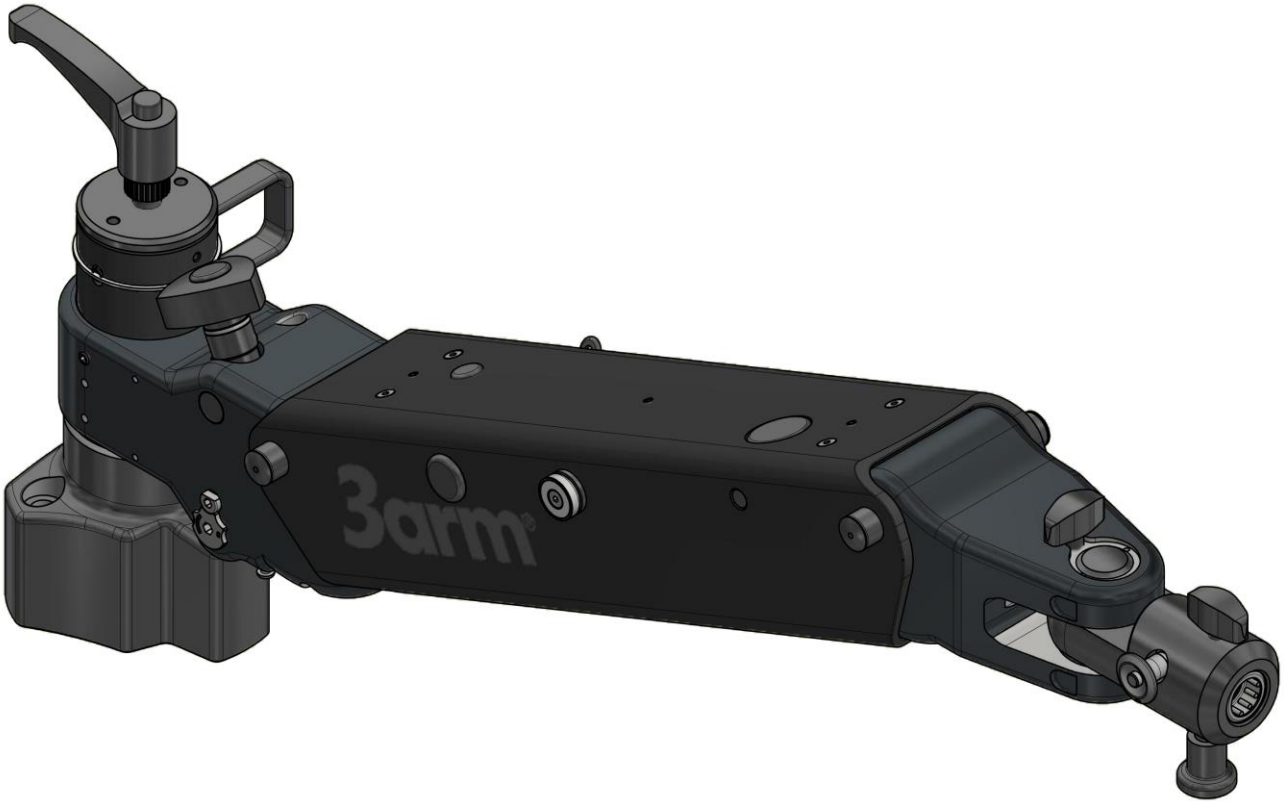
INSTRUCTION MANUAL

3arm®

SERIES 0



TECNOSPIRO MACHINE TOOL, S.L.U.
P.I Pla dels Vinyats I, s/n nau 1
08250 - Sant Joan de Vilatorrada. Barcelona - España
Telf. +34 938 76 43 59
E-mail: 3arm@3arm.net

ISO 9001
BUREAU VERITAS
Certification

TECNOSPIRO
MACHINE TOOL SLU

DESIGN & QUALITY
3arm
Made in Barcelona

www.3arm.net

TABLE OF CONTENTS

1 INTRODUCTION

Dear Customer,

We would like to congratulate you on your choice and we are pleased to continue our constant work to provide our customers with a simple, reliable and versatile way to improve ergonomics in the workplace.

We hope these simple instructions will help you commission and operate the arm you have selected. We suggest you pay special attention to the pages on the concepts of installation, maintenance and safety.

We hope your arm will have a long life and that you can reaffirm the very good investment you have made in acquiring a 3arm©.

2 ABOUT THIS MANUAL

This document corresponds to the Series 0 instruction manual.

- ORIGINAL MANUAL –

Intellectual/Industrial Property Information:

Tecnospiro Machine Tool, S.L.U. (the Company) informs that all content in this document including, for example, the text, images, graphic designs, brands, trading and company names (hereinafter, the Intellectual/Industrial Property), belong to the Company and that the Company is the exclusive owner of their use. Copying, reproduction, distribution, public communication and total or partial use of the Intellectual/Industrial Property, in any form or manner, even quoting the sources, is prohibited, unless expressly agreed in writing by the Company. The use of any content that due to its characteristics is similar to the Industrial/Intellectual Property is also considered an infringement of the Company's Industrial/Intellectual Property rights.

2.1 CONSIDERATIONS

- ✓ Before using the equipment, be sure to read this instruction manual and follow the instructions for use and safety correctly.
- ✓ All the instructions listed in this manual refer to the individual equipment. It is the end user's responsibility to analyse and apply all the necessary safety measures required for the end use.
- ✓ This manual must be kept for the entire life of the equipment, in a place close to it for future consultations.
- ✓ If any part of this manual is unclear, confusing or inaccurate, please do not hesitate to contact us.
- ✓ The content of this manual may be subject to change without prior notice.
- ✓ If this manual deteriorates, please contact TECNOSPIRO MACHINE TOOL, S.L.U. to replace it.
- ✓ Reproducing or sharing this documentation – or part of it – to third parties is only permitted with express written authorisation from TECNOSPIRO MACHINE TOOL, S.L.U.
- ✓ The illustrations shown in this manual may differ in some details with respect to their specific configuration and must be understood as a standard representation.

Paragraphs indicating assembly, adjustment, installation or maintenance steps are framed with a brown background.

Paragraphs with highlighted information are framed with a grey background.

2.2 DOCUMENT VERSION

Document	Date - version
Instruction manual Series 0	30/10/2023

3 SAFETY INFORMATION

3.1 SCOPE OF APPLICATION

This chapter contains very important information related to the safety of your arm; it is aimed at all staff involved in any of the stages of the life of this equipment (transport, assembly, installation, commissioning, adjustment, learning, operation, cleaning, maintenance, troubleshooting, dismantling/removal from service.

3.2 ALERTS AND GENERAL CONSIDERATIONS

- ✓ The equipment described in this document has been built in accordance with the current technological level and pursuant to the applicable technical standards in terms of safety. However, improper use, or incorrect integration by the end user can generate risk of injury.

- ✓ The equipment must only be used in perfect technical condition, respecting the safety regulations and the instructions provided in this document.

- ✓ Any breakdown that may affect safety must be corrected immediately.

- ✓ The equipment must not be modified without due authorisation from TECNOSPIRO MACHINE TOOL, S.L.U.

- ✓ The equipment must only be operated for its intended use. Any other use is strictly prohibited. Any use other than the use indicated is considered misuse and is prohibited. The manufacturer assumes no responsibility for any damage that may arise from it. This is solely at the user's own risk.

- ✓ It is the responsibility of the integrator, owner and/or end user to determine the suitability of the product for each use, as well as its place of installation and the specific definition of the task to be carried out with this product within the limits stated in this manual.

- ✓ Do not use the equipment in any way that is not considered in this manual and pay special attention to the uses mentioned in section 3.3 EXCLUSIONS, which must not be carried out.

- ✓ The operator must only use the equipment after having received the instructions for its use.

- ✓ The integrator/end user must ensure that the gripping device is suitable for the end application.

- ✓ Do not exceed the maximum working loads indicated in this manual as well as in the identification on the structure of the equipment.

- ✓ It is recommended that only one operator use the equipment at a time, any other use must be evaluated by the integrator/end user.

- ✓ When it is not in use, it must be left in the retracted or parking position. Ensure the air supply to the equipment has been cut off at the end of the working day.

- ✓ The operator may only use the equipment for safe movements, accompanying the movement of the equipment at all times, and thus reducing the risk of uncontrolled or involuntary movements.

- ✓ Although the parts with a higher risk of possible shearing or mechanical gripping are protected and have guards, it is forbidden to manipulate the moving components and joints when it is in use.

- ✓ The operator must stay out of the swivel arm's vertical travel.

- ✓ The work area of the equipment and its surrounding area must respect conditions of safety, health and hygiene at work. It is the integrator/end user's responsibility to conduct a study to guarantee safety.

- ✓ The presence of third parties in the work area of the equipment should be restricted as much as possible, thus avoiding any impact on safety. For any other use, an additional study of the hazards derived from this way of working must be carried out.

- ✓ Only authorised personnel may be present in this area while the equipment is in use.

- ✓ It is important that the users who operate this equipment are familiar with and sufficiently trained to use this product or similar products.

- ✓ It is recommended that the operator have basic knowledge of: Safety procedures, precautions and safe working habits.

- ✓ In any case, the operator must read and understand this manual before use regardless of their knowledge, training or experience with similar equipment, especially the sections dedicated to installation, operation and safety.

- ✓ The appropriate distances that allow people to circulate safely must be added around the perimeter of the equipment. Work areas must remain free from obstacles, columns, etc. that may hinder the operators' work.

- ✓ Before any type of adjustment or maintenance task, the staff and/or operators responsible for these tasks must bear in mind that the 3arm© arm is configured to work with a certain range of loads.

- ✓ Suitable spaces must be available to carry out maintenance, adjustment, cleaning, etc. tasks.

- ✓ If you have questions about handling or maintenance procedures, please contact the authorised technical service.

- ✓ Protective equipment must be used pursuant to the manufacturer's instructions for the tool attached to the arm.

- ✓ If for any manipulation, adjustment or maintenance task, or for any other reason, the load is released from the arm (for example, when changing the tool), the arm may suddenly ascend sharply and could cause harm. Carefully read the section *Safety considerations in maintenance and adjustment tasks to avoid them*.

- ✓ Lifting devices are subject to different regulations in each country. These regulations may not be specified in this manual.

3.3 EXCLUSIONS

The following is beyond the scope of use of this arm:

- ✓ Operation in severe conditions (e.g. extreme environmental conditions such as freezing, high temperatures, corrosive environment, strong magnetic fields).
- ✓ Loads greater than the maximum working load limits (WLL).
- ✓ Use in areas with risk of explosion.
- ✓ Installation in outdoor areas.
- ✓ Handling of any component or functions of the equipment outside of those specified in this manual.
- ✓ Use by people with some type of disability or by animals.

3.4 SYSTEM INTEGRATOR

The system's integrator or end user is responsible for integrating the machine in the installation, respecting all the relevant safety measures.

The integrator/end user is responsible for the following tasks:

- ✓ Siting the equipment.
- ✓ Connecting the equipment.
- ✓ Risk assessment.
- ✓ Facilities with the necessary safety and protection functions.
- ✓ Issue of the EC statement of compliance.
- ✓ Placement of the CE marking.
- ✓ Preparing the machine's service instructions.

3.5 SYMBOLOGY AND ICONS

Throughout this manual and in the structure of the machine, different symbols and pictograms can be observed, the meaning of which is summarised below.

	General danger symbol. This symbol is usually accompanied by another symbol, or a more detailed description of the danger.
	Trapping hazard

3.6 PERSONAL PROTECTION EQUIPMENT (PPE)

The personal protection equipment for this arm is merely safety footwear for all stages of the life of the equipment.

It is the integrator/end user's responsibility to define the personal protection equipment derived from the final application of the equipment in order to comply with the essential health, safety and hygiene requirements.

Operators must not wear loose clothing, rings or bracelets that may fall within the equipment's mechanism.

It is also mandatory to wear the hair collected to avoid snags with the moving parts of the equipment.

3.7 TRAINING LEVEL OF THE STAFF INVOLVED

All people working with the equipment must have read and understood the safety chapter in the documentation.

The minimum training level required to use the equipment is:

- Production workers: a course on workplace hazard prevention, complete training on the equipment's tasks and residual risks. Minimum of one year's experience in similar facilities.

- Maintenance workers: workplace hazard prevention course, complete training on the handling, operation, maintainability and conservation of the equipment and residual risks. Minimum of two years' experience in similar facilities and with the technical level necessary to perform tasks without problems.

- Cleaning workers: course on workplace hazard prevention, training on products and procedures for carrying out cleaning tasks.

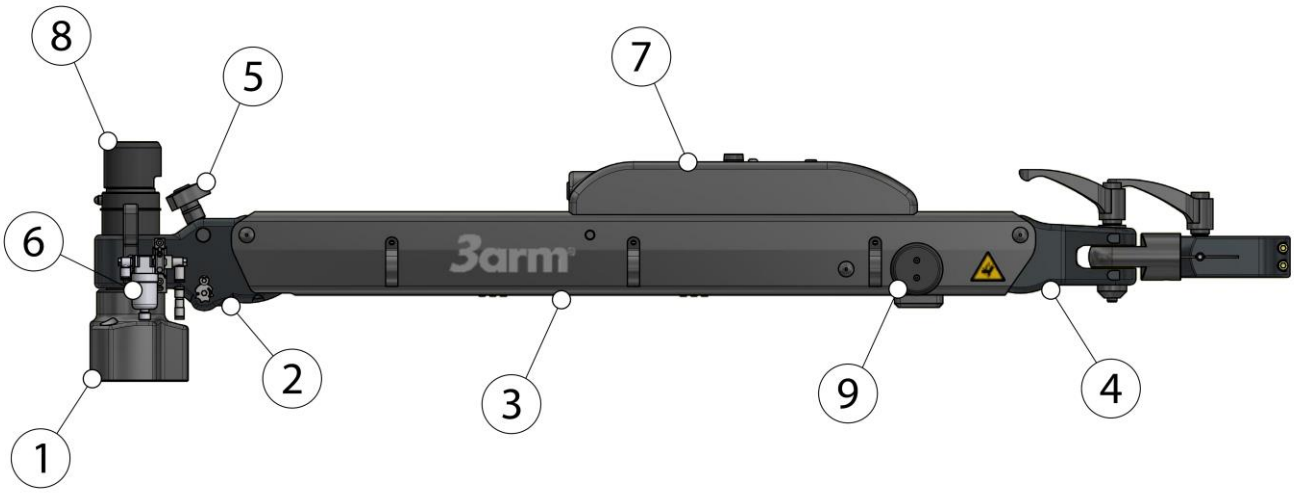
- Apprentices/students: may only work on the equipment supervised at all times by a person responsible for the facility.

- Public (non-workers): visitors or passers-by must maintain a minimum safety distance of two metres from the edges of the perimeter of the equipment.

4 GENERAL DESCRIPTION AND TECHNICAL INFORMATION

The equipment consists of a pendular parallelogram balanced by a gas spring. The assembly of both secures the clamping head and keeps it in a perpendicular position to the work area. In addition, it is possible to incorporate locks (manual or pneumatic) that lock the rotation on the shaft of the base and the tilting motion of the ar.

4.1 MAIN PARTS



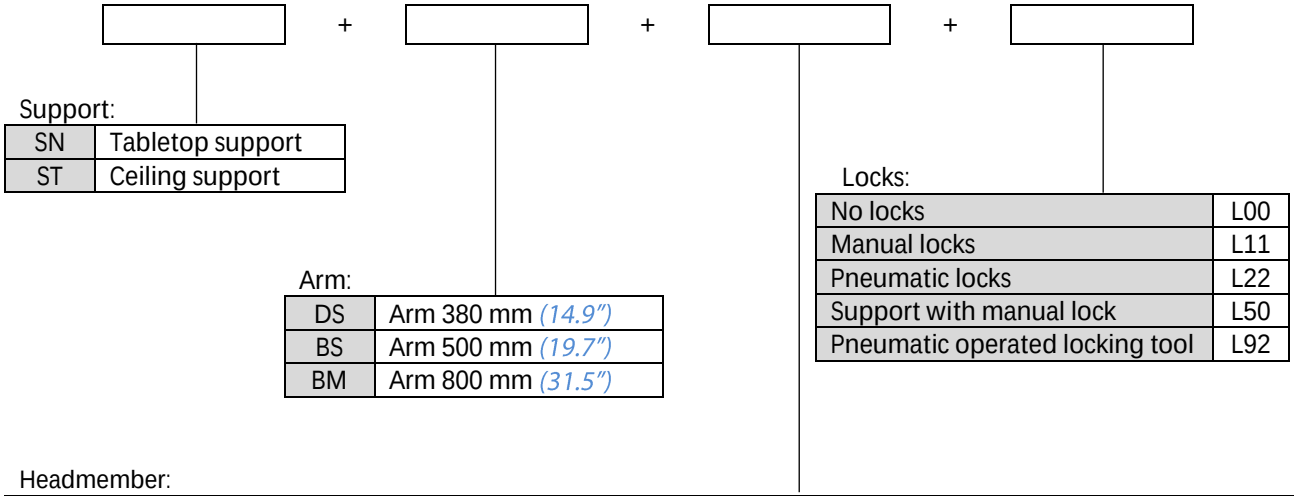
1.- Base
2.- Rear cross
3.- Arm
4.- Head
5.- Adjustment assembly
6.- Air filter and connection
7.- Control cover
8.- Base radial lock
9.- Swing arm lock

INFORMATION

The equipment in the image is a SN + BM + D0 + L22 arm

4.2 CONFIGURATIONS

4.2.1 CONFIGURATION TABLE



Headmember:

A0	Vertical	N0	Multi-position with quick change
B0	Flat vertical	P0	Double articulated flat rotative
BA0	Flat vertical + Bush	PA0	Double articulated flat rotative + Bush
C0	Vertical V-block	Q0	Multi-position reinforced with quick change
D0	Articulated rotative	QA0	Multi-position reinf. security with quick change
E0	Articulated flat rotative	QB0	Multi-position reinforced with manual brake
EA0	Articulated flat rotative + Bush	R0	Manual revolving + Bush
EB0	Articulated flat rotative reinforced	RA0	Manual revolving + Bush
EC0	Articulated flat rotative reinforced + Bush	RAS0	Automatic revolving + Bush
ED0	Articulated flat automatic rotative	RB0	Manual revolving + Bush
EE0	Articulated flat automatic rotative + Bush	RBS0	Automatic revolving + Bush
F0	Articulated rotative V-block	RC0	Manual revolving 4x90º + Bush
GA0	Multi-turn	RS0	Automatic double revolving + Bush
HA0	Multi-turn reinforced	SN0	Giraffe multi-position
I0	Flat electromagnet	SQ0	Giraffe multi-position reinforced
J0	Articulated rotative electromagnet	SQA0	Giraffe multi-position reinforced security
K0	Adjustable strap	SR0	Giraffe revolving + Bush
L0	Adjustable ball joint with vertical adjustment	T0	Multi-position with quick change
LA0	Adjustable auto ball joint with vertical adjustment	U0	Multi-position reinforced with quick change
LB0	Adjustable ball joint horizontal	UA0	Multi-position reinf. security with quick change
LC0	Adjustable automatic ball joint horizontal	W0	Vertical extension
LD0	Adjustable ball joint vertical	WA0	Automatic vertical extension (high torque)
LE0	Adjustable automatic ball joint vertical	WB0	Automatic vertical extension (low torque)
LH0	Reinforced manual ball joint vertical	Z0	Fork
M0	Pressure support	ZA0	Reinforced fork

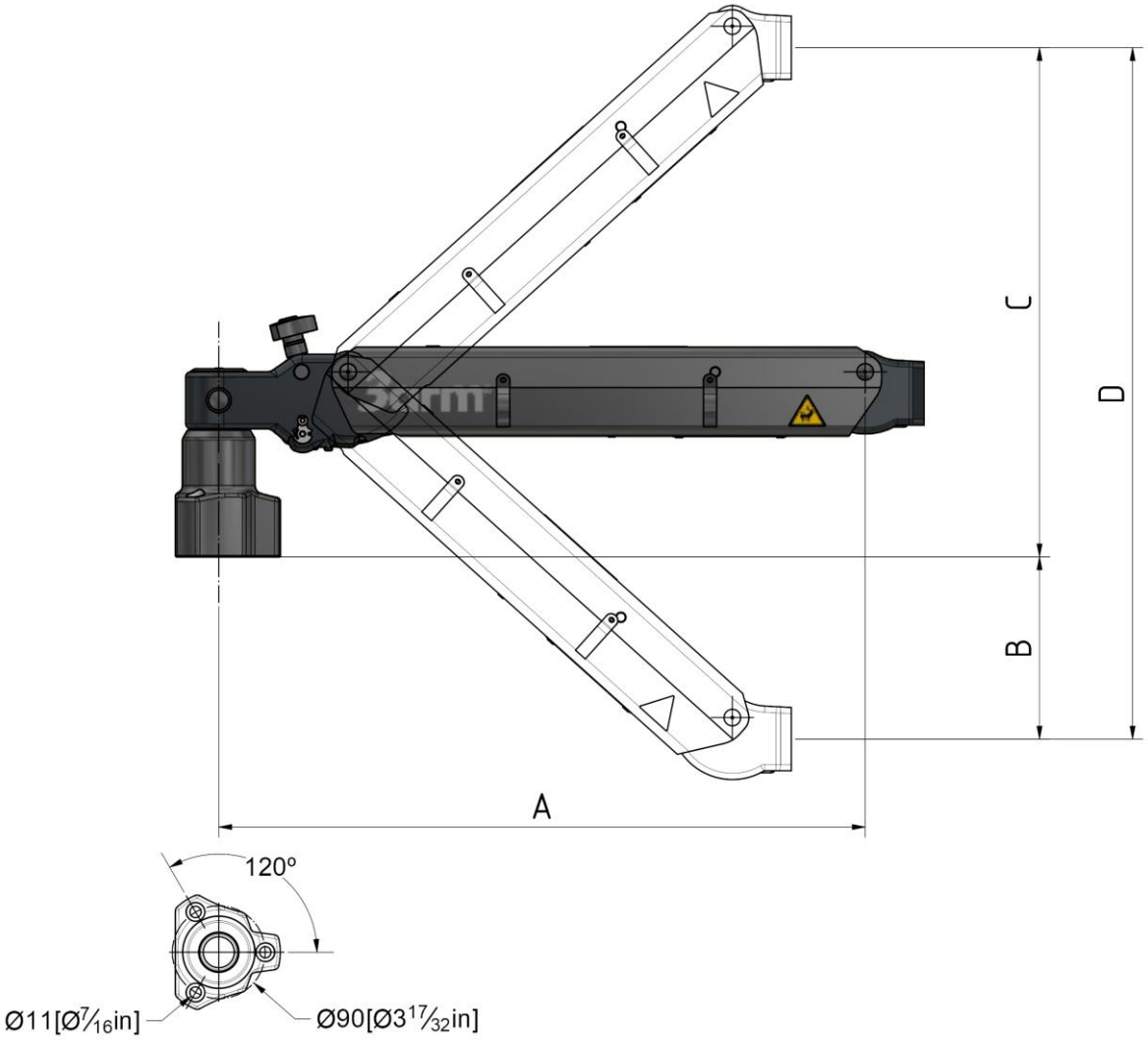
Note: See dimensions of the heads and functional applications in the ***Appendix of S0-S3-S4 heads.***
Note: For dangerous environments consider the HARD version with stainless steel handles. (e.g. SN + BS + BA0 + L22**H**).
Note III: To complement its use with a pneumatic LIFT, switches are included to control it (e.g. SN + BS + BA0 + L22**E**).

4.2.2 ORDER EXAMPLE

Order example: SN + BM + D0 + L22

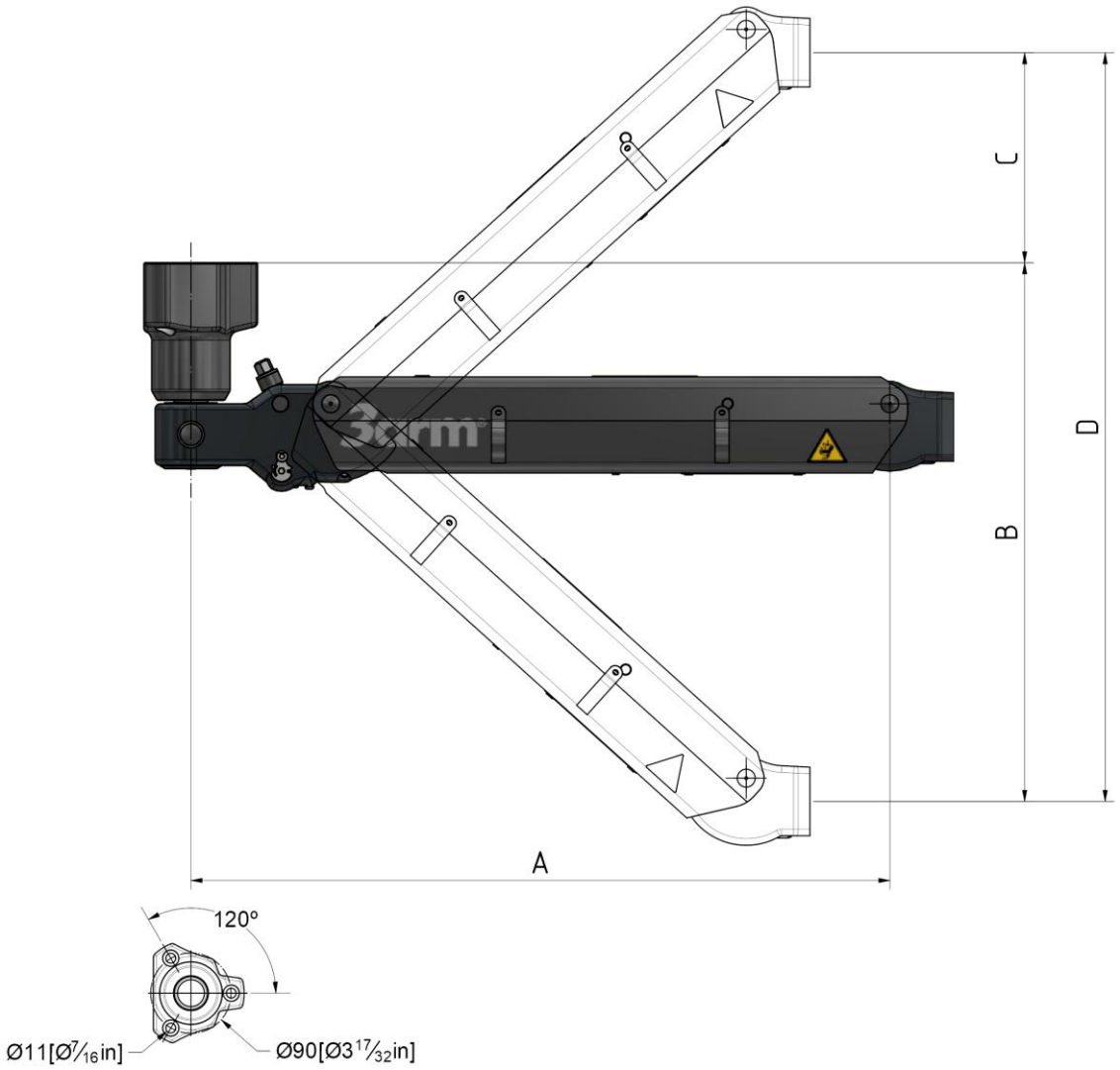
SN + BM + D0 + L22

4.3 DIMENSIONS



3arm© Series 0 tabletop

CONFIGURATION		DIMENSIONS			
Support	Arm	*A (mm/inches)*	*B (mm/inches)*	*C (mm/inches)*	*D (mm/inches)*
SN	DS (380mm)	505 / *19.9″*	96 / *3.8″*	412 / *16.2″*	509 / *20″*
	BS (500mm)	625 / *24.6″*	176 / *6.9″*	493 / *19.4″*	669 / *26.3″*
	BM (800mm)	925 / *36.4″*	377 / *14.8″*	693 / *27.3″*	1071 / *42.2″*

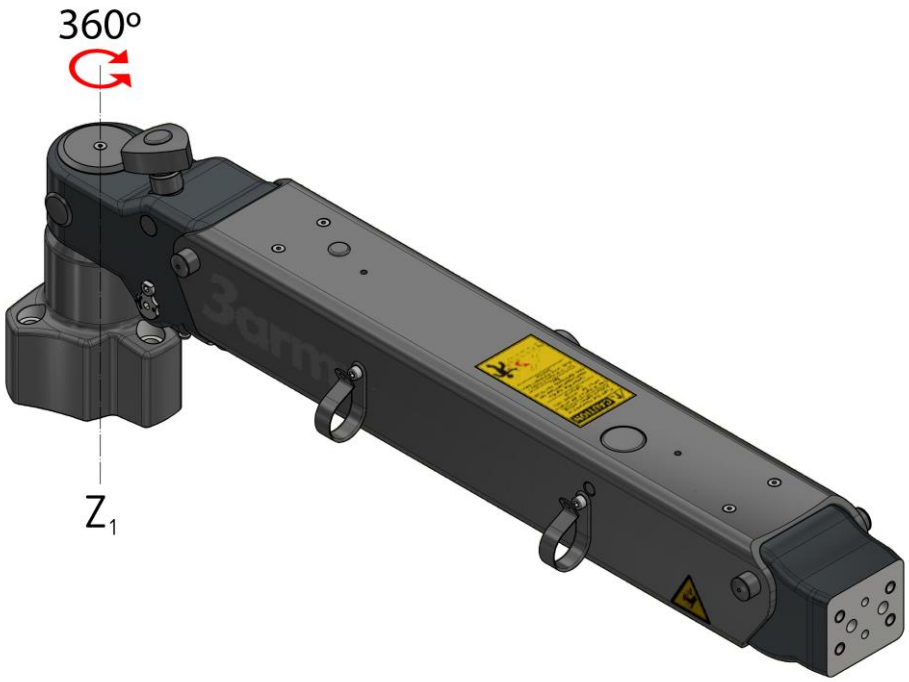


3arm© Series 0 Ceiling

CONFIGURATION		DIMENSIONS			
Support	Arm	*A (mm/inches)*	*B (mm/inches)*	*C (mm/inches)*	*D (mm/inches)*
SN	DS (380mm)	505 / *19.9″*	401 / *15.8″*	107 / *4.2″*	509 / *20″*
	BS (500mm)	625 / *24.6″*	481 / *18.9″*	188 / *7.4″*	669 / *26.3″*
	BM (800mm)	925 / *36.4″*	682 / *26.8″*	388 / *15.3″*	1071 / *42.2″*

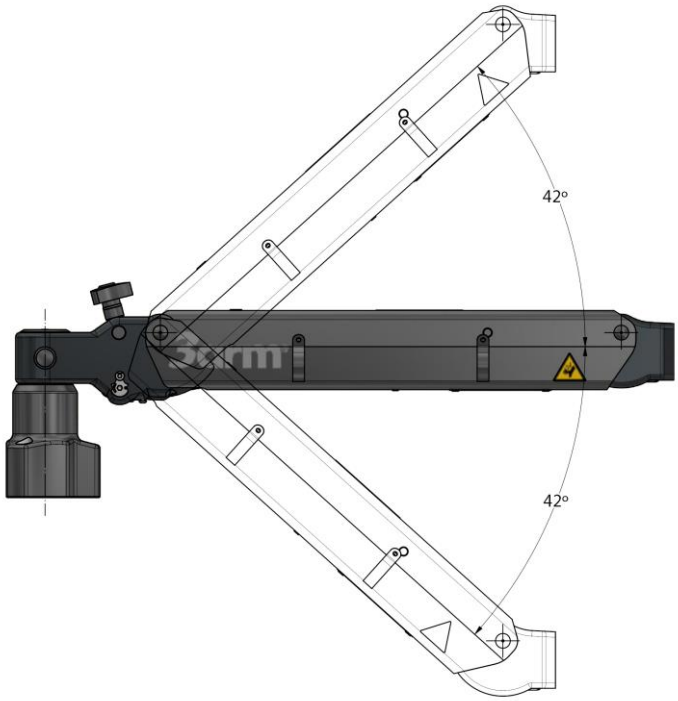
4.4 MOVEMENTS

4.4.1 MOVEMENT OF ROTATION



- Base rotation movement: 360º (Axis Z_1)

4.4.2 ASCENDING AND DESCENDING MOVEMENTS



The tilting movement on the plane ZX goes from -42º to +42º, obtaining a complete vertical stroke of 509mm (DS), 669mm (BS) or 1071mm (BM).

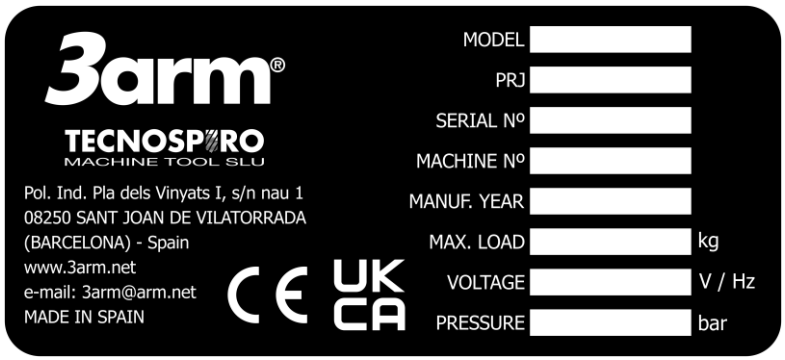
4.5 TECHNICAL SPECIFICATIONS

GENERAL TECHNICAL SPECIFICATIONS		
Load capacity[1]		
(Gross load: Tool + head)	Gross load range (DS)	0-21 kg *(46 lbs)*
	Gross load range (BS)	0-35 kg *(77 lbs)*
	Gross load range (BM)	0-19 kg *(42 lbs)*
Reaction torque[2]		
Maximum torque	Vertical work Max.	650 Nm *(479 ft lb)*
	Horizontal work Max.	250 Nm *(184 ft lb)*
	Work at any angle Max.	200 Nm *(148 ft lb)*
Other		
	Resistance to manipulation	0.5 kg *(1.34 lb)*
Pneumatic specifications[3]		
	Power fluid	Pressurised air
	Operating pressure	0.5 to 0.7 MPa *(5 to 7 bar)*
Operating conditions		
	Temperature	-10ºC to + 50ºC
	Relative humidity	Max. 70%
	Environment	Industrial environments

4.6 IDENTIFICATION

A sticker on the radial arm identifies the arm and indicates the following features.

CE and UKCA marking, manufacturer (name, address and business name), date of manufacture, serial number, model, maximum working load, maximum working pressure (for versions with pneumatic lock L22 and L92) and voltage (for versions with pneumatic lock L92).



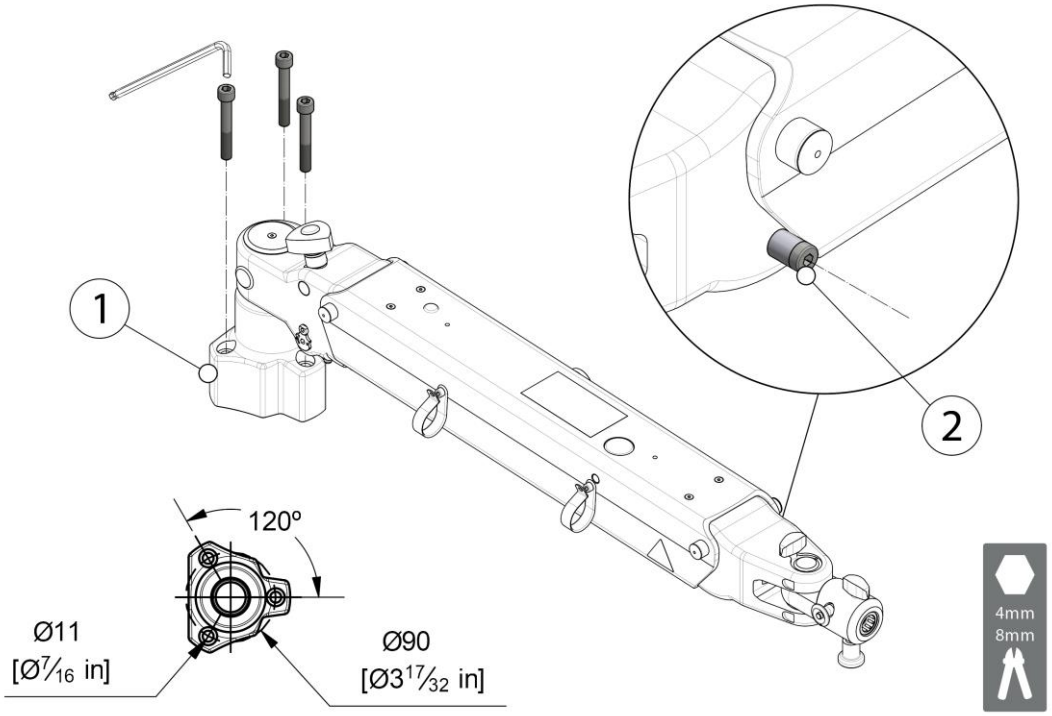
[1]The load shown corresponds to the upper limit for a Series 0 arm. This arm may have a lower maximum load. Consult the maximum load of your arm on the identification plate riveted to the structure of the arm.
[2] The data shown corresponds to the maximum torque that the arm can absorb. These values may be reduced depending on the head used.
[3] For versions with pneumatic locks.

5 INSTALLATION

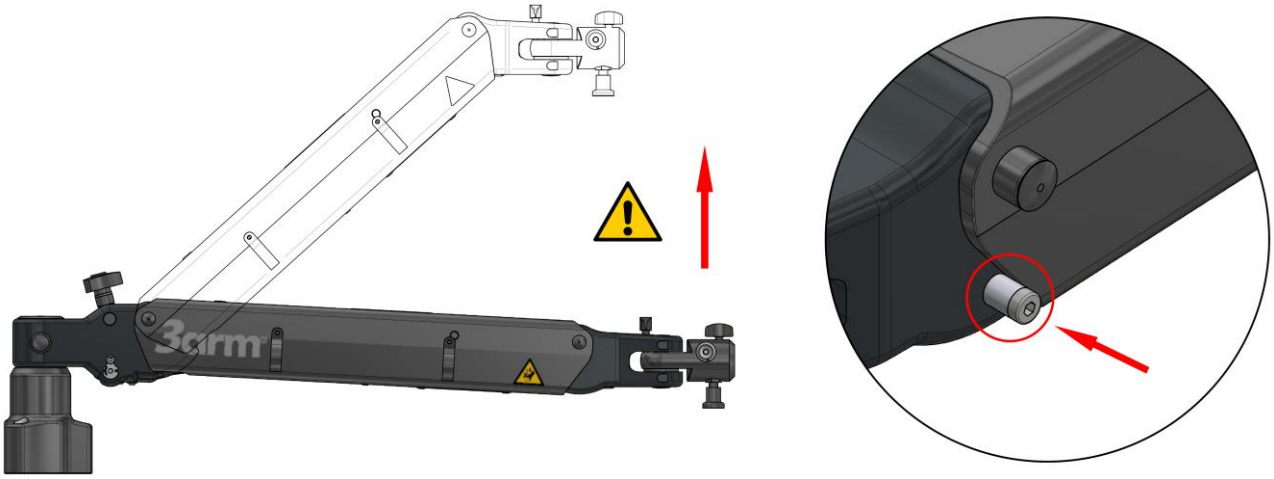
INSTALLATION

- ✓ The work bench or installation location must be a horizontal surface, thus avoiding shifts and deviations.
- ✓ **CAUTION!** Do not remove the security screw before you have finished installing the tool. Otherwise the arm could start a sharp upward movement that could cause harm.

1. **Fasten the base of the arm** (1) **to the work bench with the three M10 screws supplied** (Recommended torque 45 Nm) or with the fastening flange (3arm® accessory).
2. **Fasten the tool to the head**. (Consult details in the ***Appendix of S0 heads***).

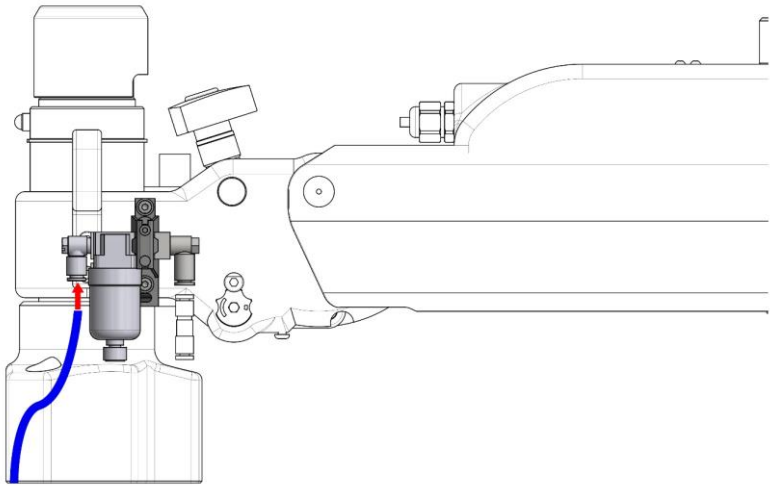


3. **Remove the security screw and the spacer** (2) that stops the tilting arm being in a raised position. Take care as the arm could start a sharp upward movement.



4. Air connection (for versions with pneumatic locks L22 or L92 only).

Requires suitable piping tube for use with compressed air. ($Ø_{exterior}$= 6 mm and working pressure 0.5 - 0.7 MPa/ 5 - 7 bar).



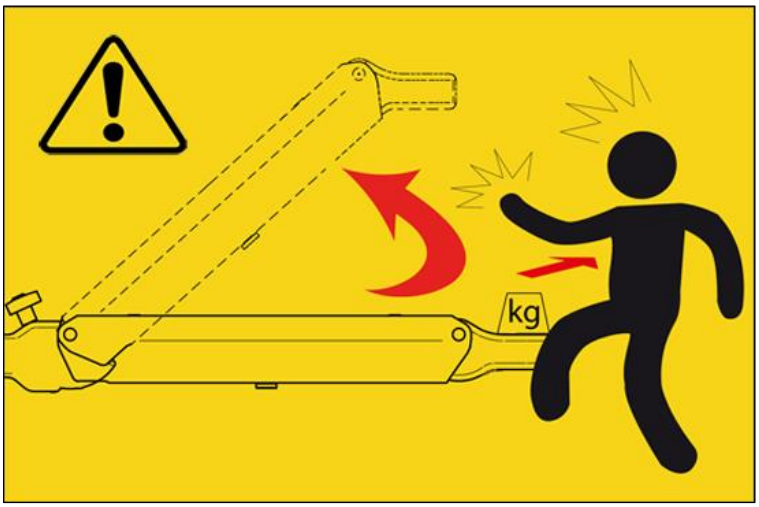
5. Wiring connection (for versions L92 only). To connect your 3arm® arm to the controller of your tool [See ELECTROPNEUMATIC SYSTEM p. 33].

5.1 INSTALLING AND CHANGING TOOLS

Before any type of adjustment or maintenance task, the staff and/or operators responsible for these tasks must bear in mind that the 3arm© arm is configured to work with a certain range of loads.

SUDDEN SHARP UPWARD MOVEMENT

If for any manipulation, adjustment or maintenance task, or for any other reason, the load is released from the arm (for example, when changing the tool), **the arm may suddenly ascend sharply and could cause harm.**



Follow these guidelines to minimise the risks and/or possible damage:

In tool replacement tasks
Take the tilting arm to its highest position and secure it in that position at all times. If necessary, have two operators to carry out this task with total safety.

6 ADJUSTMENTS

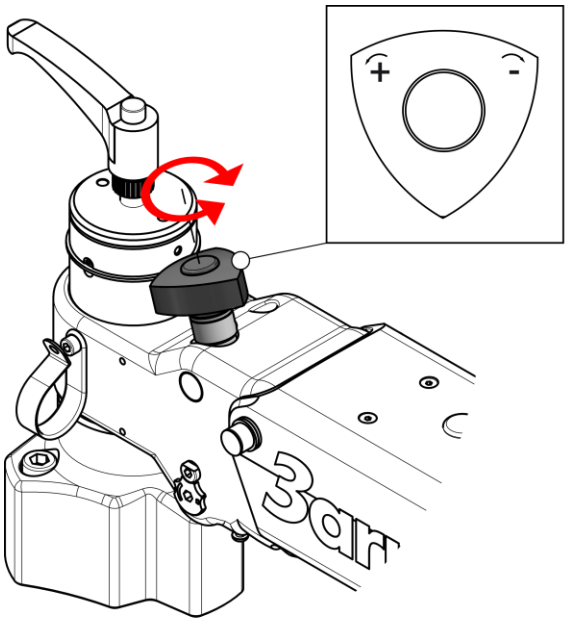
6.1 BALANCING THE ARM

Regulate the tension of internal shock absorber if the arm drops or has a lot of upward force.

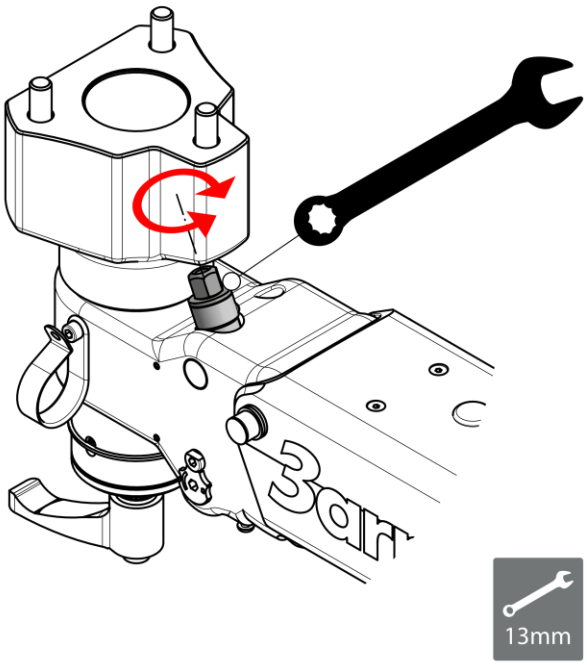
1- Maintain the tilting arm in an approximately horizontal position to facilitate the task.
2- Using the flywheel installed for this purpose, in the upper part of the cross, rotate it as necessary.

- **Anticlockwise:** Gives the shock absorber more tension.
- **Clockwise**: Reduces the tension in the shock absorber.

Bench-top arm



Ceiling arm



6.2 BALANCED, CENTRED POSITION

-Balanced arm position: It tends to stay in the position in which it was left free.
-Centred arm position: It tends to remain horizontal once left free.

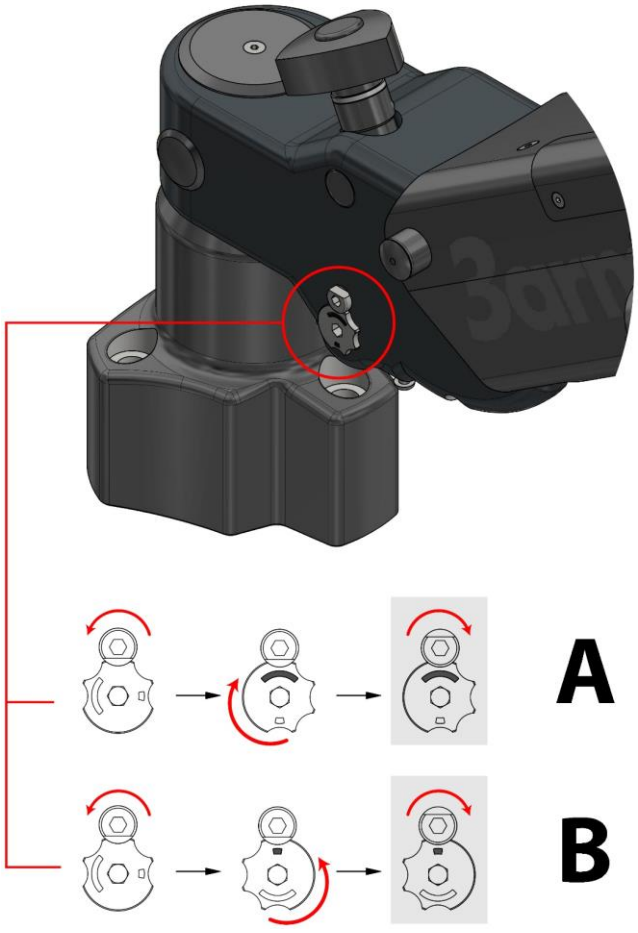
It is possible to adjust the arm to achieve balanced or centred adjustment.

A - BALANCED (see image below)

1- Turn the Allen screw *(4 mm Allen key)* until the flat part of the screw head is in contact with the eccentric.
2- Position the eccentric so the **line** marking is just under the screw *(5 mm Allen key).*
3- Turn the screw back to the original position (safety lock).

B - CENTRED (see image below)

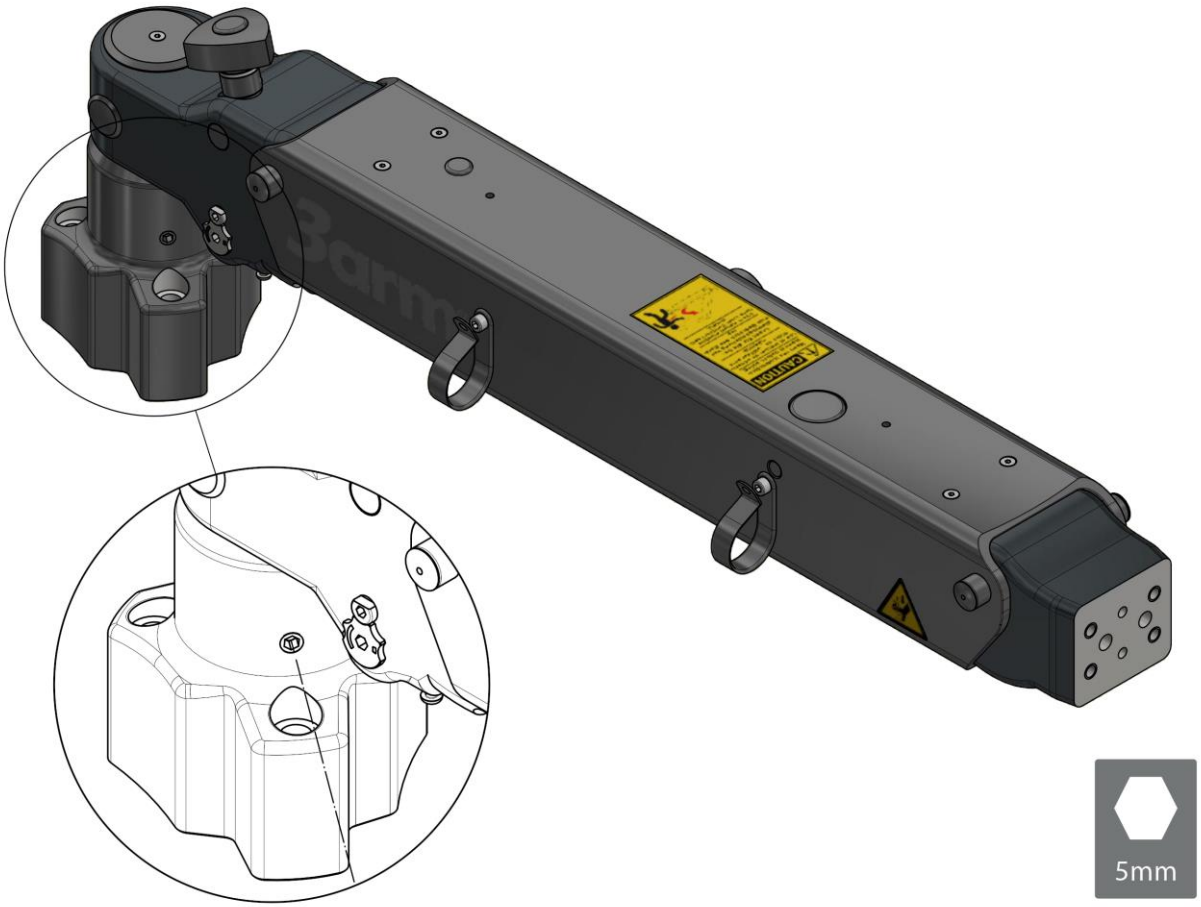
1- Turn the Allen screw *(4 mm Allen key)* until the flat part of the screw head is in contact with the eccentric.
2- Position the eccentric so the **dot** marking is just under the screw *(5 mm Allen key).*
3- Turn the screw back to the original position (safety lock).



6.3 REGULATION OF THE RESISTANCE TO ROTATION.

The stud in the support enable you to adjust the rotational resistance of the axe of movement of the arm. The stud with a Nylon tip can be tightened or loosened to regulate this turning resistance (5 mm Allen key).

Regulating the turning resistance is especially useful in situations where the base of the arm is not completely horizontal.

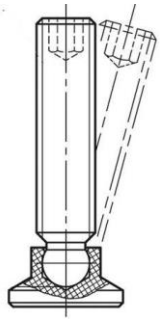


SHIFTING AND DEVIATIONS

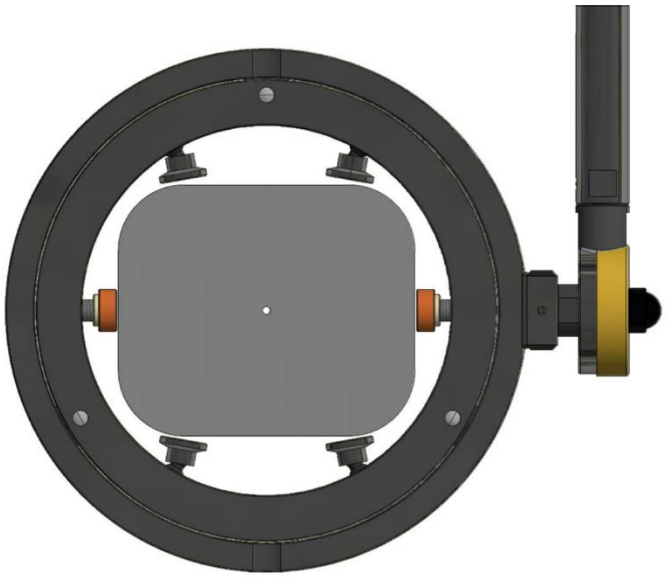
Correctly adjusting the regulation of the turning resistance prevents the risk of shifting and deviations during the operation of the arm.

6.4 HOW TO SECURE TOOLS WITH A SQUARE SECTION

To secure the tool correctly, Tecnospiro recommends using ball-tip headless Allen studs for thrust pads. This component allows you to adjust the tool from all sides, adapting the pads to the surface of the tool.



Example of securing a square tool:

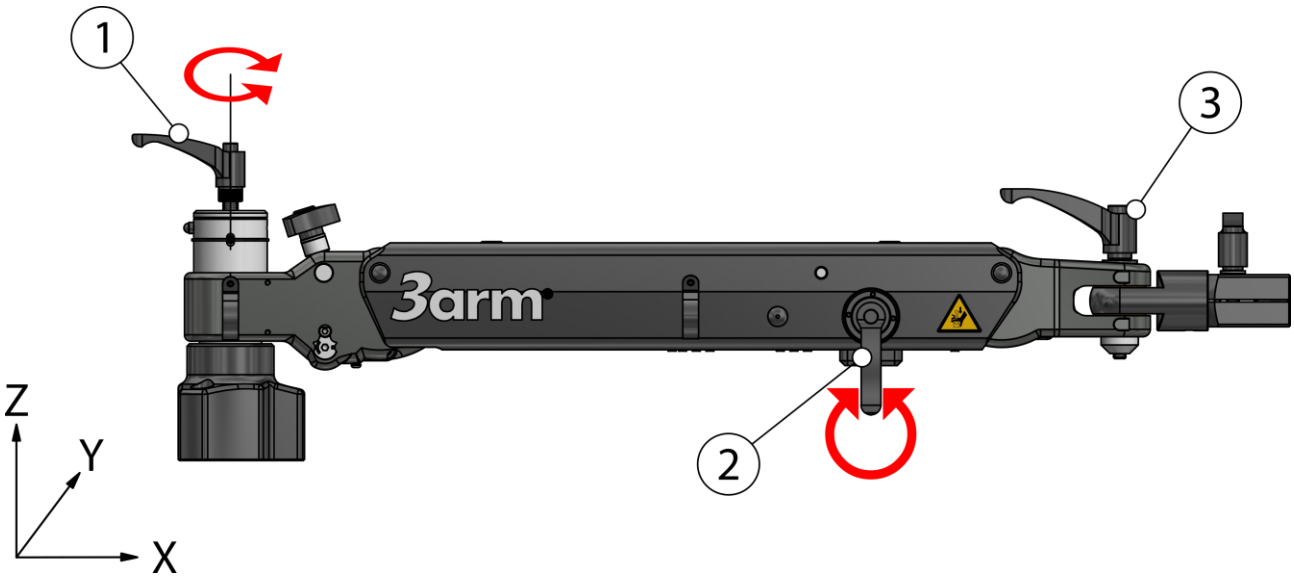


Check that the assembly for securing square tools is in the machine packaging.

7 OPERATION

7.1 L11 MANUAL LOCK

The L11 configuration allows manual locking of different arm movements by means of adjustable handles.



1- Base radial lock
2- Arm tilting lock
3- Head lock[4]

To lock the movement, turn the handle (1, 2 or 3) clockwise.

To unlock the movement, turn the handle (1, 2 or 3) anticlockwise.

Handles	Control movement
1, 3	**Radial movement (X-Y plane)**
2	**Tilting movement (ZX plane)**

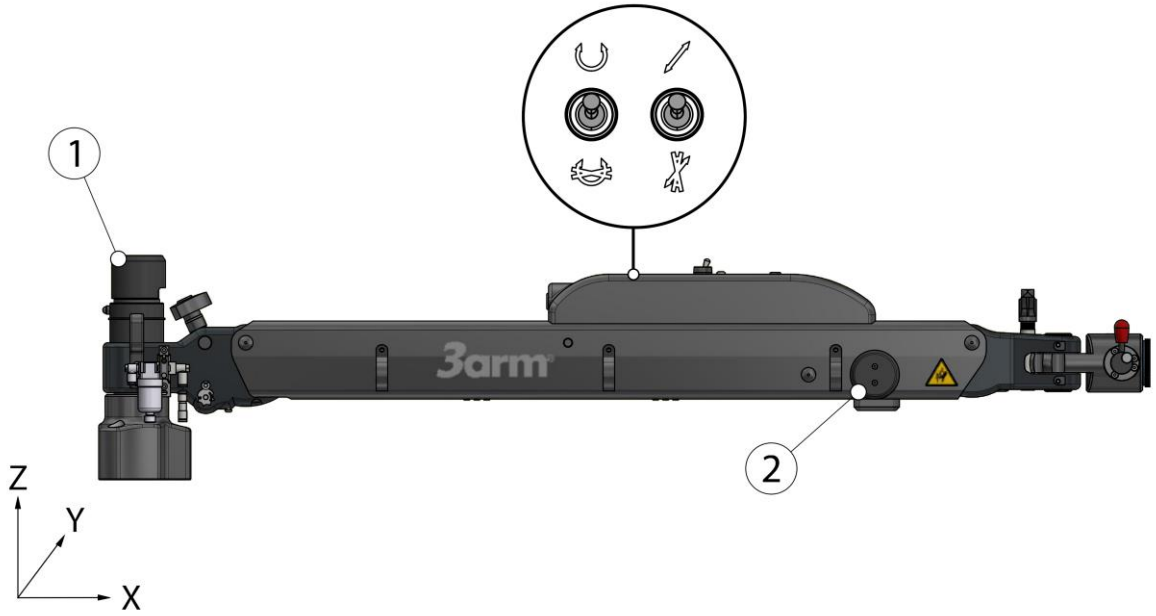
CAUTION

If the locking handles are not tightened firmly, they will not lock the equipment properly, acting as a friction brake and causing premature wear of the pads.

[4] Optional, depending on the head. See ***Appendix of S0-S3-S4 heads***

7.2 PNEUMATIC LOCK L22

The L22 configuration allows you to pneumatically lock different arm movements using switches.



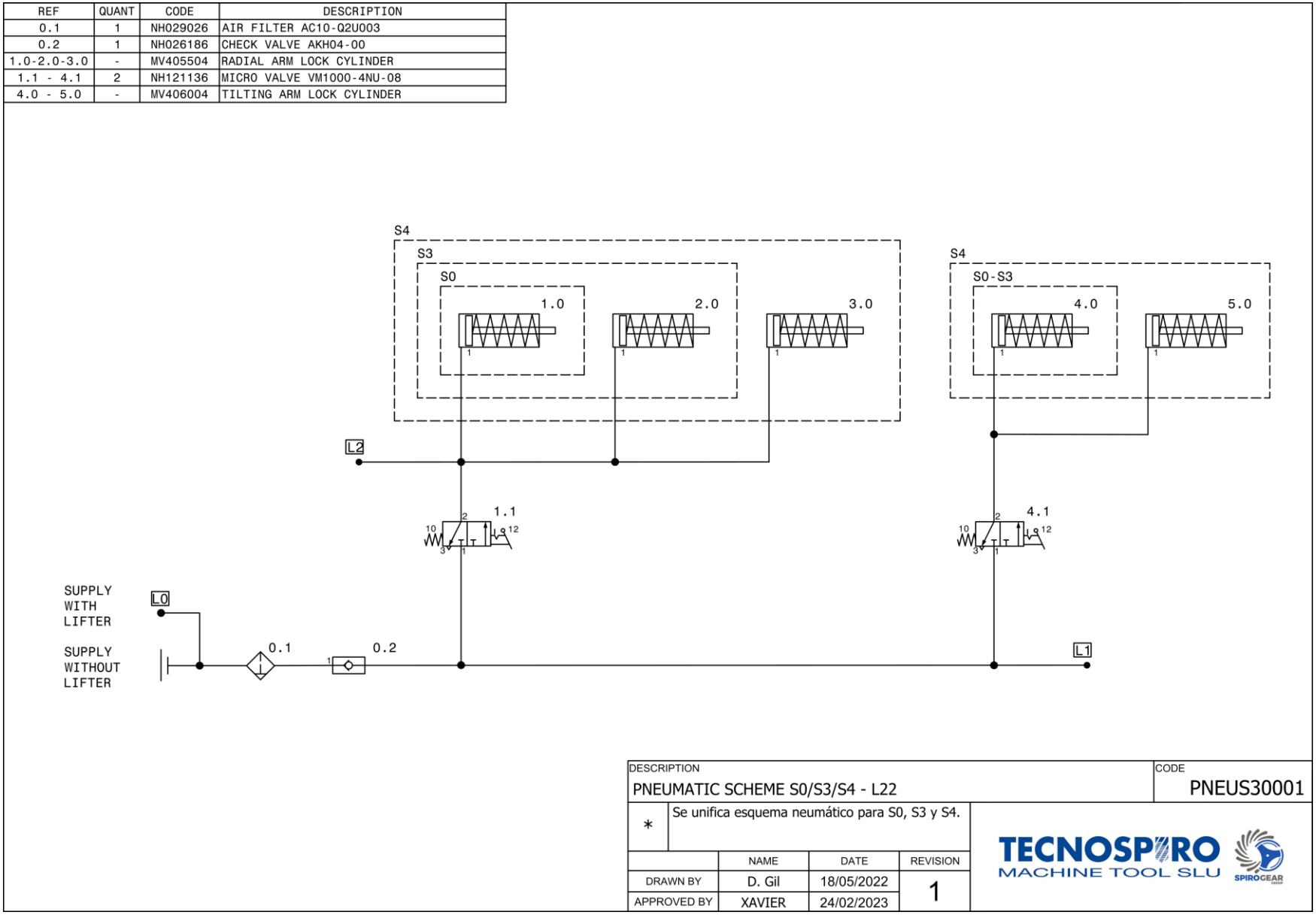
1- Base radial lock
2- Swing Arm lock

Position of the switches to obtain one lock or another.

Movements	Switches	Cylinder control
Radial movement (X-Y plane)		1
Swing movement (Z-X plane)		2

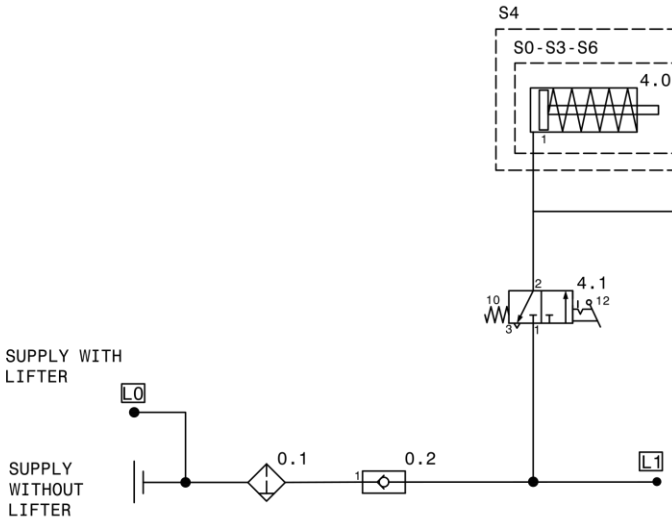
7.2.1 Pneumatic diagram L22

REF	QUANT	CODE	DESCRIPTION
0.1	1	NH029026	AIR FILTER AC10-Q2U003
0.2	1	NH026186	CHECK VALVE AKH04-00
1.0-2.0-3.0	-	MV405504	RADIAL ARM LOCK CYLINDER
1.1 - 4.1	2	NH121136	MICRO VALVE VM1000-4NU-08
4.0 - 5.0	-	MV406004	TILTING ARM LOCK CYLINDER



7.2.2 Pneumatic diagram L02/L52

REF	QUANT	CODE	DESCRIPTION
0.1	1	NH029026	AIR FILTER AC10-Q2U003
0.2	1	NH026186	CHECK VALVE AKH04-00
4.0-5.0	1	MV406004	TILTING ARM LOCK CYLINDER
4.1	1	NH121136	MICRO VALVE VM1000-4NU-08



DESCRIPTION	CODE
PNEUMATIC SCHEME S0/S3/S4/S6 - L02/L52	PNEUS30005

*	Standardization of the scheme for S0/S3/S4/S6

	NAME	DATE	REVISION
DRAWN BY	D. Gil	18/05/2022	1
APPROVED BY	P.Punti	14/03/2023	

TECNOSPIRO MACHINE TOOL SLU SPIROGEAR

7.3 L92 PNEUMATIC LOCK

L92 PNEUMATIC LOCK

- Failing to use telescopic compensators could cause malfunction or premature wear of the pneumatic locking system.

- To configure L92 it is advisable to use telescopic compensators [See L92 PNEUMATIC LOCK: USE WITH COMPENSATORS p. 28]

- If you decide to work without compensators, carefully read the following chapter their operation [See L92 PNEUMATIC LOCK: USE WITHOUT COMPENSATORS p. 29]

INFORMATION

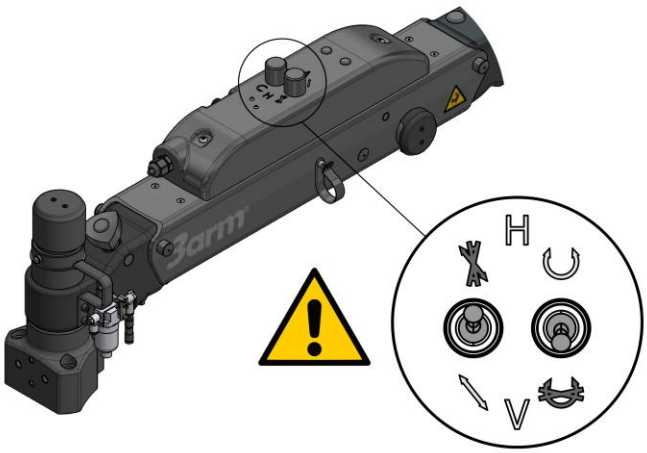
If the supply pressure drops below 4.5 bar the tool will not be activated.

7.3.1 L92 PNEUMATIC LOCK: USE WITH COMPENSATORS

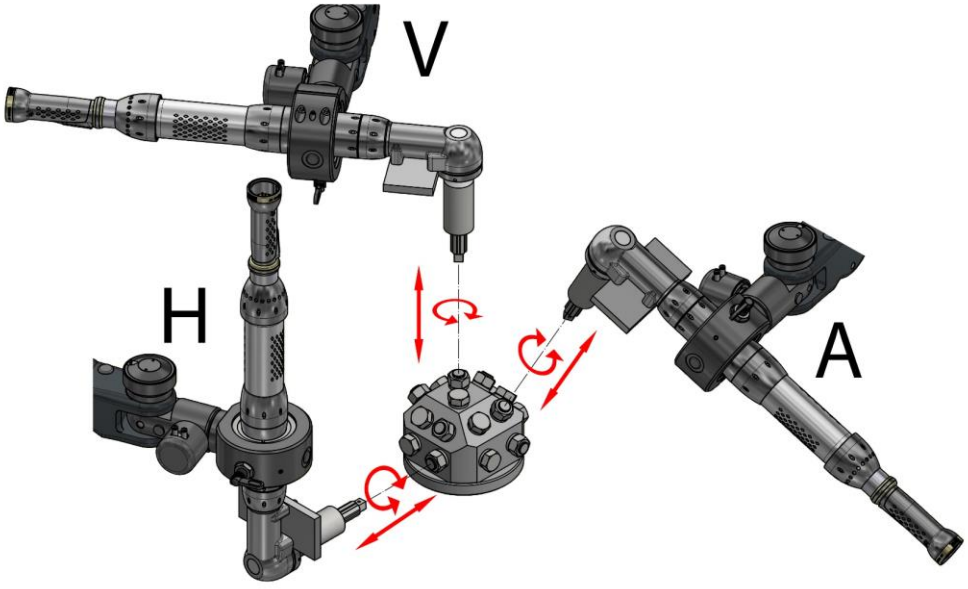
The use of telescopic compensators allows screw-mounting or tightening in any position (V-Vertical, H-Horizontal, A-Angle) with the arm completely blocked.

For the use of compensators in your 3arm arm, follow these instructions.

1. Remove the guards and verify that the switches are in the locked position. Put them back immediately.

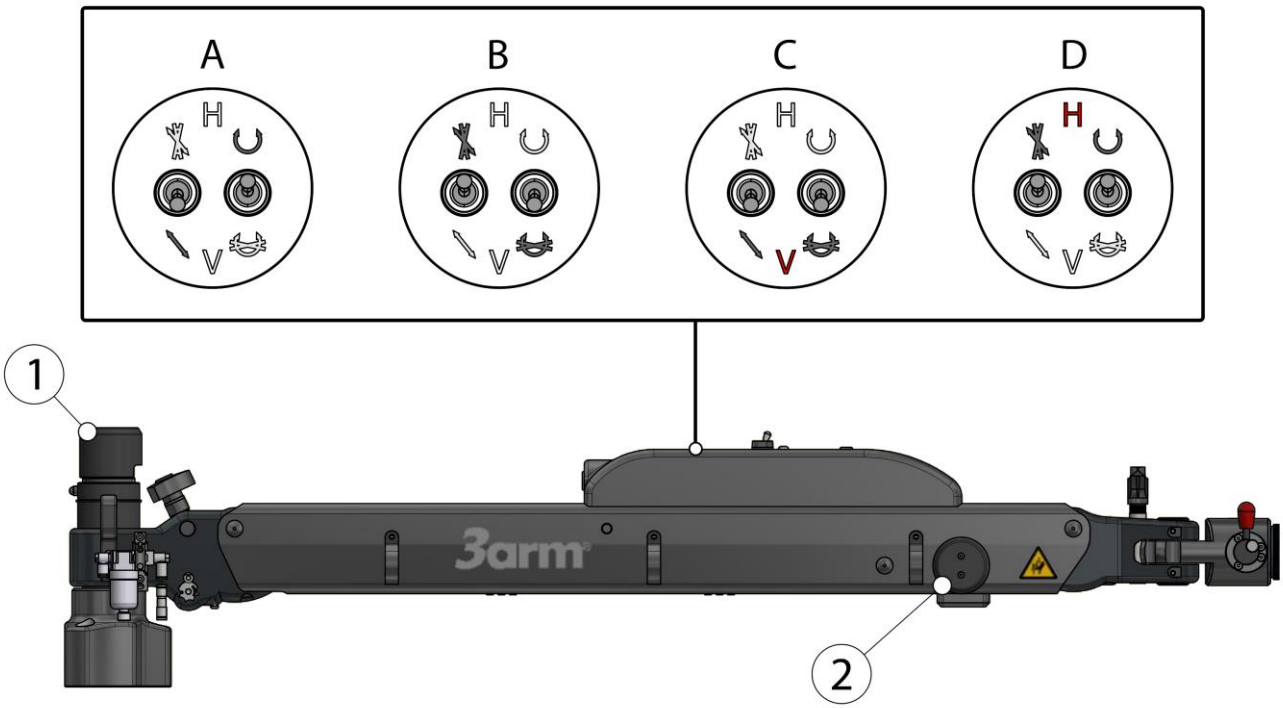


2. Installer the compensator that have acquired with the tool according to the needs of torque and size of the panel *(Consult your distributor regarding the characteristics of the compensators).*
3. Connect the tool along with your control device following the manufacturer's recommendations [See ELECTROPNEUMATIC SYSTEM p. 33].
4. Compress the regulator into its position (V-Vertical, H-Horizontal or A- Angle) as necessary and actuate the tool.



7.3.2 L92 PNEUMATIC LOCK: USE WITHOUT COMPENSATORS

The configuration L92 allows different arm movements to be locked **through the activation of the tool or, failing that, the electrovalve.**

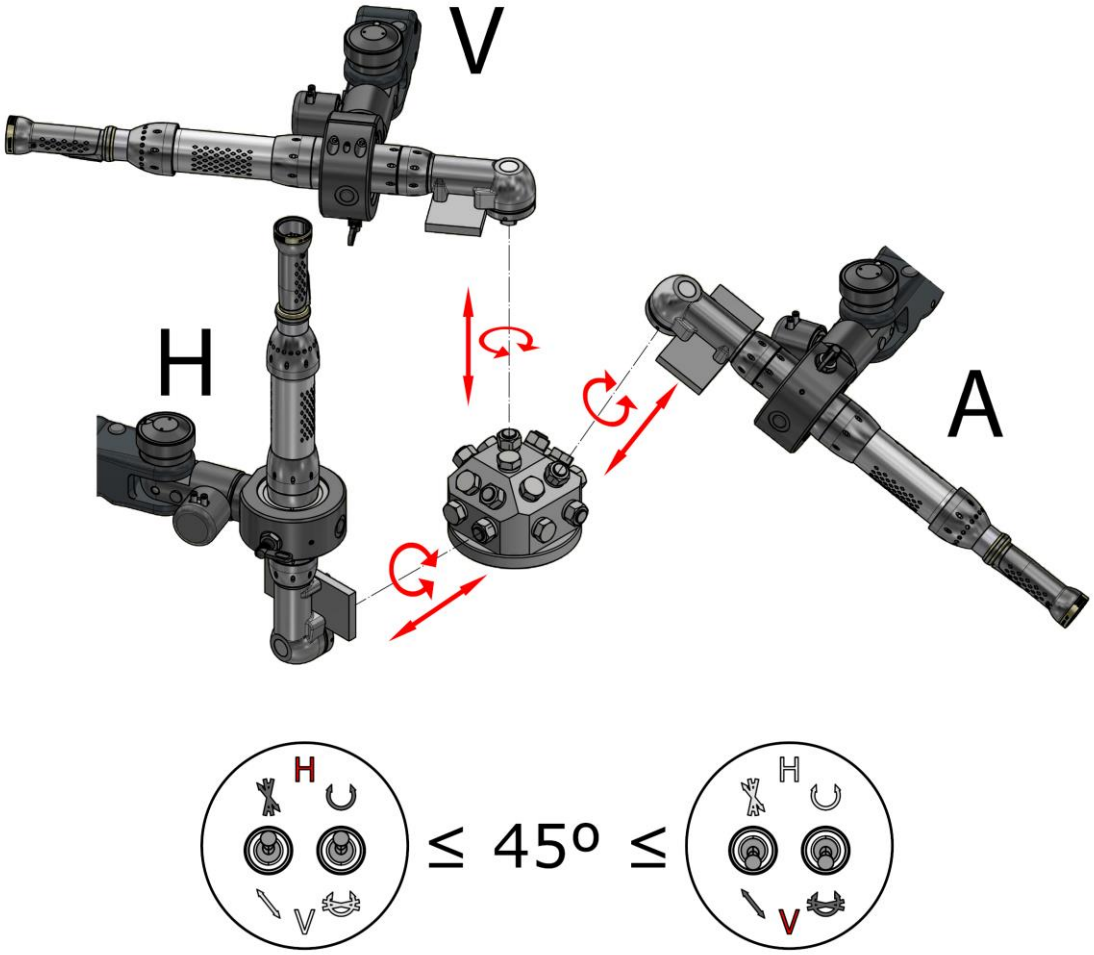


1- Base radial lock
2- Swing Arm lock

Below, the movements that are locked and unlocked depending on the ***position of the switch when the tool is operated***. (The switches are on the cover of the arm).

Movements	***Position switches***	***Cylinders locked***
All the movements are free	A	-
All the movements are locked	B	1, 2
Vertical work. V	C	1
Horizontal work. H	D	2

Depending on the Vertical (V) or Horizontal (H) work that is going to be carried out, you must position the switch as shown in the image.



If working in A (angle), the switches must be positioned at V (vertical) if a more vertical than horizontal position prevails, or otherwise H (horizontal).

In other words, taking 0º as a reference, the surface where the base of arm has been installed:

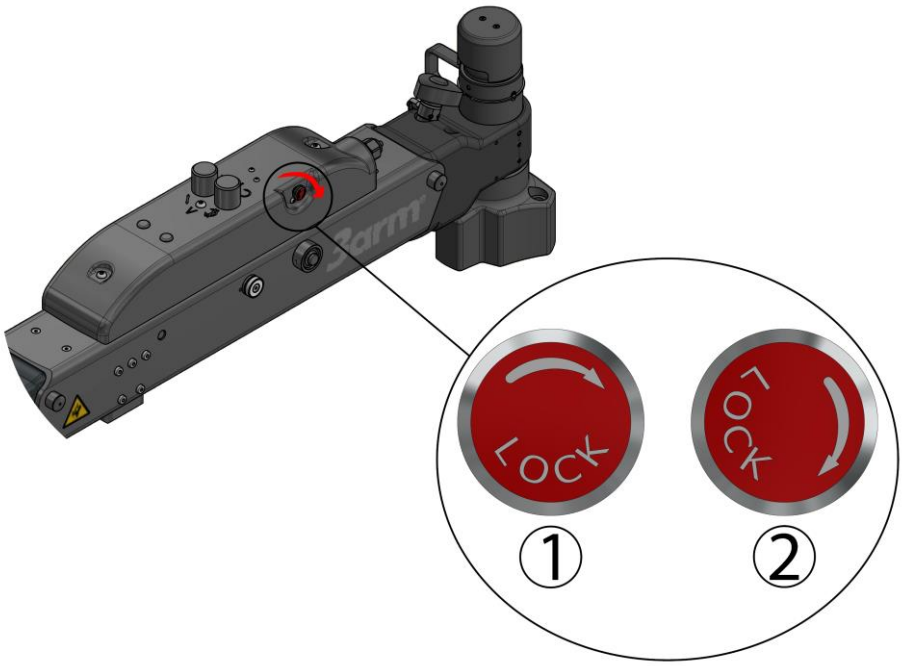
- ≤ 45º → H
- ≥ 45º → V

7.3.3 L92 PNEUMATIC LOCK: MANUAL ACTIVATION

When the wheel on the cover is operated (Versions L92), **the arm's pneumatic lock is activated.**

The wheel has to move from position 1 to 2.
To do this, apply a slight rotation, with your hand, as indicated in the diagram.

1- Wheel extended, arm free.
2- Wheel retracted, lock activated [See L92 PNEUMATIC LOCK p. 27]



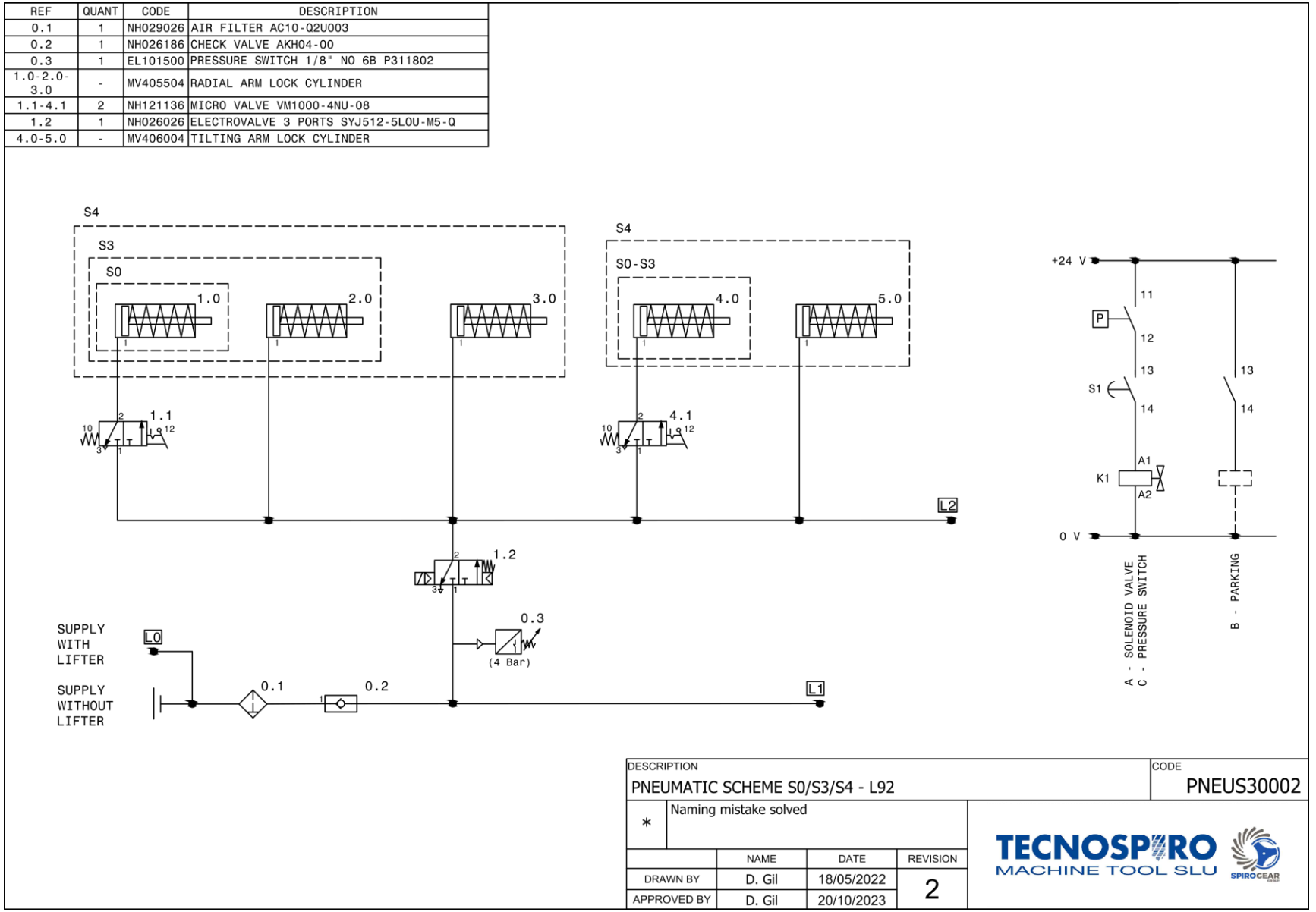
To disable the lock, proceed in reverse order (from 2 to 1), rotating it the opposite direction.

- Keep it in position 2 during maintenance tasks, periods when not in use, and when changing the tool and/or head.

-Manual actuation, together with the switches, enables you to lock the arm without the tool connected.

7.3.4 PNEUMATIC DIAGRAM L92

REF	QUANT	CODE	DESCRIPTION
0.1	1	NH029026	AIR FILTER AC10-Q2U003
0.2	1	NH026186	CHECK VALVE AKH04-00
0.3	1	EL101500	PRESSURE SWITCH 1/8" NO 6B P311802
1.0-2.0-3.0	-	MV405504	RADIAL ARM LOCK CYLINDER
1.1-4.1	2	NH121136	MICRO VALVE VM1000-4NU-08
1.2	1	NH026026	ELECTROVALVE 3 PORTS SYJ512-5LOU-M5-Q
4.0-5.0	-	MV406004	TILTING ARM LOCK CYLINDER



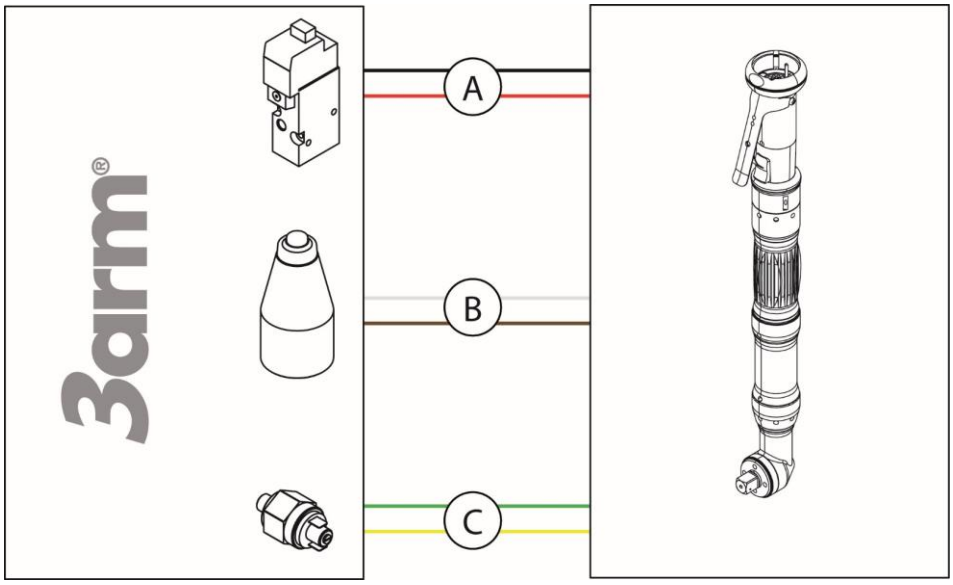
DESCRIPTION	CODE
PNEUMATIC SCHEME S0/S3/S4 - L92	PNEUS30002

*	Naming mistake solved			
		NAME	DATE	REVISION
	DRAWN BY	D. Gil	18/05/2022	2
	APPROVED BY	D. Gil	20/10/2023	

TECNOSPIRO MACHINE TOOL SLU

7.3.5 ELECTROPNEUMATIC SYSTEM

This system links the 3arm® L92 arm with the tool using a suitable controller or control device (DC) following the diagram below.



The left of the diagram represents the 3arm® arm while the right shows the tool that will be used, controlled by the control device (DC).

The connecting cable that you will find with the 3arm® arm are identified with the following correlation.

a) Electrovalve. Cables labelled A (red and black cables)
The electrovalve is responsible for operating the arm locks when the tool is functioning.

b) Parking. Cables labelled B (white and brown cables)
Provides a potential free signal when the arm is retracted. This signal can be used to enable other components such as a light, activate other processes, etc.

c) Pressure switch. Cables labelled C (green and yellow cables)
This component disables the tool when there is insufficient supply pressure (below 4.5 bar).

Consult further details on the connections between the control device (DC) and the distributor of the tool.

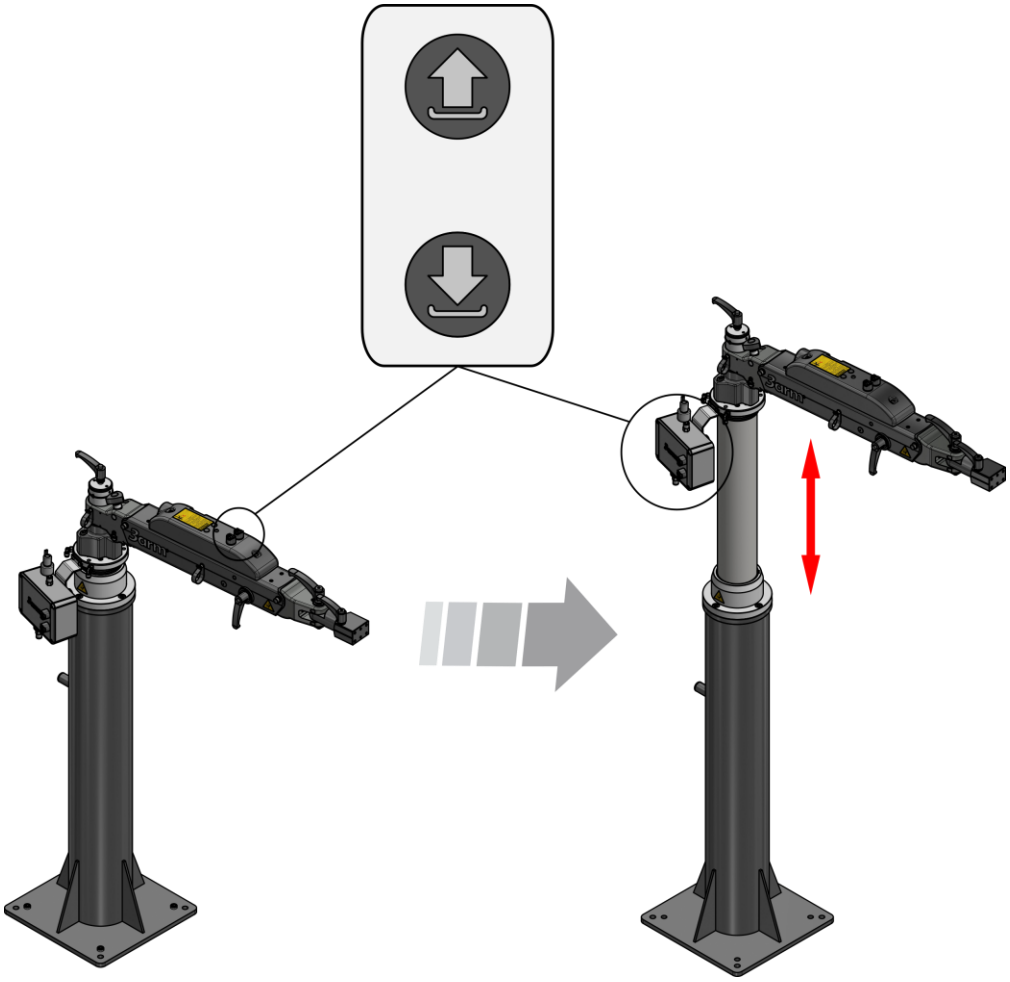
7.4 LIFTER / PNEUMATIC COLUMN

If you complement your 3Arm® equipment with a pneumatic lift or a lifting column, you can control the up and down movement from the control panel of your 3Arm® equipment and/or the control panel of the lift.

Press and hold the button until the appropriate position is reached:

-> Upward movement.

-> Downward movement.

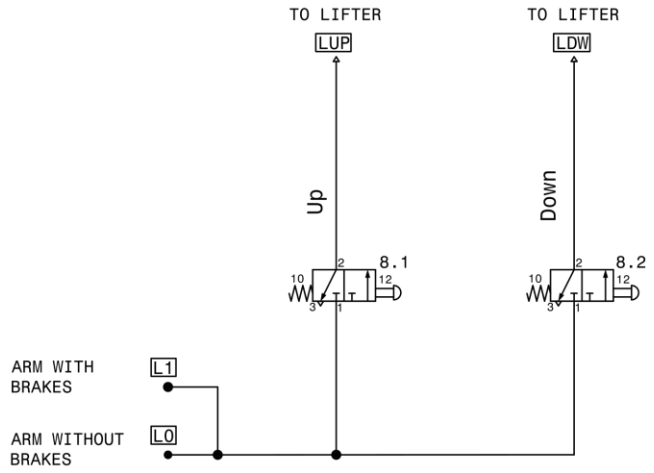


CAUTION

- ✓ The pneumatic lifter should only be operated when the tool supported by the 3arm® equipment is not in use. (they cannot be used at the same time)
- ✓ During periods of inactivity the pneumatic lift should be positioned in its lowest possible position.

7.4.1 Lifter pneumatic diagram

REF	QUANT	CODE	DESCRIPTION
8.1	1	M3153100	BUTTON VALVE VM1000-4NU-32B UP
8.2	1	M3171800	BUTTON VALVE VM1000-4NU-32B DOWN



DESCRIPTION	CODE
PNEUMATIC SCHEME - ELEVATOR CONTROL	PNEUS30006

*	Standardization of the scheme

	NAME	DATE	REVISION
DRAWN BY	D. Gil	18/05/2022	1
APPROVED BY	P.Punti	14/03/2023	

TECNOSPIRO MACHINE TOOL SLU

8 MAINTENANCE

The arm does not require maintenance and, when used properly, anomalies are unlikely to occur. Even so, the main, simple repairs that you can do are set out.

8.1 COMPRESSED AIR MAINTENANCE UNIT

For good functioning of the compressed air unit, an air quality level of class 1.4.1 is recommended, according to the table attached. ISO8573-1 2010

ISO8573-1:2010 CLASE	Partículas sólidas				Agua		Aceite
	Número máximo de partículas por m^3			Concentración másica mg/m^3	Punto de rocío a presión de vapor	Líquida g/m^3	Concentración total de aceite (líquido, aerosol y vapor) mg/m^3
	0,1 - 0,5 micras	0,5 - 1 micras	1 - 5 micras				
0	Tal como especifique el usuario o el proveedor del equipo y más estrictos que los de la Clase 1.						
1	≤ 20 000	≤ 400	≤ 10	-	≤ -70 °C	-	0,01
2	≤ 400 000	≤ 6000	≤ 100	-	≤ -40 °C	-	0,1
3	-	≤ 90 000	≤ 1000	-	≤ -20 °C	-	1
4	-	-	≤ 10 000	-	≤ +3 °C	-	5
5	-	-	≤ 100 000	-	≤ +7 °C	-	-
6	-	-	-	≤ 5	≤ +10 °C	-	-
7	-	-	-	5 - 10	-	≤ 0,5	-
8	-	-	-	-	-	0,5 - 5	-
9	-	-	-	-	-	5 - 10	-
X	-	-	-	> 10	-	> 10	> 10

Periodically check the water level accumulated in the reservoir, and bleed if it has reached the limit.

8.2 PNEUMATIC LOCKING BRAKES

It is advisable to revise the functioning of the locking brakes periodically.
The frequency of this revision will, in each case, depend on the number of cycles carried out with them. It is recommended to revise the functioning every 6 months. For revision, adjustment or replacement [See PNEUMATIC LOCKS p. 43].
The stroke of the locking brake actuators is 1.2 mm.

CAUTION

Do not operate the pneumatic brakes at no load (with the sub-assemblies removed), as this would damage the mechanism.

8.3 TIGHTENING THE SCREWS

To ensure the equipment functions correctly, it is advisable to check the tightness of all the screws periodically. The recommended period is every 6 months. The recommended torque for the 4 screws of the arm is 40 Nm.

8.4 GENERAL CLEANING

It is advisable to carry out a general clean of the arm and accessories every week to keep the whole unit in good condition and prolong its useful life.

8.5 REPLACING THE GAS SPRING

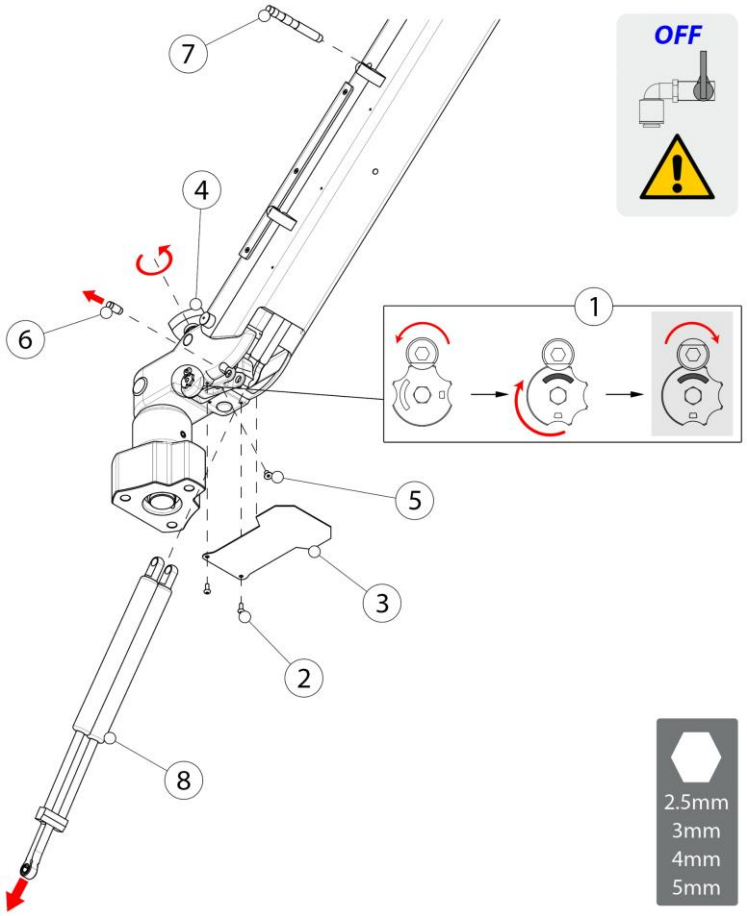
PRIOR TO REPLACING THE GAS SPRING

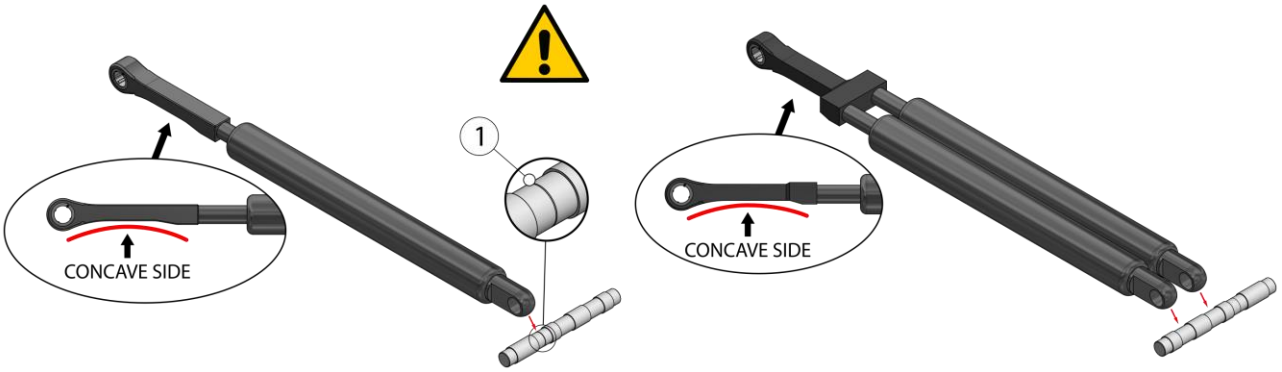
- ✓ The equipment must be duly installed and integrated.
- ✓ Disconnect the pneumatic supply from the equipment.
- ✓ It is advisable to dedicate two operators to this task.
- ✓ If the arm has a double spring, in the event a fault is detected in one of the two, both springs must be replaced.

1- Adjust the arm to put it in the balanced position [See BALANCED, CENTRED POSITION p.20].
2- Remove the screws (2) (2.5 mm Allen key) and remove the cover (3).
3- Swivel the arm to its highest position.

CAUTION! KEEP THE ARM IN THAT POSITION

4- Rotate the regulation flywheel (4) anticlockwise all the way.
5- Remove the screw (5) (3 mm Allen key) from the end of the fork.
6- Turn the regulation flywheel (4) again until the lower shaft of the spring protrudes.
7- Remove the lower shaft of the spring (6) in the direction indicated in the image, securing the spring (8).
8- Remove the upper shaft of the spring (7) and remove the spring (8) by moving it in the direction indicated.
9- Replace the spring (8) and proceed in reverse order for assembly.





Pay special attention to the position of the shock absorber within the groove of the arm shaft. If the shock absorber is single, mount it in the groove indicated with the notch (1), however, if the shock absorber is double, mount it in the grooves not marked with the notch (1).
In turn, mount the **"concave" face** of the shock absorber facing **downward.**

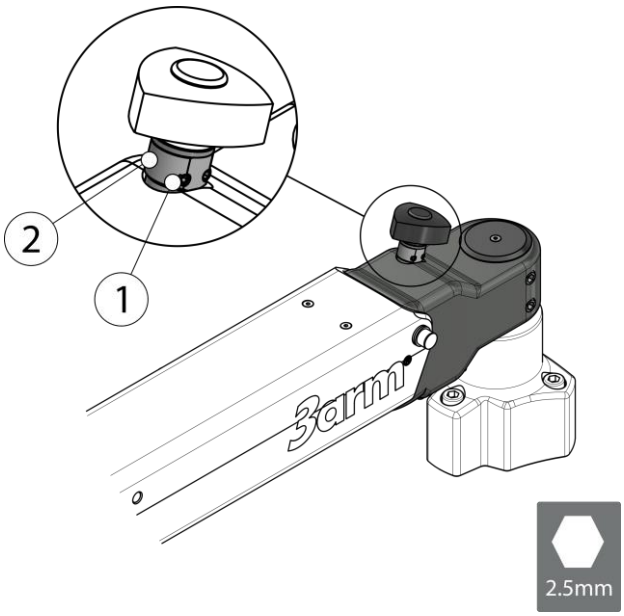
ARMS WITH DOUBLE SPRING.

If the arm has a double spring, in the event a fault is detected in one of the two, both springs must be replaced.

8.6 ADJUSTING THE SPRING REGULATION SYSTEM

Operation to be carried out as maintenance, in case play should appear in the regulation assembly.

1. Move the arm to its lowest position.
2. Loosen the studs (1) (2.5 mm Allen key).
3. Adjust the nut (2) until there is no play. The noise must disappear. Do not tighten this nut too much, as it stops the regulation turning gently.
4. Re-tighten the studs (1) (2.5mm Allen key).

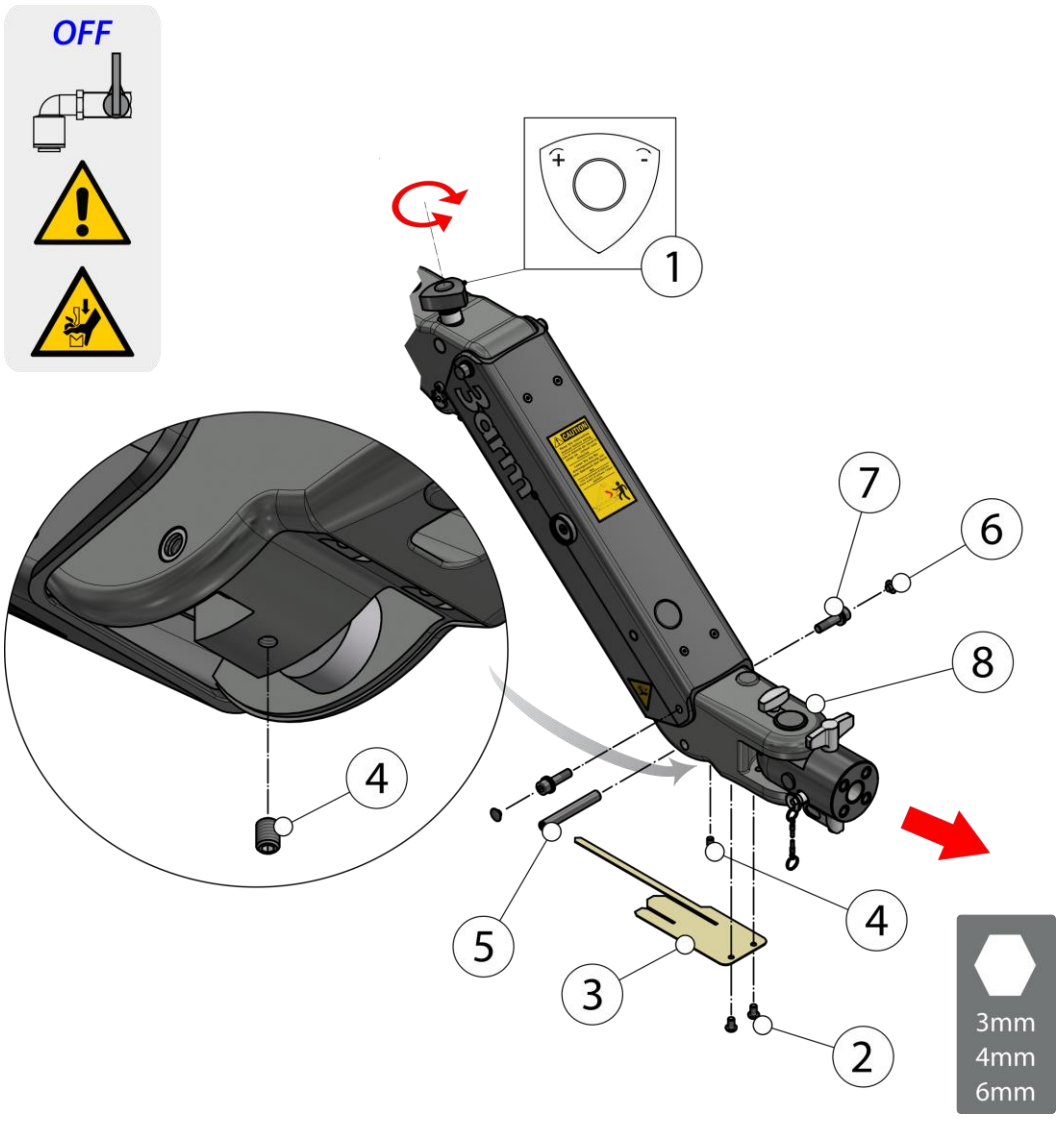


8.7 REPLACING THE HEAD

BEFORE REPLACING THE HEAD

- ✓ The equipment must be duly installed and integrated.
- ✓ Disconnect the pneumatic supply from the equipment (if connected).
- ✓ It is advisable to dedicate two operators to this task.

1. Remove all tension from the shock absorber (1) [See BALANCING THE ARM page 19].
2. Swivel the arm to its **lowest position**.
3. Remove the screws (2) (4 mm Allen key) and remove the cover (3).
4. Remove the stud (4) (3mm Allen key) and use an M6 extractor to remove the pin (5).
5. Swivel the arm to its **highest position**.
6. Remove the caps (6) and the screws (7) from the arm (6 mm Allen key).
7. The head (8) will be free and can be replaced by a new one. Proceed in reverse order for assembly.

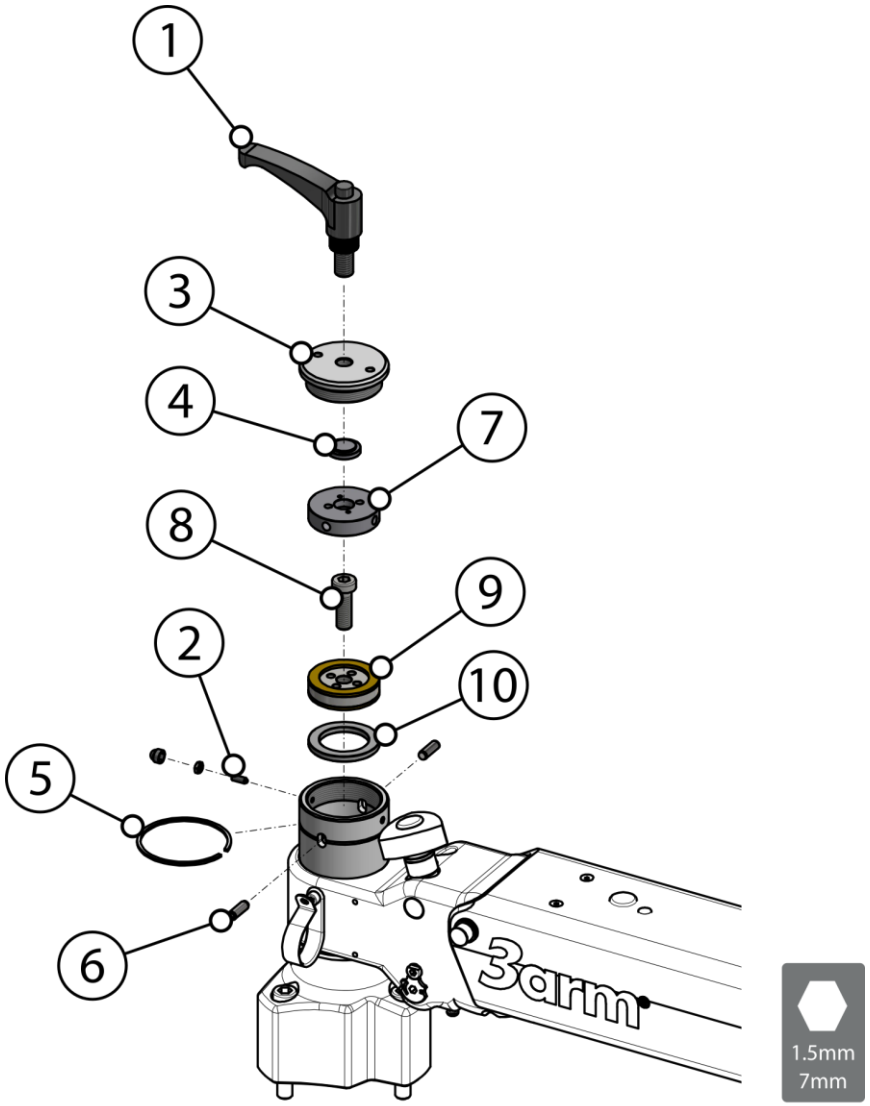


8.8 REPLACING RADIAL PADS L11

BEFORE THE REPLACEMENT

✓ The equipment must be duly installed and integrated.

1- Loosen the handle (1) and remove it.
2- Loosen the stud (2) (1.5mm Allen key), untwist the cover (3) and take out the pusher (4).
3- Remove the safety ring (5) and use an M4 extractor to remove the pins (6).
4- Remove the cylindrical pusher (7).
5- Remove the screw (8) (7 mm Allen key) and use an M10 extractor to take out the brake assembly with the pads (9) and remove the brake disc (13).
6- Replace the brake assembly (9) and the brake disc (10) and screw them onto the shaft of the base with the screw (8) (7 mm Allen key).
7- Proceed in reverse order for assembly.

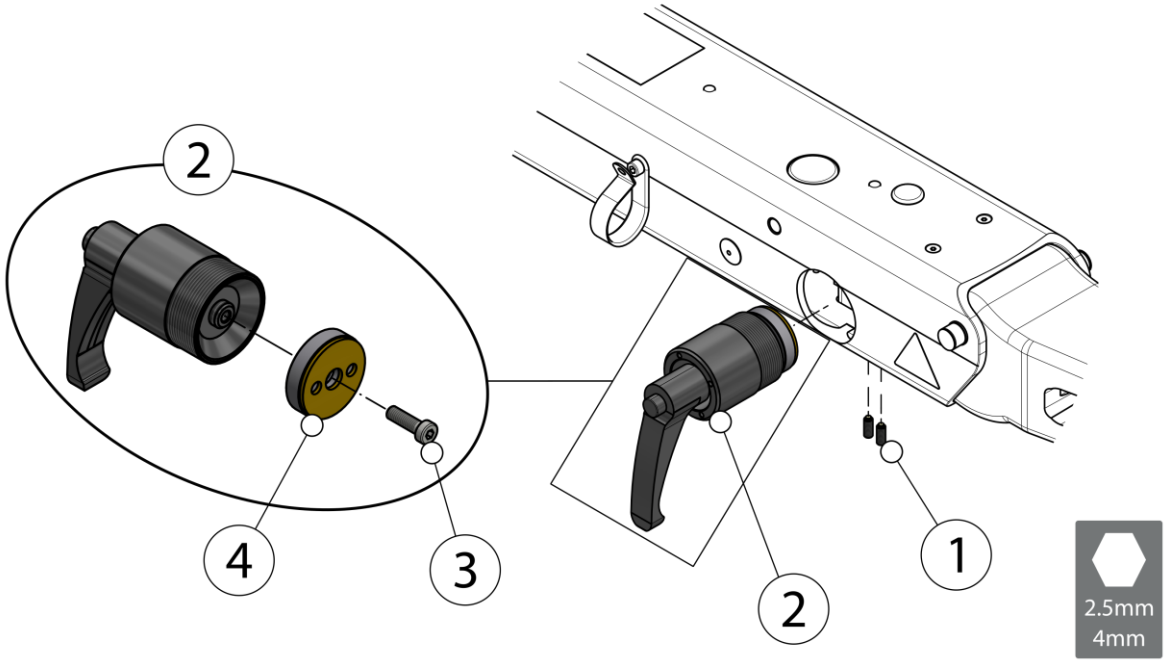


8.9 REPLACING TILTING PADS L11

BEFORE THE REPLACEMENT

✓ The equipment must be duly installed and integrated.

1. Loosen the studs (1) (2.5 mm Allen key) from the bottom of the arm.
2. Unscrew the brake assembly (2) with a compass wrench.
3. Remove the screw (3) (4 mm Allen key) from the brake assembly (2).
4. Replace the pad (4) with the new one. Apply sealant, tighten screw (3) (4 mm Allen key) and loosen it ¼ turn.
5. Screw in the brake assembly (2) and tighten the studs (1) (2.5 mm Allen key).



8.10 MAINTENANCE TABLE

The following table summarises the preventive maintenance tasks that will ensure the proper functioning of the equipment.
The time period detailed in the table corresponds to a normal environment. If your equipment is installed in a dirty environment (foundries, outside, dust, humidity...) you should reduce the interval between maintenance tasks.

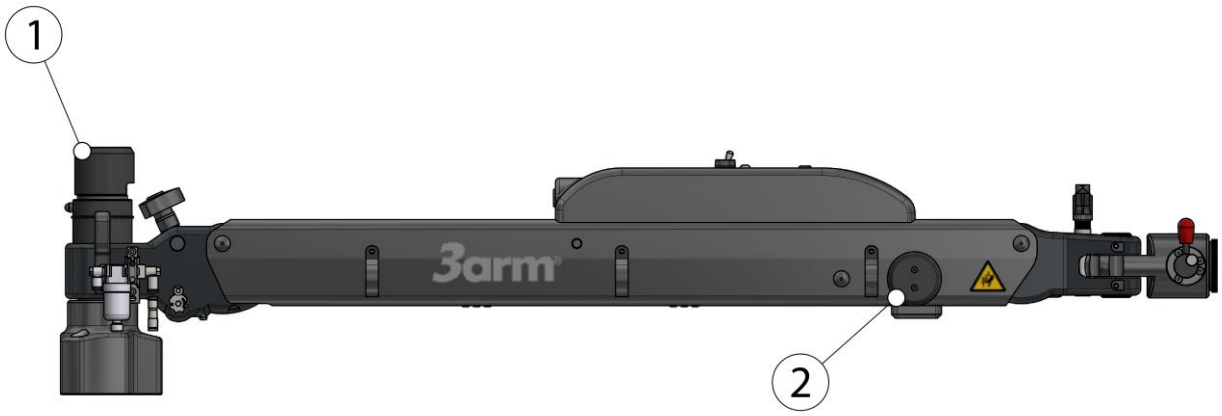
DESCRIPTION ELEMENT	ACTION	PERIOD
Regulator filter (air group)	Look for breaks, scratches or any deterioration of the transparent resin vessel on the air filter, regulator.	Every six months
	Replace the filter cartridge.	Every two years or when the pressure drop is 0.1 MPa, whichever comes first.
	Remove moisture before it reaches maximum capacity. Manually open and close the air filter bleed tap. Using tools can damage the product.	Every six months
Screws and fasteners	Check tightening and functionality of the securing elements.	Every six months
General cleaning	When dirty, clean with a mild household product. Do not use other cleaning agents, as they may cause damage.	Monthly
General check of the pneumatic circuit and pneumatic connections	Carry out a general check of the fixings and housings between tubes. Check there is no air leakage and that the connectors are working correctly.	Monthly
Locking brakes	It is advisable to revise the functioning of the locking brakes periodically. The frequency of this revision will, in each case, depend on the number of cycles carried out with them. To check, adjust or replace [See PNEUMATIC LOCKS page 43].	Every six months
Regulation assembly	Clean and grease the threaded rod	Every six months

9 PNEUMATIC LOCKS

In case of malfunction of the pneumatic locks of your 3arm® arm
In versions L22 and L92, follow these checkpoints.

Complement this information with that shown in the section [see PNEUMATIC LOCK L22 p. 24 and L92 PNEUMATIC LOCK p. 27].

9.1 PNEUMATIC LOCKS: IDENTIFICATION



1- Base radial lock
2- Swing Arm lock

9.2 CHECK CONNECTIONS: DEVICE CONTROL – 3arm® ARM

Only for L92 versions.

The locks failing to act in versions L92 is often due to a bad connection between the device control and the 3arm© **To rule out this possibility, enable the pneumatic lock manually.** [See L92 PNEUMATIC LOCK: MANUAL ACTIVATION p. 31].

If the check is not satisfactory, so the locks are actuated manually, ensure the device control and 3arm® arm are properly connected. [See ELECTROPNEUMATIC SYSTEM p. 33] Also verify that the following checkpoints described below are passed successfully.

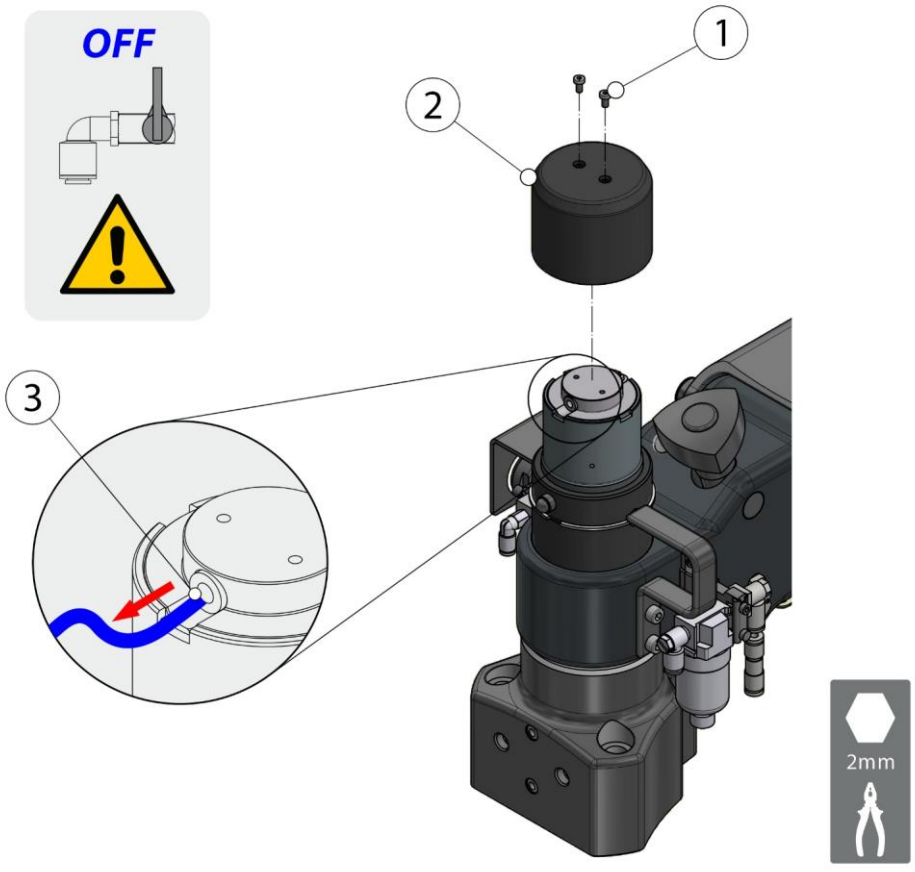
9.3 CHECK AIR SUPPLY

Operative valid for any locking cylinder.

To perform this check:

1. Release the air pressure of the arm.
2. Remove the cap (2), first removing the screws (1) *(2 mm Allen key)* and disconnect the air supply tube from the joint (3) that feeds the cylinder.
3. Allow the air to pass and activate the lock in question, checking that air flows through the tube.
4. Proceed in reverse order for assembly and verify the functioning of the lock again.

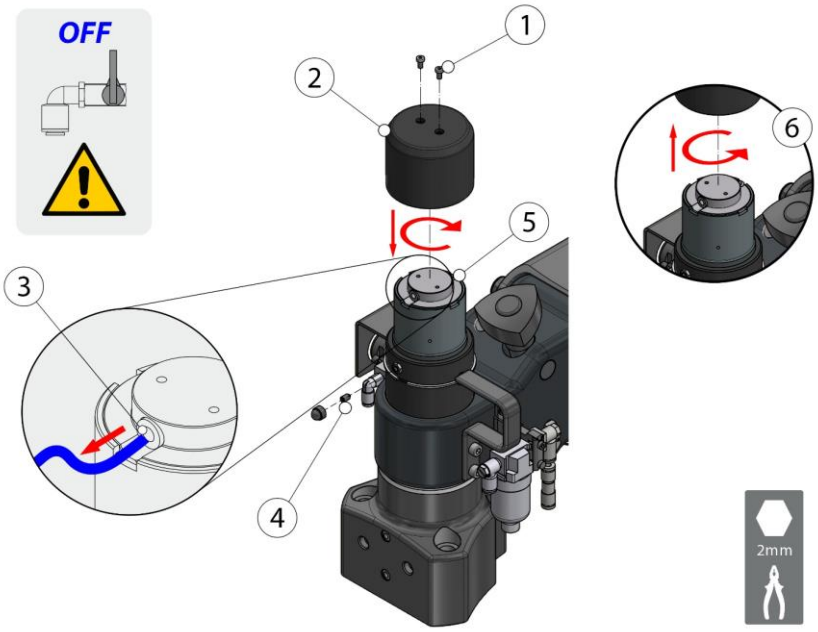
If the check is not satisfactory, review the pneumatic diagram paying special attention to the connection between tubes and derivations, pinching or a failure with the electrovalve (in versions L92).



9.4 CHECK CYLINDER ADJUSTMENT

Operative valid for any locking cylinder.

1. Release the air pressure of the arm.
2. Remove the cap (2), first removing the screws (1) (2 mm Allen key) and disconnect the air supply tube from the joint (3) that feeds the cylinder.
3. Loosen the stud (4) (2 mm Allen key).
4. Screw the cylinder (5) clockwise until it stops.
5. Slightly unscrew the cylinder (5) anticlockwise (approx. 1/12 turn).
6. Proceed in reverse order for assembly and verify the functioning of the lock again.



If the problem persists, it is probably due to a fault in the functioning of the cylinder (it must be replaced), or wear of the pads (they must be replaced).

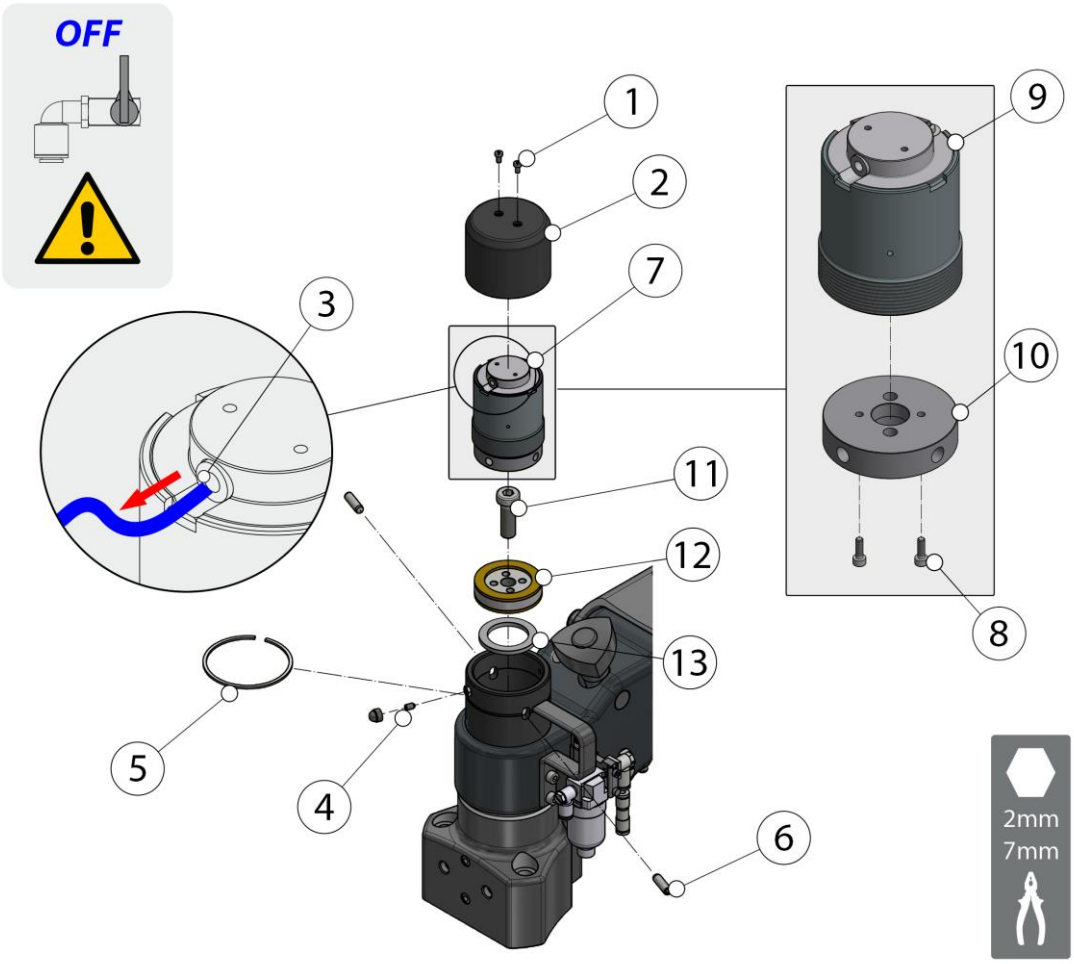
9.5 REPLACING THE CYLINDER AND/OR RADIAL PADS

PRIOR TO REPLACING THE CYLINDER AND/OR RADIAL PADS

- ✓ The equipment must be duly installed and integrated.
- ✓ Disconnect the pneumatic supply from the equipment.

If you wish to replace the locking cylinder (9) do step 1 to 6 and 10 to 16.
If you have the pad replacement kit (12) carry out the full process.

1. Release the air pressure of the arm.
2. Remove the cap (2), first removing the screws (1) (2 mm Allen key) and disconnect the air supply tube from the joint (3) that feeds the cylinder.
3. Loosen the stud (4) (2 mm Allen key).
4. Remove the safety ring (5) and use an M4 extractor to remove the pins (6).
5. Unscrew the cylinder assembly (7) and remove it.
6. Remove the screws (8) (2 mm Allen key) and separate the cylinder (9) from the pushrod (10).
7. Remove the screw (11) (7 mm Allen key) and use an M10 extractor to take out the brake assembly with the pads (12) and remove the brake disc (13).



8. Replace the brake assembly (12) and the brake disc (13) and screw them onto the shaft of the base with the screw (11) (7 mm Allen key).
9. Replacing the pushrod (10).
10. Assemble the cylinder (9) and the pushrod (10) with the screws (8) (2 mm Allen key).
11. Position the cylinder assembly (7) and screw it on clockwise until the pushrod holes coincide (10) with the elongated holes of the lug.
12. Fit the pins (6).
13. Screw the cylinder assembly (7) all the way on and unscrew it slightly, anticlockwise (approx 1/12 turn).
14. Tighten the stud (4), fit the safety ring (5) and connect the supply pipe.
15. Put the cover in place (2) with the screws (1) (2 mm Allen key).
16. Check the lock works correctly.

INFORMATION

The cylinder replacement kit **MV405504** includes part (9).

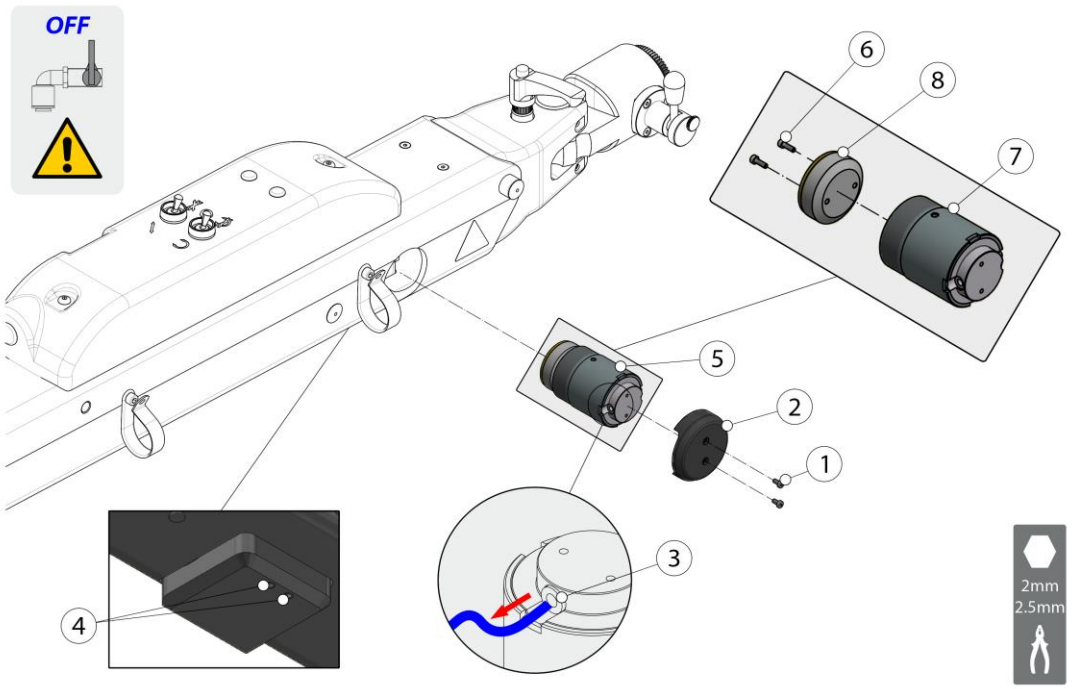
The pad replacement kit **MV4062A4** includes part (12).

9.6 REPLACING THE CYLINDER AND/OR SWIVEL PADS

PRIOR TO REPLACING THE CYLINDER AND/OR SWIVEL PADS

- ✓ The equipment must be duly installed and integrated.
- ✓ Disconnect the pneumatic supply from the equipment.

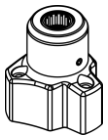
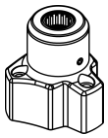
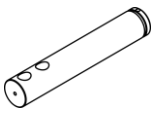
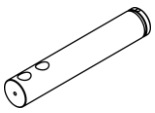
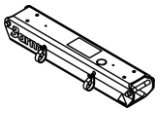
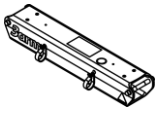
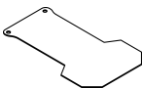
1. Release the air pressure of the arm.
2. Remove the cap (2), first removing the screws (1) (2 mm Allen key) and disconnect the air supply tube from the joint (3) that feeds the cylinder.
3. Loosen the studs (4) (2.5 mm Allen key) of the lower of the arm.
4. Unscrew the cylinder assembly (5) and remove it.
5. Remove the screws (6) (2 mm Allen key) and separate the cylinder (6) from the pushrod (8).
6. Replace the cylinder (7) and/or the pushrod with the pads (8).
7. Assemble the cylinder (7) and the pushrod (8) with the screws (6) (2 mm Allen key).
8. Screw the cylinder assembly (5) all the way on and unscrew it slightly, anticlockwise (approx 1/12 turn).
9. Tighten the studs (4) (2.5 mm Allen key) and connect the supply pipe.
10. Put the cover in place (2) with the screws (1) (2 mm Allen key).
11. Check the lock works correctly.

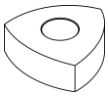
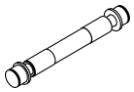
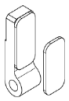
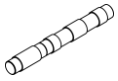


INFORMATION

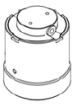
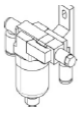
To replace the pad inside the arm, consult your 3arm© distributor.

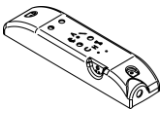
10 SPARE PARTS

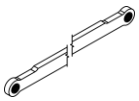
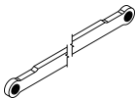
CODE	DESCRIPTION	PICTURE
MV400104R	BASE WITHOUT LOCKING L00 **(S4)**	
MV402503	BASE WITH LOCKING L11 - L22 **(S4)**	
MV308403	BASE SPINDLE WITHOUT LOCKING L00 **(S4)**	
MV402203	BASE SPINDLE - WITH L11 - L22 **(S4)**	
MV400603	TILTING ARM **DS** - L00 **(S4)**	
MV402103	TILTING ARM **DS** - L11-L22-L92 **(S4)**	
M3275200	TILTING ARM **BS** - L00 **(S3)**	
MV3012B3	TILTING ARM **BS** - L11-L22-L92 **(S3)**	
MV3062A3	TILTING ARM **BM** - L00 **(S3)**	
MV3061A3	TILTING ARM **BM** - L11-L22-L92 **(S3)**	
MV306303	BASE&CROSS COVER	

MV308203	HEADMEMBER COVER	
MV30C704R	FORK REGULATION ASSEMBLY, Ø15 ***(S3,S4)***	
MV30C704HR	FORK REGULATION STEEL ASSEMBLY, Ø15 (S3,S4)	
AC020056	REGULATING HANDWHEEL	
MV498904R	HEADS & CROSS UNIT AXIS WITH SCREWS	
MV31J603R	LOCKING HANDLE -UNION AXIS-	
MV432105	SWING ARM PAD REPLACEMENT KIT, 380 ***(S4)***	
MV301003	DAMPER AXIS AT THE ARM-2 DAMPERS-	
MVHXXX[5]04R	3ARM S3 DAMPER KIT, 1 UNIT **(Max. 130 kg) (S4)**	
MVHXXX04R	3ARM DAMPER KIT, 2 UNITS (140- 260kg) ***(S4)***	
MV330605	KIT L11 MANUAL LOCKING **BS-BM (S3)**	
MV305205R	SWIVEL ARM LOCKING SUPPORT (L11, L22, L92)	

[5] XXX corresponde a la carga del amortiguador

MV30G1A3	BUTTON PANEL COVER, L22 ***(S3,S4)***	
MV404604R	SOLENOID VALVE PUNCH ASSEMBLY, NB ***(S3,S4)***	
NH121136	SWITCH, VM1000 4NU 08 ***(S4)***	
EL101500	PRESSURE SWITCH, 1/8", NC, 6 BAR ***(S4)***	
NH026026	SMC SOLENOID VALVE ***(S4)***	
MV431405	PARKING REPLACEMENT KIT (***S4)***	
MV406503	CLAO CAP, CIL 38 ***(S4)***	
MV405903	CLAO CAP, CIL 42 ***(S4)***	
MV405504	RADIAL ARM LOCK CYLINDER ***(S4)***	
Mv406004	SWING ARM LOCK CYLINDER ***(S4)***	
MV499104R	AIR FILTER ASSEMBLY ***(S4)***	
MV4062A4	D33 RADIAL PAD ASSY ***(S4)*** (From S/N: 003-631/ 004-95)	

MV4064A4	D33 JOINT/UNION PAD ASSY ***(S4)*** (From S/N: 003-631/ 004-95)	
MV4315A5	RADIAL ARM PAD REPLACEMENT KIT (***S4)*** (Previous S/N: 003-631 /004-95)	
MV4316A5	JOIN PAD REPLACEMENT KIT *(**S4**)* (Previous S/N: 003-631 /004-95)	
MV431805	SWING ARM PAD REPLACEMENT KIT L22-L92 ***(S4)***	
MV431905	SWING ARM PAD REPLACEMENT KIT L11 **(S4)**	
MV432405	KIT CAP HOLDERS SELECTORS ***(S4)***	
MV431105	MAGNET REPLACEMENT KIT ***(S4)***	
MV431705	MAGNETIC BASE ANCHOR REPLACEMENT KIT ***(S4)***	
MV432205	MAGNETIC BASE ANCHOR REPLACEMENT KIT, LOCK ***(S4)***	
MV3034A5R	L11 MANUAL LOCKING DS-DM FRONT	
M3210400R	L11 MANUAL LOCKING DS-DM REAR (BASE)	
MV4075A3	BUTTON PAD COVER L92	

M31794A0R	SWIVEL LOCK HANDLE ASSEMBLY L11	
AC060406	RADIAL HANDLE L11	
MV397204R	STAY 800	
MV498804R	STAY 500	

11 ACCESSORIES

Caution: not all the accessories shown below are compatible. Check the compatibility table [See COMPATIBILITY OF ACCESSORIES page 58].

BENCHES

(1) (2) (3)



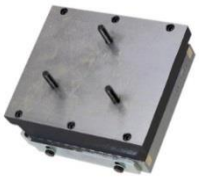
Four wheels (two with brake)
Slots for fastening parts or tools.
Supports for tap holder or tools.

CODE	DESCRIPTION	DIMENSIONS		MAX. LOAD
TP0001A0	Small bench (1)	500 x 500 x 900 mm	19 11/16" x 19 11/16" x 35 7/16"	100 kg
TF0001A0	Medium bench (2)	850 x 850 x 850 mm	33 7/16" x 33 7/16" x 33 7/16"	200 kg
907B00A0	Large bench (3)	1100 x 850 x 850 mm	43 5/16" x 33 7/16" x 33 7/16"	500 kg

SUPPORTS

(1)

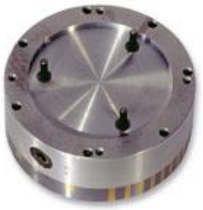
Tie for securing the machine
Magnetic support for placing it on a metal surface and securing the machine



(3)

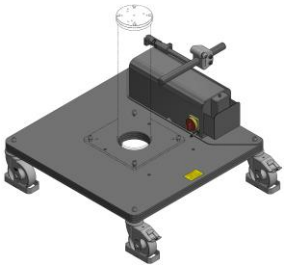
(2)

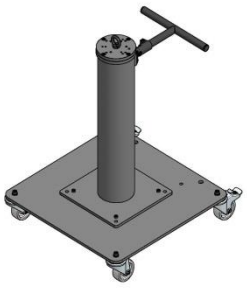
CODE	DESCRIPTION	DIMENSIONS
BR000100	Small tie (1)	N/A
BR100100	Large tie (2)	N/A
IA000100	Magnetic support (3)	150x150
IB000100	Magnetic support (4)	Ø200
IC000100	Magnetic support (5)	Ø250



(4)(5)

TROLLEY



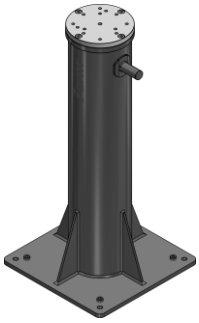


To move the work unit.
It has four orientable wheels.

DESCRIPTION	DIMENSIONS	
Carriage 700	700 x 700 mm	27 9/16" x 27 9/16"
Carriage 900	900 x 900 mm	35 7/16" x 35 7/16"
Electric carriage	900 x 900 mm	35 7/16" x 35 7/16"
Electric carriage	800 x 800 mm	31 1/2" x 31 1/2"

FIXED COLUMN

To secure to the floor using four metal studs.



DESCRIPTION/DIMENSIONS	
Column 62 mm	2 ½ "
Column 112 mm	4 3/8″
Column 162 mm	6 3/8″
Column 275 mm	10 7/8"
Column 375 mm	14 ¾"
Column 450 mm	17 ¾"
Column 635 mm	25"
Column 740 mm	29 1/8"
Column 850 mm	33 ½"
Column 1100 mm	43 ¼"
Column 1350 mm	53 1/8"
Column 1600 mm	63"

LIFTER

It consists of a telescopic column and a pneumatic cylinder with anti-rotation.

DESCRIPTION	VERTICAL TRAVEL
Lifter 300	300 mm – 11 7/8"
Lifter 500	500 mm – 19 7/8"
Lifter 750	750 mm – 29 17/32"

COLUMN D63

Pneumatic lift. The vertical position can be locked at any point, it has a pneumatic cylinder. It can be secured to the ground, on a trolley or on the ground rail to have movement on two shafts.

DESCRIPTION	VERTICAL TRAVEL
Column 1500 D63	940 mm – 37"
Column 2000 D63	1440 mm – 56 11/16"
Column 2500 D63	1940 mm – 76 3/8"

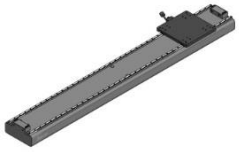
EXTENSION

(1) (2)

Extender that enables the arm's working area to be increased. It can also be installed on other accessories, such as column, lift, beam, etc.

DESCRIPTION	ADDITIONAL WORK AREA
Extension 500 (1)	500 mm – 19 11/16"
Extension 1000 (2)	1000 mm – 39 3/8"

FLOOR RAIL



Rail to fasten to the floor and on which the different columns and lifts can be fastened. Several sections can be joined from a base section 2 m. The horizontal position can be locked at any point.

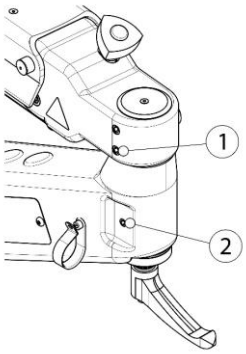
CODE	DESCRIPTION	TRAVEL
CL040000	Floor rail	1520 mm – 59 13/16"

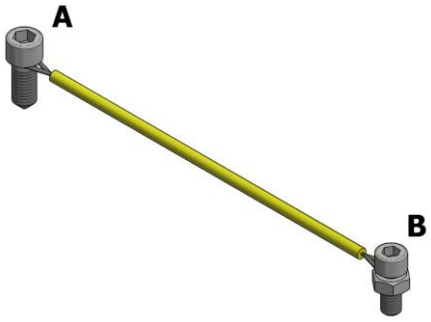
LINEAR GUIDE

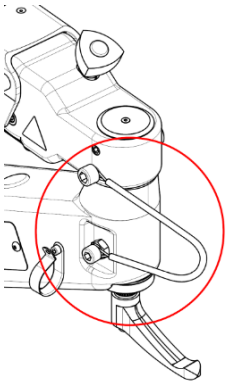
Guide for the horizontal movement of the arm. Several sections can be joined from a base section 2 m. This may be bench-top, fixed to the wall or ceiling, or on pillars of various heights that can be selected. The horizontal position can be locked at any point.

CODE	DESCRIPTION	TRAVEL
CL023300	Linear guide 1000	635 mm – 25"
CL020000	Linear guide 2000	1635 mm – 64 3/8"
CL023000	Linear guide 3000	2635 mm – 103 3/4"

ROTATION LIMITER







The rotation limiter is a flexible reinforced steel cable that limits the rotational movement of the front arm, to a maximum of 1 turn, with an added margin of 10% in each rotation direction.

To assemble it, unscrew the screws/studs (1) and (2) that come in the arm from the factory, and replace them with screws "A" and "B" in the KIT.

Screw "A" (M12) will go in position 1 and screw "B" (M10) in position 2.

CODE	DESCRIPTION
LG100600	Rotation limiter assembly

BASE ROTATION LIMITER

Support that limits the rotation of the radial arm of the equipment. The stops can be moved to adjust the range of rotation.

CODE	DESCRIPTION
LG000104	Rotation Limiter

HAND RAIL BRACKET

Bracket which enables you to couple your equipment to existing components in the workplace such as handrails, structures, etc.

CODE	DESCRIPTION
CL108500	Hand rail bracket

11.1 COMPATIBILITY OF ACCESSORIES

ACCESSORY	SERIES – 3 ARM					
	S0	S1	S2	S3	S4	S6
RADIAL EXTENSION	●	●	●	●	●	●
TROLLEY + FIXED COLUMN	●	●	●	●	●	●
FIXED COLUMN	●	●	●	●	●	●
PNEUMATIC TELESCOPIC LIFT	●	●	●	●	●	●
D63 PNEUMATIC LIFTER	●	●	●	●	●	●
FLOOR RAIL	●	●	●	●	●	●
LINEAR GUIDE	●	●	●	*	*	*
SMALL BENCH (500)	*	●	●	⦸	⦸	⦸
MEDIUM BENCH (850 x 850)	●	●	●	*	*	*
LARGE BENCH (1100 x 850)	●	●	●	●	●	●
SMALL TIE	⦸	●	●	*	⦸	⦸
LARGE TIE	●	●	●	●	●	●
HAND RAIL BRACKET	●	●	●	●	●	●
MAGNETIC SUPPORT	*	*	*	*	*	*
ROTATION LIMITER	⦸	⦸	⦸	●	⦸	⦸
BASE ROTATION LIMITER	●	●	●	●	●	●

● = Compatible
⦸ = NOT Compatible
* = Please ask

12 WARRANTY

See attached warranty document.

13 GUIDELINES FOR PACKAGING, TRANSPORT AND DISMANTLING

13.1 PACKAGING

Follow the instructions below for packing the equipment for location changes or shipments for repair and maintenance.

13.1.1 Preparatory measures

The equipment must be placed out of service. Assembling the "transport safety elements" will prevent movement during transport and thus possible damage to the installation.

13.1.2 Choice of packaging

For long transport distances, the components of the production installation must be packed in such a way that they are protected from atmospheric conditions.

13.1.3 Inscription on the packaging

Observe the specific provisions of the country in which the equipment is transported. In fully closed packaging, an indication must be placed on the packaging indicating where the top is.

13.1.4 Packaging procedure

Place the components of the machine on manufactured wooden pallets. Use lashing straps to ensure the components are secured against possible falls. Attach all the technical documentation that must accompany the machine.

13.2 TRANSPORT

The following data must be taken into account for transport.

- ✓ Approx. external dimensions (width x height x depth):
  - DS and BS Arm: 750 x 370 x 260 mm
  - BM Arm: 1160 x 570 x 360 mm
- ✓ Total weight depending on the segment: maximum approx. 13,5 kg

13.3 DISASSEMBLY

- ✓ The equipment must be taken out of service by duly trained and authorised personnel.
- ✓ The machine must be dismantled taking the safety instructions, waste disposal and recycling into account.
- ✓ Protect the environment. The machine must be disposed of pursuant to current regulations and guidelines on safety, noise prevention, environmental protection and accident prevention.

NOTES

DATE	DESCRIPTION

CE STATEMENT OF COMPLIANCE

The manufacturer:

Company:	TECNOSPIRO MACHINE TOOL, S.L.U.
Address:	P.I. Pla dels Vinyats I, s/n nau 1
City:	Sant Joan de Vilatorrada
Country:	Spain - EU

Declares that this product:

Name:	Series 0
Serial number:	From 000 - 023

It is classified as a machine according to the Machinery Directive 2006/42/EC and to which this Declaration refers, and complies with the following European EC Directives, and their applicable Essential Health and Safety Requirements (EHSR):

2006/42/EC – Machinery Directive

2014/68/EU – Pressure Equipment Directive

Authorised for documentation:

Mr Ramon Jou Parrot of TECNOSPIRO MACHINE TOOL, S.L.U.

Sant Joan de Vilatorrada, Monday, 30 October 2023

Ramon Jou Parrot, Technical Director