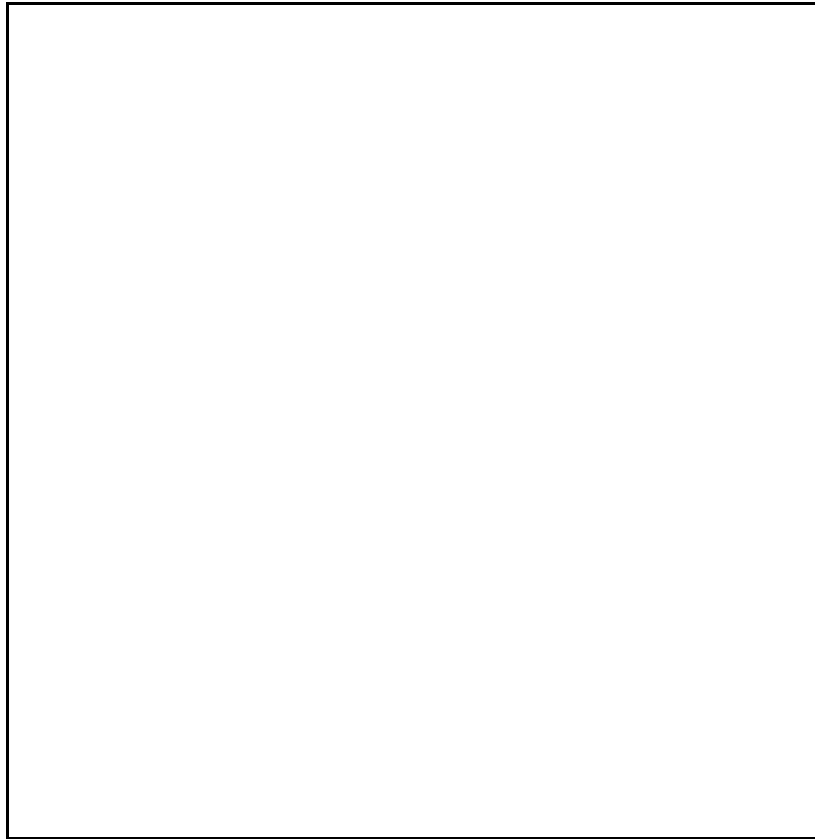


# VACUUM METER



## TABLE OF CONTENTS

1. FEATURES.....	1
2. TYPICAL APPLICATION.....	2
3. SPECIFICATIONS.....	2
3-1 General Specifications.....	2
3-2 Electrical Specifications.....	3
4. FRONT PANEL DESCRIPTION.....	4
4-1 Display.....	4
4-2 Power Button.....	4
4-3 Data Hold Button.....	4
4-4 " Max./Min. " Button.....	4
4-5 Unit Button.....	4
4-6 Battery Compartment/Cover.....	4
4-7 Sensor Input Socket.....	4
4-8 RS-232 Output Terminal.....	4
4-9 Port Connector of Vacuum Sensor.....	4
4-10 Vacuum Sensor Main body.....	4
4-11 Plug of Vacuum Sensor.....	4
5. MEASURING PROCEDURE.....	5
6. AUTO POWER DISABLE.....	7
7. RS232 PC SERIAL INTERFACE.....	7
8. BATTERY REPLACEMENT.....	9
9. OTHER OPTIONAL ACCESSORIES.....	9

## **1. FEATURES**

- \* Absolute vacuum & absolute pressure measurement.
- \* Wide measure range from 1 to 1500 mbar.
- \* Overload protection up to 2000 mbar max.
- \* Separate probe, easy operation.
- \* Application : Automobile, Industrial, laboratory, heating, ventilation, medical hospital.....
- \* Heavy duty sensor used for air, oil gas, liquid.
- \* 8 kind display units ( torr, mm Hg, micron, mbar, KPa, Pa, inch Hg, psi ) select by push button on the front panel.
- \* Auto shut off saves battery life.
- \* Microprocessor circuit assures maximum possible accuracy, provides special functions and features,
- \* Records maximum & minimum readings with recall.
- \* Data Hold function for stored the desired value on display.
- \* Built-in low battery indicator.
- \* RS232 PC serial interface, can match the personal computer used as the Data Logger, Recorder....

## 2. TYPICAL APPLICATION

- \* Measure pneumatic pressures.
- \* Measure automobile engine pressures.
- \* Pressure for super heat measurements.
- \* Hydraulic servo controls.
- \* Refrigeration.
- \* Air conditioning.
- \* Food processing.

## 3. SPECIFICATIONS

### 3-1 General Specifications

Display	61 mm x 34 mm supper large LCD display. 15 mm ( 0.6" ) digit size.
Display units	8 kind display units : torr, mm Hg, micron, mbar, KPa, Pa, inch Hg, psi.
Circuit	Microprocessor LSI circuit.
Function	Data hold, memory ( max., min.)
Sensor probe	* Separate probe, easy operation. * Heavy duty sensor used for vacuum measurement of air, oil gas, liquid.
Data hold	By push button.
Data record	Record maximum & minimum readings.
Data output	RS 232 PC serial interface.
Sampling time	Approx. 0.8 second.
Power off	Auto shut off, saves battery life, or manual off by push button.
Operating temperature	0 to 50 蛎 ( 32 to 122 蚌 ).
Operating humidity	Less than 80% R.H.

Power supply	006P DC 9V battery(heavy duty).
Power current	Approx. DC 6.0 mA.
Pressure Port Connector	1/4" PS
Weight	Instrument : 220 g/0.48 LB. Sensor probe : 175 g/0.39 LB.
Dimension	Meter : 180 x 72 x 32 mm ( 7.1 x 2.8 x 1.3 inch ) Sensor probe : 74 mm x 30 mm Dia. ( 4.8 inch x 1.2 inch Dia. )
Accessories included	* Vacuum sensor probe..... 1 PC. * Instruction manual..... 1 PC. * Hard carrying case..... 1 PC.
Optional accessories	* Data acquisition software ( Windows version ), SW-U801-WIN. * RS232 cable, UPCB-01

### **3-2 Electrical Specifications**

Unit	Max. range	Resolution	Accuracy
mbar	1500 mbar	1 mbar	±1 % F. S. ( 23 ±5 蚓 ) Note : Included linearity, hysteresis and repeatability F.S.: Full Scale
KPa	150.0 KPa	0.1 KPa	
Pa	150,000 Pa	100 Pa	
torr	1125 torr	1 torr	
mm Hg	1125 mm Hg	1 mm Hg	
micron	1125,000 micron	1000 micron	
inch Hg	44.30 inch Hg	0.02 inch Hg	
psi	21.75 psi	0.01 psi	

## 4. FRONT PANEL DESCRIPTION

Fig. 1

- |     |                               |      |                                 |
|-----|-------------------------------|------|---------------------------------|
| 4-1 | Display                       | 4-8  | RS-232 Output Terminal          |
| 4-2 | Power Button                  | 4-9  | Port Connector of Vacuum Sensor |
| 4-3 | Data Hold Button              | 4-10 | Vacuum Sensor Main body         |
| 4-4 | " Max./Min. " Button          | 4-11 | Plug of Vacuum Sensor           |
| 4-5 | Unit Button                   |      |                                 |
| 4-6 | Battery Compartment/<br>Cover |      |                                 |
| 4-7 | Sensor Input Socket           |      |                                 |

## 5. MEASURING PROCEDURE

- 1) Plug the " Plug of Vacuum Sensor " ( 4-11, Fig. 1 ) into meter's " Sensor Input Socket " ( 4-7, Fig. 1 ).
- 2) Power on the meter by pressing the " Power Button " ( 4-2, Fig. 1 ).
- 3) To select different measuring unit by pressing the " Unit Button " ( 4-5, Fig. 1 ). There are eight units for your choice.
- 4) Connect the " Port Connector of Vacuum Sensor " ( 4-11, Fig. 1 ) to the equipment that intend to be measured the vacuum value.
- 5) Apply the equipment and the vacuum meter will show the vacuum value.
- 6) Data Hold  
During the measurement, pushing the " Data Hold Button " ( 4-3, Fig. 1 ) will freeze the measured value on display and there will indicate a " HOLD " symbol.  
\* Push the "Data Hold Button" again to exit the data hold function.
- 7) Data Record ( Maximum, Minimum reading )  
\* The DATA RECORD function displays the maximum and minimum readings. To start the DATA RECORD function, press the " Max./Min. Button " ( 4-4, Fig. 1 ) once. " REC " symbol will appear on the LCD display.  
\* With the " REC " symbol on the display :
  - (a) Push the " Max./Min. Button " ( 4-4, Fig. 1 ) once, the " Max " symbol along with the maximum value will appear on the display.
  - (b) Push the " Max./Min. Button " again, the " Min " symbol along with the minimum value will appear on the display.
  - (c) To exit the memory record function, push the " Max./Min. " button continuously for around 2 seconds. The display will revert back to the current reading.

8 ) For quick measurement, follow the procedures shown below :

**Main procedures :**

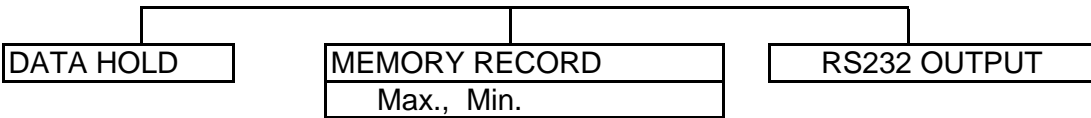
Connect the " Sensor Plug " to the meter's " Input Socket ".

Power on the meter & select the display unit.

Connect the pressure sensor connector with the equipment.

Apply the equipment and get the pressure value.

**Optional measuring procedures :**



**Power management :**

AUTO POWER OFF or MANUAL POWER OFF

(Not available during Memory Record function)

9) Measuring considerations :

- \* *The sensor diaphragm can be damaged by solid or sharp objects. Never insert any object into the inlet port.*
- \* *The vacuum sensor is compatible with industrial gases & liquid that are compatible with ceramic material. To determine the compatibility of a liquid or gas, refer to manufacture's specification.*

## 6. AUTO POWER OFF DISABLE

The instrument has built-in " Auto Power Off " in order to prolong battery life. The meter will switch off automatically if no buttons are pressed for around 10 minutes.

**To inactivate this feature by pressing the " Max./Min. " button ( 4-4, fig. 1 ) to get into the memory record function during the measurement.**

## 7. RS232 PC SERIAL INTERFACE

The instrument features an RS232 output via 3.5 mm Terminal ( 4-8, Fig. 1 ).

The connector output is a 16 digit data stream which can be utilized to the user's specific application.

**An RS232 lead with the following connection will be required to link the instrument with the PC serial input.**

Meter (3.5 mm jack plug)	PC (9W 'D" Connector)
Center Pin.....	Pin 2
Ground/shield.....	Pin 5

**The 16 digit data stream will be displayed in the following format :**

D15 D14 D13 D12 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1 D0
---

**Each digit indicate the following status :**

D0	End Word
D1 & D8	Display reading, D1 = LSD, D8 = MSD For example : <i>If the display reading is 1234, then D8 to D1 is : 00001234</i>
D9	Decimal Point(DP), position from right to the left 0 = No DP, 1= 1 DP, 2 = 2 DP, 3 = 3 DP
D10	Polarity 0 = Positive                      1 = Negative
D11 & D12	Annunciator for Display
	Psi = 23                      mm/Hg = 78                      inch/Hg = 80
	mbar = 86                      Pa = 87                      K Pa = 88
D13	u Hg = 89                      torr = 90
D13	1
D14	4
D15	Start word

**Baudrate : 9600**

**parity : None**

**Data Bit :8**

**Stop Bit : 1**

## 8. BATTERY REPLACEMENT

- 1) When the left corner of LCD display show " ", it is necessary to replace the battery. However, in-spec measurement may still be made for several hours after low battery indicator appears before the instrument become inaccurate.
- 2) Slide the " Battery Cover " ( 4-6, Fig. 1 ) away from the instrument and remove the battery.
- 3) Install a 9 V battery ( heavy duty ) and replace the cover.

## 9. OPTIONAL PRESSURE SENSOR

RS-232 cable, Model : UPCB-01	RS-232 cable, used for connecting the pressure meter & the computer.
Application Software ( Window version )  SW-U801-WIN	After setup whole hardware  <i>Pressure meter + RS-232 cable + Computer + software ( SW-U801-WIN )</i>  whole system can execute as a data logger, data recorder.... record data can be retrieved for EXCELL, LOTUS-123.....