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PRODUCT AND MAINTENANCE MANUAL **3M PRECISION DRILLING MACHINE**



YOUR BROBO DISTRIBUTOR IS:

-
- Precision Drilling Machines ● Tapping Machines ● Multi Head Drills ● Tool Grinders ●
 - Tool Post Grinders ● Machine Vices ● Special Production Equipment ●
 - Accessories ● Riveting Machines ● Pedestal Grinders ● Metal Cutting Saws ● Linishers ●

OPERATING MANUAL FOR **BROBO GROUP** 3M PRECISION DRILLING MACHINE

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TECHNICAL SPECIFICATION

	3M SERIES (BENCH MOUNTED)	3M SERIES (FLOOR MOUNTED)
DRILLING CAPACITY	32mm	32mm
SIZE OF TABLE • Standard Square • Optional Round • Optional T-Slots	- - 305 × 305	- 350 305 × 305
SPINDLE TRAVEL	101	101
COLUMN DIAMETER	74.6	74.6
MAXIMUM DISTANCE SPINDLE TO TABLE	340	714
MAXIMUM DISTANCE SPINDLE TO BASE	530	1208
THROAT DEPTH	191	191
MOTOR kW	1.1	1.1
SPINDLE SPEEDS (NOMINAL) STRAIGHT DRIVE INTERMEDIATE DRIVE	480, 850, 1450, 2500 150, 280, 320, 480, 570, 650, 1800, 2000, 3000	480, 850, 1450, 2500 150, 280, 320, 480, 570, 650, 1800, 2000, 3000
WEIGHT UNPACKED	130kg	145kg
WEIGHT PACKED	149kg	164kg
HEIGHT PACKED (mm)	985	1390
HEIGHT INSTALLED (mm)	985	1700
BASE AREA (mm)	368 × 600	368 × 600



CHAPTER 1 - Installation of the Machine

1.1. Unpacking and Handling the Machine



WARNING – HEAD HEAVY MACHINES

The 3M Drill is heaviest where the drill heads are fitted and as such, care must be taken while relocating or moving the machines.

Upon receiving the **Brobo Group 3M Drill**, the machine should be standing upright and positioned centrally on top of a wooden pallet. While the machine is situated on the pallet, position the forklift arms under the pallet between the runners, keeping in mind that the machine is **head heavy** and minimal force should be exerted on the electrical box located beneath the machine. Move the entire unit to an accessible area as close as possible to the final location.

Carefully remove the wooden frame surrounding the drill unit (*Figure 1*). Once completed, proceed by elevating the machine away from the pallet base using a sling harness wrapped around the entire unit ensuring that it is *equally supported*. Ensure that the floor is as level as possible before finally positioning the machine to the desired location.

Once in position, verify that the electrical supply is connected. Attached the 3MT arbour and chuck set (*not provided*) into the quill housing, while ensuring that the arbour step correctly mates into the quill housing slot.



Figure 1. *Handling of 3M Drill*

PLEASE OBSERVE AND FOLLOW THE INSTALLATION INSTRUCTIONS ON PAGE 5

1.2. Parts Checklist

Along with the drill unit, check that the following accessories, packed "loose", are included as follows:

A. STANDARD ACCESSORIES

- 1) 1 × Operation Manual

1.3. Minimum Requirements

For the machine to function correctly, the room in which the drill unit is to be installed must be in the vicinity of, and satisfy the following conditions:

- 415/240V Power Supply
- Ambient Temperature - From -10 °C to +50 °C.
- Relative Humidity: Not more than 90%.
- Lighting: More than 500 LUX.



WARNING – OPERATING VOLTAGE VARIATION

Each drill model has an inbuilt safety system to protect it against voltage variations. However, for the machine to perform efficiently, ensure that the drill unit operates within $\pm 10\%$ limits of the recommended voltage of the motor.

1.4. Anchoring the Drill

Prior to anchoring the drill unit, take into considerations the requirements mentioned in *Section 1.3* and *Section 2.2*, and other aspects regarding the usage of the machine such as accessibility to drilled parts and safe access for the operator.

The drill unit arrives fastened to the shipping pallet using 3 × M16 bolts provided. When positioning and fastening the drill, please refer to the hole locations shown in *Figure 2*.

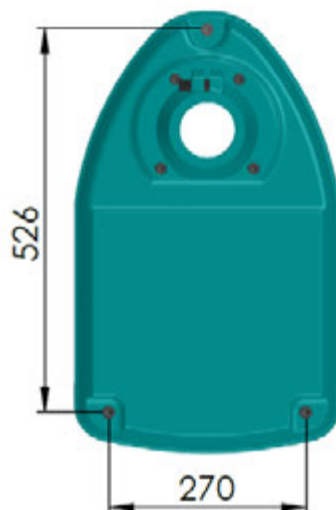


Figure 2. Anchoring Hole Locations



WARNING – EXCEEDING MAXIMUM HEIGHT

Do not extend the height of the machine past the maximum 'height installed' indicated (Page 3). Exceeding past this limit will cause the column to extend out of the column support, which might subsequently cause damage to the machine, as well as causing injury to any person in the vicinity.

1.5. Connection to Power Source

Before connecting the machine to the power supply, check that the socket is not connected in series with other machines. This condition is critical for the ideal operation of the drill unit.

Single and Three Phase

- a) **Single phase machines** are provided with three pins, **15 amps** rated plugs and leads for connection to **240V, 50Hz** power supply in **Australia**.

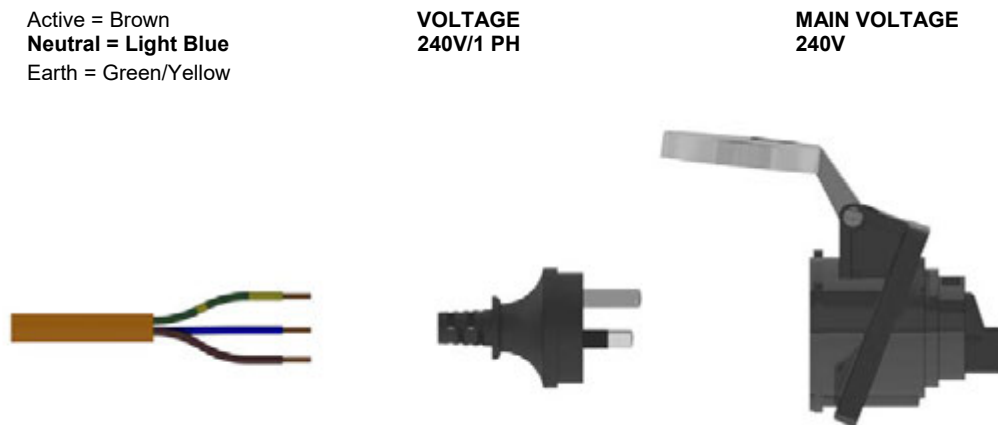


Figure 3.1 Connection 3 pins – 1 Phase

- b) **Three phase machines** should be fitted with a suitable, approved **four pin plugs** (i.e. three phase and earthing - **not provided**)

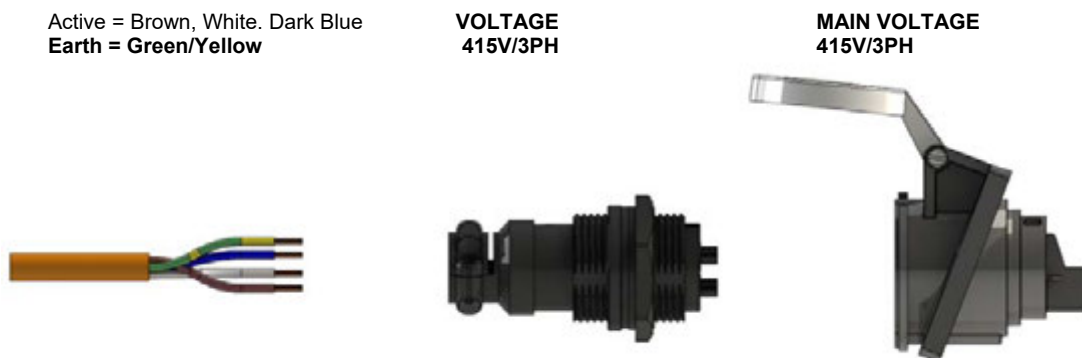


Figure 3.2 Connection for "4-CORE" Wire System with Neutral – 3 Phase

- c) Check the power supplied and motor specifications before plugging in the machine. Check terminal connection on dual voltage motor terminal box and connect it accordingly to the corresponding voltage supply.

To connect the machine to the power supply, proceed as follows:

- 1) Ensure that all electrical leads and cables (including supply leads) are maintained in a good condition and away from sharp objects. All leads should be replaced if cut, sliced or damaged in any way.
- 2) Insert the power plug into the socket, while ensuring that the **mains voltage is compatible** for which the drill unit is operating at.
- 3) Inspect that the power switch on the main box is closed and set to **OFF** position
- 4) To prepare the machine for operation, release the **STOP/EMERGENCY STOP** button by twisting the red mushroom button. To activate the drill, engage the green **START** button.
- 5) Check that the spindle rotary direction and change the phasing if required; clockwise rotation observing top-down on top of the motor pulley
- 6) If all of the above procedures have been carried out correctly, the drill should now be operational

Brobo Group 3M Drill is now ready for use.

Chapter 3 provides a detailed description of the various features of the drill and its operating cycles



CHAPTER 2 - Safety and Accident Prevention

The **Brobo Group 3M Drill** has been designed and manufactured in accordance to **Australian Standards**. It is **HIGHLY RECOMMENDED** that the instructions and warnings contained in this chapter be carefully followed for correct usage of the machine.

2.1. Operation of the Machine

The **Brobo Group 3M Drill** is specifically design to drill through ferrous and metal cross sections with thin-walled or “plate” profiles. Other types of material and machining are not compatible for use with the specifications of the drill. ***This machine involves a high-speed revolutions; therefore extreme caution is required when operating the device.***

The employer is responsible for instructing the personnel who, in turn, are obliged to inform the operator of any accident risks, safety devices, noise emission and accident prevention regulations provided for by national and international laws governing the use of the machine. ***The operator must be fully aware of the position and functions of all the machine’s controls.***

All those concerned must strictly adhere to ALL instructions, warnings and accident prevention standards in this manual.

The following definitions are those provided for by the **EEC DIRECTIVE ON MACHINERY No. 98/37/CE**:

- **Danger Zone** - any zone in and/or around a machine in which the presence of a person constitutes a risk for the safety and health of that person.
- **Person Exposed** - any person finding him or herself, either completely or partly in a danger zone.
- **Operator** - the person or persons given the responsibility of installing, operating, adjusting, maintaining, cleaning, repairing, and transporting the machine.



WARNING – UNAUTHORISED MODIFICATIONS/REPLACEMENTS/USE

The manufacturer declines any responsibility whatsoever, either civil or criminal, in the case of unauthorised interference or replacement of one or more parts or assemblies on the machine, or if accessories, tools and consumable materials used are different from those recommended by the manufacturer, or if the machine is inserted in a plant system and its proper function is altered.

2.1.1. Noise Level

The noise level of an idling drill has been measured to be **below 85 dBA**. This complies with the **Australian Occupational Health and Safety (Noise) Regulations 1992**.

Please note that peak impulse noise levels will be experienced due to variables including drill characteristics, type, and condition. This will also vary accordingly depending on the size and type of sample being drilled. Under these circumstances, management should make available to the operator(s) the appropriate hearing protection equipment as prescribed under the above stated act.

2.1.2. Power Supply

The 415/240V power supply requirements for this machine are of a high level and unauthorised interference and or inadequate maintenance could result in a situation that could put the operator at risk. A **qualified** electrical engineer should always be assigned to maintain and repair the system.

2.2. General Requirements

Lighting

Insufficient lighting during the operation of the drill unit would constitute a safety hazard for the people concerned. For this reason, the user of the machine must provide adequate lighting in the working area to eliminate areas in shadow, whilst also preventing dazzling illumination sources
(Reference standard **ISO 8995 - 2002 'Lighting of Indoor Workplaces'**).

Connection

Check that the power supply cables, compressed air supply (if applicable) and/or coolant system complies with, and are operating within the acceptable range of the drill capabilities.

Faulty, damaged or worn components must be replaced immediately.

Earthing Systems

The installation of the earthing system must comply with the requirements stated in the:
IEC Standards Part 195: Earthing and Protection Against Electric Shocks 1998.

Position of the Operator

The user controlling the machine drill operations must be positioned as shown in the *figure 4* below.



Figure 4. *Correct Position for Operating Drill Unit*



2.3. Advice for the Operator



Protective eyewear or goggles must be worn at all times while attending and operating the Drill.



Ensure that **hands and arms are kept clear of the drilling zone** when the machine is operating.



Do not wear loose clothing with long sleeves and oversize gloves, bracelets, necklaces or any other loose object that may become entangled in the machine's tooling bit during drilling. Long hair must be tied back or placed in a hair net.



Always disconnect the power supply to the machine before carrying out any maintenance work or adjustments. This includes cases of abnormal operations of the machine.



The operator **MUST NOT** conduct any risky operations or those not required for the drilling in course (e.g. remove swarf shavings from the machine while drilling).

Never move the Drill while the machine is operating.



Always keep the workplace as clean as possible.

Remove equipment, tools or any other objects from the drilling zone.

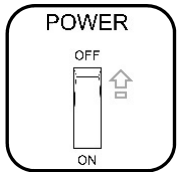


Support the work piece on both sides of the machine to prevent it falling or jamming during the drilling cycle.





If the drill bit is jammed, activate the *emergency stop* function immediately. Do not continue forcing the drill bit through. This could damage the drill, the specimen or be a cause for potential injury to the operator.



Always turn off the machine before carrying out any repair work. Consult the **Brobo Group** Engineering Department in the country in which the machine was initially purchased.

2.4. Machine Safety Devices

This product and maintenance manual is not purely intended as a guide for the usage, operation and maintenance of the drill unit in a strictly production environment; it is instead an instrument to providing information on how to use the machine correctly and safely. The following standards listed in section 2.4.1, which are applicable to the **Brobo Group 3M Drill**, are those specified by the EEC Committee that governs safety of machinery, health and safety at work, personal protection and safeguarding of the work environment. In addition, the drill also complies with the **Australian Standards** regarding the safeguarding and general requirements for electrical equipment.

2.4.1. Reference Standards

MACHINE SAFETY

- *EEC Directive No. 98/37/CE - Machines Directive*
- *EEC Directive No. 91/368 - 94/68 - Amends sections of EEC Directive No. 98/37/CE relating to machine safety*
- *EEC Directive No. 73/23 - Low Voltage Directive*
- *AS4024.1 - 1996 - Safeguarding of Machinery*

HEALTH AND SAFETY AT WORK

- *AS3100 - 2002 - General Requirements for Electrical Equipment*
- *OH. & S. 1995.81/1995 - Compliance References*
- *EEC Directive No. 80/1107; 83/477; 86/188; 88/188; 88/642 - Protection of workers against risks caused by exposure to physical, chemical and biological agents in workplace*
- *EEC Directive No. 73/23 and Special EEC Directives No. 89/654; 89/655 - Improvements in health and safety at work*



CHAPTER 3 - Main Functions and Operation of the Machine

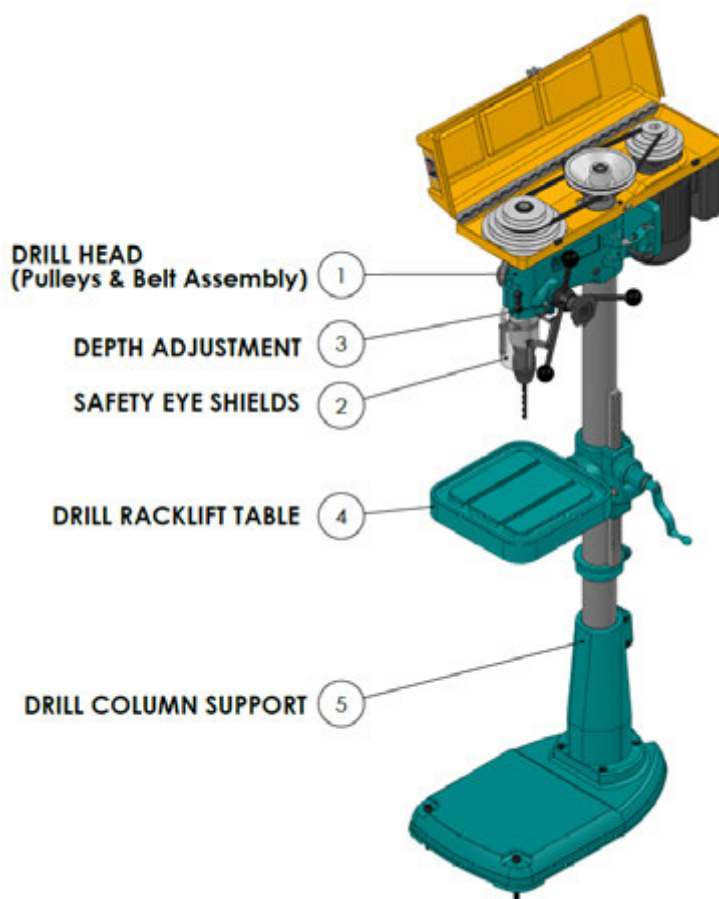


Figure 5. 3M Drill Main Figures

3.1.1. Drill Head (Pulley & Belt Assembly)

The full set of motor drive, intermediate and quill pulleys are all housed within the protective drill guard cover. Facing the front of the drill unit, the spindle speed setting is located on the right hand side of the cover, beneath the locking mechanism. To change the spindle speed settings, the user must manually change the V-belt positions as shown in the black panel.

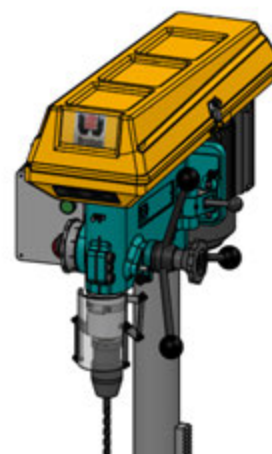


Figure 6. Drill Head

3.1.2. Safety Eye Shields

As the name suggests, the safety eye shield should be lowered into position prior to drilling to prevent any swarf dislodging in the direction of the user.



Figure 7. Safety Eye Shields

3.1.3. Depth Adjustment

Situated beneath the 3-pronged handle boss is the depth adjustment gauge. Using the gauge and the scale indicator shown on the left hand side of the drill, the operator can manually set the desired depth for a drill hole and lock its position.

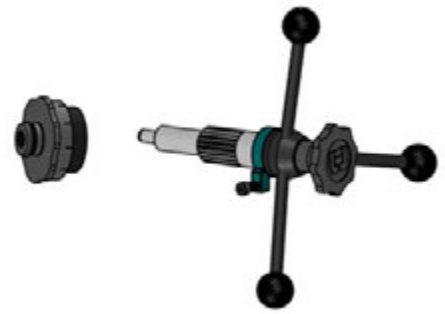


Figure 8. *Depth Adjustment*

3.1.4. Drill Racklift Table

Available in round or rectangular profile, all workpiece is fastened to the racklift table using a standard mechanical vice (not provided). The racklift can be adjusted up or down via the rack handle, to obtain optimum user working height.

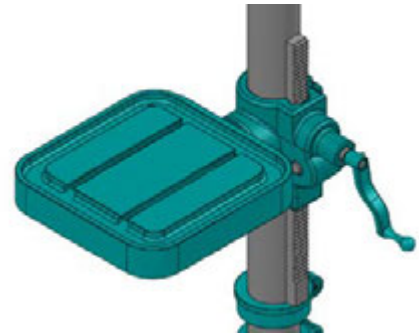


Figure 9. *Racklift Table*

3.1.5. Drill Column Support

Prior to usage, ensure that the column support is securely fastened to the ground using the 3 x M16 bolt holes provided.

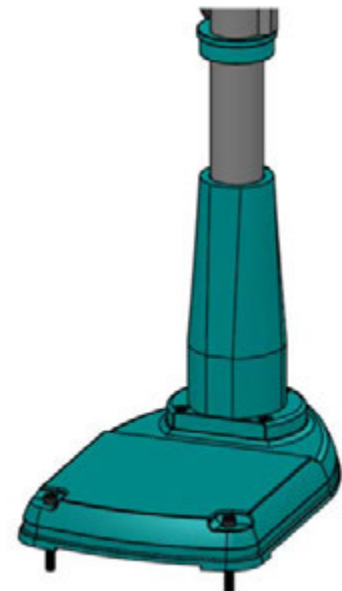


Figure 10. *Drill Column Support
(Floor Mounts)*



3.2. Preparation for Operation

The following procedure is recommended for the correct drilling using the **Brobo Group 3M Drill**.



WARNING – SAFETY GEAR

*Protective clothing, safety glasses and gloves should **always** be worn while loading parts, operating the machine, or undertaking any maintenance work on the drill.*

PROCEDURE

- 1) Clean the workpiece to ensure it is free of any grit, swarf or flammable substances. It is highly recommended that a solvent be used to remove any residue, while ensuring the solvent is inflammable and non-toxic.
- 2) Prior to drilling, clear the drill and the work area around the work piece of any swarf or/and tools to minimise the likelihood of the user getting injured during the drilling operation.
- 3) Load the workpiece into the mechanical vice (sold separately), located on the racklift, and fastened workpiece securely. Loosen the racklift and adjust the height and horizontal position. Once you have position the workpiece into the desired location, relock the racklift assembly.
- 4) Check that the correct speed drill speed setting is selected, and the safety eye shield is directly positioned to deflect swarf and any dislodged particles.
- 5) Turn the machine on. Proceed by slowly drilling into the workpiece until a guide indent is created. Steadily increase the feed rate of drilling by applying a constant yet steady force on the feed handle until the desired hole depth is reached.
- 6) Reverse the direction of the drill feed until it come to rest in its start position and turn the drill machine off.

3.3. Operation Recommendations

- To reduce the amount of frictional contact between the drill bit and work piece, a light coating of oil or lubricant can be applied onto the drill bit prior to drilling.
- Do not force the drill bit through the workpiece as this significantly reduces the lifespan of the bit, as well as increasing the risk of the bit bending and/or breaking and injuring the operator.
- When drilling through larger hole diameters through thick materials, it is advisable to split the drilling operation into two or three stages, starting from drilling a smaller hole size and increasing it until the desired final hole size.

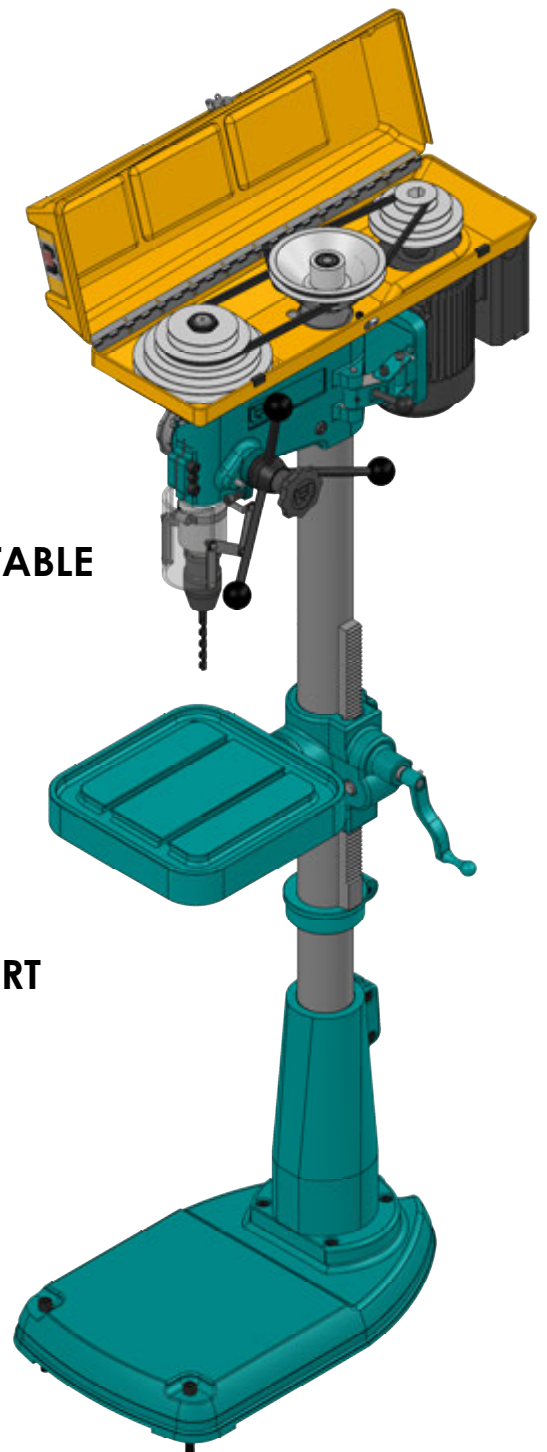
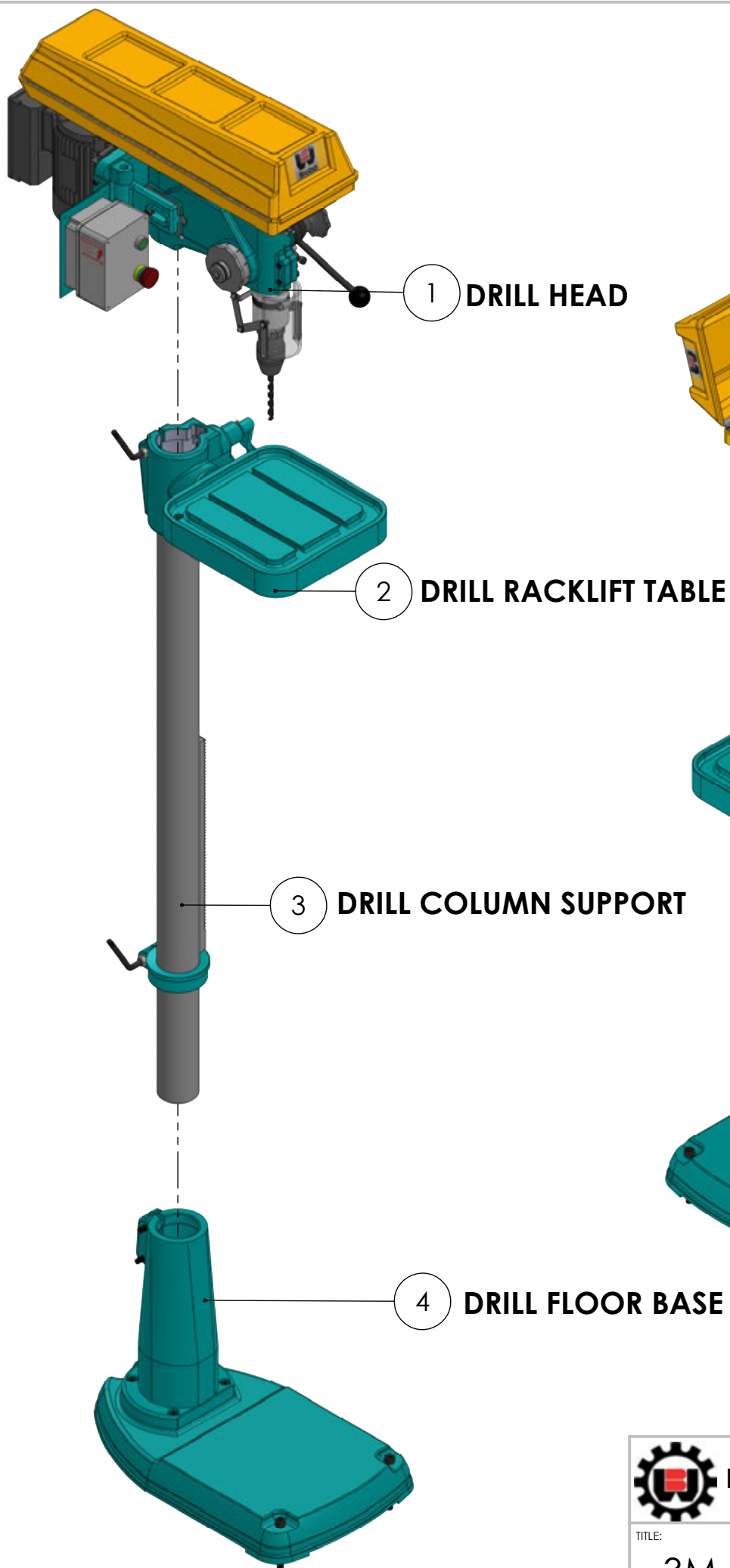
CHAPTER 4 - Drawings, Layouts, Assembly and Spare Parts

4.1. Spare Parts

Please find below of most commonly replaced spare parts. These listed parts draw reference to components found predominantly on the rack lift assembly and drill column support. Should you require a spare part that you are not familiar with, or not shown in Chapter 4, please contact **Brobo Group Engineering** department.

PART NUMBER	SPARE PART DESCRIPTION
1132010	BASE, FLOOR TYPE
2112010	COLUMN SUPPORT (use with Floor Base)
2114060	COLUMN, FLOOR (Solid, 1220mm)
1035190	COLUMN, BENCH (Solid, 767mm)
2122020	COLUMN CLAMP (includes 1042000 & 2124050)
2121310	RACKLIFT ASSEMBLY, COMPLETE (Floor Type)
1041080	RACKLIFT ASSEMBLY, COMPLETE (Bench Type)
2114010	RACK
2111140	WORMWHEEL & BUSH ASSEMBLY
2114020	WORM
2114040	SPINDLE WORMWHEEL
2111170	SPINDLE & EXTENSION ASSEMBLY
2111300	QUILL ASSEMBLY
2125200	MOTOR (0.75kW, 1HP, 1PH, TEFC)
2125180	MOTOR (0.75kW, 1HP, 3PH, TEFC)

3M DRILL



BROBO GROUP

ISSUED DATE 07.08.2017
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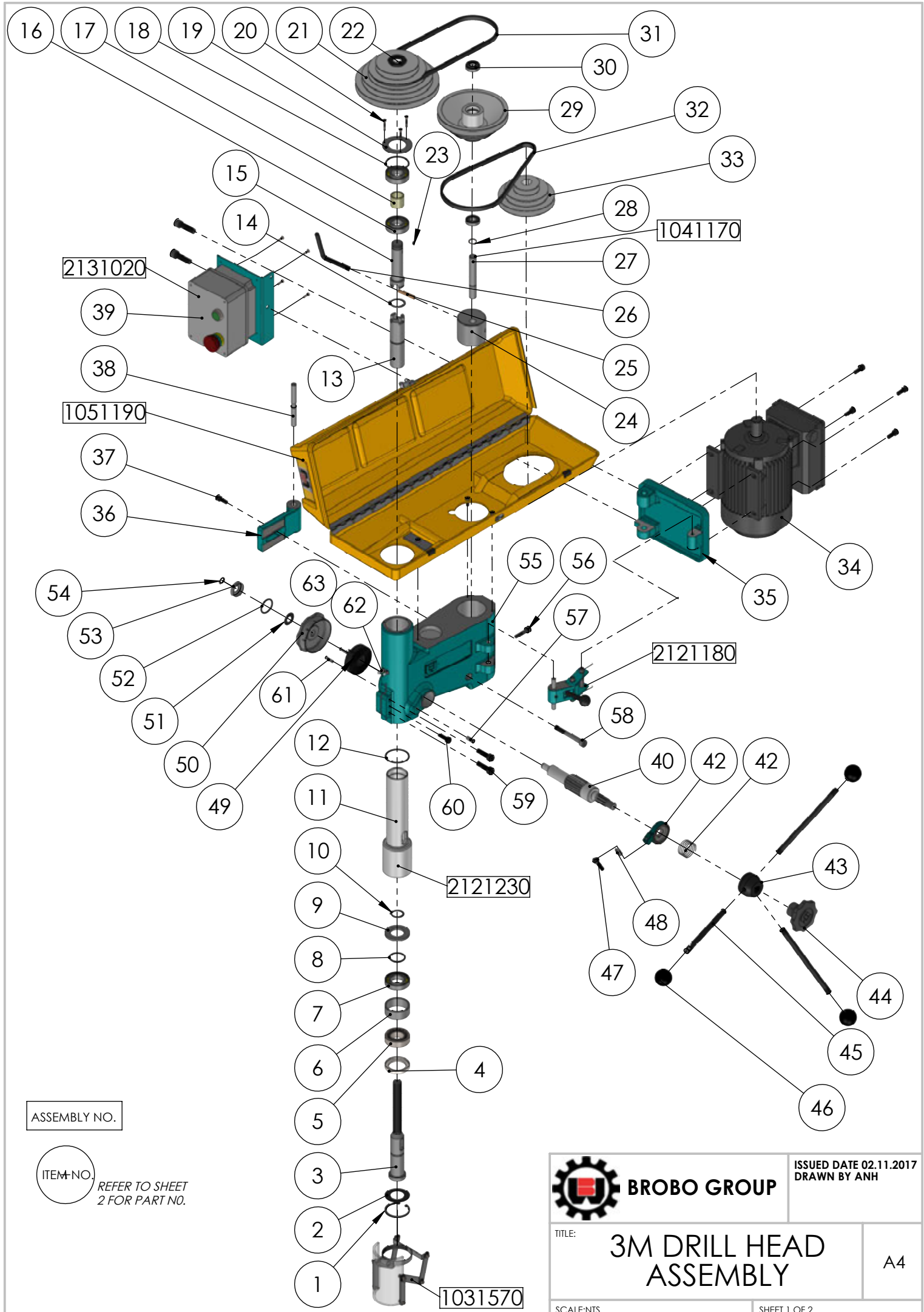
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3M DRILL ASSEMBLY

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SHEET 1 OF 1



ASSEMBLY NO.

ITEM NO. REFER TO SHEET 2 FOR PART NO.

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TITLE: 3M DRILL HEAD ASSEMBLY		A4	
SCALE: NTS		SHEET 1 OF 2	

DRILL QUILL ASSEMBLY (2121230)			
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	2115330	Internal Circlip (52mm)	1
2	2113030	Shim Quill OD=ø50 ID=ø30	1
3	2124330	Drill Spindle	1
4	2114150	Bearing Spacer	1
5	2115080	Taper Roller Bearing 55x30x17	1
6	2114160	Bearing Spacer Sleeve	1
7	8115030	Ball Bearing (Quill) 55x30x13	1
8	2115290	O-Ring (ID=ø30mm)	1
9	1043200	Spindle Washer	1
10	8115070	External Circlip (3M)	1
11	2124340	Drill Quill Sleeve	1
12	2115060	O-Ring ID 47.6mm	1

DRILL HEAD PULLEY ASSEMBLY			
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
13	2124110	Drill Drive Sleeve	1
14	2125070	External Circlip 35.6x30.3	1
15	2124120	Drill Castellated Pulley Spindle	1
16	2115230	Bearing (6205: ODø52 IDø25)	2
17	2124130	Bearing Spacer	1
18	5125340	O-Ring 50x3.5	1
19	2123040	Bearing Cap	1
20	-	M4 x 25	3
21	2122060	Drill Head Pulley 4 Step	1
22	1044120	M24 Nut	1
23	1035130	Woodruff Key No3	1

DRILL DRIVE INTERMEDIATE ASSEMBLY (1041170)			
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
24	1044190	Intermediate Drive Block	1
25	1034230	Drill Plunger	1
26	1044210	Locking Handle	1
27	1044200	Intermediate Drive	1
28	1045810	External Circlip 15mm	1
29	1045290	Intermediate Drive Pulley	1
30	1045280	Bearing (6002-2Z)	2
31	2112150	Belt (Inter Head)	1
32	2112160	Belt (Motor)	1

DRILL MOTOR ASSEMBLY			
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
33	1045270	Drill Motor Pulley 3 stepx19mm	1
34	1105160	Drill Motor LM(E)80L4	1
35	2122070	Motor Plate	1
36	2122080	Motor Plate Hinge	1
37	8705120	Screw M8x20	5
38	2124210	Pivot Pin	1
39	2131020	Assembly Switch	1

DRILL HANDLE ASSEMBLY			
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
40	2114070	Drill Pinion	1
41	1034020	Drill Handle Stop	1
42	1035010	Spring	1
43	1044030	Drill Handle Boss	1
44	1031360	Handnut	1
45	2124350	Drill Capstan Spoke (3M)	3
46	1045020	Knob 38mm	3
47	1034050	Stop Screw (M8x35)	1
48	1035030	Drill Stop Screw Spring	1

DRILL DIAL ASSEMBLY			
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
49	2115010	Drill Return Spring	1
50	2122190	Dial (Spring Cover)	1
51	9305350	Shim 50x62x0.1	1
52	2115290	O-Ring (ID=ø30mm)	1
53	2114080	Dial Pressure Cap	1
54	1035070	External Clip	1

DRILL HEAD			
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
55	2122050	Drill Head 3M	1
56	8705140	Soc HD Cap M8x35	1
57	1034060	Stop Pin	1
58	8705210	M10x80	1
59	8725500	Soc HD Cap M10x35	2
60	8705130	Screw M8x25	1
61	2124140	Pin (Return Spring)	2
62	Clamp	Clamp Round	1
63	Screw M4	M4	1



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ISSUED DATE 02.11.2017
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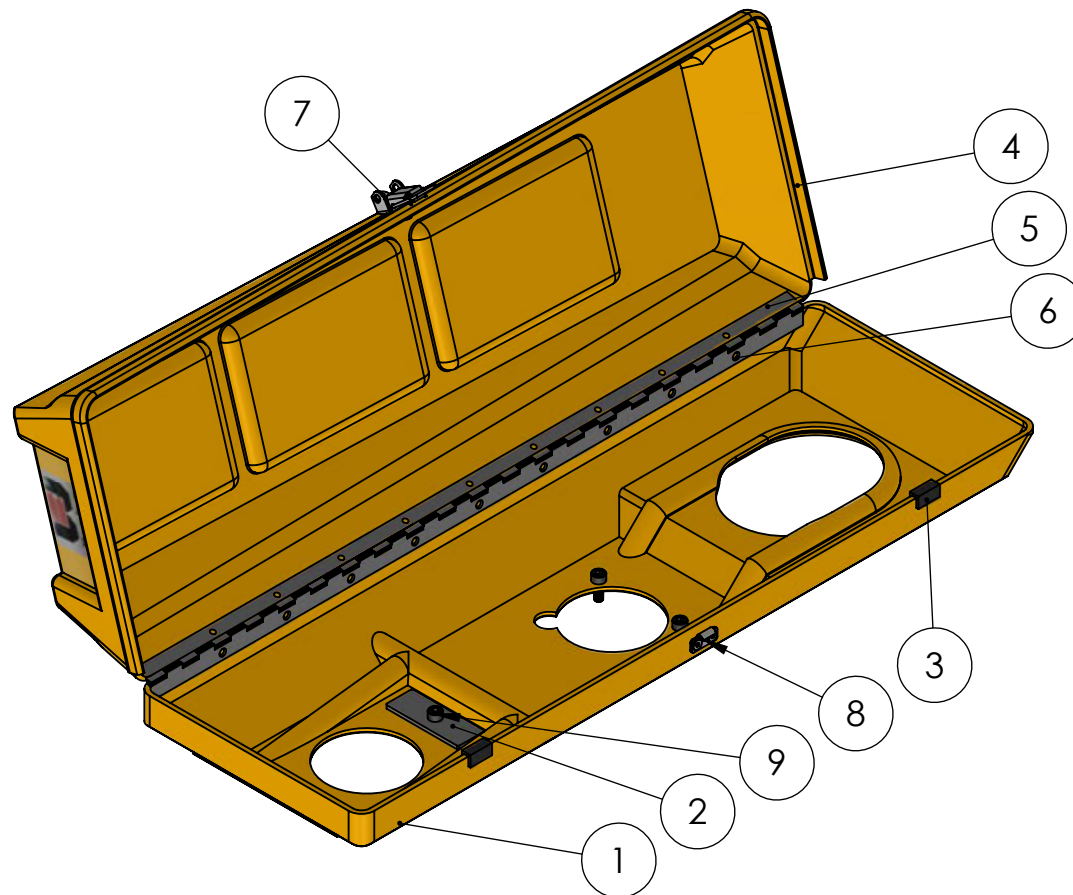
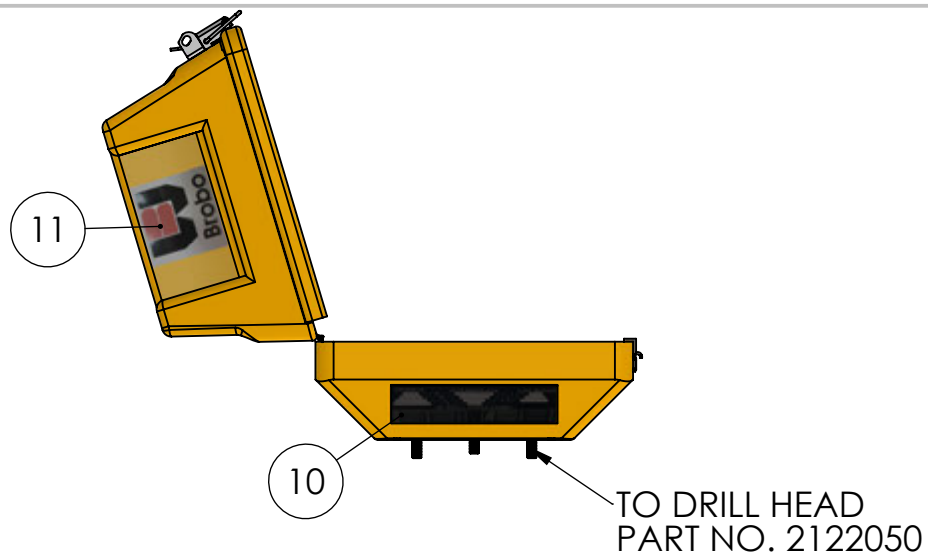
TITLE:

**3M DRILL HEAD
ASSEMBLY**

A4

SCALE:NTS

SHEET 2 OF 2



11	8115090	Brobo Logo	1
10	2125140	Speed Chart	1
9	8705340	Hex HD Cap M6x16	3
8	1105050	Catch Plate	1
7	1015240	Latch	1
6	8715930	Rivet	-
5	1034340	Piano Hinge	1
4	1035360	Drill Belt Guard Cover	1
3	1034250	Rubber Buffer	2
2	1604100	Plate Clamp	1
1	1035370	Drill Belt Guard Bottom	1
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
DRILL BELT GUARD ASSEMBLY			



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TITLE:

**3M DRILL BELT GUARD
ASSEMBLY**

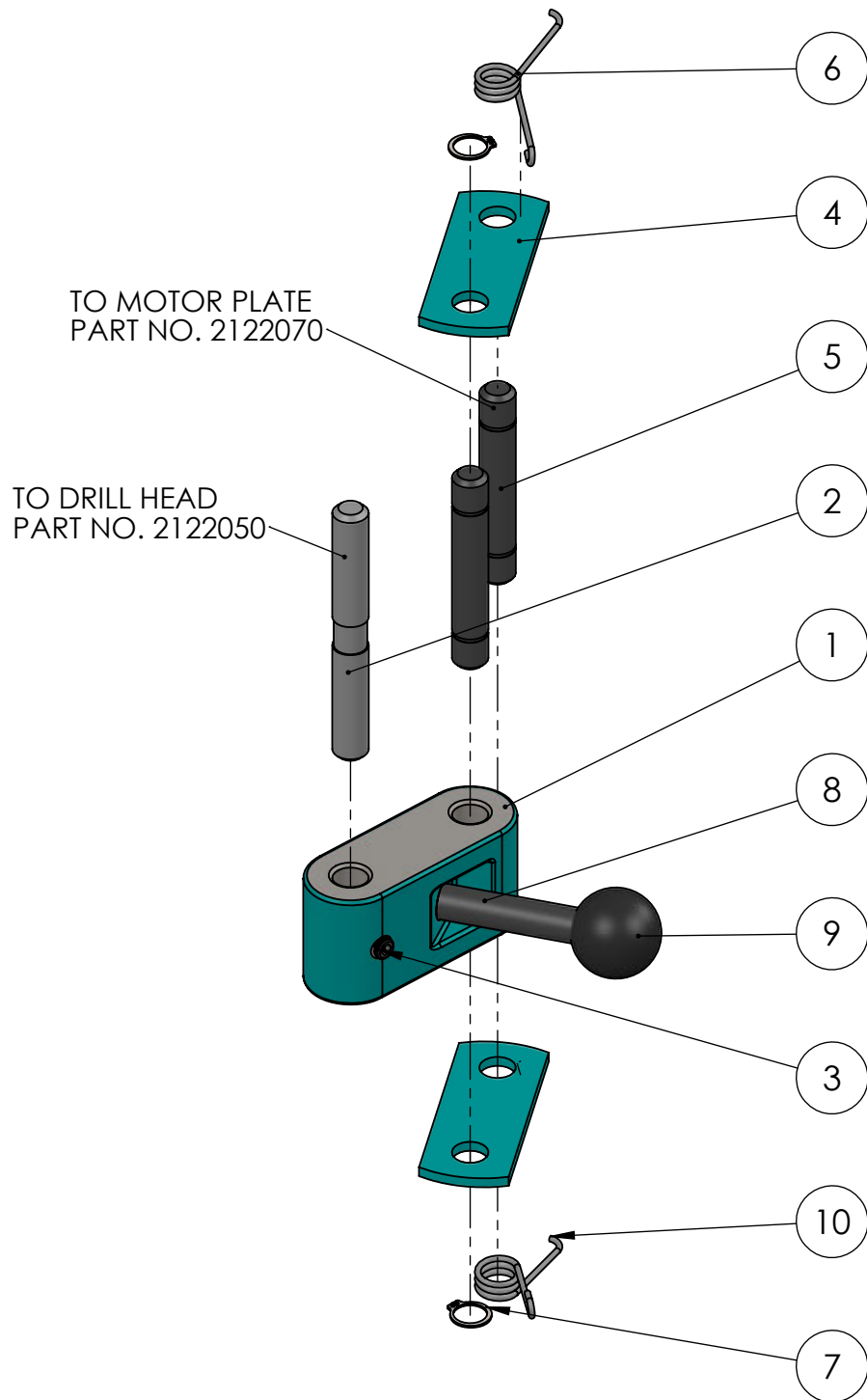
PART NO.

1051190

A4

SCALE:NTS

SHEET 1 OF 1



10	2115110	Drill Toggle Bottom Spring	1
9	104520	Knob 25mm	1
8	2124190	Drill Toggle Handle	1
7	2125090	Toggle Link Circlip 10mm	2
6	2115100	Drill Toggle Top Spring	1
5	2124180	Drill Toggle Link Pin	2
4	2134200	Drill Toggle Link	2
3	Screw	M6	1
2	2124170	Drill Toggle Head Pivot Pin	1
1	2122090	Motor Plate Toggle	1
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
TOGGLE ASSEMBLY			



BROBO GROUP

ISSUED DATE 17.07.2017
DRAWN BY ANH

TITLE:

TOGGLE ASSEMBLY

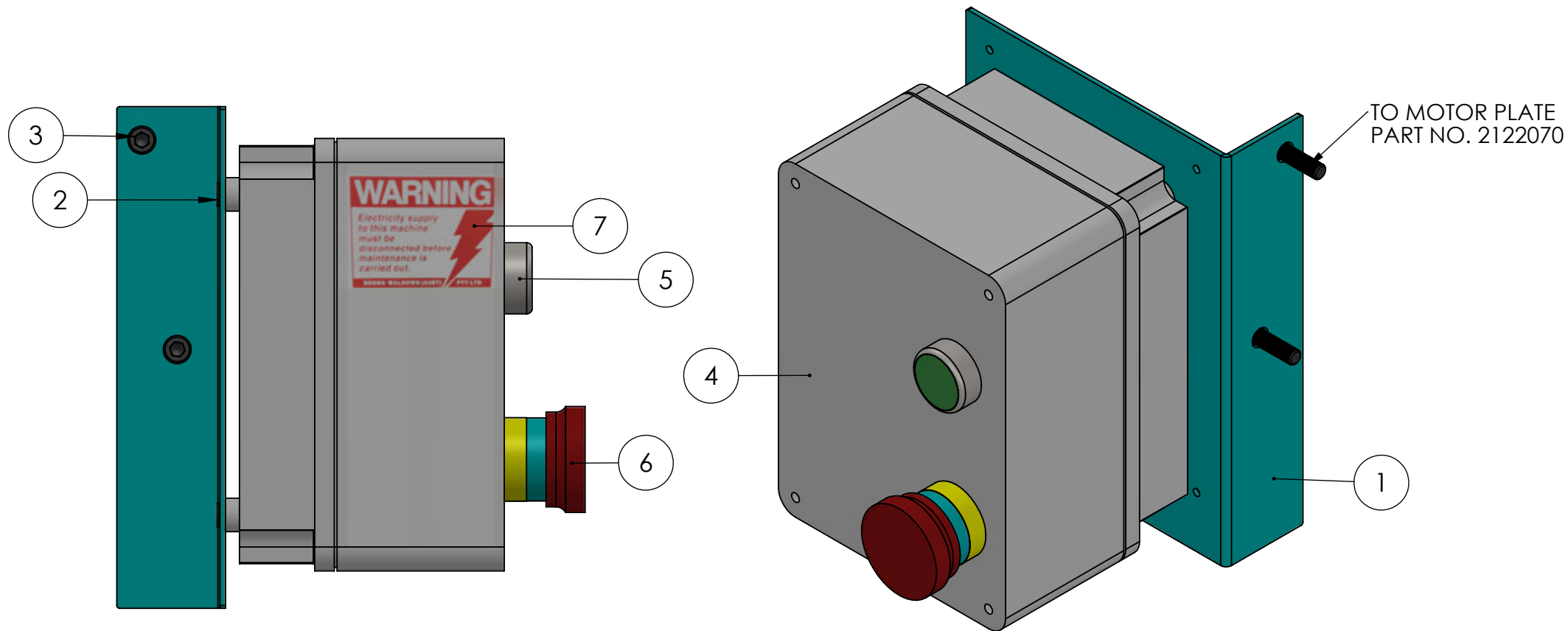
PART NO.

2121180

A4

SCALE:NTS

SHEET 1 OF 1



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	1063110	Switch Plate	1
2	M4	Screw M4	4
3	8705070	Screw Soc Hex HD Cap M6x20	2
4	1055480	Drill Switch Base	2
5	Button Green	Start	1
6	Button Red	Emergency/Stop	1
7	Warning Label	Electrical Hazard Safety Sign	1



BROBO GROUP

ISSUED DATE 21.07.2017
DRAWN BY ANH

TITLE:

**3M STANDARD
SWITCH ASSEMBLY**

PART NO.

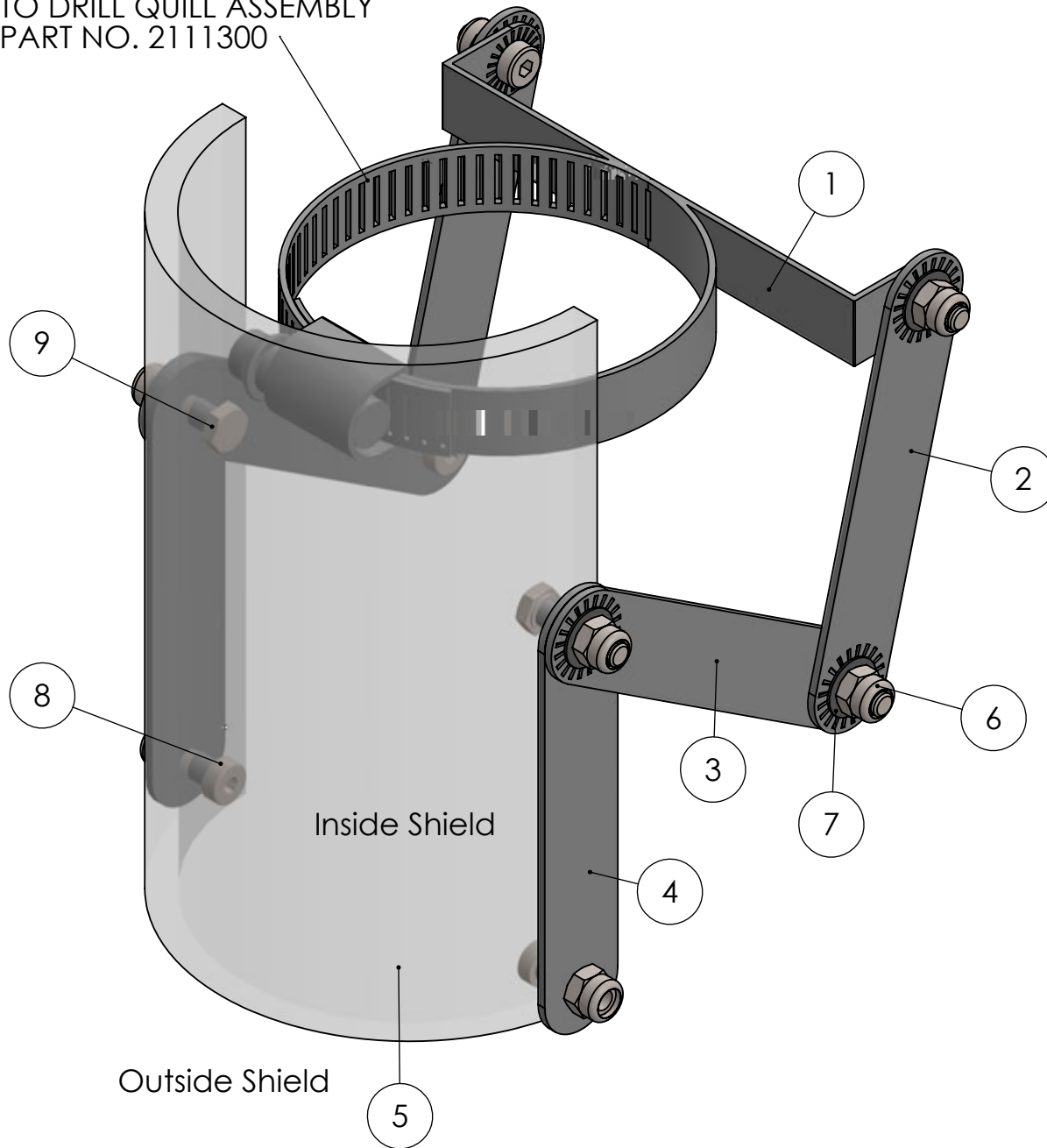
2131020

A4

SCALE:NTS

SHEET 1 OF 1

TO DRILL QUILL ASSEMBLY
PART NO. 2111300



9	8725040	M4x16 Pan Head Screw	2
8	8725030	M4x10 Pan Head Screw	6
7	8735480	Disc Spring $\phi 10 \times \phi 4.2 \times 0.4$	6
6	8725050	M4 Nylon Nut	8
5	1035850	Shield	1
4	1033270	Link 4 (Plain Ends)	2
3	1033260	Link 3 (One End Serated)	2
2	1033250	Link 2 (Both End Serated)	2
1	1601080	Link1 (1033190) & Clamp (1605080)	1
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
CHUCK GUARD ASSEMBLY			

Note

Nut & Disc Spring are outside the shield



BROBO GROUP

ISSUED DATE 14.07.2017
DRAWN BY ANH

TITLE:

**CHUCK GUARD
ASSEMBLY**

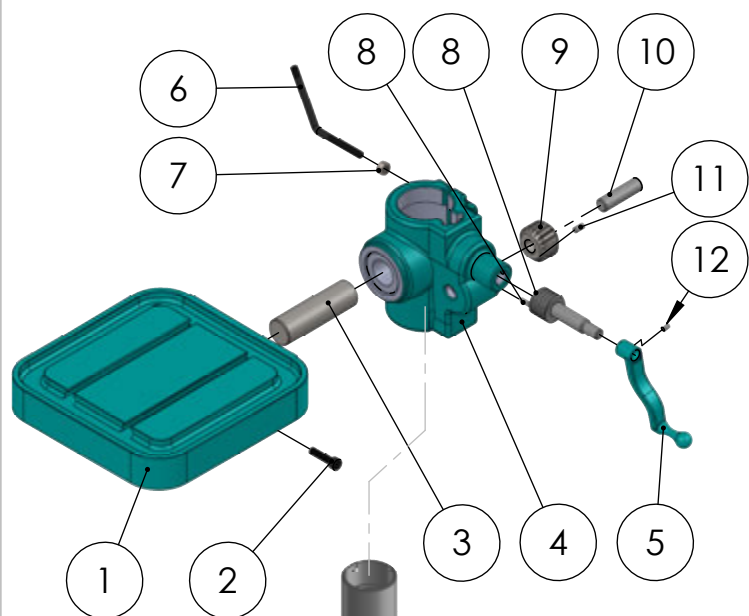
PART NO.

1031570

A4

SCALE:NTS

SHEET 1 OF 1



12	-	Pin M6	1
11	-	Pin M8	1
10	2114040	Drill Wormwheel Spindle	1
9	2114030	Drill Wormwheel	1
8	2114020	Drill Spindle & Insert	1
7	1042000	Nut M10	1
6	2124050	Drill Clamp Handle	1
5	2122160	Drill Crank Handle	1
4	2122030	Drill Table Support	1
3	1044180	Drill Table Support Pin	1
2	8725960	M10x40	1
1	2122040	Drill Table	1
ITEM NO.	PART NUMBER	Drill Spindle	QTY.

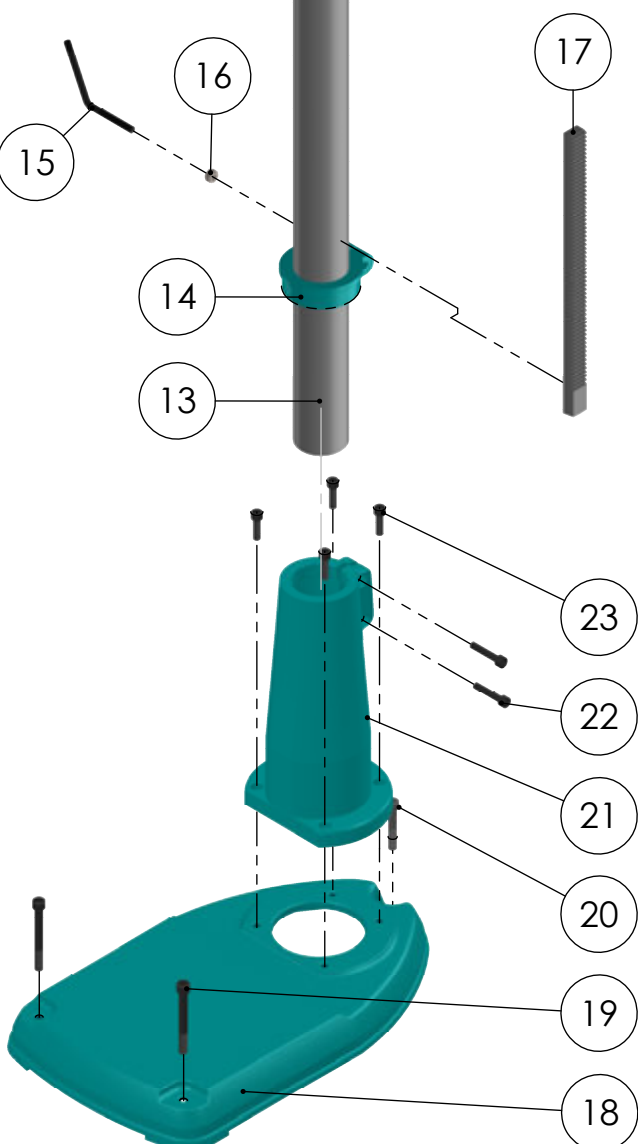
DRILL RACKLIFT TABLE (2121310)

17	2114010	DRILL Table Racklift	2
16	1042000	Nut M10	2
15	2124050	Drill Clamp Handle	2
14	2122020	Drill Column Clamp	2
13	2114060	Drill Column (1220mm)	1
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.

DRILL COLUMN SUPPORT

23	8725500	Soc HD Cap M10x35	4
22	-	M10x50	2
21	2112010	Drill Column Support	1
20	8705280	M12x65	1
19	8705300	Soc HD Cap M12x100	2
18	1132010	Drill Floor Base	1
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.

DRILL FLOOR BASE



BROBO GROUP

ISSUED DATE 01.11.2017
DRAWN BY ANH

TITLE:

**3M FLOOR DRILL
COLUMN ASSEMBLY**

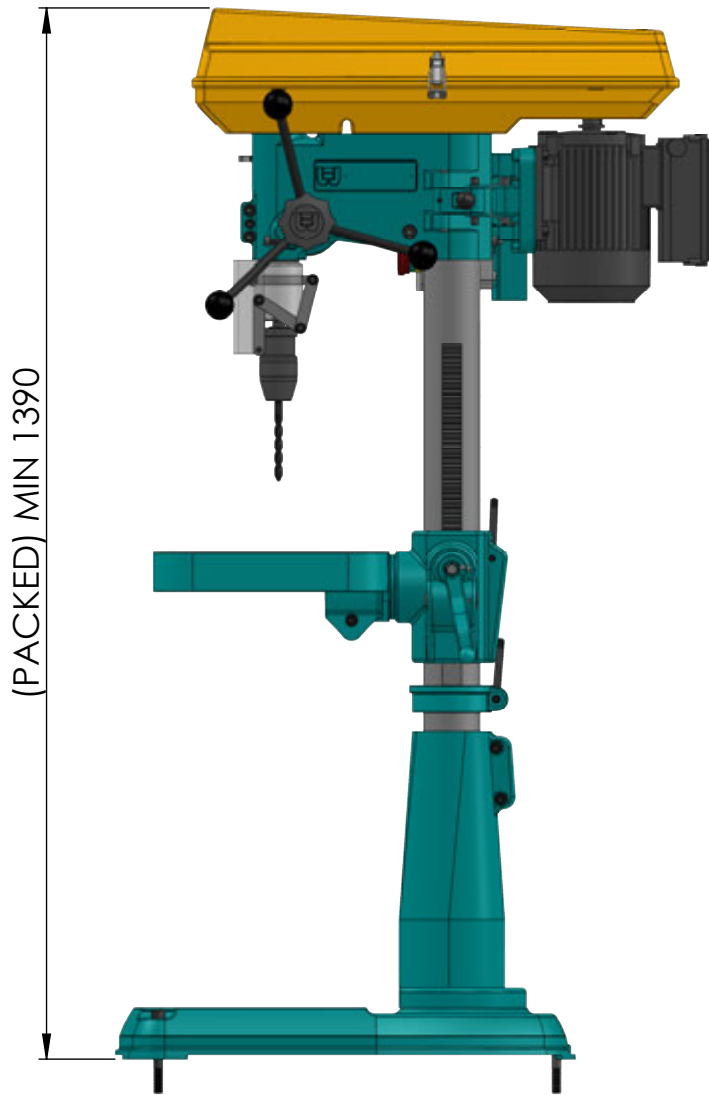
A4

SCALE:NTS

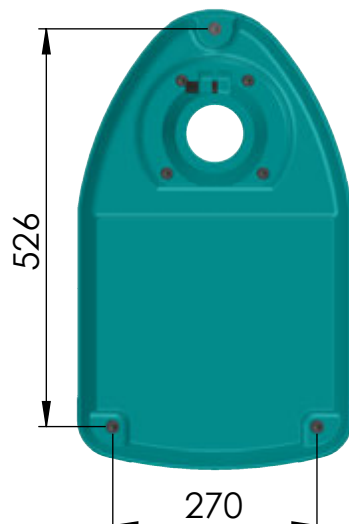
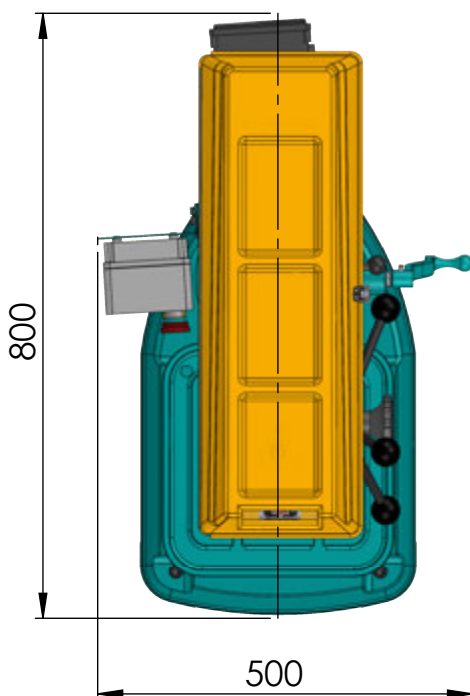
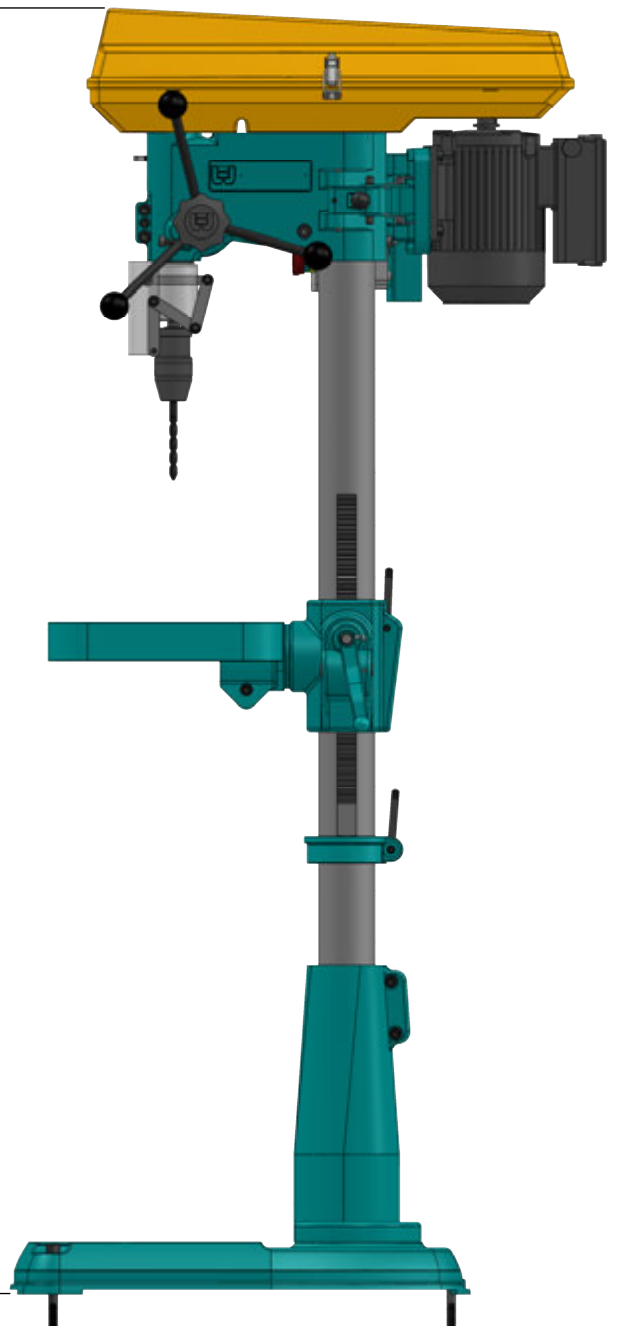
SHEET 1 OF 1

NOTE

MINIMUM 600MM ALL
AROUND SAFE SPACE FOR
OPERATING ZONE



MAX 1700



ANCHOR HOLE
LOCATION

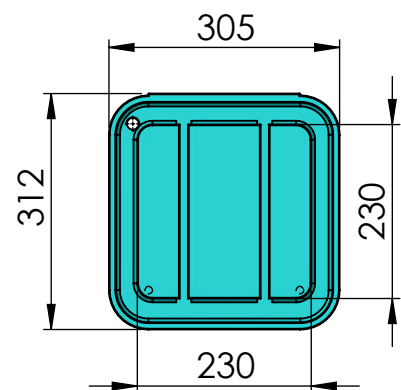


TABLE SIZE



BROBO GROUP

ISSUED DATE 07.08.2017
DRAWN BY ANH

TITLE:

**3M DRILL
FLOOR MOUNT**

A4

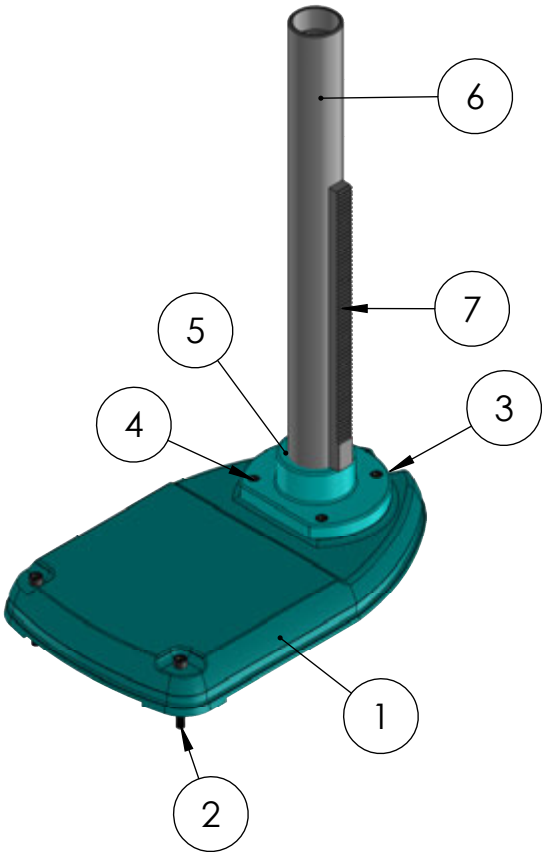
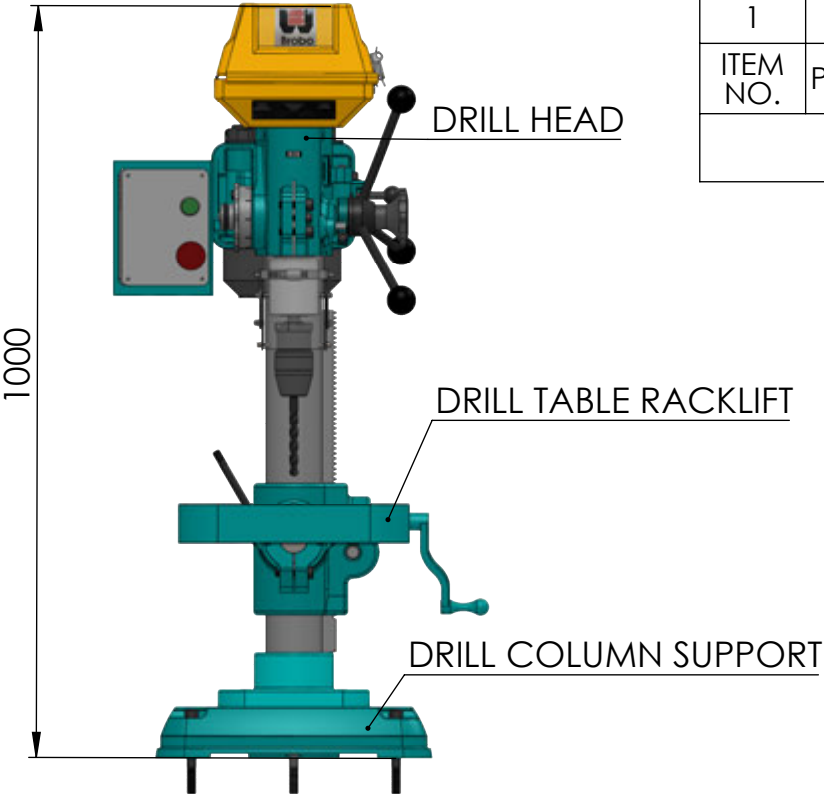
SCALE:NTS

SHEET 1 OF 1

NOTE

MINIMUM 600MM ALL
AROUND SAFE SPACE FOR
OPERATING ZONE

7	2114010	DRILL Table Racklift	1
6	2114310	Drill Column (Bench)	1
5	2442160	Column Support (Bench)	1
4	8725500	M10x35	4
3	8705280	M12x65	1
2	8705300	Soc HD Cap M12x100	2
1	1132010	Drill Floor Base	1
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
DRILL COLUMN SUPPORT			



**COLUMN SUPPORT
ASSEMBLY
BENCH DRILL**

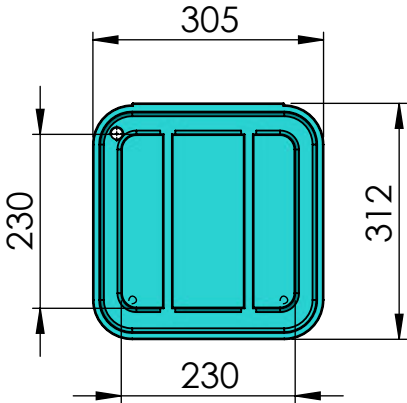
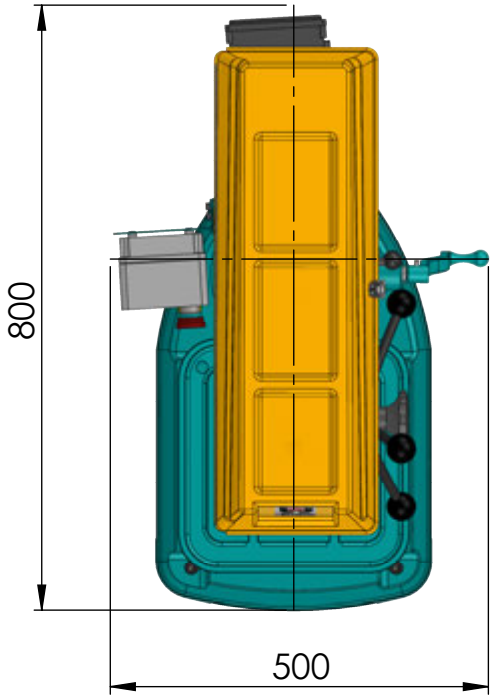


TABLE SIZE



CHAPTER 5 – Maintenance and Selection of Consumables

5.1. Role of the Operator

The person operating and maintaining the **Brobo Group 3M Drill** must familiarise themselves with these instructions for their own safety and that of the others, in addition to safeguarding the production of the machine. Responsibility must be taken by the user on the general maintenance and up keeping of the unit as specified in this chapter, with particular emphasis on:

- Check to ensure that other operators of the machine always aware of and comply with the relevant safety instructions and standards as specified in *Chapter 2 - Safety and Accident Prevention*. Therefore, check that the safety devices are operational and work perfectly and that personal safety requirements are complied with.
- Ensure that the working cycle is efficient and guarantees maximum productivity, inspect the:
 - o Functions of the main components of the machine
 - o Sharpness of the drill bit and lubricating fluid
 - o Correct working parameters for the type of material being drilled
- Verify that the quality of each drilled hole meets the requirements and that the final product is free from any machining defects.

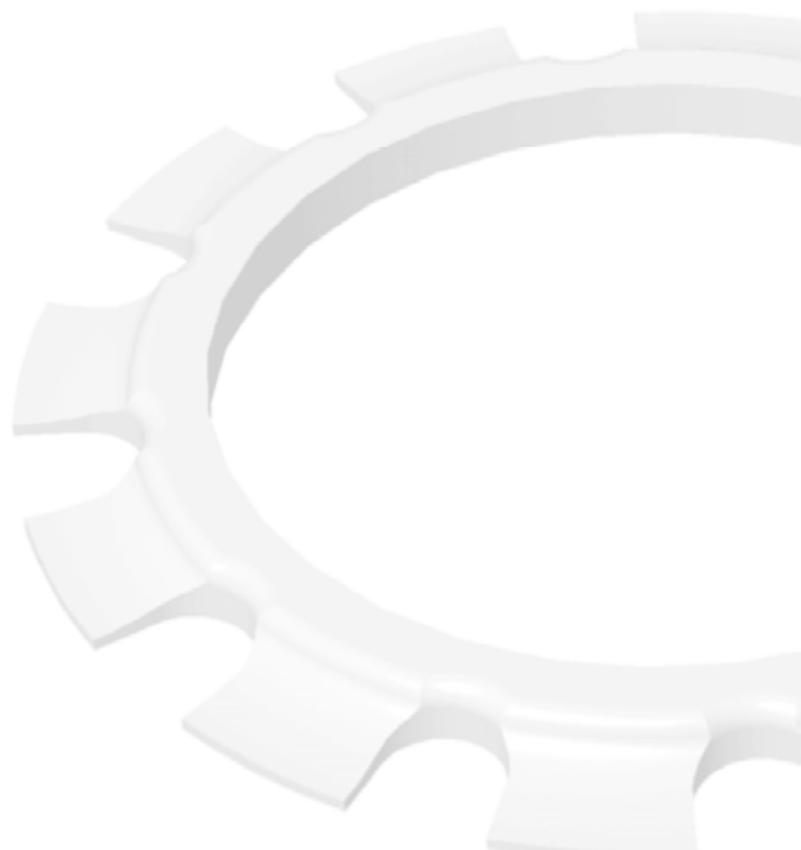
5.2. Maintenance Requirements

- All maintenance must be carried out with the power switched off and the machine in emergency stop condition.
- To guarantee for optimum operation, all spare parts must be **Brobo Group** originals.
- On completion of maintenance works, ensure that the replaced parts or any tools used have been removed from the machines before starting it up.
- Any behaviour not in accordance with the instructions for using the machine specified in this manual may create hazards and/or safety risks for the operator.
- Therefore, read and follow all the instructions for use and maintenance of the machine and those on the product itself.

5.3. General Maintenance of Functioning Components

The general maintenance operations that should be carried out regularly are as follows:

- 1) Keep the rack lift table, overall machine and path of the drilling free of any offcuts, accumulated swarf and lubricants by using compressed air or preferably thread-free cloth.
- 2) Lubricate the drill shaft and rotary chuck regularly with an *NLGI 2 extreme pressure grease, Shell Alvania No.1 grease* or equivalent.
- 3) Check the belt condition and tension regularly. ***Do not over tighten belts***, as this will inadvertently exert tension on the spindle and motor bearings. To provide the right tension, follow the belt manufacturer's recommendations and specifications.
- 4) Clean and lubricate any moving joints or sliding surfaces with good quality oil.
- 5) Clean the drill machine regularly and keep any unpainted surfaces lightly oiled to protect from rust and corrosion.
- 6) Ensure that the machine performs drill perpendicular to the work surface. If not, contact **Brobo Group** engineering department.

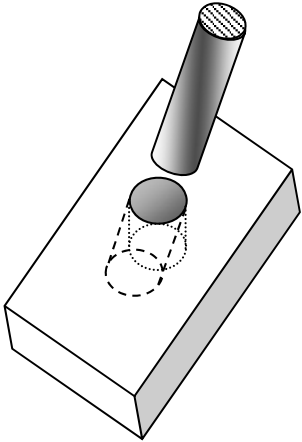
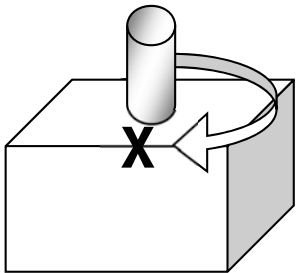




CHAPTER 6 - Troubleshoot

6.1. General Troubleshooting

Below lists of some of the most common problems associated with the **Brobo Group 3M Drill** and the recommended troubleshooting procedures to undertake to rectify the situation. If the solutions provided do not resolve the problems, or the problem identified differs from those listed, immediately contact **Brobo Group** engineering department.

PROBLEM IDENTIFIED	DIAGNOSIS	SOLUTIONS
<i>Drilling is not at 90°, or is angled to the rack lift table</i> 	Work piece not held firmly in vice clamp Excessively fast feed rate forcing the drill bit through the material Drill bit is not locked properly inside the chuck unit	Ensure that the vice clamps is securely fastened to the work piece prior to drilling. Slow down the drill feed rate, else it might cause the drill bit to break and cause harm to the operator. Check that no swarf is lodged in the chuck unit. Remove aggregate using an air gun. Also check that the chuck teeth are not worn. If so, the chuck unit might need to be replaced.
<i>Drill bit not turning penetrating the material</i> 	Work piece exceeds the recommended drilling capacity V-Belt slipping Blunt drill bit Excessive swarf trapped in the drill hole	Please ensure that the work piece required drilling area does not exceed the recommended drilling capacity. Check that the motor/pulley belts are not worn and if so, promptly replace them. The V-belts are available for purchase from Brobo Group. Replace or sharpen the drill bit to continue with the drilling process. To reduce the amount of friction between the drill bit and parent material, apply a light coating or grease/lubricant onto the drill bit prior to drilling.

Worn bearings/seal in quill housing

Back off the feed rate on the drill. Use an airgun to clean out any remaining swarf in the hole. Reapply lubricant on the drill bit and continue with the drilling process.

The bearing and seal components can be purchase direct from your nearest **Brobo distributor**. For more information, please check www.brobo.com.au

Worn/broken component

Replace component

worn/broken

All component to the 3M drill are sold as spare parts (pending availability). Please contact your nearest **Brobo distributor** or our **Brobo Group** head office. Please visit www.brobo.com.au for more details.





BROBO GROUP®

BROBO GROUP (AUST) PTY. LTD.

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A.C.N. 098 264 316
A.B.N. 42 098 264 316

Quality
Endorsed
Company

ISO 9001 Lic. 10292
Standards Australia



Email: info@brobo.com.au
Website: www.brobo.com.au

APPENDIX - RISK/HAZARD ASSESSMENT

Hazard Type	Hazard Identification	Hazard Assessment	Hazard Management Strategies (Recommended for the Purchasing / Buyer / User)
Mechanical	Cutting/Severing	Low/Med	Keep machine correctly guarded and operational at all times. Keep hands clear of rotating drill bit.
	Entanglement	Low	Do not wear loose jewellery, clothing or items that might get caught in the drill. Always keep the work area free of unnecessary objects or tools.
	Impact	Low	Wear protective safety glasses when utilising the drilling machine. Strongly encouraged that steel-capped safety boots be worn during operation of drill machine.
Electrical	Electrocution	Low	Remove the power supply when any maintenance and/or repairs are to be undertaken. Power source is to be isolated prior to opening electrical enclosures.
Noise	-	Low	Under no load testing, the noise level measured is below 80db (A). If the noise level becomes too high during a drilling cycle, stop the process and inspect for problem, if any are present.
Substance	-	Low	Keep the work area clean and regularly remove excess coolant, oils and other aggregate.
Hazardous Events	Unexpected Start Up	Low	During a power failure, turn the machine off. If problem persists, please contact Brobo Group engineering department.
Additional Hazards	Operator Error	Low	Ensure blades, clamps and materials are correctly secured.

MACHINE TYPE: _____

SERIAL NO.: _____

RECEIVING COMPANY: _____ (SAFETY OFFICER)

Brobo Group Warranty

- 1.1 The supplier warrants that all goods supplied by it, shall be free from defects in materials and workmanship for a period of twenty four (24) months from the date of delivery to the Customer. ("The Warranty Period"), on the following terms and conditions.
- 1.2 The Customer shall promptly provide written particulars to the supplier on becoming aware of any defect in the goods during the Warranty Period, and shall provide the Supplier with all necessary access, facilities and information to enable the Supplier to ascertain or verify the nature and the cause of the defect and to carry out its obligations under this warranty.
- 1.3 The Supplier's obligation under this warranty is limited to repairs of the defect goods and the Supplier is under no obligation to replace the goods or refund the value of the goods to the Customer.
- 1.4 If the goods are, in the opinion of the Supplier, not defective or if any defect is attributable to any one or more of the following circumstances then the Supplier is under no obligation whatsoever to the Customer:
- 1.4.1 The use of the goods for a purpose other than that for which they were intended to be used;
 - 1.4.2 The repair, modification or alteration of the goods by any person other than the Supplier;
 - 1.4.3 Where the defect has arisen due to misuse, neglect or accident, howsoever arising;
 - 1.4.4 Where the defect has arisen due to installation of the goods which were, in the reasonable opinion of the Supplier, incorrectly carried out
 - 1.4.5 Where the goods have not been correctly stored or maintained
 - 1.4.6 Where the defect has arisen due to normal wear and tear on the goods
- 1.5 The Supplier is under no obligation under this warranty where the Customer has failed to observe the terms of payment for the goods or any other obligation imposed by the terms and conditions of this warranty.
- 1.6 In the event that the Supplier is supplying goods, which have been manufactured by third parties, the Customer shall be entitled to the benefit of any Manufacturer's Warranty in respect of such goods. The Customer acknowledges that the Supplier accepts no responsibility whatsoever for any Manufacturer's Warranty or any claim howsoever arising from the use of the goods, whether singularly or in combination with other products.
- 1.7 The Supplier shall not be liable for any indirect or consequential losses or expenses suffered by the Customer, howsoever caused.
- 1.8 Except as specifically set out herein, or in writing by way of catalogue or pamphlet or otherwise provided by the Supplier to the Customer any term, representation, condition or warranty in respect of the quality, condition or description of the goods, whether implied by statute, common law, trade usage, custom or otherwise, is hereby expressly excluded.

This warranty is given by **Brobo Group Pty Ltd**, ABN: 42 098 264 316

Address: 8 Fowler Rd, Dandenong, VIC 3175



03 9794 8751



03 9794 8792



info@brobo.com.au

This warranty is provided in addition to other rights and remedies you have under law: Our goods come with guarantees which cannot be excluded under the Australian Consumer Law. You are entitled to replacement or refund for a major failure and to compensation for other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.



BROBO GROUP®

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WORKPLACE HEALTH & SAFETY POLICY

SAFETY COMPLIANCE DESIGN EVOLUTION

Brobo Group (Brobo Waldown) has been a leading manufacturer of quality industrial products since 1947.

Our products have been synonymous with the Australian workplace since the beginning.

As Health & Safety standards have improved Nationally, Brobo Group has adopted OH&S design disciplines to drive ongoing development of its products in line with the highest workplace safety standards.

Brobo Group is committed to design and manufacture equipment of the highest quality standard for Australian & International workplaces.

“We are committed to providing Australian workplaces with the safest and most durable high quality tools.”

David Golic

Dated this 24th day of May 2017

Director
Brobo Group