

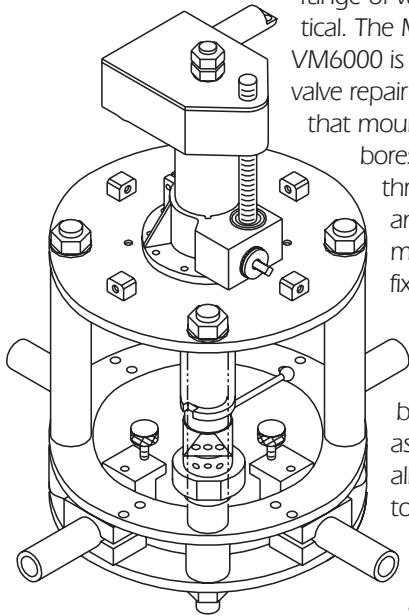
# VALVE REPAIR MACHINES

FEATURES • SETUP & OPERATION  
COMPONENTS & ACCESSORIES • TECHNICAL DATA

## VM6000

**Repair in-line valves with 2.5 - 13 inch (63.5 - 330.2 mm) diameter pressure seal bores**

The Model VM6000 Portable Valve Repair Machine makes on-site repair of a wide range of valves practical. The Model VM6000 is a "generic" valve repair machine that mounts on and bores the throat area of any valve the mounting fixtures can attach to. Remove the valve bonnet assembly to allow access to the valve throat, machine a weld prep groove, apply a weld buildup as necessary in the eroded area, and bore out the valve throat to its original dimensions.

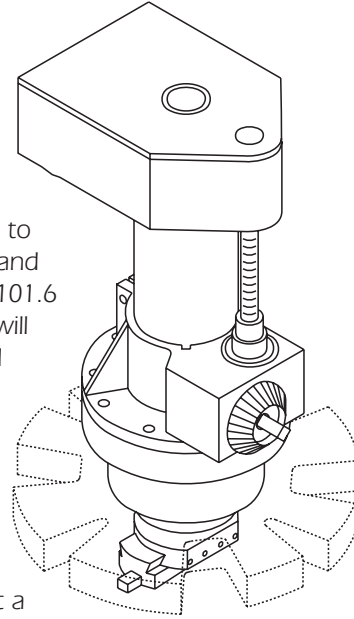


## VM7000

**Repair a safety valve in about the same time it would take to remove the damaged valve.**

The Model VM7000 is designed to mount directly on safety valves and rework nozzles up to 4 inches (101.6 mm) in diameter. The VM7000 will mount on Dresser Consolidated Maxi-Flow valves, orifice sizes 1 through 6, and on many Crosby Safety Valves.

By eliminating downtime and spare valve inventory costs, you can probably pay for the Model VM7000 by repairing just a few valves in-line.

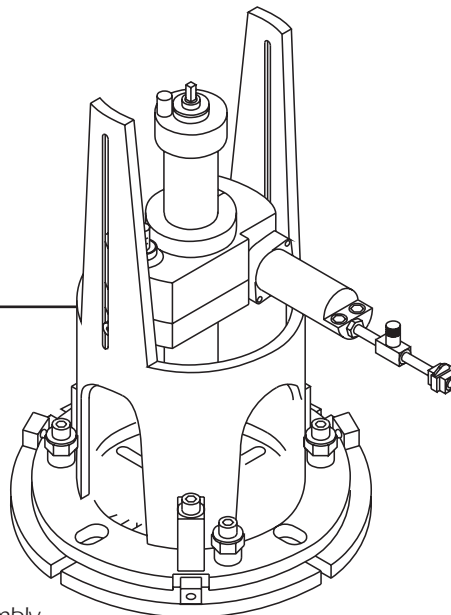


## VM8000

**Repair corroded seal areas on-site with the valve in-line.**

The VM8000 is designed for on-site remachining of seats and seal areas of Fisher and Dresser Masoneilan (or any other, similar type) control valves. The machine mounts directly on the valve and bores throat areas from 2.5 - 10 inches (63.5 - 254 mm) in diameter.

With the Model VM8000 Valve Repair Machine, the repair operation consists of removing the valve bonnet and stem

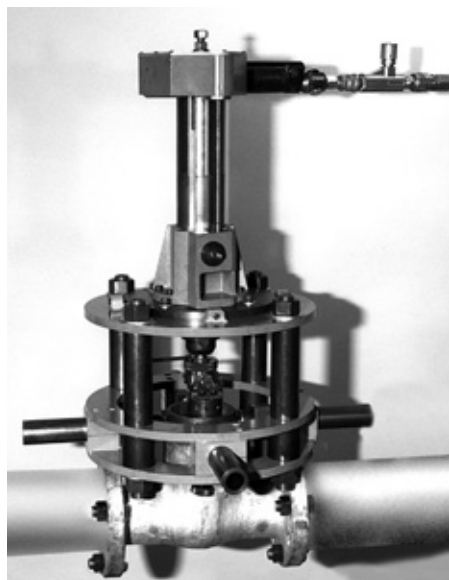


assembly, applying a stainless weld buildup in the valve seat and seal areas and remachining to the manufacturer's original specifications. The original in-line welds are not disturbed and need no recertification.



**CLIMAX**<sup>®</sup>  
Portable Machine Tools, Inc.

## Repair n-Line Valves With 2.5 - 13 inch (63.5 - 330.2 mm) Diameter Pressure Seal Bores



Valves are often damaged in the throat area by corrosion or steam cavitation. Now you can eliminate remove/replace downtime and expense by repairing the worn valve while you leave it in-line.

The Model VM6000 Portable Valve Repair Machine makes on-site repair of a wide range of valves practical. With the VM6000, you remove the valve bonnet assembly to allow access to the valve throat, machine a weld prep groove, apply a weld build-up as necessary in the eroded area, in the eroded area, and bore out the valve throat to original dimensions.

### Capabilities

The Model VM6000 is a "generic" valve repair machine that mounts on and bores the throat area of any valve the mounting fixtures can attach to. Using three mounting ring sizes, the VM6000 mounts directly on valves with outside flange diameters from 3.5 - 17 inches (88.9 - 431.8 mm). It machines inside diameters from 2.5 - 13 inches (63.5 - 330.2 mm). The VM6000 is capable of boring inside diameters, turning outside diameters, undercutting, and cutting recesses and grooves.

### Features

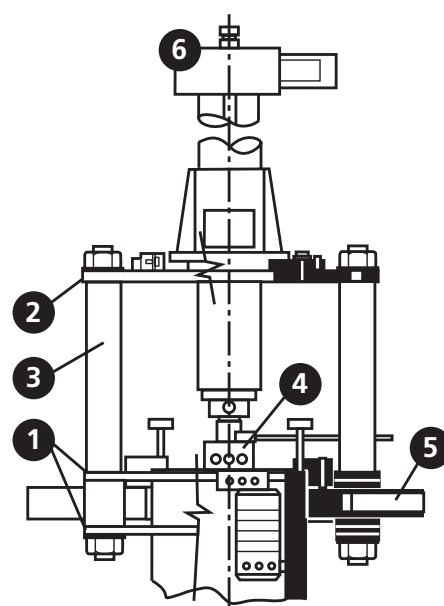
The VM6000's power head long ago proved its rugged dependability in our Model FF12 portable flange facing machine. The 1.2 hp (0.90 kW) pneumatic motor and gear reduction provide plenty of torque for remachining valves.

The mounting fixtures, which form a sturdy base, mount directly on the valve to align and center the unit. Two different tool heads provide access to any inside and outside diameter within the standard 2.5 - 13 inch (63.5 - 330.2 mm) range.

Axial feed is via automatic power feed (optional digital readout available). The power feed unit can be quickly removed if you want manual feed for tool positioning. Automatic radial feed is incorporated in both tool heads and allows cutting of recesses and grooves. The small tool head feeds the tool radially at 0.0025 or 0.005 inches (0.0635 or 0.1270 mm) per revolution. Automatic tool stop allows cutting to a preset diameter.

### Setup and operation

To set up the VM6000, attach, center and align the proper mounting fixture components. Insert and center the power head/spindle and align it in the valve. Once the VM6000 has been aligned it can be removed and replaced without disturbing the alignment.



1. Valve clamping ring
2. Power head alignment plate
3. Support leg
4. Automatic boring head
5. Clamping jaw
6. Power head

For cutting weld prep grooves, remove the machine from the mounting fixture and adjust the tool head using the bench gauge/fixture.

Once the cutting diameter and preset stop are set on the tool head, insert it in the power head spindle and replace the VM6000 in the valve. The machine is now ready to machine a weld prep groove to a preset depth. When boring, the radial feed is disengaged, the boring diameter is set using a micrometer and

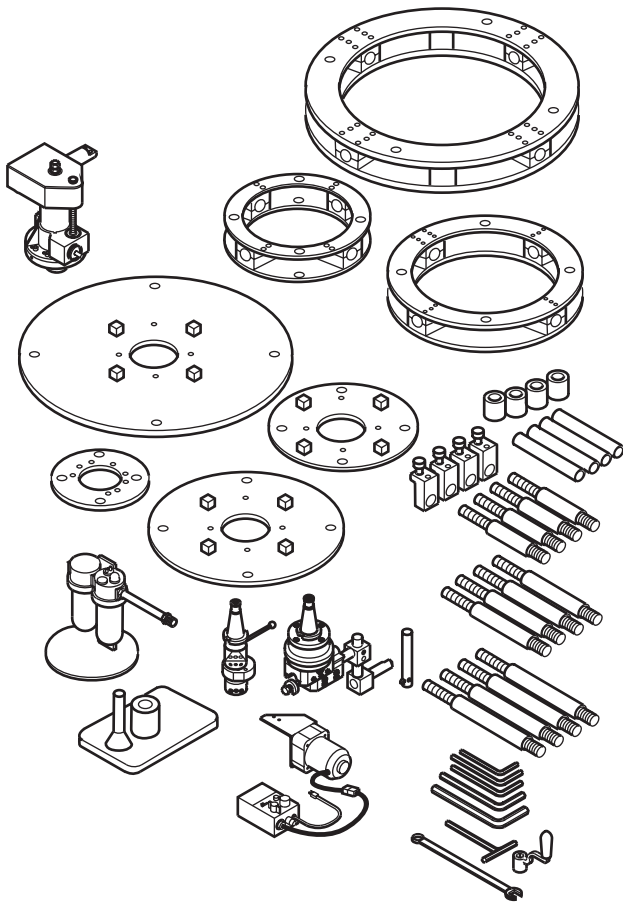
the boring depth is controlled manually. Depth of the bore is determined by visual inspection or optional digital readout.

After corroded material and old weldments are removed, take out the VM6000 and apply weld buildup as needed. Finally, reattach the VM6000 and remachine the valve to manufacturer's original specifications. There is one tool holder for each of the three standard machining operations.

## Digital readout option

The VM 6000 Valve Repair Machine is available with or without a digital readout control unit. The digital readout control unit allows precise boring to a predetermined depth without visual inspection.

## VM6000 Components



### NO. DESCRIPTION

#### 17151 VM6000 Valve Repair Machine

Standard machine complete with valve fixturing assembly for mounting to the valve, 8 inch stroke power unit assembly, 1.2 hp (0.90 kW) air motor, pneumatic conditioning unit, small and large tool holders, small [7 inch (177.8 mm) maximum OD valves], medium [10 inch (254 mm) maximum OD valves], and large [17 inch (431.8 mm) maximum OD valves], mounting rings, tool bits, tool fixture for presetting tool stops, electric power feed unit, tool kit, instruction manual, and wooden storage crate.

#### 30487 VM 6000 Valve Repair Machine with Digital Readout Control

Contains all the features of the standard VM 6000 (above), plus a Digital Readout Control unit for precise boring to a predetermined depth without visual inspection.

Drawings may not represent actual product.

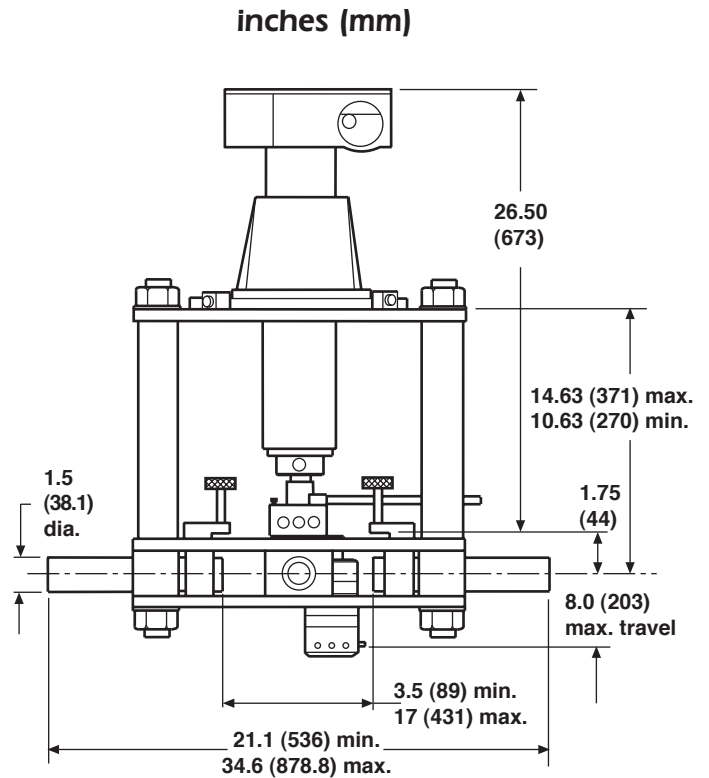
## VM6000 Specifications

<b>Valve ID min.:</b>	2.5 inches	(63.5 mm)
<b>Valve ID max.:</b>	13 inches	(330 mm)
<b>Valve OD min.:</b>	3.5 inches	(88.9 mm)
<b>Valve OD max.:</b>	17 inches	(431.8 mm)
<b>Air motor:</b>	1.2 hp	(0.90 kW)
<b>Stroke (slide travel) max.:</b>	8 inches	(203.2 mm)
<b>Air pressure requirements:</b>		
<b>(at rated hp):</b>	90 psi @ 40 ft <sup>3</sup> /min.	6.2 bar @ 1.13 m <sup>3</sup> /min.
<b>(at max rpm):</b>	90 psi @ 50 ft <sup>3</sup> /min.	6.2 bar @ 1.42 m <sup>3</sup> /min.
<b>Maximum rpm:</b>	80 rpm	
<b>Spindle rpm (at rated hp):</b>	54 rpm	
<b>Electric feed:</b>	115V	
<b>Net weight:</b>	845 lbs	(348 kg)
<b>Shipping weight:</b>	920 lbs	(418 kg)
<b>Cutter:</b>	0.25 inch square HSS tool bit	

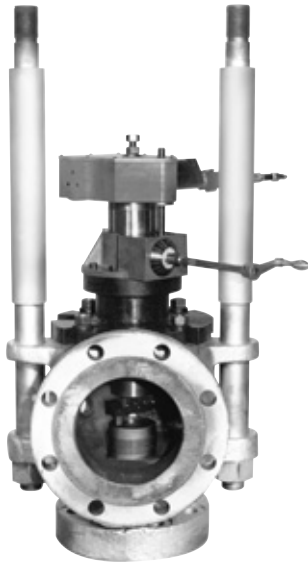
**Radial feed (small tool holder):**  
automatic, 0.002 inches (0.05 mm) per revolution.

**Radial feed (large tool holder):**  
automatic, 0.002, 0.004, 0.006, or 0.008 inch (0.05, 0.10, 0.15, 0.20 mm) per revolution.

**Axial feed:**  
manual or automatic. Automatic feed is infinitely variable 0.04 - 1.4 inches (1.0 - 35.5 mm) per minute.



## Now you can repair a safety valve in about the same time it would take to remove the damaged valve.



If the valve was welded in-line, eliminate rewelding and recertification by remachining in place. By eliminating downtime and spare valve inventory costs, you can probably pay for the Model VM7000 by repairing just a few valves in-line.

### Capabilities

The Model VM7000 is designed to mount directly on safety valves and rework nozzles up to 4 inches (101.6 mm) in diameter. The VM7000 will mount on Dresser Consolidated Maxi-Flow valves, orifice sizes 1 through 6, and on many Crosby Safety Valves.

Any safety valve with a similar configuration can be repaired with the VM7000 (optional modified mounting fixtures may be needed). Combine the various tool bits and tool holders to remachine valve bushing seats to the manufacturer's original specifications. Machine outside diameter, inside diameter, and bushing seat faces to close tolerances.

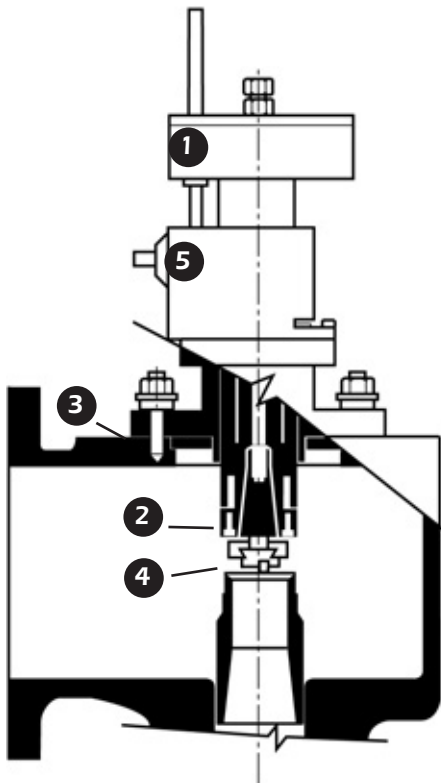
### Features

The VM7000 consists of a compact pneumatic power head and spindle, a set of mounting fixtures, and tool heads for a range of machining operations.

The power head features a 1.2 hp (0.90 kW) pneumatic motor that drives a worm gear reduction, for plenty of torque at the tool head. The spindle turns in ball bearings to ensure smooth operation.

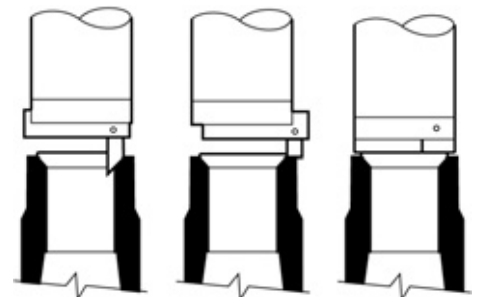
The tooling assembly consists of the tool head, the tool set fixture, the boring and facing heads, and the tool bits. A draw bolt holds the tool head to the spindle. The tooling assembly does three basic valve remachining operations: boring, turning and facing.

The VM7000 mounts on the valve with a fixturing assembly that consists of mounting fixtures, adapter rings and clamp bars. The adapter ring, machined to fit standard valve bore sizes, centers and aligns the machine in the valve opening. The adapter ring raises the machine slightly above the flange surface to ensure alignment with the valve axis, even if the valve face is uneven due to corrosion. The valve mounting fixture uses existing valve flange studs.



- 1. Rotational drive box
- 2. Quill
- 3. Valve mounting fixture
- 4. Removable tool head
- 5. Axial feed control

### Boring Turning Facing



Three tool configurations and machining operations for the VM7000

## Setup and operation

To set up the VM7000, pick the proper adapter ring and put it in the valve's counterbore. The upper surface of the ring will be slightly above the surface of the valve face.

Next, choose the proper mounting fixture and put it on the valve. The adapter ring will automatically center the mounting fixture. Rotate the mounting fixture to fit the slots to the valve studs.

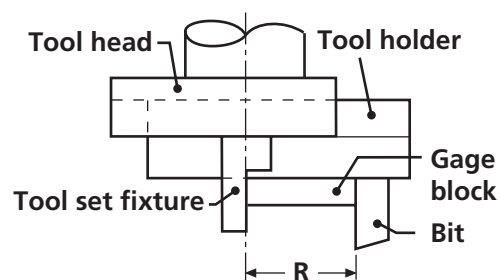
Once the mounting fixture is set up, the power head with attached tool head goes into the mounting fixture bore and

is bolted in place. With the proper head and tool bit in place, you can do facing, boring and turning operations. Vertical feed is controlled manually. The vertical adjustment dial is calibrated in 0.001 inch increments.

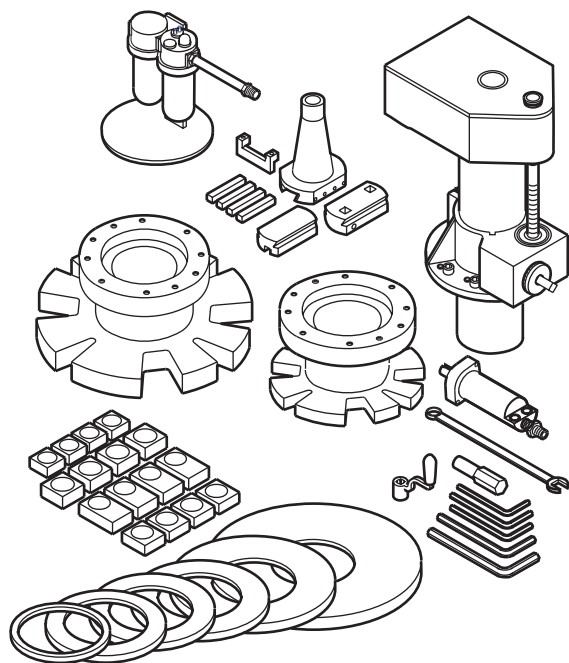
To start a cut, turn the vertical feed crank clockwise until the tool just begins to cut and the vertical adjusting dial is zeroed. Then cut to the valve manufacturer's specified depth. A tool set fixture is provided with the machine to give a reference point for determining the cut diameter.

## Optional tool gage set

To ensure a perfect tool setup, Climax offers gage block sets that allow exact tool positioning every time. The gage blocks are precision machined to match the valve nozzle manufacturer's original specifications.



## VM7000 Components



NO.	DESCRIPTION
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<b>1677</b>	<b>VM7000 Valve Repair Machine</b>
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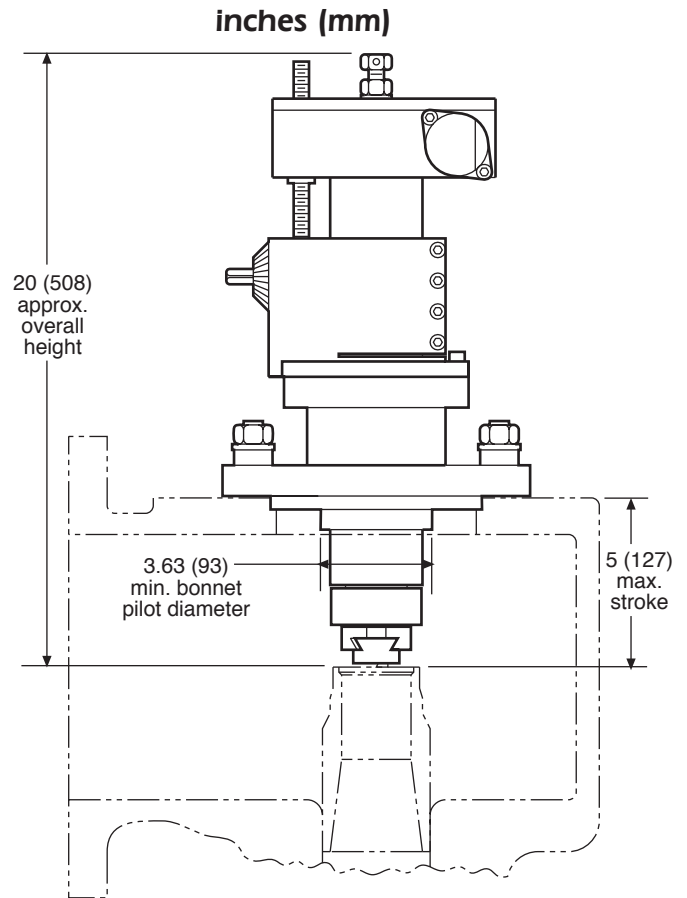
	Standard machine complete with mounting fixtures and adapter rings for mounting to the valve, 5 inch (127 mm) stroke, 80 rpm power unit assembly, 1.2 hp (0.90 kW) air motor, pneumatic conditioning unit, #40 taper spindle, tool heads, tool kit, instruction manual and wooden storage crate.
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<b>15220</b>	<b>Tool Gage Set (optional)</b>
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	Gage blocks precision machined to original specifications allow exact tool positioning. Contact your Climax representative for more information.
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## VM7000 Specifications

<b>Valve nozzle dia. min.:</b>	1.5 inches	(38 mm)
<b>Valve nozzle dia. max.:</b>	6 inches	(152 mm)
<b>Air motor:</b>	1.2 hp	(0.90 kW)
<b>Stroke (slide travel) max.:</b>	5 inches	(127 mm)
<b>Gear reduction:</b>	15:1	
<b>Air pressure requirements:</b>		
<b>(at rated hp)</b>	90 psi @ 32 ft <sup>3</sup> /min.	(6.2 bar @ 0.91 m <sup>3</sup> /min.)
<b>(at max rpm)</b>	90 psi @ 40 ft <sup>3</sup> /min.	(6.2 bar @ 1.13 m <sup>3</sup> /min.)
<b>Max rpm:</b>	80 rpm	
<b>Spindle rpm (at rated hp):</b>	54 rpm	
<b>Spindle torque (at rated hp):</b>	90 ft-lbs	(122.4N•m)
<b>Net weight:</b>	154 lbs	(70 kg)
<b>Shipping weight:</b>	176 lbs	(80 kg)
<b>Axial feed:</b>	manual, adjustable in	0.001 inch (0.025 mm)
		increments.



Note: fixtures will accommodate 4, 6, and 8-hole bolt patterns that are 5 to 10 inches (127 - 254 mm) in diameter.

## Repair corroded seal areas on-site with the valve in-line.



Sometimes it's economical to replace smaller valves, but it's usually more cost-effective to repair the larger sizes. Maintaining an inventory of replacement valves to keep your system operating would be prohibitive. Using portable machine tools to repair valves in-line, you save all the expense of replacement valve inventory, weld reinspection, recertification, and the downtime necessary to complete the job.

With the Model VM8000 Valve Repair machine, the repair operation consists of removing the valve bonnet and stem assembly, applying a weld build-up as necessary in the corroded valve seat and seal areas and remachining to the manufacturer's original specifications. The original in-line welds are not disturbed and need no recertification.

### Capabilities

The VM8000 is designed for on-site remachining of seats and seal areas of Fisher and Dresser Masoneilan (or any other, similar type) control valves. The machine mounts directly on the valve and bores throat areas from 2.5 - 10 inches (63.5 - 254 mm) in diameter. Also reface seats up to 0.75 inches (19.05 mm) wide without tool bit adjustment. The machine can reach 16 inches (406.4mm) from the top to the valve body and has a boring stroke of 10 inches (254mm).

The machine cuts nearly any kind of finish from fine to 40-pitch scroll for gasket seals.

### Features

Components of the VM8000 include a main body, rotational drive unit, turning bar, mounting fixtures and tool holder

set. Machining torque is delivered through the rotational drive unit, which may be either hydraulically or pneumatically driven. The axial feed system is manually controlled. Calibrated in 0.001 inch (0.0254 mm) increments, the feed dial can be zeroed to cut precise depths specified by the manufacturer. Boring diameter is set with the manual hand wheel on top of the bar. Make multiple boring passes without removing the machine for tool adjustments.

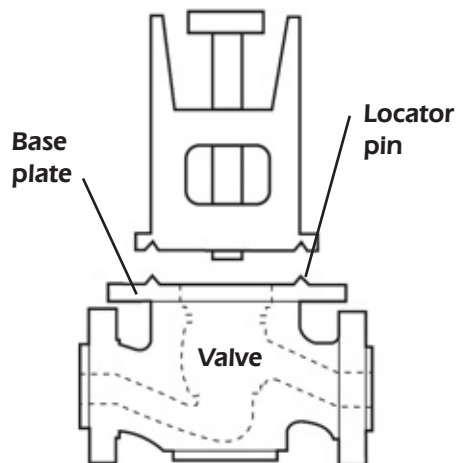
Pin locators in the mounting plates allow accurate repositioning of the machine's main body during multiple setups. Because the turning bar rotates in close-tolerance needle bearings, the machine is capable of high precision machining. During boring operations, total indicated runout (TIR) will not exceed 0.002 inches (0.0508 mm) over the entire stroke.

With the long turning bar, deep valve machining is possible. The rack-actuated tool head radial feed is automatic at 0.003 inches (0.076 mm) per revolution, or manual at 0.025 inches (0.635 mm) per revolution.

Precision machining is achieved with the calibrated radial feed dial located on top of the turning bar.

### Setup and Operation

Remove the valve's bonnet and stem and mount the Model VM8000 base plate. Attach, center and level the intermediate plate and main body assembly. Cut the necessary weld preps, making sure old weldments and all corrosion is removed. Remove the VM6000 and apply weld buildup as needed. Using the pin locator system, the machine is reattached to the intermediate plate in perfect alignment for finish machining all seat and seal areas. The tool bit remains visible during machining operations so the operator has excellent control of all precision boring and facing operations.



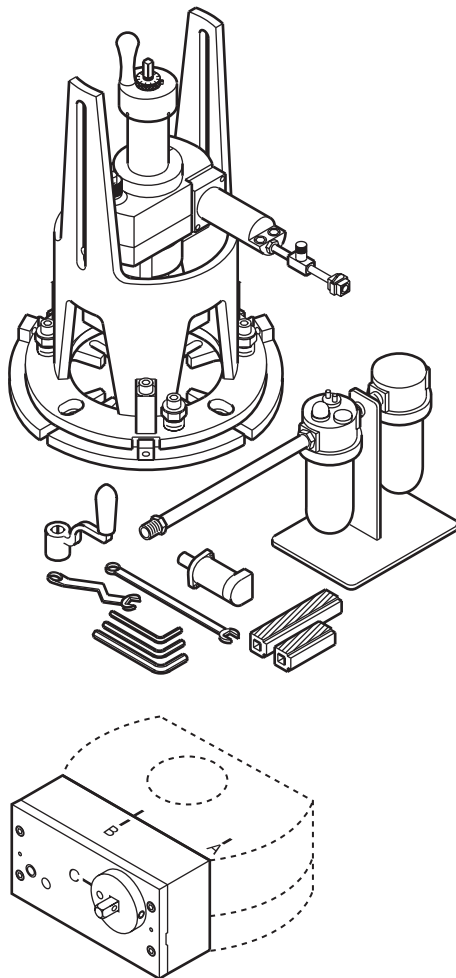


## Threading option

With the optional threading attachment, the machine can cut threads that meet the original manufacturer's specifications. The machine can cut any pitch between 8 and 16 threads per inch in 1/4-pitch increments and pitches 16 to 21 in

1-pitch increments. Any six pitches (user specified) are provided with the machine. Thread pitch is changed by replacing the pitch gear in the optional threading attachment gear box... a five minute operation.

## Model 8000 Components



Drawings may not represent actual product.

NO.	DESCRIPTION
<b>17794</b>	<b>Model 8000 Valve Repair Machine</b>
	Standard machine includes rotational drive assembly with 1.1 hp air motor and 1.5 hp hydraulic motor, main body assembly with cone locators, turning bar assembly with three tool holders, pneumatic conditioning unit, tool kit, and instruction manual.
<b>17788</b>	<b>Model 8000 Valve Repair Machine with Threading Attachment</b>
	As above with threading attachment described below.
<b>16208</b>	<b>Threading Attachment</b>
	Threading attachment allows the Model VM8000 to cut new or recut existing threads in Fisher-style control valves. Cut from 8 to 20 threads/inch by changing the threading gears. Attachment includes gear box which mounts to the rotational drive assembly, threading gears for 8, 10, 12, 16, 18, and 20 threads/inch, slow speed 1.1 hp pneumatic motor (20 rpm max spindle speed), and instructions.

## VM8000 Specifications

<b>Height:</b>	39 inches	(991 mm)
<b>Valve ID min.:</b>	3 inches	(76.2 mm)
<b>Valve ID max.:</b>	10 inches	(254 mm)
<b>Vertical stroke: (slide travel) max.</b>	10 inches	(254 mm)
<b>Air motor:</b>	1.1 hp	(0.83 kW)
<b>Air pressure requirements: (at rated hp)</b>	90 psi @ 32 ft <sup>3</sup> /min. (6.2 bar @ 1.1 m <sup>3</sup> /min.)	
<b>(at max rpm)</b>	90 psi @ 40 ft <sup>3</sup> /min. (6.2 bar @ 1.13m <sup>3</sup> /min.)	
<b>Max. spindle rpm:</b>	75 rpm	
<b>Metal removal rate:</b>	(in C1018 steel with a sharp tool) 0.8 in <sup>3</sup> /min. (13.1 cm <sup>3</sup> /min.)	
<b>Shipping weight:</b>	248 lbs.	(113 kg)

**Cutter:**

0.5 inch square HSS tool bit or carbide inserts

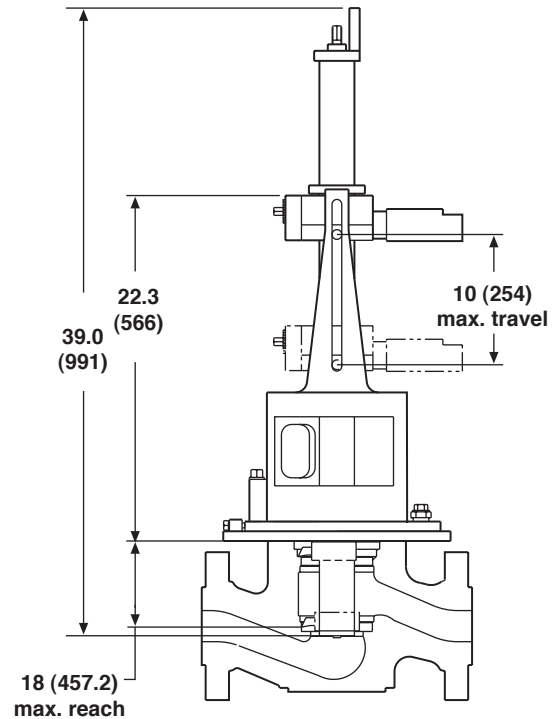
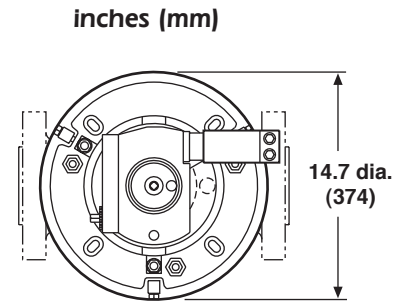
**Radial feed:**

**Automatic,** 0.003 inches (0.076 mm) per revolution with handcrank

**Manual,** up to 0.025 inches (up to 0.63 mm) per revolution.

**Axial feed:**

Standard machine feed is manual. Optional threading attachment is adjustable in 0.001 inch (0.025 mm) increments.



## Portable valve grinding and lapping

### **Models VM/GT and VM/GA Portable Valve Grinding and Lapping Machines, For Flat and Conical Seats.**

Return globe and gate valve seats to operational condition for less than 1/3 the cost of a replacement valve with these portable valve grinding and lapping machines. Valve grinding and lapping machines are available in pneumatic or electric versions. Six models for gate valves from 1.26 - 19.68 inches (32 - 500 mm) diameter. Six models for globe valves from 0.39 -27.56 inches (32 - 500 mm).

### **VM1000 Series For Gate Valves**

### **VM2000 Series For Globe Valves**

### **Model VM9000**

A portable valve machining system that quickly and safely repairs nuclear plant MSIV and other globe valve assemblies. The Climax Model VM9000 is a portable valve repair system designed to repair MSIV and other globe valves from 14 - 30 inches (356 mm – 762 mm) in diameter. It will machine and grind pressure-seal bores, guide ribs and seats.

## Stationary valve repair machines

### **Model VM5800 Series**

Work stations for grinding and lapping seal surfaces up to 13.78 inches (350 mm) and face turning seal surfaces up to 9.8 inches (250 mm) for offline/offsite valve repairs. Tilt table accommodates valves up to 660 lbs (300 kg). Optional rotary table accommodates valves up to 550 lbs (250 kg).

## Grinding and lapping tables

### **Models VM5600 & VM5900**

For repair operations on gate wedges, valve plugs. Features variable table speed, safety rail, optional foot switch.

## Grinding and lapping adapter units

### **Models VM3000 & VM4000**

Turn your radial drilling machine into a grinding and lapping machine with our adapter-tool set-tilt table package.

## Abrasives, cleaning technology, and accessories

Water-resistant, self-adhesive abrasive rings and segments, all common sizes and grains in stock. Abrasive rings and segments are delivered in screw-top jars for protection against dust and humidity.

CBN-grinding discs, used with planet wheels for high material removal and durability.

Self-centering chuck for quick alignment of globe valve grinding machine.

Professional cleaning set with ergonomically designed 1000W professional power brush, assorted brush heads, safety goggles, and dust mask.

## Valve test benches

These small, portable test benches fit on any normal workbench. Clamps and pressure-tests DIN and ASA flanges with either water or air.

# Climax Portable Machine Tools Worldwide Manufacturing, Sales & Rental Facilities



VRM-1M0604

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