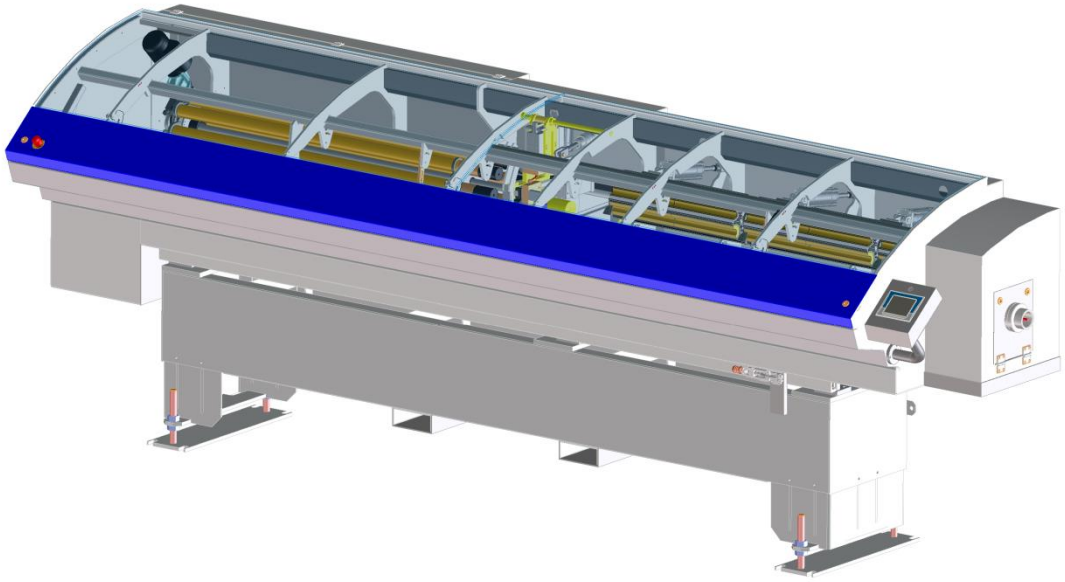
Operating instructions

Multi-channel loading magazine

PROFImat III and IV

with servo drive

(Machine No.: 10 003 200 and the following
Machine-No.: 10 004 200 and the following
Machine-No.: 10 005 200 and the following)
Valid Touchpanel ETV 0552-B



Revision list

Revision	Change
2016-01-XX	First edition

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INHALT

1 Safety

1.1 Safety instructions

The loading magazine is only to be set up and operated by trained and instructed personnel.

Maintenance and servicing work is only to be done by trained and authorised qualified personnel.

These operating instructions are to be read and understood completely before commissioning.

These operating instructions must always be handy and available in full to the personnel.

The signal words DANGER – WARNING – CAUTION classify the possible degree of danger of bodily injury in a concrete situation. Injuries can be avoided by complying with the specified rules of behaviour.

	Description
	Type of danger and its source. Potential consequence(s) if not observed. Measure(s) to prevent the danger.

Pictogram	Signal word	Meaning	Consequences if not observed
	**DANGER!**	Indicates an immediately threatening danger.	Leads to serious bodily injury or death.
	**WARNING**	Indicates a potentially dangerous situation.	Can lead to serious bodily injury or death. Severe damage.
	CAUTION!	Indicates a potentially damaging situation.	Minor damage.
	**NOTE**	Useful note or tip.	

Furthermore, all occupational safety and accident prevention regulations of the user apply.

	Working on the electrical system. Do not touch live parts.
 	**Danger!** Multitude of dangers due to working on the electric system. Electric shock can cause personal damage. ➢ Fundamentally, work may only be carried out by authorized personnel. ➢ Disconnect the system from the mains. ➢ The electric cabinet may only be opened by authorized personnel.

	Check safety equipment daily for proper function.
	**WARNING!** Multitude of dangers due to moving machine parts with missing protective equipment. Fingers and hands can get caught in the device when reaching in, causing severe injuries. ➢ As a matter of principle, do not put any safety equipment out of operation.

	Manual mode with open, separating hood or protective mechanism
	**WARNING!** Multitude of dangers due to moving machine parts with moving, separating protective mechanism/hood open in manual mode. Fingers and hands can get caught and cause severe injuries. Moving parts, such as exposed gear wheels, cylinders, stoppers, limit stop, inlay forks, toothed belts and pushers, are openly accessible. Required for set-up as well as troubleshooting. ➢ Only carry out work with the hood open once the device has come to a standstill. ➢ Do not reach into moving parts. ➢ Only operate the device with the hood closed. ➢ Keep unauthorized persons away.

	Danger of crushing when working without safety equipment.
	**WARNING!** Multitude of dangers due to moving machine parts with missing protective equipment. Fingers and hands can get caught in the device when reaching in, causing severe injuries. ➢ As a matter of principle, do not put any safety equipment out of operation. ➢ Only authorized personnel may carry out the removal. ➢ Removal is only permissible for maintenance and repair. ➢ Make sure protective equipment is reinstalled after every intervention.

	Danger of injury due to moving parts.
	**WARNING!** The material pusher can be moved out of the housing in manual mode and when the magazine is swivelled out. ➢ Make sure there is a safety barrier in place. ➢ Only have work done by authorized personnel. ➢ Keep unauthorized persons away.

	Exchanging spare parts and accessory parts.
	**WARNING!** Multitude of dangers due to moving machine parts with missing protective equipment. Fingers and hands can get caught in the device when reaching in, causing severe injuries. ➢ Only carry out work with the hood open once the device has come to a standstill. As a matter of principle, do not put any safety equipment out of operation. ➢ Exit automatic operation, switch to manual operation. ➢ Only use original Breuning/IRCO spare parts. ➢ Make sure protective equipment is reinstalled after every intervention. ➢ Keep unauthorized persons away.

	Avoid contact with rotating components.
	**⚠ WARNING!** Multitude of dangers due to moving machine parts with moving, separating protective mechanism/hood open in manual mode. Fingers and hands can get caught and cause severe injuries. Moving parts, such as rotating material, exposed gear wheels, cylinders, stoppers, limit stop, inlay forks, toothed belts and pushers, are openly accessible. Required for set-up as well as troubleshooting. ➢ Only carry out work with the hood open once the device has come to a standstill. ➢ Do not reach into moving parts. ➢ Only operate the device with the hood closed. ➢ Keep unauthorized persons away.

	Not on type plate, type designation, informational sign.
	**⚠ WARNING!** Danger if product label is missing or illegible. ➢ Always keep the type plate and safety, warning and operational information in easily legible condition. ➢ Replace damaged or missing product labels. ➢ Always specify the IRCO serial number when contacting the manufacturer.

	Danger of tool breakage.
	**⚠ Caution** The workpiece and tool can be damaged by activating the "Emergency stop" function. Opening the protective equipment causes an immediate "Emergency stop". Pushing back/swivelling out the device in automatic mode causes an immediate "Emergency stop". ➢ Only activate "Emergency stop" in the event of danger. ➢ Only open protective equipment after the device is at a standstill. ➢ Only have work done by authorized personnel. ➢ Keep unauthorized persons away. ➢ Make sure protective equipment is reinstalled after every intervention.

	Avoid tool breakage when swivelling out the loading magazine.
	**⚠ Caution** Pushing back/swivelling out the device in automatic mode causes an "Emergency stop". Make sure that no material from the spindlestock can get into the device. ➢ Only have work done by authorized personnel. ➢ Keep unauthorized persons away. ➢ Remove material from the spindlestock that gets into the device.

	Avoid mechanical damage when indexing the guide channel.
	**⚠ Caution** When indexing, ensure that no material is present in the guide channel. ➢ Only have work done by authorized personnel. ➢ Keep unauthorized persons away. ➢ Remove any material present in the guide channel or lathe.

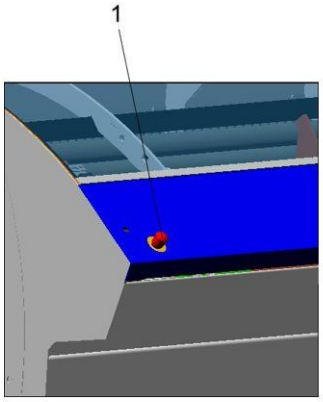
	Avoid collisions while the guide channel is closing.
	**⚠ Caution** ore closing the guide channel, ensure that there is no material in the area of the material pusher. ➢ Only have work done by authorized personnel. ➢ Keep unauthorized persons away. ➢ Visual inspection, remove material from the collision area.

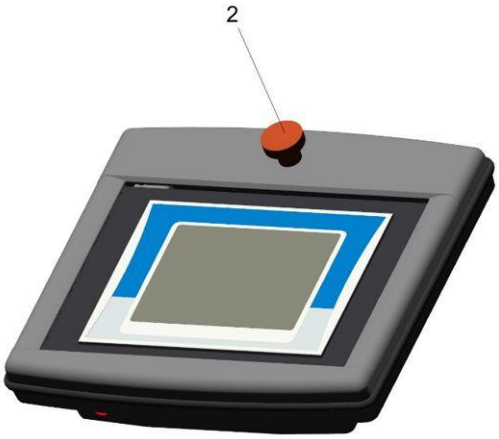
	Never allow dry running in the guide channel.
	**⚠ Caution** Sufficient cooling lubricant (oil/emulsion) must always make it to the guide channels. Running dry can lead to the destruction of the guide unit. ➢ Only have work done by authorized personnel. ➢ Keep unauthorized persons away. ➢ Visual inspection of the level. ➢ If necessary, refill cooling lubricant.

	Avoid damaging the measuring barrier.
	**⚠ Caution** Before manually disposing of the remnants (back through the loading magazine), make sure that the mechanical measuring barrier has responded. If not, move forward with the material pusher until the measuring barrier responds. ➢ Only have work done by authorized personnel. ➢ Keep unauthorized persons away. ➢ Move the pusher forward, trigger the measuring barrier.

1.1 Emergency stop

	Danger of tool breakage.
	**Caution** The workpiece and tool can be damaged by activating the "Emergency stop" function. Opening the protective equipment causes an immediate "Emergency stop". Pushing back/swivelling out the device in automatic mode causes an immediate "Emergency stop". ➢ Only activate "Emergency stop" in the event of danger. ➢ Only open protective equipment after the device is at a standstill. ➢ Only have work done by authorized personnel. ➢ Keep unauthorized persons away. ➢ Make sure protective equipment is reinstalled after every intervention.





1 Emergency Stop button (fixed)

2 Emergency Stop button operating unit

Emergency Stop buttons are permanently installed in the front area of the loading magazine and on the operating unit.

Pressing them leads to the immediate stop of the loading magazine and the CNC machine in their momentary working positions.

► Report any safety equipment malfunctions and defects to customer service immediately.

If it is necessary to dismantle safety equipment during set-up, repair work or maintenance, this must be remounted immediately after completing the maintenance/repair work.

2 Legal principles

2.1 Intended use

The loading magazine is for the automatic feeding of CNC machines with burr- and chip-free bar stock. For diameters and lengths, see the machine chart.

2.2 Warranty

The company Kurt Breuning IRCO Maschinenbau GmbH accepts no liability whatsoever for damage to machines and persons which is caused by improper operation of the loading magazine.

The company accepts liability for the perfect function in the agreed-upon scope of delivery for an operation period of 18 months without shift limits starting from the day of delivery.

Only use original spare parts from the company Kurt Breuning IRCO Maschinenbau GmbH, since otherwise the warranty becomes void. The warranty includes the spare parts which are necessary during the warranty period. The independent installation/exchange of spare parts during the warranty period without the written permission of our company will lead to any warranty claims immediately becoming void.

Wear parts are excluded from the warranty. Wear parts must always be paid for.

The "General conditions for delivery and services of the electric/electronics industry" apply for the electric and electronic components.

2.3 Type plate

The type plate is on the base frame.

The loading magazine's type designation and machine number are entered here for a correct tracking of wear and spare parts.

	Not on type plate, type designation, informational sign.
	**WARNING!** Danger if product label is missing or illegible. ➢ Always keep the type plate and safety, warning and operational information in easily legible condition. ➢ Replace damaged or missing product labels. ➢ Always specify the IRCO serial number when contacting the manufacturer.

2.4 EC Declaration of Incorporation

EC Declaration of Incorporation **for the purpose of the machinery directive**

2006/42/EC,
Appendix II B

The manufacturer

Kurt Breuning IRCO Maschinenbau GmbH
Im Maurer 15
D 71140 Steinenbronn
Germany
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Fax: 0049 (0) 7157–528655

herewith declares that the following product

Product designation: **Multi-channel loading magazine**

Type designation: PROFImat III and IV
Machine number: 10 003 000 and the following
10 005 000 and the following
10 005 000 and the following
year of construction: See machine chart

meets the provisions of the directives
2006/42/EC about machinery, Annex II B
2014/30/EU EMC directive
and has been subject to the conformity assessment process.

The following harmonized standards have been applied:
EN ISO 12100:2010 Safety of machinery – General principles for design – Risk assessment and risk
risk reduction.
EN ISO 11161:2007/A1:2010 Safety of machinery – Integrated manufacturing systems – Fundamental requirements.
EN ISO 13849-1:2008 Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design
EN ISO 13849-2:2012 Safety of machinery – Safety-related parts of control systems – Part 2: validation
EN 349:1993/A1:2008 Safety of machinery – Minimum gaps to avoid crushing of parts of the human body
ISO 13857:2008-06, Safety of machinery – Safety distances to prevent hazard zones being reached by lower and upper limbs
EN 60204-1:2006 Safety of machinery – Electrical equipment of machines – Part 1: General requirements
EN 61000 Electromagnetic compatibility (EMC) — Generic standards
- Part 6-1:2007 – Interference immunity – Residential, business and commercial environments as well as small businesses.
- Part 6-2:2005 – Interference immunity for industrial areas
- Part 6-3:2007/A1:2011 – Emitted interference – Residential, business and commercial environments as well as small businesses
- Part 6-4:2007/A1:2011 – Emitted interference – Industrial areas.

The incomplete machine may only be put into operation when it has been determined that the machine, in which the incomplete machine is to be installed, meets the provisions of this directive.

The German original operating instructions and the installation instructions in accordance with the job confirmation will be included in delivery.

The manufacturer is obligated to provide the 'technical documentation' according to Annex VII Part B to the individual national bodies if a justified request has been made.

Last name, first name:	Ms. Andrea Breuning-Kuhn
Contact data:	See manufacturer address

Name and address of the person who is authorized to compile the technical documentation.

Steinenbronn, April 01, 2016

Location, date

Roland Breuning
Managing Director

Information about person who is authorized to issue this declaration on behalf of the manufacturer or his representative, as well as the signature of this person.

2.5 Synonyms

Multiple names for the same objects or actions are common in everyday life. For technical devices and these instructions, a simple, uniformly structured language is advised so the operating personnel can more easily understand it.

Individual names might currently still be contradictory.

2.6 Preventing foreseeable misuse

Only machine parts released by the manufacturer, BREUNING IRCO, according to the order confirmation / order specification.

Only install in a system according to the order confirmation / order specification.

Comply with the safety instructions / so-called 'Requirements' in the instructions, as for servicing.

Conversions and modifications are impermissible.

Only use original spare parts, wear parts and accessories from the manufacturer, Kurt Breuning IRCO; otherwise, the expected safety might be compromised.

2.7 Personnel qualification

Safe operation requires specialized requirements and the individual qualification of every person.

The organizational responsibility is borne by the '**supervisor**' (user). According to EN 50110-1, a supervisor is a person who is appointed to bear direct responsibility for work being carried out. If necessary, some of this responsibility can be assigned to other persons. [...] The supervisor must instruct all persons involved with the work about all dangers, which would not otherwise be apparent.

Only '**skilled personnel**' are allowed to carry out work.
According to IEC 60204-1, skilled personnel are "persons who, due to their relevant training and experience, are capable of identifying risks and preventing possible dangers."

- Electric work may only be carried out by skilled electricians.
- Transport may only be carried out by experienced transport professionals.
- Mechanical work may only be carried out by skilled mechanics.

Initial commissioning may only be carried out by the manufacturer service BREUNING IRCO or by personnel specially trained by BREUNING IRCO.

Setup may only be carried out by the manufacturer service BREUNING IRCO or by personnel specially trained by BREUNING IRCO.

3 Technical data

3.1 Preconditions for optimal operation

The following factors are to be considered for the operation of the loading magazine at optimum speed:

- Aligning the system, i.e. alignment of the loading magazine with the CNC machine.
- CNC machine and loading magazine must be anchored to the floor.
- Rod straightness: max. deviation ≤0.5 mm per 1,000 mm.
- Rod profile and material quality.
- Burr-free bar stock.
- Backlash-free guidance.
- Oil/oil damping quality.
- Clamping device (collet chuck or jaw chuck).
- Chamfer bar stock (pusher side) centrically with chamfer of 4 to 5 x 60° for better take-up in the pusher head/clamping sleeve.
- Furnish end of bar (machine side) with a centric chamfer of about 60° for better guidance into the clamping device.

3.2 Design variants

PROFImat	with remnant feed; remnant disposal through the CNC machine.
PROFImat -R	with remnant gripper remnant disposal through the loading magazine.
PROFImat -PR	with precise, stopless positioning for feed and remnant gripper. remnant disposal through the loading magazine.

3.3 Mechanical data

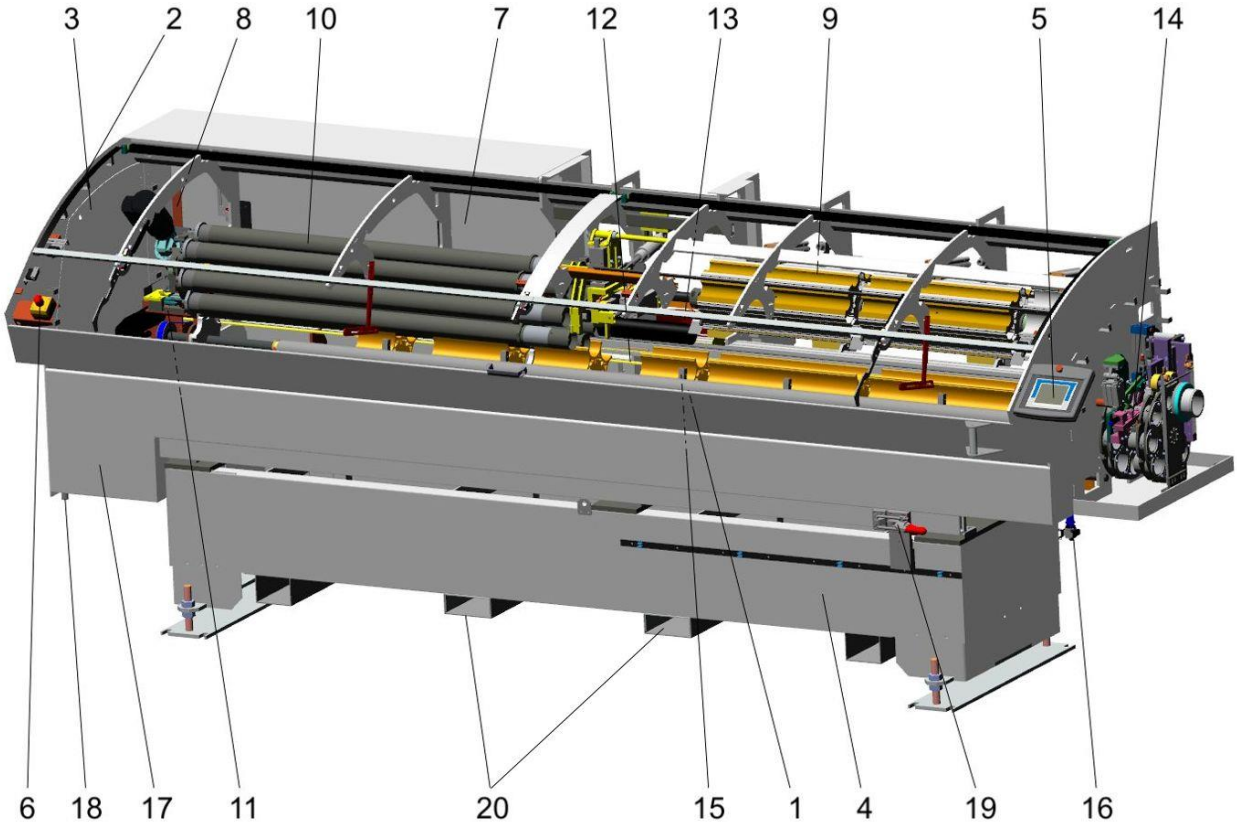
Typ 196 III (R) [SG]	**PROFImat 196-3000**	**PROFImat 196-4000**	**PROFImat 196-6000**
Length	4.400 (4.800) [5.180] mm	5.450 (5.800) [6.180] mm	7.600 (8.000) [8.250] mm
Width	1.350 (1.520) mm .		
Typ 270 V (R) [SG]	**PROFImat 270-3000**	**PROFImat 270-4000**	**PROFImat 270-6000**
Length	4.400 (4.800) [5.180] mm	5.450 (5.800) [6.180] mm	7.600 (8.000) [8.250] mm
Width	1.600 (1720) mm .		
Typ 340 III	**PROFImat 340-3000**	**PROFImat 340-4000**	**PROFImat 340-6000**
Length	4.920 mm	6.000 mm	8.100 mm
Width	1.590 mm		
Dimensions	je nach Baugröße 1.500 bis 6.000 kg, siehe Lieferschein.		
Hight	siehe Aufstellplan.		
Spindle height	siehe Maschinenkarte.		
Inner diameter guide channel	siehe Maschinenkarte.		
Material length max.	3.200 mm	4.200 mm	6.200 mm
Material diameter	Siehe Maschinenkarte		
Pneum. operating pressure	min. 6 bar, 1500 l/min (gereinigte, wasserfreie Druckluft).		
Noise level	70 dB (A).		
Ambient temperature	10 bis 40 °C.		

Technical modifications and adjustments made for a lathe are not considered.

3.4 Electrical data

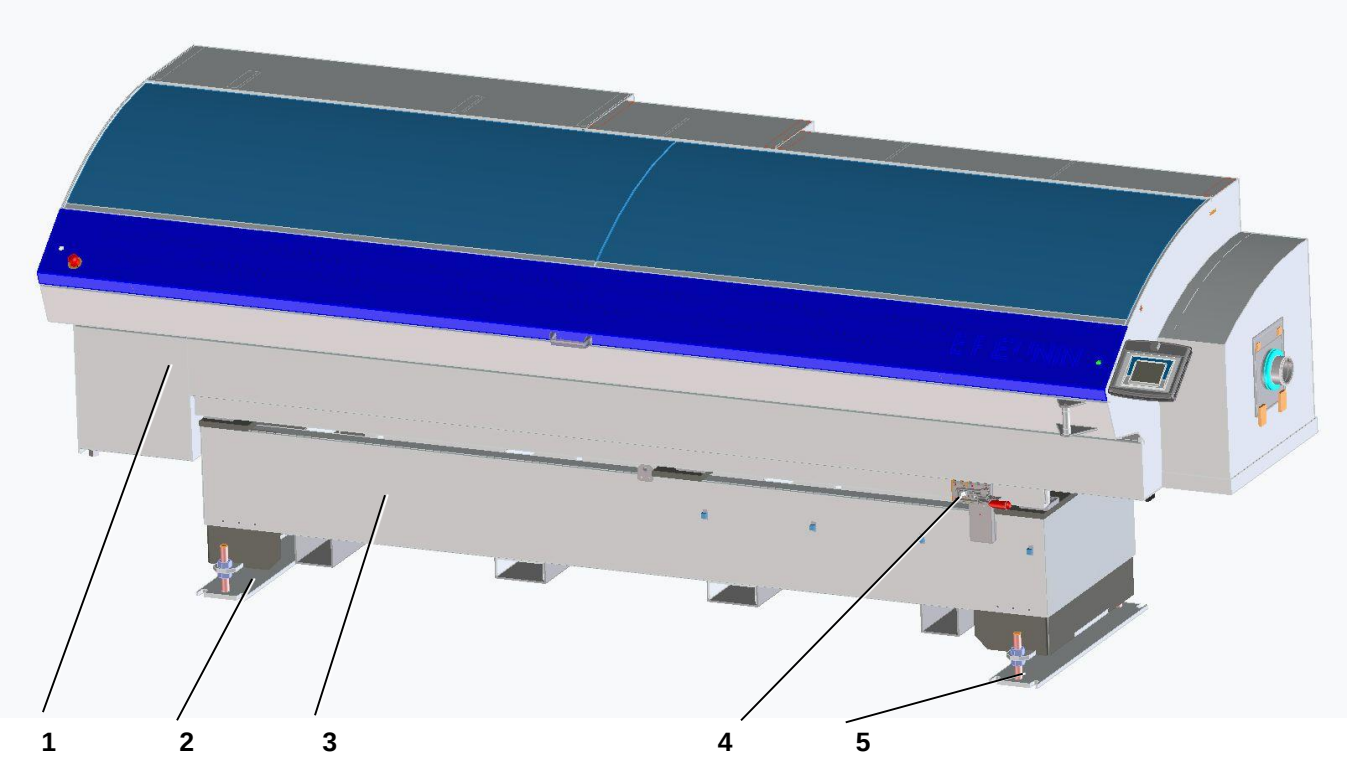
Supply voltage	3 x 200 V / 3 x 400 V (from CNC machine)
Fuses	10 A (via CNC machine).
Protection class, electric cabinet	IP 65.
Control / Voltage	SPS / 24 V.
Signal exchange	Potential-free.
Drives	Servo drives.
Interface to the CNC machine	Is set before delivery by Breuning.
Control according to parameter lists	Feeding speed in "Automatic" operating mode. - Feed force (torque).
Circuit diagrams	are located in the electric cabinet of the loading magazine.

4 Components



	Designation	Sect.		Designation	Sect.
1	Storage flap	3	2	Hood	3
3	Mounting flap	3	4	Base frame	3.1
5	Operating and input unit	10	6	Emergency stop button	1.3
7	Electric cabinet, electric system	10	8	Electric cabinet, pneumatic system	4.13
9	Guide channel	4.4	10	Material pusher	4.9
11	Short pusher	4.9	12	Drive, deflection, toothed belt	4.8
13	Remnant collection container (optional)	4.12	14	Combination steady rest	4.7
15	Storage rack / material supply	4.2	16	Oil level indicator	4.14
17	Oil tank	4.14	18	Oil drain screw / cock	4.14
19	Interlock, axial slide	4.1	20	Transport holders	6

4.1 Base frame and machine pan



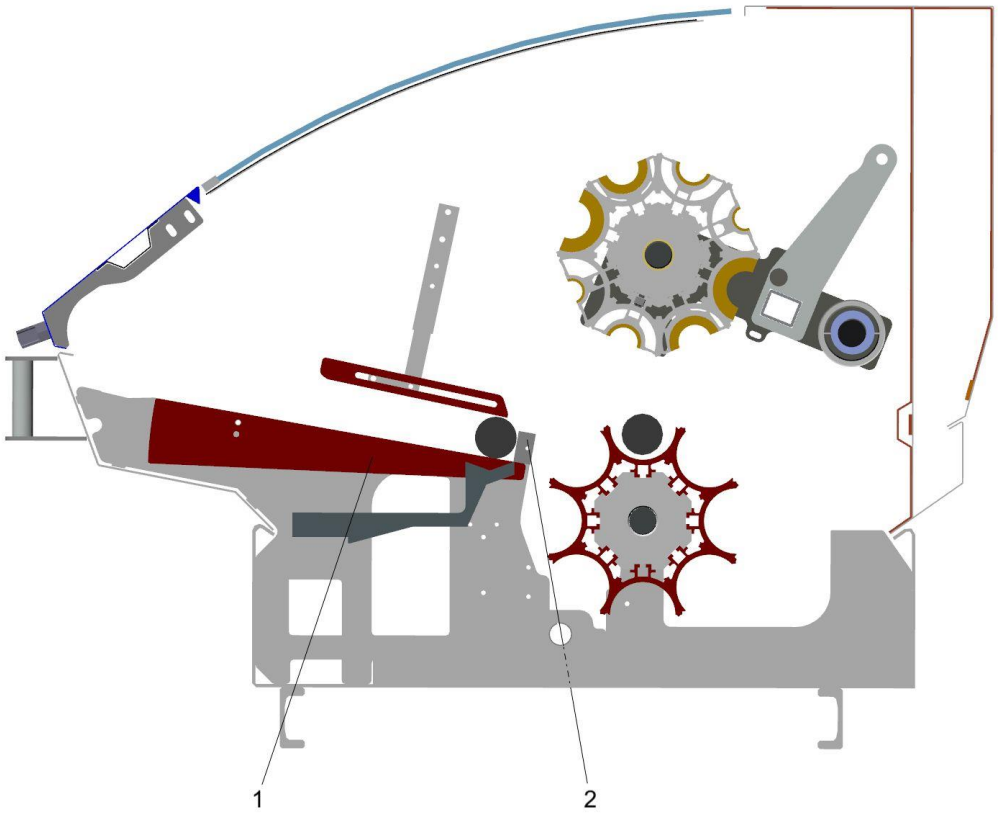
1	Machine pan	2	Base plate
3	Base frame	4	Interlock
5	Height adjustment		

The loading magazine can be moved by releasing the interlock. Standard: axial; optional: radial.

The base plates of the base frame must be anchored to the hall floor after alignment.

4.2 Material procurement

	Exchange spare parts and accessory parts.
	**⚠ WARNING!** Multitude of dangers due to moving machine parts with missing protective equipment. Fingers and hands can get caught in the device when reaching in, causing severe injuries. ➢ Only carry out work with the hood open once the device has come to a standstill. As a matter of principle, do not put any safety equipment out of operation. ➢ Exit automatic mode; switch to manual mode. ➢ Only use original Breuning/IRCO spare parts. ➢ Make sure protective equipment is reinstalled after every intervention.



1 Storage rack 2 Material limit stop

The separator and holding-down device are to be set to the respective material diameter.

The loading magazine may only be operated with the hood closed.

Load the loading magazine with remnant gripper (types R and PR) left-aligned, and load the loading magazine with remnant disposal toward the front, right-aligned.

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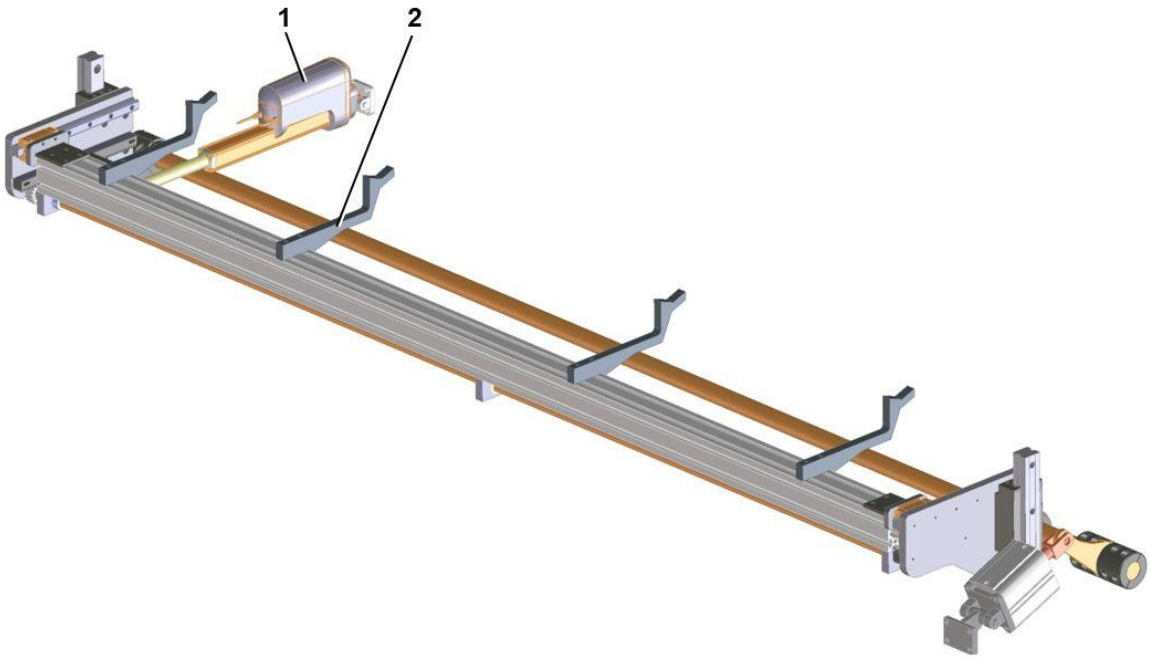
4.3 Bar separator/material inlay

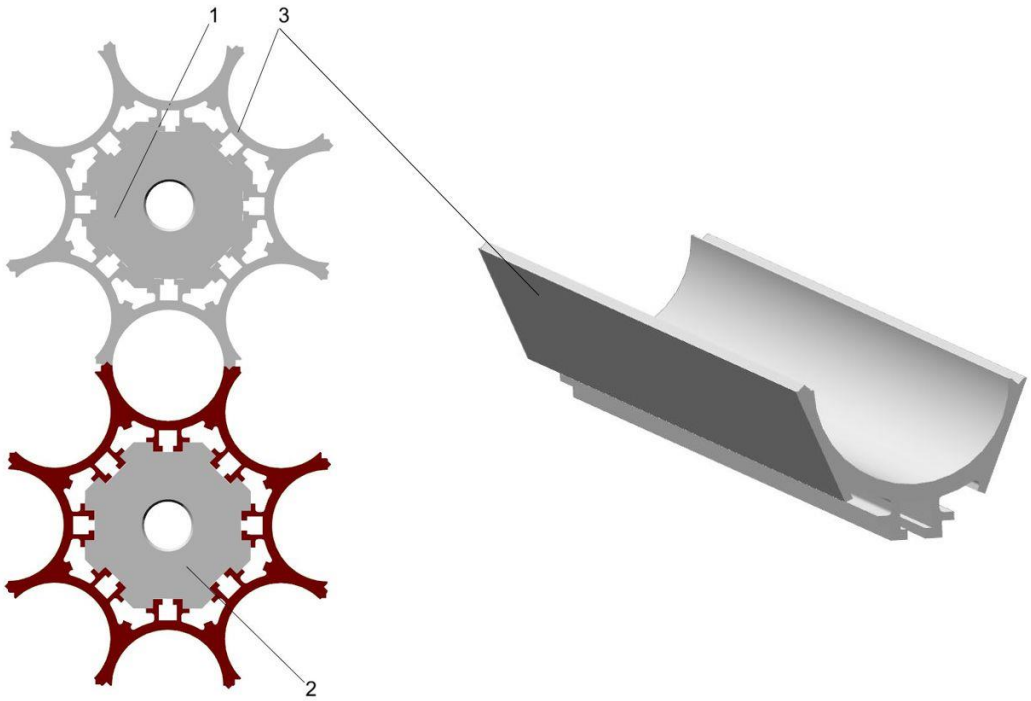


1	Separating lever	2	Inlay fork

The separator is to be set to the respective material diameter.

Input via control panel.

4.4 Guide channel



1	Guide channel drum, top	2	Guide channel drum, bottom
3	Guide channel shell		

The loading magazine is equipped with a maximum of six guide channels. The guide channels are arranged on drums and are indexed as needed (channel width selected).

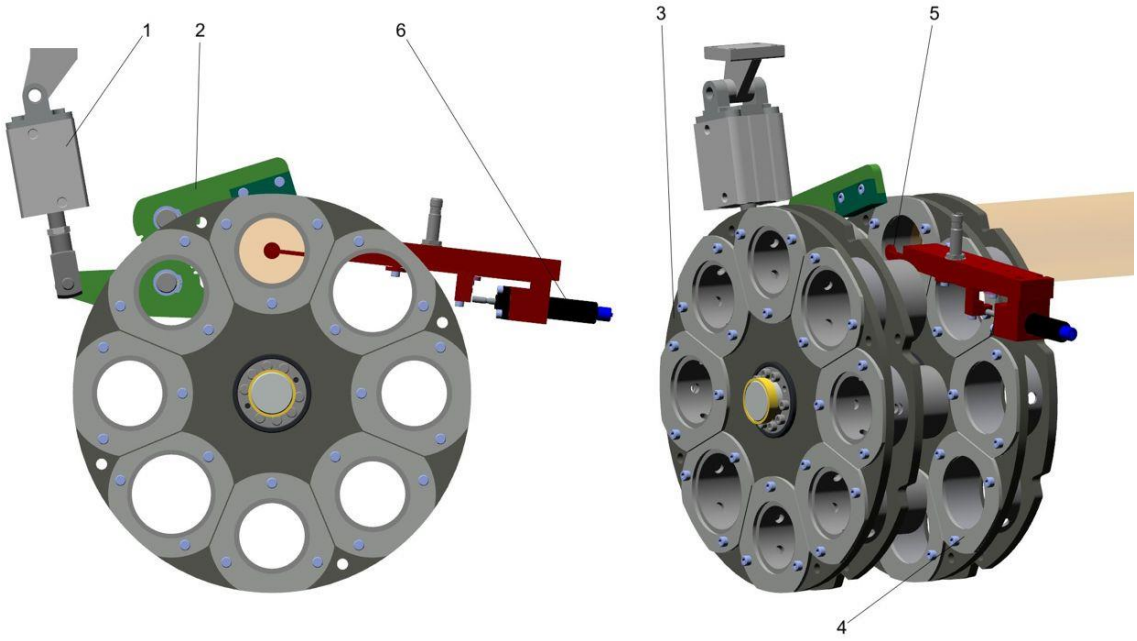
The guide channel consists of several channel segments coated with plastic.

The guide channels are available in different sizes.

In order to achieve optimal smooth running, we recommend the bars be guided in the guide channel as snugly as possible.

4.5 Stopper and measuring barrier

	Avoid damaging the measuring barrier.
	**Caution** Before manually disposing of the remnants (back through the loading magazine), make sure that the mechanical measuring barrier has responded. If not, move forward with the material pusher until the measuring barrier responds. ➢ Only have work done by authorized personnel. ➢ Keep unauthorized persons away. ➢ Move the pusher forward, trigger the measuring barrier.

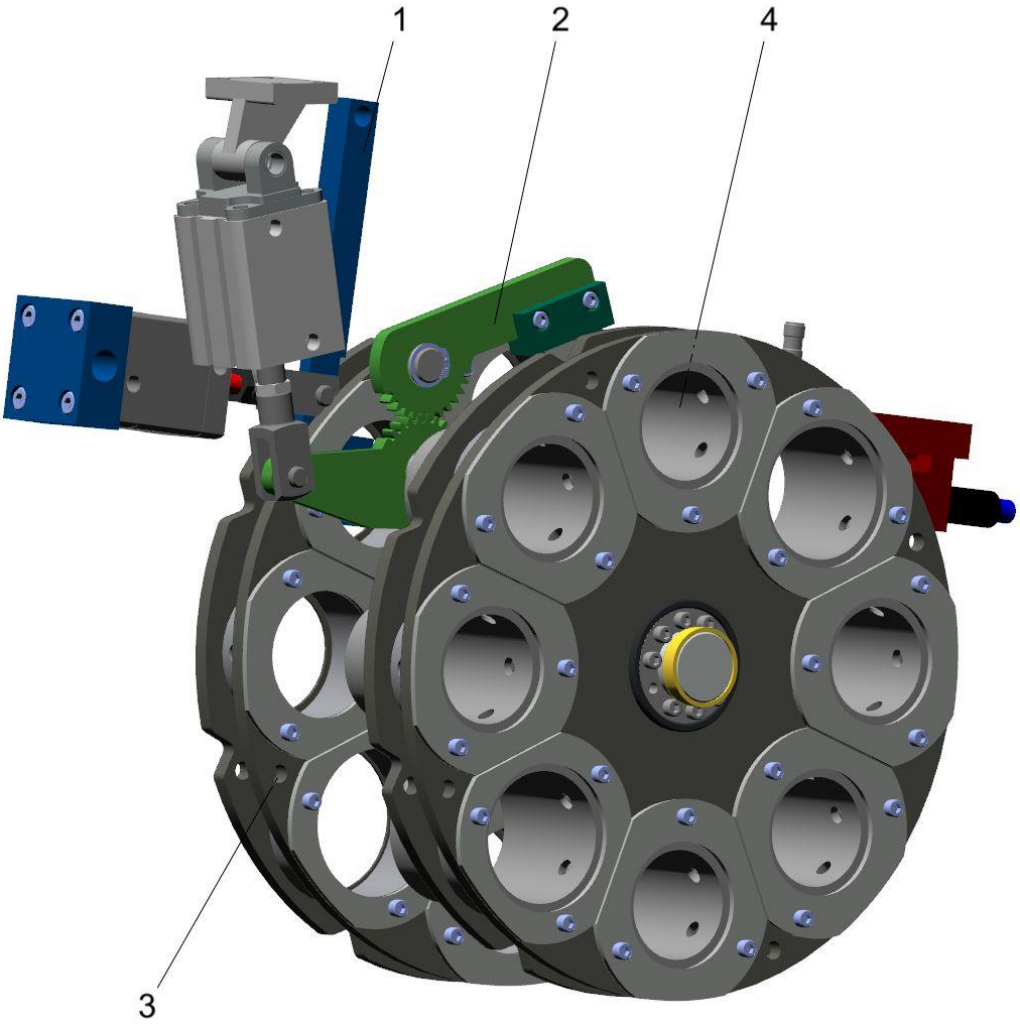


1	Stopper cylinder	2	Stopper, complete
3	Front guide drum	4	Rear guide drum
5	Barrier flap	6	Barrier cylinder

The stopper acts as an insertion aid in the machining of bar profiles.

The mechanical barrier is for determining the bar length and the position of the beginning of the bar.

4.6 Guide drum

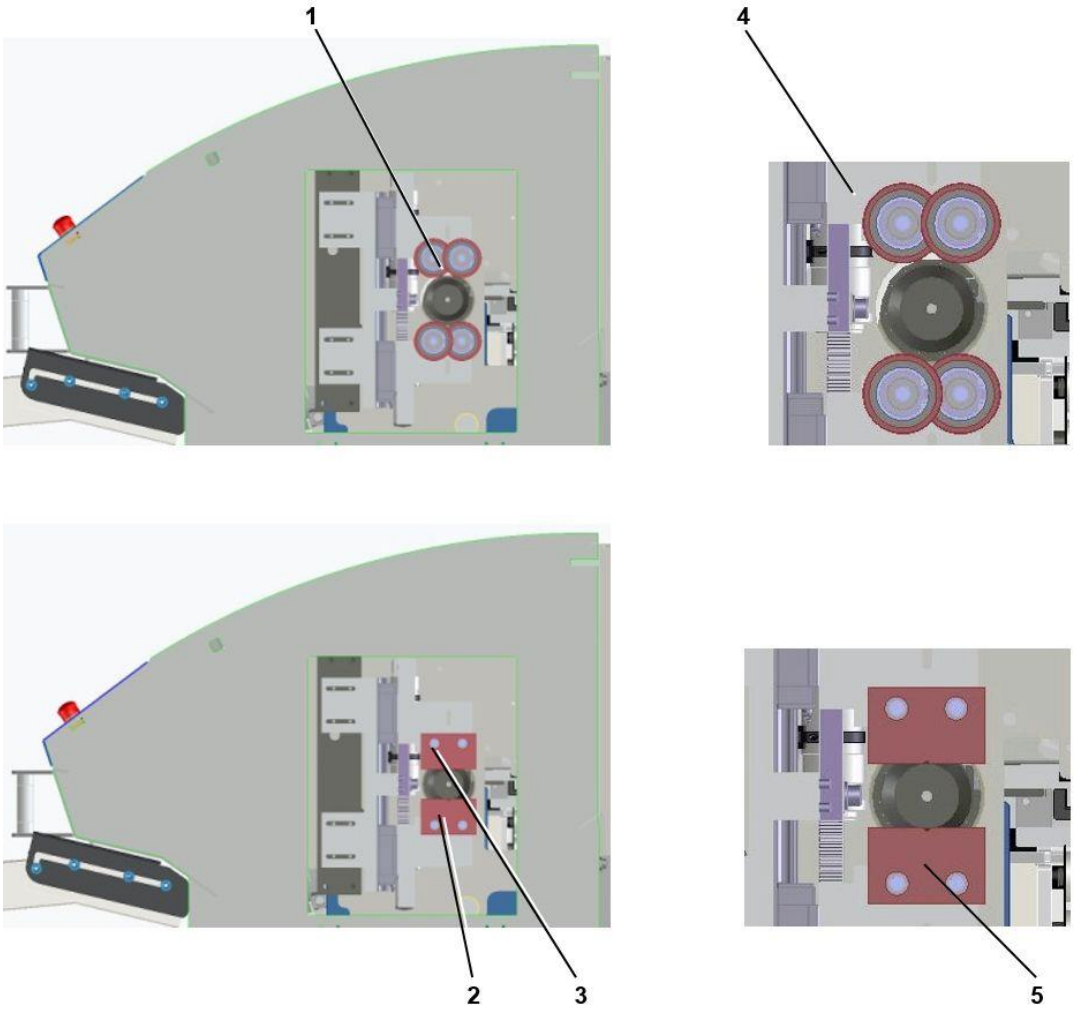


1	Drum locking mechanism	2	Stopper
3	Rear guide bushing drum	4	Oil flow
5	Guide bushing		

The guide bushings and the oil flow result in smoother running.
The internal diameter of the guide bushing corresponds to that of the guide channel. The guide drum is coupled mechanically with the indexing system.

4.7 Combination steady rest (Option)

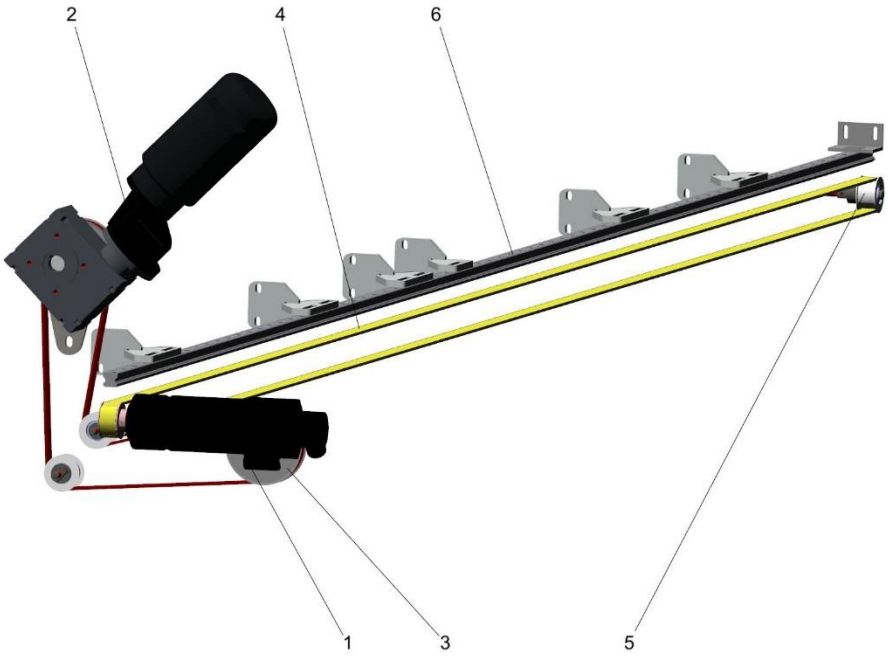
	Avoid damage to the combination steady rest and to the device
	**⚠ WARNING!**
	Improper operation as well as incorrect parameter settings can lead to damage to the steady rest and to the device. ➢ Set the parameters correctly.



1	Combination steady rest	2	Centring jaw, bottom
3	Centring jaw, top	4	Detail rollers
5	Detail jaw		

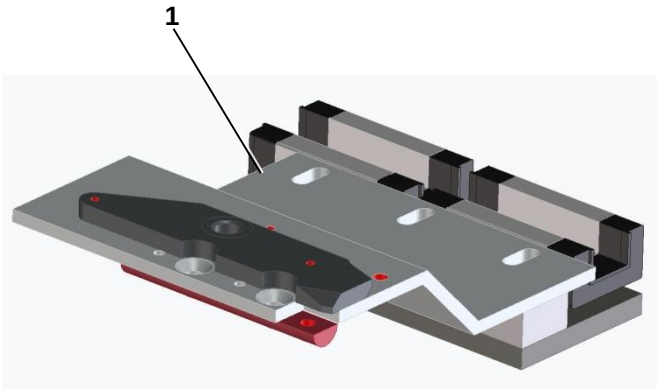
The inner diameter of the centring jaws must be equivalent to the material Ø +1 mm.
The bar stock is additionally guided with the combination steady rest.
Round material ø> 23 → rollers.
Round material ø< 23 and profile material → jaws.

4.8 Drive, deflection and toothed belt



1	Servo motor	2	Gears
3	Pulley wheel	4	Toothed belt
5	Deflection roller	6	Linear guide

4.9 Short pusher



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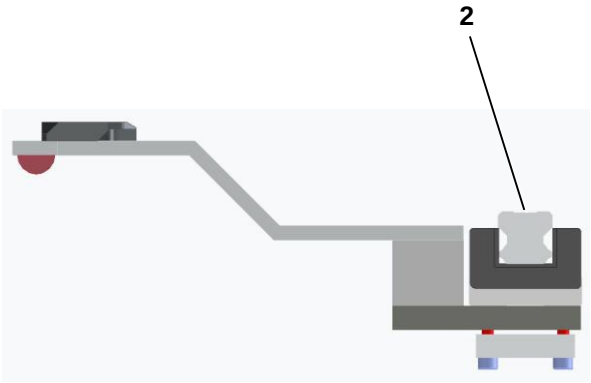

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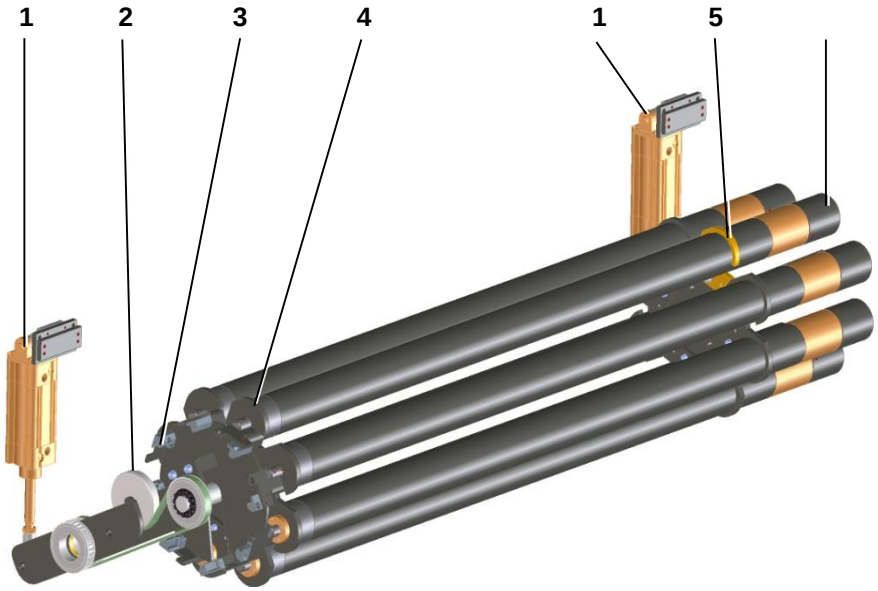
1	Short pusher plate	2	Linear guide
3	Interlock	4	Pusher pad

The short pusher transports the bar stock and the material pusher into the machine spindle.

The material pusher is form-fit with the short pusher.

4.10 Pusher drum

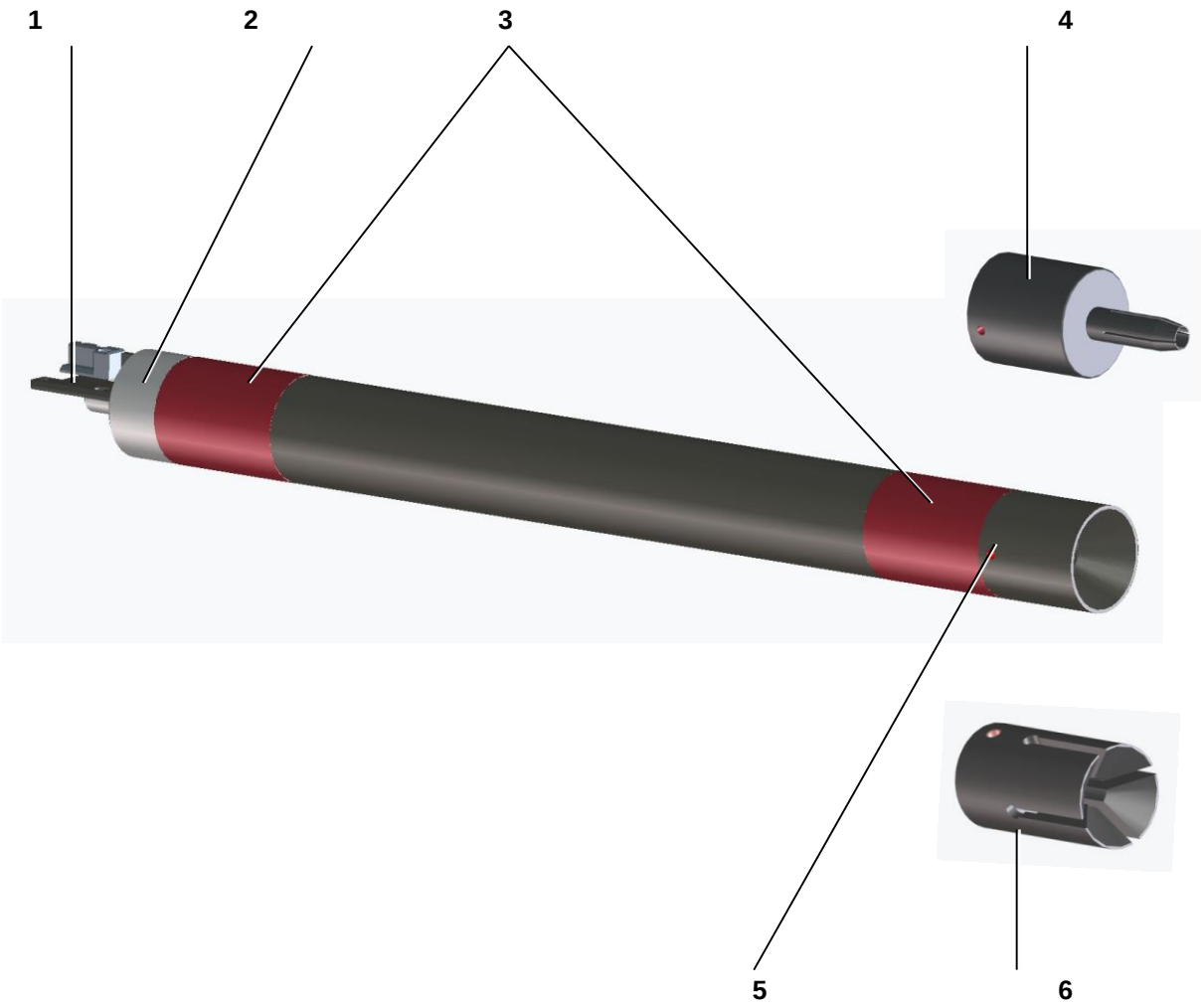


1 Lift/lower the pneumatic cylinder
2 Deflection/tension pulley
3 Rear part of pusher
4 Rear slide holder
5 Front slide holder

	Avoid mechanical damage when indexing the guide channel.
	**Caution** When indexing, ensure that no material is present in the guide channel. ➢ Only have work done by authorized personnel. ➢ Keep unauthorized persons away. ➢ Remove any material present in the guide channel or lathe.

The material pushers of various sizes are also arranged on the pusher drum according to the inner diameters of the guide channels.

4.11 Material pusher, double bearing



1	Material pusher locking device	2	Material pusher rear part
3	Bearings	4	Inner clamping sleeve
5	Pusher head short version VKK	6	Outer clamping sleeve

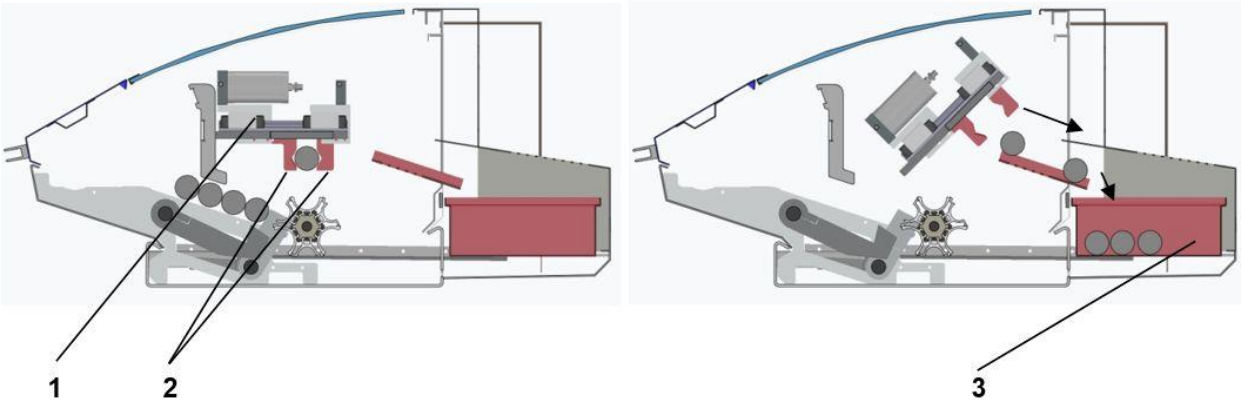
The material pusher transports and guides the bar stock.

The vertical movements are pneumatically controlled.

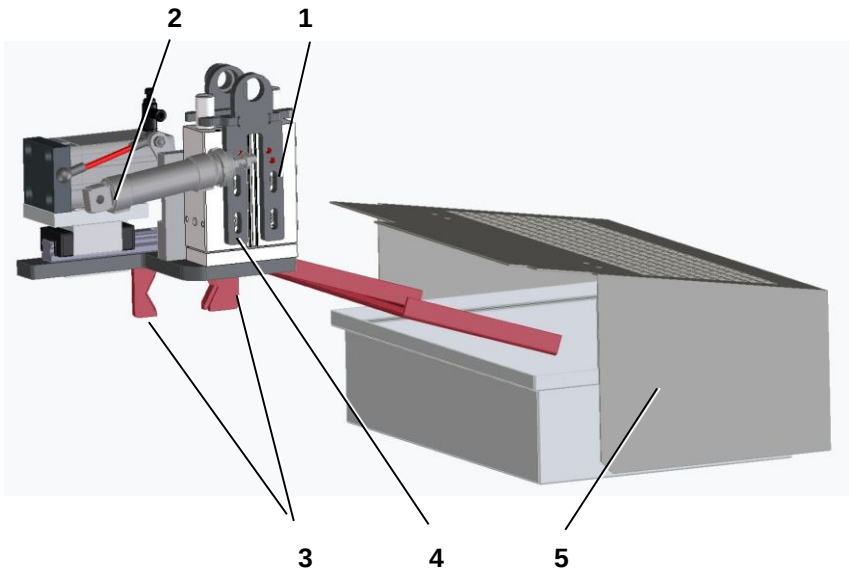
The loading magazine is equipped as follows:

Loading magazine, standard type, without remnant tongs	Pusher head short version VKK
Loading magazine type -R –PR,, with remnant retraction towards the rear	
	Outer clamping sleeve
	Inner clamping sleeve

4.12 Remnant disposal and remnant gripper (optional)



1 Remnantgripper
2 Gripper jaws
3 Remnant container

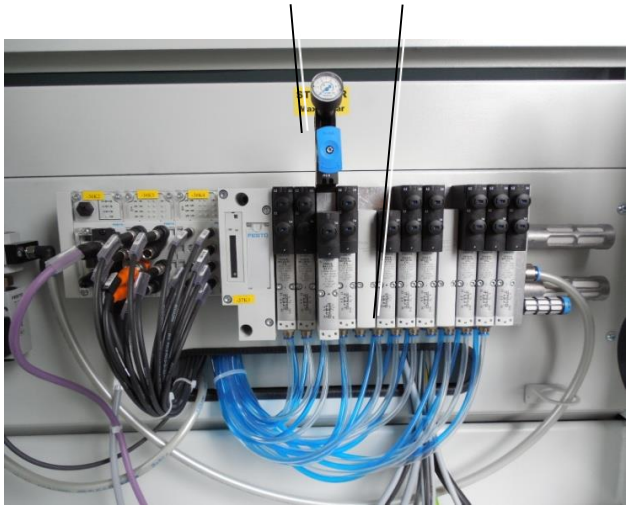


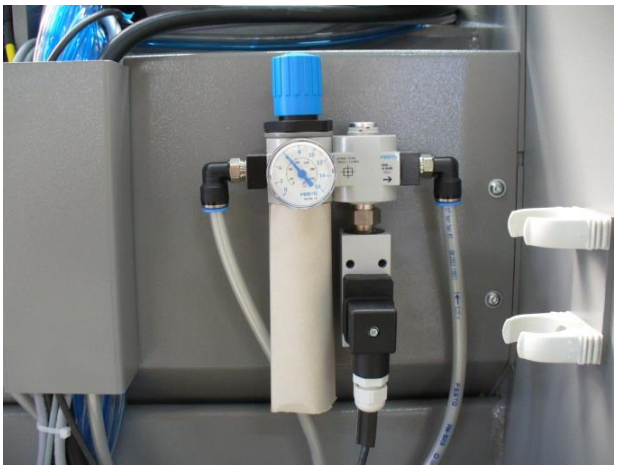
1 Pneumatic cylinder gripper up/down
2 Pneumatic cylinder forward/back
3 Gripper jaws
4 Pneumatic cylinder open/closed
5 Collecting tank for remnants

PROFImat xx.x	Remnant disposal through the CNC machine.
PROFImat xx.xR	Remnant disposal through the loading magazine. Option: Remnant disposal through the CNC machine.
PROFImat xx.xPR	Positioning, remnant disposal through the loading magazine. Option: Remnant disposal through the CNC machine.

4.13 Pneumatic system

1 **2** **3**

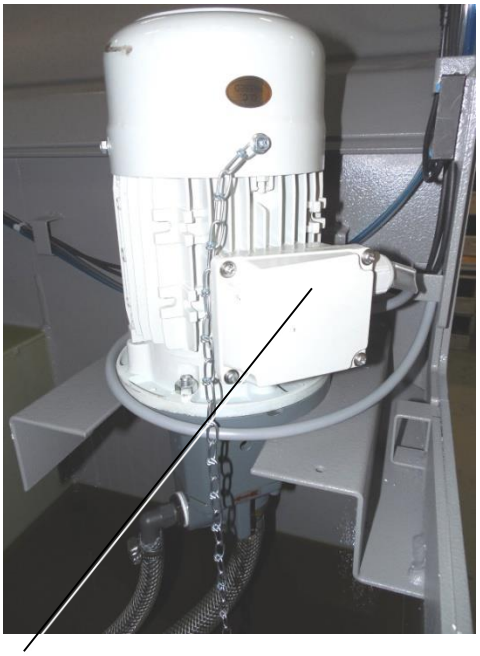




1 Manifold
2 Maintenance unit / Shut-off valve
3 Pressure switch

To operate the system, a constant air pressure of 6 bar of cleaned and dried air is required.

4.14 Oil unit



1 **2**

1 Pump and motor

2 Oil filter

The loading magazine can either be operated with hydraulic oil ISO VG 100 or emulsion (grease content at least 12%). When changing the medium, we recommend also exchanging the filter. Note! Emulsion operation → Diminished smooth running.

The magazine is filled via the loading slope; the medium is drained via the drain cock on the basin.

	Never allow dry running in the guide channel.
	**Caution** Sufficient cooling lubricant (oil/emulsion) must always make it to the guide channels. Running dry can lead to the destruction of the guide unit. ➢ Only have work done by authorized personnel. ➢ Keep unauthorized persons away. ➢ Visual inspection of the level. ➢ If necessary, refill cooling lubricant.

5 Functioning

1	Start CNC program. There is bar stock in the CNC machine. The material pusher is at the rear end of the bar stock or the clamping sleeve is pulled onto the bar.
2	Query for end of bar: "No", continue with step 3; "Yes", continue with step 9.
3	CNC machine makes limit stop ready. No stop with –PR loading magazine.
4	CNC machine opens the clamping device and outputs a pushing command.
5	Loading magazine begins to push. CNC machine moves the limit stop to the desired unclamping length. The material pusher follows the limit stop.
6	CNC machine closes clamping device.
7	The feed torque switches to the holding torque preset in the parameter.
8	CNC machine machines the workpiece. Steps 3 to 8 are repeated until the bar stock is too short for further part production.
9	Loading magazine has reached the end of the bar (remnant). An "end of bar" signal is output to the CNC machine. The CNC machine still machines the last part.
10	CNC machine branches to subprogram for rod change at the beginning of the program.
11	CNC machine prepares for the disposal of the remnant (collecting pan). Just to make sure, the limit stop should be positioned in a safe distance in front of the spindle.
12	CNC machine opens the clamping device. The material pusher moves back to its end position in rapid feed. The material pusher unit lifts up and the new bar stock is placed in the guide channel with the inlay fork. With the -R loading magazine, the remnant is disposed via the gripper and the remnant chute through the loading magazine.
13	The CNC machine gives the command for loading with new bar stock and waits until the loading magazine has completed the rod change.
14	The short pusher pushes the bar stock forward and out of the loading magazine until this is out of the collision range of the material pusher. As this is being done, the mechanical measuring barrier is triggered. The short pusher moves back and the guide channel is closed. The material pusher pushes the bar stock forward (with the -R loading magazine, the clamping sleeve is pulled onto the bar stock).
15	The bar stock is pushed forward without a stop to the preset position (bar start position parameter) with the material pusher. Here, the remnant is pushed out of the clamping device with this bar stock (standard).
16	The loading magazine signals "Loading finished" to the CNC machine. The clamping device is closed. With this, the loading operation is completed.
17	CNC machine jumps back to the main menu and machines the workpiece.

6 Transport

6.1 Delivery

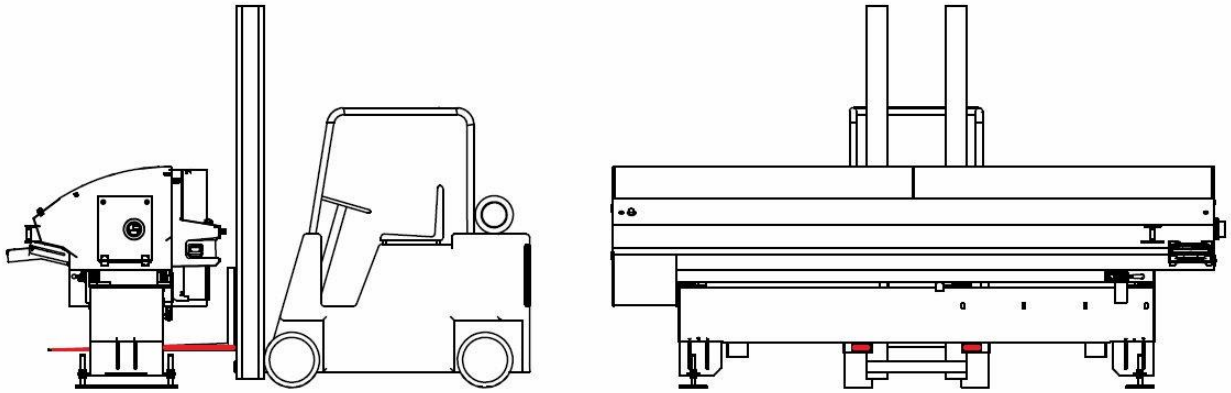
The loading magazine is delivered securely attached to wooden planks for safe transport. It is to be unloaded from the lorry on the transport frame and transported to the installation location.

The loading magazine packaging material should be disposed of by the customer in accordance with applicable environmental and waste management laws.

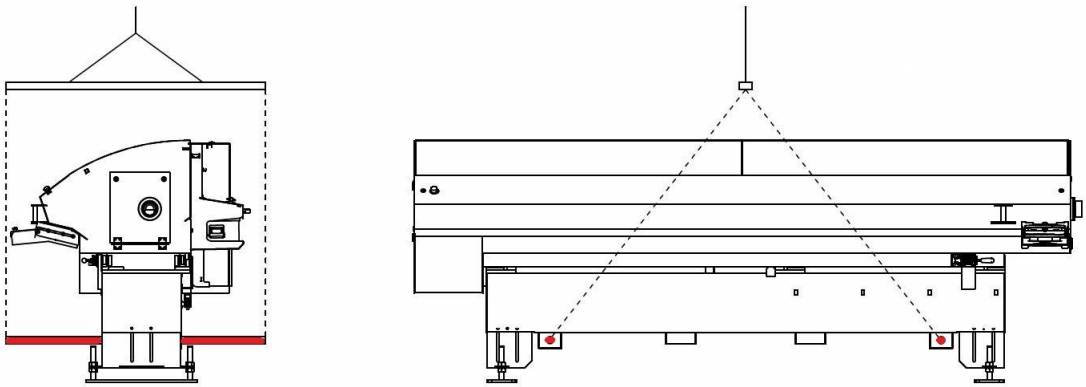
6.2 In-company transport

Transport to the set-up site can be done with a fork lift, hand lift truck or crane (as shown in the sketches). All flaps and transport securing devices must be closed.

Loading on/off with fork lift:



Loading on/off with crane:



Lift the loading magazine at its centre of gravity and secure it against tipping over. Protection against slipping (possibly a rubber mat) is to be provided by the customer.

The minimum load-bearing capacity of the lifting equipment /devices must be selected according to the weight of the magazine.

Lifting the loading magazine from the wooden planks may only be done in the presence of a service technician or after consultation with Kurt Breuning IRCO Maschinenbau GmbH.

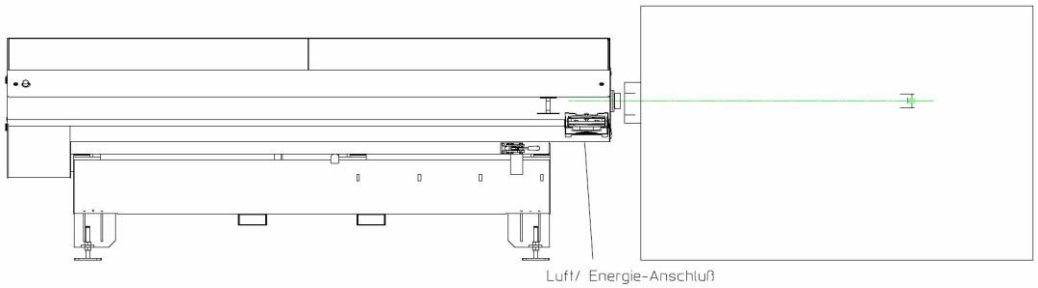
7 Installation

	Working on the electrical system. Do not touch live parts.
 	**Danger!** Multitude of dangers due to working on the electric system. Electric shock can cause personal damage. ➢ Fundamentally, work may only be carried out by authorized personnel. ➢ Disconnect the system from the mains. ➢ The electric cabinet may only be opened by authorized personnel.

	Check safety equipment daily for proper function.
	**WARNING!** Multitude of dangers due to moving machine parts with missing protective equipment. Fingers and hands can get caught in the device when reaching in, causing severe injuries. ➢ As a matter of principle, do not put any safety equipment out of operation.

	Manual mode with open, separating hood or protective mechanism
	**WARNING!** Multitude of dangers due to moving machine parts with moving, separating protective mechanism/hood open in manual mode. Fingers and hands can get caught and cause severe injuries. Moving parts, such as exposed gear wheels, cylinders, stoppers, limit stop, inlay forks, toothed belts and pushers, are openly accessible. Required for set-up as well as troubleshooting. ➢ Only carry out work with the hood open once the device has come to a standstill. ➢ Do not reach into moving parts. ➢ Only operate the device with the hood closed. ➢ Keep unauthorized persons away.

	Danger of injury due to moving parts.
	**⚠ WARNING!** The material pusher can be moved out of the housing in manual mode and when the magazine is swivelled out. ➢ Make sure there is a safety barrier in place. ➢ Only have work done by authorized personnel. ➢ Keep unauthorized persons away.



The loading magazine is to be placed aligned with the spindle of the CNC machine. A max. distance of 10 mm between the CNC machine and loading magazine is permissible.

The installation situation and the interface must be dimensioned appropriately for the above-named bar feed for the lathe. The bar feed must be behind the lathe by the time our fitter arrives. The CNC machine must be fixed to the hall floor.

Alignment and commissioning may only be carried out by Breuning-IRCO service technicians or authorized persons.

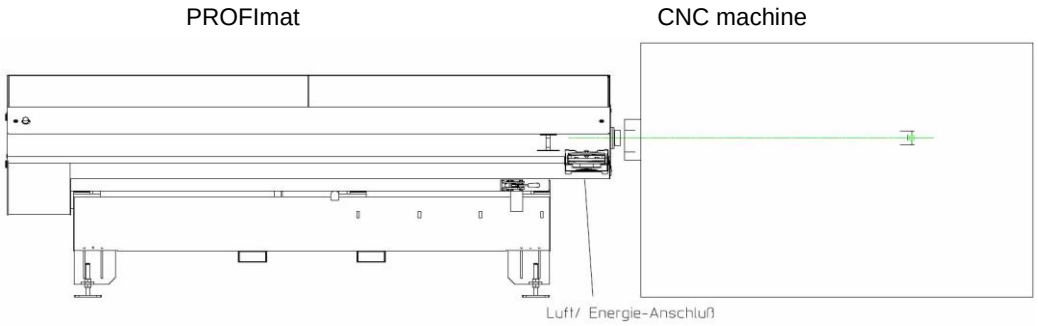
7.1 Connecting

	Working on the electrical system. Do not touch live parts.
	**Danger!** Multitude of dangers due to working on the electric system. Electric shock can cause personal damage. ➢ Fundamentally, work may only be carried out by authorized personnel. ➢ Disconnect the system from the mains. ➢ The electric cabinet may only be opened by authorized personnel.

	Avoid the destruction of all electronics.
	**Danger!** Multitude of dangers due to working on the electric system. Over-voltage, destruction of hardware and software on the CNC machine and on the device. ➢ The electric cabinet may only be opened by authorized personnel. ➢ Fundamentally, work may only be carried out by authorized personnel. ➢ Before connecting the system to the mains, check the operating voltage. ➢ Check the pin assignment according to the interface description. ➢ Before plugging in, make sure to check the allocation of the interface of the CNC machine and the device according to the specifications on the circuit diagrams.

1		Plug in the interface plug on the CNC machine.
2		Switch on the CNC machine.
3		Unlock the Emergency Stop button on the loading magazine.
4		Establish the compressed air supply with at least 6 bar, open the shut-off valve.
5		Unlock the Emergency Stop button on the CNC machine.
6		Make the loading magazine ready for operation on the control unit. For this, observe the information on the control unit and acknowledge any pending malfunction messages with "Reset".
7		As soon as the LED strip is illuminated in green, the magazine is ready.
8		Fill hydraulic oil/emulsion mixture in the machine pan. For filling level, see the machine chart.

7.2 Alignment



The loading magazine is to be placed aligned with the spindle of the CNC machine. A max. distance of 10 mm between the CNC machine and loading magazine is permissible.

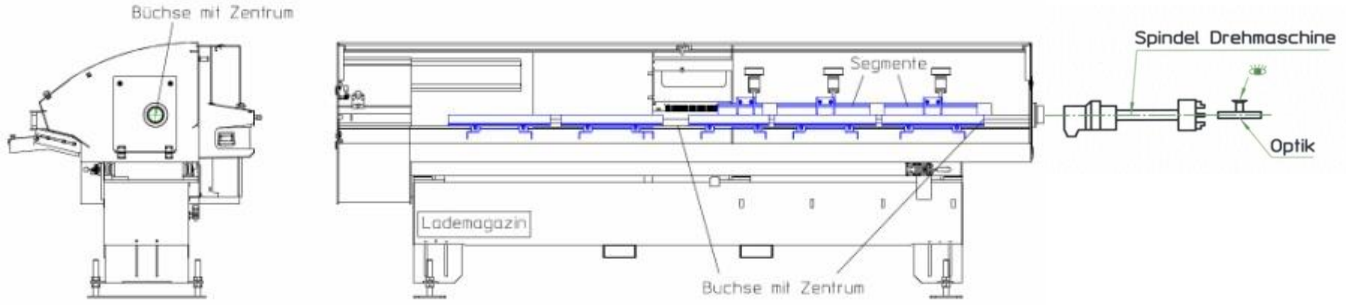
Alignment and commissioning may only be carried out by Breuning-IRCO service technicians or authorized persons.

The CNC machine must be fixed to the hall floor.

The exact alignment of the loading magazine to the CNC machine is decisive for the function and smooth running of the system.

After aligning the loading magazine, fix it to the hall floor with heavy-duty dowel pins (18 x 100).

Aligning with optics



8 Handling

	Working on the electrical system. Do not touch live parts.
 	**Danger!** Multitude of dangers due to working on the electric system. Electric shock can cause personal damage. ➢ Fundamentally, work may only be carried out by authorized personnel. ➢ Disconnect the system from the mains. ➢ The electric cabinet may only be opened by authorized personnel.

	Check safety equipment daily for proper function.
	**WARNING!** Multitude of dangers due to moving machine parts with missing protective equipment. Fingers and hands can get caught in the device when reaching in, causing severe injuries. ➢ As a matter of principle, do not put any safety equipment out of operation.

	Manual mode with open, separating hood or protective mechanism
	**WARNING!** Multitude of dangers due to moving machine parts with moving, separating protective mechanism/hood open in manual mode. Fingers and hands can get caught and cause severe injuries. Moving parts, such as exposed gear wheels, cylinders, stoppers, limit stop, inlay forks, toothed belts and pushers, are openly accessible. Required for set-up as well as troubleshooting. ➢ Only carry out work with the hood open once the device has come to a standstill. ➢ Do not reach into moving parts. ➢ Only operate the device with the hood closed. ➢ Keep unauthorized persons away.

	Danger of crushing when working without safety equipment.
	**⚠ WARNING!** Multitude of dangers due to moving machine parts with missing protective equipment. Fingers and hands can get caught in the device when reaching in, causing severe injuries. ➢ As a matter of principle, do not put any safety equipment out of operation. ➢ Only authorized personnel may carry out the removal. ➢ Removal is only permissible for maintenance and repair. ➢ Make sure protective equipment is reinstalled after every intervention.

	Danger of injury due to moving parts.
	**⚠ WARNING!** The material pusher can be moved out of the housing in manual mode and when the magazine is swivelled out. ➢ Make sure there is a safety barrier in place. ➢ Only have work done by authorized personnel. ➢ Keep unauthorized persons away.

	Exchange spare parts and accessory parts.
	**⚠ WARNING!** Multitude of dangers due to moving machine parts with missing protective equipment. Fingers and hands can get caught in the device when reaching in, causing severe injuries. ➢ Only carry out work with the hood open once the device has come to a standstill. As a matter of principle, do not put any safety equipment out of operation. ➢ Exit automatic mode; switch to manual mode. ➢ Only use original Breuning/IRCO spare parts. ➢ Make sure protective equipment is reinstalled after every intervention.

	Avoid contact with rotating components.
	**⚠ WARNING!** Multitude of dangers due to moving machine parts with moving, separating protective mechanism/hood open in manual mode. Fingers and hands can get caught and cause severe injuries. Moving parts, such as rotating material, exposed gear wheels, cylinders, stoppers, limit stop, inlay forks, toothed belts and pushers, are openly accessible. Required for set-up as well as troubleshooting. ➢ Only carry out work with the hood open once the device has come to a standstill. ➢ Do not reach into moving parts. ➢ Only operate the device with the hood closed. ➢ Keep unauthorized persons away.

	Not on type plate, type designation, informational sign.
	**⚠ WARNING!** Danger if product label is missing or illegible. ➢ Always keep the type plate and safety, warning and operational information in easily legible condition. ➢ Replace damaged or missing product labels. ➢ Always specify the IRCO serial number when contacting the manufacturer.

	Danger of tool breakage.
	**⚠ Caution** The workpiece and tool can be damaged by activating the Emergency Stop function. Opening the protective equipment causes an immediate Emergency Stop. Pushing back/swivelling out the device in automatic mode causes an immediate Emergency Stop. ➢ Only activate Emergency Stop in the event of danger. ➢ Only open protective equipment after the device is at a standstill. ➢ Only have work done by authorized personnel. ➢ Keep unauthorized persons away. ➢ Make sure protective equipment is reinstalled after every intervention.

	Avoid tool breakage when swivelling out the loading magazine.
	**⚠ Caution** Pushing back/swivelling out the device in automatic mode causes an Emergency Stop. Make sure that no material from the spindlestock can get into the device. ➢ Only have work done by authorized personnel. ➢ Keep unauthorized persons away. ➢ Remove material from the spindlestock that gets into the device.

	Avoid mechanical damage when indexing the guide channel.
	**⚠ Caution** When indexing, ensure that no material is present in the guide channel. ➢ Only have work done by authorized personnel. ➢ Keep unauthorized persons away. ➢ Remove any material present in the guide channel or lathe.

	Avoid collisions while the guide channel is closing.
	**⚠ Caution** ore closing the guide channel, ensure that there is no material in the area of the material pusher. ➢ Only have work done by authorized personnel. ➢ Keep unauthorized persons away. ➢ Visual inspection, remove material from the collision area.

	Never allow dry running in the guide channel.
	**⚠ Caution** Sufficient cooling lubricant (oil/emulsion) must always make it to the guide channels. Running dry can lead to the destruction of the guide unit. ➢ Only have work done by authorized personnel. ➢ Keep unauthorized persons away. ➢ Visual inspection of the level. ➢ If necessary, refill cooling lubricant.

	Avoid damaging the measuring barrier.
	**⚠ Caution** Before manually disposing of the remnants (back through the loading magazine), make sure that the mechanical measuring barrier has responded. If not, move forward with the material pusher until the measuring barrier responds. ➢ Only have work done by authorized personnel. ➢ Keep unauthorized persons away. ➢ Move the pusher forward, trigger the measuring barrier.

8.1 Manual mode

In manual mode, the loading magazine functions are controlled via buttons on the operating unit.

		"Manual mode" button.

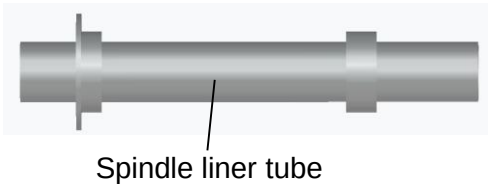
8.1.1 Switching on

When the CNC machine is switched on, the loading magazine is also operational.

8.1.2 Selecting a spindle liner tube

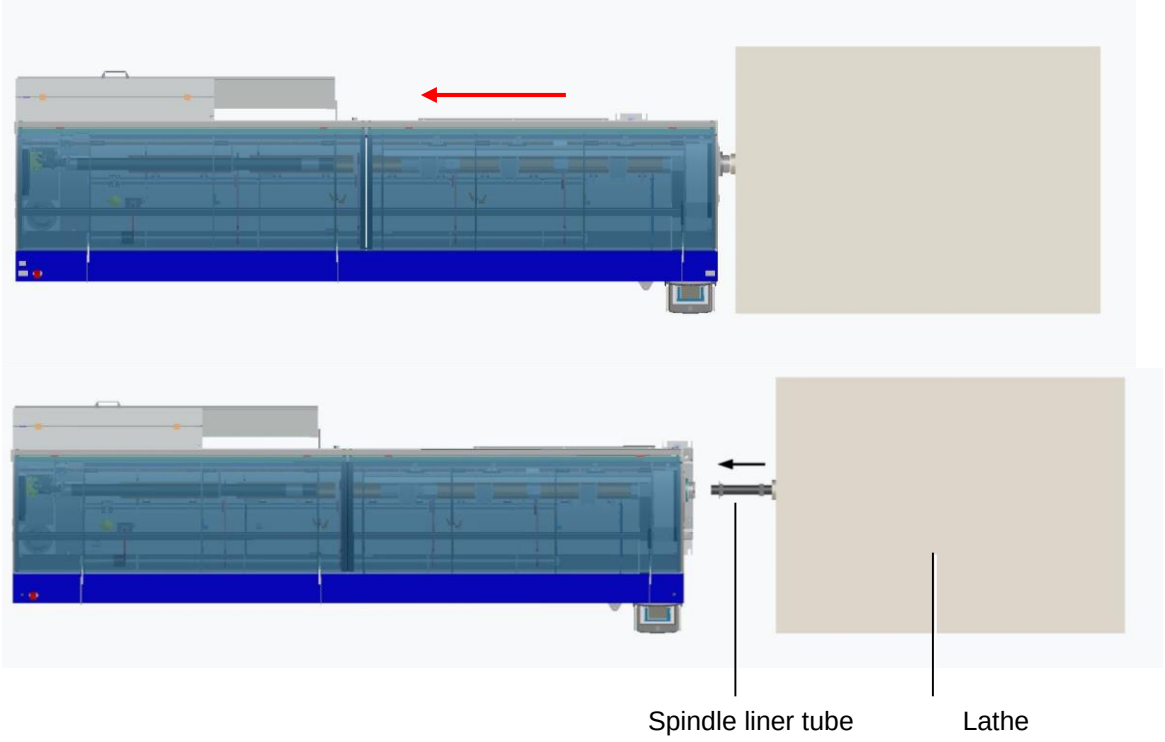
Spindle liner tubes guide the bar stock and the material pusher into the machine spindle.

The inner diameter of the spindle liner tube and the selected guide channel must be identical.



Any projecting ends of the spindle liner tube must be protected from contact by the user. Use IRCO coolant collecting tank (option).

8.1.3 Changing the spindle liner tube



	Avoid tool breakage when swivelling out the loading magazine.
	**Caution** Pushing back/swivelling out the device in automatic mode causes an Emergency Stop. Make sure that no material from the spindlestock can get into the device. ➢ Only have work done by authorized personnel. ➢ Keep unauthorized persons away. ➢ Remove material from the spindlestock that gets into the device.

	Avoid mechanical damage when indexing the guide channel.
	**Caution** When indexing, ensure that no material is present in the guide channel. ➢ Only have work done by authorized personnel. ➢ Keep unauthorized persons away. ➢ Remove any material present in the guide channel or lathe.

8.1.4 Axial slide

Figure 1: Axial slide maintenance position

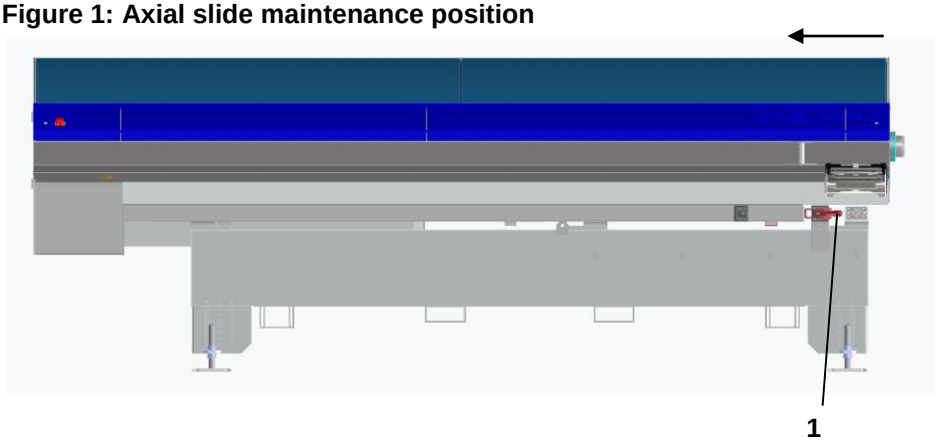
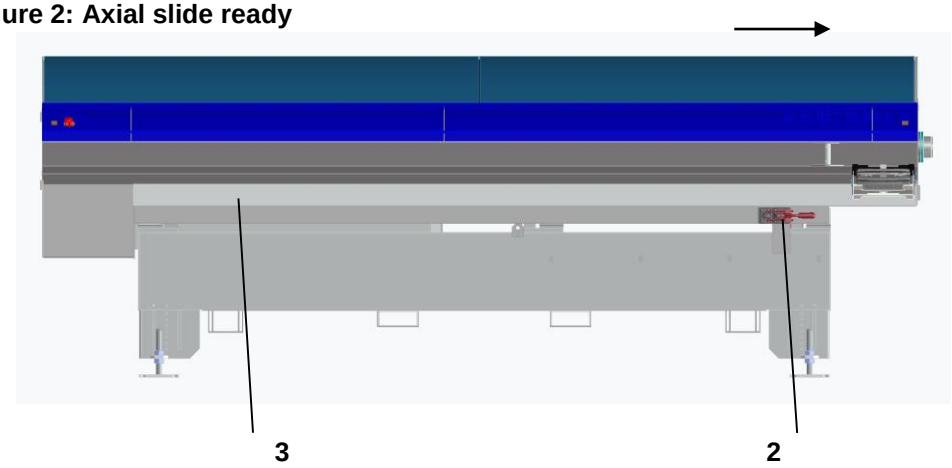


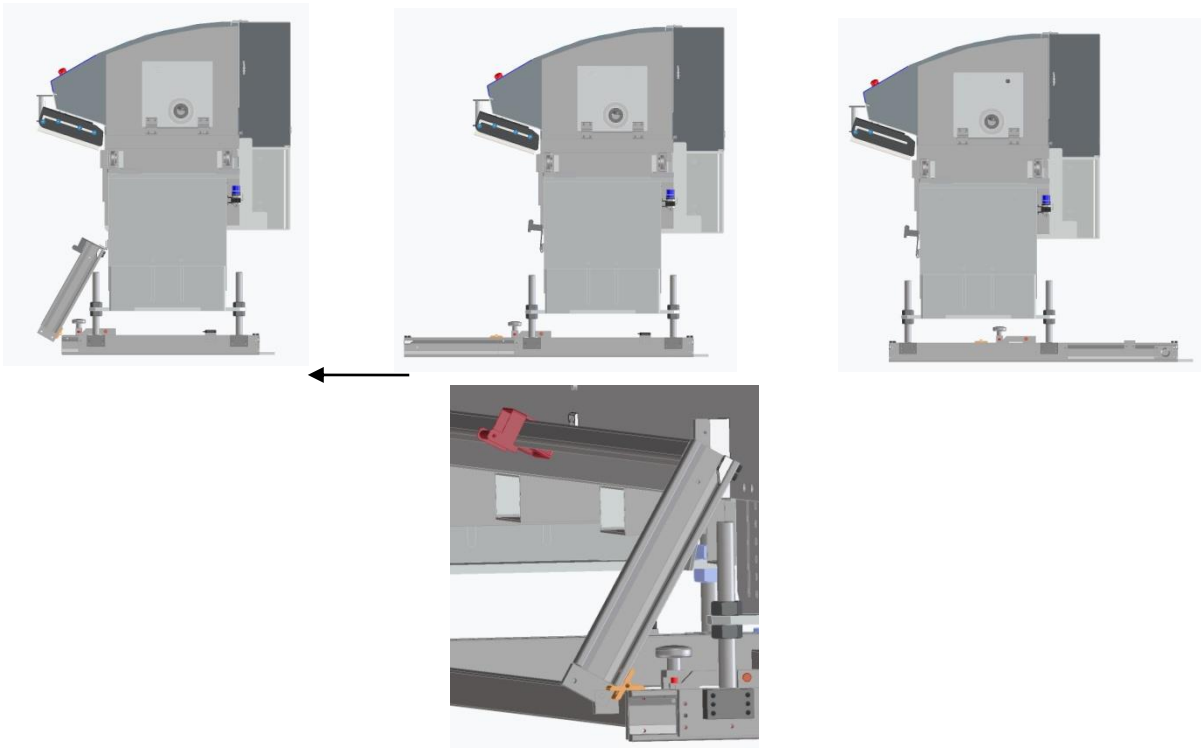
Figure 2: Axial slide ready



1 Rocker lever open
2 Rocker lever closed
3 Shifting track

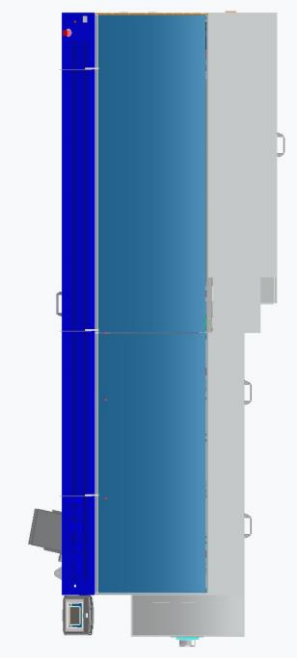
1		Unlock the loading magazine, to do this, turn the rocker lever.	
2		Push the machine pan toward the rear on the shifting track. The safety switch is actuated. Error message on the display: "Loading magazine swung out".	
3		Release the existing spindle liner tube on the CNC machine and remove. Insert a spindle liner tube in the CNC machine which matches the material.	
4		Pull the machine pan forward to the stop.	
5		Lock the machine pan and secure.	
6		Delete error message with the "Reset" button.	

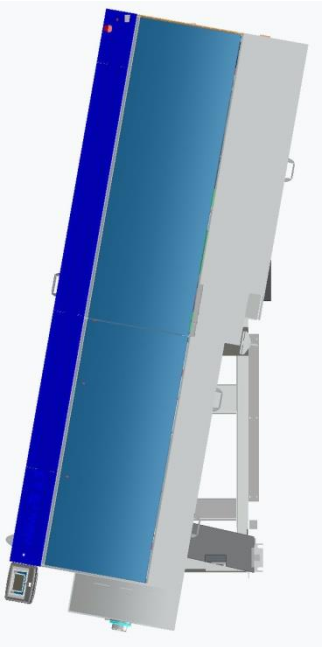
8.1.5 Lateral displacement - option

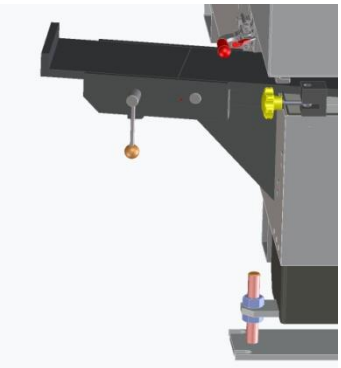


1		Fold down the foldable rail; to do this, release the clamping.
2		Unlock the loading magazine. To do this, turn down the rocker lever.
3		Pull the loading magazine on the sliding rail toward the operating side. The safety switch is actuated. Error message on the display: "Loading magazine swung out".
4		Release the existing spindle liner tube on the CNC machine and remove. Insert a spindle liner tube in the CNC machine which matches the guide channel.
5		Push the loading magazine back to the limit stop.
6		Lock and secure the loading magazine.
7		Delete message with the "Reset" button.

Swifelout foldable - option

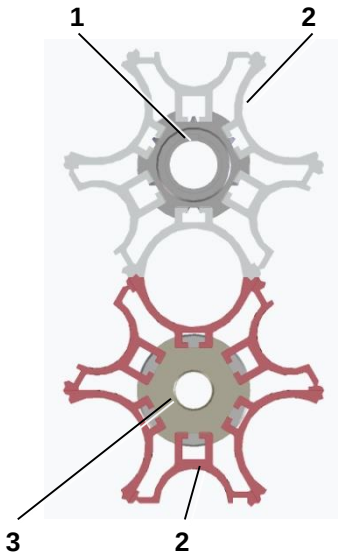






8.1.6 Indexing the guide channel

	Avoid mechanical damage when indexing the guide channel.
	**Caution** When indexing, ensure that no material is present in the guide channel. ➢ Only have work done by authorized personnel. ➢ Keep unauthorized persons away. ➢ Remove any material present in the guide channel or lathe.



1	Guide channel drum, top	2	Guide channel shell
3	Guide channel drum, bottom	4	

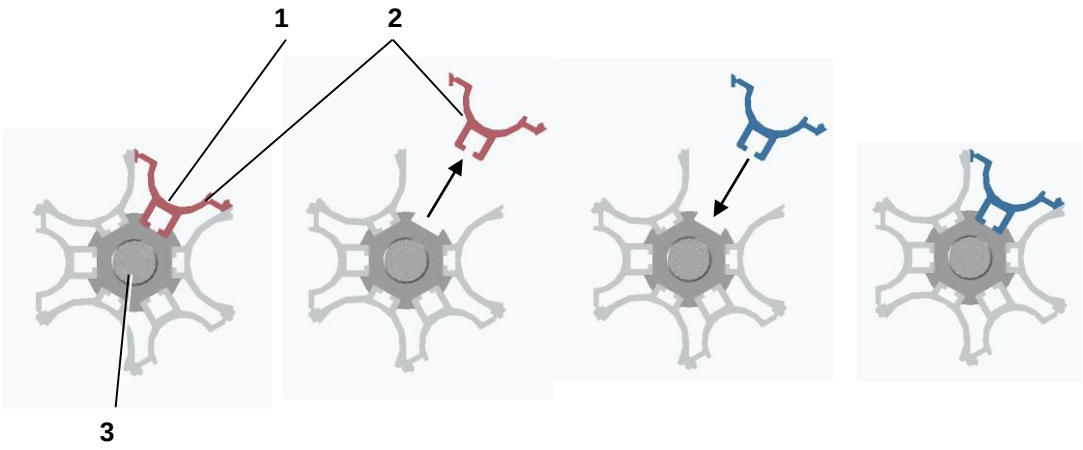
Indexing the guide channel is for changing the channel diameter.
The drums of the guide channel rotate in opposite directions.

Description of the indexing operation

1	Press the "Manual mode" button.
2	Move the pusher back until the workpiece pusher is in the end position.
3	Open the guide channel Lift the top guide channel drum and material pusher drum.
4	Lift the inlay fork to activate the mechanical barrier; this ensures that there is no material in the front area
5	"Inlay fork down".
6	Check whether the guide channel is free by visually inspecting it.
7	If all prerequisites for the home position are met, the symbol for a channel change is displayed.
8	"Manual indexing" Press "Index channel" twice – channel indexes by one position.
9	"Automatic indexing". Press the "Index channel" button once. Entry of the material diameter via numerical entry. Observe the information in section **Fehler! Verweisquelle konnte nicht gefunden werden. Fehler! Verweisquelle konnte nicht gefunden werden.**.
10	Press the "Index channel" button again. The drums turn until the desired guide channel is in position.
11	The inlay fork automatically adjusts itself to the corresponding diameter.
12	The new maximum possible material diameter is shown on the display. Insert matching spindle liner tube.

8.1.7 Changing channel shells

Opening the glass hoods, see "Maintenance" section. Chapt. 14.1



1 Fastening screw
2 Channel shell
3 Guide channel, drum

Changing the channel shells is usually not necessary since the mounted components cover the diameter range desired by the customer.

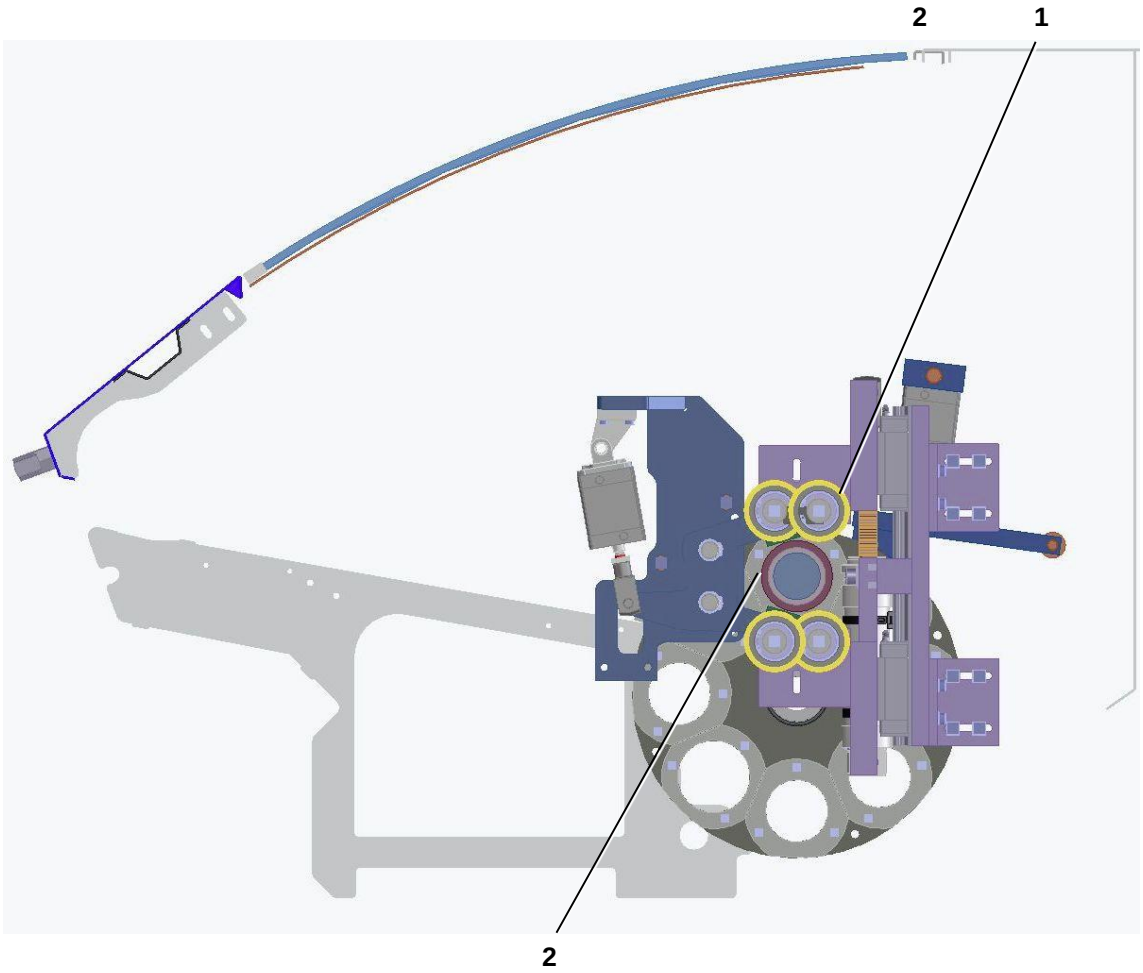
Should the material pusher also be replaced, it must by all means be disassembled before changing the channel shells.

In individual cases, e.g. in the event of damage, exchange the channel shells as follows:

1		Press the "Manual mode" button. Open hood.
2		With the procedure described in section 8.1.6 "Indexing the guide channel", index until the channel shell to be exchanged is easily accessible.
3		Change the guide channel shells as follows: - Loosen the fastening screws of the channel shell, but do not remove. - Remove the channel shell. - Insert the channel shell and tighten the fastening screws.
4		Close hood.
5		Delete the error message with the "Reset" button.

Covering at the segment gaps is a part of the safety equipment and must be reinstalled when the guide channels are replaced.

8.1.8 Changing the guide bushings



1 Combination steady rest 2 Guide bushing

Loosen screws, replace guide bushing (inner diameter like channel), tighten screws.

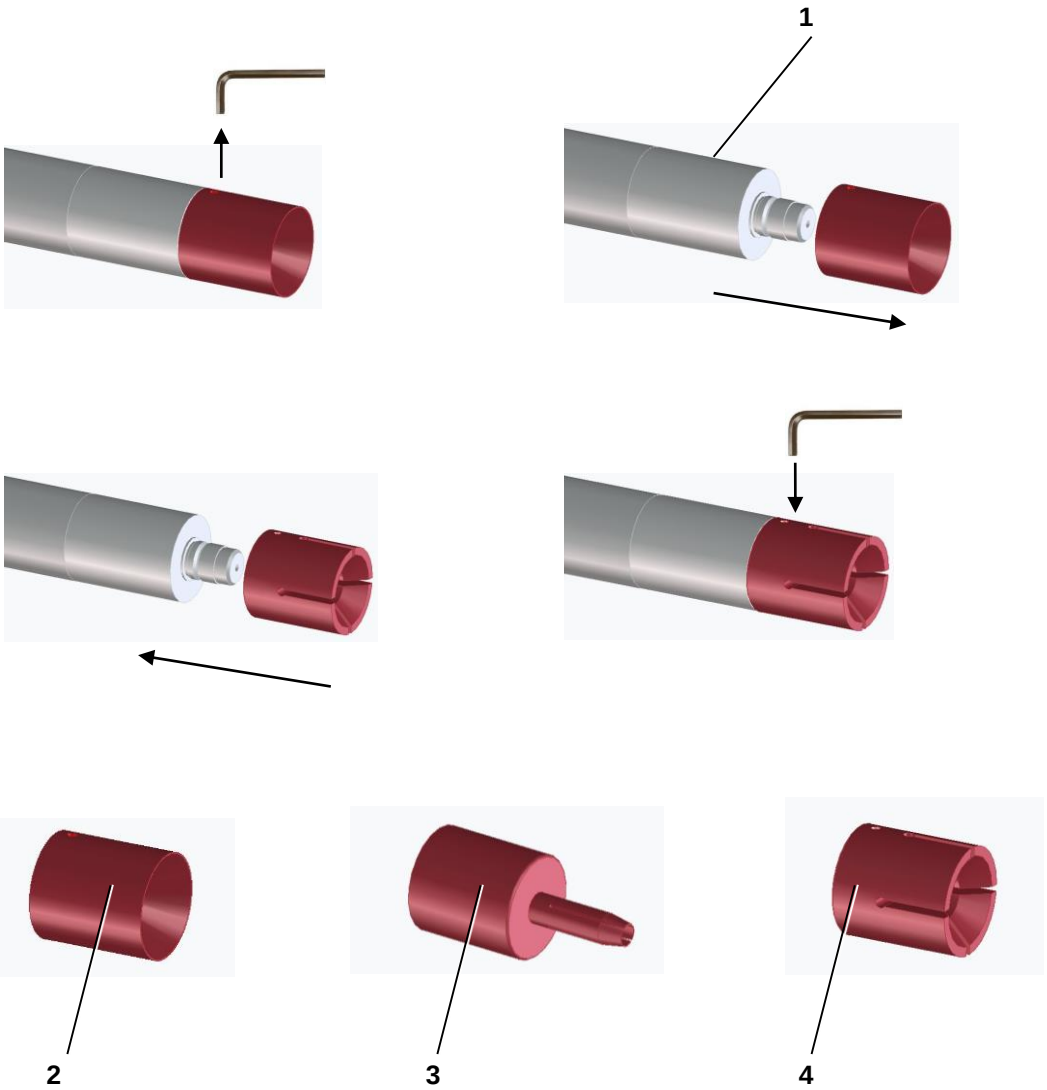
8.1.9 Selecting the material pusher, pusher head/clamping sleeve

Select the guide channel and accessories so they fit the material diameter. For delivered guide channels, see machine chart.

8.1.10 Changing the material pusher

1	Select manual mode.
2	Move pusher back to the rear end position.
3	Close channel.
4	Move the material pusher forward until all segments have opened.
5	Move material pusher back until it lies freely accessible in the lower channel.
6	Remove material pusher. To do this, push the interlock back and lift up and remove the material pusher.
7	Move the material pusher back into the rear end position.
8	Open channel.
9	For deviating diameter: Change material pusher holder (front): - Loosen the fastening screws. - Remove material pusher holder. - Select holder fitting the material pusher (inner Ø of holder must match the outer Ø of material pusher). - Put on holder and tighten fastening screws.
10	Close channel.
11	Move the material pusher forward until all segments have opened.
12	Move material pusher back until it can be placed freely behind the short pusher in the lower guide channel.
13	Insert material pusher: Push the interlock back and insert material pusher. Release the interlock.
14	Move pusher back to the rear end position.

8.1.11 Changing the pusher head/clamping sleeve

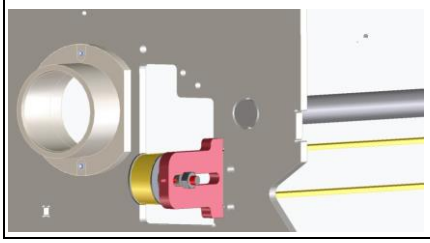
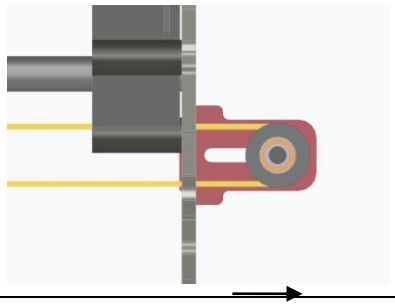
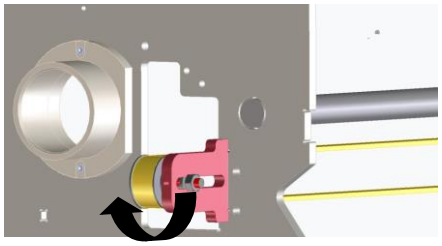


1 Bearings
2 Pusher head short version VKK
3 Inner clamping sleeve
3 Outer clamping sleeve

8.1.12 Tensioning the toothed belt

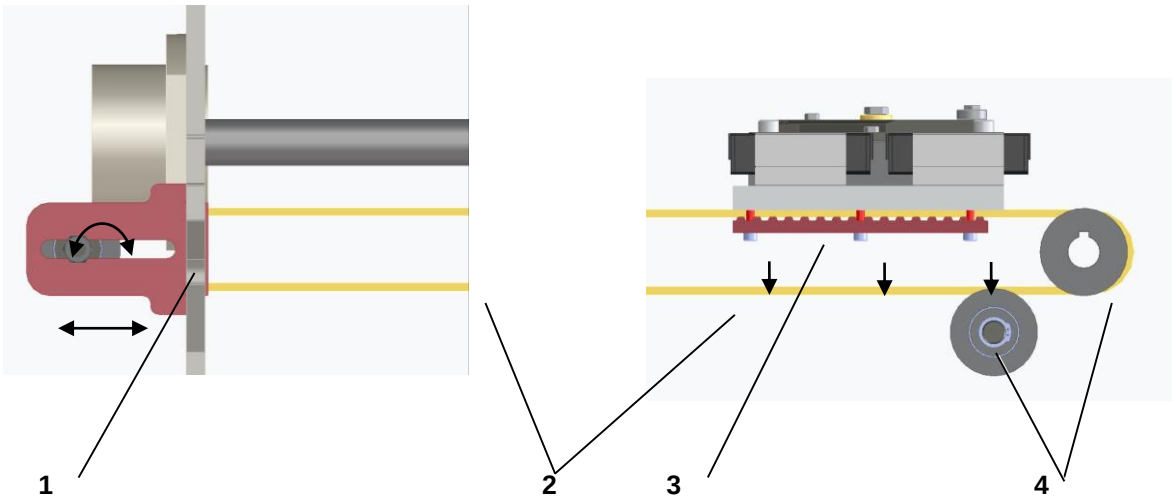
	Manual mode with open, separating hood or protective mechanism
	**WARNING!** Multitude of dangers due to moving machine parts with moving, separating protective mechanism/hood open in manual mode. Fingers and hands can get caught and cause severe injuries. Moving parts, such as exposed gear wheels, cylinders, stoppers, limit stop, inlay forks, toothed belts and pushers, are openly accessible. Required for set-up as well as troubleshooting. ➢ Only carry out work with the hood open once the device has come to a standstill. ➢ Do not reach into moving parts. ➢ Only operate the device with the hood closed. ➢ Keep unauthorized persons away.

1	Switch with the "Manual mode" button and open the rear mounting flap/hood.
2	Loosen the clamping screws on the deflection plate.
3	Re-tighten clamping screw until the toothed belt is taut.
4	Tighten clamping screws.
5	Close mounting flap/hood. Delete error message with "Reset".

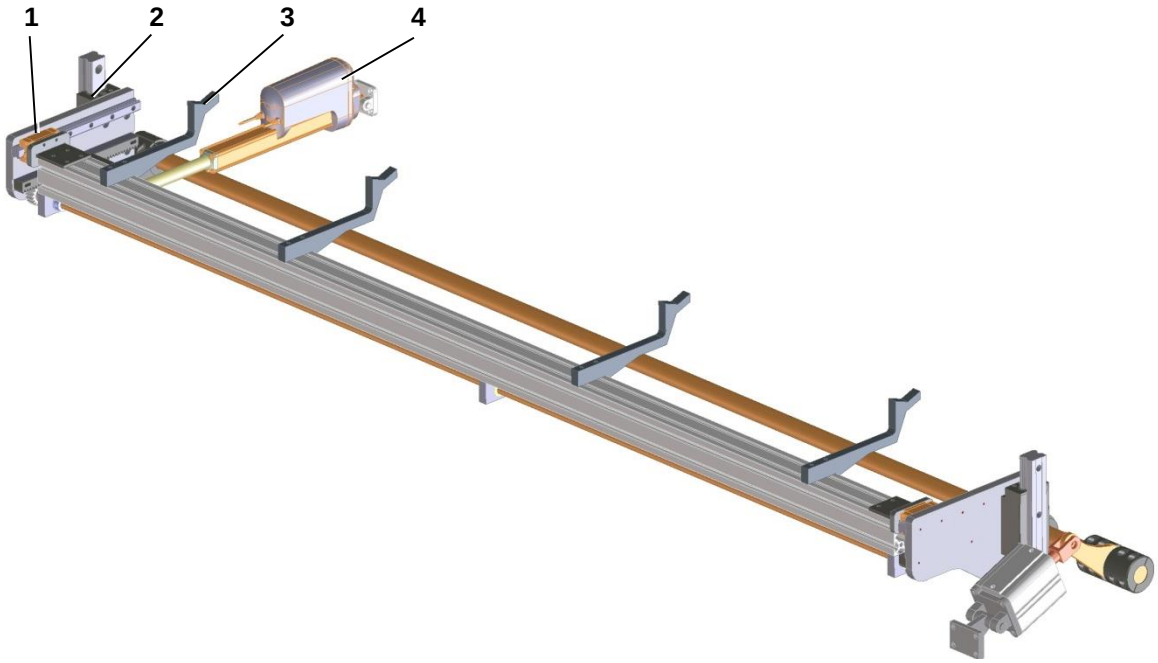
8.1.13 Changing the toothed belt

1	Switch magazine to "Manual mode" and open the rear mounting flap. Remove rear plate.
2	Put the pusher in a position where the toothed belt clamping plate is easy to reach.
3	Loosen the clamping screws on the deflection plate. Loosen the toothed belt tension via the clamping screw.
4	Release the short pusher from the toothed belt, To do this, loosen the screws of the clamping plates and lift up the clamping plates.
5	Pull off toothed belt from the drive and deflection roller and remove.
6	Installation in the opposite order. Tension the toothed belt.



1 Toothed belt tension
2 Toothed belt
3 Clamping plate, short pusher
4 Deflection rollers

8.1.14 Adjusting the bar separator



1	Guide forward / back	2	Guide up / down
3	Inlay fork	4	Drive

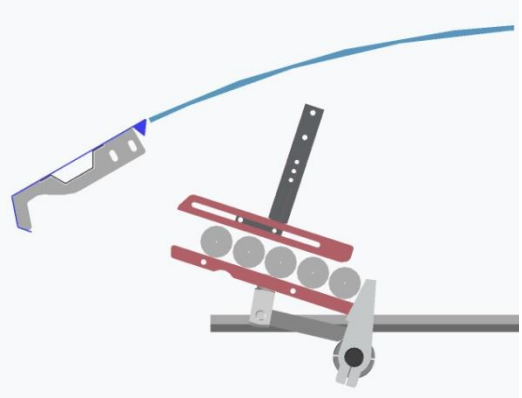
The separator is to be set to the respective material diameter. Input via control panel.

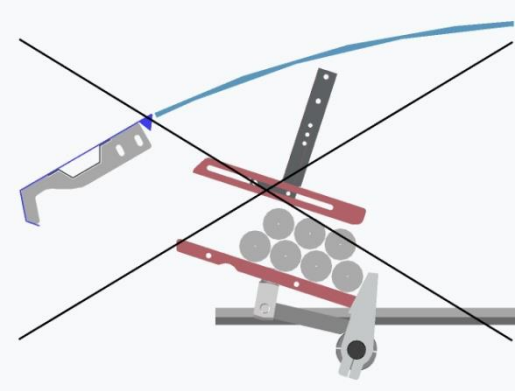
In machines with remnant disposal to the rear, the material diameter is to be entered in addition to the outer diameter of the clamping sleeve used. Observe section 4.3 for this.

8.1.15 Loading material

	Avoid malfunctions on the insertion system and during the working sequence.
	**Caution** Damage to the insertion system and holding-down devices. Malfunctions in the working sequence. ➢ The holding down devices must be adjusted according to the material.

1	End automatic mode on the lathe.
2	With the magazine in manual mode, open the storage flap.
3	Deposit bar material on the loading slope. Attention: Danger of crushing.
4	Adjust the holding-down device. Adjust the holding-down device so that the bar stock always lies in one layer on the storage rack.
5	Place the bar stock left-aligned.
6	Close the storage flap. Delete error message with "Reset".
7	Start automatic mode as described in section 8.1.16 or **Fehler! Verweisquelle konnte nicht gefunden werden.**.

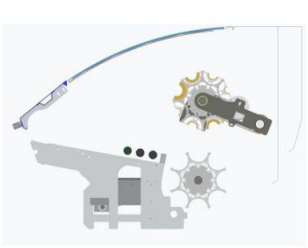
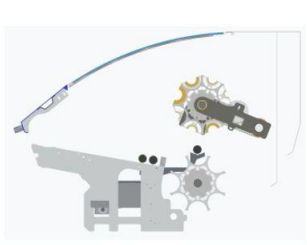
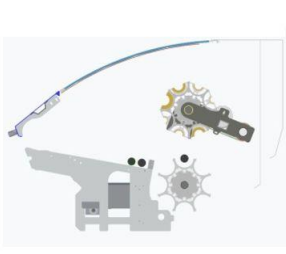
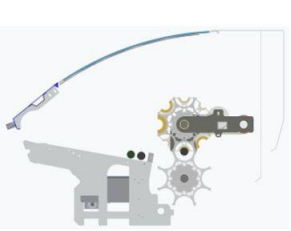




8.1.15.1 Manual loading of bar stock for R or PR magazines

There is bar stock on the storage rack. The material pusher/short pusher is in the rear end position. The guide channel is open.

1		Inlay fork up.
2		Move inlay fork forward.
3		Inlay fork down. Material now lies in the guide channel, "M" is on the display and material is in the channel.
4		Move inlay fork back.
5		Swivel the gripper unit forward.
6		Open the gripper.
6		Press the "Move pusher forward" button. Keep the button pressed until the "M" on the display disappears.
7		Lower the gripper.
8		Close the gripper.
9		Move the short pusher to the rear end position.
10		Close channel.
11		Move the material pusher forward until the clamping sleeve is pulled onto the bar stock.
12		Open the gripper.
13		Lift the gripper.
14		Move the material pusher forward until the bar stock has reached the desired position in the CNC machine area.

8.1.15.2 Manual unloading of remaining material for R or PR magazines

Remnant disposal in the magazine. For max. remnant length, see the machine chart.

1		Move pusher back. Remnant is stuck in the clamping sleeve of the material pusher. The material pusher stops automatically in the gripper area.
2		Swivel the gripper forward.
2		Lower the gripper.
3		Close the gripper. The remnant gripper grabs the remnant and holds it tightly.
4		Move material pusher back. The material pusher moves to its end position. The clamping sleeve is pulled off of the remnant.
5		Lift the gripper. The remnant is stuck in the gripper.
6		Swivel the gripper back.
6		Press the "Open gripper" button. The remnant is disposed of by the remnant gripper via a chute into a container on the loading magazine.

	Avoid damaging the measuring barrier.
	**⚠ Caution** Before manually disposing of the remnants (back through the loading magazine), make sure that the mechanical measuring barrier has responded. If not, move forward with the material pusher until the measuring barrier responds. ➢ Only have work done by authorized personnel. ➢ Keep unauthorized persons away. ➢ Move the pusher forward, trigger the measuring barrier.

	Avoid collisions while the guide channel is closing.
	**⚠ Caution** ore closing the guide channel, ensure that there is no material in the area of the material pusher. ➢ Only have work done by authorized personnel. ➢ Keep unauthorized persons away. ➢ Visual inspection, remove material from the collision area.

Material remaining in the spindle of the CNC machine, which cannot be unloaded in the work area of the CNC machine, must be unloaded manually. For this, the material is to be pushed back through the spindle liner tube in the open guide channel of the loading magazine and removed manually.

8.1.16 Start with production/material supply

Bar is already inserted. Material pusher is at the end of the bar.

1		Clamping device of CNC machine must be closed.
2		Start automatic mode.
3		Start CNC program.

8.1.17 Start with material change

1		Channel empty.
2		Pusher moves back to end position.
		Activate channel and steady rest unit.
3		Open channel.
4		Visual inspection: No bar stock in the guide channel or in the spindle.
5		Press "Automatic". Bar change is executed.

8.1.18 Ending automatic mode

1		End automatic mode. The loading magazine can be operated via the manual functions.

8.2 Switching off

Material pusher unit must be in the lower end position.

Disconnection of the power supply (air and voltage) when the channel is open will result in damage on the short/material pusher.

The magazine is supplied with voltage via the CNC machine and can be switched off via the main switch of the CNC machine.

9 Putting out of operation / disposal

The loading magazine is put out of operation by the user and disposed of according to the valid environmental and waste disposal laws.

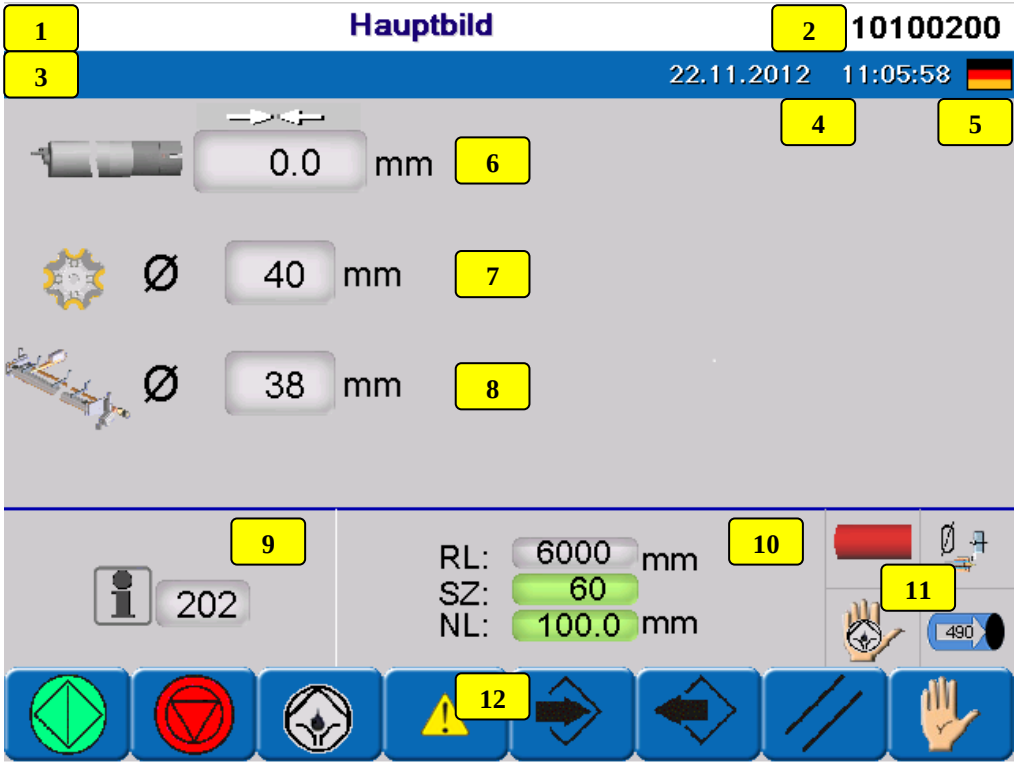
10 Operating and input unit

10.1 Foreword on symbols

Symbols are adapted to the different magazine types and to their components. Deviations between the display and these operating instructions can therefore not be ruled out.

10.2 Main screen

After the PLC control has started up, the main screen first appears on the display.



Screen layout overview

1	Title text of the shown menu screen	
2	Machine number	
3	Status bar - Red: Faults - Green: Message text - Yellow: Help text	
4	Date and time	If the corresponding field is clicked on, the date and time can be set.
5	Set language setting	The language setting can be changed via the parameter menu. Note: Translations are not available for all set languages.
6	Current pusher position	The actuated direction of the pusher can be seen via the arrow symbols.

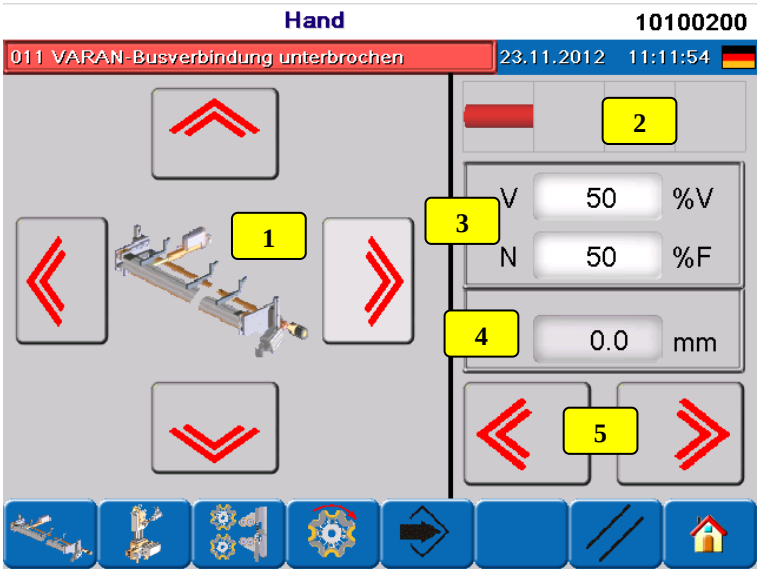
7	Guide channel diameter	Symbols may vary, depending on the machine type.
8	Diameter setting for inlay fork	Not available for all machine types
9	Information about the current/last automatic step.	This information is very helpful for ensuring an exact and quick error analysis in the event of an error. This number is to be provided in service cases. Note: Clicking on the symbol shows an overview of the last 20 steps.
10	Information about RL: Remaining bar length SZ: Piece number TL: Part length If required, safety instructions will be shown.	If the piece number and part length are highlighted in green, these values were automatically determined based on the actual supply length. Shown safety instructions: To check the safety technology (Emergency Stop and protective doors of the CNC machine), it is required that the contacts be interrupted at system start as well as every 24 hours, for Emergency Stop and every 8 hours for the protective door. If this time has elapsed, the corresponding warning is shown. The system can continue to be used with no problems. The safety instructions can be hidden for 5 minutes via "Reset" in automatic mode.
11	**Status symbols**	
	 **Material inserted**	Symbol is shown during the insertion operation and only disappears again once the reversal point has been passed with the short pusher. If this symbol is shown, the lowering of the pusher drum is disabled.
	 **End of bar**	The symbol is shown in automatic mode when the "end of bar" position has been passed, and goes out during the insertion operation. The symbol does not mean the same thing as the "end of bar" message for the lathe.
	 **Oil pump in manual mode**	The oil pump can be activated in manual mode via the softkey in the main menu. The corresponding symbol is shown.
	 **Bar start position**	When positioning the new bar, the symbol is shown with the target position.
11	Row of softkeys	

In the usual case, the "Emergency Stop" message appears at the top of the display. This message must be reset with the "Reset" key  .

Softkeys	Allocation
	Automatic mode On
	Automatic mode Off
	Malfunction memory
	Switches the oil pump on/off
	Call up "Parameters" screen.
	Calls up the diagnostics screen
	Call up "Manual" screen.
	Reset : Reset all faults.
	Back to main screen
	Block input (option)

10.3 Manual

From the main screen, one gets to manual mode by pressing the  key. Here, all functions of the bar loader can be carried out manually.
The inlay fork symbol can vary from this documentation, depending on the machine type. If a component is in its end position, the corresponding key is highlighted in light green. If a movement is locked in manual mode, a corresponding warning is output in yellow in the top text line.



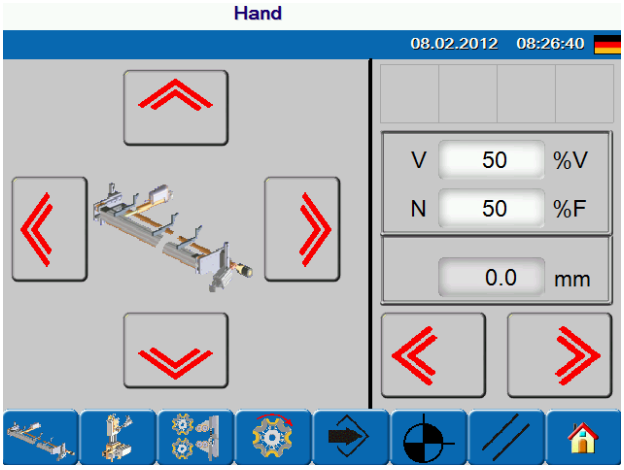
1	Illustration of the component selected via the row of softkeys	
2	Status symbols (as described on the main screen)	
3	Setting of the speed (V) and torque (F) of the feed axis in manual mode	Input 0-100%
4	Current pusher position	
5	Keys for moving the pusher forwards and backwards	
	Softkey: Selection of inlay fork component	(illustration depending on machine type)
	Softkey: Selection of gripper component	
	Softkey: Selection of channel and steady rest component	(steady rest is optional)
	Softkey: Indexing system	(for Profimat machine type)
	Softkey: Reference run	If a reference run is required, this can be started with this key.

10.4 Referencing

The bar loader is referenced after switching on the lathe according to a defined pattern. For this, the pusher position is continually written to a power failure-proof memory before switching off the system, so that the position is known again after switching on. Referencing is still required, despite the known position.

Referencing by pattern:

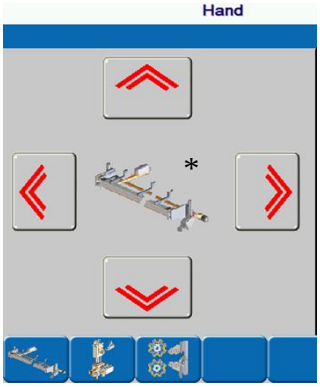
1. Automatic referencing, in the event the pusher is at the rear at the reference limit switch.
2. Request for referencing via message text, in the event the pusher is not at the rear at the reference limit switch and the fixed defined position has not yet been exceeded.
3. If the pusher has gone past the fixed defined position, a temporary reference point is set at first. The actual referencing will start up automatically as soon as the pusher is in the rear end position. This occurs in manual mode, as well as in automatic mode.



Key	Allocation
	Call up "Manual" screen.
	Start reference run.
	Reset: Reset all faults. (if required)

If the fault "Ref. point lost" should appear during operation, this usually means that the toothed belt has skipped. This only happens when the pusher rod hits the end of the bar stock at full speed.
After acknowledging this fault, referencing starts up automatically according to the above-explained pattern.
In the parameter group 7 Functions the reference point can be deleted.
To do this, set the parameter and go back to the screen for manual mode again. The text "219 Please start reference run" appears. Then traverse as indicated on the top of the screen.

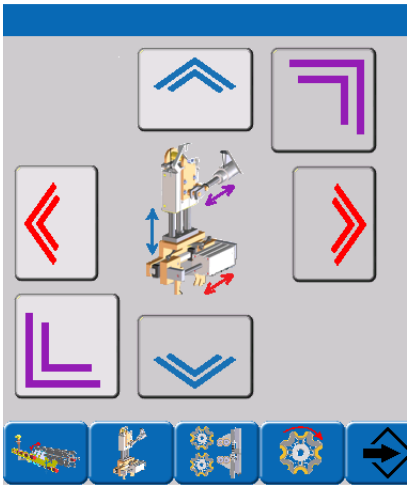
10.5 Inlay fork component



* Symbol of the inlay fork and keys are adapted to the machine type

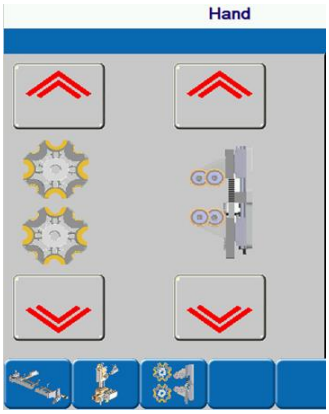
Key	Allocation
	Select inlay fork unit
	Inlay fork up
	Inlay fork down
 *	Move the inlay fork to the middle of the channel
 *	Move the inlay fork into the material take-up
 *	Turn the channel to take-up
 *	Turn the channel back to home position

10.6 Remnant gripper component



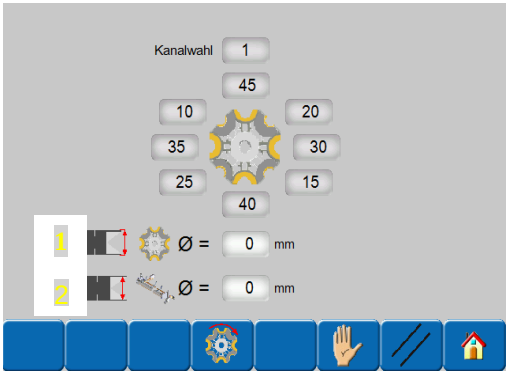
Key	Allocation
	Activate the gripper unit
	Lift gripper
	Lower gripper
	Open the gripper
	Close gripper
	Gripper in the ejection position
	Gripper in pull up/down position (home position)

10.7 Channel and steady rest component



Key	Allocation
	Activate channel and steady rest unit
	Open channel Open steady rest (optional)
	Close channel Close steady rest (optional)

10.8 Indexing system component (PROFImat machine type)

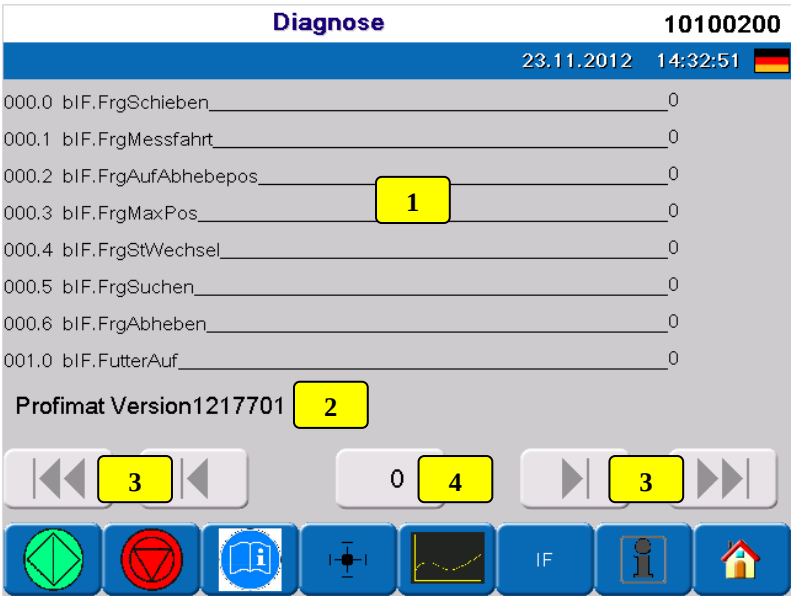


Key	Allocation
	Activate channel diameter The 1st press of the key switches to the input screen for direct activation of a channel diameter. Every further press of the key without a direct activation starts an indexing cycle to the next channel.
	The direct activation of a channel diameter goes via two input fields marked with 1 and 2. For R machines (remnant disposal via the loading magazine), the following applies to external clamping sleeves: 1 = outer diameter, clamping sleeve 2 = bar diameter (inner diameter, clamping sleeve) For R machines (remnant disposal via the loading magazine), the following applies to internal clamping sleeves: 1 = bar diameter 2 = bar diameter For systems with remnant disposal via the lathe, this input applies: 1 = bar diameter 2 = bar diameter Input 1 affects the channel diameter and input 2 affects the inlay fork separator. Input in field 1 will automatically be transferred to field 2.
	Activate channel diameter

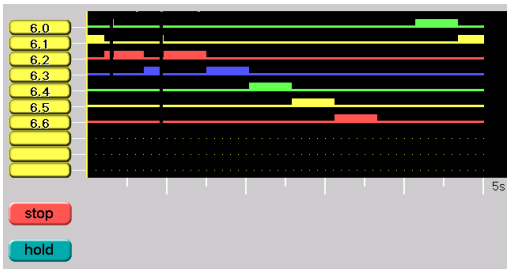
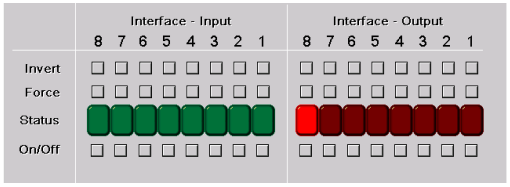
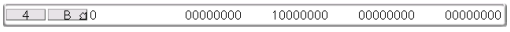
	The 1st press of the key switches to the input screen for direct activation of a channel diameter. Every further press of the key without a direct activation starts an indexing cycle to the next channel.

10.9 Diagnostics

Information and PLC status can be called up using the diagnostics in the case of service.



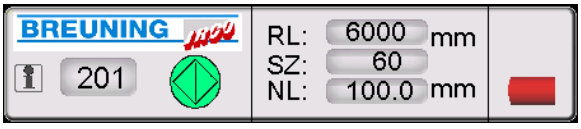
1	Designation and status of the called-up variables	
2	Software version	
3	Navigation of the variable address	
4	Direct input of the diagnostics address	
	Softkey: Starting automatic mode	
	Softkey: Ending automatic mode	
	Softkey: Calls up the documentation parameter and error description.	
	Softkey: "Touch" calibration	See section 10.11 "Touch" calibration
	Softkey: Oscilloscope	Allows variables to be graphically recorded. The desired address can be found on the basic diagnostics screen.

		
IF	Softkey: Diagnostics/force interface 	This softkey is only shown when there is a password saved (-52860). **Invert**: Inverts the input or output. This setting is retained when the system is restarted. Unintentional changes can lead to communication malfunctions with the CNC machine! **Force**: Allows forced switching of the corresponding input/output. **Status**: Shows the status of the inputs/outputs. If forcing is activated, the respective input/output can be switched by pressing the key. **On/Off**: Switches the input/output permanently in forced operation.
	Show diagnostics in the title line 	Allows the diagnostics of inputs/outputs even outside the diagnostics screen. For example, the status of an input can be read off during manual mode. The desired address can be found on the basic diagnostics screen. In the binary representation, the least significant bit/byte is at the right here.
	Back to main screen	

10.10Screen saver

After 100 seconds, the screen saver is activated.
Important information can still be read off when the screen saver is on.

- Step-chain number
- Symbols for manual and automatic mode
- RL - Rest of bar length
- SZ - Piece number
- NL – Supply length
- Symbol for end of bar
- Symbol for material inserted



After an hour without any actuation, the screen switches off completely.

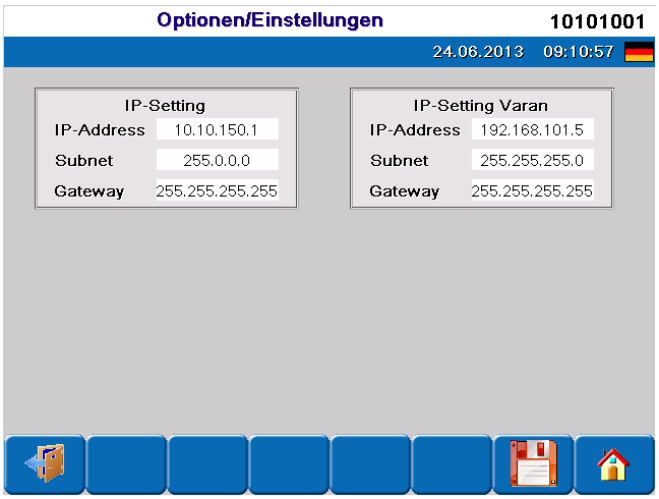
10.11"Touch" calibration

For operating unit function, the touchscreen input must be correctly calibrated. On the diagnostics screen, the calibration procedure can be called up via a softkey. Here, crosses are displayed at various places on the screen, which must be clicked on as precisely as possible. Afterwards, the points are verified. Once the procedure has been successfully completed, the data is saved to the SD card and calibration ended.

For the case that the device cannot be operated via the touchscreen, calibration can be started directly in the switch-on phase. To do this, please click on the screen several times after switching on until the start screen appears.

10.12Options / Settings

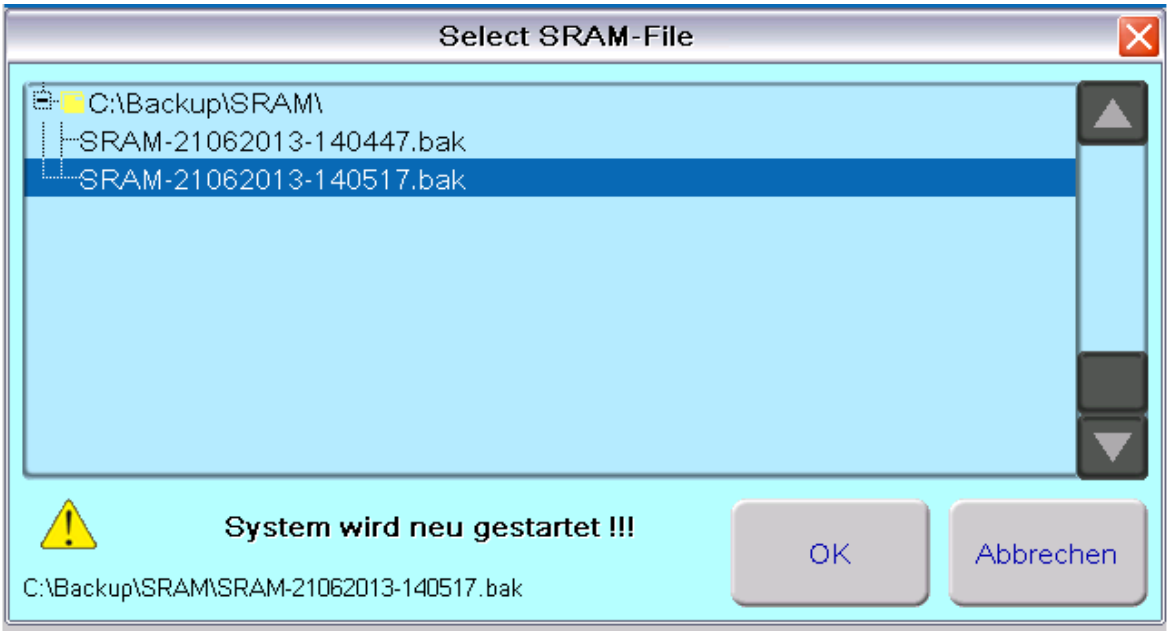
From the parameter screen, the following screen can be switched to via the softkey  .



Key	Allocation
	Exit to the File Explorer.
	Save and restore parameter settings
	Back to main screen

The control has 2 Ethernet interfaces. One is on the touchscreen operating unit, the other in the electric cabinet on the Varan bus module CIV512. Both IP addresses are freely selectable, but may not be in the same subnet.

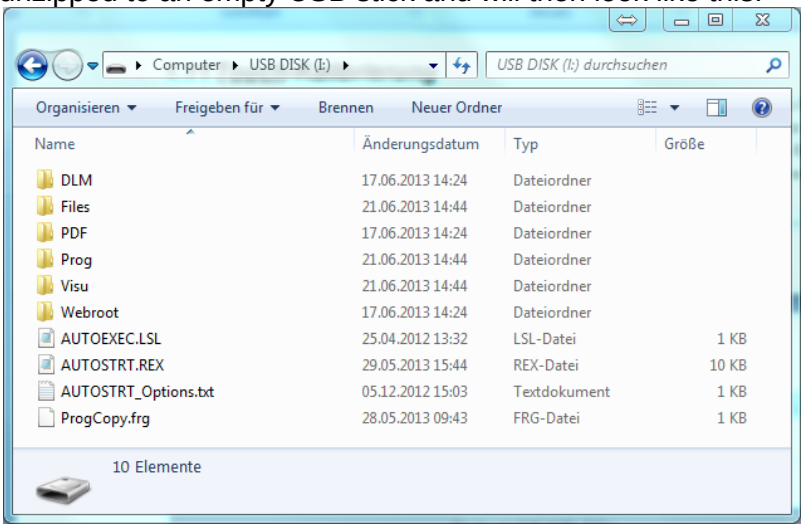
All non-volatile memory areas (SRAM) can be saved and restored with the  key. All parameter settings are saved either to the SD card of the control or to a plugged-in USB stick.
The backup file has the file extension .bak and is saved with the date and time information in the file name. The storage path is predefined. When exchanging the control, all parameter settings can be restored quickly and securely using this method.



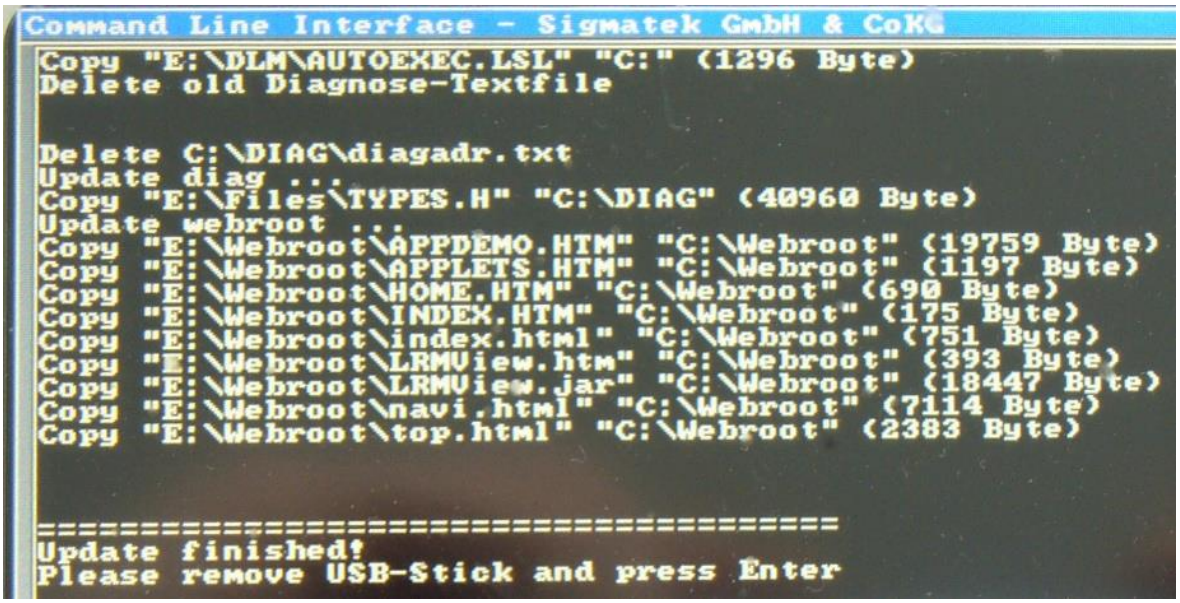
To restore by clicking on the "select file" key, the desired backup file must be selected in the directory structure. After confirming with "OK", the system restarts with the backed-up parameter settings.

10.13 Software update

The software for the bar loader is constantly being further developed and supported. If an update should be required for your bar loader, this can be done with little effort. Our Service department will send you the update file in the archived version via e-mail or download link. The archive file must be unzipped to an empty USB stick and will then look like this:



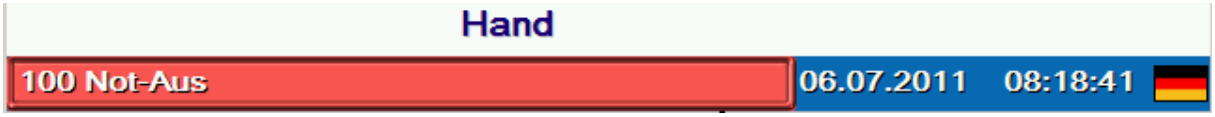
The USB stick is now connected to the USB port of the control. When the system is restarted, the update is executed automatically. Just to make sure, the current software is backed up to the USB stick first to retain the old software version.
After the update is successful, the USB stick is removed and the "Enter" key pressed. Alternatively, the system can be switched off and back on again.



11 Faults

Faults are fundamentally displayed on every screen on the operating and input unit. An overview of all faults can be seen on the alarm screen.

11.1 Display of fault on screen



After the cause of the malfunction has been remedied, confirm this with the "Reset" key  to allow operation to continue.

To reset the control, the entire system is to be switched off. To do this, the voltage supply of the CNC machine is to be switched off.

If the error message is still present when the system is switched back on again, leave the system on and contact the service consultants at Kurt Breuning IRCO Maschinenbau GmbH.

11.2 Error handling

		CAUSE	
Fault number	001	2	Feedback error, IRCO 1
Displayed text	001 Safety PLC, error X	3	Feedback error, NC mach enbl
Description	The safety PLC signals an internal error	4	Discrepancy error, Emergency Stop 1 (IRCO)
		5	Discrepancy error, protective door
		6	Discrepancy error, Emergency Stop 2 (NC mach)
		7	Feedback error, spindle enbl
		8	Feedback error, IRCO 2
		9	Feedback error, Emergency Stop
		10	Free
		11	System error, Omron

Fault number	002	
Displayed text	002 Manifold, error XXX	
Description	The manifold signals an error.	

X	CAN node ID of the manifold 2: First manifold 4: Second manifold
X10	Communication failed for longer than 5 s
X11	More than 10 unanswered PDOs
X12	No connection can be established after restart
X13	CAN emergency message was received (details can be called up in diagnostics)

•

		CAUSE
Fault number	004	– Start of bar check (mech. barrier) does not detect the material because it is bent or mechanically damaged. Limit switch, cable or input faulty or defective. – Incorrect value in the "Bar start pos." parameter When positioning the new bar during the bar change, the pusher does not come to the calculated position with the material. E.g. the material does not find its way through the clamping device, material is pushed against an incorrectly positioned limit stop. – Material, short pusher or long pusher runs sluggishly or is blocked. – Torque settings faulty – Drive belt is damaged – The clamping sleeve of the material pusher cannot be pulled on or off
Displayed text	004 Axis error	
Description	Drive does not reach the specified position.	
Fault number	099	The given internal error (xxxx) is an internal error of the servo controller. For a detailed error description, please consult the Service department. **Have the following data ready:** • Machine number • Error number (xxxx) • Step chain number (is shown on the display)
Displayed text	Axis error xxxx	
Description	Drive controller of the pusher has an internal error	
Fault number	100	– Emergency Stop button pressed on the loading magazine – No feedback from the safety PLC
Displayed text	Emergency Stop	
Description	Loading magazine EMERGENCY STOP is pending.	

		CAUSE
Fault number	101	– An EMERGENCY STOP is pending on the lathe, or is not signalled to the loader. – No feedback from the safety PLC
Displayed text	NC machine Emergency Stop	
Description	An EMERGENCY STOP is pending on the NC machine.	
Fault number	102	– Loading magazine not at limit stop. – No feedback from the safety PLC – Swivel arm limit switch defective
Displayed text	Loading magazine swung out	
Description	Loading magazine swung out	
Fault number	103	– Hoods of the loading magazine opened. – No feedback from the safety PLC – Hood switches on the hood no longer switch. – Actuating element defective or no longer present.
Displayed text	Hoods open	
Description	Hoods of the loading magazine opened.	
Fault number	104	– Check the compressed air supply for whether a pressure of 6 bars is indicated on the pressure gauge. – Check the pressure switch on the maintenance unit.
Displayed text	Compressed air dropped below 4 bar	
Description	Compressed air dropped below 4 bar	
Fault number	105	– No oil (check oil level) – Pump draws in air – Oil filter contaminated, clean oil filter – Check flow switch and readjust, if necessary
Displayed text	Oil flow, clean filter	
Description	Oil pressure sensor has pressure drop (min. 2 s)	
Fault number	106	– Check flow switch and readjust, if necessary
Displayed text	Oil flow, check pressure switch	
Description	Oil pressure sensor does not signal after the switch-on and -off time of the oil pump (10 s)	

		CAUSE
Fault number	107	– Oil pump is mechanically very sluggish – Oil pump motor is defective or dirty – Medium for pumps is viscous – Indexing drive mechanically blocked – Indexing drive motor defective
Displayed text	Motor protection triggered	
Description	Motor protection switch for the built-in motors was triggered	
Fault number	108	– Check feed of the servo amplifier – Intermediate circuit voltage too low – Check "off" switch to see if it is switched on. – Internal error of the servo amplifier
Displayed text	Servo amplifier not ready	
Description	Servo amplifier does not have controller enable	
Fault number	109	– Check whether material is lying between the segments – Check pusher unlocking mechanism for proper mechanical function – For Profimat: Check inlet in locking disc – Check the limit switch – Check the fork head on the cylinder to see if this is still in the correct position (is countered) – Check valve – Check cylinder – Check hoses
Displayed text	Material pusher end position	
Description	Material pusher holder did not move to end position	
Fault number	110	– Check whether material is lying between the segments – Check the limit switch – Check the fork head on the cylinder to see if this is still in the correct position (is countered) – Check valve – Check cylinder – Check hoses
Displayed text	End position segment 1…10	
Description	Segment 1…10 did not move to the end position	
Fault number	117	– Check the limit switch – Check the fork head on the cylinder to see if this is still in the correct position (is countered) – Check valve – Check cylinder – Check hoses
Displayed text	End position, inlay fork up/down	
Description	Inlay fork is not in the upper or lower end position.	
Fault number	118	– Check the analogue measurement system – Check the Linak drive – Check the actuating electronics
Displayed text	Inlay fork end position forward/back	
Description	Inlay fork did not move to end position	
Fault number	119	– Part length (end of bar is not set correctly) – Max. pusher position has been maladjusted
Displayed text	Max. pusher position	
Description	Maximum pusher position exceeded	
Fault number	120	– Material is pushed through the gripper tongs – Pull-up force too low – Pull-up window too small – Material is not correctly chamfered – Clamping sleeve too small
Displayed text	Outside of pull-up window	
Description	Material pusher is not in the pull-up window when it pulls up on the material	

		CAUSE
Fault number	121	– Material is sluggish when pushed again – Torque too low – If there are multiple pushes per workpiece, the supply monitor must be deactivated.
Displayed text	Outside of supply window	
Description	Supply length at lathe limit stop is outside of the supply window when the material is re-pushed.	

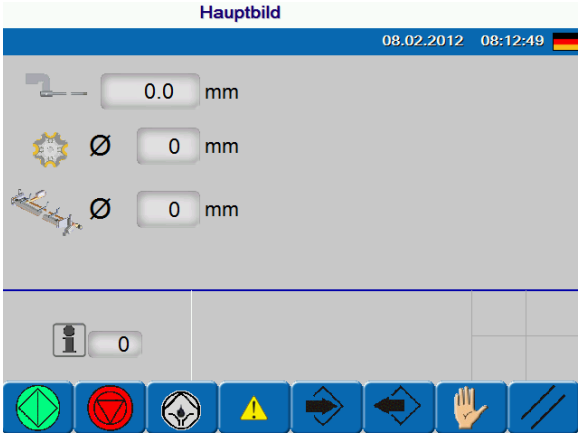
Fault number	122	– Material lies in the front area of the channel – Channel monitor defective or dirty – Limit switch does not work
Displayed text	Measuring barrier signals incorrectly	
Description	Measuring barrier (channel monitor) always signals or not at all	
Fault number	123	– Belt jumped – Rear pusher limit switch defective
Displayed text	Reference point lost	
Description	Pusher position and reference limit switch do not agree	
Fault number	124	– Limit switch maladjusted or defective – Reference torque too low – Pusher is jammed
Displayed text	Servo motor jammed or limit switch defective	
Description	During the reference run, "Pusher at rear" limit switch was not approached.	
Fault number	125	– Reverse speed too high – Material stuck in clamping device of the lathe – Clamping sleeve worn out – "Gripper closed" limit switch signals although there is material in gripper. Check limit switch to make sure it's in correct position.
Displayed text	Remnant lost	
Description	Remnant was lost when the material pusher moved back	
Fault number	126	– Check the limit switch – Check the fork head on the cylinder to see if this is still in the correct position (is countered) – Check valve – Check cylinder – Check hoses
Displayed text	End position, gripper jaws	
Description	Gripper did not move into the end position	
Fault number	127	– Check the limit switch – Check the fork head on the cylinder to see if this is still in the correct position (is countered) – Check valve – Check cylinder – Check hoses
Displayed text	End position, gripper swivelling mechanism	
Description	Swivel gripper unit in/out, did not move to end position	
Fault number	128	– Limit switch maladjusted or defective – Reference torque too low – Pusher is jammed
Displayed text	End position, gripping unit	
Description	Gripper unit did not move into the end position	

		CAUSE
Fault number	130	– Switch loading magazine to automatic mode
Displayed text	Automatic mode is not activated	
Description	Loading magazine was not in automatic mode during a supply request	
Fault number	131	– Refill storage area – Check time specification for "Magazine empty switch-off time"
Displayed text	Switch off, magazine empty	
Description	Storage area is empty for longer than specified in the time specification	
Fault number	132	– Check material length – Pull up short bars manually and position in the work area of the lathe. – Faulty setting of the "Gripper closed" limit switch
Displayed text	No material detected during measurement	
Description	(For R magazine only) Material length is below minimum dimension during bar change	
Fault number	133	– Faulty block input – Check length dimension and piece number
Displayed text	Faulty block input	
Description	Incorrect or missing block input during block editing (PR or PPR)	
Fault number	134	– Remnant stuck in gripper jaw – Faulty setting of the "Gripper closed" limit switch
Displayed text	Remnant not ejected	
Description	Part did not fall out of gripper jaws	
Fault number	135	– Shutdown relay defective
Displayed text	Voltage supply error for Linak	
Description	Voltage supply error for Linak drive	
Fault number	136	– Material could not be pushed through the clamping device. – Material is blocked. – Bar start position is incorrect, lathe limit stop is incorrectly positioned – Bar change command from CNC machine is still pending or was not properly acknowledged.
Displayed text	Bar start program timeout	
Description	Bar change was not ended	

		CAUSE
Fault number	137	– Remaining length is really too long – Check parameter "Clamping/unclamping length" – Check parameter "Chute width"
Displayed text	Remnant too long	
Description	The end piece to be unloaded is too long for the gripper ejector	
Fault number	138	– A loading command came from the NC machine although the loading magazine did not yet signal "end of bar".
Displayed text	Bar change request from CNC not possible	
Description	Loading command from NC machine cannot be carried out	
Fault number	139	– Check the limit switch – Check the fork head on the cylinder to see if this is still in the correct position (is countered) – Check valve – Check cylinder – Check hoses
Displayed text	End position, steady rest	
Description	Steady rest did not move into the end position	
Fault number	141	– Motor defective – Position limit switch defective – Sluggish mechanics
Displayed text	Indexing system timeout	
Description	The switch-on duration of the indexing motor is too long.	
Fault number	142	– Close the loading magazine channel
Displayed text	"Automatic On" from CNC not possible	
Description	NC machine cannot switch loading magazine into automatic mode	
Fault number	143	– Bus cable interrupted or not plugged in – Incorrect bus address – Check voltage supply of the bus device
Displayed text	Fieldbus timeout (Profibus, Ethernet IP, ….)	
Description	The bus connection (Profibus, CAN Bus, …) is interrupted	
Fault number	144	– Indexing system not in the correct position – Limit switch defective or not queried at "Unlocked" position – Error in the pneumatic actuation
Displayed text	Indexing system locking cylinder not in end position	
Description	Indexing system locking mechanism does not work properly	

12 Parameters

Before parametrizing, the loading magazine must:



- be ready for operation.
- show the main screen.
- not be in automatic mode.

12.1 Parameter input / changing

The way the loading magazine works is determined by parameters, which can be adapted according to production.

The parameters are pre-set in standard function when the equipment is delivered. Adaptations to the CNC machine have to be done for the commissioning. Furthermore, a few parameters must be set specific to the product.

The following key combination is to be actuated first for changing parameters using the operating and input unit.

	Avoid mechanical damage due to incorrect parameter input.
	**WARNING!** The parameters are for the basic settings of the loading magazine. Incorrect inputs can destroy the device. ➢ Only have work done by authorized personnel. ➢ Keep unauthorized personnel away.

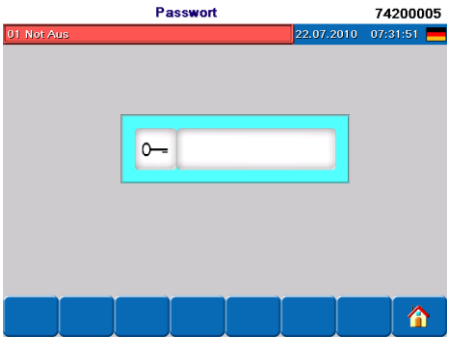
1		The main screen must be activated and automatic mode deactivated.
2		Call up the "Parameters" screen.
3		Select the parameter group.
4		Enter new parameter value.
5		Back to main screen
6		Except for the 1st parameter group "Part-specific", all other groups can only be reached via the password 52860. This protection prevents a parameter from being changed by mistake.

12.2 Parameters screen

The screen changes from the main screen to the "Parameters" screen by pressing the key.

In general, all inputs have defined limits.

All parameters except for "Part-specific" can only be reached via the ***password 52860***. The password input remains saved for 15 minutes.
The yellow numbers before the parameter groups and parameter numbers are for easier navigation in case of service.



Key		Allocation
1	Part-specific	Parameters which might have to be adjusted when setting up a new product.
2	Speeds/forces	Parameters for different insertion speeds and forces.
3	Positions/lengths	Design-specific parameters
4	Channels/segments	Parameters for channel diameter and segment positions
5	Inlay fork/steady rest	Parameters for the settings and positions of the inlay fork and steady rest
6	Gripping unit/stopper	Parameters for the settings and positions of the gripping unit and stopper
7	Functions	Parameters for sequential functions
8	IF, CNC machines	Parameters for activating the interfaces
9	Oil pump	Parameters for the oil pump
		Back to main screen
		Numeric input
		Password input/52860
		Block input for stopless operation (option at extra charge)

12.3 Parameter description

The input mask of the parameters is divided into different categories.

12.3.1 1 Part-specific parameters

The part-specific parameters might have to be adjusted for a new product. The parameter access is not subject to an access code.

Parameters	Description
1 Supply length	Input 0 – 9999.9 mm. With the input of the part length + cut-off width, the end of bar is calculated depending on the max. pusher position. (Max. pusher pos. - actual position) < supply length
2 Bar start position	Input 0 - 9999,9 mm After a bar change, the beginning of the bar material is pushed to the entered position (positioning mode > 0). The insertion length results here from the differential measurement of the light barrier or mechanical "start of bar" barrier to the desired position of the new bar. This parameter must also be correctly set when the bar is pushed against a limit stop when changed. The bar start position is for checking whether the new bar has really arrived at the limit stop.
3 Autom. feed speed	Input 0 to 100% V Feed speed of the pusher when pushing material forward in automatic mode.
4 Autom. feed force	Input 0 to 100% F Feed force of the pusher when pushing material forward in automatic mode.
5 Feed force, synchronous mode	Input 0 to 100% F Force setting, for the case that synchronous mode (electronic gears between spindle and pusher) is switched to supply mode.
6 Number of supply movements at the end of bar	Input 0 to 99 As soon as the end of the bar is detected and the chuck is closed, the pusher stops at every further feed command. The specified number activates a counter and allows supply movements (counting pulse) until the counter status and number are the same.

12.3.2 2 Speeds/forces parameters

Basic settings for the speeds and forces of the pusher are stored in this group of parameters.

Parameters	Description
1 Reference speed	Input 0- 100% V Speed at which the pusher moves toward the reference point
2 Reference torque	Input 0- 100% F The pusher moves with this force to the rear end position during the reference run. A change only takes effect when the system is restarted.
3 Measurement speed	Input 0- 100% V The new bar is pushed at this speed to the measuring barrier during the bar change to determine the bar length.
4 Reverse speed	Input 0- 100% V Speed at which the pusher moves in reverse.
5 Bar-changing speed	Input 0- 100% V Speed at which the pusher continues to move after the measuring barrier falls over.
6 Force reduction, remaining length	Input 0- 100% The feed force decreases continuously the shorter the bar becomes. E.g.: Autom. feed force = 84%F (62) Force reduction, remaining length = 20% The "Autom. feed force" is reduced from 84%F (62) by up to 16.8%F (12.4) to 67.2%F (49.6).
7 Holding force	Input 0- 100% F After the pusher comes to a standstill, 1 second later, it switches from feed force to holding force.

12.3.3 3 Positions/lengths parameters

Basic settings for the positions and lengths are stored in this group of parameters.

Parameters	Description
1 Testing position	Input 0 - 9999 mm After the insertion operation, the short pusher moves the new bar forward for measuring. If there is no bar in the channel, the short pusher aborts the measurement run when it reaches the input value. The loading magazine prepares a new insertion and outputs the message "**Magazine empty".**
2 Max. position	Input 0 - 9999 mm If the material pusher exceeds this set position, a fault occurs. The position must be chosen so that the material pusher does not project into the collet chuck (clamping surface) or chuck jaws. This parameter is used for calculating the remnant length. ***Attention: This parameter must be adjusted as soon as the clamping device of the lathe changes.***
3 Retraction stroke	Input 0 - 9999 mm The material pusher retracts away from the inserted material by the input value.
4 Feed window	Input 0.00 - 9.99 mm Function can only be used by the lathe limit stop. For the second push after the bar change or during a change from manual mode to automatic mode, the supply length of the lathe between chuck "open" and chuck "closed" is measured and stored. For every further push, the supply length has to be within the entered window. Input 0 deactivates monitoring
5 Pull-up window	Input 0.00 - 9.99 mm For an input greater than 0, the next time material is pulled up onto the clamping sleeve, the pull-up position will be saved. Pull-up positions which are measured outside of the input value result in a fault. Input 0 deactivates monitoring
6 Waiting position	Input 0- 9999 mm Input 0: Function deactivated For loading sawed sections. After the insertion operation, the short pusher positions itself at the waiting position at high speed. This allows the measurement run to be shortened timewise.

12.3.4 4 Channels/segments parameters

Basic settings for the channel and segments are stored in this group of parameters.

Parameters	Description
1 Channel selection	Input 1 – 8 Only for Profimat machine type. Defines which is the currently set channel. Synchronizes the display.
2 Channel allocation	Input 1 – 150 mm Only for Profimat machine type. Input of the material pusher diameter in the order of the guide channel layout. Synchronization is done via the "1 Channel selection" parameter. When changing guide channels, the value of the parameter of the respective channel diameter must be modified.
3 Pusher rod length	Input 0 - 9999 mm Refer to the machine chart for the length of the material pusher.
4 Segments 1 - 10	Input 0 - 9999 mm Using measuring equipment, measure from the front edge of the short pusher (must be at zero point) to the left edge of the segment and enter this value in mm. Or: Move the pusher to the right place in manual mode, read off the actual position and enter it in the parameter. The counting direction of the segments begins starting from the material pusher holder. For a missing segment, the value "0" must be entered, since otherwise the function and monitoring would be active, which would lead to an error message.
5 Min./Max. torque	Input 0 – 100% (approx. 10 – 17 Nm) Settings for the smallest and largest guide channel. When the guide channel is changed, the torque for the respective channel is adjusted automatically. The torque for guide channels in between is calculated proportionally.

12.3.5 5 Inlay fork/steady rest

Basic settings for the inlay fork and steady rest are stored in this group of parameters.
Parameters 2 to 4 are hidden, depending on the inlay fork drive version.

Parameters	Description
1 Inlay fork waiting time	Input 0 – 5000 ms This parameter influences the settling time (oscillation attenuation) of the bar during the insertion operation.
1 Inlay fork 0-position	Input 0 - 500,0 mm This parameter must be set such that no material is taken up when the inlay fork is lifted.
1 Inlay fork 0-position	Input 0 - 500,0 mm This parameter must be set such that **no** material is taken up when the inlay fork is lifted.
2 Inlay fork position, channel centre	Input 0 - 500,0 mm Inlay fork position for inserting the bar in the guide channel. This position must be set such that the inlay fork arms place the material centred in the guide channel.
3 Inlay fork, max. take-up position	Input 0 - 500,0 mm The drive stroke for the inlay fork is limited via the max. take-up position. This is necessary to avoid collisions with the machine body.
4 Inlay fork calculation factor for measurement system	Input 0 to 999.99 Conversion factor of increments in millimetres to calculate the automatic setting of the material separator (inlay fork).

5 Steady rest mode		Input 0 - 9
	Input 0:	No steady rest installed.
	Input 1:	Installed steady rest always closed.
	Input 2:	Installed steady rest always open.
	Input 3:	Alignment of profile material, steady rest closes as soon as the beginning of a new bar moves through the steady rest. This function only runs during an automatic bar change. Alignment jaws specially adapted to the material must be used for this operating mode!
	Input 4:	The jaw steady rest is closed until the pusher has reached the open position 6.
	Input 5:	The roller steady rest is closed until the pusher has reached the open position 6.
	Input 6:	The jaw steady rest remains closed and is only opened starting from the open position 6 until the 7 closed position is reached.
	Input 7:	The roller steady rest remains closed and is only opened starting from the open position 6 until the 7 closed position is reached.
	Input 8:	Input 3 + 4 combined.
	Input 9:	Input 3 + 6 combined.
		Attention: Roller steady rests must always be opened when the material is being pushed forward. Therefore, installed roller steady rests may only be operated in modes 2,5 and 7! Roller steady rests may only be used starting from a diameter of 18 mm.
6 Steady rest open position		Input 0 - 9999 mm Steady rest opens as soon as the long pusher moves past the input position. Using measuring equipment, measure from the front edge of the material pusher (must be at zero point) to the beginning of the steady rest, and then enter this value minus 5 mm. Or: Move the pusher to the right place in manual mode, read off the actual position and enter it in the parameter.
7 Steady rest closed position		Input 0 - 9999 mm Steady rest closes as soon as the long pusher moves past the input position. Move the pusher to the right place in manual mode (pusher head must be completely through and outside of the steady rest), read off the actual position and enter it in the parameter. The minimum difference between the open position and closed position is 120 mm and is ensured by the software.
8 Steady rest delay path		Input 0 - 999 mm For steady rest modes 3, 8 and 9, for the case that the start of bar switch (mech. barrier) is triggered before the material is in the steady rest, a delay path from the switch to exiting the steady rest must be input.

12.3.6 6 Gripping unit/stopper

Basic settings for the gripping unit and stopper are stored in this group of parameters.

Parameters	Description
1 Gripping unit available	☐ Without gripping unit ☒ With gripping unit "Without gripping unit" switches all monitoring functions off.
2 Dispose of material via CNC	☐ Off ☒ On On = Remnant is not disposed of via the loader
3 Do not pull up material	☐ Off ☒ On On = The gripping unit functions are deactivated, but monitoring is active.
4 Pull-off position	Input 0 - 9999 mm In this position, the pusher stops its reverse motion and allows the remnant to be disposed of. ***Attention: This setting must be carried out with the largest clamping sleeve, since the depth between the small and large clamping sleeve varies.*** ***The position must be set such that the remnant is located near the chute.***
5 Pull-up speed	Input 0- 100% V The material must be burr-free or lightly chamfered. The pretension of the clamping sleeve should be between 0.2 and 0.4 mm. To ensure that the clamping sleeves can be pulled up onto the bar material with no problems, the pull-up speed and force might have to be adjusted. In the normal case, the factory settings are chosen such that this works for nearly all bar diameters used in this bar loading magazine. Make sure that the bar is not pushed through the closed gripper when it is being pulled up. If the pull-up force is too high, there is a risk that the drive belt might jump. In this case, the reference point must be reapproached.
6 Pull-up force	Input 0 – 100% F See 5 Pull-up speed

7 Insertion position compensation	Input 0 - 99.9 mm For the automatic bar change, the new bar is measured two different ways, depending on the bar length. Measuring point = Light barrier or mechanical "start of bar" barrier. 1. A short bar is first pulled up and then measured. 2. A long bar is measured with the short pusher. Afterwards, the long pusher is fetched and the bar pulled up, if necessary. As a result, there will be 2 different measured results. This difference can be compensated with this parameter.
8 Chute width	Input 0 - 999 mm The gripper ejects the remnant onto a chute for disposal. Enter the chute width – 40 mm here.
9 Clamping/unclamping length	Input 0 -999 mm If the IRCO magazine receives a loading command, the control unit calculates whether the remaining end piece can be unloaded at all. The following are used for calculation: • Clamping and unclamping length • Ejection chute width (depends on magazine) – 40 mm • Current remnant length (RL) at loading command If the remnant length + clamping/unclamping length exceeds the width of the chute, there will be a fault.
10 Stopper for pusher support	☐ Off ☒ On On = Stopper is used for pusher support. Not applicable for all machine types. If the loading magazine is equipped with a steady rest, the steady rest can be used for supporting the pusher and should be deactivated here.
11 Stopper clamping position	Input 0 - 9999 mm Using measuring equipment, measure from the front edge of the material pusher (must be at zero point) to the beginning of the stopper and then enter this value plus the rotatable pusher head length. Or: Move the pusher to the right place in manual mode, read off the actual position and enter it in the parameter. Attention: Only the fixed part of the material pusher may be held.

12.3.7 7 Functions

This parameter group is to be set for different function sequences of the loading magazine.

	Avoid malfunctions.
	NOTE The prerequisite for the various functions to run problem-free is an appropriate interface to the CNC machine. The multitude of non-standard functions and the very different interfaces must be tested with a function test after commissioning. If a function test has a negative result, the CNC machine does not have the right interface or the entered function combinations could not yet be tested. Kurt Breuning IRCO Maschinenbau GmbH is happy to help eliminate malfunctions, but makes no guarantees regarding functions which go beyond the standard ones.

Parameters	Description
2 Automatic bar change	☐ Off ☒ On On = After detecting the end of the bar and closing the clamping device, a new bar is automatically prepared for the bar change.
3 Automatic end of bar	☐ Off ☒ On On = The end of the bar is determined automatically. Here, it is to be noted that after changing from manual to automatic mode, the exact supply length is only known after the second supply. If a part is pushed several times before cutting off, the parameter must be set to 0.
4 End piece at max. position	☐ Off ☒ On On = The remnant is pushed forward to the maximum position for "end of bar". This option is necessary: 1) to prevent bars of small diameters from being pushed on top of each other in the spindle liner tube during the bar change. 2) if the NC machine uses a gripping device and requires a defined position for it. **(not possible for all NC machines)**
5 Chuck turning signal	☐ Off ☒ On On = With this parameter, the interface input of the clamping device signal of the lathe is queried inverted.
6 Oscillation	☐ Off ☒ On On = Oscillation of the pusher rod during the bar change when the profile material is being pushed into the clamping device.

7 Allow pushing at end of bar	☐ Off ☒ On On = After detecting the end of bar, additional supply commands are allowed. Required when pushing is repeated several times for each workpiece. Off = Additional supply commands after detecting the end of bar are disabled.
8 Calculate end of bar	☐ Off ☒ On On = The pusher rod does not follow the workpiece. For every supply command, the remnant length is reduced by the supply length (by calculation).
9 Find bar without bar change	☐ Off ☒ On In preparation
10 Find bar with bar change	☐ Off ☒ On In preparation
11 Initiate measurement run automatically	☐ Off ☒ On After the read-in operation, the measuring run is initiated automatically. Here, the new bar is pushed to the mechanical barrier. If the reversal point is exceeded here, the short pusher moves back and the material pusher is lowered.
12 After the first insertion, continue without stopping	☐ Off ☒ On After the positioning of the new bar is completed, it is pushed further to the lathe limit stop directly in the bar change. As a result, under certain circumstances, the time for closing the clamping device and opening it again can be saved. The acknowledgement for "Bar change completed" is only output once the bar is at the limit stop.
15 Reference point set	☐ Not set ☒ Set If the reference point is no longer correct, e.g. due to the belt jumping or being exchanged, the reference point can be reset here. *Never set!*
16 Function test (trade fair)	☐ Off ☒ On On = Function test is active.

12.3.8 8 IF CNC machines

This parameter group is to be adapted to the CNC machine.

Parameters	Description
1 CNC machine interface	Input 0-9, 0-9, 0-9, 0-99: NC-machine-specific
2 Fieldbus address	Input 0-99 0-127 If there is advanced data exchange via a bus system, the slave address can be specified here (bus node).
3 Waiting time after "Chuck closed"	Input 0.0-9.9 s Lifting up the pusher to the rear is delayed by this set time.
4 Switch-off time, "Magazine empty"	Input 1-99 min. After detecting "Magazine empty" and after the preset time has elapsed, a fault will occur.
5 Fragmentation position	Input 0-9999 mm If the interface of the CNC machine has an additional query signal for fragmentation, the output relay is switched starting from the set position.

12.3.9 9 Oil pump

This parameter group is for actuating the oil pump.

Parameters		Description
1 Oil pump mode	Input 0:	Standard operating mode, pump is switched off during the entire bar change. In the event of a malfunction, the pump continues to run for 15 minutes.
	Input 1:	If the material pusher goes past the set position, the pump switches off. In addition, the pump is switched off during the entire bar change.
	Input 2:	The oil pump is switched off long-term. Caution: Fire hazard! The bar material must not be subject to any turning movement.
	Input 3:	The oil pump switches off during the bar change as long as the material pusher is in its upper end position.
	Input 4:	The oil pump remains switched on during the bar change.
2 Oil pump "Off" position		Input 0-9999 mm Shutdown position for mode 1

12.3.10 Set input

The block input is for loading magazines with P – PR function.
This option for stopless supply operation costs extra. It is possible to enable it at a later time.

After a bar change, the supply program generally starts with the 1st block. Once this block has completely finished running according to the piece number, the supply program jumps to the next block. This repeats itself until a block with the piece number 0 is found or all 5 blocks have been run through. The supply program begins again with the 1st block.

The supply program can be started specifically via block preselection and starting from the counter status.

Parameters	Description
1 Stopless pushing	☐ Off ☒ On On = Bar is pushed without stop. Input the supply lengths in "Block input"
2 Correction of first part	Input –9.99 to +9.99 mm Required only for PR mode when length tolerances are to be determined for the first part after the bar change. For correcting the first stopless pushing after the bar change.

13 Parameter settings of the loading magazine

No.	Display text	Input/unit		Factory settings	Customer settings
	Displayed text part-related				
1.1	Supply length	xxx.x	mm		
1.2	Bar start position	xxxx.x	mm		
1.3	Autom. feed speed	xxx	%V		
1.4	Autom. feed force	xxx	%F		
1.5	Feed force, synchronous mode	xxx	%F		
1.6	Number of supply movements at the end of bar	x			
	Speeds/forces display text				
2.1	Reference speed	xxx	%V		
2.2	Reference torque	xxx	%F		
2.3	Measurement speed	xxx	%V		
2.4	Reverse speed	xxx	%V		
2.5	Bar-changing speed	xxx	%V		
2.6	Force reduction, remaining length	xxx	%F		
2.7	Holding force	xxx	%F		
	Positions/lengths display text				
3.1	Test position	xxxx	mm		
3.2	Max. position	xxxx	mm		
3.3	Retraction stroke	xxxx	mm		
3.4	Feed window	xx.x	mm		
3.5	Pull-up window	xx.x	mm		
3.6	Waiting position	xxxx	mm		
	Channels/segments display text				
4.1	Channel selection	x			
4.2	Channel allocation 1	xxx	mm		
4.2	Channel allocation 2	xxx	mm		
4.2	Channel allocation 3	xxx	mm		
4.2	Channel allocation 4	xxx	mm		
4.2	Channel allocation 5	xxx	mm		
4.2	Channel allocation 6	xxx	mm		
4.2	Channel allocation 7	xxx	mm		
4.2	Channel allocation 8	xxx	mm		
4.3	Pusher rod length	xxxx	mm		
4.4	Segment 1	xxxx	mm		
4.4	Segment 2	xxxx	mm		
4.4	Segment 3	xxxx	mm		
4.4	Segment 4	xxxx	mm		
4.4	Segment 5	xxxx	mm		
4.4	Segment 6	xxxx	mm		
4.4	Segment 7	xxxx	mm		
4.4	Segment 8	xxxx	mm		
4.4	Segment 9	xxxx	mm		
4.4	Segment 10	xxxx	mm		
4.5	Min. torque	xxx	%F		
4.5	Max. torque	xxx	%F		

No.	Display text	Input/unit		Factory settings	Customer settings
	Inlay fork/steady rest display text				
5.1	Inlay fork waiting time	xxxx	ms		
5.1	Inlay fork 0-position	xxx.x	mm		
5.2	Inlay fork position, channel centre	xxx.x	mm		
5.3	Inlay fork, max. take-up position	xxx.x	mm		
5.4	Inlay fork calculation factor for measurement system	xx.xx	Ink/mm		
5.5	Steady rest mode	x			
5.6	Steady rest open position	xxxx	mm		
5.7	Steady rest closed position	xxxx	mm		
5.8	Steady rest delay path	xxx	mm		
	Gripping unit/stopper display text				
6.1	Gripping unit available	☐			
6.2	Dispose of material via CNC	☐			
6.3	Do not pull up material	☐			
6.4	Pull-off position	xxxx	mm		
6.5	Pull-up speed	xxx	%V		
6.6	Pull-up force	xxx	%F		
6.7	Insertion position compensation	xx.x	mm		
6.8	Chute width	xxx	mm		
6.9	Clamping/unclamping length	xxx	mm		
6.10	Stopper for pusher support	☐			
6.11	Stopper clamping position	xxxx	mm		
	Functions display text				
7.1		☐			
7.2	Automatic bar change	☐			
7.3	Automatic end of bar	☐			
7.4	Bar rest at max. position	☐			
7.5	Chuck turning signal	☐			
7.6	Oscillation	☐		X	
7.7	Allow pushing when end of bar is reached	☐			
7.8	Calculate end of bar	☐			
7.9	Find bar with bar change	☐			
7.10	Find bar without bar change	☐			
7.11	Initiate measurement run automatically	☐			
7.12	After the first insertion, continue without stopping	☐			
7.13					
7.14					
7.15	Reference point set	☐		X	
7.16	Function test (measuring)	☐			
	IF, CNC machines display text				
8.1	CNC machine interface addition 1	x			
8.1	CNC machine interface addition 2	x			
8.1	CNC machine interface addition 3	x			
8.1	CNC machine interface	xx			
8.2	Fieldbus address addition	xx			
8.2	Fieldbus address	xxx			

No.	Display text	Input/unit		Factory settings	Customer settings
8.3	Waiting time after "Chuck closed".	x.x	s		
8.4	Switch-off time, "Magazine empty"	xx	min		
8.5	Fragmentation position	xxxx	mm		
	Oil pump display text				
9.1	Oil pump mode	x		0	
9.2	Oil pump "Off" position	xxxx	mm	0	

14 Maintenance

	Working on the electrical system. Do not touch live parts.
 	**Danger!** Multitude of dangers due to working on the electric system. Electric shock can cause personal damage. ➢ Fundamentally, work may only be carried out by authorized personnel. ➢ Disconnect the system from the mains. ➢ The electric cabinet may only be opened by authorized personnel.

	Check safety equipment daily for proper function.
	**WARNING!** Multitude of dangers due to moving machine parts with missing protective equipment. Fingers and hands can get caught in the device when reaching in, causing severe injuries. ➢ As a matter of principle, do not put any safety equipment out of operation.

	Manual mode with open, separating hood or protective mechanism
	**WARNING!** Multitude of dangers due to moving machine parts with moving, separating protective mechanism/hood open in manual mode. Fingers and hands can get caught and cause severe injuries. Moving parts, such as exposed gear wheels, cylinders, stoppers, limit stop, inlay forks, toothed belts and pushers, are openly accessible. Required for set-up as well as troubleshooting. ➢ Only carry out work with the hood open once the device has come to a standstill. ➢ Do not reach into moving parts. ➢ Only operate the device with the hood closed. ➢ Keep unauthorized persons away.

	Danger of injury due to moving parts.
	**⚠ WARNING!** The material pusher can be moved out of the housing in manual mode and when the magazine is swivelled out. ➢ Make sure there is a safety barrier in place. ➢ Only have work done by authorized personnel. ➢ Keep unauthorized persons away.

	Exchanging spare parts and accessory parts.
	**⚠ WARNING!** Multitude of dangers due to moving machine parts with missing protective equipment. Fingers and hands can get caught in the device when reaching in, causing severe injuries. ➢ Only carry out work with the hood open once the device has come to a standstill. As a matter of principle, do not put any safety equipment out of operation. ➢ Exit automatic mode; switch to manual mode. ➢ Only use original Breuning/IRCO spare parts. ➢ Make sure protective equipment is reinstalled after every intervention. ➢ Keep unauthorized persons away.

	Avoid contact with rotating components.
	**⚠ WARNING!** Multitude of dangers due to moving machine parts with moving, separating protective mechanism/hood open in manual mode. Fingers and hands can get caught and cause severe injuries. Moving parts, such as rotating material, exposed gear wheels, cylinders, stoppers, limit stop, inlay forks, toothed belts and pushers, are openly accessible. Required for set-up as well as troubleshooting. ➢ Only carry out work with the hood open once the device has come to a standstill. ➢ Do not reach into moving parts. ➢ Only operate the device with the hood closed. ➢ Keep unauthorized persons away.

Avoid tool breakage when swivelling out the loading magazine.

Caution

Pushing back/swivelling out the device in automatic mode causes an Emergency Stop.
Make sure that no material from the spindlestock can get into the device.

- Only have work done by authorized personnel.
- Keep unauthorized persons away.
- Remove material from the spindlestock that gets into the device.

while the guide channel is closing.

Caution

Before closing the guide channel, ensure that there is no material in the area of the material pusher.

- Only have work done by authorized personnel.
- Keep unauthorized persons away.
- Visual inspection, remove material from the collision area.

Avoid damaging the measuring barrier.

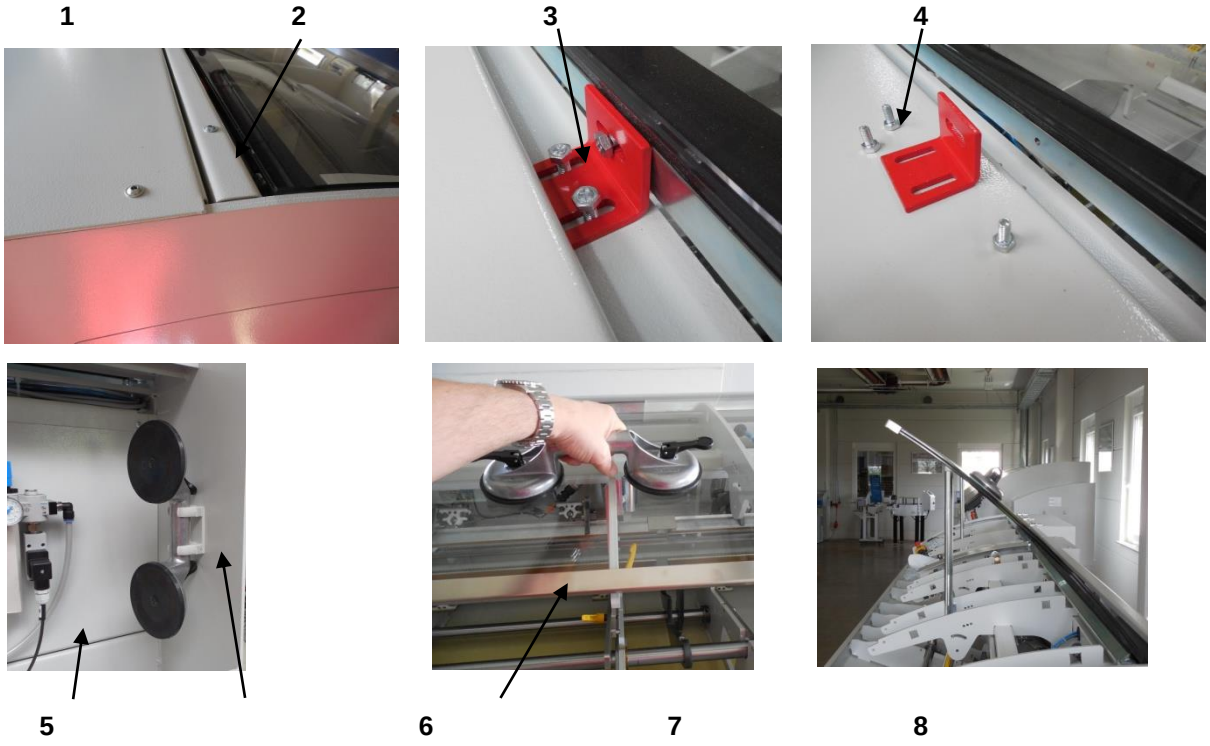
Caution

Before manually disposing of the remnants (back through the loading magazine), make sure that the mechanical measuring barrier has responded.
If not, move forward with the material pusher until the measuring barrier responds.

- Only have work done by authorized personnel.
- Keep unauthorized persons away.
- Move the pusher forward, trigger the measuring barrier.

14.1 Opening the glass hoods

	Manual mode with open, separating hood or protective mechanism
	**⚠ WARNING!** Multitude of dangers due to moving machine parts with moving, separating protective mechanism/hood open in manual mode. Fingers and hands can get caught and cause severe injuries. Moving parts, such as exposed gear wheels, cylinders, stoppers, limit stop, inlay forks, toothed belts and pushers, are openly accessible. Required for set-up as well as troubleshooting. ➢ Only carry out work with the hood open once the device has come to a standstill. ➢ Do not reach into moving parts. ➢ Only operate the device with the hood closed. ➢ Keep unauthorized persons away.



1 Glass hood closed
2 Remove U-rail
3 Red safety bracket
4 Safety bracket removed
5 Hood support in the pneumatic cabinet
6 Glass suctioner in the pneumatic cabinet
7 Lift up the glass pane with suctioner.
8 Secure the glass pane with hood supports.

14.2 Maintenance plan

The user must always keep the loading magazine clean.

Item	Component	Activity	Interval
1	**Short pusher**	- Function check.	daily
	Short pusher - pusher pad	- Visual check for damage and wear. - Clean, if dirty.	daily
	Toothed belt with deflection	- Visual check for damage and wear. - Check voltage.	daily
2	**Material pusher**	- Function check.	daily
		- Visual check for damage and wear.	daily
		- Lubrication (lubricating nipple, locking)	daily
	Pusherhead/clamping sleeve	- Visual check for damage and wear. - Clean, if dirty.	daily when needed
3	**Guide channel**	- Function check.	daily
		- Visual inspection for damage and wear.	daily
		- Clean the guide shells, if dirty.	when needed
		- Check channel lubrication.	daily
4	**Pneumatic system**	- Function check.	daily
		- Check air pressure.	daily
	Maintenance unit	- Drain condensate.	when needed
5	**Oil unit**	- Function check.	daily
		- Check/refill oil level.	when needed
	Oil filter	- Clean/exchange.	when needed
	Oil change	- Clean machine pan.	when needed
6	**Emergency stop button**	- Function check.	daily
	► **Report any safety equipment malfunctions and defects to customer service immediately.**		
7	**Steady rest (optional)**	- Function check.	daily
		- Visual check for damage and wear.	daily
8	**Guide bushing**	- Function check.	daily
		- Visual check for damage and wear.	daily
9	**Stopper**	- Function check.	daily
		- Visual check for damage and wear.	daily
10	**Measuring barrier**	- Function check.	daily
		- Visual inspection for damage.	when needed
		- Clean	when needed
11	**Longitudinal shift (optional)**	- Lubricate shifting track.	when needed
12	**Remnant gripper (optional)**	- Function check.	daily
	Gripper jaws	- Visual inspection for damage and wear.	daily

For exchange and installation of wear and spare parts, please contact Service at Kurt Breuning IRCO Maschinenbau GmbH.

14.3 Lubricants and operating materials

Operating materials: Hydraulic oil in acc. with ISO VG 100;
Emulsion mixture 12 to 15%.

Lubricant: Klüber Isoflex NBU15.

15 Wear and spare parts

For exchange and installation of wear and spare parts, please contact Service at Kurt Breuning IRCO Maschinenbau GmbH.

	Exchange spare parts and accessory parts.
	**⚠ WARNING!** Multitude of dangers due to moving machine parts with missing protective equipment. Fingers and hands can get caught in the device when reaching in, causing severe injuries. ➢ Only carry out work with the hood open once the device has come to a standstill. As a matter of principle, do not put any safety equipment out of operation. ➢ Exit automatic mode; switch to manual mode. ➢ Only use original Breuning/IRCO spare parts. ➢ Make sure protective equipment is reinstalled after every intervention. ➢ Keep unauthorized persons away.

	Not on type plate, type designation, informational sign.
	**⚠ WARNING!** Danger if product label is missing or illegible. ➢ Always keep the type plate and safety, warning and operational information in easily legible condition. ➢ Replace damaged or missing product labels. ➢ Always specify the IRCO serial number when contacting the manufacturer.

15.1 Wear parts

Wear parts are parts which are subject to natural wear from operation.

For exchange and installation of wear and spare parts, please contact Service at Kurt Breuning IRCO Maschinenbau GmbH.

Material pusher
Pusher head, exchangeable pusher head short version, clamping sleeve
Intermediate piece, bearing
Material pusher, rear part
Oil filter
Tension spring
Steady rest roller
Toothed belt
Synchronous disc, toothed washer

15.2 Spare parts

The spare parts list of the mechanical components can be requested.

A complete list of materials of the used electric and electronic components can be found in the circuit diagram attachment.