



## MM200 Vacuum Controller

Part Number: 2-7900-20

### Operating Specifications<sup>1</sup>

Operating Range	1 x 10 <sup>-11</sup> to 9900 Torr max
Communications <sup>2</sup>	RS-232/RS-485
Analog Output	0 to 10 VDC (1 per sensor)
Analog Output Resolution	12 Bits
Programmable Set Points	4 per module (8 max)
Set Point Type	Relay
Supply Voltage	115/230 VAC (2/1 A), 50-60Hz
Maximum Power	230 W
Calibration Medium	Dry air or nitrogen
Operating Temperature	0° to +50° C
Storage Temperature	-40° to +85° C
Display Readable Distance	10 m (35 ft)
Maximum Sensors Controlled	10

### Physical Characteristics

Housing	Aluminum
Electrical Connections	Power cord (IEC 60320 C-13)
Weight (base unit)	2.2 kg (5 lbs)
Dimensions	See dimensional drawings

### Benefits

- Customer configurable design
- Rack mountable
- Built-in self-diagnostics
- Easy to read large LED display
- Selectable units of measurement (Torr/micron, Pascal, mbar)
- Digital interface
- One analog output per sensor
- Excellent customer support
- Designed and manufactured in the United States of America

### Set Points<sup>2</sup>

The MM200 has up to eight relay set points. The relays are located on two optional relay modules with four set points each. Individual relay status LEDs are displayed on the front panel. The heavy duty relays have a SPDT (1 Form C) contact form and are rated for 24 VDC. They have a maximum current rating of 8 A at 250 VAC or 5 A at 30 VDC.

### Description

The MM200 controls any Televac vacuum sensor including cold cathode, convection, diaphragm, hot ion, and thermocouple sensors. It also has optional features including up to 8 relay set points and RS-232/RS-485 communications. The large, bright LED display makes it easy to read from a distance. The MM200 is a modular unit, allowing customers to choose a vacuum sensing solution specific to their needs.



### Ratings and Compliance

- Certified to UL 61010-1
- CE certified to EN61326-1:2006
- ISO 17025 accredited calibration optional
- NIST traceable calibration optional

<sup>1</sup>Visit our website at [www.frederickscompany.com](http://www.frederickscompany.com) for a list of definitions for terms used in the operating specifications. All test data was acquired at 23° C.

<sup>2</sup>The data sheet for the relays can be found at:

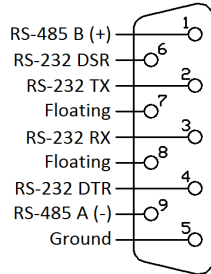
<http://www.omron.com/ecb/products/pdf/en-g6rn.pdf>

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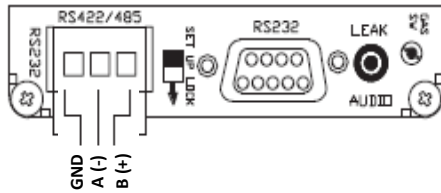


### Electrical Connections

Pin	Description
1	RS-485 B (+)
2	RS-232 TX
3	RS-232 RX
4	RS-232 DTR
5	Ground
6	RS-232 DSR
7	Floating
8	Floating
9	RS-485 A (-)



\*RS-485 uses a 3 pin interface



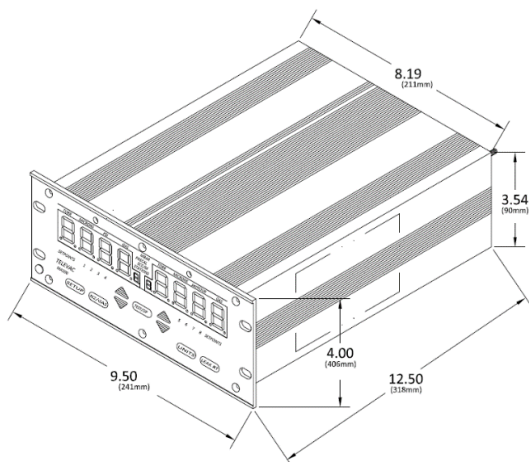
### Related Products

CC-10 Active Vacuum Gauge – This gauge utilizes dual sensor technology to replace multiple conventional vacuum gauges, permitting seamless measurement of twelve decades of pressure. It has a variety of features including a wide range of measurement from  $1 \times 10^{-9}$  up to 1000 Torr, RS-485 communications, three programmable set points, and a selectable analog output and a bright LED display. Options can be set from either four touch controls located on the front of the unit or through RS-485 communications. The simplicity of use and wide measurement range make this unit an excellent choice for a variety of vacuum applications.

MC300 Vacuum Sensor Controller – The MC300 controls up to two Televac thermocouple or convection rough vacuum sensors and an optional cold cathode or mini hot ion high vacuum sensor. It features 4 relay set points and large, bright LED displays, making it easy to read from a distance.

Visit our website at [www.frederickscapany.com](http://www.frederickscapany.com) for a full list of products.

### Dimensional Drawings (units in inches)



### Ordering Information

<b>MM200 Base Unit</b>	2-7900-20
<b>MM200 Part Number</b>	2-6200-XXX
Quad Relay Module	211
RS-232/485 Communications Module	213
2A Dual Thermocouple Module	186
4A Dual Convection Module	215
7B Penning Magnetron Cold Cathode Module	227
7E DIM Cold Cathode Module (obsolete - use 285)	223
7F/7FC DIM Cold Cathode Module (obsolete - use 285)	245
7FCS DIM Cleanable CC Quick Start Module	285
1E Dual Piezo Diaphragm Module	220
1F Dual Piezo Diaphragm Module	244
Capacitance Diaphragm Module	252
3F Mini Bayard-Alpert Hot Ion Module	291

### Simulators

2A Octal, Red Line	2-2100-237
2A Octal, 3 Point: 0, 100, 1000 Torr	2-2100-242
2A Mini, Red Line	2-2100-240
2A Mini, 3 Point: 0, 100, 1000 Torr	2-2100-241
4A, Red Line	2-2119-000
4A, 3 Point: 0, 1, 760 Torr	2-2119-003
7B, 2 Point: $10^{-3}$ , $10^{-5}$ Torr	2-2100-93
7E/7F/7FC/7FCS, 2 Point: $10^{-3}$ , $10^{-5}$ Torr	2-2145-000

### Standard Cables<sup>3</sup>

Length	2A Cable	4A Cable	7B Cable
10 ft (3 m)	2-9800-52	2-9819-010	2-9800-09
20 ft (6.1 m)	2-9800-53	2-9819-020	2-9800-41
35 ft (10.6 m)	2-9800-55	2-9819-035	2-9800-42
50 ft (15.2 m)	2-9800-56	2-9819-050	2-9800-43

Length	Mini BA Cable	7 E/F Cable
10 ft (3 m)	2-9854-010	2-9841-010
20 ft (6.1 m)	2-9854-020	2-9841-020
35 ft (10.6 m)	2-9854-035	2-9841-035
50 ft (15.2 m)	2-9854-050	2-9841-050

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<sup>3</sup> Sensor-specific cables will need to be purchased to match the desired sensor configuration. High temperature, radiation-resistant, and triaxial cables are also available.

**MM200 Vacuum Controller**  
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**Configuration Addendum**

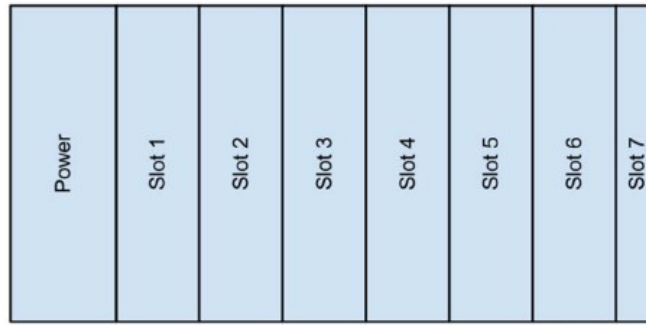


### Module Selection Guide

Module	Description	Range (Torr)	Sensors Controlled	Slots (Max Modules)
1E	Dual Piezo Diaphragm	1 to 1000	2	1 (5)
1F	Dual Piezo Diaphragm	10 to 9900	2	1 (5)
2A	Dual Thermocouple	10 <sup>-3</sup> to 20	2	1 (5)
4A	Dual Convection	10 <sup>-3</sup> to 1000	2	1 (5)
3F	Mini Bayard-Alpert Hot Ion	10 <sup>-10</sup> to 10 <sup>-2</sup>	1	2 (2)
7B	Penning Magnetron Cold Cathode	10 <sup>-7</sup> to 10 <sup>-3</sup>	1	2 (3)
7E	Double Inverted Magnetron Cold Cathode	10 <sup>-8</sup> to 10 <sup>-2</sup>	1	1 (5)
7F/FC	Double Inverted Magnetron Cold Cathode	10 <sup>-11</sup> to 10 <sup>-2</sup>	1	1 (5)
7FCS	Double Inverted Magnetron Cold Cathode with Quick Start	10 <sup>-11</sup> to 10 <sup>-2</sup>	1	1 (5)
CDG	Capacitance Diaphragm	10 <sup>-4</sup> to 1000	2	1 (5)
Quad Relay	Quad Relay Set Points	-	-	1 (2)
RS-232/485	RS-232/485 Communications	-	-	1 (1)

### Sample Configuration

The Televac MM200 vacuum sensor controller may be assembled by combining several modules to form the desired multi-functional controller. Select the desired modules and build the controller as shown in the example below. Modules can be placed in any of slots 1 through 6. Slot 7 is reserved for RS-232/485. No configuration may contain more than ten sensors. Blank panels are used if there is less than a full complement of modules.



\*Image not to scale

### Back Panel Module Expansion Slots Sample Configuration



MM200	
Slot 0:	Power Module
Slot 1:	Quad Relay Module
Slot 2:	Dual Convection Module
Slot 3:	Dual Thermocouple Module
Slot 4:	Blank Panel
Slot 5:	Cold Cathode Module
Slot 6:	Blank Panel
Slot 7:	RS-232/485 Module

**Notes:**

1. Selectable 110 VAC or 220 VAC operation – units shipped in 110 VAC standard unless otherwise specified
2. Slot 0 is reserved for power supply module
3. Slot 7 is reserved for RS-232/485 module