

DRAPER®

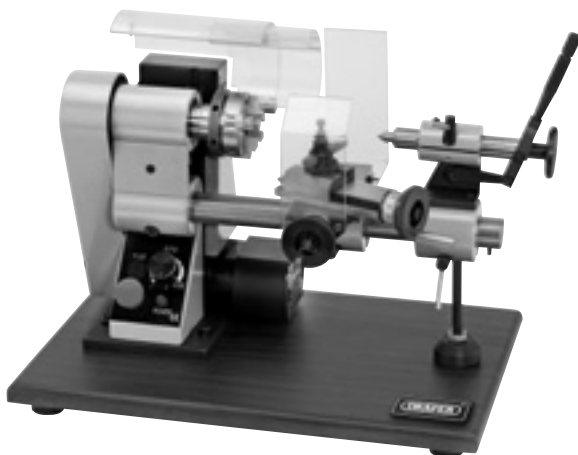
®

INSTRUCTIONS FOR

150W Micro Lathe

Stock No.22824 Part No.MICRO-100

IMPORTANT: PLEASE READ THESE INSTRUCTIONS CAREFULLY TO ENSURE THE SAFE AND EFFECTIVE USE OF THIS PRODUCT.



CE

DRAPER®

GENERAL INFORMATION

These instructions accompanying the product are the original instructions. This document is part of the product, keep it for the life of the product passing it on to any subsequent holder of the product. Read all these instructions before assembling, operating or maintaining this product.

This manual has been compiled by Draper Tools describing the purpose for which the product has been designed, and contains all the necessary information to ensure its correct and safe use. By following all the general safety instructions contained in this manual, it will ensure both product and operator safety, together with longer life of the product itself.

All photographs and drawings in this manual are supplied by Draper Tools to help illustrate the operation of the product.

Whilst every effort has been made to ensure the accuracy of information contained in this manual, the Draper Tools policy of continuous improvement determines the right to make modifications without prior warning.

1. TITLE PAGE

1.1 INTRODUCTION:

USER MANUAL FOR:

150W MICRO LATHE

Stock no. 22824

Part no. MICRO-100

1.2 REVISIONS:

Date first published April 2011

As our user manuals are continually updated, users should make sure that they use the very latest version.

Downloads are available from: <http://www.drapertools.com/b2c/b2cmanuals.pgm>

DRAPER TOOLS LIMITED

HURSLEY ROAD

CHANDLER'S FORD

EASTLEIGH

HAMPSHIRE

SO53 1YF

UK

WEBSITE: www.draper.co.uk

PRODUCT HELPLINE: +44 (0) 23 8049 4344

GENERAL FAX: +44 (0) 23 8026 0784

1.3 UNDERSTANDING THIS MANUALS SAFETY CONTENT:

WARNING! Information that draws attention to the risk of injury or death.

CAUTION! Information that draws attention to the risk of damage to the product or surroundings.

1.4 COPYRIGHT © NOTICE:

Copyright © Draper Tools Limited.

Permission is granted to reproduce this publication for personal & educational use only.

Commercial copying, redistribution, hiring or lending is prohibited.

No part of this publication may be stored in a retrieval system or transmitted in any other form or means without written permission from Draper Tools Limited.

In all cases this copyright notice must remain intact.

2. CONTENTS

2.1 CONTENTS

<i>Page content</i>		<i>Page</i>
1	TITLE PAGE	
	1.1 INTRODUCTION	2
	1.2 REVISION HISTORY	2
	1.3 UNDERSTANDING THIS MANUAL	2
	1.4 COPYRIGHT NOTICE	2
2	CONTENTS	
	2.1 CONTENTS	3
3	GUARANTEE	
	3.1 GUARANTEE	4
4	INTRODUCTION	
	4.1 SCOPE	5
	4.2 SPECIFICATION	5
	4.3 HANDLING & STORAGE	5
5	HEALTH & SAFETY INFORMATION	
	5.1 GENERAL SAFETY INSTRUCTIONS FOR POWER TOOL USE	6
	5.2 SPECIFIC SAFETY INSTRUCTIONS FOR LATHE USE	8
	5.3 CONNECTION TO THE POWER SUPPLY	9A
6	TECHNICAL DESCRIPTION	
	6.1 IDENTIFICATION	10B
	6.2 MAIN COMPONENT DESCRIPTIONS	10A
7	UNPACKING & CHECKING	
	7.1 PACKAGING	11
	7.2 WHAT'S IN THE BOX	11
8	PREPARING THE LATHE	
	8.1 INSTALLATION	12
	8.2 FITTING THE GUARDS	12
9	SETTING THE LATHE	
	9.1 LOADING THE CUTTING TOOL	14
	9.2 LOADING THE UNIVERSAL CHUCK	14
	9.3 REVERSING THE CHUCK JAWS	15
	9.4 USING THE TAIL STOCK	16
	9.5 CARRIAGE ADJUSTMENT	17
10	BASIC LATHE OPERATIONS	
	10.1 SWITCH BOX OPERATION	18
11	MAINTENANCE	
	11.1 SLIDE ADJUSTMENT	19
	11.2 OILING	19
12	EXPLANATION OF SYMBOLS	
	12.1 EXPLANATION OF SYMBOLS	20
13	DISPOSAL	
	13.1 DISPOSAL	21
14	GLOSSARY	
	14.1 GLOSSARY	22
	DECLARATION OF CONFORMITY	ENCLOSED

3. GUARANTEE

3.1 GUARANTEE

Draper tools have been carefully tested and inspected before shipment and are guaranteed to be free from defective materials and workmanship.

Should the tool develop a fault, please return the complete tool to your nearest distributor or contact Draper Tools Limited, Chandler's Ford, Eastleigh, Hampshire, SO53 1YF. England.

Telephone Sales Desk: (023) 8049 4333 or Product Helpline (023) 8049 4344.

A proof of purchase must be provided with the tool.

If upon inspection it is found that the fault occurring is due to defective materials or workmanship, repairs will be carried out free of charge. This guarantee period covering parts/labour is 12 months from the date of purchase except where tools are hired out when the guarantee period is ninety days from the date of purchase. The guarantee is extended to 24 months for parts only. This guarantee does not apply to normal wear and tear, nor does it cover any damage caused by misuse, careless or unsafe handling, alterations, accidents, or repairs attempted or made by any personnel other than the authorised Draper warranty repair agent.

Note: If the tool is found not to be within the terms of warranty, repairs and carriage charges will be quoted and made accordingly.

This guarantee applies in lieu of any other guarantee expressed or implied and variations of its terms are not authorised.

Your Draper guarantee is not effective unless you can produce upon request a dated receipt or invoice to verify your proof of purchase within the guarantee period.

Please note that this guarantee is an additional benefit and does not affect your statutory rights.

Draper Tools Limited.

4. INTRODUCTION

4.1 SCOPE

This micro metal **lathe** is a bench mounted, manually controlled turning machine (without numerical control) capable of accepting 100mm **stock**.

It is a **light duty** machine designed for beginners, D.I.Y., and hobby users; producing small parts; for example, model making and other detailed pieces.

4.2 SPECIFICATION

Stock no	22824
Part no	MICRO-100
Motor:	
Rated voltage	230V~
Rated frequency	50Hz
Rated input	150W
Revolutions per minute (no load)	18,000min ⁻¹
Fuse (glass).....	1 amp
Spindle speed	100 – 4,500min ⁻¹
Distance between centres	100mm
Turning capacity (swing)	100mm
Bore in headstock spindle	8mm
Tailstock travel	26mm
Compound slide travel:	
X Axis (Lateral/cross slide)	40mm
Z Axis (Longitudinal slide).....	53mm
Compound slide angle	±30°
Dimensions (L x W x H)	360 x 250 x 230mm
Sound pressure level	78dB(A)
Weight	9.2kg

4.3 HANDLING & STORAGE

Although this machine is small in size, care must still be taken when handling and lifting. Dropping this machine will have an effect on the accuracy and may also result in personal injury. This machine is not a toy and must be respected.

The environment will have a negative result on its operation if you are not careful. If the air is damp, components will rust. If the machine is unprotected from dust and debris; components will become clogged: And if not cleaned and maintained correctly or regularly the machine will not perform at its best.

5. HEALTH & SAFETY INFORMATION

5.1 GENERAL SAFETY INSTRUCTIONS FOR POWER TOOL USE

When using any type of power tool there are steps that should be taken to make sure that you, as the user, remain safe.

Common sense and a respect for the tool will help reduce the risk of injury.

Read the instruction manual fully. Do not attempt any operation until you have read and understood this manual.

Most important you must know how to safely start and stop this machine, especially in an emergency.

Keep the work area tidy and clean. Attempting to clear clutter from around the machine during use will reduce your concentration. Mess on the floor creates a trip hazard. Any liquid spilt on the floor could result in you slipping.

Find a suitable location. If the machine is bench mounted; the location should provide good natural light or artificial lighting as a replacement. Avoid damp and dust locations as it will have a negative effect on the machine's performance.

If the machine is portable; do not expose the tool to rain. In all cases do not operate power tools near any flammable materials.

Beware of electric shock. Avoid contact with earthed surfaces; because they can conduct electricity if there is an electrical fault with the power tool. Always protect the power cable and route it away from danger.

Keep bystanders away. Children, onlookers and passers by must be restricted from entering the work area for their own protection. The barrier must extend a suitable distance from the tool user.

Unplug and house all power tools that are not in use. A power tool should never be left unattended while connected to the power supply. They must be housed in a suitable location, away locked up and from children.

Do not overload or misuse the tool. All tools are designed for a purpose and are limited to what they are capable of doing. Do not attempt to use a power tool (or adapt it in any way) for an application it is not designed for. Select a tool appropriate for the size of the job. Overloading a tool will result in tool failure and user injury: This covers the use of accessories.

Dress properly. Loose clothing, long hair and jewellery are all dangerous because they can become entangled in moving machinery: This can also result in parts of body being pulled into the machine.

Clothing should be close fitted, with any long hair tied back and jewellery and neck ties removed. Footwear must be fully enclosed and have a nonslip sole.

5. HEALTH & SAFETY INFORMATION

Wear personal protective equipment (PPE). Dust, noise, vibration and **swarf** can all be dangerous if not suitably protected against. If the work involving the power tool creates dust or fumes; wear a dust mask. Vibration to the hand, caused by operating some tools for longer periods must be protected against. Wear vibration reducing gloves and allow long breaks between uses. Protect against dust and **swarf** by wearing approved safety goggles or a face shield. These are some of the more common hazards and preventions; however, always find out what hazards are associated with the machine/work process and wear the most suitable protective equipment available.

Do not breathe contaminated air. If the work creates dust or fumes; connect the machine (if possible) to an extraction system either locally or remotely. Working outdoors can also help if possible.

Move the machine as instructed. If the machine is hand held, do not carry it by the power supply cable. If the product is heavy; employ a second or third person to help move it safely or use a mechanical device. Always refer to the instructions for the correct method.

Do not overreach. Extending your body too far can result in a loss of balance and you falling. This could be from a height or onto a machine and will result in injury.

Maintain your tools correctly. A well maintained tool will do the job safely. Replace any damaged or missing parts immediately with original parts from the manufacturer. As applicable; keep blades sharp; moving parts clean, oiled or greased; handles clean; and emergency devices working.

Wait for the machine to stop. Unless the machine is fitted with a safety brake; some parts may continue to move due to momentum. Wait for all parts to stop; then unplug it from the power supply before making any adjustments, carrying out maintenance operations or just finishing using the tool.

Remove and check setting tools. Some machinery requires the use of additional tools or keys to set, load or adjust the power tool. Before starting the power tool always check to make certain they have been removed and are safely away from the machine.

Prevent unintentional starting. Before plugging any machine in to the power supply, make sure the switch is in the OFF position. If the machine is portable; do not hold the machine near the switch and take care when putting the machine down; that nothing can operate the switch.

Carefully select an extension lead. Some machines are not suitable for use with extension leads. If the tool is designed for use outdoors; use an extension lead also suitable for that environment. When using an extended lead, select one capable of handling the current (amps) drawn by the machine in use. Fully extend the lead regardless of the distance between the power supply and the tool. Excess current (amps) and a coiled extension lead will both cause the cable to heat up and can result in fire.

Concentrate and stay alert. Distractions are likely to cause an accident. Never operate a power tool if you are under the influence of drugs (prescription or otherwise), including alcohol or if you are feeling tired. Being disorientated will result in an accident.

5. HEALTH & SAFETY INFORMATION

Have this tool repaired by a qualified person. This tool is designed to conform to the relevant international and local standards and as such should be maintained and repaired by someone qualified; using only original parts supplied by the manufacturer: This will ensure the tool remains safe to use.

5.2 SPECIFIC SAFETY INSTRUCTION FOR LATHE USE

There are certain risks linked to using any lathe, large or small, that have to be guarded against. This manual will advise you on basic safety and how to operate your lathe. Detailed application of the lathe is beyond the scope of this manual; however, further reading or training is recommended before attempting to use this lathe.

Beware of contact hazards (crushing). Keep your hands away from the **spindle** and any other moving parts while the lathe is running.

Beware of contact hazards (cutting). Take care when handling the work piece and parts of the lathe. **Swarf** on and around the lathe will be sharp to the touch: **Burrs** left on the **stock** can also be extremely sharp. Wear appropriate gloves to protect your hands and clear up after each operation.

Beware of ejection hazards (thrown). While performing standard tasks on the lathe, **swarf** and other debris can be thrown outwards towards you. Always wear suitable safety goggles and face protection. Before starting the lathe, always double check the work piece is securely held in the jaws of the chuck. Always check the lathe before starting it to make sure all tool used for **setting** it have been removed. When **setting** the lathe, get in the habit of holding onto any tools required and not leaving them in the machine. This will help prevent them being thrown by the lathe on start-up

Beware of entanglement hazards. While the lathe is operating, all moving parts must be avoided as there is a risk on clothing, hair and jewellery becoming tangled. Entanglement can also result in the item being pulled in further. Wear appropriate clothing and make sure any long hair is tied back and the all jewellery is removed.
Note: Parts at the rear of the spindle can also present a risk.

Beware of slip, trip and fall hazards. The area closely surrounding the lathe, both on the bench and floor, must be kept clear, clean and tidy.

Beware of fire and explosion. Do not operate this lathe in or around flammable materials. This machine is not designed for use in hazardous environments.

Beware of hot parts. After use the work piece can become very hot. Wear gloves when handling it: or allow time for it to cool.

All guards must be fitted and in good working order. This is for your safety.

Never leave the lathe unattended. This machine must never be left running without supervision. If it is necessary to leave it, stop the motor, press the emergency stop button, raise the guard and unplug the lathe.

5. HEALTH & SAFETY INFORMATION

Keep these instructions with the lathe. If this machine is lent, or sold on, to another person these instructions must remain with it as they are part of the tool.

Remove the cutting tool. After use (at the end of the day) always remove the cutting tool as store it away.

Cover the lathe and store the cutting tools. To help maintain this machine in a good working order, store it under a soft piece of cloth material and store the cutting tools and other accessories in a wooden box. Lubricate all accessories before storing them away.

Do not attempt to fit material larger than this machine is capable of turning. Oversized stock will damage the lathe and is more likely to be thrown off.

Match the motor speed to the job. Incorrect motor speeds can result in damage to the lathe and the cutting tools; it will also result in a poorly finished work piece.

This lathe is not a toy. Treat it with the respect you would give a much larger machine.

Before switching on the power. Rotate (turn) the chuck fully to make sure it will not strike any part of the carriage. While feeding the tool closer to the work piece, always be aware of the chuck in relation to the carriage and slide mechanism.

5.3 CONNECTION TO THE POWER SUPPLY

Make sure the power supply information on the machine's rating plate are compatible with the power supply you intend to connect it to.

This lathe comes supplied with a UK standard 3 pin plug fitted. It is designed for connection to a domestic power supply rated at 230V AC.

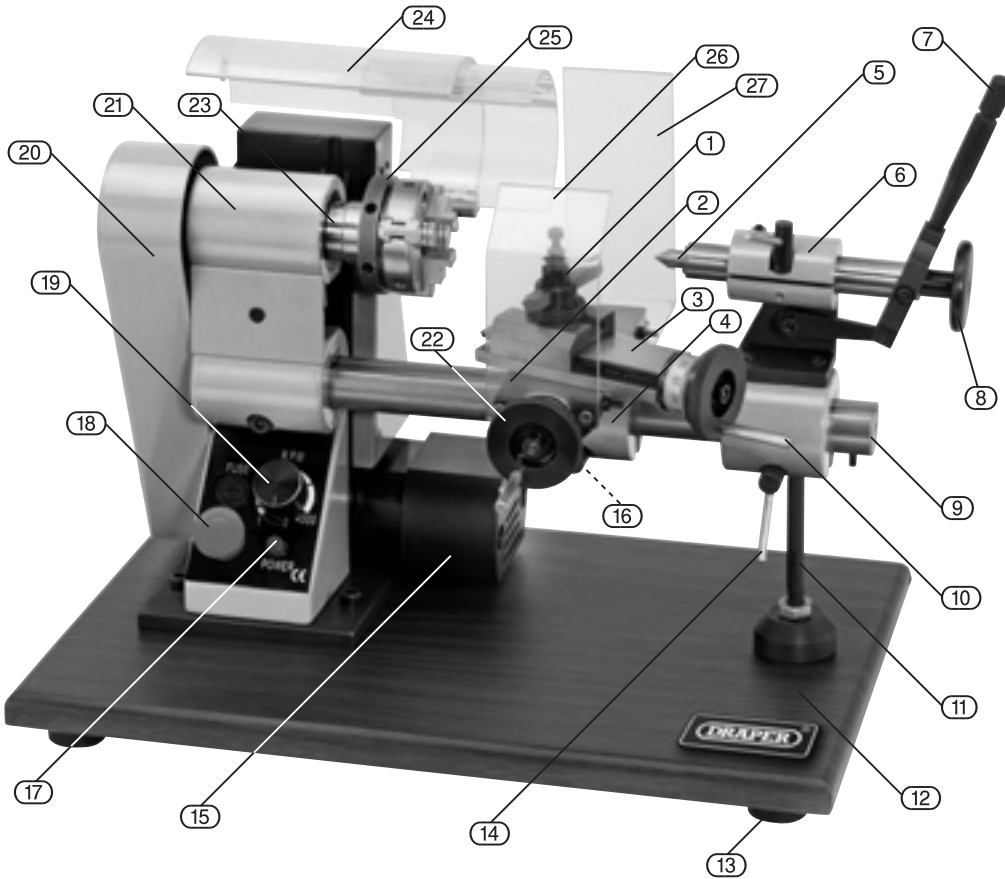
Because it is constructed mostly of metal parts, it is a Class 1 machine; meaning, it must have an earth connection in the power supply. This is to prevent electrocution in the event of a failure.

Apart from replacing the fuse in the plug, no other electrical work is recommended on this lathe.

Blank page

6. TECHNICAL DESCRIPTION

6.1 IDENTIFICATION



- | | |
|---------------------------------------|------------------------------------|
| ① Tool post | ⑭ Tail stock locking screw |
| ② Cross slide (Lateral) | ⑮ 150W Brush motor |
| ③ Compound slide (Longitudinal) | ⑯ Carriage locking screw |
| ④ Carriage | ⑰ Power indicator light |
| ⑤ Dead centre | ⑱ Emergency stop button |
| ⑥ Tail stock | ⑲ Variable speed dial |
| ⑦ Tail stock feed handle | ⑳ Drive belt guard |
| ⑧ Hand wheel | ㉑ Head stock |
| ⑨ Bed bar | ㉒ Cross slide feed handle (X axis) |
| ⑩ Compound slide feed handle (Z axis) | ㉓ Spindle |
| ⑪ Bed support foot | ㉔ Chuck guard with position switch |
| ⑫ Stand | ㉕ 3 Jaw universal chuck |
| ⑬ Anti-vibration feet | ㉖ Front chip guard |
| | ㉗ Rear chip guard |

6. TECHNICAL DESCRIPTION

6.2 MAIN COMPONENT DESCRIPTIONS

The **TOOL POST** is designed to hold the cutting tool at the adjusted angle and height; securely and firmly.

The **CARRIAGE** assembly contains the tool post, cross slide and traverse compound slide. The **carriage** can be moved along the length of the bed bar to suit the work piece. By means of the feed handles; the tool can then be fed on to the side or face of the spinning work piece. One complete turn of the feed wheels moves the related slide 1mm.

The **TAIL STOCK** is mainly used for supporting longer pieces of **stock** bar; however, it is possible to change the dead centre for a geared chuck. This will hold an HSS drill bit and when fed into the spinning work piece will centre drill the work piece.

The **EMERGENCY STOP BUTTON**; when pushed it will stop all power to the motor. After operating the button it is necessary to release it again to restore the power.

The **CHUCK GUARD** is designed to help protect the user from injury; should anything be thrown out from the **lathe**. It includes a position switch that stops the power to the motor; either preventing it from starting or stopping mid use.

The **MOTOR** is maintenance free and will only require attention when the carbon brushes become worn. Due to the location and complexity, disassembly of the motor and surrounding parts is not recommended. The carbon brushes (Stock No.07030) should be replaced by a Draper Tools authorized service agent.

The **VARIABLE SPEED DIAL** is used to change the motor speed during use. After a break in operations (e.g. pressing the emergency stop button or lifting the chuck guard); the dial must be reset back to zero.

7. UNPACKING & CHECKING

7.1 PACKAGING

Carefully remove the lathe from the packaging and examine it for any sign of damage that may have happened during shipping. Lay the contents out and check them against the parts shown below. If any part is damaged or missing; please contact the Draper Helpline (the telephone number appears on the Title page) and do not attempt to use the lathe.

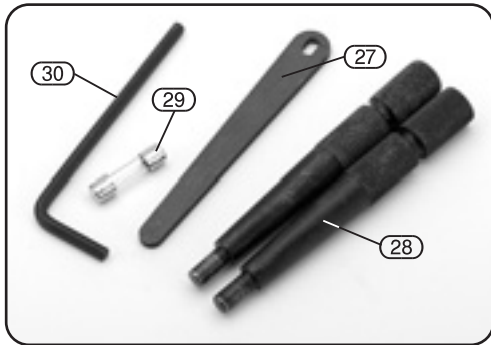
The packaging material should be retained at least during the guarantee period: in case the machine needs to be returned for repair.

Warning! Some of the packaging materials used may be harmful to children. Do not leave any of these materials in the reach of children.

If any of the packaging is to be thrown away, make sure they are disposed of correctly; according to local regulations.

7.2 WHAT'S IN THE BOX?

As well as the lathe; there are several parts not fitted or attached to it.



- (27) Compound angle key
- (28) Universal chuck keys (2)
- (29) 1 amp glass fuse
- (30) 3mm Hex Key

NOTE: No cutting tools come supplied in the box.

They are available as a set of two double-end HSS cutters (Stock No.06834).

8. PREPARING THE LATHE

8.1 INSTALLATION

Choose a location that is level, flat and with a lot of natural light.

The **lathe** should be operated on a work bench that is high enough to prevent any injury caused by working in an uncomfortable position; but not too high that the work piece cannot be safely viewed from above.

WARNING! Bending over or having your neck bent for too long (from looking down) can lead to fatigue injuries.

The environment will have a negative result on its operation if you are not careful. If the air is damp, components will rust. If the machine is unprotected from dust and debris; components will become clogged: And if not cleaned and maintained correctly or regularly the machine will not perform at its best.

The work bench should offer enough space around the lathe for all possible applications and to house any accessories.

Although the **lathe** has been assembled in the factory, some final assembly and adjustments will be required before it can be used. The fine setup will come from experimenting with your new **lathe** and making small adjustments.

To setup, adjust and operate this lathe you will require some additional tools that are not supplied in the box:

- 1 x set of metric hex. keys (including a 2.5mm)
- 1 x metric spanner (including a 5.5mm)
- 1 x 3.0mm plain slot screwdriver
- 1 x No.1 cross slot screwdriver

8.2 FITTING THE GUARDS - FIGS. 1 - 3

To comply with the current regulations and help maintain your safety during use; the machine is supplied with three guards. A chuck guard with sliding section and two carriage guards.

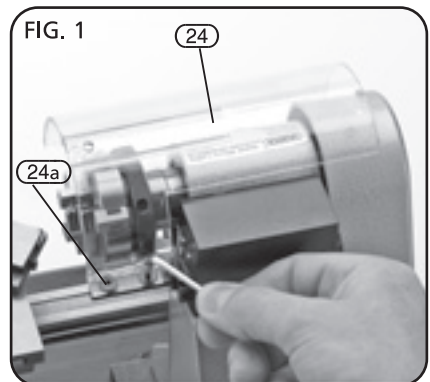
WARNING: These guards must be fitted to the lathe before use.

CHUCK GUARD

- i. Remove the two machine screws (24a) with a 2.5mm hex. key.
- ii. Line up the chuck guard (24) (without sliding section) and refit the two machine screws (24a). Do not overtighten the screws as you will crack the guard.

Note: The guard mechanism contains a microswitch that will prevent the machine from starting unless it is correctly lowered.

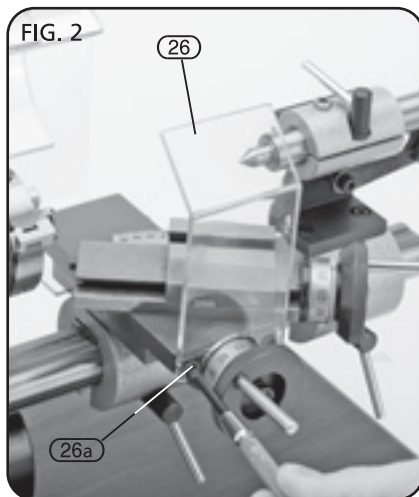
The sliding section of this guard is not required for lathe use as it will obstruct movement of the carriage.



8. PREPARING THE LATHE

FRONT CHIP GUARD

- i. With a No.1 cross slot screwdriver loosen the two screws (26a).
- ii. Slide the front chip guard (26) down over the screws.
- iii. Tighten the screws (26a). Do not overtighten the screws as you will crack the guard.

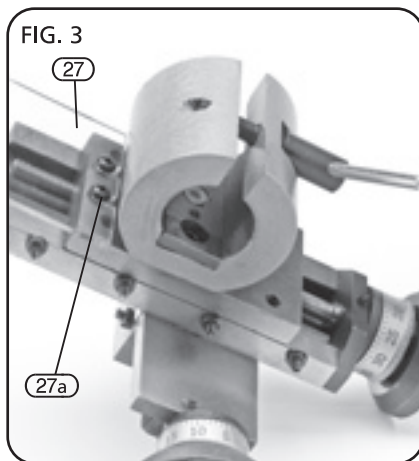


REAR CHIP GUARD

NOTE: It may be necessary to remove the carriage from the bed bar to access the screws fully.

- i. With a No.1 cross slot screwdriver loosen the two screws (27a).
- ii. Slide the rear chip guard (27) behind the screws.
- iii. Tighten the screws (27a). Do not overtighten the screws as you will crack the guard.

WARNING! Replace any damaged guards immediately with an original Draper part.



9. SETTING THE LATHE

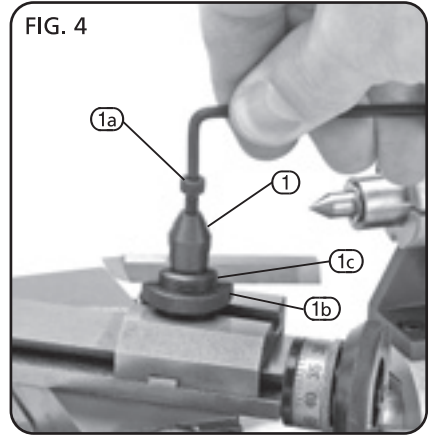
Warning! Do not make any of the following adjustments with the lathe connected to the power supply.

9.1 LOADING A CUTTING TOOL – FIG. 4

If the cutting tool is wrongly loaded it can result in **chattering** which will cause a rough cut and a general poor finish on the work piece. More importantly; it can cause the tool to snap or wear faster. The height of the cutting tool is another important detail. The ideal point of contact is the centre line of the work piece. If the tool is set too high or too low it must be adjusted. If it is not possible to set the tool low enough; it may be necessary to swap the tool for another one or grind it down a little.

Note: Make sure the tool is the correct type for your intended job.

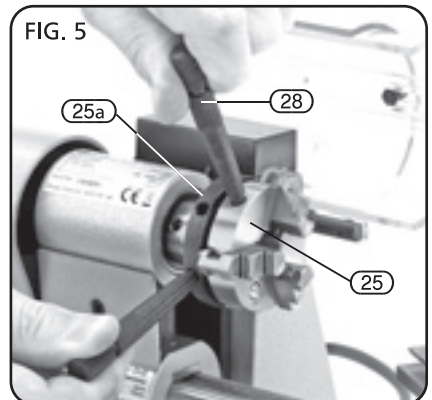
- i. Using a 3mm hex. key loosen the bolt (1a) on the top of tool post (1).
- ii. Turn the **knurled ring** (1b) clockwise. Stop when the bottom of the slot in the threaded body (1c) is above the top of the ring.
- iii. Line up both slots and slide the cutting tool (not supplied) into position.
- iv. Hold down the cutting tool while you adjust the **knurled ring** (1b) until it touches the underside of the tool.
- v. Set the angle of the tool in relation to the work piece and adjust the overhang to approximately 12mm before tightening the bolt (1a) with the 3mm hex. key.



9.2 LOADING THE UNIVERSAL CHUCK – FIG. 5

The size and length of the **stock** will dictate how you mount it. If the material is longer than 50mm then it will need additional support from the dead centre mounted in the tail stock. Diameter; and if the **stock** is solid or tubular will decide on which way round the chuck jaws will need to be mounted.

- i. By hand; lightly grip the **stock** in the jaws of the universal chuck (25).
- ii. Rotate the material by hand to make sure it is sat correctly on the jaws and then pull it out slightly (2mm) from the back of the chuck.
- iii. Insert the chuck keys (28): Holding the back part of the chuck (25a) to stop it from moving; rotate the other chuck key downward.
- iv. Tighten the chuck at the three points around its body.



9. SETTING THE LATHE

Warning! Do not make any of the following adjustments with the lathe connected to the power supply.

9.3 REVERSING THE CHUCK JAWS – FIGS. 6 - 7

The jaws are reversible to suit different situations. When turning and fitting the jaws, close attention must be paid to their order. In the back of the chuck are stamped the numbers 1 to 3. Each jaw has two sets of numbers stamped on it. Depending which way they are to be fitted will dictate their order. The stamped number nearest to the slot is the appropriate one to use.

- i. Open the chuck fully and continue doing so until the jaws become free.
- ii. Turn the back of the chuck until the start of the thread (25b) is aligned just before slot 1.
- iii. Insert jaw 1 into slot 1 and turn the back of the chuck until the start of the thread (25b) is aligned just before slot 2.
- iv. Continue until all the chuck jaws are locked in place.

Note: If the chuck becomes tight to turn, check the individual jaws to make sure they are running true in the slots.

FIG. 6

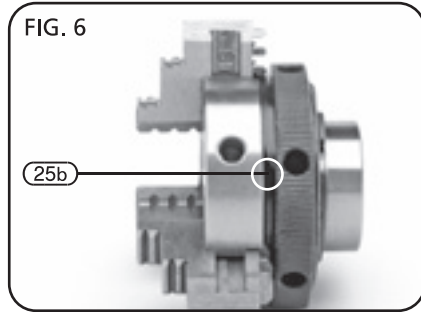
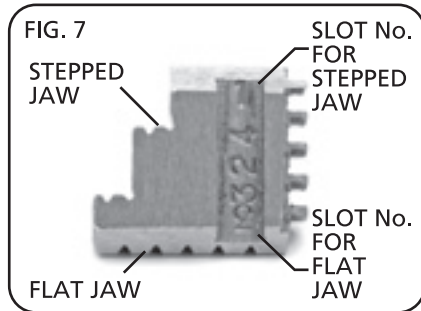


FIG. 7



9. SETTING THE LATHE

9.4 USING THE TAIL STOCK – FIG. 8

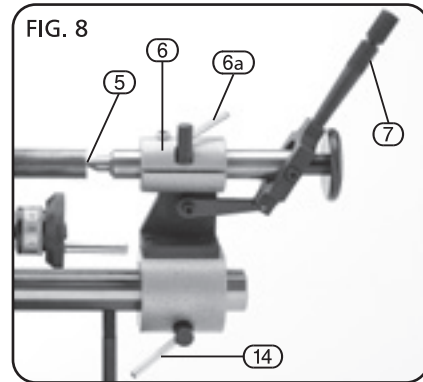
If the stock is longer than 50mm the tail stock will provide the necessary support to stop any damage or injury. The longer the **stock**, the more it will want to **whip**.

The back end of the stock needs to be pre-drilled with a 60° countersink to match the angle of the **dead centre**.

Caution! The countersink must be drilled exactly in the centre of the stock, otherwise the work piece will run off centre.

- i. Lubricate the tip of the dead centre (5) with a few drops of oil.
- ii. With the **stock** mounted in the chuck (25): slide the tail stock (6) to fit into place on the dead centre (5).
- iii. Tighten the tail stock locking screw (14).
- iv. Loosen the tail stock barrel screw (6a) and move the tail stock feed handle (7) toward the head stock (21).
- v. Tighten the tail stock barrel screw (6a) to lock it in place.

Note: Keep the dead centre (5) lubricated to reduce wear on the components.



9. SETTING THE LATHE

Warning! Do not make any of the following adjustments with the lathe connected to the power supply.

9.5 CARRIAGE ADJUSTMENT – FIGS. 9 - 10

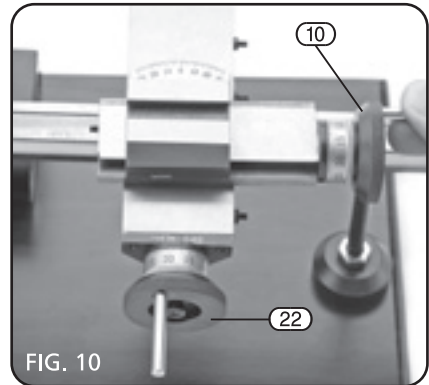
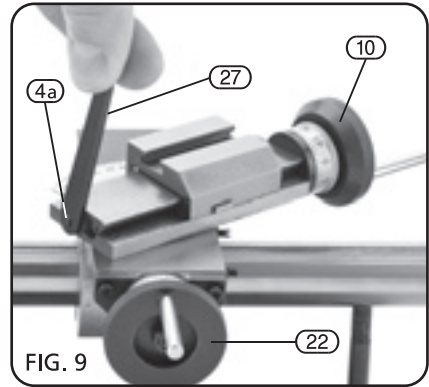
The **carriage** and compound slide need careful adjustment before any **turning** can begin. The **carriage** slides along the bed bar **longitudinally** (also known as the **Z axis**). After the carriage is in position, all movement of the tool is done using the compound slide along the side of the work piece and the cross slide which moves the tool onto the work piece **laterally** (also known as the **X axis**).

- i. Slide the **carriage** (4) into position and tighten the **carriage** locking screw (16).

WARNING! Make sure no moving parts will impact the **carriage** assembly. Rotate the chuck several times by hand before starting the lathe.

- ii. Slot the compound angle key (27) over the end of tab (4a) and lift it upward to unlock the slide.
- iii. Carefully set the angle, before pushing down the compound angle key (27) to lock it in position.
- iv. Remove the compound angle key (27) from tab (4a).
- v. Turn the cross slide feed handle (22) clockwise to move the tool away from you. One complete turn is equal to 1mm along the **X axis**.
- vi. Turn the compound slide feed handle (10) clockwise to move tool from right to left. One complete turn is equal to 1mm along the **Z axis**.

Note: If you want to keep a parallel line with the tool bit and the work piece; the angle of the compound slide is very important.



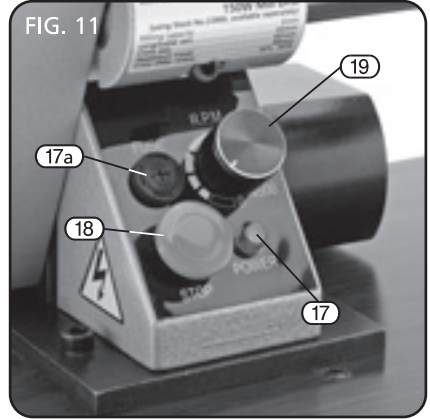
10. BASIC LATHE OPERATIONS

10.1 SWITCH BOX OPERATION – FIG. 11

The knowledge of where to find, and how to operate, the emergency stop button is the most important piece of information in this manual. Read and understand this before beginning to use this machine.

With the **lathe** set-up and connected to the power supply:

- i. Lower the chuck guard (24). Failing to do this will prevent the motor from operating.
- ii. If not already in position: Turn the variable speed dial (19) anticlockwise (until you hear a click).
- iii. Release the emergency stop button (18) by pressing it.
- iv. When the emergency stop button is released the green power indicator light (17) will come on. The motor will be audible (capable of being heard) but will not move.



Note: If the green power indicator light (17) does not come on, disconnect the lathe from the power supply before checking the fuse inside holder (17a).

- v. To start the **spindle** (23) moving; gradually turn the variable speed dial (19) clockwise. The further round you turn the dial, the greater the speed.
- vi. There are three ways to stop the power to the motor.
 - a. Turn the variable speed dial (19) anticlockwise.
 - b. Raise the chuck guard (24).
Warning! This is not recommended because you are putting your fingers close to the moving chuck.
 - c. Striking the emergency stop button (18).
- vii. Remember to reset the variable speed dial (19) and emergency stop button (18) after stopping the **lathe**.

Note: After you have finished with the **lathe**, it is good practice to leave the emergency stop button pressed in.

Note: If the tool begins to **chatter** try adjusting the speed a little or reduce the depth of cut.

With practice and a reasonable amount of time invested you will be able to achieve operations such as turning, facing, grooving (parting), drilling and boring. Due to the subjects complexity any instruction to this detail is beyond the scope of this manual; however, there is a wealth of information on the internet and there are a lot of good text books on the subject of metal lathes and clock maker's lathes.

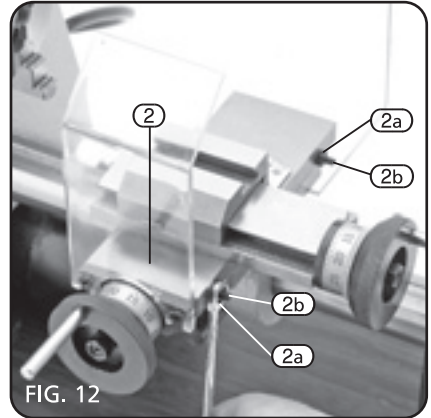
11. MAINTENANCE

11.1 SLIDE ADJUSTMENT – FIG. 12

Regularly check the slide mechanisms: The slide should remain free to move with a smooth action but without any side to side play. Regularly clean and re-oil the slide as build-up of **swarf** will restrict the feed mechanism.

Adjustment should be carried out on the cross slide first:

- i. With a 5.5mm spanner, loosen all the lock nuts (2a) on the cross slide (2) .
- ii. With a 3mm plain slot screwdriver adjust the **gib** screws (2b). Turning the screw clockwise increases pressure on the **gib** strip which in turn restricts the play in the slide mechanism.
- iii. Continually check the full movement of the slide, because too much pressure will restrict the slide and feed smoothness lost.
- iv. When you are happy that the slide mechanism remains smooth for its complete travel distance; lock the nuts (2a) while stopping the **gib** screws (2b) moving.



11.2 OILING

After use, all moving parts should be oiled to help maintain the lathe in a good working order.

Additionally, any bare metal surfaces and components will benefit from a regular wipe over with an oil cloth. This will keep components moving freely and prevent rust appearing.

12. EXPLANATION OF SYMBOLS

12.1 EXPLANATION OF SYMBOLS



Warning! Ejection hazards.
Wear safety goggles



Warning!
Read the instruction manual



Warning! Noise.
Wear ear defenders



Warning! Disable the machine
before attempting to maintain it



Warning! Contact hazards.
Keep hands away from moving
parts



Danger! Electricity.
Keep your distance



WEEE
Do not dispose of Waste Electrical
& Electronic Equipment in with
domestic rubbish

13. DISPOSAL

13.1 DISPOSAL

- At the end of the machine's working life, or when it can no longer be repaired, ensure that it is disposed of according to national regulations.
- Contact your local authority for details of collection schemes in your area.

In all circumstances:

- Do not dispose of power tools with domestic waste.
- Do not incinerate.
- Do not abandon in the environment.
- Do not dispose of WEEE* as unsorted municipal waste.



* Waste Electrical & Electronic Equipment.

14. GLOSSARY

14.1 GLOSSARY

Alphabetical list of words relating to this manual

Burr	Rough (and usually very sharp) projection left when cutting or drilling metal.
Carriage	Assembly which carries the slide mechanisms and tool post.
Chatter	Vibration of the tool usually caused by incorrect setup or excess speed during a cut, resulting in a poor finish and reduced tool life.
Dead Centre	Pivot to support the work piece which does not contain a bearing.
Face	Front surface.
Gib	A metal wedge pad or thrust bearing.
HSS	High speed steel.
Knurled	Raised ridged pattern to provide additional grip.
Lateral	Across the width (across face of the chuck).
Lathe	Machine to rotate a work piece (metal object) against a stationary tool.
Light Duty	For domestic use (not intended for extended use).
Longitudinal	Lengthwise direction.
Pip	Small piece of residual material left in the centre, missed during facing operations.
Spindle	Metal rod/axis on which the chuck is fitted.
Stock	Piece of raw metal before it becomes a work piece.
Swarf	Fine chips/fillings produced by machinery processes.
Turning	Process to reduce material width on a lathe.
Whip	Uncontrolled off centre shake caused by off centre mass rotating.
X Axis	Imaginary line horizontally passing across the face of the chuck (front to back).
Z Axis	Imaginary line between head stock and tail stock (side to side).

- **DRAPER TOOLS LIMITED,**
Hursley Road, Chandler's Ford,

Eastleigh, Hampshire. SO53 1YF. U.K.

- **Helpline:** (023) 8049 4344
- **Sales Desk:** (023) 8049 4333
- **Internet:** www.draper.co.uk
- **E-mail:** sales@drapertools.com
- **Sales Fax:** (023) 8049 4209
- **General Enquiries:** (023) 8026 6355

- **Service/Warranty Repair Agent**

For aftersales servicing or warranty repairs, please contact the Draper Tools Helpline for details of an agent in your local area.

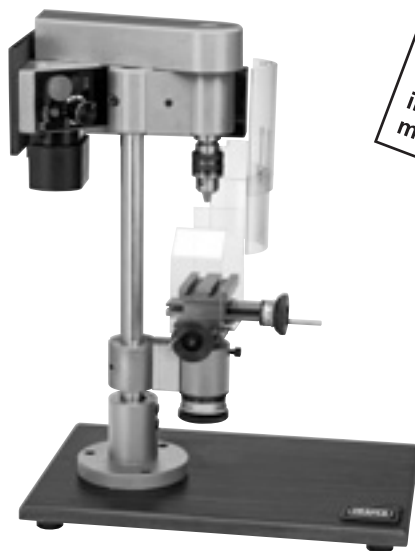
YOUR DRAPER STOCKIST

DRAPER®

INSTRUCTIONS FOR Micro Mill

Stock No.22832 Part No.MICRO-MILL

IMPORTANT: PLEASE READ THESE INSTRUCTIONS CAREFULLY TO ENSURE THE SAFE AND EFFECTIVE USE OF THIS PRODUCT.



WARNING
This manual must be read
in conjunction with the
manual for lathe 22824.

CE

DRAPER®

GENERAL INFORMATION

These instructions accompanying the product are the original instructions. This document is part of the product, keep it for the life of the product passing it on to any subsequent holder of the product. Read all these instructions before assembling, operating or maintaining this product.

This manual has been compiled by Draper Tools describing the purpose for which the product has been designed, and contains all the necessary information to ensure its correct and safe use. By following all the general safety instructions contained in this manual, it will ensure both product and operator safety, together with longer life of the product itself.

All photographs and drawings in this manual are supplied by Draper Tools to help illustrate the operation of the product.

Whilst every effort has been made to ensure the accuracy of information contained in this manual, the Draper Tools policy of continuous improvement determines the right to make modifications without prior warning.

1. TITLE PAGE

1.1 INTRODUCTION:

USER MANUAL FOR:

MICRO MILL

Stock no. 22832

Part no. MICRO-MILL

1.2 REVISIONS:

Date first published April 2011

As our user manuals are continually updated, users should make sure that they use the very latest version.

Downloads are available from: <http://www.drapertools.com/b2c/b2cmanuals.pgm>

DRAPER TOOLS LIMITED

HURSLEY ROAD

CHANDLER'S FORD

EASTLEIGH

HAMPSHIRE

SO53 1YF

UK

WEBSITE: www.draper.co.uk

PRODUCT HELPLINE: +44 (0) 23 8049 4344

GENERAL FAX: +44 (0) 23 8026 0784

1.3 UNDERSTANDING THIS MANUALS SAFETY CONTENT:

WARNING! Information that draws attention to the risk of injury or death.

CAUTION! Information that draws attention to the risk of damage to the product or surroundings.

1.4 COPYRIGHT © NOTICE:

Copyright © Draper Tools Limited.

Permission is granted to reproduce this publication for personal & educational use only.

Commercial copying, redistribution, hiring or lending is prohibited.

No part of this publication may be stored in a retrieval system or transmitted in any other form or means without written permission from Draper Tools Limited.

In all cases this copyright notice must remain intact.

2. CONTENTS

2.1 CONTENTS

<i>Page content</i>		<i>Page</i>
1	TITLE PAGE	
	1.1 INTRODUCTION	2
	1.2 REVISION HISTORY	2
	1.3 UNDERSTANDING THIS MANUAL	2
	1.4 COPYRIGHT NOTICE	2
2	CONTENTS	
	2.1 CONTENTS	3
3	GUARANTEE	
	3.1 GUARANTEE	4
4	INTRODUCTION	
	4.1 SCOPE	5
	4.2 SPECIFICATION	5
	4.3 HANDLING & STORAGE	5
5	HEALTH & SAFETY INFORMATION	
	5.1 GENERAL SAFETY INSTRUCTIONS FOR POWER TOOL USE	6
	5.2 SPECIFIC SAFETY INSTRUCTIONS FOR MILL USE	6
	5.3 CONNECTION TO THE POWER SUPPLY	7
6	PREPARING THE LATHE	
	6.1 LATHE STRIP DOWN	8
	6.2 WORKTABLE ASSEMBLY	9
	6.3 ASSEMBLE MILL PARTS	11
	6.4 SLIDING GUARD	12
7	SETTING THE MILL	
	7.1 MILLING TOOL INSTALLATION	13
8	BASIC MILL OPERATIONS	
	8.1 END MILLING	14
9	MAINTENANCE	
	9.1 SLIDE ADJUSTMENT	15
10	EXPLANATION OF SYMBOLS	
	10.1 EXPLANATION OF SYMBOLS	16
11	DISPOSAL	
	11.1 DISPOSAL	17
	DECLARATION OF CONFORMITY	ENCLOSED

3. GUARANTEE

3.1 GUARANTEE

Draper tools have been carefully tested and inspected before shipment and are guaranteed to be free from defective materials and workmanship.

Should the tool develop a fault, please return the complete tool to your nearest distributor or contact Draper Tools Limited, Chandler's Ford, Eastleigh, Hampshire, SO53 1YF. England.

Telephone Sales Desk: (023) 8049 4333 or Product Helpline (023) 8049 4344.

A proof of purchase must be provided with the tool.

If upon inspection it is found that the fault occurring is due to defective materials or workmanship, repairs will be carried out free of charge. This guarantee period covering parts/labour is 12 months from the date of purchase except where tools are hired out when the guarantee period is ninety days from the date of purchase. The guarantee is extended to 24 months for parts only. This guarantee does not apply to normal wear and tear, nor does it cover any damage caused by misuse, careless or unsafe handling, alterations, accidents, or repairs attempted or made by any personnel other than the authorised Draper warranty repair agent.

Note: If the tool is found not to be within the terms of warranty, repairs and carriage charges will be quoted and made accordingly.

This guarantee applies in lieu of any other guarantee expressed or implied and variations of its terms are not authorised.

Your Draper guarantee is not effective unless you can produce upon request a dated receipt or invoice to verify your proof of purchase within the guarantee period.

Please note that this guarantee is an additional benefit and does not affect your statutory rights.

Draper Tools Limited.

4. INTRODUCTION

4.1 SCOPE

This manually operated micro milling machine uses a rotating cutting tool (mill bit) and is designed for processing (end milling) cold metal or plastic. The maximum mill capacity is 6mm.

It is a **light duty** machine designed for beginners, D.I.Y., and hobby users; producing small parts; for example, model making and other detailed pieces.

4.2 SPECIFICATION

Stock no	22832
Part no	MICRO-MILL
Milling capacity	6mm
Longitudinal axis (Y) travel	45mm
Cross axis (X) travel	40mm
Vertical axis (Z) travel	80mm
T-slot size	8mm
Worktable tilt	±45°
Dimensions (L x W x H)	380 x 250 x 430mm
Sound pressure level	78dB(A)
Weight	11kg

4.3 HANDLING & STORAGE

Although this machine is small in size, care must still be taken when handling and lifting. Dropping this machine will have an effect on the accuracy and may also result in personal injury. This machine is not a toy and must be respected.

The environment will have a negative result on its operation if you are not careful. If the air is damp, components will rust. If the machine is unprotected from dust and debris; components will become clogged: And if not cleaned and maintained correctly or regularly the machine will not perform at its best.

5. HEALTH & SAFETY INFORMATION

5.1 GENERAL SAFETY INSTRUCTIONS FOR POWER TOOL USE

This section of the lathe manual 22824 applies.

5.2 SPECIFIC SAFETY INSTRUCTION FOR MILL USE

There are certain risks linked to using any mill, large or small, that have to be guarded against. This manual will advise you on basic safety and how to operate your mill.

Beware of contact hazards (crushing). When setting/changing a tool or maintaining the machine avoid crushing injuries sustained between fixed and moving parts of this machine.

Beware of contact hazards (cutting or severing). At all times the workpiece shall be clamped, as manual support will lead to injury.

Beware of entanglement hazards. Switch off the machine for maintenance, workpiece loading/unloading, swarf/chip removal and cutting/lubrication fluid application, as contact with the rotating spindle or tool will cause entanglement and possibly lead to injury and entrapment. Do not reach over or around the machine at any time. Remove jewellery and tie back long hair.

Beware of ejection hazards (thrown). Ensure the workpiece is securely clamped at all times to avoid sudden movement (rotation) or ejection causing injury. Make sure any special tools, associated with tool exchange, i.e. chuck keys, are removed before starting the machine.

Beware of stabbing, cutting, or puncture wounds. Take care when handling the tools and avoid contact with swarf and burrs created during drilling as they are extremely sharp.

Avoid contact with live parts. During assembly, operation, maintenance and troubleshooting operations, do not remove, open or expose any electrical terminal or control boxes due to the danger of electrocution. If the mains cable is damaged, unplug the machine immediately and have the cable replaced before continuing.

Always wear personal protective equipment. Wear personal protective equipment (P.P.E) to avoid contact from harmful fluids, gases or material thrown during the drilling process.

Beware of fire or explosion. Do not drill in the vicinity of flammable or combustible materials.

Maintain a good posture. When mounting the machine, choose a location that will not lead to an unhealthy posture or repetitive strain during normal operation.

Good lighting is important. Adequate lighting must be provided to prevent injuries caused by working in impaired lighting conditions.

Beware of unexpected start-up. Remove the plug from the socket before carrying out adjustment, servicing or maintenance.

Beware of incorrect fitting. Make sure a suitable tool for the job in hand is securely and correctly fitted before starting the machine. Guards must be fitted and in place at all times.

Beware of toppling. The drill shall be positioned on a suitable and level surface to prevent the machine from overturning, leading to injury.

Beware of slipping. Make sure the area is clean of any residue cutting/lubrication fluid and other materials which may lead to a slip, trip or other such hazard.

5. HEALTH & SAFETY INFORMATION

5.3 CONNECTION TO THE POWER SUPPLY

Make sure the power supply information on the machine's rating plate are compatible with the power supply you intend to connect it to.

This lathe comes supplied with a UK standard 3 pin plug fitted. It is designed for connection to a domestic power supply rated at 230V AC.

Because it is constructed mostly of metal parts, it is a Class 1 machine; meaning, it must have an earth connection in the power supply. This is to prevent electrocution in the event of a failure.

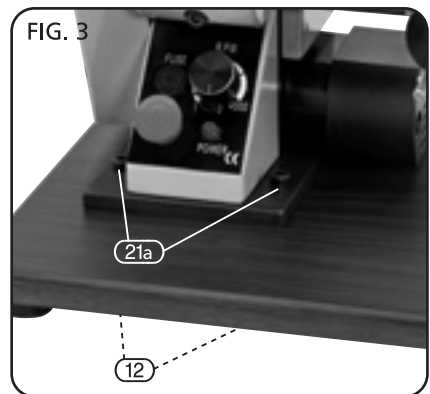
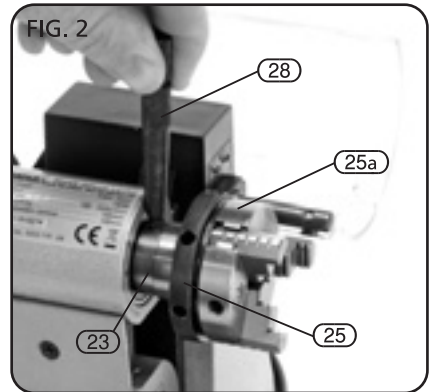
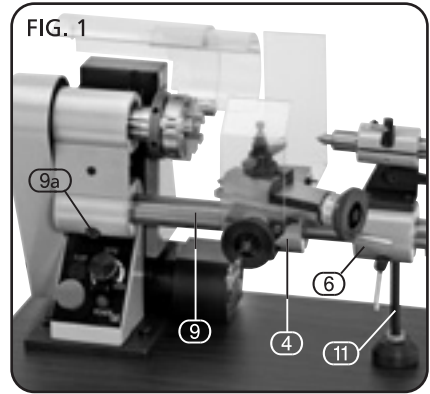
Apart from replacing the fuse in the plug, no other electrical work is recommended on this lathe.

6. PREPARING THE MILL

6.1 LATHE STRIP DOWN – FIGS. 1 - 3

To convert the lathe to either the micro mill or drill it must be removed from the wooden base and reconstructed with some additional parts in the upright position.

- i. Remove the plug from the power supply.
- ii. Loosen the bolt (9a) with a 5mm Hex. key.
- iii. Slide out the bed bar (9) with the carriage assembly (4) and tailstock (6) in position. The bed support foot (11) will drop away.
- iv. Loosen the carriage locking screen (16) and tailstock locking screw (14) before with-drawing the bed bar (9).
- v. With one chuck key (28), hold the spindle (23) in place, with the other key, turn the chuck by the outer section (25a) anti-clockwise.
Remove the chuck (25) and store it away safely.
- vi. With a 5mm hex. key, hold the two headstock bolts (21a) while removing the 10mm nuts underneath the stand (12). Stock the bolts, washers and nuts safely.

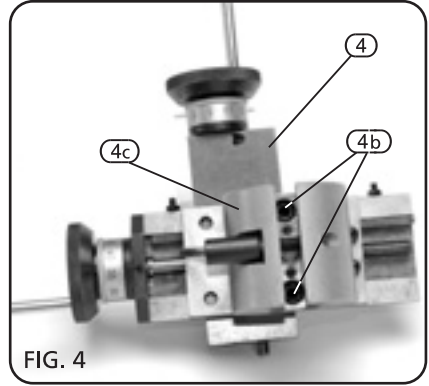


6. PREPARING THE MILL

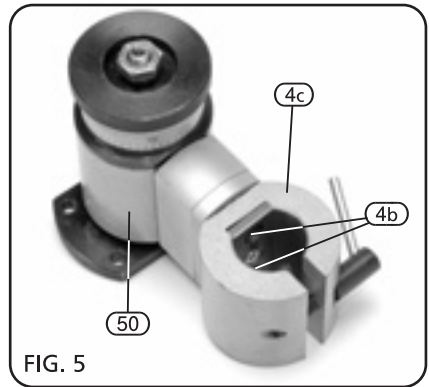
6.2 WORKTABLE ASSEMBLY – FIGS. 4 - 8

The lathe carriage assembly (4) provide some of the parts to build the mill table mechanism.

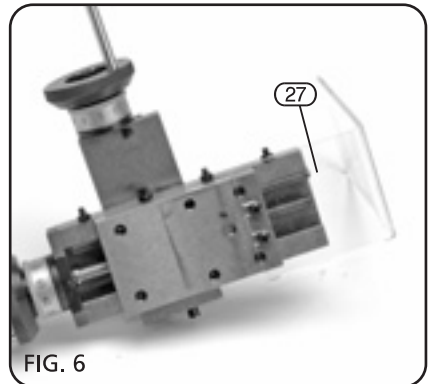
- i. Remove the two bolts (4b) using a 4mm hex. key, and separate the clamping collar (4c) from the underside of the carriage assembly (4).



- ii. Attach the clamping collar (4c) to the back of the vertical adjustment carriage (50) reusing the two bolts (4b) and tighten with a 4mm hex. key.

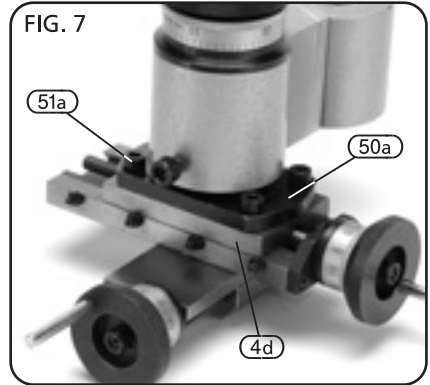


- iii. Remove the two cross slot screws holding the rear chip guard (27). Carefully store them away along with the guard to prevent loss or damage.



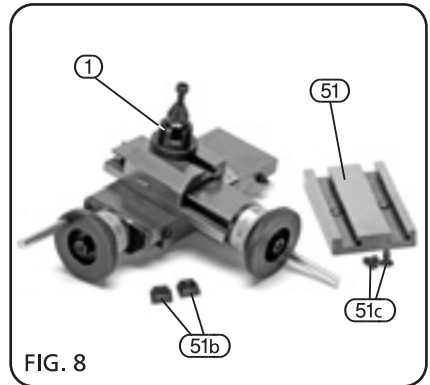
6. PREPARING THE MILL

- iv. Align the four holes in the vertical adjustment carriage top plate (50a) with the four outer holes on the underside of the feed mechanism (4d). Join them together with the four bolts (51a) and tighten.



- v. Slide the tee pieces (51b) into the tee slots in place of the tool post (1). Space them apart so they align with the two holes in table (51), with a No.2 cross slot screwdriver insert the two screw (51c).

NOTE: A small drop of thread lock maybe useful to prevent the screws coming loose from vibration.



6. PREPARING THE MILL

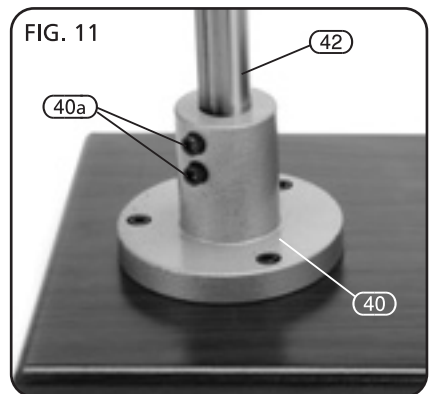
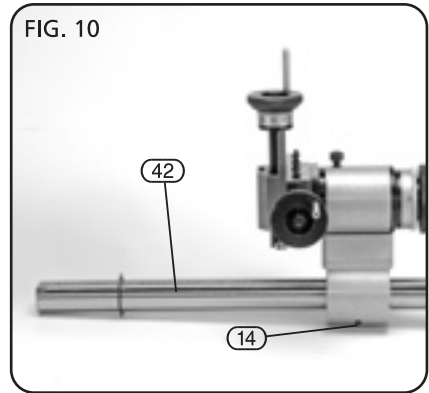
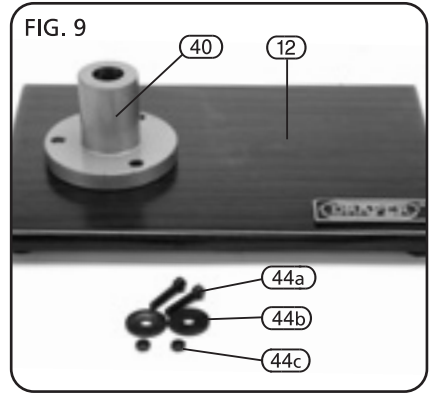
6.3 ASSEMBLE MILL PARTS – FIGS. 9 - 12

- i. Align the base hub (40) with the three matching holes in the stand (12).
- ii. Pass the longer bolts (44a) through the base hub (40) and stand (12). Insert all three before attaching the extra large washers (44b) and 10mm nuts (44c) and tighten.

NOTE: Because the extend column (42) has a circlip to support the headstock (21) the worktable assembly must be fitted first.

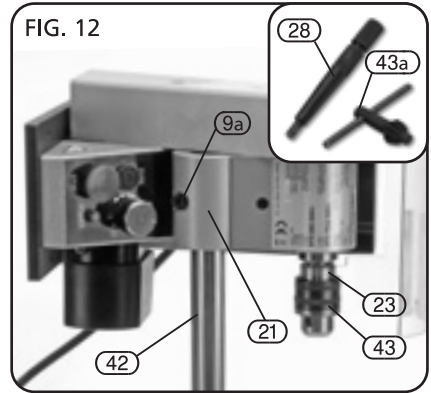
- iii. Slide the worktable assembly onto the column (42) and secure in place with the tailstock locking screw (14).

- iv. Stand the column (42) in the hub (40) and tighten the two bolts (40a) with a 5mm hex. key.



6. PREPARING THE MILL

- v. Carefully slide the headstock (21) down, onto the column (42). Tighten the bolt (9a) with the 5mm hex. key.
- vi. Screw the geared chuck (43) onto the spindle (23). To ensure the chuck is tight, lock the spindle (23) with chuck key (28) and use the geared chuck key (43a) for additional leverage (force).

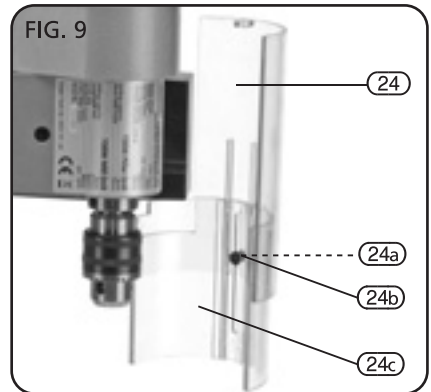


6.4 SLIDING GUARD – FIG. 13

To provide additional protection from the workpiece and drill chuck, the machine is provided with a sliding guard.

- i. Locate and separate the 3mm hex. socket bolt (24a) and 7mm nut (24b).
- ii. Position the sliding guard (24c) under the main guard (24) with the cutout toward the headstock (21).
- iii. With the plastic tab (24d) sat in the channel bolt the two sections together.

NOTE: Do not over tighten as it may damage the guard.

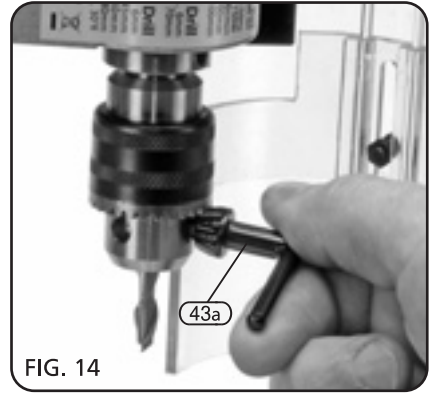


7. SETTING THE MILL

7.1 MILLING TOOL INSTALLATION – FIG. 14

The drill chuck has a maximum capacity of 6mm.

- i. Open the chuck jaws wide enough for the mill bit. To widen the jaws, insert the chuck key (43a) and turn it anti-clockwise.
- ii. Slide the shank of the mill bit up inside the chuck.
- iii. Turn the chuck key (43a) clockwise to grip the bit in the chuck jaws.
- iv. Make sure the mill bit is correctly held by the jaws, before tightening the chuck at the three points around its circumference.



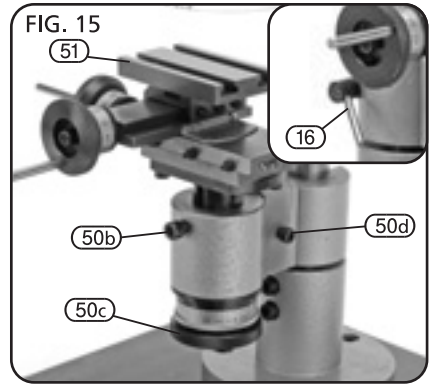
8. BASIC MILL OPERATIONS

8.1 END MILLING – FIG. 15

Because the headstock is fixed the workpiece must be setup to the necessary height and angle before being feed onto the rotating cutter.

- i. Clamp the workpiece firmly to the worktable (51).
- ii. Set the approximate height of the workpiece and secure by tightening carriage locking screw (16).
- iii. With a 5mm hex. key loosen bolt (50b).
- iv. Adjust the exact height of the workpiece by turning the fine adjustment wheel (50c). Turn the wheel from left to right to reduce the distance between mill bit and workpiece.
- v. With the 5mm hex. key lock bolt (50b) and the height of the workpiece.
- vi. Apply a drop of cutting fluid or oil.
- vii. Start the machine running (refer to 22824 10.4).
- viii. Advance the workpiece slowly onto the mill bit and along using the compound and cross slide feed handles.

NOTE: If required the angle of the workpiece can be adjusted. Loosen bolt (50d) to adjust.



9. MAINTENANCE

9.1 SLIDE ADJUSTMENT – FIG. 12

This section of the lathe manual 22824 applies.

10. EXPLANATION OF SYMBOLS

10.1 EXPLANATION OF SYMBOLS



Warning! Ejection hazards.
Wear safety goggles



Warning!
Read the instruction manual



Warning! Noise.
Wear ear defenders



Warning! Disable the machine
before attempting to maintain it



Warning! Contact hazards.
Keep hands away from moving
parts



Danger! Electricity.
Keep your distance



WEEE
Do not dispose of Waste Electrical
& Electronic Equipment in with
domestic rubbish

11. DISPOSAL

11.1 DISPOSAL

- At the end of the machine's working life, or when it can no longer be repaired, ensure that it is disposed of according to national regulations.
- Contact your local authority for details of collection schemes in your area.

In all circumstances:

- Do not dispose of power tools with domestic waste.
- Do not incinerate.
- Do not abandon in the environment.
- Do not dispose of WEEE* as unsorted municipal waste.



* Waste Electrical & Electronic Equipment.

- **DRAPER TOOLS LIMITED,**
Hursley Road, Chandler's Ford,
Eastleigh, Hampshire. SO53 1YF. U.K.
- **Helpline:** (023) 8049 4344
- **Sales Desk:** (023) 8049 4333
- **Internet:** www.draper.co.uk
- **E-mail:** sales@drapertools.com
- **Sales Fax:** (023) 8049 4209
- **General Enquiries:** (023) 8026 6355
- **Service/Warranty Repair Agent**
For aftersales servicing or warranty repairs, please contact the Draper Tools Helpline for details of an agent in your local area.

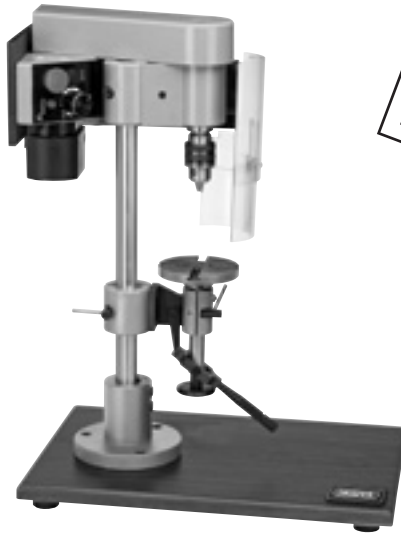
YOUR DRAPER STOCKIST

DRAPER[®]

INSTRUCTIONS FOR Micro Drill

Stock No.22866 Part No.MICRO-DRILL

IMPORTANT: PLEASE READ THESE INSTRUCTIONS CAREFULLY TO ENSURE THE SAFE AND EFFECTIVE USE OF THIS PRODUCT.



WARNING
This manual must be read
in conjunction with the
manual for lathe 22824.

CE

DRAPER[®]

GENERAL INFORMATION

These instructions accompanying the product are the original instructions. This document is part of the product, keep it for the life of the product passing it on to any subsequent holder of the product. Read all these instructions before assembling, operating or maintaining this product.

This manual has been compiled by Draper Tools describing the purpose for which the product has been designed, and contains all the necessary information to ensure its correct and safe use. By following all the general safety instructions contained in this manual, it will ensure both product and operator safety, together with longer life of the product itself.

All photographs and drawings in this manual are supplied by Draper Tools to help illustrate the operation of the product. Whilst every effort has been made to ensure the accuracy of information contained in this manual, the Draper Tools policy of continuous improvement determines the right to make modifications without prior warning.

1. TITLE PAGE

1.1 INTRODUCTION:

USER MANUAL FOR:

MICRO DRILL

Stock no. 22866

Part no. MICRO-DRILL

1.2 REVISIONS:

Date first published April 2011

As our user manuals are continually updated, users should make sure that they use the very latest version.

Downloads are available from: <http://www.drapertools.com/b2c/b2cmanuals.pgm>

DRAPER TOOLS LIMITED

HURSLEY ROAD

CHANDLER'S FORD

EASTLEIGH

HAMPSHIRE

SO53 1YF

UK

WEBSITE: www.draper.co.uk

PRODUCT HELPLINE: +44 (0) 23 8049 4344

GENERAL FAX: +44 (0) 23 8026 0784

1.3 UNDERSTANDING THIS MANUALS SAFETY CONTENT:

WARNING! Information that draws attention to the risk of injury or death.

CAUTION! Information that draws attention to the risk of damage to the product or surroundings.

1.4 COPYRIGHT © NOTICE:

Copyright © Draper Tools Limited.

Permission is granted to reproduce this publication for personal & educational use only.

Commercial copying, redistribution, hiring or lending is prohibited.

No part of this publication may be stored in a retrieval system or transmitted in any other form or means without written permission from Draper Tools Limited.

In all cases this copyright notice must remain intact.

2. CONTENTS

2.1 CONTENTS

	<i>Page</i>
1	TITLE PAGE
	1.1 INTRODUCTION 2
	1.2 REVISION HISTORY 2
	1.3 UNDERSTANDING THIS MANUAL 2
	1.4 COPYRIGHT NOTICE 2
2	CONTENTS
	2.1 CONTENTS 3
3	GUARANTEE
	3.1 GUARANTEE 4
4	INTRODUCTION
	4.1 SCOPE 5
	4.2 SPECIFICATION 5
	4.3 HANDLING & STORAGE 5
5	HEALTH & SAFETY INFORMATION
	5.1 GENERAL SAFETY INSTRUCTIONS FOR POWER TOOL USE 6
	5.2 SPECIFIC SAFETY INSTRUCTIONS FOR DRILL USE 6
	5.3 CONNECTION TO THE POWER SUPPLY 7
6	PREPARING THE DRILL
	6.1 LATHE STRIP DOWN 8
	6.2 WORKTABLE ASSEMBLY 9
	6.3 ASSEMBLE DRILL PARTS 9
	6.4 SLIDING GUARD 10
7	SETTING THE DRILL
	7.1 DRILL BIT INSTALLATION 11
8	BASIC DRILL OPERATIONS
	8.1 HOLE BORING 12
9	MAINTENANCE
	9.1 SLIDE ADJUSTMENT 13
10	EXPLANATION OF SYMBOLS
	10.1 EXPLANATION OF SYMBOLS 14
11	DISPOSAL
	11.1 DISPOSAL 15
	DECLARATION OF CONFORMITY ENCLOSED

3. GUARANTEE

3.1 GUARANTEE

Draper tools have been carefully tested and inspected before shipment and are guaranteed to be free from defective materials and workmanship.

Should the tool develop a fault, please return the complete tool to your nearest distributor or contact Draper Tools Limited, Chandler's Ford, Eastleigh, Hampshire, SO53 1YF. England.

Telephone Sales Desk: (023) 8049 4333 or Product Helpline (023) 8049 4344.

A proof of purchase must be provided with the tool.

If upon inspection it is found that the fault occurring is due to defective materials or workmanship, repairs will be carried out free of charge. This guarantee period covering parts/labour is 12 months from the date of purchase except where tools are hired out when the guarantee period is ninety days from the date of purchase. The guarantee is extended to 24 months for parts only. This guarantee does not apply to normal wear and tear, nor does it cover any damage caused by misuse, careless or unsafe handling, alterations, accidents, or repairs attempted or made by any personnel other than the authorised Draper warranty repair agent.

Note: If the tool is found not to be within the terms of warranty, repairs and carriage charges will be quoted and made accordingly.

This guarantee applies in lieu of any other guarantee expressed or implied and variations of its terms are not authorised.

Your Draper guarantee is not effective unless you can produce upon request a dated receipt or invoice to verify your proof of purchase within the guarantee period.

Please note that this guarantee is an additional benefit and does not affect your statutory rights.

Draper Tools Limited.

4. INTRODUCTION

4.1 SCOPE

This manually operated micro drilling machine uses a rotating cutting tool (drill bit) and is designed to produce holes in cold metal or plastic. The maximum capacity is 6mm.

It is a **light duty** machine designed for beginners, D.I.Y., and hobby users; producing small parts; for example, model making and other detailed pieces.

4.2 SPECIFICATION

Stock no	22866
Part no	MICRO-DRILL
Motor:	
Rated voltage	230V~
Rated frequency	50Hz
Rated input	150W
Chuck capacity.....	6mm
Drilling capacity.....	6mm
Worktable travel	70mm
Sound pressure level	78dB(A)
Dimensions (L x W x H)	380 x 250 x 430mm
Weight	9.3kg

4.3 HANDLING & STORAGE

Although this machine is small in size, care must still be taken when handling and lifting. Dropping this machine will have an effect on the accuracy and may also result in personal injury. This machine is not a toy and must be respected.

The environment will have a negative result on its operation if you are not careful. If the air is damp, components will rust. If the machine is unprotected from dust and debris; components will become clogged: And if not cleaned and maintained correctly or regularly the machine will not perform at its best.

5. HEALTH & SAFETY INFORMATION

5.1 GENERAL SAFETY INSTRUCTIONS FOR POWER TOOL USE

This section of the lathe manual 22824 applies.

5.2 SPECIFIC SAFETY INSTRUCTIONS FOR DRILL USE

There are certain risks linked to using any drill, large or small, that have to be guarded against. This manual will advise you on basic safety and how to operate your drill.

Beware of contact hazards (crushing). When setting/changing a tool or maintaining the machine avoid crushing injuries sustained between fixed and moving parts of this machine.

Beware of contact hazards (cutting or severing). At all times the workpiece shall be clamped, as manual support will lead to injury.

Beware of entanglement hazards. Switch off the machine for maintenance, workpiece loading/unloading, swarf/chip removal and cutting/lubrication fluid application, as contact with the rotating spindle or tool will cause entanglement and possibly lead to injury and entrapment. Do not reach over or around the machine at any time. Remove jewellery and tie back long hair.

Beware of ejection hazards (thrown). Ensure the workpiece is securely clamped at all times to avoid sudden movement (rotation) or ejection causing injury. Make sure any special tools, associated with tool exchange, i.e. chuck keys, are removed before starting the machine.

Beware of stabbing, cutting, or puncture wounds. Take care when handling the tools and avoid contact with swarf and burrs created during drilling as they are extremely sharp.

Avoid contact with live parts. During assembly, operation, maintenance and troubleshooting operations, do not remove, open or expose any electrical terminal or control boxes due to the danger of electrocution. If the mains cable is damaged, unplug the machine immediately and have the cable replaced before continuing.

Always wear personal protective equipment. Wear personal protective equipment (P.P.E) to avoid contact from harmful fluids, gases or material thrown during the drilling process.

Beware of fire or explosion. Do not drill in the vicinity of flammable or combustible materials.

Maintain a good posture. When mounting the machine, choose a location that will not lead to an unhealthy posture or repetitive strain during normal operation.

Good lighting is important. Adequate lighting must be provided to prevent injuries caused by working in impaired lighting conditions.

Beware of unexpected start-up. Remove the plug from the socket before carrying out adjustment, servicing or maintenance.

Beware of incorrect fitting. Make sure a suitable tool for the job in hand is securely and correctly fitted before starting the machine. Guards must be fitted and in place at all times.

Beware of toppling. The drill shall be positioned on a suitable and level surface to prevent the machine from overturning, leading to injury.

Beware of slipping. Make sure the area is clean of any residue cutting/lubrication fluid and other materials which may lead to a slip, trip or other such hazard.

5. HEALTH & SAFETY INFORMATION

5.3 CONNECTION TO THE POWER SUPPLY

Make sure the power supply information on the machine's rating plate are compatible with the power supply you intend to connect it to.

This lathe comes supplied with a UK standard 3 pin plug fitted. It is designed for connection to a domestic power supply rated at 230V AC.

Because it is constructed mostly of metal parts, it is a Class 1 machine; meaning, it must have an earth connection in the power supply. This is to prevent electrocution in the event of a failure.

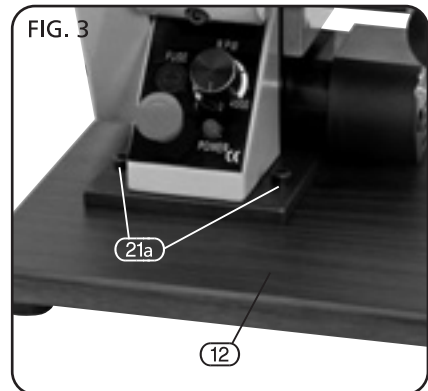
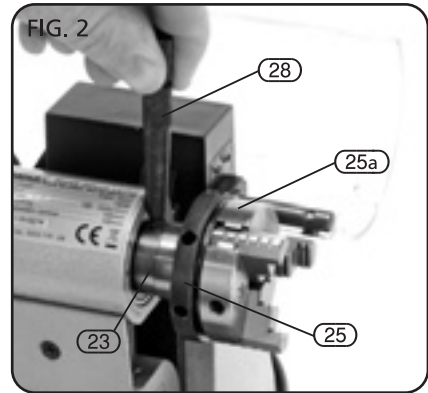
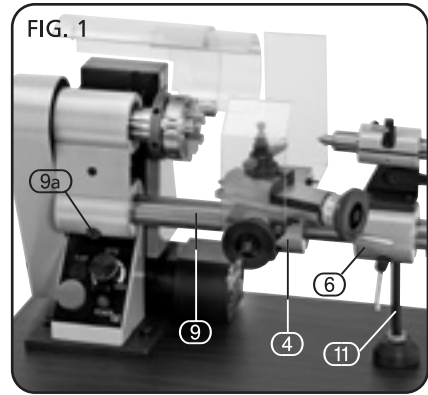
Apart from replacing the fuse in the plug, no other electrical work is recommended on this machine.

6. PREPARING THE DRILL

6.1 LATHE STRIP DOWN – FIGS. 1 - 3

To convert the lathe to either the Micro Mill or Drill it must be removed from the wooden base and reconstructed with some additional parts in the upright position:

- i. Remove the plug from the power supply.
- ii. Loosen the bolt (9a) with a 5mm hex key.
- iii. Slide out the bed bar (9) with the carriage assembly (4) and tail stock (6) in position. The bed support foot (11) will drop away.
- iv. Loosen the carriage locking screw (16) and tail stock locking screw (14) before withdrawing the bed bar (9).
- v. With one chuck key (28), hold the spindle (23) in place, with the other key, turn the chuck by the outer section (25a) anti-clockwise. Remove the chuck (25) and store it away safely.
- vi. With a 5mm hex. key, hold the two headstock bolts (21a) while removing the 10mm nuts underneath the stand (12). Stock the bolts, washers and nuts safely.

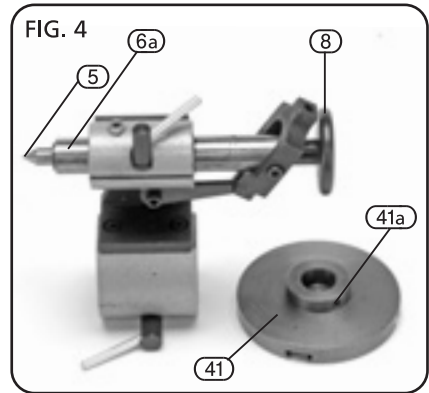


6. PREPARING THE DRILL

6.2 WORKTABLE ASSEMBLY – FIG. 4

The tailstock slide mechanism provides the worktable movement as the headstock is fixed in position.

- i. Hold the dead centre (5) firm while you loosen the hand wheel (8).
- ii. Remove the dead centre (5) and hand wheel (8).
- iii. With a 2.5mm hex key, unscrew the grub screw (41a) but do not remove it.
- iv. Slot the worktable (41) over the tailstock shaft (6a) and secure by tightening the grub screw (41a).

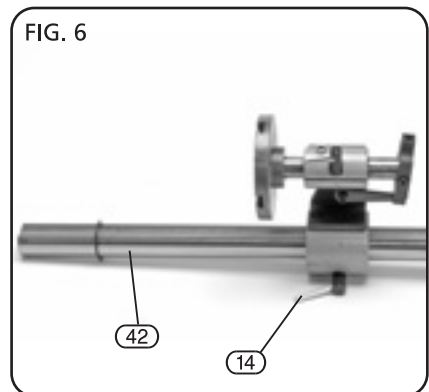
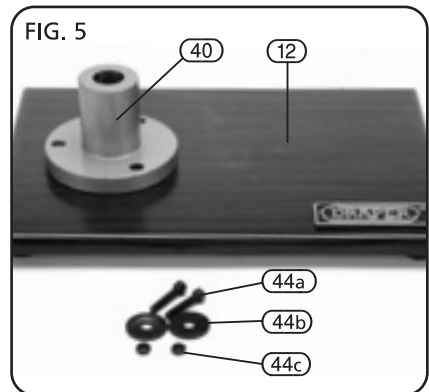


6.3 ASSEMBLE DRILL PARTS – FIGS. 5 - 8.

- i. Align the base hub (40) with the three matching holes in the stand (12).
- ii. Pass the longer bolts (44a) through the base hub (40) and stand (12). Insert all three before attaching the extra large washers (44b) and 10mm nuts (44c), and tighten.

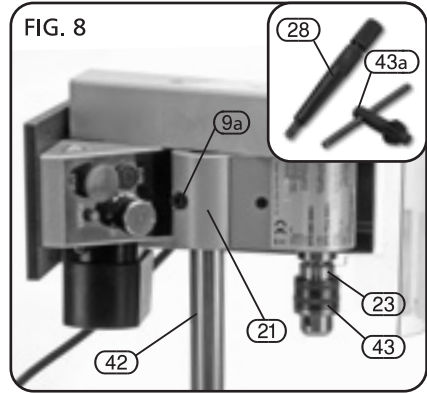
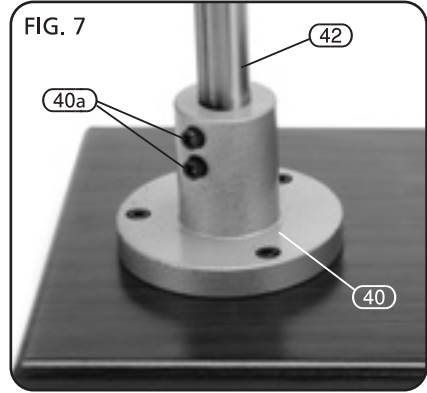
Note: Because the extended column (42) has a circlip to support the headstock (21) the worktable assembly must be fitted first.

- iii. Slide the worktable assembly onto the column (42) and secure in place with the tailstock locking screw (14).



6. PREPARING THE DRILL

- iv. Stand the column (42) in the hub (40) and tighten the two bolts (40a) with a 5mm hex key.
- v. Carefully slide the headstock (21) down, onto the column (42). Tighten the bolt (9a) with the 5mm hex key.
- vi. Screw the geared chuck (43) onto the spindle (23). To ensure the chuck is tight, lock the spindle (23) with chuck key (28) and use the geared chuck key (43a) for additional leverage.

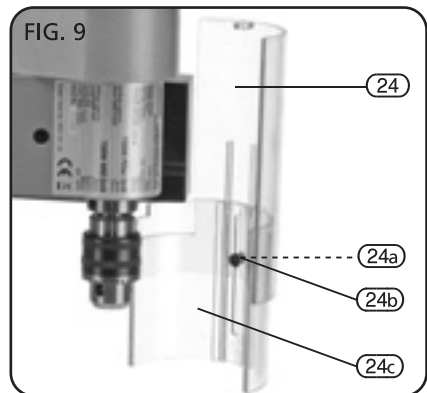


6.4 SLIDING GUARD – FIG. 9

To provide additional protection from the workpiece and drill chuck, the machine is provided with a sliding guard.

- i. Locate and separate the 3mm hex socket bolt (24a) and 7mm nut (24b).
- ii. Position the sliding guard (24c) under the main guard (24) with the cut out toward the headstock (21).
- iii. With the nut in the channel, bolt the two sections together.

Note: Do not over tighten as it may damage the guard.

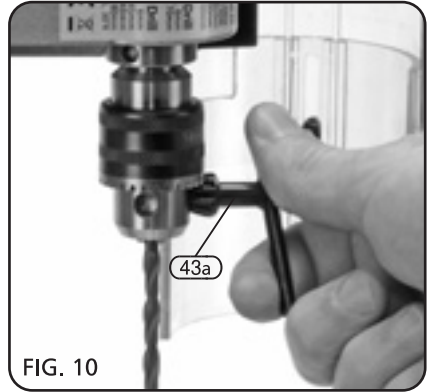


7. SETTING THE DRILL

7.1 DRILL BIT INSTALLATION – FIG. 10

The drill chuck has a maximum capacity of 6mm.

- i. Open the chuck jaws wide enough for your chosen drill bit. To widen the jaws, insert the chuck key (43a) and turn it anticlockwise.
- ii. Slide the shank of the drill bit up inside the chuck.
- iii. Turn the chuck key (43a) clockwise to grip the bit in the chuck jaws.
- iv. Make sure the drill bit is correctly held by the jaws, before tightening the chuck at the three points around its circumference.



8. BASIC DRILL OPERATIONS

8.1 HOLE BORING

Because this machine converts from a lathe the headstock remains fixed. The plunge, necessary for drilling into material is achieved by raising and lowering the worktable.

- i. Clamp the workpiece firmly to the worktable (41).

Note: Use Draper 06838 vice or Draper 06836 clamping kit to safely and securely hold the workpiece.

- ii. Apply a drop of cutting fluid or oil.
- iii. Start the machine running (refer to 22824 10.1).
- iv. Gradually raise the worktable up onto the rotating drill bit by the tail stock feed handle (7).

9. MAINTENANCE

9.1 SLIDE ADJUSTMENT

This section of the lathe manual 22824 applies.

10. EXPLANATION OF SYMBOLS

10.1 EXPLANATION OF SYMBOLS



Warning! Ejection hazards.
Wear safety goggles



Warning!
Read the instruction manual



Warning! Noise.
Wear ear defenders



Warning! Disable the machine
before attempting to maintain it



Warning! Contact hazards.
Keep hands away from moving
parts



Danger! Electricity.
Keep your distance



WEEE
Do not dispose of Waste Electrical
& Electronic Equipment in with
domestic rubbish

11. DISPOSAL

11.1 DISPOSAL

- At the end of the machine's working life, or when it can no longer be repaired, ensure that it is disposed of according to national regulations.
- Contact your local authority for details of collection schemes in your area.

In all circumstances:

- Do not dispose of power tools with domestic waste.
- Do not incinerate.
- Do not abandon in the environment.
- Do not dispose of WEEE* as unsorted municipal waste.



* Waste Electrical & Electronic Equipment.

- **DRAPER TOOLS LIMITED,**
Hursley Road, Chandler's Ford,
Eastleigh, Hampshire. SO53 1YF. U.K.
- **Helpline:** (023) 8049 4344
- **Sales Desk:** (023) 8049 4333
- **Internet:** www.draper.co.uk
- **E-mail:** sales@drapertools.com
- **Sales Fax:** (023) 8049 4209
- **General Enquiries:** (023) 8026 6355
- **Service/Warranty Repair Agent**
For aftersales servicing or warranty repairs, please
contact the Draper Tools Helpline for details of an
agent in your local area.

YOUR DRAPER STOCKIST