

# HURCO®



## GETTING STARTED

with Your VM Series Machining Center

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# INSTALLATION CHECKLIST

Use this checklist as a guide to properly prepare your Hurco machine for final installation:

## Task

- |  |        |
|--|--------|
| <input type="checkbox"/> Ensure the foundation and floor are capable of supporting the machine's weight. . . . .                     | 1 - 2  |
| <input type="checkbox"/> Ensure there is a clear route from the loading dock to the machine location.. . . .                         | 1 - 5  |
| <input type="checkbox"/> Ensure there is adequate space for machine door clearances.. . . .  | 1 - 6  |
| <input type="checkbox"/> Ensure there is appropriate power availability and the voltage requirements are met. . . . .                | 1 - 8  |
| <input type="checkbox"/> Ensure adequate service fusing is available. . . . .  | 1 - 9  |
| <input type="checkbox"/> Ensure transformer requirements are met.. . . .   | 1 - 10 |
| <input type="checkbox"/> Ensure compressed air is available. . . . .   | 1 - 11 |
| <input type="checkbox"/> Ensure operating temperature requirements are met. . . . .  | 1 - 12 |
| <br>   |        |
| <input type="checkbox"/> Inspect the machine for damage. . . . .   | 2 - 2  |
| <input type="checkbox"/> Unload the machine. . . . .   | 2 - 3  |
| <input type="checkbox"/> Ensure an appropriate forklift or crane is available. . . . .   | 2 - 3  |
| <input type="checkbox"/> Position the machine onto the foundation. . . . .   | 2 - 6  |
| <input type="checkbox"/> Rough-level the machine.. . . .   | 2 - 9  |
| <br>   |        |
| <input type="checkbox"/> Review the pre-installation requirements. . . . .   | 3 - 2  |
| <input type="checkbox"/> Schedule an appointment for a Hurco-certified Service Engineer to prepare the machine for start-up. . . . . | 3 - 2  |
| <input type="checkbox"/> Attend a Hurco Training class for machine operators. . . . .  | 3 - 3  |



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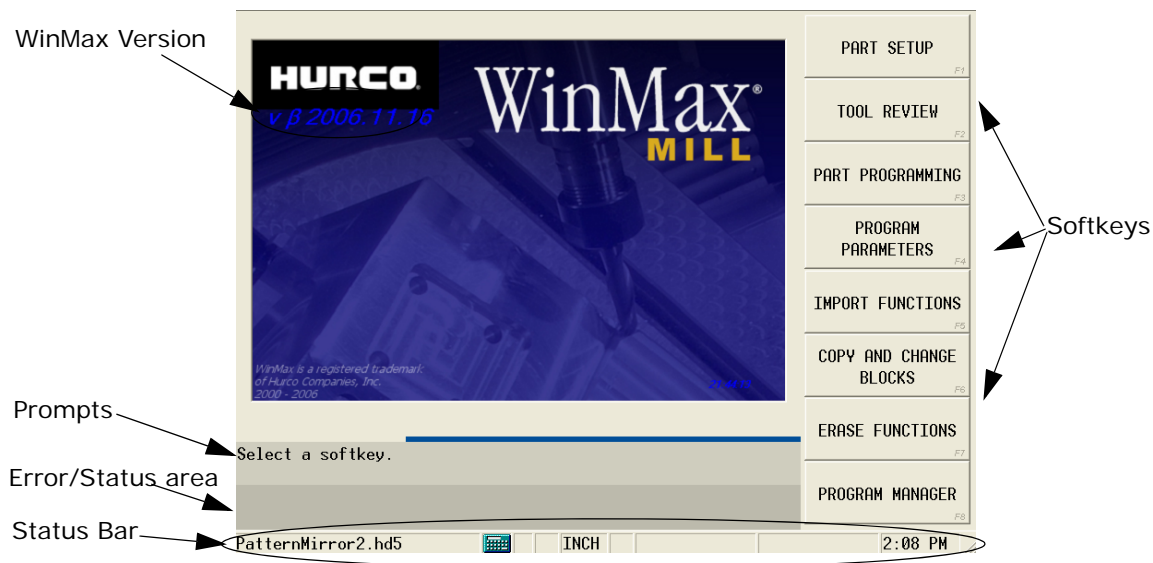
# USING THIS MANUAL

This documentation uses several conventions to explain the safety features and emphasize key concepts. These conventions are described in this section.

Additional information is available on the machine's Documentation CD.

## Sample Screens

Sample screens in this documentation were taken from a WinMax Mill single-screen control. All screens are subject to change. The screens on your system may vary slightly. The sample screen here illustrates softkeys and includes a software version.



## Softkeys

Softkeys are located on the side of the screen. You can set the softkeys to appear on either the right or left side of the screen. Refer to the *Getting Started with WinMax Mill* for information about making this selection. Softkeys may change upon field entries or other softkey selection. References to softkeys in the documentation appear with the softkey's corresponding F-key. For example, the Part Setup softkey from the Input screen above is referenced as the PART SETUP F1 softkey.

## Screen Areas

The screens are divided into the following areas, in addition to the row of softkeys:

### Data Entry

The data entry area is located on the opposite side of the screen from the softkeys.

Available softkeys may change even when the text and data entry area does not.

Fields in the data entry area display or receive information. Refer to *Using the Touch Screen*, on page ix for information on entering information in fields.

## Prompts and Error/Status Area

The bottom portion of the screen is reserved for prompts, program status and error messages.

Prompts provide help on data entry selections based on the field with the blinking cursor.

Errors and status messages occur anytime the status or error occurs. They are not based on the field with the blinking cursor. These messages provide machine information to the operator.

Error messages may also stop and/or prevent machine operation until the cause of the error is corrected.

## Status Bar

The status bar contains

- The name of the open, selected program.
- A calculator icon—select the icon to display a working, on-screen calculator.
- Units of measure (Inch or Millimeters)—select the units of measure in the status bar to toggle between Inch and Metric.
- Programming mode (R for Radius; D for Diameter)—select the programming mode in the status bar to toggle between Radius and Diameter.
- A yellow icon—indicates the feed hold is on when visible.
- A red icon—indicates the Emergency Stop button has been pressed when visible.
- A keyboard icon—select the icon to display a working on-screen keyboard.
- The current time.

When viewed on a single-screen console, all icons appear in the same status bar; when viewed on a dual-screen console, the program name and calculator icon appear on the left screen status bar, and the unit of measure, keyboard icon and time appear on the right screen status bar.

## Console Buttons and Keys

References to console buttons and keys appear in bold text throughout the documentation. For example, the Start Cycle button appears as the **Start Cycle** button and the Manual key appears as the **Manual** console key in text.

Refer to the *Getting Started with Your WinMax Mill* for information about console buttons and keys, in addition to other information about using softkeys and the pop-up text entry window.



## Using the Touch Screen

The console has a touch screen for entering programming data. To make a selection, tap the screen on a softkey, field, or drop-down list using the stylus attached to the side of the console or another suitable pointing device.

## Printing

To print part or all of this manual from the CD, select **File/Print**. Be sure to review the **Print Range** selections and make the appropriate choice for pages. Select **Properties/Paper/Quality** and adjust the **Tray Selection/Paper Source** if necessary.

Printing to a Post Script printer provides the best results.

## Icons

This manual may contain the following icons:

### Caution/Warning



The operator may be injured and the machine severely damaged if the described procedure is not followed.

### Hints and Tricks



Useful suggestions that show creative uses of the WinMax features.

### Important



Ensures proper operation of the machine and control.

### Troubleshooting



Steps that can be taken to solve potential problems.

### Where can we go from here?



Lists several possible options the operator can take.

### Table of Contents



To assist with onscreen viewing, this icon is located on the cover page. Click the icon to access the Table of Contents (TOC).

You can also access many of the same TOC entries from the Adobe Reader bookmarks located on the left side of the PDF page.

## Using the On-screen Help

On-screen Help provides information about using WinMax. The Help is context-sensitive to the screen level. Press the console Help button to display the Help topic for the current screen. The following list describes Help functions:

- Buttons in the upper left-hand corner of the Help screen are used to move through Help topics and print screens.
  - Use the **Hide** button to hide the navigation pane.
  - Use the **Back** button to return to the previous Help screen.
  - Use the **Print** button to print the current displayed Help topic, if a printer is attached and configured. See [Accessing the On-screen Help in PDF format](#) for more information about printing.
- Use the arrow buttons to move between pages within a Help topic and to move through topics.
- Use the **Contents** tab for a list of information sorted by subject:
  1. Select the "+" to expand the topic and view sub-topics.
  2. Select the topic to display it.
- Use the **Index** tab to show the Help index:
  1. Quickly scroll to an index topic by typing the topic in the box at the top of the index.
  2. Select a topic and the Display button to view the topic.
- Use the **Search** tab to search the Help for a word or phrase:
  1. Type the search word(s) into the text box at the top of the pane.
  2. Select the List Topics button. A list of topics that contain the search word(s) is displayed.
  3. Select a topic and the Display button to view that topic.
- Use the **Favorites** tab to save Help topics for quick access:
  1. Select the Add button at the bottom of the pane to add the current topic.
  2. Select a topic from the Favorites list, and select the Display button to view it.

Select a topic from the Favorites list, and select the Remove button to remove it from the list.

## Accessing the On-screen Help in PDF format

The WinMax On-screen Help is also provided in PDF format for easy printing. The information contained in the PDF files is identical to the on-screen Help. The PDF files may be copied to a floppy disk or USB memory device to be transferred to a PC for viewing or printing. Here are the steps to access the PDF files:

1. From the Input screen, select the PROGRAM MANAGER *F8* softkey.
2. Select the DISK OPERATIONS *F7* softkey.
3. In the left-hand pane, navigate through the folders:
  - For WinMax Mill on a machine, the path is D:\Hurco\Winmax Mill\hlp.
  - For WinMax Desktop on a PC, the path is C:\Program Files\Winmax Mill\hlp.

The PDF files will appear in the right-hand pane.



The SHOW ALL FILE TYPES field in User Interface Settings must be set to YES (default is NO) in order to see the PDF files in the directory. Access the SHOW ALL FILE TYPES field in Auxiliary Mode, Utilities/ User Preferences/ User Interface Settings.

4. Highlight the PDF file(s) in the right-hand pane, and select the COPY *F2* softkey.
5. Ensure that your media is loaded (either a floppy disk in the disk drive or a USB memory device in the USB port), and navigate to the proper location in the left-hand pane of the DISK OPERATIONS screen (either the floppy drive A: or the USB port E:). Highlight the desired location.
6. Place the cursor in the right-hand pane and select the PASTE *F3* softkey to paste the PDF file(s) to the desired location.

You may now remove your media and load the PDF file(s) onto a PC for viewing and printing.



# SITE PREPARATION

The following topics are covered in this section:

- Preparing the Site . . . . . 1 - 2
- Foundation Supporting the Machine . . . . . 1 - 2
- Machine Weight . . . . . 1 - 3
- Machine Dimensions . . . . . 1 - 4
- Electrical Service Requirements . . . . . 1 - 8
- Compressed Air Requirements . . . . . 1 - 11
- Recommended Operating Temperature . . . . . 1 - 12
- Tool Retention Knobs . . . . . 1 - 12

## Preparing the Site

To avoid problems when the equipment arrives for installation, Hurco recommends that the site be prepared. Specific site preparation information is provided in this manual.

Review the following:

- Capacity of the floor to support machine weight.
  - Capacity of forklift or crane.
  - Overhead and door clearances.
  - Plant obstructions on the way to machine location.
  - Code requirements for utility services.
  - Space to allow efficient operation, considering full axes travel and future servicing access requirements.
  - Use of internal personnel for management of installation.
  - Proximity of compressed air and proper electrical service.
- ⇒ Additional information about the coolant system and its component parts may be found in the *Maintenance and Safety Manual*.

## Foundation Supporting the Machine

- ☐ Ensure the foundation and floor are capable of supporting the machine's weight.

The foundation must be able to support the weight of the machine, and should be constructed of continuous concrete (reinforced is best). The thickness and consistency of the concrete must be compatible with industry standards for supporting machine weight. Actual requirements will depend upon the physical properties of underlying soil. A local civil engineer should be consulted if soil conditions are questionable.

## Machine Weight

Approximate weights for the specified machines appear below, in metric and English measurements. Shipping weights include the shipping pallet, cover, and packaging.

Machine Model	Shipping Weight	Operating Weight
VM1	3018 kg	2818 kg
VM1G	3120 kg	2920 kg
VM1P	3300 kg	3100 kg
VM2	4400 kg	4100 kg
VM3	4545 kg	4245 kg
VM10	3018 kg	2818 kg
VM10G	3400 kg	3100 kg
VM10P	3300 kg	3100 kg
VM10U	3177 kg	2977 kg
VM20	4400 kg	4100 kg
VM30	4545 kg	4245 kg

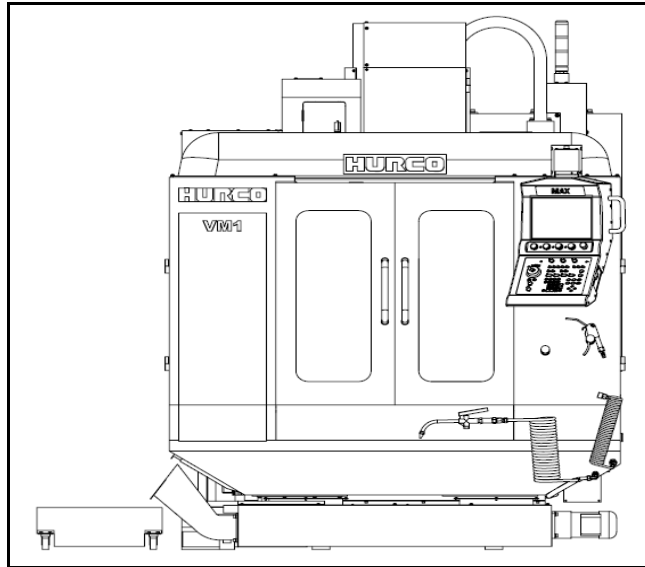
**Table 1–1. VM Machine Shipping & Operating Weights, Metric**

Machine Model	Shipping Weight	Operating Weight
VM1	6640 lb	6200 lb
VM1G	6875 lb	6435 lb
VM1P	7260 lb	6820 lb
VM2	9700 lb	9039 lb
VM3	10000 lb	9339 lb
VM10	6640 lb	6200 lb
VM10G	7480 lb	6825 lb
VM10P	7260 lb	6820 lb
VM10U	6990 lb	6550 lb
VM20	9700 lb	9039 lb
VM30	10000 lb	9339 lb

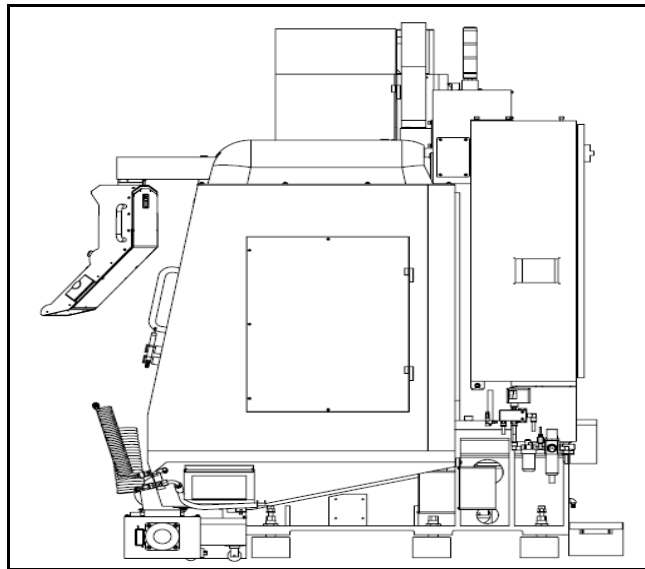
**Table 1–2. VM Machine Shipping & Operating Weights, English**

## Machine Dimensions

The following figures are a guide to the dimension tables that follow. The machine pictured below does not represent a specific model. Use these tables, in metric and English measurements, and the illustrations as a guide for shipping, operating, and servicing dimensions. All dimensions are approximate.



*Figure 1-1. VM Machining Center—Front View*



*Figure 1-2. VM Machining Center—Side View*



## Shipping Dimensions

These dimensions are with the machine under its shipping cover and on its shipping pallet. The Z axis is retracted fully down.

☐ Ensure there is a clear route from the loading dock to the machine location.



When moving a machine, be sure to allow adequate space for maneuvering. If door and ceiling clearances appear to be close to approximate machine dimensions, measure the machine first before attempting to move it.

Machine Model	Shipping Dimensions		
	Width	Depth	Height
VM1	1960 mm	2300 mm	2425 mm
VM1G	1960 mm	2300 mm	2425 mm
VM1P	1960 mm	2300 mm	2425 mm
VM2	2950 mm	2300 mm	2425 mm
VM3	2950 mm	2300 mm	2450 mm
VM10	1960 mm	2300 mm	2425 mm
VM10G	1960 mm	2300 mm	2425 mm
VM10P	1960 mm	2300 mm	2425 mm
VM10U	1960 mm	2300 mm	2425 mm
VM20	2950 mm	2300 mm	2426 mm
VM30	2950 mm	2300 mm	2450 mm

**Table 1-3. VM Approximate Shipping Dimensions, Metric**

Machine Model	Shipping Dimensions		
	Width	Depth	Height
VM1	77.2 in	90.5 in	95.5 in
VM1G	77.2 in	90.5 in	95.5 in
VM1P	77.2 in	90.5 in	95.5 in
VM2	116.1 in	90.5 in	95.5 in
VM3	116.1 in	90.5 in	96.5 in
VM10	77.2 in	90.5 in	95.5 in
VM10G	77.2 in	90.5 in	95.5 in
VM10P	77.2 in	90.5 in	95.5 in
VM10U	77.2 in	90.5 in	95.5 in
VM20	116.1 in	90.5 in	95.5 in
VM30	116.1 in	90.5 in	96.5 in

**Table 1-4. VM Approximate Shipping Dimensions, English**

## Operating and Servicing Dimensions

Machine operating and servicing dimensions are listed in the following sections. Allow additional space around the machine for servicing and safe operation. Leave room for removing the coolant tank and the chip conveyor(s), whose dimensions are the approximate maximum machine width

- ☐ Ensure there is adequate space for machine door clearances.

### Machine Operating Dimensions

Machine Operating Dimensions are measured with doors closed and console mounted.

Machine	Height	Width		Depth	
		Enclosure Only	Enclosure Only	With Max Console	With Dual-Screen Console
VM1	2470.0 mm	1800.0 mm	1616.0 mm	2000.0 mm	2463.0 mm
VM1G	2470.0 mm	3295.0 mm	1616.0 mm	2000.0 mm	NA
VM1P	2470.0 mm	1800.0 mm	1616.0 mm	2000.0 mm	NA
VM2	2576.0 mm	2460.0 mm	1800.0 mm	2200.0 mm	2722.0 mm
VM3	2576.0 mm	2830.0 mm	1800.0 mm	2290.0 mm	2722.0 mm
VM10	2470.0 mm	1800.0 mm	1587.5 mm	1938.7 mm	2463.0 mm
VM10G	2470.0 mm	1800.0 mm	1587.5 mm	1938.7 mm	NA
VM10P	2470.0 mm	1800.0 mm	1612.9 mm	1964.1 mm	NA
VM10U	2520.0 mm	1800.0 mm	1616.0 mm	2000.0 mm	2469.0 mm
VM20	2576.0 mm	2460.0 mm	1851.7 mm	2385.1 mm	2722.0 mm
VM30	2576.0 mm	2830.0 mm	1800.0 mm	2290.0 mm	2722.0 mm

**Table 1-5. Operating Dimensions (Enclosure Doors Closed), Metric**

Machine	Height	Width		Depth	
		Enclosure Only	Enclosure Only	With Max Console	With Dual-Screen Console
VM1	97 in	71 in	64 in	79 in	97 in
VM1G	97 in	130 in	64 in	79 in	NA
VM1P	97 in	71 in	64 in	79 in	NA
VM2	102 in	97 in	71 in	87 in	107 in
VM3	102 in	112 in	71 in	90 in	107 in
VM10	97 in	75 in	63 in	76 in	97 in
VM10G	97 in	71 in	63 in	76 in	NA
VM10P	97 in	71 in	64 in	77 in	NA
VM10U	99 in	71 in	64 in	79 in	97 in
VM20	102 in	97 in	73 in	94 in	108 in
VMx30	102 in	112 in	71 in	90 in	107 in

**Table 1-6. Operating Dimensions (Enclosure Doors Closed), English**

## Machine Servicing Dimensions

Machine servicing dimensions are measured with all doors open.

Machine	Width	Depth	
	Enclosure	Enclosure with Max Console	Enclosure with Dual-Screen Console
VM1	2994 mm	2575 mm	3292 mm
VM1G	*3892 mm	2575 mm	NA
VM1P	2994 mm	2575 mm	NA
VM2	3650 mm	2680 mm	3171 mm
VM3	4020 mm	2770 mm	3171 mm
VM10	2994 mm	2487 mm	3043 mm
VM10G	2994 mm	2487 mm	NA
VM10P	2994 mm	2535 mm	NA
VM10U	2994 mm	2575 mm	3044 mm
VM20	3650 mm	2865 mm	3171 mm
VM30	4020 mm	2770 mm	3171 mm

\* with dust collector

**Table 1–7. VM Servicing Dimensions (Enclosure, Cabinet Doors Open), Metric**

Machine	Width	Depth	
	Enclosure	Enclosure with Max Console	Enclosure with Dual-Screen Console
VM1	118 in	101 in	130 in
VM1G	*153 in	101 in	NA
VM1P	118 in	101 in	NA
VM2	144 in	106 in	125 in
VM3	158 in	109 in	125 in
VM10	118 in	98 in	120 in
VM10G	118 in	98 in	NA
VM10P	118 in	100 in	NA
VM10U	118 in	101 in	120 in
VM20	144 in	113 in	125 in
VM30	158 in	109 in	125 in

\* with dust collector

**Table 1–8. VM Servicing Dimensions (Enclosure, Cabinet Doors Open), English**

## Electrical Service Requirements

☐ Ensure there is appropriate power availability and the voltage requirements are met.

Become familiar with the following Electrical Service requirements:

- On-site wiring must comply with all applicable electrical codes.
- Dedicated, grounded 3-phase AC power is required to prevent high/low voltages, spikes, surges, and noise.
- The AC power source must match the voltage specifications on the machine electrical cabinet.
- Wiring to the machine must be capable of supplying continuous specified amperage.
- Failure to provide the required power parameters may affect safety, machine performance, and the warranty.
- A Hurco-certified Service Engineer must supervise final electrical connections to the machining center.



Always disconnect machine power before working with electrical connections.

## Incoming Service KVA Requirements

Full load KVA is provided in the Serial Identification Plate located on your machine. Incoming Service KVA is specified at 125% of the full load KVA. Fuse sizes should be based on the Incoming Service KVA. Use the table and the calculations below to calculate service fusing.

Machine	Spindle Speed (RPM)	Full Load (KVA)	Incoming Service Requirements (KVA)
VM1	8000	13	16
VM1G	20000	14	18
VM1P	12000	22	28
VM2	8000	19	24
VM3	8000	19	24
VM10	10000	14	18
VM10G	20000	15	19
VM10P	12000	22	28
VM10U	10000	22	28
VM20	10000	20	25
VM30	10000	20	25

**Table 1–9. Service KVA Requirements**

## Calculating Service Fusing

- ☐ Ensure adequate service fusing is available.

First, determine your incoming AC Voltage, 3 Phase service.

Use the Service KVA Requirements table to calculate the service fusing for your machine.

For 3-phase power, the equation is  $P_{3\Phi} = \frac{I}{\sqrt{3} \times E}$ .

For example, to calculate the fuse current where incoming service KVA ( $P_{3\Phi}$ ) is 50 KVA and Input Voltage (E) is 230 VAC:

$$I = \frac{P_{3\Phi}}{E \times \sqrt{3}} = \frac{50,000VA}{230V \times 1.732}$$

$$I = \frac{50,000VA}{398V} = 126A$$

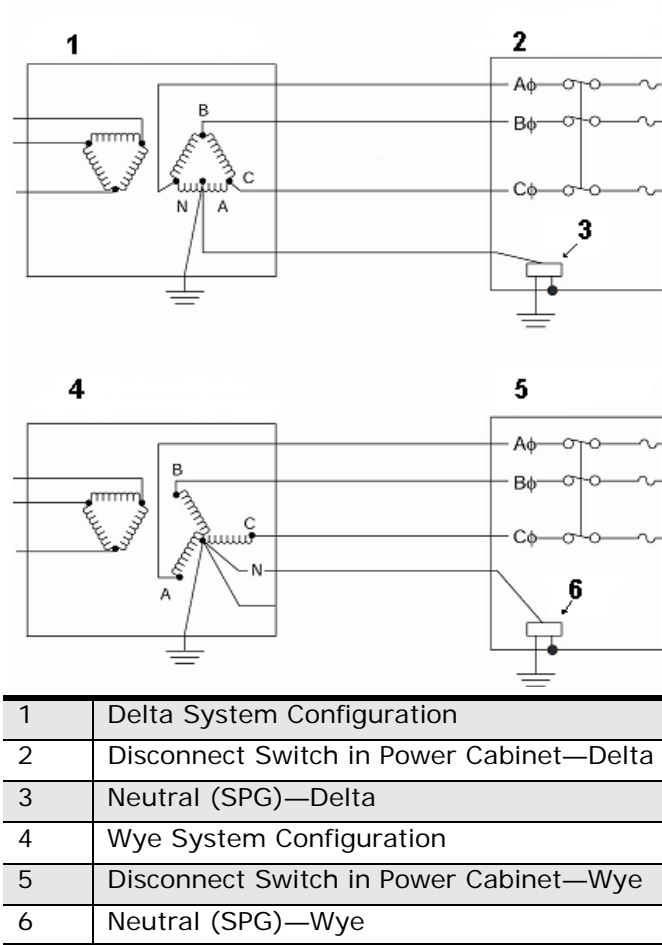


Run an electrical power line of adequate length and gauge to the machine's location to reach the connections in the power cabinet. Final connections must be supervised by a Hurco-certified Service Engineer.

## Recommended Isolation Transformer Configuration

- ☐ Ensure transformer requirements are met.

If a transformer is required and the machine was not equipped with one, the customer is responsible for providing a transformer. Contact your Hurco distributor for details. The transformer must meet Hurco's machine-operating voltage requirements. Use one of the configurations shown in the figure below. Hurco recommends the Wye configuration. It is the customer's responsibility to have a qualified electrician connect the transformer to the power source.



**Figure 1-3. Delta and Wye Transformer Configurations**

## Grounding Equipment

The electrical and electronic control systems of the machining center are interconnected, terminating at the single point ground (SPG) terminal.

- The SPG must be properly connected to the ground circuit of the AC power source. The SPG is located inside the machine power cabinet.
- The SPG provides only one conducting path between the machine and external ground, preventing an unwanted ground loop (ground differential voltage).
- The grounding conductor must be sized to conform to all applicable electrical codes. However, Hurco recommends that the size of the neutral conductor (when applicable) be at least the size of the phase (current carrying) conductors.

## Compressed Air Requirements

- Ensure compressed air is available.

A continuous supply of clean and dry air is essential for proper machine operation, and must be connected to the machine as described here.

Compressed air for use by the machine tool must conform to this specification:

5 CFM at 80 - 100 PSI or 0.14 M<sup>3</sup>/min at 6-8 bar.

- Use a minimum 1/2" (13 mm) diameter (trade size) pipe, or an equivalent 3/4" (19 mm) diameter hose supply line to the machine. This will supply the required air volume.
- Install a drip leg in the line ahead of the FRL unit. The drip leg will help remove the moisture in the air supply, making the filter last longer.
- Do not use quick-coupler type fittings at the connection to the FRL unit or in the supply line to the machine because these fittings restrict the air supply.

## Recommended Operating Temperature

☐ Ensure operating temperature requirements are met.

Hurco machines that are not equipped with the air conditioning option may be operated in ambient temperatures up to 95°F (35°C), and in relative humidity (non-condensing) up to 95%. Set up the machine away from external heat sources, such as direct sunlight and heating vents.

⇒ Linear positioning accuracy of the machine was set at the factory for an ambient temperature of 68°F (20°C). Continual operation at higher or lower temperatures may necessitate adjustment of the leadscrew map.

## Tool Retention Knobs

Caterpillar V-Flange tooling is standard. BT tooling is optional. Hurco recommends using the tool retention knobs listed in the following table.

Spindle Taper	Tooling	Hurco Part Number
VM1 VM2 VM3	CAT 40 V-Flange	802-1860-001 (non-CTS) 802-1860-002 (CTS)
	BT 40	802-1860-006 (non-CTS) 802-1860-004 (CTS)
	DIN	802-1860-010 (non-CTS) 802-1860-011 (CTS)
VM1G	BT 30 (required CAT Retention Knob)	802-1860-009 (non-CTS)
VM1P	Standard V- Flange	802-1860-009 (non-CTS)
VM10 VM20 VM30	CAT 40	802-1860-002 (CTS)
	BT 40	802-1860-004 (CTS)
	DIN	802-1860-010 (non-CTS) 802-1860-011 (CTS)
VM10G	BT 30	802-1860-009
VM10P	BT 30	802-1860-009

**Table 1–10. Recommended Retention Knobs**



# MACHINE ARRIVAL

The following topics are covered in this section:

- Inspecting for Damage Before Unloading . . . . . 2 - 2
- Unloading the Machine . . . . . 2 - 3
- Moving the Machine into Final Position . . . . . 2 - 6
- Leveling the Machine . . . . . 2 - 9

## Inspecting for Damage Before Unloading

- Inspect the machine for damage.

All Hurco equipment passes a quality control inspection before being shipped. However, damage may occur during shipment. Hurco strongly recommends that the machine equipment be inspected for damage before unloading.

- Before unloading the machine from the shipping carrier, or after placing the machine onto its foundation, check whether the shock meter sensor is tripped. If the sensor is tripped in either case, the ball bearings will be dislodged from the spring(s).
- Examine the machining center for structural damage.
- Note any shipping damage to the machine on the shipper's bill of lading. If damage occurs after the machine is placed onto its foundation, the responsibility is that of the machine rigger. It is the customer's responsibility to file a damage claim in either case.
- Photograph any equipment damage for your records.

⇒ Hurco-certified Service personnel can help determine the cost of repairing any damages that occurred during shipment, or during or after placement onto its foundation.

## Unloading the Machine

- Unload the machine.

Unload the undamaged machine from the shipping container, using a forklift that can handle the machine's size and weight.

### Forklift Capacities

- Ensure an appropriate forklift or crane is available.

Make sure the forklift you use to unload the machine is rated to hold the machine weight, and is equipped with fork tines long enough to fully support the machine. Refer to the table in the section titled *Machine Weight*, on page 1 - 3. The table below lists the Fork Tines Length recommendations.

<b>Fork Tines Length</b>	<b>mm</b>	<b>in</b>
VM1	1828	72
VM1G	1828	72
VM1P	1828	72
VM2	2438	96
VM3	2468	96
VM10	1828	72
VM10G	1828	72
VM10P	1828	72
VM10U	1828	72
VM20	2438	96
VM30	2468	96

**Table 2-1. Fork Tines Length Recommendations**



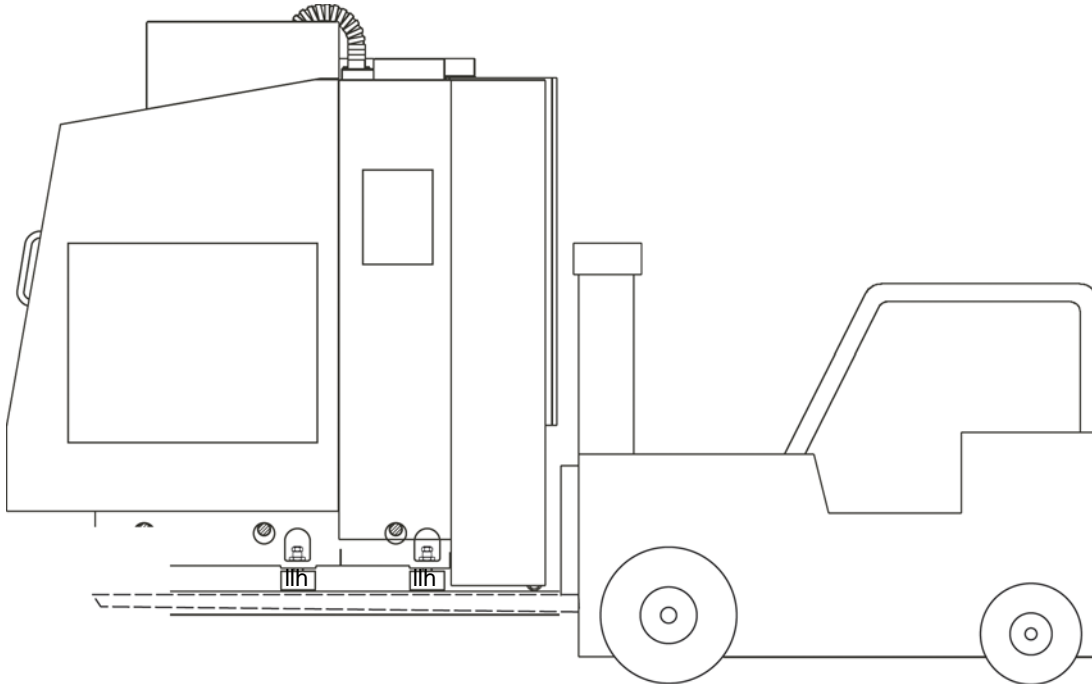
The forklift must be rated to hold the machine weight, and the machine must be correctly positioned on the fork tines before lifting.

Unload the machine and position it as described below. If the recommended method is not workable, use a professional rigger who has experience moving machining centers.

## Unloading the Machine from Shipping Carrier

Follow these steps to unload the machine:

1. Use a forklift at the front or rear of the machine to remove the machine from the shipping pallet.
  - Position the forklift under the heaviest part of the machine. The load center is normally toward the rear, where the column is located.



**Figure 2-1. Forklift and Machine Positioning**

2. Move the machine on its shipping pallet to a location next to the final installation site.
3. Set the machine down, allowing enough space around the machine to later lift it away from the shipping pallet.

4. Unpack the equipment:
  - a. Remove the outer covering and all boxes attached to the pallet.
  - b. Remove the flood coolant tank and all other packaged items from the shipping pallet.
  - c. Remove the nuts and washers that attach the machine to the shipping pallet.
  - d. Remove any options kits, such as the optional chip conveyor, from the shipping pallet.
  - e. If the machine model includes a separate transformer, remove the transformer from the shipping pallet and move it to the rear of the area where the machine will rest.
5. Verify that all equipment has arrived and is unloaded.
6. Use one of the procedures in the next section to lift the machine for final installation.

## Moving the Machine into Final Position

- Position the machine onto the foundation.

After unpacking the equipment, use a forklift or a crane to lift the machine from its shipping pallet for final installation. Inventory your shipment after it is placed next to the final installation site.

- ⇒ Do not remove the orange shipping supports inside the enclosure. If you discover any damage, contact your Hurco representative and the freight company immediately.
- ⇒ Do not remove the dual-screen console shipping bracket from its box. The console will be unpacked and installed by the Hurco-certified Service Engineer.

## Lifting the Machine

VM and VMX series machines may be lifted using a forklift or an overhead crane or hoist. You may position the forklift at the front, rear, or tool changer side of the machine.

### Using Forklift at Front or ATC Side of a VM or VMX Machine



The forklift must be rated to hold the machine's weight. For the weight of Hurco machines, refer to the table in the section titled *Machine Weight*, on page 1 - 3.

Follow these steps to lift a VMX series machine from the front or ATC side:

1. Guide the forklift tines under the machine base or machine base casting. For the VMX64 machine, guide the forklift tines into the channels in the machine base.
2. Keep adequate clearance between the machine and the front of the forklift by placing wedge blocks on top of the forks.

## Using Forklift at Rear of a VM or VMX Machine

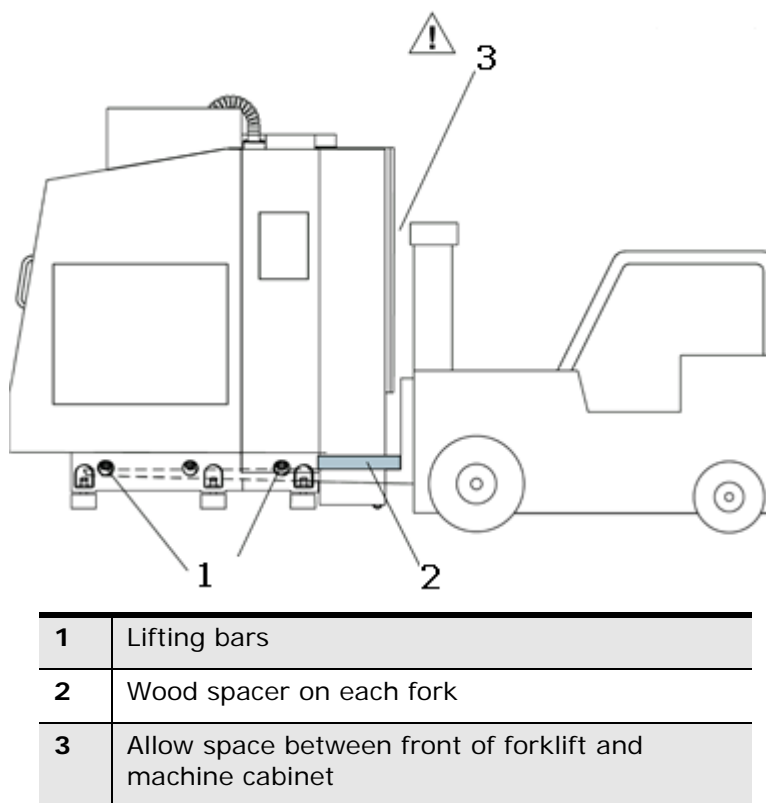
Use solid steel lifting bars when forklifting a machine from the rear. Lifting bars must be long enough to span the machine frame, and capable of supporting the machine without bending.

⇒ Because the power cabinet is located at the rear of the machine, longer fork tines are required when forklifting at the rear of the machine.

Contact a professional rigger to determine the necessary fork tine length.

Follow these steps to lift a machine from the rear:

1. Use the existing holes in each side of the machine base to insert the solid steel lifting bars. The lifting bars can also be inserted into the holes toward the rear of the machine that are used to route coolant hoses. Re-route the coolant hoses temporarily to move them out of the way. After the machine is set in place, return the coolant hoses through the holes as originally routed.
2. Insert a solid steel lifting bar into each outermost hole as indicated in the following figure.



**Figure 2-2. Lifting a VM or VMX Machine from Rear**

3. Feed each lifting bar under the machine and through the hole on the opposite side of the machine base. Some machines can also be lifted from the front using solid steel lifting bars.
4. Carefully guide the forklift tines under both lifting bars until the tines have passed well beyond the farthest bar.
5. Place wedge blocks on top of the forklift tines to maintain a clearance between the machine and the forklift.

## Using a Crane to Lift a VM or VMX Machine

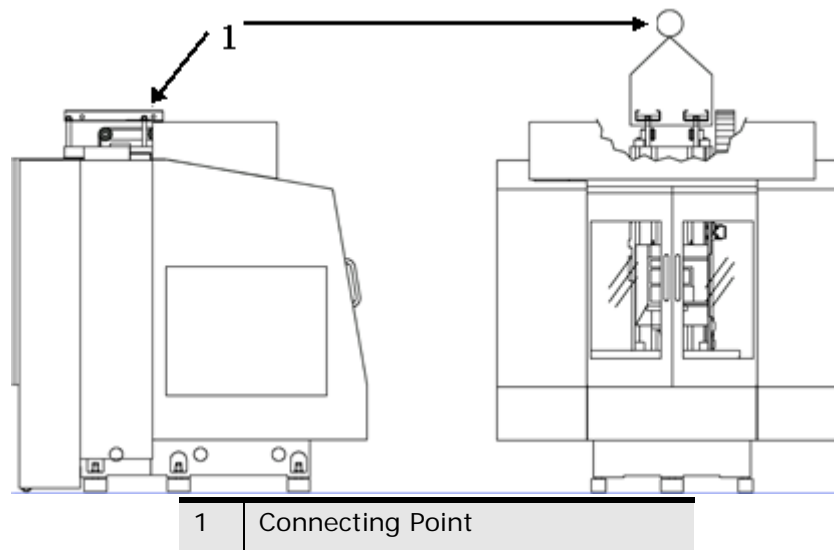
- ⇒ These steps apply for all VM and VMX series machines except the VMX64 and VMX84 series.
- ⇒ A special lifting bracket is required when using a crane. This bracket may have been included during shipment. If not, contact your full service dealer or Hurco to obtain the lifting bracket.



The crane or hoist must be rated to hold the machine weight.

Follow these steps to lift a machine using a crane or hoist:

1. Secure the lifting bracket to the top of the machine.
2. Attach the crane to the machine at the connecting point indicated below.



**Figure 2–3. Lifting a VM or VMX Machine with a Crane**



## Lowering the Machine onto its Foundation

After lifting the machine from its shipping pallet, position the machine over the spot where the machine is to be installed.

1. Lower the machine to within 150 to 250 mm (6 to 10 inches) of the floor. Do not set the machine down.
2. Position the foot pads directly beneath the leveling bolts.



All leveling bolts—including the center ones—must be used in rough leveling to evenly support the machine.

3. Lower the machine slowly onto the footpads.
4. Adjust the leveling bolts to half travel.
5. Lower the machine onto the footpads.
6. Torque all bolts evenly.

Rough-level the machine.

Rough-level the machine following these guidelines:

1. Adjust the leveling bolts to rough level the machine.
2. Once the machine is resting on all foot pads, remove the forklift (or crane).
3. Do not remove the shipping support from beneath the Automatic Tool Changer or the machine head.

## Leveling the Machine

Once the machine is rough leveled, contact your full service distributor or Hurco to have a Hurco-certified Service Engineer visit and finish the leveling. Place the flood coolant tank, tubing, and pump motor near the machine base for installation by a Hurco-certified Service Engineer.

After the service engineer has leveled the machine, it is the customer's responsibility to check and maintain this level (using the initial leveling specifications obtained at installation). Check machine level each month for the first six months after installation, and then once every six months.



# START-UP PREPARATION

The following topics are covered in this section:

Pre-Installation Requirements . . . . . 3 - 2  
Service Visit . . . . . 3 - 3  
Programming Training . . . . . 3 - 3

## Pre-Installation Requirements

- Review the pre-installation requirements.

After you have completed the following requirements, contact your full service distributor or Hurco's customer service department. When you call, give the date that you completed pre-installation, and your machine serial number (stamped on the data plate attached to the electrical cabinet door).

- All machine equipment is located at the final installation site.
- Machine positioned for installation, on a suitable foundation that will bear its weight.
- Machine rough-leveled.
- Utilities made available.
- All lubrication levels checked.
- Flood coolant tank, tubing, and coolant pump motor placed near the machine base.

A Hurco-certified Service Engineer will visit your site and prepare the machine for start-up.

The customer agrees to furnish, at no charge to Hurco, the materials and personnel necessary to assist the Hurco-certified Service Engineer in testing and inspecting the machine.

⇒ It is the customer's responsibility to provide tooling, coolant, and appropriate lubrication and hydraulic fluid.

- Schedule an appointment for a Hurco-certified Service Engineer to prepare the machine for start-up.

## Service Visit

The Hurco-certified Service Engineer performs these tasks:

1. Inspects the machine level and makes required adjustments.
2. Checks and connects electrical service to the machine.
3. Installs the control console.
4. Measures voltages in the electrical cabinet and the control enclosure, and makes adjustments, if needed.
5. Installs the flood coolant tank and coolant pump motor.
6. Installs covers and enclosures.



After the shipping brackets have been removed, the way covers need to be fastened to the table, saddle, and head. Then, manually jog the machine and verify that the way covers are properly aligned and fastened.

7. Checks fans and pumps for proper operation.
8. Checks all axes for calibration and correct limit switch operation.
9. Tests all options installed.

## Programming Training

- Attend a Hurco Training class for machine operators.

Learn how to create part programs in minutes on the easy-to-use control.

Hurco offers hands-on training classes to demonstrate the powerful programming capabilities of its controls. Every customer will gain an advantage by attending training classes.

For additional information, or to register for a Training class, contact your local Hurco office or distributor, or go to Hurco's website at [www.hurco.com](http://www.hurco.com).



# MACHINE AND SOFTWARE OPTIONS

The following options are described in this section:

UltiPocket Option . . . . .	4	-	2
UltiDraw DXF . . . . .	4	-	2
3D Part Programming Option . . . . .	4	-	2
Conversational Rotary Option. . . . .	4	-	2
UltiNet Option . . . . .	4	-	3
Cutter Inserts Option . . . . .	4	-	3
Probing Option . . . . .	4	-	3
ISNC Option. . . . .	4	-	4
NCPP Option . . . . .	4	-	4
Helical Plunge Option . . . . .	4	-	4

## UltiPocket Option

The UltiPocket programming option adds special milling routines for machining pocket boundaries with islands. This option provides complete clean-out of odd-shaped pockets, leaving islands untouched. Automatic software calculation eliminates the arduous task of plotting tool paths around an unlimited number of islands. Rotate, scale, and repeat islands for even more part programming flexibility.

## UltiDraw DXF

The UltiDraw Data Exchange Format (DXF) File option allows you to convert an AutoCAD® DXF file into a conversational data block. Use WinMax to add part and tool setup information to complete the part program.

## 3D Part Programming Option

The WinMax 3D part programming option creates three-dimensional (3D) parts from two-dimensional (2D) open contours. Define the surface as a 2D profile in either the X-Y or X-Z plane. The 2D profile is then repeated along a straight line (translated), or around a centerline (revolved), to produce the final 3D shape.

## Conversational Rotary Option

The WinMax Conversational Rotary option provides four and five-axis machining for complex multi-sided, curved, odd-shaped, and cylindrical parts. The ability to machine complex parts with a single setup increases productivity and minimizes incorrect part alignment.

Rotary axis tables with a Tilt feature may also be installed on some Hurco machining centers. The rotary/tilt feature helps maintain accuracy and uniformity when drilling angle holes around a cylinder. It is also effective for tall work pieces.



## UltiNet Option

The UltiNet option expands your WinMax operation by providing connection to a Local Area Network (LAN). Use UltiNet to communicate with other CNCs, PCs, or file servers, using standard TCP/IP and FTP protocols. With UltiNet, 10 megabyte files can be transferred in less than 40 seconds.

## Cutter Inserts Option

The Cutter Inserts option is used by cutter insert manufacturers to mill pockets in triangular, diamond and hexagon shapes. WinMax part programming is sophisticated, yet simple -- it allows a Cutter Insert routine to be created in one data block.

## Probing Option

With the WinMax Probing option, you can probe parts and tools within a Conversational part program. Purchase either the Part Probing package, or Part and Tool Probing package. Each probing package requires both software and equipment to function.

The Part Probing package allows you to create Conversational data blocks for hands-free part positioning and inspection. Probe a part in either Manual or Auto mode during part programming. With Part Probing:

- Find part location more precisely.
- Use Skew Probing to align the machine with the part, instead of aligning the part with the machine – ideal for irregularly-shaped parts or parts misaligned on the table surface.
- Inspect work piece geometry while the part is fixtured on the machining center table.
- Export date and time stamped part programs as text or spreadsheet files.

The WinMax Tool Probing package allows you to accurately measure tools with your stylus touch or laser probe. The tool probe can be operated manually or automatically within Conversational part programming to:

- Precisely measure tool length and diameter.
- Monitor tools for wear and breakage.
- Set up a “spare” tool to automatically replace a worn or broken tool during the machining process.

## ISNC Option

Industry Standard Numerical Control (ISNC) option available for WinMax supports the most popular and widely accepted language protocol. The ISNC option provides a Fanuc® level of M and G code compatibility.

## NCPP Option

The Numerical Control Productivity Package (NCPP) option provides features that enhance productivity and aid in producing smaller, more powerful, and easier to maintain NC programs. NCPP features include variables, subprogram calls, macros, user-defined codes, mathematical equations, and address expressions. The NCPP option requires the ISNC option to operate.

## Helical Plunge Option

With the additional Helical Ramp Entry Conversational programming capabilities, a helical ramp entry plunge can be selected as an alternative machining strategy to the standard straight Z-axis plunge. Straight or helical ramp plunges can be used for separate rough and finish passes. Helical Plunge significantly reduces machining cycle time by using higher feedrates in the X- and Y-axes, while plunging slowly in the Z-axis.

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# RECORD OF CHANGES

704-0212-107, VM Series Getting Started, March 2009, ECN 16535

Revised by: K.Gross

Approved by: P. Baechle, D. Skrzypczak, March 2009

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## Changes

- Added information for VM10, VM20, and VM30 machines, per revised technical specifications:

VM10 757-4002-425, Rev E  
VM10G 757-4002-356, Rev G  
VM10P 757-4002-497, Rev E  
VM20 757-4002-426, Rev E  
VM30 757-4002-427, Rev E

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704-0212-106, VM Series Getting Started, October 2008, ECN 16541

Revised by: K.Gross

Approved by: P. Baechle, D. Ornelas, D. Skrzypczak, October 2008

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## Changes

- Added information for VM1, VM2, and VM3 machines, per technical specifications:

VM10 757-4002-425, Rev D  
VM10G 757-4002-356, Rev F  
VM10P 757-4002-497, Rev D  
VM10U 757-4002-507, Rev A  
VM20 757-4002-426, Rev D  
VM30 757-4002-427, Rev D

704-0212-105, VM Series Getting Started, January 2008, ECN 16292

Revised by: K.Gross

Approved by: P. Baechle, D. Ornelas, D. Skrzypczak, December 2007

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## Changes

- Added information for VM1P machine, per technical specification 757-4002-497, Rev B.
- Updated information for VM1, VM2, and VM3 machines, per technical specifications:

VM1—757-4002-425, Rev C  
VM1—757-4002-313, Rev D  
VM1G—757-4002-356, Rev D  
VM1P—757-4002-497, Rev B  
VM2—757-4002-426, Rev B  
VM2—757-4002-338, Rev D  
VM3—757-4002-427, Rev B  
VM3—757-4002-357, Rev D

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704-0212-104, VM Series Getting Started, August 2007, ECN 16292

Revised by: M. Baechle

Approved by: P. Baechle, D. Ornelas, and S. Kays, July 2007.  
D. Skrzypczak, August, 2007

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## Changes

- Updated information for VM1, VM2, and VM3 machines, per technical specifications:

VM1—757-4002-425, Rev B  
VM2—757-4002-426, Rev B  
VM3—757-4002-427, Rev B

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704-0212-103, VM Series Getting Started, 6/29/05, ECN 15925

Revised by: L. Hart

Approved by: P. Baechle, D. Ornelas, D. Skrzypczak, July 2005

---

## Changes

- Updated VM1 and VM2 information per technical specifications:

VM1—757-4002-313, Rev C  
VM2—757-4002-338 Rev C

- Added VM3 and VM1G information per technical specifications:

VM3—757-4002-357, Rev B  
VM1G—757-4002-356, Rev C

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