VM2050C-2150C

Globe Valve Grinding Machine for Conical Seats

OPERATING MANUAL

CLIMAX
Portable Machining & Welding Systems

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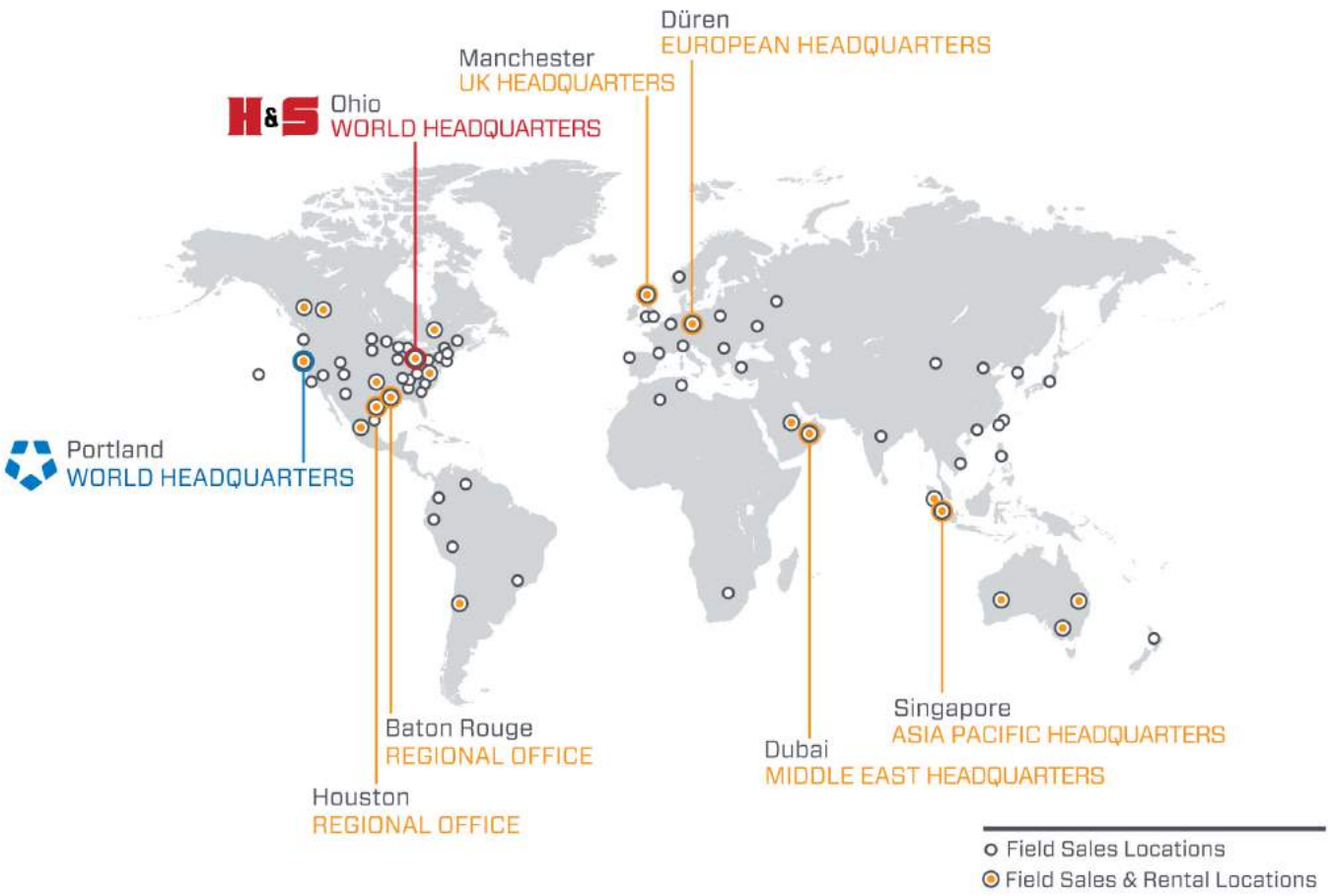

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- Damage caused by improper or inadequate machine maintenance
- Damage caused by unauthorized machine modification or repair
- Damage caused by machine abuse
- Damage caused by using the machine beyond its rated capacity

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About this manual

CLIMAX provides the contents of this manual in good faith as a guideline to the operator. CLIMAX cannot guarantee that the information contained in this manual is correct for applications other than the application described in this manual. Product specifications are subject to change without notice.

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TABLE OF CONTENTS

LIST OF FIGURES

FIGURE **PAGE**

LIST OF TABLES

TABLE **PAGE**

1 INTRODUCTION

IN THIS CHAPTER:

1.1 How to use this manual

This manual describes information necessary for the setup, operation, maintenance, storage, shipping, and decommissioning of the VM2050C-2150C.

The first page of each chapter includes a summary of the chapter contents to help you locate specific information. The appendices contain supplemental product information to aid in setup, operation, and maintenance tasks.

Read this entire manual to familiarize yourself with the VM2050C-2150C before attempting to set it up or operate it.

1.2 Safety alerts

Pay careful attention to the safety alerts printed throughout this manual. Safety alerts will call your attention to specific hazardous situations that may be encountered when operating this machine.

Examples of safety alerts used in this manual are defined here[1]:

DANGER

indicates a hazardous situation which, if not avoided, ***WILL*** result in death or severe injury.

WARNING

indicates a hazardous situation which, if not avoided, ***COULD*** result in death or severe injury.

1. For more information on safety alerts, refer to *ANSI/NEMA Z535.6-2011, Product safety Information in Product Manuals, Instructions, and Other Collateral Materials*.

⚠ CAUTION

indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

indicates a hazardous situation which, if not avoided, could result in property damage, equipment failure, or undesired work results.

1.3 GENERAL SAFETY PRECAUTIONS

CLIMAX leads the way in promoting the safe use of portable machine tools and valve testers. Safety is a joint effort. You, the end user, must do your part by being aware of your work environment and closely following the operating procedures and safety precautions contained in this manual, as well as your employer's safety guidelines.

Observe the following safety precautions when operating or working around the machine.

Training – Before operating this or any machine tool, you should receive instruction from a qualified trainer. Contact CLIMAX for machine-specific training information.

Risk assessment – Working with and around this machine poses risks to your safety. You, the end user, are responsible for conducting a risk assessment of each job site before setting up and operating this machine.

Intended use – Use this machine in accordance with the instructions and precautions in this manual. Do not use this machine for any purpose other than its intended use as described in this manual.

Personal protective equipment – Always wear appropriate personal protective gear when operating this or any other machine tool. Flame-resistant clothing with long sleeves and legs is recommended when operating the machine. Hot chips from the workpiece may burn or cut bare skin.

Work area – Keep the work area around the machine clear of clutter. Restrain cords and hoses connected to the machine. Keep other cords and hoses away from the work area.

Lifting – Many CLIMAX machine components are very heavy. Whenever possible, lift the machine or its components using proper hoisting equipment and rigging. Always use designated lifting points on the machine. Follow lifting instructions in the setup procedures of this manual.

Lock-out/tag-out – Lock-out and tag-out the machine before performing maintenance.

Moving parts – CLIMAX machines have numerous exposed moving parts and interfaces that can cause severe impact, pinching, cutting, and other injuries. Except for stationary operating controls, avoid contact with moving parts by hands or tools during machine operation. Remove gloves and secure hair, clothing, jewelry, and pocket items to prevent them from becoming entangled in moving parts.

Sharp edges – Cutting tools and workpieces have sharp edges that can easily cut skin. Wear protective gloves and exercise caution when handling a cutting tool or workpiece.

Hot surfaces – During operation, motors, pumps, HPUs, and cutting tools can generate enough heat to cause severe burns. Pay attention to hot surface labels, and avoid contact with bare skin until the machine has cooled.

1.4 MACHINE-SPECIFIC SAFETY PRECAUTIONS

Eye hazard – This machine produces metal chips during operation. Always wear eye protection when operating the machine.

Sound level – This machine produces potentially harmful sound levels. Hearing protection is required when operating this machine or working around it.

Hazardous environments – Do not operate the machine in environments where potentially explosive materials, toxic chemicals, or radiation may be present.

Machine mounting – Do not operate the machine unless mounted to a workpiece in accordance with this manual. If mounting the machine in an overhead or vertical position, do not remove hoist rigging until the machine is mounted to the workpiece in accordance with this manual.

1.5 RISK ASSESSMENT AND HAZARD MITIGATION

Machine Tools are specifically designed to perform precise material-removal operations.

Stationary Machine Tools include lathes and milling machines and are typically found in a machine shop. They are mounted in a fixed location during operation and are considered to be a complete, self-contained machine. Stationary Machine Tools achieve the rigidity needed to accomplish material-removal operations from the structure that is an integral part of the machine tool.

In contrast, Portable Machine Tools are designed for on-site machining applications. They typically attach directly to the workpiece itself, or to an adjacent structure, and achieve their rigidity from the structure to which it is attached. The design intent is that the Portable Machine Tool and the structure to which it is attached become one complete machine during the material-removal process.

To achieve the intended results and to promote safety, the operator must understand and follow the design intent, set-up, and operation practices that are unique to Portable Machine Tools.

The operator must perform an overall review and on-site risk assessment of the intended application. Due to the unique nature of portable machining applications, identifying one or more hazards that must be addressed is typical.

When performing the on-site risk assessment, it is important to consider the Portable Machine Tool and the workpiece as a whole.

1.6 RISK ASSESSMENT CHECKLIST

The following checklist is not intended to be an all inclusive list of things to watch out for when setting up and operating this Portable Machine Tool. However, these checklists are typical of the types of risks the assembler and operator should consider. Use these checklists as part of your risk assessment:

TABLE 1-1. RISK ASSESSMENT CHECKLIST BEFORE SET-UP

	Before set-up
☐	I took note of all the warning labels on the machine.
☐	I removed or mitigated all identified risks (such as tripping, cutting, crushing, entanglement, shearing, or falling objects).
☐	I considered the need for personnel safety guarding and installed any necessary guards.
☐	I created a lift plan, including identifying the proper rigging, for each of the setup lifts required during the setup of the support structure and machine.
☐	I located the fall paths involved in lifting and rigging operations. I have taken precautions to keep workers away from the identified fall path.
☐	I considered how this machine operates and identified the best placement for the controls, cabling, and the operator.
☐	I evaluated and mitigated any other potential risks specific to my work area.

TABLE 1-2. RISK ASSESSMENT CHECKLIST AFTER SET-UP

	After set-up
☐	I checked that the machine is safely installed and the potential fall path is clear. If the machine is installed at an elevated position, I checked that the machine is safeguarded against falling.
☐	I identified all possible pinch points, such as those caused by rotating parts, and informed the affected personnel.
☐	I planned for containment of any chips or swarf produced by the machine.
☐	I checked that all affected personnel have the recommended personal protective equipment, as well as any site-required or regulatory equipment.
☐	I checked that all affected personnel understand and are clear of the danger zone.
☐	I evaluated and mitigated any other potential risks specific to my work area.

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2 OVERVIEW

IN THIS CHAPTER:

2.1 FEATURES AND COMPONENTS

Figure 2-1 on page 9 shows VM2050C-2150C features.

2.1.1 Globe Valve Grinder VM2050C basic package

The VM2050C basic package includes all accessories except the grinding cones and abrasives. These items have to be purchased separately depending on the seat angles.

Nominal working diameter is 10 mm–50 mm (0.4–2").

Submerging depth is 250 mm (10").

Scope of supply:

- Machine with quick change coupling to accept the grinding spindle.
- Grinding spindle dia 15 mm for grinding up to DN15. Submerging depth 150 mm (6”)
- Grinding spindle dia 25 mm up to DN50. Submerging depth 250 mm (10”).
- Centering cone for grinding spindle dia 15 mm.
- Centering cone for grinding spindle dia 25 mm.
- 1 set of tooling.
- Carrying cases with foam inlet for the machine and the accessories.

VM2050C has an electric motor 230 V / 50 Hz (P/N 320-00S-L02).

VM2050C has a pneumatic motor (P/N 320-00S-L03).

VM2050C has an electric motor 115 V / 60 Hz (P/N 320-00S-L05).

2.1.2 Globe Valve Grinder VM2100C basic package

Globe Valve Grinder VM2100C basic package

The basic package includes all accessories except the grinding cones and abrasives. These items have to be purchased separately depending on the seat angles.

Nominal working diameter is 10–100 mm (0.4–4”).

Submerging depth is 250 mm (10").

Scope of supply:

- Machine with quick change coupling to accept the grinding spindle.
- Grinding spindle diameter is 15 mm for grinding up to DN15. Submerging depth is 150 mm (6").
- Grinding spindle dia 25 mm up to DN100. Submerging depth 250 mm (10").
- Centering cone for grinding spindle dia 15 mm.
- 2 pcs centering cones for grinding spindle dia 25 mm.
- 1 set of tooling.
- Carrying cases with foam inlet for the machine and the accessories.

VM2100C has an electric motor 230 V / 50 Hz.

VM2100C has a pneumatic motor.

VM2100C has an electric motor 115 V / 60 Hz.

2.1.3 Globe Valve Grinder VM2150C basic package

The basic package includes all accessories except the grinding cones and abrasives. These items have to be purchased separately depending on the seat angles.

Nominal working dia 10 mm to 150 mm (0.4–6“)

Submerging depth 450 mm (18“).

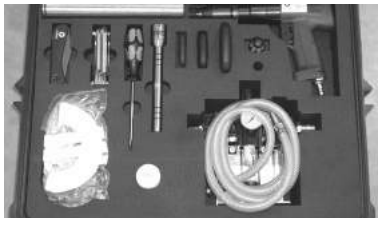
Scope of supply:

- Machine with quick change coupling to accept the grinding spindle.
- Grinding spindle dia 15 mm for grinding up to DN15. Submerging depth 150 mm (6")
- Grinding spindle dia 25 mm up to DN150. Submerg-ing depth 250 mm (10").
- Grinding spindle dia 25 mm up to DN150. Submerg-ing depth 450 mm (18").
- Centering cone for grinding spindle dia 15 mm.
- 2 pcs centering cones for grinding spindle dia 25 mm.
- 1 set of tooling.
- Carrying cases with foam inlet for the machine and the accessories.

320-00S-L22VM2150C with electric motor 230 V / 50 Hz

320-00S-L23VM2150C with pneumatic motor

320-00S-L25VM2150C with electric motor 115 V / 60 Hz



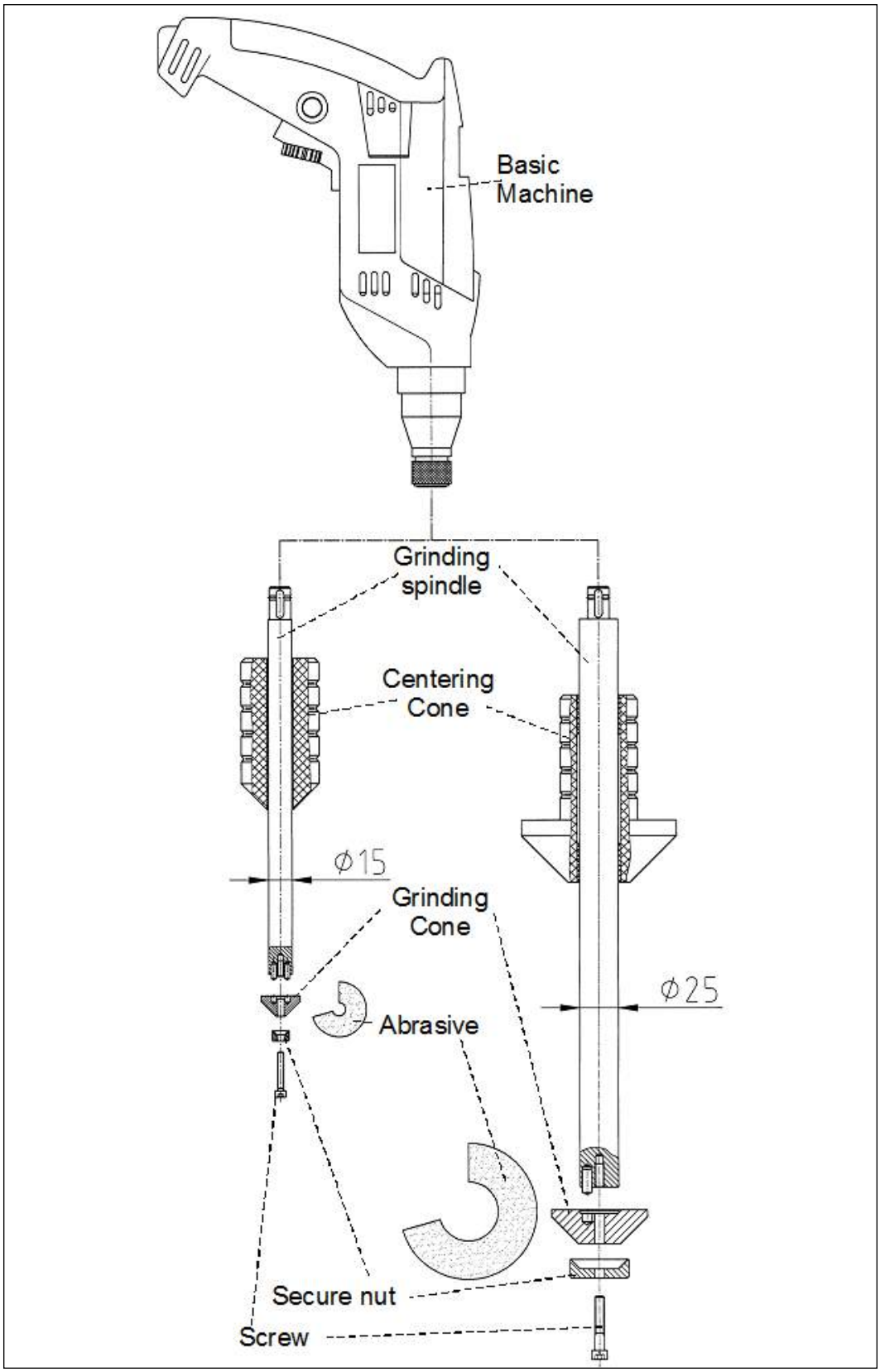


FIGURE 2-1. VM2050C-2150C COMPONENTS

2.2 TOOLING AND ACCESSORIES

2.2.1 Grinding cones DN10–DN50 (0.4–2")

- 7 pcs grinding cones
- required number of securing nuts
- 100 pcs abrasives Grain 120 and Grain 500 each for every dimension (total 1400 pcs)

TABLE 2-1. SEAT ANGLE SPECIFICATIONS

Part number	Description
320-61S-L21	Seat angle 15° (total 30°)
320-63S-L21	Seat angle 30° (total 60°)
320-64S-L21	Seat angle 37.5° (total 75°)
320-65S-L21	Seat angle 45° (total 90°)

2.2.2 Grinding cones DN65–DN100 (2.5–4")

- 1 grinding cones with securing nut for DN65
- 2 segment grinding cones for DN80 and DN100
- 100 pcs abrasives Grain 120 and Grain 500 each for DN65
- 100 pcs rectangular abrasive pads Grain 120 and Grain 500 each for DN80 and DN100

TABLE 2-2. SEAT ANGLE SPECIFICATIONS

Part number	Description
320-61S-L22	Seat angle 15° (total 30°)
320-63S-L22	Seat angle 30° (total 60°)
320-64S-L22	Seat angle 37.5° (total 75°)
320-65S-L22	Seat angle 45° (total 90°)

2.2.3 Grinding cones DN125–DN150 (5–6")

- 2 segment grinding cones for DN125 and DN150

- 100 pcs rectangular abrasive pads Grain 125 and Grain 500 each for DN80 and DN150

TABLE 2-3. SEAT ANGLE SPECIFICATIONS

Part number	Description
320-61S-L23	Seat angle 15° (total 30°)
320-63S-L23	Seat angle 30° (total 60°)
320-64S-L23	Seat angle 37.5° (total 75°)
320-65S-L23	Seat angle 45° (total 90°)

2.2.4 Grinding spindle for submerging depth 450 mm (18") (320-23S-N01)

To extend the submerging depth of VM2050C or VM2100C to 450 mm (18").

2.2.5 Centering cone to OD 200 mm (8") (320-32S-L02)

To extend the centering dia of VM2050C or VM2100C to 200 mm (8”)

2.2.6 3-jaw centering chuck (320-33S-N01)

- Centering dia 80 mm to 430 mm (3.2” … 16.9”)
- Includes the complete chuck and a guiding bushing to accept the grinding spindle dia 25 mm
- Comes in a case with foam inlet

2.3 SPECIFICATIONS

TABLE 2-4. TECHNICAL DATA

Technical Data			
Working range DN…	min	**0.4"**	***10 mm***
	max (VM2050C)	**2"**	***50 mm***
	max (VM2100C)	**4"**	***100 mm***
	max (VM2150C)	**6"**	***150 mm***
Submerging depth	(VM2050C,VM2100C)	**10"**	***250 mm***
	(VM2150C)	**18"**	***450 mm***
Power	electric	***0,65 kW***	
	pneumatic	***0,40 kW***	
Variable Spindle Speed	electric (nominal load)	**100 … 450 1/min**	
	pneumatic	**100 … 650 1/min**	
Spindle Torque	permanent	***7,2 Nm***	
	max	***40 Nm***	

TABLE 2-5. WEIGHTS

Weight	
Basic machine without tool	*5 kg*
VM2050C (for two different seat angles)	
Machine case	*26 kg*
VM2100C (for two different seat angles)	
Machine case	*15 kg*
Accessory case	*26 kg*
VM2150C (for two different seat angles)	
Machine case	*15 kg*
Accessory case	*32 kg*

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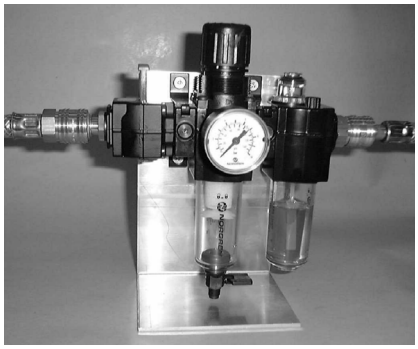
3 MAINTENANCE

3.1 MAINTENANCE UNIT FOR PNEUMATIC MOTOR (240-13K-001)

The maintenance unit is not included in the standard scope of supply with pneumatic driven machines.



Includes:

- filter
- oiler
- pressure gauge
- speed controller

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4 STORAGE AND SHIPPING

IN THIS CHAPTER:

4.1 Storage

Proper storage of the Globe Valve Grinding Machine for Conical Seats will extend its usefulness and prevent undue damage.

Before storing, do the following:

1. Clean the machine with solvent to remove grease, metal chips, and moisture.
2. Drain all liquids from the pneumatic conditioning unit.

Store the Globe Valve Grinding Machine for Conical Seats in its original shipping container. Keep all packing materials for repackaging the machine.

4.1.1 Short-term storage

Do the following for short-term storage (three months or less):

1. Retract the tool head from the workpiece.
2. Remove the tooling.
3. Remove hoses.
4. Remove the machine from the workpiece.
5. Clean the machine to remove dirt, grease, metal chips, and moisture.
6. Spray all unpainted surfaces with LPS-2 to prevent corrosion.
7. Store the Globe Valve Grinding Machine for Conical Seats in its original shipping box.

4.1.2 Long-term storage

Do the following for long-term storage (longer than three months):

1. Follow the short-term storage instructions, but use LPS-3 instead of LPS-2.
2. Add a desiccant pouch to the shipping container. Replace according to manufacturer instructions.
3. Store the shipping container in an environment out of direct sunlight with temperature < 70ºF (21ºC) and humidity < 50%.

4.2 SHIPPING

The Globe Valve Grinding Machine for Conical Seats can be shipped in its original shipping container.

4.3 DECOMMISSIONING

To decommission the Globe Valve Grinding Machine for Conical Seats prior to disposal, remove the drive assembly from the RDU and dispose of the drive assembly separately from the rest of the machine components.


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