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## Getting Started with Your VMX Machining Center

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# Using This Manual

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## Standard Text Icons

This manual may contain the following icons:



### Caution

The machine may be damaged, or a part ruined, if the described procedure is not followed.



### Hints and Tricks

Useful suggestions that show creative uses of the Ultimax features.



### Important

Ensures proper operation of the machine and control.



### Troubleshooting

Steps that can be taken to solve potential problems.



### Warning

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



### Where can we go from here?

Lists several possible options the operator can take.

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# Site Preparation

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## 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 the machine's weight
- Capacity of forklift or crane
- Use of internal personnel or professional riggers
- Overhead and door clearances
- Plant obstructions on the way to machine location
- Proximity of compressed air and electrical power with a separate disconnect
- Code requirements for utility services
- Space to allow efficient operation, considering full axes travel and future servicing access requirements

## Foundation Supporting the Machine

The foundation must be able to support the weight of the machine tool, 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 the machine's 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 VMX series machines appear below. Shipping weights include the shipping pallet, cover and packaging.

Weight	VMX Machine							
	24		24S		30		42	
	<i>kg</i>	<i>lb.</i>	<i>kg</i>	<i>lb.</i>	<i>kg</i>	<i>lb.</i>	<i>kg</i>	<i>lb.</i>
Shipping	4640	10200	4640	10200	4700	10360	6800	14960
Operating	4200	9260	4200	9260	4450	9810	6400	14080

Weight	VMX Machine					
	50/50S		50/50T		64 40-Taper 50-Taper	
	<i>kg</i>	<i>lb.</i>	<i>kg</i>	<i>lb.</i>	<i>kg</i>	<i>lb.</i>
Shipping	9000	19850	9415	20750	16670	36750
Operating	8700	19200	9120	20100	14510	32000

*Table 1 - 1. Approximate Machine Weights*

## Machine Size

Use the following tables and illustrations as a guide. All dimensions are approximate.

### Shipping Dimensions

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

Shipping Dimension	VMX Machine							
	24		24S		30		42	
	<i>mm</i>	<i>in.</i>	<i>mm</i>	<i>in.</i>	<i>mm</i>	<i>in.</i>	<i>mm</i>	<i>in.</i>
Width	2300	90.6	2300	90.6	2300	90.6	2950	116
Depth	2950	116.1	2950	116.1	2950	116.1	2300	90.6
Height	2540	100	2540	100	2540	100	2535	99.8

Shipping Dimension	VMX Machine					
	50/50S		50/50T		64 40-Taper 50-Taper	
	<i>mm</i>	<i>in.</i>	<i>mm</i>	<i>in.</i>	<i>mm</i>	<i>in.</i>
Width	3245	127.75	3250	128	4448	175.12
Depth	2250	88.6	2260	89	2769	109
Height	2410	94.88	2700	106.3	3260	128.4

*Table 1 - 2. Approximate Shipping Dimensions*



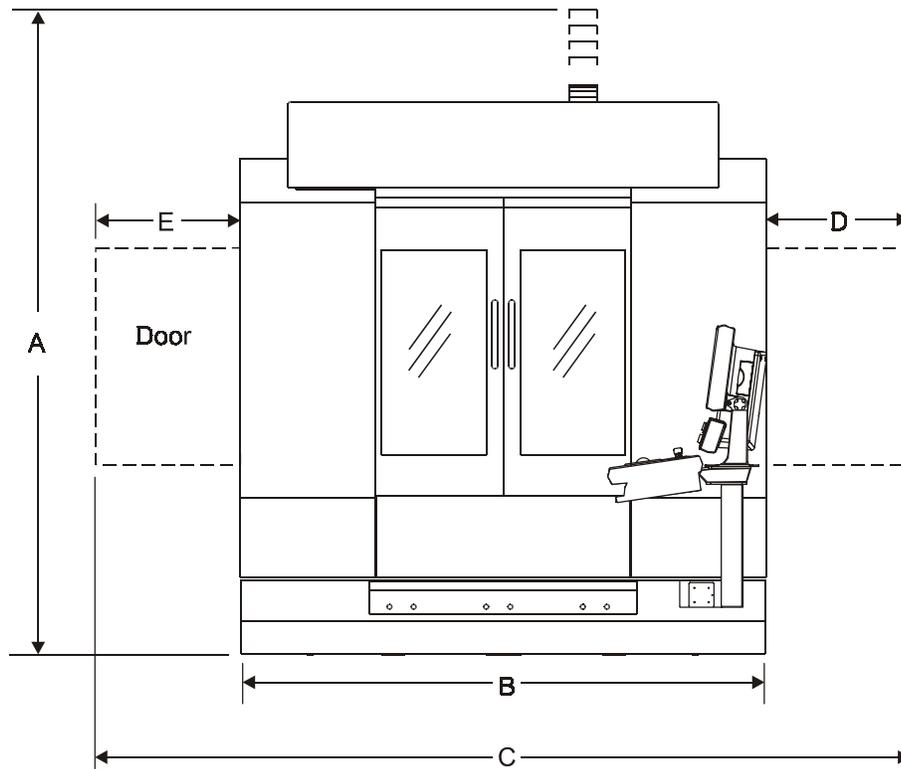
### Important

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 moving it.

## Operating Dimensions

Machine “operating” dimensions are with the enclosure and electrical cabinet doors open, the Z axis fully up, and the console swung out.

The following drawings show the approximate minimum space that each machine occupies. Allow additional space around the machine for servicing and safe operation. The machine pictured below does not represent any specific model.



*Figure 1 - 1. VMX Machining Center – Front View (shown with Ultimex 4 console)*

VMX Machine									
Dimension	24		24S		30		42		Comment (All Models)
	mm	in.	mm	in.	mm	in.	mm	in.	
A	276 9	109	276 9	109	280 0	110.2	268 0	105.6	Height
B	218 0	85.9	218 0	85.9	218 0	85.9	280 0	110.3	Enclosure width (side doors closed)
C	380 6	149.8	380 6	148.8	366 8	144.4	463 2	182.5	Maximum width (side doors open)
D	997	39.25	997	39.25	857	33.7	105	41.6	Right side door
	x 817	x 32.2	x 817	x 32.2	x 817	x 32.2	7 x 871	x 34.3	
E	627	24.7	627	24.7	627	24.7	697	27.4	Left (ATC) door
	x 797	x 31.4	x 797	x 31.4	x 797	x 31.4	x 871	x 34.3	

VMX Machine							
Dimension	50/50S		50/50T		64 40-Taper and 50-Taper		Comment (All Models)
	mm	in.	mm	in.	mm	in.	
A	2950	116	3000	118	3260	128.4	Height
B	3450	136	4875	192	3938	155	Enclosure width (side doors closed)
C	4786	188.4	4850	191	6338	249.5	Maximum width (side doors open)
D	685 x	27 x	800 x	31.5 x	1197 x	47.1 x	Right side door
	1047	41.2	1100	43.3	1296	51	
E	685 x	27 x	800 x	31.5 x	1197 x	47.1 x	Left (ATC) door
	1047	41.2	1100	43.3	1296	51.1	

**Table1 - 3. Width and Height Dimensions**

**Note**

The approximate maximum width (dimension C) for the VMX50, VMX50S and VMX50/50T includes a chip conveyor.

Depth dimensions for VMX series machines are shown below.

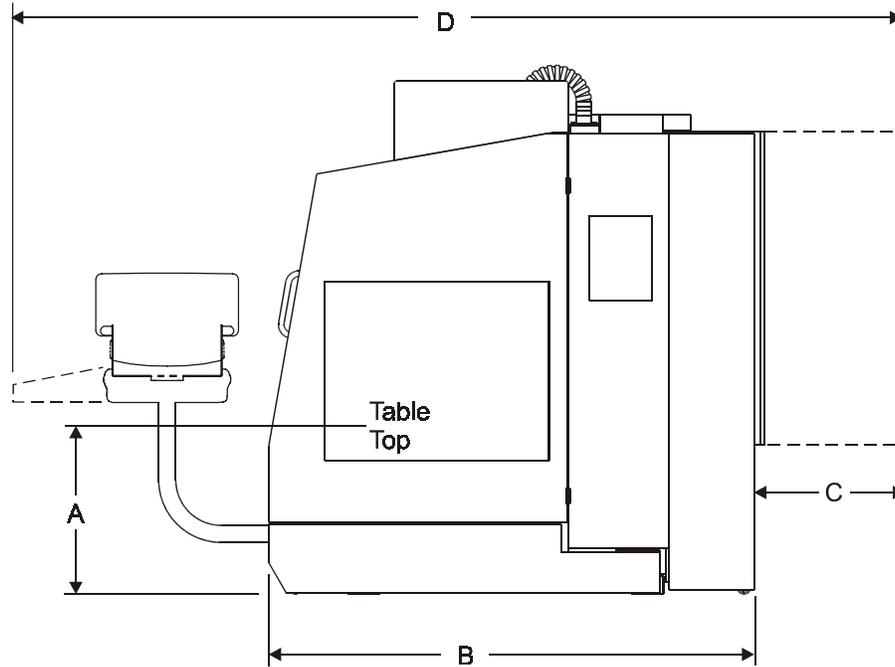


Figure 1 - 2. VMX Machining Center – Side View (shown with Ultimax 4 console)

Dimension	VMX Machine								Comment (All Models)	
	24		24S		30		42			
	mm	in.	mm	in.	mm	in.	mm	in.		
A	920	36.2	920	36.2	889	35	889	35	Floor to table surface	
B	231 1	91	231 1	91	231 0	90.9	217 8	85.8	Enclosure depth (cabinet door closed)	
C	664	26.1	664	26.1	664	26.1	548	21.6	Electrical cabinet door open	
D	Max	365 1	143.7	365 1	143.7	365 1	143.7	338 2	133.2	Enclosure depth with screen (cabinet door open)
	UltiMax	398 6	156.9	398 6	156.9	398 6	156.9	373 5	147.1	
	Max	298 7	117.6	298 7	117.6	298 7	117.6	283 4	111.6	Enclosure depth with screen (cabinet door closed)
	UltiMax	332 2	130.8	332 2	130.8	332 2	130.8	318 7	125.5	

(Table continued from previous page)

Dimension	VMX50/50S		VMX50/50T		VMX64 40 Taper and 50 Taper		Comment (All Models)
	mm	in.	mm	in.	mm	in.	
A	915	36	915	36	1016	40	Floor to table surface
B	1157	45.5	2260	89	2658	104.7	Enclosure depth (cabinet door closed)
C	1160	45.7	1160	45.7	660	26	Electrical cabinet door open
D	Max	-----	-----	-----	-----	-----	Enclosure depth with screen (cabinet door open)
	UltiMax	4557	179.4	4580	180.3	4400	
	Max	-----	-----	-----	-----	-----	Enclosure depth with screen (cabinet door closed)
	Ultimax	3397	133.7	3420	134.7	3740	

**Table 1 - 4. Depth Dimensions**

**Note**

VMX64 50 Taper machines include a small stand-alone hydraulic unit at the rear of the machining center (not shown in above figures), which does not affect the overall machine width and depth dimensions.

## 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’s electrical cabinet.
- Wiring must be capable of supplying continuous amperage, as stated in the latest National Electrical Code Standards.
- Failure to provide the required power parameters may affect safety, machine performance and the warranty.

## KVA Requirements

The machining center will function properly if operated within the voltage range specified below.

Specification	VMX Machine								
	24	24S	30	42	50	50S	50/50 T	64 40- Taper	64 50- Taper
Full Load KVA	18	18	25	30	34	41	40	38	40
Incoming Service KVA*	23	23	31	38	42	51	50	48	50

\*Service KVA is specified at 125% of the full load KVA.

**Table 1 - 5. KVA Requirements**

## Calculating Service Fusing

Use the KVA Requirements table to calculate the service fusing for your machine. For 3-phase power, the equation is  $P_{3\phi} = E \times I \times \sqrt{3}$

To calculate the fuse current for a VMX30 machine, where incoming service KVA ( $P_{3\phi}$ ) is 31 KVA and Input Voltage (E) is 230 VAC:

$$I = \frac{P_{3\phi}}{E \times \sqrt{3}}$$

$$I = \frac{31,000VA}{398V} = 78 \text{ A}$$

## Input Voltage



### Important

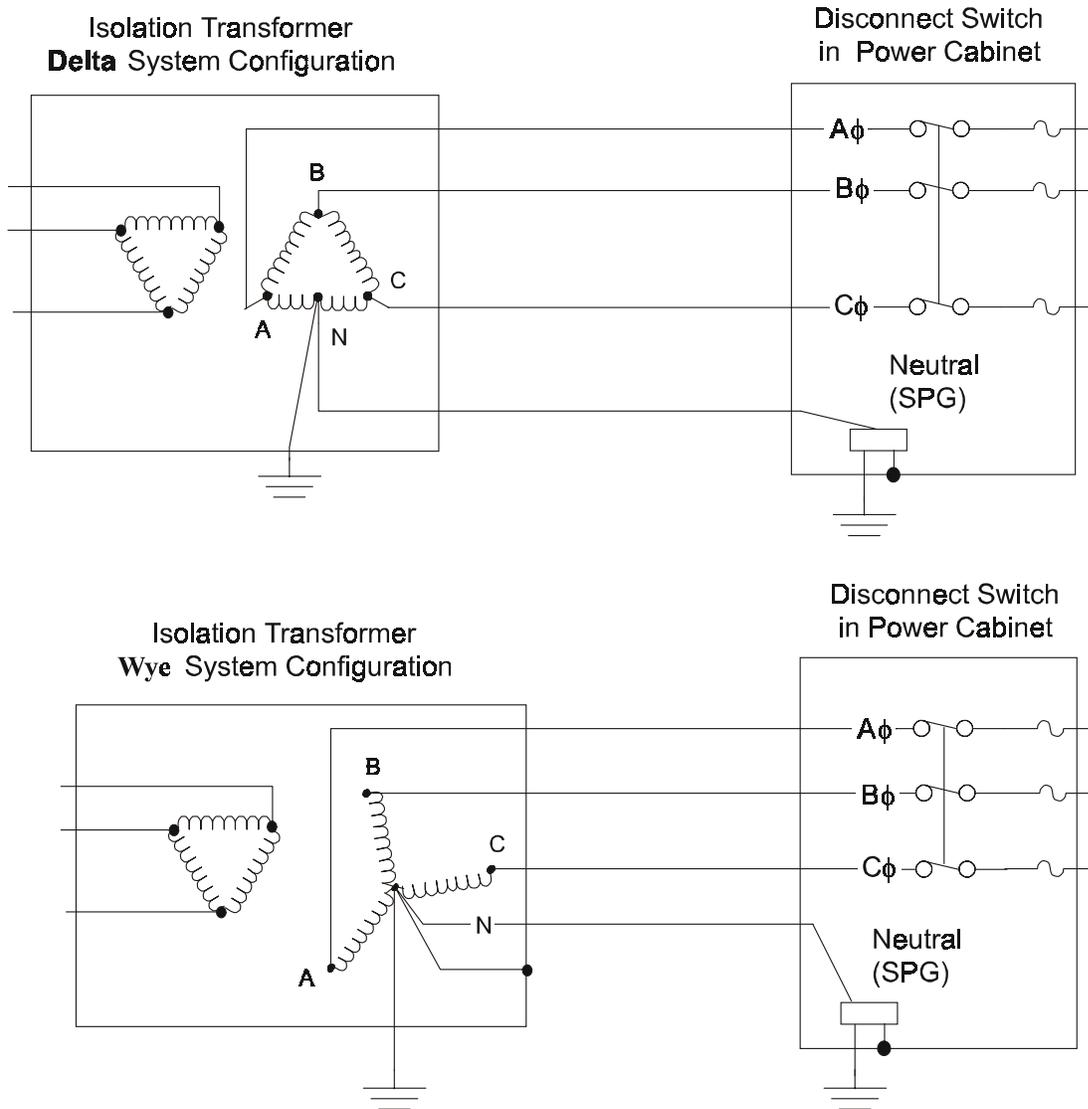
Run electrical power to the machine's location, with adequate length to reach the connections in the power cabinet. Final connections MUST be supervised by a Hurco Certified Field Service Engineer.

Specification	VMX Machine								
	24	24S	30	42	50	50S	50/50 T	64 40- Taper	64 50- Taper
230 VAC +/- 5% 60 Hz	58 A	58 A	78 A	96 A	106 A	128 A	126 A	121 A	126 A
380 VAC +/- 5% 50 Hz	35 A	35 A	47 A	58 A	64 A	78 A	76 A	73 A	76 A
415 VAC +/- 5% 50 Hz	32 A	32 A	43 A	53 A	58 A	71 A	70 A	67 A	70 A

*Table 1 - 6. Input Voltage (VAC) Table*

## Recommended Isolation Transformer Configuration

If a transformer other than the one supplied by Hurco is used, it must meet Hurco's machine operating voltage requirements. Use one of the configurations shown in the figure below. Hurco recommends the Wye system. 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 machine's electrical and electronic control systems are interconnected, terminating at the single point ground (SPG) terminal. This terminal, which is located inside of the machine's power cabinet, must be properly connected to the ground circuit of the AC power source. 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

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

### Specification

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 air hose supply line to the machine. This will provide the required air volume.
- Install a drip leg in the line ahead of the FRL Unit. The drip leg will help remove 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. These fittings restrict the air supply.

## Recommended Operating Temperature

Hurco Machining Centers 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 your machining center away from external heat sources, such as direct sunlight and heating vents.



### Important

Linear positioning accuracy of the machining center 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.

## Machine Coolant System

A flood coolant system is standard on each machining center. A washdown hose and nozzle to clean chips from the inside of the enclosure are also included.

Specification		VMX Machine						
		24/24S	30	42	50/50S	50/50 T	64 40- Tape r	64 50- Taper
Tank Capacity	Liters	190	190	340	350	350	285	285
	Gal.	50	50	90	93	93	75	75
Flood Pump Rating	Liters/min	41	41	41	41	41	151	151
	Gal./min.	11	11	11	11	11	40	40
Wash Down Pump Rating	Liters/min	189	190	190	270	270	270	270
	Gal./min.	50	50	50	71	71	71	71

*Table 1 - 7. Coolant Capacity and Pump Rating*

## Selecting Coolant

Use a coolant to prevent damage to the machine's guideways, precision ballscrews, and painted surfaces. Use a non-synthetic water soluble oil, such as METSOL 525, or equivalent. See the *Maintenance and Safety Manual* for more coolant information.

## Machine Lubrication

Lubrication points and recommended lubricants appear in the table below. This list is not exhaustive. Lubricants that meet the same specifications as those listed below may be substituted.

<b>Lube Point</b>	<b>Fill Level or Condition</b>	<b>Lubricant Type</b>	<b>Lubricant and Manufacturer</b>
ATC Oil Unit 40-Taper 24-station Swing Arm ATC	Maintain reservoir at 1/3 full.	I.S.O. V.G. 32	Teresso 32 (Esso), DTE Oil Light (Mobil), Tellus Oil 32 (Shell), Turbo 32 (Shell), Magnus Oil 32 (Phillips), Hyken Golden (Kendall)
Hydraulic Power Unit 40-Taper 40-station and 50-Taper Swing Arm ATC	Top of the tank's sight gauge.		
FRL Unit	Between the high and low marks on the plastic bowl.		
Optional High Speed Machining Spindle Oil Cooler	Midway on the sight gauge.		
Tool Release Cylinder	Maintain at 1/3 full, not to exceed 1/2 full. Otherwise, oil will flow out during pumping of cylinder.		
Autolube Linear Way Ballscrew	Between the high and low marks on the reservoir. Include a rust prevention additive in the lubrication system prior to shutdown, if the machine will be idle for 30 days or more.	I.S.O. V.G. 68	Febis K68 (Esso), Vactra No. 2 (Mobil), Tonna Oil T68 (Shell)

*Table1 8. Lubrication for VMX Series Machines*

# Machine Arrival

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## Inspecting for Damage Before Unloading

All Hurco equipment must pass 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, check whether the shock meter sensor is tripped. This sensor is located to the left of the machine column. If the sensor is tripped, the ball bearings will be dislodged from the spring. Check the shock meter sensor again after the machine is rigged onto its foundation.
- Examine the machining center for structural damage.
- Note any damage to the machine on the shipper's bill of lading. File a "hidden damage" claim
- Photograph any equipment damage for your records.

### Note

Hurco Certified Field Service personnel can help determine the cost of repairing any damages that occurred during shipment.

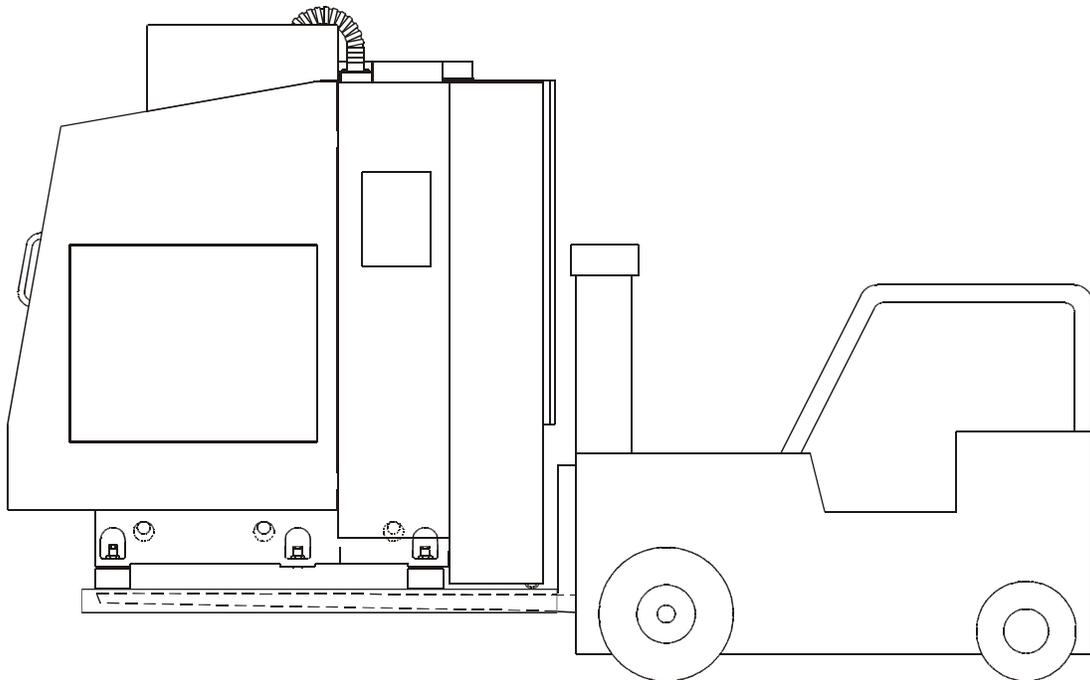
## Unloading the Machine

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

Unload the machine:

1. Use a forklift at the front or rear of the machine to remove it from the shipping pallet. If possible, position the forklift under the heaviest part of the machine. The load center is normally toward the rear, where the column is located.
2. Move the machine on its shipping pallet to a location next to the final installation site.



*Figure 2 - 1. Lifting Machine on Pallet from Rear*

3. Set the machine down, allowing enough space around the machine to later lift it away from the shipping pallet.
4. Verify that all equipment has arrived and is unloaded.

## Forklift Capacities

Before lifting a machine, make sure the forklift is rated to handle the machine's weight, with fork tines long enough to fully support the machine. See the recommendations below.

Specification		VMX Machine					
		24/24S	30	42	50/50S	50/50T	64 40 Taper 50 Taper
Fork Tines Length	<i>mm</i>	1,829	1,829	1,829	1,829	1,829	2,032
	<i>in.</i>	72	72	72	72	72	80

*Table 2 - 1. Fork Tines Length*



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

## Unpacking the Machine Equipment

After placing the machine and its shipping pallet next to the final installation site, inventory your shipment.



### Important

Do not remove the shipping supports from under the machine head or the tool changer at this time. If you discover any damage, contact your Hurco representative and the freight company immediately.

Do not unpack the Ultimax console from its box. The console will be unpacked and installed by the Certified Field Service Engineer.

Unpack equipment as follows:

1. Remove the outer covering and all boxes attached to the pallet.
2. Remove all items from the chip enclosure.
3. Remove the flood coolant tank, tubing, pump motor and all other packaged items from the shipping pallet.
4. Remove the nuts and washers that attach the machine and electrical cabinet to the shipping pallet.
5. If the machine model includes a separate transformer, remove the transformer from the pallet and move it to the rear of where the machine will rest.
6. Use one of the procedures in the next section to lift the machine for final installation.

## Moving the Machine into Final Position

After unpacking the equipment, lift the machine from its shipping pallet for final installation.

### Lifting the Machine

VMX series machines may be lifted using a forklift or a crane. If a forklift will be used, the forklift may be positioned at the machine's front, rear, or tool changer side.

#### Using Forklift at Front or ATC Side of the Machine



#### **Warning**

The forklift must be rated to handle the machine's weight. See the "Machine Weight" table in this manual for the weight of Hurco VMX machines.

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 VMX 64 machine, the forklift tines go into channels in the machine base.
2. Keep adequate clearance between the machine and the front of the forklift by placing wood spacers on top of the forks.

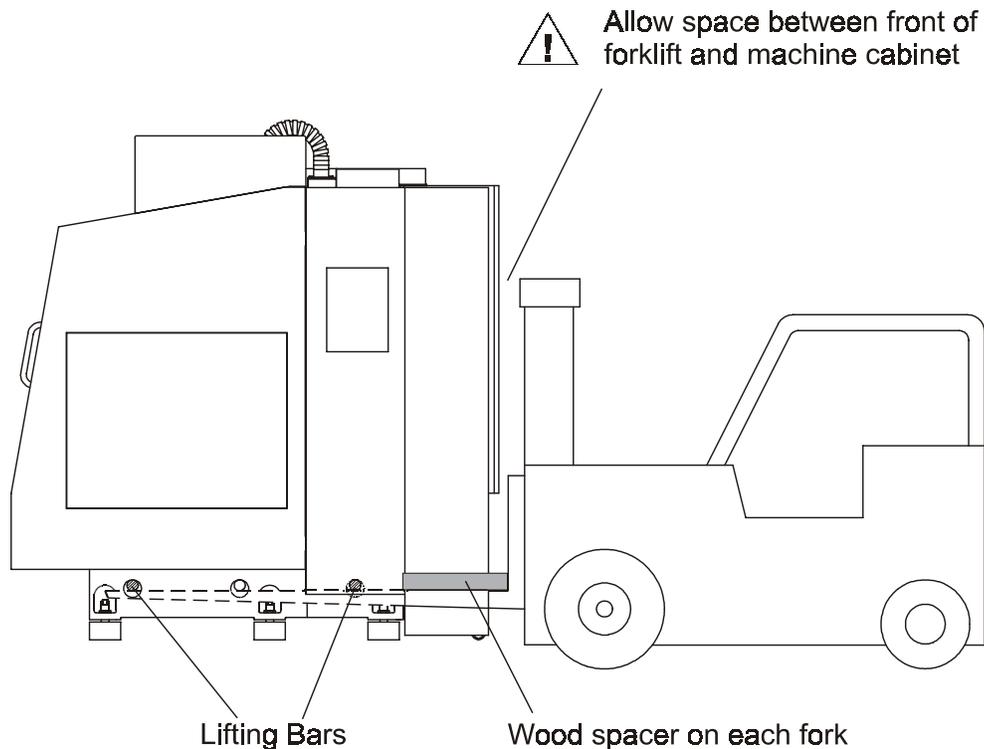
## Using Forklift at Rear of the Machine

Use steel lifting bars when lifting 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 machine's rear, longer fork tines are also required when lifting at the rear of the machine. Contact a professional rigger to determine the necessary fork tine length.

To lift a VMX series machine from the rear:

1. Existing holes in each side of the machine base may be used to insert the lifting bars. The holes toward the rear of the machine are used to route coolant hoses. Re-route these hoses temporarily, to get them out of the way. After the machine is set in place, the coolant hoses must be returned through the holes as originally routed.
2. Insert a steel lifting bar into each outermost hole as indicated in the following figure.



**Figure 2 - 2. Lifting a VM Series Machine from Rear**

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

**Note**

For the VMX 64, fork tines are guided into channels in the machine's base. Because forklift tines are thicker toward the rear, some might be too thick to lift the VMX 64.

## Using a Crane to Lift the Machine



### Important

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 bracket.



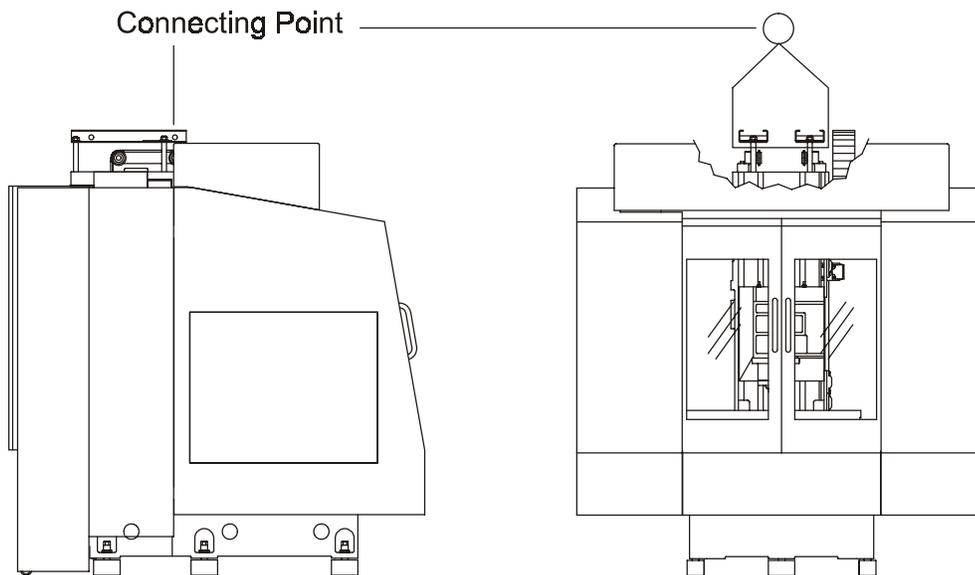
### Warning

The crane or hoist must be rated to handle the machine's weight.

To lift a VMX series machine using a crane or hoist:

Secure the lifting bracket to the top of the machine.

1. Attach the crane to the machine at the connecting point indicated below.



**Figure 2 - 3. Lifting a VMX Series Machine with Crane**

## Lowering the Machine onto its Foundation

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

1. Lower the machine to within 6 to 10 inches (150 to 200 mm) of the floor. Do **not** set the machine down.
2. Insert leveling bolts into the machine base and position foot pads directly beneath the bolts. Leveling bolts and foot pads are provided. **Do not forget the center bolts.**
3. Lower the machine onto the footpads.
4. Adjust EVERY leveling bolt down until it presses into the indentation of the underlying footpad. The machine is now rough leveled.

## Leveling the Machine

Once the machine is rough leveled, contact your full service distributor or Hurco to have a Field Service Engineer visit and finish the leveling.

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 (6) months after installation, and then once every six (6) months.



### Important

ALL leveling bolts – including the center ones – MUST be used in rough leveling to evenly support the machine.

1. Rough level the machine following these guidelines:
  - Torque ALL bolts evenly so that the machine does not teeter.
  - For the VMX 24, 30, 42 and 50, adjust the leveling bolts to about halfway, so the coolant tanks can clear the bottom of the enclosure.
  - For the VMX64, adjust the leveling bolts all the way down (this will raise 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.
4. Place the flood coolant tank, tubing and pump motor near the machine base for installation by a Hurco Certified Field Service Engineer.

# Start-up Preparation

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## Meeting Requirements Before the Service Visit

- All machine equipment located at the final installation site.
- Machine positioned for installation, on a suitable foundation that can 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.

After you have completed the requirements above, 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's serial number (stamped on the data plate attached to the electrical cabinet door).

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 Service Engineer in testing and inspecting the machine. It is the customer's responsibility to provide tooling and coolant.

## Ultimax Programming Training

Learn how to create part programs in minutes on the easy-to-use Ultimax control. Hurco offers “hands-on” training classes to demonstrate the powerful programming capabilities of Ultimax. Every customer will gain an advantage by attending Ultimax training classes.

For additional information or to register for an Ultimax Program 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

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## 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 Option

The UltiDraw Data Exchange Format (DXF) File option allows you to rapidly create Conversational part programs from 2D CAD drawings. Selected geometric data from a 2D CAD drawing is automatically loaded into Conversational data blocks – use Ultimax to add part and tool setup information to complete the part program.

## 3D Part Programming Option

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

## Conversational Rotary Option

The Ultimax Conversational Rotary option provides five-axis machining for larger parts. Machine complex parts with a single setup, increasing productivity and minimizing incorrect part alignment. The rotary/tilt table helps maintain accuracy and uniformity when drilling angle holes around a cylinder, and is effective for tall work pieces.

## UltiNet Option

The UltiNet option expands your Ultimax 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, ten megabyte files can be transferred in less than 40 seconds.

## AVC/ASF Options

The Advanced Velocity Control (AVC) option provides a continuous 400 block look ahead algorithm through a 225 block sliding window. Jerk and Stiction Compensation parameters allow the system to decelerate and accelerate during tool path direction changes - improving the surface quality of parts with complex geometries. Data Smoothing, Additional Surface Finish Quality parameters obtain required surface finish quality with optimum execution speed.

The Adaptive Surface Finishing (ASF) option supplies a continuous 600 block look ahead algorithm through a 600 block window. Advanced Data Smoothing, Additional Surface Finish Quality parameters obtain the required surface finish quality with optimum execution speed. Data processing speed is greatly enhanced with the option's 566 MHz processor, 128 MB RAM memory and Octavia 80 MHz motion card.

## Cutter Inserts Option

The Cutter Inserts option is used by cutter insert manufacturers to mill pockets in triangular, diamond and hexagon shapes. Ultimax's part programming is so easy, a Cutter Insert routine can be created in one data block.

## Probing Option

With the Ultimax 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 Ultimax 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

Ultimax's Industry Standard Numerical Control (ISNC) option 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 Ultimax 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 roughing 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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