OPERATING INSTRUCTIONS

1000 mTorr Vacuum Gauge Indicators Controllers, and Calibrators

Your 1000 mTorr Vacuum Gauge has been calibrated at the factory using N.I.S.T. Traceable Vacuum Gauges. All you need to do is install the gauge tube in your vacuum system and connect to it the octal connector on the Gauge Tube cable. Then connect the vacuum gauge line cord to AC power.
Indicators may be connected to any voltage from 90 to 240 V, 50/60 Hz.
Controllers (with adjustable set points) must be connected to either 115V or220V as specified on their S/N tag.

If in the future you want to verify the calibration of your gauge, there are 2 procedures that you can use depending on the equipment you have available.

NOTE: Be advised that, unlike our Pirani gauges, the calibration of Thermocouple Gauges -- such as this one; is affected by changes in length of the gauge tube (sensor) cable. When calibrating be sure to calibrate with the same cable length as is used during operation of the gauge.

A. "Hard Vacuum" calibration using a vacuum system with pressure of 1 X 10^{-4} Torr or lower.

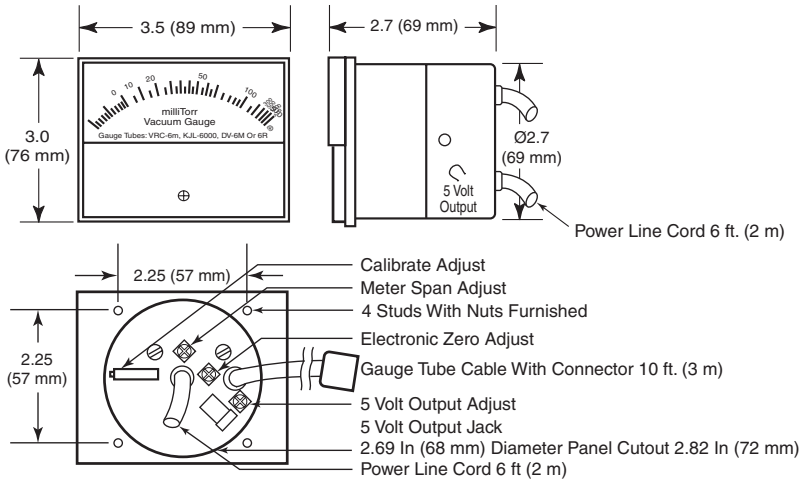
1. Verify the mechanical zero of the meter. Disconnect the AC power and make sure the instrument is straight upright; not lying on its back. The meter pointer should now be just barely below zero. When looking at the meter straight on, you should see a small bit of white showing between the pointer and the zero mark. Adjust the front panel screw if required.

2. After adjusting the mechanical meter zero, (if required) a new gauge tube at 1 X 10^{-4} should read zero after a 15 minute warm up. If it does not, adjust the calibration pot (located in the side of the gauge at 9 o'clock when facing the rear of the instrument.) If the procedures listed above do not give satisfactory results, you should obtain an "Electronic Vacuum Gauge Calibrator" or return the instrument to the factory for service.

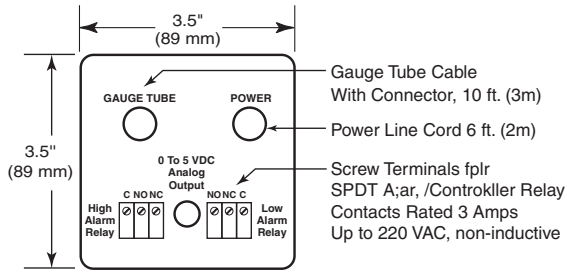
B. Calibrating with an "Electronic Vacuum Gauge Calibrator" (available as an accessory with your 1000 mTorr gauge).

1. Verify the mechanical zero of the meter. Disconnect the AC power and make sure the instrument is straight upright; not lying on its back. The meter pointer should now be just barely below zero. When looking at the meter straight on, you should see asmall bit of white showing between the pointer and the zero mark. Adjust the front panel screw if required.

2. Connect both the calibrator and the vacuum gauge to the appropriate voltage power line, 50 or 60 Hz.



1000 mTorr Analog Vacuum Gauge Calibrator



Rear Panel 1000 mTorr Analog Gauge Controller With 2 Set Points

3. Plug the tube cable from the gauge into the calibrator. Plug the output signal connector from the calibrator into the jack on the side of the gauge (located at about 5 o'clock when facing the rear of the gauge.) Allow 15 minutes for warm up after these connections are made.

4. Place the calibrator switch to the 'calibrate' position. The calibrator digital meter should read between 1890 and 1910. If it does not, adjust the calibrate pot (located in the side of the vacuum gauge, at about the 9 o'clock position) until the calibrator meter reads 1900 ± 10.

5. The vacuum gauge meter should now read zero. If it does not, then remove the two large screws on the rear of the vacuum gauge and move the aluminum cover to one side. Adjust the electronic zero adjust pot until the vacuum gauge meter splits the zero line.

6. Move the calibrator switch to the ‘output’ position. The calibrator digital meter should now read 495 to 505. If it does not, adjust the 5 volt output adjust pot (located at 4 o’clock on the circuit board) until the calibrator meter reads 500 ± 5.

7. Unplug the 5 volt output signal connector located on the side of the gauge (located at about 5 o’clock when facing the rear of the gauge.) Also unplug the gauge tube connector from the calibrator and plug it into a gauge tube exposed to atmosphere. The unit should now read ‘ATM’ (Atmosphere). If it does not, then adjust the meter span adjust pot (located between the meter studs until it does.

8. Repeat steps 3 through 6 until no adjusting is required.

9. Disconnect the power from the calibrator and the gauge and install the gauge cover.

Setting the Control Points on Dual Set Point Models

To set the control points, press in either the Low or High “Push To Display” push-button on the front panel. This will display that set point on the meter. Adjust the multi-turn pot that corresponds to that set point until the desired pressure for the control action is read on the meter. Release the “Push To Display” push-button and the instrument will again read pressure.

The LED’s show control action in the following manner:

- Relay energized, LED is ON; de-energized, LED is OFF
- Relays are de-energized when pressure is above the set-point (on atmospheric pressure side of set point.)
- Atmospheric pressure = de-energized = loss of power
- “NORMAL” = de-energized relay
- No Power = in no power state relays are de-energized

With no power to the instrument the relays go to their “normal” (de-energized) position and the LED is off. The relay are also de-energized and the LED is off when pressure being measured is above the set-point (that is, closer to atmosphere).

When the pressure gets below the set point value the LED lights and the relay changes to the energized state.

Contact Rating:

- 3 A @ 115 or 120 VAC, resistive
- 1.5 A @ 28 VDC, inductive

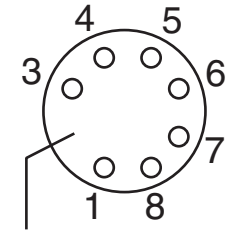
Gently pull the rear panel connectors and they will detach from their sockets for wiring. Plug the connectors back in after wires are connected.

Analog Output Voltage			
Volts	Pressure in mTorr	Pressure in mbar	Pressure in Pascal
0.10	2	.003	.3
0.20	4	.005	.5
0.30	6	.008	.8
0.40	8	.011	1.1
0.50	10	.013	1.3
0.60	12	.016	1.6
0.70	14	.019	1.9
0.80	16	.021	2.1
0.90	18	.024	2.4
1.00	20	.027	2.7
1.25	25	.003	3.3
1.45	30	.040	4.0
1.65	35	.047	4.7
1.85	40	.053	5.3
2.05	45	.060	6.0
2.20	50	.067	6.7
2.35	55	.073	7.3
2.45	60	.080	8.0
2.55	65	.087	8.7
2.65	70	.093	9.3
2.75	75	.100	10
2.85	80	.107	10.7
3.00	85	.113	11.3
3.10	90	.120	12.0
3.20	95	.127	12.7
3.30	100	.133	13.3
3.50	120	.160	16
3.70	140	.187	18.7
3.85	160	.213	21.3
3.95	180	.240	24
4.05	200	.267	26.7
4.25	250	.333	33.3
4.40	300	.400	40
4.55	400	.533	53.3
4.65	500	.666	66.6
4.75	1000	1.333	133.3
4.90	ATM	ATM	ATM
5.00	Full scale	Full scale	Full scale

Gauge Tube Wiriing

The gauge tube can be checked with an ohmmeter between pins 3 and 5 to verify that the sensor is good. Generally, the reading is 19 ohms (± 2 ohms) if good.

Stainless Steel Tube



MISSING PIN
2 ACTS AS KEY

Standard Tube