User Manual

English (original)
January 2025

Metalock Machines MPB60

Traversing line boring machine

Key features	
Operational range	Ø65-600 mm (2.6-23.6 in.)
Functionality	Boring / Line Boring Facing / Grooving

Technology based on over 100 years of machining experience™

User Manual - MPB60

1. Product overview

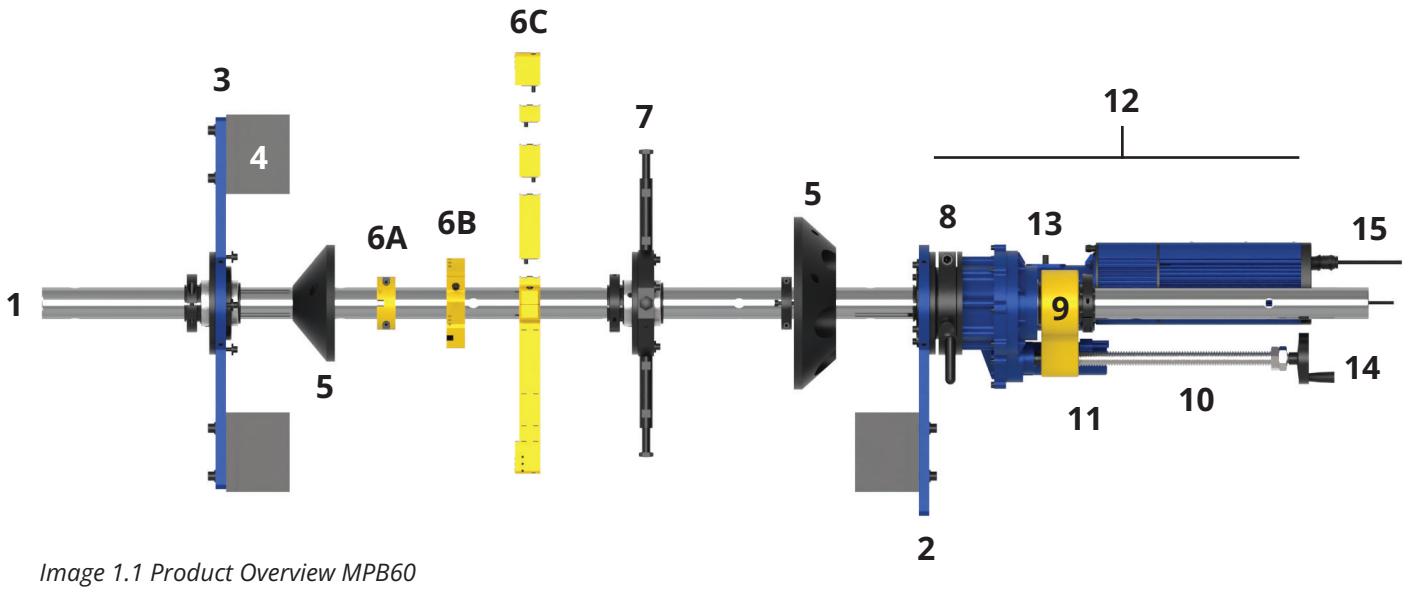


Image 1.1 Product Overview MPB60

1.1 MPB60 Line Boring Machine

1. Boring Bar
2. Mounting plate, Single arm with drive bearing assembly
3. Mounting plate, Dual arm with support bearing assembly
4. U-shaped spacer
5. Setup Cones
6. Tool Posts - A & B) Fixed, C) Premium Modular with Adjustable Head
7. Internal Diameter Mount with support bearing
8. Mounting Clamp with handle
9. Feedarm
10. Leadscrew (RFU)
11. Feed Motor
12. Rotational Feed Unit (RFU) – incl. rotational motor, motor steering unit, gearbox, feed motor
13. Gear Lever
14. Manual Axial Displacement Lever
15. Power cord, Control Unit cord and Welding equipment cord connections.
    See “Image 1.2 Connections”.

For for pruduct key specifications see “13.1 Key specifications”. For product dimensions see “Appendix iv – Dimensions”.

Image 1.2 Connections

1.2 Boxes

MPB60 Transportation and Storage box

Delivered with the machine. Wooden interior with shelves and hangers for easy storage of machine parts.

For product dimensions see “Appendix iv – Dimensions”.

Image 1.3 MPB60 Transportation and Storage box

Boring bar transportation and storage box

Delivered with the boring bar. For product dimensions see “Appendix iv – Dimensions”.

Image 1.4 MPB60 Transportation and Storage box

1.3 Control Unit

See “Image 1.5 Control Unit”

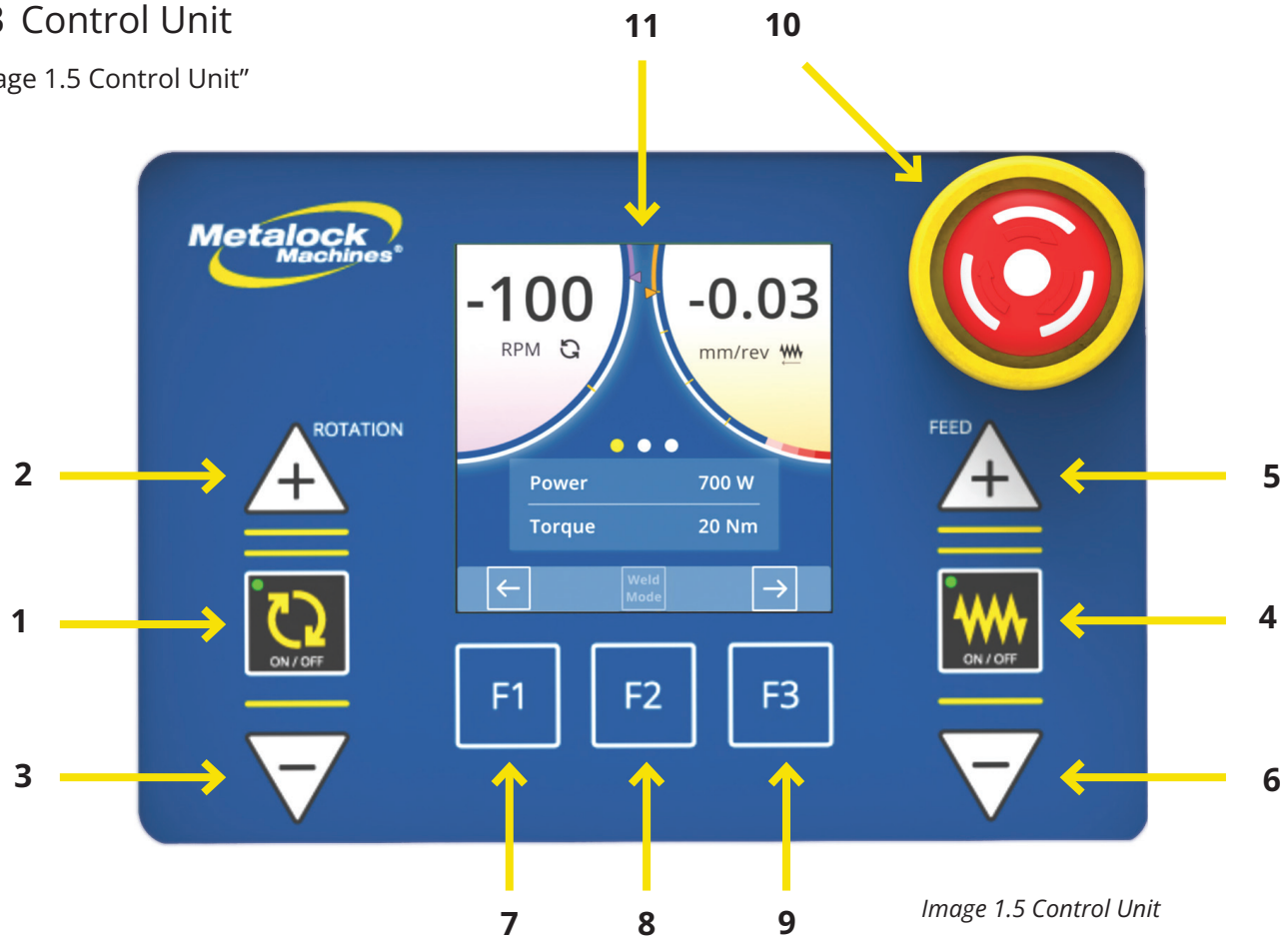


Image 1.5 Control Unit

Rotation

1. Power ON / OFF
2. Increase Velocity
3. Decrease Velocity

Feed

4. Power ON / OFF
5. Increase Velocity
6. Decrease Velocity

Function

7. F1 – Toggle information (Operational mode) / JOG Rotation (Traverse mode)
8. F2 – Toggle between Operational and Traverse mode, See “8.2 Modes”
9. F3 – Toggle information (Operational mode) / JOG Feed (Traverse mode)
10. Emergency Shutdown Device with aluminium guard
11. 4 in. 480x480 pixel screen

Control Unit Interface

See “Image 1.6 Control Unit interface”

Rotation

A. Rotational velocity (RPM), + / - direction positive or negative

B. Rotational velocity direction icon

C. Rotational velocity scale and bar (actual - colour and maximum - white)

D. Rotational velocity indication arrow, set value

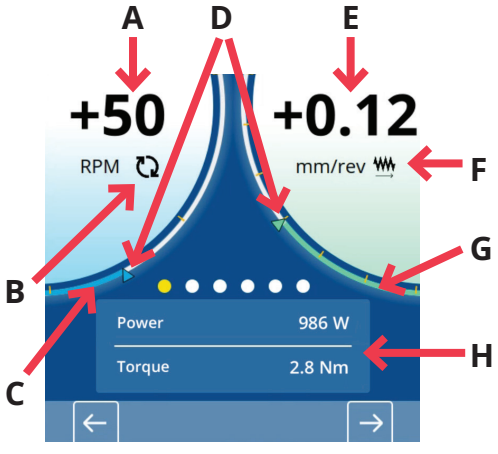


Image 1.6 Control Unit interface

Feed

E. Feed velocity (mm/rev), + / - direction positive or negative

F. Feed velocity direction icon

G. Feed velocity scale and bar (actual - colour and maximum - white)

D. Feed velocity indication arrow, set value

Data

H. Maching data parameters - (Power / Torque at motor / Feed speed (mm/min) / Temp. motor / Temp. electronics)

1.4 Machine Information Plate

Metalock Machines MPB60 houses a metal plate containing all relevant machine information, the Machine Information Plate, see “Image 1.8 Machine Information Plate placement RFU”. The informational plate is housed on the RFU and consists of three parts as shown in “Image 1.7 Machine Information Plate”: machine identification (**A**), warning and informational labels (**B**) as well as rotation and feed direction (**C**).

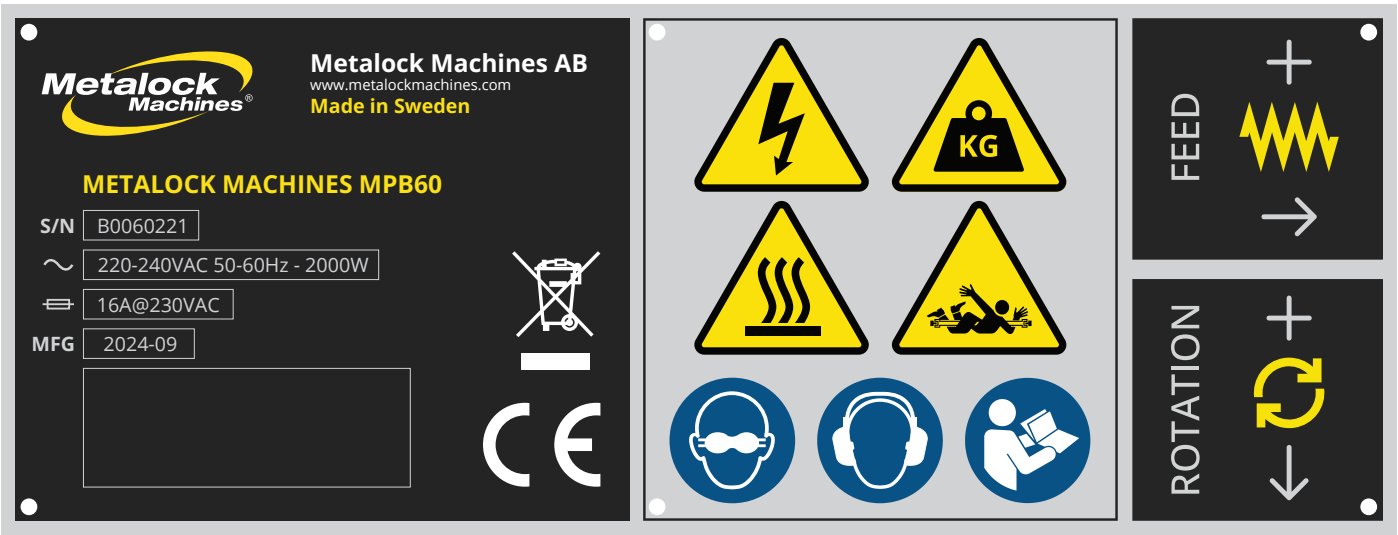


Image 1.7 Machine Information Plate

Image 1.8 Machine Information Plate placement RFU

IMPORTANT

Never alter, change, modify, or damage any part of the Machine Information Plate. If the machine identification part becomes damaged, it is important to contact your local authorised Metalock Machines service provider to have the plate replaced.

Machine Identification

Each machine has a machine tag that is unique to that specific product. The machine identification is located on the left part of the informational plate on the RFU (**A**). **The identification includes :**

- Logotype as well as company name and homepage
- Model and version
- Serial number
- Voltage
- Current
- Manufacturing date
- Customer text area
- Weee directive symbol
- CE symbol

IMPORTANT

Always refer to your product's serial number for any service or warranty claims.

Machine Labeling

The Metalock Machines MPB60 is labeled with relevant warning and informational labels. Warning and informational labels can be found in the center part of the information plate placed on the RFU (**B**).

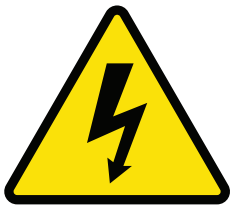
Warning and informational signs found on the machine:			
Electrical Hazard	**Heavy Product**	**Hot Surfaces**	**Risk of Entanglement**
			
Opaque eye protection must be worn	**Ear protection must be worn**	**Refer to User Manual**	
			

Table 1.1 Machine Labeling

Rotation and Feed Direction

Operational directions for the machines are placed on the right part of the machine information plate (**C**). The directions show the positive direction for rotation as well as feed/traverse. These directions correspond to the directions on the Control Unit. See "8.4 Direction of Feed and Rotation" for more details regarding operational directions.

2. Safety Information

Before using the Metalock Machines AB (“Metalock Machines”) product, it is essential to thoroughly read this manual. This manual details how to handle, mount, install, operate, disassemble, maintain, store, ship, and dispose of the Metalock Machines MPB60 Line Boring Machine. Always ensure that this manual and all relevant publications are readily accessible to any operator or user of the product.

Never use the product if the instructions require breaking local laws and restrictions. The user is responsible for adhering to these instructions, safe installation practices, and maintenance guidelines. Failure to comply with these instructions and safety guidelines may result in machine damage, serious injury, or even death.

Before intercting with any rotational parts, always ensure the machine is fully stopped and secured using a Lockout/Tagout (LOTO) procedure. Verify that all residual voltage is discharged before performing any setup, teardown, or adjustment tasks.

Metalock Machines cannot accept any responsibility if the user fails to act in accordance with this information. Metalock Machines also cannot assume responsibility for external factors or regulations that may hinder compliance with instructions or prescribed use. Never modify or disassemble any parts of the machine from their factory-delivered state. Any disassembled parts must be reassembled and inspected by an authorised supplier or the Metalock Machines factory before use.

Never purchase a Metalock Machines product from a non-authorised Metalock Machines supplier. The authenticity of the product can only be guaranteed when ordered from an authorised supplier. Metalock Machines is the original manufacturer of the machine described in this document.

Metalock Machines has the right, without prior notice, to update and change this document and product specifications at any time. Metalock Machines reserves itself from any misprints in this document. The original repository for this document can be found on metalockmachines.com.

For Compliance and Warranty see “Appendix i - CE Compliance and Warranty”, “Appendix ii - EC Declaration of Conformity in accordance with EC Machinery Directive 2006/42/EC, Annex 2.1A” and “Appendix iii - Safety information messages”.

IMPORTANT

The content in this manual is provided as a guideline to the operator. Metalock Machines cannot guarantee that the information provided is correct and applicable for applications other than those described in this manual.

Contact Metalock Machines for any enquiry

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2.1 Intended Use

All products from Metalock Machines are only to be used for their intended purposes as delivered from the factory and described in this document by the manufacturer, Metalock Machines. Any other form of usage can result in property damage, failure, serious injuries, death, as well as undesired machining results. Metalock Machines takes no responsibility for usage deviating from these instructions.

The Metalock Machines MPB60 is intended to be used only in dry, well-ventilated, well-lit, and safe environments.

The machine's intended use involves boring, drilling, facing, grooving, and welding of metal applications and surfaces. The machine is intended to be used only by trained professionals.

Never use the machine in wet conditions.

⚠ WARNING

Inaccurate use will lead to machine and property damage, as well as potentially cause unwanted machining results.

2.2 User

All Metalock Machines products should only be used by trained and qualified professionals during handling, installation, operation, and disassembly.

Never use the machine alone. It must be installed, operated, and disassembled by two or more trained professionals. Always ensure the machine is turned off, disconnected from any power source and secured using a Lockout/Tagout (LOTO) procedure before installing, adjusting, or disassembling it or any of its parts . Never set up, use, or disassemble the machine alone.

⚠ DANGER

High-powered and high-torque machines with rotating parts at high velocity and force may cause serious injuries or death. Make sure to follow all local safety regulations. Avoid loose clothing or personal belongings when operating the machine. Long hair must be contained and covered using proper headwear.

Never interact with any rotating part when the machine is turned on.

! IMPORTANT

It is the user who is solely responsible for ensuring relevant training to use the machine. Refer to your local legislation for relevant training requirements.

2.3 Safety Gear

Safety gear (PPE) must always be used when interacting with the product. Best practice safety gear includes:

- Protective eyewear
- Hearing protection
- Safety footwear
- Protective clothing

⚠ DANGER

Loose clothing, accessories, long hair, gloves etc. may get caught in the machine, causing serious injuries or death.

! IMPORTANT

It is the user's responsibility to ensure proper safety gear (PPE) according to the specific local regulations

Image 2.1 Safety gear

2.4 Work Environment

A proper work environment is key for safe and successful machining. Metalock Machines recommends inspecting the work environment prior to installing and using the machine to ensure that the conditions are good, see “2.7 Risk Assessment”. To minimise the risk of injuries or machine damage, always make sure a good work environment is present. Lighting and sight must be clear before use. The work environment shall be dry. Any obstacle obstructing free movement around the work area must be removed. The work area must always be secure, not to interfere with the use of the product. Always ensure clear floor spaces, free from oil and obstables, and a tidy environment around the machine’s workspace. Cables on the floor should be protected from external impacts. Securing the work environment ensures that non-trained and non-qualified personnel will not interact with the product or work environment .

⚠ DANGER

Do not use the machine underwater, this will permanently damage the machine. Water containment may also lead to serious injury or death.

⚠ WARNING

Hot work environments might be present due to welding. Always refer to local regulations for hot environments.

! IMPORTANT

It is the user who is always fully responsible for ensuring a good and proper work environment.

2.5 Lifting & Handling

⚠ WARNING

The machine and its individual parts as well as the machine and boring bar transportation boxes are heavy. It is recommended that two or more professionals lift and handle the machine and all its parts. Ensure to always use correct lifting equipment when handling, installing, and disassembling the product. Improper handling and lifting may result in property damage, crush injuries or fatalities.

Rotational Feed Unit

Metalock Machines MPB60 has a handle mounted to the Mounting clamp to enable the machine to be lifted by hand. The handle comes pre-mounted from factory. If supporting the motor at the far end while carrying by the handle, make sure to not damage the power and Control Unit connections.

! IMPORTANT

The handle is intended to lift the machine by hand, not by mechanical or electrical lifting equipment.

Never lift the machine by the feed motor.

Image 2.2 Carrying handle RFU

Boring Bar

The Boring bar is equipped with threaded holes (M16) at each end for fitting lifting eye bolts. For lifting capabilities, refer to selected lifting eye bolts.

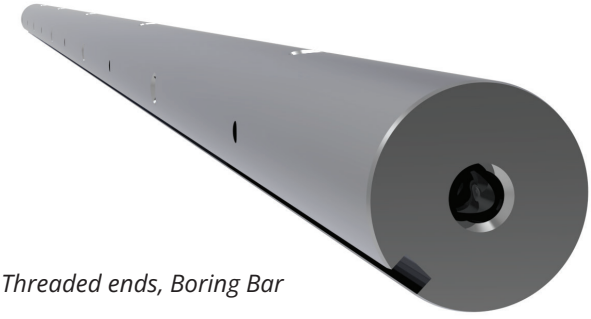


Image 2.3 Threaded ends, Boring Bar

Transportation Box

The transportation box is equipped with four handles as well as feet for lifting using a forklift. The handles are specified for lifting a maximum of 400 kg in total including the weight of the box.

Handle and lift the box with care not to damage the box, its contents, or the user.

Image 2.4 Transportation Box

Boring Bar Transportation Box

The Boring Bar Transportation box is equipped with feet for easy forklifting.

Image 2.5 Boring Bar Transportation Box

2.6 Electrical

DANGER

The machine uses high voltage to run. Improper handling and use may result in fire, serious injury or fatality.

Ensure to always use the machine with the designed voltage output, 210-250VAC 50-60Hz, 16A.

WARNING

Never cover the machine during use. Risk of the machine overheating which may lead to machine damage or fire.

IMPORTANT

If electrical cords or parts show signs of wear or damage, affected parts must be replaced before using the machine.

2.7 Risk Assessment

Generally, it is considered best practice, and sometimes mandated by law, to perform a risk assessment. Before using the machine, ensure to perform a complete risk assessment. Always refer to the risk assessment required by local authorities or the contractor. The risk assessment must be adapted to the specific application as well as environmental requirements.

Checklist example for Risk Assessment:

- Work description
- Permits
- Qualification to perform the operation
- Work environment
  - Visibility
  - Lighting
  - Surrounding environment which may affect the operation
  - Emergency exits
  - Fire safety

    - Obstacles
    - Barricades
    - Falling objects
    - Work position and lifting utilities
    - Work environment in order and secured
- Safety gear (PPE) being used
- Electrical supply
- Tools & Equipment
    - Proper tools & equipment
    - Condition of tools & equipment
    - Boring Bar for cuts, marks and/or dents

If the risk assessment indicates that something is not in order, make sure that this is managed and secured prior to starting to operate the machine.

IMPORTANT

Always check to ensure that the boring bar is clean and free of cuts, marks, and other dents. Any marks, cuts, or dents may inhibit proper use of and/or permanently damage the machine and its parts. If necessary, smooth out any uneven protrusive surface area gently. Always clean the boring bar thoroughly after use.

3. Hazards and Risks

The use of high-voltage, heavy, fast-moving machines involves multiple risks. Neglecting these risks may lead to property damage, serious injuries, or death. Listed below are the risks identified with interacting with the product.

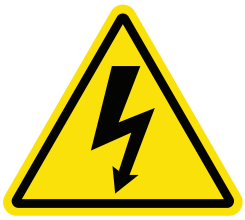
These safety information messages and symbols refer to “Appendix iii - Safety information messages” and ISO 3864:2011.

The Numbers in the images refer to the types of risks associated with the product, as stated in the chapters below. See “Image 3.1 Hazards of the MPB60”.

Image 3.1 Hazards of the MPB60

3.1 Electrical Hazard

DANGER



Be aware that electrical equipment may cause electrical shocks, leading to serious injuries or death. Faulty electrical components may cause fires. Electrical faults near flammable gases or materials may cause explosions.

IMPORTANT

Never use the machine if any electrical parts have been damaged or exposed to wet conditions.

3.2 Heavy Objects

WARNING

The product, its parts, and the transportation box for the machine and boring bar are heavy. Dropping the machine, any parts, or the transportation boxes may cause property damage, serious injury, or fatality. Always ensure proper mounting of the equipment.

3.3 Hot Surfaces

WARNING

The machine and the machined surfaces of applications may become hot during use. Caution should be taken when handling the machine during or after use to prevent the risk of burn injuries. Always ensure that machined surfaces and cutting steel are cooled before handling. If they are hot, use hand protection as necessary when handling the product during installation or disassembly.

IMPORTANT

It is not recommended to use hand protection when operating the machine due to the risk of entanglement.

3.4 Crushing Hazard

DANGER

Moving parts can pose a risk of crushing injuries to hands and other body parts. Always ensure the machine is turned off and secured before interacting with moving parts. Heavy parts may cause crush injuries during installation.

3.5 Rotating Parts

DANGER

Rotating parts and entanglement can pose a risk of serious injuries to hands and other body parts. Never interact with the machine's rotating parts or any parts near the rotating parts when the machine is in use. Rotating parts may cause cutting injuries as well as life-threatening entanglement injuries. Always ensure the machine is turned off and secured before interacting with rotating parts or the machined surface.

IMPORTANT

It is not recommended to use hand protection when operating the machine due to the risk of entanglement.

3.6 Sharp Edges

⚠ WARNING

Sharp edges are present on cutting steel. Sharp edges may also appear on the machined surfaces and metal shavings. Use extreme caution to avoid cutting injuries and death.

3.7 Noise

⚠ CAUTION

Sudden loud noises may occur during operation. Always use appropriate hearing protection in accordance with local regulations at all times.

3.8 Sparks

⚠ DANGER

Sparks may appear between the insert and the machined surface during operation. Ensure no flammable liquids, gases, or materials are in proximity, as these might ignite, resulting in injury or death. Always refer to local regulations regarding sparks and the risk of ignition.

❗ IMPORTANT

Demands special consideration for use in EX environments. The MPB60 is not EX-classified.

3.9 Flying objects

⚠ WARNING

Metal shavings from the machined surface may appear when using the machine. These may pose a risk by being propelled from the machine and machined surface at high velocity. Metal shavings may also be sharp and hot. Always use protective eyewear and proper safety clothing when using the machine to avoid serious damage to eyes or other body parts. Be aware of the risk of cutting injuries.

4. Terminology and Parameters

Terminology and parameters	
Rotation	
	Rotational displacement around the axis of the boring bar is measured in revolutions per minute (RPM). The rotational displacement of the cutting insert secures the possibility to remove material by rotational force. Rotation is possible in both clockwise and counterclockwise directions. See “8.4 Direction of Feed and Rotation”.
Feed	
	Axial displacement, measured in mm per revolution (mm/rev), occurs along the active feed length of the leadscrew, see “6.3 Active Feed Area Length”. The feed displacement of the cutting insert secures the possibility to remove material by axial force. The feed is dependent on rotational velocity. Feed displacement is possible in both positive and negative directions. See “8.4 Direction of Feed and Rotation”.
Traverse	
	Axial displacement independent of rotational velocity and is expressed as a percentage (%) of the maximum axial displacement. Traverse is possible in both positive and negative directions. See “8.4 Direction of Feed and Rotation”.
Emergency Shutdown Device - ESD	
	There is a physical Emergency Shutdown Device-button on the Control Unit that stops all axial and rotational displacement. It is secured by an aluminum frame.
Brake/Parking	
	Disables the machine from displacing either axially or rotationally. When the rotation or feed function is turned off, they are set to Brake/Parking.
Rotational Feed Unit (RFU)	
Motor and gearbox assembly including a servo motor for rotation of the boring bar, a motor control system, gearbox, as well as a feed motor. See “1. Product overview”.	
Tool Post	
The part that secures the cutting insert and holder to the boring bar. See “13.2 Tool Posts ø60 mm, minimum recommended boring diameter.”.	
Power	
Watt, W – Power output of the motor.	
Torque	
Newton Meter, Nm (ft.-lb.) – Torque output at the motor or boring bar.	

Table 4.1 Terminology and Parameters

5. Principles

5.1 Machining Principles

A brief explanation of common machining principles used for portable line boring machines.

Boring / Line-Boring

Used to enlarge or finish a pre-existing bore. A hole is bored through an axial cutting area at a specific cutting depth. Ensuring a uniform surface inside the bore of the workpiece to a specific axial depth. Boring is done by swinging a cutting tool around the axis of a boring bar, enabling adjustment of rotational cutting depth to specific diameters.

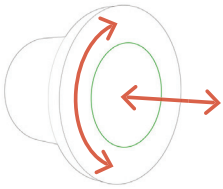


Image 5.1 Boring / Line-Boring

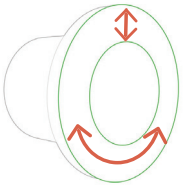


Image 5.2 Facing

Facing

A surface of the application is machined flat in a circular motion over a plane. Facing is commonly performed through axial cutting to a specific depth along the outer surface of the application perpendicular to the bore.

Grooving

Aa groove is machined into the workpiece area. Grooving is usually performed when boring or facing to secure a groove for gaskets or O-rings.

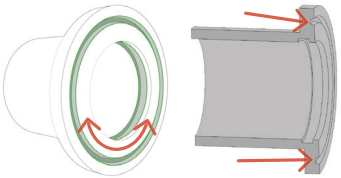


Image 5.3 Grooving

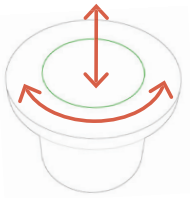


Image 5.4 Drilling

Drilling

Drilling create holes to a specific depth. The method uses a cutting tool with a fixed diameter rotating around its own axis. To increase the width of the bore, the cutting tool needs to be replaced to one with the specific diameter width.

Coupling

Coupling, similar to Boring / Line-Boring, is used to reshape and re-align pre-existing bolts holes for coupling applications and shafts.

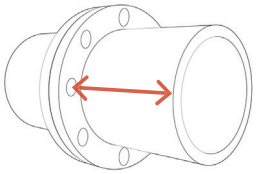


Image 5.5 Coupling

End-Hole

Similar to Boring / Line-Boring, machining end holes involves machining a pre-existing bore, see “Image 5.1 Boring / Line-Boring”. The walls of the bore, and sometimes parts of the bottom surface, are machined to the required measurements. When machining end holes, the bearing positions cannot be placed on both sides of the bore; all bearing positions must be placed on one side. See “7.12 End Hole mounting”.

5.2 Boring Machine Principles

There are two major principles for line boring machines: Traversing Bar, where the bar moves axially, and the tool post is fixed to the bar; or Traversing Tool, where the bar is fixed axially, and the tool post moves axially along the bar.

The Metalock Machines MPB60 leverages the principle of a Traversing Bar.

Traversing Bar

The Traversing Bar is a principle where the Tool Post moves with the Boring Bar. The Tool Post is securely mounted to the Boring Bar, which is in turn mounted to a feedarm. The feedarm is connected to the motor through a leadscrew. When the feed motor turns, the leadscrew rotates, causing the boring bar to displace

axially. This moves the Tool Post with the Boring Bar along the axis of the bar. The Boring Bar and Tool Post are rotated by a secondary rotational motor and gearbox.

The benefits of a traversing bar are that small-diameter bores can be machined, as a smaller tool post can be used compared to a machine leveraging the Traversing Tool principle.

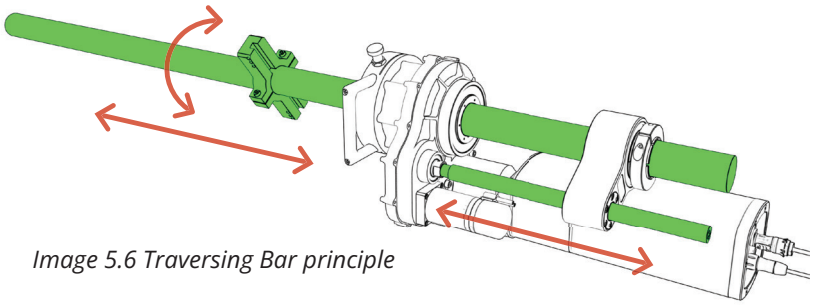


Image 5.6 Traversing Bar principle

5.3 Alignment Principle

Aligning the machine to the required precision is performed by measuring the boring bar's position to a reference surface. See "Image 5.7 Alignment principle".

When aligning the machine, at least two reference surfaces should be used. The further apart the two reference surfaces (L) are, the more precise alignment is possible, with D=0 mm (in.). The measurement should be taken at multiple spots on the reference surface for the bar to be aligned both vertically and horizontally.

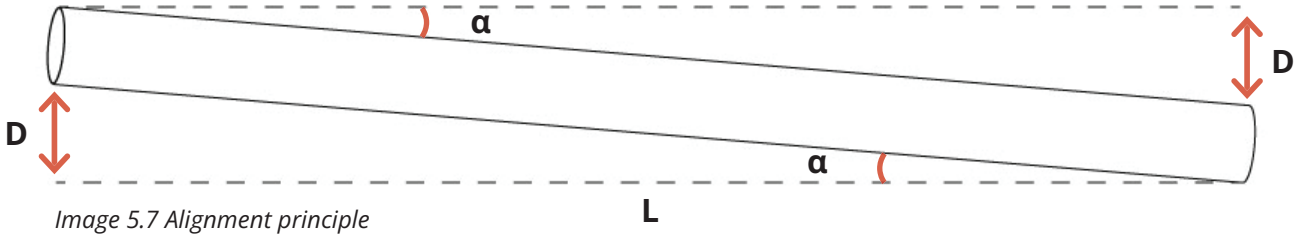


Image 5.7 Alignment principle

6. Preparations

6.1 Support bearings

The gravitational force pulls the boring bar downwards. The shorter the free-hanging span between the support bearings, the more stable the bar becomes. In contrast, the longer the span, the more the bar deflects (**D**). It is important that the bar is supported in accordance with the requirements and standards specific to the job. See "Image 6.1 Deflection of boring bar".

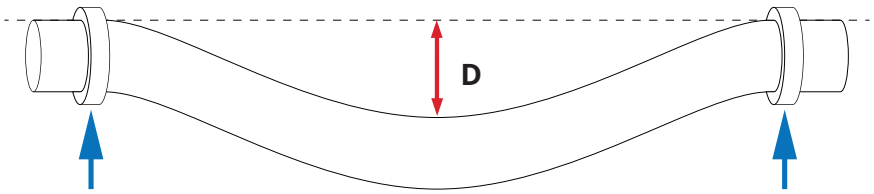


Image 6.1 Deflection of boring bar

A longer span will result in greater vibrations of the boring bar and, in turn, affect the machining result.

6.2 Bearing Types

Metalock Machines use radial spherical plain bearings to facilitate installation and maximise performance. Radial spherical plain bearings enable the boring bar to be tilted to an angle (V) of up to 4.5°. See "Image 6.2 Tilted installation with radial spherical plain bearings".

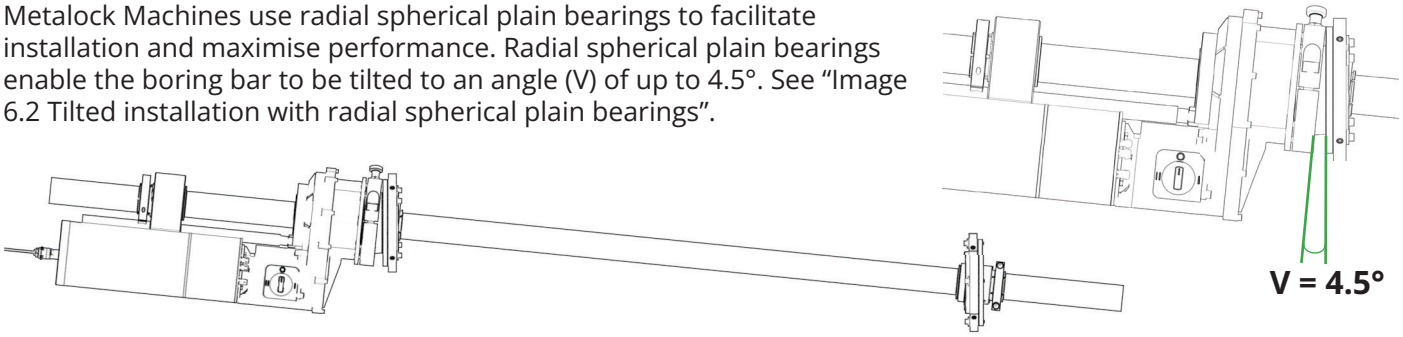


Image 6.2 Tilted installation with radial spherical plain bearings

6.3 Active Feed Area Length

The length of the leadscrew determines the length of the Active Feed Area (**A**). Select the length of the leadscrew according to the specific job requirements. See “Image 6.3 Active Feed Area”.

The length of the Active Feed Area is equal to the length of the threaded area of the leadscrew, excluding the width of the feedarm and collet. If dual stop bolts (see “7.11 Vertical mounting”) are used for vertical mounting the width of the bolts must be excluded as well.

Calculate the Maximum **Active Feed Area Length** (**A**) by subtracting 178,5 mm (7 in.) from the leadscrew length. Subtract an additional 30 mm (1.2 in.) if dual stop bolts are used.

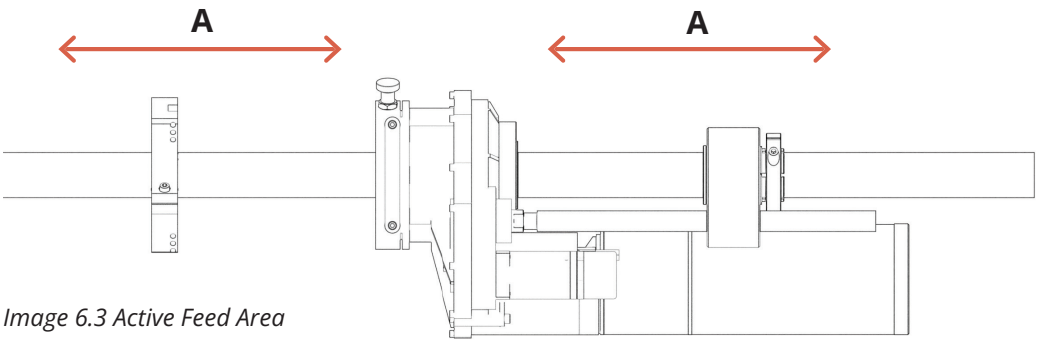


Image 6.3 Active Feed Area

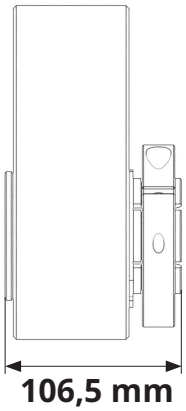


Image 6.4 Feedarm and collet

6.4 Boring Bar

It is important that the boring bar is in good condition before use. Always check to ensure that the boring bar is clean and free of cuts, marks, and other dents. Any marks, cuts, or dents may inhibit proper use and/or permanently damage the machine and its parts. If necessary, gently smooth out any uneven protrusive surface areas before use. Always clean the boring bar thoroughly after use.

IMPORTANT

Remove all marks, cuts, and dents before use. A boring bar with damage to the chrome or keyway can cause damage to the machine or bearing assemblies, and may also result in total machine failore.

6.5 Lubrication

To enable easier mounting and disassembly, the user may use low-friction lubrication for RFU mounting to the Boring Bar. Never use grease.

IMPORTANT

Make sure to always clean any excess lubrication and remove dirt with a suitable solvent.

7. Mounting and Installation

Installing the Metalock Machines MPB60 involves rough aligning the boring bar, spacers, mounting plates, and bearings, and connecting the RFU and Feed assembly to the installed boring bar and mounting plates and bearings. Make sure to secure the mounting plates and spacers properly. Poorly installed and fastened mounting plates and spacers may create vibrations leading to unwanted machining results and possible property damage.

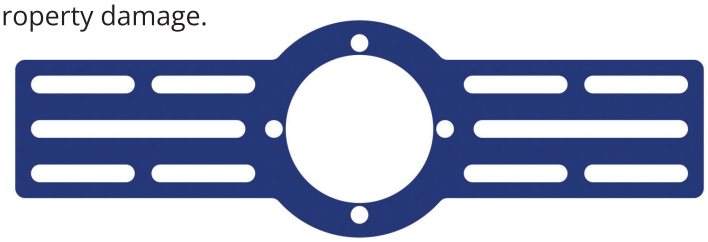


Image 7.1 Dual arm mounting plate

Best practice is to always use two or more independent supports when machining.

IMPORTANT

Before you install the product, ensure to perform a Risk Assessment as required.

7.1 Mounting and Alignment

The first step of installation of the machine is to mount the boring bar to the application. This may be done by using setup cones. See “Image 7.2 Mounting and Alignment”.

Attach the cones to the boring bar and push the cones towards the bore (**A**). By tightening the screws on the collar clamp, the cone is pushed axially along the bar, pushing the cones towards the bore (**B**).

By roughly aligning the boring bar using setup cones, the boring bar can be installed providing correct conditions for further fine alignment to required tolerance. See “7.5 Fine Alignment”.

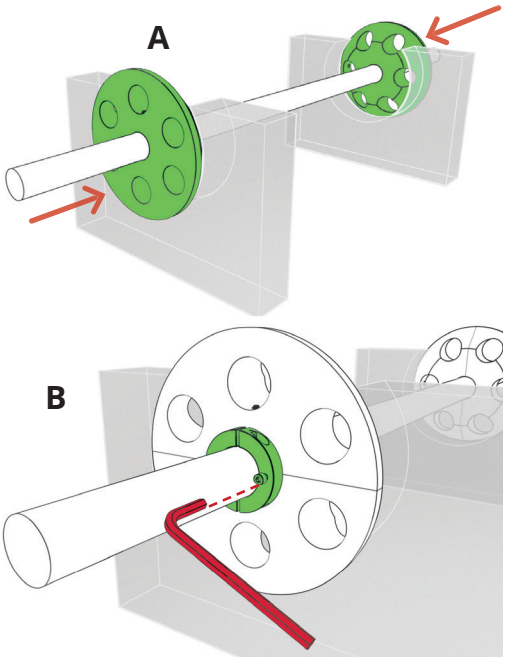


Image 7.2 Mounting and Alignment

NOTICE

Not all applications are suitable to rough align using setup cones.

Remove cones after mounting plates and bearings have been fitted.

7.2 Mounting of Spacers, Mounting plates and Bearing assemblies

When the boring bar is mounted and roughly aligned, the mounting plates and bearings shall be mounted. Use U-shaped spacers or other applicable mounting supports if required for proper fitment of mounting plates and bearings.

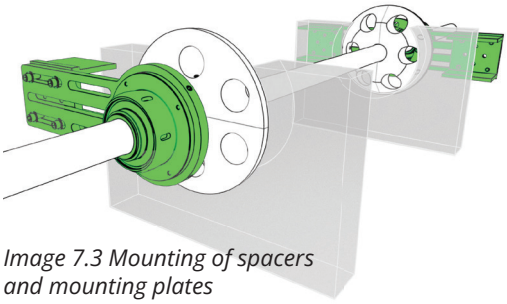


Image 7.3 Mounting of spacers and mounting plates

NOTICE

Before mounting the spacers and mounting plates, make sure to center the bearings within the plates. This ensures maximum adjustability of the bearings after mounting, allowing for proper alignment.

IMPORTANT

Make sure both spacers and mounting plates are tightly secured to the application using bolts or welds to minimize vibrations and risk of injury.

If an internal diameter mount and bearing are used, select the required supports for the correct length and mount them to the internal diameter mount. Make sure to secure the supports tightly using a wrench. Rough alignment can be achieved by adjusting the length of the screws at the end of the supports. Fine alignment of the bearing position is managed the same way as for fixed brackets with bearings, see “7.5 Fine Alignment”.

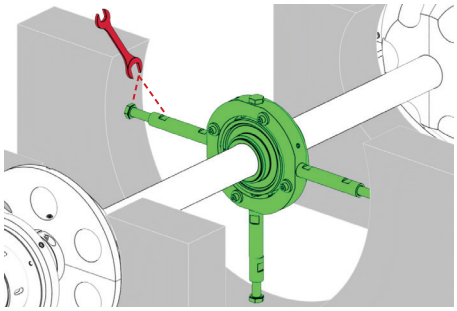


Image 7.4 Mounting of ID-mount and bearing

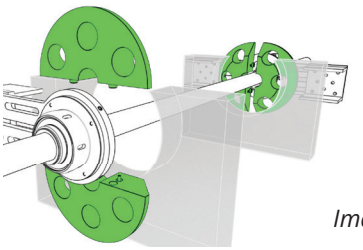


Image 7.5 Remove Setup Cones

7.3 Remove Setup Cones

If applicable, remove all alignment accessories, such as mounting cones, before fine-aligning the boring bar to the application.

7.4 Mount Tool Post

Mount suitable Tool Post to the boring bar. The Tool Post may also be useful when fine aligning the boring bar, see “7.5 Fine Alignment”.

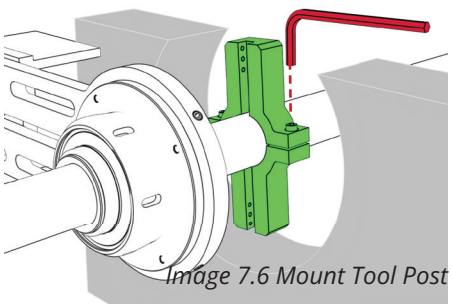


Image 7.6 Mount Tool Post

IMPORTANT

Select the largest possible tool post for the specific hole diameter to minimise machining vibrations. Secure the tool post firmly.

7.5 Fine Alignment

Align the boring bar to the application according to the required specifications. Adjust the screws (x4) in the mounting plate to align the boring bar (**A**). Measure using a precise method for measurement (**B**). See “Image 7.7 Fine Alignment”.

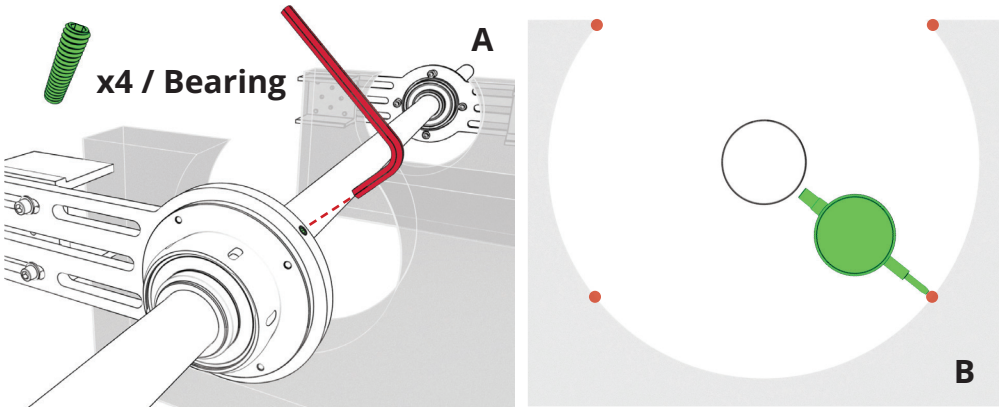


Image 7.7 Fine Alignment

IMPORTANT

Align the boring bar to required specifications to minimize vibrations and enable precise machining results.

7.6 Mounting of Rotational Feed Unit (RFU)

Slide the RFU (**A**) onto the boring bar. When mounting horizontally, allow gravity to rotate the machine to position, ensuring the motor housing points downwards. Push it towards the bearing housing (**B**) to connect the parts. Make sure you hear a “click” as the index plunger of the mounting clamp on the RFU engages with the bearing housing. Rotate the RFU slightly to the sides if the index plunger does not engage.

When the index plunger has engaged, tighten the bolt on the mounting clamp of the RFU (**C**). The mounting clamp bolt shall be tightened firmly. See “Image 7.8 Mounting of Rotational Feed Unit (RFU)”.

DANGER

Ensure that the index plunger has clicked into position and that the mounting clamp bolt is secured to the required specification.

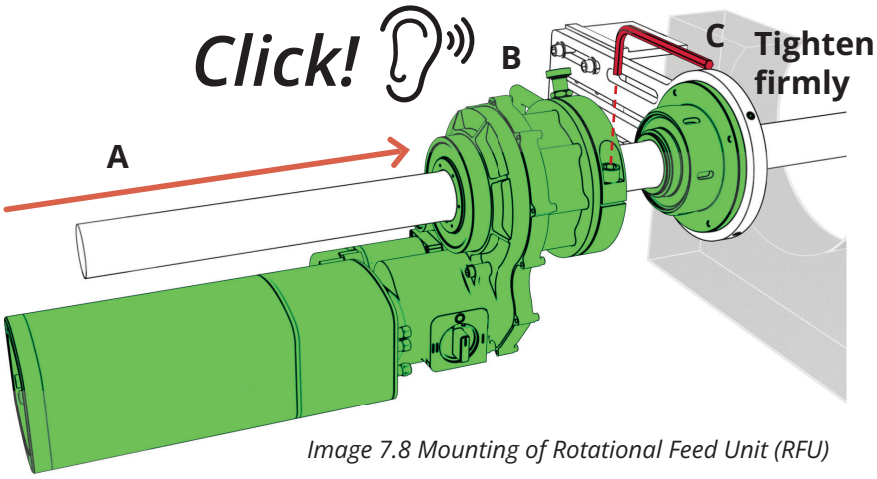


Image 7.8 Mounting of Rotational Feed Unit (RFU)

IMPORTANT

Never run the machine without securing proper installation of the RFU in accordance with these instructions.

7.7 Feedarm and Leadscrew Mounting

When the RFU is mounted to the boring bar and bearing housing, the feedarm and leadscrew should be mounted to the RFU. Slide the feedarm with the leadscrew attached onto the boring bar. Secure it to the boring bar by tightening the bolt on the collar clamp (**A**). The feedarm collar clamp should be tightened firmly.

Screw the leadscrew into the RFU and secure it tightly using two wrenches (**B**). Remember to always tighten the stop screw (**C**) to securely fasten the leadscrew to the RFU as an added safety measure before using the machine, see “Image 7.9 Mounting of Feedarm and Leadscrew”.

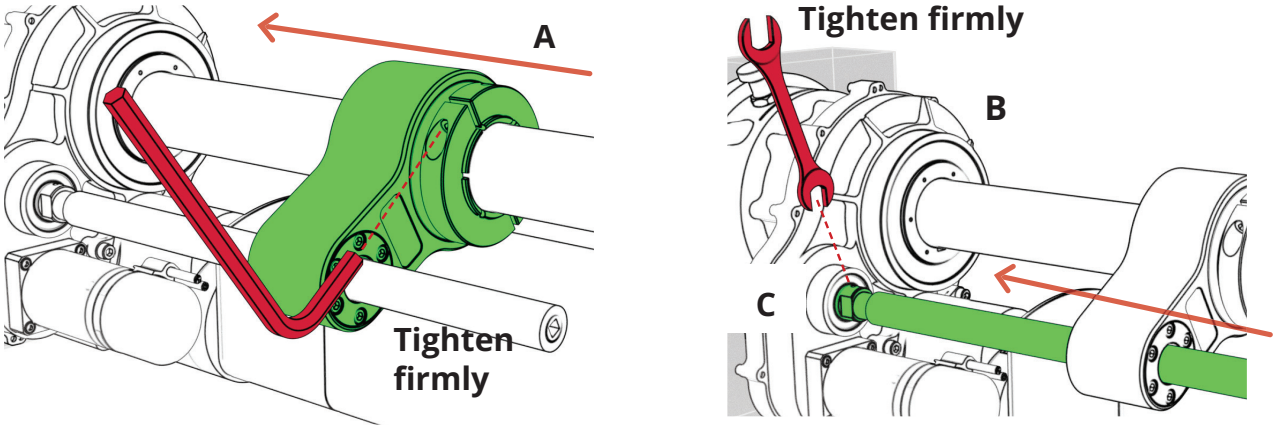


Image 7.9 Mounting of Feedarm and Leadscrew

Ensure that the boring bar always can move freely in the axial direction through the bearing assemblies. Otherwise, the feed displacement may not function properly during operation.

If the machine is vertically mounted with the RFU pointing downwards, make sure to fit the dual stop bolts to the leadscrew. See “7.11 Vertical Mounting”.

IMPORTANT

Before intercting with any rotational parts, always ensure the machine is fully stopped and secured using a Lockout/ Tagout (LOTO) procedure. Verify that all residual voltage is discharged before performing any setup, teardown, or adjustment tasks.

7.8 Alignment verification

When the machine is installed to the application, it is recommended to verify the alignment of the boring bar. A properly aligned boring bar will result in better machining performance and place less strain on the machine. See “7.5 Fine Alignment”.

7.9 Connect Control Unit and Power

Connect the power cord to a power source as well as the RFU* (**A**). Connect the Control Unit to the RFU (**B**). When both cords are connected, the machine interface of the Control Unit will automatically start up. See “Image 7.10 Control Unit and Power Connections”.

**Note that the third connection point is used for connection of welding equipment*

Note that the machine will not run nor be possible to operate until the Control Unit is connected to the RFU.

The machine has no memory of any previous use. It always starts up with both rotation and feed turned off, 0 RPM and 0 mm/rpm.

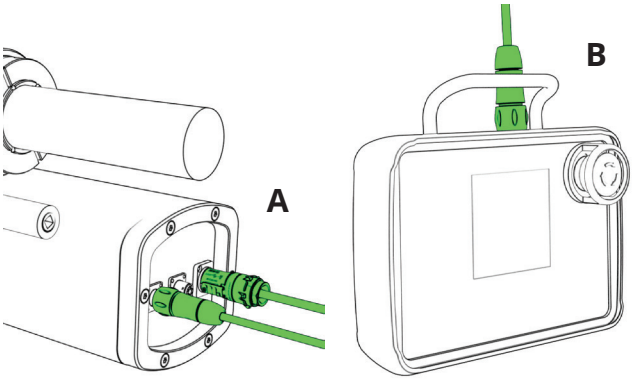


Image 7.10 Control Unit and Power Connections

The power source and cord are single phase 210-250 VAC 50/60 Hz, 16A.

7.10 Horizontal Mounting

Many applications require horizontal mounting, see “Image 7.11 Horizontal Mounting”. This is achieved by inserting the boring bar into the bearings and securing the RFU to the bearing housing as described in “7.1 Mounting and Alignment”.

Image 7.11 Horizontal Mounting

Vertical Mounting

When installing the machine in a vertical position, make sure to always secure the boring bar when inserted into the bearing supports to prevent it from falling through. This can be done by temporarily installing a collar clamp (**A**) which prohibits the bar from falling before the RFU has been installed to secure the boring bar. See “Image 7.12 Vertical Mounting”.

When the RFU is mounted to the boring bar and application, it is important to mount and secure the feedarm and leadscrew to the boring bar using a collar clamp (**B**).

Dual bolts (**C**) need to be fitted to the leadscrew when vertically mounting with the RFU pointing downwards to prevent the feedarm from falling if unscrewed from the leadscrew.

After the RFU is installed and the boring bar is secured to the RFU, make sure to remove the collar clamp (**A**) before running the machine. The machine may be permanently damaged if the collar clamp (**A**) is not removed and prevents the machine from displacing axially.

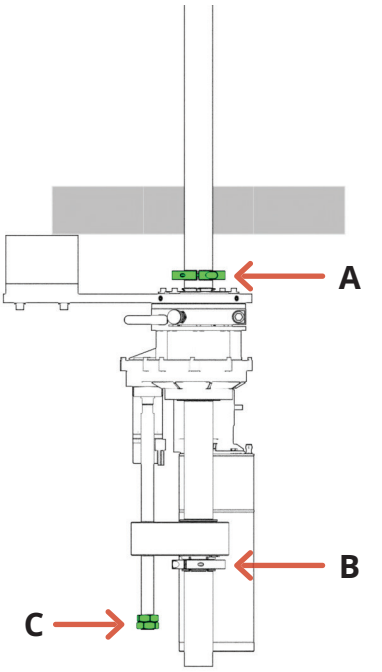


Image 7.12 Vertical Mounting

⚠ WARNING

If the boring bar is not secured during installation, there is a serious risk of crushing injuries from falling objects.

IMPORTANT

*The collar clamp (**B**) securing the feedarm to the boring bar **must never** be removed, as this secures the boring bar during operation.*

7.11 End Hole mounting

End hole applications are complex to machine. No support bearing can be used at the far end of the application to support the far end of the boring bar. As the boring bar is not supported at both ends, there is an increased risk of vibrations during operation, which can affect the machining results. See “Image 7.13 End Hole application”.

IMPORTANT

*To minimise the risk of vibrations during machining, the machine should be supported using multiple bearing supports, mounted as close to the tool post/surface to be machined as possible, minimising the distance (**D**) as much as possible.*

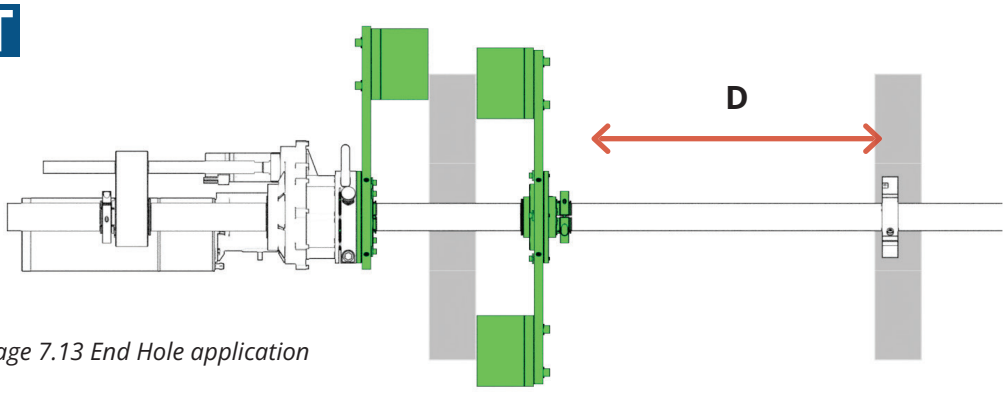


Image 7.13 End Hole application

8. Machine Operation

8.1 Control Unit

To operate the machine, the Control Unit must be connected to the RFU. Connect the cord between the Control Unit and the RFU. Without this connection, the machine will not start. See “Image 7.10 Control Unit and Power Connections”. Once the Control Unit is connected to the RFU, its screen will automatically start up when power is connected.

IMPORTANT

Ensure that the machine is connected to both a power source and the Control Unit to enable operation.

8.2 Modes

The Control Unit has multiple modes:

- Operational Mode
- Traverse Mode

To toggle between modes, use **F2** on the Control Unit. See “Image 8.1 CU and Operational mode interface”.

8.3 Operational mode

The operational mode is used when the machine is intended for any type of machining action. Upon startup, the Control Unit is automatically set to Operational mode.

Interface

See “Rotation” and “Feed” in chapter “8.3 Operational mode” for operational information about rotation and feed control.

The interface for Travese mode has a similar approach as Operational mode however the backround is black instead of blue, the machine data parameter section is changed and axial displacement is shown in % of maximum velocity. See “Traverse Mode” in chapter “8.3 Operational mode”.

Machining data shown in Operational mode provides live updated data when machining.

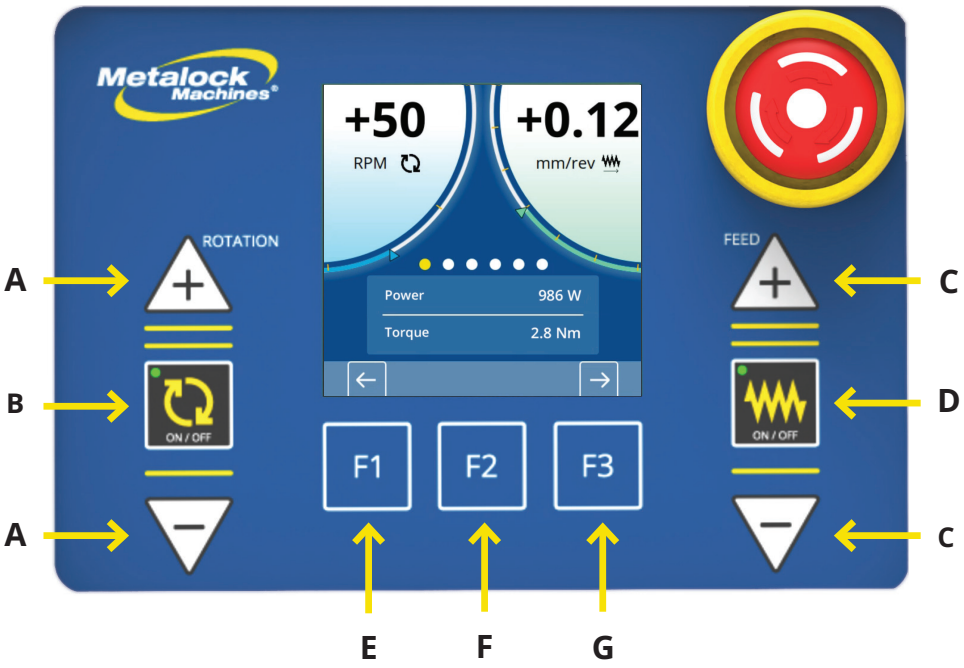


Image 8.1 CU and Operational mode interface

Rotation

The preferred rotational velocity depends on factors such as the size of the bore, the material, and the depth of the cut. The rotational direction of the boring bar is determined by a positive/negative RPM value on the Control Unit. Refer to “8.4 Direction of Feed and Rotation” for details.

To adjust the RPM, press the + / - buttons (**A**) to increase / decrease the RPM to the desired set value and direction. Rotation will not commence until the ON / OFF switch is turned on.

Press the Rotation ON / OFF button to start the rotational displacement to the set value (**B**). When Rotation is on, a green LED will illuminate on the Rotation ON / OFF button. To stop the rotation, press the Rotation ON / OFF button again; the green LED will switch off.

If the + / - buttons are pressed while rotation is ON, the rotational velocity will increase/decrease accordingly.

Rotational velocity is displayed on the left side of the screen as both a numeric value in RPM and through an indicator bar that outlines the quarter circle. The indicator bar visually represents the rotational velocity in relation to its maximum value, with the filled portion indicating the current rotational velocity. As you increase or decrease the rotational velocity, the indicator arrow moves to reflect the set value. Once the machine reaches this set value, the bar aligns with the arrow. See “Image 8.2 100 RPM, 1st gear” and “Image 8.3 100, RPM 2nd Gear”.

For positive rotation (+RPM), the indicator bar and arrow move from the bottom to the top as the value increases. Conversely, for negative rotation (-RPM), the bar and arrow move from the top to the bottom as the velocity increases. See “Image 8.4 Positve Rotation & Feed” and “Image 8.5 Negative Rotation & Feed”.

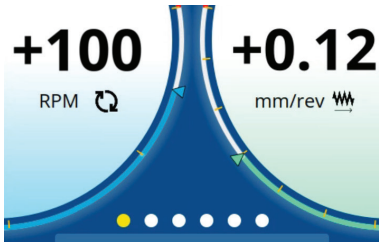


Image 8.2 100 RPM, 1st gear

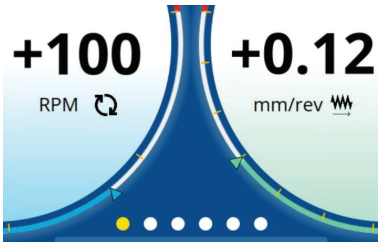


Image 8.3 100, RPM 2nd Gear

The selected gear influences the indicator bar for rotational velocity. For example, if the machine is set to +100 RPM (positive rotation), the indicator arrow will be positioned 1/3 from the top of the bar when 1st gear is selected, see “Image 8.2 100 RPM, 1st gear”. Conversely, in 2nd gear, the arrow will be 1/3 from the bottom of the bar, see “Image 8.3 100, RPM 2nd Gear”.

In the quarter circle and indicator bar, positive rotational velocity is shown in blue, while negative velocity is represented in purple. See Image “Image 8.4 Positve Rotation & Feed” and “Image 8.5 Negative Rotation & Feed”.

For further details, please refer to “8.4 Direction of Feed and Rotation”.

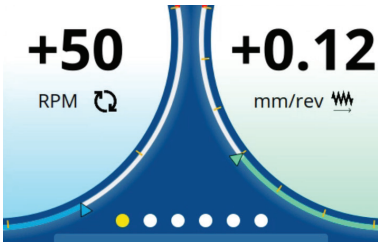


Image 8.4 Positve Rotation & Feed

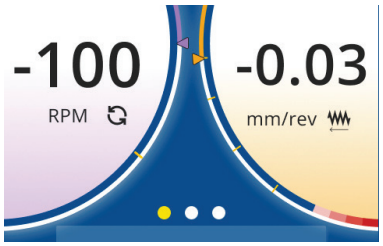


Image 8.5 Negative Rotation & Feed

NOTICE

The rotational velocity displayed on the control unit interface may fluctuate slightly during operation, as it reflects the real-time value during machining.

If vibrations occur during machining, adjust the rotational speed, axial feed rate, or cutting depth to optimise the operation and machining results.

Feed

Feed refers to the axial displacement of the boring bar during cutting operations. It is dependent on rotational velocity, making the Feed a Relative Feed in relation to the RPM, measured in mm/RPM.

The direction of axial displacement (Feed) of the boring bar is determined by a positive/negative mm/RPM value on the Control Unit. Refer to “8.4 Direction of Feed and Rotation” for details.

To adjust the Feed, press the + / - buttons (**C**) to increase / decrease the Feed to the desired set value and direction. The feed will not commence until the ON / OFF switch is turned on. Additionally, axial displacement will not start if the rotation is OFF or set to 0 RPM, as the feed is dependent on rotational velocity.

Press the Feed ON / OFF button to start the axial displacement of the boring bar to the set feed value relative to the RPM (D). When the Feed is activated, a green LED will illuminate on the Feed ON / OFF button.

To stop the Feed, press the Feed ON / OFF button again; the green LED will switch off.

If the + / - buttons are pressed while rotation is ON, the axial displacement will increase / decrease.

Axial displacement is displayed on the right side of the screen as both a numeric value in mm/revolution and through an indicator bar that outlines the quarter circle. The indicator bar visually represents the axial displacement in relation to its maximum value, with the filled portion indicating the current axial displacement. As you increase or decrease the axial displacement, the indicator arrow moves to reflect the set value. Once the machine reaches this set value, the bar aligns with the arrow.

For positive axial displacement (+mm/rev), the indicator bar and arrow move from the bottom to the top as the

value increases. Conversely, for negative axial displacement (-mm/rev), the bar and arrow move from the top to the bottom as the velocity increases. See images “8.4 Positive Rotation & Feed” and “8.5 Negative Rotation & Feed” for reference.

In the quarter circle and indicator bar, positive axial displacement is shown in green, while negative displacement is represented in orange. See Image “Image 8.4 Positve Rotation & Feed” and “Image 8.5 Negative Rotation & Feed”.

For further details, please refer to “8.4 Direction of Feed and Rotation.”.

NOTICE

The axial displacement velocity displayed on the control unit interface may fluctuate slightly during operation, as it reflects the real-time value during machining.

The feed will not run solely by setting a feed value if Rotation is set to 0 RPM or turned off.

For independent axial displacement of the bar regardless of Rotation, refer to “Traverse Mode”.

If vibrations occur during machining, adjust the rotational speed, axial feed rate, or cutting depth to optimise the operation and machining results.

Traverse Mode

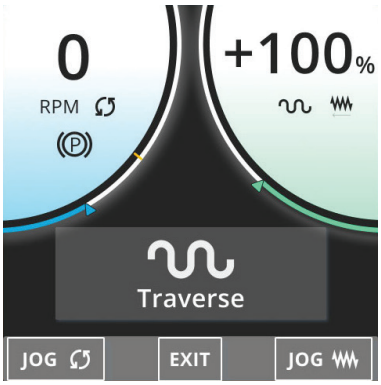


Image 8.6 Interface Traverse Mode

To displace (traverse) the boring bar axially, independent of rotation, Traverse mode is used. Traverse, unlike Feed, is an absolute axial displacement, independent of rotation. The Absolute Feed is set to a percentage (%) of the maximum feed.

To Traverse the boring bar, toggle to Traverse mode by pressing F2 (**F**), see “Image 8.1 CU and Operational mode interface”, and adjust the machine to the desired speed and direction. See “8.7 Cutting Insert Holder to Boring Bar”.

By pressing + / - on the feed controls (**C**) when in Traverse mode, the Feed/axial displacement set value will increase / decrease. Set the Traverse to a desired set value and direction. To Traverse the machine, press and hold JOG Feed F3 (**G**) or press Feed ON / OFF (**D**). When F3 is held down, the machine is Jogged until the button is released. The user may also use Feed ON / OFF (**D**) for continuous traversing. When Feed ON / OFF (**D**) is released, the Traversing stops.

JOG may also be used for Rotation if the boring bar and tool post need to be rotated. This is performed as described above, however using the Rotational controls (**A**) instead and F1 (**E**) to JOG or Rotation ON / OFF (**B**). Rotation is set to a RPM value from ± 0-300, just as in operational mode.

You may also activate JOG Feed in Operational Mode by holding the Feed + / - (**C**) button for 3 seconds. The JOG Feed will be set to 50% of the Absolute Feed, and the Control Unit will switch to Traverse mode. When the Feed + / - button is released, the Feed is turned OFF and the Control Unit will instantly switch back to Operational mode. You cannot increase/decrease the traverse speed in Operational mode.

Note! It is not possible to JOG rotation in Operational mode.

Manual Axial Displacement

The Metalock Machine MPB60 features the option to attach a manual lever at the end of the leadscrew. This lever is secured in place with a set screw that is threaded into the leadscrew. By using the lever, the leadscrew can be rotated manually, allowing for axial displacement of the boring bar without the need for electrical power.


Image 8.7 Axial Displacement lever

8.4 Direction of Feed and Rotation

The direction of feed and rotation is crucial for the safe and correct use of the machine. The direction is indicated through positive (+) and negative (-) symbols, which are displayed on both the machine and the control devices.

Feed and rotational directions can be found on the identification plate mounted on the RFU, as detailed in “1.4 Machine Information Plate”. It indicates which direction is positive feed as well as positive rotation. The negative direction is opposite to what is indicated through the markings. These directions are set in relation to the machine.

Feed/Traverse Direction

As indicated by the markings on the machine, the positive (+) feed / traverse direction is always the direction away from the RFU. All feed / traversing actions on the control devices indicated as + will move the bar away from the RFU. See “Image 8.8 Positive direction of Feed / Traverse”.

Conversely, the negative direction (-) is the direction towards the RFU. All feed/traversing actions on the control devices indicated as - will move the bar towards the RFU. See “Image 8.9 Negative direction of Feed / Traverse”.

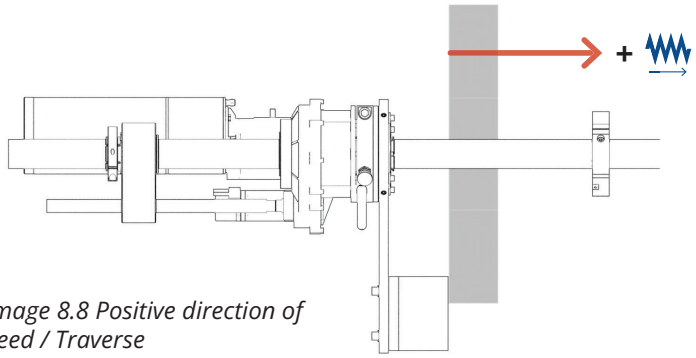


Image 8.8 Positive direction of Feed / Traverse

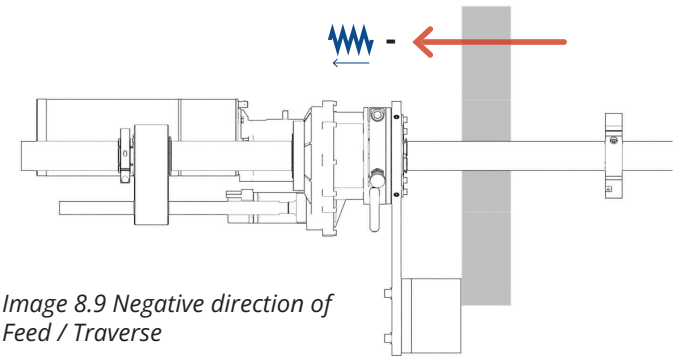


Image 8.9 Negative direction of Feed / Traverse

Rotational Direction

As indicated by the markings on the machine, the positive direction (+) always represents clockwise rotation when looking from the motor of the RFU towards the gear house clamp collar, see “Image 8.12 Operational directions symbols and placement on the machine”. All rotational actions on the control devices indicated as + will rotate the bar clockwise as described above. See “Image 8.10 Positive direction of Rotation”.

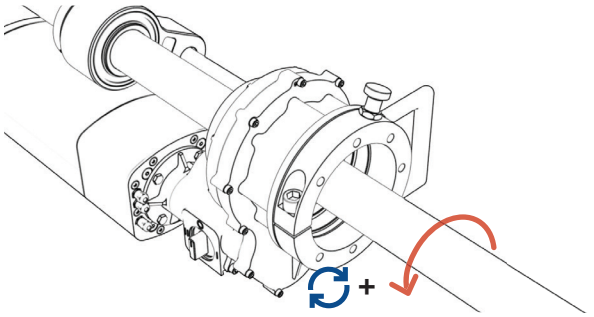


Image 8.10 Positive direction of Rotation

Conversely, the negative direction (–) always represents counterclockwise rotation when looking from the motor of the RFU towards the gear house clamp collar. All rotation actions on the control devices indicated as - will rotate the bar counterclockwise as described above. See “Image 8.11 Negative direction of Rotation”.

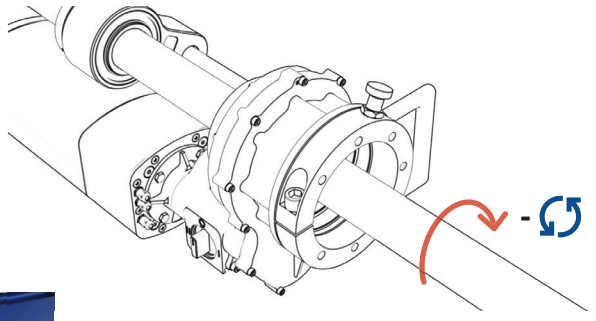


Image 8.11 Negative direction of Rotation

The direction of rotation of the bar is independent of the user’s position in relation to the machine. Instead, it is static to the position of the RFU.

Image 8.12 Operational directions symbols and placement on the machine

8.5 Gear change

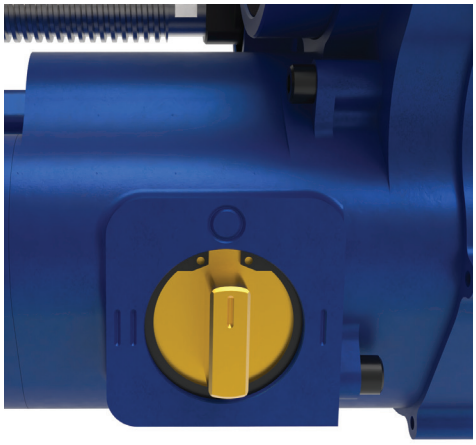


Image 8.13 Gear lever RFU

MPB60 offers a possible rotational velocity of up to 300 RPM. To reach maximum velocity, the RFU must be switched from 1st to 2nd gear.

- **1st gear (Low gear)**
  - High torque and Low RPM, with a range of 0-150 RPM, in both positive and negative direction.
- **2nd gear (High gear)**
  - High RPM and Low torque, with a range of 0-300 RPM, in both positive and negative direction.

For rotational velocities under 150 RPM, it is recommended to always use 1st gear to maximise torque. Switching gears is managed through a gear lever on the RFU. Rotate the gear lever while slightly rotating the boring bar back and forth by hand to enable gear change.

A gear will engage to a certain level when the lever is turned towards any gear, see “Image 8.13 Gear lever RFU”. For the gear to fully engage, the lever must be turned to the end position. When the lever is fully turned to the end position for the 2nd gear, the gear selector sensor will confirm that 2nd gear is selected through the Control Unit interface, see Rotation in chapter “8.3 Operational mode”. If the lever is only partially turned and does not reach the end position, the sensor will not acknowledge that 2nd gear is selected. Always ensure that the lever is switched to the end position of the selected gear to avoid damaging the gears and to ensure that the Control Unit indicates the correct gear selection.

The Control Unit indicates 1st gear for any position of the gear lever, except when the lever is turned to the end position of 2nd gear. This is displayed in the Control Unit’s interface, as described in “8.3 Operational Mode.” Please refer to images “Image 8.2 100 RPM, 1st gear” and “Image 8.3 100, RPM 2nd Gear” for clarification.

The bar can rotate freely when neither 1st nor 2nd gear is engaged, which is indicated as gear 0 on the RFU next to the gear lever.

⚠ WARNING

Both Rotation and Feed / Traverse must be turned off when switching gears. Switching gears while the machine is running will result in serious machine damage and risk of personal injuries. Do not run the machine if no gear is engaged. Running the machine while no gear is engaged may lead to gear damage or total machine failure.

Always ensure the gear lever is turned fully to the end position to avoid damaging the gears, ensure accurate gear selection display in the Control Unit, and minimize the risk of personal injury.

⚠ DANGER

The machine will run in 2nd gear when the gear lever is shifted towards that position, even if not fully engaged. This means the machine can reach up to 300 RPM, but the control unit will not display more than 150 RPM if the gear selector sensor hasn’t confirmed full engagement (end-position).

8.6 Temperature

The MPB60 may become hot during continuous operation. The maximum operating temperature for the motor, gearbox, and electronics is 140°C (284°F); temperatures up to this limit are considered normal. The Control Unit displays both motor and electronics temperatures, which refer to the internal temperatures of these components in the MPB60.

See “14. Informational messages” for guidence if the MPB60 is exceeding operational temperature.

⚠ WARNING

The MPB60 may become hot to the touch during continuous operation.

8.7 Cutting Insert Holder to Boring Bar

For small diameter applications where a tool post cannot be used, Metalock Machines offers the possibility to mount a cutting insert holder or cutting steel directly to the boring bar through 1/2 in. (12.7 mm) square holes. Place the cutting insert holder or cutting steel and secure it tightly with the locking screw. Both 1/2 in (12.7 mm) and 12 mm (0.47 in.) Cutting Insert Holders can be fitted to the boring bar.

You may adjust the cutting depth moving the cutting insert holder through an adjustment screw, see "Image 8.15 Adjustment screw". A full turn of the adjustment screw equals 1 mm in cutting depth.

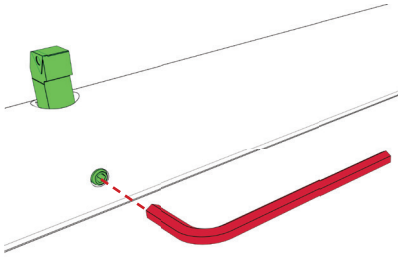


Image 8.14 Cutting Insert Holder Boring Bar

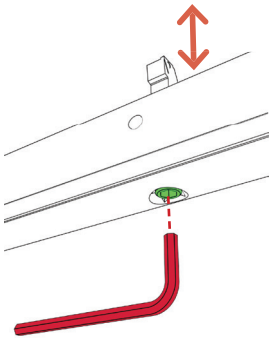


Image 8.15 Adjustment screw

⚠ DANGER

Before intercting with any rotational parts, always ensure the machine is fully stopped and secured using a Lockout/ Tagout (LOTO) procedure. Verify that all residual voltage is discharged before performing any setup, teardown, or adjustment tasks.

Always make sure to tightly secure the cutting insert holder orf cutting steel before operating the machine. An unsecured cutting insert holder or cutting steel may come loose and cause serious injury or death.

8.8 Adjust Cutting Insert Holder, Tool Post

Fixed and Modular Tool Posts

The Tool Posts available for the MPB60 have easy Cutting Insert Holder or cutting steel adjustment possibilities. Both the Fixed and Modular Tool Posts adust the cutting insert holder by changing its position through the loosening of the locking screws.

Premium Modular with Adjustable Head

The Large Premium Modular & Adjustable Head uses the same method of fastening the Cutting Insert Holder or cutting steels as described in "Fixed and Modular Tool Posts". However, it also offers the possibility to adjust the cutting insert holder through an adjustment screw. By loosening the locking screws enough for the cutting insert holder to move slightly without falling out, the cutting insert holder can be adjusted using an 3 mm Allen key on the M6 adjustment screw. The adjustment screw enables the insert holder to be adjusted to 12.5/100 of a mm (0.0049 in.) per marked step. A full rotation of the adjustment screw will move the cutting insert holder 1 mm. When adjusted to the required position, secure the cutting insert holder by tightening the locking screws. See "Fixed and Modular Tool Posts".

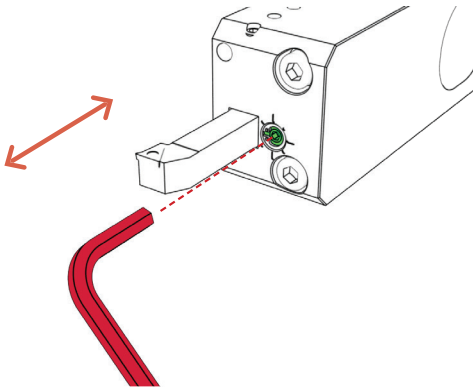


Image 8.16 Adjustable Head

! IMPORTANT

Select the largest possible tool post for the specific hole diameter to minimise machining vibrations.

⚠ DANGER

Before intercting with any rotational parts, always ensure the machine is fully stopped and secured using a Lockout/ Tagout (LOTO) procedure. Verify that all residual voltage is discharged before performing any setup, teardown, or adjustment tasks.

Always make sure to tightly secure the cutting insert holder orf cutting steel before operating the machine. An unsecured cutting insert holder or cutting steel may come loose and cause serious injury or death.

8.9 Emergency Shutdown Device (ESD)

The Emergency Shutdown Device (ESD) ensures that the machine stops all axial and rotational displacement when pressed. The button has an aluminum frame surrounding it, preventing unintentional pressing and protecting it if the Control Unit is dropped. See “Image 8.18 Emergency Shutdown Device with protective frame”.

When the ESD button is pressed, the machine enters Emergency Shutdown mode. This is indicated by an informational message on the Control Unit. See “Image 8.17 Emergency Shutdown device screen message Control Unit”.

While the ESD button is pressed, the machine will not run until the button is released. To release the button, screw it clockwise. Upon release, the machine instantly returns to the last used mode, with rotation and feed/ traverse turned OFF.

Image 8.17 Emergency Shutdown device screen message Control Unit

Previous set values for both Rotation and Feed are stored. By clicking Rotation ON, the rotation will start up to the previous set value. Corresponding behavior applies for the Feed.

Image 8.18 Emergency Shutdown Device with protective frame

9. Maintenance & Repairs

If your Metalock Machine MPB60 breaks down or fails to operate as intended, please contact your local authorised Metalock Machines supplier or service provider. All repairs and maintenance are handled by authorised Metalock Machines service providers.

IMPORTANT

Never service the machine through a non-authorised Metalock Machines service provider.

10. Spare Parts

If you need any additional parts or tools for your machine, please contact your local supplier. No spare parts are required for servicing the machine. Repairs and maintenance are handled by an authorised Metalock Machines service provider. See table “Spare Parts list”.

Spare Parts list	
Spare Part number	**Description**
MP-01-0102	Spherical Bearing Rotation and Feed Unit (RFU), Ø60 mm
MP-01-0103	Spherical Bearing Support, Ø60 mm
MP-01-0113	Feedarm, Ø60 mm
MP-01-0165	Tool Post Boring (Fixed), Ø60 mm, Min. boring diameter Ø100 mm
MP-01-0168	Tool Post Boring (Fixed), Ø60 mm, Min. boring diameter Ø135 mm
MP-01-0200	Tool Post Boring (Fixed), Ø60 mm, Min. boring diameter Ø225 mm
MP-01-0236	Tool Post Boring (Fixed), Ø60 mm, Min. boring diameter Ø166 mm
MP-01-0278	Collar Clamp, Ø65 mm
MP-01-0283	Mounting Plate, Single Arm, T=20 mm
MP-01-0284	Mounting Plate, Double Arm, T=20 mm
MP-01-0286	Mounting Plate, Quad Arm, T=20 mm
MP-01-0287	Tool Post Boring (Fixed), Ø60 mm, Min. boring diameter Ø284 mm
MP-01-0290	Tool Post Boring (Fixed), Ø60 mm, Min. boring diameter Ø343 mm
MP-01-0293	Tool Post Boring (Fixed), Ø60 mm, Min. boring diameter Ø403 mm
MP-01-0296	Tool Post Boring (Fixed), Ø60 mm, Min. boring diameter Ø462 mm
MP-01-0299	Tool Post Boring (Fixed), Ø60 mm, Min. boring diameter Ø522 mm
MP-01-0309	Internal Diameter Mount Ø220 to 940 mm
MP-01-0373	Collar Clamp with Axial Set screws, 60 mm

Table 10.1 Spare part list

11. Storage and Shipping

11.1 Storage

The machine should be stored in its box when not in use. It is recommended to lubricate all oxidised metals with an appropriate rust inhibitor when the machine is stored away. Store the machine, boring bar, and its boxes in a dry environment.

11.2 Shipping

The transportation and storage boxes provided with the machine and boring bar are intended for shipping purposes. The transportation and storage box for the machine is sized to fit on a Euro-pallet with pallet collars. Always ship the machine in its box, wrapped and covered to prevent damage to the box or machines.

12. Decommissioning

The machine and all its parts must be recycled and disposed of in accordance with applicable country-specific regulations at its end-of-life. Efforts should be made during disposal to recover all recyclable parts, such as electronics, metals, and plastics. Any hazardous waste, such as lubrication oils and grease, should be handled in accordance with applicable country-specific regulations. Contact your local Metalock Machines supplier for details if necessary.

13. Reference Data

13.1 Key specifications

MPB60 product key specifications	
Boring bar	
Diameter	60 mm (2.36 in.) 2.25 in. (57.15 mm), Adapter Kit 2.25 in.
Length	0.5 - 6 m (2-20 ft.)
Electronics	
Control Interfaces	Wired graphical control unit
Electrical Supply	Single phase 210 - 250 VAC 50/60 Hz 3500 W (4.69 Hp)
Axial Feed	
Velocity	Relative (Feed): min 0.04 mm/rev (0.0016 in./rev), max 0,24 mm/rev (0,009 in./rev) Absolute (Traverse): max 738 mm/min (29 in./min)
Power	100 W
Motor type	Electric Servo motor
Boring stroke	Max 821,5 mm (32.3 in.) with 1000 mm (39.4 in.) feed screw
Rotation	
Velocity	0-300 RPM
Power (machining)	Max 2200 W
Motor type	Electric Servo motor
Torque at bar (Calculated)	265 Nm (195.5 ft.-lb.)
Dimensions	
Width	278 mm (10.9 in.)
Height	341 mm (13.4 in.)
Length	702 mm (27.6 in.) incl. mounting clamp
Weight	34.5 kg (76 lbs) incl. mounting clamp, excl. feedarm and leadscrew (500 mm) 41 kg (90 lbs) incl. mounting clamp, feedarm, leadscrew (500 mm) and feed lever

Table 13.1 MPB60 Key specifications

13.2 Tool Posts Ø60 mm, minimum recommended boring diameter.

Tool Post Fixed

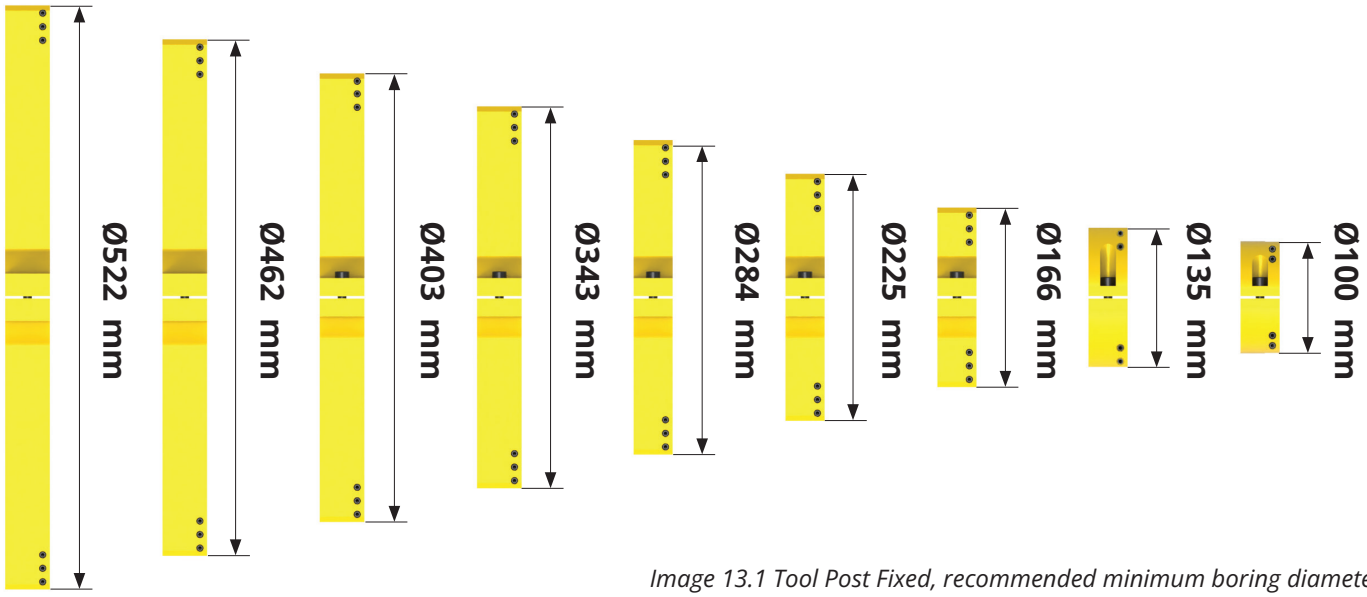


Image 13.1 Tool Post Fixed, recommended minimum boring diameter

Tool Post Modular

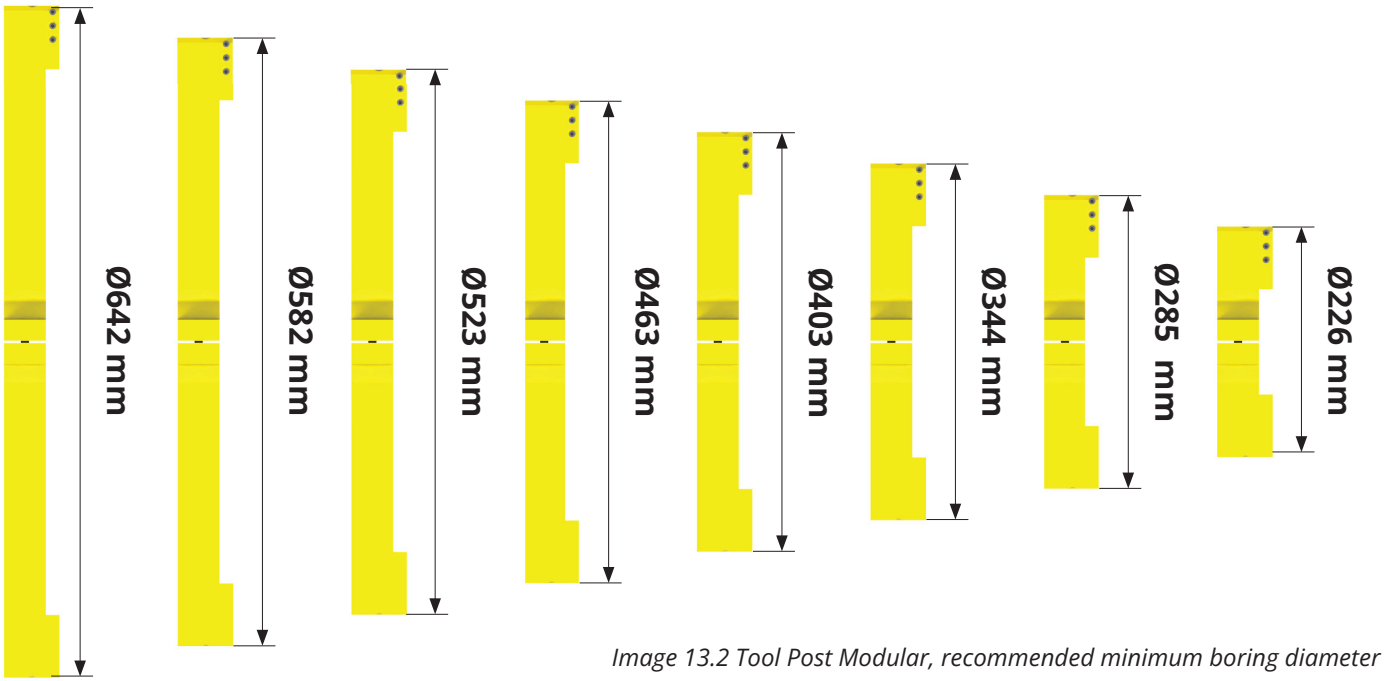


Image 13.2 Tool Post Modular, recommended minimum boring diameter

Tool Post Premium Modular with Adjustable Head

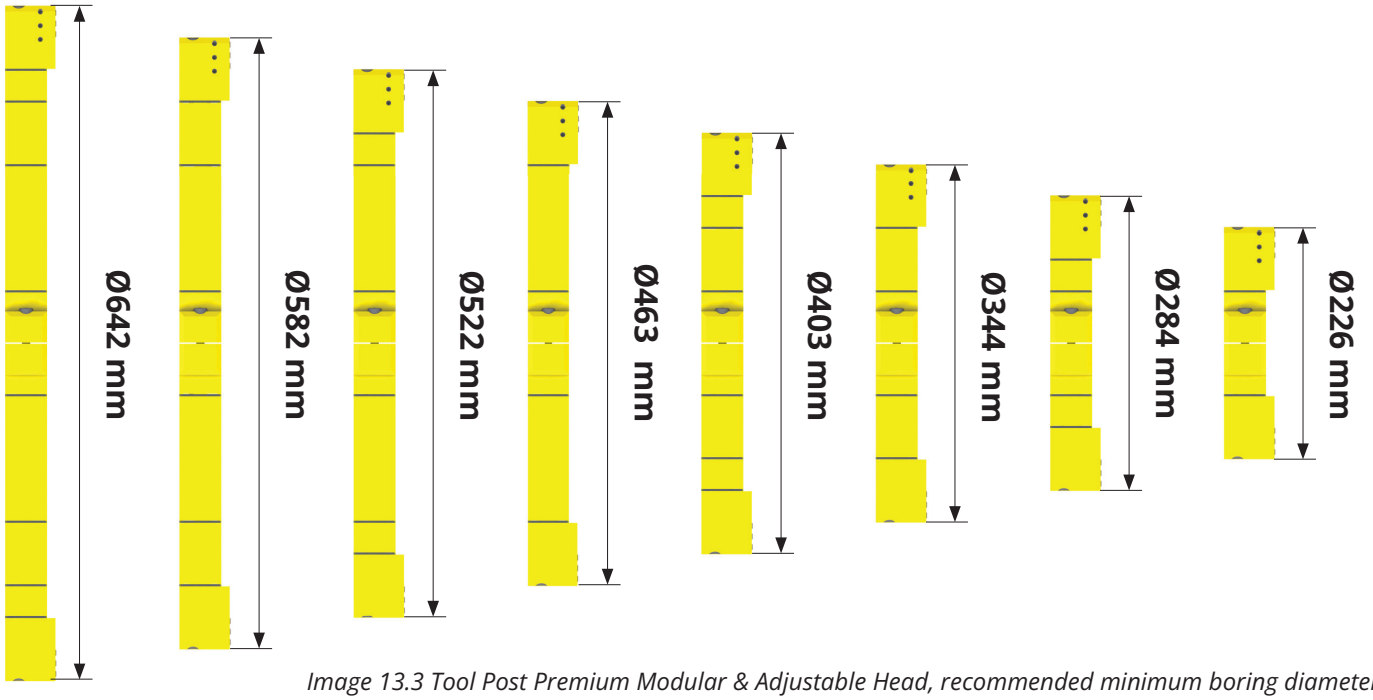


Image 13.3 Tool Post Premium Modular & Adjustable Head, recommended minimum boring diameter

13.3 Internal Diameter mount and bearing

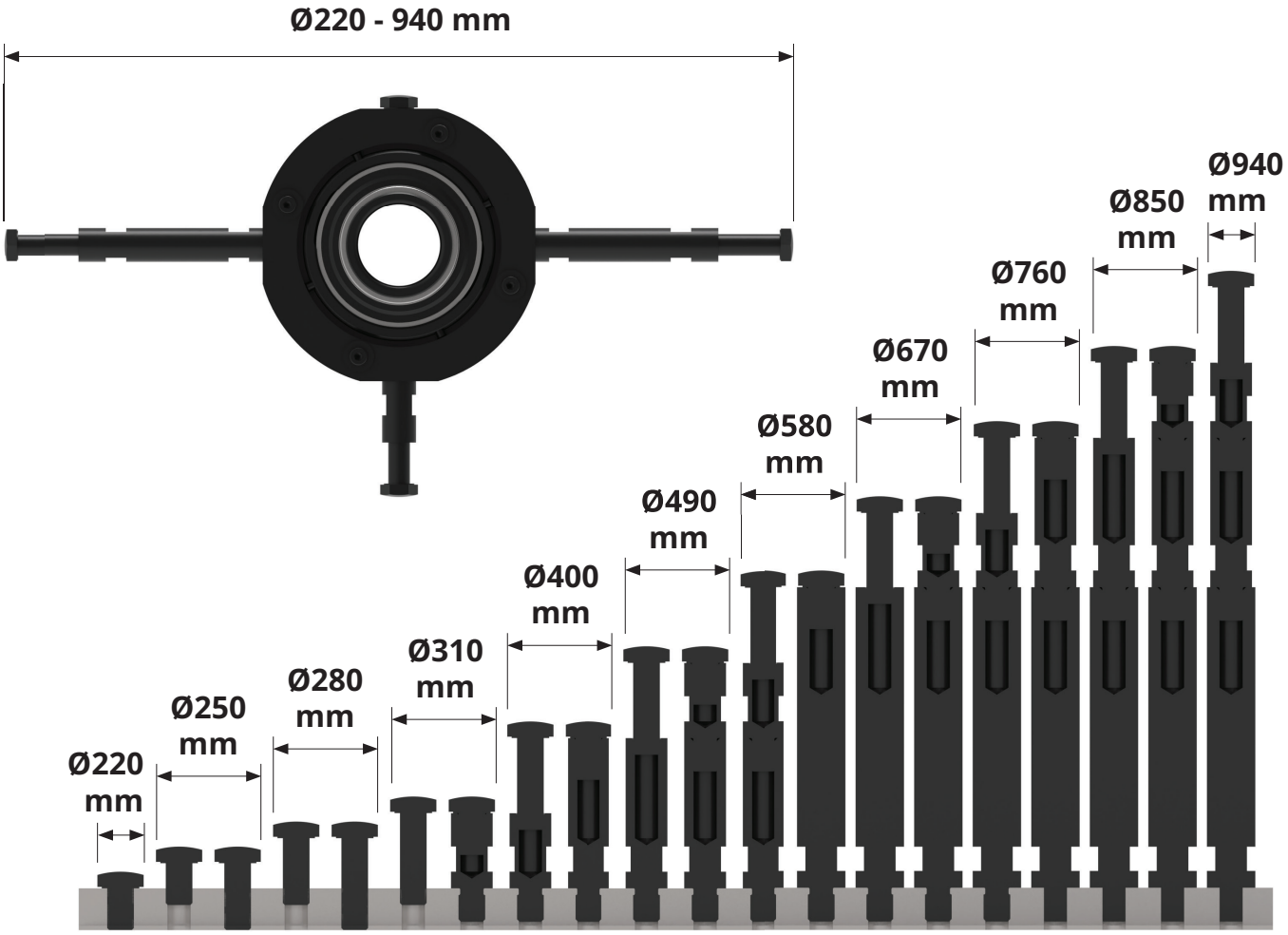


Image 13.4 Internal Diamerter mount Size variations with different Supports and Screws

13.4 Setup cones

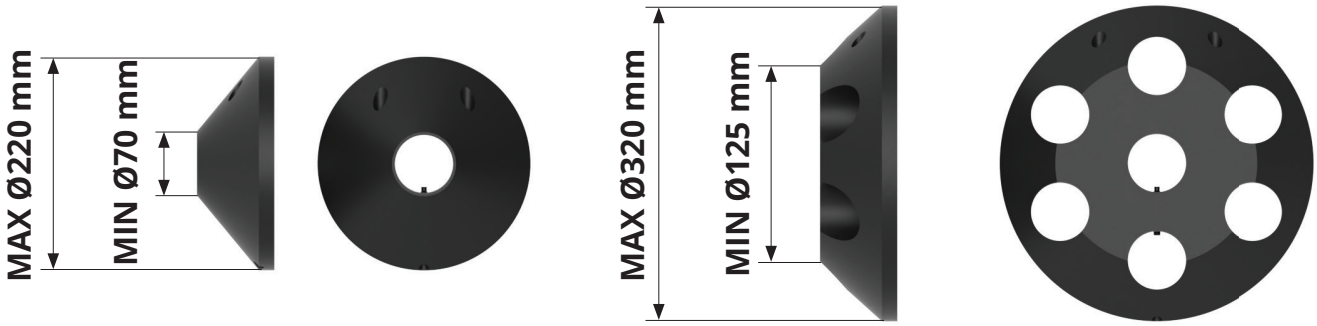


Image 13.5 Setup cone sizes

Setup cones come in two versions depending on the bore dimensions.

Bore dimensions:

- Small cones: 70 mm (2.76 in.) – 220 mm (8.67 in.)
- Large cones: 215 mm (8.46 in.) – 320 mm (12.6 in.)

13.5 Relationship, Rotational Velocity - Bore Diameter

The rotational velocity, RPM, is related to the bore diameter. The formula $\boldsymbol{n} = \frac{\mathbf{V_c \cdot 1000}}{\boldsymbol{\pi \cdot d}}$ provides a way to calculate rotational velocity in relation to insert, material and bore diameter.

n = RPM

$\boldsymbol{V_c}$ = cutting speed, m/min (a value that depends on the type of insert (HSS or Carbide) and the material type).

d = bore diameter

Please note that recommended rotational velocity for bore diameter is based on stationary machines. Adjustments may be needed depending on the boring bar mounting, vibrations, cutting material etc.

For more detailed information, refer to the appropriate mechanics handbook.

13.6 Tools

Allen Keys and Wrenches are required to install the machine. Best practice is to always include a Metric Allen Key set in the transportation box as well as a set of Metric wrenches when installing and operating the machine.

⚠ DANGER

Always make sure to remove any tools used for installation or adjustment of the MPB60 before operating the maching. Any tools left in the machine may come loose at high velocity, causing machine damage or serious personal injury.

Wrenches, sizes needed (mm) - 17 / 19 / 24 / 41	
Size mm	**Where to use**
17	• Leadscrew mounting nut
19	• Inner Diameter-Mount arm connection
24	• Inner Diameter-Mount adjustment screw • Leadscrew mounting Nut, RFU
41	• Dual nuts Leadscrew when vertical mounting of RFU. 2x 41 mm wrenches needed

Table 13.2 Wrenches

Allen keys, sizes needed (mm) - 2.5 / 3 / 4 / 5 / 6 / 10 / 14	
Size mm	**Where to use**
2.5	• Locking bolt for Leadscrew mounting nuts
3	• Tool Post fastening of insert holder or cutting steel • Adjustment screw Tool Post Large Premium Modular Base & Adjustable Head
4	• Setup cone stop screw
5	• Fine adjustment screws mounting plates • Premium Tool post end bit lid • Mounting screws lifting handle
6	• Collar clamps • Tool post fastening • Premium Tool post connections • Bearing fastening mounting brackets • Setup cone connections
10	• Bolts for fastening of mounting plates
14	• Mounting Clamp RFU

Table 13.3 Allen keys

13.7 Additional Materials

To properly operate the machine, additional materials are required. Always have the following additional products at hand when installing and operating the machine:

- Low friction lubrication (NO grease) for RFU mounting to Boring Bar
- Cutting inserts
- Measurement equipment (e.g., measurement tape, calipers)
- Precise measurement equipment (e.g., dial gauge)

14. Informational messages

Metalock Machines MPB60 provides information in the Control Unit when corrective action is required or an error has occurred.

14.1 Informative Messages

Emergency Shutdown Device activated

Indicated when the Emergency Shutdown Device (ESD) has been pressed, stopping all machine operations and activating Emergency Shutdown mode. See “8.9 Emergency Shutdown Device (ESD)” for details.

Release the ESD button to resume machine operation. The message will disappear once the button has been released.

Image 14.1 Emergency Shutdown Device screen message

Communication Error

Image 14.2 Communication Error

Appears when the connection and communication between the Rotational Feed Unit (RFU) and the Control Unit has been lost. The Control Unit still has power however lost the communication to the RFU. The message will disappear as soon as the connection and communication between the Control Unit and the RFU is restored.

To resolve the issue, start with checking the cord to the Control Unit and all connections. Next try restarting the machine. Disconnect the power cord for a minimum of 90 seconds to ensure that the machine loses all voltage. Reconnect the power cord and wait for the machine to start up.

If the error message persists, contact your local service supplier.

14.2 Error Messages

Image 14.3 Example error message dialog

Error messages appear when the machine cannot operate properly and are displayed in an error dialog on the screen. Clear them by pressing F2 for OK; the Control Unit will attempt to reset the message. The machine may need time to cool down, and multiple attempts might be required.

If a restart is necessary, ensure the machine loses all voltage by disconnecting the power cord for at least 90 seconds. Then, reconnect the power cord and wait for the machine to start up.

Configuration Error

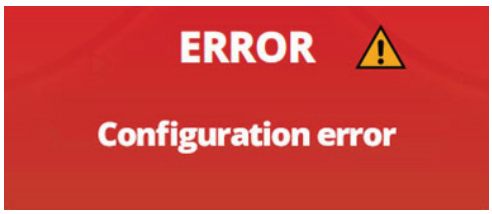


Image 14.4 Configuration Error

Internal error - *Error message | 1 |*

To resolve this issue:

- Clear the error message by pressing F2.
- If the error message does not disappear, try restarting the machine. Ensure that the machine loses voltage before restarting.

Contact your local service supplier if the issue persists.

Motor Over-Current

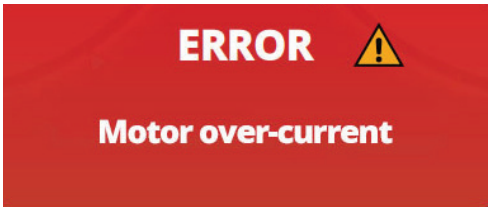


Image 14.5 Motor Over Current

Internal error - *Error message | 2 |*

To resolve this issue:

- Clear the error message by pressing F2.
- If the error message does not disappear, try restarting the machine. Ensure that the machine loses voltage before restarting.

Contact your local service supplier if the issue persists.

Drive Supply Under-Voltage

Image 14.6 Drive Supply Under-Voltage

Power supply issues. Voltage is too low - *Error message | 5 |*

To resolve this issue:

- Check the power supply, connections, and cables.
- Clear the error message by pressing F2.
- If the error message does not disappear, try restarting the machine. Ensure that the machine loses voltage before restarting.

Contact your local service supplier if the issue persists.

Drive Supply Over-Voltage

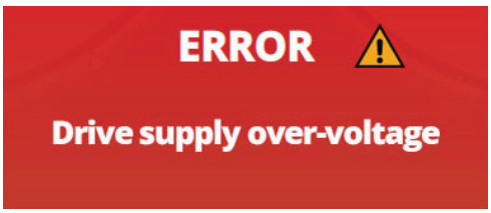


Image 14.7 Drive Supply Over-Voltage

Error message | 6 |

This error is caused by hard braking of the rotational velocity or if the machine is supplied with too high voltage from the power supply.

To resolve this issue:

- Clear the error message by pressing F2.
- If the error message does not disappear, the input voltage may be too high.
- Try restarting the machine, ensuring it loses all voltage before restarting.

Drive-Stage Over-Temperature

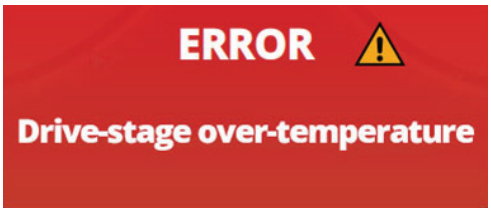


Image 14.8 Drive Supply Over-Temperature

Error message | 7 |

This error appears when the electronics become too hot.

To resolve this issue:

- Reduce the Material-Removal Rate (MRR) by decreasing the cutting depth or feed rate.
- Clear the error message by pressing F2.
- Allow the machine to cool down.

⚠ WARNING

Do not turn off the machine or power source, as it is important to keep the cooling fan on to cool the machine. Turning off the machine may cause serious property damage.

Position Following Error

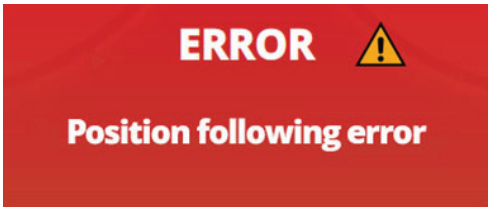


Image 14.9 Position Following Error

Error message | 8 |

This error indicates that the Material-Removal Rate (MRR) is too high or the rotational velocity is blocked.

To resolve this issue:

- Decrease the Material-Removal Rate.
- Check for any possible obstructions that might be prohibiting displacement.
- Clear the error message by pressing F2.

If the error persists after these steps, further investigation may be required to identify and remove the blockage.

Angle Sensor Stuck Value

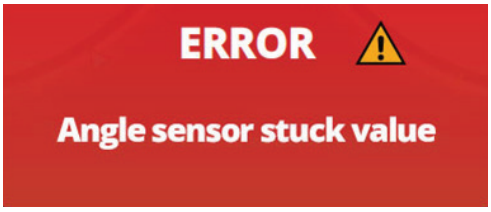


Image 14.10 Angle Sensor Stuck Value

Internal error - *Error message | 10 |*

To resolve this issue:

- Clear the error message by pressing F2.
- If the error message does not disappear, the input voltage may be too high.
- Reconnect the power cord and wait for the machine to start up.

Contact your local service supplier if the issue persists.

CAN Communication Error

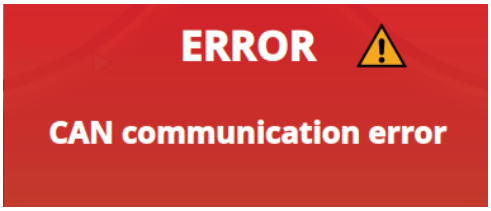


Image 14.11 CAN communication error

Error message | 16 |

Communication failure between the RFU and the Control Unit.

To resolve this issue:

- Check cable and connections. Clear error message, F2.
- If the error message does not disappear, the input voltage may be too high.

Contact your local service supplier if the issue persists.

Safety Circuit Supervision

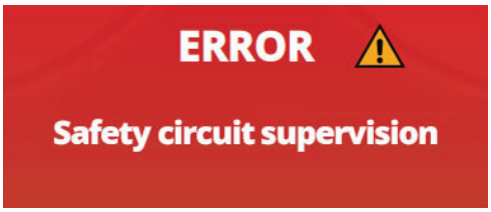


Image 14.12 Safety circuit supervision

Error message | 18 |

Sync problem between ESD circuits. This may occur if the Control Unit is unplugged and plugged in when the RFU is powered on, or if the cable is damaged.

To resolve this:

- Press down the ESD button to allow the circuits to sync.
- If the problem persists after releasing the ESD button, the Control Unit cable may be damaged. Troubleshoot by checking the cable and connections.
- Clear the error message by pressing F2.

Contact your local service supplier if the issue persists.

Motor Over-Temperature

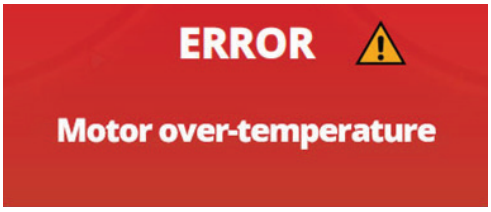


Image 14.13 Motor over-temperature

Occurs when the motor becomes too hot - *Error message | 19 |*

To resolve this issue:

- Reduce the Material-Removal Rate (MRR) by decreasing the cutting depth or feed rate.
- Clear the error message by pressing F2, and allow the machine to cool down.

Note! It may take up to 10-15 minutes for the machine to cool down sufficiently.

⚠ WARNING

Do not turn off the machine or power source. Keep the cooling fan on to cool the machine. Turning off the machine may cause serious machine damage.

Internal Communication Problem

Image 14.14 Internal communication problem

Error in internal circuit communication - *Error message | 20 |*

This error is most likely caused by electromagnetic interference.

To resolve this issue:

- Check for possible interferences such as nearby transformer stations, welding equipment, etc.
- Clear the error message by pressing F2.
- If the error message persists, try restarting the machine. Ensure that the machine loses voltage before restarting.

Speed Tracking Error

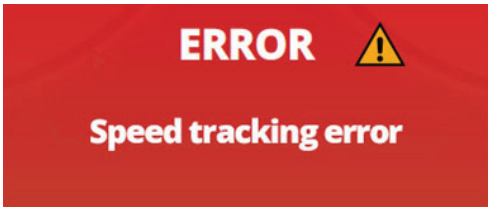


Image 14.15 Speed Tracking Error

Too high Material-Removal Rate or blocked rotational velocity - *Error message | 21 |*

To resolve this issue:

- Decrease the Material-Removal Rate.
- Check for any possible obstructions that might be prohibiting displacement.
- Clear the error message by pressing F2.

If the error persists after these steps, further investigation may be required to identify and remove the blockage.

Appendix

Appendix i - CE Compliance and Warranty

The Metalock Machines MPB60 is CE compliant and has been developed to meet the requirements of applicable European Union directives. See “Appendix ii - EC Declaration of Conformity in accordance with EC Machinery Directive 2006/42/EC, Annex 2.1A”.

Warranty

Metalock Machines fulfills all applicable local warranty legislation. All products will be managed in accordance with the legislated warranty requirements in the specific country/region. Refer to your local legislation for more details regarding coverage.

Always refer to the serial number on your product for any warranty claims.

IMPORTANT

Metalock Machines does not provide any warranty for products bought from a non-authorised supplier.

Appendix ii - EC Declaration of Conformity in accordance with EC Machinery Directive 2006/42/EC, Annex 2.1A

We

Metalock Machines AB
Brodalsvägen 11b
433 38 Partille, Sweden

Certifies under own responsibility that machine: **Portable Line boring machine MPB60 and + Control unit, CU**, with machine number: **B0060XXX + CUXXX**

Is manufactured in accordance with the Council directive on machinery, 2006/42/EC, with specific references to the directive's Annex 1 on essential health and safety requirements in connection with the construction of machinery.

The following other directives have been applied:

2014/30/EU Electromagnetic compatibility (EMC)

and the following harmonized standards have been taken into account:

EN ISO 12100:2010	Safety of machinery - General principles for design - Risk assessment and risk reduction
EN ISO 13849-1:2023	Safety of machinery. Safety-related parts of control systems - General principles for design
EN ISO 13850:2015	Safety of machinery - Emergency stop - Principles for design
EN ISO 14118:2018	Safety of machinery - Prevention of unexpected start-up
EN 60204-1:2018	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
EN ISO 20607:2019	Safety of machinery – Instruction handbook – General drafting principle
EN 60439-1	Low-voltage switchgear and controlgear assemblies - Part 1: General rules
EN 61000-6-2	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
EN 61000-6-4	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments
EN 61131-1, -2, -3	Programmable controllers

Partille, Sweden 2024-10-30

Metalock Machines AB

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Jon Ström, MD

Partille, Sweden 2024-10-30

Metalock Machines AB

.....

Victor Bruce, Project Manager

Appendix iii - Safety information messages

These safety information messages and symbols adhere to ISO 3864:2011 standards. This instruction manual contains various safety information messages crucial for ensuring safe handling and operation of the machine.

It is imperative to pay close attention to these messages as they indicate specific risks and hazards associated with operating the machine.

The product must be used strictly in accordance with the instructions outlined in this manual. Failure to do so may result in serious personal injury or damage to materials.

⚠ DANGER

The Danger message indicates a severe hazard that **could lead to serious injury or death** if not avoided.

⚠ WARNING

The Warning message indicates a significant hazard that **may result in serious injury or death** if not avoided.

⚠ CAUTION

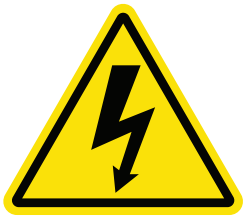
The Caution message indicates a hazard that **could lead to personal injury** if not avoided.

! IMPORTANT

The Important message indicates specific information that is crucial to read and understand.

! NOTICE

The Notice message indicates specific information that is important to read and understand.

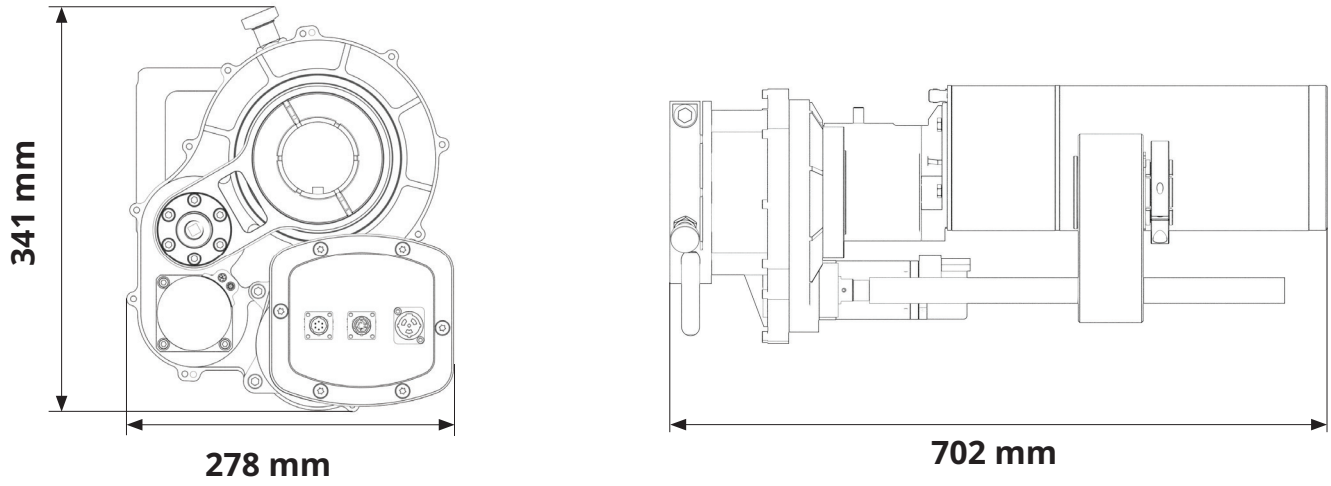


A Warning sign highlights a specific hazard related to the use of the machine and associated tools and materials.

A Mandatory sign indicates a necessary action related to the use of the machine and associated tools and materials.

Appendix iv – Dimensions

RFU - Rotational Feed Unit



Width: 278 mm (10.9 in.)

Height: 341 mm (13.4 in.)

Length: 702 mm (27.6 in.) incl. mounting clamp

Weight: 34.5 kg (76 lbs) incl. mounting clamp, excl. feedarm and leadscrew (500 mm)

41 kg (90 lbs) incl. mounting clamp, feedarm, leadscrew (500 mm) and feed lever

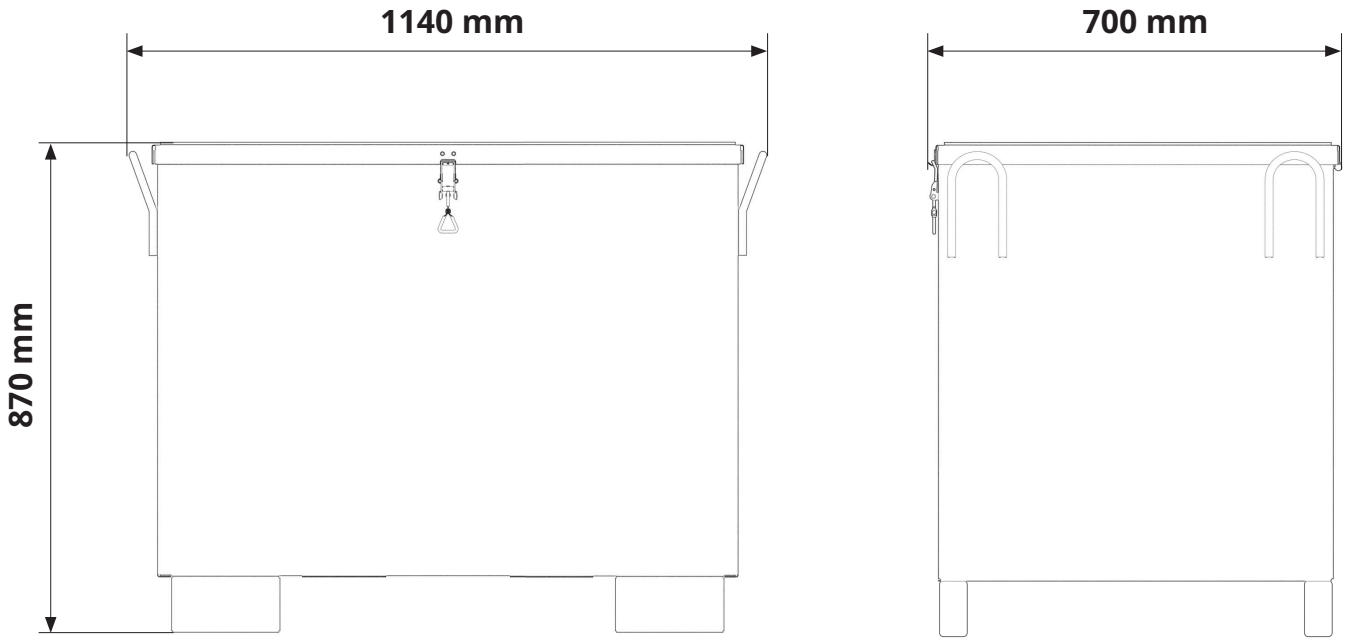
Transportation and Storage Box

Width: 700 mm (27.56 in.)

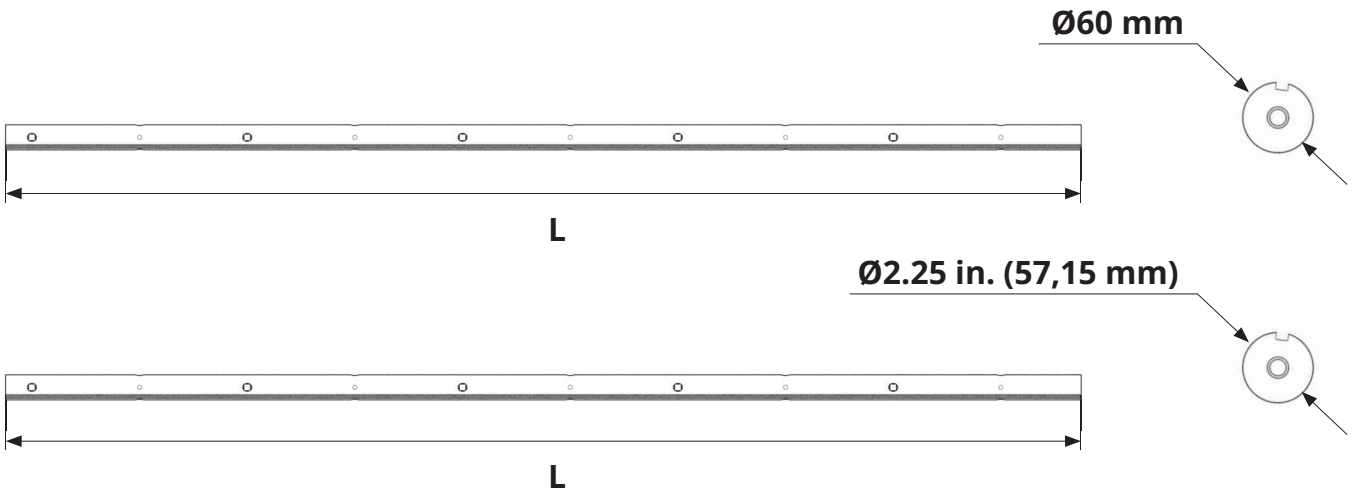
Height: 870 mm (34.25 in.)

Length: 1140 mm (44.88 in.)

Dry weight incl. wooden inserts: Approx. 144 KG (317.5 lbs)



Boring Bar



Length: As ordered

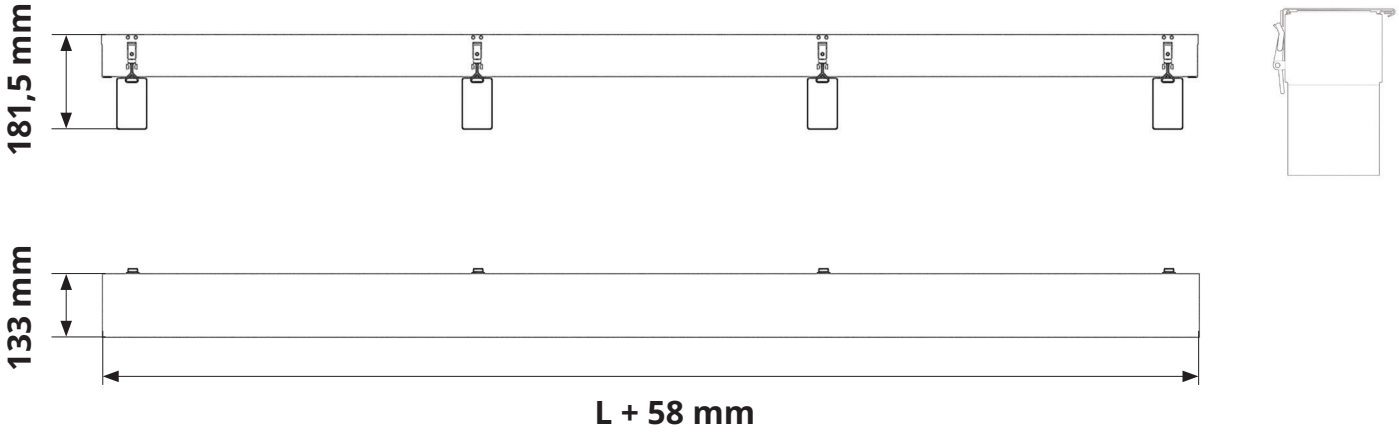
Diameter: Ø60mm (2.36 in.)

Ø57,15 mm (2.25 in.)

Weight: 23 kg/m (15 lb./ft.) at Ø60mm (2.36 in.)

20 kg/m (13 lb./ft.) at Ø57,15 mm (2.25 in.)

Transportation and Storage Box for Boring bar

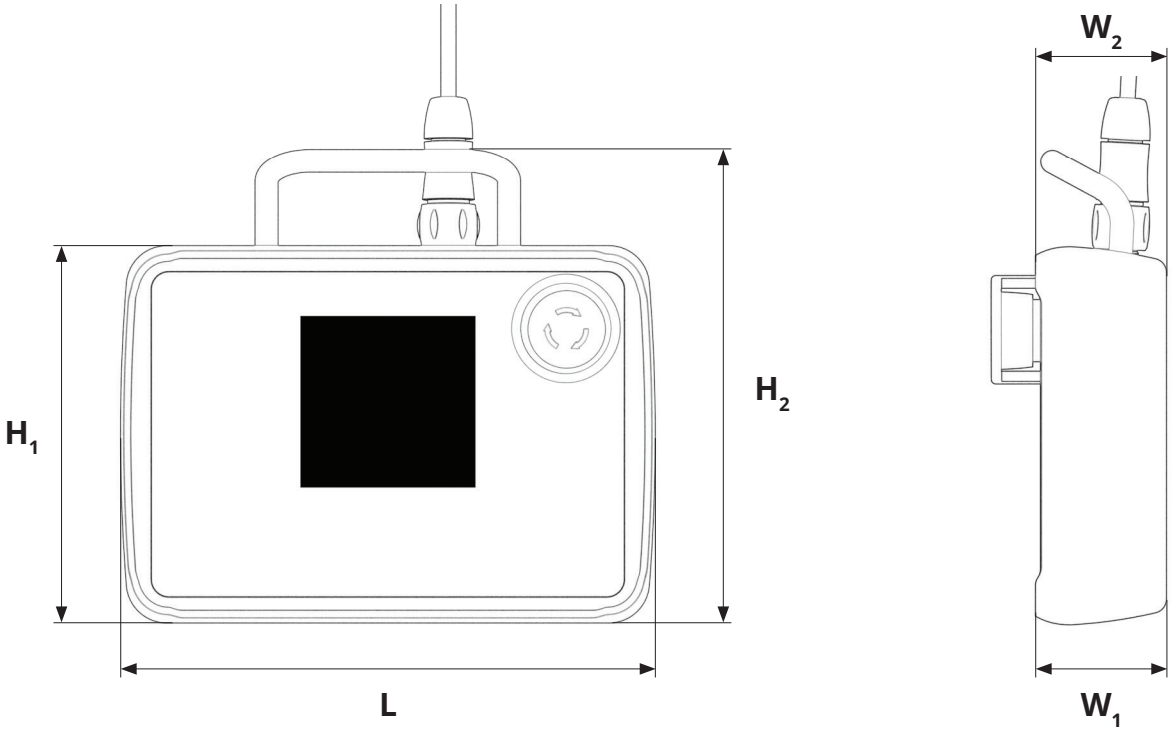


Width: 133 mm (5.24 in.)

Height: 181.5 mm (7.15 in.)

Length: Length of bar as ordered, L, + 58 mm (2.28 in.) *

** The length of the boring bar transportation box may differ from the above formula when ordering boring bar of custom length.*



Height, H_1: 156 mm (6.1 in.)

Height, H_2: 196 mm (7.7 in.)

Length: 221 mm (8.7 in.)

Width, W_1: 54,3 mm (2.1 in.)

Width, W_2: 71 mm (2.8 in.)

Weight: 0.85 kg (1.9 lbs) excl. 3m (9.8 ft.) cord
1.15 kg (2.5 lbs) incl. 3 m (9.8 ft.) cord

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