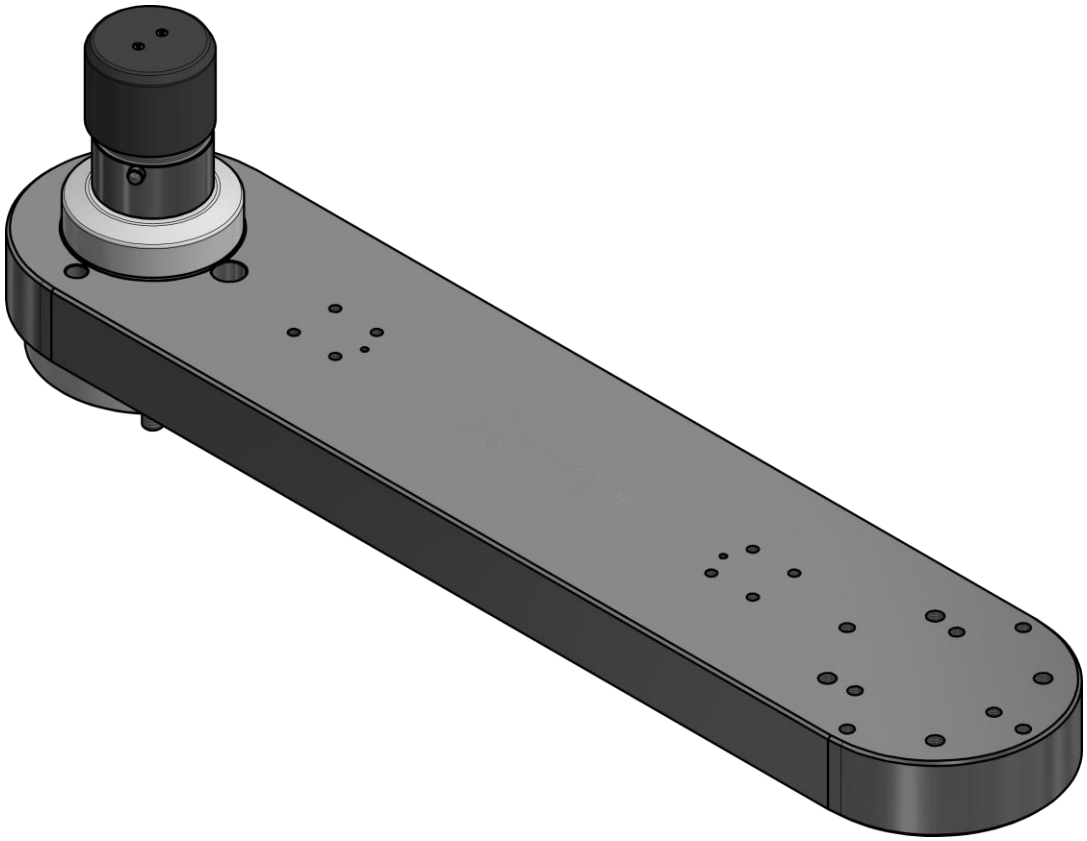
INSTRUCTION MANUAL

3arm®

RADIAL EXTENSION 600



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TECNOSPIRO MACHINE TOOL SLU

DESIGN & QUALITY 3arm Made in Barcelona

www.3arm.net

CONTENTS

1 INTRODUCTION

Dear Customer,

Thank you for choosing the Radial Extension 600. Your trust in us is what motivates us to continue our efforts to provide customers with a simple, reliable and flexible way of improving ergonomics at work.

We hope that you find these simple instructions useful when setting up and using your chosen machine. We recommend that you pay special attention to the pages containing installation, maintenance and safety information.

We wish you many years of productivity using your machine, and we hope that you have backed up your initial investment by purchasing a lifting column compatible with 3Arm® products.

2 ABOUT THIS MANUAL

This document is the instruction manual for the Radial Extension 600.

- ORIGINAL MANUAL –

Intellectual/Industrial Property Information

Tecnospiro Machine Tool, S.L.U. (the Company) declares itself to be the owner of or have exclusive usage rights to all the elements that feature in this document, including text, images, graphic designs, brands, trade names and company names (hereinafter, Intellectual/Industrial Property). Any copying, reproduction, distribution, public communication or use, whether wholly or in part, of this Intellectual/Industrial Property, in any shape or form, without the Company's express written permission is strictly prohibited, even if the source is credited. Any use of any content which, by its nature, could be considered similar to the Company's Intellectual/Industrial Property is also strictly prohibited.

2.1 CONSIDERATIONS

- ✓ Before using the equipment, ensure that you read this instruction manual in full and follow the safety and operating instructions correctly.
- ✓ All instructions contained in this manual refer to the specific device in question; it is the end user's responsibility to assess and apply any necessary safety measures required for the intended use of the equipment.
- ✓ This manual should be kept near the equipment at all times so that it can be consulted in the future if necessary.
- ✓ If any part of this manual seems unclear, confusing or inaccurate, please do not hesitate to contact us.
- ✓ The contents of this manual may be subject to change without prior notice.
- ✓ If this manual becomes lost or damaged, please contact TECNOSPIRO MACHINE TOOL, S.L.U. to request a new one.
- ✓ This document, or any part thereof, may only be reproduced or issued to third parties with the express written authorization of TECNOSPIRO MACHINE TOOL, S.L.U.
- ✓ Some illustrations in this manual may differ from the equipment in question and should be understood as being representative of the standard product.

Paragraphs containing assembly, adjustment, installation and maintenance instructions shall have a brown background.

Paragraphs containing important information shall have a grey background.

2.2 VERSION

Document	Revision date
Instruction Manual	7/10/2023

3 SAFETY INFORMATION

3.1 SCOPE OF APPLICATION

This section contains very important information concerning how to use this equipment safely. It is intended for anyone involved in any stage of the life cycle of this equipment (transportation, assembly, installation, commissioning, adjustment, training, operation, cleaning, maintenance, troubleshooting and disassembly/decommissioning).

3.2 WARNINGS AND GENERAL CONSIDERATIONS

- ✓ The equipment described in this document has been built using current technology and conforms to all applicable technical safety standards. However, misuse or improper configuration by the end user may result in a risk of injury.
- ✓ The equipment should only be used if it is proper working order. All safety rules and instructions in this document should be adhered to at all times.
- ✓ Any issue that could affect the safety of the equipment should be corrected immediately.
- ✓ No modifications should be made to this equipment without prior authorization from TECNOSPIRO MACHINE TOOL, S.L.U.
- ✓ The equipment should only be used for its intended purpose; any other use is strictly prohibited. All use other than that indicated in this document will be considered improper use and is strictly prohibited. The manufacturer accepts no liability for any damage that may arise from such misuse.
- ✓ The installer, owner and/or end user are responsible for determining whether the product is appropriate for its intended use, as well as determining the installation site and specifically defining the task to be performed using this product, within the constraints set out in this manual.
- ✓ Do not use this equipment for any purpose not covered in this manual.
- ✓ The operator may only use the equipment once they have received appropriate instructions regarding its operation.
- ✓ It is recommended that only one operator use the equipment at one time; any other use should be assessed by the installer / end user.
- ✓ The area where the equipment will be used and its immediate vicinity must comply with workplace healthy, safety and hygiene standards; the installer / end user is responsible for ensuring that the work area is safe at all times.
- ✓ The presence of any personnel other than the user in the working area should be restricted as much as possible to avoid any safety risks; if any other usage is intended, an additional assessment of any potential risks should be carried out.

- ✓ It is important that all operators of this equipment are familiar with its operation and have received sufficient training in the use of this product or similar equipment.

- ✓ All operators must ensure that they have read and fully understood this manual before using the equipment, regardless of any prior knowledge, training or experience they may have with similar equipment; the sections containing installation, operation and safety information are especially critical.

- ✓ If you are unsure about how to use or maintain this product, please contact your 3Arm® and/or Roscamat® distributor.

3.3 RESTRICTIONS

The device is not intended for the following uses:

- ✓ Use of any component or feature of the equipment except as specified in this manual.
- ✓ Use by animals or by any person with any type of disability
- ✓ Use by anyone who has not completed a workplace risk prevention course

This equipment should not be installed in:

- ✓ Corrosive atmospheres
- ✓ Dusty environments
- ✓ Area with high electromagnetic emissions
- ✓ Areas with extreme temperatures (very high or very low)
- ✓ Areas with high humidity
- ✓ Outdoors

3.4 SYMBOLS AND ICONS

- ✓ Throughout this manual and on the equipment itself, symbols and diagrams are used with the following meanings:

	General danger symbol. This symbol is generally accompanied by an additional symbol or a more detailed description of the danger.

3.5 SYSTEM INSTALLATION

The system installer or end user is responsible for installing the machine in the facility in full respect of all relevant safety measures.

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

- ✓ Location and correct installation.
- ✓ Connections.
- ✓ Risk assessment.
- ✓ Installation of all necessary safety and security features.

3.6 PERSONAL PROTECTIVE EQUIPMENT (PPE)

The personal protective equipment required when using this product consists of: **safety boots, a safety helmet, safety glasses and safety gloves**, all of when should be worn when transporting, assembling, installing, commissioning or disassembling the equipment.

Safety footwear, safety gloves and safety goggles should be used whenever operating the machine, making adjustments, troubleshooting or providing or receiving training.

The installer / end user is responsible for specifying the personal protective equipment required, according to the intended application for the equipment, in accordance with obligatory health, safety and hygiene requirements.

Operators must not wear loose clothing, rings, bracelets or wrist watches as these may get caught in the mechanisms of the machine.

Hair should also be tied back to prevent it from getting caught the machine's moving parts.

3.7 LEVEL OF TRAINING FOR PERSONNEL WHO WORK WITH THE DEVICE

Anyone working with this equipment must ensure that have read and understood the safety chapter of this document.

The minimum level of training required in order to use the manipulator will be:

- Production operators: occupational risk prevention course, complete training on workstations and residual risks of the machine. Minimum one year of experience with similar installations.

- Maintenance operators: Occupational risk prevention course, complete training in handling, operation, maintenance and conservation of the machine and residual risks. Minimum two years of experience with similar installations and the necessary technical competence to perform tasks without problems.

- Cleaning operators: Occupational risk prevention course, training on products and procedures to perform cleaning tasks.

- Apprentices / Students: May only work on the machine if supervised at all times by a person in charge of the equipment.

- Public (non-operators): Any non-operator visiting or passing the equipment must maintain a minimum safety distance of two meters from the ends of the machine perimeter.

4 GENERALDESCRIPTION AND TECHNICAL INFORMATION

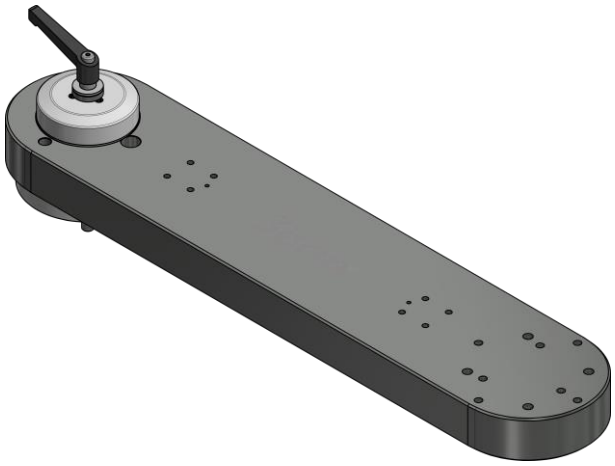
The Radial Extension 600 is designed to increase the working area of 3Arm equipment, such as weightless arms and manipulators, manufactured by Tecnospiro Machine Tool, S.L.U.

The base allows free 360° rotation. It can be locked in any position using the locking lever on the base.

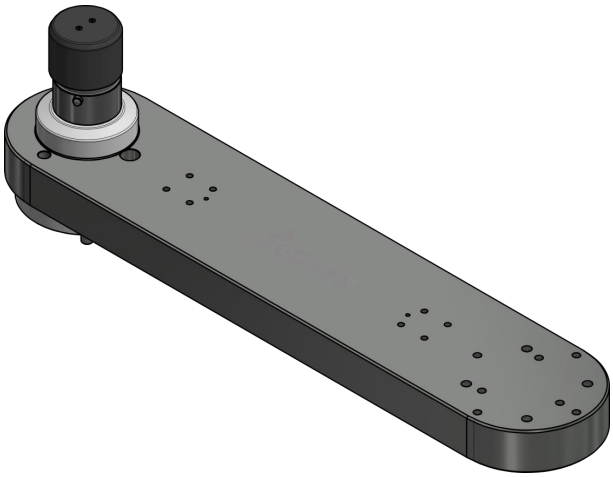
INTEGRATION

- ✓ This equipment is not a complete machine. It requires additional compatible equipment (Roscamat® or 3Arm® devices) to perform a task. The installer is responsible for assessing and identifying any potential risks associated with its chosen application.

4.1 CONFIGURATIONS



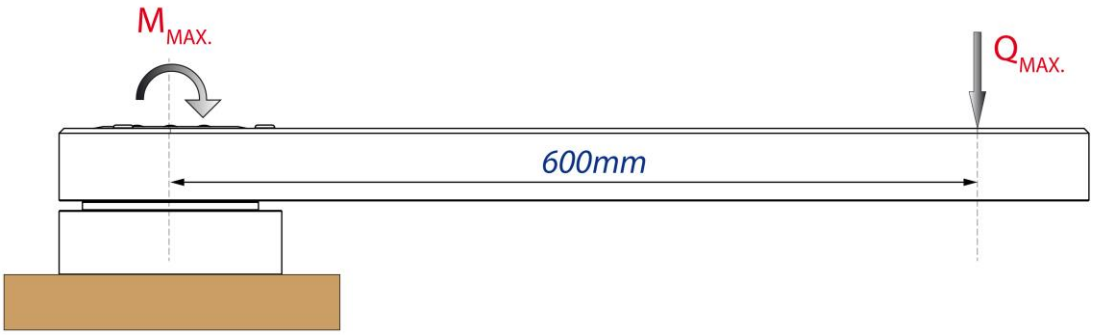
With manual locking



With automatic locking

4.2 TECHNICAL SPECIFICATIONS

GENERAL TECHNICAL SPECIFICATIONS		
Maximum load[1]		270 Kg *(595 lb)*
Maximum moment[2]		1600 Nm *(1180 lb ft)*
Unloaded weight[3]		20 kg *(44.10 lb)*
Pneumatic specifications[4]		
	Feed fluid	Pressurized air
	Working pressure	0.5 to 0.7 MPa *(5 to 7 bar)*
Working conditions		
	Temperature	-10 to +50ºC
	Relative humidity	Max. 70%
	Environment	Industrial environments



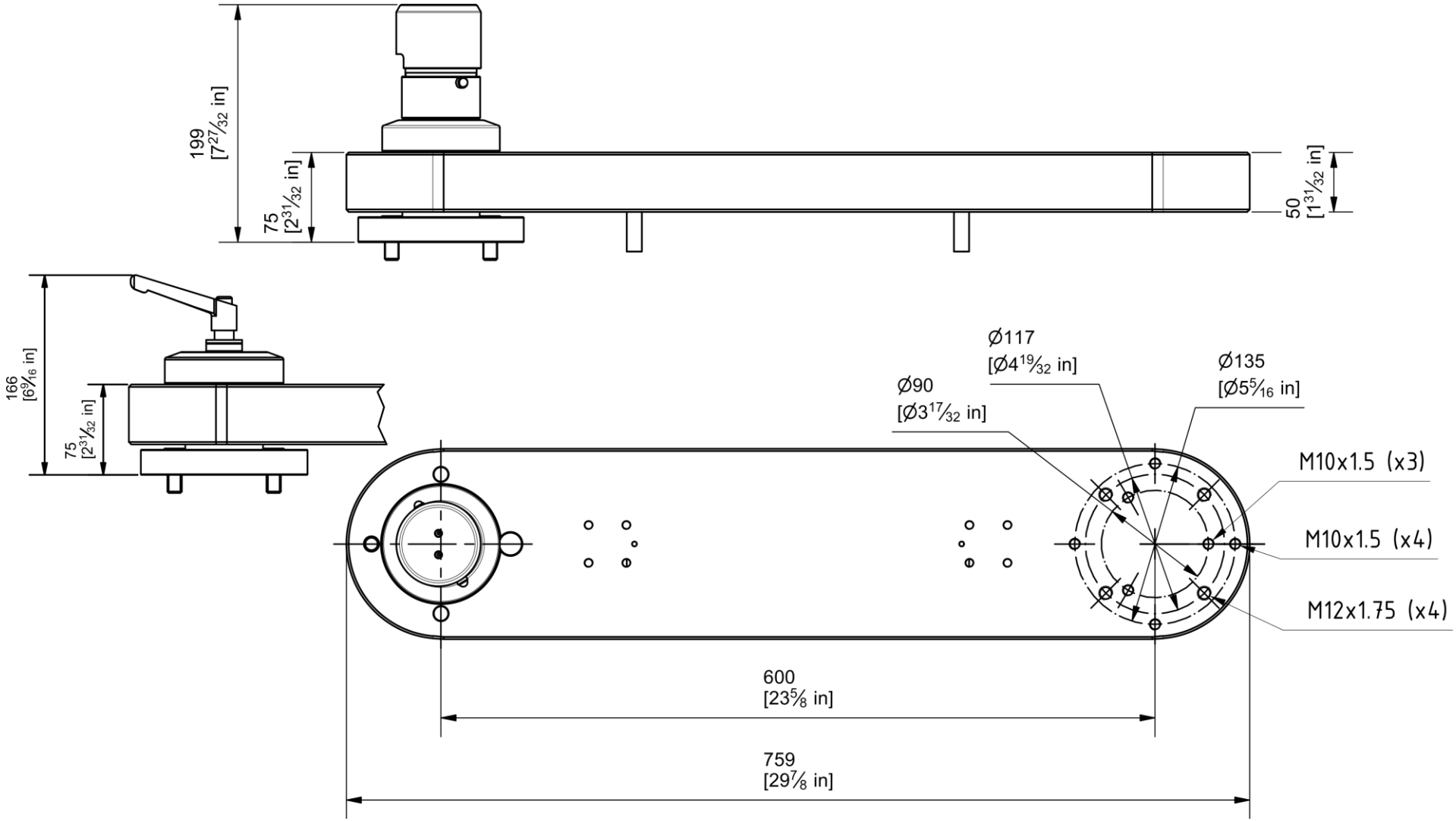
[1] **Maximum load (Qmax.):** Maximum load that can be sustained under the conditions set out in this manual. It is defined as the load placed at the end of the extension. The maximum load value for the version purchased can be found on the identification label.

[2] **Maximum moment (Mmax.) :** Maximum applicable moment at the center of the base of the Radial Extension 600. The Maximum Moment value for the version purchased can be found on the identification label. The use of the equipment in conjunction with loads that cause the Maximum Moment to be exceeded is strictly prohibited.

[3] **Unloaded weight:** The unloaded weight refers to the dead weight of the Radial Extension 600

[4] For versions with pneumatic locks.

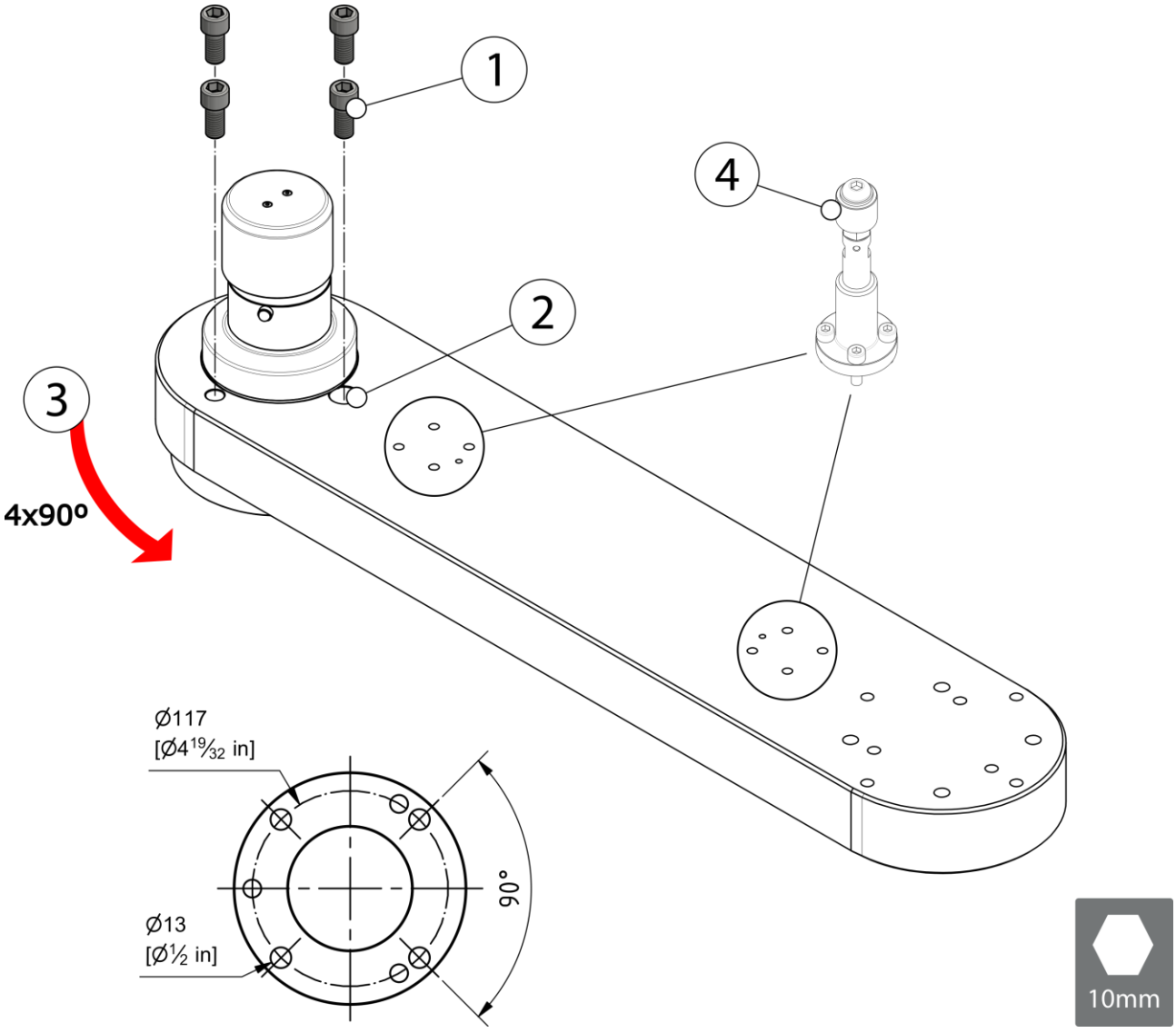
4.3 GENERAL DIMENSIONS



5 INSTALLATION

1. Remove the radial extension from its original packaging.
2. Place the radial extension on a flat, stable and sufficiently robust horizontal surface.
3. Holding the base of the extension, rotate the free end in order to insert the M12 screws (1) through the large hole (2).
4. Insert and tighten the four screws (with a 10mm Allen key). Once the first screw is in place, rotate the extension 90º (3) to line up the next hole (2), and so on until all four screws are in place.
5. The stop (4) should be installed in one of the positions indicated according to the extension's intended application.

If required for safety reasons, assign two operators to perform this task.



GENERAL INSTALLATION CONSIDERATIONS

- ✓ The work bench or location for installation must be a horizontal surface to prevent drifting and shifting. It should also be sufficiently stable and robust.
- ✓ The installation steps below will depend on how the device is anchored and the alternatives available in the chosen installation location. Regardless, the installer, owner and/or end user are responsible for determining whether the product is appropriate for each specific use, as well as for determining the installation site and specifically defining the task to be performed with this product, within the constraints set out in this manual and the Declaration of Conformity.

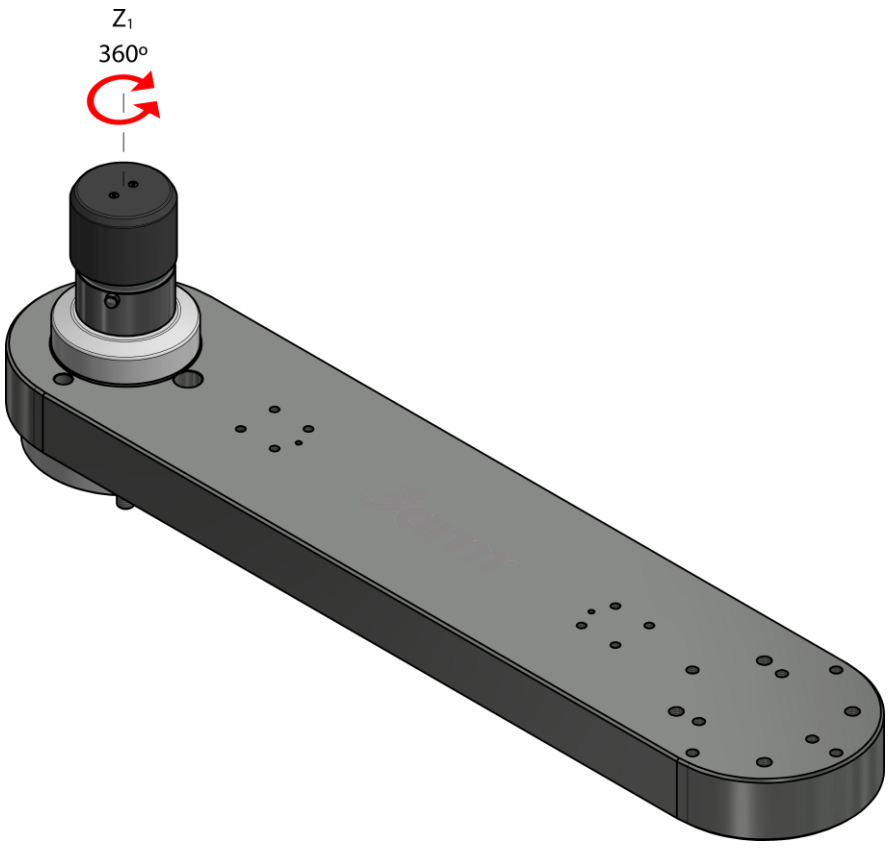
INSTALLATION LOCATION

Do not install the equipment in the following areas:

- ✓ outdoors
- ✓ areas with corrosive atmospheres
- ✓ areas with extreme temperatures (very high or very low)
- ✓ areas with high humidity
- ✓ dusty areas

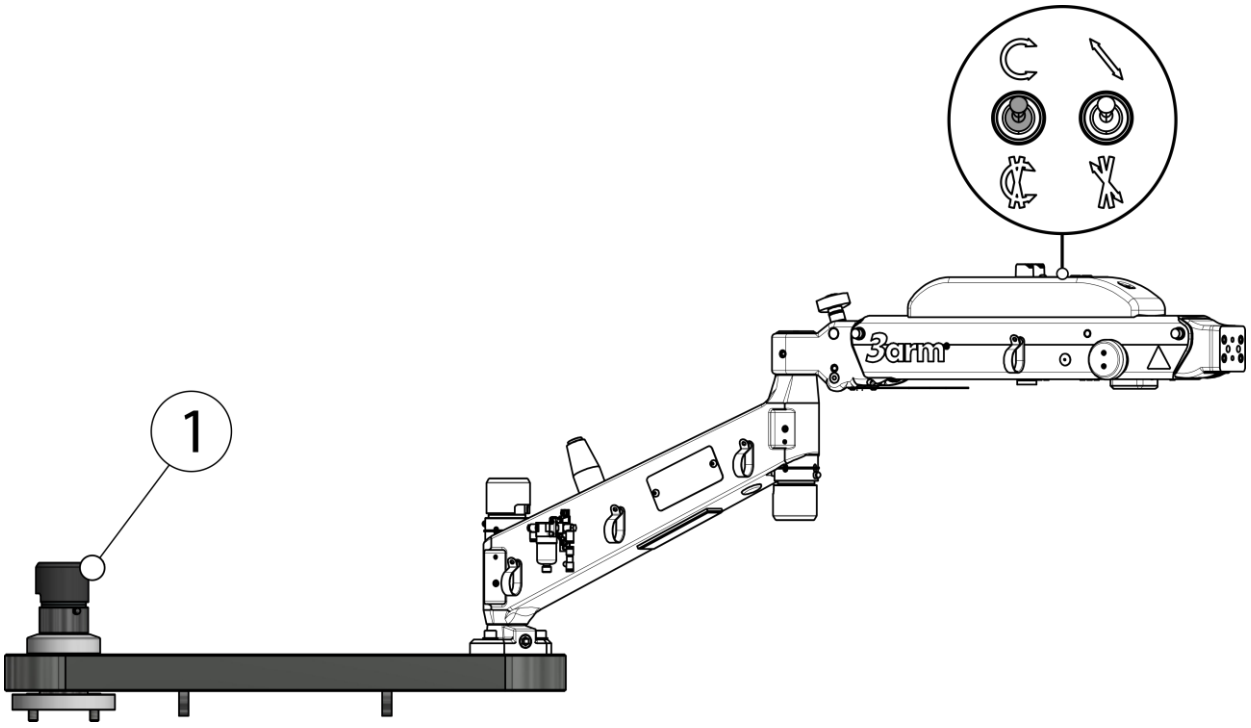
6 MOVEMENTS

360° Z-axis movement, lockable in any position using the locking lever or cylinder.



7 OPERATION

The radial extension allows radial movement of the base to be pneumatically locked. This is achieved using selectors.



1- Radial base locking

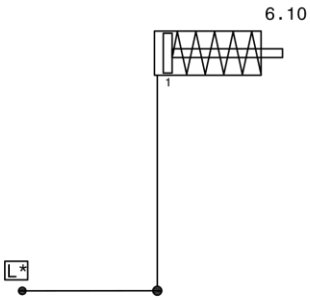
Selector position to lock movement.

Movements	Selectors	Cylinder control
Radial movement		1

7.1 PNEUMATIC DIAGRAM

REF	QUANT	CODE	DESCRIPTION
6.10	1	W5178900	50 CYLINDER ARM BRAKE

L2 -> 3ARM
L8 -> MANIPULATOR



DESCRIPTION	CODE
PNEUMATIC SCHEME - BRAKE EXTENSION	PNEUER0001

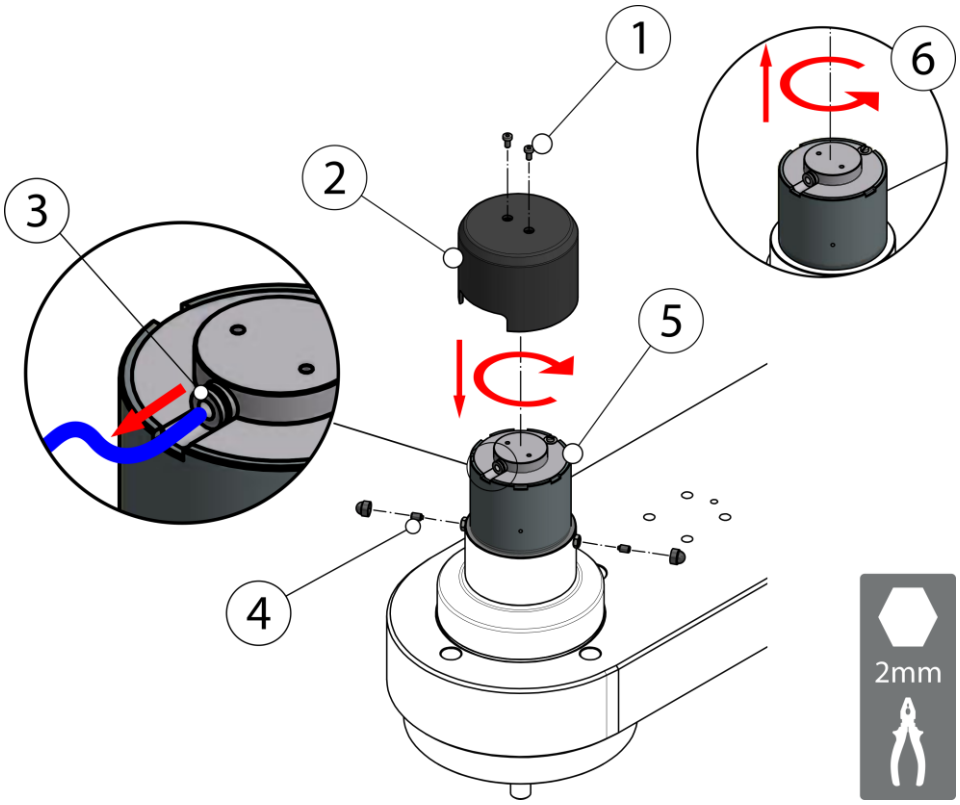
*				
	NAME	DATE	REVISION	
DRAWN BY	Alex C.	09/06/2023	0	TECNOSPIRO MACHINE TOOL SLU
APPROVED BY	OSCAR	09/06/2023		

8 MAINTENANCE

8.1 SUPPLY CHECK AND RADIAL CYLINDER ADJUSTMENT

To check the cylinder adjustment, perform steps 1 to 8, omitting step 4.
To check the air supply, perform steps 1 to 4 and then step 8.

1. De-pressurize the arm.
2. Remove the screws (1) (with a 2 mm Allen key) and remove the cap (2).
3. Disconnect the air supply tube from the fitting (3) feeding the cylinder.
4. To check the supply, turn on the air supply, activate the locking mechanism and check that air is flowing from the tube.
5. To check the cylinder adjustment, loosen the stud bolts (4) (with a 2mm Allen key).
6. Turn the cylinder (5) clockwise until it stops.
7. Unscrew the cylinder (5) counterclockwise slightly (6) (approx. 1/12 of a turn).
8. Proceed in reverse order for assembly and check the operation of the locking mechanism once more.

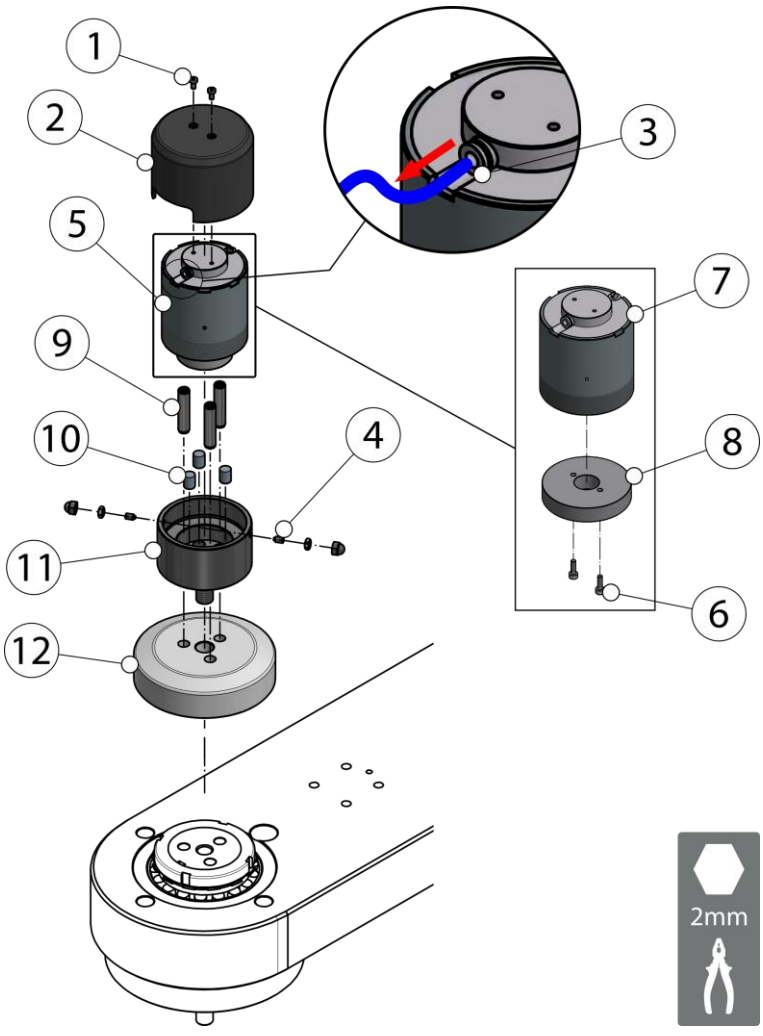


If the problem persists, this is probably due to a cylinder malfunction or worn brakes (in each case, the component in question should be replaced).
If no air flows from the tube when performing the supply check, the pneumatic circuit should be checked, paying special attention to any pinching and the connections between tubes and branches [See PNEUMATIC DIAGRAM page 14].

8.2 REPLACING THE CYLINDER OR RADIAL BRAKES

To replace the locking cylinder (9), perform steps 1 to 6 and 9 to 10.
If you have a brake subassembly replacement kit (Part 12), perform the entire process.

1. De-pressurize the arm.
2. Remove the screws (1) (with a 2 mm Allen key) and remove the cap (2).
3. Disconnect the air supply tube from the fitting (3) feeding the cylinder.
4. Loosen the stud bolts (4) (using a 2mm Allen wrench).
5. Unscrew the cylinder assembly (5) and remove it.
6. Remove the screws (6) (with a Allen key 2mm) and separate the cylinder (7) from the pusher (8).
7. Remove the pins (9) and pushers (10).
8. Unscrew the locking bushing (11), remove the brake subassembly (12) and replace it.
9. Proceed in reverse order for assembly, screwing the cylinder assembly (5) until it stops and then slightly unscrewing it counterclockwise (approx. 1/12 of a turn).
10. Check the operation of the lock.



9 3ARM COMPATIBILITY

Description	SERIES – 3arm®								
Radial Extension 600	S0	S1	S2	S3	S4	S6	S7	M3	M5
	●	●	●	●	●	●	●	⦸	●

10 ACCESSORY COMPATIBILITY TABLE

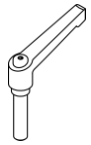
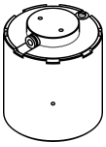
	EXTENSION 600
EXTENSION 500	⦸
EXTENSION 1,000	⦸
TROLLEY	⦸
FIXED COLUMN	⦸
PR COLUMN	●
LIFT MECHANISM 500	⦸
LIFT MECHANISM PR	●
D63 COLUMN	⦸
D100 COLUMN	●
FLOOR TRACK	●
LINEAR GUIDE	⦸

● = Compatible
⦸ = Incompatible

COMPATIBILITY

✓ The equipment has been designed to be used in conjunction with 3arm® products as well as 3arm® compatible accessories. The manufacturer accepts no liability for any damage that may result from using the equipment for other purposes.

11 SPARE PARTS

CODE	DESCRIPTION	PICTURE
CM164700	ZAMAK HANDLE	
ER0025A5	BRAKE EXTENSION SUBASSEMBLY	
W5178900	LOCKING CYLINDER ASSEMBLY	
W5180600	CYLINDER COVER	

12 WARRANTY

See warranty document attached

13 GUIDANCE FOR PACKAGING, TRANSPORT AND DISASSEMBLY

13.1 PACKAGING

Follow the instructions below when packaging the Radial Extension 600 to move it or ship it for repair or maintenance.

13.1.1 Preparation

Decommission the Radial Extension 600.
Use straps to prevent movement during transport or potential damage to the equipment.

13.1.2 Choice of packaging

When transporting over long distances, production installation components should be packaged so that they are protected from atmospheric conditions.

13.1.3 Inscription on packaging

Follow the specific provisions of the country where transport is taking place. For completely closed packages, a label must be placed on the package indicating which end is up.

13.1.4 Packing procedure

Position the Radial Extension 600 on wooden pallets. Use straps to secure components and prevent them from falling. Attach all technical documentation that needs to accompany the Radial Extension 600.

13.2 TRANSPORT

The following information should be considered when transporting the equipment.

- ✓ External dimensions vary depending on the accessories or machines being transported with the equipment.
- ✓ Total weight (according to segment): 25 kg

13.3 DISASSEMBLY

- ✓ The equipment must be taken out of service by authorized personnel who have received proper training.
- ✓ The Radial Extension 600 must be disassembled according to any safety, waste disposal and recycling procedures.
- ✓ Protect the environment. The equipment must be disposed in accordance with all applicable standards and directives relating to safety, noise prevention, environmental protection and accident prevention.

NOTES

DATE	DESCRIPTION

CERTIFICATE OF INCORPORATION

In accordance with Machinery Directive 2006/42/EC, Annex II B

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:

Designation: Radial Extension 600

Conforms to Machinery Directive 2006/42/EC

We also declare that the technical documentation for this partially complete machinery has been prepared pursuant to the requirements of Annex II B. This documentation will be released to the competent market oversight authorities with a duly substantiated application.

Use of this partially completed machinery is prohibited until it has been fully assembled and commission, in conjunction with other parts, as a machine that complies with the European Machinery Directive and has an EC Declaration of Conformity pursuant to Annex II A.

Harmonized reference standards:

Directive / Standard	Description
EN ISO 12100-1:2012	Safety of machinery. General principles for design. Risk assessment and risk reduction.
UNE-EN 349:1994+A1:2008	Safety of machinery. Minimum distances to avoid crushing of human body parts.

Documentation officer:

Mr Ramon Jou Parrot at TECNOESPIRO MACHINE TOOL, S.L.U.

Sant Joan de Vilatorrada, Monday, 10 July 2023

Ramon Jou Parrot, Technical Director

3arm®

TECNOSPIRO MACHINE TOOL SLU