

CC-10

Wide range vacuum gauge



Featuring

- Seamless measurement from atmospheric pressure to UHV on a single vacuum port
- 0-10VDC analogue output
- Three adjustable set points
- Digital display, read in Torr, Mbar or Pa
- Vacuum range: Atmosphere to 1×10^{-9} Torr
- RS485 Digital communications

MM 200

Modular vacuum gauge

Featuring

- Expandable design
- Exceptional readability
- Built in self-diagnostics
- Selectable units
- System leakup rate
- RS232/RS485 Digital communications



MC 300

Vacuum measurement solutions

Featuring

- Vacuum range: Atmosphere to 1×10^{-11} Torr
- Large, bright LED display
- Built in self-diagnostics
- 0-10V outputs for each sensor
- Selectable units: Torr, microns, mBar or Pascal
- Four process control relays with individually assignable set points
- Operator lockout switch



Vacuum measurements



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CC-10 Wide range vacuum gauge

Measurement range: 760 Torr to 1×10^{-9} Torr



Description

The CC-10 is a self-contained compact gauge and controller designed to replace multiple conventional vacuum gauges by incorporating the latest sensor technology to permit seamless measurement of twelve decades of pressure. This gauge uses dual sensor technology. Rough vacuum, from atmospheric pressure to 10^{-2} Torr is measured using a crystal sensor; while pressure from 10^{-2} Torr to 1×10^{-9} Torr is measured with a double inverted magnetron cold cathode sensor.

All operating parameters are easily addressed and checked from the membrane panel on the front of the electronics module. A blue-green segmented LED provides pressure indication. Discrete LEDs indicate status for each of the three set point relays.

The CC-10 offers the user the choice of both analogue and digital communication as a standard feature.

Features

- Seamless measurement from atmospheric pressure to UHV on a single vacuum port
- 0-10VDC analogue output
- Three adjustable set points
- Digital display, read in Torr, Mbar or Pa
- Vacuum range: Atmosphere to 1×10^{-9} Torr
- RS485 Digital communications
- Power with 24VDC
- Small Size: 94 x 70 x 160

Typical product applications

- Physical vapour deposition
- Optical and functional thin films
- Molecular beam epitaxy
- Accelerators and UHV research
- Electron device manufacture
- Optoelectronic device manufacture

All dimensions are nominal in millimetres unless specified

CC-10 Wide range vacuum gauge

Measurement range: 760 Torr to 1×10^{-9} Torr



Sensor description

The crystal sensor is a simple tuning-fork quartz oscillator, similar to the oscillators commonly used in wrist watches. The electrical impedance of the oscillation depends upon the pressure of the gas that surrounds the quartz oscillator, because the resistance to the oscillation (as caused by friction between the quartz surface and gas molecule), varies as the pressure changes. The crystal sensor measures the electrical impedance of the quartz oscillator and its circuitry converts it to the pressure value.

The double inverted magnetron cold cathode sensor measures pressure by ionizing the residual gases in a magnetron discharge. The body of the sensor serves as the cathode and is at ground potential. The anode operates at as much as 4000 volts. A permanent magnet traps electrons in the sensor to sustain the discharge at a very low pressure. This type of sensor, like all ionization sensors, is sensitive to gas type, but unlike conventional ionization gauges, has no filaments to burn out, can operate continuously at higher pressure and is considerably more rugged and reliable.

Specifications

Measurement range	760 Torr to 1×10^{-9} Torr
Measurement units	Torr Mbar or Pa
Sensor technology	Crystal/double inverted magnetron cold cathode that is a modular and replaceable assembly
Display	Green segmented LED numeric pressure indicator plus discrete LEDs for set point status
Analogue output	0-10VDC, log/combined linear characteristics
Set points	3 independent set points, adjustable. Contact rating 50VDC @ 0.12A
Digital interface	RS485 via D-sub 15 pin female
Vacuum connection	NW40 or 2.75" CF
Operating voltage	22-26VDC
Operating temperature	Maximum 50°C
Bake temperature	Maximum 150°C with electronics module removed
Physical envelope	94 x 70 x 160
Weight	700 grams with NW25 flange

Ordering information

Description	Reference	Part number	£	€	SFr.
CC-10 Instrument with NW25 mounting flange	CC-10-K25	1401000	1341	1469	2132
CC-10 Instrument with NW40 mounting flange	CC-10-K40	1401001	1345	1473	2139
CC-10 Instrument with 2.75" CF Flange	CC-10-C40	1401002	1361	1490	2163
Replacement sensor assembly with NW25 mounting flange	RSA-K25	1401003	495	542	787
Replacement sensor assembly with NW40 mounting flange	RSA-K40	1401004	495	542	787
Replacement sensor assembly with with 2.75" CF Flange	RSA-C40	1401005	507	555	806
Replacement Viton® O-Ring for anode and crystal assembly	RVOR	1401007	2	2	3
Remote display module	RDM	1401008	846	926	1345
CC-10 Cable, 304.8 cm length	CABLE-CC10	1401009	125	137	198
Remote display module cable, 304.8 cm length	RDMC	1401010	130	143	207
110VAC / 24VDC power supply	PS-CC10	1401011	94	103	150

All dimensions are nominal in millimetres unless specified. Weights given are approximate.



MC 300 Series Vacuum measurement gauge



Features

- Large, bright LED display
- Built-in self-diagnostics
- Selectable units Torr; microns, mBar or Pascal
- Gas compensation Argon N2
- Four process relays with individually assignable set points
- Recorder outputs for each sensor
- Operator lockout switch

Range	Model	Sensor
20,000 microns to 10^{-7} Torr	MC2A 7B	2A Thermocouple 7B2 Cold cathode
Atmosphere to 10^{-7} Torr	MC4A 7B	4A Convection B2 Cold cathode
20,000 microns to 10^{-8} Torr *	MC2A 7E/F	2A Thermocouple 7E/F Cold cathode
Atmosphere to 10^{-8} Torr *	MC4A 7E/F	4A Convection 7E/F Cold cathode
20,000 microns to 1 Micron (millitor)	MC 300 2A	2A Thermocouple
Atmosphere to 1 Micron (millitor)	MC 300 4A	4A Convection

* 10^{-10} Torr when used with 7F

Description

The MC 300 Series Instrument utilizes time-proven and patented Televac sensor technology. State-of-the-art electronics provide a reliable, rugged vacuum measurement and control instrument with two channels of rough vacuum and one high vacuum. Each instrument measures a specific vacuum range offering exact measurement and control for each application. The MC 300 is the most cost-effective vacuum measurement system available today.

Specifications

Calibration medium	Dry nitrogen
Operating temperature (instrument)	0° to 50°C
Operating voltage/frequency	95 to 135 or 220 VAC 50/60 Hz
Relay contact rating	Dry circuit to 5A 110 VAC 3A 240 VAC
Recorder outputs	0 to 10 VDC
Weight	2.27 Kg

All dimensions are nominal in millimetres unless specified

MC 300 Series Vacuum measurement gauge



2A Thermocouple sensor

Measurement range 1 to 20,000 microns
Construction Nickel-plated brass, stainless steel



Reference	Part number	£	€	SFr.
2A-1/8NPT-NB	1401040	59	65	94
2A-1/8-NPT-SS	1401041	153	167	243
2A-K16-SS	1401042	160	175	254

Other fittings available

Ordering information

Reference	Sensor	Cables	Part number	£	€	SFr.
MC2A-7B	2A/ 7B	2A/ 7B	1401030	1177	1289	1872
MC4A-7B	4A/ 7B	4A/ 7B	1401031	1326	1451	2108
MC2A-7E/F	2A/ 7E or 7F	2A/ 7E or 7F	1401032	1462	1601	2325
MC4A-7E/F	4A/ 7E or 7F	4A/ 7E or 7F	1401033	1567	1716	2492
MC-300-2A	2A	2A	1401034	979	1072	1556
MC-300-4A	4A	4A	1401035	1076	1178	1711

4A Patented convection sensor

Measurement range 10³ Torr to atmosphere
Construction Nickel-plated brass, stainless steel



Reference	Part number	£	€	SFr.
4A-1/8-NPT-NB	1401050	90	98	143
4A-1/8-NPT-SS	1401051	153	167	243

Other fittings available

2A/4A Cable



7B2 Coax connectors MHV



7E/F Coax connectors SHV



Reference	Length	Part number	£	€	SFr.
CABLE-MC300-2A-900	91.4 cm	1401080	55	61	88
CABLE-MC300-2A-3000	305 cm	1401081	55	60	87
CABLE-MC300-2A-6000	610 cm	1401082	60	66	95
CABLE-MC300-2A-10000	10.7 m	1401083	73	80	117
CABLE-MC300-2A-30000	15.2 m	1401084	86	94	136

Reference	Length	Part number	£	€	SFr.
CABLE-MC300-4A-3000	305 cm	1401090	62	68	99
CABLE-MC300-4A-6000	610 cm	1401091	76	84	121
CABLE-MC300-4A-10000	10.7 m	1401092	94	102	149
CABLE-MC300-4A-30000	15.2 m	1401093	101	111	161

Reference	Length	Part number	£	€	SFr.
CABLE-MC300-7B2-3000	305 cm	1401100	66	73	105
CABLE-MC300-7B2-6000	610 cm	1401101	70	77	112
CABLE-MC300-7B2-10000	10.7 m	1401102	82	90	130
CABLE-MC300-7B2-30000	15.2 m	1401103	94	102	149

Reference	Length	Part number	£	€	SFr.
CABLE-MC300-7EF-3000	305 cm	1401110	94	102	149
CABLE-MC300-7EF-6000	610 cm	1401111	97	107	155
CABLE-MC300-7EF-10000	10.7 m	1401112	101	111	161
CABLE-MC300-7EF-30000	15.2 m	1401113	109	120	174

7E/7F Patented double inverted magnetron cold cathode sensor

Measurement range 7E 10⁻² to 10⁻⁹ Torr
Measurement range 7F 10⁻² to 10⁻¹⁰ Torr
Construction All stainless steel



Reference	Part number	£	€	SFr.
7E-K25	1401060	398	435	632
7E-K40	1401061	402	440	638
7F-C40	1401062	409	448	651

Other fittings available

7B2 Penning cold cathode sensor

Measurement range 10⁻³ to 10⁻⁷ Torr
Construction Brass, stainless steel
 Cleanable, replaceable anode



Reference	Part number	£	€	SFr.
7B2-3/4-NPT-B	1401045	271	296	430
7B2-3/4-NPT-TB	1401046	366	401	583
7B2-K25-SS	1401048	366	401	583

Other fittings available

Accessories

Accessories	Description	Part number	£	€	SFr.
MBK	Mounting bracket kit	1401065	12	13	19
ZM2AS	Simulator 2A Octal red line	1401066	129	141	205
ZM4AS	Simulator 4A Red line	1401067	129	141	205
7B2-S	Simulator B7B2/B7AC/MP7B2 2 PT	1401068	176	193	280
7E/7S-S	Simulator 7E/7F 10-3 and 10-7	1401069	191	209	304

Other fittings available

All dimensions are nominal in millimetres unless specified



MM 200 Modular vacuum gauge



Features

- Expandable design
 - Add gauges as required without removal from panel
- Exceptional readability
 - Large, bright LEDs
- Built-in self-diagnosis
 - Test mode automatically initiated upon power up
- Selectable units
 - Torr; microns, psi, mBar; or Pascal
- System leakup rate
 - Digitally displayed in microns per hour
- Computer interface
 - RS232/RS485 digital communication with host computer
- Flip down door
 - Settings as well as station identification and setpoint assignment record

Description

This dual display, half-rack, microprocessor-based modular vacuum gauge replaces the numerous instruments previously required for different functions and ranges. Configurations include various combinations of ionization, thermocouple, convection, diaphragm and setpoint relay modules. Assignments of up to 8 relays and setpoint hysteresis are controlled from the front panel. The ionization gauge can be turned on manually or automatically. The MM 200 Modular gauge is the most flexible solution to vacuum measurement and control.

Specifications

Calibration medium	Dry nitrogen
Operating temperature (instrument)	0° to 50°C
Operating voltage/frequency	110/220 ± 10% 50/60 HZ
Relay contact rating	Dry circuit to 5A 110/220 VAC
Analogue (recorder) outputs	0 to 10VDC
Weight	2.27 Kg

All dimensions are nominal in millimetres unless specified

MM 200 Modular vacuum gauge



Gauge configuration

Modules	Range Torr	Recorder output	Maximum station/setpoints
Hot cathode	10 ⁻¹⁰ to 10 ⁻²	Linear/decade, log, linear	1 Station
Cold cathode	10 ⁻¹¹ to 10 ⁻²	Linear/decade, log, linear, non-linear	3 Stations
Convection	10 ⁻³ to 10 ⁺³	Linear/decade, log, linear, non-linear	10
Thermocouple	10 ⁻³ to 20	Linear, log, non-linear	10
Diaphragm	1 to 10 ⁺³	Linear, log, linear/decade	10
Capacitance diaphragm	10 ⁻⁴ to 10 ⁺³	Linear, log	–
Set points	–	–	8

Specify 110-volt or 220-volt operation Units shipped in 110 volt (User switchable)

Sample configuration

Televac modular gauges may be assembled by combining several modules to form the desired multi-functional gauge. Select the desired modules and build the gauge as shown in the example below. Modules can be placed in any of slots 1 through 6. Slot 7 is reserved for RS232/RS485. Blank panels are used if there is less than a full complement of modules.

Televac sensors

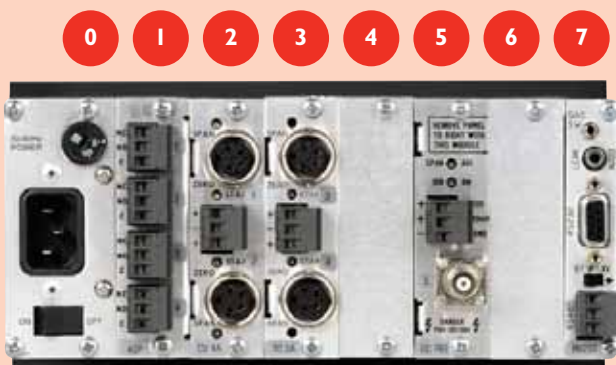
Gauge tube		Range Torr
Thermocouple	2A	10 ⁻³ to 20
Convection	4A	10 ⁻³ to 10 ⁺³
Capacitance diaphragm	CDG	10 ⁻⁴ to 10 ⁺³
Hot cathode Bayard-Alpert	3D1	10 ⁻¹⁰ to 10 ⁻³
Hot cathode Platinized	3D2	10 ⁻¹⁰ to 10 ⁻²
Hot cathode Nude	3D3	10 ⁻¹¹ to 10 ⁻³
Cold cathode	7B2	10 ⁻⁷ to 10 ⁻³
Cold cathode	7E	10 ⁻⁸ to 10 ⁻²
Cold cathode UHV	7F	10 ⁻¹¹ to 10 ⁻²

Available modules

Description	Reference	Part number	£	€	SFr.
MM 200 Base unit (required)	MM200	1401120	928	1016	1475
2A Thermocouple, 2 stations	MM200-2ATC-2S	1401121	292	320	465
4A Convection, 2 stations	MM200-2AC-2S	1401122	292	320	465
CDG Capacitance diaphragm, 2 stations	MM200-CDGD-2S	1401123	444	487	707
1E Diaphragm, 2 stations	MM200-IFD-2S	1401125	265	290	422
7B2 Cold cathode, 1 station	MM200-7B2CC-1S	1401126	483	529	769
7E Cold cathode, 1 station	MM200-7ECC-1S	1401127	511	559	812
7F Cold cathode, 1 station	MM200-7FCC-1S	1401128	581	636	924
3D Hot Ion/BA, Power degas (I2R), 1 station	MM200-3DHI-PD-1S	1401129	799	875	1271
3E Hot Ion/BA, EB degas, 1 station	MM200-3EHI-EBD-1S	1401130	799	875	1271
Quad relay, 4 control relays	MM200-QR-4CR	1401131	281	307	446
RS232/RS485 Digital communications	MM200-DC	1401132	195	213	310

Provisions have been incorporated within the MM 200 for the acceptance of RS232 and RS485

Back panel modules expansion slots Sample configuration



MM 200 Microprocessor with power supply, 6 stations 4 relays and RS232:

- Slot 1** 4 relay module 5 amp, 120 VAC
- Slot 2** Dual thermocouple module 2 stations
- Slot 3** Dual thermocouple module 2 stations
- Slot 4** Blank panel
- Slot 5** Single cold cathode module 1 station
- Slot 6** Blank panel
- Slot 7** RS232 module

Notes

- 1 Slot 0 contains the power supply module.
- 2 Slot 7 has RS232/RS485 module or blank panel only.
- 3 7B2 and 7E cold cathode module requires 2 SLOTS or use Slot 6 and share Slot 7 with RS232 (RS485).
- 4 3D and 3E Hot ion/BA modules require 4 SLOTS.

All dimensions are nominal in millimetres unless specified





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