

# **HURCO®**



**Getting Started with Your**

**TM6, TM8, TM10 LATHE**

**Preliminary Manual**



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# USING THIS MANUAL

## Printing

To print part or all of this manual from the CD, select **File/Print** to print this document. 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.

## Understanding Hurco Icons

This manual may contain the following icons:

### Caution/Warning



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

### Hints and Tricks



Useful suggestions that show creative uses of the 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.

You can also access the same entries from the Adobe Reader bookmarks located on the left side of the screen.

## Notes

# 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
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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
- 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.

## TM6

Units	Shipping Weight	Operating Weight
kg	2800	2600
lbs	6160	5720

*Table 1–1. TM6 Machine Weight*

## TM8

Units	Shipping Weight	Operating Weight
kg	3980	3710
lbs	8755	8160

*Table 1–2. TM8 Machine Weight*

## TM10

Units	Shipping Weight	Operating Weight
kg	TBD	4082
lbs	TBD	9000

*Table 1–3. TM1 Machine Weight*

## 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.)

#### TM6 Shipping Dimensions

Units	Width	Depth	Height
mm	2300	1960	2000
in.	90.6	77.2	78.7

*Table 1-4. TM 6 Approximate Shipping Dimensions*

#### TM8 Shipping Dimensions

Units	Width	Depth	Height
mm	2950	2300	2032
in.	116.1	90.6	80

*Table 1-5. TM 8 Approximate Shipping Dimensions*

#### TM10 Shipping Dimensions

Units	Width	Depth	Height
mm	2997	2108	1930
in.	118	83	76

*Table 1-6. TM 10 Approximate Shipping Dimensions*



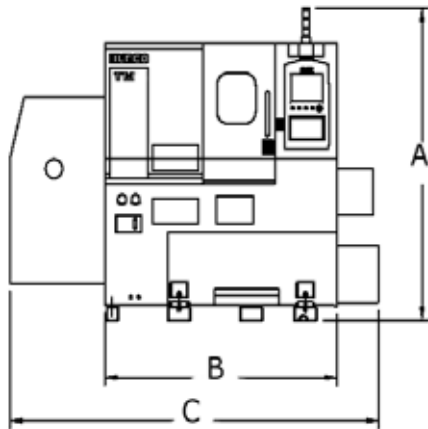
When moving a machine, be sure to allow adequate space for maneuvering. If door and ceiling clearances appear to be close to approximate machine dimensions, measure the machine first before moving it.



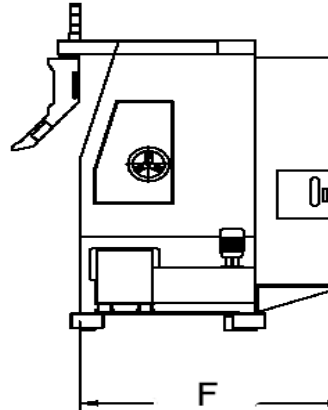
## Operating Dimensions

Machine operating dimensions are measured with the enclosure and electrical cabinet doors open, the Z axis fully up, and the console swung out. The following drawings show the machine dimensions referenced in the tables above. Allow additional space around the machine for servicing and safe operation. The machine pictured below does not represent any specific model.

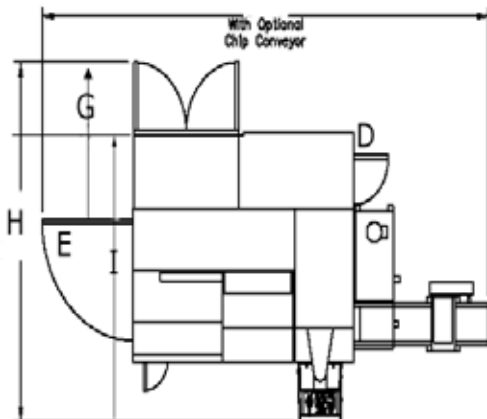
**Front View**



**Side View**



**Top View**



**Figure 1-1. TM Machining Center Operating Dimensions—Three Views**

## TM6

Operating Dimensions	mm	in.
A—Height	2108	83
B—Enclosure Width (side doors closed)	1803	71
C—Maximum Width (side doors open)	3632	143
D—Right side door	419 x 660	16.5 x 26
E—Left door	737 x 1251	29 x 49.2
F—Enclosure depth (cabinet door closed)	1410	55.5
G—Electrical cabinet (door open)	864	34
H—Enclosure depth with Max console (cabinet door open)	2197	86.5
I—Enclosure depth with Max console (cabinet door closed)	1777	70

*Table 1–7. TM6 Width and Height Dimensions*

## TM8

Operating Dimensions	mm	in.
A—Height	2057	81
B—Enclosure Width (side doors closed)	2591	102
C—Maximum Width (side doors open)	4331	170.5
D—Right side door	775 x 667	30.5 x 26.3
E—Left door	794 x 1257	31.25 x 49.5
F—Enclosure depth (cabinet door closed)	2088	82.2
G—Electrical cabinet (door open)	864	34
H—Enclosure depth with Max console (cabinet door open)	2197	86.5
I—Enclosure depth with Max console (cabinet door closed)	1777	70

*Table 1–8. TM8 Width and Height Dimensions*

**TM10**

<b>Operating Dimensions</b>	<b>mm</b>	<b>in.</b>
A—Height	2108	83
B—Enclosure Width (side doors closed)	2845	112
C—Maximum Width (side doors open)	3200	126
D—Right side door	TBD	TBD
E—Left door	TBD	TBD
F—Enclosure depth (cabinet door closed)	TBD	TBD
G—Electrical cabinet (door open)	TBD	TBD
H—Enclosure depth with Max console (cabinet door open)	3200	126
I—Enclosure depth with Max console (cabinet door closed)	TBD	TBD

**Table 1–9. TM10 Width and Height Dimensions**

## Electrical Service Requirements

Be familiar with the following 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 lathe will function properly if operated within the voltage range specified below.

### KVA

Machine	Full Load	Incoming Service *
TM6	12	15
TM8	12	15
TM10	12	15

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

**Table 1–10. 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:

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

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

## Input Voltage



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.

The following table contains service fusing currents for the input voltages listed:

**Input Voltage VAC +/- 5% Table**

<b>Machine</b>	<b>230 60 - Hz</b>	<b>380 - 50 Hz</b>	<b>415 - 50 Hz</b>
TM6	A	A	A
TM8	A	A	A
TM10	A	A	A

*Table 1-11. 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.

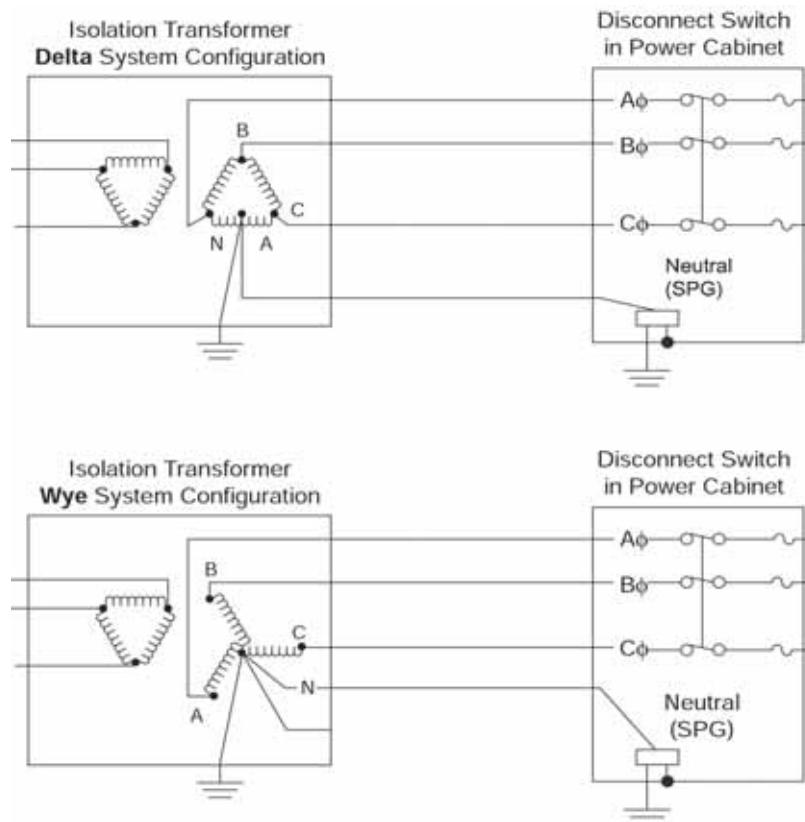


Figure 1-2. Delta and Wye Transformer Configurations

## 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.

### Compressed Air 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 in. (13 mm) diameter (trade size) pipe, or an equivalent 3/4 in. (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.

- ⇒ 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.

### TM6

Tank Capacity	FloodPumpRating	Flood Pump Size
62.0 lit.	60 l/min	0.19kW
16.3 gal	15.8 g/min	0.25 hp

Table 1–12. TM6 Coolant Capacity and Pump Rating

### TM8

Tank Capacity	FloodPumpRating	Flood Pump Size
113 .0 lit.	41 l/min	.66 kW
30 gal.	11 g/min	.89 hp

Table 1–13. TM8 Coolant Capacity and Pump Rating

### TM10

Tank Capacity	FloodPumpRating	Flood Pump Size
TBD	TBD	TBD
TBD	TBD	TBD

Table 1–14. TM10 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. 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>
FRL Unit	Between the high and low marks on the plastic bowl.	I.S.O. V.G. 32
Tool Release Cylinder	Maintain at 1/3 full, not to exceed 1/2 full. Otherwise, oil will flow out during pumping of cylinder.	I.S.O. V.G. 32
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

**Table 1–15. Lubrication for TM Series Lathes**



# MACHINE ARRIVAL

The following topics are covered in this section:

- Inspecting for Damage Before Unloading . . . . . 2 - 2
- Unloading the Machine . . . . . 2 - 2
- Moving the Machine into Final Position . . . . . 2 - 4
- Leveling the Machine . . . . . 2 - 4

## 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.

⇒ 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 of the machine to remove the machine from the shipping pallet. If possible, position the forklift under the heaviest part of the machine. The load center is at the front of the lathe.
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. 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.

Fork Tines Length	mm	in.
TM6	1828	72
TM8	1828	72
TM10	TBD	TBD

*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.



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

Use a fork lift positioned in the front of the lathe to lift the machine.



If the chip conveyor option is included, remove the chip conveyor before lifting the machine.

### 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 150 to 200 mm (6 to 10 inches) 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.



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.
2. Once the machine is resting on all foot pads, remove the forklift (or crane).
3. 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

The following topics are covered in this section:

Meeting Requirements Before the Service Visit . . . . . 3 - 2  
Lathe Max Programming Training . . . . . 3 - 2

## Meeting Requirements Before the Service Visit

Complete the following requirements, then 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).

- 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.

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.

## Lathe Max Programming Training

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

For additional information or to register for an Lathe Max 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

## Chip Conveyor

The chip conveyor is available as a machine option. The chip conveyor removes material from the machine while the part is being machined.

## 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 the Lathe Max control to add part and tool setup information to complete the part program.



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