

MACHINEMATE®

CNC SYSTEM

Hardware

SPECIFICATION

Feb 2005

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1 Introduction / General

1.1 Superior Capability in Technology and Productivity

The **MACHINEMATE** CNC Family provides you with innovative high performance technology to handle the ever-increasing demands of today's automation industry. The modern and fully open CNC architecture using a single powerful CPU gives you leading edge CNC performance and flexibility.

This specification provides the general information about the Hardware of the **MACHINEMATE** CNC family.

1.2 General hardware components

The basic models of **MACHINEMATE** CNC includes following hardware components:

CNC control unit with:

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| Motherboard | Pentium or Celeron processor (its performance depends on the order) |
| Graphics board | SVGA |
| 1 or 2 serial interfaces | COM1, COM2 (RS232C) |
| 2 PS/2 interfaces | Keyboard and mouse |
| 1 parallel interface | LPT1 (Centronics) |
| 2 or 4 USB interfaces | Peripheral devices (2 USB ports on the L2 & LW or 4 USB ports on the eCNC). |
| Network interface | EtherNet 10/100 interface. Standard on LW. Optional on L2 & eCNC (MM93). |
| Floppy-disk drive | 1.44 MB, 3.5" L2 and eCNC are delivered with built-in floppy-disk drive |
| Compact Disk drive MM64 | (Optional on eCNC only). 24X CD-R CD-RW |
| Pen Disk (64Mb) | Standard on LW |

The floppy-disk, compact disk drive or pen disk can be used to load or to save:

- NC-part programs
- PLC-programs
- Axis compensation files
- Machine parameter files
- Configuration files
- or 3rd party software

Hardware Specification

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|---|---|
| Hard disk | the hard disk uses an IDE interface. |
| MACHINEMATE CNC | installed on the hard disk; |
| Windows 2000 software | installed on the hard disk; |
| CNC-axes board | PCI – board for analog axes interface. PCI – board for Sercos interface (1 or 2 fiber-optic rings) with 24 digital inputs and 16 digital outputs on board. |
| CNC operator's panel | Available in 2 sizes that can be remotely mounted up to 33 Ft (10 meters) from the industrial computer (IPC): 1) 19 X 12.25 inches (483 X 311.5 mm) with full alpha numeric keypad and 12.1 inch TFT flat screen at 800 X 600 pixels. This 12.1 inch TFT size is also available with an optional Touch Screen. A second option in this 19-inch size is a 15-inch Touch Screen TFT. This unit does not have a built in keyboard. 2) Same size panel but with 15 inch TFT flat screen at 800 X 600 pixels. There is no alpha numeric keypad on the panel. |
| Basic switches & pushbuttons M166 & M167 | Push buttons for 'NC-Start', 'NC-Stop', 'Jog +' and 'Jog -' are available. (Note: These switches are not mounted and wired by MACHINEMATE INC). |
| Gray/binary code switches M165 | These switches are used for feedrate override and for spindle speed override. (Note: These switches are not mounted and wired by MACHINEMATE INC). |
| Machine Tool Builder's Panel | A Machine Tool Builder's Panel (MTBP) is available. This panel includes the basic requirements for a machine tool operator: emergency stop push button, cycle start and stop push buttons, jog plus and minus push buttons, feed rate and spindle speed override pots, and a number of auxiliary push buttons. There are two versions: 19" rack mount and slim line. |
| MTBP – Auxiliary Panel | A MTBP Auxiliary Panel is available. This 19" panel includes a handwheel (or manual pulse generator, MPG) and 16 auxiliary push buttons. |
| Handheld Operator | The Handheld Operator Station provides a remote station |

| | |
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| Station | for the operator. This station includes the basic requirements for manual operations: a handwheel (or manual pulse generator, MPG), an axis select rotary switch, a feed rate multiplier rotary switch, an emergency stop push button, and two push buttons (typically used for the axis jogging). |
| External floppy or CD | An external floppy drive or CD reader or CD read/write can easily be added utilizing the USB ports. |
| MMMIO PLC components | The MMMIO (MACHINEMATE Modular Input Output) system is the hardware component system for the PLC. Available are digital and analog input and output modules. Each interface module is plugged into a module box and each module box can carry two interface modules. Stopping brackets and a termination plug are needed. The connection to the MACHINEMATE is done via the high speed Superbus using cables that are available in different lengths. |
| External Modem | An external USB Data Modem is standard on the eCNC. It is optional on the L2. |
| Fieldbus Master | An optional Fieldbus master is available. The supported fieldbus technologies are Interbus (MM91), Profibus slave (MM92), Profibus master (MM97), Can-bus (MM98), DeviceNet (MM99). |

1.3 Static Specifications

- Temperature: -4° F (-20° C) to +140° F (+60° C)
- Maximum humidity: 80%, (non-condensing)
- Maximum permitted acceleration: 4.0 g
- Weight:
 - L2 IPC 18.5 lb (8.4 kg)
 - eCNC IPC 24.5 lb (11.1 kg)
 - LW IPC 15 lb (6.8 kg)
 - 19" operators display unit with 12.1" TFT 11.0 lb (5.0 kg)
 - 19" operators display unit with 15" TFT 16.0 lb (7.3 kg)
 - 11.4" slim line operators display unit and keypad 8.0 lb (4.0 kg)

1.4 Operating Specifications

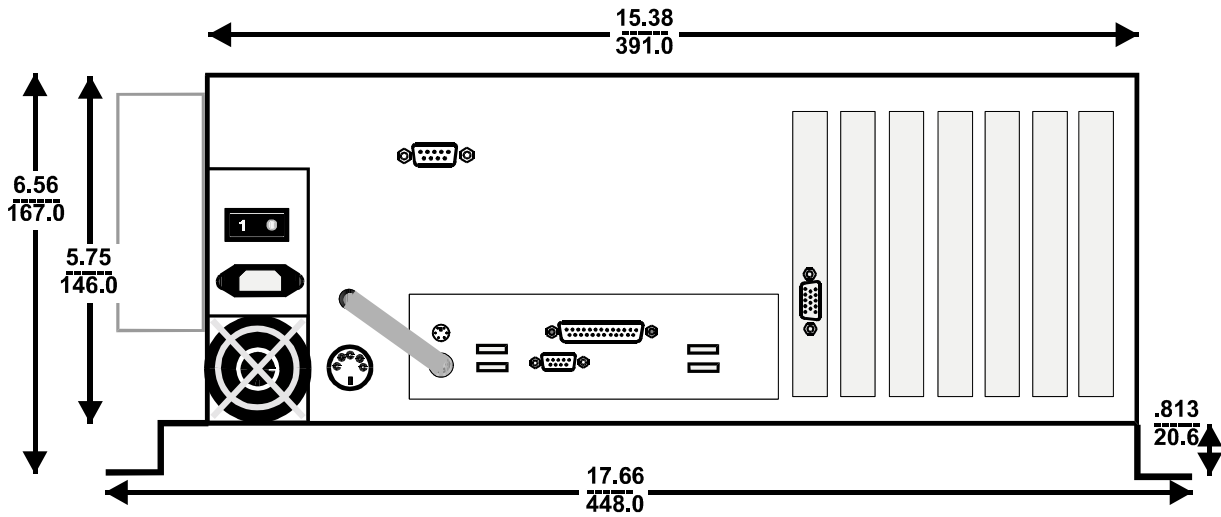
- Temperature: 50° F (10° C) to +113° F (+45° C)
- Maximum humidity: 80%, (non-condensing)
- Maximum permitted acceleration: 3.5 g
- Space Requirements:

For installation - a free space of 4" (100 mm) is required for all surfaces which have connectors or fans.
- Power Requirements: 115 - 240 V AC / 50-60 Hz
- Maximum power required: 250 VA
- Test conditions:

All controllers are subject to a run-in test of 48 hours in cycles of 50° to 113°F.
- Protection: Operator's panel IP 65

2 CNC dimensions

2.1 MACHINEMATE eCNC



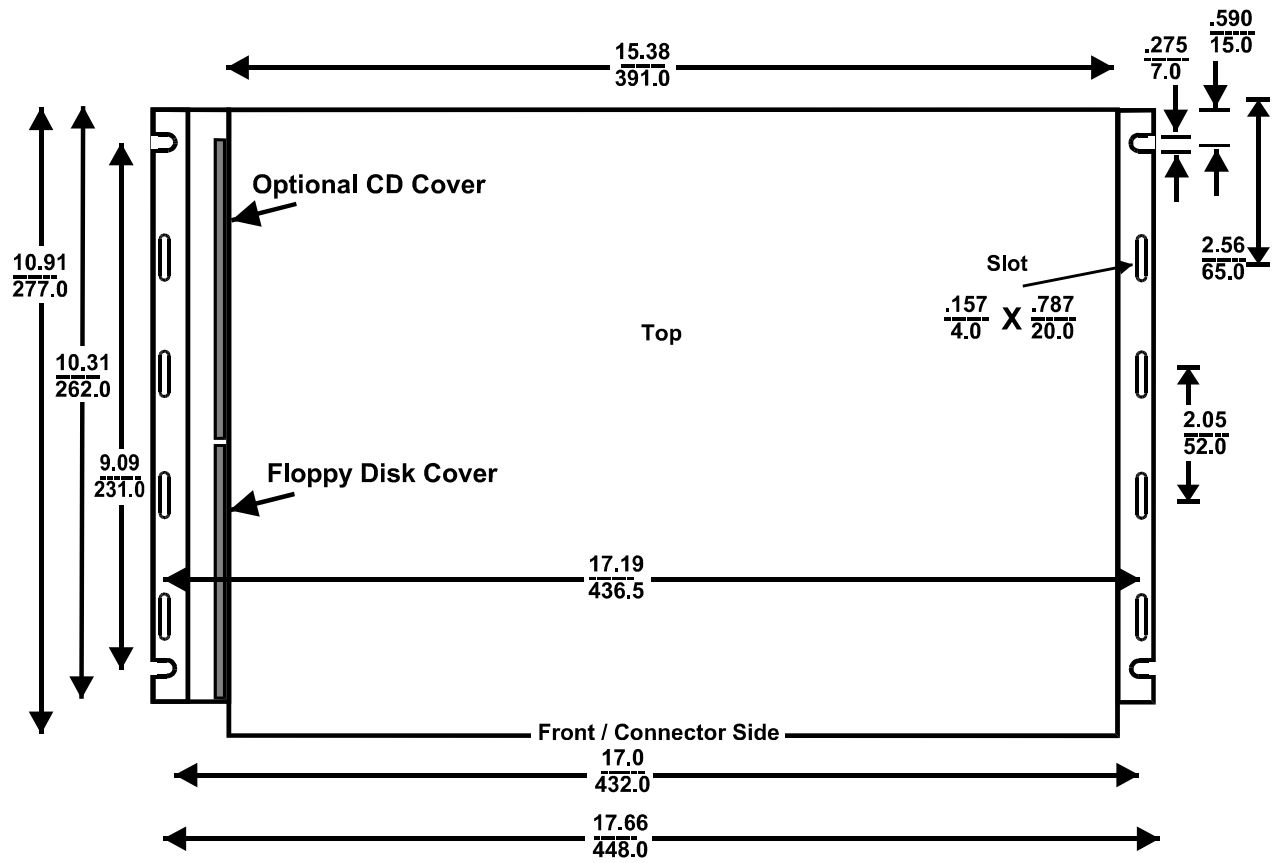
Front view

M205 – eCNC with 12.1" TFT 19" rack-mount front panel (see 3.1)

M215 – eCNC with 15" TFT 19" rack-mount front panel (see 3.1)

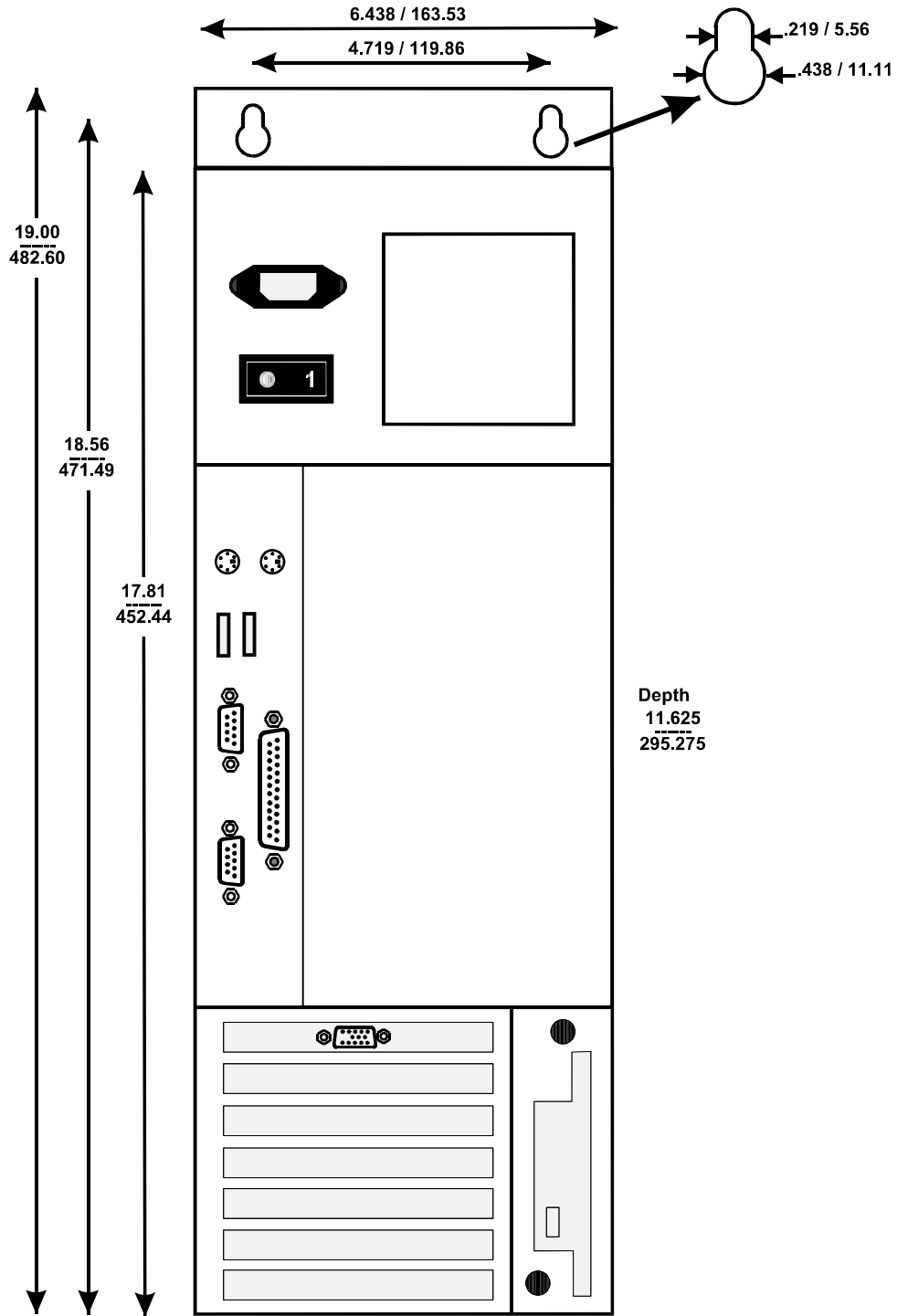
M245 – eCNC with no front panel

Each eCNC model is configured for either analog (4 servos) or SERCOS (8 servos).



Top view

2.2 MACHINEMATE L2

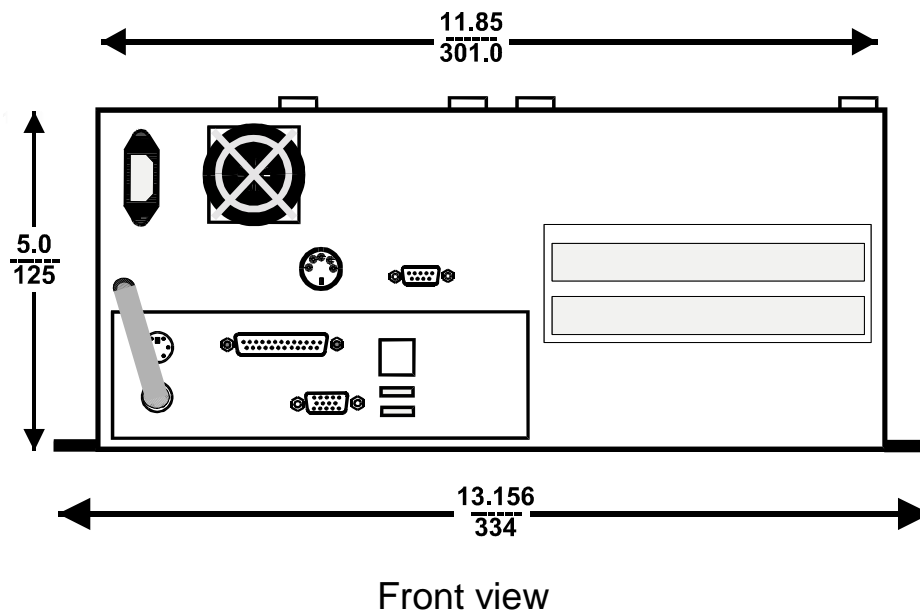


Front view

- M203 – analog L2 with 12.1" TFT 19" rack mount front panel (see 3.1)
- M210 – SERCOS L2 with 12.1" TFT 19" rack mount front panel (see 3.1)
- M211 – analog L2 with 15" TFT 19" rack mount front panel (see 3.1)
- M213 – SERCOS L2 with 15" TFT 19" rack mount front panel (see 3.1)
- M241 – analog L2 with no front panel
- M242 – SERCOS L2 with no front panel

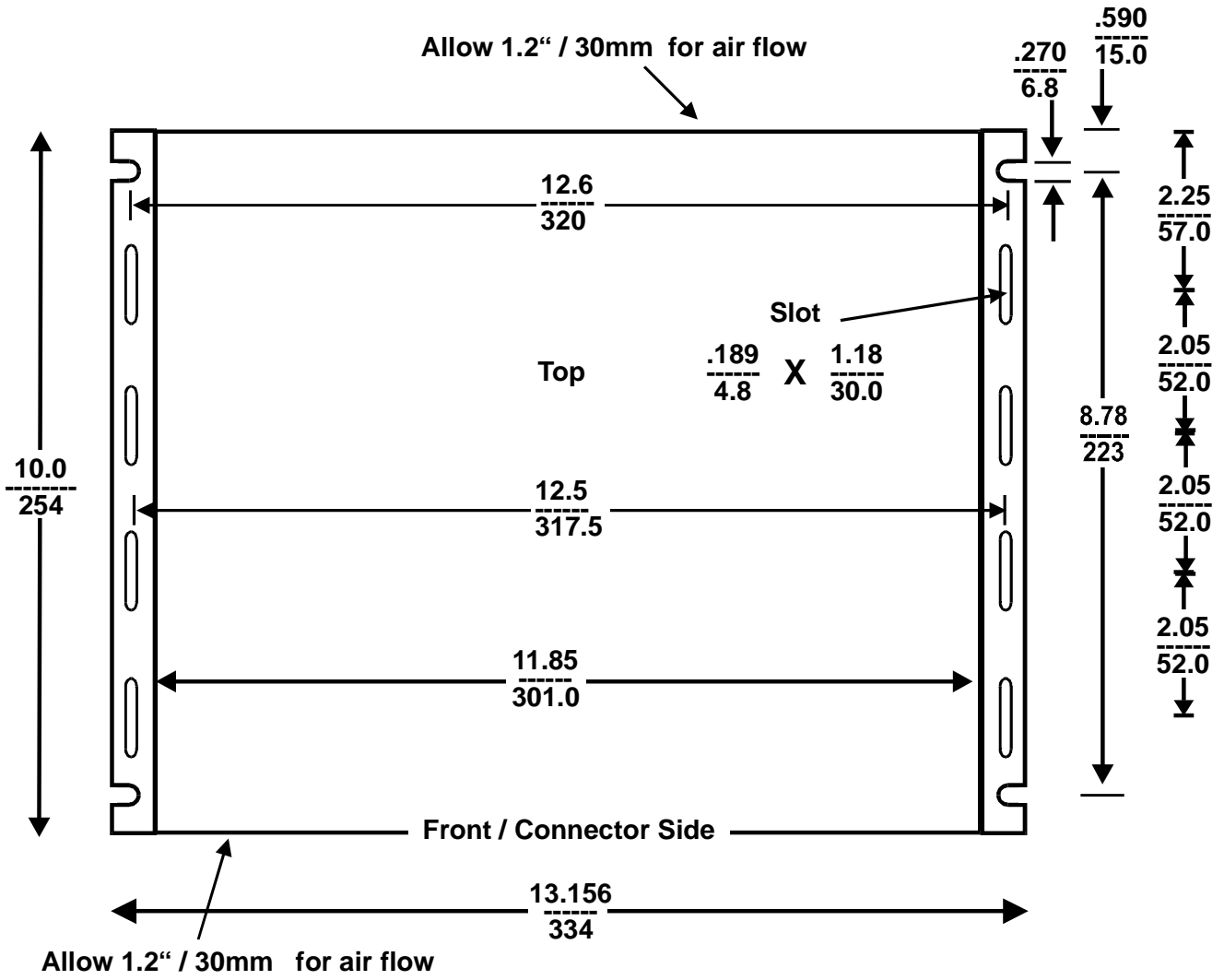
Each analog L2 model is configured for 4 servos.
 Each SERCOS L2 model is configured for 8 servos.

2.3 MACHINEMATE LW



- M222 – LW with 12.1" TFT 19" rack-mount front panel (see 3.1)
- M223 – LW with 15" TFT 19" rack-mount front panel (see 3.1)
- M227 – LW with no front panel

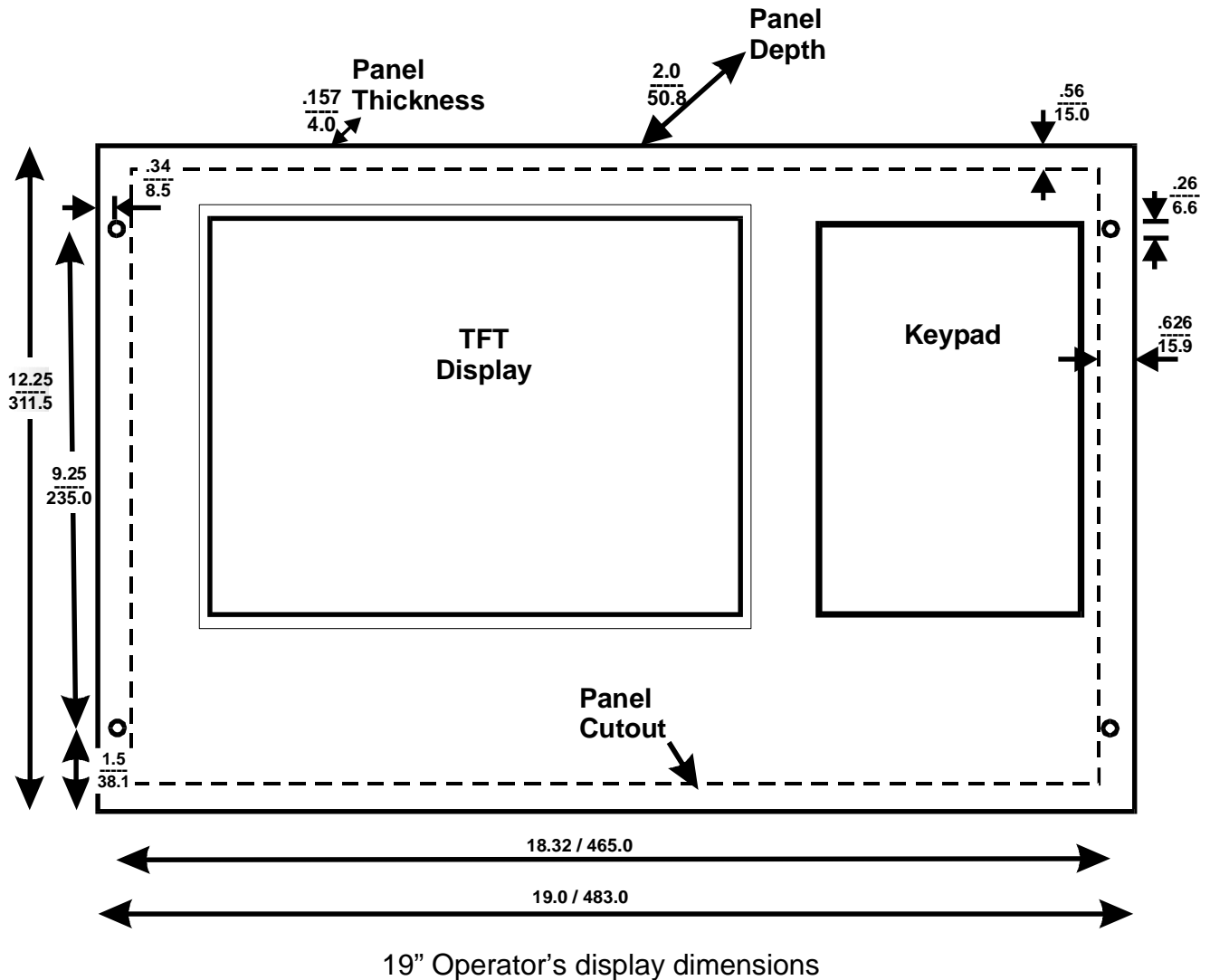
Each LW model is configured for 4 analog servos.



Top view

3 Operator's Station Dimensions

3.1 19 inch Operator's Display Panel



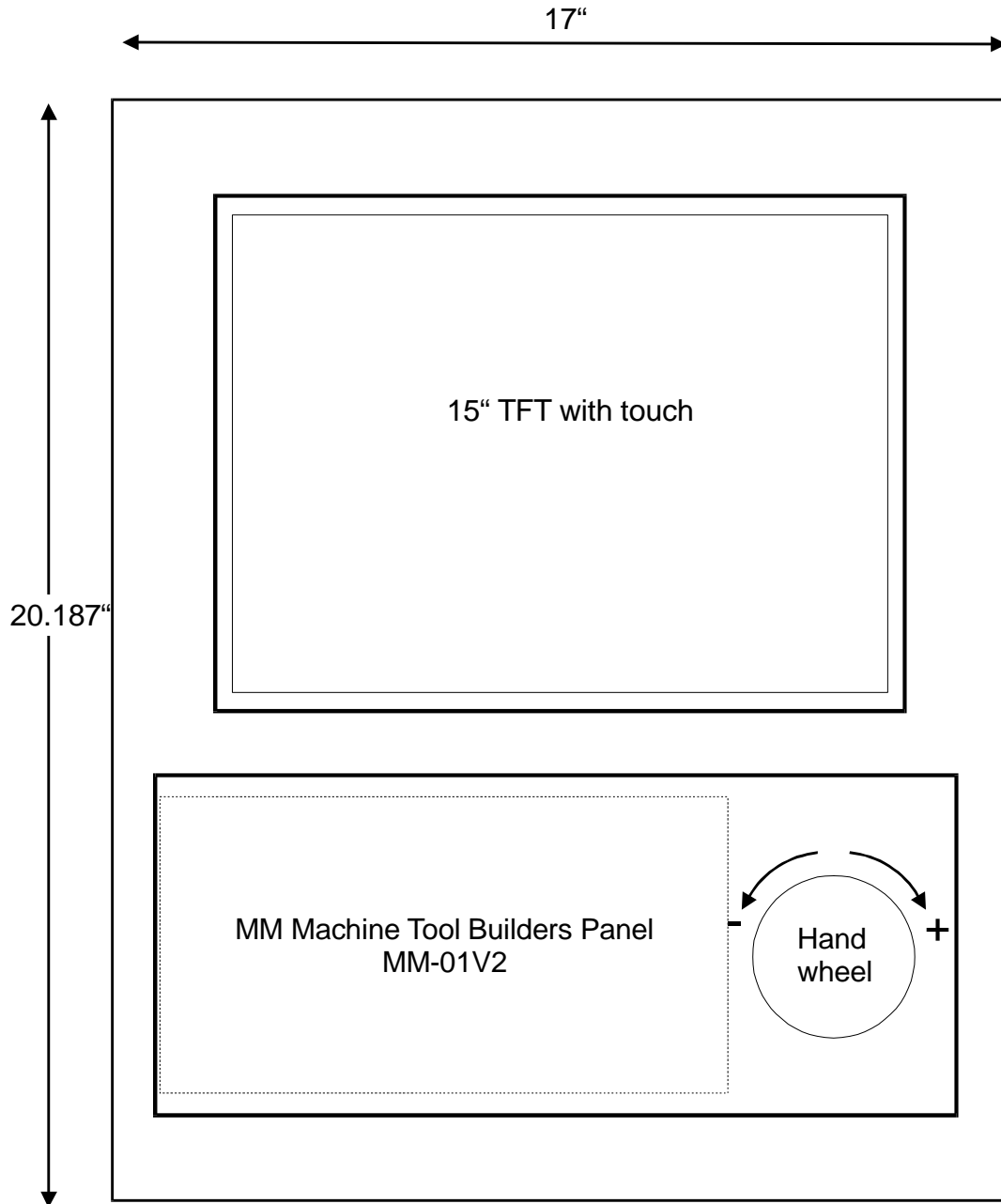
These dimensions apply to all 19" rack-mount display types.

19" with 12.1" TFT Screen with keypad – available in these CNC models:
M203 (L2 analog), M205 (eCNC), M210 (L2 SERCOS), M222 (LW)

19" with 15" TFT Screen (no membrane keypad) – available in these CNC models:
M211 (L2 analog), M213 (L2 SERCOS), M215 (eCNC), M223 (LW)

Front panel requires SVGA and keyboard cables. Different lengths are available:
M232 (2.5-meter SVGA cable for eCNC,L2,LW with 15"), M233 (10-meter SVGA cable for eCNC,L2,LW with 15"), M234 (2.5-meter SVGA/keyboard set for L2 with 12.1"), M235 (10-meter SVGA/keyboard set for L2 with 12.1"), M236 (0.6-meter SVGA/keyboard set for eCNC mounted directly on panel), M237 (2.5-meter SVGA/keyboard set for eCNC,LW with 12.1"), M238 (10-meter SVGA/keyboard set for eCNC,LW with 12.1")

3.2 Vertical Operators station

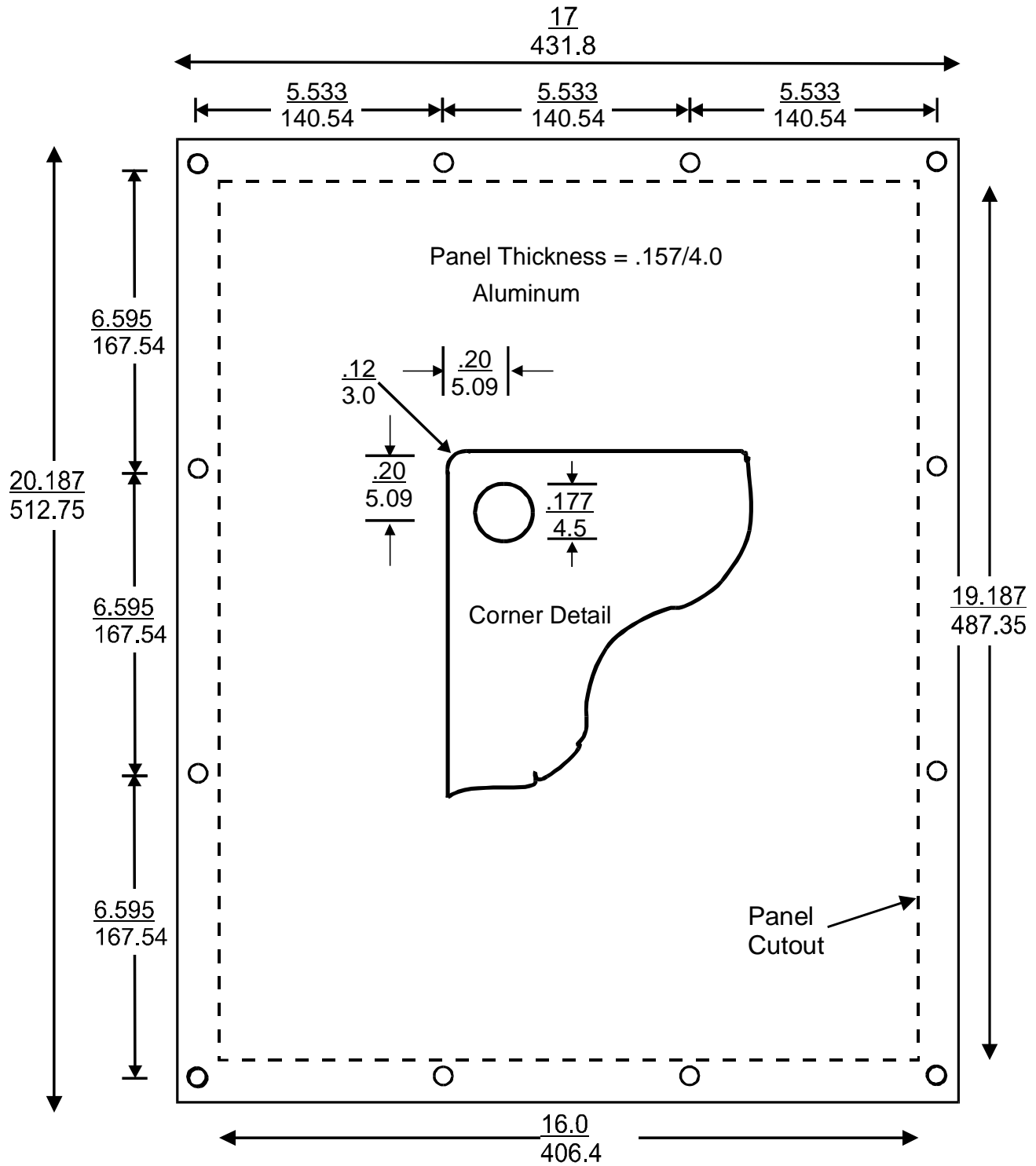


Vertical Operators Station Dimensions

M267 - Vertical Operators Station includes 15" TFT with touch screen, Slim Line MTBP (see Section 5.2) & 24V IO Handwheel.

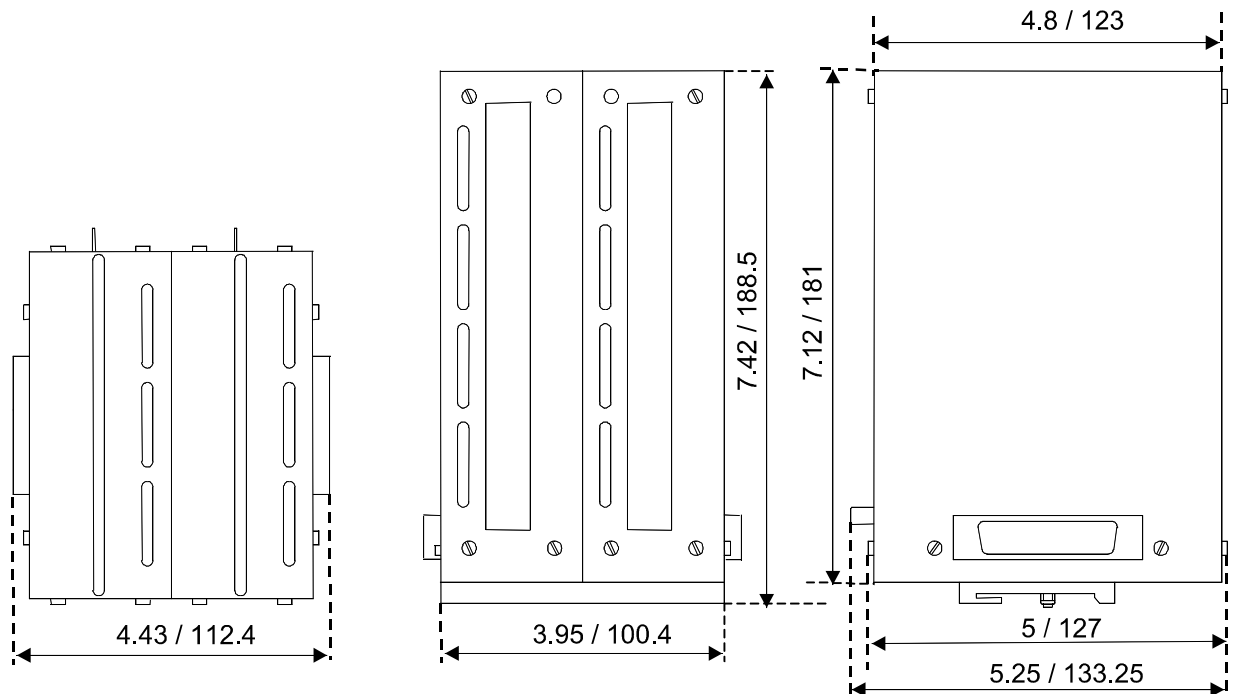
Requires SVGA cable. 2.5 and 10-meter lengths are available:

M232 (2.5-meter for eCNC,L2,LW), M233 (10-meter for eCNC,L2,LW)



Vertical Operators Station Detail Dimensions

4 MACHINEMATE Modular IO Dimensions



Modular IO Dimensions

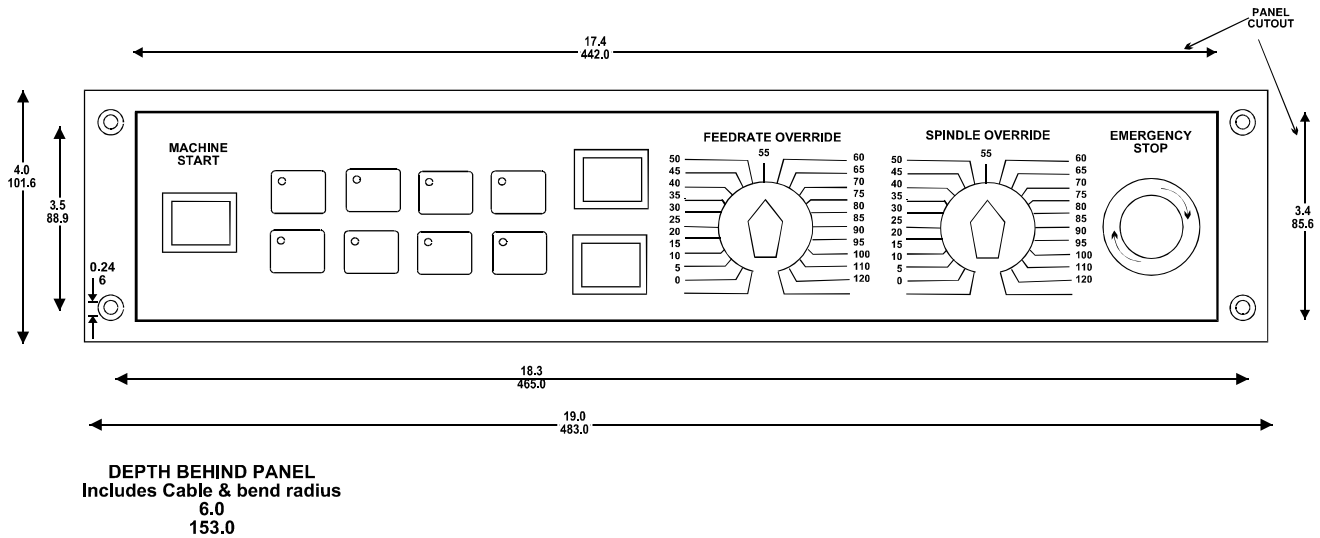
- MM72 – 16RO module - 16 relay outputs (all N.O. contacts)
- MM74 – Connector Kit for 16RO module
- MM76 – Box for two modules (box is shown above)
- MM77 – 2416 module – 24 inputs, 16 outputs (all 24VDC)
- MM80 – Connector Kit for 2416 module
- MM79 – Cover for unused slot in the box
- M148 – 4AD4DA module – 4 A/D inputs, 4 D/A outputs (all +/- 10V analog)
- M183 – Connector Kit for 4AD4DA module
- M149 – 4ENC4A module – 4 encoder inputs, 4 D/A outputs, 4 A/D inputs
- M181 – Connector Kit for 4ENC4A module
- M329 – Termination Plug (Required on the last module)
- M184 – DIN Rail Anchor (Set of 2)

Cable between IPC and IO box is available in different lengths.

MM82 (2-meter), MM85 (5-meter), MM86 (10-meter), MM87 (20-meter), MM88 (35-meter)

5 MACHINEMATE Operator's Panel Dimensions

5.1 19" Horizontal Machine Tool Builders Panel



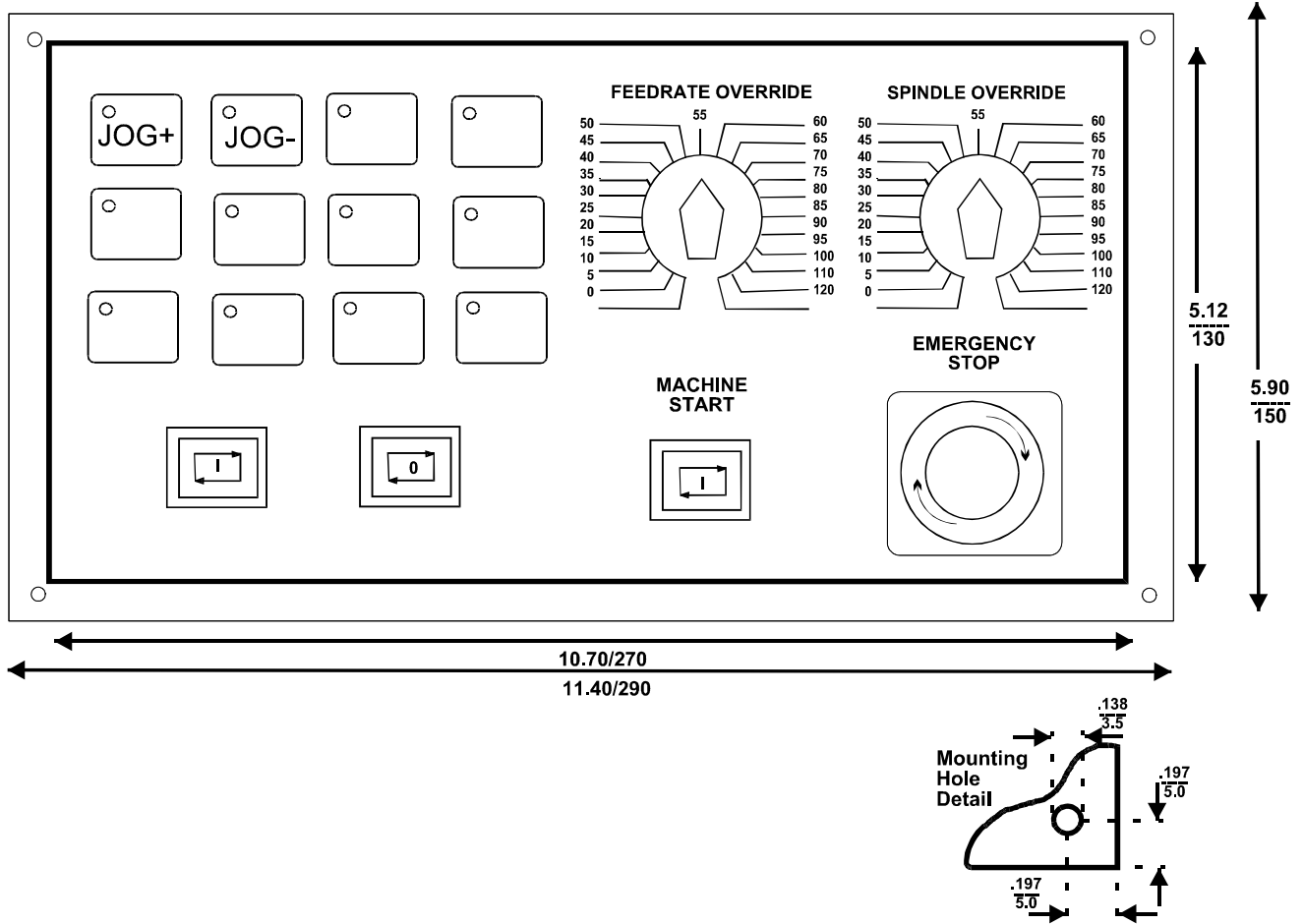
Horizontal Machine Tool Builders Panel

- M301 – Above panel with 2-meter cable
- M319 – Above panel with no cable
- M360 – Above panel with 5-meter cable

50-Pin D-shell female connector with flying lead cable can be used on any of these machine tool panels (this page and on the next two pages).

- M387 – DB50-female with 1-meter cable flying leads
- M374 – DB50-female with 5-meter cable flying leads
- M373 – DB50-female with 10-meter cable flying leads
- M372 – DB50-female with 20-meter cable flying leads

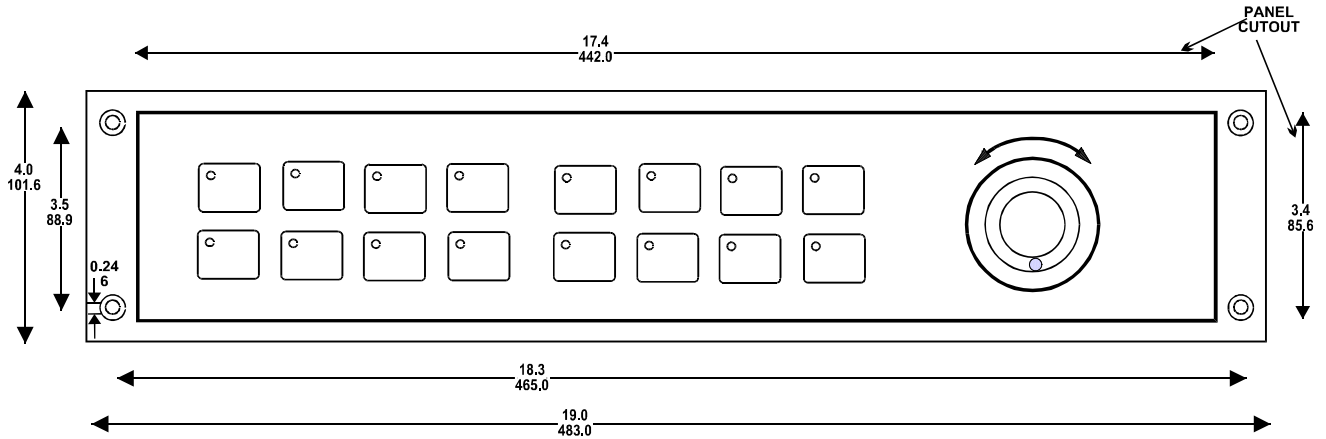
5.2 Slim Line Machine Tool Builders Panel



Slim Line Machine Tool Builders Panel

- M307 – Above panel with 2-meter cable
- M309 – Above panel with no cable
- M361 – Above panel with 5-meter cable

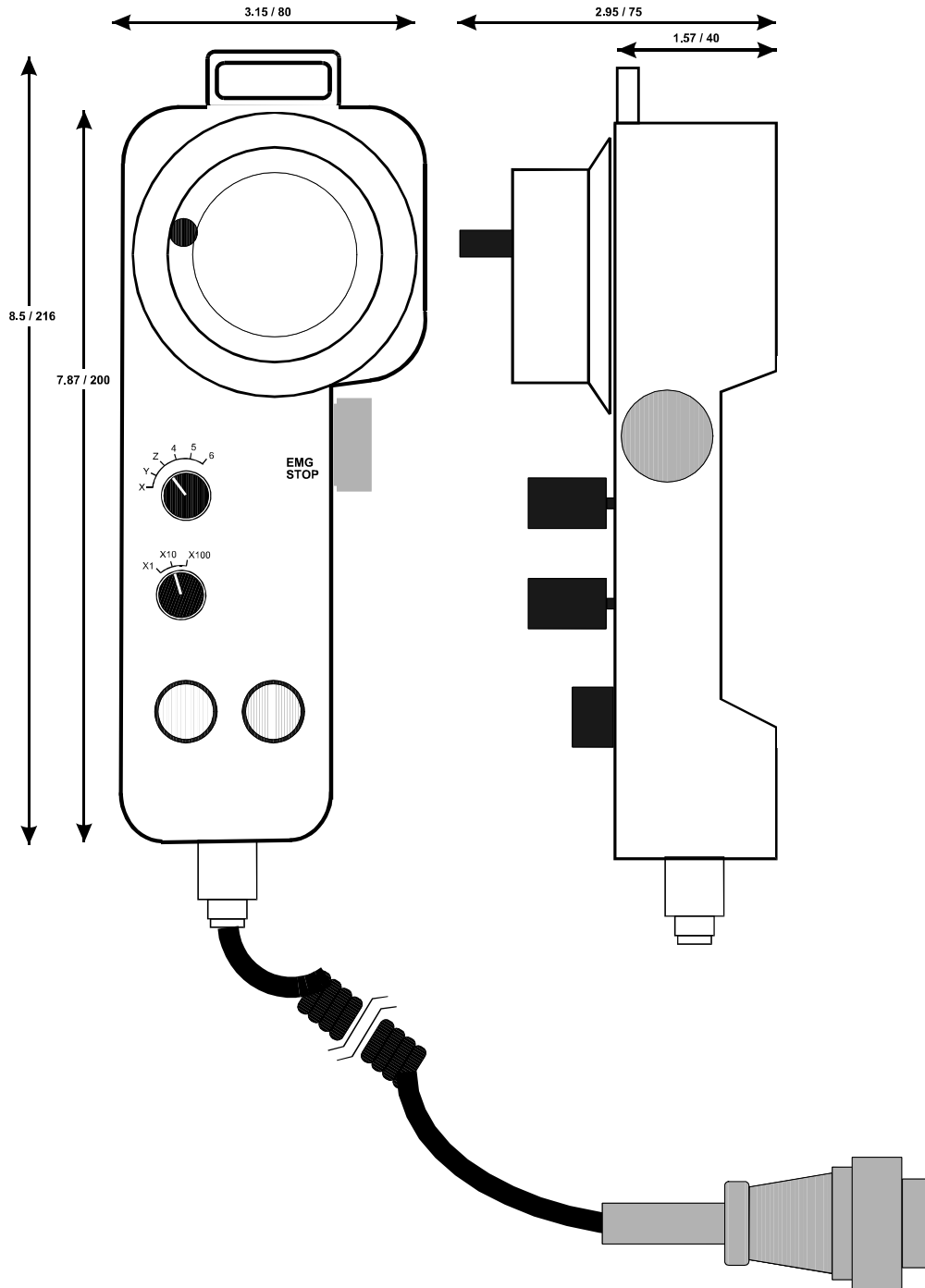
5.3 19" Horizontal Auxiliary Panel



Auxiliary Machine Tool Builders Panel

- M293 – Above panel with 24V digital MPG and with 2-meter cable
- M295 – Above panel with 5V TTL (encoder compatible) MPG and with 2-meter cable
- M362 – Above panel with 5V TTL (encoder compatible) MPG and with 5-meter cable
- M363 – Above panel with 24V digital MPG and with 5-meter cable

5.4 Hand Held Operator's Station



- M300 – Hand held MPG – 24V I/O Handwheel w 4.26' coil cord (21' extended)
- M316 – Hand held MPG – 5V TTL Handwheel w 4.26' coil cord (21' extended)
- M336 – Hand held MPG – 24V I/O Handwheel w 5.9' coil cord (34' extended)
- M337 – Hand held MPG – 5V TTL Handwheel w 5.9' coil cord (34' extended)