

# CERTIFICATE OF INSPECTION

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1100MX MILL

SERIAL NUMBER:

DATE OF MANUFACTURE:

## MACHINERY CERTIFICATION

Title	Seal or Signature	Date
Inspection Director		
Inspector		
Tormach QA Representative		

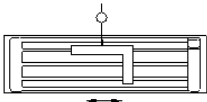
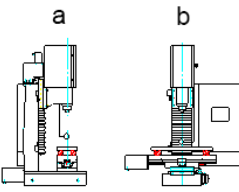
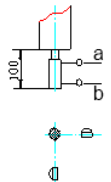
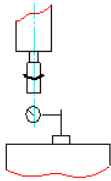
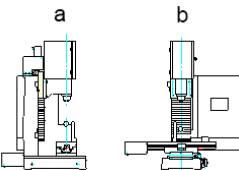
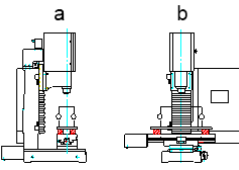
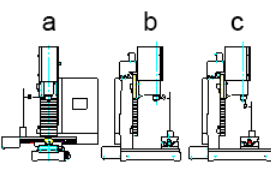
The above signatures certify this machine has passed all inspection requirements and is approved for delivery. See attached inspection documentation.

MADE IN CHINA

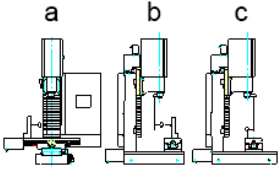
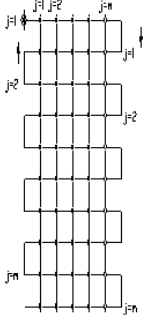
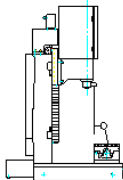
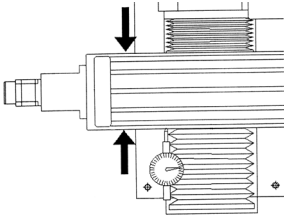
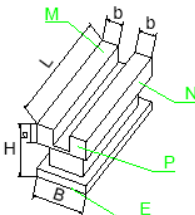


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## QA 1: PRECISION INSPECTION

No.	Inspection Item	Tolerance (mm)	Actual (mm)
G1	 Perpendicularity of X-Y motion	0.04/200	
G2	 Parallelism of axis motion to the table surface <b>a:</b> With respect to Y-axis <b>b:</b> With respect to X-axis	<b>a:</b> Within measure length of 100: 0.04/100 <b>b:</b> Within random measure length of 200: 0.03/200 Within the total travel length: ≤400 0.04 >400 0.06	
G3	 Spindle radial runout <b>a:</b> <10 mm below spindle face <b>b:</b> 100 mm below spindle face	<b>a:</b> 0.02 <b>b:</b> 0.03	
G4	 Spindle float within cartridge with respect to Z motion	0.015	
G5	 Perpendicularity of spindle head to table surface <b>a:</b> With respect to Y-axis <b>b:</b> With respect to X-axis	<b>a:</b> 0.035/150 <b>b:</b> 0.035/150	
G6	 Perpendicularity of centerline of spindle to table surface <b>a:</b> With respect to Y-axis <b>b:</b> With respect to X-axis	<b>a:</b> 0.04/200 <b>b:</b> 0.04/200	
G7	 Lost motion of linear axes <b>a:</b> X-axis <b>b:</b> Y-axis <b>c:</b> Z-axis	<b>a:</b> 0.025 <b>b:</b> 0.025 <b>c:</b> 0.035	

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No.	Inspection Item	Tolerance (mm)	Actual (mm)
G8	 <p>Axis repeatability</p>	0.02	
G9	 <p>Positioning accuracy, to be completed with laser interferometer. One machine is selected for each production batch (or each 20 machines produced, whichever is fewer). If the selected machine does not meet specification, then all machines in production batch must be completely inspected. If the selected machine does meet specification, all other machines in the production batch will be reported as not selected (NS).</p>	0.03/200	
G10	 <p>Parallelism of center T-slot to X-motion</p>	At any measuring length of 200: 0.015/200	
G12	 <p>Lateral displacement of work table to external load &lt; 300 N</p>	0.04	
P1	 <p>Milling accuracy:  <b>a:</b> Flatness of surface M  <b>b:</b> Parallelism of surface M to surface E  <b>c:</b> Perpendicularity of surface P to surface M, and surface N to surface P            One machine is selected for each production batch (or each 20 machines produced, whichever is fewer). If the selected machine does not meet specification, then all machines in production batch must be completely inspected. If the selected machine does meet specification, all other machines in the production batch will be reported as not selected (NS).</p>	<b>a:</b> 0.04/150 <b>b:</b> 0.06 <b>c:</b> 0.06/50	

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## QA 2: FUNCTION/APPEARANCE

No.	Test Name	Description	Completed
T1	Spindle Speed	Validate minimum and maximum speeds.	
T2	Spindle Direction	Clockwise and counterclockwise are correct.	
T3	Spindle Motor Drive Program	After power cycling the variable frequency drive (VFD), verify the following settings: <ul style="list-style-type: none"> <li>00.011 (Machine Name) is <b>1100</b></li> <li>00.012 (Parameter Version) is <b>3.05</b></li> <li>00.015 (Control Firmware Version) is <b>1.10.00 or greater</b></li> <li>00.016 (Power Firmware Version) is <b>1.10.00 or greater</b></li> <li>00.017 (User Program Version) is <b>1132</b></li> </ul>	
T4	Spindle Door Switch	Spindle drive contactor opens when the spindle access door is opened.	
T5	Coolant Outlet	Coolant outlet operates under control of PathPilot test controller.	
T6	Safety Decals	PN 38265 Mill Safety Decals installed: <ul style="list-style-type: none"> <li>General</li> <li>Spindle</li> <li>Electrical</li> <li>Z-axis brake</li> </ul>	
T7	Information Decals	PN 38256 1100MX Information Decals installed.	
T8	Accessory Power	<ul style="list-style-type: none"> <li>XS1 accessory power outlets operate.</li> <li>ATC power connector (XS10) voltage and polarity verified.</li> </ul>	
T9	Auxiliary Power	XS3 auxiliary power outlets operate.	
T10	Accessory Inputs	Accessory input 1 and accessory input 2 operate correctly.	
T11	X Limits	<ul style="list-style-type: none"> <li>Hard stop homing functions correctly.</li> <li>X limit switch operates.</li> <li>Limit switch flags are adjusted for <b>457.2 mm</b> of travel.</li> <li>Machine table overhangs saddle by a maximum of <b>470 mm</b> at the X+ limit.</li> </ul>	
T12	Y Limits	<ul style="list-style-type: none"> <li>Hard stop homing functions correctly.</li> <li>Y limit switch operates.</li> <li>Limit switch flags are adjusted for <b>279.4 mm</b> of travel.</li> </ul>	
T13	Z Limits	<ul style="list-style-type: none"> <li>Hard stop homing functions correctly.</li> <li>Z limit switch operates.</li> </ul>	
T14	Belt Position Change	Belt position can be changed without binding or collision.	
T15	Smooth Operation	X, Y, Z, and spindle operate without unusual noise or vibration.	
T16	24-Hour Test	24-hour run test has been completed.	
T17	Gib Adjusting Screws	<ul style="list-style-type: none"> <li>Adjusting screws are recessed into gib counterbores.</li> <li>Gib screw adjustment is marked with paint once adjusted.</li> </ul>	

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No.	Test Name	Description	Completed																											
T18	T-Slot of Work Table	Width of T-slot.																												
T19	Test resistance from 100/N and 101 on the mains cable to the machine ground Test continuity of mains cable ground to the machine ground points.	If the test result is zero, the machine must be repaired. If there is no continuity, the machine must be repaired.																												
T20	Machine Fuses	<div>Verify the installation of the following fuses:</div> <table><tr><td rowspan="2">XFM1 Transformer</td><td>F1</td><td>2.5A, Slow Blow</td></tr><tr><td>F2</td><td>2.5A, Slow Blow</td></tr><tr><td rowspan="8">BUS1 DC-BUS Board</td><td>F1</td><td>8A</td></tr><tr><td>F2</td><td>8A</td></tr><tr><td>F3</td><td>8A</td></tr><tr><td>F4</td><td>8A</td></tr><tr><td>F5</td><td>Empty</td></tr><tr><td>F6</td><td>10A, Slow Blow</td></tr><tr><td>F7</td><td>Empty</td></tr><tr><td>F8</td><td>5A</td></tr><tr><td rowspan="2">ECM1 Control Board</td><td>F1</td><td>3A, Slow Blow</td></tr><tr><td>F2</td><td>3A, Slow Blow</td></tr></table>	XFM1 Transformer	F1	2.5A, Slow Blow	F2	2.5A, Slow Blow	BUS1 DC-BUS Board	F1	8A	F2	8A	F3	8A	F4	8A	F5	Empty	F6	10A, Slow Blow	F7	Empty	F8	5A	ECM1 Control Board	F1	3A, Slow Blow	F2	3A, Slow Blow	
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T21	Machine Fit and Finish	Machine fit and finish meets Tormach's standards.																												
T22	Spindle Encoder Performance	Verify spindle encoder and spindle orient functions across all speed ranges by performing the encoder test in PathPilot.																												
T23	Power Drawbar Performance	<ul style="list-style-type: none"><li>Power drawbar regulator, cylinder, and valve function correctly and are free of leaks.</li><li>Clamping mechanism clamps with a minimum of 3.2kN of force.</li><li>Clamping mechanism spring stack is marked with paint pen once adjusted.</li></ul>																												

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## QA 3: PACKING LIST

No.	Name	Quantity	PN
1	Allen Wrenches (3 mm, 4 mm, 5 mm, 6 mm, 8 mm, 10 mm)	1 set	—
2	Double Open End Wrench (13/16)	1	—
3	Phillips Screwdriver	1	—
4	Key for Cabinet	1 set	—
5	1100M/1100MX Cable Kit, Machine	1	38378
6	Fuse, 2.5A, 5 × 20 mm, Glass Slow-Blow	2	38692
7	Hook Wrench for Spring Stack	1	50384
8	BT30 Gripper Installation Tool	1	50385
9	BT30 Power Drawbar Cylinder Assembly	1	39711
10	Power Drawbar Pushbutton Assembly	1	38216
11	Filter-Regulator-Lubricator	1	38829
12	Pneumatic Line, 1/4 in.	3 m	31457
13	Fitting, Coupler, 1/4 in. Industrial (Male) – 1/4 in. NPT (Male)	1	31989
14	Fitting, Elbow, 1/4 in. NPT (Female) – 1/4 in. Push-to-Connect	1	31990
15	NEMA 6-20P Electrical Plug	1	32594

These items are in the tool bag on the right side of the shipping pallet.