.05 Nevyužito / Unused
CIO 0.06 - PwrOn - Zapnuto / PowerOn
CIO 0.07 - M2NLim - B31 kanál / B31 channel
CIO 0.08 - KeySwManIn - S3 klíček / S3 Key switch
CIO 0.09 - TrqLimited - Omezení momentu / Torque limited
CIO 0.10 - Coin - V pozici / Positioning completion
CIO 0.11 Nevyužito / Unused
-C.X134
-X134
-B34
Material
White
Blue
Brown
-C.X133
-X133
-B33
Flag
-C.X131
-X131
-B31
Channel
-C.X138
-X138
-B38
Cover
Black
-C.X135
-X135
-B35
Retraction
-C.X132
-X132
-S32
Magazine
Splitter
-X130
-X103
-C.X103
6.9 / -X103.25
8.3 / X3.121
8.3 / X3.122
8.3 / X3.120
8.4 / X3.123
Brown/Red
Pink/Brown
Pink
White/Red
Grey/Brown
White/Pink
Brown
1CH-00
1CH-01
1CH-02
1CH-03
1CH-04
1CH-05
1CH-06
1CH-07
1CH-08
1CH-09
1CH-10
1CH-11
CIO 1.00 - NoSvoAlarm - Alarm na servopohonu / No servo alarm
CIO 1.01 - ChkOpn1 - Upínač otevřen / Chuck open
CIO 1.02 - LAuto - Soustruh v automatu / Lathe in Auto
CIO 1.03 - McodeIn - M-funkce / Mcode
CIO 1.04 Nevyužito / Unused
CIO 1.05 - CoverIn - B38 Kryt kapoty / Cover sensor
CIO 1.06 - RetractionIn - B35 Odjíždění / Retraction sensor
CIO 1.07 - Magazine - S32 Kryt stolu / Magazine sensor
CIO 1.08 Nevyužito / Unused
CIO 1.09 Nevyužito / Unused
CIO 1.10 Nevyužito / Unused
CIO 1.11 Nevyužito / Unused
0VDC / 5.1
24VDC / 5.1
-C.RS232
-COM1
RS232
Green
Yellow
White
PLC.HMI
7.3
CNC Technology, spol. s.r.o.
Inputs
Page 4
Page 12
CNC technology

-PLC

CP1E N40

CIO 100.00 - PLS - Pulse výstup / Pulse output
CIO 100.01 - TrqLimPWM - Torque PWM / Torque PWM
CIO 100.02 - MoveDir - Směr pohybu / Move direction
CIO 100.03 - xxx - Nevyužito / Unused
CIO 100.04 - CLRYask - Vymazání chybového čítače / Clear error counter
CIO 100.05 - SVON - Servo zapnuto / Servo ON
CIO 100.06 - SvoAlReset - Reset alarmu pohonu / Servo alarm reset
CIO 100.07 - Mfin - K7 M-Finish / M-Finish
CIO 101.00 - EOB - K5 Konec tyče / End Of Bar
CIO 101.01 - BFOK - K2 Podavač OK / Barfeeder OK
CIO 101.02 - K4 - K4 / K4
CIO 101.03 - M2On - K22 Start kanálu / Channel start
CIO 101.04 - E-STOP - E-Stop tlačítko / E-Stop Circuit
CIO 101.05 - M2Dir - K11 Směr M2 / M2 direction
CIO 101.06 - PwrOnRq - K20 Zapnutí / Power On
CIO 101.07 - Inhibit - Blokování PLS / PLS Block

100CH-00 100CH-01 100CH-02 100CH-03 100CH-04 100CH-05 100CH-06 100CH-07 101CH-00 101CH-01 101CH-02 101CH-03 101CH-04 101CH-05 101CH-06 101CH-07 100CH-COM1 100CH-COM2 100CH-COM3 100CH-COM4 101CH-COM1 101CH-COM2

COM COM COM COM COM COM

-C.X100 White/Red Grey/Pink Pink Grey/Brown Pink/Brown

-C.X103 Red White/Blue Brown/Blue Yellow/Brown Red/Blue Green/Brown White Grey Green Black White/Yellow

-PCB

Board I/O

-X100 20 11 22 19 21 10

-X103 24 10 9 4 8 3 1 14 16 13 7 2 15 5 6

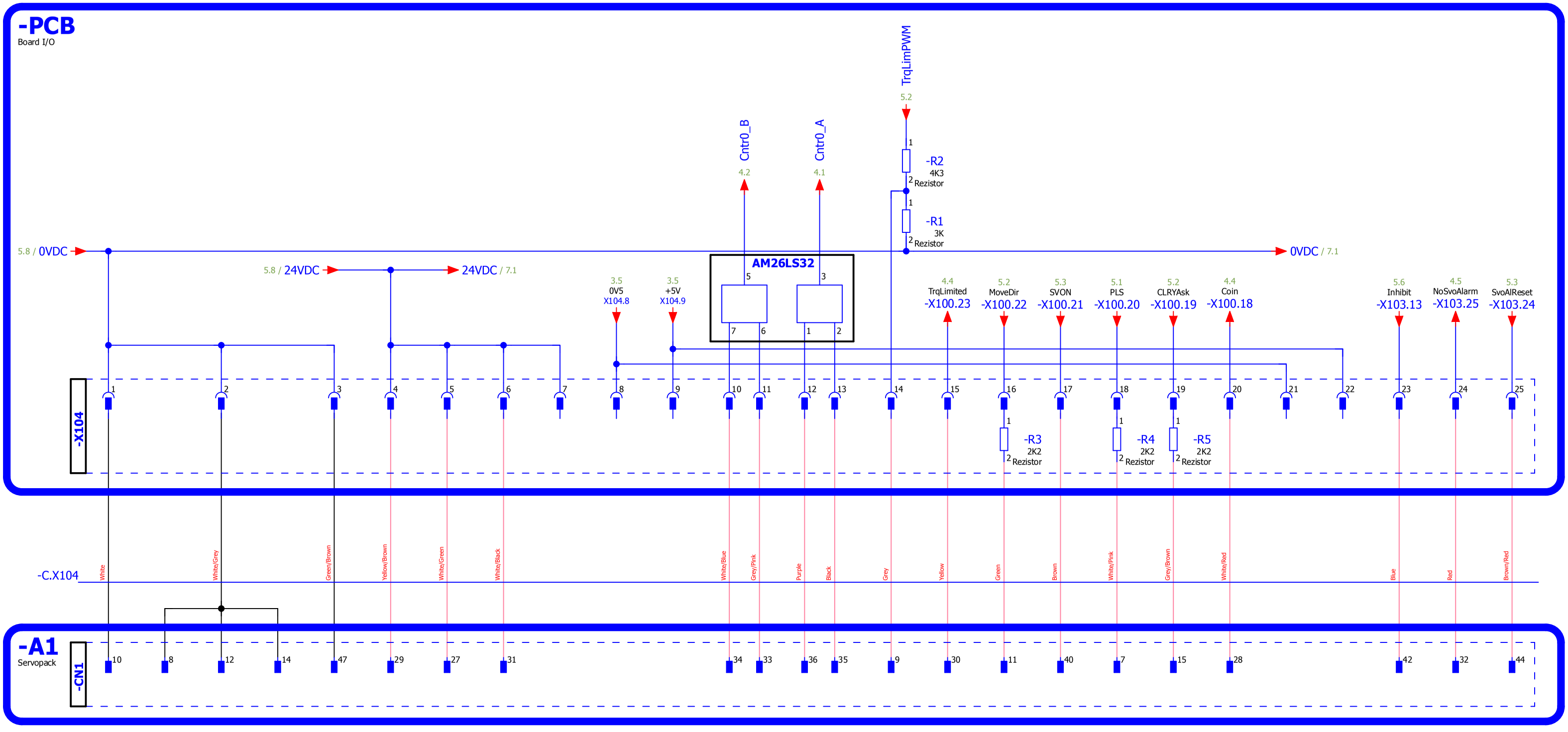
6.7 / -X100.20
6.5 / -X100.11
6.6 / -X100.22
6.7 / -X100.19
6.6 / -X100.21
6.9 / -X103.24
6.8 / -X103.13

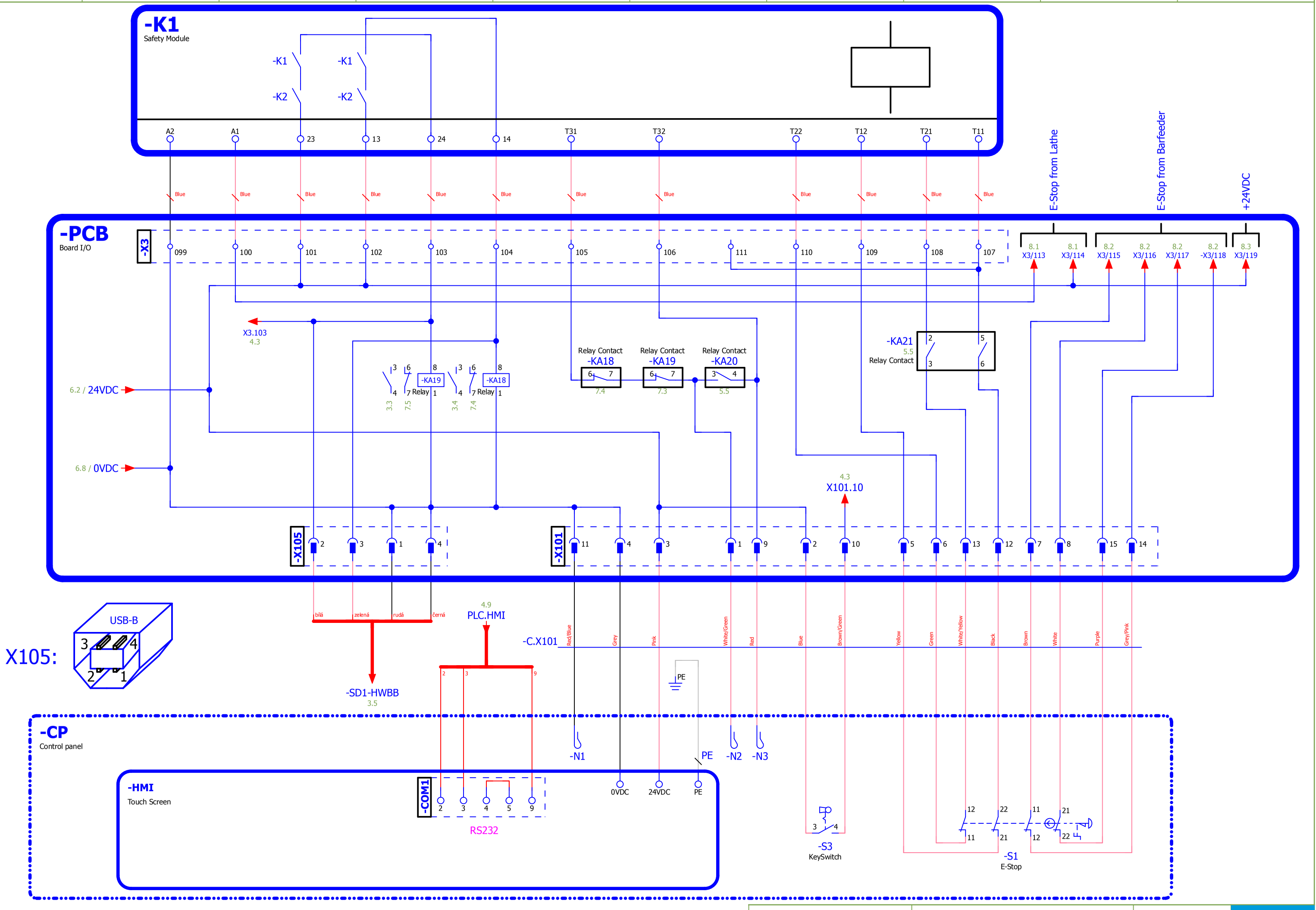
-KA24 5.3 Relay Contact

-KA24 Relay 1
-KA7 Relay 1
-KA5 Relay 1
-KA2 Relay 1
-KA4 Relay 1
-KA22 Relay 1
-KA21 Relay 1
-KA11 Relay 1
-KA20 Relay 1
-KA23 Relay 1

4.8 / 0VDC → 0VDC / 6.0
4.8 / 24VDC → 24VDC / 6.2

2-3 5.6; 7-6 5.5
4-3 8.9; 2-5; 7-6 8.8
4-3 8.5; 2-5; 7-6 8.5
4-3 3.5; 5-7-6 3.5
4-3 3.4; 5-7-6 3.4
4-3 8.8; 2-5; 7-6 8.7
4-3 8.6; 2-5; 7-6 8.6
2-3 7.7; 5-6 7.7
3-4 7.5
4-3 3.5; 2-5; 7-6 3.5


-PCB
Board I/O
TrqLimPWM
5.2
Cntr0_B
4.2
Cntr0_A
4.1
-R2
4K3
Rezistor
-R1
3K
Rezistor
5.8 / 0VDC
0VDC / 7.1
5.8 / 24VDC
24VDC / 7.1
AM26LS32
3.5
0V5
X104.8
3.5
+5V
X104.9
4.4
TrqLimited
-X100.23
5.2
MoveDir
-X100.22
5.3
SVON
-X100.21
5.1
PLS
-X100.20
5.2
CLRYAsk
-X100.19
4.4
Coin
-X100.18
5.6
Inhibit
-X103.13
4.5
NoSvoAlarm
-X103.25
5.3
SvoAlReset
-X103.24
-X104
-R3
2K2
Rezistor
-R4
2K2
Rezistor
-R5
2K2
Rezistor
-C.X104
White
White/Grey
Green/Brown
Yellow/Brown
White/Green
White/Black
White/Blue
Grey/Pink
Purple
Black
Grey
Yellow
Green
Brown
White/Pink
Grey/Brown
White/Red
Blue
Red
Brown/Red
-A1
Servopack
-CN1


-K1
Safety Module
-K1
-K2
A2
A1
23
13
24
14
T31
T32
T22
T12
T21
T11
Blue
E-Stop from Lathe
E-Stop from Barfeeder
+24VDC
-PCB
Board I/O
-X3
099
100
101
102
103
104
105
106
111
110
109
108
107
8.1 X3/113
8.1 X3/114
8.2 X3/115
8.2 X3/116
8.2 X3/117
8.2 -X3/118
8.3 X3/119
X3.103
4.3
-KA21
5.5
Relay Contact
Relay Contact
-KA18
Relay Contact
-KA19
Relay Contact
-KA20
7.4
7.3
5.5
6.2 / 24VDC
6.8 / 0VDC
-KA19 Relay
-KA18 Relay
3.3
7.5
3.4
7.4
4.3
X101.10
-X105
-X101
bílá
zelená
rudá
černá
4.9
PLC.HMI
-C.X101
Red/Blue
Grey
Pink
White/Green
Red
Blue
Brown/Green
Yellow
Green
White/Yellow
Black
Brown
White
Purple
Grey/Pink
PE
-SD1-HWBB
3.5
X105:
USB-B
-CP
Control panel
-HMI
Touch Screen
-COM1
RS232
-N1
-N2
-N3
0VDC
24VDC
PE
-S3
KeySwitch
-S1
E-Stop

-PCB

Board I/O

-K2 = Barfeeder OK
-K4 = RESERVE
-K5 = End Of Bar
-K7 = M-Finish

E-Stop from Lathe
E-Stop from Barfeeder
+24VDC
M-Code
Chuck Open
Lathe In Auto
RESERVE

X3/113 7.7
X3/114 7.8
X3/115 7.8
X3/116 7.8
X3/117 7.9
X3/118 7.9
X3/119 7.9
X3.120 4.6
X3.121 4.5
X3.122 4.5
X3.123 4.6

-X3: 113 114 115 116 117 118 119 120 121 122 123 COM COM

Barfeeder OK
-KA2
5.4
Relay Contact
6 3 7 5 2 4

RESERVE
-KA4
5.4
Relay Contact
6 3 7 5 2 4

End Of Bar
-KA5
5.4
Relay Contact
6 3 7 5 2 4

M-Finish
-KA7
5.4
Relay Contact
6 3 7 5 2 4

-K2: 12 14 11 22 24
-K4: 12 14 11 22 24
-K5: 12 14 11 22 24
-K7: 12 14 11 22 24

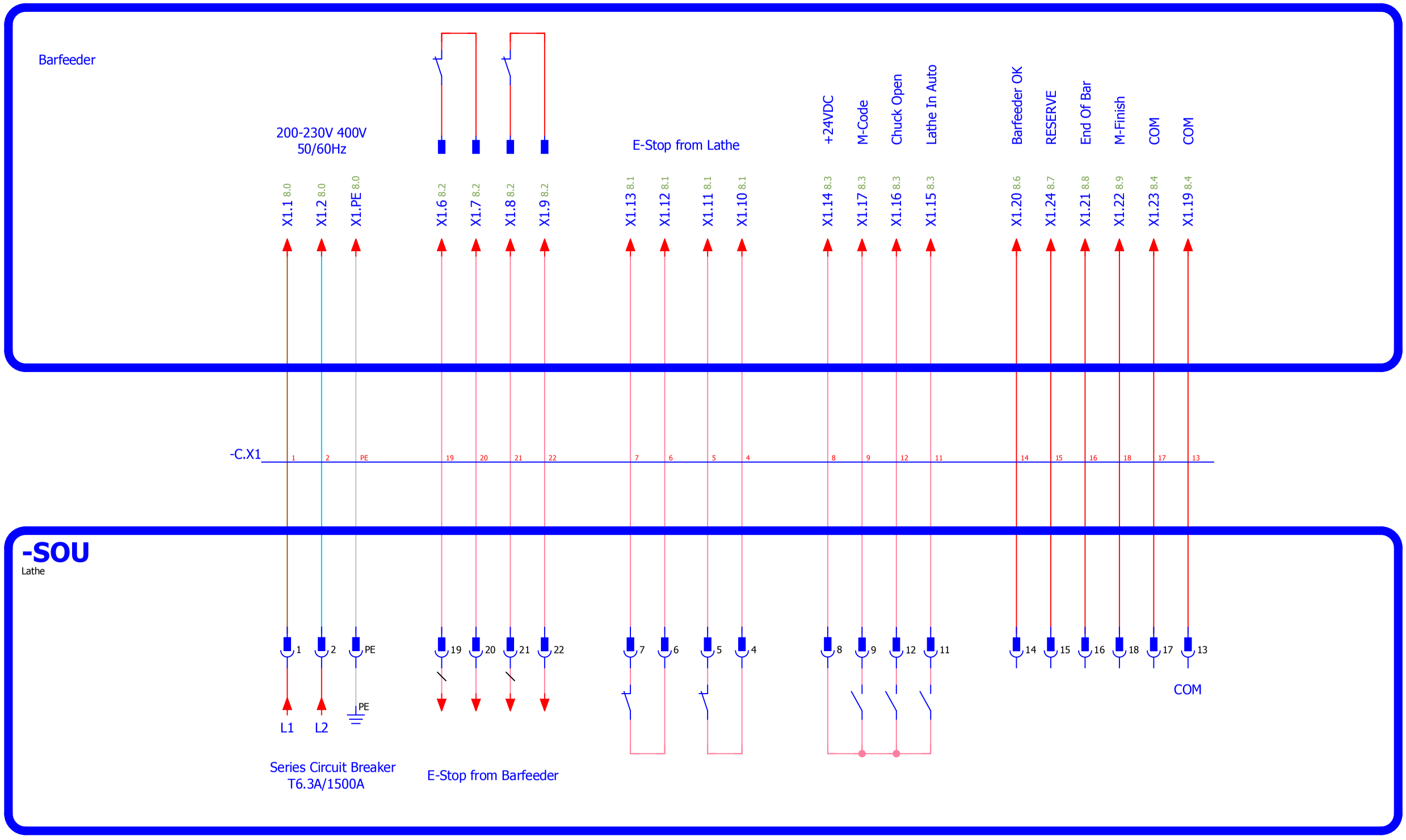
-C.X3: 13 10 8 6 7 9 14 17 16 15 23 19 20 24 21 22

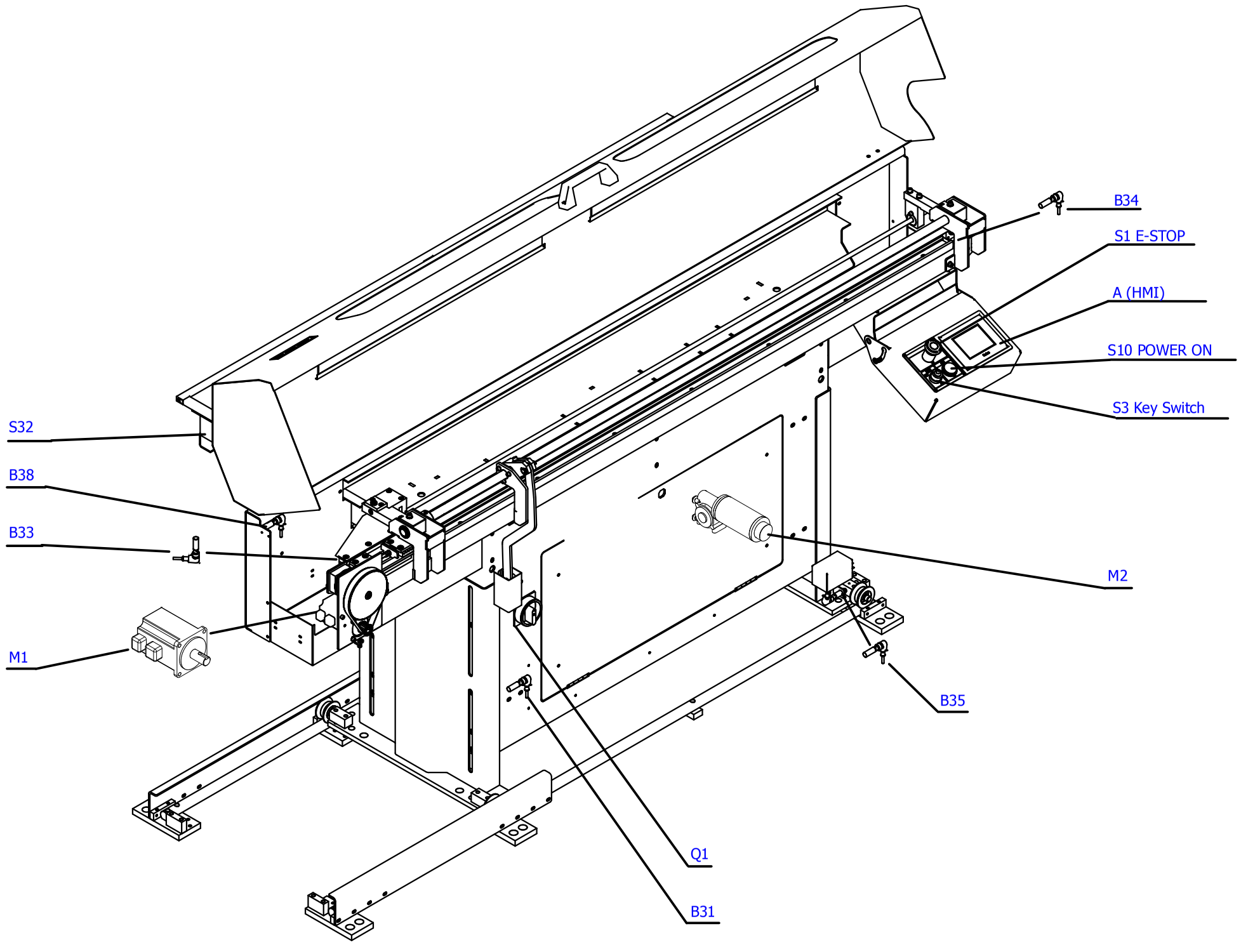
200-230V 400V
50/60Hz

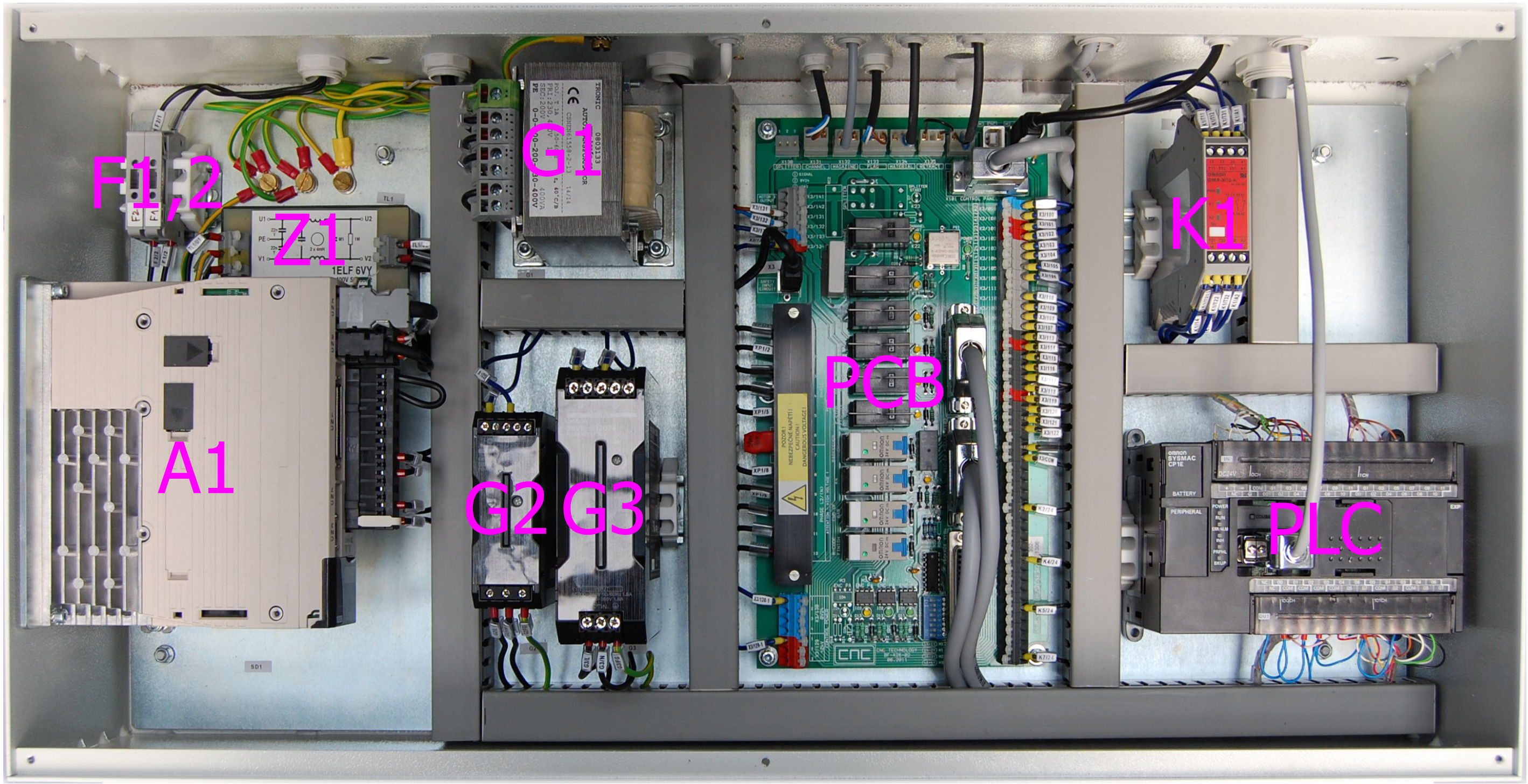
3.1
X1
1 2 PE

-X1: 1 2 PE 13 12 11 10 8 6 7 9 14 17 16 15 23 19 20 24 21 22

9.2 9.3 9.3 9.4 9.5 9.5 9.5 9.4 9.3 9.3 9.4 9.5 9.6 9.6 9.6 9.7 9.7 9.6 9.7 9.7 9.7


Barfeeder
200-230V 400V
50/60Hz
E-Stop from Lathe
+24VDC
M-Code
Chuck Open
Lathe In Auto
Barfeeder OK
RESERVE
End Of Bar
M-Finish
COM
COM
X1.1 8.0
X1.2 8.0
X1.PE 8.0
X1.6 8.2
X1.7 8.2
X1.8 8.2
X1.9 8.2
X1.13 8.1
X1.12 8.1
X1.11 8.1
X1.10 8.1
X1.14 8.3
X1.17 8.3
X1.16 8.3
X1.15 8.3
X1.20 8.6
X1.24 8.7
X1.21 8.8
X1.22 8.9
X1.23 8.4
X1.19 8.4
-C.X1
1 2 PE 19 20 21 22 7 6 5 4 8 9 12 11 14 15 16 18 17 13
-SOU
Lathe
1 2 PE
L1 L2
PE
19 20 21 22
7 6 5 4
8 9 12 11
14 15 16 18 17 13
COM
Series Circuit Breaker
T6.3A/1500A
E-Stop from Barfeeder


B34
S1 E-STOP
A (HMI)
S10 POWER ON
S3 Key Switch
S32
B38
B33
M1
M2
B35
Q1
B31


F1,2
Z1
G1
K1
PCB
A1
G2 G3
PLC

Parts list

device tag	Quantity	designation	Manufacturer	Manufacturer Part Number	CNC Technology Part Number
A1	1	Servopohon SGDV-1R6A01A	YASKAWA	SGDV-1R6A01A	E0440-0034
B31	1	Snímač indukční M12, PNP-NC, 4 piny, 4mm	OMRON	E2B-M12KS04-M1-B2	E4150-0016
B33	1	Snímač indukční M12, PNP-NC, 4 piny, 4mm	OMRON	E2B-M12KS04-M1-B2	E4150-0016
B34	1	Snímač indukční M12, PNP-NC, 4 piny, 4mm	OMRON	E2B-M12KS04-M1-B2	E4150-0016
B35	1	Snímač indukční M12, PNP-NO, 4 piny, 4mm	OMRON	E2B-M12KS04-M1-B1	E4150-0015
B38	1	Snímač indukční M12, PNP-NO, 4 piny, 4mm	OMRON	E2B-M12KS04-M1-B1	E4150-0015
CP-HMI	1	Terminál dotykový/PLC 3.8" monochrome	PROFACE	LT3201-A1-D24-C	E3710-0225
CP-S1	1	Hlava hřib pro E-stop, D22, červená	OMRON	A22E-M	e3650-0112
CP-S3	1	Klíček otočný se zámkem, D22, 2 polohy	OMRON	A22K-2ML	e3650-0703
F1	1	Svorka pojistk. RSP, šedá, 5x20	Elektro Bečov	A 631210	e3669-1600
F1	1	Pojistka 2,00A, T/1500, 5x20, keramická	Omega	GT520220	e3610-0004
F1	1	Pojistka 4,00A, T/1500, 5x20, keramická	OMEGA	GT520240	E3610-0008
F2	1	Svorka pojistk. RSP, šedá, 5x20	Elektro Bečov	A 631210	e3669-1600
F2	1	Pojistka 2,00A, T/1500, 5x20, keramická	Omega	GT520220	e3610-0004
F2	1	Pojistka 4,00A, T/1500, 5x20, keramická	OMEGA	GT520240	E3610-0008
G1	1	Autotransformátor 0-200-230-400V, 400VA	TRONIC	803133	e0431-0009
G2	1	Zdroj OMRON S8VK 60W/24V/2.5A	OMRON	S8VK-G06024	E0440-0218
G3	1	Zdroj OMRON S8VK 120W/24V/5A	OMRON	S8VK-G12024	E0440-0217
K1	1	Modul bezpečnostní G9SB OMRON	OMRON	G9SB-3012-A AC/DC24	E3649-0004
M2	1	Motor 24VDC s převod., 79t/min, 12pls	DUNKERMOTOREN	GR 63x55, 24 V,SG80, WL1 ME52	E0131-0003
MA1	1	Servomotor SGMJV-02AAA61	YASKAWA	SGMJV-02AAA61	E0151-0134
PCB	1	DPS BF-A26-01-02			P026-51001
PCB-KA2	1	Relé, 2x přepínací, 5A, do PLS, test	OMRON	G2R-2-SNI 24DC	e3641-0000
PCB-KA4	1	Relé, 2x přepínací, 5A, do PLS, test	OMRON	G2R-2-SNI 24DC	e3641-0000
PCB-KA5	1	Relé, 2x přepínací, 5A, do PLS, test	OMRON	G2R-2-SNI 24DC	e3641-0000
PCB-KA7	1	Relé, 2x přepínací, 5A, do PLS, test	OMRON	G2R-2-SNI 24DC	e3641-0000
PCB-KA11	1	Relé, 2x přepínací, 8A, do PLS	OMRON	G2RL-2 24DC	e3641-0001
PCB-KA18	1	Relé, 2x přepínací, 8A, do PLS	OMRON	G2RL-2 24DC	e3641-0001
PCB-KA19	1	Relé, 2x přepínací, 8A, do PLS	OMRON	G2RL-2 24DC	E3641-0001
PCB-KA20	1	Relé, 2x přepínací, 8A, do PLS	OMRON	G2RL-2 24DC	e3641-0001
PCB-KA21	1	Relé, 2x přepínací, 8A, do PLS	OMRON	G2RL-2 24DC	e3641-0001
PCB-KA22	1	Relé, 2x přepínací, 8A, do PLS	OMRON	G2RL-2 24DC	E3641-0001
PCB-KA23	1	Relé, 2x přepínací, 8A, do PLS	OMRON	G2RL-2 24DC	e3641-0001
PCB-KA24	1	Relé, 2x přepínací, 8A, do PLS	OMRON	G2RL-2 24DC	e3641-0001
PCB-R3	1	Rezistor 2K2, 0,5W			E3310-0222
PCB-R4	1	Rezistor 2K2, 0,5W			E3310-0222
PCB-R5	1	Rezistor 2K2, 0,5W			E3310-0222
PCB-VR1	1	Varistor JVR10N391K	JOYIN	JVR10N391K	E3340-0000
PLC	1	PLC CP1E-N40DT1-D	OMRON	CP1E-N40DT1-D	E3710-0110
S1	1	Vypínač hlavní dvoufázový	SEZ-CZ	100802	E3650-0901
S32	1	Spínač polohový, čep s kladkou, 1NO, 1NC	OMRON	D4N-1132	E3650-0605
Z1	1	Filtr odrušovací 1x400V 6A 50-60Hz	ELFIS	1ELF6VY/400	e3630-0006

6 INSTALLATION REPORT

Zpráva o instalaci podavače — **Barfeeder Installation Report**

! k rukám vedoucího servisu CNCTech ! — **! for atention of CNCTech service engineer manager !**

Zakázka:

CNC Technology, spol. s r.o., Evropska 423/178, Prague 6, 160 00, Czech Republic, tel.: +420 233 090 442-3, fax: +420 233 090 450, http:\\www.cnctech.cz, E-mail: cnctech@cnctech.cz

Zákazník / Customer	**Kontaktní osoba** / Contact person	
	Jméno / Name	**Funkce** / Job title
Adresa / Address	**Tel.** / Phone	**E-mail** / E-mail
Poznámka / Comment		

Soustruh / Lathe	**Výrobní číslo** / Serial No.	**Řídicí systém** / Control system
Poznámka / Comment		

Podavač / Barfeeder	**Výrobní číslo** / Serial No.		**Řídicí systém** / Control system	**Verze software** / Version
Podavač byl poškozen při přepravě Barfeeder was broken during transport	**Ano** / Yes*	**Ne** / No*	**Balicí list odpovídá skutečnosti** Packing list is in accordance	**Ano** / Yes* **Ne** / No*
Poznámka / Comment				

Opce / Options				
Dlouhé nohy / Long legs	**Ano** / Yes*	**Ne** / No*		
Odjíždění / Sliding system	**Podélné** / Axial*	**Příčné** / Radial*	**Ne** / No*	

Mechanické ustavení / Mechanical adjustment			**Je-li vzdálenost mezi kapotou soustruhu a kapotou podavače větší než 20 mm, zavazuje se zákazník podepsaný níže provést dodatečné zakrytí tohoto prostoru tak, aby nebylo možné mezi soustruh a podavač vložit ruku apod. Do té doby uživatel nesmí podavač provozovat. Vyvrtání děr do kapoty podavače za účelem připevnění dodatečného krytu nemá v tomto případě vliv na záruku podavače.** The distance between the rear side (rear cover) of the lathe and front cover of the barfeeder should be as small as possible. The gap between the barfeeder cover and lathe cover must not exceed 20 mm. If the distance is longer than 20 mm, customer who signed up this statement, pledge himself to make an additional covering this place between the barfeeder and the lathe. Covering must be made to avoid push in the hand between the barfeeder and the lathe. Customer must not use barfeeder without this additional cover. This additional covering has no effect on warranty.
Vzdálenost mezi kapotami soustruhu a podavače Gap between barfeeder cover and lathe cover		**mm**	
Poznámka / Comment			
Elektrické připojení Electrical connection	**Propojovací kabel** / Interface cable		
Napájení Power supply	**U =** **VAC**	**F1, F2 = T** **A**	

Propojení kostér v pořádku Grounding interconnection OK	**Ano** / Yes*	**Ne** / No*	**Chybové hlášení z podavače v pořádku** Error message from barfeeder OK	**Ano** / Yes* **Ne** / No*
Funkce tlačítek E-Stop v pořádku E-Stop buttons function OK	**Ano** / Yes*	**Ne** / No*	**Ostatní signály v pořádku** Other signals OK	**Ano** / Yes* **Ne** / No*
Poznámka / Comment				

Nastavení servisních parametrů / Service parameters setup			**Test automatického cyklu podavače** / Automatic cycle test	
			S tyčí With bar	**Bez tyče (Simulace)** Without bar (Simulation)
			Poznámka / Comment	**Pouze test signálů** Signals test only

Zaškolení obsluhy podavače / Barfeeder operator training			**Výměna vřetenové vložky** Spindle insert changing	**Ano** / Yes* **Ne** / No*
Použití a obsluha podavače Barfeeder application and operation	**Ano** / Yes*	**Ne** / No*	**Mechanické seřízení podavače** Barfeeder mechanical setting	**Ano** / Yes* **Ne** / No*
Funkce snímačů kapoty a krytu zásobníku Cover and magazine switches functionality	**Ano** / Yes*	**Ne** / No*	**Nastavení technologických parametrů** Technologic parameters setup	**Ano** / Yes* **Ne** / No*
Ukázka pracovního cyklu podavače Working cycle training	**Ano** / Yes*	**Ne** / No*	**Zahájení a ukončení automatického cyklu** Start and stop of automatic cycle	**Ano** / Yes* **Ne** / No*
Maximální délka podávané tyče Maximum bar length	**Ano** / Yes*	**Ne** / No*		
Jména školených pracovníků Trained operators' names				

Uživatel potvrzuje, že výše uvedení pracovníci byli seznámeni s funkcí a obsluhou podavače.
Customer confirms that the operators were trained for barfeeder operation and maintenance.

Poznámka / Comment

Vyplněný a podepsaný protokol prosím zašlete výrobci podavače. Nedodržení této podmínky může vést k omezení záruky podavače!!!

Send this filedout and signed report to barfeeder producer please. Barfeeder warranty restriction can be caused by nonperformance of this request!!!

E-mail: cnctech@cnctech.cz
fax: +420 233 090 450

Datum / Date	**Podpis servisního technika** / Service engineer signature	**Podpis zákazníka** / Customer signature

* Správnou odpověď zakroužkujte. / Encircle right answer.

F1000-R090729 - Barfeeder Installation Report