

# VM9000 PORTABLE GLOBE VALVE REPAIR MACHINE

## TECHNICAL DATA AND CONFIGURATION GUIDE

### A portable valve machining system that quickly and safely repairs nuclear plant MSIV and other globe valve assemblies



**CLIMAX**

Portable Machine Tools, Inc.

The Climax Model VM9000 is a portable valve repair system designed to repair MSIV and other globe valves from 356mm–762mm (14"–30") in diameter. It will machine and grind pressure-seal bores, guide ribs and seats. Switch from single-point machining to grinding in minutes. Grinding head produces a 16 Ra finish for assurance of LLRT passage.

**Extremely versatile, one set-up for multiple procedures** The VM9000 machining system repairs MSIV seats, guide ribs and pressure seal surfaces. No need to purchase separate tools for each process. Plus with one set-up you can perform both single-point machining and grinding procedures.

**Quick set-up reduces radiation exposure** The VM9000 has been designed for fast, easy set-up in potentially contaminated or "hot" areas. The open design of the machine allows excellent visibility for viewing machining operations and all operational controls are on top of the

machine for easy access. The system includes a specially designed angle lift arm for rapid insertion and removal of the VM9000 into and from angled valve housings.

**Six built-in alignment instruments provide fast centering** All support chucks are adjustable from the top of the valve plus a specially designed quick adjustment system features six built-in alignment instruments for fast tool centering. This unique feature also allows you to utilize the tool as it's own mapping and surveying device once you have the VM9000 centered in your valve.

**Unique dual-power system provides safe, high quality performance** The VM9000 includes two separate power sources. A compact, hydraulic motor provides plenty of low-speed torque for precise control of the rotational drive. Two precision pneumatic drive systems provide power for the axial feed system and for the accessory grinding attach-

#### The VM9000 is now used by these industries:

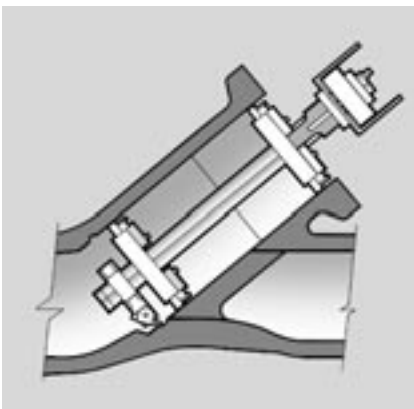
- Power generation
- Ship repair
- Petrochemical

#### Typical applications:

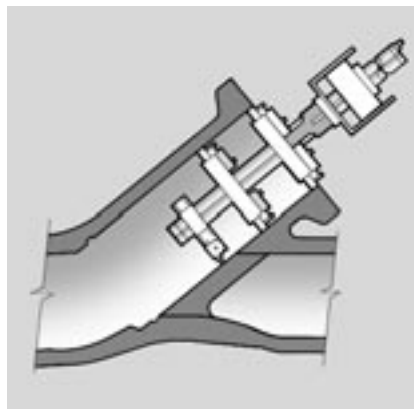
- Main Steam Isolation Valve (MSIV) valves
- Turbine throttles
- Stop valves
- Stop check valves
- Component nozzles
- Globe valve

ment. The pneumatic system has been designed to protect the operator from coming into contact with potentially contaminated particles that may be formed during the valve repair process.

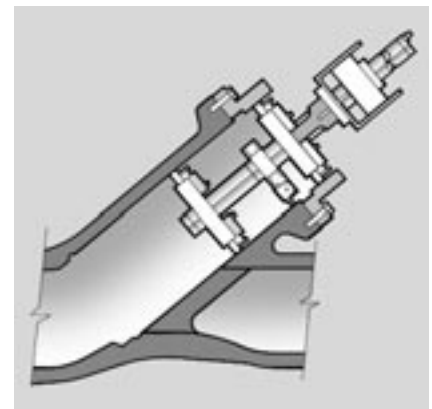
### The Climax VM9000 Globe Valve Repair System



Machining and Polishing Valve Seats



Machining Guide Ribs



Machining Pressure Seal Area

Your part number is:

VM9000 . 1 .   .      .

(To generate your part number, write the number of each option you require in the corresponding box.)

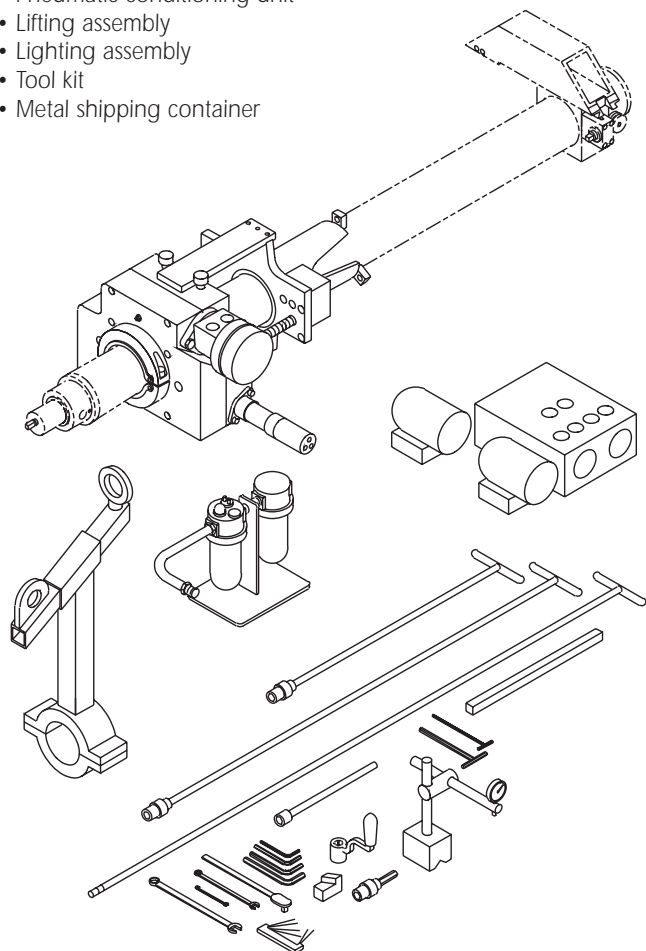
## Configure your VM9000 Valve Repair System in four easy steps.

- 1 Select a Bar Length and Hydraulic Power Option.
- 2 Select a Turning Option.
- 3 Select a Chuck Option.
- 4 Select a Chuck Jaw Option.

To generate the correct part number for the valve machine you require, simply select the option you need in each step, then write the number of that option in the corresponding box at the top of this page.

### Each VM9000 comes with a Base Configuration, which includes:

- Rotational drive/axial feed unit
- Pneumatic and hydraulic motors
- Pneumatic conditioning unit
- Lifting assembly
- Lighting assembly
- Tool kit
- Metal shipping container



VM9000 Base Configuration

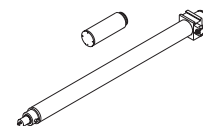
### Step 1: Select a Bar Length and Hydraulic Power Unit Option

**A** Write the number of the Turning Bar Assembly you need in box "A"

Number 1: 1473mm (58") turning bar assembly

Number 2: 1524mm (60") turning bar assembly

Number 3: 1676mm (66") turning bar assembly



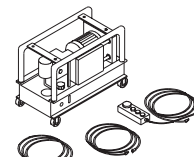
Turning Bar Assembly

**B** Write the number of the Hydraulic Power Unit (HPU) you need in box "B."

Number 1: HPU, 5hp (6GPM), 230V, 30m (100ft) hydraulic hoses, and pendant cable

Number 2: HPU, 5hp (6GPM), 380V, 30m (100ft) hydraulic hoses, and pendant cable

Number 3: HPU, 5hp (6GPM), 460V, 30m (100ft) hydraulic hoses, and pendant cable



Hydraulic Power Unit

### Step 2: Select a Turning Option

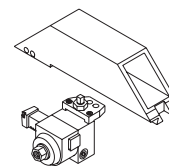
(Turning arm, grinding attachment and shaper head)

**C** Write the number of the Turning Arm you need in box "C." (Includes tool head)

Number 1: Small bore turning arm, 356mm-483mm (14"-19") dia.

Number 2: Standard turning arm, 406mm-600mm (16"-24") dia.

Number 3: Extended turning arm, 508mm-762mm (20"-30") dia.

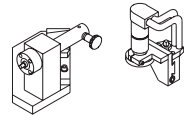


Turning Arm

**D** Write the number of the of the Grinding Attachment you need in box "D."

Number **0**: No grinding attachment

Number **1**: Include grinding attachment with wheel dresser

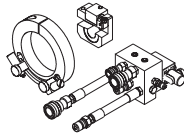


Grinding Attachment

**E** Write the number of the Shaper Head you need in box "E."

Number **0**: No shaper head

Number **1**: Include shaper head



Shaper Head

### Step 3: Select a Mounting Option

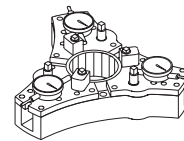
**F** Write the number of the Upper Chuck Assembly you need in box "F."

Number **1**: Small bore chuck, 356mm–610mm (14"–24"), 120 degree

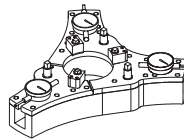
Number **2**: Small bore chuck, 356mm–610mm (14"–24"), 95 degree

Number **3**: Standard chuck, 406mm–762mm (16"–30"), 120 degree

Number **4**: Standard chuck, 406mm–762mm (16"–30"), 95 degree



120 Degree Chuck



95 Degree Chuck

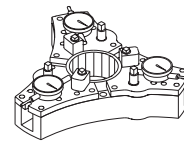
**G** Write the number of the Lower Chuck Assembly you need in box "G."

Number **1**: Small bore chuck, 356mm–610mm (14"–24"), 120 degree

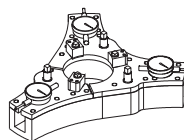
Number **2**: Small bore chuck, 356mm–610mm (14"–24"), 95 degree

Number **3**: Standard chuck, 406mm–762mm (16"–30"), 120 degree

Number **4**: Standard chuck, 406mm–762mm (16"–30"), 95 degree



120 Degree Chuck



95 Degree Chuck

### Step 4: Select a Jaw Option

**H** Write the number of the Primary Jaw Set you need in box "H."

Number **1**: 356mm–406mm (14"–16") Jaw Set (only for use with the 356mm (14") chuck)

Number **2**: 406mm–457mm (16"–18") Jaw Set

Number **3**: 457mm–508mm (18"–20") Jaw Set

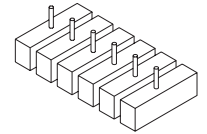
Number **4**: 508mm–559mm (20"–22") Jaw Set

Number **5**: 559mm–610mm (22"–24") Jaw Set

Number **6**: 610mm–660mm (24"–26") Jaw Set

Number **7**: 660mm–711mm (26"–28") Jaw Set

Number **8**: 711mm–762mm (28"–30") Jaw Set



Jaw Sets

**I** Write the number of the Secondary Jaw Set you need in box "I."

Number **0**: No secondary jaw set

Number **1**: 356mm–406mm (14"–16") Jaw Set (only for use with the 356mm (14") chuck)

Number **2**: 406mm–457mm (16"–18") Jaw Set

Number **3**: 457mm–508mm (18"–20") Jaw Set

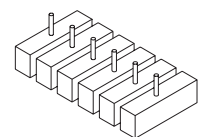
Number **4**: 508mm–559mm (20"–22") Jaw Set

Number **5**: 559mm–610mm (22"–24") Jaw Set

Number **6**: 610mm–660mm (24"–26") Jaw Set

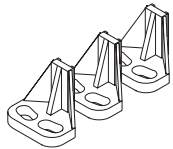
Number **7**: 660mm–711mm (26"–28") Jaw Set

Number **8**: 711mm–762mm (28"–30") Jaw Set



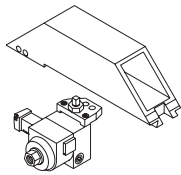
Jaw Sets

Expand the Versatility of Your VM9000 Valve Repair Machine With High Quality Climax Accessories



### Special Standoffs

Allows the VM 9000 to repair the top edge of the valve. Includes three standoffs for proper machine support. Contact Climax to order standoffs specific to your application.



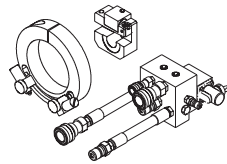
### Turning Arm

Comes complete with tool head and tool holders for the range specified. (Custom ranges are available.)

- Small Bore: 356mm–483mm (14"–19")  
PN: 39265
- Standard: 406mm–610mm (16"–24")  
PN: 39266
- Extended: 508mm–762mm (20"–30")  
PN: 39267

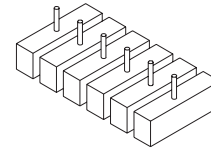
### Spare Parts Kit: PN: 39094

Includes a comprehensive collection of VM9000 spare parts. Kit is designed to provide you with the parts you need to keep your VM9000 in top operating condition.



### Shaper Head: PN: 34173

A convenient, timesaving head for machining guide ribs. Special hydraulic reversing valve provides efficient back-and-forth cutting head motion for fast rib refinishing. Kit includes shaper head, tool holder, hydraulic manifold with reversing valve, clamp collar with stops and associated plumbing fixtures.



### Jaw Sets

Jaws extend from the mounting chuck assembly arms to hold the machine tightly inside the valve. Adjustable dial indicators help center the machine inside the valve. Includes six jaws — enough for both chuck assemblies. One or two sets of jaws are included with the machine depending on how you have configured your system. Diameters listed are actual diameters, not nominal valve size.

Part No.	Range
18841	356mm–406mm (14"–16")*
18842	406mm–457mm (16"–18")
18843	457mm–508mm (18"–20")
18844	508mm–559mm (20"–22")
18845	559mm–610mm (22"–24")
18846	610mm–660mm (24"–26")
18847	660mm–711mm (26"–28")
30957	711mm–762mm (28"–30")

\*Only for use with the 356mm (14") chuck.

## VM9000 Quick Specs Guide

### Main Body Assembly

- Variable speed hydraulic rotational drive with double-enveloping worm gear (0.5–10 rpm)
- Twin ball screws for smooth axial feed

### Mounting Chuck Assembly

- Two spacings available:
  - 120°/120°/120°
  - 95°/132.5°/132.5°
- ID mounting range: 355mm–762mm (14"–30") (Requires both chuck assemblies)
- Adjustable jaws & dial indicators for pre-setting, aligning and centering machine inside valve

### Turning Bar & Arm Assembly

- Three bar lengths available: 1,473mm (58"), 1,524mm (60"), 1,676mm (66")
- ID turning range: 356mm–762mm (14"–30") (Requires all three turning arms)

- 30:1 reduction radial feed box mounted inside the bar

### Tool Head Assembly

- Rack-fed tool holder, infinitely adjustable through 360°
- Manual or automatic radial feed fixed at 0.051mm (.002") per revolution

### Grinding Head Assembly

- Pneumatically powered
- Manual or automatic radial feed at 0.076mm (.003") per revolution
- Grinding stones turn 3000–4000 rpm under load
- Total radial travel 38mm (1.5")
- 0.52 KW (0.7 hp) air motor to turn stones
- Four grinding stones included

### Pneumatic Axial Feed (Z Axis)

- Reversible 0.3 KW (0.4 hp) air motor
- Variable reversible pneumatic axial feed 0–38mm (0–1.5") per minute, high & low gear
- 171mm (7") stroke per setting

### Wheel Dressing Fixture

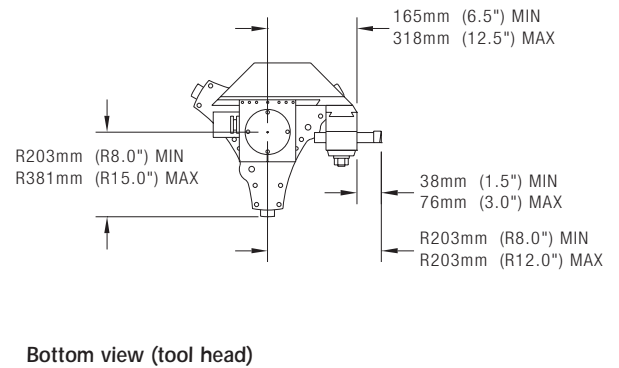
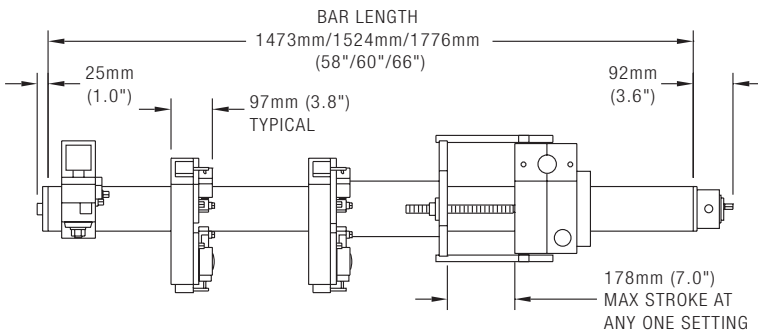
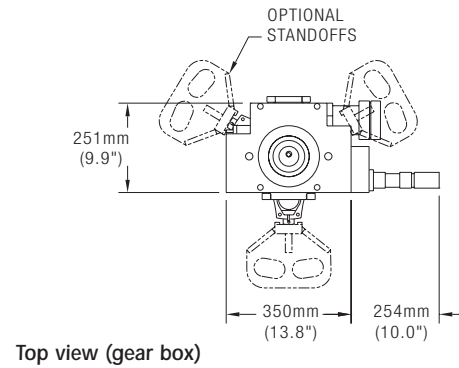
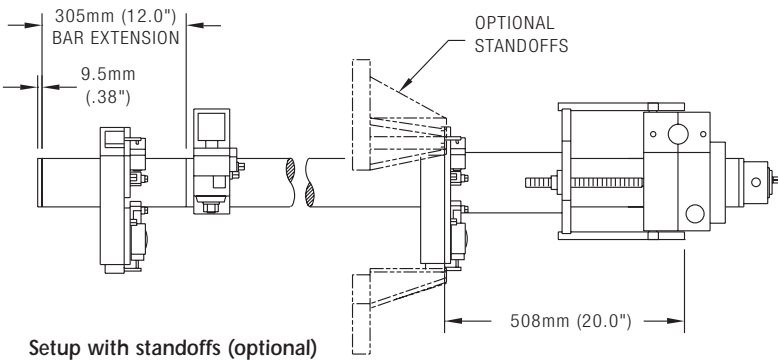
- Dresses grinding stones at angles from 0° to 50°

### Lighting Assembly

- \* Two high-intensity halogen lights with magnetic bases provide excellent visibility inside valve during operation.

### Hydraulic Power Unit

- Variable volume 0–6 gal/min. pump
- 5 hp, 1800 rpm, 230V/380V/460V, 3-phase motor
- 30 m (100 ft) hydraulic hoses
- 30 m (100 ft) control pendant cable



## Climax also offers you these specialized services:

### • Machine Rentals

With eight worldwide rental depots, you are never far from a Climax Portable Machine Tool. Contact our staff of fully trained product and logistics experts who can have a machine delivered to your site in a matter of days.

### • Special Projects

Climax has been solving our customers' complex on-site machining problems for more than 35 years. Call us today for a solution to your specific application.

### • Training

Climax is committed to providing you with comprehensive training programs. A comprehensive VM9000 training program is available utilizing knowledgeable, highly skilled instructors. Training can be held on-site at your location or at our headquarters training facility.

## Other portable machine tools manufactured by Climax

Contact Climax Portable Machine Tools for information on our comprehensive range of portable machine tools including:

- Boring Bars
- Key Mills
- Flange Facers
- Lathes
- 3-Axis Mills
- Valve Repair

## Product Warranty

Climax warrants that all new machines are free of defects in materials and workmanship for a period of one year after delivery. Within the warranty period, Climax will, at its option, either repair or replace the defective machine.

## Climax Portable Machine Tools Worldwide Rental & Manufacturing Facilities

To rent a Climax Portable Machine Tool call 1-800-333-8311 (USA/Canada);  
49 (0) 2421.9177.0 (Europe); 1-503-538-2185 (all other countries)



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