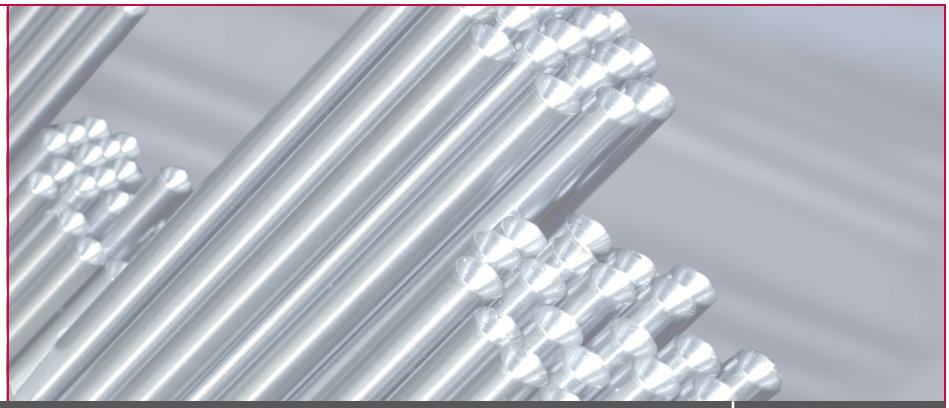

Instruction Manual

ENG

ALPHA 538 / 552

LNS America
4621 East Tech Drive
Cincinnati, Ohio 45245

9.X51.01.US

V2.6

TABLE OF CONTENTS

CHAPTER 1 :
BASIC NOTIONS

1. STRUCTURE

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

- **Document version #:** top-right of the table of content.
- **Page #:** top right-hand corner of the page.
- **# and title of chapter:** top left-hand corner of the page.
- **Model of the bar feeder:** bottom 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 avoiding 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 points out an advice about environmental protection.

2. RIGHTS

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The instructions found in this manual are only for information; they are subject to change without notice.

3. DECLARATION OF COMPLIANCE

EC DECLARATION OF CONFORMITY

According to annex II A of the directive 2006/42/EC

We declare that the following machinery complies with the next 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
Suisse

Compiling relevant technical information : **Plaseco Kurt De Pauw**
Chemin des Petits-Clos 12
CH- 1744 Chénens
Suisse

Description of the machine : BAR FEEDER

Type : ALPHA 552

Serial number : N/A

The following essential requirements of the machine directive 2006/42/EC are applied and fulfilled : 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 transposed harmonized standards have been used :

- Concerning the Machinery Directive :

- EN 14121 - 1 & 2:2007 : Safety of machinery – Risk assessment,
- EN 12100 - 1 & 2:2004 : Safety of machinery – Basic concepts & principles,
- EN 13857:2008 : Safety of machinery – Safety distances to prevent hazard zones being reached by upper and lower limbs,
- EN 13850:2006 : Safety of machinery – Emergency stop equipment,
- EN 14120:2009 : Safety of machinery – Conception of movable guards,
- EN 13849-1:2007 : Safety of machinery – Safety related parts of control systems,
- EN 14118:2000 : Safety of machinery – Prevention of unexpected start-up,
- ISO 13855:2008 : Safety of machinery — Positioning of protective equipment with respect to the approach speeds of parts of the human body
- EN 60204-1:2005 : Safety of machinery – Electrical equipment of machines,
- EN ISO 4414:2011 : Pneumatic Power – Rules and Safety requirements,
- CEI 60812:2006 : Safety of machinery – FMECA Analysis,

- Concerning the Low Voltage Directive :

- IEC 60439-1/3 : Low-voltage switchgear and control gear assemblies

- Concerning the EMC Directive :

- EN 61000-6-4 : Generic emissions standard, Industrial environment
- EN 61000-6-2 : Generic immunity standard, Industrial environment

Place and date :
Orvin, the 4h December 2012

Seal and signature :
Mrs. Nadia Pellaton
Manager Export department

ORIGINAL

4. SAFETY INSTRUCTIONS

Only qualified personal, instructed about the product, may install, set in operation, maintain and, where necessary, repair the product.

The customer must ensure that the provisions regarding internal monitoring, the events logbook, the organization of work, the staff training are available, as well as the installation / instructions manuals.

All persons who perform work on this machine must have read and understood the instructions and installation notice.

LNS disclaim all responsibility for possible accidents or property damage caused when safety instructions are not followed.

- Do not handle the machine without having knowledge of the safety instructions and the instructions for use. Safety instructions for the bar feeder system, as well as the CNC lathe, must be strictly observed.
- Non-qualified personnel, children, and persons under the influence of alcohol or medication should neither handle nor use the machine.
- Loose garments, long hair and jewelry can be dangerous when operating/maintaining the machine.
- Do not conduct any maintenance operations during the automatic cycle.
- Do not grasp moving or rotating objects, or nearby elements.
- While it is powered on, the machine should not be moved, no servicing should be carried out on the interface or inside the electrical cabinet, no maintenance should be performed, no cover should be removed or disassembled.
- If any safety shield, cover or device is to be removed to conduct maintenance, it must be reinstalled as soon as the maintenance work is completed.
- It is strictly prohibited to jump wire or remove circuit breakers, main switches, and especially safety switches to conduct normal operation.
- To avoid any harm to persons or damage to components, use only the recommended locations points for lifting and moving the machine. 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.
- For the use and maintenance of the machine, use only parts provided by or recommended by LNS.
- Don’t hit the machine when moving it, this could result in damages.
- The work area surrounding the machine should always be clear of objects and well lit. The presence of oil on the ground could cause falls; it is important to maintain 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.
- If it is necessary to move the machine once it has been originally installed, do not reinstall it before first contacting LNS or its local representative.
- LNS disclaim all responsibility for possible accidents or property damage caused when safety instructions were not followed.

Special notes in case of an LNS bar feeder system :

- Do not open the clamping device (collet or chuck) of the lathe manually when the bar feeder is in automatic mode (Interface).
- Each time the diameter is changed, also adapt 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.
- The rotating bar should never protrude the rear of the lathe spindle.
- Do not attempt to recharge the batteries of the PLC.
- The maximum length (max. L) the bar feeder system is allowed to load is given by the length of the lathe spindle. The bar should never extend without support more than 3 times its diameter beyond the lathe clamping device.

5. SAFETY ANALYSIS FOR A CORRECT INCORPORATION

Before considering assembling the machine, it is necessary to consider the following points:

- Consider safety strategies that reduce risks to an acceptable level;
- Define the tasks required for applications to predict and assess the need of access and / or for the approach;
- Identify sources of risks, including failures and failure modes associated with each task. Risks can come from:
  - machine in which the device ALPHA 538/552 is integrated;
  - its association with other equipment,
  - People's interaction with the machine.
- Evaluate and assess the risks associated by using the machine ALPHA 538/552:
  - programming risks
  - operation risks
  - risks of use
  - maintenance risks
- Choose methods of protection :
  - the use of protective devices
  - the introduction of signals
  - compliance with safe work procedures

Once the bar feeder has been aligned and anchored to the ground, the bar feeder must be connected to the interface of the lathe and compressed air needs to be connected. At this stage, the hydraulic tank may be filled.

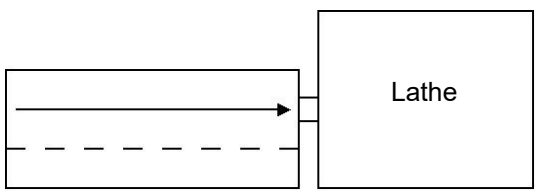
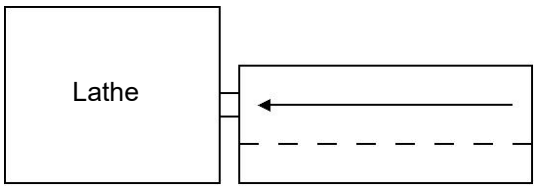
CHAPTER 2 :
TECHNICAL DATA

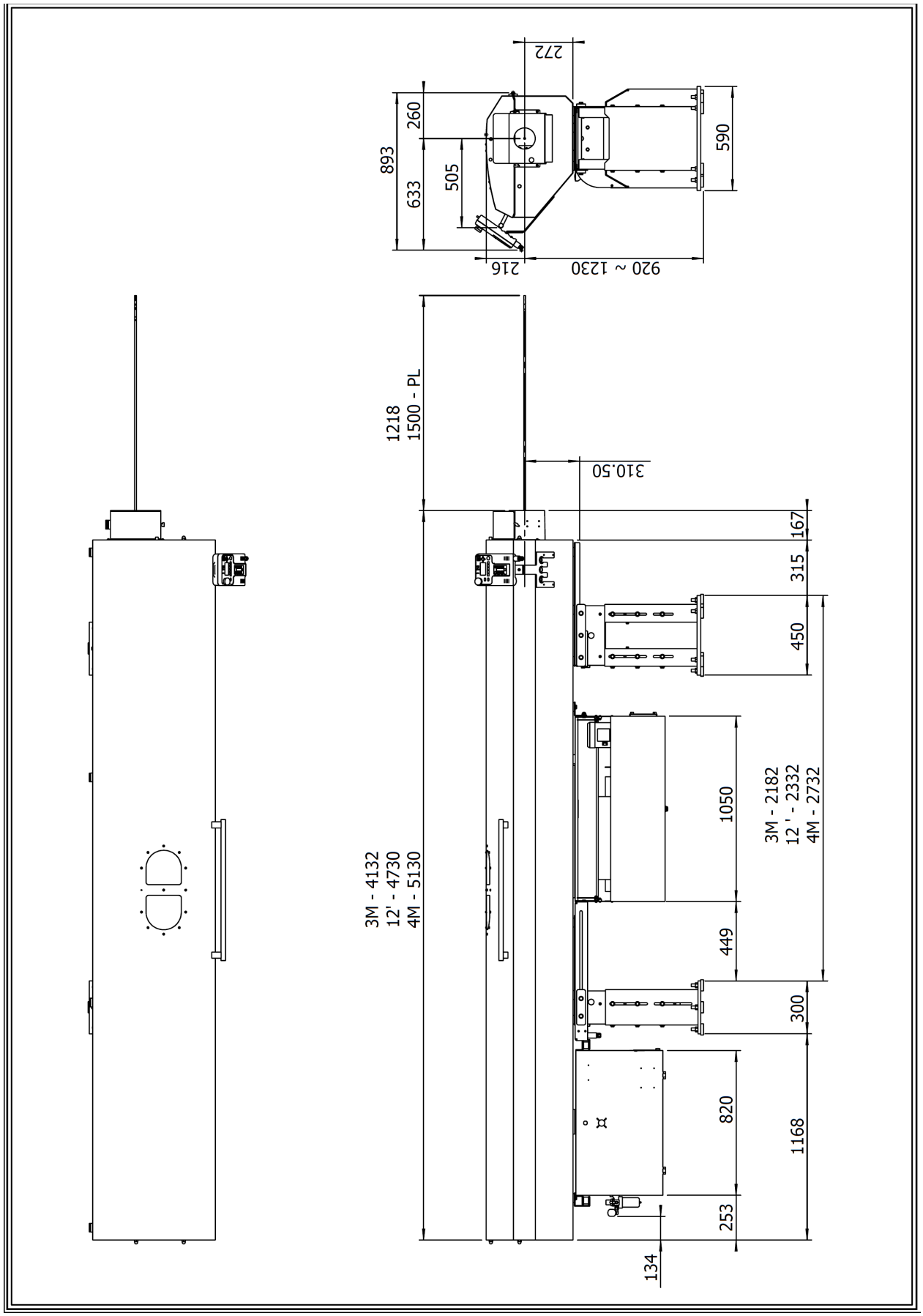
1. CHARACTERISTICS

NOTE: Depending on the options, these technical data may vary. Please refer to the technical data sheet.

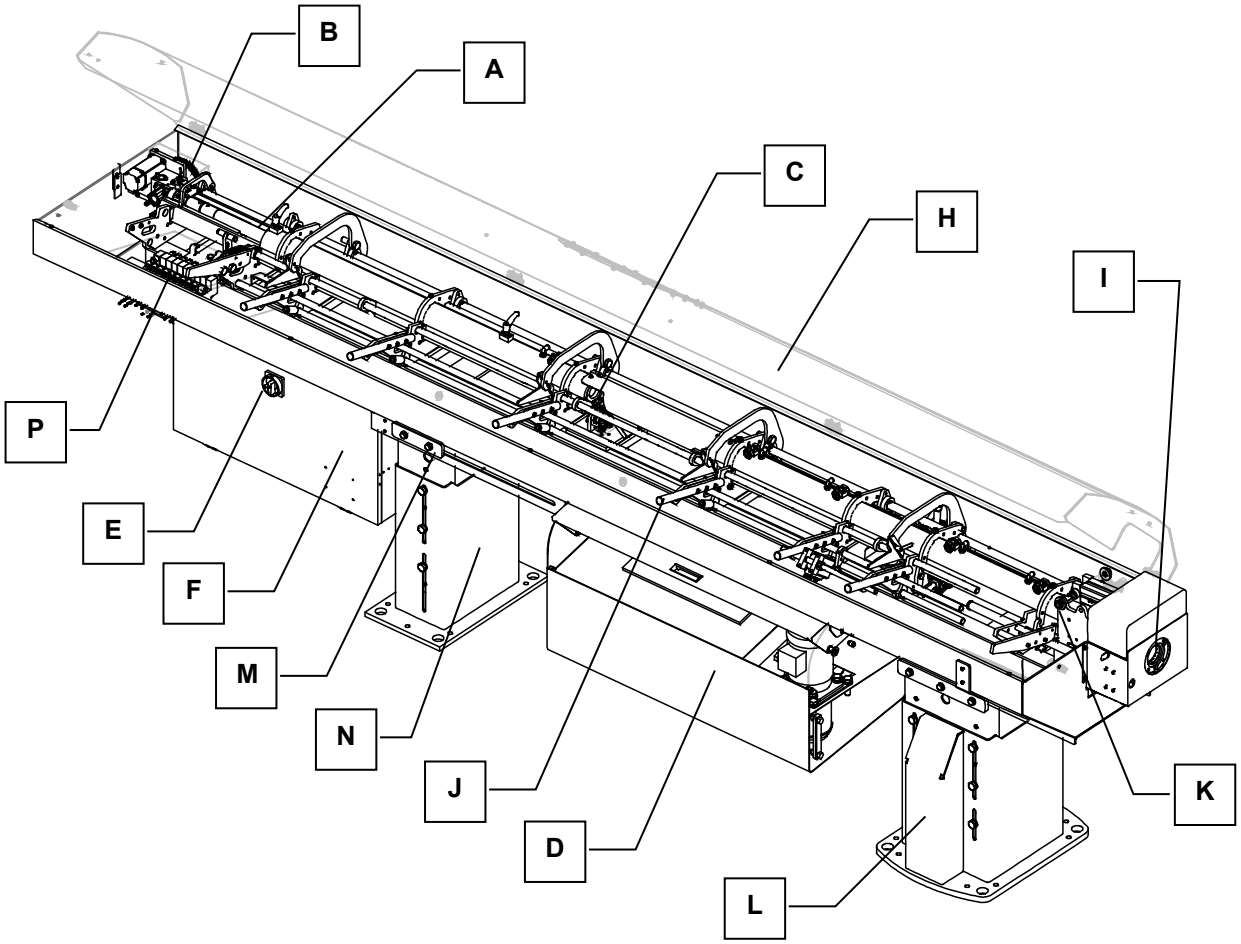
	3 meter	12 feet	4 meter
Weight	2450 lbs (1100 kg)	2550 lbs (1150 kg)	2650 lbs (1200 kg)
Dimensions	See Floor Plan, page 2-3		
Minimum diameter (profiled: on flats)	5 mm (square: 4 mm) (hex: 5 mm)	5 mm (square: 4 mm) (hex: 5 mm)	5 mm (square: 4 mm) (hex: 5 mm)
Maximum diameter	ALPHA 538: 42 mm ALPHA 552: 52 mm		
Minimum bar stock length	1000mm		
Maximum bar stock length	3200 mm	3800 mm	4200 mm
Minimum remnant length	90 mm		
Maximum remnant length	400 mm		
Pneumatic pressure	5 bar		
Air consumption	< 10 liter / loading cycle		
Main electrical power	3x 208 – 480 V 50 Hz – 60 Hz Max. 6A		
Pushing force	Nominal: 464N Max. electrical: 1160N (0,5 seconds) + 630N with mechanical booster		
Maximum feed rate	>1m/min		
Loading cycle	35 - 40 seconds		
Hydraulic oil	ISO 100 / 14 gallons	ISO 100 / 14 gallons	ISO 100 / 14 gallons

2. FLOOR PLAN

Left to right bar feeder (L to R)	Right to left bar feeder (R to L)
	


272
260
893
633
505
590
216
920 ~ 1230
1218
1500 - PL
310.50
167
315
450
1050
3M - 2182
12 ' - 2332
4M - 2732
3M - 4132
12' - 4730
4M - 5130
449
300
820
1168
253
134

3. LAYOUT OF THE ELEMENTS



Designation	Description
A	Pusher (not visible)
B	Chain drive with Smart Power Booster
C	Remnant retract device
D	Hydraulic tank with remnant tray
E	Main switch
F	Electrical cabinet
H	Main access cover
I	Pneumatic front rest
J	Loading ramp
K	Bar length measuring device (not visible)
L	Front stand
M	Retraction system
N	Rear stand
P	Pneumatic assembly

CHAPTER 3 :
SETTING INTO OPERATION

1. TRANSPORTATION

Please read the safety precautions described at the beginning of this manual before handling the following devices.

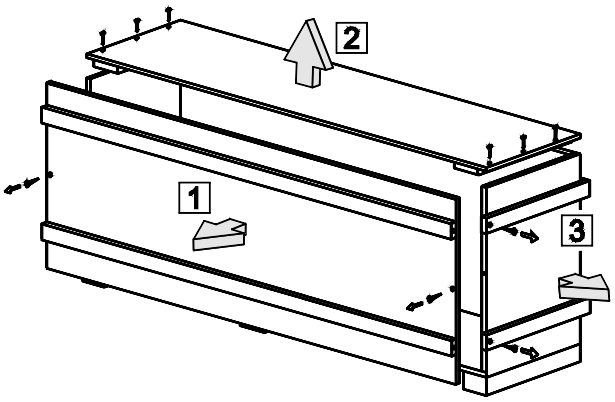
Depending on its destination, the ALPHA 538/552 bar feeder may be delivered either on a pallet or packed in a wooden crate. When transported by sea or by air, the second solution is recommended. Regardless of the type of packaging, the uncrating and lifting instructions recommended by LNS must be observed in order to prevent any injuries to persons and damages to objects. These instructions are stapled to the crate of the bar feeder.

1.1. Unpacking

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

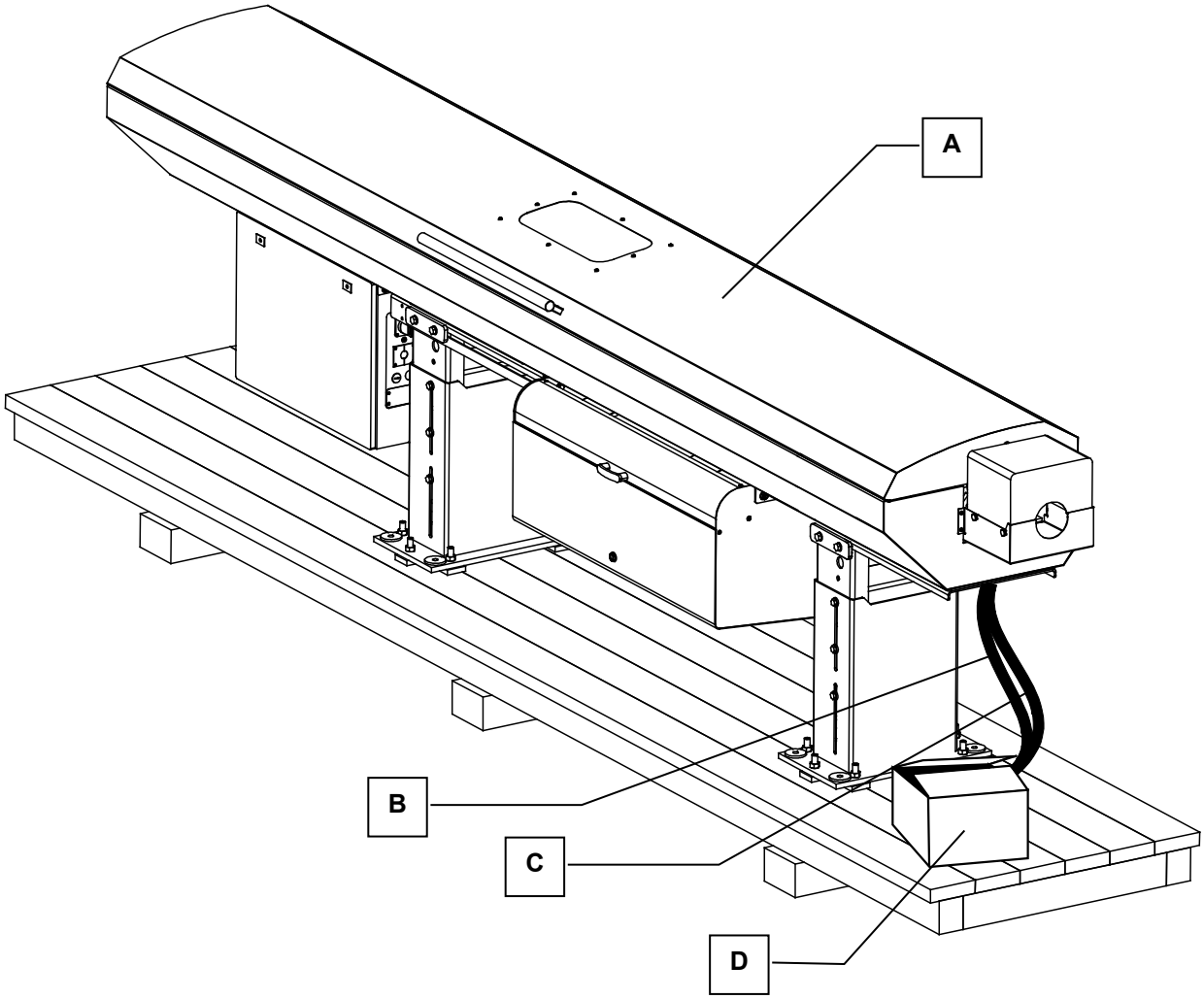
Check that the lifting capacity of the hoisting crane, or lift truck, is adequate before proceeding with the handling of the merchandise. No one should be near the hanging load, or within the operating range of the overhead hoist/crane, forklift, or any other means used for lifting and transportation.

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 ALPHA 538/552 bar feeder is always delivered as follows:



- 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.

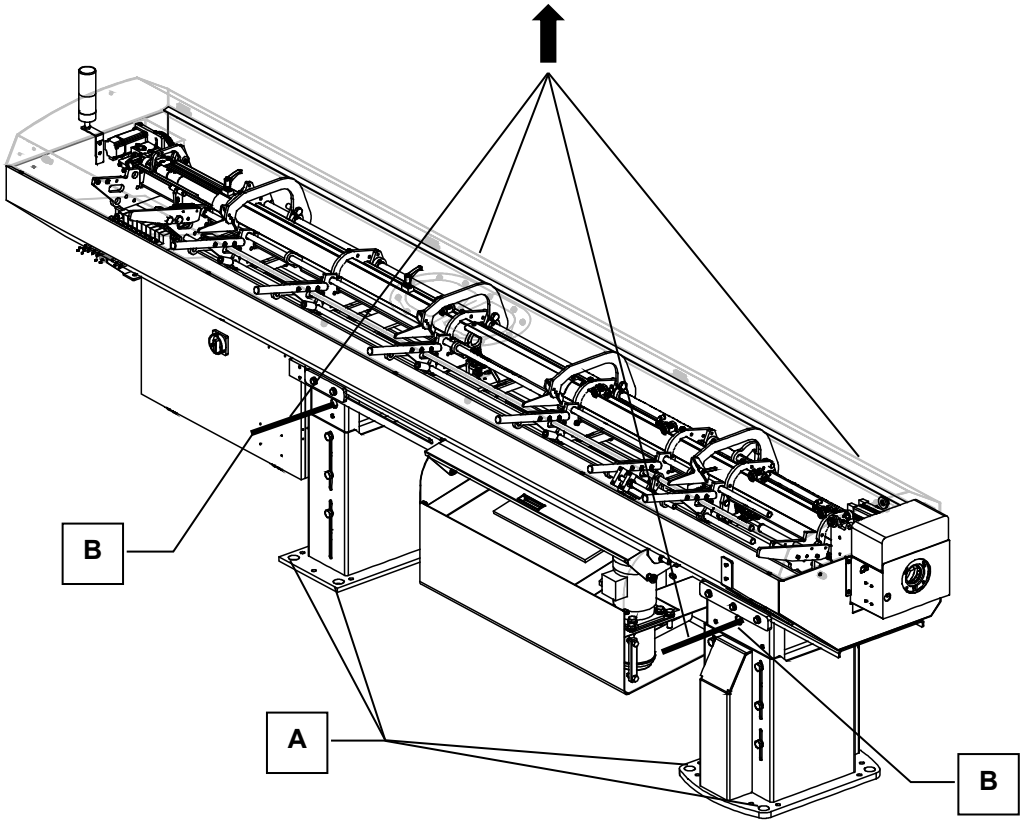
- The remote control (**B**) and the interface plug (**C**) are packaged in a separate box (**D**), with the technical documentation and the accessories. **(D)**.

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

1.2. Preparation for mounting

For mounting and installing 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 lift 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. MOUNTING

The ALPHA 538/552 bar feeder is delivered completely assembled. Because of this, it is possible to proceed directly to its alignment when in place behind the lathe.

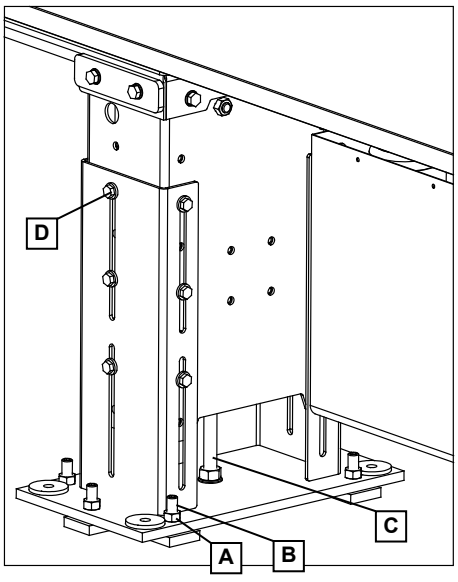
2.1. Alignment

Before proceeding with the alignment of the bar feeder, ensure that the lathe is stable and preferably levelled.

During the alignment, ensure that there is no reduction unit 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.

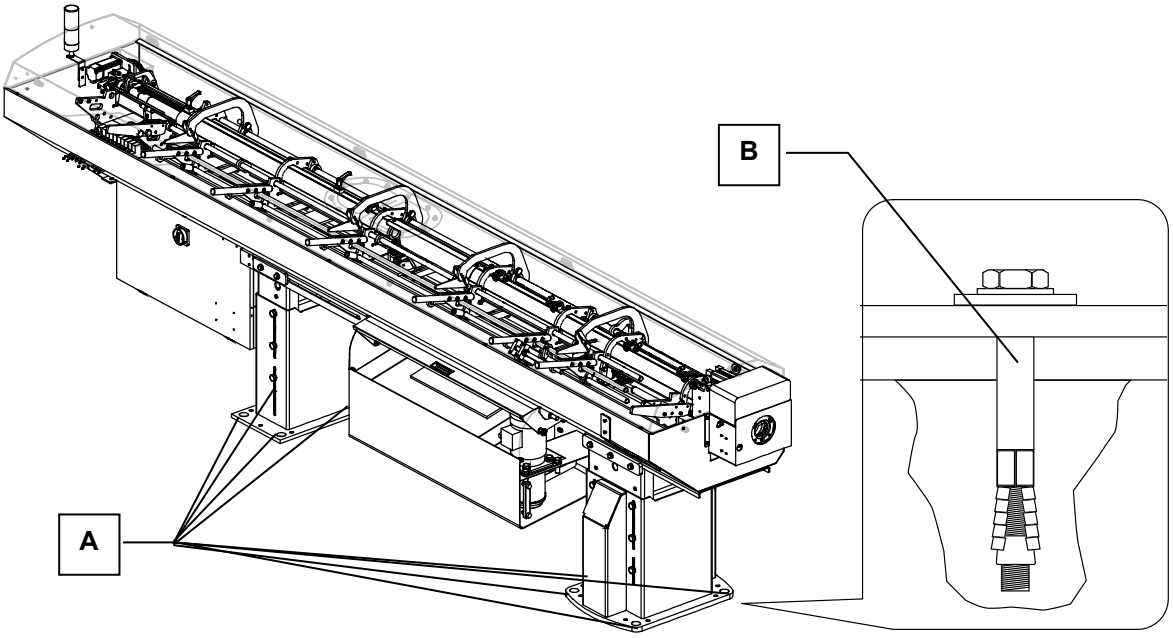
- On each foot, loosen the lock nuts (**A**) of the leveling screws (**B**). Then, make sure that the weight of the bar feeder is evenly distributed over the 12 support points.
- Loosen the nuts and locking screw (**D**) and make sure that the central screws (**C**) of the front and rear feet are supported.
- Open the guiding channel 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.
- Together with the vertical alignment, proceed with the lateral alignment, by shifting the apparatus. If you don't have the needed 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 leveling screws should only be tightened after the bar feeder is anchored to the ground.

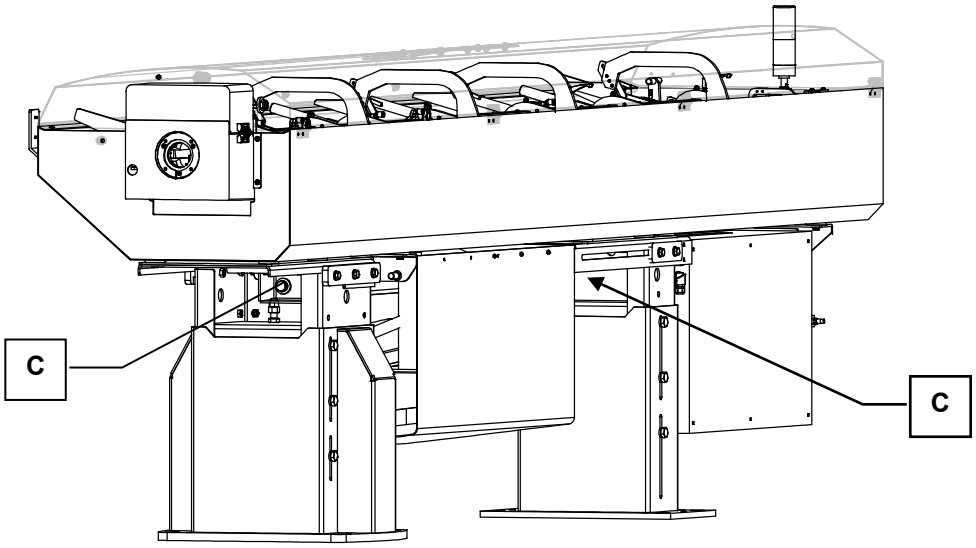
3. ANCHORING TO THE GROUND

Once the bar feeder is in place, and perfectly aligned, it should be anchored to the ground to make it stable. To accomplish this, 8 anchorage points (**A**) have been provided.
8 anchorage bolts (**B**) must be furnished by the client (min. M10 x 100 mm / 1/2" x 4").



Once the anchoring bolts are tightened, check the alignment again, and correct it if necessary.

- Tighten the nuts of the leveling screws.
- Remove the 4 (2+2) shipping screws for the retraction system **(C)**.



4. ELECTRICAL CONNECTIONS

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.

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

Maximum current: 3 x 220 V = 6 A
3 x 480 V = 3 A

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

a) Transformer T1

b) Hydraulic pump motor

The LNS bar feeders are equipped with their own thermal protection systems (breakers, thermal relays and 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^2 (AWG 16).

4.1. Electrical interface lathe – barfeed

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

Only LNS (or certified technician) is authorized to modify the interface or parameter system.

5. PNEUMATIC CONNECTIONS

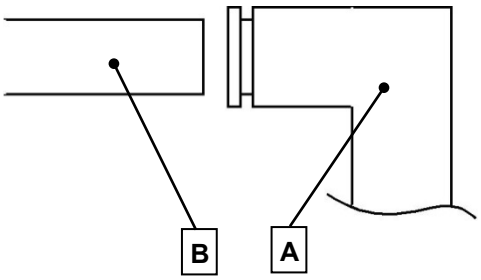
The pneumatic connection (**A**) is located behind the control cabinet.

For the pneumatic connections of the bar feeder, the customer must provide a hose (**B**) with an inside minimum diameter of ¼ inch.

Provide an air hose long enough to allow the complete travel (500 mm) of the retraction system.

When the hose is connected, it should not lie on the ground because it could become damaged.

1. Insert the hose (B) in the pneumatic connector (A)

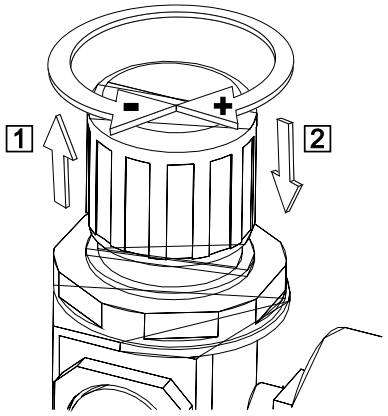


5.1. Settings

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 operational pressure should be set at **5 bar**.

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



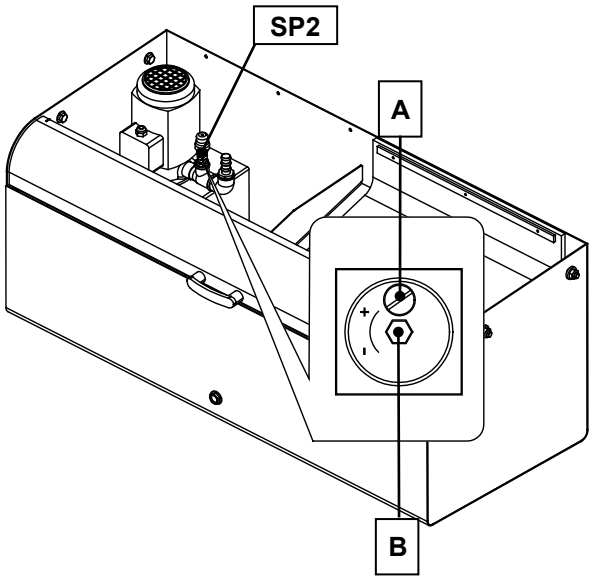
6. HYDRAULIC CONNECTIONS

The guiding concept of the ALPHA 538/552 bar feeder consists mainly in maintaining the bar suspended in an oil bath. This reduces friction of the turning bar stock, and dampens the vibration generated by the bar stock.

The hydraulic oil is contained in the machine itself. Aspirated by a pump motor, it is injected into the front rest and the guiding elements.

6.1. Settings

The pressure is constantly monitored by a pressure switch set at the factory at a point of release of 0.5 bar. It may be adjusted, if necessary. Refer to chapter 6 section 2.2 for setting instructions.



6.2. Filling

The bar feeder is delivered without oil. 50 liters (14 gallons) of hydraulic oil of the type indicated below must be provided by the client. The oil must be poured directly into the machine.

Viscosity equivalency table			
ISO 100	100 mm2/s (cSt) at 40°C	DIN 68	8°E to 50°C

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

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

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.

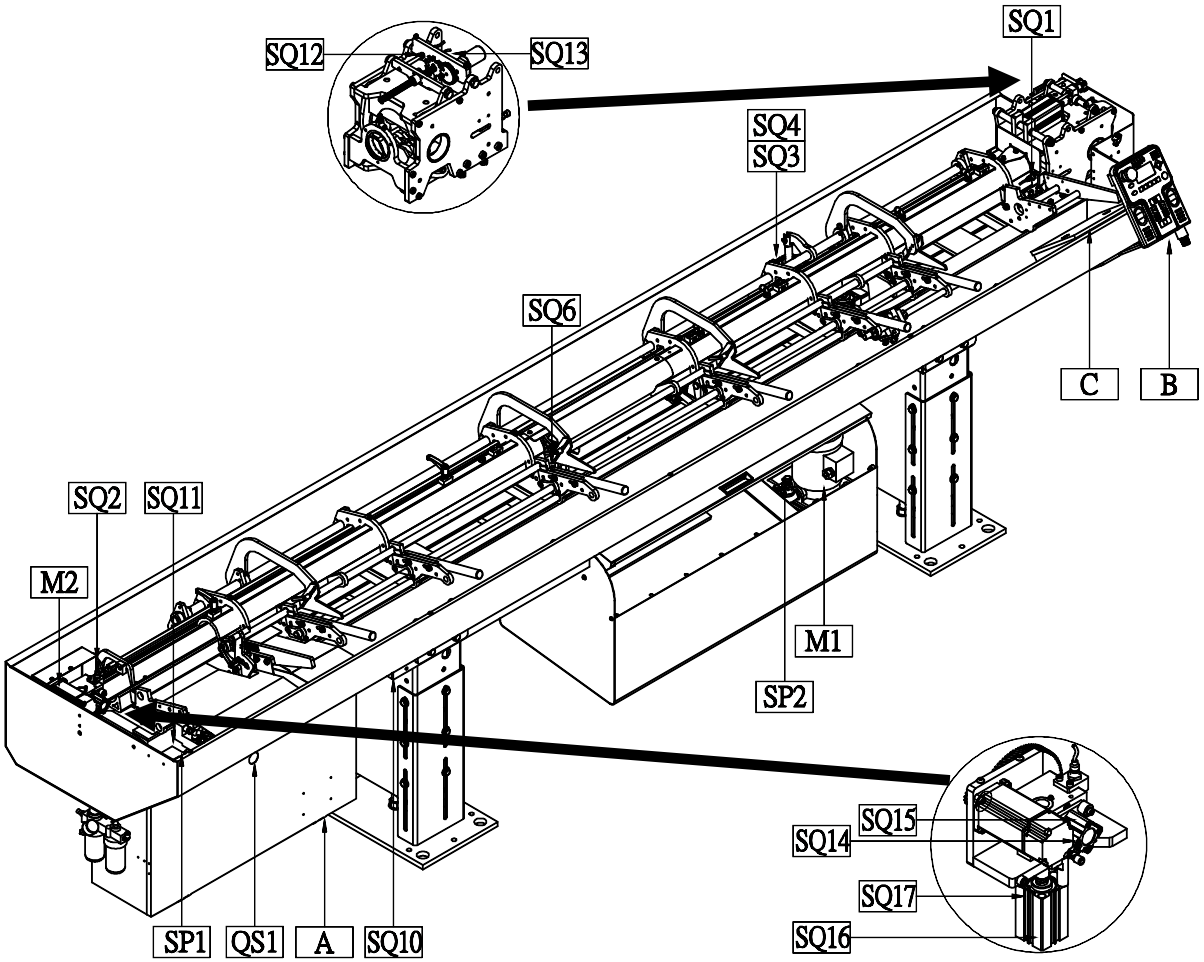
1.1. Description

The electrical parts of the bar feeder, as well as the diagrams representing them, conform to the CEI 204-1 EN 607 international electrical codes.

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 indicated, look for the element and then write down the ordering number of the desired element.

1.2. Layout of the electrical elements on the bar feeder



Designation	Article No.	Description
A	XH03202001000	Electrical cabinet
B	X51.40.A005A	Remote control
C	-	Interface (specific to each installation)
M 1	X51.09.P017A	Hydraulic pump motor
M 2	B14120203	Servo motor
QS 1	B55000003	Main power switch
SP 1	C11121400	Air pressure switch
SP 2	44.0179.K0.15	Hydraulic pressure switch
SQ 1	B18120401 (4m)	Positioned stop
SQ 2	B18120400	Home position
SQ 3	C11111100	Guiding channel in open position switch
SQ 4	C11111100	Guiding channel in closed position switch
SQ 6	C11111100	Vice system
SQ 10	4.484	Retraction safety
SQ 11	4.894	Main access cover closed safety switch
SQ 12	B18120401	Front rest reference (option)
SQ 13	B18120401	Front rest pulse signal (option)
SQ 14	C11111100	Inserting clutch off (option)
SQ 15	C11111100	Inserting clutch on (option)
SQ 16	C11111100	Material extraction (option)
SQ 17	C11111100	Material inserting (option)

1.3. Description of the electrical elements of the bar system

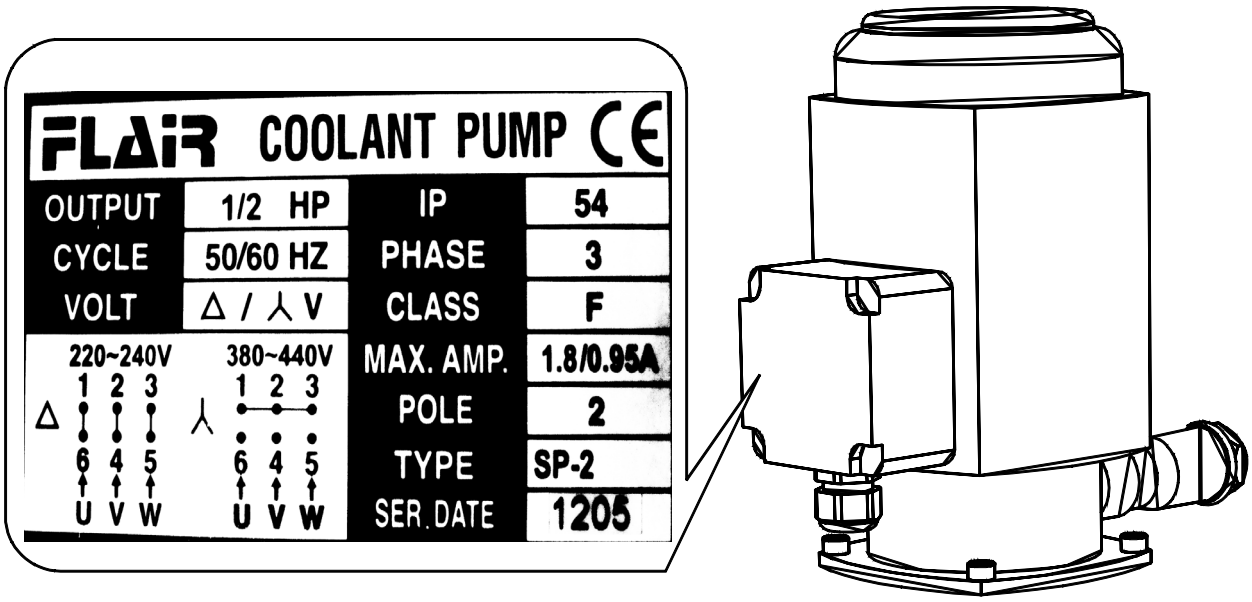
(1) Hydraulic pump motor

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 strictly prohibited to make adjustments as long as the bar feeder is under electrical power. The adjustments of the electrical equipment must only be performed 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:

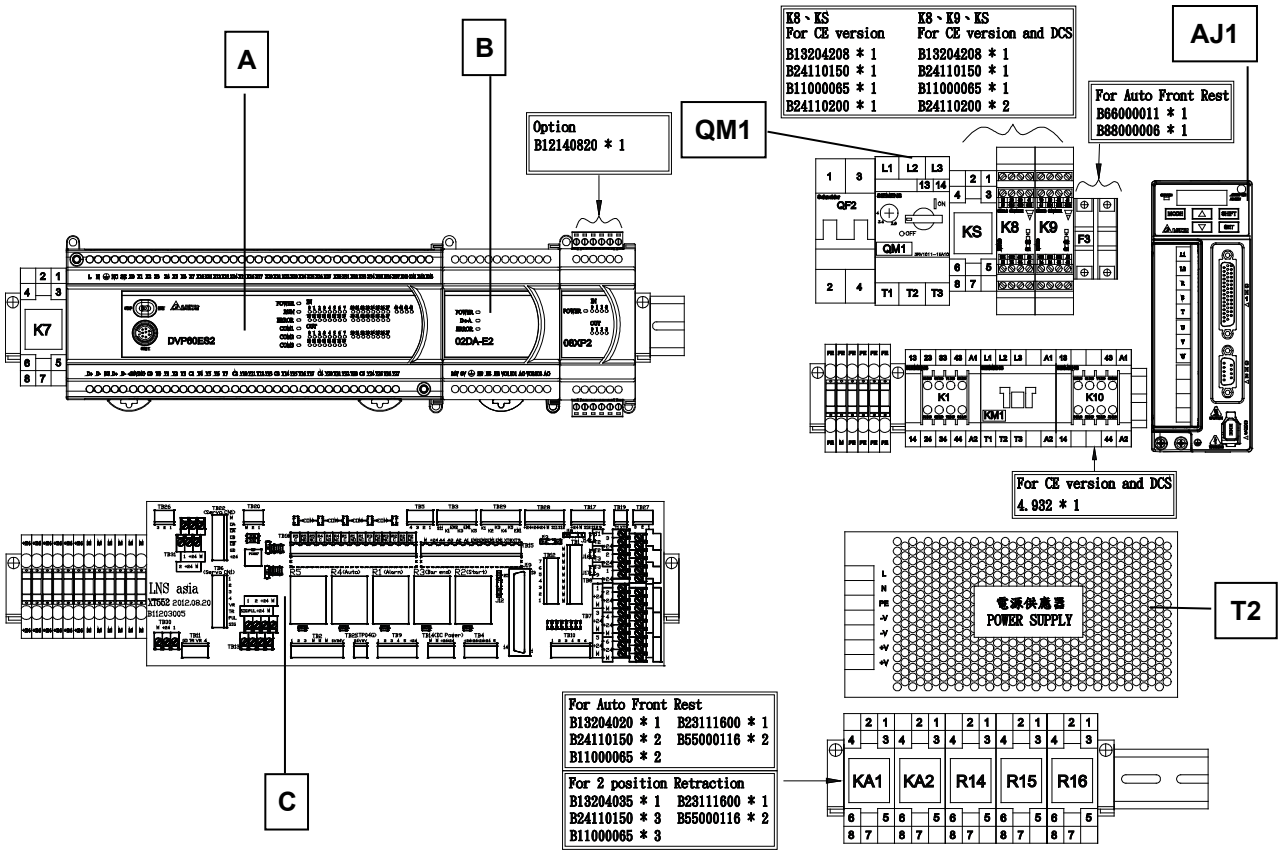


Procedure:

- 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. Layout of the elements in the electrical cabinet

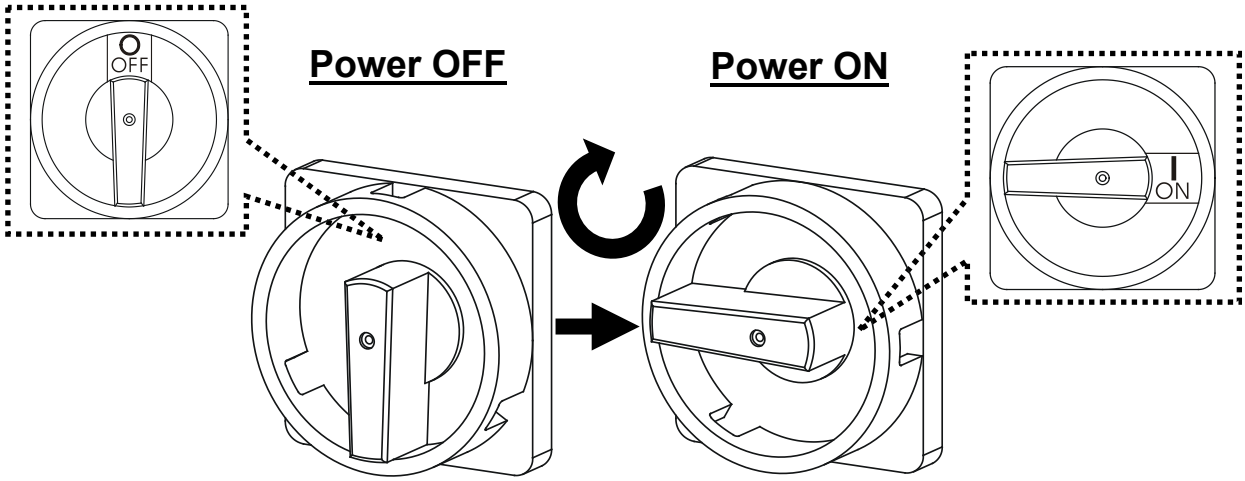


Designation	Article No.	Description
A	B12140800	Programmable logic controller (PLC)
B	B12140810	Analog module
C	B11203011	PCB Board
K1	4.932	Contactor, safety chain control
K7	B66000150	Relay
K8	B24110200	Safety relay (CE version + DCS version)
K9	B24110200	Safety relay (DCS interface)
K10	4.932	Additional contactor (Optional, for DCS version)
AJ1	B14120101	Servo drive amplifier
F3	-	<Reserved>
KA1	-	<Reserved>
KA2	-	<Reserved>
KS	B66000007	Safety restart relay (CE version)
KM1	4.932	Hydraulic pump motor M1 contactor
QF2	B19110100	Circuit breaker
QM1	4.503	Main circuit breaker 2,5 to 4 A
QS1	B55000003	Main disconnect switch
T1	-	Transformer 1-ph (Optional, not shown here)
T2	B25120020	24 VDC Power supply

2.2. Description of the elements in the cabinet

(2) Main disconnect switch QS1

In accordance with the requirements of the international IEC standards, when the main disconnect switch is at **0off**, it interrupts the input of the three phases in the control cabinet of the bar feeder.



Make sure it is turned OFF before opening the electrical cabinet.

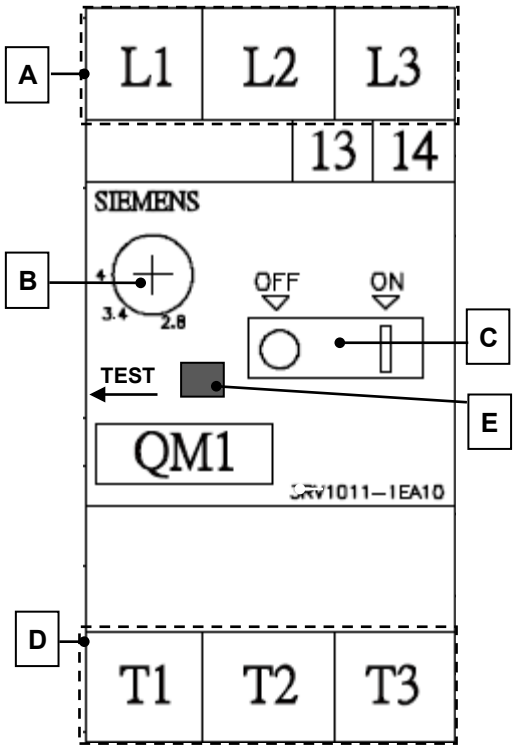
(3) Main circuit breaker QM1

Circuit breaker QM1 interrupts the 3 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 reason, 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 (**C**).

At the factory, the breaking current is set to 2.5 amperes.



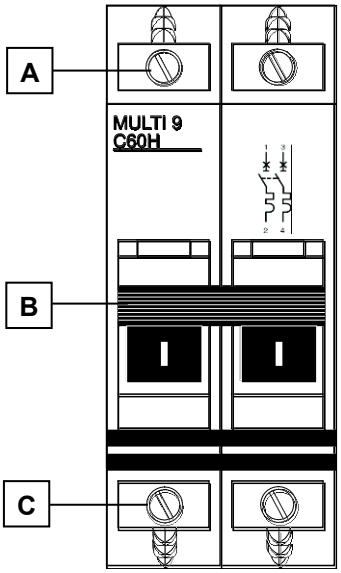
Designation	Description
A	Power in connecting terminal
B	Breaking current setup
C	Release button
D	Power out connecting terminal
E	Test button

(4) Circuit breaker QF2 (4 Amps)

Circuit breaker QF2 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 damages.

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



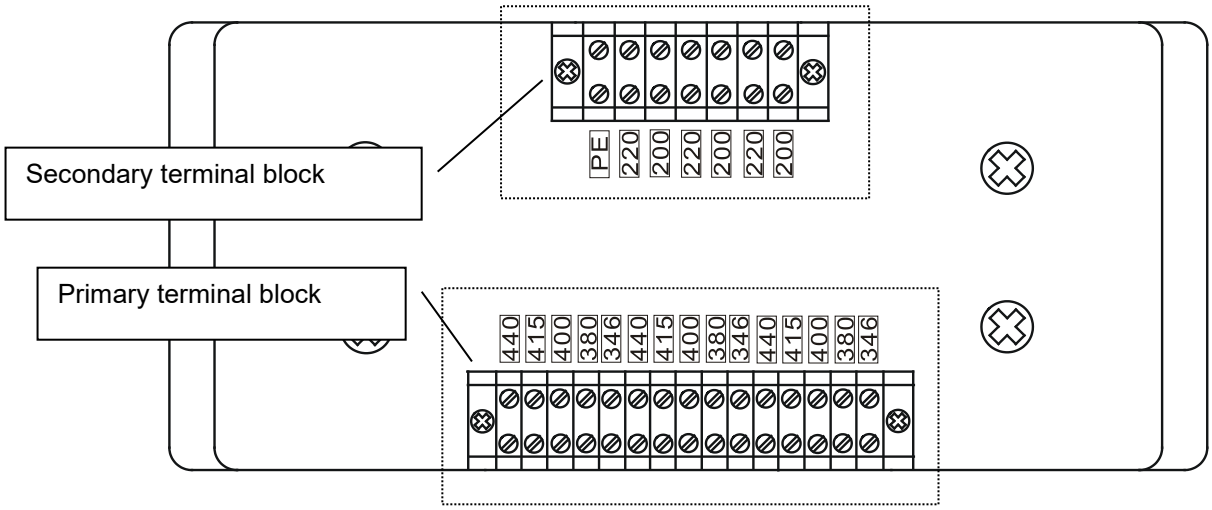
Designation	Description
A	Power in connecting terminal
B	Lever on/off
C	Power out connecting terminal

(5) Transformer 220 V (T1)

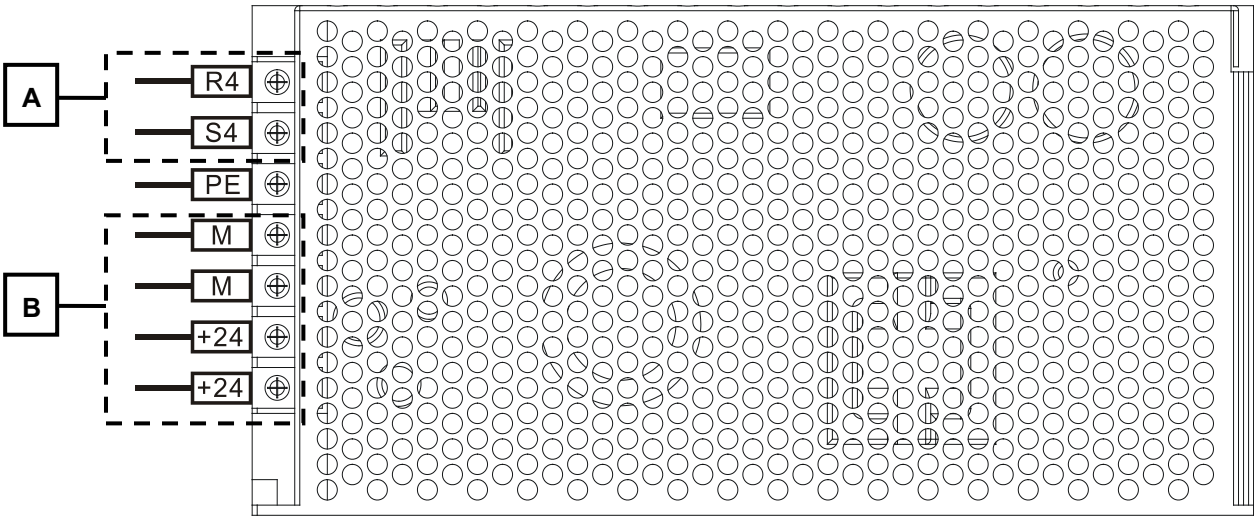
If the power supplied by the interface cable does not meet the required 220V AC the transformer must be used.

The incoming power must be connected to the Primary Terminal Block. Use the contacts corresponding to the supplied power (346V AC to 440V AC, see drawing below).

The outgoing power is always connected to the 220VAC terminals of the Secondary Terminal Block.



(6) Transformer 24V DC (T2)

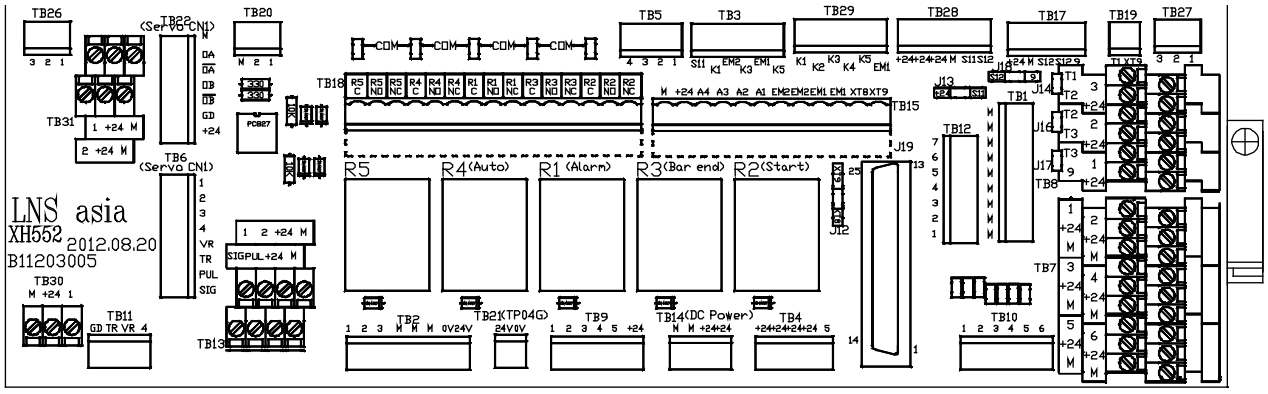


The power supply converts AC 220 V to 24V DC for the low voltage circuit.

Designation	Description
A	220V AC input terminals
B	24V DC output terminals

(7) PCB (Printed Circuit Board)

PCB is a board with circuit printed and electrical components welded on the surface. It offers sockets and terminals for electrical components like relays, cables and fuses.

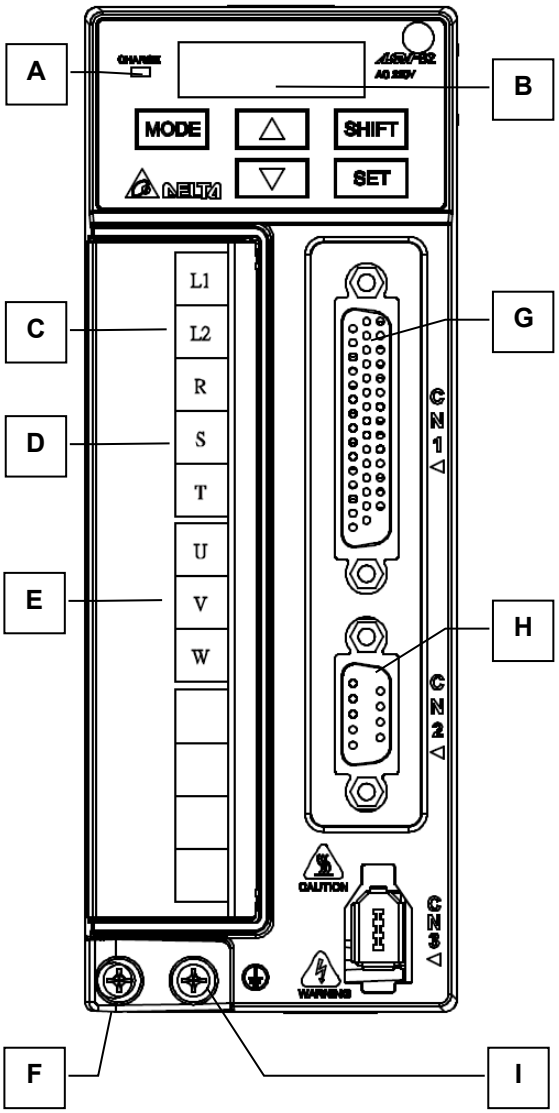


(8) Servo amplifier

By means of the SERVO amplifier, the programmable controller controls 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. Therefore, the axles do not need to be placed at zero when the bar feeder is powered up.

Ensure that the emergency stop equipment or device is connected and working correctly before operating the motor that is connected to a mechanical system.

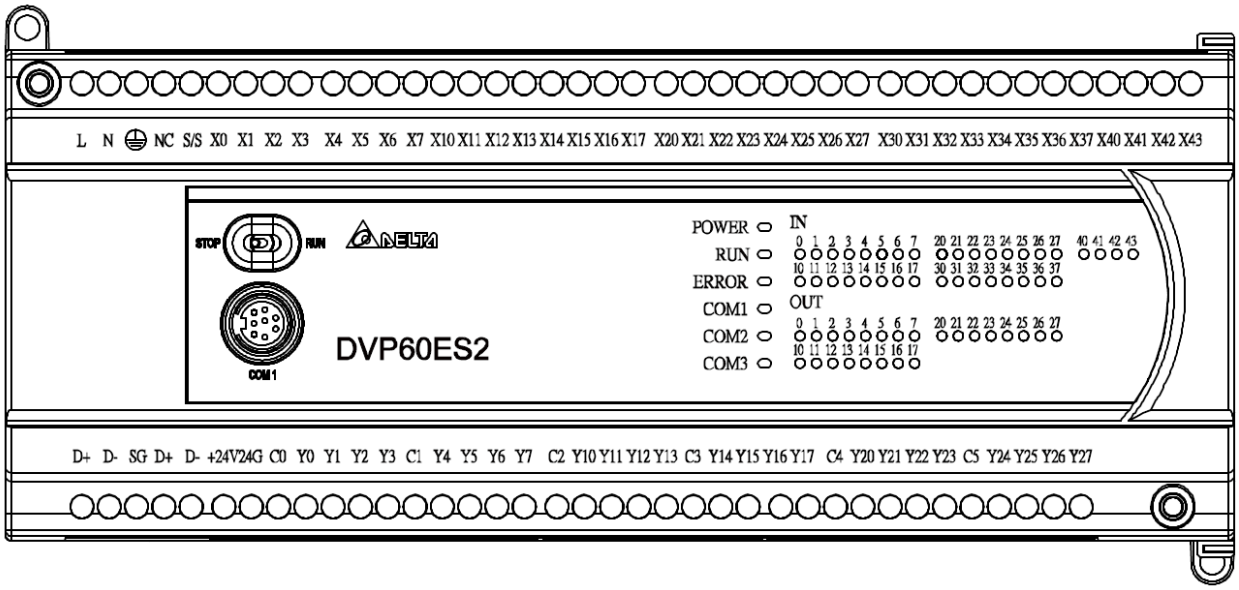
Designation	Description
A	**Charge LED** A lit LED indicates that either power is connected to the servo drive OR a residual charge is present in the drive's internal power components. DO NOT TOUCH ANY ELECTRICAL CONNECTIONS WHILE THIS LED IS LIT.
B	**LED display** Displays the servo status or fault codes.
C	**Control circuit terminal (L1, L2)** Used to connect 200 – 230 VAC, 50/60Hz single-phase power supply.
D	**Main circuit terminal (R, S, T)** Used to connect 200 – 230 VAC, 50/60Hz commercial power supply.
E	**Servo motor output (U, V, W)** Used to connect the servo motor.
F	**Heat sink** Used to secure servo drive and for heat dissipation. DO NOT TOUCH, MAY BE VERY HOT AND CAUSE SERIOUS PERSONNEL INJURY.
G	**I/O interface (CN1)** Used to connect host controller (PLC) or control I/O signal.
H	**Serial communication interface (CN2)** Used to connect other controllers
I	**Ground terminal**



(9) Programmable controller (PLC)

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

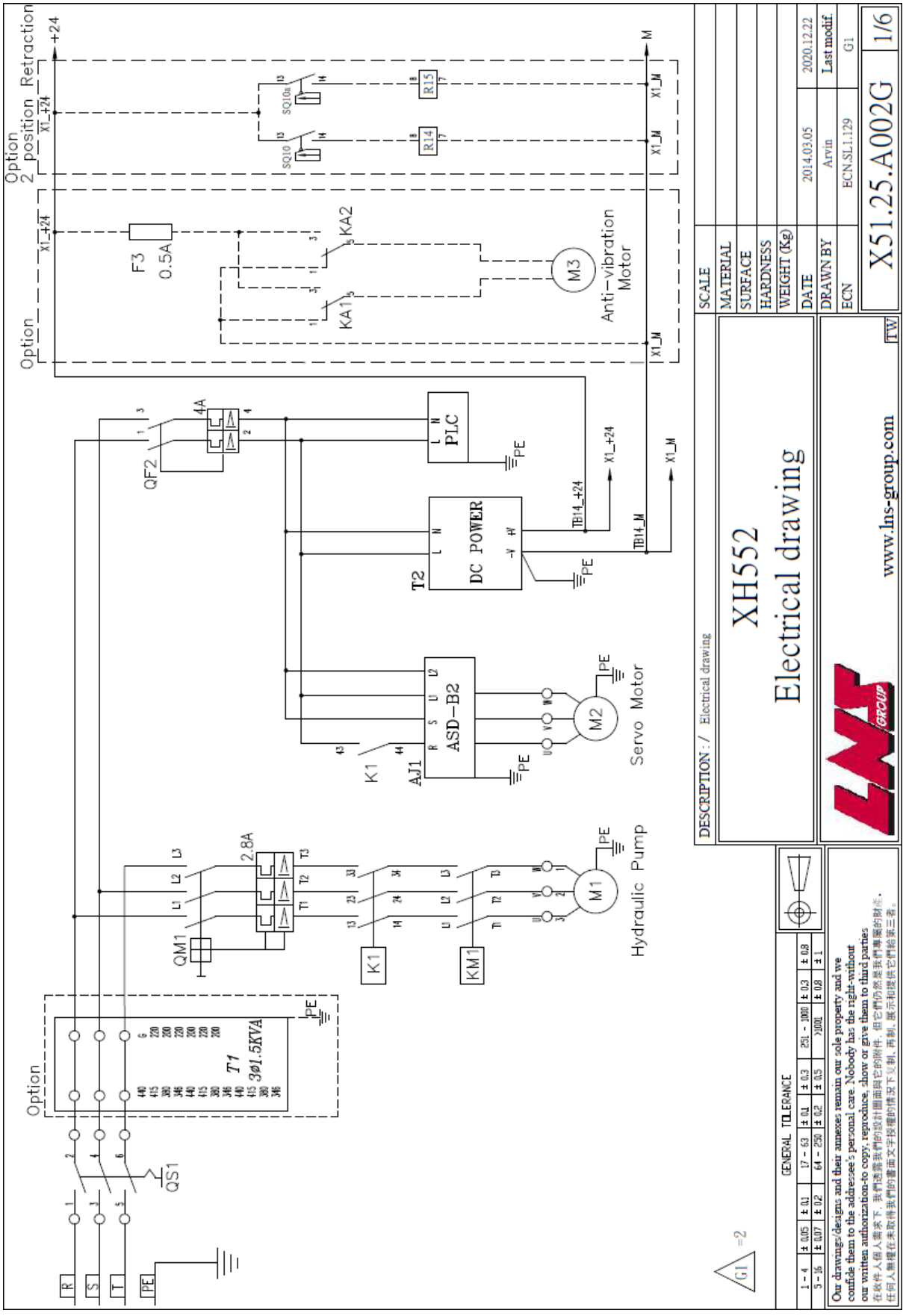
The program loaded into the PLC manages this information. The PLC then distributes the interface signals, controls the SERVO drives as well as the pneumatic valves, and displays the appropriate messages on the remote control station.

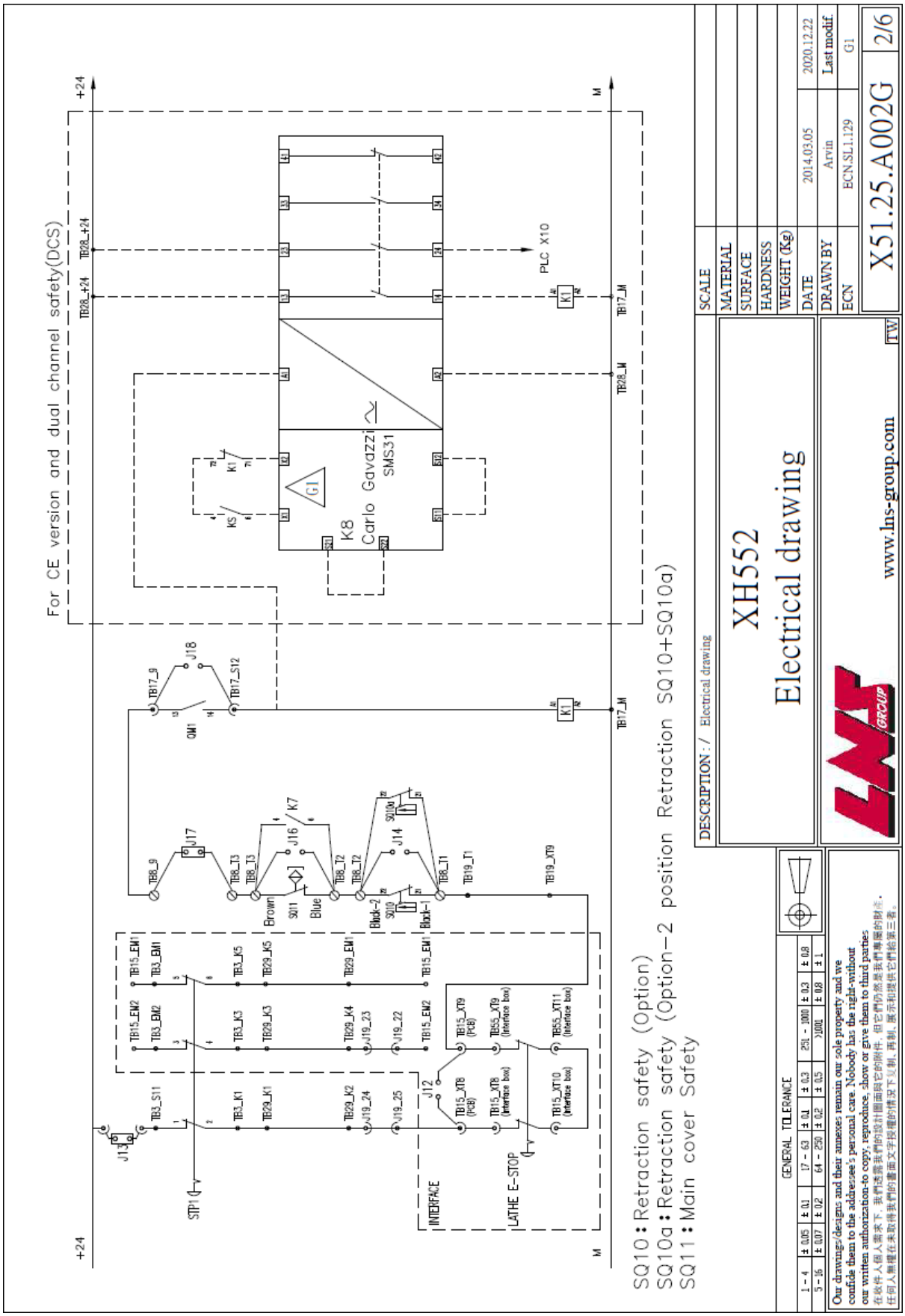


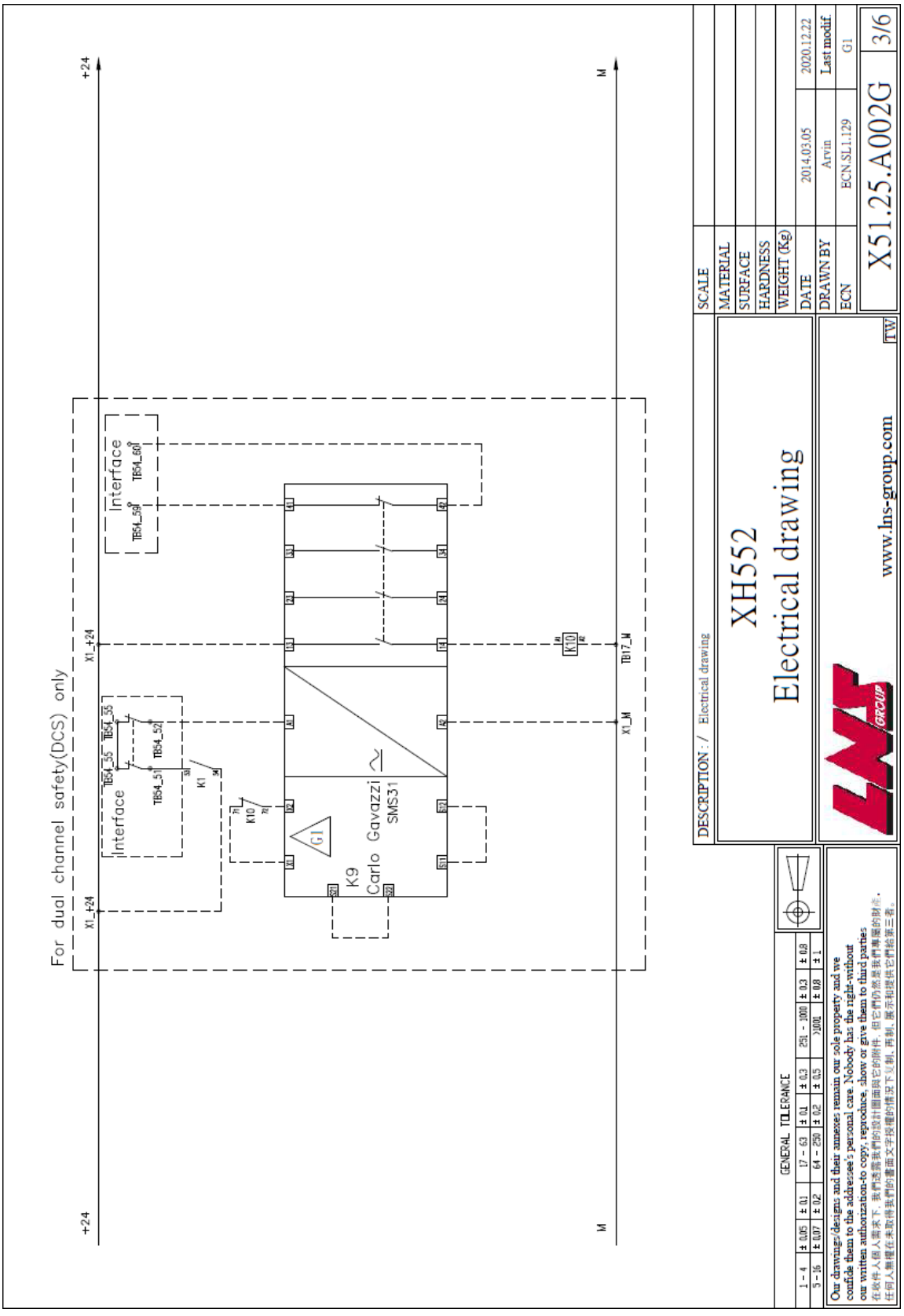
(10) PLC inputs / outputs

Inputs			Outputs		
Input	**Des.**	**Description**	**Output**	**Des.**	**Description**
X00	-	Encoder signal	Y00	-	Servo on
X01	-	Encoder signal	Y01	-	Synchro
X02	-	Alarm signal	Y02	KS	Reset relay CE
X03	SQ1	Positioned stop	Y03	KM1	Hydraulic pump
X04	SQ13	Auto front rest pulse signal (option)	Y04	YV1	Measurement device
X05	-	<Not in use>	Y05	YV2A	Channel open
X06	-	<Not in use>	Y06	YV2B	Channel close
X07	-	<Not in use>	Y07	YV3	Channel locking
X10	K1	Emergency stop	Y10	YV4	Clamping
X11	SP1	Air pressure	Y11	YV5	Loading
X12	SP2	Hydraulic pressure	Y12	YV6	Lower bar
X13	SQ2	Home position	Y13	YV7	Air blast
X14	SQ3	Guiding channel opened	Y14	YV8	Front rest (pneumatic type)
X15	SQ4	Guiding channel closed	Y15	YV9	Inserting clutch
X16	-	<Not in use>	Y16	YV10	Bar insert / extract
X17	SQ6	Vice system	Y17	YV11	2nd front rest on headstock (option)
X20	SQ11	Main cover safety	Y20	R1	R1 Alarm
X21	SQ10	Retraction safety	Y21	R2	R2 loading cycle completed
X22	SQ12	Auto front rest reference (option)	Y22	R3	R3 End Of Bar
X23	SQ14	Inserting clutch OFF	Y23	R4	R4 Automatic mode
X24	SQ15	Inserting clutch ON	Y24	R5	R5 Inching
X25	SQ16	Material extracting	Y25	YV12	Eject
X26	SQ17	Material inserting	Y26	KA1	Openings auto front rest (option)
X27	K10	Lathe door close	Y27	KA2	Closings auto front rest (option)
X30	-	<Not in use>			
X31	-	<Not in use>	D+/D-		COM3/COM2
X32	-	<Not in use>	+24V/24 G		DC out
X33	-	<Not in use>			
X34	-	<Not in use>			
X35	-	<Not in use>			
X36	-	<Not in use>			
X37	-	<Not in use>			
X40	A1	Clamping device signal			
X41	A2	Lathe in auto cycle			
X42	A3	Feed order			
X43	A4	Push order			

3. ELECTRICAL DIAGRAMS




For CE version and dual channel safety(DCS)
SQ10 : Retraction safety (Option)
SQ10a : Retraction safety (Option-2 position Retraction SQ10+SQ10a)
SQ11 : Main cover Safety
XH552
Electrical drawing
www.lns-group.com
X51.25.A002G
2/6
2014.03.05
2020.12.22
Arvin
Last modif
ECN.SL1.129
G1
K8
Carlo Gavazzi
SMS31
INTERFACE
LATHE E-STOP
PLC X10
Brown
Blue
Black-2
Black-1


For dual channel safety(DCS) only
+24
M
X1_+24
X1_M
TB17_M
Interface
TB54_55
TB54_56
TB54_51
TB54_52
TB54_59
TB54_60
K1
K10
K9
G1
Carlo Gavazzi
SMS31
DESCRIPTION: / Electrical drawing
XH552
Electrical drawing
SCALE
MATERIAL
SURFACE
HARDNESS
WEIGHT (Kg)
DATE 2014.03.05 2020.12.22
DRAWN BY Arvin Last modif.
ECN ECN SL1.129 G1
X51.25.A002G 3/6
www.lns-group.com
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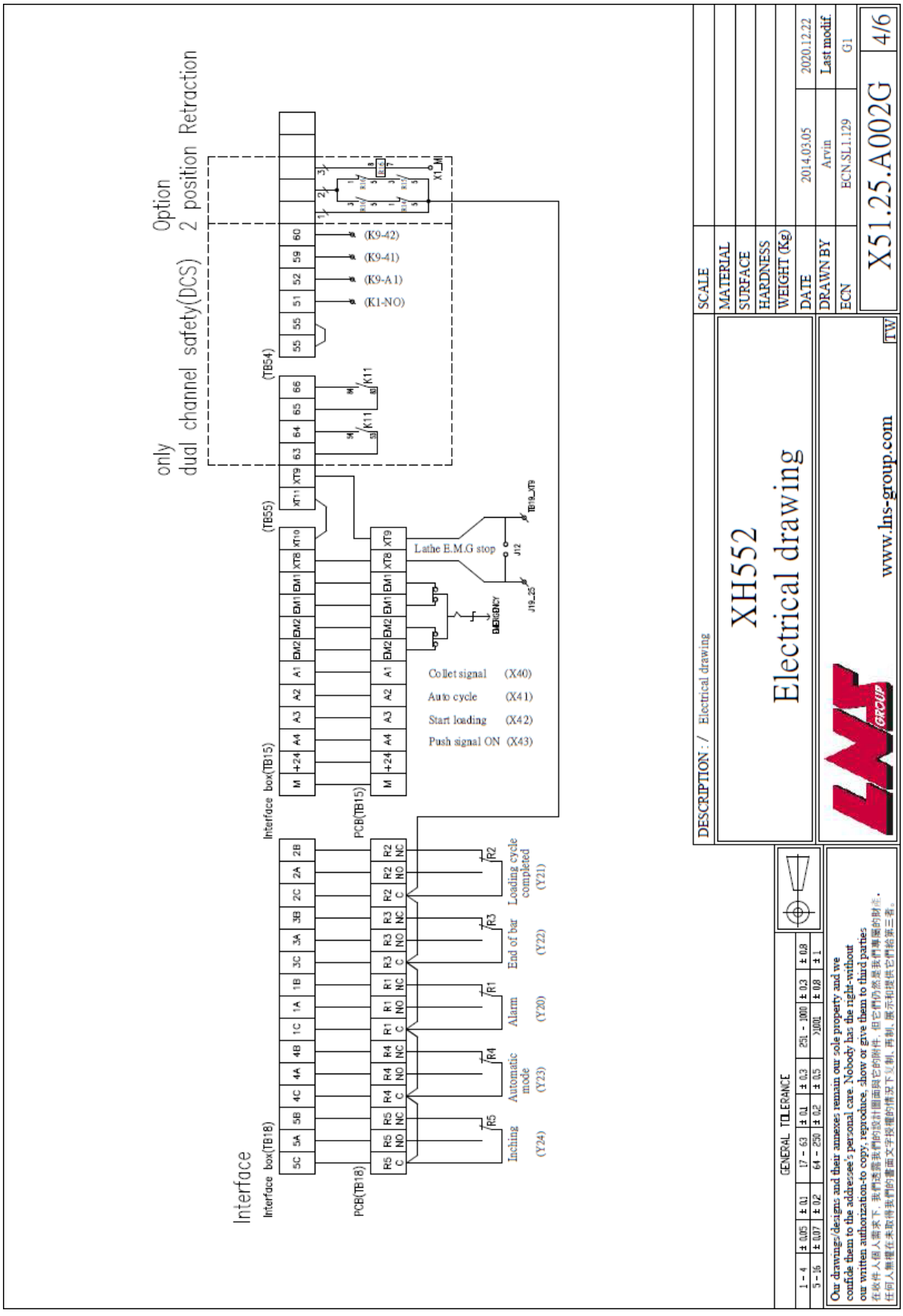
Option
only
dual channel safety(DCS) 2 position Retraction
(K9-42)
(K9-41)
(K9-A1)
(K1-NO)
(TB54)
(TB55)
Interface box(TB15)
PCB(TB15)
Lathe E.M.G stop
Collet signal (X40)
Auto cycle (X41)
Start loading (X42)
Push signal ON (X43)
Interface
Interface box(TB18)
PCB(TB18)
Loading cycle completed (Y21)
End of bar (Y22)
Alarm (Y20)
Automatic mode (Y23)
Inching (Y24)
DESCRIPTION : / Electrical drawing
XH552
Electrical drawing
www.lns-group.com
SCALE
MATERIAL
SURFACE
HARDNESS
WEIGHT (Kg)
DATE 2014.03.05 2020.12.22
DRAWN BY Arvin Last modif.
ECN ECN.SL1.129 G1
X51.25.A002G 4/6
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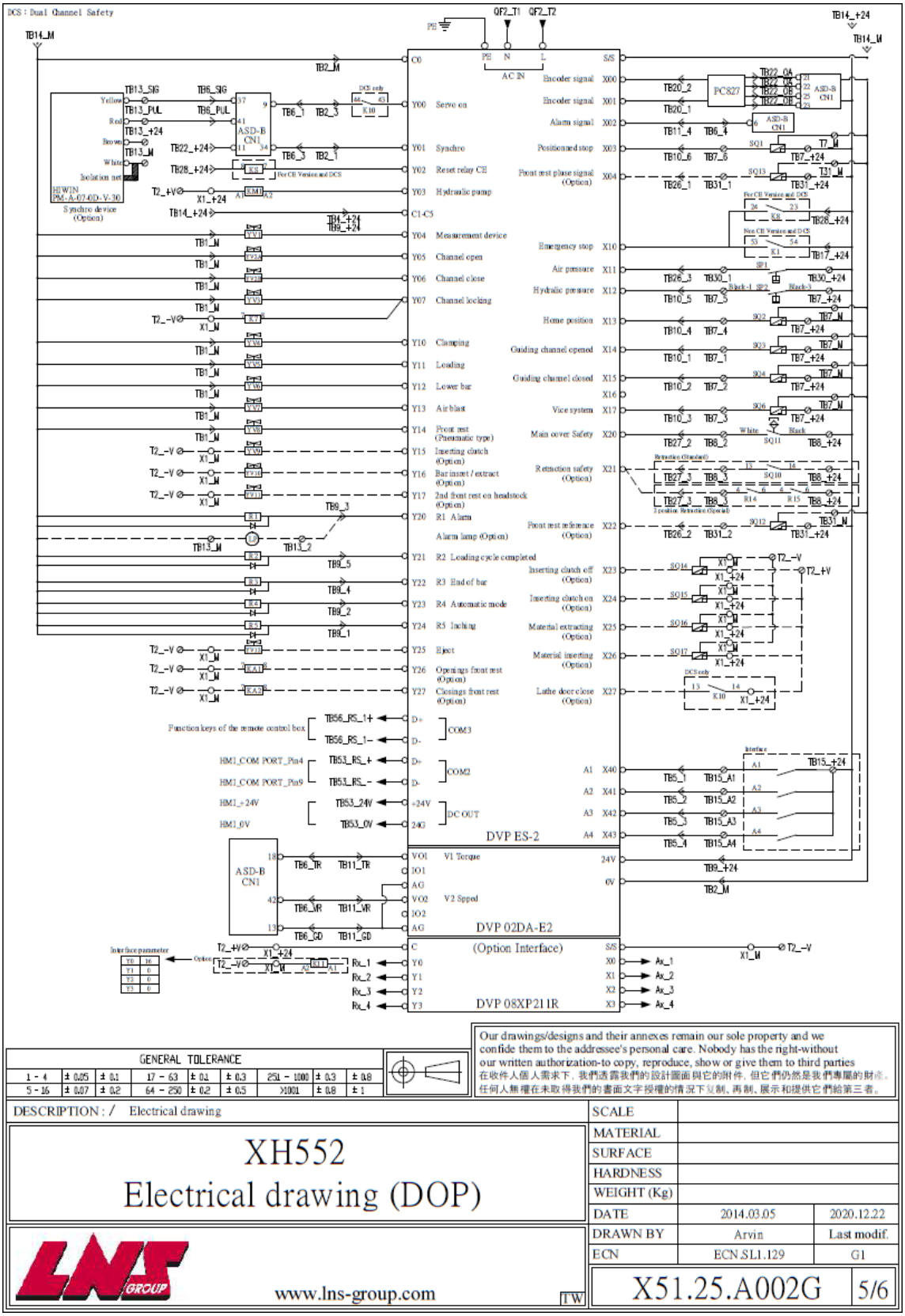
DCS : Dual Channel Safety
DVP ES-2
DVP 02DA-E2
DVP 08XP211R
(Option Interface)
ASD-B CN1
PC827
Synchro device (Option)
Function keys of the remote control box
Interface parameter
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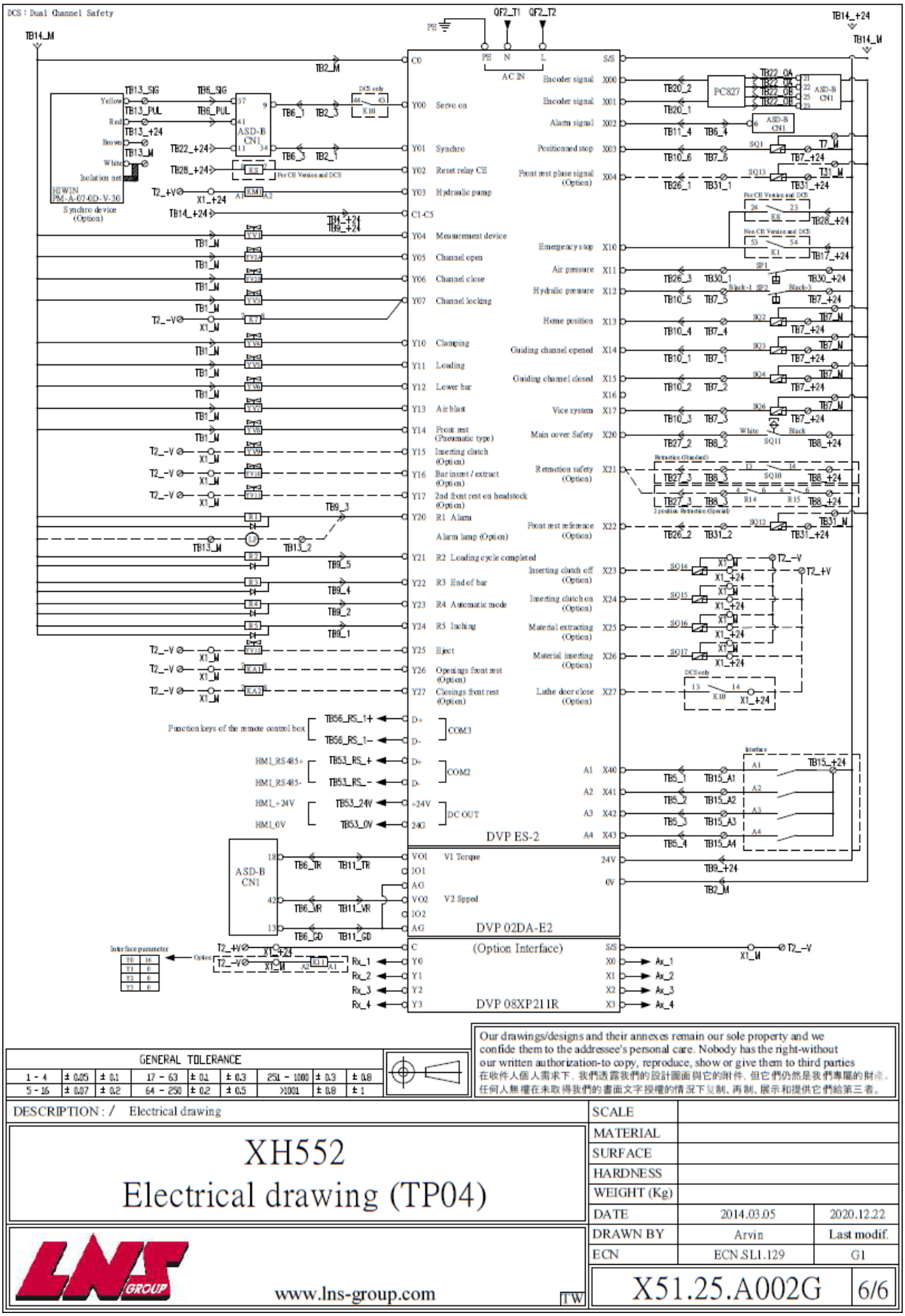
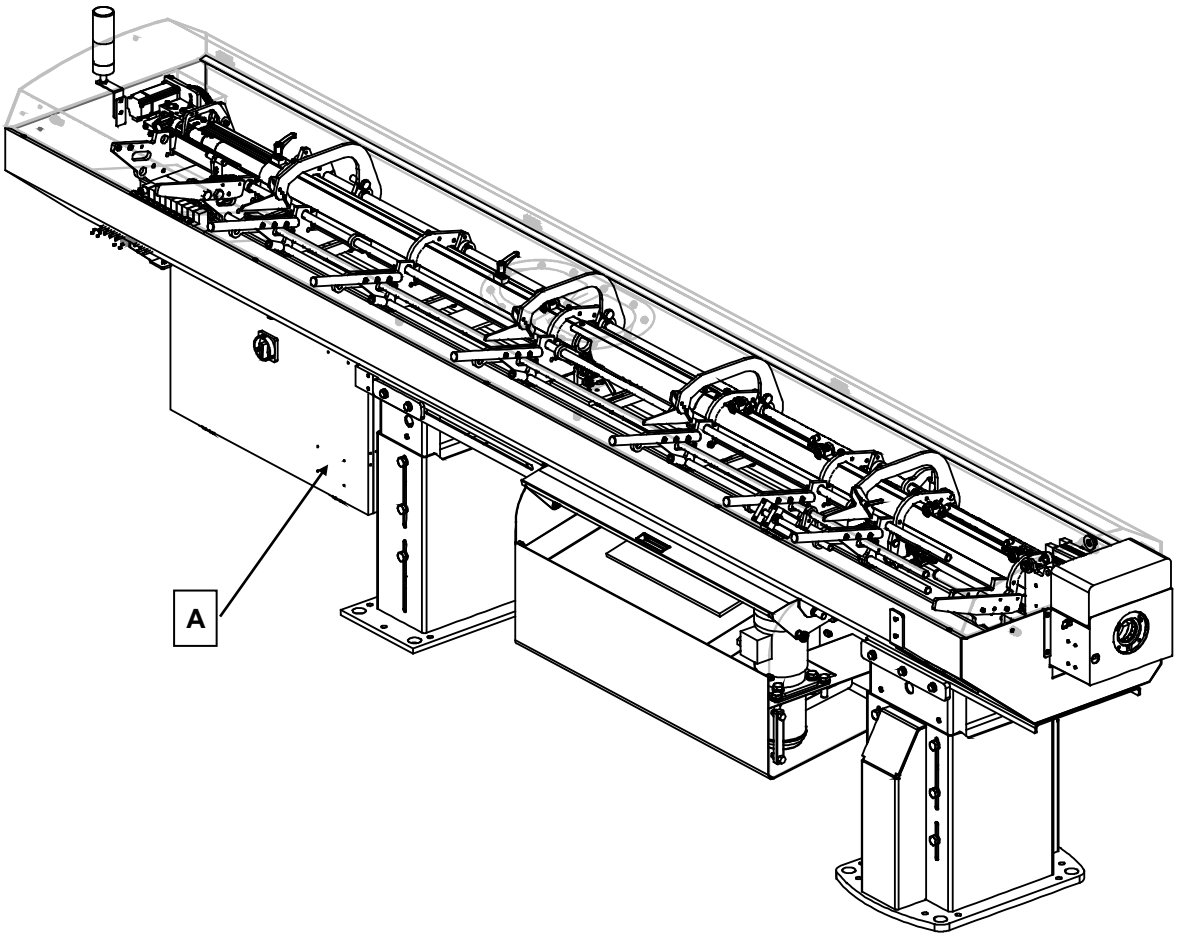
任何人無權在未取得我們的書面文字授權的情況下複制、再制、展示和提供它們給第三者。
GENERAL TOLERANCE
DESCRIPTION : / Electrical drawing
XH552
Electrical drawing (DOP)
www.lns-group.com
SCALE
MATERIAL
SURFACE
HARDNESS
WEIGHT (Kg)
DATE 2014.03.05 2020.12.22
DRAWN BY Arvin Last modif.
ECN ECN.SL1.129 G1
X51.25.A002G 5/6



TP04 = Asia market

4. INTERFACE

Before turning the power on, check that the voltage of the bar feeder corresponds to that of the lathe. The 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, are provided by LNS.

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 (500 mm).

Should the interface instructions not be observed during the setting into operation, the damaged elements as well as the resulting damages are not covered by warranty.

4.2. CONNECTIONS

(11) Power supply

Voltage: 3 x 220-480 V, 50 / 60 Hz + Ground (± 10%)
Maximum voltage: 3 x 220 V = 6 A
3 x 480 V = 3 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.

a) Transformer T1
b) Hydraulic pump motor

The LNS bar feeders are equipped with their own thermal protection systems (breakers, thermal relays and 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^2 (AWG 16**)**.

(12) 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 wires for interface connections are numbered
- All bar feeders are equipped with a power supply of +24 DC.

a) 24 V DC power supply
This 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 DC of the bar feeder.
- All signals from the bar feeder to the lathe shall be powered by the +24 V DC of the lathe.

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

b) "EMERGENCY STOP" signal of lathe XT8-XT9
This signal is part of a safety link (Emergency Stop circuit) of 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 go off and the R1 relay of the bar feeder will be triggered (see description of the R1 relay, below).

c) Lathe clamp signal (PLC input A1)
This signal is for checking the mode of the lathe clamping device (open), and is mainly used for the feeding of a part, which takes place each time the clamp opens.

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

d) Lathe in automatic cycle (PLC input A2)
This signal indicates that the lathe is in automatic cycle.

e) Load command (PLC input A3)
Should the lathe be equipped with a sub-spindle or the lathe is of twin spindle type, should the part require multiple feeds, this signal will be used as a load command from the lathe.
For safety reasons, and to prevent collisions between the part being transferred to the second spindle and the newly loaded bar stock when there is a simultaneous loading, the lathe must control the loading of a new bar.

f) Feeding pusher control (PLC input A4)
This signal orders the forward movement of the feeding pusher and the bar, independently of the mode of the lathe clamp.

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

(13) Signals from the bar feeder to the lathe

a) R1 alarm relay
When the bar feeder is in normal operation, the R1 relay signal is energized. In the event of an alarm or break in the emergency stop circuit, this relay is de-energized.
For safety reason, 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) 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 CNC must jump into a sub-program to allow the remnant to be dejected.

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

c) R4 Automatic mode relay
This signal is present as soon as the bar feeder is in automatic cycle (Aut + Start).

d) Emergency stop button of the bar feeder (EM1-EM2)
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 turn off. Two normally closed contacts of the Emergency Stop button are available for connection in the Emergency Stop circuit of the lathe.

(14) Options

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

(15) Recapitulation of safety instructions related to the interface

- The lathe foot switch for opening the lathe clamping device should not be operational during the automatic cycle of the lathe.
- The lathe pedal 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 clamping device while the feeding pusher command signal is on.
- If the lathe is in the Emergency Stop mode, the bar feeder must also be under the Emergency Stop mode, and vice-versa.
- If the bar feeder generates an alarm, the lathe must go into alarm mode. The feeding pusher feed command signal must go off, the spindle axis and rotation must stop.

CHAPTER 5 : PNEUMATICS

1. PNEUMATICAL EQUIPMENT

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

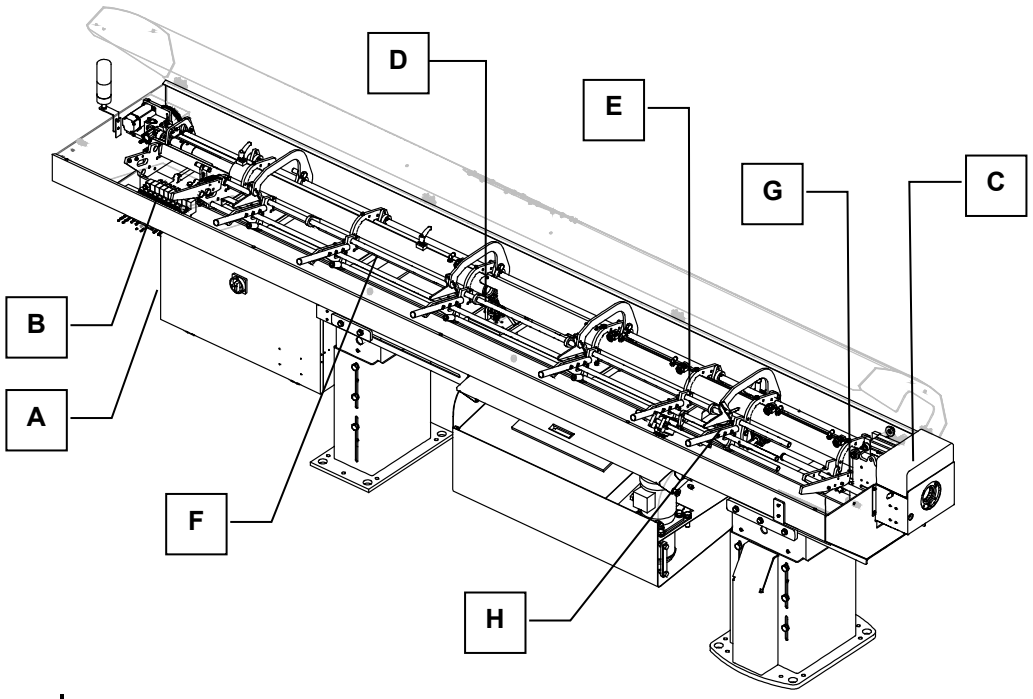
1.1. Description

The following automatic movements of the ALPHA 552 bar feeder are done via pneumatic elements, namely:

- Bar stock selection
- Bar stock dropping fingers
- Bearing blocks opening and closing
- Material clamping
- Smart booster clutch engaging
- Smart booster additional force at material insertion and extraction
- Front rest opening / closing with Air blast

To guarantee an optimal operation of the bar feeder, a minimum pressure of 5 bar (75 PSI) and a maximum pressure of 6 bar (90 PSI) are mandatory.

1.2. Layout of the pneumatic elements



Designation	Description
A	Air filtering unit with air pressure switch
B	Valve battery
C	Front rest with air blast
D	Material clamping system
E	Bearing blocks opening/closing pneumatic cylinders
F	Material dropping pneumatic cylinder
G	Protection switch SQ1 pneumatic cylinder
H	Bar stock selection

2. F.R.L. UNIT

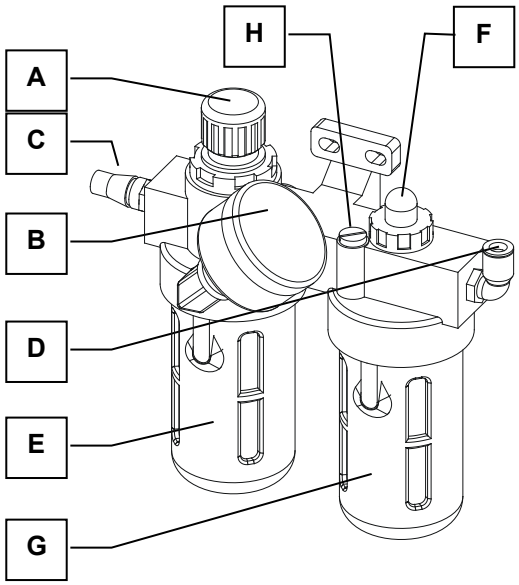
2.1. Description

The F.R.L. (Filtering-Regulation-Lubrication) combination serves to perform filtering, lubrication and regulation of the pressure air before it enters pneumatic system.

The air must be furnished at a pressure of 6 bar and whenever possible, clean and dry.

2.2. Layout of the elements

Designation	Description
A	Pressure regulator
B	Pressure gauge
C	Inlet
D	Regulated pressure outlet
E	Decanter
F	Lubricator
G	Oil cup
H	Oil refill plug

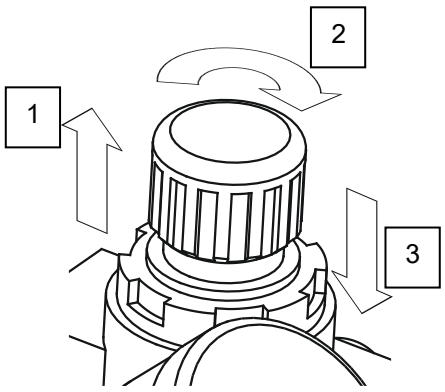


2.3. Settings

1. Unlock the adjusting knob by pulling it upward.

2. To increase the pressure, turn it clockwise.
   To decrease it, turn it in the opposite direction.
   The operational pressure should be set at 5 bar.

3. When the settings are done, lock the adjuster by pushing it downward.

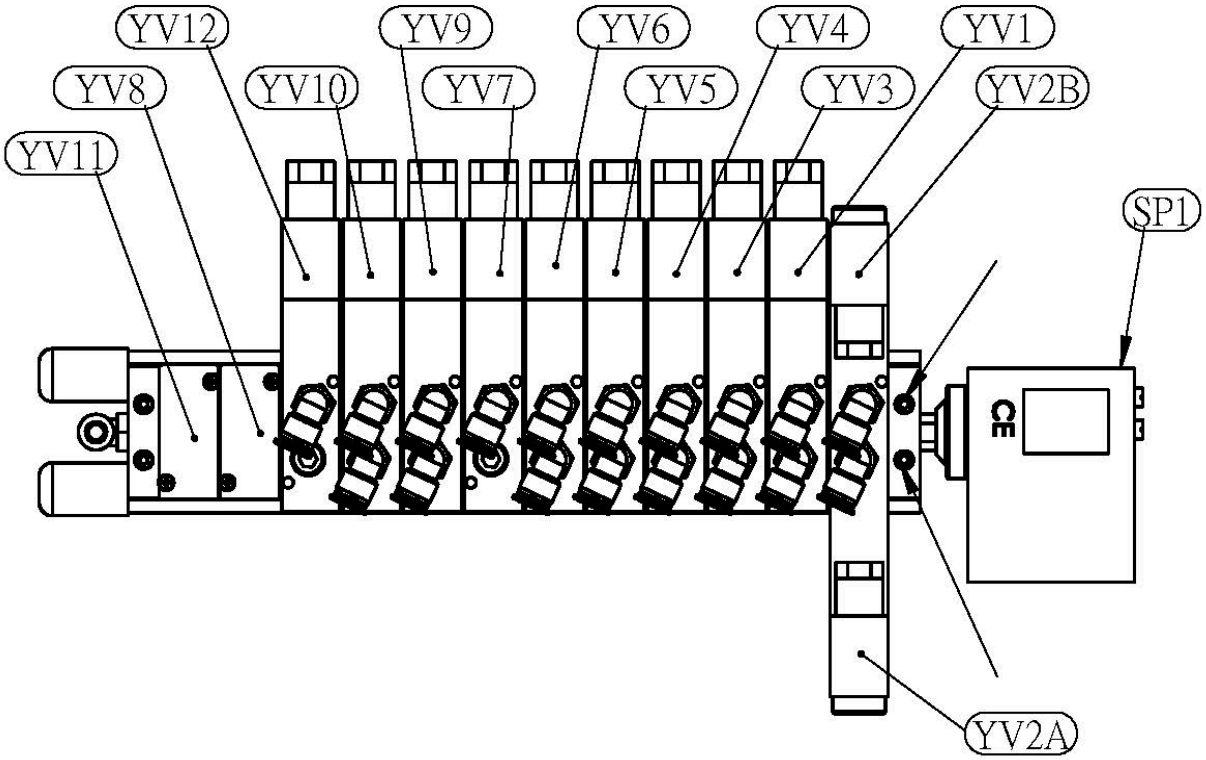


3. PNEUMATIC VALVE BATTERY

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	Article no.	Description
YV1	C11110100	Measurement device
YV2A	C11110210	Guiding channel opening
YV2B		Guiding channel closing
YV3	C11110100	Guiding Channel locking
YV4	C11110100	Material clamping
YV5	C11110100	Material loading (bar selection)
YV6	C11110100	Material dropping fingers
YV7	C11110100	Air blast
YV8	C11110100	Front rest opening/closing
YV9	C11110100	Smart booster clutch engage/disengage
YV10	C11110100	Smart booster bar insert/extract
YV11	-	<Reserved>
YV12	C11110100	Remnant ejection
SP1	C11121400	Air pressure switch

3.3. Description of the elements

(16) Air pressure switch

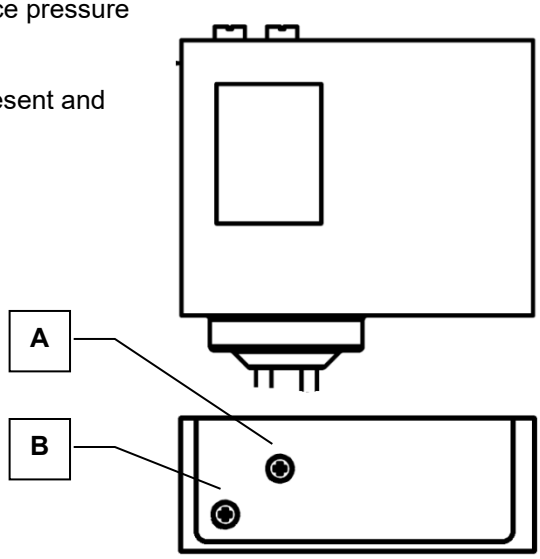
To guarantee an optimal work of the bar feeder, the service pressure must be at least 5 bar (75 Psi).

The pressure switch serves to confirm that pressure is present and adequate.

The air pressure switch is connected to the valve battery.

Settings

1. Set the base pressure on screw A.
2. Set the difference range on screw B.

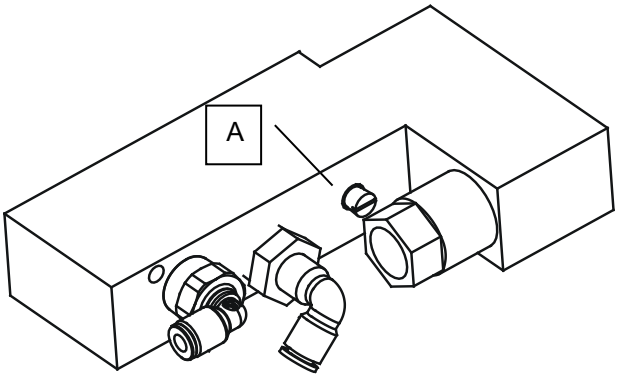


(17) Valves

Contact your LNS agent for further safety information before proceeding to any operation on the valves.

By pressing the button A, the cylinders can be activated manually. This button can be kept at the activation position by pressing it down and turning 90° clockwise. This position can be released by turning it 90° counter clockwise.

This maneuver may prove to be useful during tests or maintenance. When the button is released, the pneumatic cylinder returns to its resting position (except for pneumatic cylinders activated by double-effect solenoid valve YV2).



4. MAINTENANCE

The pneumatic system should be regularly maintained in order to ensure the system is powered by qualified compressed air. We recommend the user to check the F.R.L. combination as instructed below every week.

1. Check the condensate collector:

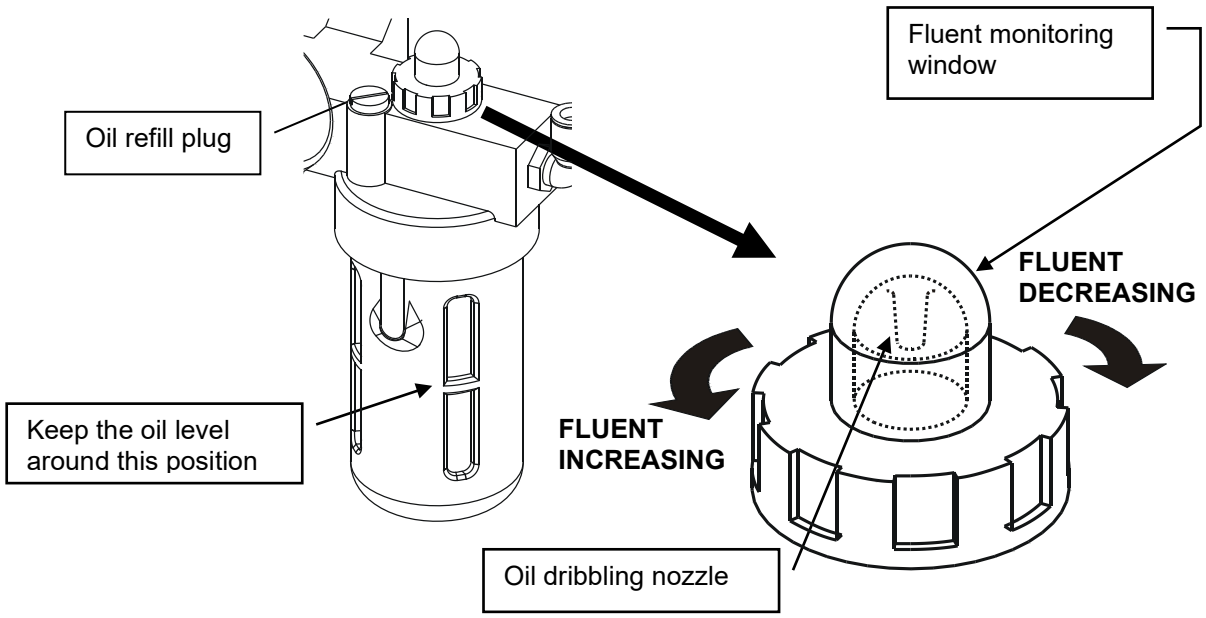
   The condensate collector is a measure of quality of the compressed air. A qualified air should not produce any condensate inside the collector.

   The collector has an automatic drain plug. When there is no pressure inside the F.R.L. system, the drain plug is activated by the spring and the condensate released.

   For users which always connect the compressed air, a manual draining is needed. Whenever the condensate is found inside the collector, drain the condensate by pushing the plug upward and check the humidity control system.

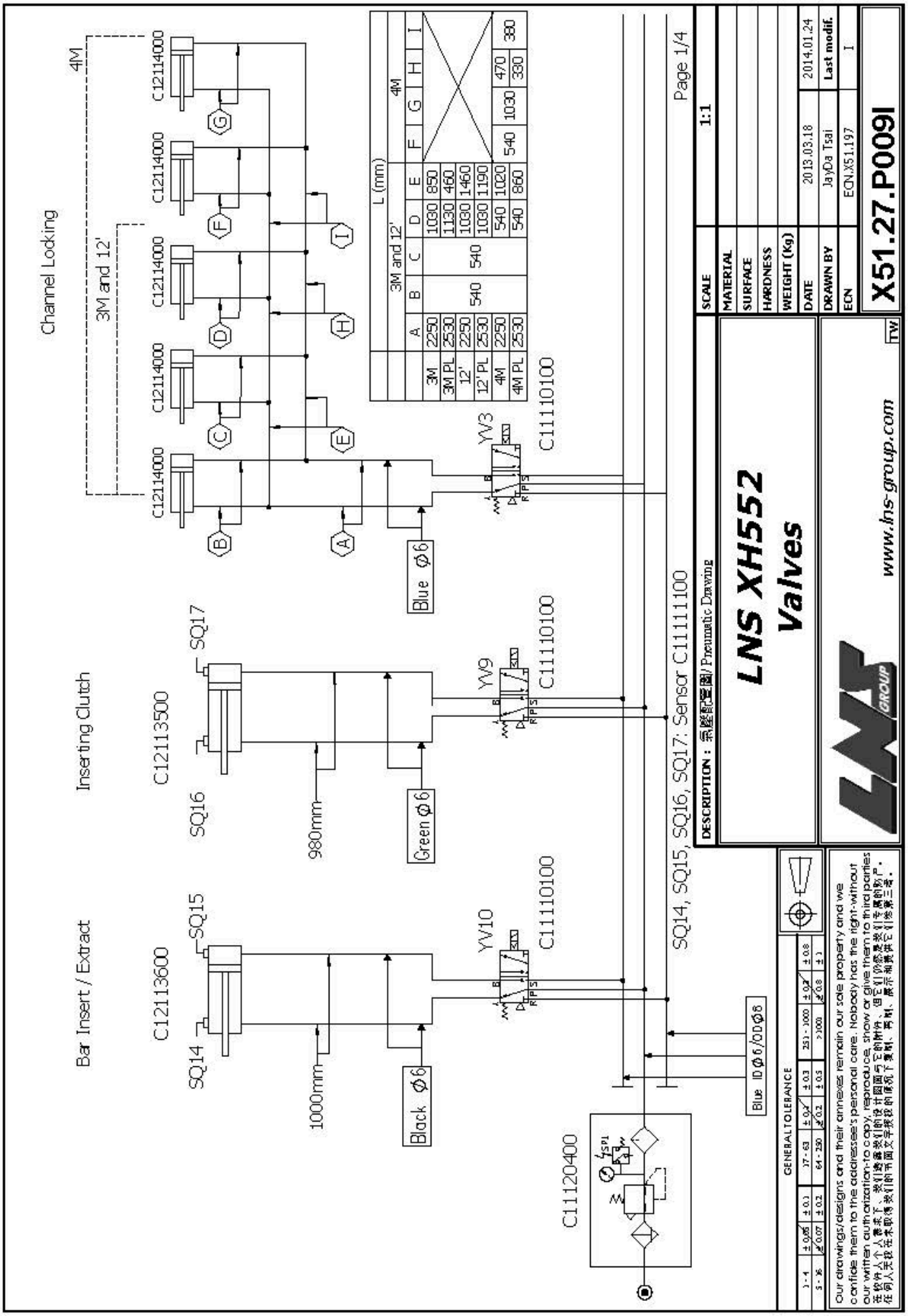
2. Check lubricator:

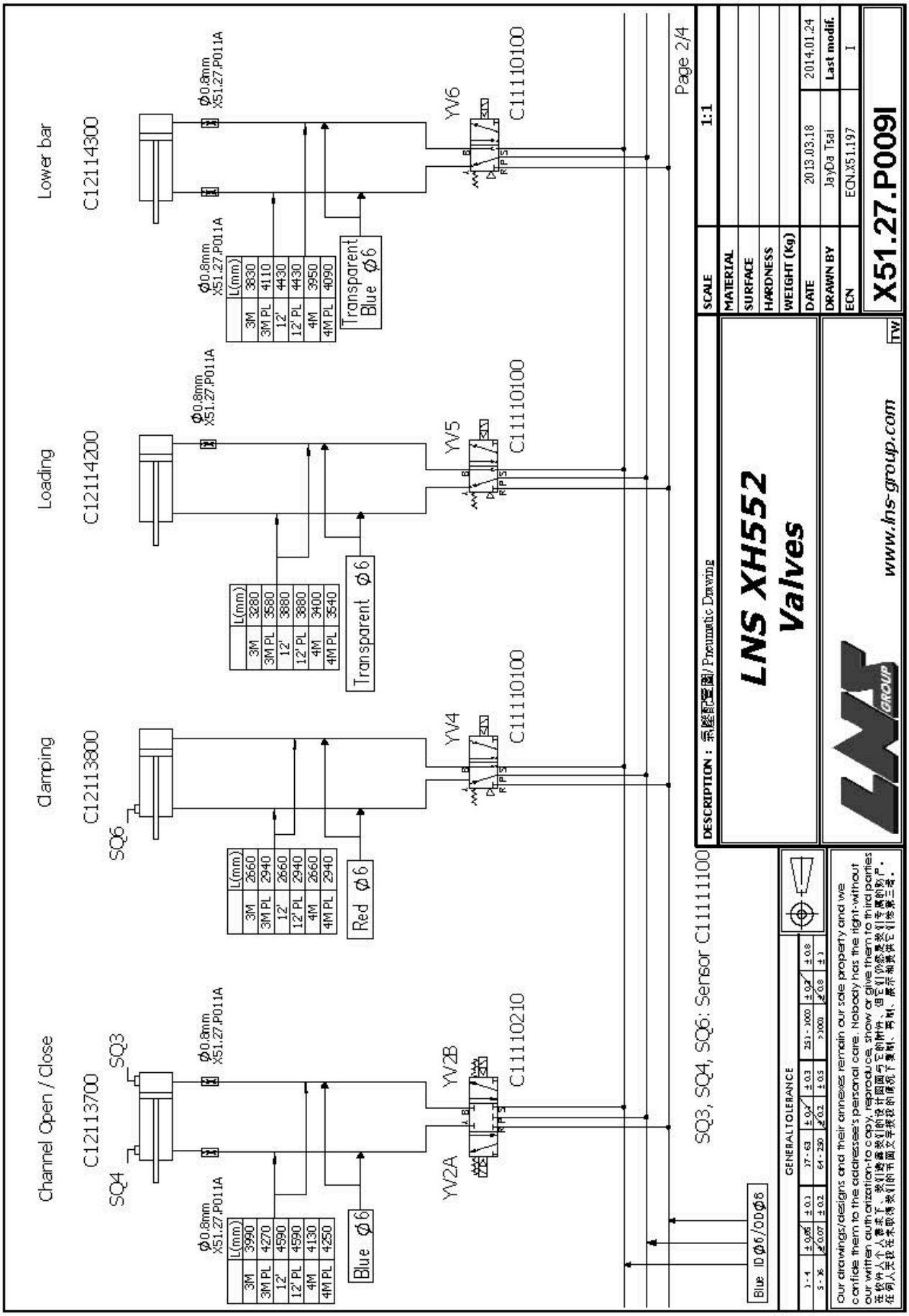
   The oil consumption varies with the bar feed system application of the user. The oil height should not exceed half height of the cup. When the oil is not enough, follow the procedures below to refill it. It is recommended to use oil ISO VG 32 only.



- Disconnect the air inlet tube.
- Remove the plug and fill the oil up to the position shown on the figure.
- For the best performance, the oil should drop every cylinder operation. Adjust the fluent with auxiliary of channel open button. Let the oil drop once after pressing the “channel open” button for 10 times.
- Connect the air inlet tube and turn air source on.

5. PNEUMATIC DIAGRAMS




Channel Open / Close
Clamping
Loading
Lower bar
C1211700
C1211800
C1214200
C1214300
SQ3
SQ4
SQ6
YV2A
YV2B
YV4
YV5
YV6
C11110210
C11110100
Ø0.8mm X51.27.P011A
Blue Ø6
Red Ø6
Transparent Blue Ø6
Transparent Ø6
L(mm)
3M 3990
3M PL 4270
12' 4590
12' PL 4590
4M 4130
4M PL 4250
3M 2660
3M PL 2940
12' 2660
12' PL 2940
4M 2660
4M PL 2940
3M 3280
3M PL 3580
12' 3880
12' PL 3880
4M 3400
4M PL 3540
3M 3830
3M PL 4110
12' 4430
12' PL 4430
4M 3950
4M PL 4090
SQ3, SQ4, SQ6: Sensor C11111100
Blue ID Ø6/OD Ø8
Page 2/4
DESCRIPTION : 系統配管圖/Pneumatic Drawing
LNS XH552
Valves
www.lns-group.com
SCALE 1:1
MATERIAL
SURFACE
HARDNESS
WEIGHT (Kg)
DATE 2013.03.18 2014.01.24
DRAWN BY JayDa Tsai Last modif.
ECN ECN.X51.197 1
X51.27.P009I
GENERAL TOLERANCE
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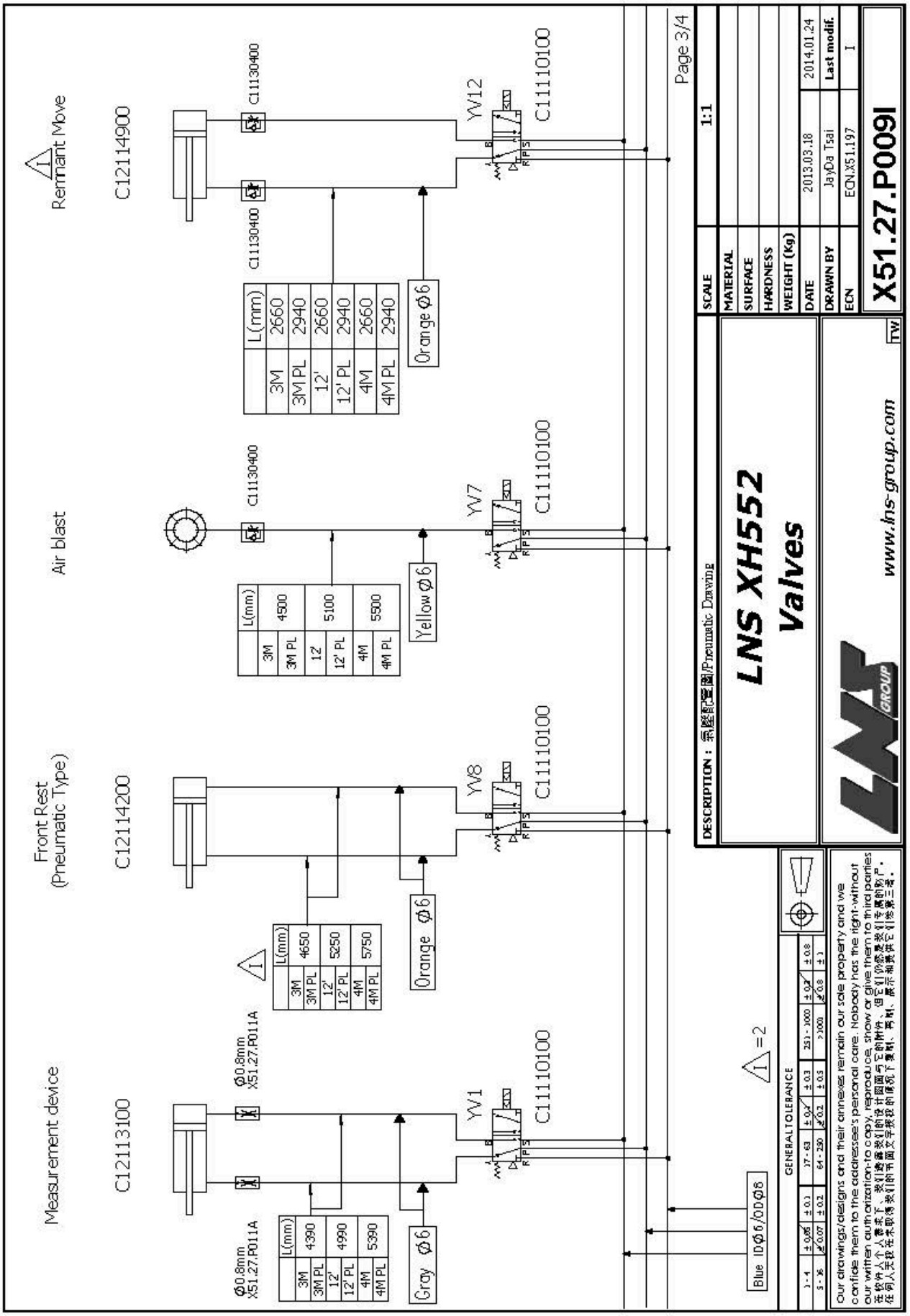
Remant Move
Air blast
Front Rest
(Pneumatic Type)
Measurement device
C1211310O
C1211420O
C1211490O
Ø0.8mm
X51.27.P011A
Gray Ø6
Orange Ø6
Yellow Ø6
Blue ID Ø6/OD Ø8
YV1
YV7
YV8
YV12
C1111010O
C1113040O
L(mm)
3M 4390
3M PL 4650
12' 4990
12' PL 5250
4M 5390
4M PL 5750
3M 4500
3M PL 5100
12' 5500
12' PL
4M
4M PL
3M 2660
3M PL 2940
12' 2660
12' PL 2940
4M 2660
4M PL 2940
Page 3/4
DESCRIPTION : 氣壓配管圖/Pneumatic Drawing
LNS XH552
Valves
www.lns-group.com
SCALE 1:1
MATERIAL
SURFACE
HARDNESS
WEIGHT (Kg)
DATE 2013.03.18 2014.01.24
DRAWN BY JayDa Tsai Last modif.
ECN ECN.X51.197 1
X51.27.P009I
GENERAL TOLERANCE
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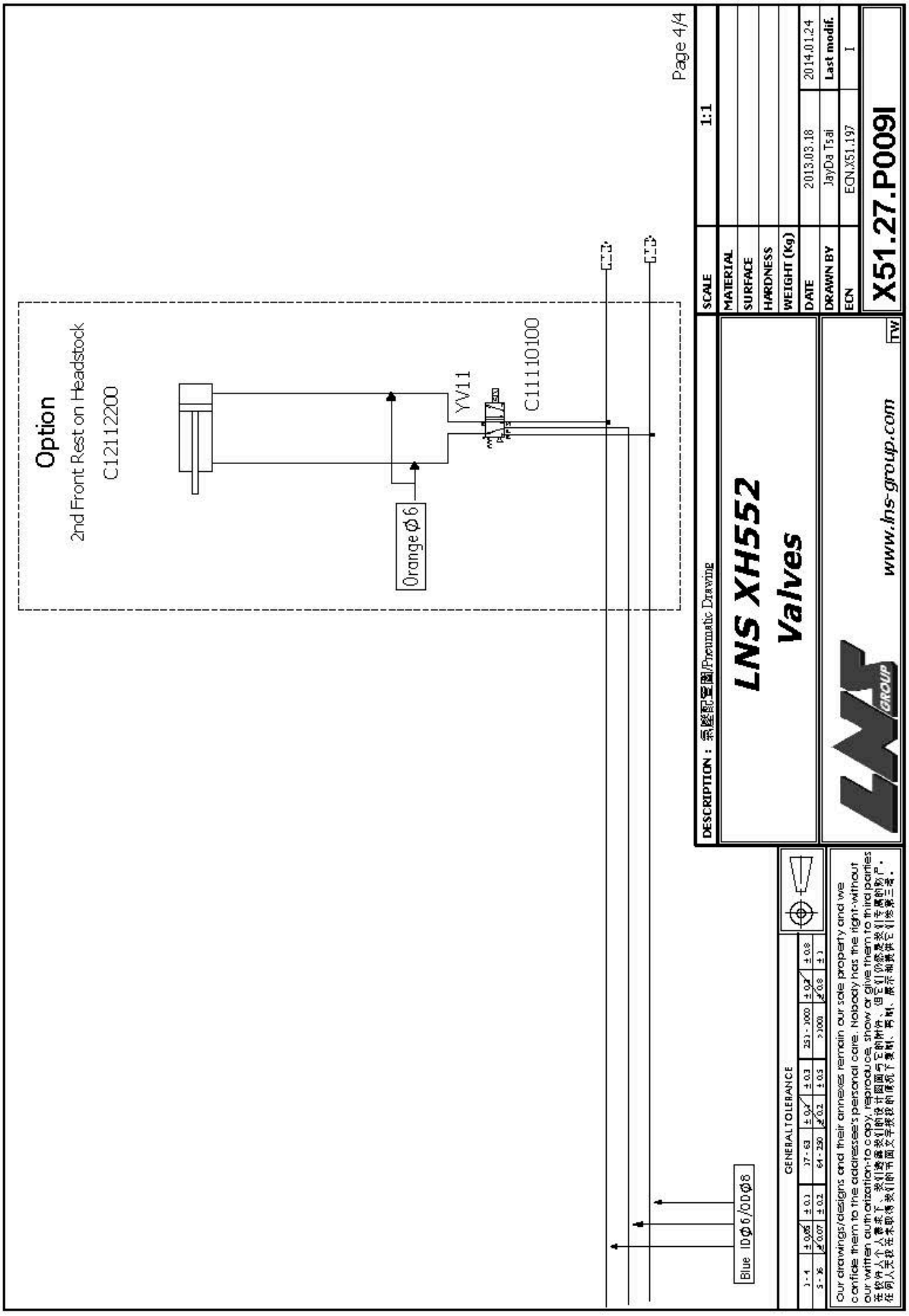
Option
2nd Front Rest on Headstock
C1211200
YV11
C11110100
Orange Φ6
Blue ID Φ6/OD Φ8
Page 4/4
DESCRIPTION : 系統配管圖/Pneumatic Drawing
LNS XH552
Valves
SCALE 1:1
MATERIAL
SURFACE
HARDNESS
WEIGHT (kg)
DATE 2013.03.18 2014.01.24
DRAWN BY JayDa Tsai Last modif.
ECN ECN.X51.197 I
X51.27.P009I
www.lns-group.com
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CHAPTER 6 : HYDRAULICS

1. HYDRAULIC EQUIPMENT

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

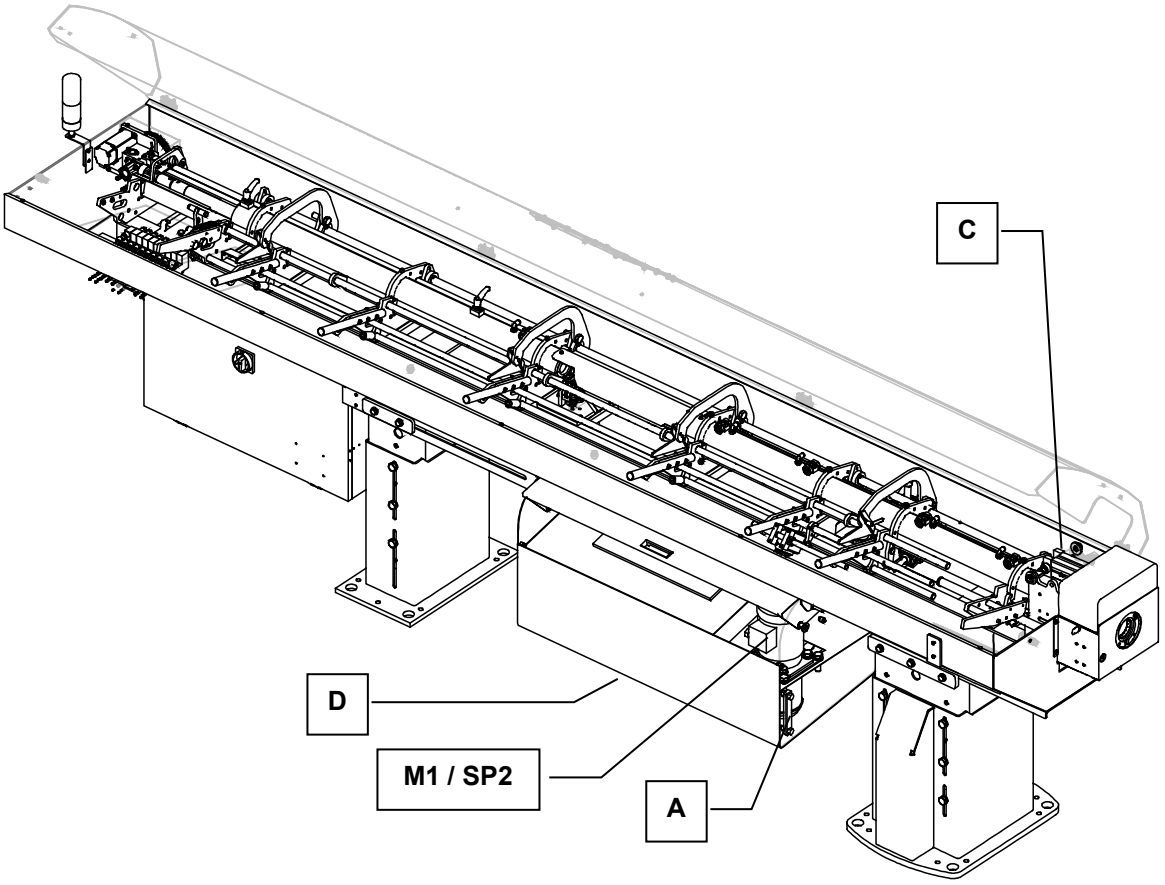
1.1. Description

The guiding concept of the ALPHA 552 bar feeder consists mainly in maintaining the bar suspended in an oil bath.

The hydraulic oil is contained in the machine itself. Aspirated by a pump motor, it is injected into the front rest and the guiding blocks. A pressure switch measures the pressure at the outlet of the pump.

A level allows the monitoring of the filling rate of the hydraulic tank.

1.2. Layout of the elements



Designation	Article No	Description
A	C17110500	Level
B	-	Guiding blocks supply tube (not shown here)
C	-	Front rest supply tube
D	C17120400	Drain plug
M1	X51.09.P017A	Hydraulic pump motor
SP2	44.0179.K0.15	Oil pressure control switch

2. DESCRIPTION OF THE ELEMENTS

2.1. Hydraulic pump motor

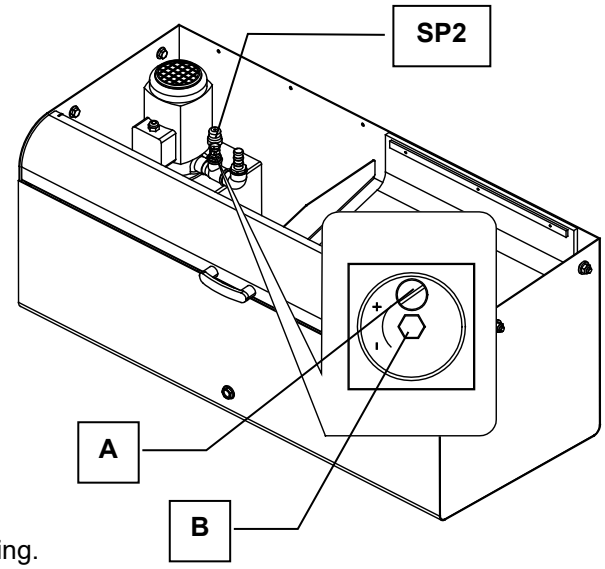
The hydraulic pump is powered by 3 phases 220V AC. The hydraulic pump powers on immediately when conditions below satisfied:

- The bar feed system switched to automatic mode.
- The guide channel is closed.
- The pusher position is located between home position the “2nd” of parameter P06.

For further information, refer to “Chapter 3. SETTING INTO OPERATION” and “Chapter 4. ELECTRICS”.

2.2. Oil pressure switch

The pressure is constantly monitored by a pressure switch set at the factory at a point of release of 0.5 bar. There are 2 types of switches that were fitted to the bar feeder. It may be adjusted, if necessary, as follows:

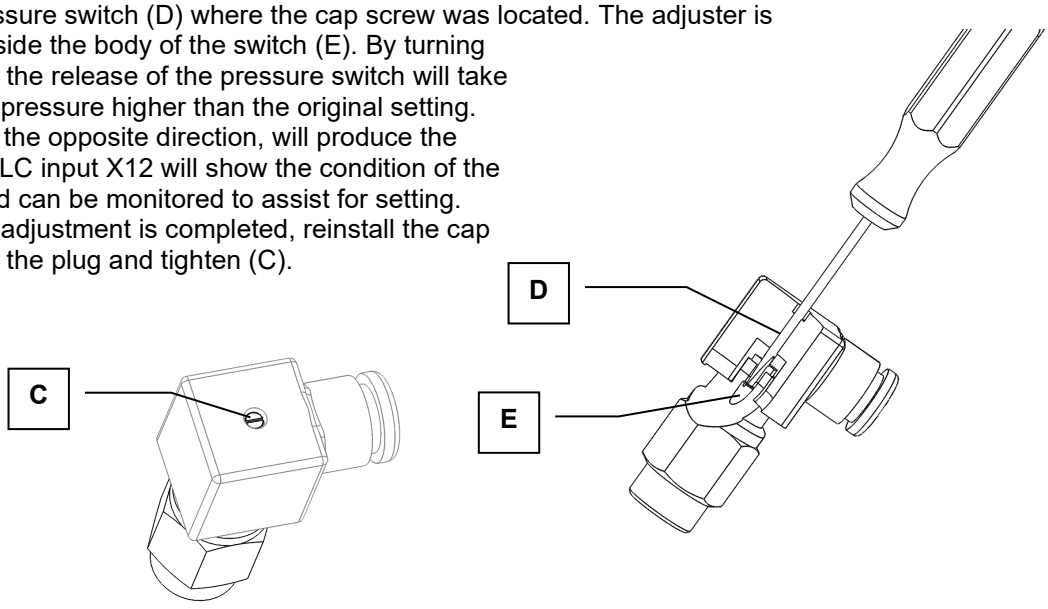


Settings for square body style:

1. With a screwdriver, unscrew the locking screw (A).
2. Insert a hex head wrench (5mm) into the center of the pressure switch (B). By turning clockwise, the release of the pressure switch will take place at a pressure higher than the original setting. Turning in the opposite direction, will produce the reverse. PLC input X12 will show the condition of the switch, and can be monitored to assist for setting.
3. When the adjustment is completed, retighten the locking screw (A).

Settings for hex body style:

1. With a screwdriver, unscrew and completely remove the cap screw from the plug, leaving the plug installed on the switch (C).
2. Insert a small diameter flat blade screwdriver (ø2-2.5mm) into the center of the pressure switch (D) where the cap screw was located. The adjuster is located inside the body of the switch (E). By turning clockwise, the release of the pressure switch will take place at a pressure higher than the original setting. Turning in the opposite direction, will produce the reverse. PLC input X12 will show the condition of the switch, and can be monitored to assist for setting.
3. When the adjustment is completed, reinstall the cap screw into the plug and tighten (C).



2.3. Filling and draining

The bar feeder is delivered without oil. 50 liters (14 gallons) of hydraulic oil of the type indicated below must be provided by the client. The oil must be poured directly into the machine. The oil height should be kept around H mark on the level when the hydraulic pump is not running.

Viscosity equivalency table			
ISO 100	100 mm2/s (cSt) at 40°C	DIN 68	8°E to 50°C

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

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

3. MAINTENANCE

The hydraulic oil quality gets worse with the bar feeder system running continuously. The cutting chips and sludge heap on button of the oil tank and will be pumped into the hydraulic system. These substances will damage the pump, the guiding channel or even bar stock. Therefore, depends on the bar feed system running status, it is recommend to drain and clean the oil tank at least once every 6 months.

Follow the procedures below:

- Power OFF the bar feeder system. Confirm most of the oil return to oil tank.
- Place a container with sufficient capacity (minimum: 50 liters) underneath the drain plug.
- Remove the drain plug and drain the oil.
- When the oil tank is empty, clean the sludge inside the tank and bar feed system.
- Clean the drain plug. Apply seal on the plug and screw the drain plug in.
- Refill new oil into the bar feed system until the indicator shows oil level at H (about 25 liters needed). Confirm there is no leaking from the plug.

Dispose of waste used oil properly in an environmentally friendly way, and according to your local regulation.

CHAPTER 7 :
GENERAL DESCRIPTION

1. BAR MAGAZINE

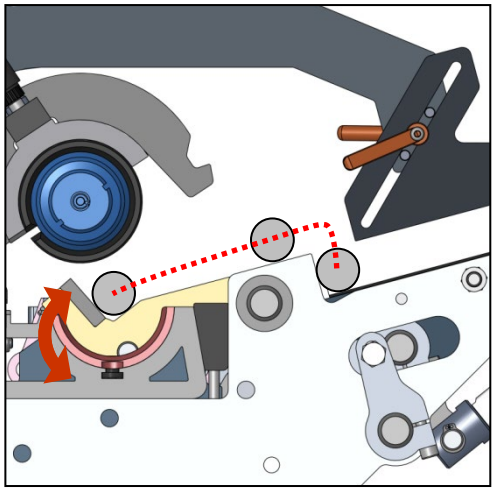
Please read the safety instructions provided at the beginning of this manual before handling the following devices.

1.1. Description

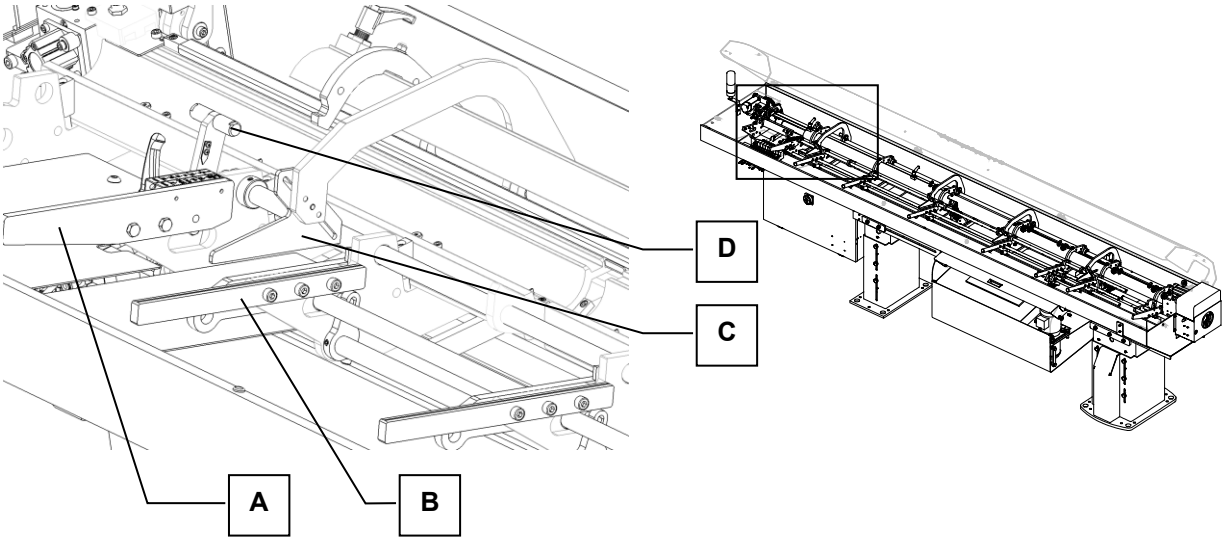
The barfeed ALPHA 538/552 is equipped with an internal, gravity-fed loading ramp. Depending on the length of the bar feeder (3M, 12', 4M), the bar magazine may include six or seven supports. Each support includes a loading ramp unit with a fixed inclination.

When the new bar loading cycle is started, one bar is lifted over the stopper, rolls over the dropping fingers while the fingers move down.

The bar is placed into the guiding elements, ready to be moved into the spindle.



1.2. Layout of the elements



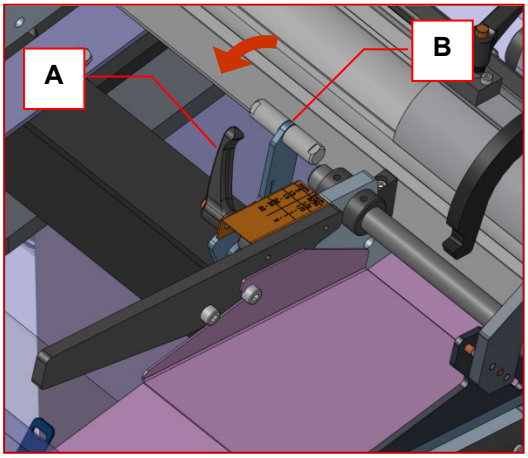
Designation	Description
A	Rear limiter
B	Loading ramp
C	Upper limiter
D	Bar selection setup

The bar stocks are installed for machining by following these conditions:

- Lay the bar stocks on the loading ramp (**B**), each one besides the other (not one above the other);
- Make sure the bar stocks rest against the rear limiter (**A**);
- Lower the upper limiters (**C**) so that the clearance left allows free rolling of the bar stocks, but prevent bars jumping over the others;
- Set properly the bar selection (**D**). Please refer to next page.

1.3. Setting the bar selection

The setting of the loading diameter is done manually, by setting the loading ramp handle to the correct diameter:



1. Unlock the side handle (**A**) completely, so that the setup handle (**B**) can be moved.

2. Move the setup handle (**B**) to the desired diameter range, corresponding to the bar stock diameter to be loaded.

3. Lock the side handle (**A**) completely, so that the setup handle (**B**) cannot be moved.

2. GUIDING ELEMENTS

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

2.1. Description

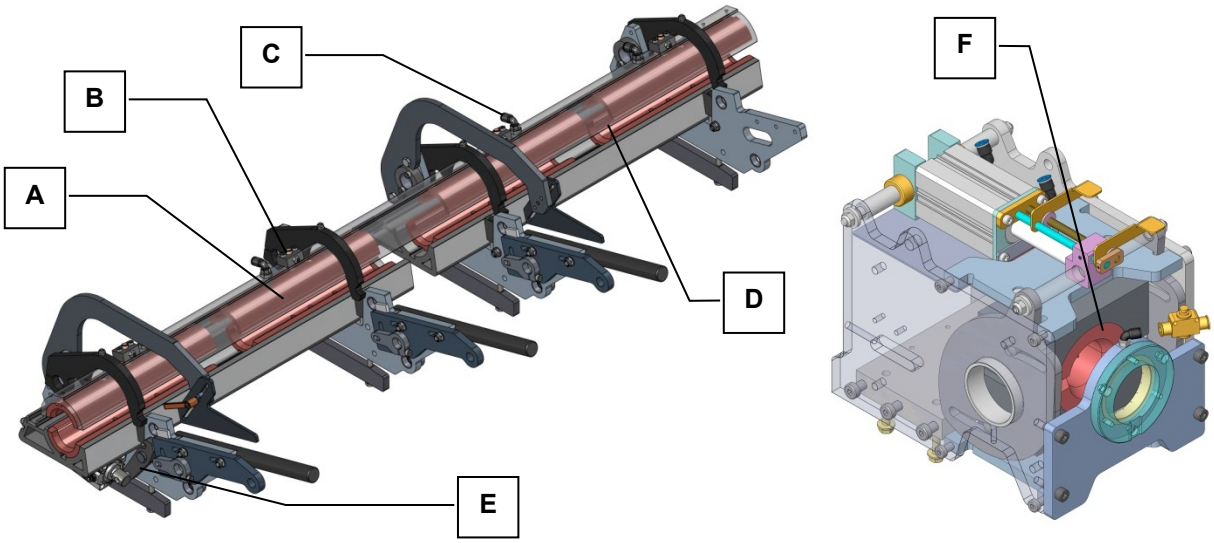
The guiding zone consists of a fixed lower aluminum profile, and a movable upper aluminum cover. Located in the guiding zone, the guiding elements act as supports for the bar stock by reducing the clearance and dampen the vibration due to their special rubber material. Sets of guiding elements of different diameters are available to adapt the barfeed to the bar stock. The best guiding quality is determined by guiding elements 1 mm bigger than bar stock diameter.

When the new bar loading cycle is started, the guiding zone opens; one bar is loaded into the guiding zone. The bar is pushed into the spindle, then the system closes and is locked in closed position. The system will remain until a remnant is evacuated, or a new bar is loaded.

Hydraulic oil is injected through the upper supports and distributed all along the bar stock. An oil bath is created around the rotating bar, inducing a hydrodynamic effect which keeps the bar stock at the center of the guiding axis, dampens the vibration, and reduces friction heat.

The guiding channels are sensitive to corrosive products. Please do not wipe or clean the channels with any corrosive detergent. Use a dry cloth only to wipe the oil off the channels.

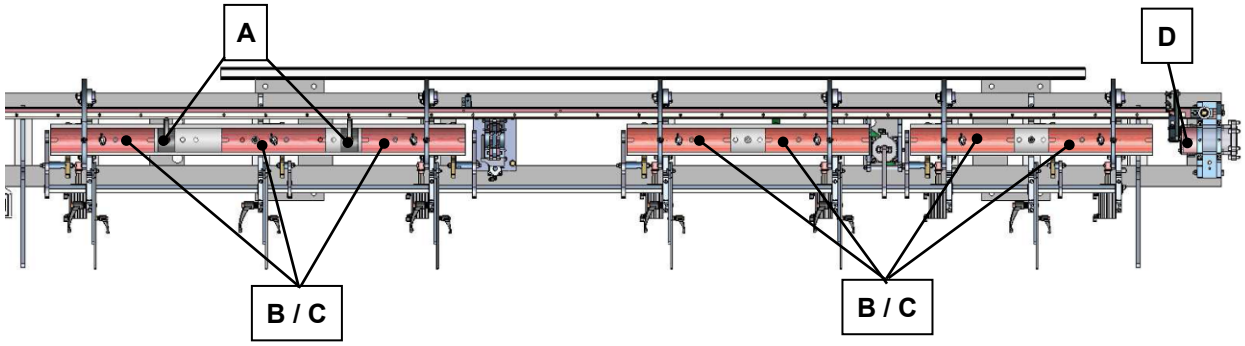
2.2. Layout of the elements (*)



Designation	Description
A	Upper guiding element
B	"Quick Change" holding system for the upper guiding elements
C	Oil supply
D	Lower guiding element
E	Locking system
F	Front rest guiding elements*

(*) Some elements are explained in more details in the following paragraphs.

2.3. Guiding elements selection



2.4. Standard pusher (1554mm)

Barfeed Length	Kit of Guiding Elements	Separated elements			Stabilizer Guiding Element [D]
		Pusher Support [A]	Lower Element [B]	Upper Element [C]	
3M	Left to Right: X51.31.A211A.xx Right to Left: X51.31.A211A.xx	*(2x)* X51.31.A003A.xx	*(8x)* X51.31.A004A/xx	*(5x)* X51.31.A005A.xx	*(2x)* X51.07.A003A.xx
12'	Left to Right: X51.31.A213A.xx Right to Left: X51.31.A213A.xx		*(9x)* X51.31.A004A/xx	*(6x)* X51.31.A005A.xx	
4M	Left to Right: X51.31.A215A.xx Right to Left: X51.31.A215A.xx		*(10x)* X51.31.A004A/xx	*(7x)* X51.31.A005A.xx	

Long pusher (1834mm)

Barfeed Length	Kit of Guiding Elements	Separated elements			Stabilizer Guiding Element [D]
		Pusher Support [A]	Lower Element [B]	Upper Element [C]	
3M	Left to Right: X51.31.A211A.xx Right to Left: X51.31.A211A.xx	*(2x)* X51.31.A003A.xx	*(8x)* X51.31.A004A/xx	*(4x)* X51.31.A005A.xx	*(2x)* X51.07.A003A.xx
12'	Left to Right: X51.31.A213A.xx Right to Left: X51.31.A213A.xx		*(10x)* X51.31.A004A/xx	*(6x)* X51.31.A005A.xx	
4M	Left to Right: X51.31.A215A.xx Right to Left: X51.31.A215A.xx		*(11x)* X51.31.A004A/xx	*(7x)* X51.31.A005A.xx	

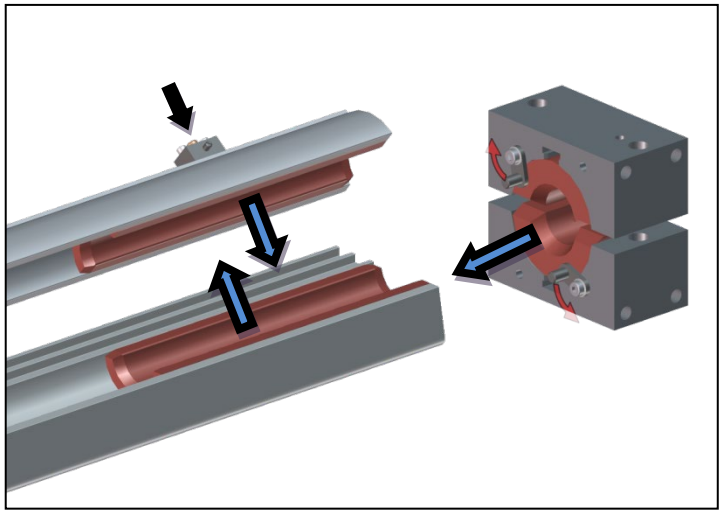
2.5. Guiding elements change over

Don't move the pusher by hand. Always use the remote control and the dedicated functions.

Not following these instructions could result in damaging the barfeed.

1. Bring the pusher in home position by pressing ◄
2. Open the guiding zone by pressing on the remote control
3. Remove the pusher and the pusher supports by loosening them. Then remove the flag.
4. Remove the guiding elements in the following order:

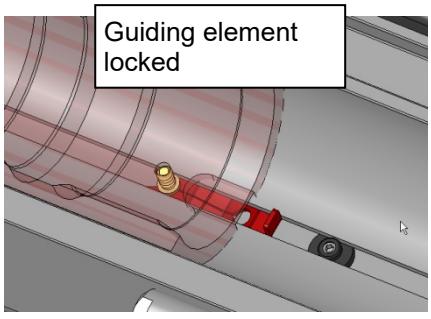
   A. Remove all the lower elements by simply lifting them up.
   B. Remove all the upper elements by pressing the button of the Quick Change system.
   C. Turn the locks in the way shown on the picture, then slide the upper and lower elements out of the front rest

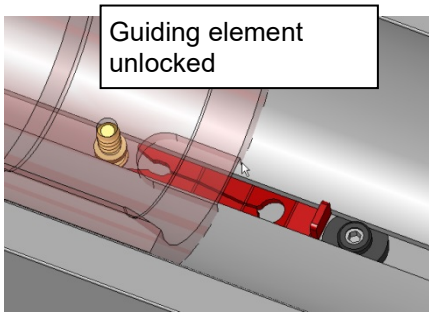


5. Mount the new elements by following the #4 in reverse order (C, B, A), the flag, the pusher and the pusher supports. Pay attention to guiding elements direction (not *symm*etric).
6. Close the guiding zone by pressing on the remote control
7. Press ◄ to move the pusher backward until the flag is in reference position, fully backwards.

2.6. Guiding element locking system

For guiding elements with diameter over 43mm, a pin is added to avoid the guiding element to stick to the pusher.





3. PUSHER

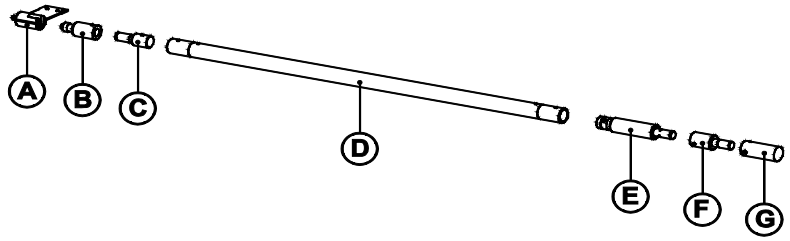
Please read the safety instructions provided at the beginning of this manual before handling the following devices.

To change the guiding elements and the pusher, the procedure in the start-up manual must be applied.

3.1. Description

The pusher is used to push the bar stock forward through the spindle of the lathe, until the remaining material is too short to machine another part. Additionally, depending on the machining process, the pusher can be equipped to pull back the remnant and evacuate it through the barfeed.
The pusher diameter is 1 mm smaller than the guiding elements' diameter. This ensures the best bar guiding.

When the new bar loading cycle is started, one bar is loaded into the guiding zone. The loading flag (**A**), which is connected to the servo drive through the chain, moves the bar stock into the spindle. When the bar is out of interference, the loading flag retracts, the guiding zone closes. The pusher assembly swings down and connects to the loading flag. The pusher moves forward to finish the bar stock positioning to the top cut position.



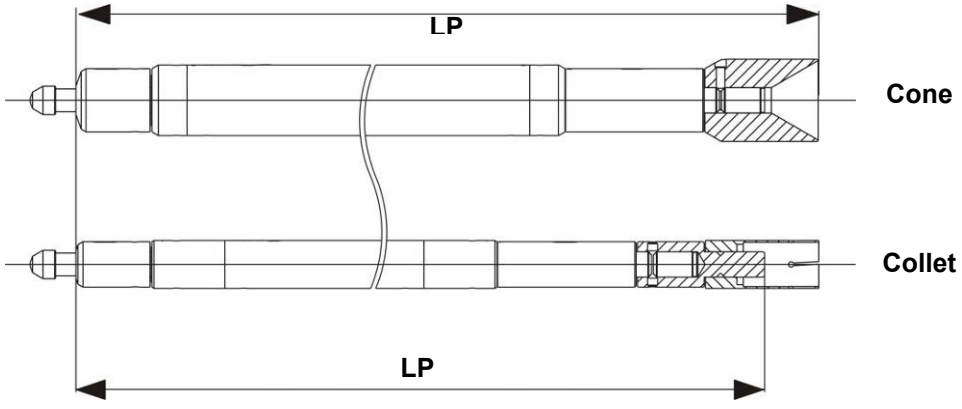
Designation	Description
A	Loading flag
B	Connecting part to the loading flag
C	Attach
D	Pusher body
E	Rotating sleeve
F	Adapter (optional)
G	Cone tip or collet

Remnant evacuation:

- Through the lathe : pusher equipped with rotating sleeve and cone tip
- Through the barfeed: pusher equipped with rotating sleeve and collet

Depending on the spindle length, 2 pusher lengths are available:

Pusher version	Pusher length (**LP**) ±1		Useable length (**Lu**) ±1	
	Cone	Collet	Cone	Collet
Standard	1596 mm	1554 mm	1220 mm	1178 mm
Long	1876 mm	1834 mm	1500 mm	1458 mm



3.2. Layout of the elements

Depending on the diameter of the bars to be guided, choose the appropriate diameter of the guiding elements; assemble the pusher using the charts below.

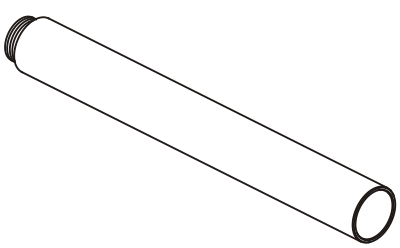
Important: The performance of the guidance may be determined by the clearance between the bar diameter and the guiding elements.

3.3. PUSHER BODIES

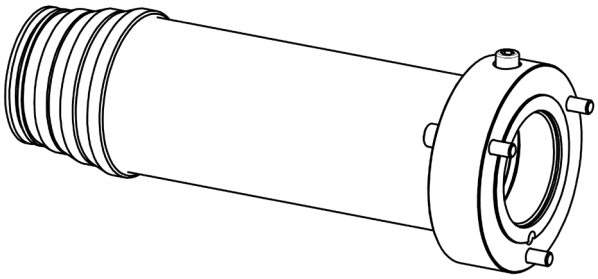
Pusher Ø mm	*Standard pusher body*	*Long pusher body*	*Rotating Sleeves*	*Collet adapter*	*Collet*
	1596mm	*1876mm*			
10	052.15.364/10	052.15.1124B/10	015.031.013/10	-	15053/10-xx.xx
11	052.15.364/11	052.15.1124/11	015.031.013/10	-	-
12	052.15.364/12	052.15.1124/12	015.031.013/10	015.31.164	15053/12-xx.xx
13	052.15.644	052.15.1134	015.031.013/10	-	-
14	052.15.764	052.15.1144	015.031.013/10	015.31.164	15053/14-xx.xx
15	052.15.754/15	052.15.1154/15	015.031.013/15	-	-
16	052.15.754/16	052.15.1154/16	015.031.013/15	028.031.074 / 028.031.064	15053/16-xx.xx
17	052.15.754/17	052.15.1154/17	015.031.013/15	-	-
18	052.015.214	052.015.1304	015.031.013/15	028.031.104 / 028.031.094	15053/18-xx.xx
19	052.015.224	052.015.1314	015.031.013/15	-	-
20	052.015.234	052.015.1324	015.031.013/15	028.031.144 / 028.031.134	15053/20-xx.xx
21	052.015.244	052.015.1334	015.031.013/15	-	-
22	052.015.254	052.015.1344	015.031.013/15	028.031.184 / 028.031.174	15053/22-xx.xx
23	052.015.264	052.015.1354	015.031.013/15	-	-
24	052.015.274	052.015.1364	015.031.013/15	-	-
25	052.015.284	052.015.1374	015.015.814	052.015.994 / 052.015.984	15053/25-xx.xx
26	052.015.294	052.015.1384	015.015.814	-	-
27	052.015.304	052.015.1394	015.015.814	-	-
28	052.015.314	052.015.1404	015.015.814	052.015.994 / 052.015.984	15053/28-xx.xx
29	052.015.324	052.015.1414	015.015.814	-	-
30	052.015.334	052.015.1424	015.015.814	-	15053/30-xx.xx
31	052.015.344	052.015.1434	015.015.814	-	-
32	052.015.354	052.015.1444	015.015.814	-	15053/32-xx.xx
33	052.015.364	052.015.1454	015.015.814	-	-
34	052.015.374	052.015.1464	015.015.814	032.31.154 / 032.031.094	15053/34-xx.xx
35	052.015.384	052.015.1474	015.015.814	-	-
36	052.015.394	052.015.1484	014.021.013	052.015.1024 / 052.015.1014	15053/36-xx.xx
37	052.015.404	052.015.1494	014.021.013	-	-
38	052.015.414	052.015.1504	014.021.013	052.015.1024 / 052.015.1014	15053/38-xx.xx
39	052.015.424	052.015.1514	014.021.013	-	-
40	052.015.434	052.015.1524	014.021.013	-	15053/40-xx.xx
41	052.015.444	052.015.1534	014.021.013	-	-
42	052.015.454	052.015.1544	014.021.013	-	15053/42-xx.xx
43	052.015.464	052.015.1554	014.021.013	-	-
44	052.015.474	052.015.1564	014.021.013	-	-
45	052.015.484	052.015.1574	014.021.013	-	15053/45-xx.xx
48	052.015.514	052.015.1604	014.021.013	-	15053/48-xx.xx
50	052.015.534	052.015.1624	014.021.013	-	15053/50-xx.xx
51	052.015.544	052.015.1634	014.021.013	-	15053/50-xx.xx
52	052.015.554	052.015.1644	014.021.013	-	15053/52-xx.xx

3.4. TUBES

The front tubes function as an extension of guiding channel, while protecting the zone between the barfeed and the lathe.



Fixed tube



Telescope / Telescopic tube

3.5. Fixed tube (fixed headstock)

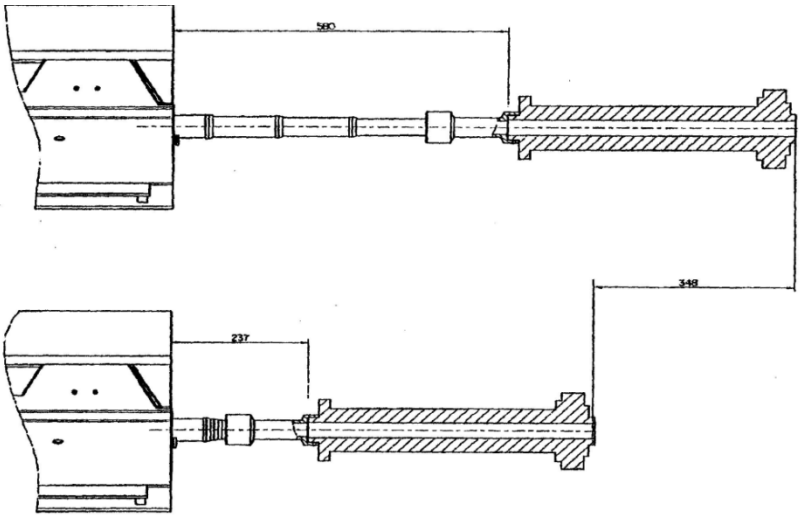
The front tube is a tube with fixed length. It serves specifically for fixed type lathe.

3.6. Telescopic tube (sliding headstock)

The telescopic tube can extend and retract. It's designed specifically for Swiss type lathe since the spindle is sliding during the part feed out and the machining. Matching reduction tubes are mounted inside of the telescopic tube to guide the bar and the pusher.

Stretched

Retracted

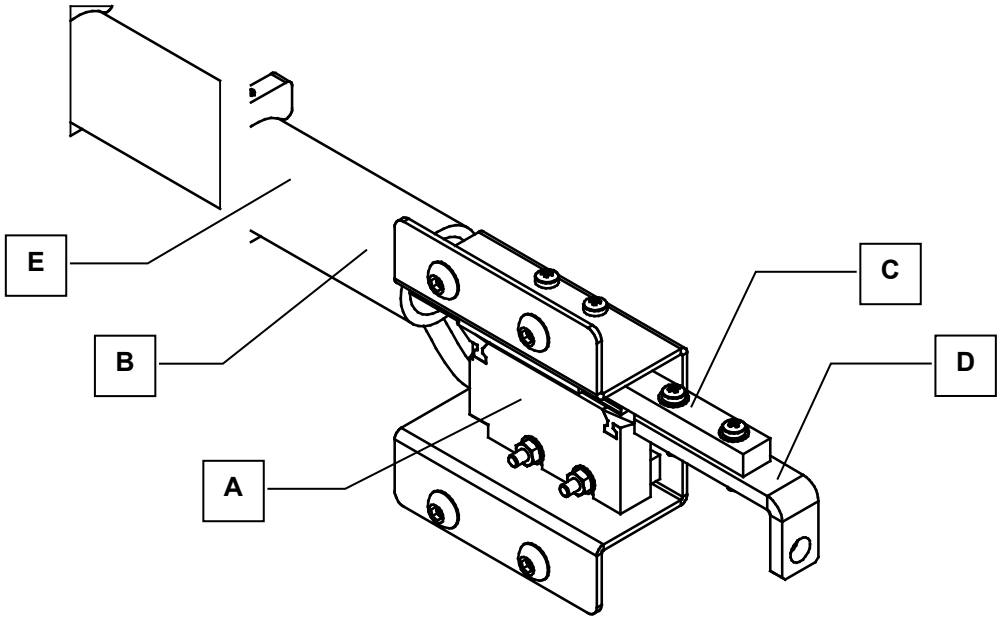


Article No	Internal ø	Retracted length	Maximum Stroke
042.037.013	48mm	178mm	384mm
042.037.073	42mm	240mm	580mm
332.037.053	42mm	225mm	530mm
332.037.023	42mm	165mm	348mm

4. SYNCHRONIZATION DEVICE

The barfeed ALPHA 538/552 uses an electronic synchronization that is directly connected to the lathe to measure the movements of the sliding headstock and replicate them to the pusher. This prevents the small bar stock to be bent during the spindle movements.

4.1. Layout of the elements



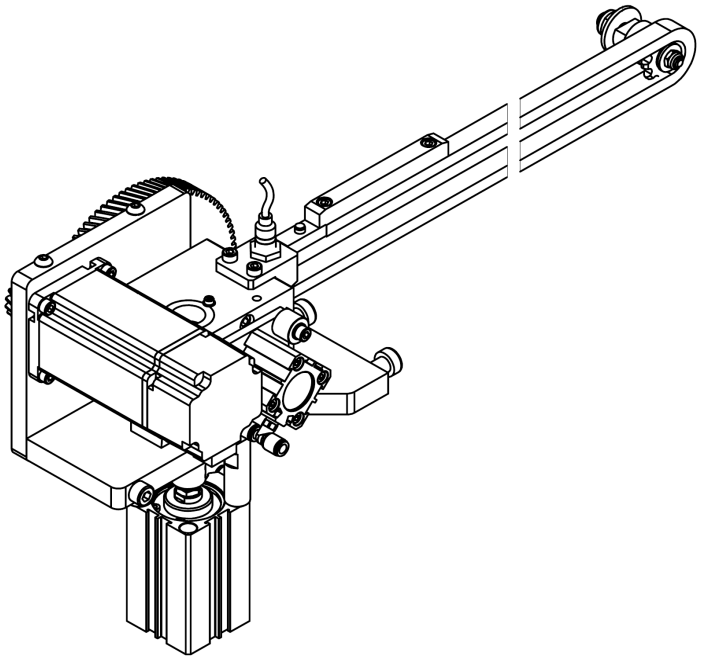
Designation	Article No	Description
A	B16120301	Measurement switch
B	B16120401	Magnetic track (not visible)
C	X51.16.A001B	Linear guiding (together as complete assembly)
D	-	Attach to the spindle
E	X51.16.A003B	Protection tube

5. CHAIN DRIVE

5.1. Description

The chain drive is controlled by a servo drive (**M2**) piloting all of the forward and backward movements of the pusher, the insertion and extraction movements of the bar in the collet.

5.2. Layout of the elements



Designation	Article No	Description
A	B14120203	Servo motor
B	11.1311.8850	Chain for 12' unit
C	B18120401	Reference switch
D	-	Smart booster

5.3. Chain

It is possible that after a certain amount of use, the Chain **(B)** needs to be tightened.

Should the Chain tension need adjustment, make sure that while adjusting, the Chain remains under tension in order not to lose the reference point. Should the reference point be lost, call for service assistance.

Procedure:

- Switch the bar feeder to **STOP** mode (remote station).
- Open the main access cover.
- Loosen the lock screws (**A**) of the adjusting bearing (**B**).
- With a torque wrench, apply a torque on the side screw (**C**) according to following chart).

Chain tension	
3M	0.5 Nm
12'	0.5 Nm
4M	0.5 Nm

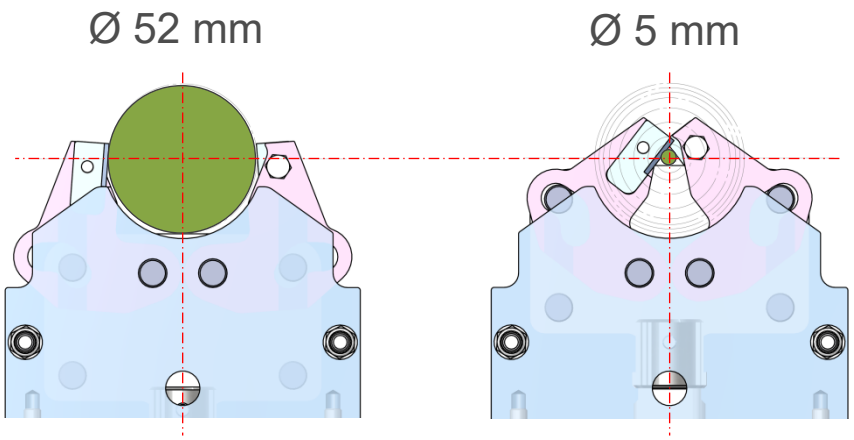
- When done, tighten the lock screws **(A)** of the adjusting bearing (**B**).

6. REMNANT EXTRACTION SYSTEM

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

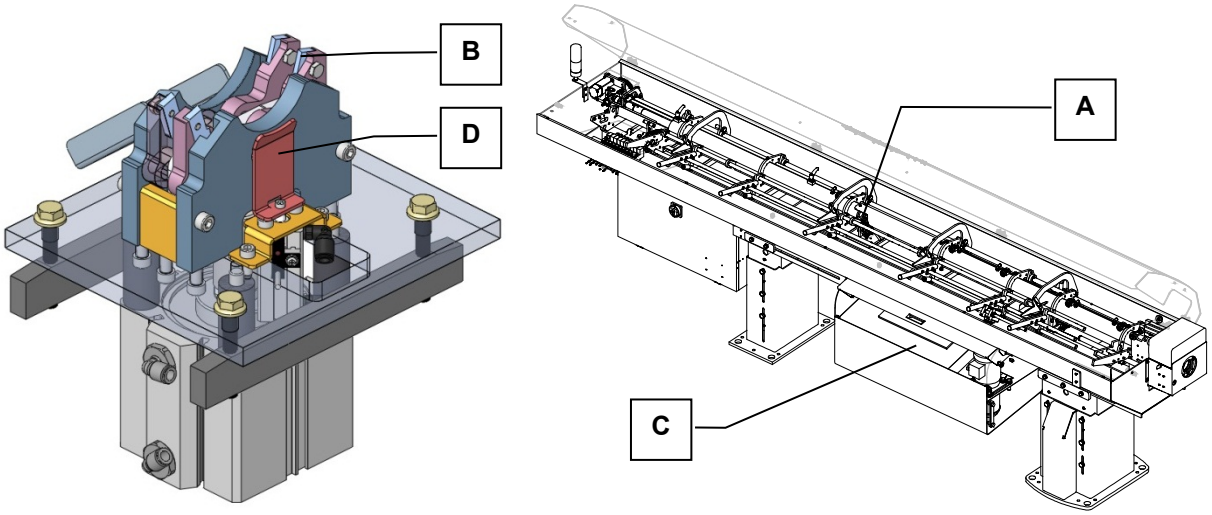
6.1. Description

The vise serves to insert and to extract material from the collet of the bar feeder.
Independently of the material, the diameter, or the bar profile, the clamping jaws are invariably the same and do not require any adjustment.



The vise of the ALPHA 552 bar feeder allows the extraction of remnants of from 90mm to 400 mm long.

6.2. Layout of the elements

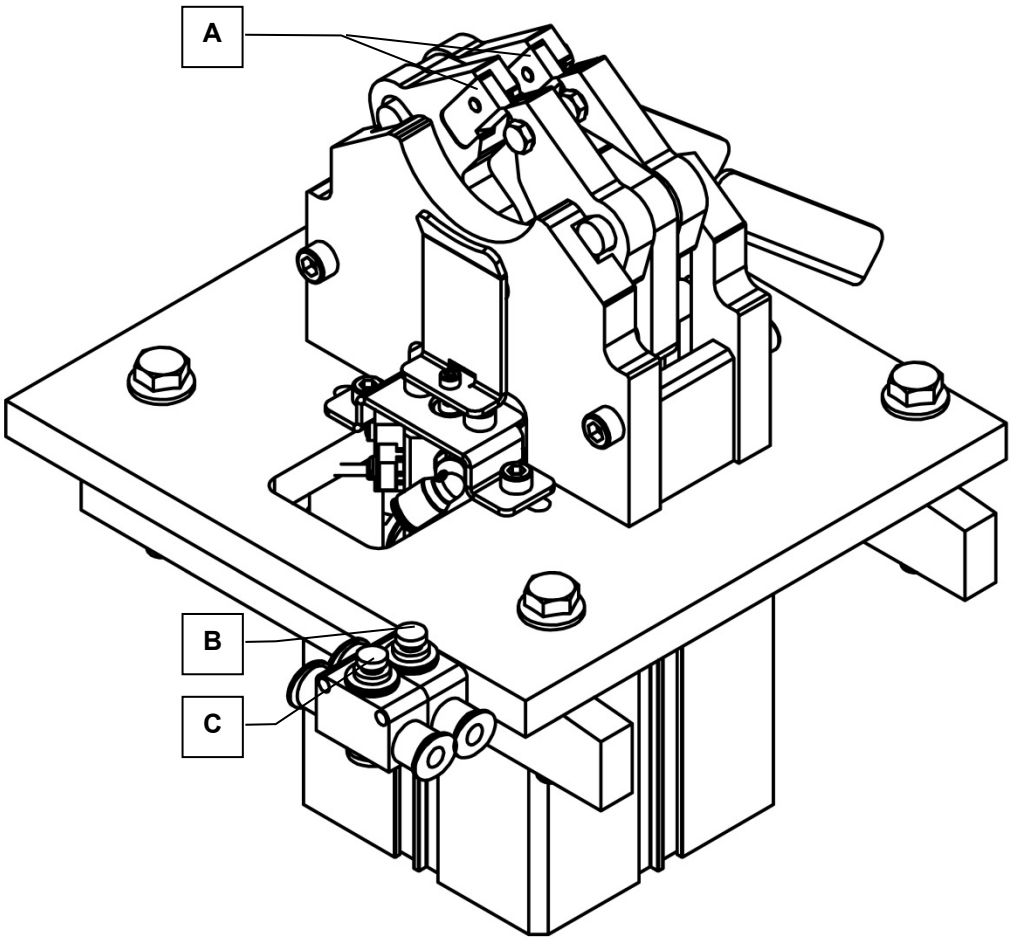


Designation	Article No.	Description
A	-	Bar stock clamping device
B	X51.22.P010C	Remnant extraction clamping blades
C	-	Remnant extraction drawer
D	X51.22.P016B	Remnant extraction help

6.3. Replacement of the blades

The clamping blades (see above) must be replaced when worn out. To do this:

1. Unscrew the 4 fastening screws and remove the worn out clamping blades **(A)**.
2. Install the new blade according to the drawing below, and secure them with the fastening screws



Designation	Article No.	Description
A	X51.22.P010C	Remnant extraction clamping blades
B	C11130400	Adjustment for lifting of the extraction cylinder
C	C11130400	Adjustment for lowering of the extraction cylinder

7. PNEUMATIC FRONT REST

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

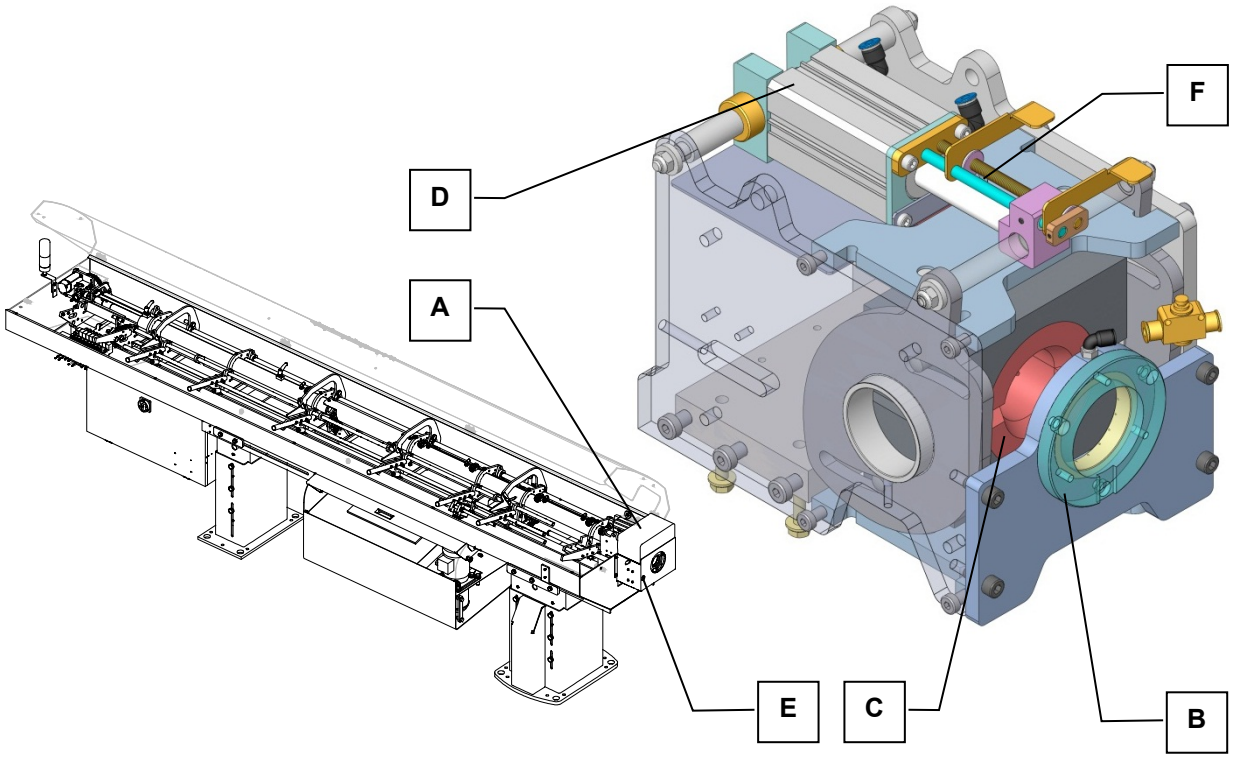
7.1. Description

Located at the front of the bar feeder, the pneumatic front rest stabilizes the stock guiding, even when the gap in the guiding elements is big.

A robust chassis contains 2 guiding elements **(C)**. The pneumatic front rest is supplied with oil during the whole automatic cycle. At the front, the oil is collected by centrifugal effect. An air blast **(B)** located just before the exit pushes away the resting oil. The rest opening is actuated by a pneumatic cylinder **(E)** and controlled by the PLC.

A cover **(A)** protects the mechanism, and an oil pan **(D)** collects the oil.

7.2. Layout of the elements



Designation	Description
A	Cover
B	Air blast
C	2 Guiding elements
D	Pneumatic cylinder
E	Oil pan
F	Setting of the front rest opening

7.3. Setup

The pneumatic front rest works as follows:

1. Closed position, holding and guiding the bar stock
2. Open position, holding and guiding the pusher

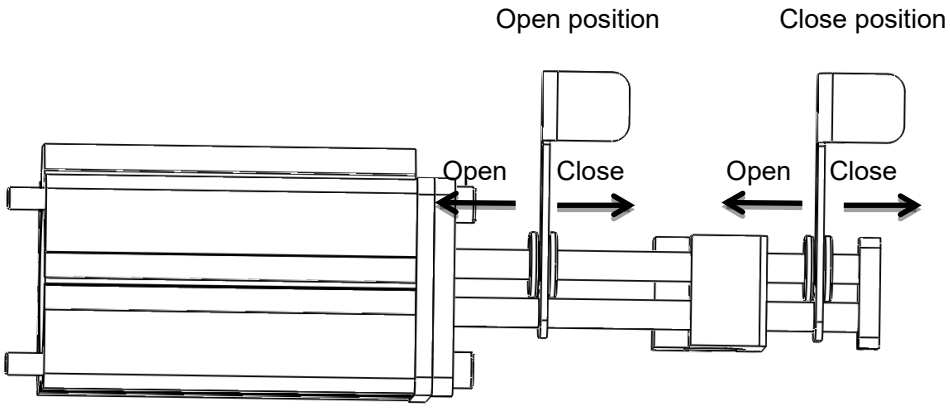
The guiding elements are adapted to the bar stock diameter (bar diameter + 1 mm). See section 2. GUIDING ELEMENTS in this chapter.

Setting procedure:

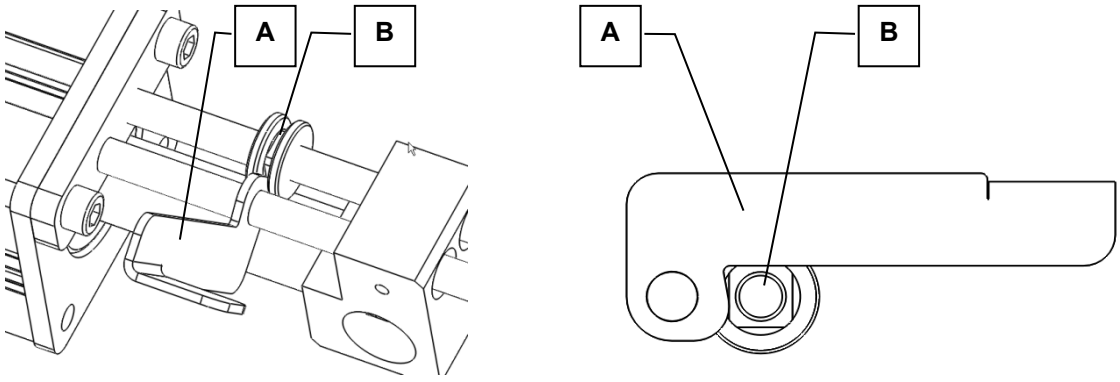
1. Mount the guiding elements with the inner diameter adapted to the bar stock to load.
2. In manual mode, close the guiding zone, and move the pusher to the air blast position.
3. If the pusher does not reach the air blast position because it hits the guiding elements, open the front rest by activating the front rest in manual mode (Parameters →User (F0) → Functions (F3) → PgDn/Down, activate function (F0). Now you can easily open and close the front rest by pressing “open channel” or “close channel” keys to set up the screw (F on page 7-17).

8.4. Open/close position

To adjust the “open” position, the front rest must be closed (menu “functions”).
To adjust the “closed” position, the front rest must be open (menu “functions”).



- Pull the lever (**A**) to unlock the stopper nut (**B**).
- Turn the stopper nut (**B**) to adjust the position.
- Turn the flat face of the stopper nut (**B**) to horizontal position.
- Lower the lever (**A**) to lock the stopper nut (**B**).



8. RETRACTION DEVICE

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 spindle and the bar feeder are long enough.

8.1. 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 ALPHA 538/552 can be equipped with a retraction system, which allows the operator to move the bar feeder. The rigidity of the system guarantees a perfect alignment when the bar feeder is in working position.

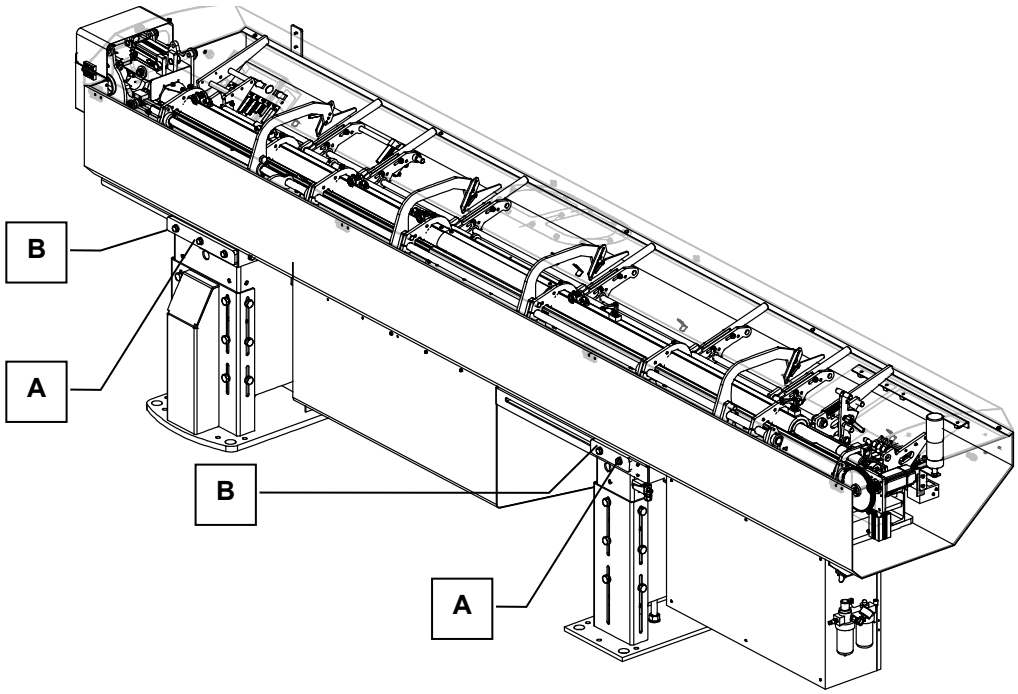
A safety switch impedes any handling as long as the bar feeder is not in operational position.

8.2. 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 10 lock screws **(A)** on the sides of the stands.
2. Loosen and remove the 4 lock screws **(B)** behind the stands.
3. Pull the bar feeder back.
4. After completing the maintenance operations, bring the bar feeder back in working position, lock the side screws **(A)** and the screws **(B)**. (max 75 Nm).



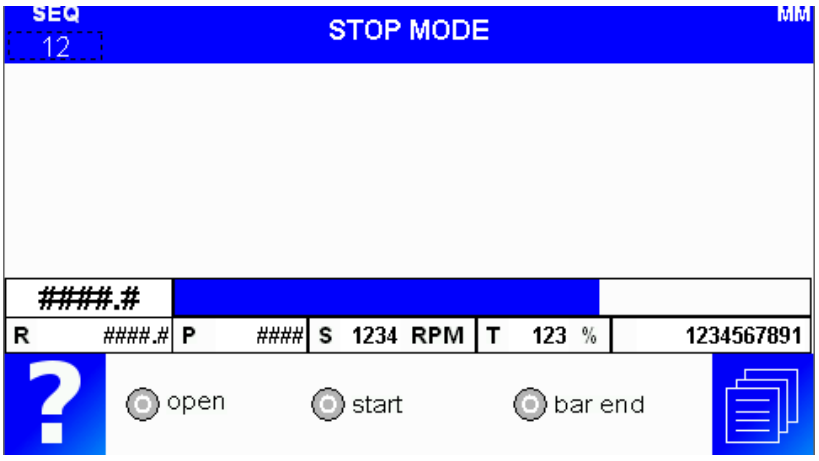
CHAPTER 8 : OPERATION

1. CONTROLS

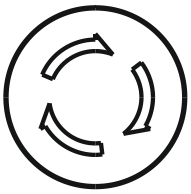
1.1. Remote control

The remote control offers a touch screen display and buttons for operating the bar feed system when it's in MANUAL mode.

1.2. Display



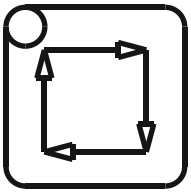
1.3. Manual function buttons



Emergency stop

When a dangerous situation arises, pressing the emergency stop button immediately interrupts the bar feeder. The bar feeder will send alarm signal to the lathe and interrupt the lathe if interface is wired accordingly. Error message e01 will be shown on the HMI display.

To cancel the alarm, release the button by rotating it clockwise and pressing the **MANUAL** mode key.



AUTO ready

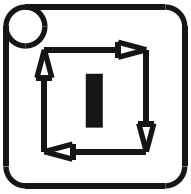
To switch the bar feeder to **AUTOMATIC ready** mode. In **AUTOMATIC ready** mode, the key LED is ON. The bar feeder is available to be switched to **AUTOMATIC** mode.

To switch to **AUTOMATIC ready** mode, one of the following conditions must be fulfilled :

- The channel is closed and the pusher is NOT at home position.

OR

- The channel is open and the pusher is at home position and the measurement device in upper position (sensor SQ1 ON).



AUTO START

To switch the bar feeder to **AUTOMATIC** mode. In **AUTOMATIC** mode, the key LED is ON. The bar feeder is running the automatic sequence controlled by the lathe.

To switch to **AUTOMATIC** mode, the following conditions must be fulfilled:

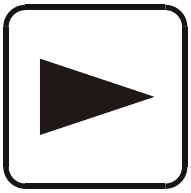
- the bar feeder in **AUTOMATIC READY** mode.

AND

- the channel is closed and the pusher is NOT at home position.

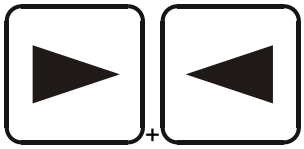
OR

- the channel is open, the pusher is at home position and the measurement device in upper position (sensor SQ1 ON).



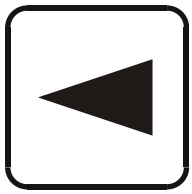
Rightward

Move pusher rightward. Only available when the bar feeder is in **MANUAL** mode.



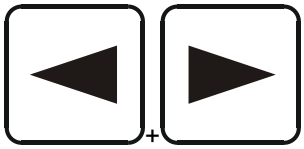
Slow Rightward

Move the pusher rightward with10% of the general forward speed. Only available when the bar feeder is in **MANUAL** mode.



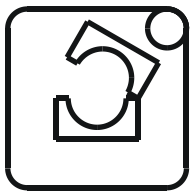
Leftward

Move the pusher leftward. Only available when bar feeder is in **MANUAL** mode.



Slow leftward

Move the pusher leftward with10% of the general forward speed. Only available when the bar feeder is in **MANUAL** mode.



Open Channel

By pressing this button, the channel opens by proceeding sequence below automatically :

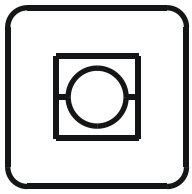
- The short pusher moves forward to the material clamping device.
- The material clamping device clamps the material and the pusher retracts hence the material is removed from the finger chuck.
- The channel opens.

To operate this button, the following conditions must be fulfilled :

- The bar feeder is in **MANUAL** mode
- The pusher is at home position (sensor SQ2 ON)

Load bar

When the channel is open, press the key again to load a bar and reset the measurement device.



Close Channel

By pressing this button, the actions below will be proceeded by sequence automatically :

- The short pusher moves forward to the material clamping device.
- The material clamping device clamps and the pusher retracts to home position.
- Channel close and the pusher charges forward for insertion.

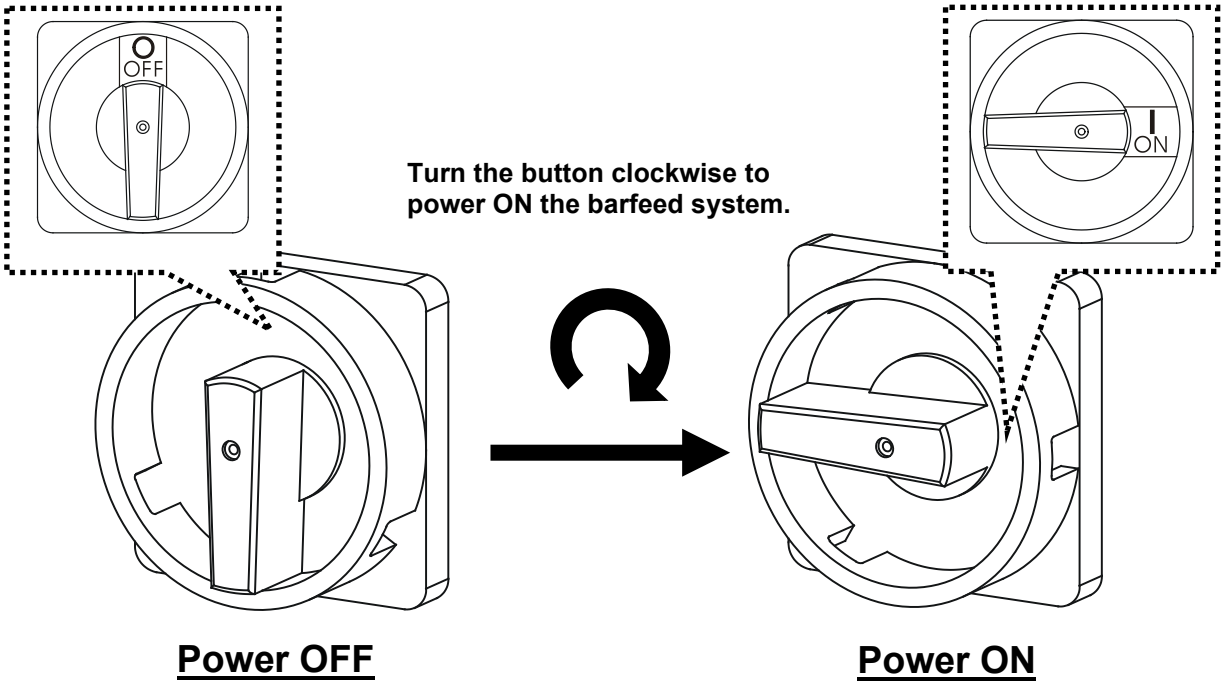
To operate this button, the following conditions must be fulfilled:

- The bar feeder is in **MANUAL** mode
- The pusher is at home position (sensor SQ2 ON)

2. POWERING ON

The motor of the ALPHA 552 bar feeder is equipped with a built-in absolute encoder that continuously controls the position of the carrier. When the bar feeder is powered down or there is a power failure, this position is kept in the memory by the PLC.

When powering up, the pusher position value saved is immediately taken into account, thus avoiding any input from the beginning. The PLC reads signals from sensors and gives the operator allowable operations only.



Notice: Do not change the pusher position when bar feeder is powered OFF. If it's found the position reading does not match the pusher's actual position. For example, when pusher is at home position, the current position is not 0. Take any approach below to reset the original position:

1. Move the pusher back to home position. Power the bar feeder OFF and ON.

2. Move the pusher back to home position. Pressing the button leftward for 3 seconds.

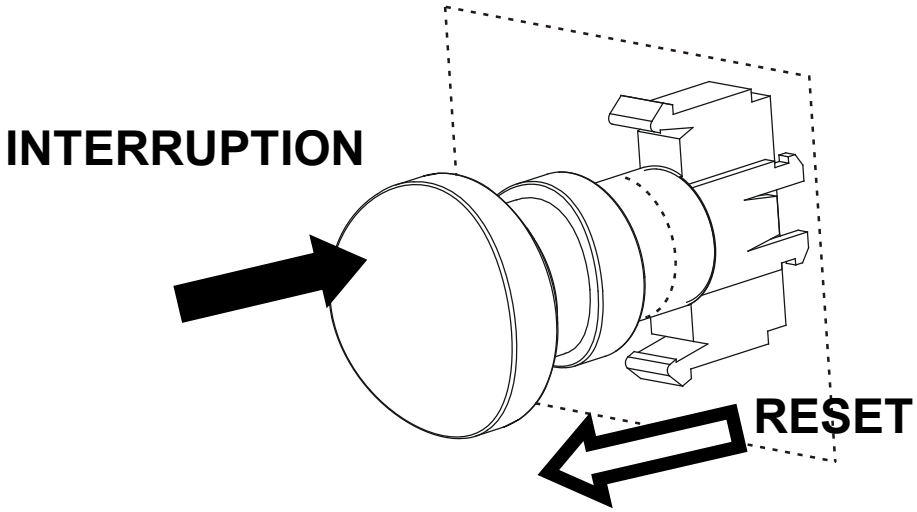
3. EMERGENCY STOP BUTTON

When there is an dangerous situation arising, pressing one of the emergency stop buttons starts actions below and interrupts the bar feeder and the lathe (if interface wired accordingly):

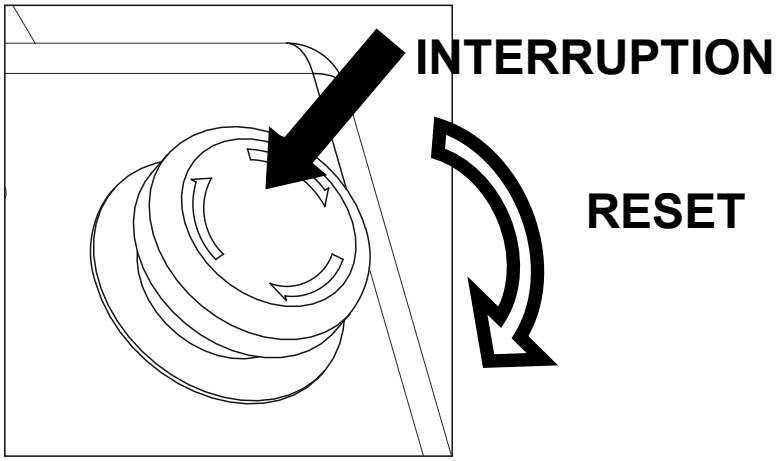
- The 3 phases 220V AC to servo amplifier is interrupted;
- All the output signals of PLC are interrupted except Y20 (input signal of relay R1);
- An alarm e01 is arising at HMI.

When the emergency situation is fixed, release the emergency stop button and press the manual key on the remote control to restart the bar feeder.

Emergency stop button on the cabinet STP1



Emergency stop button on the remote control STP2



4. AUTOMATIC SEQUENCE

The ALPHA 552 bar feeder could be switched into AUTOMATIC mode at two timings.

4.1. Starting a new machining

Warning:
Conditions must be fulfilled:

1. The lathe is not in AUTOMATIC mode.
2. The lathe chuck is open.
3. The lathe stopper must be positioned at the TOP CUT position.

Move the pusher to its origin reference and confirm the current pusher position is 0.

- Open the channel.
- Load a new bar stock by pressing the channel open button.
- Press the channel close button to measure the bar.

The bar feeder advances the bar stock to TOP CUT position.

- Switch the bar feeder into AUTOMATIC mode.
- Switch the lathe into AUTOMATIC mode.

4.2. Continue an interrupted machining:

Warning:
Conditions below must be fulfilled:

1. The lathe is not in AUTOMATIC mode.
2. The lathe chuck is open.
3. The lathe stopper is positioned at part length position.
4. The bar feeder channel is closed and pusher is not at origin reference.

Manually move the pusher forward until the bar stock pushes against the stopper.

- Close the lathe chuck.
- Switch the bar feeder into AUTOMATIC mode.
- Switch the lathe into AUTOMATIC mode.

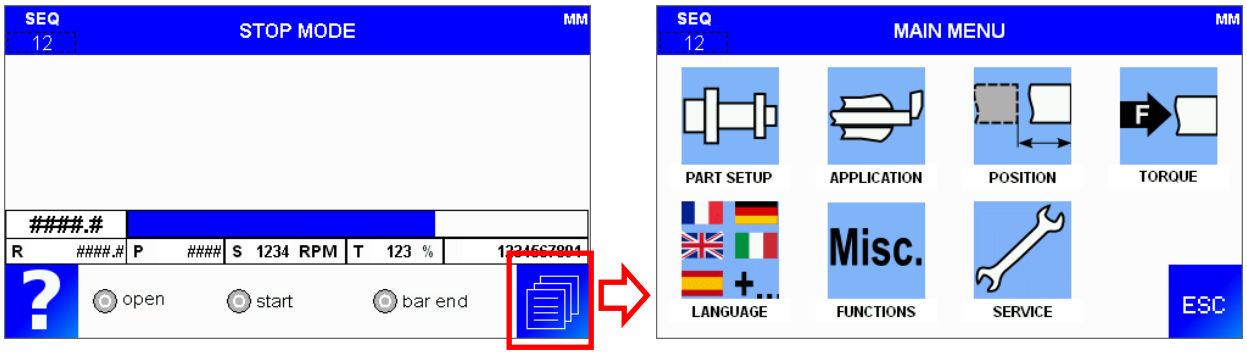
5. OPERATION PARAMETERS

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

The operation parameters are most frequently changed parameters for controlling the bar feeder when it's in AUTOMATIC mode. All the operation parameters could be changed according to the machining requirement. To achieve the best performance, the operator is strongly recommended to read this chapter before proceeding to any modification.

5.1. Accessing and editing parameters

After selecting the operation parameters the following screen will be displayed:



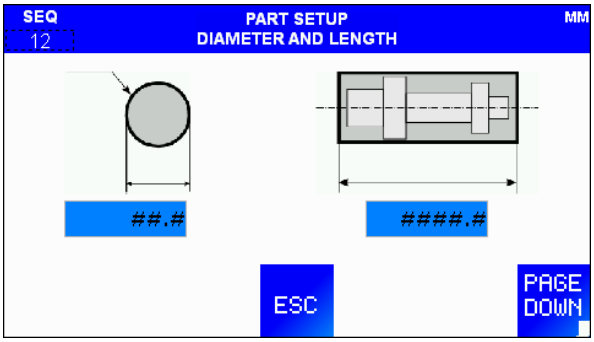
5.2. Part setup parameters

Part setup: Diameter & Length

Bar diameter
This parameter decides the basic pushing force. Enter the bar stock diameter currently loaded inside the channel.
.
Part length
Overall feeding length needed for making a part. Part length plus cut off tool width.

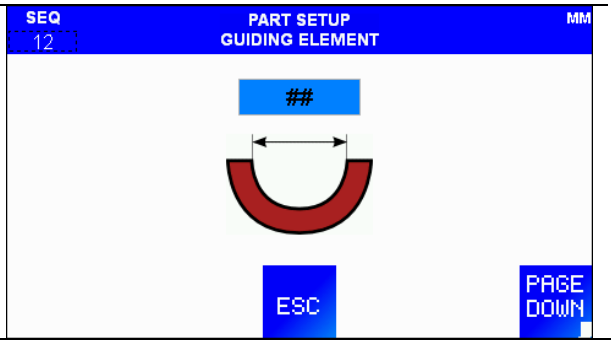
This value is for calculation of BAR END position and timing of sending CYCLE START signal. The bar feeder will not stop at this distance during feeding. The lathe must place a stopper inside the lathe for positioning.

Example: *If the part is 100mm and the cut off tool width is 3mm. The value entered here is 100+3=103.*



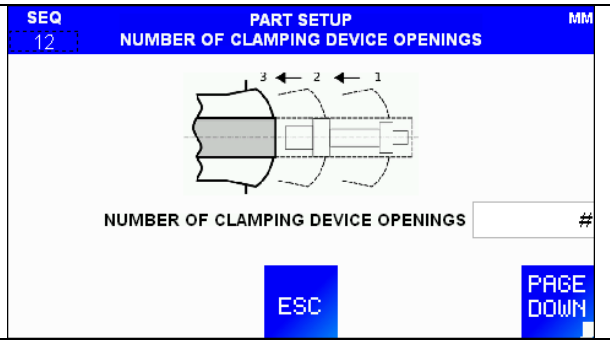
Part setup: Guiding channel

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



Part setup: Number of clamping device openings

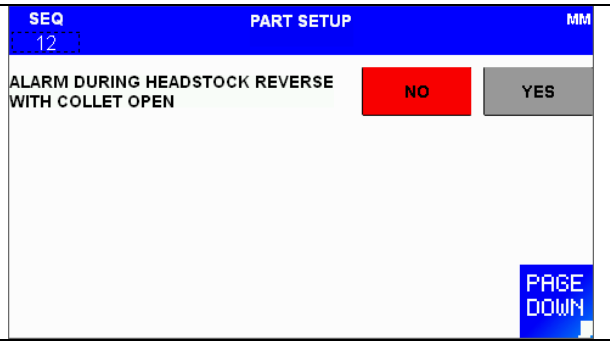
Number of clamping device openings
Number of lathe clamping openings during the machining of one part. Used to prevent undesired part feed out during clamping opening.



Part setup: Alarm headstock reverse

If the bar stock goes backwards when the lathe clamping device is open, an alarm is activated.

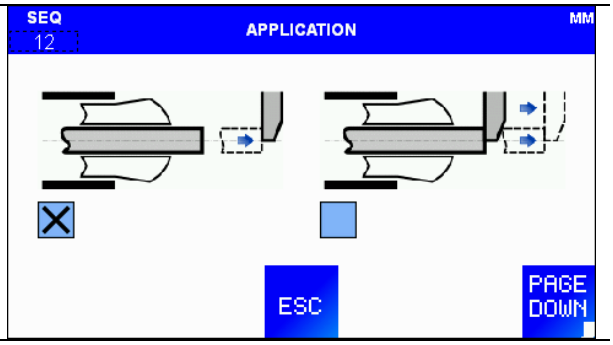
This parameter has to be deactivated if a stopper is used to positioning the bar stock.



5.3. Application parameters

Application: Part feed out with turret

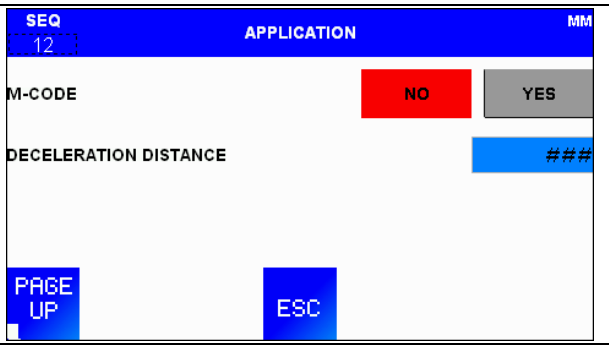
Defines if the lathe turret waits in position or follows the bar stock displacement during feeding operation.



Application M-code & deceleration distance

M-code
During production time, the lathe issues an M-Code signal (A4). The bar feed will push the bar into position and emit a signal over the R2 relay to reset the M-Code and the lathe will then be able to continue working.

Deceleration distance
Distance in which the pusher as to slow down before the stopper.



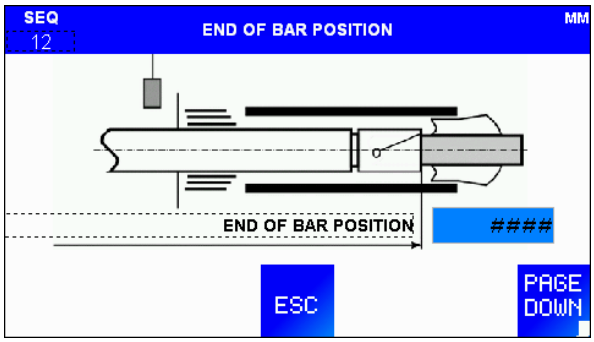
5.4. Position parameters

Position: End of bar

End of bar
(may be not visible)
The end of bar position determines the moment when the barfeed 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.

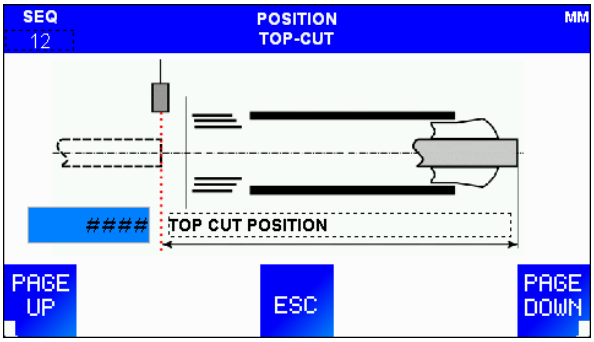
Regardless of the length of the bars, or parts, the end of bar position is always the same. In very special cases, a different end of bar setting needs to be selected.



Position: Top cut

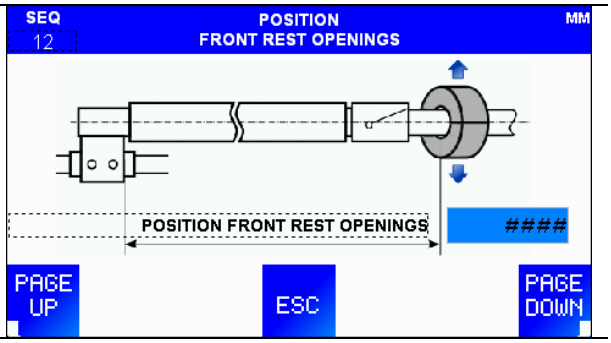
Top-cut position
During the loading cycle, the bar is automatically loaded and positioned into the spindle, outside the clamping device of the lathe (chuck or actuator).

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.



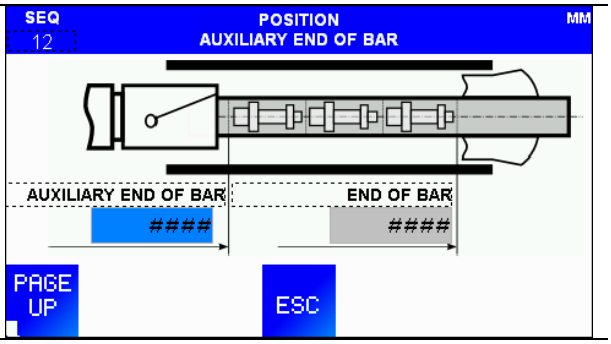
Position: Front rest opening

Front rest opening position
Define the pusher position where the front rest opens.



Position: Auxiliary end of bar

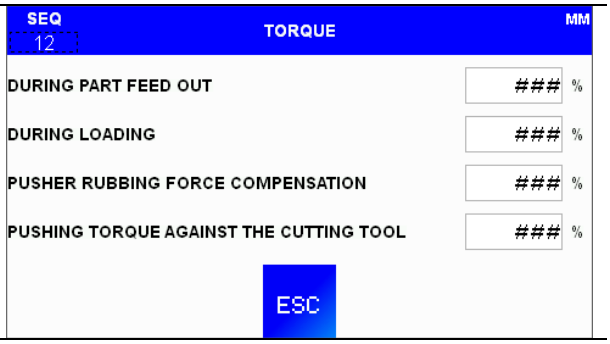
Depending on the lathe and its options, the auxiliary end of bar may be used in several ways, for example for the opening of an external rest. The procedure is the same as this for the end of bar setting.
.



5.5. Torque parameters

Torque:

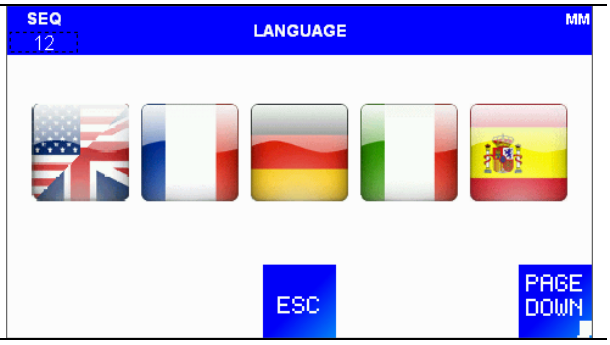
Torque values as described.



5.6. Language parameter

Language

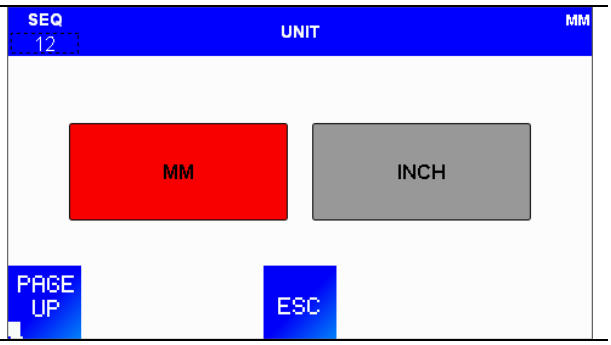
Allows the user to choose the barfeed HMI language.



5.7. Misc. parameters

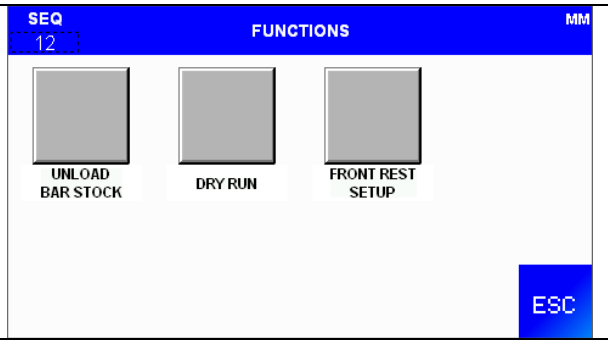
Misc: Unit

Allows to choose units of measure.



Misc: Functions

Unload bar stock, Dry run and front rest setup functions are available on this screen.

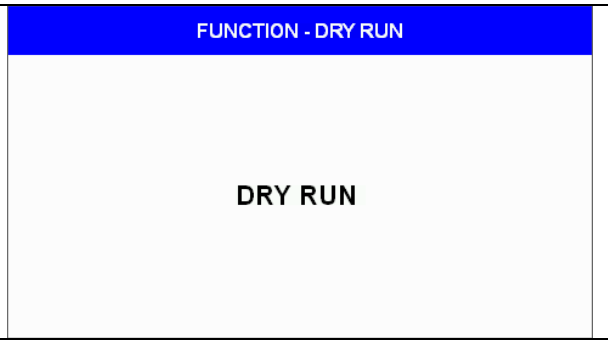


Misc: Function – Unload bar stock

Unload bar stock function

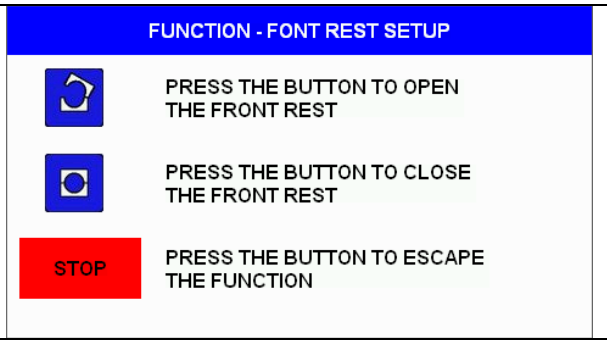
Misc: Dry Run

Dry run function



Misc: Front rest setup

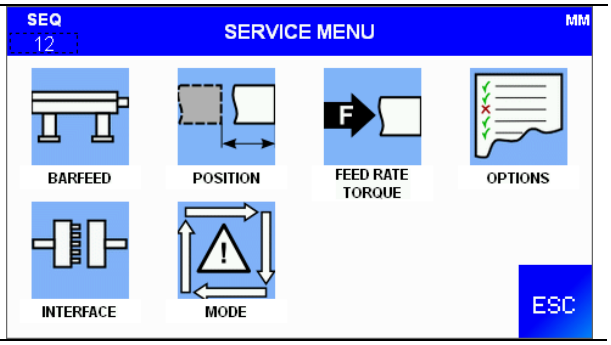
Use this function to adjust front rest open/closed positions.



5.8. Service parameters (Password protected, only for trained technician)

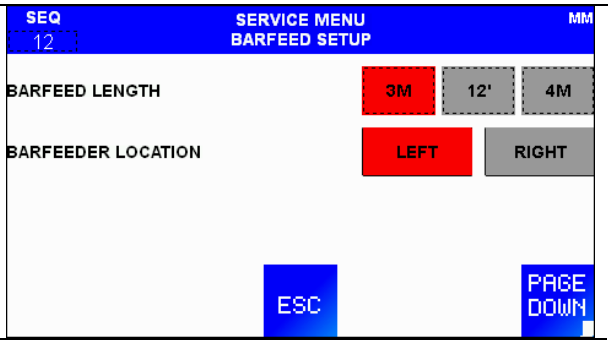
Service: Main screen

Main screen



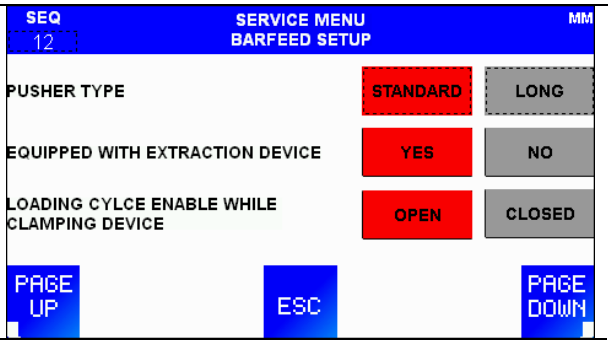
SERVICE: Bar feeder setup

Defines the Bar feeder length and loading position.



SERVICE: Bar feeder setup

Defines the pusher length, the use of extraction device and the loading cycle configuration.

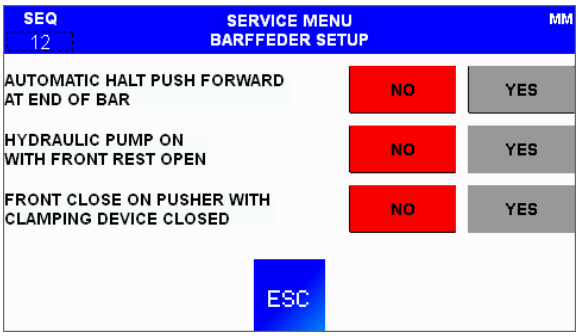


SERVICE: Bar feeder setup

Automatic halt push forward at EOB
If this parameter is set to YES, the bar feeder don't push forward at end of bar (Only with Swiss type lathe).

Hydraulic pump ON with front rest open
The hydraulic pump continues to supply oil to the guiding channel.

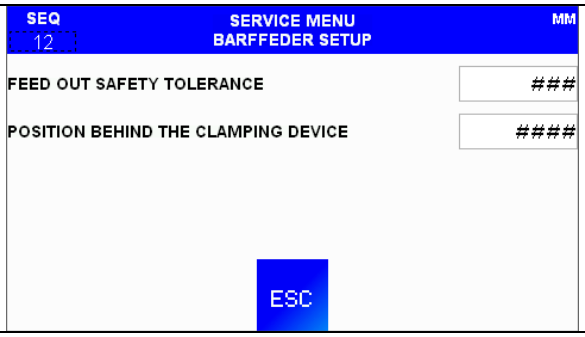
Front rest closed on pusher
Only with fixed headstock lathe and only for Asian market!
Close the front rest on the pusher during machining.
Front rest opening is synchronized with lathe clamping device opening.
This parameter reduces vibrations.



SERVICE: Bar feeder setup

Feed out safety tolerance
Tolerance added to the entered part length value to avoid a groundless alarm. (default:10mm)

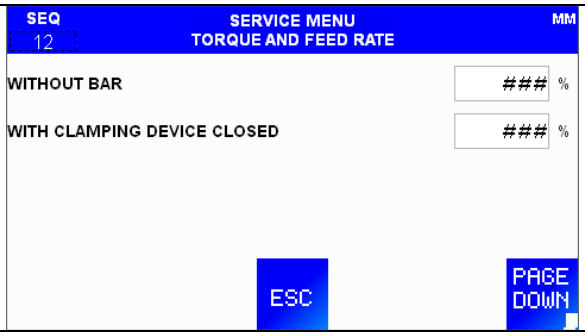
Position behind the clamping device
Position of the collet behind the clamping device



SERVICE: Torque & feed rate

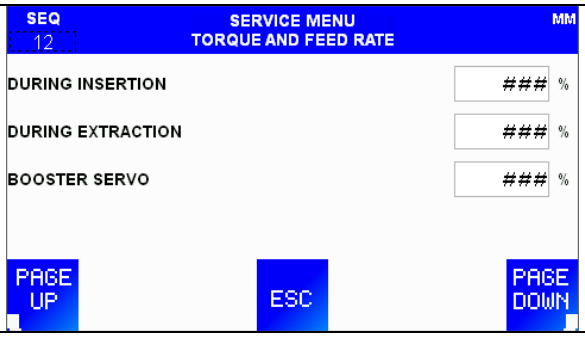
Without bar stock
Pusher feed rate without bar stock

With clamping device closed
Pusher torque with clamping device closed



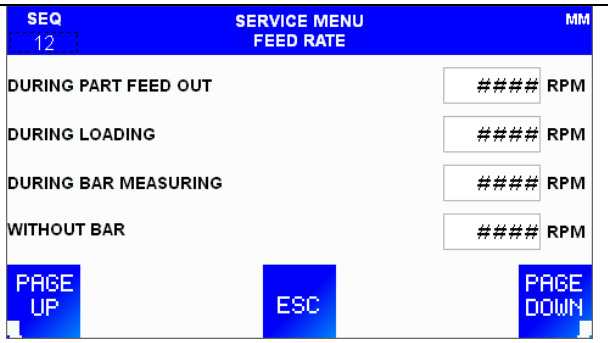
SERVICE: Torque & feed rate 2

Default values insertion/extraction: 100%
Default value Booster servo: 300%



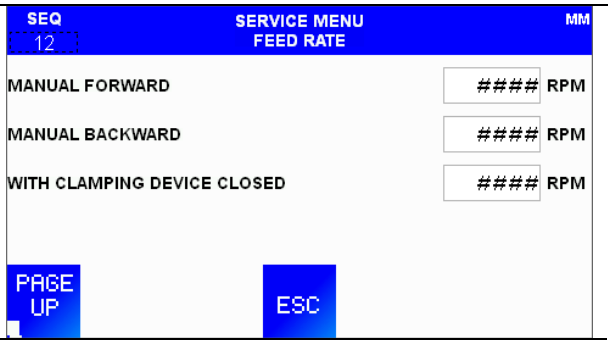
SERVICE: Feed rate

Feed rate values.



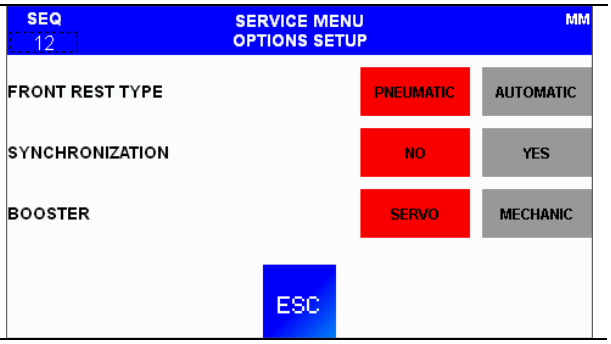
SERVICE: Feed rate 2

Feed rate values.



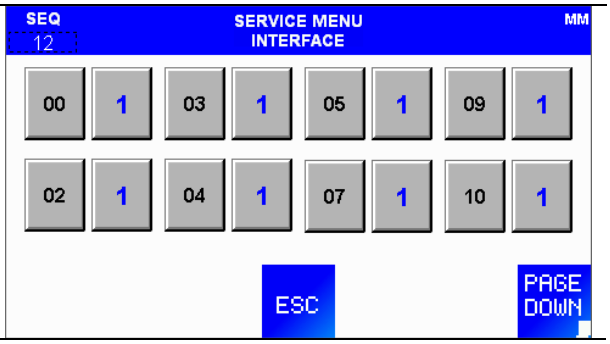
SERVICE: Options setup

Defines the front rest type, if the bar feeder uses a synchronization system and allows to choose booster options.



SERVICE: Interface

Shows several interface parameter status. Please refer to the list below for IP numbers description or click on the parameter number on the touch screen to show more information.

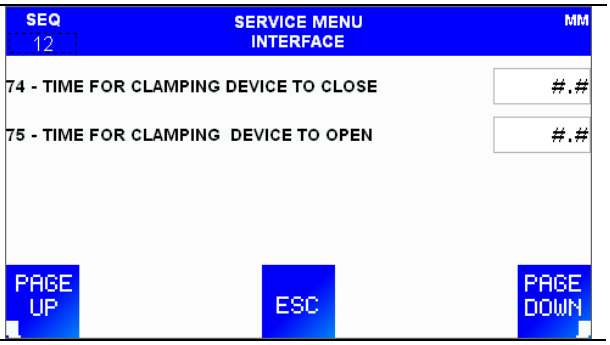


PI00: A1-clamping signal closed/open
PI01: <not in use>
PI02: Pusher Motion Control Yes/no
PI03: Loading interrupt if A2 or A4 not activated no/yes
PI04: (A3) Priority load command from lathe no/yes
PI05: EOB signal required by the lathe yes / no
PI06: Loading cycle enabled at clamping opening/closing
PI07: Lathe headstock is fixed/sliding
PI08: <not in use>
PI09: Push signal from the lathe (A2) automatic cycle/A4-M-code adv.
PI10: PLC input A2 is latched/pulsed
PI11: A4 signal is latched/pulsed
PI12: 2 pushing forces (sliding headstock) no/yes
PI13: R2 while in production cycle off/on
PI14: R2 during End Of Bar off/on
PI15: R2 ON at top cut position until clamping closes/pulsed for 2 seconds
PI16: R2 to confirm top cut only/top cut+M-code
PI17: R3 signal latches at End Of Bar yes/no
PI18: R3 turns on at EOB and turns off at Loading Start / Clamping Opening
PI19: R3 turns on at EOB and turns off at Loading Start / in top cut position

PI20: R3 pulses for 2 seconds at End Of Bar no/yes
PI21: R5 ON at Auxiliary EOB during Aux. EOB/Until bar loaded
PI22: Clamping device closed to start AUTO yes/no
PI23: <not in use>
PI24: Automatic signal connected to (A2) yes/no
PI25: <not in use>
PI26: <not in use>
PI27: <not in use>
PI28: <not in use>
PI29: <not in use>
PI30: Feed out control alarm yes/no
PI31: EOB calculated acc. to part length yes/no
PI32: R3 turns ON at clamping open/clamping close
PI33: R3 turns ON at EOB and turns off at Loading Start/Until bar loaded
PI34: <not in use>
PI74-75: Time for clamping (sec.) to close / to open
PI43: R5 is aux. EOB / inching
PI44: Lathe's door open NC/NO
PI45: A2 signal NC/NO
PI46: A4 signal NC/NO

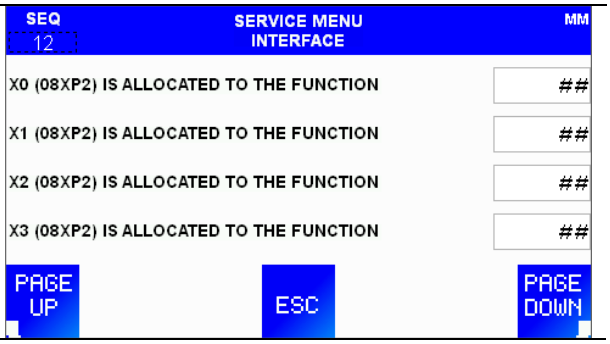
SERVICE: Clamping device

Delay between signal activation and mechanical accomplished status.



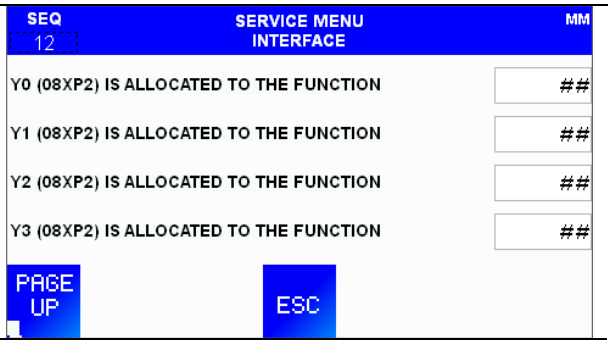
SERVICE: additional I/O module

Additional inputs for specific functions.



SERVICE: additional I/O module

Additional outputs for specific functions.

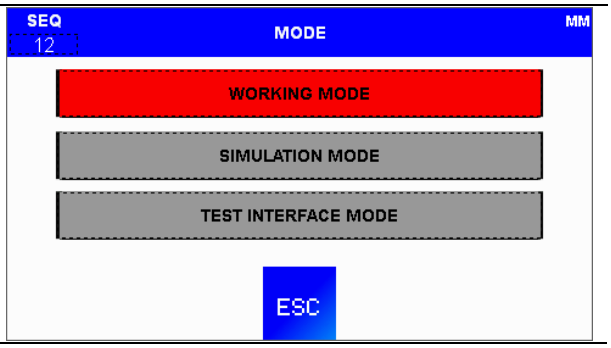


SERVICE: Mode

Working mode
Conventional mode for machining

Simulation
Only for shows. Simulate machining process without bar stock.

Test interface mode
Cycle to test the interface.

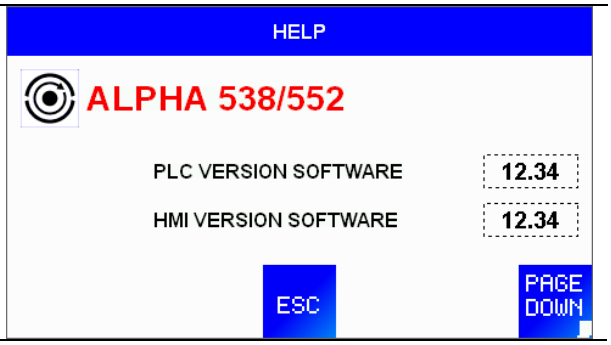


5.9. HELP

To reach the Help menu, press the STOP button, then press "?".

HELP: Software versions

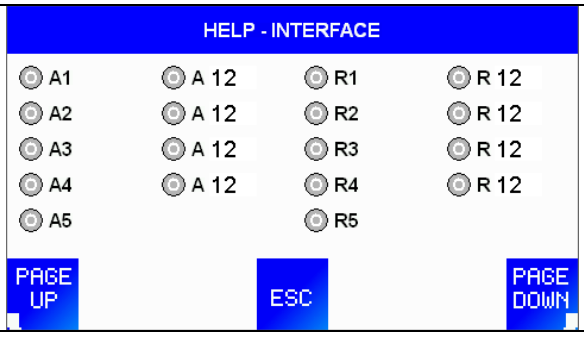
Shows PLC and HMI installed software versions.



HELP: Interface signals

Shows signals and their status.

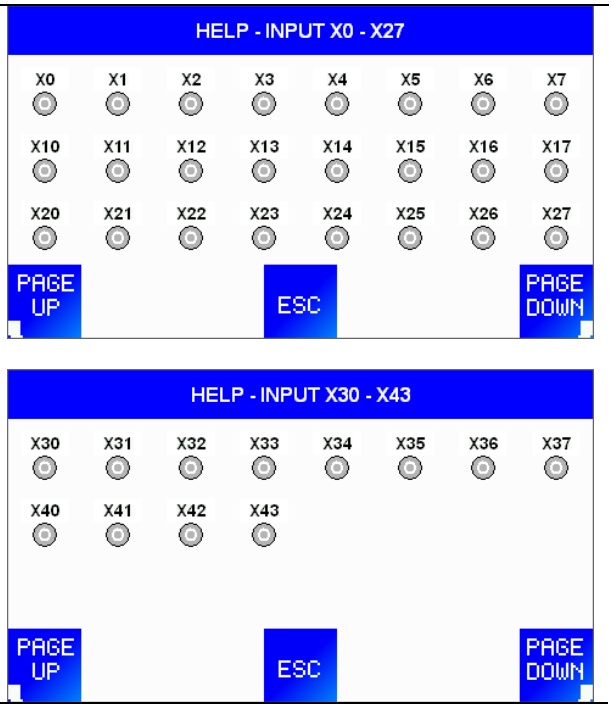
Grey = not active
Red = active



HELP: Inputs

Shows Inputs and their status.

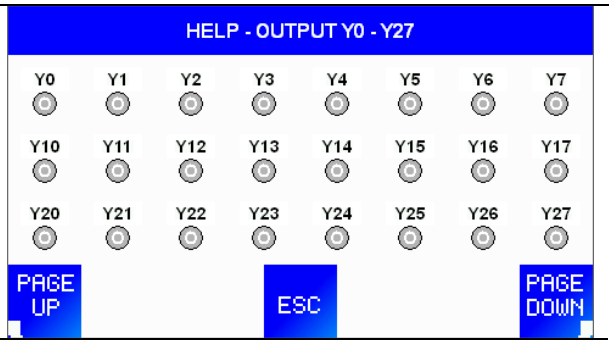
Grey = not active
Red = active



HELP: Outputs

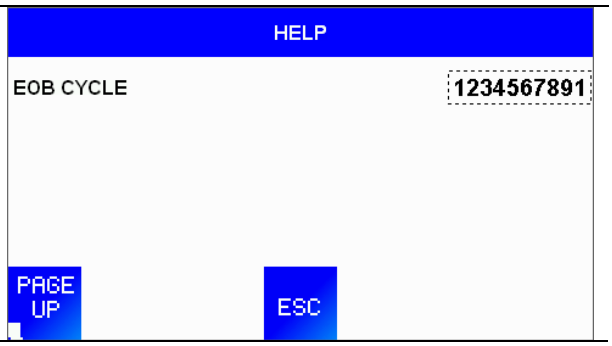
Shows Outputs and their status.

Grey = not active
Red = active



HELP: End of bar Cycles

Number of EOB cycle.



6. AUTOMATIC CYCLE

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

Every time the automatic cycle is to be started, it is recommended to check following points:

- On the loading ramp, standard bar stocks (1200 mm to 3200 mm) must be against the rear limiter. In the case very short bar stocks must be loaded (min. 700 mm), place the bar stocks in the middle of the loading ramp; make sure they will be loaded in the remnant extraction device without falling in the remnant tray.
- The guiding element must be adapted to the bar stock diameter.
- 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 pushing force must be adapted to the bar stock material.
- On the lathe, the clamping device must be adapted to the bar stock diameter.

6.1. New loading bar stock

1. The bar stock on magazine is loaded using the cylinder loading into the guiding elements. The pusher is in back position, lifted up and the pusher holding system is open.
2. The loading finger moves forward and pushes the bar stock in measuring position. The bar length is measured.
3. The loading finger goes on to maximal forward position and inserts the bar stock in the spindle.
4. The loading finger moves back to maximal back position.
5. The pusher moves down in working position.
6. The pusher moves forward to the bar stock and finishes the positioning in clamping position (top-cut).
7. The lathe's clamping device closes.

6.2. Part feed out

8. The pushes moves back by the selected value.
9. The automatic cycle starts, the parts are machined.

   To each clamping device opening, the pushes moves forward, positions the bar stock for the next part, then moves back by the selected value.

6.3. 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 extraction system clamps the material and the pusher goes in home position.
12. Once the pusher in home position, the extraction system opens and the remnant falls in the tray.
13. The pusher moves up.

7. POWERING OFF

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

When powering off the barfeed, make sure the pusher is in reference position, lifted up and no bar stock is present in the guiding element.

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

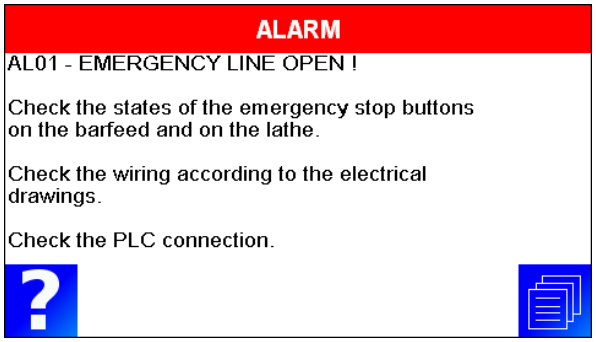
CHAPTER 9 : MALFUNCTIONS

1. ALARMS

AL01: Emergency line is open!

Description
The lathe or the bar feeder goes into an emergency stop condition and does not receive signal (X10). The problem is generated anytime there is an open in the safety circuit.

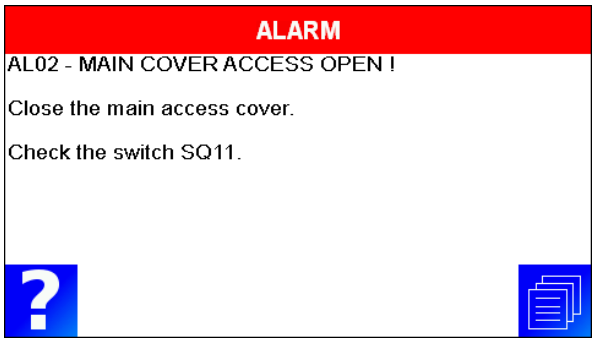
Solutions
Check the PLC connection.
Check the wiring according to the electrical diagram.
Check the emergency buttons state on the bar feeder and the lathe.
Press the STOP button on the remote control to reset the alarm.



AL02: Main cover access open!

Description
The PLC does not detect input (X20 – SQ11). The problem is generated when the main access cover on the bar feeder is open, exposing automated mechanical parts.

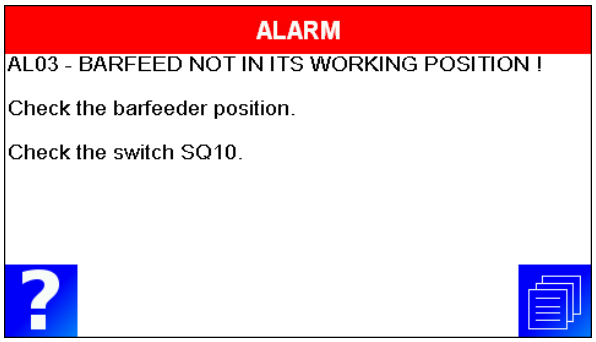
Solutions
Close the cover.
Check the SQ11 switch.



AL03: Barfeed not in its working position!

Description
The problem is generated when the bar feeder is retracted in reduction tube change position or if the retraction system is not locked.

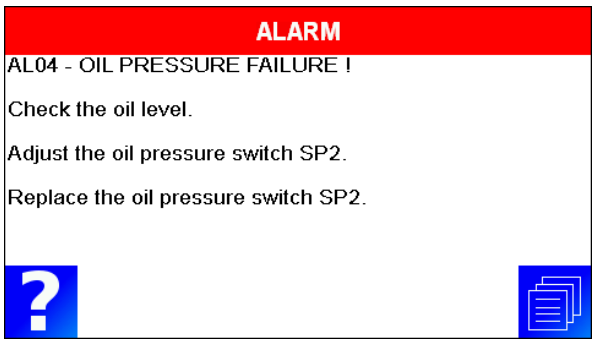
Solutions
Put back the bar feeder in working position.
Check the SQ10 switch.
Press the STOP button on the remote control to reset the alarm.



AL04: Oil pressure failure!

Description
The PLC does not detect input (X12 – SP2) after a period of 30 seconds. The problem is generated anytime oil pressure is not sufficient to make the oil pressure switch.

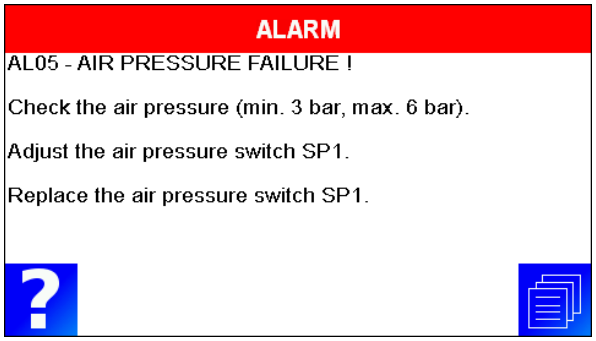
Solutions
Check the oil level 80 litres of oil ISO 100 are recommended
Switch the PLC to RUN mode.
Adjust or replace the pressure switch SP2.
Press the STOP button on the remote control to reset the alarm.



AL05: Air pressure failure!

Description
The PLC does not detect input (X11 – SP1) after a period of 5 seconds. The problem is generated anytime air pressure is not sufficient, below 3 bar or 45 psi,(300kPa) to make the air pressure switch.

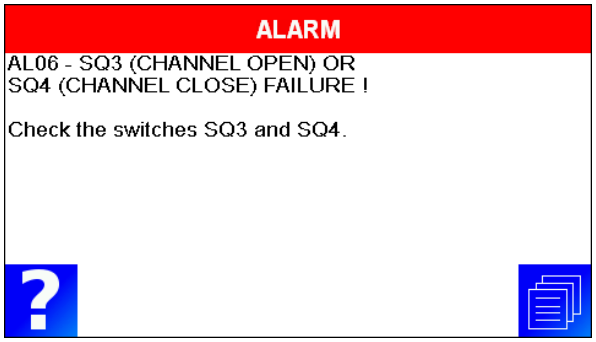
Solutions
Raise the air pressure to min. 3 bar et max. 6 bar.
Switch the PLC to RUN mode.
Adjust or replace the pressure switch SP1.
Press the STOP button on the remote control to reset the alarm.



AL06: SQ3 (channel open) or SQ4 (channel close) failure!

Description
SQ3 or SQ4 failure

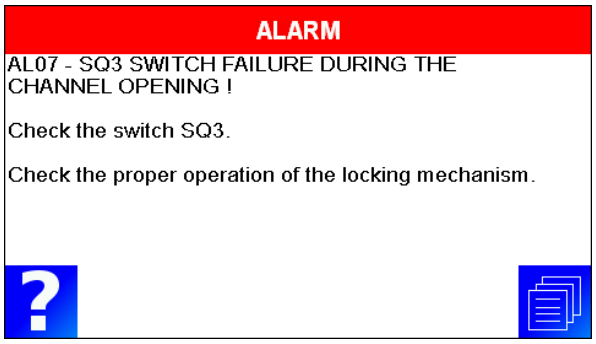
Solutions
Check the switches SQ3 and SQ4



AL07: SQ3 switch failure during the channel opening!

Description
This alarm is generated whenever the PLC does not receive the signal (X14 – SQ3). The problem occurs if the switch SQ3 is defective or misadjusted or if the opening mechanism has a malfunction.

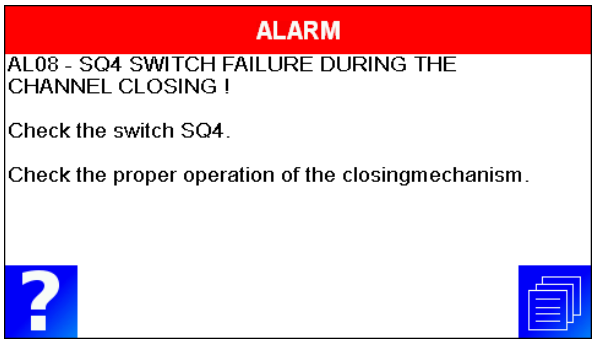
Solutions
Check the switch SQ3.
Check the locking mechanism.
Press the STOP button on the remote control to reset the alarm.



AL08: SQ4 switch failure during the channel closing!

Description
This alarm is generated whenever the PLC does not receive the signal (X15 – SQ4). The problem occurs if the switch SQ4 is defective or misadjusted or if the closing mechanism has a malfunction.

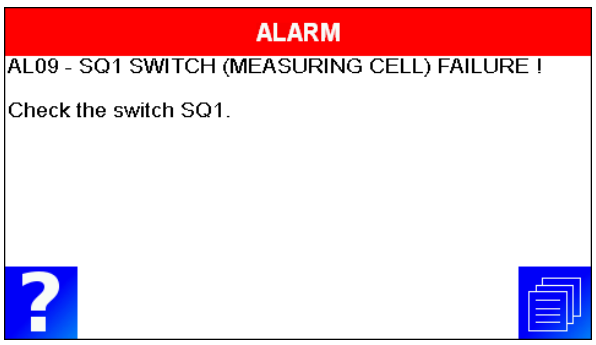
Solutions
Check the switch SQ4.
Check the closing mechanism.
Press the STOP button on the remote control to reset the alarm.



AL09: SQ1 switch (measuring cell) failure!

Description
SQ1 switch failure

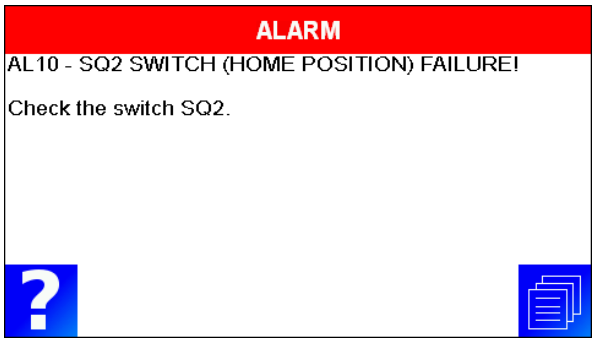
Solutions
Check the switch SQ1



AL10: SQ2 switch (home position) failure!

Description
SQ2 switch failure

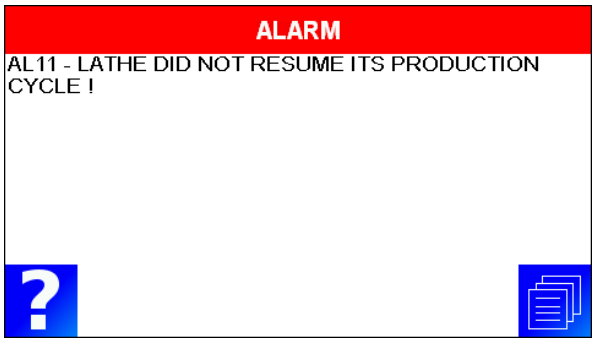
Solutions
Check the switch SQ2



AL11: Lathe did not resume its production cycle!

Description
Le PLC has not received the signal clamp closing A1 or the relay R2 is defective.

Solutions
Check the relay R2
Check the wiring of the interface.
Check the programming of the lathe.



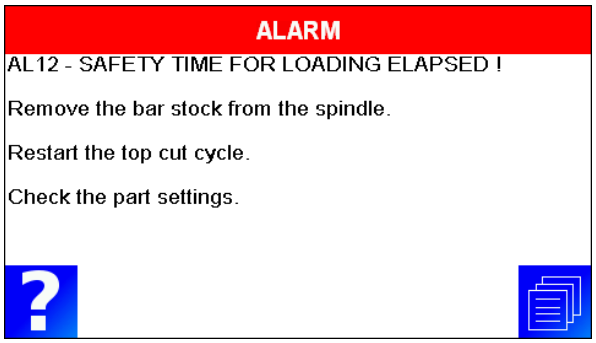
AL12: Safety time for loading elapsed!

Description
This alarm is used for the bar stock move in top-cut position.
The profiled bar stock moves until the back of the clamping device. Then, the spindle runs slowly while the bar feeder moves the bar stock to the clamping device until the material fit to the clamping device and reach the top-cut position.

After 20 try-outs, this alarm is generated.

Solutions
Press the STOP button on the remote control to reset the alarm.
Remove the bar out of the spindle.
Start the top-cut cycle again.

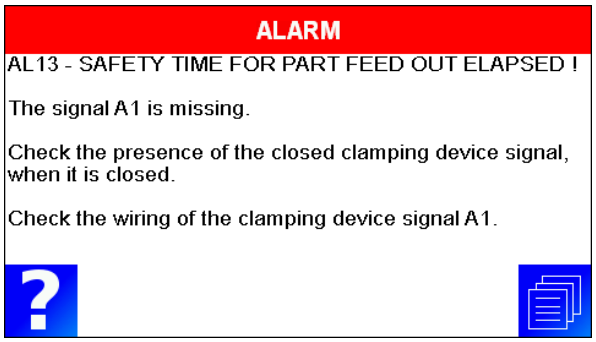
If the problem persists, please contact LNS SA.



AL13: Safety time for part feed out elapsed!

Description
This alarm is generated when the bar feeder has not received any clamping device closing signal within the determined timeframe (approx. 30s.).

Solutions
Check the presence of the closing signal.
Check the closing of the clamping device.
Check the wiring of the signal A1.



AL14: Part feed out too long!

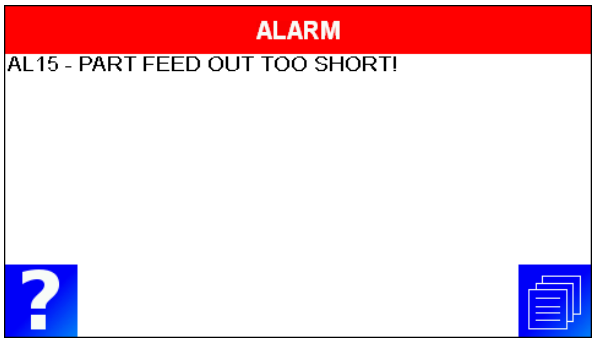
Description
The part feed out is too long.

Solutions
Check the part length value in parameter P02.

AL15: Part feed out too short!

Description
The part feed out is too short.

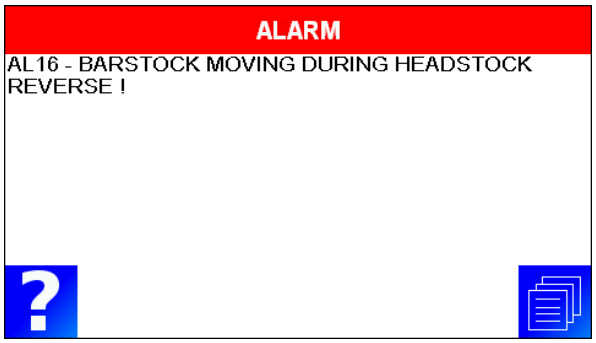
Solution
Check if a delay is set on the lathe clamping device.



AL16: Bar stock moving during headstock reverse!

Description
This alarm is generated when the headstock is reversing and the bar feeder is maintaining the bar stock against the turret, stop or tool. This problem occurs if the bar stock moves forward while this operation. This means that the turret, stop or tool is defective, broken or at the wrong place.

Solution
Check the status and position of the turret, stop or tool.



AL17: Headstock travel shorter than expected!

Description
The overall part length parameter value is too short or the pusher did not travel the distance that was programmed in for the overall part length.

Solutions
Check that the Input Overall Part Length parameter is equal to the travel of the headstock and not the finished part length.
Check the collet on the pusher. May be broken or worn or the incorrect size.
Check to see if the pusher got jammed in the channel. Make sure the front guiding channels are seated correctly in the channel (maybe chips fell underneath the guiding channels).

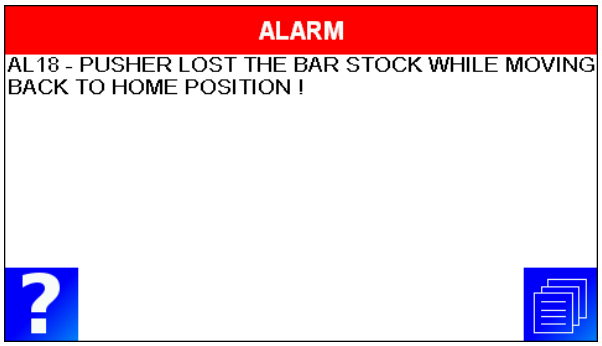
If the problem persists please contact LNS SA for further information.

AL18: The pusher lost the bar stock while moving back to home position!

Description
This alarm occurs whenever the PLC does not receive the signal (X17 – SQ6). The problem occurs if:

- the collet is too big,
- excessive burr on the bar stock prevents the remnant insertion in the collet,
- any mechanical default prevents the remnant movement, the switches are defective or misadjusted.

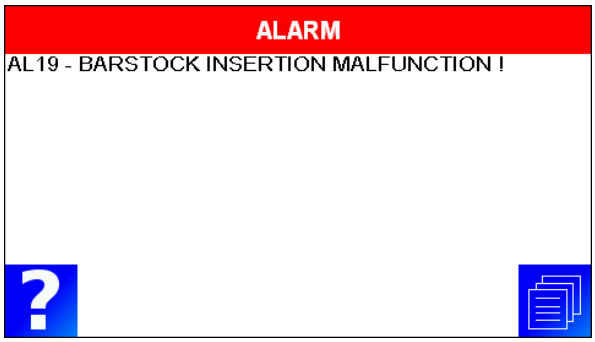
Solutions
Check the pusher size.
Check the pusher chuck condition.
Check the bar stock (burr).
Check the switch SQ6.
Check any mechanical stop.



AL19: Bar stock insertion malfunction!

Description
The "bar stock insertion malfunction" alarm is generated whenever the collet or material diameters are not adapted.

Solutions
Check the collet diameter.
Check the bar stock loading diameter.

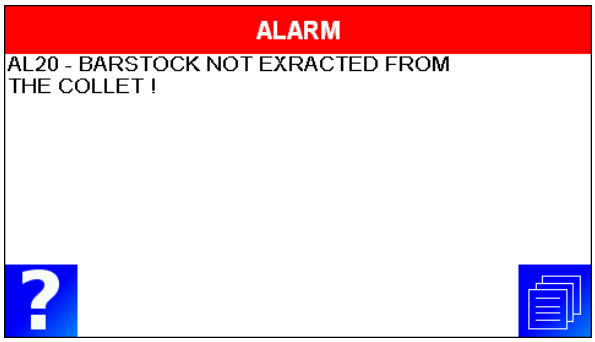


AL20: Bar stock not extracted from the collet!

Description
The "Bar stock not extracted from the collet" alarm is generated if the signal (X25 – SQ16) is not detected after the bar has been extracted from the collet of the bar feed. Before the guiding channel opens to load a new bar, the remnant check device confirms that the remnant has been extracted from the collet of the bar feed.

Solutions
Check that the extraction device jaws are not broken.
Check the adjustment of SQ16, the switch should only activate when no bar is present in the collet of the bar feed.

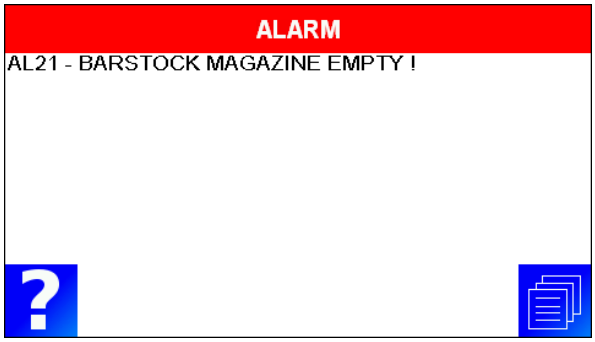
Contact LNS SA for further information.



AL21: Bar stock magazine empty!

Description
This alarm is generated when no material is detected in the guidance zone.

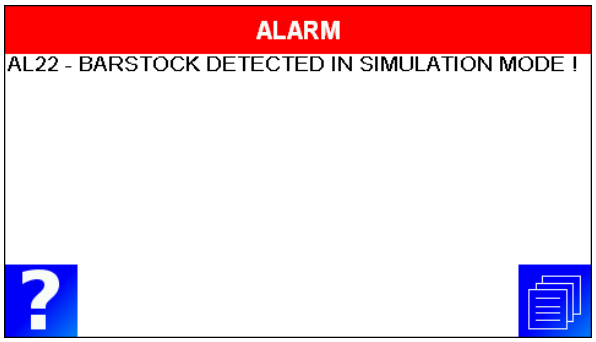
Solution
Check the material presence.



AL22: Bar stock detected in simulation mode!

Description
Whenever the bar feeder is in simulation mode, it's not allowed to have a material. If a bar is detected by the switches, they alarm is generated.

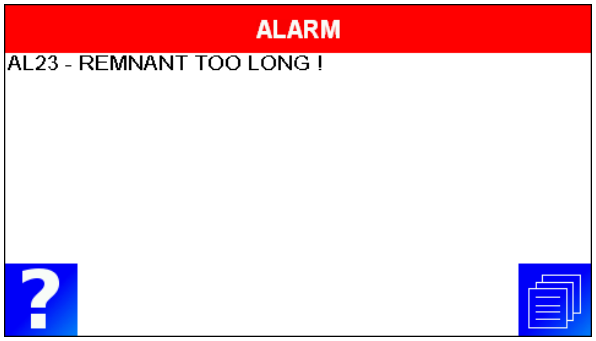
Solution
Remove present material in the bar feeder.



AL23: Remnant too long!

Description
This alarm is generated whenever the remnant is too long to be ejected.

Solution
Check the bar feed parameters and adjust the remnant length.



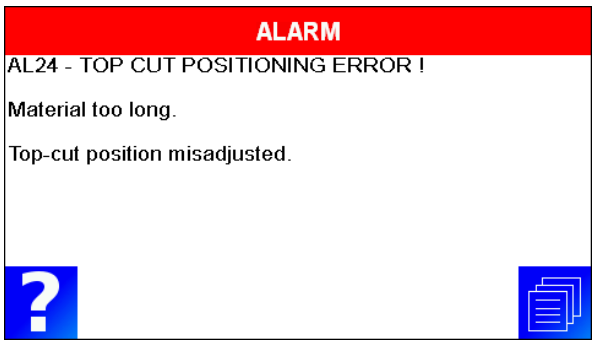
AL24: Top cut positioning error!

Description
Top-cut positioning error

Solution
Check if the material is too long
Check the Top-cut position

Description
In some cases, this alarm may trigger if strong EMI is received by the detector SQ1 ;

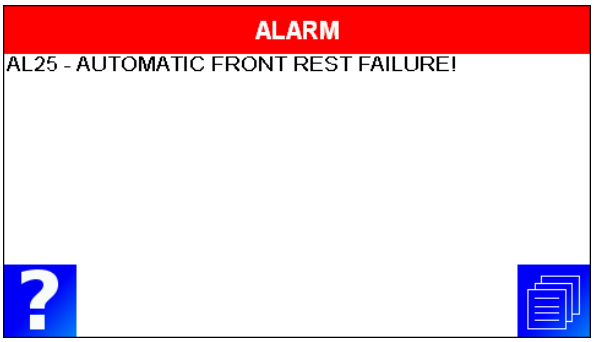
Solution
The bar detection only occurs at first signal occurrence.



AL25: Automatic front rest failure!

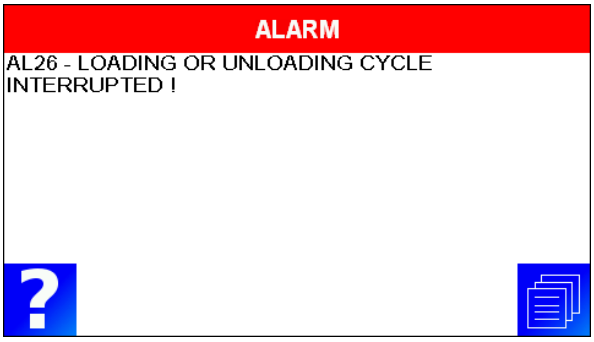
Description
Automatic front rest failure

Solutions
Check SQ13



AL26: Loading or unloading cycle interrupted!

Description
Loading or unloading cycle interrupted



AL27:

Left empty

AL28:

Left empty

AL29:

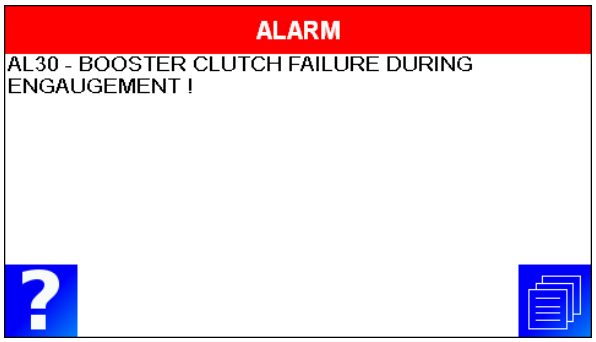
Left empty

AL30: Booster clutch failure during engagement!

Description
Default during coupling. SQ15 signal is missing.

Solutions
Check that there's no mechanical problem and check the SQ15 probe.

SQ14 (X23) OFF
SQ15 (X24) ON

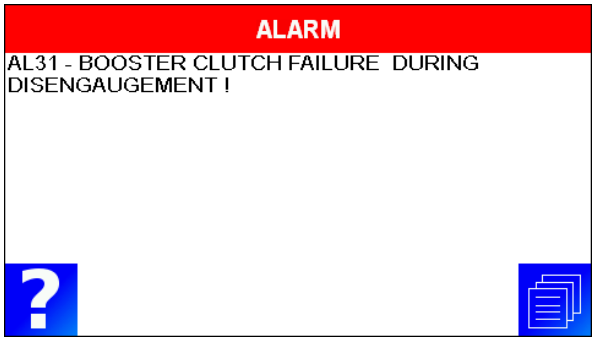


AL31: Booster clutch failure during disengagement!

Description
Default during decoupling. SQ14 signal is missing.

Solutions
Check that there's no mechanical problem and check the SQ14 probe.

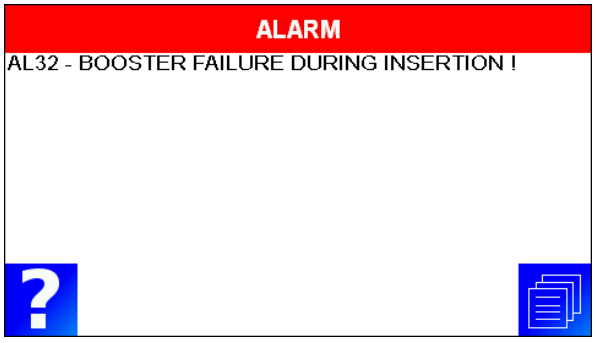
SQ14 (X23) ON
SQ15 (X24) OFF



AL32: Booster failure during insertion!

Description
This alarm is generated whenever the collet or material diameters are not adapted.

Solutions
Check the collet diameter.
Check the bar stock loading diameter.



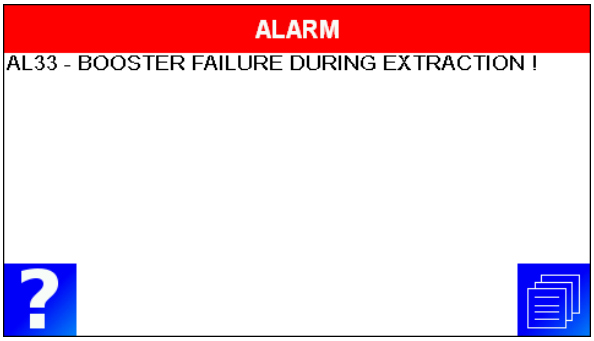
AL33: Booster failure during extraction!

Description
This alarm is generated if the signal (X25 – SQ16) is not detected after the bar has been extracted from the collet of the bar feed. Before the guiding channel opens to load a new bar, the remnant check device confirms that the remnant has been extracted from the collet of the bar feed.

Solutions

Check the function of bar stock clamping and clamping jaws.
Check function and adjustment of SQ16.

Contact LNS SA. for further information.



AL34:

Left empty

AL35:

Left empty

AL36:

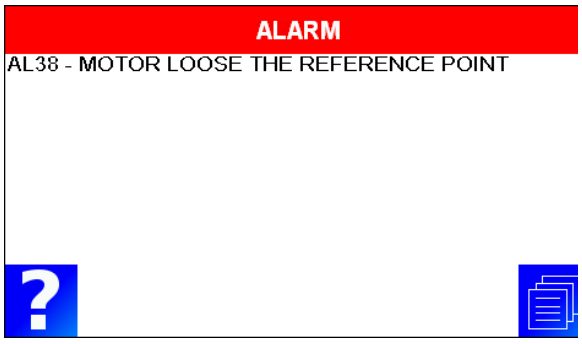
Left empty

AL37:

Left empty

AL38: Motor loses the reference point!

Description
This alarm is generated whenever the motor loose the reference point.

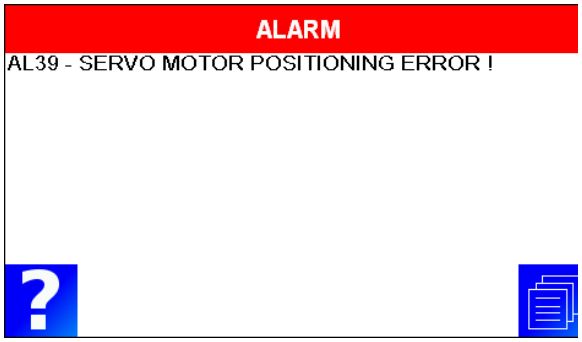


AL39: Servo motor positioning error!

Description
The Servo motor positioning following error alarm occurs whenever the motor encounters some unexpected resistance

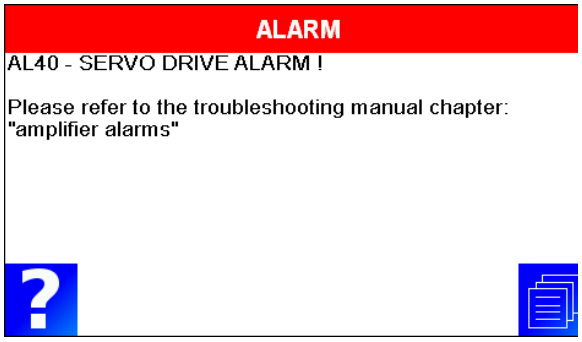
Solutions
Press the STOP button on the remote control to reset the alarm.
Verify any mechanical obstacle preventing the bar stock to feed out.
Verify the bar stock diameter. It must correspond to the entered value in the parameters.
Verify the alignment between the lathe and the bar feeder. This may slightly vary if one or both machines have not been anchored to the ground.

If the problem persists, please contact LNS SA.



AL40: Servo driver alarm!

Description
The "servo driver alarm" is generated whenever the servo driver fall in error.
Solutions
See servo drivers alarm list.



2. FACTORS AFFECTING PERFORMANCE

2.1. Installation

The installation is a very important phase that, if neglected, could seriously impede the operation of the bar feeder.

Distance

The distance between the bar feeder and the lathe influences greatly the quality of the guiding. The further the bar feeder is from the spindle - and therefore, away from the clamping system - the larger the non-guided part of the bar will be.
It is essential that the mounting of the bar feeder is done in accordance with the instructions indicated in Chapter 3: Setting into operation.

Alignment

The guiding 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 guiding channel, the alignment of the channel with the axis of the spindle must be perfect.
It is essential that the alignment of the bar feeder is done in accordance with the instructions indicated in Chapter 3: Setting into operation.

Spindle length

In some cases, the length of the spindle may influence the quality of the guidance.

2.2. Gap between the guiding elements 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 bar and the tube, the greater the rotation speeds will be.
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 rotation speeds permitted.

2.3. Gap between the spindle and the bar

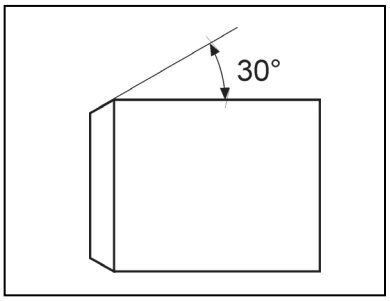
While the rear of the bar is maintained by front rest of the bar feeder and the front by the collet or the chuck of the lathe, it is possible for the portion of the bar inside the spindle to oscillate, if the clearance is too great.

It is, therefore, highly recommended to install reduction liner inside the spindle as indicated in the start-up manual.

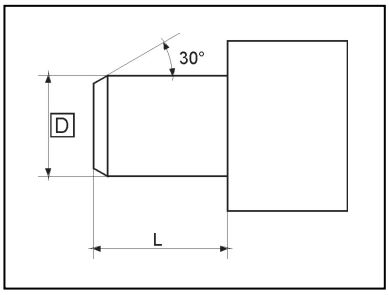
2.4. Material

(18) Bars

To obtain a perfect insertion inside the collet of the bar feeder, the bars must be chamfered concentrically (at the rear) at 30°. At the feeding process, it is recommended to deburr the bar at the front, to avoid possible catching during the introduction of the bar inside the spindle.

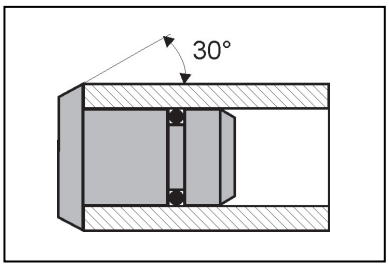


When the diameter of the bar is close to the external diameter of the collet (see assembly of pushers), the rear of the bars must be machined to the inside diameter (D) of the collet. The length of the machining (L) must be at least 30mm.



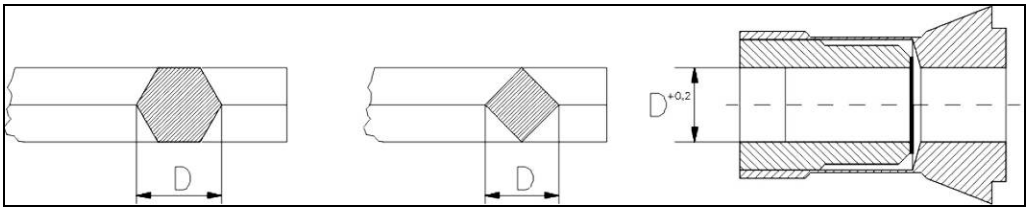
(19) Tubes

To prevent mixing the oil from the feeding process and the cutting oil from the lathe, it is recommended to put a plug in the rear of the tubes to be machined.



(20) Profiled material

It is recommended to install a bushing, inside the clamping device, with the same inside profile (+ 0.2 mm) as the bar.
The rear of this collet and the front of the bars should be flat. During the loading cycle, a slight rotation of the spindle (about 30 RPM) is desirable.



(21) Bars straightness

Performances may vary, depending on the material machined, the length of the bar, etc.
To obtain optimum output, the bars must be straight. If the torsion of the bars exceeds 0.5 mm/m, performance will automatically be reduced in regards to speeds of rotation while vibrations will increase accordingly.
In this instance, the quality of the guidance is not the cause.

(22) Material composition

In general, the difficulty increases with the specific weight of the bar. Steel bars are relatively easy to guide. Because of their great flexibility and specific weight, brass bars are relatively difficult to guide at high speeds. Aluminum bars of aluminum are very easy to guide.

3. MAINTENANCE

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

3.1. Hydraulics

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

3.2. 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 advisable to make certain that the air received by the bar feeder is as dry as possible (see Chapter 5 / Pneumatics).

3.3. 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.

3.4. Mechanics

Rotating sleeves

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.

Chain

It is possible that after a certain amount of use, the drive needs to be tightened.
To tighten the drive, refer to Chapter 7 / Point 6.3.

3.5. 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.

For cleaning on the outside, use a soft cloth and a regular detergent; for the inside, use a cloth or a brush. However, make sure that the rollers and parts made of synthetic materials do not come into contact with these products.

Use of compressed air for cleaning is not advisable, because particles could become lodged in sensitive areas and impede the proper operation of the bar feeder.

At no time should solvents, such as acetone, or diluents 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… END OF BAR CHECK (PROGRAM JUMP) >

> TURRET TO FEED IN POSITION

N... COLLET OPEN

N... TURRET TO FEED OUT POSITION

N... END OF BAR CHECK (PROGRAM JUMP) >

N... CLOSE COLLET

N... CLEAR TURRET

N...

PART PROGRAM

N... X, Z, G, F, T, S, M, ...

N... MACHINE PART

N... PARTS CATCHER IN (IF AVAILABLE)

N... CUT OFF

N... PARTS CATCHER OFF (IF AVAILABLE)

N...

N...

N... X, Z, G, F, T, S, M, ...

N...

N... END OF PROGRAM (LOOP)

> SUB-PROGRAM

N... TURRET HOME

... “M”CODE (DWELL/LOAD)

N... CLOSE COLLET

N... START SPINDLE

N... COLLANT ON

N... TOP CUT MATERIAL

N...

N...

N... END OF SUB-PROGRAM

< (RETURN TO MAIN PROGRAM)

Important: The above is an example only. Programming may change according to the application.

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.	Ordering no.	Description

Expected delivery:

Location and date:

Signature and stamp of the company:

3. LNS WEB ADDRESSES

Please find an always up-to-date list of your representatives for your region under:

LNS Europe : www.lns-europe.com
LNS America : www.lns-america.com
LNS Asia : www.lns-asia.com