

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		

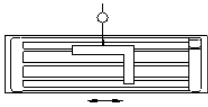
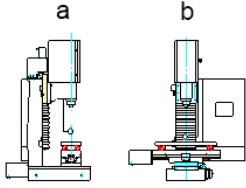
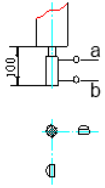
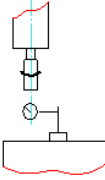
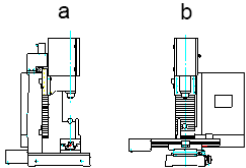
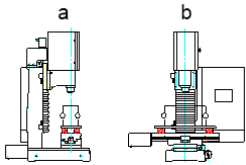
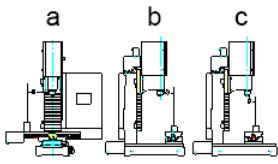
The above signatures certify this machine has passed all inspection requirements and is approved for delivery. See attached inspection documentation.

MADE IN CHINA

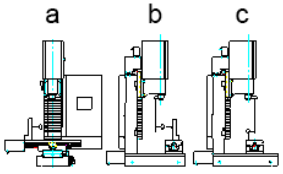
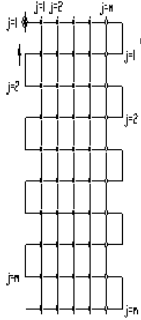
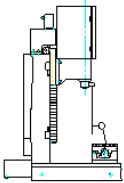
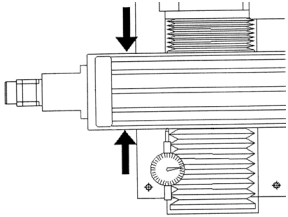
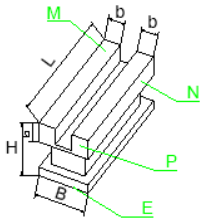


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QA 1: PRECISION INSPECTION

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

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No.	Inspection Item	Tolerance (mm)	Actual (mm)
G8	 <p style="text-align: center;">Axis repeatability</p>	0.02	
G9	 <p style="text-align: center;">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 style="text-align: center;">Parallelism of center T-slot to X-motion</p>	At any measuring length of 200: 0.015/200	
G12	 <p style="text-align: center;">Lateral displacement of work table to external load < 300 N</p>	0.04	
P1	 <p style="text-align: center;">Milling accuracy: a: Flatness of surface M b: Parallelism of surface M to surface E c: Perpendicularity of surface P to surface M, and surface N to surface P</p> <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>	a: 0.04/150 b: 0.06 c: 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	<ul style="list-style-type: none"> Verify 00.011 (Machine Name) is 1100 Verify 00.012 (Parameter Version) is 3.04 Verify 00.015 (Control Firmware Version) is 1.05.03 Verify 00.016 (Power Firmware Version) is 1.05.01 Verify 00.017 (User Program Version) is 1130 	
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"> General Spindle Electrical Z-axis brake 	
T7	Information Decals	PN 38256 1100MX Information Decals installed.	
T8	Accessory Power	<ul style="list-style-type: none"> XS1 accessory power outlets operate. ATC power connector (XS10) voltage and polarity verified. 	
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"> Hard stop homing functions correctly. X limit switch operates. Limit switch flags are adjusted for 457.2 mm of travel. Machine table overhangs saddle by a maximum of 470 mm at the X+ limit. 	
T12	Y Limits	<ul style="list-style-type: none"> Hard stop homing functions correctly. Y limit switch operates. Limit switch flags are adjusted for 279.4 mm of travel. 	
T13	Z Limits	<ul style="list-style-type: none"> Hard stop homing functions correctly. Z limit switch operates. 	
T14	Belt Position Change	Belt position can be changed without binding or collision.	

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No.	Test Name	Description	Completed																											
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"> Adjusting screws are recessed into gib counterbores. Gib screw adjustment is marked with paint once adjusted. 																												
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	Verify the installation of the following fuses: <table border="1" data-bbox="724 801 1283 1397"> <tbody> <tr> <td data-bbox="724 801 1003 902" rowspan="2">XFM1 Transformer</td> <td data-bbox="1003 801 1054 851">F1</td> <td data-bbox="1054 801 1283 851">2.5A, Slow Blow</td> </tr> <tr> <td data-bbox="1003 851 1054 902">F2</td> <td data-bbox="1054 851 1283 902">2.5A, Slow Blow</td> </tr> <tr> <td data-bbox="724 902 1003 1301" rowspan="8">BUS1 DC-BUS Board</td> <td data-bbox="1003 902 1054 952">F1</td> <td data-bbox="1054 902 1283 952">8A</td> </tr> <tr> <td data-bbox="1003 952 1054 1001">F2</td> <td data-bbox="1054 952 1283 1001">8A</td> </tr> <tr> <td data-bbox="1003 1001 1054 1050">F3</td> <td data-bbox="1054 1001 1283 1050">8A</td> </tr> <tr> <td data-bbox="1003 1050 1054 1099">F4</td> <td data-bbox="1054 1050 1283 1099">8A</td> </tr> <tr> <td data-bbox="1003 1099 1054 1149">F5</td> <td data-bbox="1054 1099 1283 1149">Empty</td> </tr> <tr> <td data-bbox="1003 1149 1054 1198">F6</td> <td data-bbox="1054 1149 1283 1198">10A, Slow Blow</td> </tr> <tr> <td data-bbox="1003 1198 1054 1247">F7</td> <td data-bbox="1054 1198 1283 1247">Empty</td> </tr> <tr> <td data-bbox="1003 1247 1054 1296">F8</td> <td data-bbox="1054 1247 1283 1296">5A</td> </tr> <tr> <td data-bbox="724 1301 1003 1397" rowspan="2">ECM1 Control Board</td> <td data-bbox="1003 1301 1054 1350">F1</td> <td data-bbox="1054 1301 1283 1350">3A, Slow Blow</td> </tr> <tr> <td data-bbox="1003 1350 1054 1397">F2</td> <td data-bbox="1054 1350 1283 1397">Empty</td> </tr> </tbody> </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	Empty	
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	F5	Empty																												
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	F7	Empty																												
	F8	5A																												
ECM1 Control Board	F1	3A, Slow Blow																												
	F2	Empty																												
T21	Machine Fit and Finish	Machine fit and finish meets Tormach's standards.																												
T22	Spindle Encoder Performance	<ul style="list-style-type: none"> Verify spindle encoder function across all speed ranges according to the test procedure. Spindle orient (M19) functions correctly. 																												
T23	Power Drawbar Performance	<ul style="list-style-type: none"> Power drawbar regulator, cylinder, and valve function correctly and are free of leaks. Clamping mechanism clamps with a minimum of 3.2kN of force. Clamping mechanism spring stack is marked with paint pen once adjusted. 																												

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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.