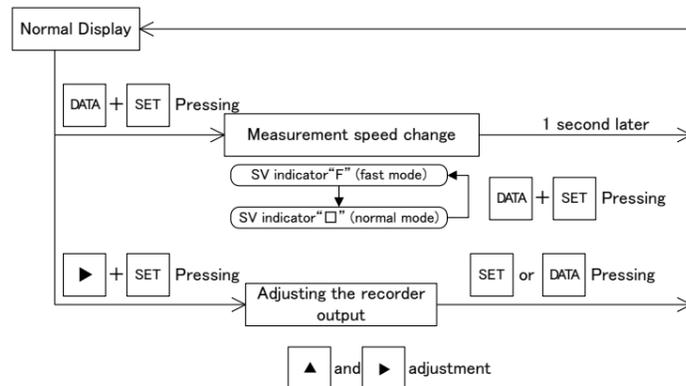
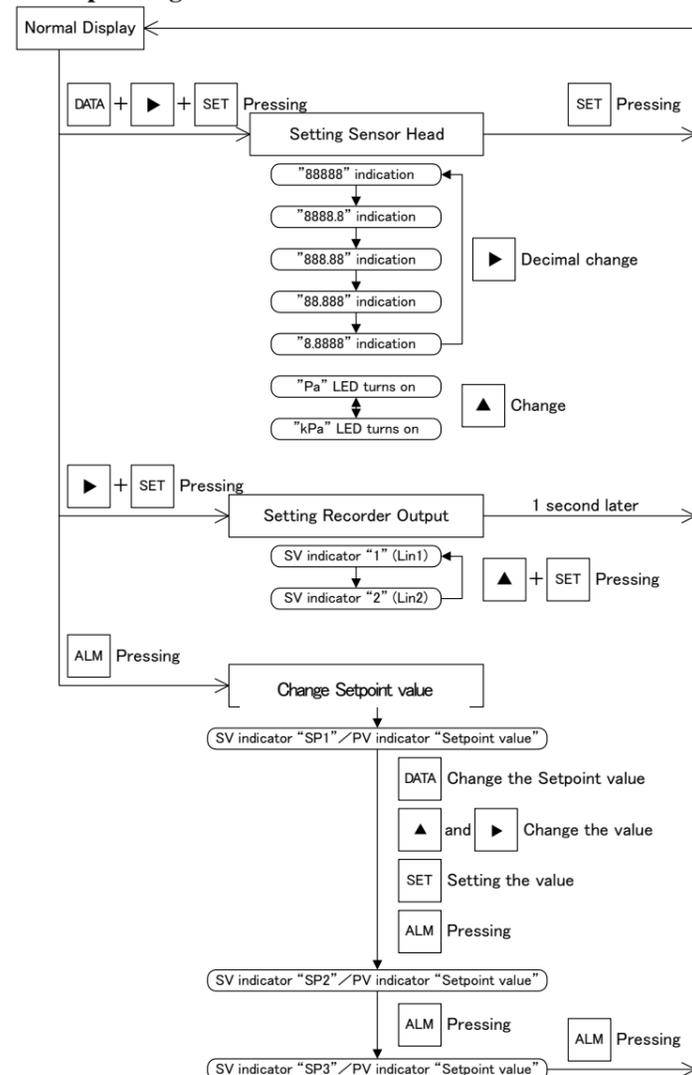


Capacitance Manometer Controller GM-2001 / GM-2002 Quick Manual

Introduction

This quick manual is for quick check of operation and display of the product. Please refer to instruction manual attached in advance for detailed information about operation, precautions and safety for proper use. Available for download from ULVAC website. <https://showcase.ulvac.co.jp/en>
 This manual is for the following gauges. Serial Nos. 00001 and higher

1. Operating Procedure



2. Setting the Sensor Head: **PLEASE CHECK**

Set the unit of pressure and the position of decimal point according to the sensor head to be used. The following shows how to set them.

※Default setting Lin1: "88888" and "Pa"

- (1) Pressing the [DATA] [▶] and [SET] switches from left to right in order sets up the unit and decimal point switching mode.
- (2) "Pt" is displayed on the SV indicator.
- (3) Press the [▶] and [▲] switches to select a unit and decimal point compatible with the sensor head to be used.
- (4) Pressing the [SET] switch finalizes the unit and decimal point and sets up the normal measurement mode.

Type and setting of sensor head

Sensor head	Decimal point	Pressure unit
CCMT-1000A/D	888.88	kPa
CCMT- 100A/D	88.888	kPa
CCMT- 10A/D	8888.8	Pa
CCMT- 1D	888.88	Pa

3. Recorder Output

The recorder (analog) output signals of this instrument include Lin1 and Lin2. Either of them can be selected. The recorder output is delivered within the range of -1.5 to 11.5 V.

(Example) When the sensor head is CCMT-10A
 Lin1 0 to 1000.0 Pa : 0 to 10V
 Lin2 0 to 100.0 Pa : 0 to 10 V

3.1. Selection the Recorder Output (Default setting Lin1)

- (1) Pressing the [▲] and [SET] switches.
- (2) "1" or "2" on the SV indicator for one second.
- (3) Select a desired output.

3.2. Recorder Output

Pressure is converted by the following equation.

$$P = V \times k \times 10 \times L \Leftrightarrow V = P \div k \div 10 \div L$$

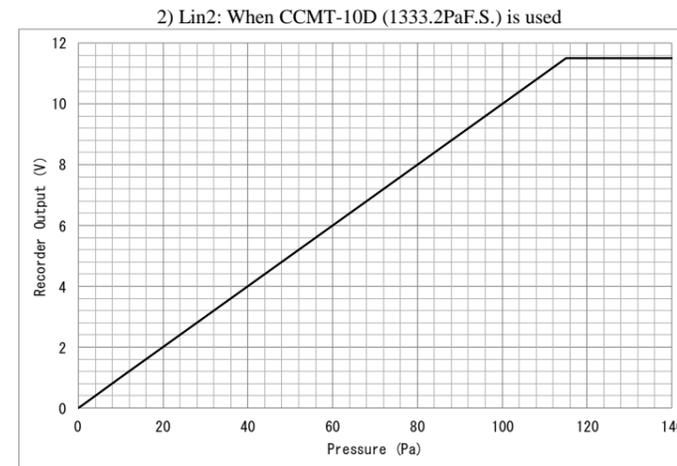
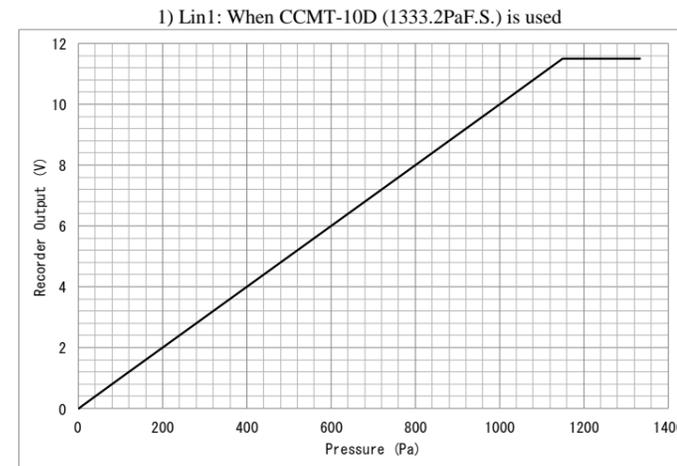
P: Pressure (Pa)
 V: recorder output voltage (V)
 k: Cf. following list
 L: setting Lin1:1 setting Lin2:10

K	Sensor head	
1000	CCMT-1000A	CCMT-1000D
100	CCMT-100A	CCMT-100D
10	CCMT-10A	CCMT-10D
1	—	CCMT-1D

When CCMT-10A (1333.2PaF.S.) is used

Lin1		Lin2	
Pressure(Pa)	Output Voltage(V)	Pressure(Pa)	Output Voltage(V)
-100.0	-1.00	-10.0	-1.00
0.0	0.00	0.0	0.00
1.0	0.01	1.0	0.10
10.0	0.10	10.0	1.00
100.0	1.00	100.0	10.0
1000.0	10.00	115.0	11.5
1150.0	11.5	1000.0	11.5
1333.2	11.5	1333.2	11.5
----	11.5	----	11.5

※On the CCMT-D Series, a pressure value of approx. 1.333x10N or higher is displayed, even when scale-over. The display does not show "----".



4. Setpoint

4.1. Setpoint Output

The setpoint output turns ON (continuity) the transistor output (open collector) if the measured value is smaller than the set comparison value and the status is maintained continuously for more than 0.5 second.

When the setpoint output is turned ON, the LED (green) that displays the comparison output action on the front panel also light up.

The setpoint output is not turned ON for approx. three seconds after power is turned ON regardless of the measured value.

4.2. Adjustable Range: between 0% and 100%FS

※when CCMT-10D is used: 0.00~1333.2Pa
 ※Default : SP1:4000Pa, SP2:6000Pa, SP3:8000Pa

4.3. Rated Load

Rated load voltage: 24 VDC, Maximum load current: 50 mA

4.4. Setting of Setpoint Value

- (1) The comparison value setting mode and the normal measurement mode can be changed over from one to the other by pressing the [ALM] switch on the front panel. Select the required indicator while watching the SV indicator. (Example) To display and change the comparison value of SETPOINT, press [ALM] switch once to display "SP1" on the SV indicator.
- (2) To change the comparison value, press the [DATA] switch, and the one of the displayed decimal places will blink. Move this blinking place to the decimal place to be changed by pressing the [▶] switch. When the decimal place is determined, press the [▲] switch to display the desired numeric value.

In the same matter, set all the decimal places to the desired value using the [] and [▲] switches. Here, pressing the [SET] switch completes the change of the comparison value.

- (3) Upon completion of the display and change of the comparison value, press the [ALM] switch to restore the blank state (measurement status) in while nothing is displayed on the SV indicator.

5. Zero Resetting Function

This is a function of resetting the indicated value and the recorder (analog) output to zero when resetting is made with the zero input signal or with the switch on the front panel of this instrument.

It is used when making zero adjustment by lowering the pressure at the

measuring point to a sufficiently low level before starting measurement.

This function is reset by turning the power OFF. Do not turn the power OFF during a series of measurements.

This function can be used within the range of ±10% of the full scale of the sensor head. Use it in conjunction with the zero adjusting function of the sensor head.

Sensor head	Adjustable range
CCMT-1000A/D	13.0 kPa or less
CCMT- 100A/D	1.30 kPa or less
CCMT- 10A/D	130 Pa or less
CCMT- 1D	13 Pa or less

5.1. Setting and Resetting the Zero Reset Value from the Zero Input Terminal

Shorting the ZERO input terminals on the rear panel of this instrument sets the zero reset value, and opening it resets the value. The zero resetting function of this instrument gives priority to the signal from the ZERO input terminal. If the zero resetting function with the front panel switch has been used, the setting will be invalid and a zero reset value from the ZERO input terminal will be set.

5.2. Setting and Resetting the Zero Reset Value with the Front Panel Switch

- #### 5.2.1. Setting the Zero Reset Value with the Front Panel Switch
- (1) Hold down the [ZERO] switch on the front panel for more than two seconds.
 - (2) "0on" is displayed on the SV indicator.
 - (3) Pressing the [SET] switch while "0on" is displayed (about 10 seconds) sets the zero reset value, and the PV indicated value becomes "0".

5.2.2. Resetting the Zero Reset Value with the Front Panel Switch

- (1) Hold down the [ZERO] and [DATA] switches on the front panel simultaneously for more than two seconds.
- (2) Hold down the [ZERO] and [DATA] switches on the front panel simultaneously for more than two seconds.
- (3) Pressing the [SET] switch while "0on" is displayed (about 10 seconds) reset the zero reset value.

6. Measurement Speed Changing Function

This instrument has two measurement speeds of "Normal mode" and "Fast mode". Select the "Fast mode" if measurement of high response is required.

- (1) The "Normal mode" an "Fast mode" can be switched over by pressing the [DATA] and [SET] switches simultaneously.
- (2) If the "Fast mode" is selected, "F" will be displayed on the SV indicator. If the "Normal mode" is selected, nothing will be displayed.

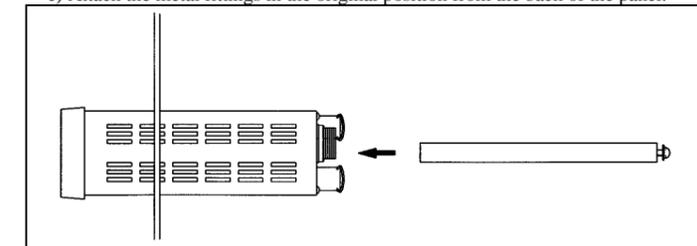
7. Adjusting the Recorder Output

Adjustment has been completed before shipment from factory. If the correlation between the displayed value and the output value cannot be obtained, refer to the instruction manual(CD) for more information .

8. Installing the Controller

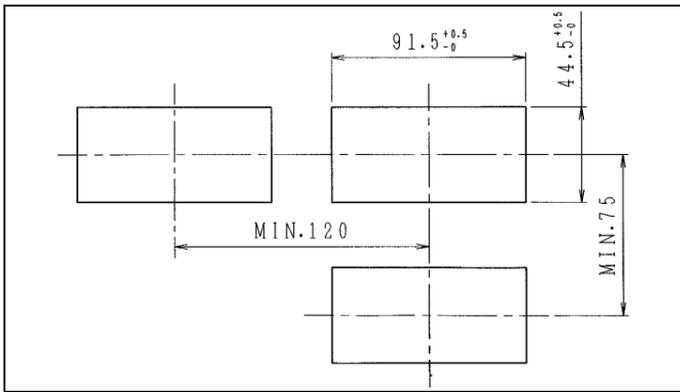
8.1. How to Mount

- Remove the metal fitting from the controller.
- Fit the controller into the front panel.
- Attach the metal fittings in the original position from the back of the panel.



8.2. Mounting Panel

- This instrument is the panel mounting type.
- The sheet thickness of the mounting panel should be 1.0 to 4.0 mm.
- A rectangular hole measuring 91.5 x 44.5 mm is required to mount this instrument.
- If the instruments are mounted side by side, provide a spacing between controllers as shown in the figure below.

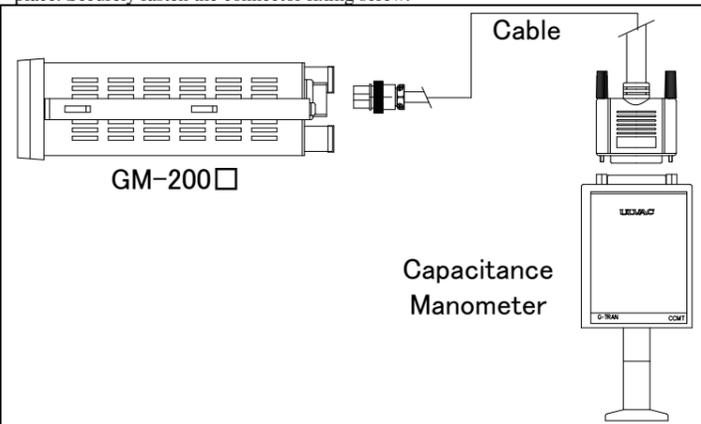


8.3. Electrical Connection

Make electrical connection after installing components.
Fix the cable by taking care not to exert undue force to the connection between the sensor head and sensor head cable and the connection between the controller and sensor head cable.

Lay the sensor head cable away from power lines, if possible. Noise may occur.
Moving the sensor head cable will generate frictional electricity between conductor and insulator, which can cause an error at a low pressure.

Avoid installation of the vacuum gauge in a high temperature or high humidity place. Securely fasten the connector fixing screw.



9. Specifications

9.1. Specifications

Designation	Ceramic Capacitance Manometer Controller
Type	GM-2001, GM-2002
Measurable pressure range	CCMT-1000A/D: 0.000 ~ 133.32kPa CCMT- 100A/D: 0.0000 ~ 13.332kPa CCMT- 10A/D: 0.00 ~ 1333.2 Pa CCMT- 1D : 0.000 ~ 133.32 Pa
Measuring point	One
Display	4 1/2 digits digital display (7 segments LED display)
Display update time	100ms
Display range	CCMT-1000A/D: -13.000 ~ 133.32kPa CCMT- 100A/D: -1.3000 ~ 13.332kPa CCMT- 10A/D: -130.00 ~ 1333.2 Pa CCMT- 1D : -13.000 ~ 133.32 Pa
Display range change function	Display range has hysteresis for increased pressure and decrease pressure. decrease pressure: <10%FS, move the decimal point increased pressure: >12.5%FS, move the decimal point Example: CCMT-10A (1333.2PaFS) Pressure decrease: 133.3Pa ⇒ 13.332Pa Pressure increase: 166.65Pa ⇒ 166.6Pa
Accuracy	※Refer to display range change function. High pressure:(100%FS ~ 10%FS): ±0.20%fs±1digit±0.005%fs/°C Low Pressure:(<12.5%FS) : ±0.32%fs±1digit±0.005%fs/°C Example: CCMT-10A High pressure(1333.2PaFS): 2.7Pa±0.1Pa±0.0667Pa/°C Low pressure(166.65PaFS): 0.53Pa±0.01Pa±0.0083Pa/°C

Recorder output signal	DC-1.5 ~ 11.5V(including outside the measurable range) 1)Setting Lin1: 0 ~ 10V CCMT-1000A/D: 0 ~ 100.00kPa CCMT- 100A/D: 0 ~ 10.000kPa CCMT- 10A/D: 0 ~ 1000.0 Pa CCMT- 1D : 0 ~ 100.00 Pa 2)Setting Lin2: 0 ~ 10V CCMT-1000A/D: 0 ~ 10.000kPa CCMT- 100A/D: 0 ~ 1.0000kPa CCMT- 10A/D: 0 ~ 100.00 Pa CCMT- 1D : 0 ~ 10.000 Pa
Recorder Output error	Lin1: ±0.24%fs±0.01%fs/°C Lin2: ±1.20%fs±0.01%fs/°C
Setpoint output	Three, transistor output (open collector) Rated load voltage: 24V DC Maximum load current: 50mA (saturation voltage : 1V)
Zero correction input	No-voltage contact input Input current: 10mA
Power requirements	GM-2001: AC85 ~ 264V 50/60Hz GM-2002: DC24V±10%
Power consumption	15VA or less
Operating temperature range	10 ~ 40°C
Weight	0.4 kg
Outside dimensions	W96mm×D151mm×H48mm

9.2. Standard Accessories

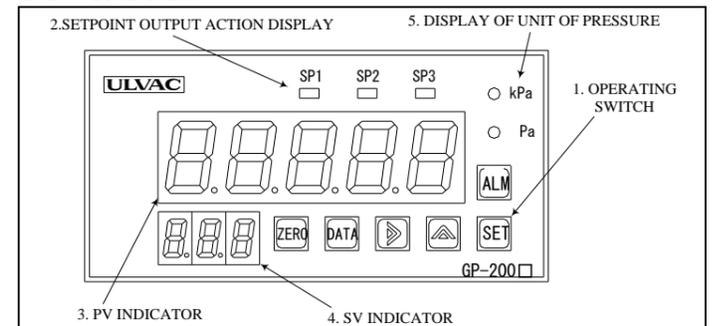
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9.3. Option

Celamic Capacitance Manometer	CCMT-1000A/D: 0.000 ~ 133.32kPa CCMT- 100A/D: 0.0000 ~ 13.332kPa CCMT- 10A/D: 0.00 ~ 1333.2 Pa CCMT- 1D : 0.000 ~ 133.32 Pa
Sensor head cable	4, 10, 15, 20, 30, 50, 100m
Supply cable	3m (only GM-2001) The plug specification of supply cable is AC125V / 7A.

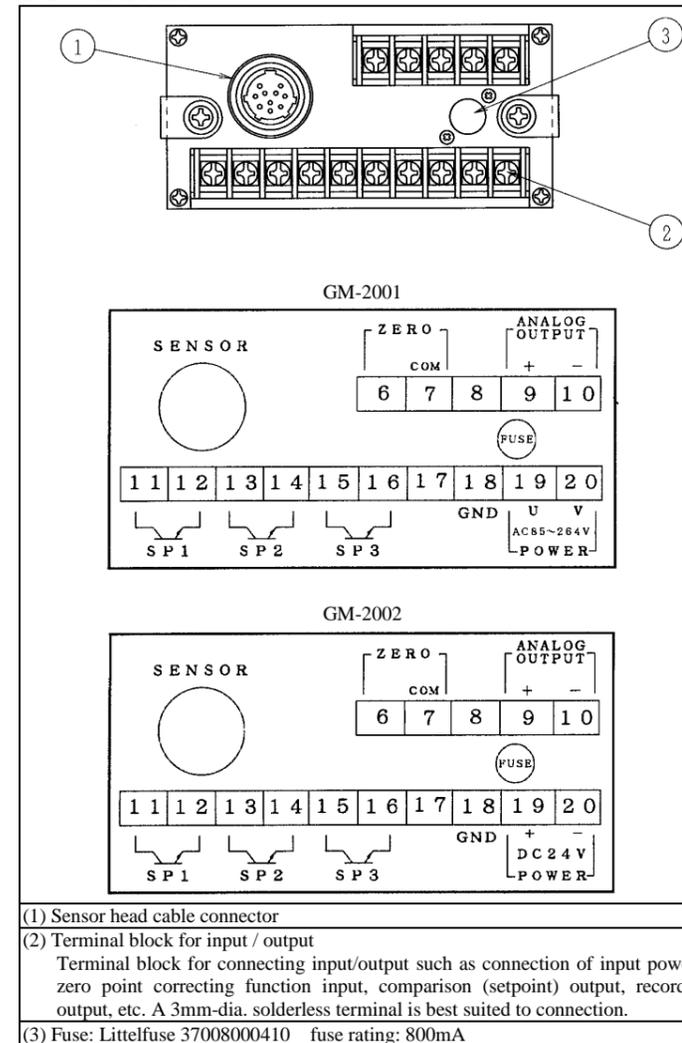
10. Panel

10.1. Front Panel



- Operation switch**
ALM : Used to display and change the comparison set value (setpoint)
ZERO : Used to set and cancel the zero point correction function
DATA : Used to change data
▼ : Used to shift the decimal place of data when changing data.
▲ : Used to change data
SET : Used to finalize data,etc
- Comparison (setpoint) output action display**
 The green LED comes on when the comparison output is ON.
- PV indicator**
 Main indicator that displays the comparison set value and set value for output adjustment, in addition to the current measurement value. If the measurement value exceeds the scale limit or if the sensor head filament has blown out, "-----" will blink on the display.
 On the CCMT-D Series, a pressure value of approx. 1.333x10N or higher is displayed, even when scale-over. The display does not show "----".
- SV indicator**
 An auxiliary indicator that explains the contents of the PV indicator. Nothing is displayed or in normal measuring condition."OFF" is displayed when the comparison set value is displayed or in the output adjustment setting.
- Display of unit of pressure**
 The LED for the selected unit of pressure comes on.

10.2. Rear Panel



- Sensor head cable connector
- Terminal block for input / output
 Terminal block for connecting input/output such as connection of input power, zero point correcting function input, comparison (setpoint) output, recorder output, etc. A 3mm-dia. solderless terminal is best suited to connection.
- Fuse: Littelfuse 37008000410 fuse rating: 800mA

11. Warranty

This product was shipped after rigid company inspection. However, in case any failure occurs under ULVAC's responsibility, such as defect in manufacturing and damage during transportation, Buyer shall inform ULVAC, Inc. or the local ULVAC representatives. ULVAC will repair or exchange it at free of charge.

Warrantable Items: Vacuum gauge (controller)

Duration of guarantee

One (1) year after shipping date from ULVAC

Warranty scope

- Domestic business in Japan: Product, which has damage, caused by a failure on delivery.
- Direct export transaction: Product, which has damage, caused by a failure on delivery. The warranty scope shall confirm to the new INCOTERMS.
- Products not satisfying meet the standard specifications although the product is used under the normal service conditions such as temperature range and power etc.

Response procedure

- Domestic business in Japan: ULVAC send a replacement or Buyer return the defective items to ULVAC, Inc. or to the local ULVAC representatives for repair. If field service is required, Buyer shall ask ULVAC, Inc. or the local ULVAC representatives.
- Direct export transaction: ULVAC send a replacement or Buyer return the defective items to ULVAC, Inc. or to the local ULVAC representatives for repair. Return charge shall be paid by Buyer.

Disclaimer

- Failure occurred after expiration of warranty period
- Failure caused by force majeure, such as fire, storm and flood damage, earthquake, lightning strike, war etc
- Failure occurred due to carelessness handling or faulty usage
- Products remodeled, disassembled or repaired without ULVAC's acceptance
- Failure occurred under abnormal environment, such as intense

electromagnetic field, radiation, high-temperature, high-humidity, flammable gases, corrosive gases, dust etc.

- Failure occurred by noise
- Product deficiency or secondary damnification occurred to Buyer, from law suit to ULVAC by third party for patent infringement.
- Sensor head being used (expiration of life, measurement error, etc.)
- Sensor head cable being used (cable burnout due to improper installation, poor contact, etc.)

Others

- In case, special agreement or memorandum for specifications is made individually, the descriptions are prior to this article "13 Product Warranty".
- Buyer shall inform ULVAC when this product is exported out of Japan. In the meantime, Buyer shall take necessary procedures according to Foreign Exchange and Foreign Trade Law.
- As for the question and consultation, Buyer shall check the model and serial number and ask the local representative or ULVAC, Inc.
- The content of this document is subject to change without notice in future.

12. Certificate of Contamination

Please enter the operating condition/trouble symptom of your vacuum gauge in this form and submit it to your local ULVAC service station or sales office after signing it. The form is available for download from ULVAC website.

13. Networks

ULVAC, Inc. <http://www.ulvac.co.jp/eng/>

Service Centers <http://www.ulvac.co.jp/eng/support/service/index.html>

Sales Office http://www.ulvac.co.jp/eng/support/sales_office/index.html