

Instruction Manual

ENG

## Sprint 545 / 565 S2



LNS SA  
CH-2534 Orvin  
[www.LNS-group.com](http://www.LNS-group.com)

9.545.01.ANG



## TABLE OF CONTENTS

<b>CHAPTER 1 : BASIC PRINCIPLES .....</b>	<b>1-1</b>
1. STRUCTURE.....	1-2
2. RIGHTS .....	1-3
3. SAFETY REQUIREMENTS.....	1-5
4. SAFETY DEVICES.....	1-6
<b>CHAPTER 2 : TECHNICAL DATA .....</b>	<b>2-1</b>
1. CHARACTERISTICS.....	2-2
2. FLOOR PLAN.....	2-3
3. LAYOUT OF THE ELEMENTS .....	2-5
<b>CHAPTER 3 : SYSTEM START UP .....</b>	<b>3-1</b>
1. TRANSPORTATION .....	3-2
2. ASSEMBLY .....	3-5
3. ANCHORING.....	3-6
4. CONNECTIONS .....	3-6
<b>CHAPTER 4 : ELECTRICS.....</b>	<b>4-1</b>
1. ELECTRICAL EQUIPMENT.....	4-2
2. ELECTRICAL CABINET .....	4-6
3. INTERFACE DIAGRAM .....	4-15
4. INTERFACE .....	4-16
<b>CHAPTER 5 : PNEUMATICS .....</b>	<b>5-1</b>
1. PNEUMATIC EQUIPMENT .....	5-2
2. AIR HANDLING.....	5-3
3. PNEUMATIC BATTERY .....	5-4
<b>CHAPTER 6 : HYDRAULICS.....</b>	<b>6-1</b>
1. HYDRAULIC EQUIPMENT .....	6-2
2. HYDRAULIC ELEMENTS .....	6-4
<b>CHAPTER 7 : GENERAL DESCRIPTION .....</b>	<b>7-1</b>
1. BAR MAGAZINE.....	7-2
2. GUIDING BLOCKS .....	7-3
3. PUSHER .....	7-6
4. BELT DRIVE.....	7-9
5. REMNANT EXTRACTION SYSTEM (option) .....	7-10
6. FRONT REST .....	7-12
7. RETRACTION DEVICE (option) .....	7-14
8. 2-POSITION OPTION.....	7-15
9. AUTOMATIC FRONT REST (option).....	7-16
10. 2-POSITION PNEUMATIC FRONT REST (option) .....	7-17

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<b>CHAPTER 8 : HANDLING .....</b>	<b>8-1</b>
1. POWERING ON .....	8-2
2. REMOTE CONTROL .....	8-3
3. SET-UP .....	8-7
4. SOFTWARE SETTINGS.....	8-12
5. PARTS LIBRARY .....	8-23
6. SERVICE.....	8-24
7. HELP SCREENS .....	8-25
8. AUTOMATIC CYCLE.....	8-27
9. END OF BAR POSITION.....	8-28
10. TOP-CUT POSITION .....	8-30
11. POWERING DOWN.....	8-31
 <b>CHAPTER 9 : MALFUNCTIONS .....</b>	 <b>9-1</b>
1. FACTORS AFFECTING PERFORMANCE .....	9-2
2. MAINTENANCE.....	9-6
 <b>CHAPTER 10 : APPENDICES.....</b>	 <b>10-1</b>
1. PROGRAMMING EXAMPLE.....	10-2
2. ORDERING FORM .....	10-3
3. LNS ADDRESSES.....	10-4

# CHAPTER 1 : BASIC PRINCIPLES

## 1. STRUCTURE

This manual consists of various chapters, each containing several points, paragraphs, etc. Lists may be contained in paragraphs.

- the page number is shown at the top of the page;
- the chapter number and title are shown at the top of the page;
- the bar feeder model is shown at the top of the page.

### 1.1. Cross-references

Each chapter generally contains all of the information related to the description and settings of the devices and elements represented therein.

Therefore, if a setting must be made while you are handling the system, please refer to the chapter on the device to be set, for example: (see chapter \*) or (see point \*).

### 1.2. Captions

Whenever possible, the reference numbers contained in the instruction manual are shown with the LNS ordering number of the indicated element.

To make it easier to place an order of supplies, a form has been included in the annex at the end of this manual.

### 1.3. Symbols and terminology



This sign recommends following the directions very closely to avoid causing an incident that could result in injury, damage to the equipment or data loss.



This sign indicates that safety measures must be taken to avoid possible electrical shocks or mishaps.



The notes stress interesting points or comments, and provide useful advice for optimal system operation.



This sign indicates advice concerning environmental protection.

## 2. RIGHTS

All rights reserved. Reproduction, recording or transmission of all, or any portion, of this manual, in any form or through any means whatsoever, whether mechanical, photographic, audio or other, without the express written authorization of LNS SA, is prohibited. LNS SA accepts no responsibility for errors which may be contained in this manual and any problems which may result.

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# "CE" DECLARATION OF CONFORMITY

As per annex II A of directive 2006/42/EC



We hereby declare that the following machinery is manufactured in compliance with the following directives:

- Machinery directive: 2006/42/EC
- Low voltage directive: 2006/95/EC
- EMC directive: 2004/108/EC

Manufacturer:

**LNS SA**  
Route de Frinvillier  
CH- 2534 Orvin  
Switzerland

Technical Dossier Compiled by:

**Plaseco Kurt De Pauw**  
Chemin des Petits-Clos 12  
CH- 1744 Chénens  
Switzerland

Description of the machine  
Type  
Delivery serial no.

Automatic bar loader  
Sprint 545 / 565 S2  
XXXXXX / 2015

The machine meets the following essential requirements applicable as per directive 2006/42/EC:

1.1.2, 1.1.3, 1.1.5, 1.1.6, 1.2.1, 1.2.2, 1.2.3, 1.2.4, 1.2.5, 1.2.6, 1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.3.5, 1.3.6, 1.3.7, 1.3.8, 1.3.9, 1.4.1, 1.4.2, 1.4.3, 1.5.1, 1.5.3, 1.5.4, 1.5.8, 1.5.9, 1.6.2, 1.6.3, 1.7.1, 1.7.2, 1.7.3, 1.7.4.

The following harmonised standards have been used as a basis:

- Concerning the Machinery directive:

- EN ISO 12100:2010 : Safety of machinery – General principles for design,
- ISO/TR 14121-2:2013 : Safety of machinery – Risk assessment,
- EN ISO 13857:2008 : Safety of machinery – Safety distances,
- EN ISO 13855:2010 : Safety of machinery – Positioning of safeguards,
- ISO 14120:2002 : Safety of machinery – Design of movable guards,
- EN ISO 13850:2008 : Safety of machinery – Emergency stop function,
- EN ISO 13849-1:2008 : Safety of machinery – Safety-related parts of control systems,
- ISO 14118:2000 : Safety of machinery – Prevention of unexpected start-up,
- EN 60204-1:2005 : Safety of machinery – Electrical equipment of machines,
- EN ISO 14119 :2013 : Safety of machinery – Interlocking devices associated with guards,
- EN ISO 4414:2011 : Pneumatic fluid power - General rules and safety requirements,
- IEC 60812:2006 : Safety of machinery – FMECA analysis

- Concerning the Low voltage directive:

- EN 61439-1/3 :2013 : Low voltage switchgear and controlgear assemblies,

- Concerning the EMC directive:

- EN 61000-6-4 : Emission standard for industrial environments,
- EN 61000-6-2 : Immunity for industrial environments

Location and date:

Stamp and signature:

**Orvin, xx xxxx 2015**

**Nadia Pellaton**  
Export Department Manager



### 3. SAFETY REQUIREMENTS

- Do not handle the equipment without having knowledge of the safety instructions and the instructions for use. Safety instructions for the bar feeder, as well as the CNC lathe, must be strictly observed.
- Non-qualified personnel, children, and persons under the influence of alcohol or medication should not handle the equipment.
- Loose garments, long hair and jewellery can be dangerous.
- Do not remove any covers while the bar feeder or the machine is under electrical power.
- Do not conduct any maintenance operations during the automatic cycle.
- Do not grasp moving or rotating objects, or nearby elements.
- If certain safety shields or safety covers are removed to conduct maintenance, they must be reinstalled as soon as the maintenance work is completed.
- No servicing should be carried out on the interface or inside the electrical cabinet while the bar feeder or the lathe is under electrical power.
- It is strictly prohibited to jump wire or remove circuit breakers, master switches, and especially safety switches.
- To avoid any harm to persons or damage to components, use only the indicated points for lifting and moving the bar feeder. No one should be near the hanging load, or within the operating range of the overhead hoist/crane, forklift, or any other means used for lifting and transportation.
- Do not knock the bar feeder while moving it as this could damage it.
- Do not move the bar feeder while it is electrically powered on.
- The work area surrounding the bar feeder should always be clear of objects and well lit. The presence of oil on the ground could cause falls; it is important to keep the floor clean on a regular basis.
- Do not place the machine in a damp area and make sure that water or oil does not come into contact with the electrical equipment.
- Do not open the clamping unit (collet or chuck) of the lathe manually when the bar feeder is in automatic mode (Interface).
- Each time the diameter is changed, also adapt the spindle reduction tube.
- The use of spindle reduction tubes is highly recommended for machining bars with diameters smaller than the maximum capacity of the spindle.
- Do not attempt to recharge the batteries of the PLC.
- For the use and maintenance of the bar feeder, use only parts provided by or recommended by LNS.
- If it is necessary to move the bar feeder after it has been commissioned, LNS or its local representative must be contacted before any attempt to restart it.
- The bar should never extend beyond the lathe's clamping unit more than 3 times its diameter.
- LNS accepts no responsibility for possible accidents or property damage caused when safety instructions are not followed.

## 4. SAFETY DEVICES

### 4.1. Description

This bar feeder has been designed with the aim of ensuring it offers maximum safety during use; it meets all EC requirements.

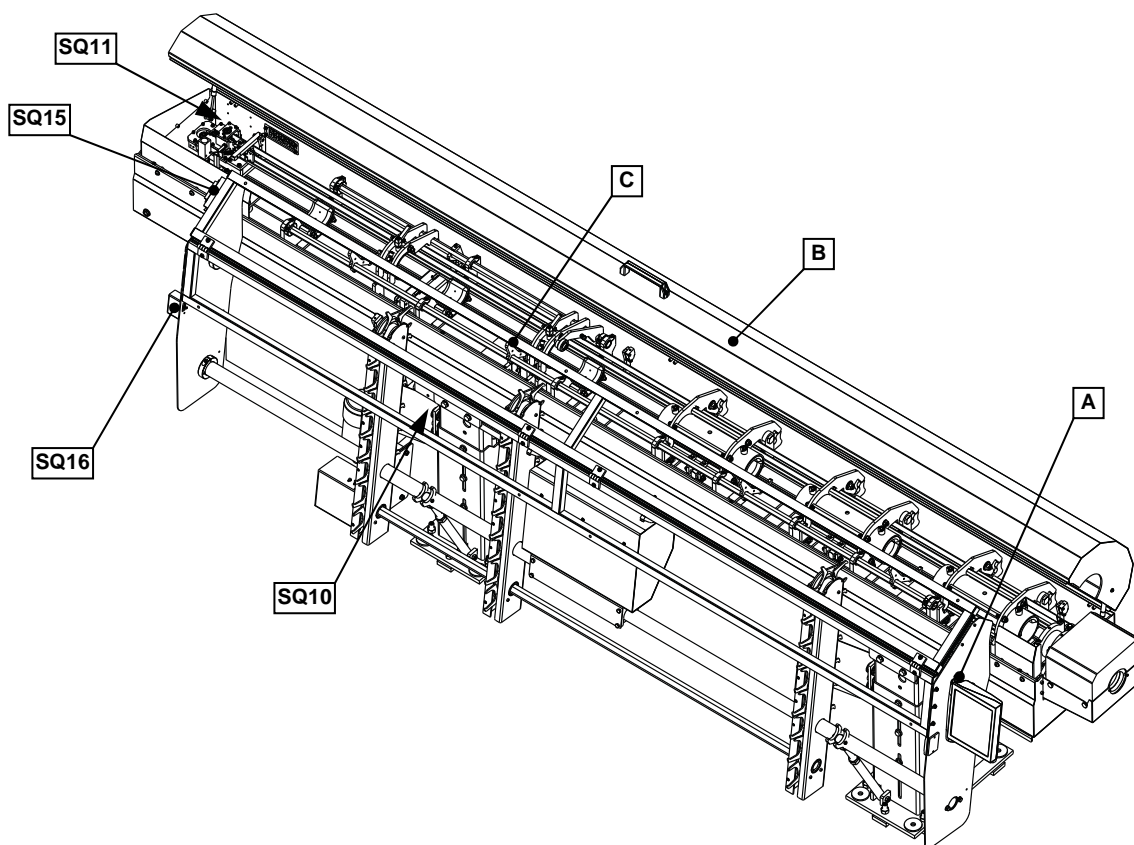
Safety covers and devices make access to the moving parts of the bar feeder impossible. Safety switches keep the bar feeder from operating when these protections are open. The design of switches, and their integration on the bar feeder, makes their exclusion almost impossible.

By pressing the emergency stop button located on the remote control, the functions of the bar feeder and the lathe are immediately stopped.



The LNS Company, or its local representative, may not be held responsible for possible accidents or property damage, whether caused directly or not, by any means whatsoever, if certain safety devices have not been included.

### 4.2. Layout of the elements on the bar feeder



Designation	Description
A	Emergency stop button
B	Main access cover
C	Protective grille
SQ10	Safety switch for the retraction system (option)
SQ11	Safety switch of the main access cover
SQ15	Safety switch for the protective grille
SQ16	Safety switch for the bar magazine

## CHAPTER 2 : TECHNICAL DATA

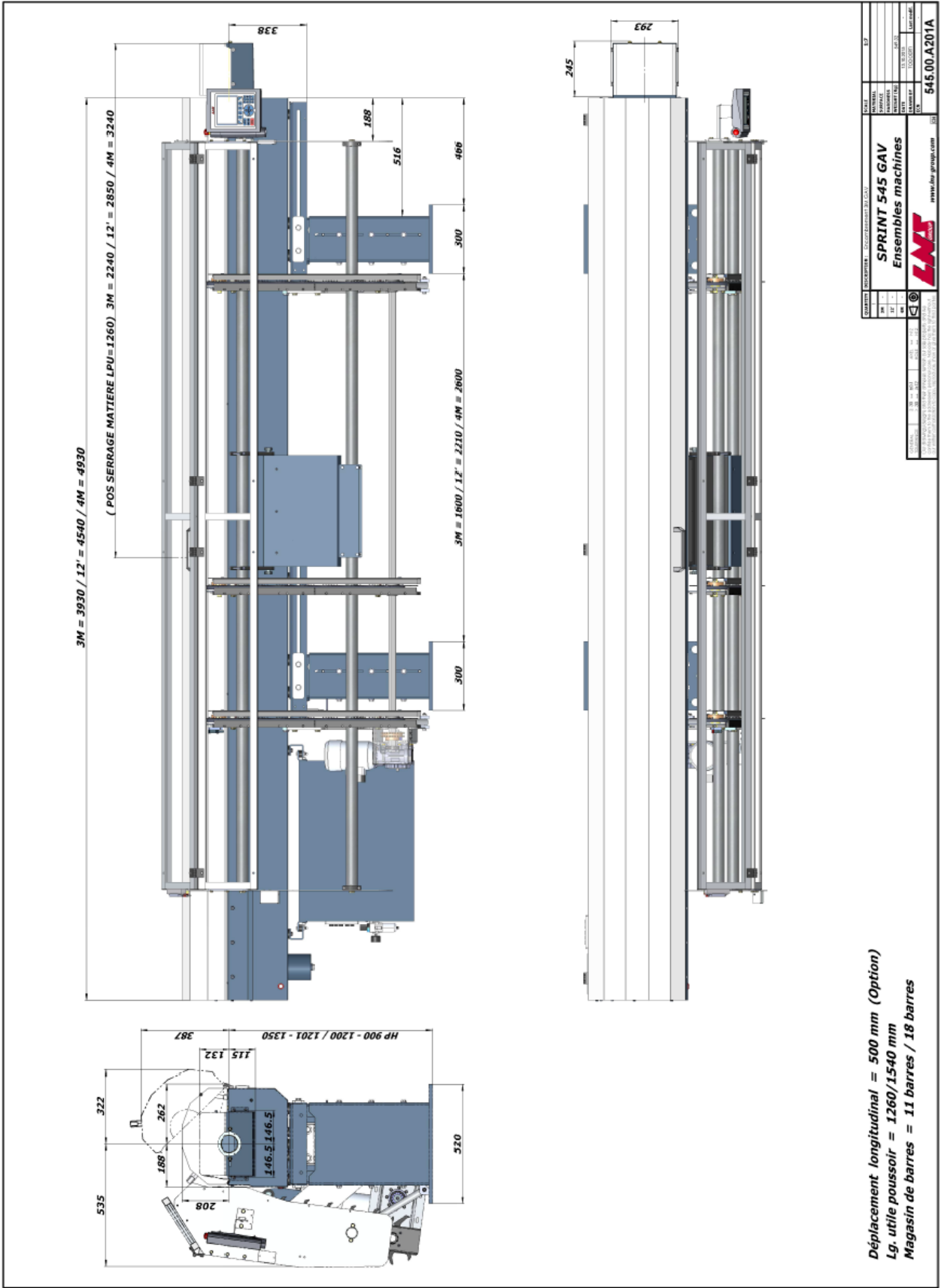
## 1. CHARACTERISTICS

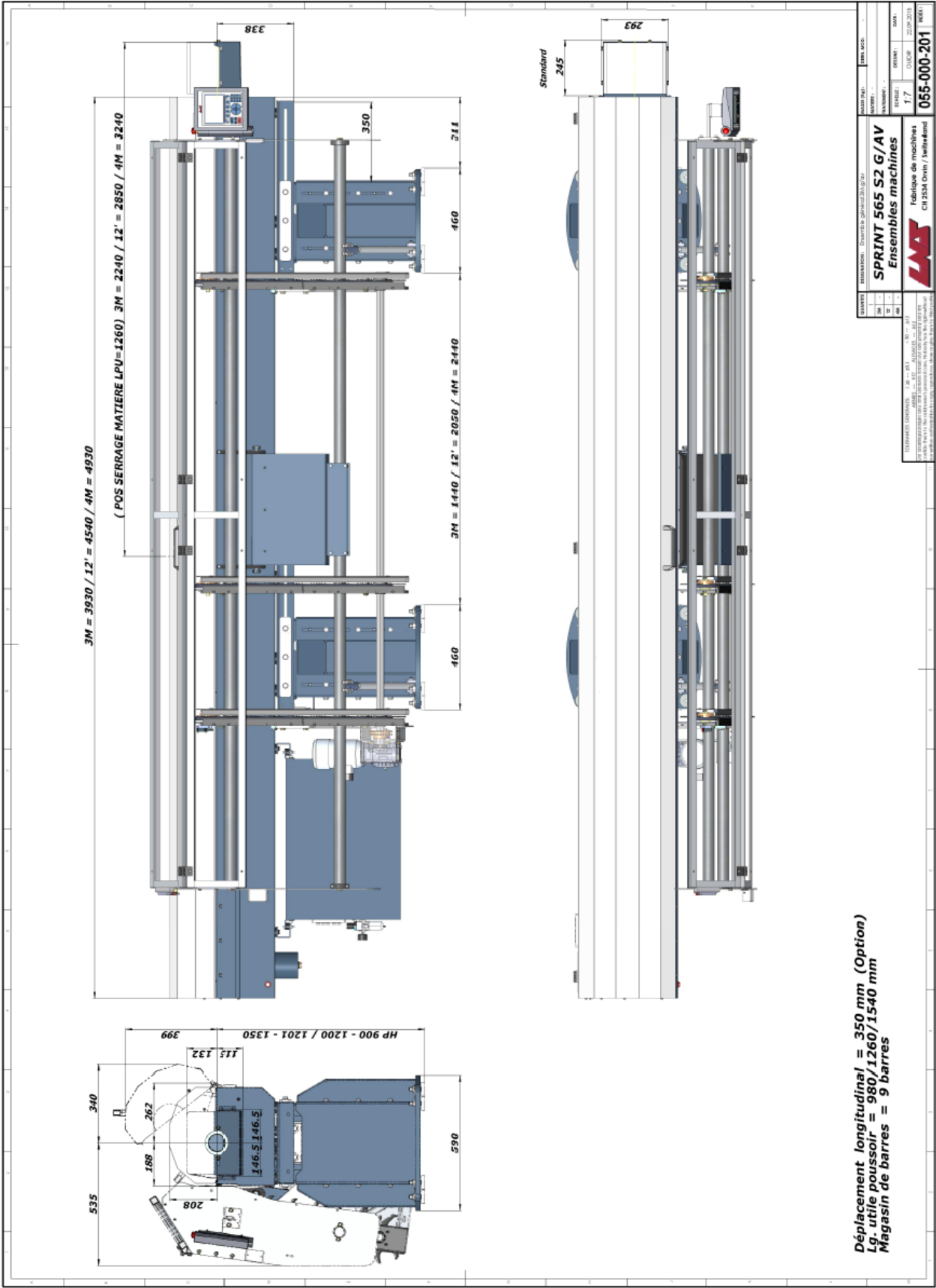
	Unit	3 m	12'	4 m
Weight	kg	900	970	1100
Dimensions		See p. 2-3		
Retraction distance (option)	mm	SPRINT 545: 500 / SPRINT 565 S2: 350		
min. Ø round bar	mm	5		
min. Ø profiled bar (size on flat sides)		square: 4 - hexagonal: 5		
<b>Sprint 545:</b> max. Ø	mm	45		
<b>Sprint 565 S2:</b> max. Ø round bar	mm	65 60 38 46		
max. Ø round bar (without bar prep.)	mm			
max. Ø square profiled bar (size on flat sides)	mm			
max. Ø hexagonal profiled bar (size on flat sides)	mm			
Minimum authorised bar length	mm	1500		
Maximum authorised bar length	mm	3200	3800	4200
Minimum authorised remnant length	mm	110		
Maximum authorised remnant length	mm	450		
Pneumatic supply pressure	bar (kPa)	5 (500)		
Air consumption	litres	< 10 / loading cycle		
Supply voltage (at 50 or 60Hz)	Volts	3x 220 – 480		
Maximum pushing force (60% motor torque: maximum possible value)	daN	SPRINT 545: 235 / SPRINT 565 S2: 120		
Maximum feed rate	m/min	>60		
Loading cycle	seconds	30 – 40		
Quantity of hydraulic oil (ISO100)	kg	80	90	100

Depending on the country and the applicable standards, some of the technical data, such as the supply voltage, may vary.

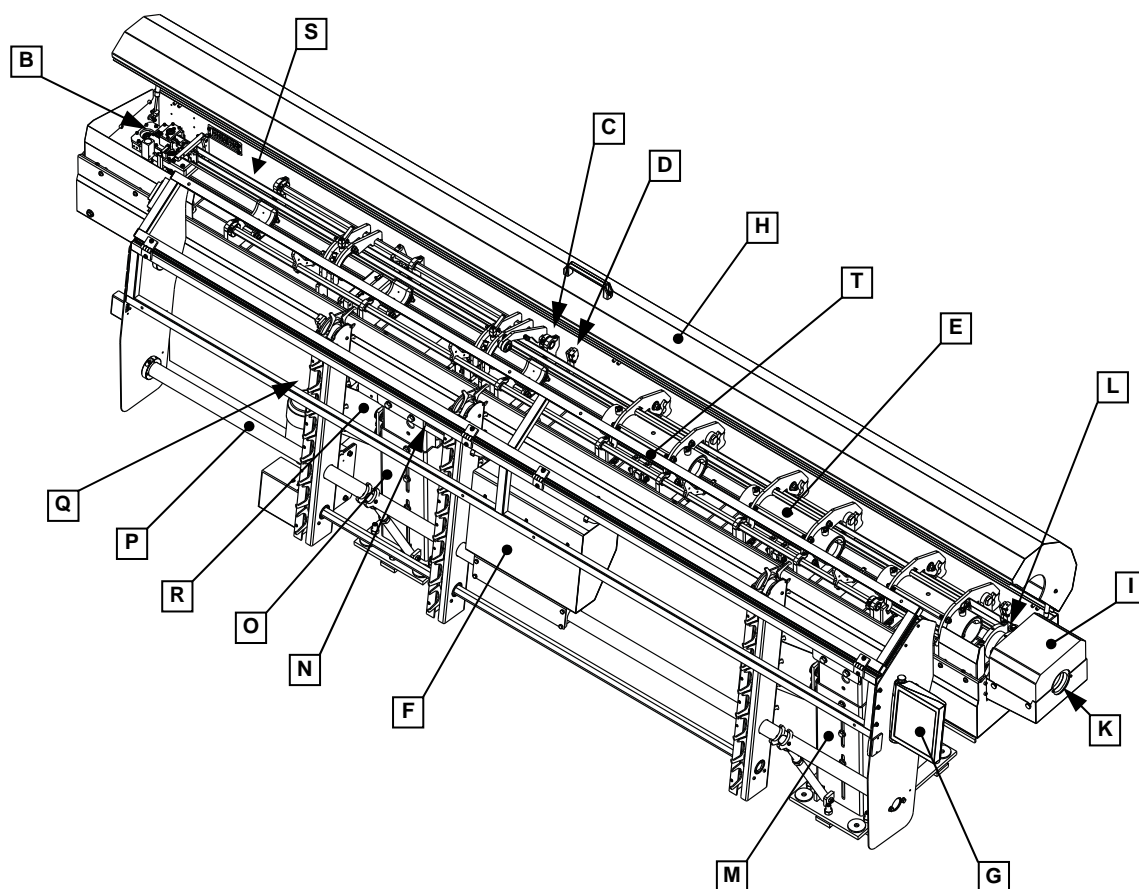
2. FLOOR PLAN

The plans below are for the SPRINT 545 and SPRINT 565 S2 respectively, showing the most frequently used dimensions for positioning the bar feeder. Details on the dimensions of other parts or elements of the bar feeder will be provided upon request.





### 3. LAYOUT OF THE ELEMENTS



Designation	Description
A	Pusher (not visible)
B	Belt drive
C	Vice
D	Remnant control
E	Guiding blocks
F	Remnant recovery device
G	Remote control
H	Main access cover
I	Front rest
J	Interface connector (not shown)
K	Air blast
L	Measure path probe
M	Front stand
N	Retraction device (option)
O	Rear stand
P	Bar magazine
Q	Air handling
R	Electrical cabinet
S	Pneumatic assembly
T	Protective grille





## **CHAPTER 3 : SYSTEM START UP**

## 1. TRANSPORTATION



Please read the safety instructions provided at the beginning of this manual before handling the following devices.

### 1.1. Description

Depending on its destination, the bar feeder may be delivered either on a pallet, or packed in a wooden crate. When transported by sea or air, the second solution is recommended. Regardless of the type of packaging, the uncrating and lifting instructions recommended by LNS must be observed in order to prevent any injuries to persons or damage to objects. These instructions are stapled to the crate of the bar feeder.

	<b>Crate</b>	<b>Pallet</b>
<i>Type</i>	<b>3m, 4m, 12'</b>	<b>3m, 4m, 12'</b>
<i>Width</i>	1150 mm	90 mm
<i>Length</i>	4700 mm	4800 mm
<i>Height</i>	1750 mm	---

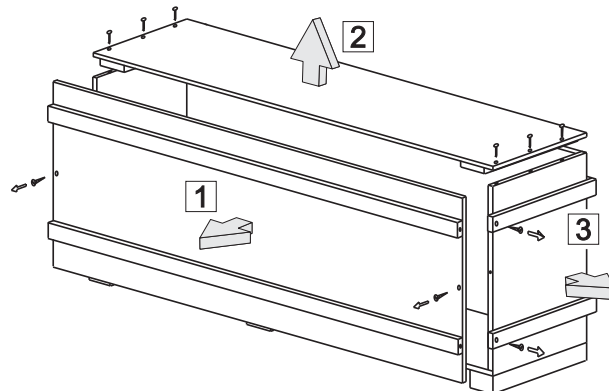
### 1.2. Unpacking

For practical and safety reasons, the bar feeder must be unpacked in a spacious, well-lit location.



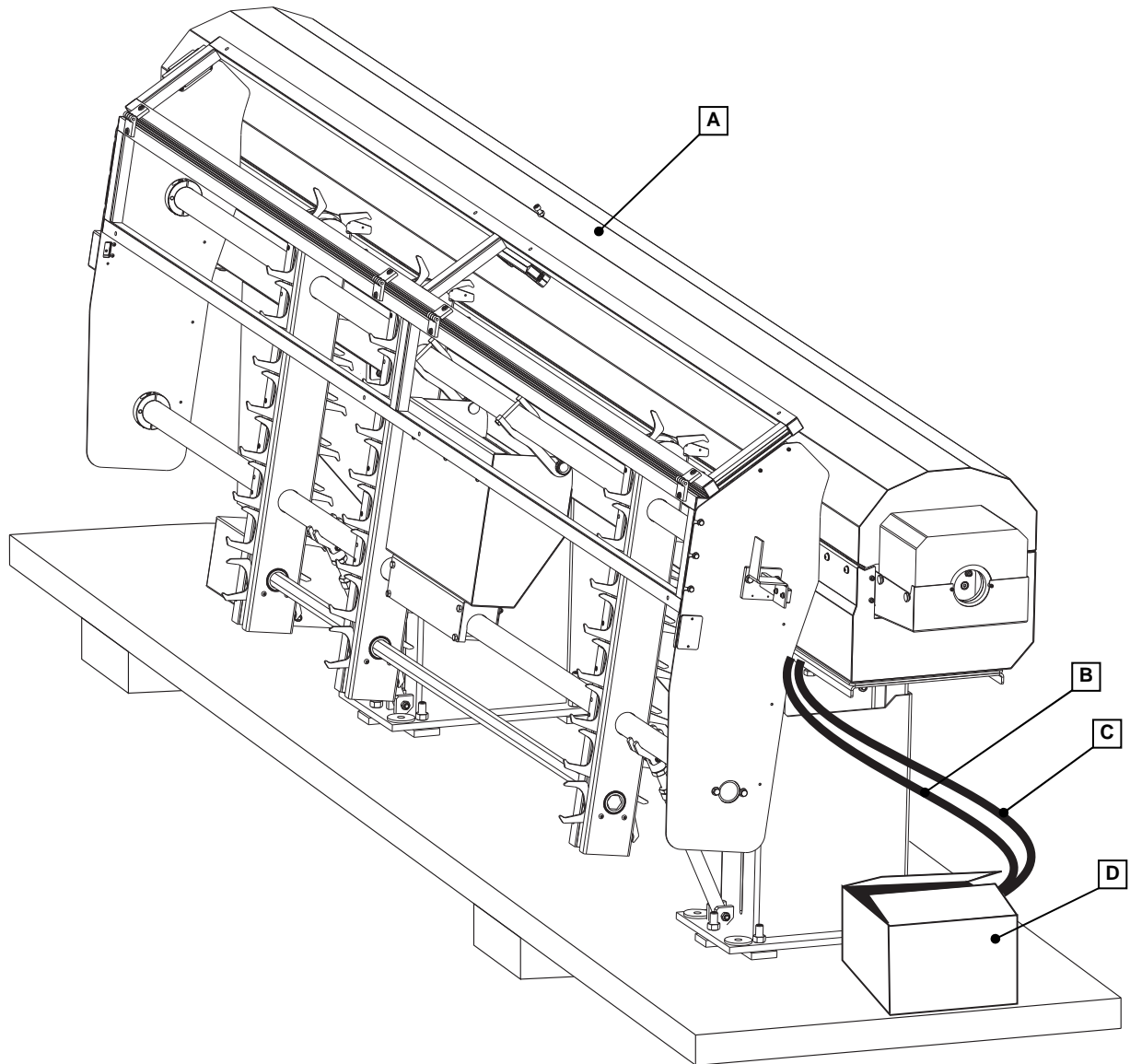
Check that the hoisting crane or lift truck has sufficient lifting capacity before starting handling of the merchandise. Ensure that no one is in the vicinity of the suspended load, or within the operating range of the hoisting crane.

- 1) If the bar feeder is received in a crate, start by unscrewing the front panel.
- 2) Remove the top.
- 3) Remove the side walls.



From this point on, the bar feeder is unpacked in the same way as when delivered on a pallet.

The bar feeder is always delivered as follows:



- X A pusher and guiding elements set is mounted in the bar feeder **(A)**. Depending on the purchase order, other sets may be delivered in a separate box.
- X The remote control **(B)** and the interface plug **(C)** are packaged in a separate box **(D)**, with the technical documentation and the accessories.

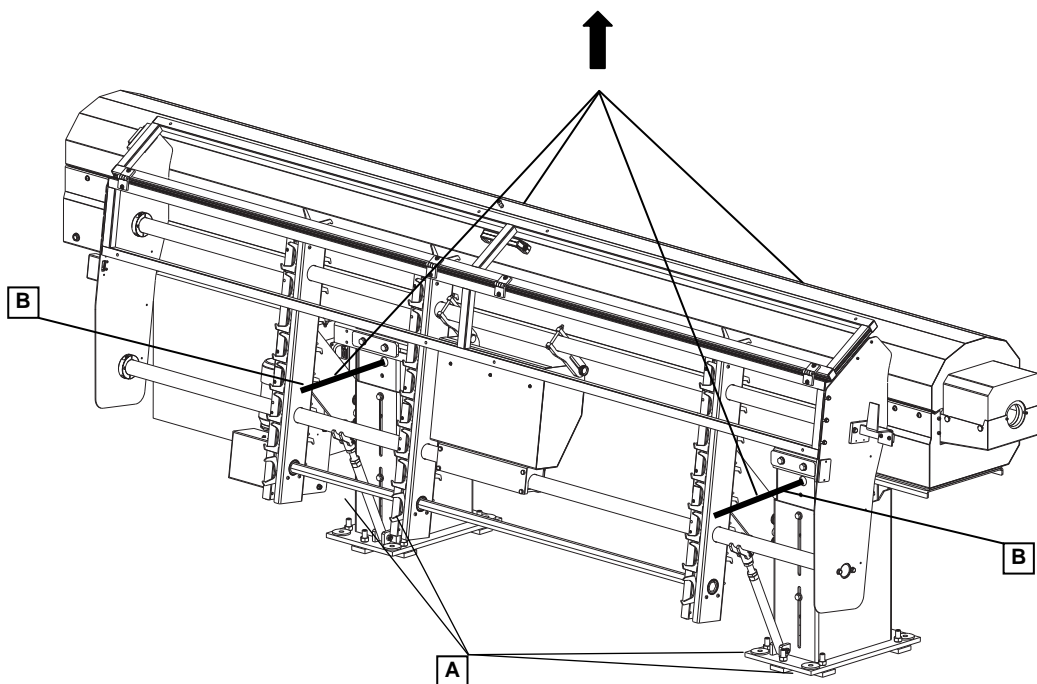
Take out the parts and place them in an easily accessible area for mounting the bar feeder.

### 1.3. Preparation for assembly

For assembly and installation of the bar feeder, it is advisable to contact LNS or one of its agents. The latter cannot be held responsible for any malfunction resulting from an incorrect installation in which they did not take part.



- Insert the two bars (**B**) delivered with the bar feeder into the holes of the lifting plates.
- Place the hoist vertically above the bar feeder.
- Place the straps over the ends of the bars (**B**), then attach them to the hoist.
- Raise the hoist to tighten the straps.



- Remove the screws (**A**) holding the bar feeder to the pallet during transportation.
- Lift the bar feeder and remove the pallet. Ensure that the bar-feed system is balanced.
- Move the bar feeder, taking care that it remains horizontal and that no one is nearby or under the suspended load.
- Do not knock the bar feeder as you move it; this may damage it.

Place the bar feeder behind the lathe, as close as possible and in approximate alignment with the spindle. For the placement, the stationary and mobile space requirements for the lathe and the bar feeder should be taken into account. When placing the bar feeder, insert levelling plates under the feet.



The distance between the lathe and the bar feeder should not exceed 20 mm. Should an obstacle impose a greater distance, contact LNS or their local representative. The area around the lathe and the bar feeder must be cleared to allow for their maintenance and handling. It should remain clear after the installation is completed.

## 2. ASSEMBLY

The bar feeder is delivered fully assembled. Because of this, it is possible to proceed directly to its alignment when in place behind the lathe.

### 2.1. Alignment



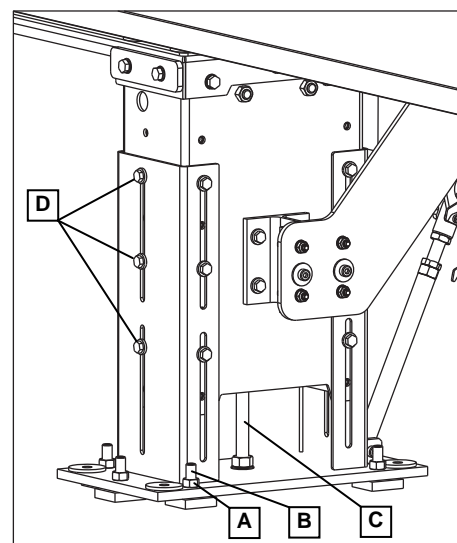
Before aligning the bar feeder, ensure that the lathe is stable and level, if possible. The bar feeder must be positioned as close as possible to the lathe spindle.



*During the alignment, ensure that there is no reduction in the spindle (spindle liner).*

The alignment may be carried out using a nylon string, an optical tool, etc. If you do not have any alignment tools, please contact LNS or their local representative so they may take care of the bar feeder installation.

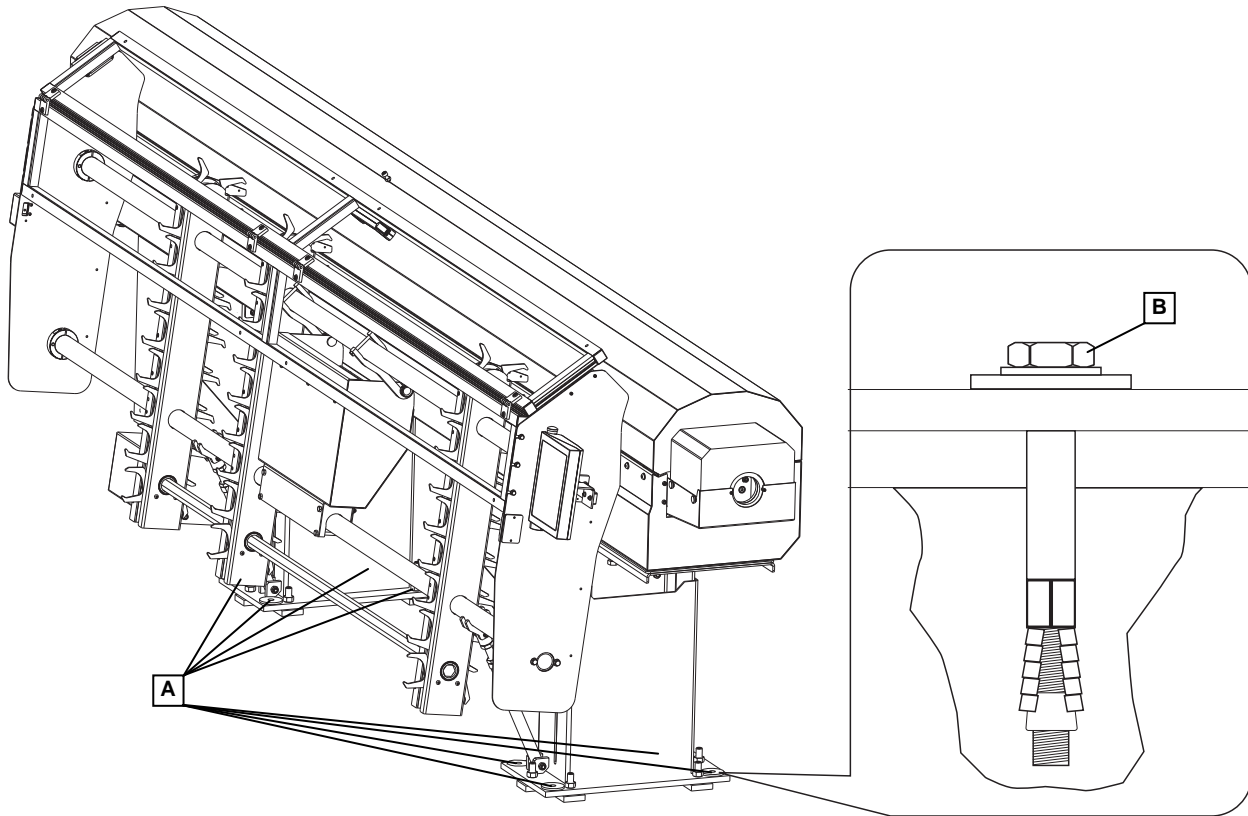
- On each foot, loosen the locking nuts (**A**) of the levelling screws (**B**). Then, make sure that the weight of the bar feeder is evenly distributed over the 12 support points.
- Loosen the locking nuts (**D**) and make sure that the central screws (**C**) of the front and rear feet are supported.
- Open the guiding blocks and place the level crosswise on the lower part. Adjusting the screws (**B**), set the lateral level of the bar feeder.
- Adjusting the central screws (**C**), set the height of the bar feeder. Normally, when the reference point is known, this adjustment is done at the factory.
- Remember to also ensure that the support bolts for the bar magazine are adjusted.
- Together with the vertical alignment, proceed with the lateral alignment, by shifting the apparatus. If you don't have the necessary material to perform this operation, please contact LNS SA or your local representative.
- When the alignment is satisfactory, tighten all locking screws (**D**). Check the alignment and, if necessary, correct it with the screws (**B**).



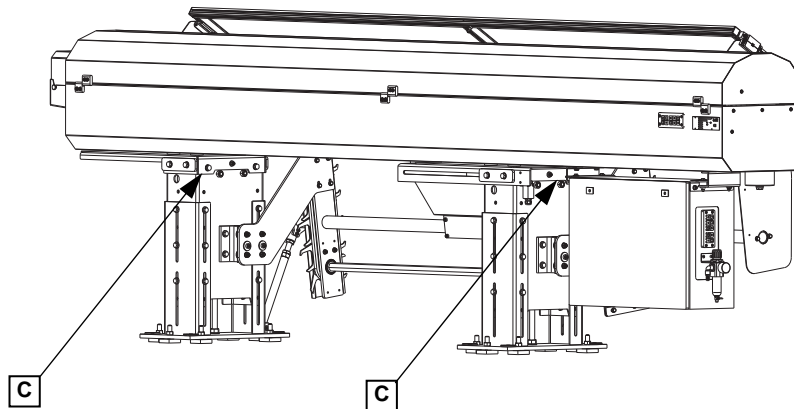
*The lock nuts of the levelling screws should only be tightened after the bar feeder is anchored to the ground.*

### 3. ANCHORING

Once the bar feeder is in place and perfectly aligned, it should be anchored to the ground to make it stable. Four anchorage points (**A**) have been provided on each foot for this purpose. Eight anchoring bolts (**B**) must be provided by the customer (minimum M10 x 100 mm).



- Once the anchoring bolts are tightened, check the alignment again, and correct it if necessary.
- Tighten the nuts of the levelling screws.
- Remove the 2 support plates from the bar magazine.
- Remove the 4 retaining screws (**C**) behind the rear foot.



### 4. CONNECTIONS

When the bar feeder is correctly aligned and anchored to the ground, its interface with the lathe and the compressed air must be connected. The hydraulic reservoir can be filled.

- For electrical connections, please refer to Chapter 4 – Electrics.
- For pneumatic connections, please refer to Chapter 5 – Pneumatics.
- To fill the tank, please refer to Chapter 6 – Hydraulics.

## **CHAPTER 4 : ELECTRICS**

## 1. ELECTRICAL EQUIPMENT



Please read the safety instructions provided at the beginning of this manual before handling the following devices.



Particular attention should be given to the handling of electrical elements because of risks of electrocution. In case of possible electrical malfunctions, it is advisable to contact LNS or their local representative.

### 1.1. Description

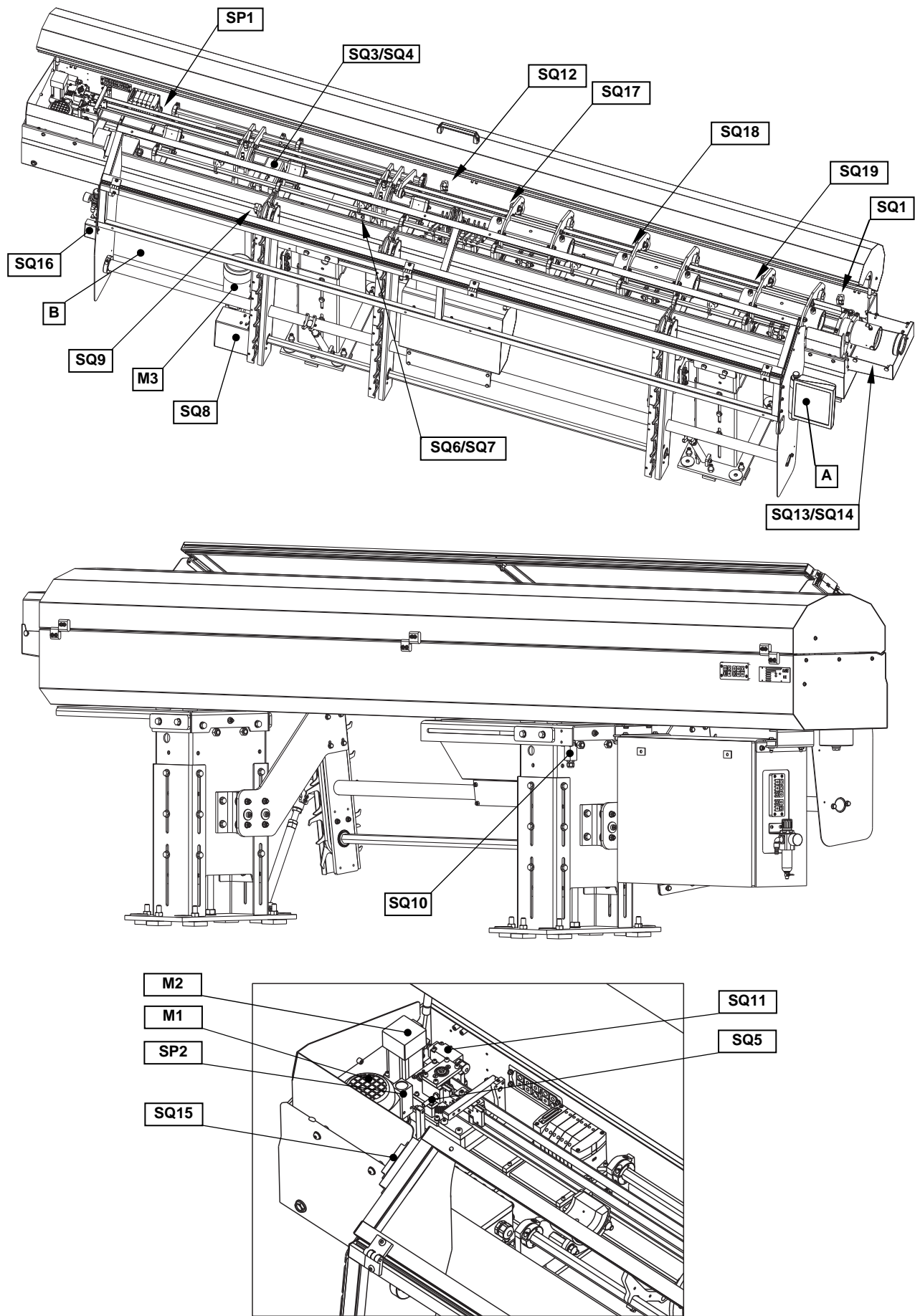
Electrical equipment and schematics comply with international electrical rules contained in ISO/IEC 204-1, 617.

This chapter contains all of the elements regarding the electrical circuit of the bar feeder. The electrical parts, and groups, which may require a setting, at some time or other, are described herein in detail.

Whenever possible, the article numbers of the elements are shown in tables below each drawing. When a group of elements is shown, find the point where it is indicated, then find the numbers for the required elements.



1.2. Layout of the electrical elements on the bar feeder



### 1.3. Layout of the electrical elements on the bar feeder

Designation	Article No	Description
A	4.972	Remote control
B	(*)	Electrical cabinet
M 1	2.210.150	Hydraulic pump motor
M 2	44.0106	servomotor
M 3	4.886	Bar magazine gear motor
QS 1	4.242	Main disconnect switch
SP 1	3.638	Pneumatic pressure control unit
SP 2	4.050	Hydraulic pressure control unit
SQ 1	4.772	Measuring cell optoelectronic sensor
SQ 3	4.968	Pusher support in open position sensor
SQ 4	4.968	Pusher support in closed position sensor
SQ 5	4.391	Pusher switch in park position
SQ 6	4.790	Material deposit sensor (bottom)
SQ 7	4.790	Material deposit sensor (top)
SQ 8	4.391	Bar loader indexing sensor
SQ 9	4.772	Material check on the bar loader
SQ 10	4.484	Retraction safety switch
SQ 11	4.484	Main access cover closed switch
SQ 12	4.772	Remnant control (with remnant extraction) (option)
SQ 13	4.391	Bar deposit reference (option)
SQ 14	4.391	Front rest pulse input (option)
SQ 15	4.894	Bar loader protective safety device
SQ 16	4.773	Bar loader optoelectronic sensor
SQ 17	4.391	Block 1 open sensor
SQ 18	4.391	Block 2 open sensor
SQ 19	4.391	Block 3 open sensor
SQ 20	4.391	Block 4 open sensor (depending on configuration)
SQ 21	4.391	Block 5 open sensor (depending on configuration)

(\*) See below

## 1.4. Description of the electrical components of the bar feeder

### 1.4.1. Hydraulic pump motor



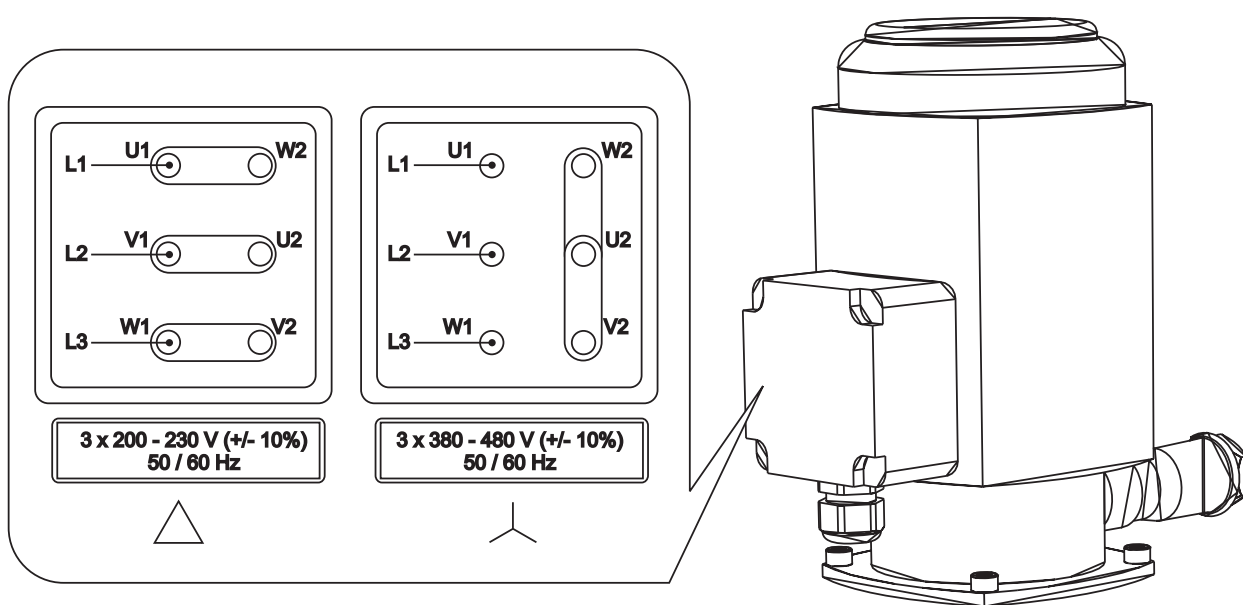
Particular attention should be given to the handling of electrical elements because of risks of electrocution. In case of possible electrical malfunctions, it is advisable to contact LNS or their local representative.



It is forbidden to intervene inside the bar feeder when it is powered on. Adaptation to local electricity supply must be carried out by qualified personnel.

During the installation, ensure that the motor is wired in accordance with the supply voltage available. The supply voltage of the bar feeder is indicated on the identification plate (point 4).

If the voltage does not correspond, the wiring of the motor must be modified:



#### Procedure:

- Turn the bar feeder off (trigger QS1 and QM1, see below)
- Open the main safety cover
- Unscrew the motor cover unit
- Make sure that all motor terminals are off
- Modify the terminal block wiring of the motor according to the diagram above
- Close the cover unit of the motor and the main safety cover
- Turn the bar feeder on (engage QS1 and QM1)

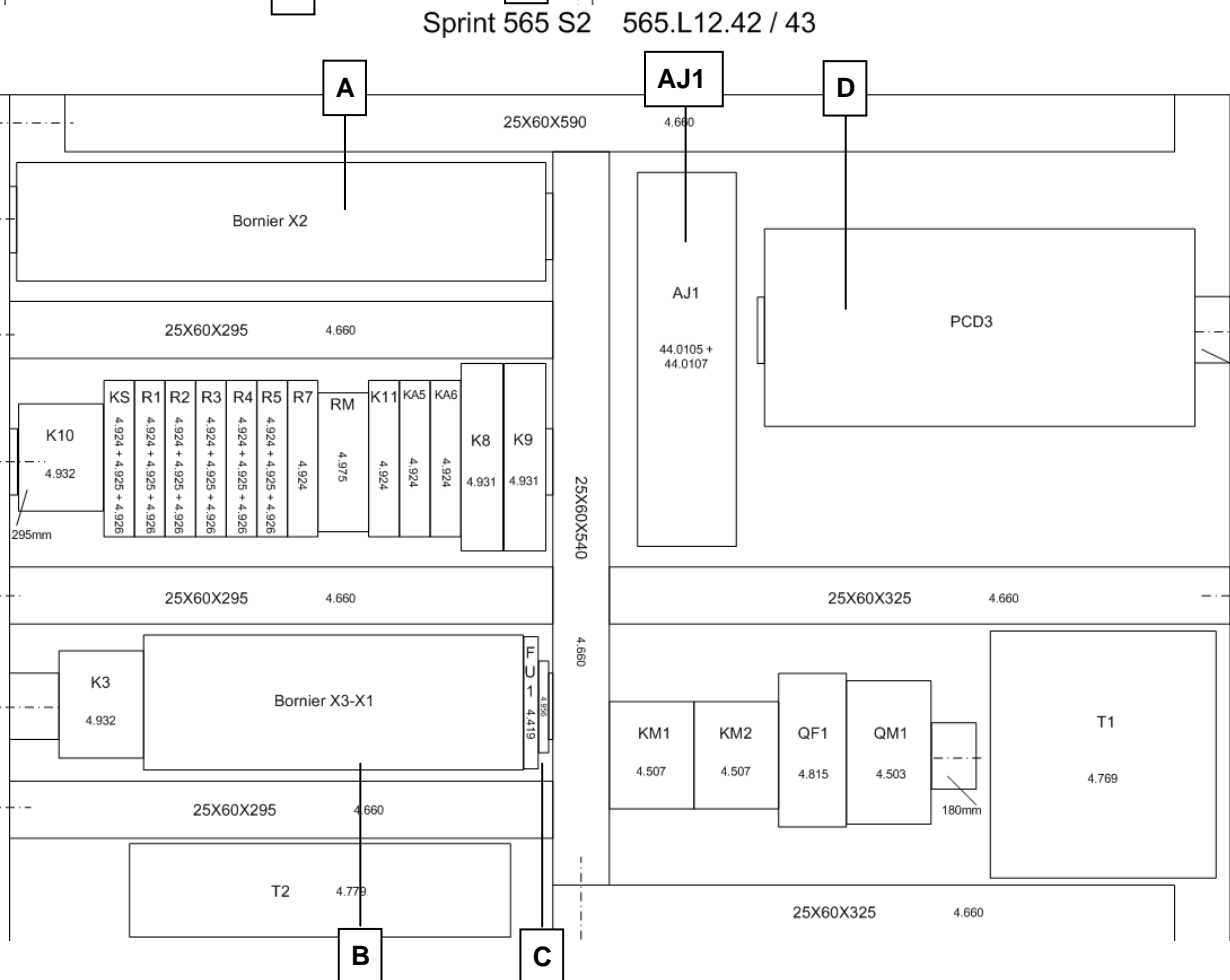
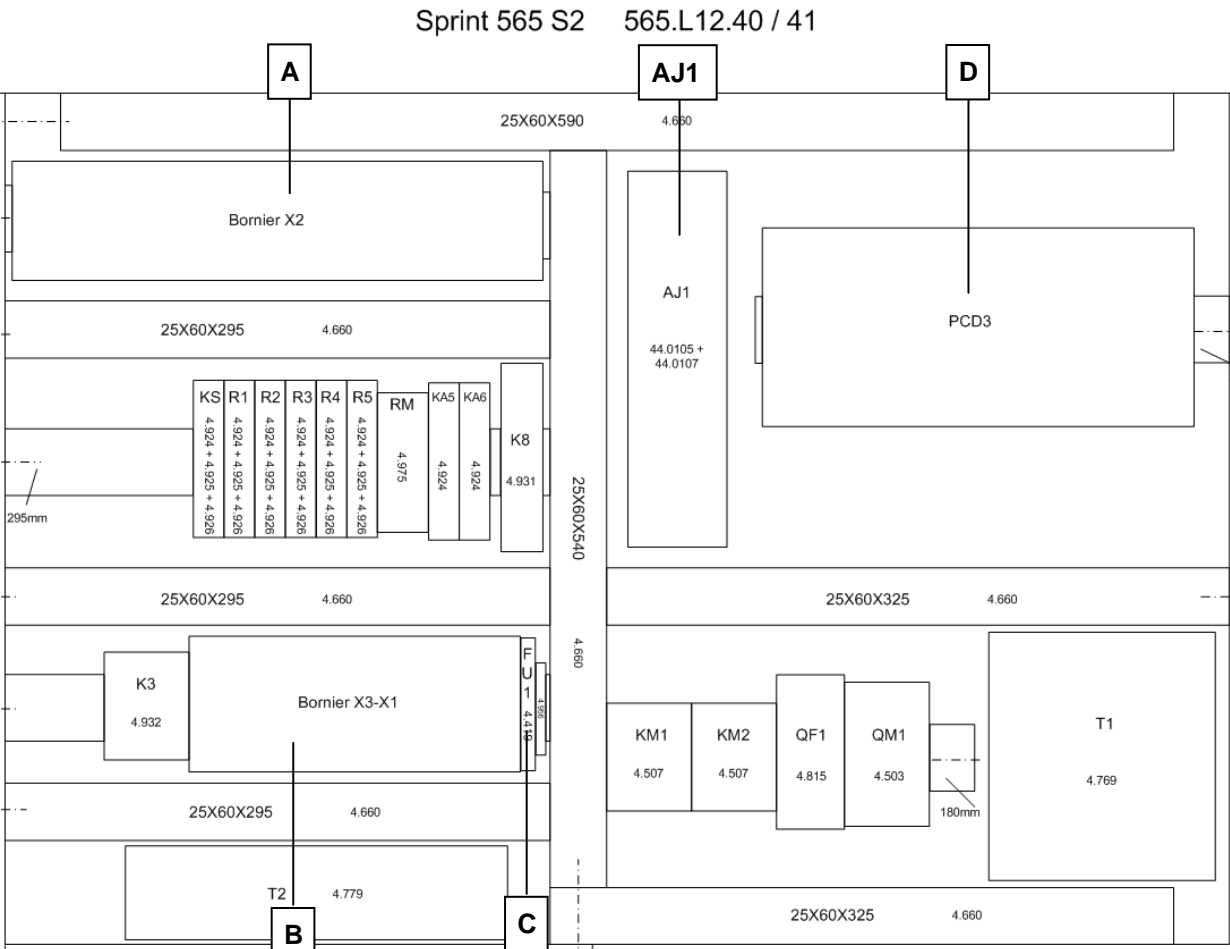
## 2. ELECTRICAL CABINET

### 2.1. List of the elements in the electrical cabinet

(see next page for their location)

Designation	Article No	Description
A	-	Interface end terminal block X2
B	-	End terminal block X3
C	-	Safety end terminal block X1
D	4.907	Programmable controller PCD3 (PLC)
AJ1	44.0105	400W servo amplifier
FU2	4.419	2A fuse for the automatic front rest motor
K3	4.932	Safety contactor
K8	4.931	Safety control relay
KA5	4.925	Automatic front rest motor opening relay M6 (option)
KA6	4.925	Automatic front rest motor closing relay M6 (option)
KM1	4.507	Hydraulic pump motor M1 relay
KM2	4.507	Loader motor relay M3
QF1	4.815	4A circuit breaker
QM1	4.503	Main circuit breaker 2,5 to 4 A
QS1	4.242	Main disconnect switch
R1	4.925	Alarm relay
R2	4.925	Relay bar feeder in loading cycle
R3	4.925	End of bar relay
R4	4.925	Spindle release relay
R5	4.925	Relay auxiliary end of bar
T1	4.769	1 ph transformer
T2	4.779	24 VDC, 150W cut-off power supply

2.2. LAYOUT OF THE ELEMENTS



## 2.3. Description of the elements in the cabinet

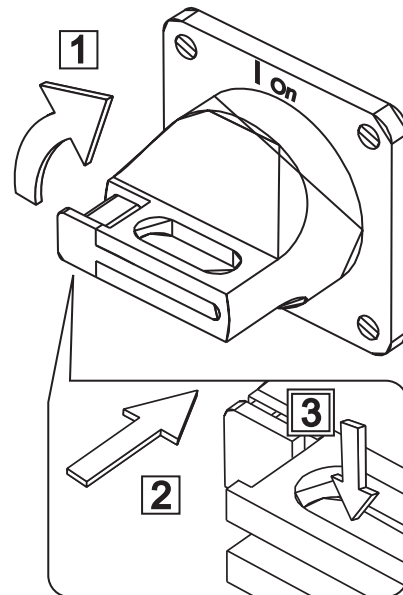
### 2.3.1. Master switch QS1

In accordance with the requirements of the international IEC standards, when the master switch is in the O/off position, it interrupts the input of the three phases in the bar feeder's electrical cabinet.

To power up the bar feeder, turn **(1)** the switch to the right, to the I/on position. To power off, turn the switch to the left, to the O/off position.

The master switch can be locked with a padlock. This means it is impossible to switch the bar feeder on.

Push **(2)** the locking mechanism and insert **(3)** the padlock into the opening. Lock the padlock.



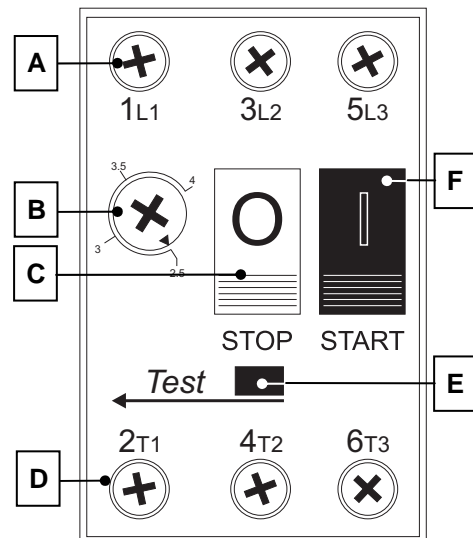
### 2.3.2. Main circuit breaker QM1

Circuit breaker QM1 interrupts the phases which power the hydraulic motor.

If the motor requires excessive power, the circuit breaker activates and push-button **(C)** STOP is released. For safety reasons, the power supply to the motor is immediately interrupted. After having located and repaired the problem causing this interruption, reset the circuit breaker by pressing the push-button **(F)** START.

The breaking current is factory set to 2.5 amperes.

Designation	Description
A	Power in connecting terminal
B	Setting the breaking current
C	Release button
D	Power out connecting terminal
E	Test push-button
F	Reset button



### 2.3.3. Circuit breaker QF1

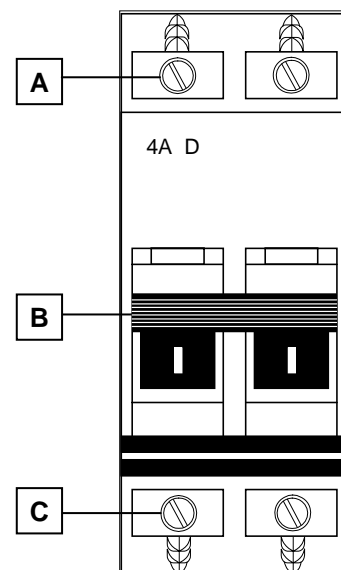
Circuit breaker QF1 protects the two phases, which power the transformer.

Should the latter require excessive power (>4 Amps), the breaker activates and lever **(B)** flips down.

The power supply to the transformer is immediately interrupted to avoid material damage.

After having located and repaired the problem causing this interruption, reset the lever of the circuit breaker.

Designation	Description
A	Power in connecting terminal
B	Lever on/off
C	Power out connecting terminal



### 2.3.4. Transformers 230 V (T1) and 24 VDC (T2)

The bar feeder's entire low voltage network and some of the interface signals (see point 4.3.2) are powered by the transformer.

The transformer has an output of 230 Volts which powers the servo motor amplifier. A 24 VDC power supply powers the rest of the machine.

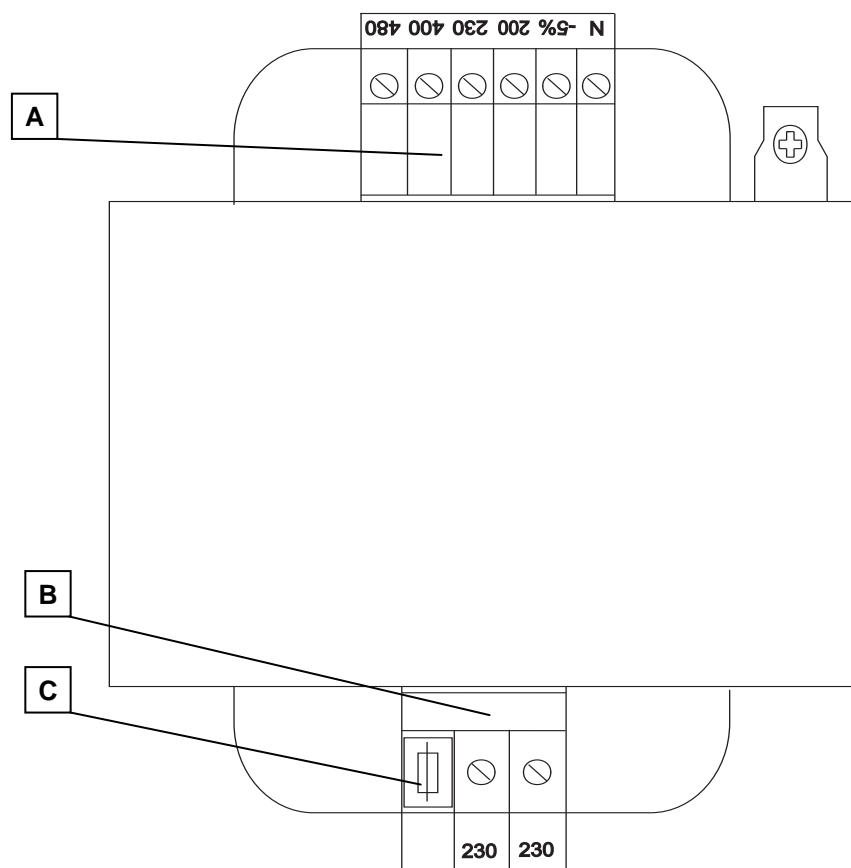
The two outputs are protected by a 3.15A fuse, fitted in a support.

To replace the fuse:

1. Unscrew the cap a quarter of a turn to the left;
2. Remove and replace the fuse with an identical one, and put the cap back.

Although fuses seldom need replacing, is it advisable to keep some spares on hand.

On the primary side, the transformer accepts a voltage of 220 to 480 volts/50 or 60 Hz. Measure the power provided by the lathe, and, if necessary, please adapt the cable on the power terminal block.



Designation	Description
A	Primary terminal block, 220V-480V / 50hz or 60 Hz $\pm$ 15%
B	Secondary terminal block, 230 V
C	Fuse (3.15 A)

### 2.3.5. Servo amplifier

The SERVO amplifier enables the programmable controller to control the movements of the motor.

The input values, as well as the position of the pusher carrier, are continuously registered. The values are saved by means of a battery, and, therefore, the axes do not need to be placed at zero when the bar feeder is powered on.

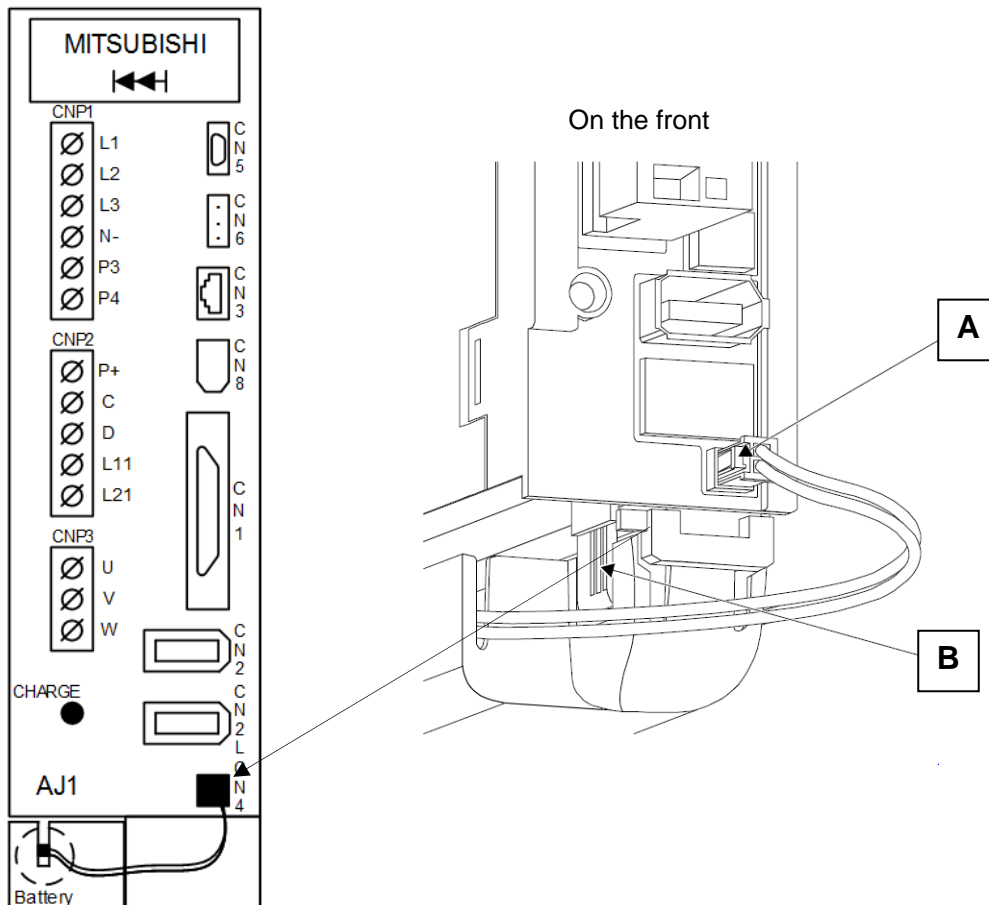
Although the batteries last for a relatively long time (2-3 years), it is advisable to keep spares on hand. When a battery becomes low, the amplifier signals this through a control light. The battery **is not rechargeable**, and must be replaced right away. The replacement must be done while the bar feed system is still powered up. The reference for the battery is **44.0107**.

#### Procedure:

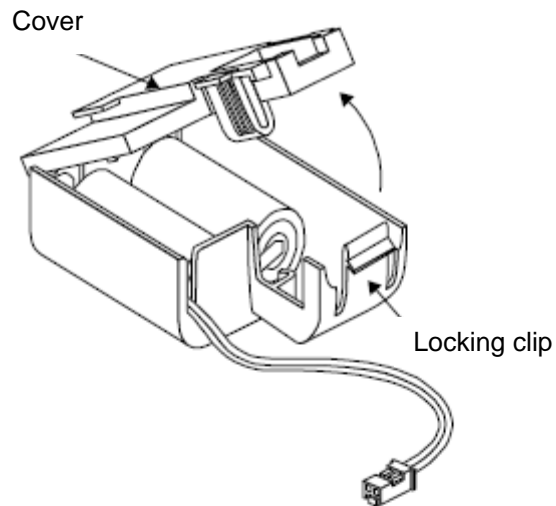
1. Disconnect the connector CN4 (A).
2. Open the battery compartment (B) according to the procedure below.  
The wires on the extremities of the battery connecting it to the connector are part of the battery.
3. Fit the new battery inside the support and close it.  
Connect the connector.



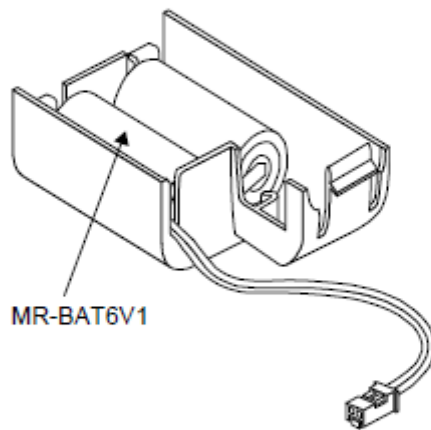
*Used batteries must be disposed of in an ecologically safe manner.*



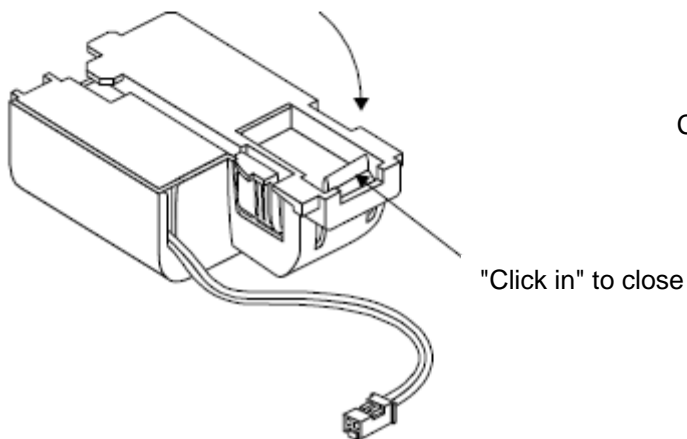




Open the battery compartment.



Remove the battery from its housing and replace.

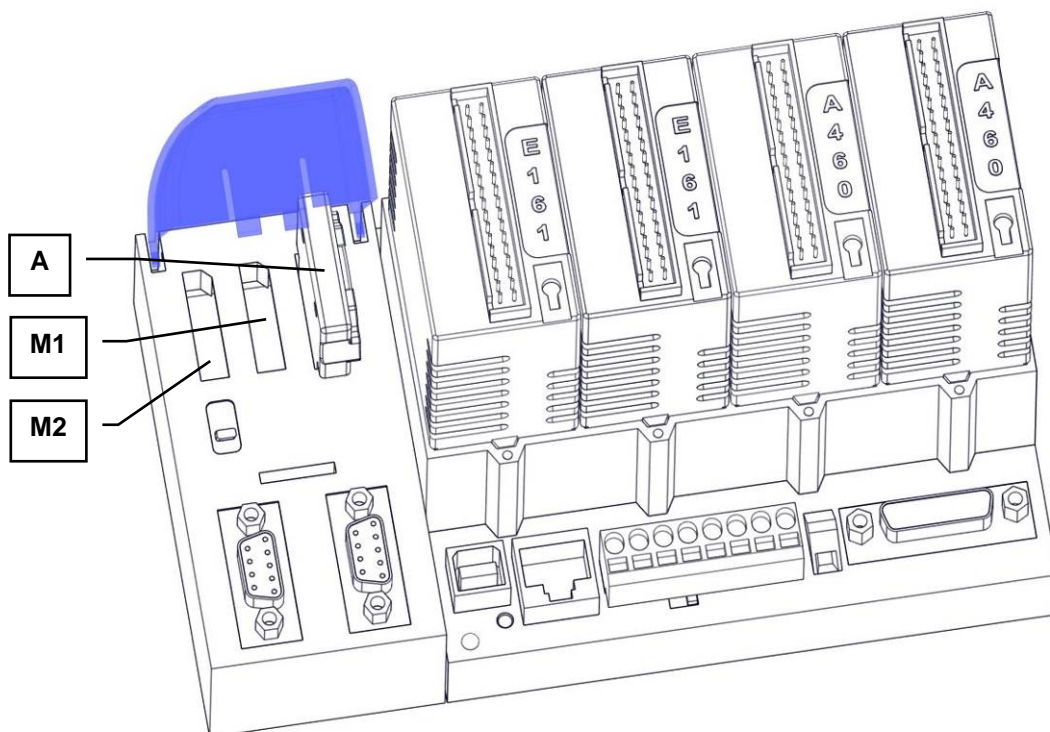


Close the battery compartment.

### 2.3.6. Programmable Logic Controller

The programmable controller (PLC) continuously scrutinises all data from the remote control, probes, switches, cells, interface, etc.

The program loaded into the PLC manages this information. The PLC then distributes the interface signals, controls the motors and displays the appropriate messages on the remote control.



Designation	Description
A	Battery module
M1	Slot for software updates
M2	Slot for memory expansion (in use as standard)



Although the batteries last for a relatively long time (2-3 years), it is advisable to keep spares on hand. When a battery becomes low, the amplifier signals this through a control light. The battery is not rechargeable, and must be replaced straight away. Replacement must take place while the bar feed system is powered up.

#### Procedure:

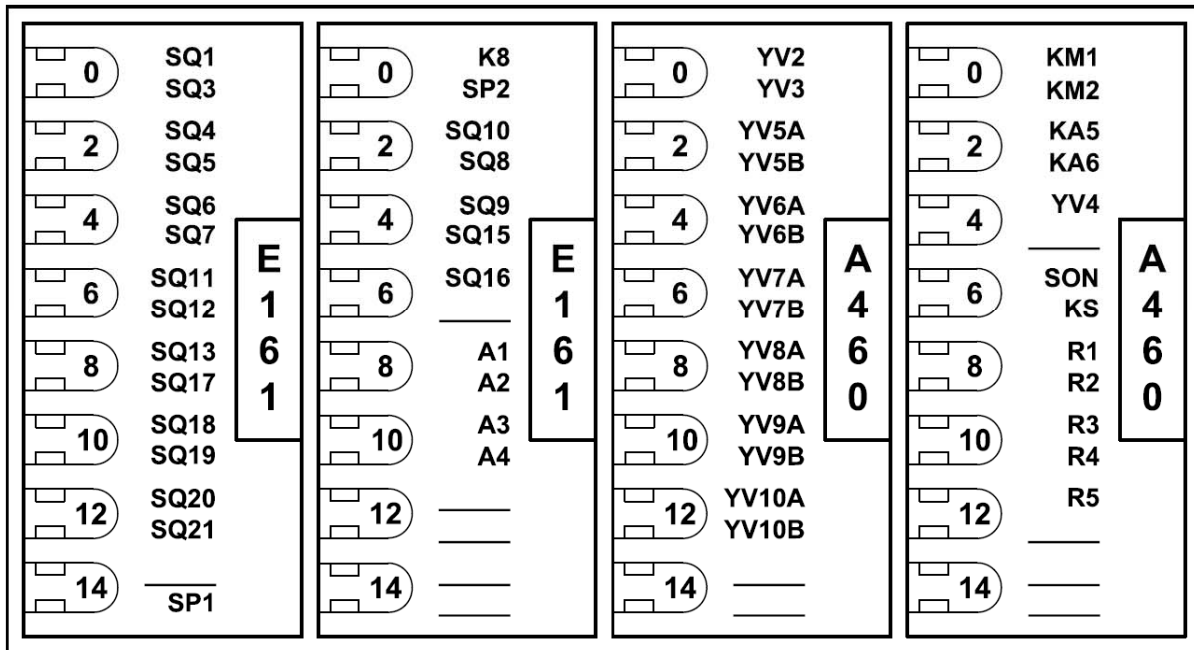
1. Lift the blue cover.
2. Pull out the card with the indicator lights.
3. Take out the battery using a small screwdriver. Fit the new battery.
4. Fit the card and close the unit.

*Used batteries must be disposed of in an ecologically safe manner.*

## 2.3.7. PLC inputs / outputs

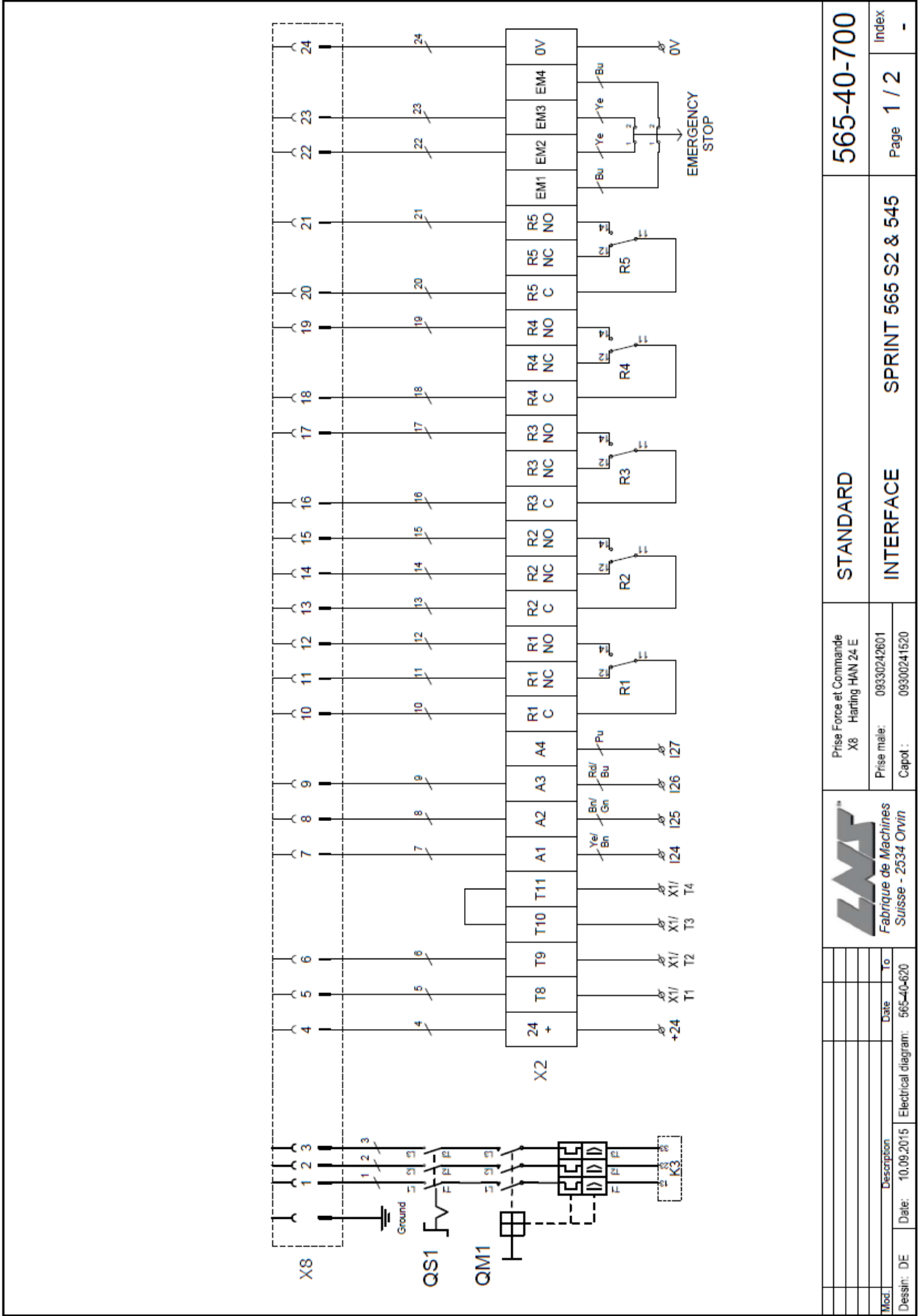
Inputs			Outputs		
Inlet	Des.	Description	output	Des.	Description
I0	SQ1	Measuring cell	O32	YV2	Material deposit valve
I1	SQ3	Pusher support open	O33	YV3	Air blast valve
I2	SQ4	Pusher support closed	O34	YV5A	Pusher bracket opening valve
I3	SQ5	Flag in referencing position	O35	YV5B	Valve pusher support closing
I4	SQ6	Material deposit (top)	O36	YV6A	Block 1 opening
I5	SQ7	Material deposit (bottom)	O37	YV6B	Block 1 closing
I6	SQ11	Main access cover safety	O38	YV7A	Block 2 opening
I7	SQ12	Remnant check	O39	YV7B	Block 2 closing
I8	SQ13	Front rest referencing	O40	YV8A	Block 3 opening
I9	SQ17	Block 1 closed	O41	YV8B	Block 3 closing
I10	SQ18	Block 2 closed	O42	YV9A	Block 4 opening
I11	SQ19	Block 3 closed	O43	YV9B	Block 4 closing
I12	SQ20	Block 4 closed	O44	YV10A	Block 5 opening
I13	SQ21	Block 5 closed	O45	YV10B	Block 5 closing
I14			O46	YV11	2-position pneumatic front rest
I15	SP1	Pneumatic pressure	O47	YV12	Profiled guide
I16	K8	Safety line relay	O48	KM1	Hydraulic pump relay (M1)
I17	SP2	Hydraulic pressure	O49	KM2	Bar loader motor relay (M3)
I18	SQ10	Retraction safety switch	O50	KA5	Auto front rest opening motor (M6)
I19	SQ8	Bar loader indexing	O51	KA6	Auto front rest closing motor (M6)
I20	SQ9	Presence of material on the bar loader	O52	YV4	Material clamping valve
I21	SQ15	Protective grille safety device	O53		
I22	SQ16	Bar loader optical safety device	O54	SON	Servo motor ON
I23	SQ10a	2-position option safety device (option)	O55	K5	Start relay
Interface			Interface		
I24	A1	Lathe collet signal	O56	R1	Alarm relay
I25	A2	Lathe in auto cycle	O57	R2	End of loading relay
I26	A3	Feed order	O58	R3	End of bar relay
I27	A4	Push order	O59	R4	Bar feeder in automatic cycle relay
I28	A..	Configurable interface input	O60	R5	Bar feeder in automatic cycle relay
I29	A..	Configurable interface input	O61	R..	Configurable interface output
I30	A..	Configurable interface input	O62	R..	Configurable interface output
I31	A..	Configurable interface input	O63	R..	Configurable interface output
INT0	SQ14	Front rest pulse input			

## LNS SPRINT 565 S2 / 545 PLC I/O SIGNALS MAP



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3. INTERFACE DIAGRAM

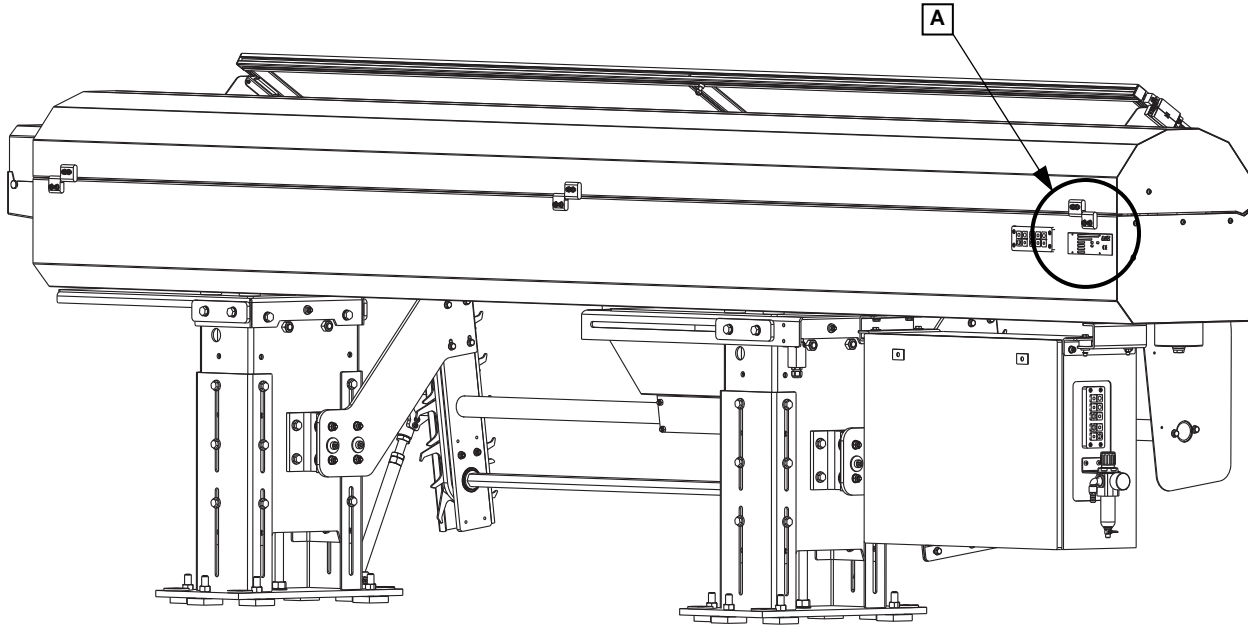


565-40-700		Index	
Page		1 / 2	
STANDARD		SPRINT 565 S2 & 545	
INTERFACE		-	
Prise Force et Commande		09330242601	
X8 - Harting HAN 24 E		09300241520	
Prise male:			
Capot:			
LMS <sup>®</sup>		Fabrique de Machines	
		Suisse - 2534 Orvin	
Mod.	Description	Date	To
Dessin: DE		10.09.2015	565-40-620
Electrical diagram:			

## 4. INTERFACE



Before connecting, check to make sure that the voltage of the bar feeder corresponds to the one provided by the lathe. The supply voltage of the bar feeder is indicated on the identification plate (A).



### 4.1. Description

The interface cable(s), between the bar feeder and the lathe is (are) provided by LNS.

Although an example of an interface diagram is provided, the diagram for the interface corresponding to your device, essential when making the electrical connection, is located inside the electrical cabinet.

When making connections, ensure that the cables are long enough to allow the entire travel of the retraction system (250 mm) to be used.



Should the interface instructions not be observed during start-up, the damaged elements as well as the resulting damages are not covered by warranty.

## 4.2. Connection

### 4.2.1. Power supply

Voltage: 3 x 220-480 V, 50 / 60 Hz + Ground ( $\pm 10\%$ )

Maximum current: 3 x 220 V = 3 A  
3 x 480 V = 1.5 A



Before connecting, check to make sure that the voltage of the bar feeder corresponds to the one provided by the lathe. The voltage of the bar feeder is indicated on the identification plate.

In the case where the voltage supplied by the lathe does not match that provided for the bar feeder, the following components must be adapted:

- a) transformer T1
- b) hydraulic pump motor
- c) bar magazine motor

LNS bar feeders are equipped with their own thermal protection systems (breakers, thermal relays, fuses, etc.). The power supply for the bar feeder should be connected to the output of a breaker mounted in the electrical control box of the lathe (10 A max.).

For the wiring inside the lathe, the section of the cables should be at least 1.5 mm<sup>2</sup>.

### 4.2.2. Signals from the lathe to the bar feeder

Always refer to the electrical diagrams shipped with the bar feeder and placed in the electrical cabinet.

- All the wires for the interface connections are numbered.
- All LNS bar feeders are equipped with a + 24 V power supply.

#### a) 24 V dc power supply

Corresponds to the +24 V of the bar feeder. This power shall be used to connect the signals from the lathe to the PLC.

- All signals from the lathe to the PLC shall be powered by the +24 V of the bar feeder.
- All signals from the bar feeder to the lathe shall be powered by the +24 V of the lathe.

For the other types of connections, please contact LNS S.A. or their local representative.

#### b) "EMERGENCY STOP" signal on the lathe XT8-XT9 (XT10-XT11)

This signal is part of the safety link (Emergency Stop circuit) on the bar feeder.

XT8-XT9 corresponds to the Emergency Stop signal of the lathe. If the circuit is open, the bar feeder will go into an Emergency Stop mode.

When the lathe is in an Emergency Stop mode, or if the safety line of the bar feeder is interrupted, an alarm will sound and the R1 relay of the bar feeder will be triggered (see description of the R1 relay, below).

**c) Lathe collet signal (Input A1)**

This signal is for checking the mode of the lathe collet (open or closed), and is mainly used for feeding parts.



For safety reasons, wire a normally open contact, coming from the signal of the lathe collet. A collet open signal must be selected.

**d) Lathe in automatic cycle (Input A2)**

This signal indicates that the lathe is in automatic cycle.

**e) Feeding command (Input A3)**

Should the lathe be equipped with a secondary spindle or pickup spindle, if the part requires multiple feeds (double feeding), or if the lathe is equipped with a sliding headstock, this signal will be used as a load command for the new bar.

**f) Part feeding command (Input A4)**

This signal orders the forward movement of the feeding pusher and the bar, independently of the mode of the lathe collet.



As long as this signal is present, the signal of the foot switch to open and close the lathe collet must be locked. The lathe should not start up in automatic cycle until the bar is clamped in the collet.

**4.2.3. Signals from the bar feeder to the lathe****a) R1 alarm relay**

When the bar feeder is in normal operation, the R1 relay is energized. In the event of an alarm or break in the emergency stop circuit, this relay is de-energized.

For safety reasons, this signal should bring to a stop all of the axis movements of the lathe as well as the rotation of the spindle.



*When the bar feeder is in alarm mode, the feeding pusher control signal should also de-energize.*

**b) R2 lathe start and stop relay**

Either: - Confirmation of the pusher command  
- Confirmation of the loading of a new bar

After the new bar has been loaded and positioned on the lathe spindle, relay R2 confirms the end of the loading cycle.



*The operational cycle of relay R2 (pulsed, latched, etc.) is controlled by parameters.*



**c) R3 end of bar signal relay**

When the feeding pusher reaches the End of Bar position, relay R3 energizes. This signal is used to indicate to the lathe that there is not enough material left to make another part.



*The operational cycle of relay R3 (pulsed, latched, etc.) is controlled by parameters.*

**d) R4 spindle release relay (locking of the lathe)**

This signal is present as soon as the bar feeder is in automatic mode (Auto + Start).

**e) Emergency stop button on the bar feeder (EM2-EM3 / EM1-EM4)**

When the Emergency Stop button is pressed, the contact opens. The lathe must be in Emergency Stop mode, and the feeding pusher signal from the lathe must switch off.

Two normally closed contacts on the Emergency Stop button are available for connection in the Emergency Stop circuit of the lathe.

**4.2.4. Options**

The options described below are an integral part of the standard equipment of LNS bar feeders.

These signals, however, are not required for the proper operation of the devices, or the safety locking for protecting persons and materials. The options are available only to optimize production conditions.

**R5 auxiliary end of bar relay**

This signal may be used to reduce the length of the remnant in case the remnants exceed the maximum admissible length for the parts catcher or its chip conveyor. Relay R5 energizes as soon as the feeding pusher reaches the programmed position.

**4.2.5. Review of safety instructions relating to the interface**

- The lathe foot switch for opening the lathe collet or mandrel should not be operational during the automatic cycle of the lathe.
- The lathe foot switch should not be operational as long as the feeding pusher feed command signal is present.
- Whenever possible, it is advisable to interlock lock the manual command for opening the lathe collet or mandrel while the feeding pusher command signal is on.
- If the lathe is in the Emergency Stop mode, the bar feeder must also be in the Emergency Stop mode, and vice-versa.
- If the bar feeder generates an alarm, the lathe must go into alarm mode. The feeding pusher command signal must disappear, the spindle and axis rotation must stop.



## **CHAPTER 5 : PNEUMATICS**

## 1. PNEUMATIC EQUIPMENT



Please read the safety instructions provided at the beginning of this manual before handling the following devices.

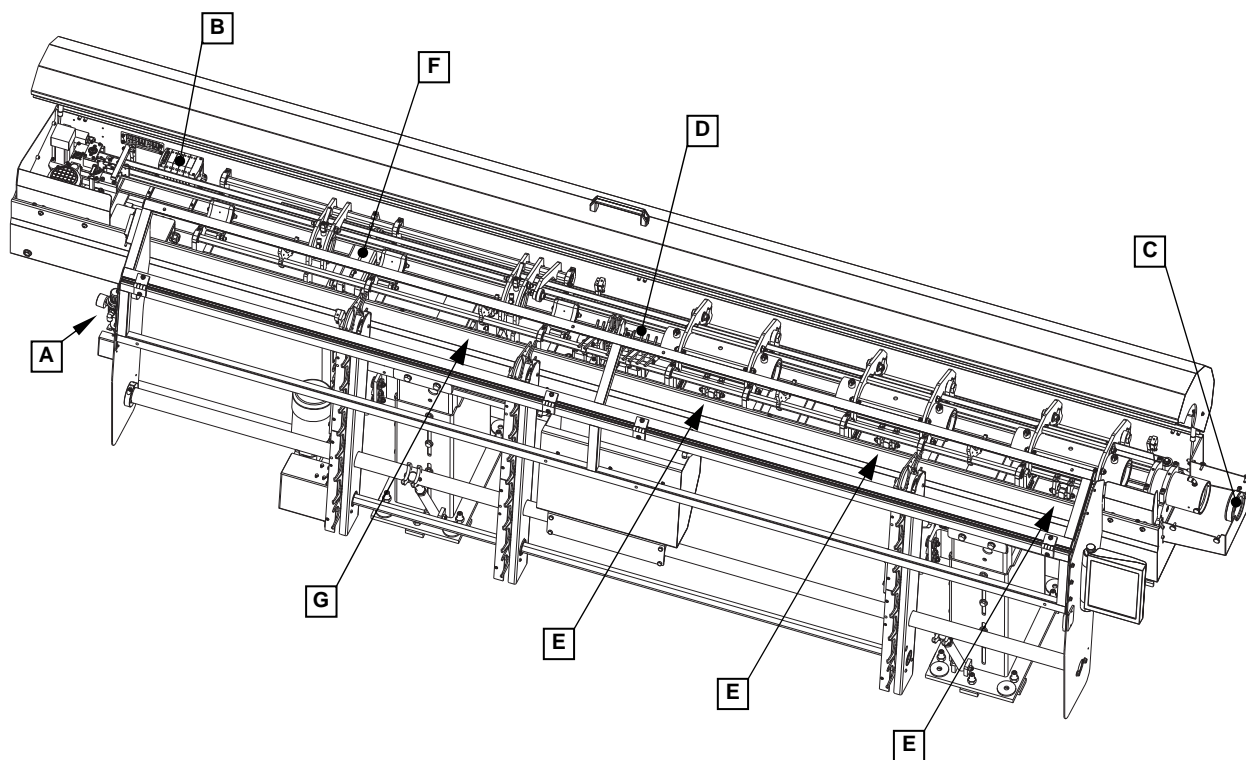
### 1.1. Description

The following devices for the bar feeder are actuated pneumatically:

- Deposit of the bar in the guiding blocks, opening and closing of the guiding blocks
- Material clamping for insertion/extraction of the collet
- Retraction of the pusher when the new bar is being loaded
- Air blast

To guarantee optimal operation of the bar feeder, a minimum pressure of 5 bar (75 psi/500 kPa), and a maximum pressure of 6 bar (90 psi/600 kPa) are mandatory.

### 1.2. Layout of the pneumatic elements



Designation	Article no.	Description
A	3.636 / 3.638 Complete kit: 3.636K	Air handling unit (ref 3.636) with pressure control switch (ref 3.638)
B	(*)	Pneumatic battery (2M: 3.657 / 3M: 3.658 / 12': 3.659 / 4M: 3.660)
C	(*)	Air blast
D	3.97080.B.40	Pneumatic cylinders of the clamping of the material
E	3.97040.A.75	Pneumatic cylinders for opening and closing the blocks
F	3.96063.B.85	Pneumatic cylinder for retracting the pusher
G	3.96063.B.75	Bar deposit pneumatic cylinder

(\*) Some elements which are not clearly visible can be seen in chapter 7/General description.

## 2. AIR HANDLING

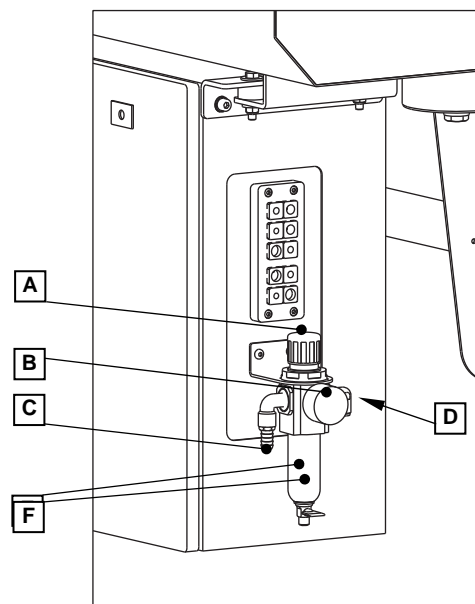
### 2.1. Description

The air filtering device serves to filter air and to set its pressure before it is distributed into the pneumatic circuit of the bar feeder.

The air must be supplied at a minimum pressure of 5 bar (500 kPa) and, whenever possible, be clean and dry.

### 2.2. Layout of the elements

Designation	Description
A	Pressure regulator
B	Pressure gauge
C	Inlet
D	Regulated outlet to the pneumatic battery
E	Decanter
F	Automatic purging



### 2.3. Connections

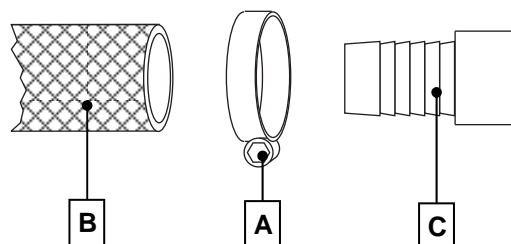
The pneumatic connection (C) is located behind the electrical cabinet.

For the pneumatic connections of the bar feeder, the customer must provide a pipe (B) with an inside diameter of 1/2" (12.7 mm).

Provide an air hose long enough to allow the complete travel (250 mm) of the retraction system to be used.

When the pipe is connected, it should not trail on the ground as it could be damaged.

1. Place a clamp (A) around the pipe (B)
2. Push the pipe (B) onto the fitting (C)
3. Tighten the clamp (A) to make it airtight.



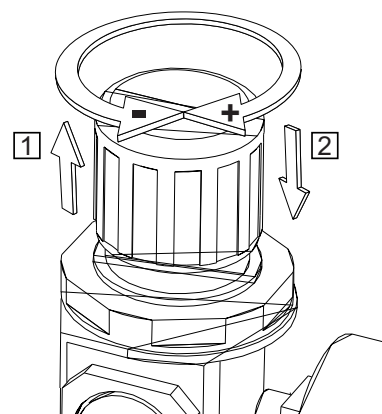
### 2.4. Settings

1. Unlock the adjusting knob by pulling it upward.

To increase the pressure, turn it clockwise. To decrease it, turn it in the opposite direction.

The service pressure should be set at 5 bar.

2. When the settings are done, lock the adjusting knob by pushing it downward.

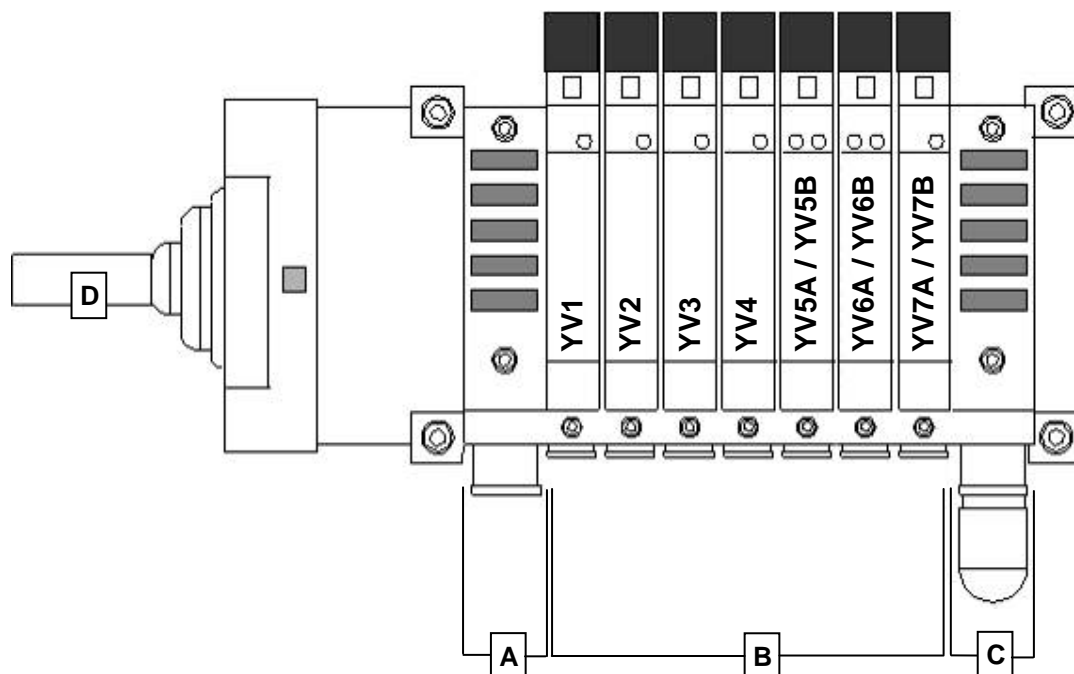


### 3. PNEUMATIC BATTERY

#### 3.1. Description

The pneumatic battery includes the control and monitoring elements of the bar feeder pneumatic circuit.

#### 3.2. Layout of the elements



Designation	Description
A	Inlet connections
B	Outlet connections
C	Silencer
D	Controller connection
YV1	Bar loading valve
YV 2	Valve air blast
YV 3	Valve remnant device clamping
YV 4	Valve protection SQ1 / Pusher lock in reference position
YV 5A	Pusher bracket opening valve
YV 5B	Valve pusher support closing
YV 6A	Guiding channel opening
YV 6B	Guide area closure valve
YV 7A	Pusher against locked channel cover valve
YV 7B	Pusher release in the channel valve

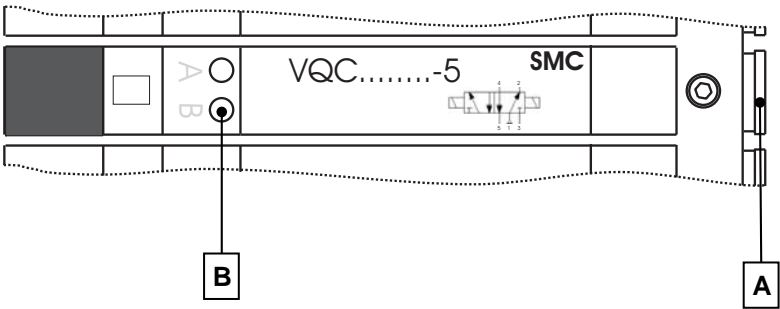
3.3. Description of the components

3.3.1. Solenoid valves

Directly controlled by the PLC, the solenoid valves activate the pneumatic cylinders.

The pneumatic cylinders can be activated manually by pressing a key (B). This manoeuvre may prove to be useful during tests or maintenance.

When the key (B) is released, the pneumatic cylinder returns to its rest position (except for cylinders activated by two solenoid valves).



Designation	Description
A	Air outlet
B	Manual activation key

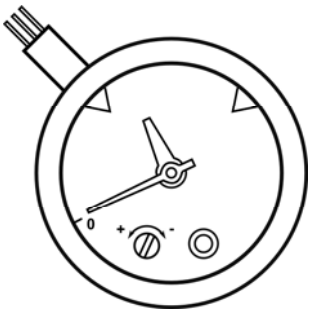
3.3.2. Pressure control unit

To guarantee optimal operation of the bar feeder, the service pressure must be at least 5 bars. The pressure control unit serves to confirm that this pressure is present and adequate.

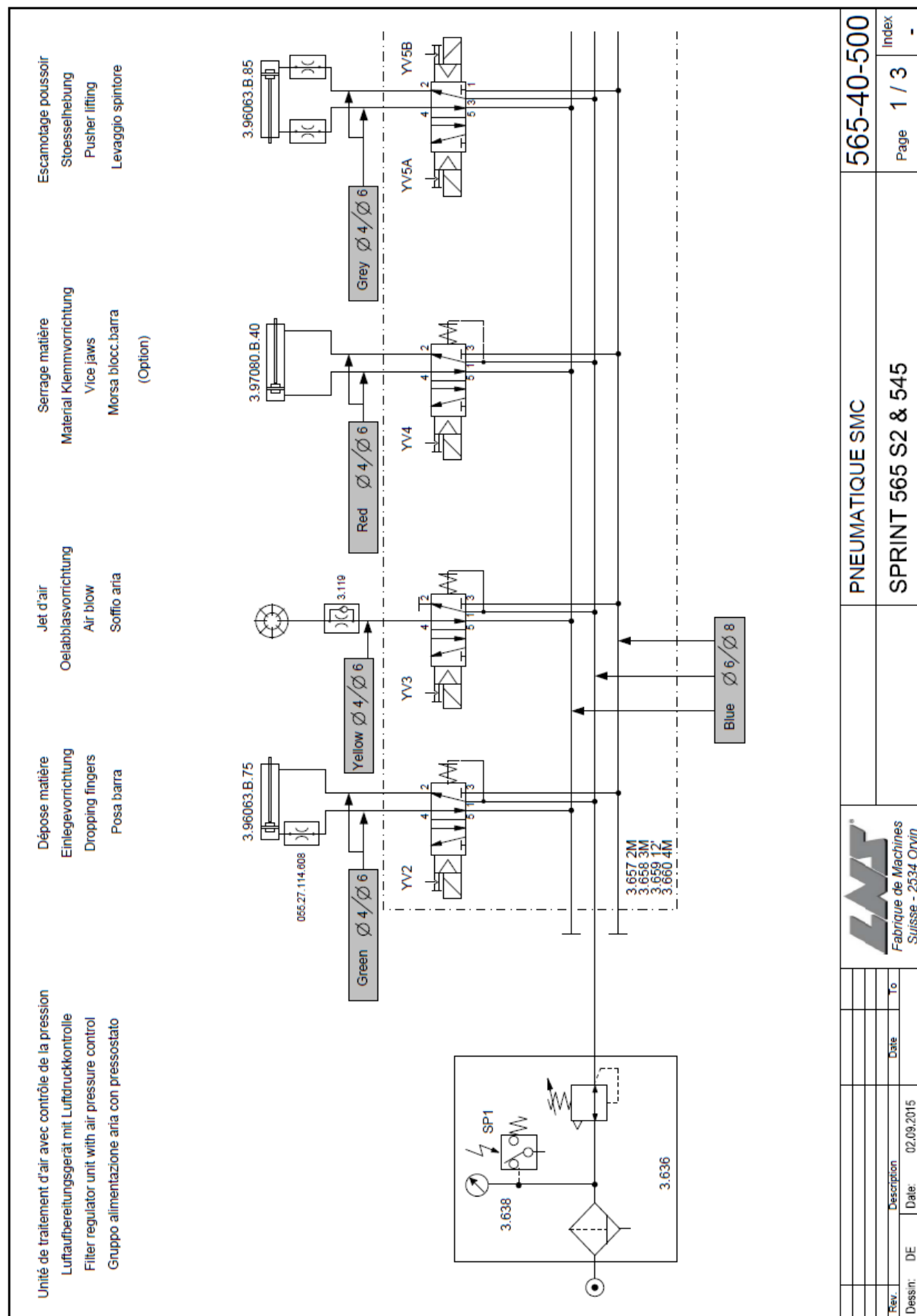
The pressure control unit is directly integrated into the pressure control unit.

Setting procedure for the pressure control unit:

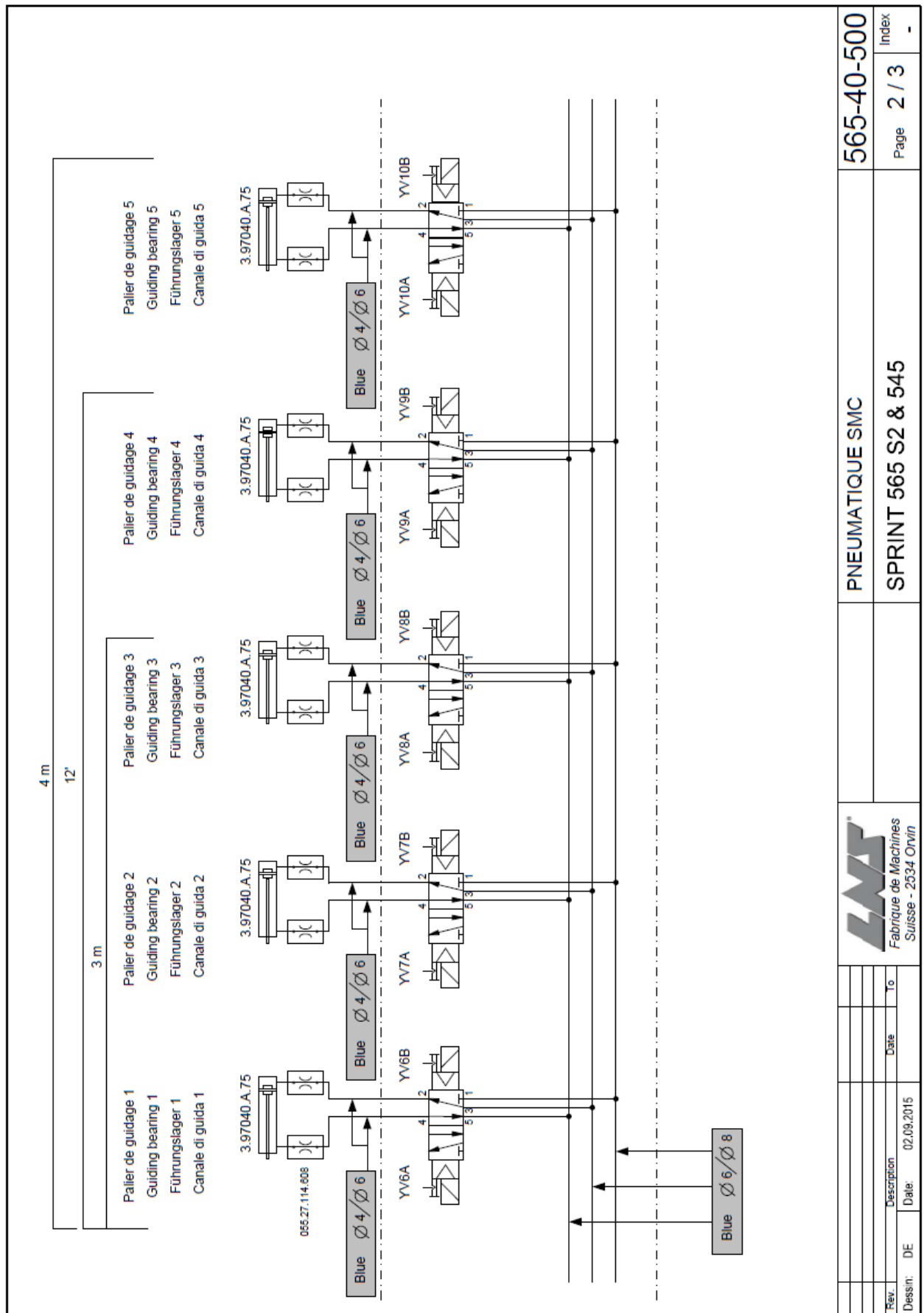
- Remove the transparent panel from the pressure gauge
- Using a screwdriver, turn the setting screw
- Refit the transparent panel.

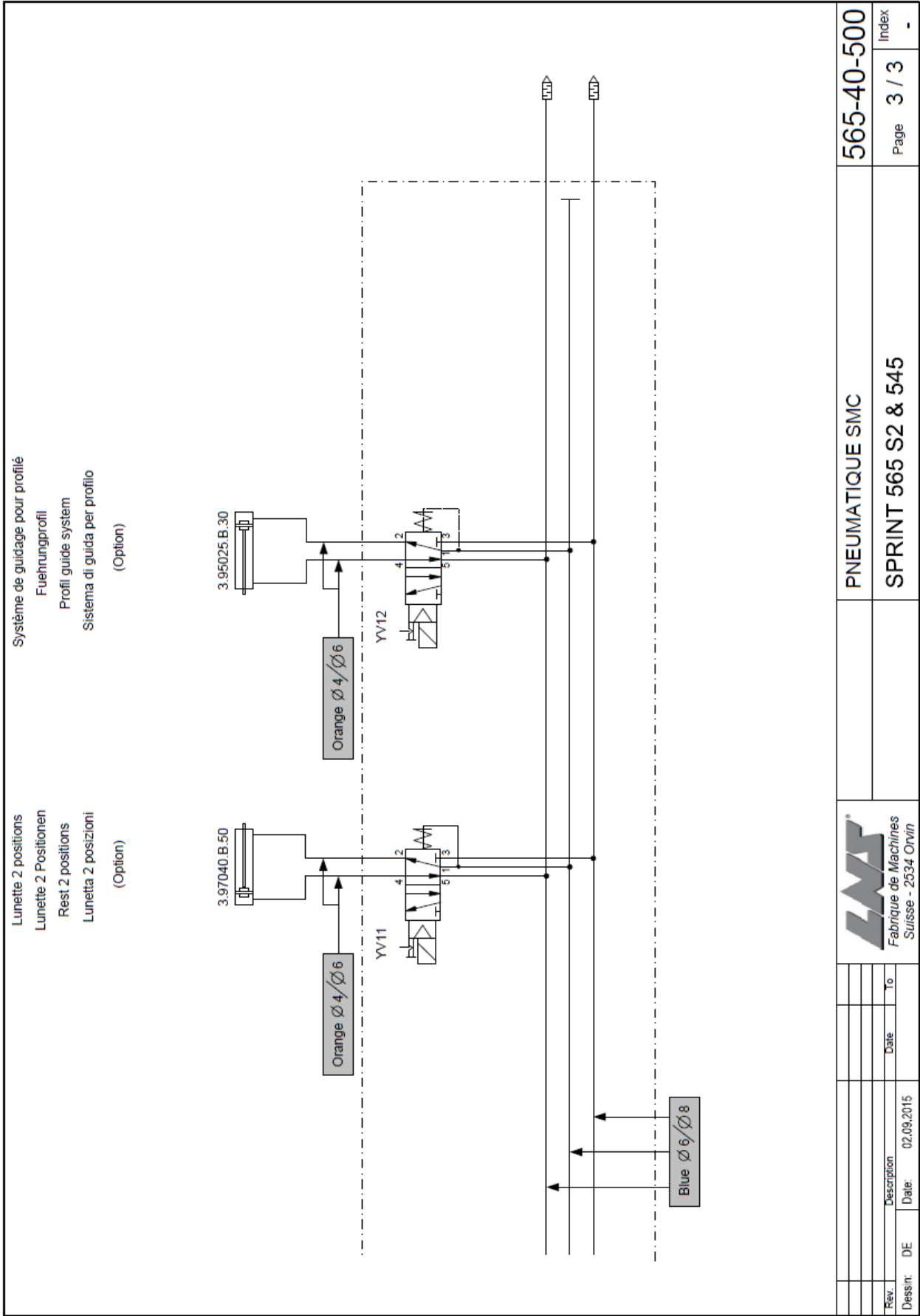


### 3.4. PNEUMATIC DIAGRAMS









## **CHAPTER 6 : HYDRAULICS**

## 1. HYDRAULIC EQUIPMENT



Please read the safety instructions provided at the beginning of this manual before handling the following devices.

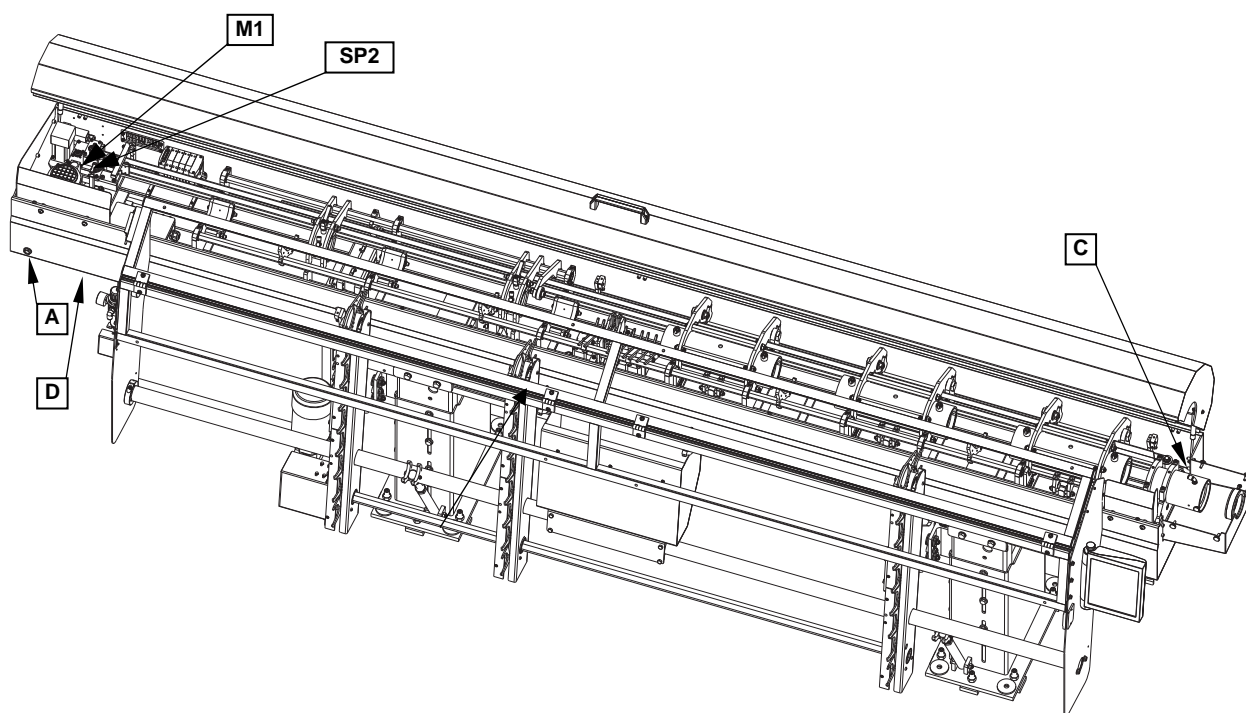
### 1.1. Description

The guiding concept for the bar feeder consists mainly of keeping the bar suspended in an oil bath.

The hydraulic oil is contained in the chassis of the device. Aspirated by a pump motor, it is injected into the front rest and the guiding blocks.

A pressure control unit measures the pressure at the outlet of the pump. A level allows the filling rate of the hydraulic tank to be monitored.

### 1.2. Layout of the elements

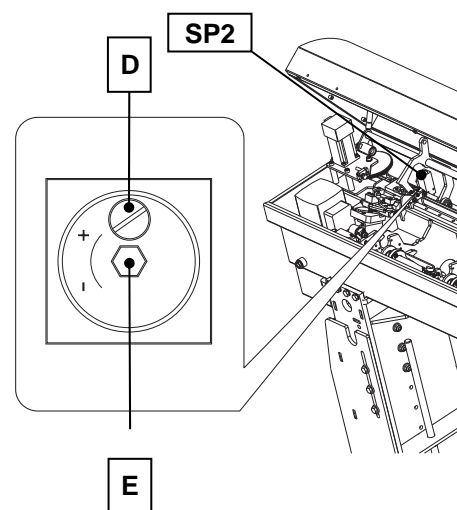


Designation	Article No	Description
A	2.216	Oil gauge
B	-	Oil supply to the guiding blocks (not shown here)
C	-	Front rest supply tube
D	3.124	Drain plug
M1	2.210.150	Hydraulic pump motor
SP2	4.050	Pressure control switch

### 1.3. Setting

The pressure is constantly monitored by a pressure switch set in the factory at a point of release of 0.5 bar (50 kPa). It may be adjusted, if necessary, as follows:

1. Using a screwdriver, unscrew the clamping screw (**D**).
2. Insert a hex head wrench (5mm) into the center of the pressure switch (**E**).  
By turning clockwise, the release of the pressure control unit will take place at a pressure higher than the original setting. Turning in the opposite direction will produce the reverse.
3. When the adjustment is completed, retighten the clamping screw (**D**).



### 1.4. Filling and draining

The bar feeder is supplied without oil. Depending on the length of the bar feeder, 80 (3M), 90 (12') or 100 kg (4M) of hydraulic oil of the type indicated below must be made available by the customer. The oil must be poured directly into the machine.

Viscosity equivalence table			
ISO 100	100 mm <sup>2</sup> /s (cSt) at 40°C	DIN 68	8°E to 50°C

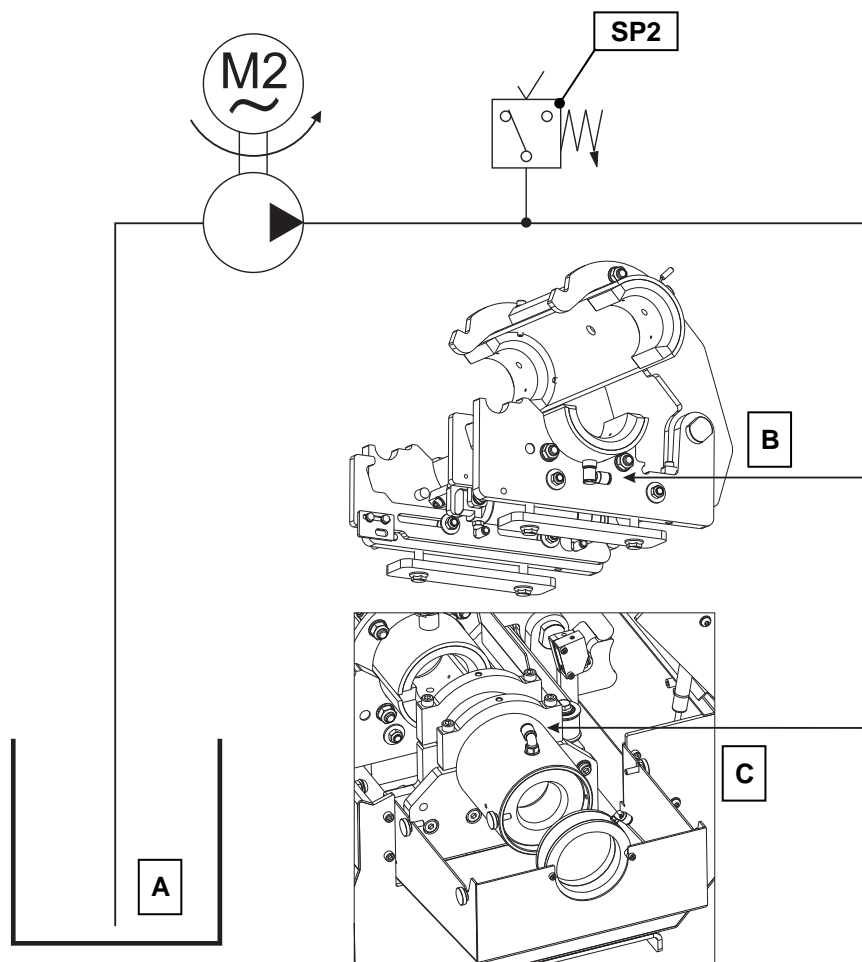
Consult your supplier who will recommend the correct oil for you.


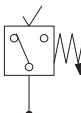
To drain the bar feeder, place a container with sufficient capacity underneath the drain plug, and unscrew the drain plug.



A thicker oil (ISO 150) may, in certain cases, produce better results when guiding profiled bars.

## 2. HYDRAULIC ELEMENTS



Symbol	Description	Designation
	Hydraulic pump motor	M2
	Hydraulic pressure control unit	SP2
-	Device chassis	A
-	Guiding block	B
-	Front rest	C

## **CHAPTER 7 : GENERAL DESCRIPTION**

## 1. BAR MAGAZINE



Please read the safety instructions provided at the beginning of this manual before handling the following devices.

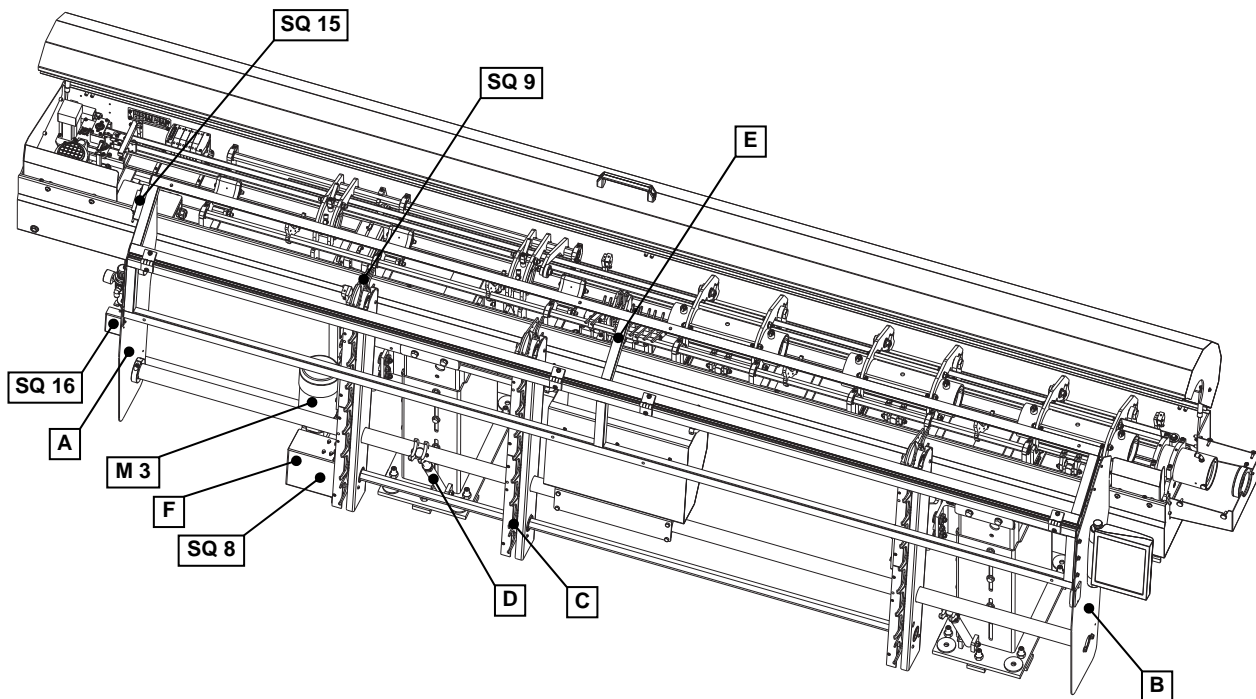
### 1.1. Bar magazine with lift

#### 1.1.1. Description

For all lengths of bar feeder (3M, 12', 4M), the bar magazine comprises 3 bar supports. The bars are set down on the support hooks. A gear motor then lifts the bars into the bar feeder. A light curtain (SQ16) prevents any movement of the magazine if something breaks its beam. A retractable guard, secured by a sensor (SQ15), controls access to the inside of the bar feeder.

When they are on the magazine, the bars must be against the rear limiter (**A**).

#### 1.1.2. Layout of the elements



Designation	Article no.	Description
A	-	Rear limiter
B	-	Front limiter
C	-	Bar deposit hook
D	-	Magazine support
E	-	Retractable guard
F	-	Drive
M 3	4.886	Bar magazine gear motor
SQ 8	4.391	Magazine indexing proximity sensor
SQ 9	4.772	Optoelectronic sensor for material check on the magazine
SQ 15	4.894	Retractable guard magnetic sensor
SQ 16	4.773	Optoelectronic sensor for magazine safety



## 2. GUIDING BLOCKS



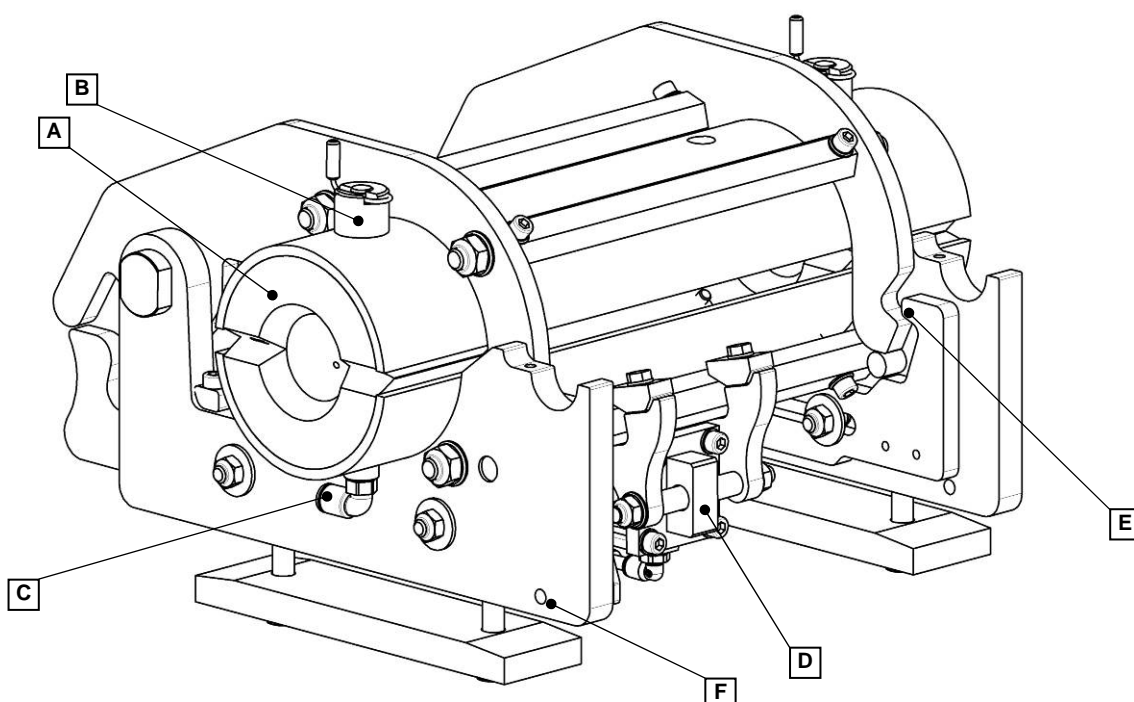
Please read the safety instructions provided at the beginning of this manual before handling the following devices.

### 2.1. Description

The guiding blocks comprise a mobile cover and a fixed lower base, which house the guiding elements. Sets of guiding elements of different diameters are available.

Hydraulic oil is injected into the cover and distributed along the guiding shells. Thanks to this oil bath, the bar which is rotating is held in the centre of the guide block.

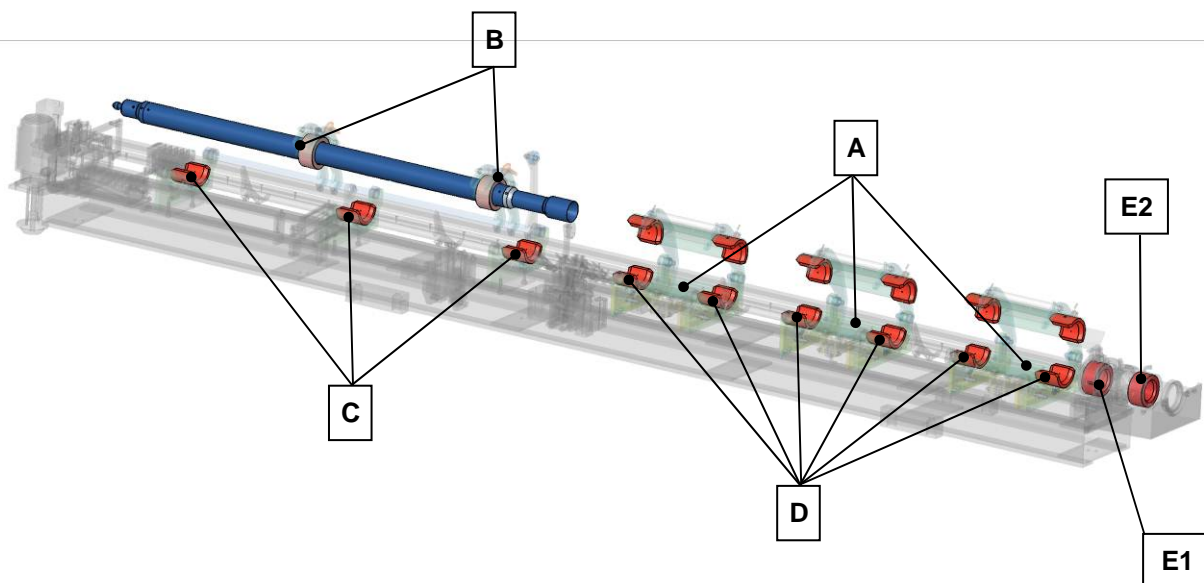
### 2.2. Layout of the elements (\*)



Designation	Article No	Description
A	-	Guiding blocks
B	-	System for retaining the upper blocks
C	-	Hydraulic supply to the blocks
D	3.97040.A.75	Guiding channel opening cylinder
E	-	Block locking system
F	4.391	Block opening/closing sensor location (SQ 17 to 21)

(\*) Some elements are shown in more detail in the following paragraphs.

## 2.3. Guiding elements (shells)



		number of blocks [A]	pusher	pusher carrier round split shell [B]	lower shell [C]
Sprint 545	3m	3	STD	2 (014.06.033/...)	3 (023.031.064/...)
	12'	4			
	4m	5			
Sprint 565 S2	3m	3	STD	2 (014.06.033/...)	3 (023.031.064/...)
	12'	4			
	4m	5			

		for round bars		
		sets of shells [D]	fixed front rest round shell [E1]	auto front rest round shell [E2]
Sprint 545	3m	6 (055.031.114/...)	2 (023.31.114C/...)	1 (023.31.114C/...)
	12'	8 (055.031.124/...)		
	4m	10 (055.031.134/...)		
Sprint 565 S2	3m	6 (055.031.114/...)	2 (023.31.114C/...)	1 (023.31.114C/...)
	12'	8 (055.031.124/...)		
	4m	10 (055.031.134/...)		

Optimum guidance quality is achieved by using guiding elements 1 mm larger than the bar diameter



The guiding channels are sensitive to corrosive products.  
Use a soft cloth to clean them.

When changing the guiding elements and the pusher, **always** ensure that point 3.2.3 of the set-up manual is applied.

## 2.4. Long guiding elements for profiled bars (option)

To improve guidance of hexagonal bars, LNS offers **long guiding elements**. These elements replace the standard guiding elements on the double blocks and enable work to be carried out at optimum rotation speeds. The play between the points of the profile and the guiding element should be between 0.5 and 3 mm max.



For the article no., refer to point 2.5.1

## 2.5. Rotating shell for profiled blocks (option)

A rotating shell has been added in the front rest to hold the profiled bar in place, significantly improving its stability. A fitting is used to lubricate the rotating shell.

Max permitted hexagonal bar: **46 mm across flats**  
 Max permitted square bar: **38 mm across flats**

The internal diameter of the rotating shell is always adapted to the diameter on the points of the bar + 0.2 to 0.3 mm. In this case, the bar feeder works with a tapered pusher with a smaller diameter than that of the rotating shell.

### 2.5.1. Elastomer rotating shell

		for profiled bars		
		long shell.	fixed front rest round shell [E1]	auto front rest round shell [E2]
Sprint 545	3m	3 (055.031.374/...)	2 (023.31.114/...)	1 (023.31.114/...)
	12'	4 (055.031.384/...)		
	4m	5 (055.031.394/...)		
Sprint 565 S2	2m	3 (055.031.364/...)	2 (023.31.114/...)	1 (023.31.114/...)
	3m	3 (055.031.374/...)		
	12'	4 (055.031.384/...)		
	4m	5 (055.031.394/...)		



The guiding channels are sensitive to corrosive products.  
 Use a soft cloth to clean them.

When changing the guiding elements and the pusher, **always** ensure that point 3.2.3 of the set-up manual is applied.

### 3. PUSHER



Please read the safety instructions provided at the beginning of this manual before handling the following devices.

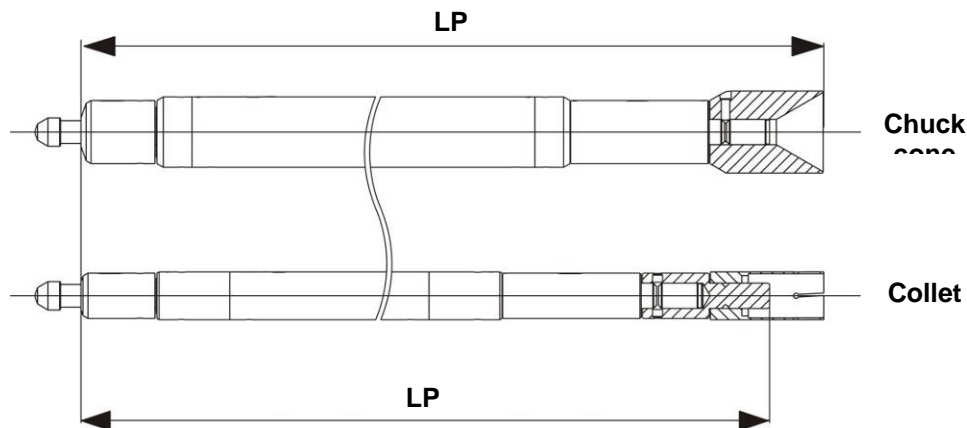
When changing the guiding elements and the pusher, **always** ensure that point 3.2.3 of the set-up manual is applied.

#### 3.1. Description

The pusher (**D**) is normally 1 mm smaller than the guiding elements. When the guiding elements are closed, a flag (**A**) provides the connection with the chain. When the guiding elements open, the connection is broken. At this point, the pusher is held in place by a mechanical lock. As soon as the guiding elements close, the connection with the chain is re-established and the lock is deactivated. Adaptor parts (**C**, **F**) can be used to equip each rotating sleeve (**E**) with different diameters of pusher body (**D**) and collets (**G**) (see table in point 3.2).

Depending on the max permissible bar length, 3 pusher lengths are available:

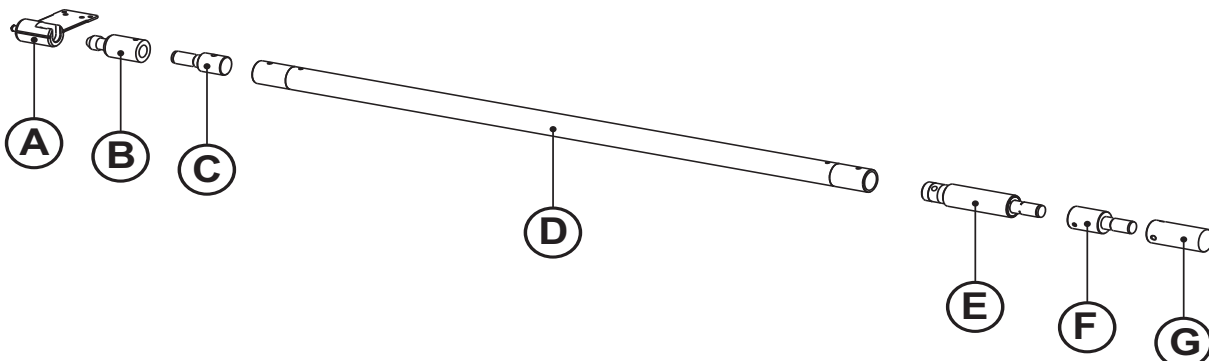
Pusher version	Pusher length (LP) $\pm 1$		Usable length (Lu) $\pm 1$	
	Chuck cone	Collet	Chuck cone	Collet
short	1316 mm	1274 mm	980 mm	938 mm
standard	1596 mm	1554 mm	1260 mm	1218 mm
long	1876 mm	1834 mm	1540 mm	1498 mm










#### 3.2. Layout of the elements

Select the diameter of the guiding elements based on the diameter of the bars to be guided, then assemble the pusher, noting the item numbers of the required elements.


**Important:** The guidance quality may be determined by the clearance between the material diameter and the guiding elements.



## 3.2.1. Pusher assembly with LP 1596 mm collet

												
		N° Attache poussoir	Fixation poussoir	Axe d'adaptation	N° Poussoir	Embout tournant	Adaptation pince/embout	N° Pince	Øext. Pince	Øint. min.	Øint. max.	Convertible
		A	B	C	D	E	F	G				
10	11	G/Av : 055.015.194 D/Av : 055.015.204 G/Av : 545.15.A001A D/Av : 545.15.A002A	-	-	052.15.364D/10	015.031.013/100	-	015.15.053/10	10	5	8	non
12	13	G/Av : 545.15.A001A D/Av : 545.15.A002A	-	-	052.15.364D/12	015.031.013/100	015.31.164	015.15.053/12	12	8	10	
14	15	G/Av : 052.015.114B D/Av : 052.015.174B	-	-	052.15.764	015.031.013/100	015.31.164	015.15.053/14 015.15.053/12	14 12	8 8	12 10	
16	17	G/Av : 052.015.114B D/Av : 052.015.174B	-	-	052.15.754/16	015.031.013/155	028.031.074 028.031.064	015.15.053/16 015.15.053/14 015.15.053/12	16 14 12	8 8 8	14 12 10	
18	19	G/Av : 052.015.104B D/Av : 052.015.164B	052.15.614C	052.015.134	052.15.744/18	015.031.013/155	028.031.104	015.15.053/18 015.15.053/16 015.15.053/14 015.15.053/12	18 16 14 12	9 9 9 9	15.5 14 12 10	oui
052.015.214						028.031.094	015.15.053/12	12	9	10		
20	21	G/Av : 052.015.104B D/Av : 052.015.164B	052.15.614C	052.015.134	052.15.744/20	015.031.013/200	028.031.144	015.15.053/20 015.15.053/18	20 18	10 10	17.5 15.5	
052.015.234						028.031.134	015.15.053/16	16	10	14		
22	23	G/Av : 052.015.104B D/Av : 052.015.164B	052.15.614C	052.015.134	052.15.744/22	015.031.013/200	028.031.184	015.15.053/22 015.15.053/20 015.15.053/18 015.15.053/16	22 20 18 16	12 12 12 12	19.5 17.5 15.5 14	
052.015.254						028.031.174	015.15.053/16	16	12	14		
25	26	G/Av : 052.015.104B D/Av : 052.015.164B	052.15.604C	052.015.144	052.15.734/25	015.015.814B	052.015.994 052.015.984	015.15.053/25 015.15.053/22 015.15.053/20	25 22 20	15 15 15	22.5 19.5 17.5	
28	29	G/Av : 052.015.104B D/Av : 052.015.164B	052.15.604C	052.015.144	052.15.734/28	015.015.814B	052.015.994	015.15.053/28 015.15.053/25 015.15.053/22	28 25 22	18 18 18	25.5 22.5 19.5	
30	31	G/Av : 052.015.104B D/Av : 052.015.164B	052.15.604C	052.015.144	052.15.734/30	015.015.814B	-	015.15.053/30 015.15.053/28 015.15.053/25	30 28 25	20 20 20	27.5 25.5 22.5	
052.015.334								015.15.053/32	32	22	29	
32	33	G/Av : 052.015.104B D/Av : 052.015.164B	052.15.604C	052.015.144	052.15.734/32	015.015.814B	-	015.15.053/30 015.15.053/28 015.15.053/25	30 28 25	22 22 22	27.5 25.5 22.5	
052.015.354								015.15.053/34	34	25	31	
34	35	G/Av : 052.015.104B D/Av : 052.015.164B	052.15.604C	052.015.144	052.15.734/34	015.015.814B	032.31.154	015.15.053/32 015.15.053/30 015.15.053/28	32 30 28	25 25 25	29 27.5 25.5	
052.015.374							032.031.094	015.15.053/28	28	25	25.5	
36	37	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/36	014.021.013C	052.015.1024 052.015.1014 052.015.1004	015.15.053/36 015.15.053/34 015.15.053/32	36 34 32	28 28 28	33 31 29	
052.015.394								015.15.053/38	38	30	35	
38	39	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/38	014.021.013C	052.015.1024	015.15.053/36 015.15.053/34	36 34	30 30	33 31	
052.015.414							052.015.1014	015.15.053/40	40	32	37	
40	41	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/40	014.021.013C	-	015.15.053/38	38	32	35	
42	43	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/42	014.021.013C	-	015.15.053/42 015.15.053/40	42 40	34 34	39 37	
45	46	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/45	014.021.013C	-	015.15.053/45 015.15.053/42	45 42	38 37	42 39	
052.015.484								015.15.053/50	50	41	46	
50	51	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/50	014.021.013C	-	015.15.053/45	45	41	42	
052.015.534								015.15.053/55	55	45	52	
55	56	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/55	014.021.013C	-	015.15.053/55	55	45	52	
052.015.584												
60	61	G/Av : 052.015.094 D/Av : 052.015.154	055.015.014	055-15-024	055.15.114/60	014.021.023C	-	015.15.053/60	60	51	57	
055.015.114/60												
65	66	G/Av : 052.015.094 D/Av : 052.015.154	055.015.014	055-15-024	055.15.114/65	014.021.023C	-	015.15.053/65	65	56	62	
055.015.114/65												

## Pusher assembly with LP 1596 mm chuck cone

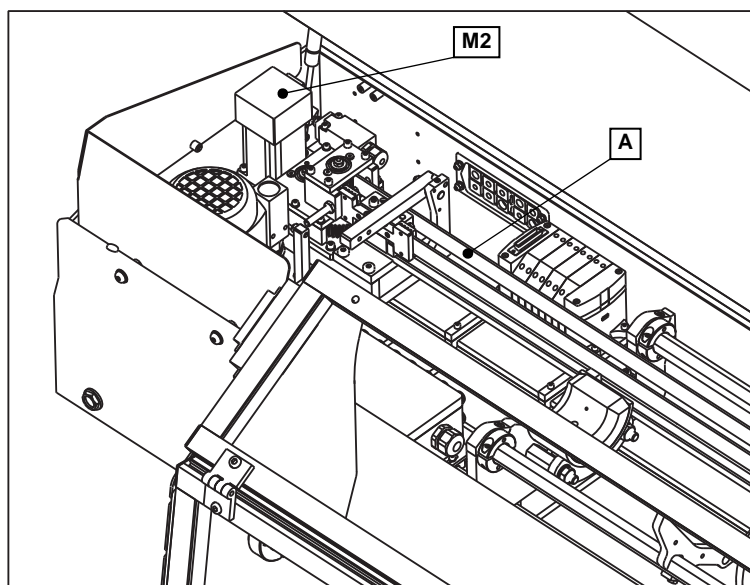
									Convertibilité	
		A	B	C	D	E	F	G		
10	11	G/Av : 055.015.194 D/Av : 055.015.204 G/Av : 545.15.A001A D/Av : 545.15.A002A	-	-	052.15.364D10	015.031.013/100	-	052.15.474D10	non	
11	12	G/Av : 545.15.A001A D/Av : 545.15.A002A	-	-	052.15.364D11	015.031.013/100	-	052.15.474D11		
12	13	G/Av : 545.15.A001A D/Av : 545.15.A002A	-	-	052.15.364D12	015.031.013/100	-	052.15.474D12		
13	14	G/Av : 052.015.114B D/Av : 052.015.174B	-	-	052.15.644	015.031.013/100	-	052.15.474D13		
14	15	G/Av : 052.015.114B D/Av : 052.015.174B	-	-	052.15.764	015.031.013/100	-	052.15.474D14		
15	16	G/Av : 052.015.114B D/Av : 052.015.174B	-	-	052.15.754/15	015.031.013/155	-	052.15.464E15		
16	17	G/Av : 052.015.114B D/Av : 052.015.174B	-	-	052.15.754/16	015.031.013/155	028.031.074	052.15.464E16		
17	18	G/Av : 052.015.114B D/Av : 052.015.174B	-	-	052.15.754/17	015.031.013/155	-	052.15.464E17		
18	19	G/Av : 052.015.104B D/Av : 052.015.164B	052.15.614C	052.015.134	052.15.744/18	015.031.013/155	028.031.104	052.15.464E18		oui
052.015.214										
19	20	G/Av : 052.015.104B D/Av : 052.015.164B	052.15.614C	052.015.134	052.15.744/19	015.031.013/155	-	052.15.464E19		
052.015.224					015.031.013/200	-	052.15.464E20			
20	21	G/Av : 052.015.104B D/Av : 052.015.164B	052.15.614C	052.015.134	052.15.744/20					
052.015.234					015.031.013/200	-	052.15.464E21			
21	22	G/Av : 052.015.104B D/Av : 052.015.164B	052.15.614C	052.015.134	052.15.744/21					
052.015.244					015.031.013/200	-	052.15.464E22			
22	23	G/Av : 052.015.104B D/Av : 052.015.164B	052.15.614C	052.015.134	052.15.744/22					
052.015.254					015.031.013/200	-	052.15.464E23			
23	24	G/Av : 052.015.104B D/Av : 052.015.164B	052.15.614C	052.015.134	052.15.744/23					
052.015.264					015.031.013/200	-	052.15.464E24			
24	25	G/Av : 052.015.104B D/Av : 052.015.164B	052.15.614C	052.015.134	052.15.744/24					
052.015.274					015.031.013/200	015.015.814B	052.015.994	052.15.434E25		
25	26	G/Av : 052.015.104B D/Av : 052.015.164B	052.15.604C	052.015.144	052.15.734/25					
052.015.284					015.015.814B	-	052.15.434E26			
26	27	G/Av : 052.015.104B D/Av : 052.015.164B	052.15.604C	052.015.144	052.15.734/26					
052.015.294					015.015.814B	-	052.15.434E27			
27	28	G/Av : 052.015.104B D/Av : 052.015.164B	052.15.604C	052.015.144	052.15.734/27					
052.015.304					015.015.814B	052.015.994	052.15.434E28			
28	29	G/Av : 052.015.104B D/Av : 052.015.164B	052.15.604C	052.015.144	052.15.734/28					
052.015.314					015.015.814B	-	052.15.434E29			
29	30	G/Av : 052.015.104B D/Av : 052.015.164B	052.15.604C	052.015.144	052.15.734/29					
052.015.324					015.015.814B	-	052.15.434E30			
30	31	G/Av : 052.015.104B D/Av : 052.015.164B	052.15.604C	052.015.144	052.15.734/30					
052.015.334					015.015.814B	-	052.15.434E31			
31	32	G/Av : 052.015.104B D/Av : 052.015.164B	052.15.604C	052.015.144	052.15.734/31					
052.015.344					015.015.814B	-	052.15.434E32			
32	33	G/Av : 052.015.104B D/Av : 052.015.164B	052.15.604C	052.015.144	052.15.734/32					
052.015.354					015.015.814B	-	052.15.434E33			
33	34	G/Av : 052.015.104B D/Av : 052.015.164B	052.15.604C	052.015.144	052.15.734/33					
052.015.364					015.015.814B	-	052.15.444E34			
34	35	G/Av : 052.015.104B D/Av : 052.015.164B	052.15.604C	052.015.144	052.15.734/34					
052.015.374					015.015.814B	-	052.15.434E35			
35	36	G/Av : 052.015.104B D/Av : 052.015.164B	052.15.604C	052.015.144	052.15.734/35					
052.015.384					015.015.814B	014.021.013C	052.015.1024	052.15.424E36		
36	37	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/36					
052.015.394					014.021.013C	-	052.15.424E37			
37	38	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/37					
052.015.404					014.021.013C	052.015.1024	052.15.424E38			
38	39	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/38					
052.015.414					014.021.013C	-	052.15.424E39			
39	40	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/39					
052.015.424					014.021.013C	-	052.15.424E40			
40	41	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/40					
052.015.434					014.021.013C	-	052.15.424E41			
41	42	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/41					
052.015.444					014.021.013C	-	052.15.424E42			
42	43	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/42					
052.015.454					014.021.013C	-	052.15.424E43			
43	44	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/43					
052.015.464					014.021.013C	-	052.15.424E44			
44	45	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/44					
052.015.474					014.021.013C	-	052.15.424E45			
45	46	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/45					
052.015.484					014.021.013C	-	052.15.424E46			
46	47	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/46					
052.015.494					014.021.013C	-	052.15.424E47			
47	48	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/47					
052.015.504					014.021.013C	-	052.15.424E48			
48	49	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/48					
052.015.514					014.021.013C	-	052.15.424E49			
49	50	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/49					
052.015.524					014.021.013C	-	052.15.424E50			
50	51	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/50					
052.015.534					014.021.013C	-	052.15.424E51			
51	52	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/51					
052.015.544					014.021.013C	-	052.15.424E52			
52	53	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/52					
052.015.554					014.021.013C	-	052.15.424E53			
53	54	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/53					
052.015.564					014.021.013C	-	052.15.424E54			
54	55	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/54					
052.015.574					014.021.013C	-	052.15.424E55			
55	56	G/Av : 052.015.094 D/Av : 052.015.154	052.015.204	052.15.564	052.15.724/55					
052.015.584					014.021.013C	-	055.15.034/56	OUI		
56	57	G/Av : 052.015.094 D/Av : 052.015.154	055.015.014	055-15-024	055.15.114/56					
055.015.114/56					014.021.023C	-	055.15.034/57			
57	58	G/Av : 052.015.094 D/Av : 052.015.154	055.015.014	055-15-024	055.15.114/57	014.021.023C	-	055.15.034/58		
58	59	G/Av : 052.015.094 D/Av : 052.015.154	055.015.014	055-15-024	055.15.114/58	014.021.023C	-	055.15.034/59		
59	60	G/Av : 052.015.094 D/Av : 052.015.154	055.015.014	055-15-024	055.15.114/59	014.021.023C	-	055.15.034/60		
60	61	G/Av : 052.015.094 D/Av : 052.015.154	055.015.014	055-15-024	055.15.114/60	014.021.023C	-	055.15.034/61		
61	62	G/Av : 052.015.094 D/Av : 052.015.154	055.015.014	055-15-024	055.15.114/61	014.021.023C	-	055.15.034/62		
62	63	G/Av : 052.015.094 D/Av : 052.015.154	055.015.014	055-15-024	055.15.114/62	014.021.023C	-	055.15.034/63		
63	64	G/Av : 052.015.094 D/Av : 052.015.154	055.015.014	055-15-024	055.15.114/63	014.021.023C	-	055.15.034/64		
64	65	G/Av : 052.015.094 D/Av : 052.015.154	055.015.014	055-15-024	055.15.114/64	014.021.023C	-	055.15.034/65		
65	66	G/Av : 052.015.094 D/Av : 052.015.154	055.015.014	055-15-024	055.15.114/65	014.021.023C	-	055.15.034/66		

## 4. BELT DRIVE

### 4.1. Description

The belt drive is controlled by the servo motor (**M2**), which controls all the forward and reverse movements of the pusher and the positioning of the bar, and the insertion and extraction of the bar in the collet.

### 4.2. Layout of the elements



### 4.3. Belt

It is possible that after a certain amount of use, the bar feeder belt (**A**) will need tensioning.

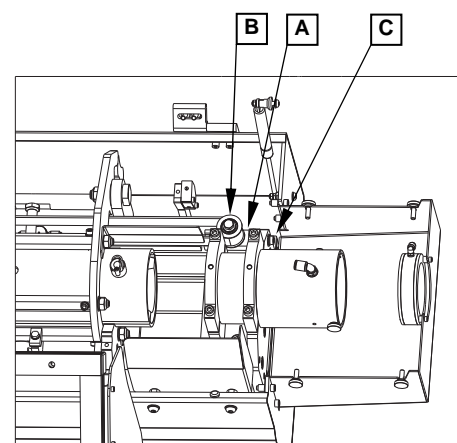


During the intervention, the belt must remain tensioned. If the belt and the notched pulley are misaligned, the motor will lose its reference points. If this occurs, please contact technical support.

#### Procedure:

- Bar feeder in STOP position.
- Open the protective grille and the protective cover.
- Undo the retaining screws (**A**) from the return pulley (**B**).
- Using a torque wrench, adjust the belt tensioning torque to 5 Nm using the lateral screw, as per the table below: (**C**).

bar feeder	Belt tension
3m	5 Nm
12'	5.7 Nm
4m	6 Nm



- Once the tension has been adjusted, retighten the retaining screws (**A**) for the return pulley (**B**).



## 5. REMNANT EXTRACTION SYSTEM (option)



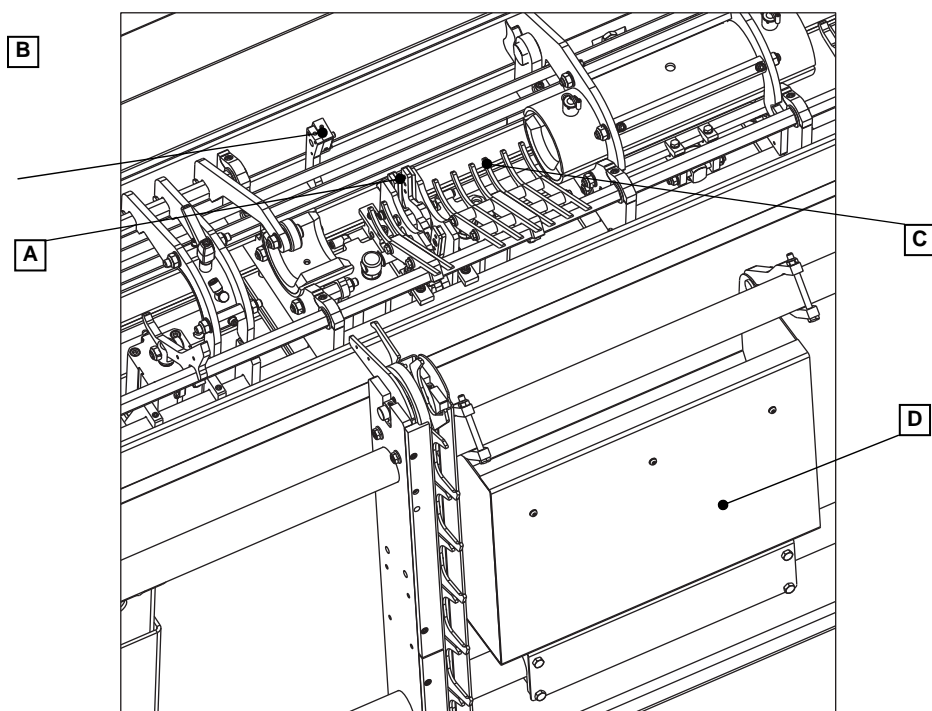
Please read the safety instructions provided at the beginning of this manual before handling the following devices.

### 5.1. Description

The vice serves to hold the material in order to insert into the collet when loading a new bar, and to extract it from the collet of the bar feeder during remnant extraction.

Irrespective of the material, the diameter, or the bar profile, the jaws are invariably the same and do not require any adjustment. The vice for the bar feeder is used to extract remnants 110 mm to 450 mm long.

### 5.2. Layout of the elements



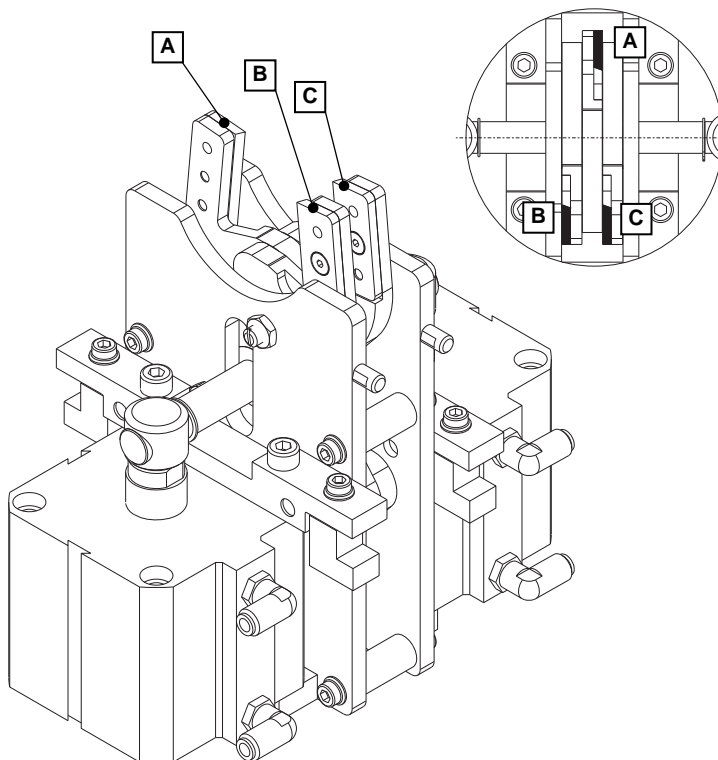
Designation	Article No.	Description
A	-	Material clamping system
B	-	Material presence check
C	-	Remnant extraction paddles
D	-	Remnant extraction drawer



### 5.3. Replacement of the blades

The clamping blades must be replaced when worn out. To do this:

1. Undo the 3 retaining screws and remove the worn clamping blades (**A**, **B** and **C**).
2. Install the new blades, check their positioning according to the drawing below, and secure them with the retaining screws.



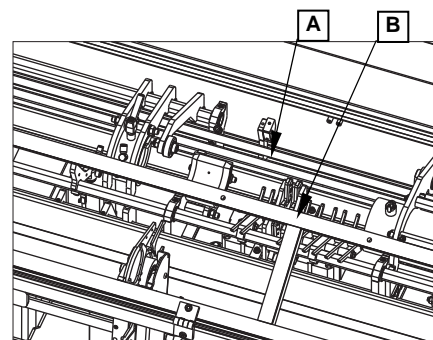
### 5.4. Material presence check

Depending on the sequence of the bar feed system and in order to prevent damages to material, a control system verifies that there is no material in the collet. Bar presence check consists of the optical cell (**A**) located in front of the vise (**B**).

The check is carried out as follows:

- the optical switch first determinates if the remnant has been extracted out of the spindle.
- the optical switch then determinates if the remnant has been properly ejected out of the bar feeder.

This control takes place after opening of the channel.



## 6. FRONT REST



Please read the safety instructions provided at the beginning of this manual before handling the following devices.

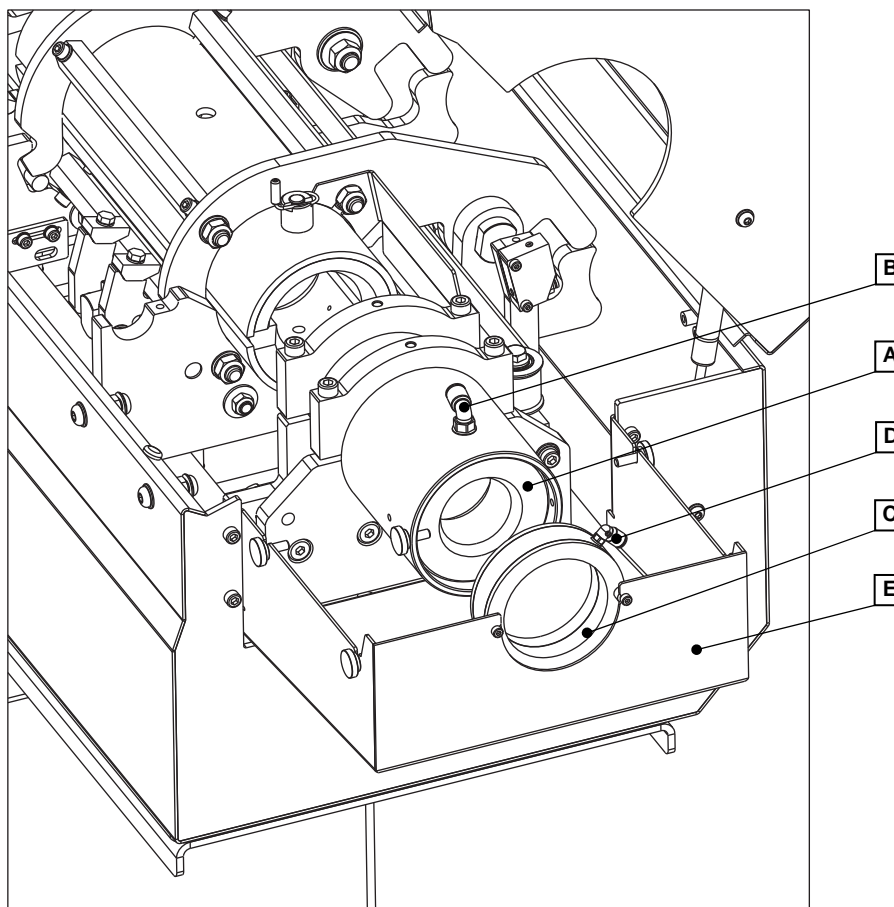
### 6.1. Description

A new guiding element (**A**) is located in the front rest.

The front rest is supplied with hydraulic oil during the entire automatic cycle via the fitting (**B**).

At the front rest outlet, some of the hydraulic oil which is on the bar is recovered using a centrifugal effect. A blast of air (**C**) emitted just before the bar feeder outlet discharges the remaining oil.

### 6.2. Layout of the elements

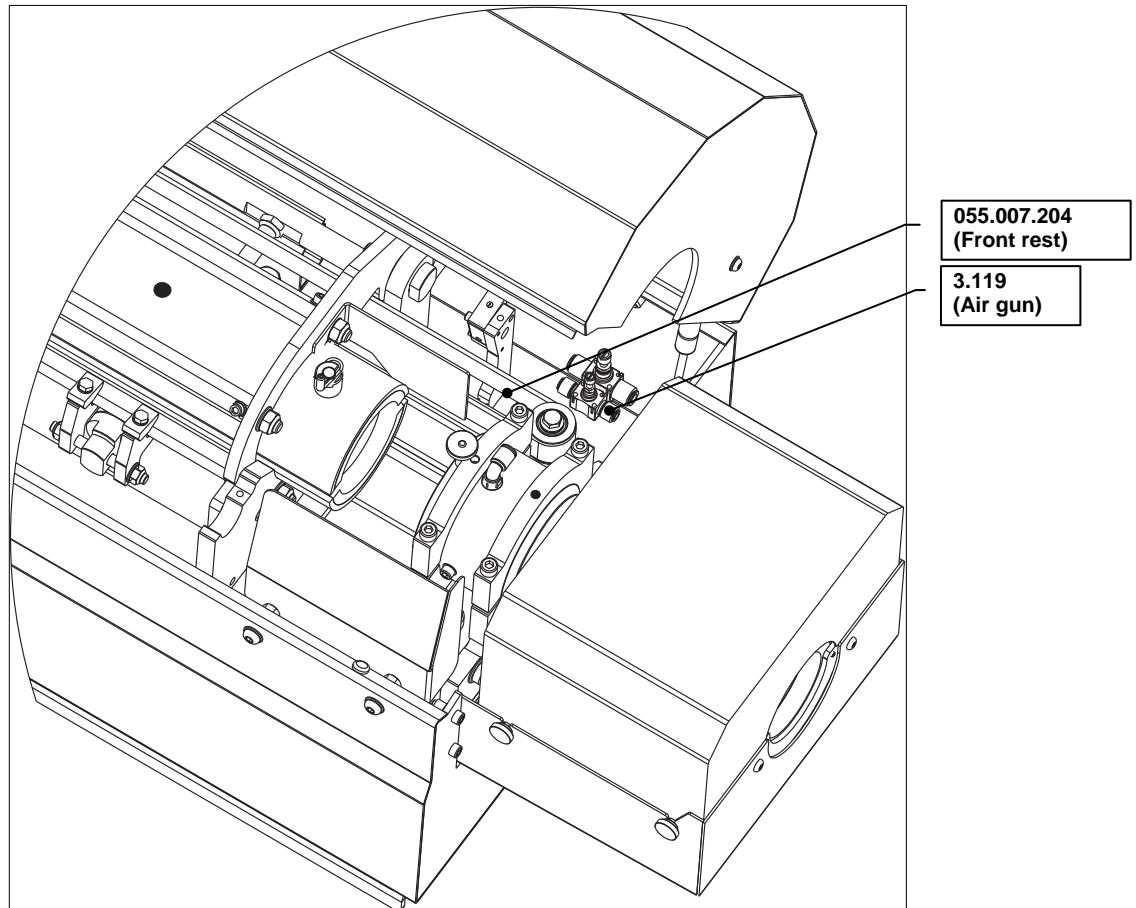


Designation	Article No	Description
A	-	Block for the front rest guiding element
B	-	Fitting for lubricating the block
C	-	Air blast
D	-	Fitting for air blast
E	-	Oil recovery device

### 6.3. Adjusting the hydraulic flow rate of the front rest and the pneumatic flow rate of the air gun

The hydraulic flow rate of the front rest and the pneumatic flow rate of the air gun are adjusted using the two flow reducers at the rear of the front rest.

The factory settings are adjusted so that the two reducers are completely open. The reducer on the yellow pipe adjusts the air gun and the reducer on the black pipe adjusts the front rest.



## 7. RETRACTION DEVICE (option)



It is strictly prohibited to use the retraction system before the bar feeder is anchored to the ground. Please read the safety instructions provided at the beginning of this manual before handling the following devices.



Before handling the retraction mechanism, check to see that the interface cables between the lathe and the bar feeder are long enough.

### 7.1. Description

When a lathe is equipped with a bar feeder, certain elements (motors, spindle reduction tubes, etc.) become inaccessible, and sometimes it is difficult, or even impossible, to proceed with their maintenance.

To facilitate these tasks, the bar feeder can be equipped with a retraction device which allows the operator to move it by 250mm. The rigidity of the system guarantees perfect alignment when the bar feeder is in working position.

A safety switch impedes any handling as long as the bar feed system is not in operational position.

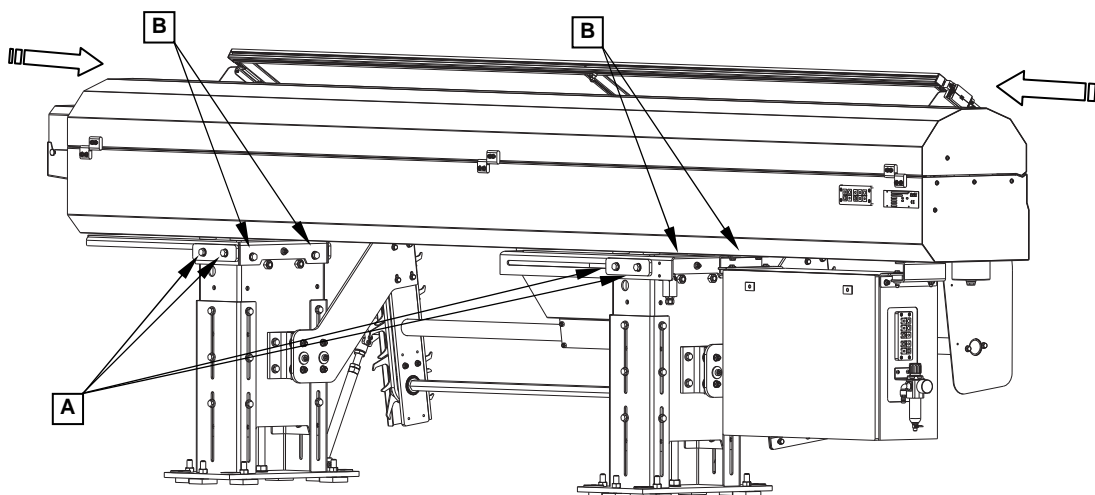
### 7.2. Operation

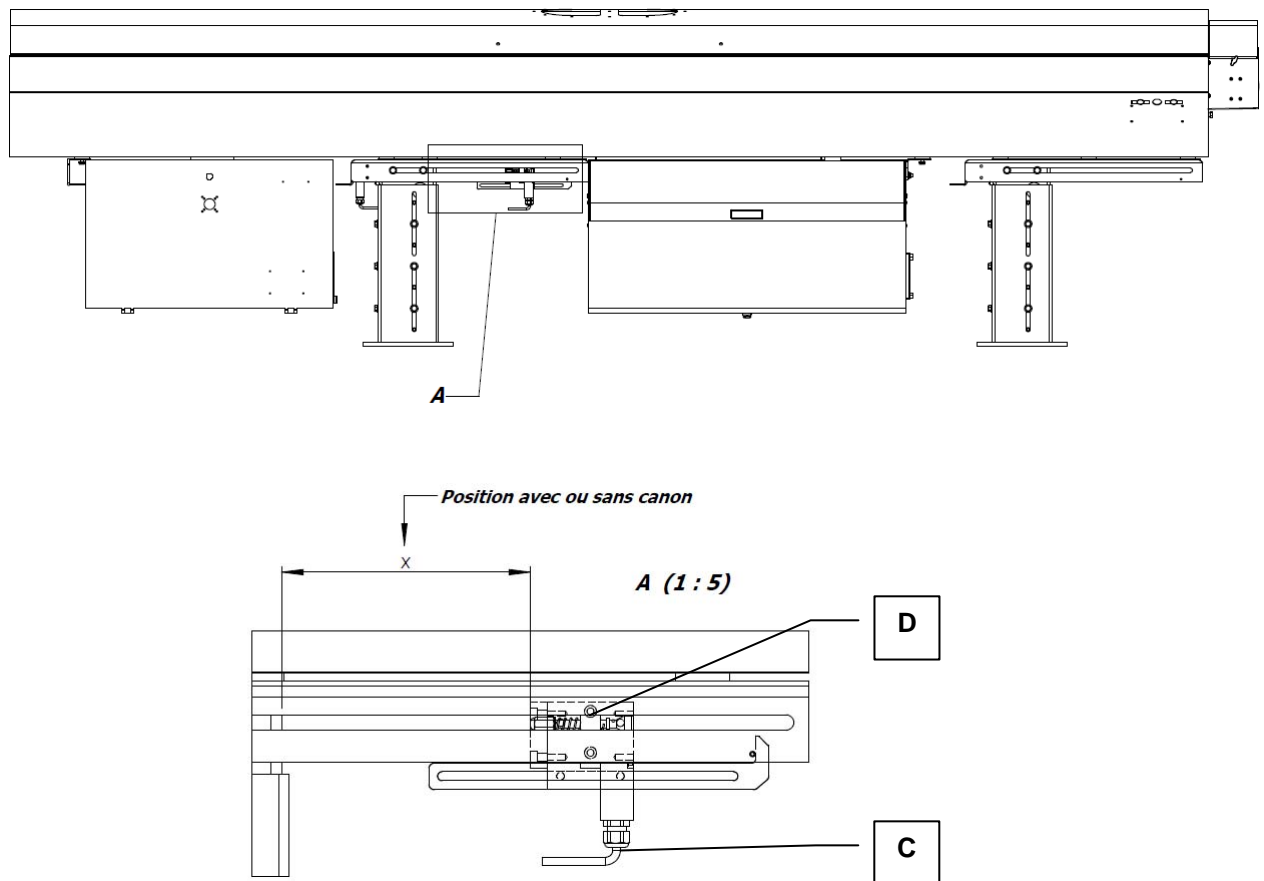
**Conditions:**

- Bar feeder in MAN or STOP mode
- No bar between the bar feeder and the lathe
- Pusher inside the bar feeder
- The area around the bar feeder must be clear

**Procedure:**

1. Loosen the 8 lock screws **(A)** on the front side of the stand.
2. Undo and remove the 4 retaining screws **(B)** behind the front and rear foot.
3. Pull the bar feeder back.
4. When the maintenance operations are complete, bring the bar feeder to the work position, lock with the retaining screws **(A)** and refit the screws **(B)**. (max 75 Nm)





## 8. 2-POSITION OPTION

When the bar loader must be adapted to a lathe which has no guide bush, this option (detail A above) allows the loader to be moved with precision in the direction of the lathe so that it can be connected directly to the spindle. The software takes the position into account, and saves the „End Of Bar” (EOB) and the „Top Cut” positions in a separate memory zone.

### Control mechanism of the 2 positions

Adjust both retraction positions with the setting screws **(C)** and **(D)**.

The lathe and bar feeder interface can be optimised according to the application.

## 9. AUTOMATIC FRONT REST (option)



Please read the safety instructions provided at the beginning of this manual before handling the following devices.

When working with a non-round bar, the automatic front rest is deactivated. To use a rotating shell, a standard front rest must be installed

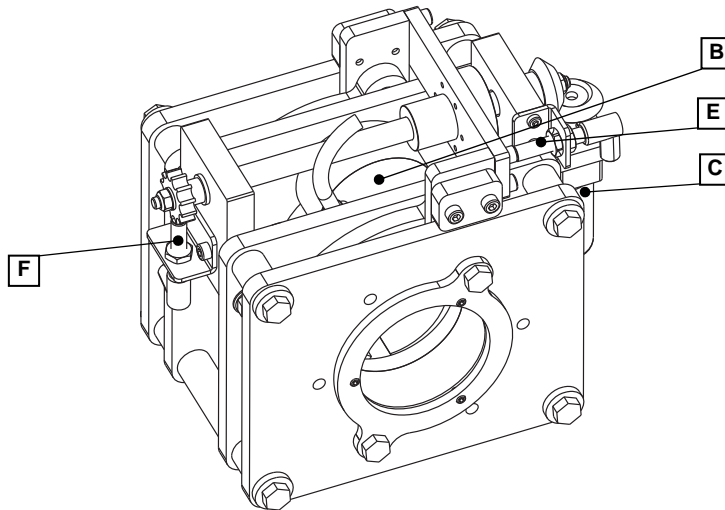
### 9.1. Description

Located at the front of the bar feeder, the front rest stabilises the bar guidance, even when there is a lot of play in the guiding channel elements.

Formed of a robust chassis which houses 3 grips **(B)** made from a synthetic material, the front rest is supplied with hydraulic oil throughout the entire automatic cycle. At the front rest outlet, some of the hydraulic oil which is on the bar is recovered using a centrifugal effect. A blast of air **(A)** emitted just before the bar feeder outlet discharges the remaining oil. The front rest opening is actuated by an electric motor **(C)** and controlled by the PLC.

A cover **(not shown)** protects the mechanism, while the oil recovery device **(not shown)** protects the underneath of the assembly.

### 9.2. Layout of the elements



Designation	Article No	Description
-	-	Cover (not shown)
A	055-007-093	Air blast (not shown)
B	-	Grips 565 S2 (1 with lubrication: 055-007-074 / 2 without lubrication: 055-007-104) Grips 545 (1 with lubrication: 042-007-074 / 2 without lubrication: 042-007-064)
C	4.307	Gear motor
D	-	Oil recovery device (not shown)
E	4.391	Automatic front rest sensor in original position
F	4.391	Opening and closing count sensor

### 9.3. Setting

The operating principle for the front rest is as follows:

1. Closed position: bar held in place and guided
2. Open position: pusher held in place and guided

Regardless of the diameter of the bar requiring guidance, the grips are invariably the same. The open and closed positions of the front rest are automatically adjusted when the pusher and bar diameters are entered into the bar feeder parameters.

## 10. 2-POSITION PNEUMATIC FRONT REST (option)



Please read the safety instructions provided at the beginning of this manual before handling the following devices.

When working with a non-round bar, the automatic front rest is deactivated. To use a rotating shell, a standard front rest must be installed.

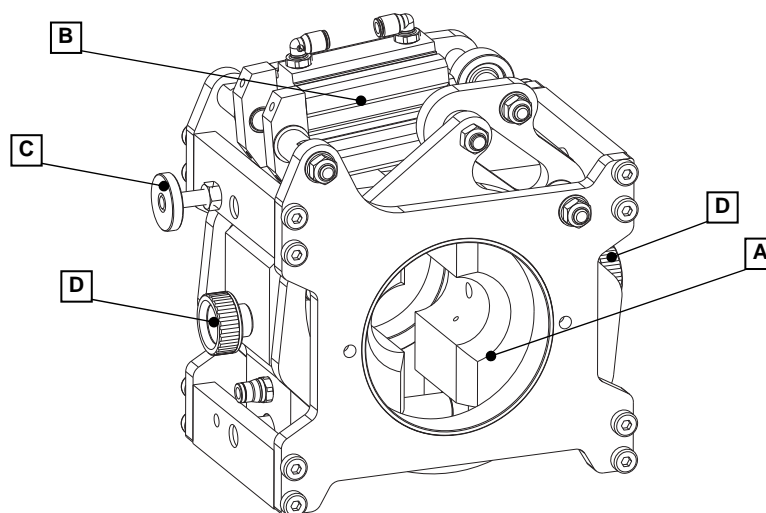
### 10.1. Description

Located at the front of the bar feeder, the pneumatic front rest stabilises the bar guidance, even when there is a lot of play in the guiding channel elements.

Formed of a robust chassis which houses 2 shells **(B)** made from a synthetic material, the front rest is supplied with hydraulic oil throughout the entire automatic cycle. At the front rest outlet, some of the hydraulic oil which is on the bar is recovered using a centrifugal effect. A blast of air **(A)** emitted just before the bar feeder outlet dispenses with the remaining oil. The front rest opening is actuated by a pneumatic cylinder **(C)** and controlled by the PLC.

A cover **(not shown)** protects the mechanism, while the oil recovery device **(not shown)** protects the underneath of the assembly.

### 10.2. Layout of the elements



Designation	Article No	Description
A	023.31.104	2 Guiding shells
B	3.97040.B.50	Pneumatic actuator
C	-	Front rest opening adjustment
D	-	Retention of the guiding shells

### 10.3. Setting

The operating principle for the front rest is as follows:

1. Closed position: bar held in place and guided
2. Open position: pusher held in place and guided

Regardless of the diameter of the bar requiring guidance, guiding shells are invariably the same. The open position of the front rest is adjusted manually using the setting screw **(E)**.





## CHAPTER 8 : HANDLING

## 1. POWERING ON



Please read the safety instructions provided at the beginning of this manual before handling the following devices.

The motor of the SPRINT 545 S2 / 565 S2 bar feeder is equipped with a built-in absolute encoder that continuously monitors the position of the pusher.

When the bar feeder is switched off or there is a power failure, this position is kept in the memory by the amplifier.

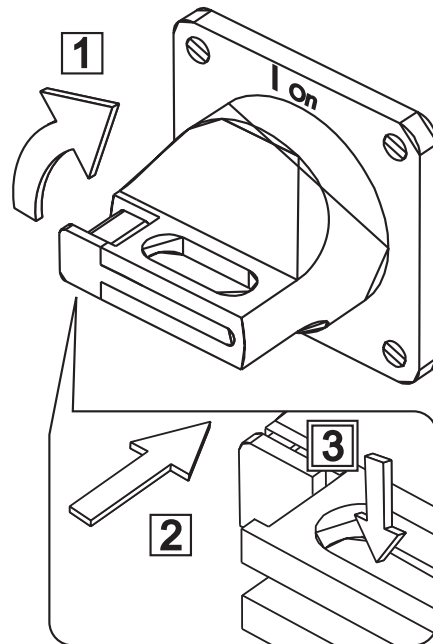
When powering on, the value saved is immediately taken into account, thus avoiding any referencing position. The status parameters saved in the PLC prior to powering off are then checked by the PLC which analyses them. The latter then gives the operator access only to those handling operations that can be undertaken.

To power up the bar feeder, turn **(1)** the switch to the right, to the **I/on** position.

To power down, turn the switch to the left, to the **0-off** position.

The master switch can be locked with a padlock. This means it is impossible to switch the bar feeder on.

Push **(2)** the locking mechanism and insert **(3)** the padlock into the opening. Lock the padlock.



## 2. REMOTE CONTROL

The ergonomic and user-friendly remote control with a clear built-in display facilitates the handling of the bar feeder. Depending on the sequence under way, the bar feeder gives access only to those functions which are available, thus avoiding any incorrect handling, and reducing the access time to the necessary functions.

The screen continuously and clearly shows the status of the bar feeder and the production, allowing the functions, diagnostics and error signals to be checked or analysed at any time.

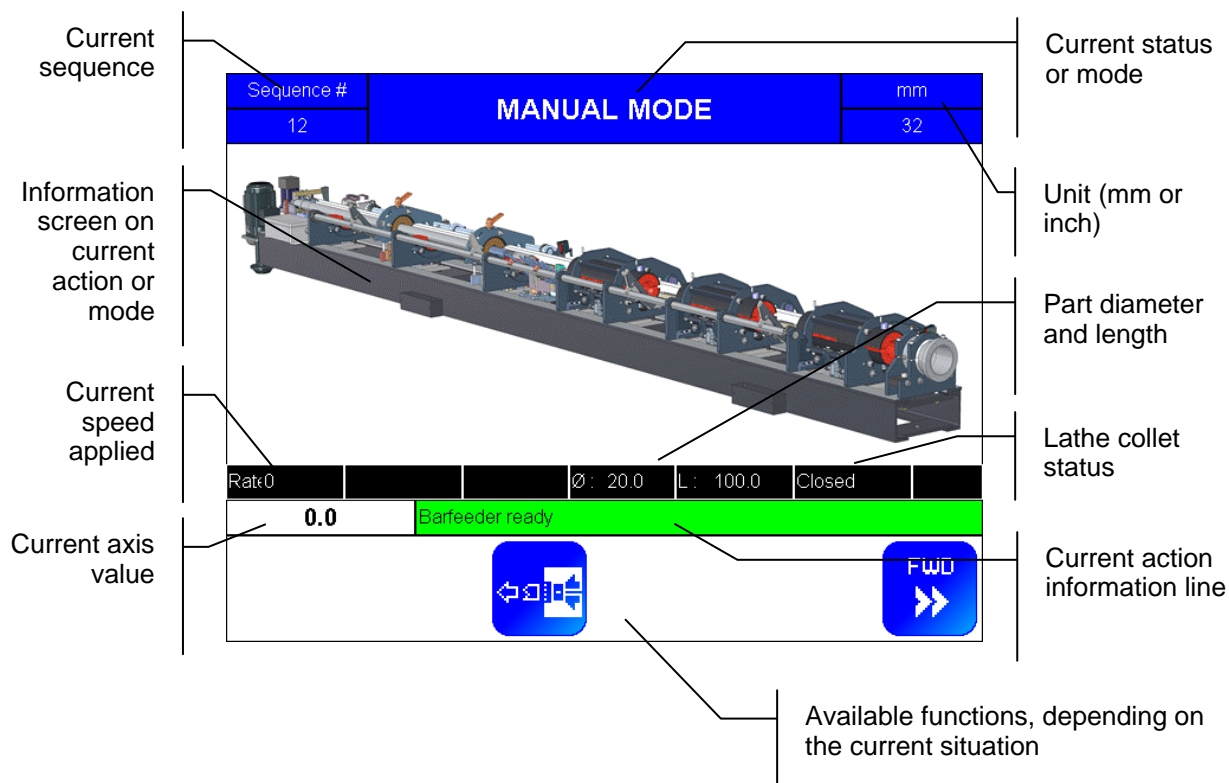
The most recent error signals are saved in a register and can be recalled to establish diagnostics.

The remote control has five distinct segments, namely: display (A), function keys (B), directional keys and numeric pad (C), modes buttons with STOP, MENU and HELP buttons (D), and the emergency button (E).



















## 2.1. Display

The liquid crystal display with touchscreen function provides the operator with all the necessary data, both for handling the bar feed system and for maintenance.



The available icons are as follows:

Icon	Meaning	Icon	Meaning
	Access to the STOP mode		Set current parameter
	Access to the main menu		Access to the help menu
	Referencing position		Change of the guiding elements
	Switch to automatic mode		Exit the current function, back to start
	Stop after machining one bar		Back to previous page
	Switch to manual mode		Go to next page

	Pusher forward (picture may be reversed depending on the feed side)		Validate
	Pusher reverse (picture may be reversed depending on the feed side)		Cancel
	Close guide zone		Load a bar in the guiding elements
	Open guide zone		Confirm manual extraction of a bar from the guiding elements
	Automatic Top-Cut positioning in manual mode (picture may be reversed)		Teach data
	Remove the material from the lathe's spindle (the image can be reversed to match the feeding side)		Value modification by correction
	Confirm. In settings mode, to validate a new parameter or a new value, press and hold until the icon disappears. (approximately 3 seconds)		Increase value during correction setting
	Start sequence		Reduce value during correction setting

## 2.2. Function keys F1 - F4

The variable function keys are located right below the display. The functions attributed to them are indicated on the display by icons.

As the operator advances through the handling operations, the functions of the buttons are automatically reattributed.

## 2.3. Direction keys and numerical block

These keys allow values to be entered (bar stock diameter, part length, etc.).

## 2.4. Emergency stop push button

When a dangerous situation arises, pressing the emergency stop button immediately interrupts all bar feeder and lathe functions.

To cancel the alarm, turn the button anticlockwise.

## 2.5. MODE buttons

### 2.5.1. MENU key

The MENU key allows access to the main menu, where the parameters concerning production, the interface and the general settings can be reviewed and changed.

### 2.5.2. STOP key

The STOP key is used to interrupt the sequence under way.

**Important: the automatic cycle of the lathe must first be interrupted.**

The STOP key can be pressed to exit setting mode, regardless of the level reached, and return to the work screen.



**The STOP key is not an emergency button, and cannot be interpreted as such. In emergency cases, always use the emergency stop button located on the top of the remote control.**

### 2.5.3. HELP key

The HELP key displays useful information about the software version, the firmware of the critical components, the current status of the inputs and outputs of the system.

### 2.5.4. CLEAR key

Allows cancelling a wrongly introduced value.

### 3. SET-UP



Please read the safety instructions provided at the beginning of this manual before handling the following devices.

All handling, adaptations and settings required by the bar feeder to carry out a specific job are part of the set-up.

A few simple operations are necessary to prepare the device to handle another range of diameters.

The set-up must be modified when following parameters change:

1. Bar stock diameter
2. Bar stock shape
3. Part length

### 3.1. Guiding elements adaptation

Depending on the bar stocks to feed, a changeover of the guiding elements (bearings, pusher, collet, front rest adjustment) may be necessary.



*The elements of the cover must only be replaced if they are worn or damaged.  
The guide channels may be damaged by corrosive products.  
Use a soft cloth to clean them.*

#### Conditions:

- Guiding channel opened
- No bar stock in the magazine
- Pusher in home position
- Bar feed system in **STOP** mode

#### Procedure:

On the remote control, use the manual functions to move back the pusher to its reference, in lifted position.

1



Press the **[STOP]** key.

2



Enter the manual menu.

3



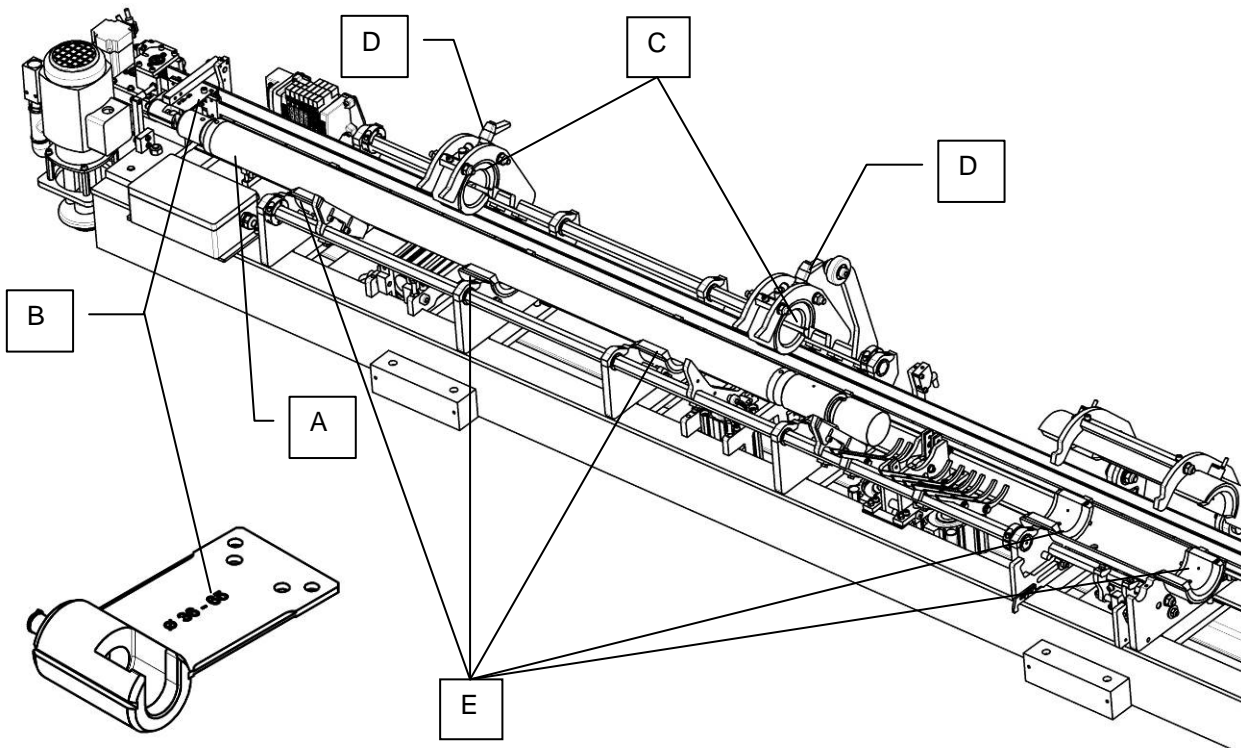
Select the pusher changeover function.

The text "READY TO START PUSHER CHANGEOVER CYCLE» is displayed on the screen.



Start the function.

Le pusher goes to its changeover position.  
Follow the instructions on the remote control.





Designation	Article No	Description
A		Pusher assembly
B		Loading finger
C		Split guiding elements (or shells) for the pusher carrier
D		Pusher carrier guiding element retaining handles
E		Guiding module elements

1. Once the pusher in changeover position, open the main access cover.
2. Remove the pusher.
3. Guiding elements change :

Once the pusher assembly is in the rear position, pull all of the front and rear guiding elements **(E)** upwards to remove them and replace with new elements. Remove the two pusher supports **(C)**; to do so, unscrew the handles **(D)** and fit new ones, then screw in the handles.

4. Replace the loading finger **(B)**, if necessary, according to the new diameter of the elements.
5. Install the new pusher and place it in the guiding elements.
6. Validate the pusher modification.

4



Enter the manual menu.

5

Follow the instructions on the remote control screen.  
Change the guiding channels diameter if necessary.



Once the guiding channel diameter has been changed, press the Start button.

The pusher is engaged in its home position.

Once the bar feeder has completed the pusher changeover cycle, the bar feeder is ready to work. At this point, it is necessary to check and change parameters such as the bar diameter, feeding length, etc.  
See this chapter, section SETTINGS for further information.

### 3.1.1. Changing the front rest

When the guiding elements are worn, have a standard replacement of the front rest performed. To do so, contact LNS SA.

## 3.2. LATHE SETUP

### 3.2.1. Clamping method

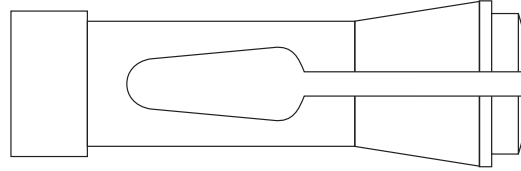
#### Collets

There are different kinds of collets that are more or less effective:

a) Single cone collet

The bar is held over about 350 degrees, over a length of 0.5 to 7 times the diameter.

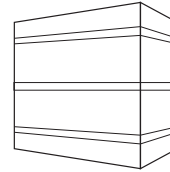
Efficiency : good to very good



b) Biconical collet

Clamping over 1 or 2 x 350 degrees, over an approximate length of 1.2 times the diameter.

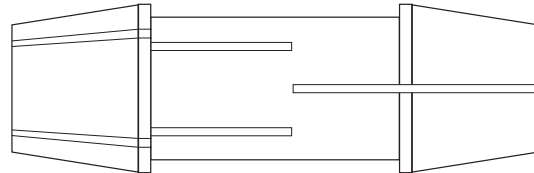
Efficiency : very good to excellent



c) Double cone collet

The double cone collet has the great advantage of holding the bar at two points separated by about 1.5 the diameter, with clamping 2 times 350 degrees over about 0.5 times the diameter.

Efficiency : excellent



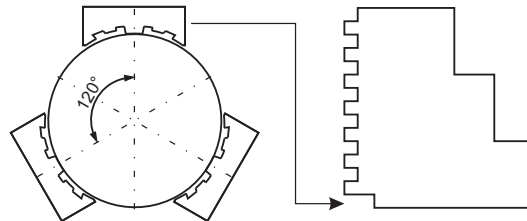
#### 3-jaws chuck

With this type of clamping, one should be very careful given that in many cases the bar is held only at three points, thereby greatly increasing the risk of vibration.

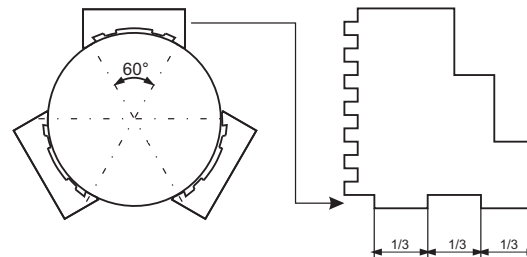
Frequent errors and possibilities for improving the effectiveness of the clamping grip.

a) Hard grips

Incorrect: The radius of the grip is greater than the radius of the bar. The jaws press against only three points at 120 degrees.

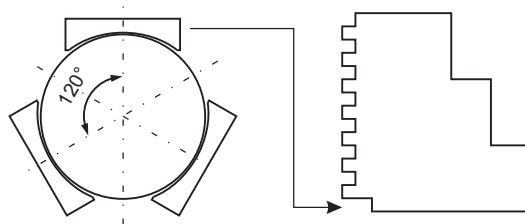


Correct: Modify the centers of the jaws to obtain 2 times 6 support clamping points at 60 degrees.

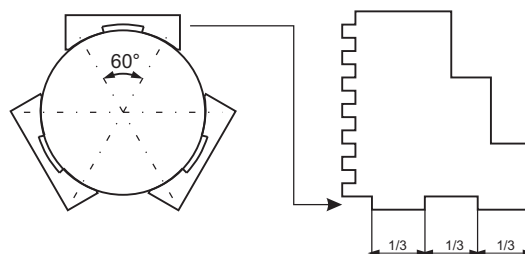


## b) Soft grips

**Incorrect:** The radius of the grip is greater than the radius of the bar. The jaws press against only three points at 120 degrees.



**Correct:** Modify the centers of the jaws to obtain 2 times 6 support clamping points at 60 degrees.



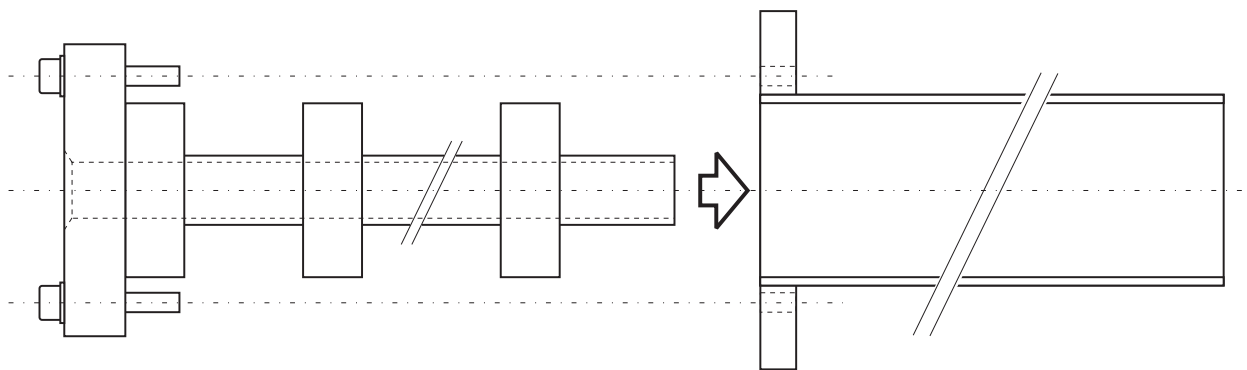
### 3.3. Lathe – barfeed adaptation

#### 3.3.1. Reduction tubes

The efficiency of the bar guiding in the lathe is determined by the clearance between the spindle bore and the rotating bar. The greater the clearance, the more frequent the vibrations.

Using reduction tubes helps to reduce this clearance. Guiding is thus improved, but, in addition, the insertion of the bar into the collet of the lathe is made much easier.

The inside diameter of the reduction tubes should be chosen in terms of the diameter of the bar ( $\varnothing$  of the bar + 1 mm), but should always be larger than that of the diameter of the feeding pusher.



For inserting and removing the spindle reductions, move the bar feed system using the retraction device.

Spindle reduction tubes are available from LNS, upon request.

## 4. SOFTWARE SETTINGS



Please read the safety instructions provided at the beginning of this manual before handling the following devices.

### 4.1. Description

The SPRINT 545 / 565 S2 bar feeder has various parameters and functions allowing the operator to configure it so that it adapts as closely as possible to the lathe on which it is installed, as well as to the production mode being used.

Thanks to these parameters, when feeding, the material can be positioned in the lathe's clamping unit. Then, during the production cycle, each time the clamping unit is opened, the material is moved forward with precision.

The position of the flag, or the quantity of material left to be machine, can be known at any time by checking the remote control.

The pushing torque of the motor is automatically selected according to the bar stock diameter.

When hexagonal or squares bars must be loaded, the servo motor intelligently manages the loading into the lathe.

This section indicates the activating and setting procedures for these functions.

## 4.2. Access to the functions

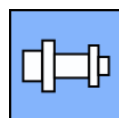
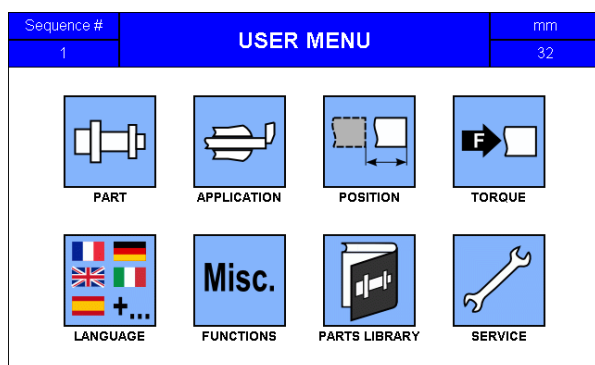
By pressing the **MENU** key, it is possible to access the setting functions.



To edit these parameters, the bar feeder must be in **STOP** mode.  
To validate a new parameter or a new value, keep **[ENTER]** pressed until the icon disappears.



Depending on your lathe or your production needs, some of the parameters may not be visible. The additional parameters to be displayed can be selected under **SERVICE > DISPLAY**.



### Part

Used to define the parameters and values of the part, e.g.:

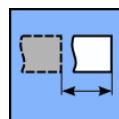
- Bar stock shape (round, hex, square, other, diameter)
- Feeding length
- Number of collet openings
- Feeding length for the auxiliary part (remnant machining)



### Application

Used to quickly set the working mode by selecting the desired application. Following working modes are always available:

- Feed with /without turret
- Dry Run



### Positions

Quick access to the current position values:

- End of bar
- Top-cut position
- Auxiliary end of bar
- Front rest opening position



### Torques

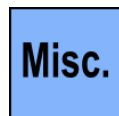
Quick access to the current torque values:

- Torque for the bar loading
- Torque for part feeding



### Language

Access to other languages



### Miscellaneous functions

- Referencing position
- Front rest setup
- Timings on lathe's clamping device



### Library

This function allows for loading, adding, saving, replacing a part



### Service

Reserved for LNS technicians for maintenance and displaying masked parameters.

### 4.2.1. Part adjustment

#### Shape and diameter of the bar, length of the part

Sequence #	PART SETUP	mm	Séquence n°:	REGLAGE PIECES	mm
1	DIAMETER, SHAPE AND LENGTH	32	1	DIAMETRE, PROFIL ET LONGUEUR	
Sequence #	PART SETUP	mm			
1	MATERIAL SHAPE	32			

#### Bar profile

Round bar:

- Outside diameter
- Standard loading cycle

Hexagonal / square bar:

- Size on flat sides
- Size on corners
- Front rest elements

This parameter must be defined when the standard elements of the pneumatic front rest have been replaced with elements specific to profiled bar guiding (elements with round inner profile).

The bar feeder looks for this parameter to adjust the pneumatic front rest.



During the loading, the bar feeder tries several times (during 2 minutes) to introduce the bar in the gripper or the lathe jaws. The precision of the positioning is also ensured by a procedure specially dedicated to profiled bars.

#### Introduce the diameter of the bar to be loaded

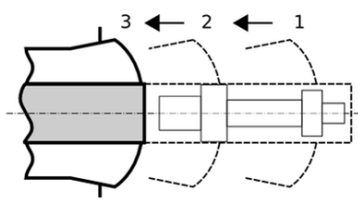
It is important, that, for each production changeover, the diameter of the new bars that the bar feeder will have to load is updated in the parameters. The PLC can therefore take it into account, and adapt the torque (push force) of the pusher. A greater precision of the positioning may therefore be guaranteed. Furthermore, small diameter bars will not be under the pressure of the pusher. The adjustment of the closed position of the front rest and the position of the motor of the bars magazine are determined by this value.

#### Introduce the diameter on edges of the profiled bars (option)

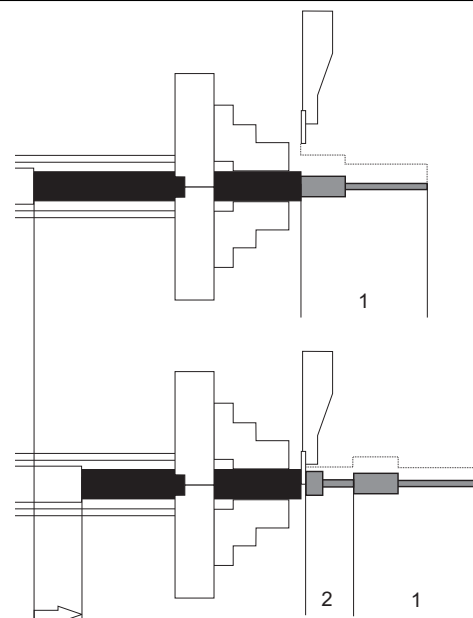
This function only serves to adapt the front rest to the edge diameters.

### Number of clamping device openings for overall part length

Sequence #	PART SETUP	mm
12	CLAMPING DEVICE OPENINGS	32

Number of clamping device openings **1**



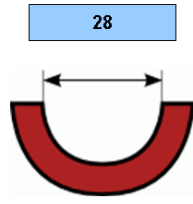
When the machining of a part requires several openings of the collet (e.g. a long part, or transfer of the part to the second spindle), some interface conflicts may occur during the feeding process.

It is important for the bar feeder to be “informed” of the number of times the collet must open for the machining of a part.

The bar feed system only carries out the first positioning for a single part. The following positioning (if any) must be done by the turret.

### Diameter of the guiding elements

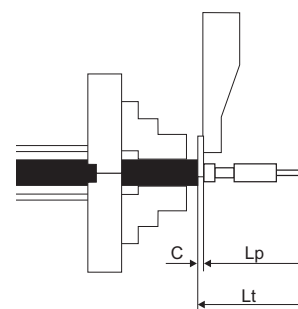
Sequence #	PART SETUP	mm
1	GUIDING ELEMENT	32

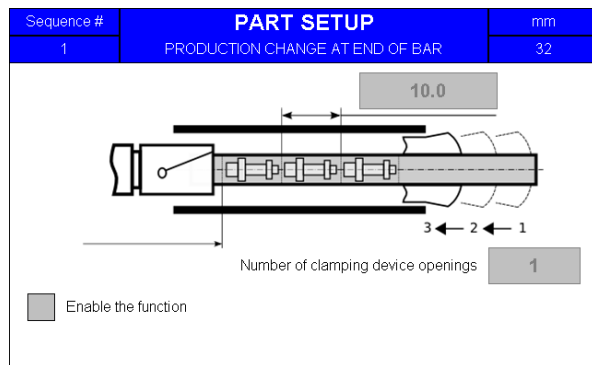
The diameter of the guiding elements is always proposed for change after the pusher changeover cycle.

### Total length of the loading

The total loading length (**Lt**) included the work piece length (**Lp**), the thickness of the top-cut tool (**C**) and the thickness of the facing tool (not represented on this picture, depends on the part program).



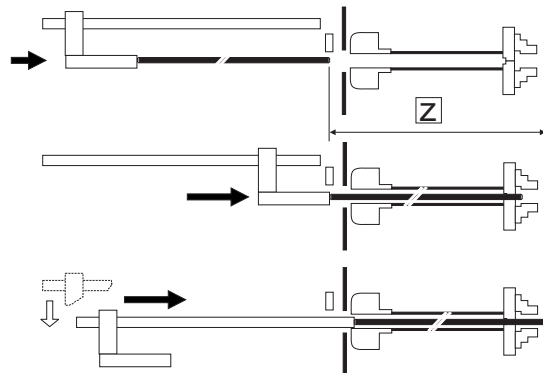
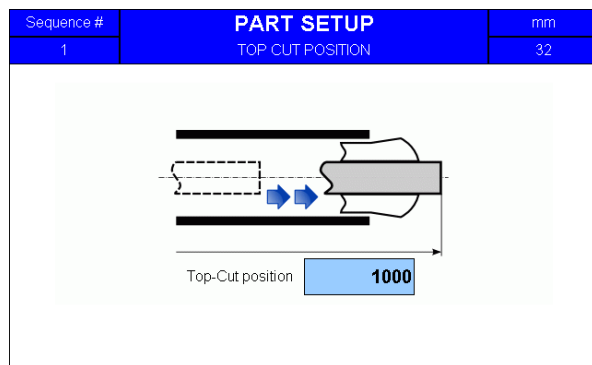
The bar feeder gives the order to the lathe to machine shorter pieces during long remnants (*may not be visible*)



When the current manufacturing generates substantially long remnants, it is possible (depending on the capabilities of the lathe), to select a second production mode for machining the residual material. The lathe starts a second machining program and produces shorter pieces.

The supply length and the number of openings of the jaws must also be introduced  
The supply length comprises the length of the piece to be realized and the thickness of the cutting tool.

**Top-cut position** (*may not be visible*)



During feeding, the bar is inserted in the spindle and automatically positioned in the clamping unit of the lathe.

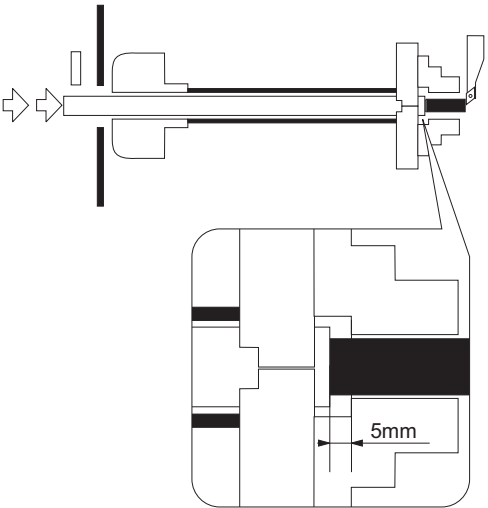
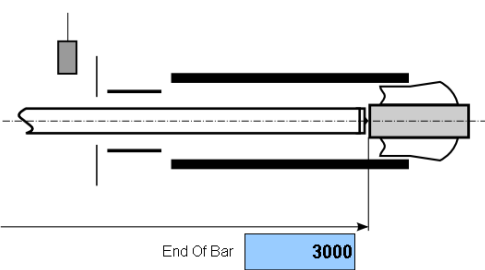
This positioning corresponds to a value (**Z**) programmed by the operator, which is equal to the distance between the measuring cell and the position of the material in the lathe clamping device.  
With this system, the setting is the same for any bar length.

More information in section 10 of this chapter.



End of bar position (may be not visible)

Sequence #	PART SETUP	mm
1	END OF BAR	32



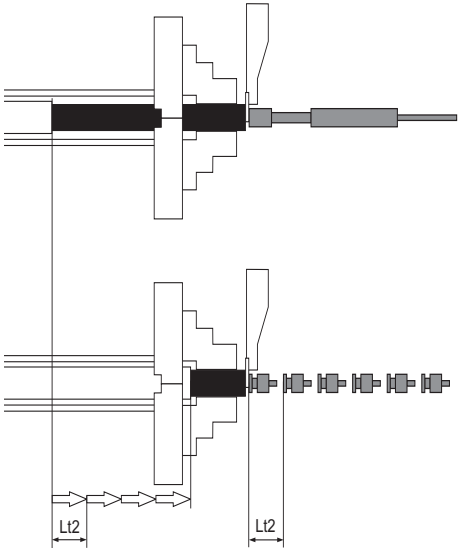
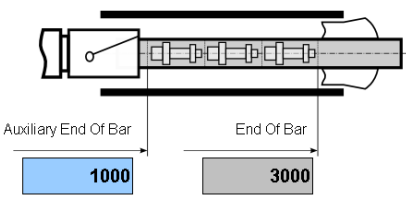
The end of bar position determines the moment when the bar feeder enters the loading cycle. In principle, the end of bar position is adjusted as closely as possible behind the lathe's clamping unit (approximately 5 mm) to ensure the shortest remnants.

Regardless of the length of the bars or parts, the end of bar position is always the same. In very special cases, a different end of bar setting needs to be selected.

More information in section 9 of this chapter.

Auxiliary end of bar position (may be not visible)

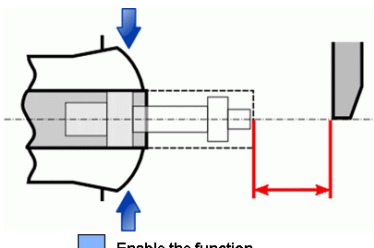
Sequence #	PART SETUP	mm
1	AUXILIARY END OF BAR	32



Depending on the lathe and its options, the auxiliary end of bar may be used in several ways. For example, for the opening of an additional front rest installed at the rear of the lathe spindle. The procedure is the same as this for the end of bar signal.

Alarm: control of the bar support against the cutting tool (only for lathes)

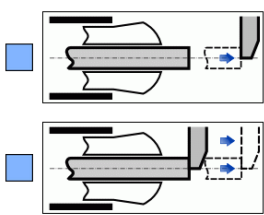
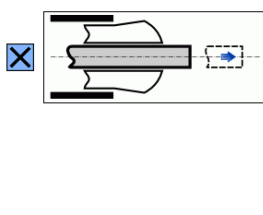
Sequence #	PART SETUP	mm
1	Bar stock control during headstock reversing	32

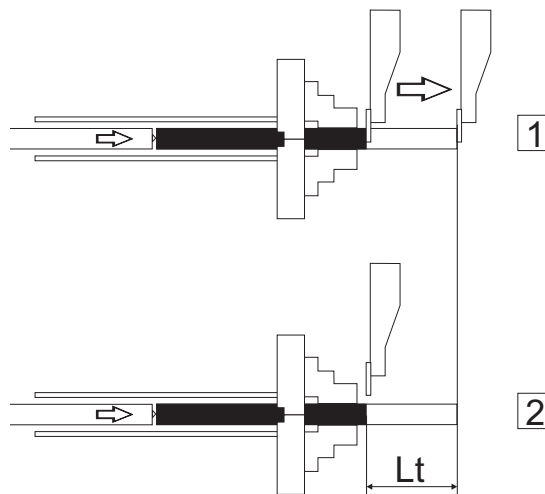


When the headstock backs up with open clamp, this setting ensures that the position of the bar does not change. For example, in the case where the gripper would have remained bonded and would nonetheless pull the bar.

### 4.2.2. Application setup

#### Part feed out with/without turret

Sequence #	APPLICATION SETUP	mm
1	PART FEED OUT	32
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>With turret</p>  </div> <div style="text-align: center;"> <p>Without turret</p>  </div> </div> <p style="text-align: center;">■ Activate M-code</p>		



#### Part feed out with turret

This parameter determines whether the lathe controls the part feeding. In this case, a special loop must be provided in its programme.

#### Additional parameter (may be not visible):

- a) The turret is parked in position:  
the turret travels to the point the bar stock will be pushed to and waits that the bar feed has pushed the material to this point.
- b) The turret is moving to position:  
The turret comes to the bar stock end; the bar feed starts pushing against the turret. Then, the turret moves to the desired feeding length, the bar feed still maintaining the bar stock pressure against the turret.


#### Feeding without turret

The bar feeder feeds the part. When the collet opens, the pusher pushes the bar according to the value entered in the "total part feeding length" parameter. The bar feeder is not able to drive the feeding cycle if the manufacturing process requires several collet openings.

#### Part feed out with M-function

This parameter is used to deactivate the M function receipt of the turret if this function is not used in the lathe interface. In this case, a timer can be used to give acknowledgement.

#### Misc. Applications

Sequence #	APPLICATION SETUP	mm
1	MISC APPLICATIONS	32
<div style="text-align: center;">  <p>Dry run</p> </div>		

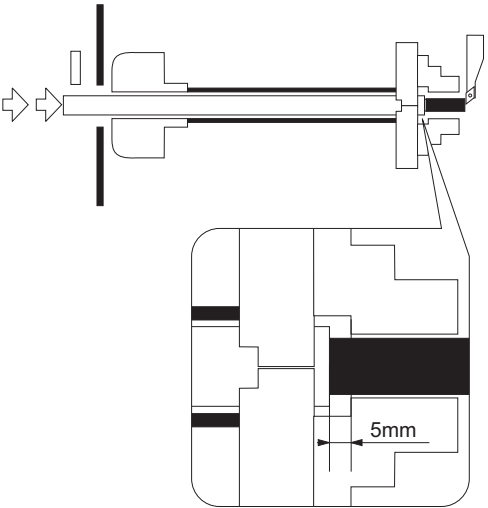
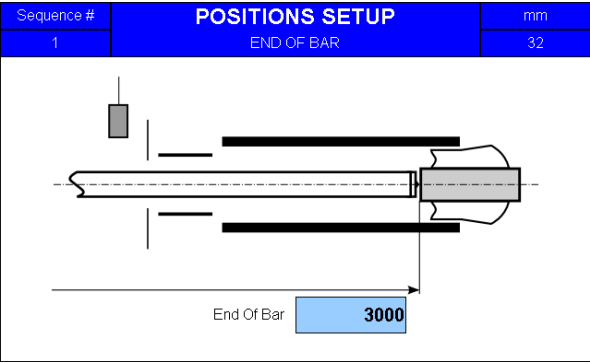
#### Emulation function of the auto cycle - Dry Run

This function allows to use the lathe (production cycle) without the bar feeder (work piece, lathe preheating, etc.).

To enable this setting, the pusher must be in the rear position, the guide channel must be open and the protective cover closed.

4.2.3. Positions

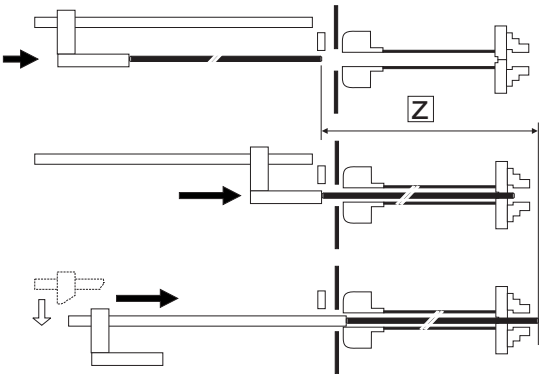
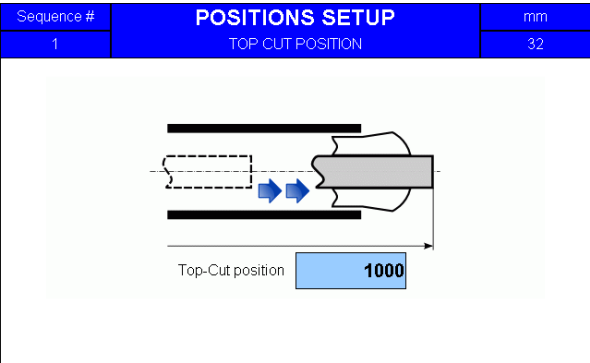
Position end of bar signal



The end of bar position determines the moment when the bar feeder enters the loading cycle. In principle, the end of bar position is adjusted as closely as possible behind the lathe's clamping unit (approximately 5 mm) to ensure the shortest remnants. Regardless of the length of the bars or parts, the end of bar position is always the same. In very special cases, a different end of bar setting needs to be selected.

9 Refer to the Start-up manual for the settings.

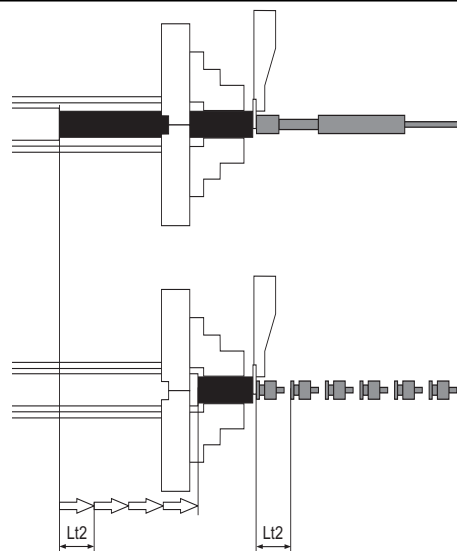
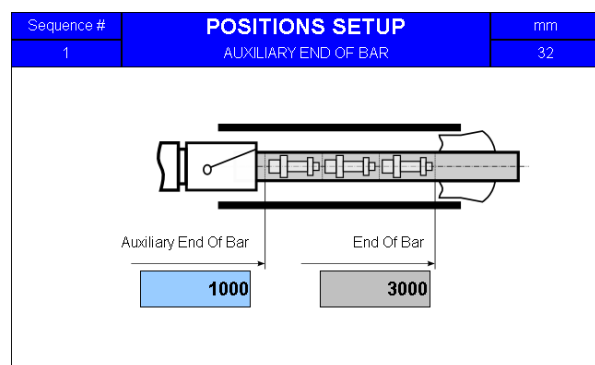
Top-cut position



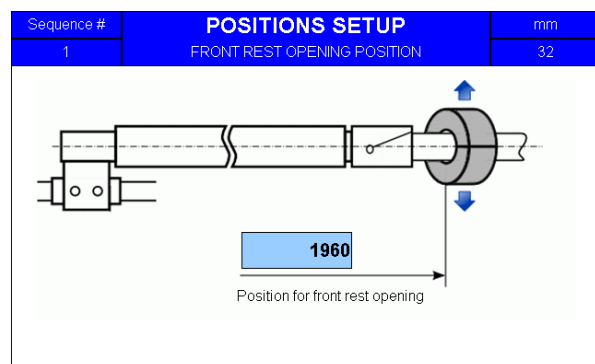
During feeding, the bar is inserted in the spindle and automatically positioned in the clamping unit of the lathe.

This positioning corresponds to a value (**Z**) programmed by the operator, which is equal to the distance between the measuring cell and the position of the material in the lathe clamping device. With this system, the setting is the same for any bar length.

10 Further information in the startup manual.

**Auxiliary end of bar position** *(may be not visible)*

Depending on the lathe and its options, the auxiliary end of bar may be used in several ways. For example, for the opening of an additional front rest installed at the rear of the lathe spindle. The procedure is the same as this for the end of bar signal.

**Front rest opening position**

This parameter makes it possible to determine when the front rest will open, in relation to the position of the pusher, in order to permit its passage. The indicated value represents the position of the pusher from its position of origin. In principle, this value is set in the factory and must not be altered.

#### 4.2.4. Torques

Sequence #	TORQUES SETUP	mm
1		32
	Torque during part feed out, depending on bar diameter	30 %
	Torque during bar loading, depending on bar diameter	30 %
	Torque for pusher friction compensation	10 %
	Torque during headstock reversing	8 %

Depending on the diameter of the bar, the bar feed system will automatically select an appropriate pushing torque and speed.

The operator may modify this selection if necessary.

When the material to be loaded has a high specific weight, the torque must be significant. The contrary applies if the specific weight of the bars is low.

##### **Torque set according to the diameter of the material for the bar loading (%)**

This torque must be sufficient so that the bar can defeat the various frictions during positioning, particularly in the clamp.

Depending on the bar diameter, the feeder suggests a suitable thrust torque.

##### **Torque rate during loading according to bar diameter (%)**

Same principle as for the couple fast forward, applied this time to loading.

##### **Couple for compensation of friction during machining with tailstock Machine (%)**

This torque must be sufficient so that the bar does not have to pull the pusher when the headstock advances. However, if this force is excessive, when the headstock back, the bar can flex if it is of small diameter.

##### **Support Couple of the material against the machine tool during the recoil of the headstock with the opening clamp (%)**

This torque must be sufficient so that the bar remains pressed against the tool when the headstock back. However, if this force is excessive, the tool may break.

### 4.2.5. Language

This parameter allows to adapt the language in which the messages will appear, depending on the country of destination of the bar feed system (*for practical reason, it is not necessary to stop the bar feeder to select a language*).

Sequence #	LANGUAGE	mm
1		32
	 Français	
	 English	
	 Deutsch	
	 Italiano	
	 Espanol	

### 4.2.6. Miscellaneous functions

#### Request for reference point



This operation allows the bar feeder to find the original parameters and positions of the servo motor if these have been lost.

#### Front rest settings

This parameter allows calibrating the front rest. It also allows activating or deactivating the front rest (symbol close then symbol open).

Two icons allows for opening and closing of the front rest, thus easing the possible replacement of the elements.

The protection cover must be opened before entering this parameter.

Sequence #	MISC FUNCTIONS	mm
1		32
	 REFERENCING	
	 FRONT REST	

#### Clamping mode reversed (*may be not visible*)

The interface signal is reversed depending on whether the clamping device functions by pushing or by pulling. When changing clamping unit, the interface signal that indicates opening and closing is reversed. At this point, the bar feeder will incur an error.

#### Mechanical closing/opening time for the clamping system (*may not be visible*)

For clamping with a mandrel, a closing/opening time may have to be configured to prevent the lathe starting up before the unit has closed/opened completely.

Sequence #	MISC FUNCTIONS	mm
1		32
	Clamping signal inversion	<input type="radio"/> NO <input type="radio"/> YES
	Time for clamping device to close	<input type="text" value="1.0"/> s
	Time for clamping device to open	<input type="text" value="0.0"/> s

5. PARTS LIBRARY



The party library is only operational if an optional memory extension card is installed on the PLC. Please contact LNS for more information.

PART LIBRARY

The main « Parts Library » shows the current state of the library.

- Active part: shows the part ID currently in use.
- Total parts: shows the total number of parts stored in the library.

(the underlining denotes the current part)



LOAD PART

This screen allows recalling and loading the parameters of an existing part from the parts library into the parts parameters, by calling its part ID.



ADD PART / OVERWRITE EXISTING PART

This screen allows adding a new part to the Parts Library by storing all the current parameters under a new part ID.

**Caution:** Entering and confirming an existing ID overwrites the stored parameters with the new ones. Once confirmed, the parameters of the old ID are permanently overwritten in the Parts Library and cannot be recovered.



DELETE PART

This screen allows deleting a part from the Parts Library by calling its part ID.

**Caution:** Entering and confirming an existing part no. deletes all the parameters for this no. Once the operation has been confirmed, the parameters for the part are permanently deleted and cannot be recovered.

Sequence #	PARTS LIBRARY				mm
1					32
	Part number	Diameter	Shape	Length	
	32	12.0	Round	95.0	
	5	15.0	Hexagonal	100.0	↑
	32	12.0	Round	95.0	↑
	18	5.0	Round	63.5	↑
	11	11.0	Round	25.4	↑
				Total parts	5
↑ ESC ↓					

Sequence #	PARTS LIBRARY				mm
1					32
	Part number	Diameter	Shape	Length	
	32	12.0	Round	95.0	
	5	15.0	Hexagonal	100.0	↑
	18	5.0	Round	63.5	↑
	11	11.0	Round	25.4	↑
	14	11.0	Round	36.0	↑
				Total parts	5
↑ ESC ↓					

Load a part

Enter the part number

18

OK Cancel

Sequence #	PARTS LIBRARY				mm
1					32
	Part number	Diameter	Shape	Length	
	32	12.0	Round	95.0	
	5	15.0	Hexagonal	100.0	↑
	18	5.0	Round	63.5	↑
	11	11.0	Round	25.4	↑
	14	11.0	Round	36.0	↑
				Total parts	5
↑ ESC ↓					

Add a part

Enter the part number

45

OK Cancel

Sequence #	PARTS LIBRARY				mm
1					32
	Part number	Diameter	Shape	Length	
	32	12.0	Round	95.0	
	5	15.0	Hexagonal	100.0	↑
	18	5.0	Round	63.5	↑
	11	11.0	Round	25.4	↑
	14	11.0	Round	36.0	↑
				Total parts	5
↑ ESC ↓					

Delete a part

Enter the part number









11

OK Cancel

## 6. SERVICE



The service parameters allow to configure the bar feed system in its environment and to adapt the interface connected to the lathe. Changing these values can damage the devices and create operator safety issues. Therefore, these parameters are protected with a password, and only an LNS (or certified) technician is authorised to modify them.

Sequence #	SERVICE		mm
1			32
<div><div> BARFEEDER</div><div> POSITION</div><div> FEED RATE</div><div> OPTIONS</div><div> INTERFACE</div><div> MODE</div><div> DISPLAY</div><div> NETWORK</div></div>			

<b>Bar feeder</b>	<ol style="list-style-type: none"> <li>1. Bar feeder length (2m/3m/12'/4m)</li> <li>2. Bar feeder location (left hand / right hand)</li> <li>3. Unit (mm/inch)</li> <li>4. Type of pusher (short/standard/long)</li> <li>5. Type of bar feeder (545 / 565 S2)</li> <li>6. Transmission gear ratio (1/8 / 1/4)</li> <li>7. Time for clamping device to close (factory value 0.0 sec)</li> <li>8. Time for clamping device to open (factory value 0.0 sec)</li> <li>9. Automatic thrust stop on end of bar (no / yes)</li> <li>10. Stop of the hydraulic pump when the window is open (yes / no)</li> <li>11. Gap between the guide window and the material (1.0 mm factory value)</li> </ol>
<b>Position</b>	<ol style="list-style-type: none"> <li>1. Position behind the clamping device (mm)</li> <li>2. Feed out safety tolerance when feeding with lathe's turret (factory value 10 mm)</li> <li>3. Bar limiter position</li> </ol>
<b>Speed/Torque</b>	<ol style="list-style-type: none"> <li>1. Feed rate before bar measuring (factory values min-max 80 - 400 min<sup>-1</sup>)</li> <li>2. Feed rate during loading cycle (factory values min-max 100 - 3000 min<sup>-1</sup>)</li> <li>3. Feed rate without bar stock (factory values min-max 1000 - 4000 min<sup>-1</sup>)</li> <li>4. Feed rate for part feed out (factory values min-max 100 - 3000 min<sup>-1</sup>)</li> <li>5. Part loading feed rate (min-max values 100 - 3000 min<sup>-1</sup>)</li> <li>6. Torque without bar stock (factory values min-max 0 - 100%)</li> <li>7. Torque during part loading (factory values 70%)</li> <li>8. Torque during bar extraction (factory values 100%)</li> </ol>
<b>Options</b>	<ol style="list-style-type: none"> <li>1. Bar feeder with type of front rest (no/automatic/2-position)</li> <li>2. Bar feeder with extraction system (no/yes)</li> </ol>
<b>Interface</b>	These parameters set the communication and working mode between the lathe and the barfeed.
<b>Working mode setup</b>	<ol style="list-style-type: none"> <li>1. Bar feeder in : Working mode (normal operation)</li> <li>2. Simulation</li> <li>3. Demo mode</li> <li>4. Interface simulation with lathe, without bar</li> </ol>
<b>Display</b>	<ol style="list-style-type: none"> <li>1. Parameter access: Clamping device signal inversion (no/yes)</li> <li>2. Parameter access: Turret waits in position or follows bar (no/yes)</li> <li>3. Parameter access: Feed out to part length with or without M-code (no/yes)</li> <li>4. Parameter access: loading according to the status of the locking device (no/yes)</li> <li>5. Parameter access: End of bar (yes/no)</li> <li>6. Parameter access: Auxiliary end of bar (no/yes)</li> <li>7. Parameter access: Top-cut position (no/yes)</li> <li>8. Parameter access: Tooling of short parts when long remnants (no/yes)</li> <li>9. Parameter access: Dry run function (no/yes)</li> </ol>
<b>Network</b>	Setting the network communication parameters



## 7. HELP SCREENS

From any screen in manual or automatic mode, press the HELP or “?” button on the screen, displays the help screens to troubleshoot or gather information about the software and components.

### Software

This screen displays the current software running the bar feeder and its version.

Sequence #	HELP		mm
1	ABOUT		



PLC Software number : 565.000

PLC Software version : v0.01                      HMI software version : v0.01

PLC serial number : 6AC36A

PLC Firmware : 1.22.28                      HMI Firmware :

PLC Hardware : PCD3.M5340

### Interface

This screen shows the current signals being sent / received through the interface between the barfeed and the lathe.

Sequence #	HELP		mm
1	INTERFACE		
INPUT		OUTPUT	
A1	<input type="radio"/>	R1	<input checked="" type="radio"/>
A2	<input type="radio"/>	R2	<input type="radio"/>
A3	<input type="radio"/>	R3	<input type="radio"/>
A4	<input type="radio"/>	R4	<input type="radio"/>
A5	<input type="radio"/>	R5	<input type="radio"/>
A6	<input type="radio"/>	R6	<input type="radio"/>
A7	<input type="radio"/>	R7	<input type="radio"/>
A8	<input type="radio"/>	R10	<input type="radio"/>

### Inputs

This screen shows the current input signals being used in the barfeed.

Sequence #	HELP		mm
1	INPUT		
E161-0		E161-1	
I0 - SQ1	<input checked="" type="radio"/>	I8 - SQ13	<input checked="" type="radio"/>
I1 - SQ3	<input checked="" type="radio"/>	I9 - SQ17	<input type="radio"/>
I2 - SQ4	<input type="radio"/>	I10 - SQ18	<input type="radio"/>
I3 - SQ5	<input type="radio"/>	I11 - SQ19	<input type="radio"/>
I4 - SQ6	<input checked="" type="radio"/>	I12 - SQ20	<input type="radio"/>
I5 - SQ7	<input type="radio"/>	I13 - SQ21	<input type="radio"/>
I6 - SQ11	<input type="radio"/>	I14 -	<input type="radio"/>
I7 - SQ12	<input type="radio"/>	I15 - SP1	<input checked="" type="radio"/>
		I16 - K8/24	<input checked="" type="radio"/>
		I17 - SP2	<input type="radio"/>
		I18 - SQ10	<input type="radio"/>
		I19 - SQ8	<input type="radio"/>
		I20 - SQ9	<input type="radio"/>
		I21 - SQ15	<input type="radio"/>
		I22 - SQ16	<input type="radio"/>
		I23 - SQ10a	<input checked="" type="radio"/>
		I24 - A1	<input type="radio"/>
		I25 - A2	<input type="radio"/>
		I26 - A3	<input type="radio"/>
		I27 - A4	<input type="radio"/>
		I28 - Ax1	<input type="radio"/>
		I29 - Ax2	<input type="radio"/>
		I30 - Ax3	<input type="radio"/>
		I31 - Ax4	<input type="radio"/>

### Outputs

This screen shows the current output signals being used in the barfeed.

Sequence #	HELP		mm
1	OUTPUT		
A460-2		A460-3	
O32 - YV2	<input type="radio"/>	O40 - YV8A	<input type="radio"/>
O33 - YV3	<input type="radio"/>	O41 - YV8B	<input type="radio"/>
O34 - YV5A	<input type="radio"/>	O42 - YV9A	<input type="radio"/>
O35 - YV5B	<input type="radio"/>	O43 - YV9B	<input type="radio"/>
O36 - YV6A	<input type="radio"/>	O44 - YV10A	<input type="radio"/>
O37 - YV6B	<input type="radio"/>	O45 - YV10B	<input type="radio"/>
O38 - YV7A	<input type="radio"/>	O46 - YV11	<input type="radio"/>
O39 - YV7B	<input type="radio"/>	O47 - YV12	<input type="radio"/>
		O48 - KM1	<input type="radio"/>
		O49 - KM2	<input type="radio"/>
		O50 - KA5	<input type="radio"/>
		O51 - KA6	<input type="radio"/>
		O52 - YV4	<input type="radio"/>
		O53 -	<input type="radio"/>
		O54 - SON	<input type="radio"/>
		O55 - KS	<input type="radio"/>
		O56 - R1	<input checked="" type="radio"/>
		O57 - R2	<input type="radio"/>
		O58 - R3	<input type="radio"/>
		O59 - R4	<input type="radio"/>
		O60 - Rx1	<input type="radio"/>
		O61 - Rx2	<input type="radio"/>
		O62 - Rx3	<input type="radio"/>
		O63 - Rx4	<input type="radio"/>

**IP addresses**

This screen displays the configured IP addresses.

Sequence #	HELP				mm
1	IP ADDRESSES				
IP Address - PLC	0	0	0	0	
Subnet mask	0	0	0	0	
Default gateway	0	0	0	0	
IP Address - HMI	0	0	0	0	

**Alarms list**

This screen shows the history of the last 10 alarms.

Sequence #	HELP		mm
1	ALARM LIST		32
<b>ALARM LIST</b>			

**Memory list**

This screen helps entering and monitoring specific bits (status in green/red), and register values (value in left box).

Sequence #	HELP				mm
1	DISPLAY OF MEMORY				
<b>FLAG</b>		<b>REGISTRE</b>			
0	OFF	0	0		
0	OFF	0	0		
0	OFF	0	0		
0	OFF	0	0		
0	OFF	0	0		
0	OFF	0	0		

**Interface relay**

This screen allows to force an interface relay into a logical state (0 or 1).

Sequence #	HELP		mm
1	INTERFACE RELAY FORCING		
R1	R5		
R2	R6		
R3	R7		
R4	R10		

## 8. AUTOMATIC CYCLE



Please read the safety instructions provided at the beginning of this manual before handling the following devices.

### 8.1. Description

The barfeed autonomy is depending on the bar stocks placed by the operator on the loading ramp. This task can be performed anytime in the production cycle.

Every time the bar feeder automatic sequence is to be started, it is recommended to check the following points:

- On the loading ramp, standard bar stocks must be against the rear limiter.
- The guiding elements must be adapted to the bar diameter.
- The elements of the front rest can be adapted to the profile of the material.
- The pusher must be adapted to the bar stock diameter, to the guiding element diameter and to the spindle inner diameter (including spindle liner).
- The bar feeder collet must correspond to the bar diameter.
- The pushing force must be adapted to the material being loaded.
- On the lathe, the clamping unit must be adapted to the material being loaded.

### 8.2. New bar stock loading

1. The bar stock on magazine is loaded using the cylinder loading into the guiding elements. The pusher is in the fully retracted rear position and the pusher guide is open.
2. The loading finger moves forward and pushes the bar to the measuring position. The bar length is measured.
3. The loading finger moves to the fully forward position and inserts the bar stock in the lathe spindle.
4. The loading finger moves to the fully retracted position.
5. The pusher moves down into the working position.
6. The pusher moves forward behind the bar and finishes the positioning of the bar in top-cut position.
7. The lathe's clamping unit closes.

### 8.3. Part feeding

8. The pusher moves back by the programmed value.
9. The lathe's automatic cycle starts, the parts are machined.

At each clamping unit opening, the pusher moves forward, positions the bar for the next part then moves back by the programmed value.

### 8.4. Remnant extraction

10. The cycle goes on until end of bar signal is given. At this point, the lathe enters a sub-program and the pusher moves to remnant switch (SQ12).
11. The collet clamps the material and the pusher moves to the fully retracted position.
12. Once the pusher is fully retracted, the collet releases the material and the remnant falls into the tray.
13. The pusher moves up.

## 9. END OF BAR POSITION

### 9.1. Description

The end of bar position determines the moment when the bar feed enters the loading cycle.

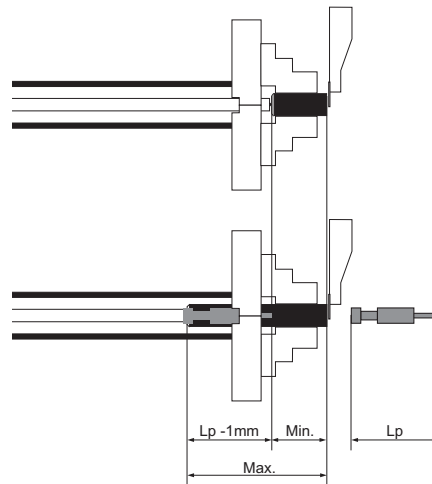
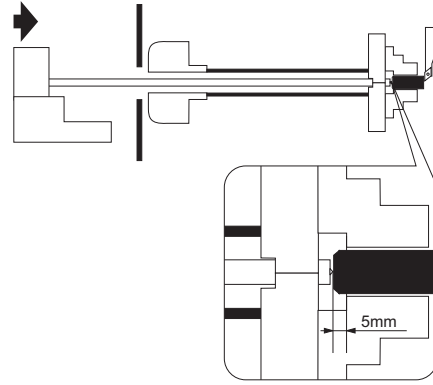
Usually, the end of bar position is adjusted as closely as possible behind the clamping system of the lathe (approximately 5 mm or a 1/4" behind the chuck jaws or collet pads). This will provide minimum bar stock remnant.

Regardless of the length of the bars or parts, the end of bar position is always the same.

The length of the remnant may vary :

- The minimum remnant length (Min) is obtained when the feeding pusher is just behind the clamping device while the last part is being machined.
- The maximum remnant length (Max) is obtained when there is not enough material for machining an additional part ( $L_p - 1 \text{ mm}$ ).

Maximum remnant length =  $L_p - 1 \text{ mm} + \text{Min}$



Before handling the bar feeder, stop the lathe at the end of part cycle !

To edit these parameters, the bar feeder must be in **STOP** mode.

To validate a new parameter or a new value, keep **[ENTER]** pressed until the icon disappears.

1



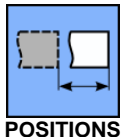
Press the key **[STOP]**.

2



Press the key **[MENU]**.

3



Press the key **[POSITIONS]** on the screen.

4



Press the key attributed to the icon **[PAGE DOWN]** to scroll through the screens, until the "**END OF BAR**" screen is displayed.

5

TEACH  
IN  
↺↻↺

+/-

The remote command displays the following text : **"END OF BAR POSITION"**. Tap the value displayed on the screen.

Depending on which sequence the bar feed is in when the parameter is selected, the available functions and icons can change :

Conditions	Functions	
	By offset correction	By teaching
- Loading channel down	Icon <b>[+/-]</b>	Icon <b>[TEACH IN]</b>
- No bar stock in the loading channel		
- All other cases	Icon <b>[+/-]</b>	---

Setting by offset correction:  
Setting by teach in:

jump to point 6  
jump to point 7

6

+/-

[+/-]

+

-

**[+/-]** by offset correction:

- Press the key corresponding to the icon **[+/-]**. The display shows the current end of bar position.
- Press the **[+]** icon to add the value, or the icon **[-]** to subtract it. The new value is stored.
- To exit the end of bar set mode, press the key attributed to the icon **[ESC]**.

Jump to point 8.

7

TEACH  
IN  
↺↻↺

[TEACH IN]

REW  
↶

FWD  
↷

[REW] [FWD]

ENTER

[ENTER]

**[TEACH IN]** By teaching:

- Press the key attributed to the icon **[TEACH IN]**. The display shows the current end of bar position.
- Press the key **[FWD]** and advance the pusher to the desired position (see previous page). Correct if necessary with the key **[REW]**.
- To validate the new end of bar position, keep **[ENTER]** pressed until the screen blinks.

8

ESC

[ESC]

or

STOP

[STOP]

To exit the set mode, press the keys **[ESC]** or **[STOP]**.

## 10. TOP-CUT POSITION

### 10.1. Description

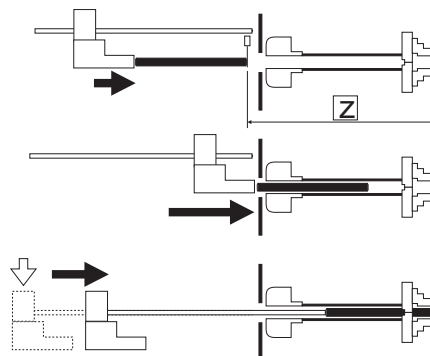
During feeding, the bar is inserted in the spindle and automatically positioned in the clamping unit of the lathe.

This positioning corresponds to a value (**Z**) programmed by the operator, which is equal to the distance between the measuring cell and the position of the material in the lathe clamping device.

With this system, the setting is the same for any bar length.

The top-cut position can be adjusted at any time in one of two ways:

- By offset correction
- By teaching (Teach-In)




### 10.2. Setting





Before handling the bar feeder, stop the lathe at the end of part cycle !  
To edit these parameters, the bar feeder must be in **STOP** mode.  
To validate a new parameter or a new value, keep **[ENTER]** pressed until the icon disappears.

- 1  Press the key **[STOP]**.

- 2  Press the key **[MENU]**.

- 3  Press the key **[POSITIONS]** on the screen.

- 4  Press the key attributed to the icon **[PAGE DOWN]** to scroll through the screens, until the "**TOP CUT POSITION**" screen is displayed.

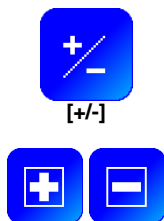
- 5  The remote command displays the following text : "**TOP CUT POSITION**". Tap the value displayed on the screen.
- Depending on which sequence the bar feed is in when the parameter is selected, the available functions and icons can change :

Conditions	Functions	
	By offset correction	By teaching
- Guiding channel opened	Icon <b>[+/-]</b>	Icon <b>[TEACH IN]</b>
- Presence of a bar in the guiding channel		
- All other cases	Icon <b>[+/-]</b>	---

Setting by offset correction:  
Setting by teach in:

jump to point 6  
jump to point 7

6



[+/-] by offset correction:

- Press the key corresponding to the icon [+/-]. The current top cut position (z) is displayed.
- Press the [+] icon to add the value, or the icon [-] to subtract it. The new value is stored.
- To exit the top cut position set mode, press the key attributed to the icon [ESC].

Jump to point 8.

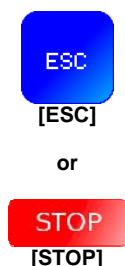
7



[TEACH IN] By teaching:

- Press the key attributed to the icon [TEACH IN].
- Press the key attributed to the icon [START]. The loading channel raises and grasps a bar as it passes by. The feeding pusher inserts the bar into the lathe spindle. The feeding pusher returns to its reference position. The feeding pusher is now facing the spindle.
- Press the key [FWD] and advance the pusher to the desired position (see previous page). Correct if necessary with the key [REW].
- To validate the new end of bar position, keep [ENTER] pressed until the screen blinks.

8



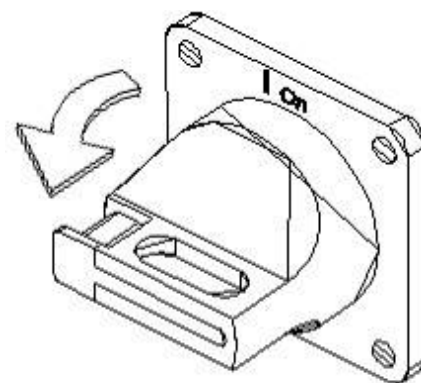
To exit the set mode, press the keys [ESC] or [STOP].

## 11. POWERING DOWN



Before handling the bar feeder, stop the lathe at the end of part cycle !  
When powering off the device, make sure the carriage is in the rear position, the pusher is retracted and there is no bar present in the guiding elements.

To power down, turn the switch to the left, to the **0-off** position.







## **CHAPTER 9 : MALFUNCTIONS**

## 1. FACTORS AFFECTING PERFORMANCE

### 1.1. Installation

Installation is a very important phase which, if neglected, could seriously compromise the operation of the bar feeder. The following parameters must be taken into account:

<b>Distance</b>	The distance between the bar feeder and the lathe has a huge effect on the quality of the guiding. The further the bar feeder is from the spindle, and therefore from the clamping system, the larger the non-guided part of the bar will be. It is essential that the bar feeder is mounted in accordance with the instructions indicated in Chapter 3: Start-up.
<b>Alignment</b>	The guide channel of the bar feeder serves, by definition, to guide the bar outside the lathe. Although the bar rotates in an oil bath inside the guide channel, the alignment of the channel with the axis of the spindle must be perfect. It is essential that the bar feeder is aligned in accordance with the instructions indicated in Chapter 3: Start-up.
<b>Spindle length</b>	In some cases, the length of the spindle may influence the quality of the guidance.

### 1.2. Clearance between the channel and the bar

The best results are obtained when the bar is guided with precision (2 mm). The greater the reduction of the clearance between the guide channel and the bar, the higher the rotation speeds.

When the clearance between the bar and the tube becomes too great, a rupture of the oil film occurs which results in the reduction of the permitted rotation speeds.

### 1.3. Clearance between the spindle and the bar

While the rear of the bar is maintained by front rest of the bar feed system and the front by the collet or the chuck of the lathe, it is possible for the portion of the bar inside the spindle to oscillate, if the clearance is too great.

It is therefore highly recommended to install reduction liners inside the spindle as indicated in the set-up manual.

## 1.4. Material

<b>Bars</b>	To ensure the bar is inserted into the bar feeder collet perfectly, it is essential that the bars are chamfered (at the rear), concentrically, at 30°. It is recommended that the bars are deburred at the front, to prevent them from catching when the bar is inserted into the spindle as it is fed.
<b>Tubes</b>	To prevent oil from the bar feeder and coolant from the lathe from mixing, it is recommended that tubes are capped at the rear when machined (see the set-up manual).
<b>Profiled bars</b>	Round and hexagonal bars are relatively easy to guide. Square bars or special profiles increase the risk of the film of oil rupturing.
<b>Bar straightness</b>	<p>Performances may vary, depending on the material machined, the length of the bar, etc.</p> <p>To obtain optimum output, the bars must be straight.</p> <p>If the torsion of the bars exceeds 0.5 mm/m, performance will automatically be reduced in terms of rotation speed, while vibrations will increase accordingly.</p> <p>In this instance, the quality of the guidance is not the cause.</p>
<b>Material composition</b>	<p>In general, the difficulty increases with the specific weight of the bar. Steel bars are relatively easy to guide.</p> <p>Because of their great flexibility and specific weight, brass bars are relatively difficult to guide at high speeds. Aluminium bars are very easy to guide.</p>

## 1.5. Clamping mode

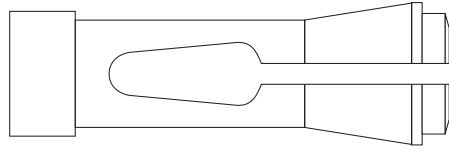
### 1.5.1. Collets

There are different kinds of collets that are more or less effective:

**A) Simple cone collet.**

The bar is held over about 350 degrees, over a length from 0.5 to 7 times the diameter.

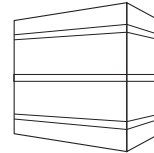
Efficiency : good to very good



**B) Bi-conical collet**

Clamping over 1 or 2 x 350 degrees, over an approximate length of 1.2 times the diameter.

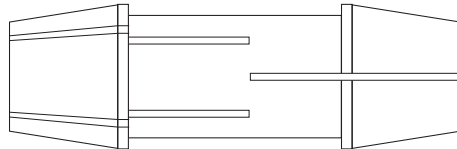
Efficiency : very good to excellent



**C) Double cone collet**

The double cone clamp has the great advantage of holding the bar at two points separated by about 1.5 the diameter, with a clamping 2 times 350 degrees over about 0.5 times the diameter.

Efficiency : excellent



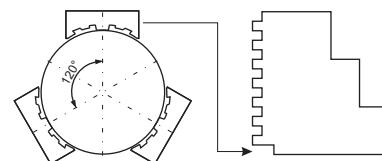
### 1.5.2. 3-jaws chuck

With this type of clamping, one should be very careful given that in many cases the bar is held only at three points, thereby greatly increasing the risk of vibration.

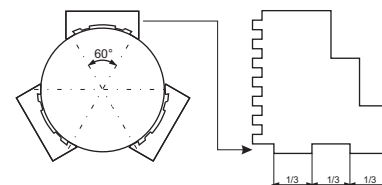
Errors and options to improve the effectiveness of the clamping grips:

#### A) Hard grips

Wrong: The radius of the grip is greater than the radius of the bar. The jaws press against only 3 points at 120 degrees.

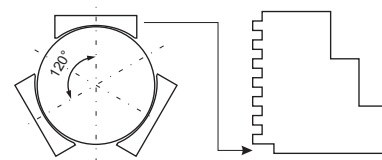


Correct: Modify the centers of the jaws to obtain 2 times 6 support clamping points at 60 degrees.

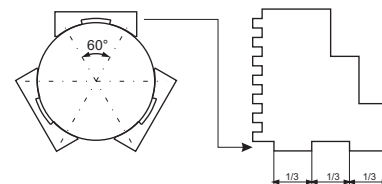


#### B) Soft grips

Wrong: The radius of the grip is greater than the radius of the bar. The jaws press against only 3 points at 120 degrees.



Correct: Modify the centers of the jaws to obtain 2 times 6 support clamping points at 60 degrees.



## 2. MAINTENANCE



Please read the safety instructions provided at the beginning of this manual before handling the following devices.

### 2.1. Hydraulics

It is important to clean the bars (even briefly) before loading them on the feeder magazine. Excessive dirt can form a deposit at the base of the bar feeder, which can in turn slow the oil return.

### 2.2. Pneumatics

The air-filtering device is equipped with an automatic drainage valve, making it unnecessary to empty it. The water recuperated comes from the pneumatic circuit of the building. It is recommended that steps are taken to ensure the air received by the bar feeder is as dry as possible (see Chapter 5/Pneumatics).

### 2.3. Batteries

In the event of a power failure, a backup battery saves the data contained in the PLC. It is possible that with time this battery will slowly drain; in this case a message will be displayed on the remote control. The battery must be replaced as soon as possible with a battery of the same type. The same applies to the servo amplifier.

### 2.4. Mechanics

#### ***Rotating sleeve***

In order to guarantee the correct operation of the bar feeder, the rotating sleeve must function perfectly. Although the construction of the sleeve is very sturdy and reliable, it is recommended to verify periodically that it rotates without friction. If a defect should be present, please contact your local agent.

#### ***Belt***

It is possible that after a certain amount of use, the bar feeder belt will require tensioning. To tension the belt, see chapter 7/point 4.3.

### 2.5. Cleaning

As with any vehicle, machinery, or device, regular cleaning of your bar feeder can only serve to improve its operation and prolong its useful life.

To clean the outside, use a soft cloth and a regular detergent; for the inside, use a cloth or a brush soaked in petrol or benzine. However, make sure that the rollers and parts made of synthetic materials do not come into contact with these products.

The use of compressed air for cleaning is not advisable, because particles could become lodged in sensitive areas and compromise the operation of the bar feeder.



At no time should solvents, such as acetone or thinners be used for cleaning the bar feeder. At no time should cleaning products come into contact with electrical components.

## **CHAPTER 10 : APPENDICES**

## 1. PROGRAMMING EXAMPLE

### MAIN PROGRAM

```
N... "M" CODE "LATHE IN AUTOMATIC CYCLE"
N... SPINDLE STOP
N... COOLANT OFF
N... TURRET TO FEED IN POSITION
N... CLAMPING UNIT OPEN
N... TURRET TO FEED OUT POSITION
N... END OF BAR CHECK (PROGRAM JUMP) >
N... CLOSE CLAMPING UNIT
N... TURRET HOME
N...
```

### PART PROGRAM

```
N... X, Z, G, F, T, S, M, ...
N... MACHINE PART
N... PARTS CATCHER IN (IF INSTALLED)
N... TOP-CUT
N... PARTS CATCHER OFF (IF INSTALLED)
N...
N...
N... X, Z, G, F, T, S, M, ...
N...
N... END OF PROGRAM (LOOP)
```

### SUB-PROGRAM

```
N... TURRET HOME
... "M"CODE (FEED OK)
N... CLOSE CLAMPING UNIT
N... START SPINDLE
N... COOLANT ON
N... TOP-CUT
N...
N... END OF SUB-PROGRAM
< (RETURN TO MAIN PROGRAM)
```

**Important: Programming may change depending on the interface.**



2. ORDERING FORM

*This form should be photocopied, duly filled out, and returned to your retailer or nearest LNS agent.*

Company name:

Person in charge:

Address:

ZIP: City:

Country:

Phone:

Fax:

Type of device:

Serial number:

Qty.	Order no.	Description

Expected delivery:

Location and date:

Signature and stamp of the company:

### 3. LNS ADDRESSES

LNS Europe: [www.lns-europe.com](http://www.lns-europe.com)  
LNS America: [www.lns-america.com](http://www.lns-america.com)  
LNS Asia: [www.lns-asia.com](http://www.lns-asia.com)