MIRAGE
PORTABLE MACHINING TOOLS

For the toughest on-site machining jobs

ENERPAC®

Mirage Portable Machining Tools

Since joining the Enerpac portfolio, the design innovation of Mirage machines has continued to deliver new products that help get the job done faster, safer, and smarter. Explore the full Mirage product line from flange facing machines, milling machines, hot tapping, drilling and tapping machines to clamshell pipe cutters, decommissioning and band saws. All backed by Enerpac training, application support and service.

Specialist Support, Experience & Expertise

Design & Innovation

Mirage Portable Machine Tools are the result of over 25 years of expertise and innovation. The pioneering spirit continues under Enerpac ownership through our commitment to new product development. Watch out for more new tools being launched in the near future!

Utilities

Continuous Improvement

Our specialist manufacturing operation is ISO9001 certified. This means we drive a culture of continuous improvement. Our team members are encouraged to find ways to improve today, tomorrow, and long into the future.

Specialist Support, Experience & Expertise

Each machining project presents difficult and unique challenges. Making the right choice for your next and any future projects can be complex. That is why our team is eager to support you through every step on your journey. Whether it is choosing the right specification, commissioning your machine, or maintenance - we're with you all the way.

Nuclear

Oil & Gas

Petrochemicals

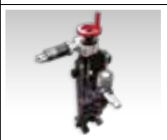
Power Generation

Ship Building, Maintenance and Repair

Wind Power

Construction and Mining

Mirage Portable Machining Tools – Overview

Machining Capacities	Mirage Portable Machining Tools	Series		Page
ø 1 - 161 inches ø 25,4 - 4100 mm	**Internal Mount Flange Facing Machines** Create the right flange sealing surface	FF MM-I		4 ▶
ø 0 - 80 inches ø 0 -2032 mm	**External Mount Flange Facing Machines** Create the right flange sealing surface	MM-E		5 ▶
ø 2 - 177 inches ø 51 - 4495 mm	**Clamshell Pipe Cutting and Bevelling Machines** Narrow Body, Mid-Size and Heavy-Duty	NB MS HD		6 ▶
ø 98 - 315 inches ø 2500 - 8000 mm	**General Orbital Milling Machines** Machine large flanges accurately and efficiently	OM		8 ▶
ø 70 - 181 inches ø 1800 - 4600 mm	**Wind Power Orbital Milling Machines** Machine large flanges accurately and efficiently	WP		9 ▶
40 - 120 inches 100 - 3000 mm	**Linear Milling Machines** On-site milling with workshop precision 2 and 3-Axis Configuration	LMR MR, MRY GM		10 ▶
ø 1/2 - 60 inches ø 12.7 - 1524 mm	**Hot Tapping Machines & Line Stopping Actuators** Built to deliver power where it matters most	HTM, LPH MHT, CHT LSA		12 ▶
ø 6 - 60 inches ø 152 - 1524 mm	**Decommissioning Diamond Wire & Band Saws** Cutting the toughest materials	MDWS BS		14 ▶
ø 2 - 12 inches ø 51 - 305 mm	**Drilling & Tapping Machines** Make light work of the toughest applications	HT T DDU		16 ▶
ø ⅞ - 11 inch ø 22 - 279 mm	**GeniSYS™ IV Portable 3-axis CNC Mill** Removal of cracked or broken studs and refurbishment of damaged threads	GeniSYS™		18 ▶
ø ¾ - 40 inch ø 19 - 1016 mm	**Isolation & Test Tools** Piping Isolation and Pressure Testing	MITT		20 ▶
	Overview Bolting and Flange Maintenance Tools Controlled Tightening, Joint Assembly and Separation Bolting Integrity Software Solutions			22 ▶

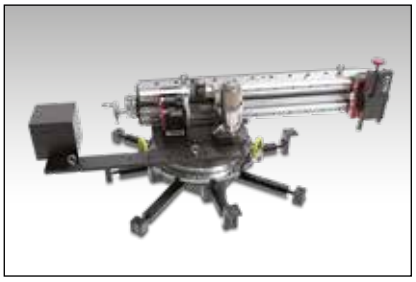
Internal Mount Flange Facing Machines

FF120
- Mechanical tool manually operated
- Simple to operate
- Lightweight - only 15 lbs (6,8kg)
- Multiple leadscrew options allow for manually driven continuous fixed feeds for ASME standard surface finishes
- Calibrated slide to define cut depth and correct finish.

MM305I and MM610I
- Swivel toolpost for groove details, reduces the need for separate accessories
- Supplied with a range of 2 quick set base sizes for improved onto site operation
- Collet base allows for efficient machine mounting and centering.

MM860I and MM1000I
- 360 swivel toolpost for groove details, reduces the need for separate accessories (power feed on MM1000I)
- Supplied with a range of 3 quick set base sizes for improved onto site operation
- Adjustable height clamping jaws for efficient machine setting.

MM1500I
- Power feed 360 swivel toolpost for groove details, reduces the need for separate accessories
- Supplied with a range of 3 quick set base sizes for improved onto site operation
- Adjustable height clamping jaws for efficient machine setting.



MM2000I
- Power feed 360 swivel toolpost for groove details, reduces the need for separate accessories
- Supplied with a range of 2 quick set base sizes for improved onto site operation
- Adjustable height clamping jaws for efficient machine setting.

MM3000I and MM4500I
- Power feed 360 swivel toolpost for groove details, reduces the need for separate accessories
- Supplied with a range of 3 quick set base sizes for improved onto site operation
- Adjustable height clamping jaws for efficient machine setting
- Milling accessories available with the Hydraulic drive version.

Flange Facing Machines

Mirage Flange Facers are known for precision construction, the results they deliver, and how easy they are to set-up on-site. These high-performing machines produce continuous groove facing feeds to ASME standards for the oil & gas, power generation and petrochemical industries.

MM-I Series feature
- Hardened slideways for long term accuracy
- High torque low noise drive
- Heat exchanger machining accessories available on most models.

Applications
- Heat exchanger flanges
- Hub profiles
- Lens ring joints & Raised face flanges
- Recessed gaskets and spigots
- Ring type joint grooves (RTJ)
- SPO compact flanges
- Swivel ring & TECHLOK flanges
- Welding preparations.

▼ *MM860I machine to ensure flange joint integrity.*

Internal Mount Flange Facing Machines

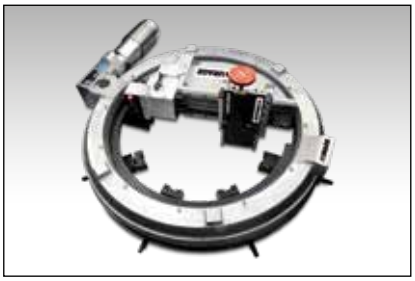
Flange Facing Diameter Range		Machine Model Number	Drive Power Options	
(inch)	(mm)		Pneum.	Hydr.
1 – 12	25 – 305	**FF120 ***		
2 – 12	51 – 305	**MM305I**	●	
2 – 24	51 – 610	**MM610I**	●	
6 – 34	152 – 864	**MM860I**	●	
6 – 40	152 – 1016	**MM1000I**	●	●
12 – 60	305 – 1524	**MM1500I**	●	●
24 – 80	610 – 2032	**MM2000I**	●	●
5 – 120	127 - 3048	**MM3000I**	●	●
83 – 161	2100 – 4100	**MM4500I**		●

* FF120 is not suitable for lens-ring joint flanges or ring type joint (RTJ) flanges.

External Mount Flange Facing Machines

MM200E
- Preloaded cross roller bearing drive, ensuring robust, accurate, repeatable machining
- Hardened slideways for long term accuracy
- Swivel toolpost for groove details, reduces the need for separate accessories
- Continuous fixed feed for ASME standard surface finish
- Quick set integrated clamping jaws.

MM300E
- Preloaded cross roller bearing drive, ensuring robust, accurate, repeatable machining
- Hardened slideways for long term accuracy
- Swivel toolpost for groove details, reduces the need for separate accessories
- Multiple continuous fixed feeds for ASME standard surface finishes
- Quick set intergrated clamping jaws.



MM600E
- Preloaded cross roller bearing drive, ensuring robust, accurate, repeatable machining
- Hardened slideways for long term accuracy
- Power feed 360 swivel toolpost for groove details, reduces the need for separate accessories
- Multiple continuous fixed feeds for ASME standard surface finishes
- Quick set intergrated clamping jaws.

MM760E, MM1000E, MM1250E, MM1500E, MM1775E, MM2000E
- Continuous variable auto-feed for ASME standard finishes
- Choice of pneumatic and hydraulic drive motors
- Quick-set radial clamping adjustment
- Quick-set axial adjustment jaws
- Heavy duty bearing construction for high metal removal rates and accuracy
- Heat exchanger kits for back facing and slot machining in one operation.

External Mount Flange Facing Machines

Flange Facing Diameter Range		Machine Model Number	Drive Power Options	
(inch)	(mm)		Pneum.	Hydr.
0 – 8	0 – 203	**MM200E**	●	
0 – 12	0 – 305	**MM300E**	●	
0 – 24	0 – 610	**MM600E**	●	
0 – 30	0 – 762	**MM760E**	●	●
0 – 40	0 – 1016	**MM1000E**	●	●
0 – 50	0 – 1270	**MM1250E**	●	●
0 – 60	0 – 1524	**MM1500E**	●	●
0 – 70	0 – 1778	**MM1775E**	●	●
0 – 80	0 – 2032	**MM2000E**	●	●

FF MM Series

Internal Mount Facing Diameter:
1 - 161"/ 25,4 - 4100 mm

External Mount Facing Diameter:
0 - 80"/ 0 - 2032 mm

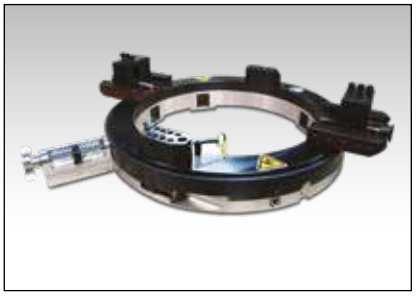
Cutting Resultant Roughness:
Ra 125-492 µin / 3,2-12,5 µ

Surface finish & accuracy

All Mirage Flange facing Machines provide a serrated finish with 30-55 grooves per inch and a resultant roughness of between Ra 3,2-12,5µ (125-492 micro inches). Geared multiple continuous groove facing feeds for a gramophone finish (ASME Standard).

▼ *MM600E external mount flange facing machine to ensure flange joint integrity.*

Narrow Body & Mid-Size Clamshell Cutters



DLR-NB12, NARROW BODY CLAMSHELL CUTTER

- NB or "Narrow Body" portable clamshells are ideal when space is at a premium
- Standard NB-series cover a range from 2 to 36" outside diameter (51 to 914 mm)
- Narrow body design: ideal when space is at a premium or obstructions present
- Pneumatic, hydraulic, and electric drive options
- Several different drive options are available to best position the motor for a specific machining application
- Accepts a wide range of accessories to increase performance and expand capabilities
- Full range of bevel and sever tools available.

DLR-MS30, MID-SIZE CLAMSHELL CUTTER

- Mid-size machines weigh less than the HD heavy-duty series, but provide greater rigidity than the NB-narrow body series
- Standard MS-series cover a range from 4⅛ to 48¼" outside diameter (105 to 1226 mm)
- Increased manoeuvrability and greater clearance than the HD series
- Several different drive options are available to best position the motor for a specific machining application
- Accepts a wide range of accessories to increase performance and expand capabilities
- Full range of bevel and sever tools available.

◀ *NB-model narrow body clamshell cutter.*

Clamshell Cutters

Clamshell cutters in the Enerpac range remain true to the pioneering designs that made DL Ricci the 'go-to' brand for machinists worldwide. Outstanding performance and a comprehensive choice has seen them used widely for applications in new construction, decommissioning, component replacement, fabrication, and maintenance.

Robust and efficient pipe cutting and bevelling

Designed for any industry that needs pipe or tube cutting, or any pipe end preparation weld repair. This may be in oil and gas sector, power generation, ship building/dock yards, or processing plants during maintenance and shut downs.

Applications

- Pipe cutting
- Weld preparation
- Cutting materials, including super duplex, carbon steel, stainless steel, hastelloy and incolloy
- For pipe diameters up to 177 inch (4495 mm)
- Ideal for projects beyond the usual clamshell configuration – using a wide range of purpose designed accessories.

Included as Standard with Each Machine

- Clamshell body
- Locators & extensions covering the full range
- Slides
- Motor & Mounting
- Air Caddy
- Tool Kit
- Manual
- Shipping crate.

NB Narrow Body Series Clamshell Cutters

Mounting Outside Diameter (min. - max.)		Machine Model Number	Drive Power Options		
(inch)	(mm)		Pneumatic	Hydraulic	Electric
2 – 4½	51 – 114	**DLR-NB4**	●	●	
2⅜ – 6⅝	60 – 168	**DLR-NB6**	●	●	
3½ – 8⅝	89 – 219	**DLR-NB8**	●	●	●
4½ – 10¾	114 – 273	**DLR-NB10**	●	●	●
6⅝ – 12¾	168 – 324	**DLR-NB12**	●	●	●
8⅝ –14	219 – 356	**DLR-NB14**	●	●	●
10⅝ – 16	219 – 406	**DLR-NB16**	●	●	●
12¾ – 18	324 – 457	**DLR-NB18**	●	●	●
14 – 20	356 – 508	**DLR-NB20**	●	●	●
18 – 24	457 – 609	**DLR-NB24**	●	●	●
20 – 26	508 – 660	**DLR-NB26**	●	●	●
22 – 28	559 – 711	**DLR-NB28**	●	●	●
24 – 30	610 – 762	**DLR-NB30**	●	●	●
26 – 32	661 – 813	**DLR-NB32**	●	●	●
30 – 36	762 – 914	**DLR-NB36**	●	●	●

MS Mid-Size Series Clamshell Cutters

Mounting Outside Diameter (min. - max.)		Machine Model Number	Drive Power Options	
(inch)	(mm)		Pneumatic	Hydraulic
4⅛ – 13	105 – 330	**DLR-MS12**	●	●
7⅜ – 16¼	187 – 413	**DLR-MS16**	●	●
9⅜ – 18¼	238 – 464	**DLR-MS18**	●	●
11⅜ – 20¼	289 – 514	**DLR-MS20**	●	●
15⅜ – 24¼	391 – 616	**DLR-MS24**	●	●
19⅜ – 28¼	492 – 718	**DLR-MS28**	●	●
21⅜ – 30¼	543 – 769	**DLR-MS30**	●	●
23⅜ – 32¼	594 – 819	**DLR-MS32**	●	●
27⅜ – 36¼	695 – 921	**DLR-MS36**	●	●
27⅞ – 36¾	708 – 934	**DLR-MS365**	●	●
33⅜ – 42¼	848 – 1073	**DLR-MS42**	●	●
39⅜ – 48¼	1000 – 1226	**DLR-MS48**	●	●

HD Heavy-Duty Clamshell Cutters

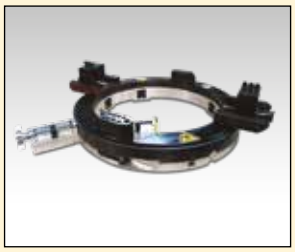
DLR-HD54, HEAVY-DUTY CLAMSHELL CUTTER

- **Robust body design - ideal for large diameter heavy wall pipe applications**
- **18 HD-models cover a range of 20 - 177" outside diameter (508 - 4495 mm)**
- **Pneumatic and hydraulic drive options**
- **Fully adjustable heavy duty bearing design provides greater serviceability**
- **Stepped and keyed gear clamps equipped with a through bolt provide a positive fit at each assembly joint**
- **Accepts a wide range of accessories to increase performance and expand capabilities**
- **Full range of bevel and sever tools available.**

HD Heavy-Duty Series Clamshell Cutters

Mounting Outside Diameter (min. - max.)		Machine Model Number	Drive Power Options	
(inch)	(mm)		Pneumatic	Hydraulic
20 – 32	508 – 813	**DLR-HD32**	•	•
24 – 36	610 – 914	**DLR-HD36**	•	•
27 – 39	686 – 990	**DLR-HD39**	•	•
31 – 43	787 – 1092	**DLR-HD43**	•	•
33 – 45	838 – 1143	**DLR-HD45**	•	•
36 – 48	915 – 1219	**DLR-HD49**	•	•
38 – 50	966 – 1270	**DLR-HD50**	•	•
41 – 53	1042 – 1346	**DLR-HD53**	•	•
42 – 54	1067 – 1360	**DLR-HD54**	•	•
43 – 55	1092 – 1397	**DLR-HD55**	•	•
45 – 57	1143 – 1448	**DLR-HD57**	•	•
48 – 60	1220 – 1524	**DLR-HD60**	•	•
54 – 66	1372 – 1676	**DLR-HD66**	•	•
60 – 72	1524 – 1828	**DLR-HD72**	•	•
68 – 80	1728 – 2032	**DLR-HD80**	•	•
74 – 86	1880 – 2184	**DLR-HD86**	•	•
86 – 121½	2182 – 3086	**DLR-HD120**	•	•
144 – 177	3658 – 4495	**DLR-HD180**	•	•

DLR Series



Outside Mounting Diameter Range:
2 - 177 inches

Outside Mounting Diameter Range:
51 - 4495 mm

Recommended Accessories for Clamshell Cutters

Other clamshell accessories available. Details available on request.

Counter-bore Swivel Head Modules

- 10 inch size available
- Match boring applications
- Up to 60 degree adjustability in the head
- Internal diameter bevelling.

Description	Part Number
2 inch travel	**F0108A1224AA-SK**
6 inch travel	**F0108A1224AB-SK**

Low Profile Tool Slide

- Brings cut line closer to the back of machine
- Allows cutting & bevelling on short pipe sections
- Use for facing, RTJ grooves and compound angle weld preparations.

Description	Part Number
Low profile slide	**F0130A0016XX**

Out-of-round Tool Block Slide

- Dual compensating Spring Assembly
- Rides on OD of pipe and tracks the contour
- For up to 1 inch out-of-round.

Description	Part Number
Out of round slide	**F0130A0022XX**
Tripper for NB models	**F0145A0019XX**
Tripper for MS models	**F0145A0020XX**
Tripper for HD models	**F0145A0028XX**

General Orbital Milling Machines

ENERPAC

▼ OM6000 Orbital Milling Machine

OM Series

Cutting Diameter Range:
98 - 315 inches

Cutting Diameter Range:
2500 - 8000 mm

General Orbital Milling Machines

Orbital milling machines are designed to deliver fast material removal and achieve high accuracy across large flange diameters.

Applications

- Machining crane bearing faces
- Repairing drag lines
- Machining large flanges
- Machining ship thruster flanges.

Machine large flanges accurately and efficiently

- **Precision flatness tolerances across large diameters**
- **Hydraulic high-torque anti-backlash drive**
- **Precision preloaded linear rotary drive**
- **Adjustable fast-set hydraulic chuck**
- **Rigid and adjustable mounting base.**

▼ *Machining crane bearing face.*

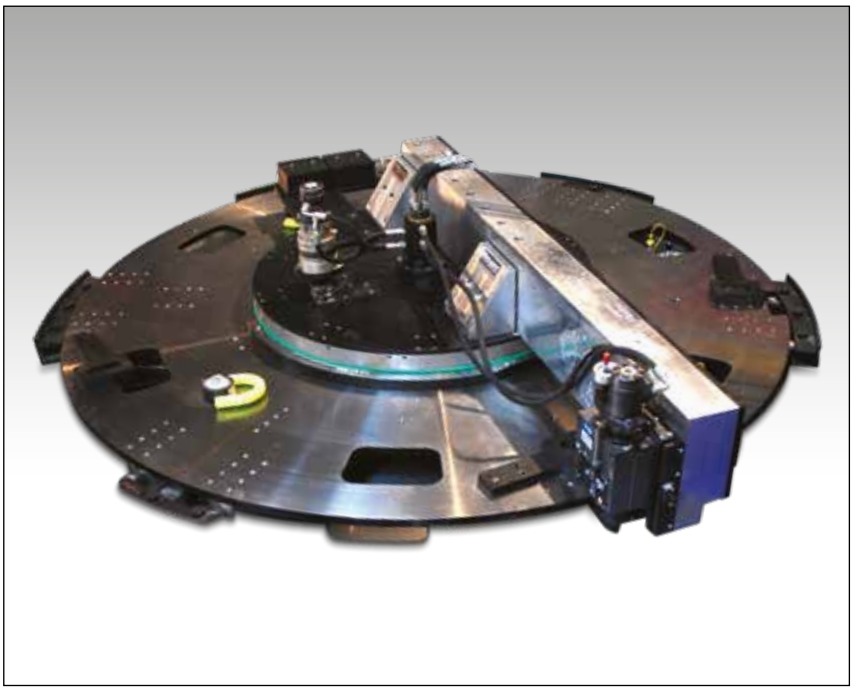
▼ *Milling a ship thruster flange.*

General Orbital Milling Machines

Cutting Diameter Range (min. - max.) (inch)	Cutting Diameter Range (min. - max.) (mm)	Machine Model Number	Hydraulic Power Drive
98 – 178	2500 - 4500	**OM4500**	•
98 – 237	2500 – 6000	**OM6000**	•
138 – 315	3500 – 8000	**OM8000**	•

Wind Power Orbital Milling Machines

▼ WP3500 Wind Power Orbital Milling Machine



WP Series

Cutting Diameter Range:
70 - 181 inches

Cutting Diameter Range:
1800 - 4600 mm

Wind Power Orbital Milling Machines

The wind power orbital milling range is designed especially for companies manufacturing wind turbine rotor blades and towers.

Applications

- Wind turbine blade root end milling
- Wind tower flange machining.

Machine large flanges accurately and efficiently

- **Fully packaged system; includes trolley, power unit and base**
- **Accurate and repeatable process time**
- **Minimum distortion fast mount hydraulic base**
- **Adjustable arm for different diameters**
- **Patented hydraulic mounting system for blade and tower production**
- **Direct drive spindle**
- **High torque anti-backlash drive.**

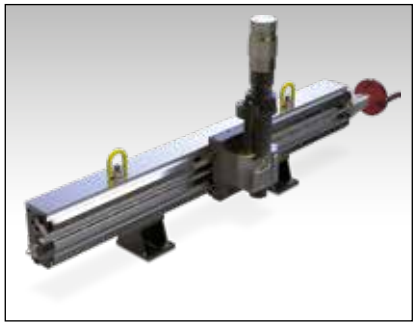
▼ *Wind tower machining with WP4600.*

▼ *WP3500 milling turbine blade end.*

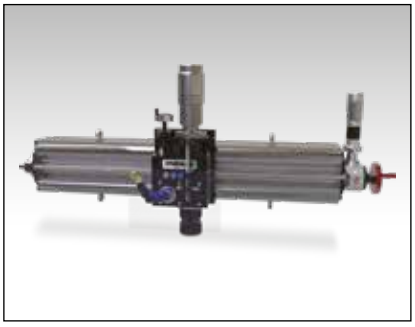
Wind Power Orbital Milling Machines

Cutting Diameter Range (min. - max.) (inch)	Cutting Diameter Range (min. - max.) (mm)	Machine Model Number	Hydraulic Power Drive
70 – 96	1800 - 2450	**WP2500**	•
90 – 137	2300 – 3500	**WP3500**	•
110 – 181	2800 – 4600	**WP4600**	•

2-Axis Milling Machines



LMR1000, 2-AXIS MILLING MACHINE
- Ideal for lightweight applications
- Hand feed to main axis; auto feed optional
- Features ER40 Collet with ISO30 spindle option
- Choice of Pneumatic and Hydraulic drive.



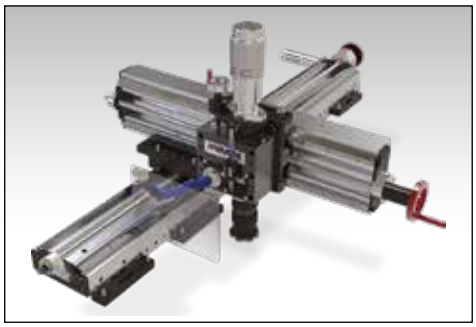
MR1000, 2-AXIS MILLING MACHINE
- Induction hardened 'V' rails ensure accuracy and durability
- Ball-screw feed
- Hand & auto feed to main axis
- Direct drive ISO 40 spindle
- Choice of Pneumatic and Hydraulic drive
- Variety of mounting options including; bolting, switch magnets, pipe chain clamps and gantry.

LMR, MR, MRY Series

X-Axis Maximum Stroke:
40 - 120" / 1,0 - 3,0 m

Y-Axis Maximum Stroke (MRY-Series only):
12 inches / 305 mm

3-Axis Milling Machines



MRY1500, 3-AXIS MILLING MACHINE
- Induction hardened 'V' rails ensure accuracy and durability
- Ball-screw feed
- Hand & auto feed to main axis
- Direct drive ISO 40 spindle
- Choice of Pneumatic and Hydraulic drive
- Variety of mounting options including; bolting, switch magnets, chain clamps and gantry.

▼ *MRY Milling machine on a heat exchanger.*

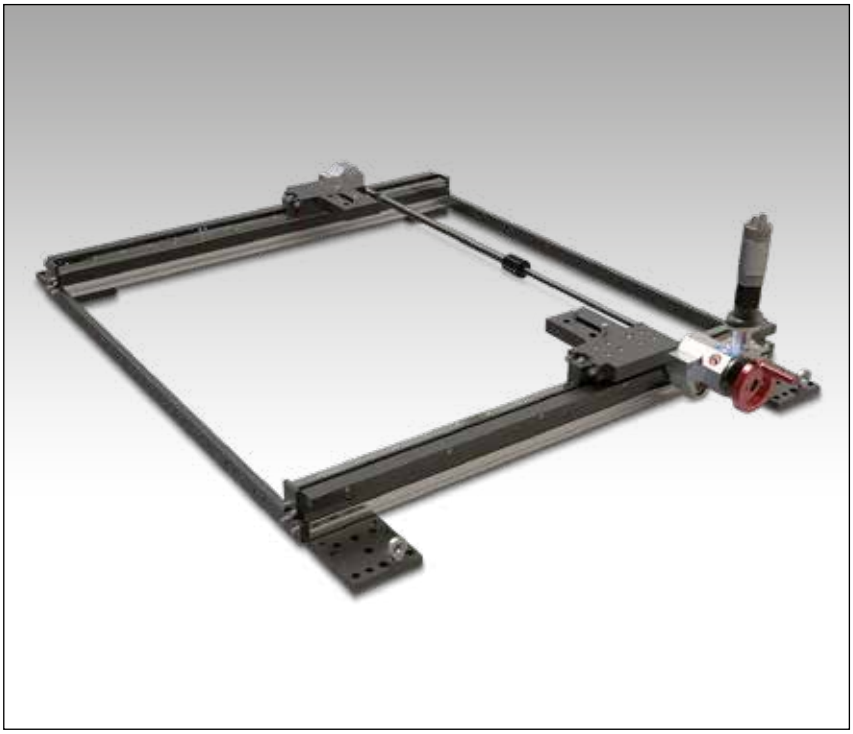
2-Axis Linear Milling Machines

X-Axis Maximum Stroke		Machine Model Number	Drive Power Options	
(inch)	(mm)		Pneumatic	Hydraulic
40	1000	**LMR1000**	•	•
60	1500	**LMR1500**	•	•
80	2000	**LMR2000**	•	•
40	1000	**MR1000**	•	•
60	1500	**MR1500**	•	•
80	2000	**MR2000**	•	•
120	3000	**MR3000**	•	•

3-Axis Linear Milling Machines

X-Axis Maximum Stroke		Y-Axis Maximum Stroke		Machine Model Number	Drive Power Options	
(inch)	(mm)	(inch)	(mm)		Pneumatic	Hydraulic
60	1500	12	305	**MRY1500**	•	•
80	2000	12	305	**MRY2000**	•	•
120	3000	12	305	**MRY3000**	•	•

Gantry Milling Machine



GMRF1000, GANTRY RAIL KIT

- **Modular jointing system for lengths up to 10 m**
- **Linear rail and precision carriages**
- **Quick set up with jacking system**
- **Auto and manual feed**
- **Optional quick-set magnets for mounting.**

GMRF
Series

X-Axis Maximum Stroke:
40 - 394" / 1,0 - 10,0 m

Y-Axis Maximum Stroke:
40 - 118"/ 1,0 - 3,0 m

Linear Milling Machines – Take workshop precision to your next on-site milling project

These precise and robust milling machines are available in 2 and 3 axis configurations. Each includes the latest workshop tool technology in a portable format. For a fast and efficient set-up, you can choose our optional switch magnets.

Applications

- Motor and pump mounting pads
- Aerospace machining
- Crane pedestals
- Heat exchanger repair
- Shaft keyways
- Steel mill housings
- Turbine split line machining.

I-Beam end face milling with a GMRF1000. ▶

Gantry Milling Machine

Feed Type	X-Axis Max. Stroke Options [1]		Y-Axis Max. Stroke Options [2]		Machine Model Number	Drive Power Options	
	(inch)	(m)	(inch)	(m)		Pneumatic	Hydraulic
Rack Feed	40 - 394	1,0 - 10,0	40 - 118	1,0 - 3,0	**GMRF1000**	•	•

[1] Common base module 1000 mm.

[2] MR milling rail required. Extension kits available.

Mirage Hot Tapping Machines

ENERPAC

▼ **HTM100**

HTM, MANUAL HOT TAPPING
- Operates to 1480 psi (102 bar)
- Versatile hot taps, bypass lines and completion plugs
- Manual rotation & feed
- Optional pneumatic feed
- 2" NPT connection
- Lightweight construction.

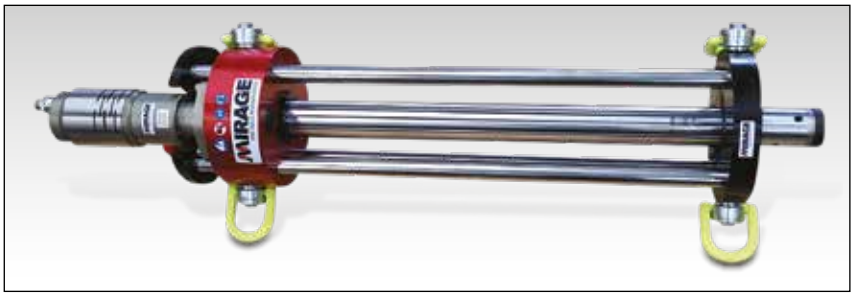
HTM, LPHT MHT Series

Tapping Diameters:
½ - 60" / 12,7 - 1524 mm

Maximum Stroke:
18 - 180" / 457 - 4572 mm

Maximum Operating Pressure:
285-1480 psi / 20-102 bar

▼ **LPHT312**



▼ **MHT312**

LPHT312, LOW PRESSURE HOT TAPPING
- Operates up to 285 psi (20 bar)
- Pneumatic or hydraulic drive
- Depth stop to ensure correct hot tap distance.

MHT, HOT TAPPING MACHINES
- Pressure rating up to 1480 psi (102 bar)
- Helical geared drive situated close to the cutter
- Hydraulic and pneumatic drive options
- Industry standard connection flanges
- Compatible with industry standard tooling
- Fast traverse feed motors available
- Cutter holders included
- Interchangeable seal cartridge.

Hot Tapping – Built to deliver power where it matters most.

Hot tapping is a high-pressure intervention and our range of hot tapping machines can help towards a safe and effective solution. Industry-leading innovations used include a helical gear drive located as close to the cutting head as possible for maximum efficiency, rotary pressure seals, and four fixed feeds.

Applications
- Construction tie-ins
- Gas distribution
- Petrochemical pipelines
- Subsea pipelines
- Temporary installation
- Transmission pipelines
- Valve installation and repair
- Water mains pipelines
- Wellhead maintenance.

▼ *On-site hot tapping with MHT312.*

Hot Tapping Machines

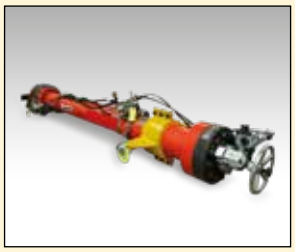
Tapping Diameters (Min. - Max.)		Maximum Stroke		Max. Operating Pressure		Machine Model Number	Drive Power Options	
(inch)	(mm)	(inch)	(mm)	(psi)	(bar)		Pneumatic	Hydraulic
½ – 4	12,7 – 102	18	457	1480	102	**HTM100**	*	*
½ – 6	12,7 – 152	32	813	1480	102	**HTM150XL**	*	*
3 – 12	76,2 – 305	30	762	285	20	**LPHT312**	•	•
3 – 12	76,2 – 305	42	1067	1480	102	**MHT312**	•	
4 – 20	102 – 508	72	1829	1480	102	**MHT420**		•
8 – 24	203 – 609	80	2032	1480	102	**MHT824**		•
12 – 36	76,2 – 914	110	2794	1480	102	**MHT1236**		•
12 – 42	76,2 – 1066	132	3353	1480	102	**MHT1242**		•
24 – 60	203 – 1524	180	4572	1480	102	**MHT2460**		•

* HTM has manual rotation & feed.

Mirage Hot Tapping Machines & Line Stopping Actuators

▼ **CHT3000**

CHT, LSA Series



Tapping Diameters:
3 - 60" / 76 - 1524 mm

Maximum Stroke:
43 - 165" / 1092 - 4191 mm

Maximum Operating Pressure:
1480-5000 psi / 102-350 bar

▼ **LSA1420-H**

LSA-Series Line Stopping Actuators

Mirage Line Stopping Actuators (LSA) are used in conjunction with the required line stop head and housings to carry out line stops in surface or subsea environments.
The range is designed for easy use on pipelines in various materials and differing wall thickness. Their use provides temporary pipeline isolation, temporary or permanent bypass and no costly interruption of service.

CHT, HOT TAPPING MACHINES

- Working pressure capacity up to 5000 psi (350 bar)
- Drive as close to the cut enhances cut efficiency
- Auto feed - infinitely variable for differing cut conditions
- Constant pressure seal monitoring ports
- Internally pressure balanced for higher pressure applications
- Industry standard connection flanges
- Compatible with standard industry tooling.

LSA, LINE STOPPING ACTUATOR

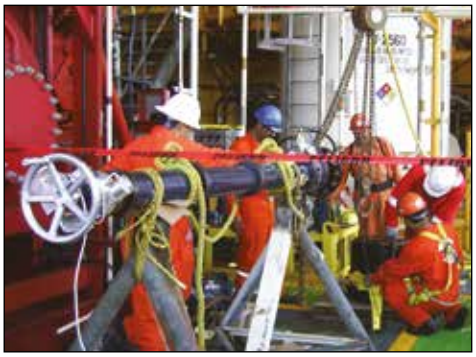
- Operates up to 1480 psi (102 bar)
- Hydraulic drive
- Depth measurement
- Control bar mechanical lock.

▲ *CHT3000 hot tapping application for petrochemical pipeline installation.*

CHT-Hot Tapping Machines & LSA-Line Stopping Actuators

Tapping Diameters (Min. - Max.)		Maximum Stroke		Max. Operating Pressure		Machine Model Number	Drive Power
(inch)	(mm)	(inch)	(mm)	(psi)	(bar)		Hydraulic
3 – 12	76 – 305	43	1092	5000	350	**CHT1000**	•
3 – 16	76 – 406	66	1676	5000	350	**CHT1675**	•
6 – 24	152 – 609	80	2032	5000	350	**CHT2000**	•
12 – 48	305 – 1219	150	3810	5000	350	**CHT3000**	•
4 – 12	102 – 305	72	1829	1480	102	**LSA412-H**	•
14 – 20	356 – 508	105	2667	1480	102	**LSA1420-H**	•
22 – 36	559 – 914	140	3556	1480	102	**LSA2236-H**	•
36 – 60	914 – 1524	165	4191	1480	102	**LSA3660-H**	•

▼ *CHT2000 hot tapping offshore application.*



▼ **MDWS1638-H**

MDWS
Series

Cutting Diameters:
6 - 60" / 152 - 1524 mm

Cutting the toughest materials in the most challenging environments

- **Strong aluminum frame**
- **Overload clutch for bow damage prevention**
- **Hydraulic Auto Clamp and auto-feed**
- **Diver and ROV compatible**
- **Available with optional flotation modules for deep water use**
- **User replaceable clamp contact pads, wheels, and wheel liners**
- **Crimped or continuous loop wires available.**

Decommissioning Saws

A range of portable saws for a diverse range of tubular severance projects. The band saw range delivers a cost-effective solution to cold cutting requirements in either surface or subsea situations. Diamond wire saws are ideal for cutting through dissimilar materials quickly.

Applications

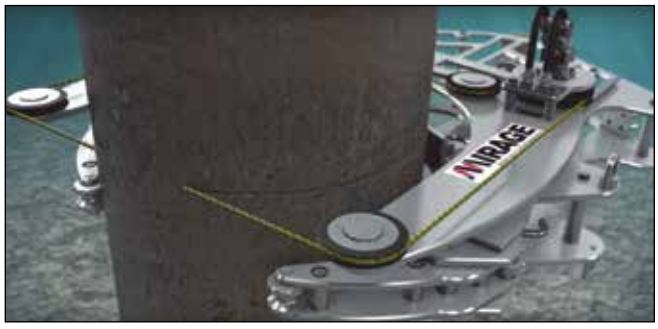
- Offshore platform decommissioning
- Conductors, caissons, piles
- Multiple grouted strings
- Subsea ROV-applications
- Subsea structures
- Pipes, casings and risers.

Items included with each machine;

- Diamond wire rope
- Toolkit
- Storage / shipping crate
- CE Certificate
- Packing list and manual.

▲ *MDWS Diamond Wire Saw lowered into sea.*

▼ *Subsea pile cutting.*

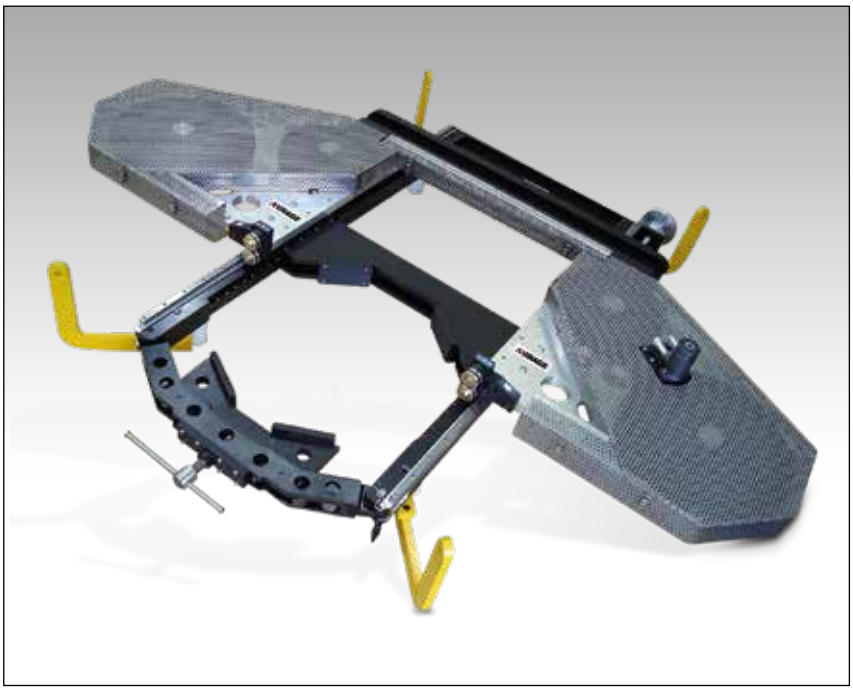


Decommissioning Diamond Wire Saws

Cutting Diameters (Min. - Max.) (inch)	Cutting Diameters (Min. - Max.) (mm)	Machine Model Number	Main Application	Hydraulic Drive Power
6 – 20	152 – 508	**MDWS620-H**	Subsea	•
16 – 38	406 – 965	**MDWS1638-H**	Subsea	•
36 – 60	914 – 1524	**MDWS3660-H**	Subsea	•

Mirage Portable Band Saws

▼ **BS1636-H**



BS
Series

Cutting Diameters:
9 - 36" / 228 - 914 mm

Portable Band Saws

Hydraulically powered portable band saws designed for tubular severance. Designed primarily for topside use, but also suitable for subsea applications.

Applications

- Offshore platform decommissioning
- Conductors, caissons, piles
- Multiple grouted strings
- Subsea ROV-applications
- Subsea structures
- Pipes, casings and risers.

Items included with each machine:

- Band Saw blade (2-3TP carbide tipped)
- Toolkit
- Storage / shipping crate
- CE Certificate
- Packing list and manual.

Cutting the toughest materials in the most challenging environments

- **Fast, efficient and cost effective cold cutting**
- **Cuts grouted multiple casings**
- **Fast mounting system**
- **Vertical or parallel operation**
- **Fast clamping and set up**
- **Low height design for minimum clearances**
- **Extensive blade selection for all materials.**

▲ *Pipe cutting with Mirage BS portable band saw.*

▼ *Decommissioning job with band saw.*

Portable Band Saws

Cutting Diameters (Min. - Max.) (inch)	Cutting Diameters (Min. - Max.) (mm)	Machine Model Number	Main Application	Hydraulic Drive Power
9 – 24	228 – 610	**BS924-H**	Topside	•
16– 36	406 – 914	**BS1636-H**	Topside	•

Portable Drilling Machines

HT20
- 4MT spindle accepts standard tooling
- Linear rails & guides provide accuracy and high load carrying capacity
- Direct spindle drive
- Manual and variable auto feed.

HT50
- ISO50 geared spindle
- Linear rails & guides provide accuracy and high load carrying capacity
- Geared reduction spindle drive
- Manual and variable auto feed.

HT40
- ISO40 geared spindle
- Linear rails & guides provide accuracy and high load carrying capacity
- Geared reduction spindle drive
- Manual and variable feed.

HT
Series

Drilling Capability:
Up to 5" / 127 mm

Maximum Stroke:
11 - 17" / 279 - 432 mm

Drilling & Tapping

Make light work of the toughest drilling and tapping applications

Drilling and tapping projects on-site require powerful and stable machines that deliver precise results first time. Our machines are designed to do exactly this - giving you reassurance that the job will be done efficiently and to the right specification. They offer high torque and easy operation through their heavy-duty spindles with ISO standard tapers.

Optional switch magnet mounts and chain clamps are also available for a quick and easy setup.
For large scale offshore decommissioning projects, Mirage casing pin drills provide an effective solution for creating lift holes into casings - especially in the most challenging of working environments.

Applications
- Drilling through armour plate
- Bulkhead hole cutting
- Flange stud drilling
- Flange stud re-threading
- Motor pump stud removal
- Short stroke line boring
- Turbine case stud removal
- Turbine pill drilling
- Casing pin drilling.

▼ *HT40 portable drilling machine.*

Portable Drilling Machines

Maximum Diameter with Standard Drills		Maximum Standard Stroke		Machine Model Number	Drive Power Options	
(inch)	(mm)	(inch)	(mm)		Pneumatic	Hydraulic
2	50,8	11	279	**HT20**	•	•
4	101,6	16	406	**HT40**	•	•
5	127,0	17	432	**HT50**	•	•

Portable Tapping Machines

T30
- Rigid 3 pillar construction
- Quick key hole mounting
- Capable of tapping blind and through holes
- High torque reduction drive
- Hydraulic drive
- Pressure relief self feed system.

T725
- Heavy duty 4 pillar construction
- Quick key hole mounting system
- Capable of tapping blind and through holes
- High torque reduction drive
- Hydraulic drive
- Pressure relief self feed system.

Casing Pin Drilling Machine

DDU1636
- Efficient pin drilling cold cut method
- Horseshoe mount options
- Helical drive spindle
- 4 inch (102 mm) cutter assembly supplied as standard
- Alternative cutter kits available up to 12 inch (305 mm).

T, DDU Series

Tapping Capability:
Up to 7¼" / 184 mm

Case Pin Drilling Diameter:
Up to 12" / 305 mm

Maximum Stroke:
12 - 16" / 305 - 406 mm

GeniSYS IV Portable CNC Mill

Ideal for removal of cracked or broken studs and refurbishment of damaged threads. For hole diameters up to 11 inch and maximum 15.1 inch depths.

Page: 18

Included as Standard with Each Machine

- Toolkit
- All required mounting legs and connections
- Storage/shipping box
- CE certificate
- Operator's Manual.
- Packing list.

Portable Tapping & Casing Pin Drilling Machines

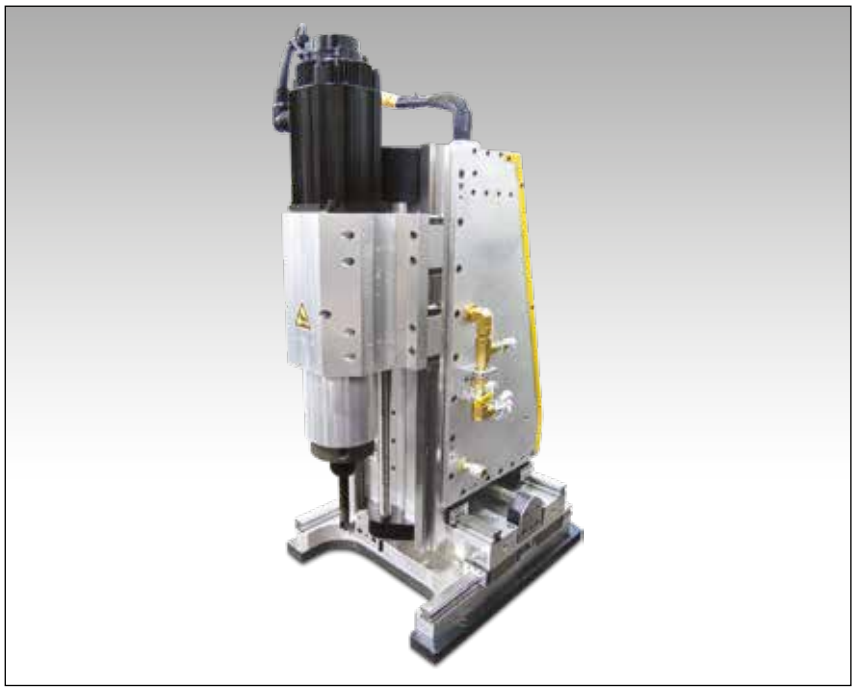
Maximum Diameter with Standard Drills		Maximum Standard Stroke		Casing Pin Drill Clamping Diameter		Machine Model Number	Drive Power Options	
(inch)	(mm)	(inch)	(mm)	(inch)	(mm)		Pneumatic	Hydraulic
3	76	12	305	–	–	**T30**	•	•
7¼	184	13	330	–	–	**T725**	•	•
12	305	16	406	9 – 24	228 – 609	**DDU924**		•
12	305	16	406	16 – 36	406 – 914	**DDU1636**		•

▼ *DDU1636 casing pin drilling.*

GeniSYS™ IV Portable CNC Mill

ENERPAC

▼ GeniSYS™ IV Portable CNC Mill



Removal of cracked or broken studs, refurbishment of damaged threads

- **CNC software allows the geniSYS to be programmed to perform multiple tasks within its working envelope**
- **Can create bore and thread hole diameters ranging from 22,2 mm – 279,4 mm (0.875 – 11 inches)**
- **Hole depths up to 384 mm (15.12 inches)**
- **High tolerance profile rails produce consistent results**
- **All three axes utilize precision ground ball screws, providing precise movement of the milling head**
- **Accurate and repeatable machining**
- **A cold cutting operation**
- **Ejects chips during operation**
- **Single machine capable of drilling, threading and general milling applications.**

GeniSYS IV Portable CNC Mill

The GeniSYS™ IV is a highly portable 3-axis CNC milling machine.
The motion control command center provides the ultimate in performance monitoring and technician safety.

Designed for the accurate removal of cracked or broken studs up to 11 inch diameter and the precise refurbishment of damaged threads. This is achieved without the need for manually controlled drilling or metal disintegration techniques.

Can be used for automated general profile milling applications.

Typical examples

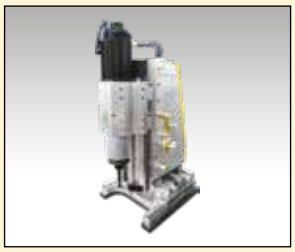
- Manway covers
- Reactor studs
- Bolt extraction and threading applications
- Recirculation pumps
- Turbine cases
- Heat exchangers
- Motor bases and many more high impact assets.

▼ *Thread cutting*

▼ *Mirage GeniSYS IV CNC Milling Machine.*

GeniSYS™ IV Portable 3-axis CNC Milling Machine

GeniSYS



Hole Diameter:
⅞ - 11" / 22 - 279 mm

Hole Depths:
Up to 15.12" / 384 mm

▲ *A typical thread before refurbishment*

▲ *New machined thread*

▲ *Enlarging a hole*

▲ *Coring out the centre of a bolt (minor diameter).*

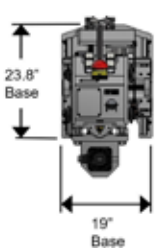
Included as Standard

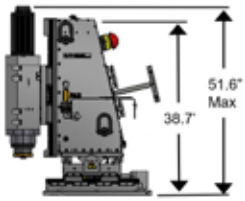
The machine is supplied complete with the following items:

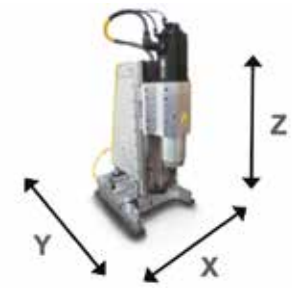
- GeniSYS IV milling machine
- Control System
- Laptop
- Motor and Cables
- Storage / Shipping Boxes
- Operator's Manual.

Tooling

Standard tooling packages available to support general milling and thread milling applications.







Dimensions GeniSYS IV

Base Length		Base Width		Total Height		Weight	
(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(lbs)	(kg)
23.8	605	19	483	51.6	1311	1100	499

Specifications GeniSYS IV Portable 3-axis CNC Milling Machine

Hole Diameters (Min. - Max.)		Machine Model Number	Maximum Hole Depth		Milling Head Maximum Travel						Spindle Speed	Spindle Motor		Motor Voltage
					X-axis		Y-axis		Z-axis					
(inch)	(mm)		(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(RPM)	(hp)	(kW)	(Volt, 3 phase)
⅞ – 11	22,2 – 279,4	**GeniSYS IV**	15.12	384	8	203,2	8	203,2	17	431,8	3000	6.7	5,0	380 - 440

▼ Shown: **MITT6A, MITT16A, MITT2A, MITT1A Isolation & Test Tools**

Ultimate Versatility in Piping Isolation and Pressure Testing

- **Combination Isolation and Test Tool assures vapor-free isolation for hot work and high-pressure capability between seals for testing welds with one tool**
- **Multi-schedule capability – up to 6 schedules covered per tool, 40 tools cover 154 pipe diameter / schedule combinations**
- **Lightweight, slim and versatile design – no crane required, able to mount in elbows and tees, able to test mismatched schedules**
- **High-pressure capability – test welds with relative ease up to 310 bar**
- **Self-centering tools are user-friendly and require minimal training**
- **Hydrodynamic capability for heat treating.**

Inline Isolation & Test Tools

MITT series tools obsolete traditional pipe cleaning and hydrotesting methods used for maintenance and construction operations.

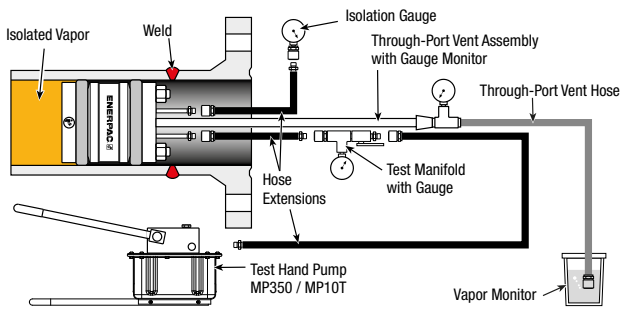
Improve operator safety and reduce system downtime by eliminating cleaning requirements and limiting test pressure volume.

The MITT series tools improve safety by limiting the test pressure volume and reduce downtime by eliminating cleaning requirements.

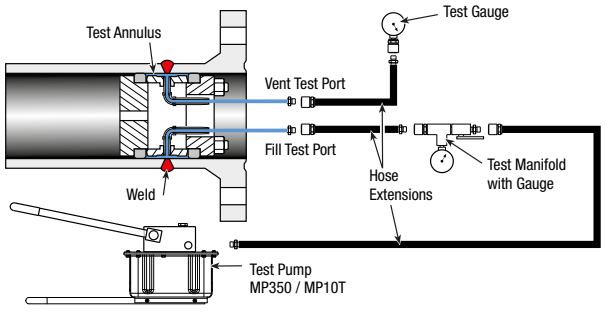
Key benefits of the tools include:

- Significantly reduce maintenance project timelines
- Safely perform welding on hydrocarbon lines with the peace of mind of a positive pressurized hydrostatic isolation
- Achieve significant reduction in wastewater (<1,0 litres of water required for a 24 inch test)
- Patent Pending.

MITT Isolation / Vapor Barrier Arrangement



MITT Isolation Pressure Test Arrangement



Nominal Pipe Diameter (inch)	Model Number	Pipe Schedules Covered	Max. Tool Pressure Rating (bar)	Tool Body Diameter (mm)	Overall Length (mm)	Stud, Nut, Washer Size (inch)	Pressure Port Size (ASME NPT)	(kg)
¾	MITT075A	5, 10, STD/40	310	18	356	1/8"	Female 1/8"	0,7
	MITT075B	XS/80, 160	310	15	356	1/8"	Female 1/8"	0,7
1	MITT1A	5, 10, STD/40	310	23	356	1/8"	Female 1/8"	0,9
	MITT1B	XS/80, 160	310	18	356	1/8"	Female 1/8"	0,7
1¼	MITT125A	5, 10, STD/40 XS/80	310	29	356	¼"	Female 1/4"	1,3
1½	MITT150A	5,10, XS/80	310	35	356	¼"	Female 1/4"	1,9
	MITT150B	160	310	28	356	¼"	Female 1/4"	1,5
2	MITT2A	5,10, STD/40, XS/80	310	46	356	¼"	Female 1/4"	2,4
	MITT2B	160, XXS	310	37	356	¼"	Female 1/4"	2,0
3	MITT3A	5,10, STD/40, XS/80	310	71	178	3/8"	Male 1/8"	2,3
	MITT3B	160, XXS	310	57	178	3/8"	Male 1/8"	2,0
4	MITT4A	5,10, STD/40, 60, XS/80	310	94	178	5/16"	Male 1/8"	2,5
	MITT4B	120, 160	310	81	178	5/16"	Male 1/8"	2,2
	MITT4C	XXS	310	77	178	5/16"	Male 1/8"	1,9
6	MITT6A	10 , STD/40, 60	310	145	178	5/8"	Male 1/4"	5,9
	MITT6B	XS / 80, 120	310	137	178	5/8"	Male 1/4"	5,4
	MITT6C	160, XXS	310	122	178	5/8"	Male 1/4"	4,5
8	MITT8A	10, 20, 30, STD/40, XS/80	310	189	178	5/8"	Male 1/4"	8,6
	MITT8B	100, 120, 140, XXS, 160	310	168	178	5/8"	Male 1/4"	7,3
10	MITT10A	20, 30, STD/40, XS/60, 80	310	238	178	5/8"	Male 1/4"	13,2
	MITT10B	100, 120, XXS/140, 160	310	213	178	5/8"	Male 1/4"	11,3
12	MITT12A	10, 20, 30, STD, 40, XS	310	294	178	5/8"	Male 1/4"	19,5
	MITT12B	60, 80, 100, XXS/120	310	272	178	5/8"	Male 1/4"	18,6
	MITT12C	140, 160	310	248	178	5/8"	Male 1/4"	14,5
14	MITT14A	10, 20, STD/30, 40	310	324	178	5/8"	Male 1/4"	20,4
	MITT14B	XS, 60, 80	310	324	178	5/8"	Male 1/4"	19,1
	MITT14C	100, 120, 140, 160	310	283	178	5/8"	Male 1/4"	17,2
16	MITT16A	10, 20, STD/30, XS/40, 60	310	372	178	5/8"	Male 1/4"	24,5
	MITT16B	80, 100	310	344	178	5/8"	Male 1/4"	21,8
	MITT16C	120, 140, 160	310	324	178	5/8"	Male 1/4"	20,4
18	MITT18A	10, 20, STD, 30, XS, 40	310	419	178	5/8"	Male 1/4"	29,0
	MITT18B	60, 80	310	400	178	5/8"	Male 1/4"	27,2
	MITT18C	100, 120	310	378	178	5/8"	Male 1/4"	24,9
	MITT18D	140, 160	310	357	178	5/8"	Male 1/4"	23,6
20	MITT20A	10, STD/20, XS / 30	310	480	178	5/8"	Male 1/4"	36,3
	MITT20B	40, 60	310	457	178	5/8"	Male 1/4"	33,1
	MITT20C	80, 100	310	433	178	5/8"	Male 1/4"	30,4
	MITT20D	120, 140	310	410	178	5/8"	Male 1/4"	27,7
	MITT20E	160	310	399	178	5/8"	Male 1/4"	27,2
22	MITT22A	STD, XS	310	524	178	5/8"	Male 1/4"	40,4
	MITT22B	60, 80	310	492	178	5/8"	Male 1/4"	36,7
	MITT22C	100, 120	310	467	178	5/8"	Male 1/4"	34,0
	MITT22D	140, 160	310	441	178	5/8"	Male 1/4"	31,3
24	MITT24A	10, STD/20, XS, 30	79	575	178	5/8"	Male 1/4"	44,9
	MITT24B	40, 60	155	551	178	5/8"	Male 1/4"	42,6
	MITT24C	80, 100	232	522	178	5/8"	Male 1/4"	39,9
	MITT24D	120, 140	310	495	178	5/8"	Male 1/4"	37,2
	MITT24E	160	310	480	178	5/8"	Male 1/4"	36,3
26	MITT26A	10, STD, XS	79	626	178	5/8"	Male 1/4"	52,2
30	MITT30A	10, STD, XS/20, 30	79	727	178	5/8"	Male 1/4"	66,7
	MITT30B	40	79	714	178	5/8"	Male 1/4"	63,5
32	MITT32A	10, STD, XS/20, 30	79	778	178	5/8"	Male 1/4"	71,7
	MITT32B	40	79	768	178	5/8"	Male 1/4"	70,3
34	MITT34A	10, STD, XS/20, 30	29	829	178	5/8"	Male 1/4"	76,2
	MITT34B	40	29	819	178	5/8"	Male 1/4"	74,8
36	MITT36A	10, STD, XS	29	879	178	5/8"	Male 1/4"	84,8
38	MITT38A	STD, XS	29	930	178	5/8"	Male 1/4"	94,3
40	MITT40A	STD, XS	29	981	178	5/8"	Male 1/4"	104,3

MITT Series

Pipe Diameters:
¾ - 40 inch

Water Capacity per Test:
0,4 - 3,0 litres

Maximum Test Pressure:
310 bar

Cost-Effective Spares

Buna 90 shore hardness seals and stainless steel seal backing rings provide additional pressure capacity for a low cost.

Ancillary Kit – MITTAK

All ancillary components required to safely isolate piping and test new welds (includes manual valves, gauge set, hoses, hand tools, fittings).

Pump and Reservoir

To match the full capability of the tools, the **MP350** hand pump and **MP10T** reservoir are recommended.

▼ *MITT2A tool being torqued in a test stand for high pressure testing.*

ATM-Series, Flange Alignment Tools

Misaligned joints

Joints must be pulled together and correctly aligned prior to tightening. Current methods of manipulation tend to be dangerous and involve a high degree of manual lifting using slings, hooks and lifting gear.
These methods can damage joint components, are time consuming in setup and disassembly, operational time and the amount of manpower required.

Solution: Flange Alignment Tools

The Enerpac ATM-Series Flange Alignment Tools are developed to rectify twist and rotational misalignment without additional stress in pipelines.
Hydraulic cylinders, jacks and lifting wedges can also be used to assist in positioning and aligning.

E-Series, Torque Multipliers

Controlled tightening when external power is unavailable

Applications are often located where external power sources to drive air or electric powered tools are unavailable but controlled bolting is required, typically at values higher than an operator can generate using manual wrenches.

Solution: Manual Torque Multipliers

Enerpac E-Series manual torque multipliers offer a range of output torques from manual inputs that can easily be achieved by an operator, providing accurate, efficient torque multiplication for make-up or break-out of joint fasteners.

S, W, RSL, DSX and HMT-Series, Torque Wrenches

Industrial Applications

Controlled tightening of multiple sized fasteners for industrial applications.

Solution: Hydraulic Torque Wrenches

Enerpac hydraulic torque wrenches are professional tools for industrial applications. Truly versatile tools which utilize standard Impact Sockets, optional direct Allen-Key Drives or interchangeable hexagon and square drive cassettes to provide controlled tightening of multiple sized fasteners per tool. Optional accessories further extend the application range of these products.

PTW-Series, Torque Wrenches

General Applications

Applications that require controlled bolting, feature a high volume of fastenings.

Solution: Pneumatic Torque Wrenches

Enerpac PTW-Series pneumatic torque wrenches are fast, easy to use and highly accurate.

Bolting and Flange Maintenance Tools

Controlled Bolting

Increasing Health and Safety, Environmental and Productivity requirements demand even and parallel joint closure to ensure a sound assembly, especially on pressure containing vessels. This often requires the simultaneous tightening of multiple fasteners.

Solution: Hydraulic Bolt Tensioners

Enerpac Bolt Tensioners can achieve accurate preload in single or multiple fastener applications simultaneously, without inducing rotational twist or contending with the uncertainties of friction and lubrication.
Power Generation Bolt Tensioners (PGT) and Foundation Bolt Tensioners (FTE, FTR) are also available.

HM, GT and EAJ-Series, Bolt Tensioners

Frozen or Corroded Nuts

Often nuts are difficult to remove, while loosening using tightening tools is possible, it generally requires larger equipment and is time consuming.
The use of cutting torches or hammers and chisels can cause damage to the joint components, requires significantly longer setup and operational time, and can present a potential safety risk.

Solution: Hydraulic Nut Splitters

Nut splitting with Hydraulic Nut Splitters is the safest method. It takes less time and avoids costly damage to joint components. The head design fitted with heavy-duty chisels permits the splitting of nuts on a wide variety of applications. With the two blades models nuts are split from two side in one action.

NC, NSC and NSH-Series, Nut Splitters

Joint Separation

Separation of stubborn joints for inspection and maintenance, particularly those fitted with ring grooves or those with external forces acting on them are often difficult to separate. The use of hammers and wedges, chain blocks and lever bars can damage joint components and present a potential safety risk.

Solution: Flange Spreading Tools

Enerpac Wedge Spreaders and Flange Spreading Tools offer controlled separation without bending or risk of slipping from the joint. The SWi and SG-Series flange spreading tools can also be used.

FC-Series Flange Pullers can be used to close the gap between flanges.

FSC, FSH, FSM-Series, Wedge Spreaders

Pumps and Accessories

A wide range of torque and tensioning pumps and accessories are available including: manual, air, cordless and electric pumps, hoses, gauges, manifolds and fittings.

Enerpac Bolting Integrity Software Solutions

Comprehensive on-line software solutions for Bolted Joint Integrity. The software offers Tool selection, Bolt Load calculations and Tool pressure settings, as well as, a combined Application Data Sheet and Joint Completion Report. Custom Joint information can also be entered.

Pumps and Accessories Bolting Integrity Software

THE RIGHT TOOL MAKES ALL THE DIFFERENCE

Since joining the Enerpac portfolio, the design innovation of Mirage machines has continued to deliver new products that help get the job done faster, safer and smarter. Explore the full Mirage product line from flange facing machines, milling machine, drilling and tapping machines to clamshell pipe cutters and much more. All backed by Enerpac training, application support and service.

Decades of engineering know-how combined with a continuing drive to innovate has resulted in a wide range of world-class portable machining products - each one robust enough to handle the toughest of on-site machining challenges.

ELITE TOOLS. FOR ELITE PROFESSIONALS.

Mirage Portable Machining Tools

Internal Mount
Flange Facing Machines

External Mount
Flange Facing Machines

Clamshell Pipe Cutting
and Bevelling Machines

General Orbital Milling Machines

Wind Power Orbital Milling Machines

Linear Milling Machines

Hot Tapping Machines

Line Stopping Actuators

Decommissioning Diamond
Wire & Band Saws

Drilling & Tapping Machines

GeniSYSTM IV
Portable 3-axis CNC Mill

Piping Isolation & Test Tools

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