

**DDU1636
DOUBLE DRILL UNIT**

**OPERATING &
MAINTENANCE MANUAL**

DDU1636

**OPERATING &
MAINTENANCE
MANUAL**

Version No.	Implemented By	Revision Date	Approved By	Approval Date	Comments
7	DB	24/09/2018	DMS	24/09/2018	Updated maintenance section
8	STH	02/10/2019	DMS	02/10/2019	Added sling lengths
9	STH	02/12/2019	MH	02/12/2019	Added control panel information
10	STH	28/07/2020	DRB	28/09/2020	Added note regarding using Mirage tooling
11	STH	28/07/2020	-	-	Enerpac rebrand

Products Overview

Enerpac has developed a wide range of portable machines for a wide variety of industries and applications. We have a fully dedicated team of engineers to assist you in solving your in situ machining problems.

Product List

Model	Range
FLANGE FACING	
MM300e	0 - 12"
MM600e	0 - 24"
MM600ie	0 - 80"
MM1080ie	0 - 120"
MM610i	2 - 24"
MM860i	6 - 34"
MM1500i	12 - 60"
MM2000i	24 - 80"
MM3000i	45 - 120"
DRILLING & TAPPING	
HT20	2"
HT40	4"
HT50	5"
MILLING	
MR1000 - 3000	0.8m - 3m
MRY1500 - 3000	1.3m - 3m
WP2500 - 8000	1.8m - 8m
GM1000 - 10000	1.0m - 10m
HOT TAPPING	
HTM150	1/2" - 4"
HTM150XL	1/2" - 6"
CHT815 - 4000	2 - 48"
PIPE CUTTING / BEVELLING	
MSF300 - 1220	12 - 48"
LINE BORING	
LB30	1.5" - 6"
LB3060	1.5" - 24"
LB100	6 - 36"
LB150	12 - 60"



Flange facing

(0 - 315") Internal, external mounting and machining of all flange types and groove details including RTJ and compact flanges



Drilling

(0 - 5") Pneumatic or hydraulic portable drill



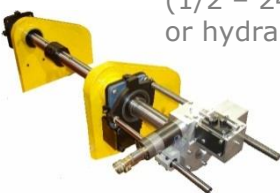
Tapping

(0 - 7") Pneumatic or hydraulic portable tapping machines



Milling

(50 - 120") 2 axis
(393 x 120") 3 axis / gantry



Line Boring

(1/2 - 24") Pneumatic or hydraulic



Hot Tapping

(1/2 - 36") Pneumatic or hydraulic



Pipe cutting / prepping

(8 - 36") Pneumatic or hydraulic



Hydraulic Power units

50 LPM @ 80 bar
380/440V 3 ph supply

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Important Notice

Enerpac has made every effort to ensure that the Information given in this technical leaflet and other publications relating to this machine is correct and understandable. However it is acknowledged that there may be errors or omissions in this publication.

The company reserves the right to modify its products without notification and consequently to supply machines that may not be in accordance with the descriptions and procedures within this publication.

The company also reserves the right not to provide updates, corrections or amendments to this publication but will endeavour to keep its customers up to date with all changes that may affect the machine operation or safety.

Health & Safety at Work Act

Section 6[4] of the above act requires manufacturers to advise their customers on the safety and handling precautions to be observed when installing , operating, maintaining and servicing their products. Accordingly, the following points should be noted:-

1. The relevant sections of these instructions should be carefully read before proceeding.
2. Installation, maintenance and servicing should only be carried out by suitably trained and competent personnel.
3. Normal safety procedures must be taken into account to avoid the possibility of an accident occurring.
4. Any safety equipment necessary for the maintenance / use of the equipment is the responsibility of the customer. Enerpac accepts no responsibility for accidents that may occur due to incorrect installation, maintenance or use.

GENERAL OPERATION

The following procedures are provided to enable your Enerpac machine to be installed and function correctly and safely.

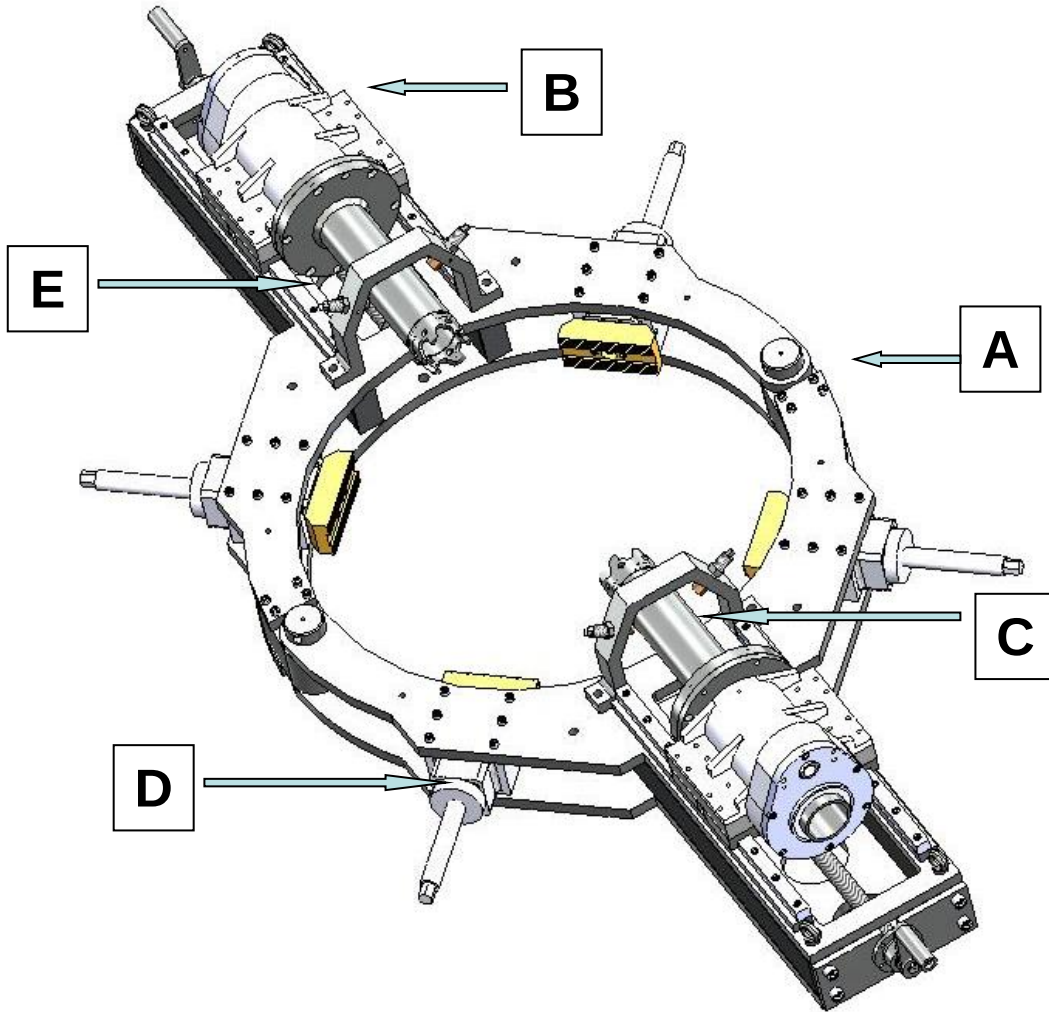
PLEASE READ THE FOLLOWING BEFORE PROCEEDING

1. All safety procedures must be observed prior to operating the equipment.
2. Do not pressurise the equipment if the inlet hose or serviceability of the equipment is suspect.
3. The operators must wear the correct safety equipment whilst operating this equipment.
4. Do not attempt to machine above the specification of the machine or below the specified sizes. This will invalidate the guarantee.
5. Do not attempt to machine if the locking of the machine is suspect or below that recommended.
6. Ensure that the machine gearbox is stored in neutral and the air supply valve is in the closed position. This is important before connecting the air supply to the machine.
7. Never allow another person to operate the air control valve whilst you are using the machine.
8. Never leave the machine working unattended or leave the air line pressurised whilst disconnected.
9. Make sure that all personnel are fully trained in both the operation of the machine and all the relevant safety aspects.

CAUTIONS

1. Do not use the machine without connecting the air filter/lubricator This will invalidate the motor manufacturer's guarantee.
2. Do not attempt to alter the feeds whilst the machine is rotating.

Machine Features



- A** – Frame Assembly
- B** – Spindle Assembly
- C** – Cutter & Steady Assembly
- D** – Clamping Assembly
- E** – Steady Bearing Assembly

Technical details

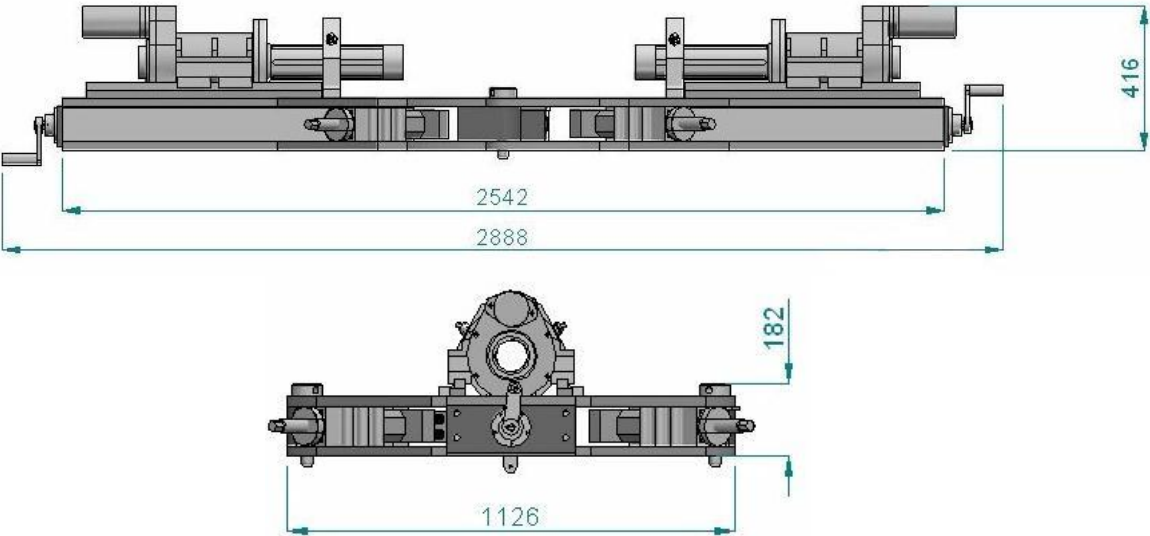
RANGE		
Minimum pipe diameter	152mm	6"
Maximum pipe diameter	915mm	36"
Minimum Clamping diameter	405mm	16"
Maximum Clamping diameter	915mm	36"
Min. / Max. Pin diameters (4" standard)	100mm / 4"	305mm / 12"
Cutting stroke	400mm	16"
R.P.M	Min: 10	Max: 31
Drive – hydraulic @ 1050 p.s.i (72 bar)	6.0 Hp	4.47 Kw
Hydraulic supply required (max power, both spindles)	50 L/min	11 gal/min

FEED RATES		
Advance manual Feed rate / revolution	4mm	0.157"

WEIGHTS AND DIMENSIONS		
Machine weight	706 kg	1556 lbs
Shipping weight	806 Kg	1777 lbs

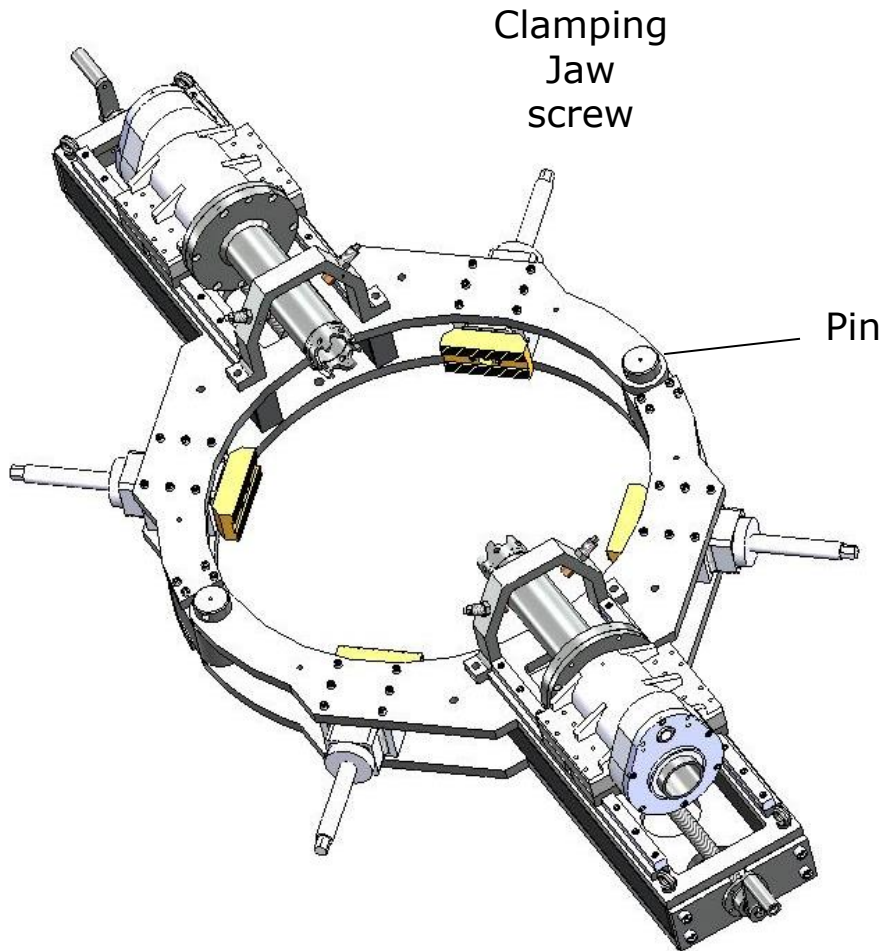
Shipping dimensions 2 off boxes	L - 148cm - (58")	W- 173cm (68")	H- 79cm (31")
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THE USE OF STANDARD MIRAGE SUPPLIED TOOLING MUST BE USED TO ENSURE THE MACHINE PERFORMS AS EXPECTED



Packing details

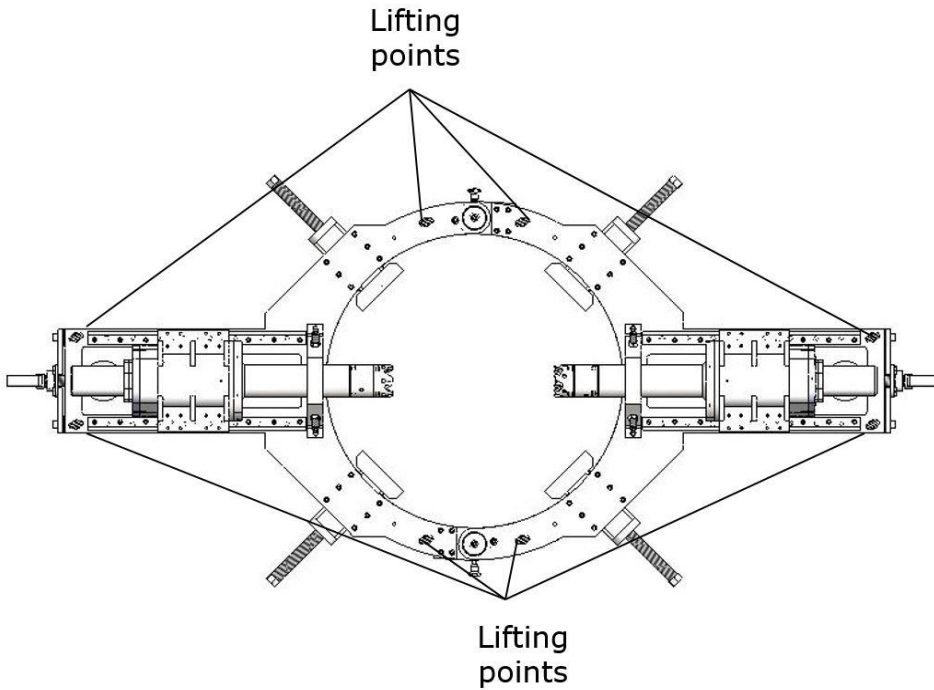
Qty	Packed ✓ x	Part No.	Description	Box
1		DDU1636-1	Double Drill Unit Frame Assembly	
2		DDU1636-2	DDU Drive Spindle Assembly - No Motor	
2		DDU1636-3	4" DDU Cutter & Steady Assembly	
2		OMP400	Danfoss Hydraulic Motors (151-0318) 100rpm @ 40 lpm	
2		OD0117L	Motor Spacer	
2			½" Quick Release Coupling - Female	
2			½" Quick Release Coupling - Male	
Tool Kit comprising:				
1			Tool Roll	
1			Metric Hexagon Key Set 1.5 - 10mm	
1			14mm Hexagon Key	
1			12mm Combination Spanner	
1			27mm Black Open End Spanner	
1			36mm Ring Slogging Spanner	
8			M16 Eyebolts	
Additional Items:				



1.1 Machine installation

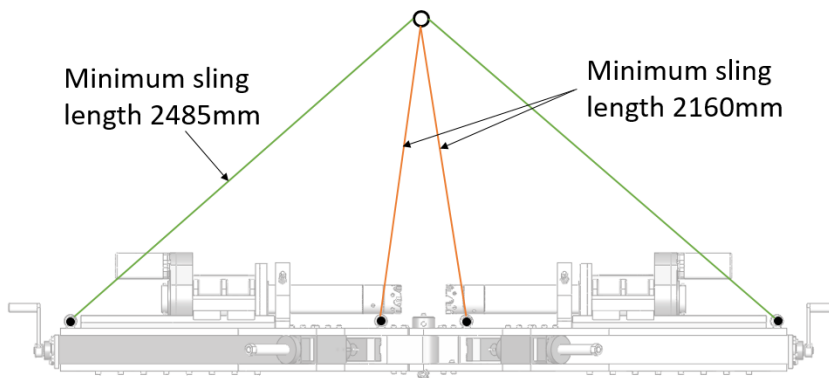
1. Measure diameter of the pipe to be drilled and ensure this is within the working parameters of the machine.
2. Screw the legs equally spaced from the internal bore of the frame to the required diameter. Back 2 legs off 5mm.
3. Remove the pin from the frame and swing open. Mount on pipe ensuring the machine is reasonably square.
4. Position the drill where required and reinstall the swing pin. Tighten the 2 off legs that were backed out first then re tighten all jaws.

Lifting

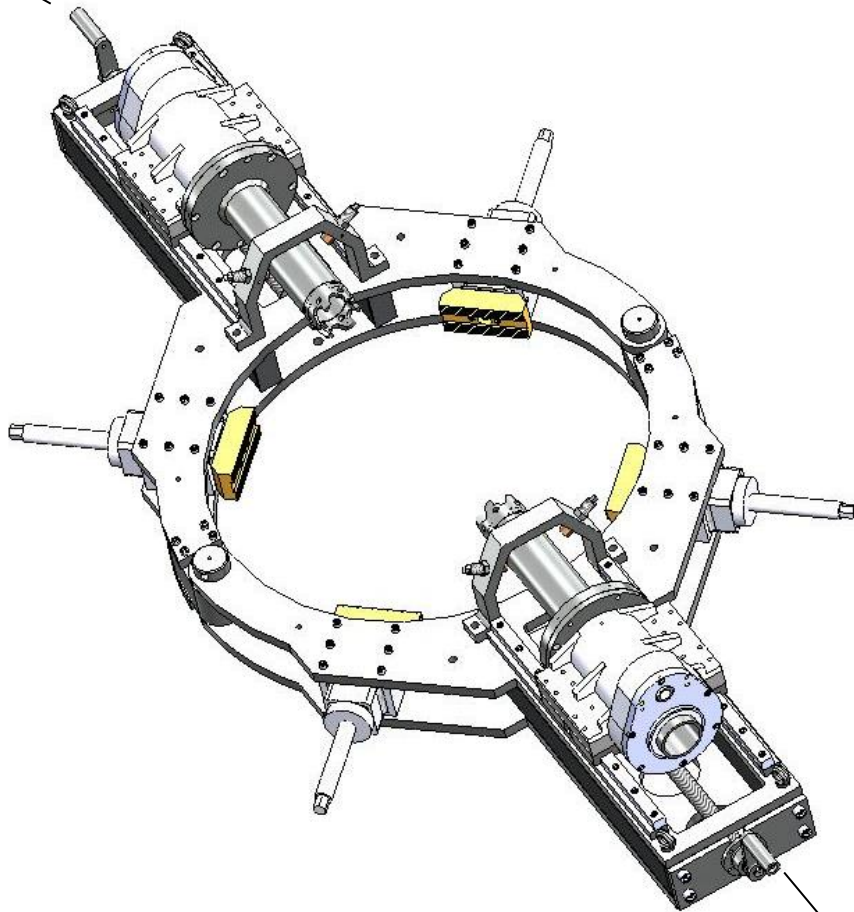


1.2 Machine Lifting

1. Each half required the following components to ensure a safe lift: -4 off certified M16 eyebolts, 4 off certified to lift 1000kg small bow shackles, 4 off 1000kg x 2m EWL round wire slings.
2. Ensure all threads are clean and free from damage. Using the eyebolts in the four locations install and tighten
3. Using the bow shackles and slings the machine can now be lifted safely.



Feed
Handle



Feed
Handle

1.1 Machine operation

1. Ensure the machine is firmly clamped into position.
2. Screw the cutter heads onto the spindles and tighten. Wind both spindles to within 6mm / ¼" of the pipe and rotate the spindles.

Note: the use of standard mirage supplied tooling must be used to ensure the machine performs as expected

3. Feed the cutters into the pipe at an even rate with even pressure applied. It may be necessary in thick walled pipes or multi grouted casings to back the cutters out of the cut to clear swarf and grout coupons.
4. Once the cut is made to centre (This may require extension pieces if small diameter or offset casings are encountered) retract the spindles and stop rotation.

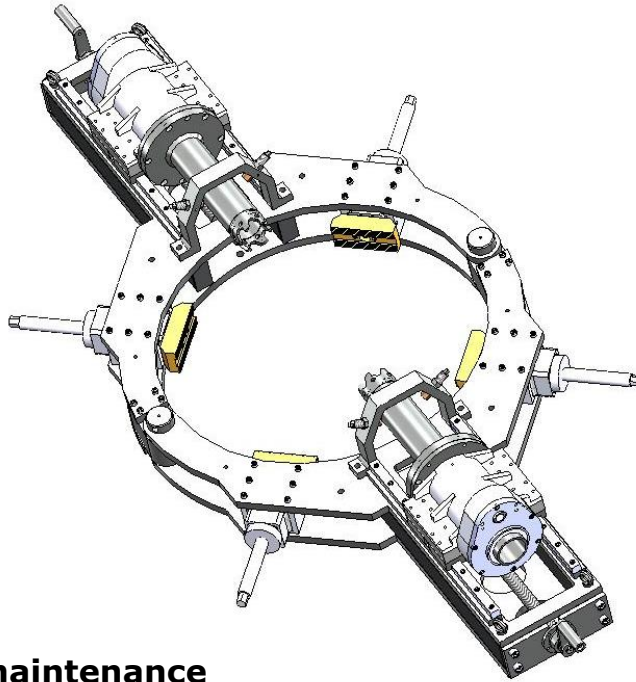
TROUBLE SHOOTING CHART

The following chart is supplied to enable the operator to locate possible faults arising from the operation of the machine. If any faults persist or are out of the scope of this chart please contact Enerpac technical staff

THE USE OF STANDARD MIRAGE SUPPLIED TOOLING MUST BE USED TO ENSURE THE MACHINE PERFORMS AS EXPECTED

FAULT	POSSIBLE REASON	ACTION TO TAKE
MACHINE WILL NOT ROTATE WHEN HYD SUPPLY IS ON	1. Check machine rotation by hand.	Contact technical staff
	2 Hyd supply not available.	Check hyd supply
	3. Faulty drive motor.	Check drive motor – contact technical staff
	4. Faulty hyd valve	Check operation
	5. Incorrect hyd supply	Check hyd supply
MACHINE WILL NOT TRAVERSE	1 Check leadscrew & nut	Check for wear & damage
POOR CUTTING ON PIPE	1. Tool tip worn	Replace / regrind tip
	2. Machine not correctly clamped	Check and tighten all mounting bolts
	3. Check feed rate.	Reduce feed rate
	4. Tool loose	Tighten tool.
	5. Linear guides loose.	Check and tighten
	6. Spindle bearings loose	Check & contact technical staff

General Maintenance



1.1 Machine maintenance

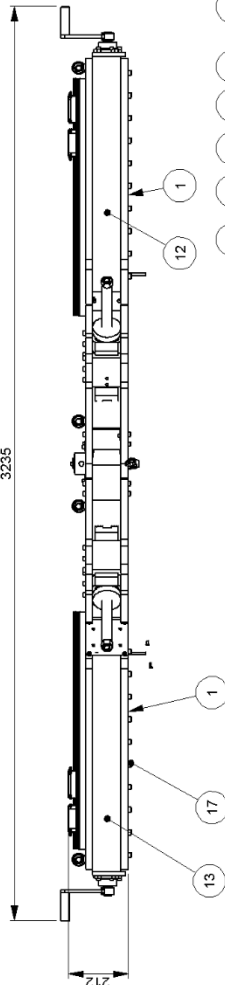
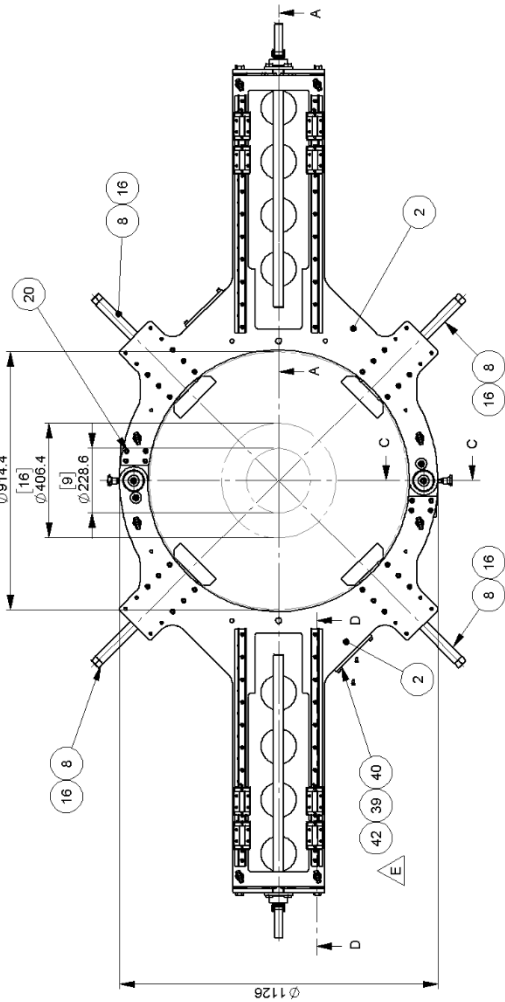
1. Ensure the machine is fully cleaned and washed thoroughly after each use.
2. Lightly oil linear guides and grease blocks with lithium based grease after each use or before long term storage.
3. The DDU frame, joining pins, clamp screws and pivots should all be cleaned and oiled pre and post machine use.
4. Check steady bearings for wear – replace if necessary.
5. Clean and grease removable frame pin.
6. Grease spindle – 5 shots.
7. Clean and lightly oil main feed screw and nut.
8. Check cutter spindle threads.
9. Check cutter bodies – send for re tipping or re grinding.
10. **DO NOT** store the machine where it would be exposed to outdoor elements or salt water for extended periods of time.
11. If the machine was used in an environment where salt water is present, wash the machine with fresh water after use and then reapply a layer of grease and oil to the relevant parts.

Please note that even with careful maintenance that the linear rails will not keep their original as-supplied colour.

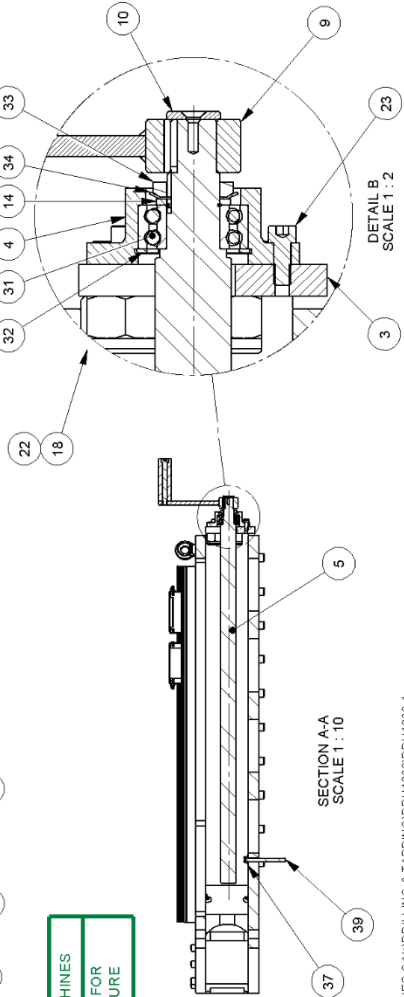
Printed on 23/08/2018

DO NOT SCALE

IF IN DOUBT ASK



MIRAGE MACHINES
APPROVED FOR
MANUFACTURE



ITEM NO.	REV	PART NUMBER	DESCRIPTION	QTY
1	D	OD 0186	36" LOWER FRAME PLATE	2
2	F	OD 0185	36" UPPER FRAME PLATE	2
3	B	OD0116	BULKHEAD PLATE	2
4	A	OD 0142	Thrust block	2
5	D	OD 0112	LEADSCREW	2
6	C	OD 0120A	hinge pin	2
7	D	OD 0121	hinge	2
8	A	DDU1636-6	clamping assembly	4
9	B	OD0129	CRANK HANDLE	2
10		ML0107	caprive washer	2
11	A	OD 0199	RAIL MOUNTING BLOCK	4
12	A	OD 0200 B	SANDWICH PLATE	2
13	A	OD 0200 A	SANDWICH PLATE	2
14		OD 0198	bearing spacer	2
15		M12 x 35	Hex Socket Head - BS EN ISO 4762	4
16		M10 x 150	HEX SOCKET HEAD - BS EN ISO 4762	24
17		M12x45	Socket hd cap screw	40
18		M8 x 16	Hex Socket Head	8
19		M10 x 40	Hex Socket Head	16
20		M18x70	Hex Head Bolt	8
21		M8 x 35	Hex Socket Head - BS EN ISO 4762	8
22		M8x20	Hex Socket Head - BS EN ISO 4762	2
23		M8 x 30	Hex Socket Head - BS EN ISO 4762	2
24		EGR30-840	LINEAR GUIDEWAY	44
25		EGH30CA-20	CARRIAGE	8
26		3306 V494	single - acting ball lock pin	2
27		M18 x 20	EYEBOLT	8
28		MB3040DU	DU bush	4
29		MB3020DU	DU bush	2
30		3205 2R S	double row ang con bng	2
31		D1300 0520	INTERNAL CIRCLIP	2
32		KMS	locknut	2
33		MBS	lockwasher	2
34		33250 M0956	RETAINING CABLE	4
35		M20 washer form C	WASHER (FORM A)	6
36		Bright washer BS 4320 - M12	Hex Socket Head - BS EN ISO 4762	29
37		M8 x 25	Socket Head Cap Screw	10
38		MB6190	Mounting Plate	2
39		DDU1636-1-001	Hex Socket Head - BS EN ISO 4762	7
40		M5 x 50	Hex Socket CTSK Head	8
41		M6 x 16		
42				

ITEM 35, 33250 M0956 NOT SHOWN.

REV.	INC.	DESCRIPTION	DATE	DRAWN BY	APPROVED
E	-	AGB64 DDU1636-1-001 / M8x30 cap heads and M8x25 CTSK heads	14-Jul-16	DRB	SR
D		RE-DESIGN	29-Jun-16	DC	SR
C		REPLACED M6 X 50 SHCS WITH M16 X 50 HEX HEADS	16/2/2015	DRB	BC
B		FASTENERS CHANGED TO SUIT REVISION B OF OD0116 BULKHEAD PLATE	15/8/2014	SR	DRB
A		2 OFF 3325W266 REPLACED BY EXTRA PART 3325W266 (M8 X 25) & M8 WASHERS WERE 4 OFF	24/7/2010	CWD	KAW



THIRD ANGLE PROJECTION

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MAY BE MADE WITHOUT PRIOR WRITTEN PERMISSION

WEIGHT 60.380kg
DRAWN BY CWD
CHECKED BY JMS
APPROVED BY RMC
DATE 01/11/2010
DATE 01/11/2010



MIRAGE
PORTABLE PERFORMANCE

10 ENTERPRISE WAY, JUBILEE PARKWAY,
STORES ROAD, DERBY DE21 4BB
TEL: 01332 350000 FAX: 01332 350036
E MAIL: info@mirage-machines.co.uk
DWG No

16" to 36" FRAME ASSEMBLY

SCALE: 1:15

DDU 1636-1

SHEET 1 OF 2

A3

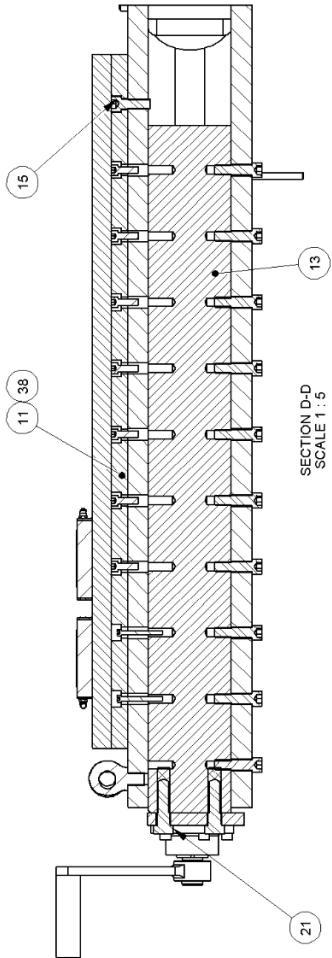
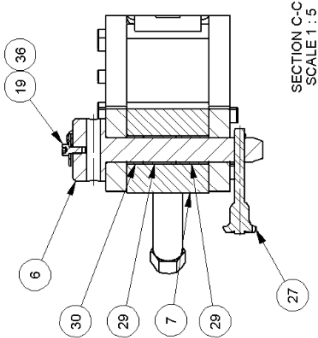
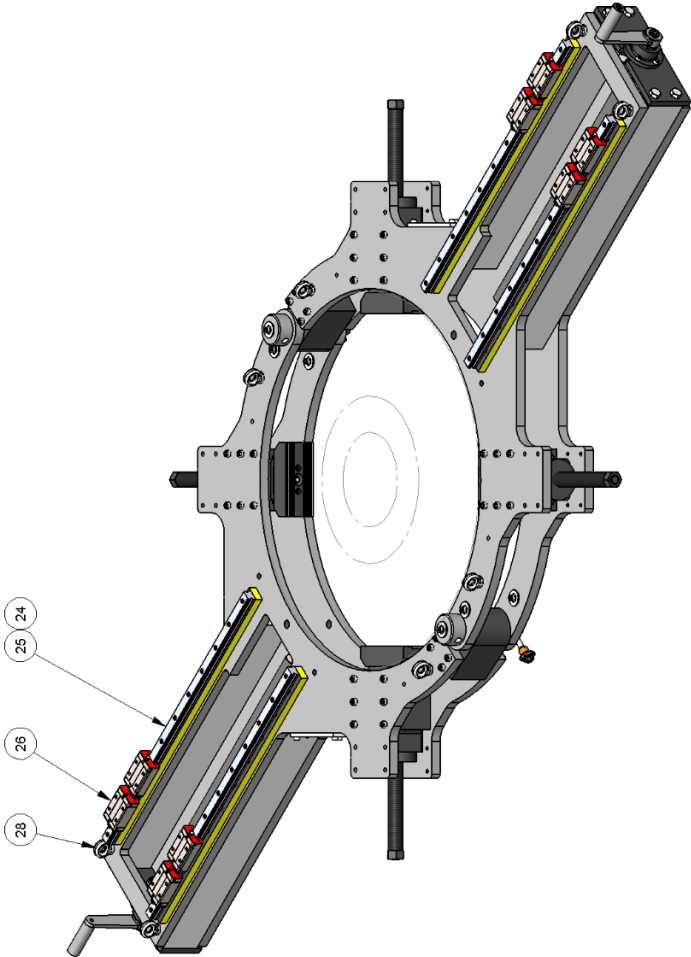
N Drawing Storage\MACHINES GAS\DRILLING & TAPPING\DDU1636\DDU1636-1

A3 ASSEMBLY (AUTO) - 7-4-2008

IF IN DOUBT ASK

DO NOT SCALE

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REV.	INC.	DESCRIPTION	DATE	DRAWN BY	APPROVED
E	-	AG5601 DDU1636-1 001 1M8x30 GGP heads and 1M8x25 CT3X heads	14-Jul-16	DRB	SR
D	-	RE-DESIGN	29-Jun-16	DC	SR
C	-	REPLACED M8 x 50 SHCS WITH M16 x 50 HEX HEADS	16/2/2015	DRB	BC
B	-	FASTENERS CHANGED TO SUIT REVISION 8 OF DDU116 BULKHEAD PLATE	15/8/2014	SR	DRB
A	-	2 OFF 3325W966 REPLACED BY EXTRA PART 3325W956 (4 OFF) 6 x M6x16.8. M8 WASHERS WERE 4 OFF	26/7/2010	CWD	KAW
REV.	INC.	DESCRIPTION	DATE	DRAWN BY	APPROVED



THIRD ANGLE PROJECTION

MIRAGE
PORTABLE PERFORMANCE

10 ENTERPRISE WAY, JUBILEE PARKWAY,
STORES ROAD, DERBY DE11 4BB
TEL: 01332 353555 FAX: 01332 353556
E MAIL: info@mirage-machines.co.uk
DWG No

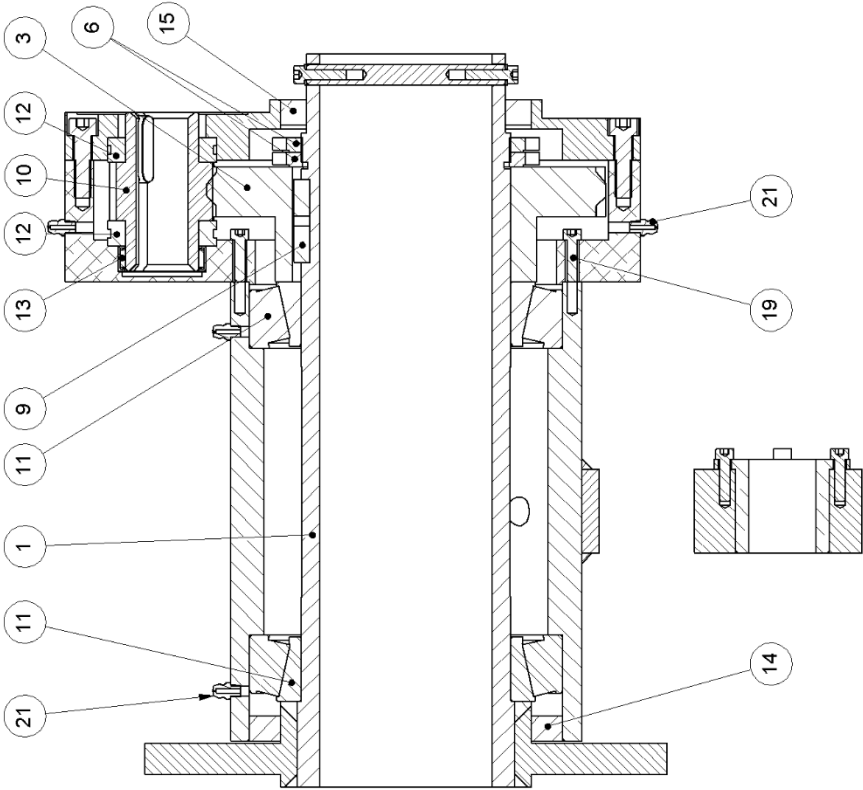
16" TO 36" FRAME ASSEMBLY
SCALE: 1:10

DDU 1636-1
SHEET 2 OF 2

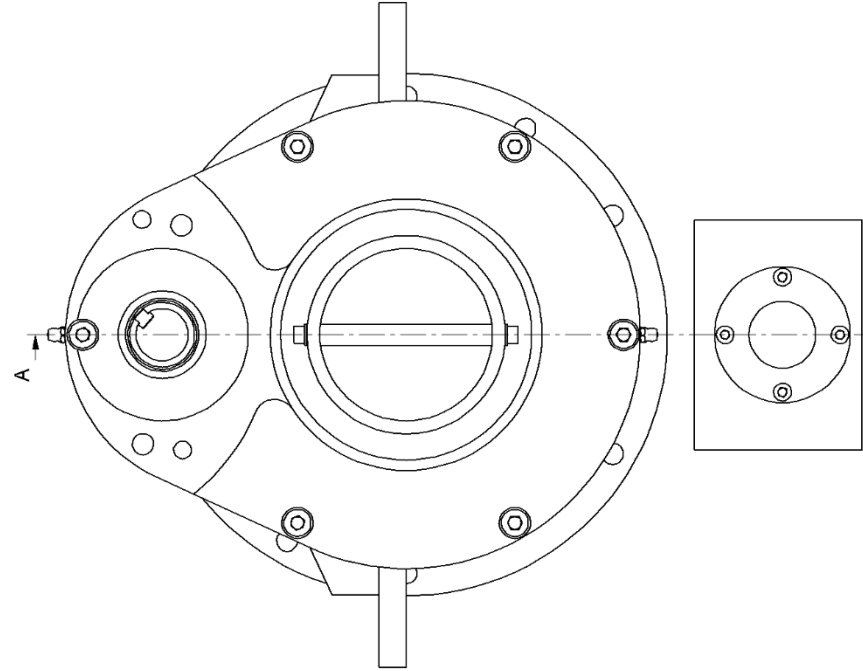
Printed on 23/08/2018

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SECTION A-A



C	3473	Added M6 Grease Nipples	14/05/2018	DRB	DMS
REV.	INC.	DESCRIPTION	DATE	DRAWN BY	APPROVED
 THIRD ANGLE PROJECTION					
MIRAGE M A C H I N E S					
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WEIGHT	42.519kg				
DRAWN BY	CHD	19/03/2009			
CHECKED BY	CHD	19/03/2009			
APPROVED BY	GDS	19/03/2009			
TITLE	DDU drive spindle assembly				
DWG No	DDU1636-2				
SHEET 1 OF 2					A3

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MANUFACTURE

N:\Drawing Storage\MACHINES GAN\DRILLING & TAPPING\DDU1636\DDU1636-2 (DDU drive spindle assembly)

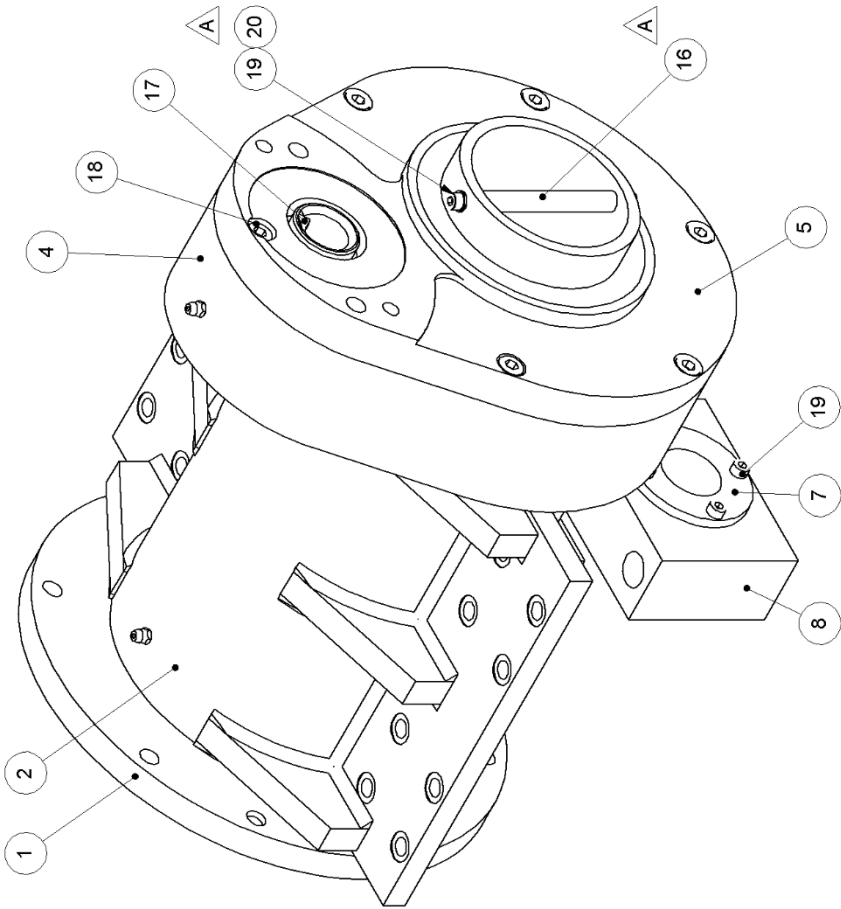
A3 ASSEMBLY (AUTO) - 7-4-2009

IF IN DOUBT ASK

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ITEM NO.	REV.	PART NUMBER	DESCRIPTION	Default/QTY.
1	C	OD0101A	FLANGED SPINDLE	1
2	F	OD 0103	SPINDLE HOUSING	1
3	A	OD 0104	84t drive gear	1
4	A	OD 0105	gearcase	1
5	C	OD 0106	GEARCASE LID	1
6		OD 0107	locknut	2
7	A	OD 0143	LEADSCREW NUT	1
8	D	OD 0144	leadscREW nut housing	1
9		OD 0174	spindle drive key	1
10	J	HTD0407C	21t DRIVE GEAR	1
11		32020	taper roller bearing	2
12		51107	thrust bearing	2
13		HK 3512	needle roller bearing	1
14		120 x 150 x 12	SEAL	1
15		95 x 120 x 12 seal	METRIC OIL SEAL	1
16		DDU1636-2-001	COUPON RETAINER	1
17		HT50-1-002	Stepped Key	1
18		M8 x 30	Hex Socket Head - BS EN ISO 4762	6
19		M5 x 20	Hex Socket Head - BS EN ISO 4762	14
20		M5	WASHER (FORM A)	2
21		M6	STRAIGHT GREASE NIPPLE	4



C	3473	Added M6 Grease Nipples	14/05/2018	DRB	DWS																				
REV.	INC.	DESCRIPTION	DATE	DRAWN BY	APPROVED																				
 THIRD ANGLE PROJECTION © MIRAGE MACHINES LTD 2009 ALL RIGHTS RESERVED. NO PART OF THIS DOCUMENT OR THE ARTICLE SHOWN MAY BE MADE WITHOUT PRIOR WRITTEN PERMISSION <table><tr><td>WEIGHT</td><td>45.519 kg</td><td>DATE</td><td>23/09/2018</td></tr><tr><td>CHECKED BY</td><td>DC</td><td>DATE</td><td>19/09/2009</td></tr><tr><td>APPROVED BY</td><td>GBE</td><td>DATE</td><td>19/09/2009</td></tr><tr><td>TITLE</td><td colspan="3">DDU drive spindle assembly</td></tr><tr><td colspan="4">SCALE 1:2</td></tr></table>						WEIGHT	45.519 kg	DATE	23/09/2018	CHECKED BY	DC	DATE	19/09/2009	APPROVED BY	GBE	DATE	19/09/2009	TITLE	DDU drive spindle assembly			SCALE 1:2			
WEIGHT	45.519 kg	DATE	23/09/2018																						
CHECKED BY	DC	DATE	19/09/2009																						
APPROVED BY	GBE	DATE	19/09/2009																						
TITLE	DDU drive spindle assembly																								
SCALE 1:2																									
 10 ENTERPRISE WAY, LILLEE PARKWAY, LILLEE, LANCASHIRE, L17 9JG TEL 01332 329767 FAX 01332 370356 E MAIL info@mirage-machines.co.uk DWG No																									
DDU1636-2					A3																				
SHEET 2 OF 2																									

MIRAGE MACHINES
APPROVED FOR
MANUFACTURE

N Cracking StorageMACHINES GASDRILLING & TAPPINGDDU1636DDU1636-2 (DDU drive spindle assembly)

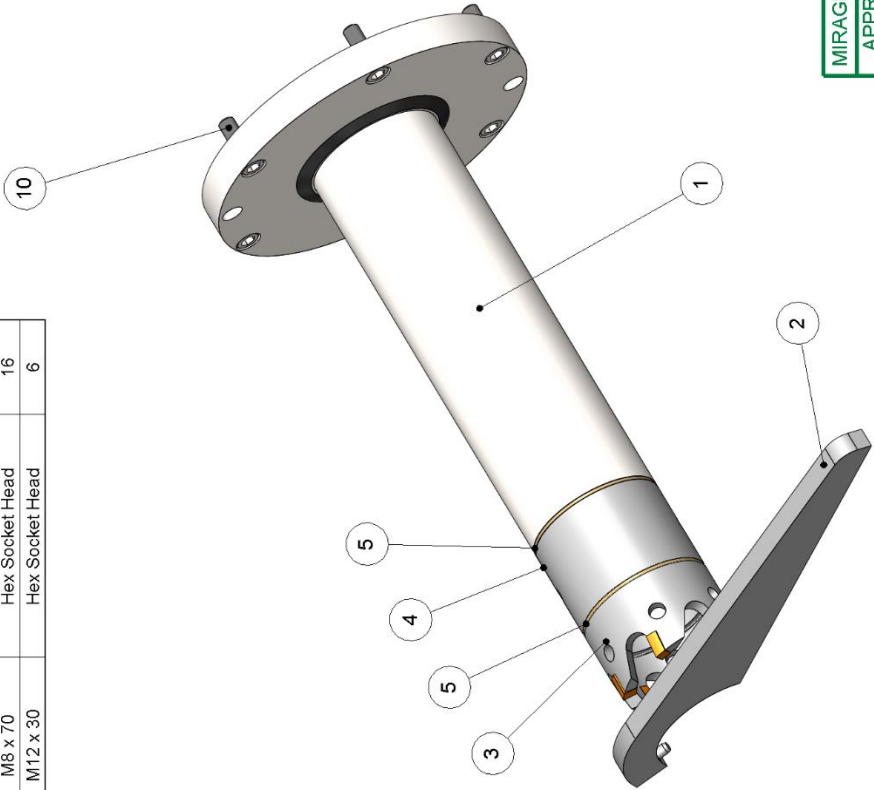
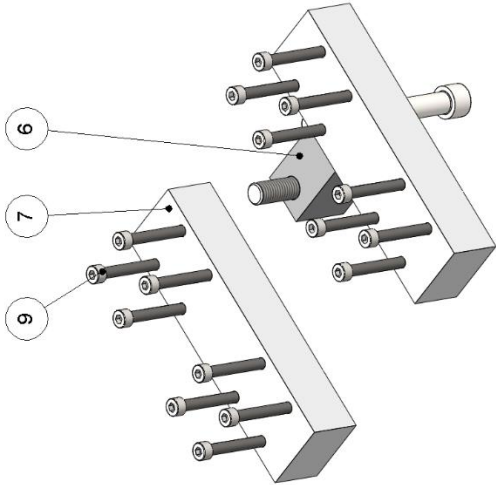
A3 ASSEMBLY (AUTO) - 7-4-2009

IF IN DOUBT ASK

DO NOT SCALE

Printed on 23/08/2018

ITEM NO.	REV.	PART NUMBER	DESCRIPTION	Default/QT
1	A	OD 0101-4F	4" FLANGED MANDREL	1
2	A	OD 0101B	"C" SPANNER	1
3	E	OD 0109 - 4	4in cutter body	1
4				1
5	B	OD 0130A	cutter thrust washer	2
6		OD 0154	leadscrew nut spacer	1
7		OD 0167	spindle housing spacer	2
8		M16 x 130	Socket head cap screw	2
9		M8 x 70	Hex Socket Head	16
10		M12 x 30	Hex Socket Head	6



MIRAGE MACHINES
APPROVED FOR
MANUFACTURE

A	Removed shrouds as per INC 2660	09/04/2018	DRB	SM
REV.	DESCRIPTION	DATE	DRAWN BY	APPROVED
 THIRD ANGLE PROJECTION				
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WEIGHT	24.119 kg	CWD	22/08/2018	
DRAWN BY	DC	26/08/2009		
CHECKED BY				
APPROVED BY				
TITLE	4" CUTTER & STEADY ASSEMBLY			
DWG No. DDU1636-3				A3
SHEET 1 OF 1				

MIRAGE

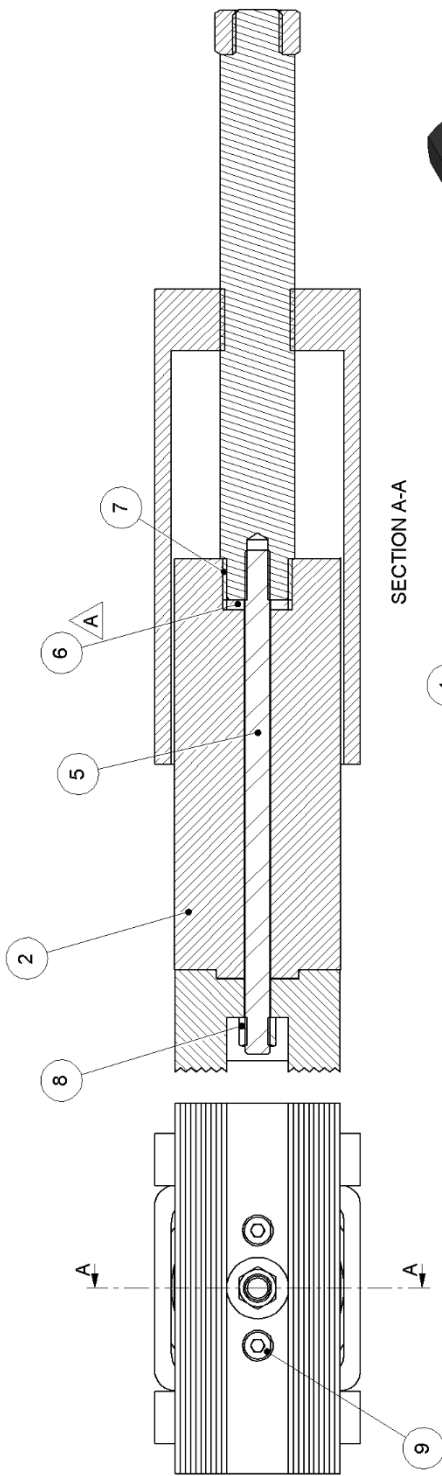
MACHINES

10 ENTERPRISE WAY, JUBILEE PARKWAY,
STOKES ROAD, DERBY DE21 4EB,
TEL: (01332) 291767 FAX: (01332) 370356
E-MAIL: info@mirage-machines.co.uk

N:\Drawing Storage\MACHINES\CAMDRILLING & TAPPING\DDU1636\DDU1636-3 (4 inch cutter & steady assembly)

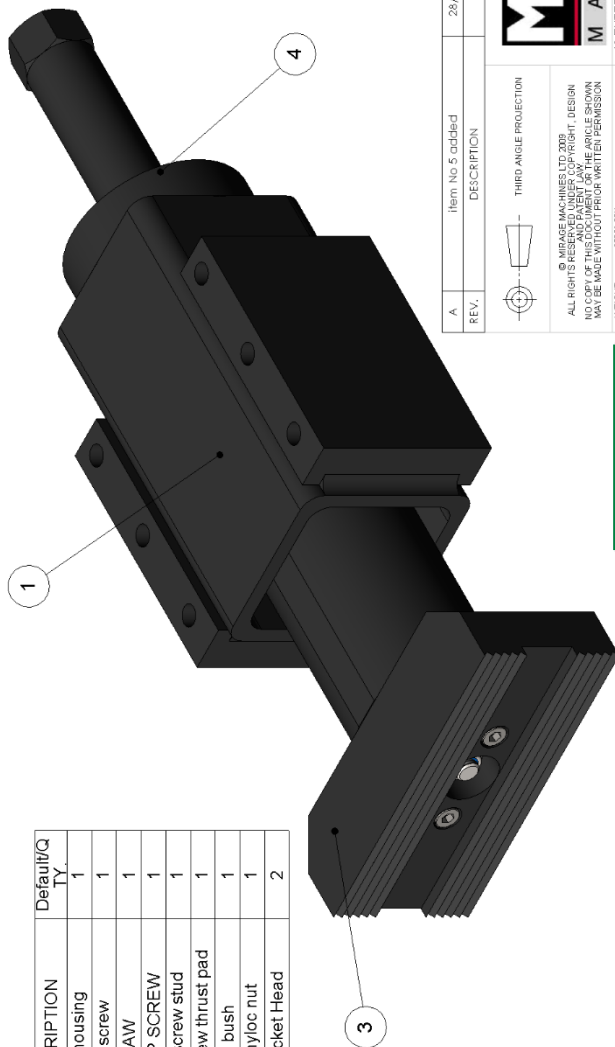
DO NOT SCALE

IF IN DOUBT ASK



SECTION A-A

ITEM NO.	REV.	PART NUMBER	DESCRIPTION	Default/QTY.
1	C	OD 0123C	jaw housing	1
2	C	OD 0136B	jaw screw	1
3	B	OD 0136	JAW	1
4	D	OD 0138 A	CLAMP SCREW	1
5		OD 0138 B	clamp screw stud	1
6		OD 0175	clamp screw thrust pad	1
7		MB3020DU	DU bush	1
8		M12 nyloc nut	M12 nyloc nut	1
9		M8 x 50	Hex Socket Head	2



A	item No 5 added		28/07/2010	CWD	DC
REV.	DESCRIPTION		DATE	DRAWN BY	APPROVED
	THIRD ANGLE PROJECTION 				
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	WEIGHT DRAWN BY CHECKED BY APPROVED BY TITLE 27266/08/C CWD DC RMS 20/07/2010				
					
		10 INDUSTRIAL WAY • JULIETTE PARKWAY, STOICES ROAD • DEBENTON LE11 1BS TEL 01332 291767 FAX 01332 370356 E MAIL info@mirage-machines.co.uk DWG No			
clamping assembly		DDU1636-6		A3	
SCALE: 1:2		SHEET 1 OF 1			

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WEIGHT	27350.83KG	06/10/2018
DRAWN BY	CWD	18/08/2009
CHECKED BY	DC	28/07/2010
APPROVED BY	RMS	
FILE		

MIRAGE MACHINES
APPROVED FOR
MANUFACTURE

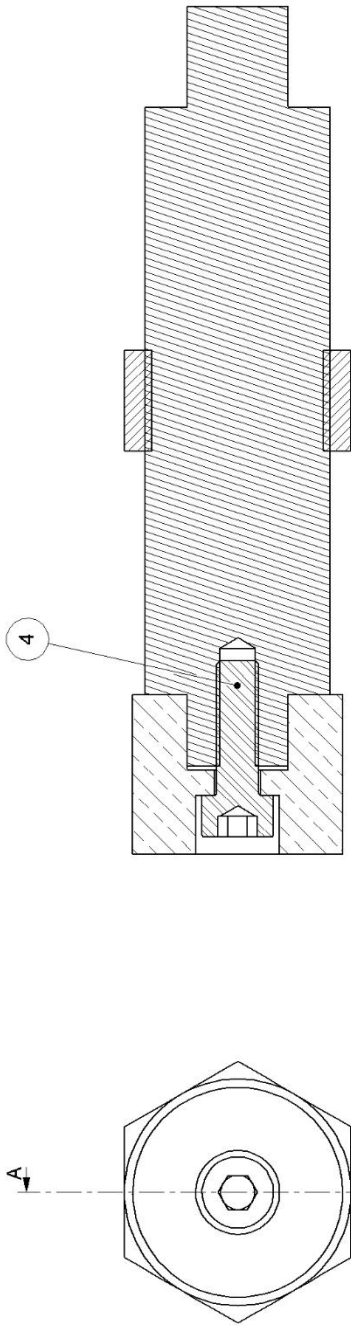
clamping assembly
SCALE: 1:2

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A3 ASSEMBLY (AUTO) - 7-4-2009

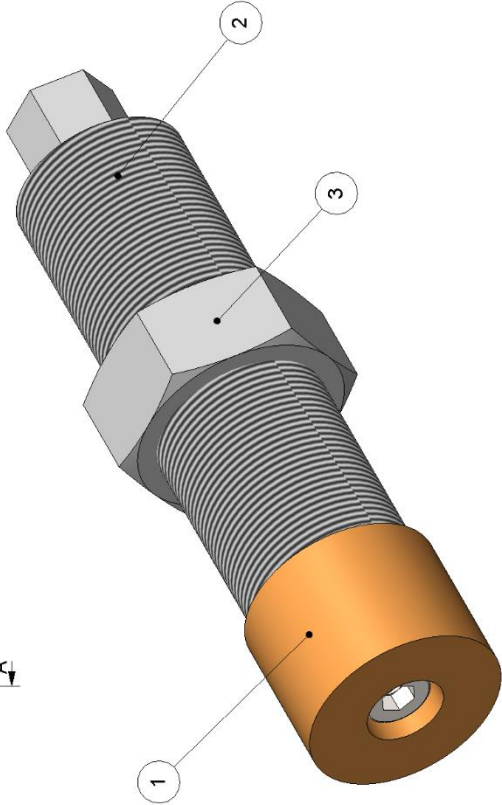
IF IN DOUBT ASK

DO NOT SCALE

ITEM NO.	REV.	PART NUMBER	DESCRIPTION	QTY.
1	B	OD 0169	steady bearing	1
2		OD 0170	steady screw	1
3		OD 0172	locknut	1
4		M5 x 16	Hex Socket Head	1



SECTION A-A



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MANUFACTURE

REV.	DESCRIPTION	DATE	DRAWN BY	APPROVED
	 THIRD ANGLE PROJECTION			
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WEIGHT	0.318KG			
DRAWN BY	CWD	06/10/2015		
CHECKED BY	DC	22/08/2009		
APPROVED BY				
TITLE	STEADY BEARING ASSEMBLY			
SCALE: 2:1				A3
DDU1636-7				SHEET 1 OF 1

10 ENTERPRISE WAY, JUBILEE PARKWAY,
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DWG No.

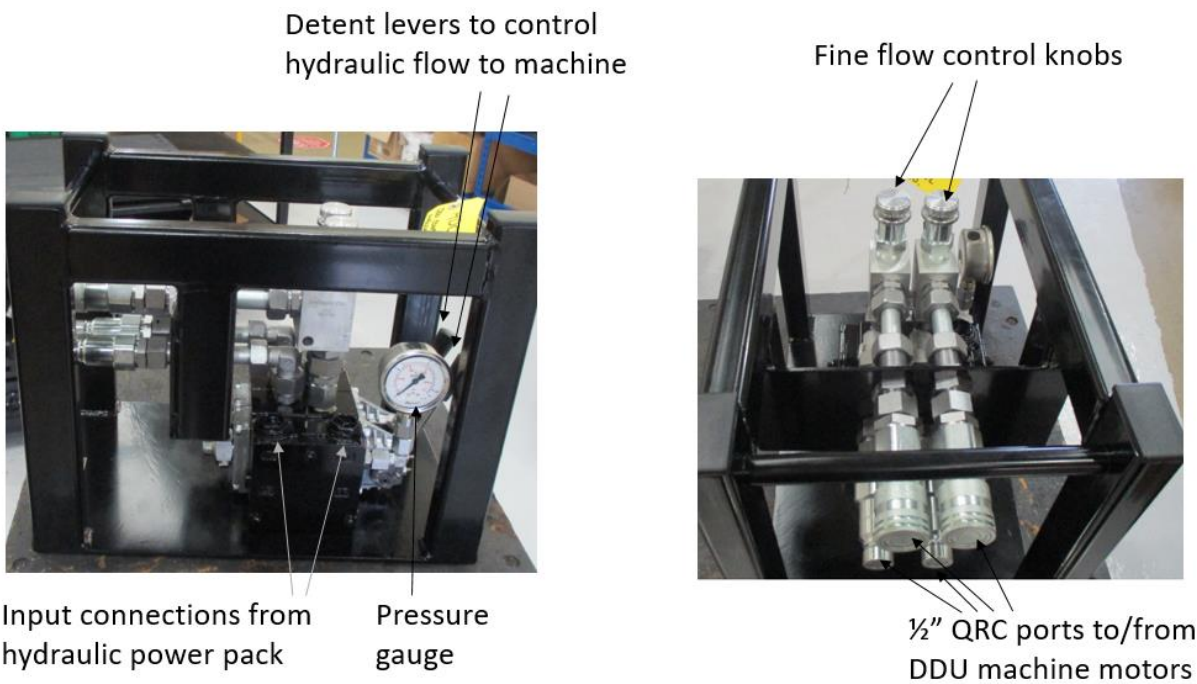
Appendix

Control Panel (HDCP-DDU)

Details of the Enerpac Hydraulic Control if supplied with the DDU1636

The control panel is fitted with a 2 section PVG32 valve with manual detent levers. These each have 50LPM motor spools and therefore a power pack with a minimum flow capability of 100LPM is required to run the machine.

The control panel also features 2 pressure compensated fine flow control valves with manual control knobs.



Check that the machine cutters are rotating in the correct orientation before the machine is used. If they are incorrect swap the inlet and outlet hose connections.

[illegible]