

Quotation 2017- 18

Subject; Gas sensor development system along with DC resistance measurement system

Dear Sir,

Refer to your enquiry for gas sensor development system along with dc resistance measurement system.

Kindly find attached here below the quotation for the said item along with the terms and conditions.

Please note that the similar item is installed to many scientific organizations list below:

- Solid State Lab (SSPL) Delhi
- GVM college Sonapat
- NPL, NEW DELHI
- NIT kurushetra

Specifications of gas sensor development system

Chamber

SS chamber with facility to hold vacuum

Facility to hold specimen bulk thin and thick film

For films microprobes arrangements are installed inside the chamber

Gas purging facility

Two no's solenoid valve are installed operated though time based software

Continues gas and purge gas both functions are set to measure the change in resistance of sample

MFC of user choice can be connected directly to set the flow rate of the test gas

A combination of 129 gases can be selected through MFC

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Specification of DC resistance measurement system.

Resistance measurement range

1 Milliohm to 100 Giga Ohm

Temperature range

Range 1

- **- 100 degree C to 250 degree C in low temp attachment**

Range II

- **RT to 550 degree C in high temp attachment**
- **Accuracy 1 degree**
- **Resolution 0.1 degree**

Various items and attachments Included

Current Source

- Current range 1 nA to 10 m A
- Resolution 1% of the range
- Voltage compliance 100 Volts

DC Voltmeter

- Range 1 microV to 100 Volt
- Resolution 1% of the range
- Voltage compliance 100 Volts
-

Temperature Stage

- SS construction sample holder RT – 500 degree C
- Facility to load bulk pellet of size 2 mm to 25 mm dia or rectangular pellet for four probe setup of size 16*4*2 mm
- PID controlled heating arrangement using NX4 controller having RS232 interface
- 2.5 K watt thyrester power supply
- RS232 PCI card to control the temperature controller.

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- Sample holder shall have 4 connections on top plate for connection to current source and DC voltmeter 2 nos connector for heater and thermocouple sensor each .

Software

- Software to set field automatically for all four quadrant
- Standard graph and data in tabular form for following
 - o I/V Current vs voltage in fixed interval
 - o DC resistivity at different temperatures
 - o Gas response vs resistivity/resistance
- RS232/USB interface hardware.

Software Requirements

- A normal PIV computer to be provided by the user

Price Details and Terms & Conditions

Gas sensing chamber along with fittings of valve	Rs 3,50,000
MFC 0 – 200 CCM	Rs 2,00,000
DC resistance measurement system	Rs 8,00,000/-
-	
-	
- From 1 st July @ 18% will be charged.	
- Payment 100% against delivery	
- Performa invoice will be provided after material is ready for inspection	
- Warranty 1 year from date of installation	
- Warranty certificate shall be provided	

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We hope you will find the attached information in order and remain at your disposal for any information that you may require.

Thanking you

A handwritten signature in black ink, consisting of a series of loops and a final vertical stroke.

Yours truly,
For Marine India

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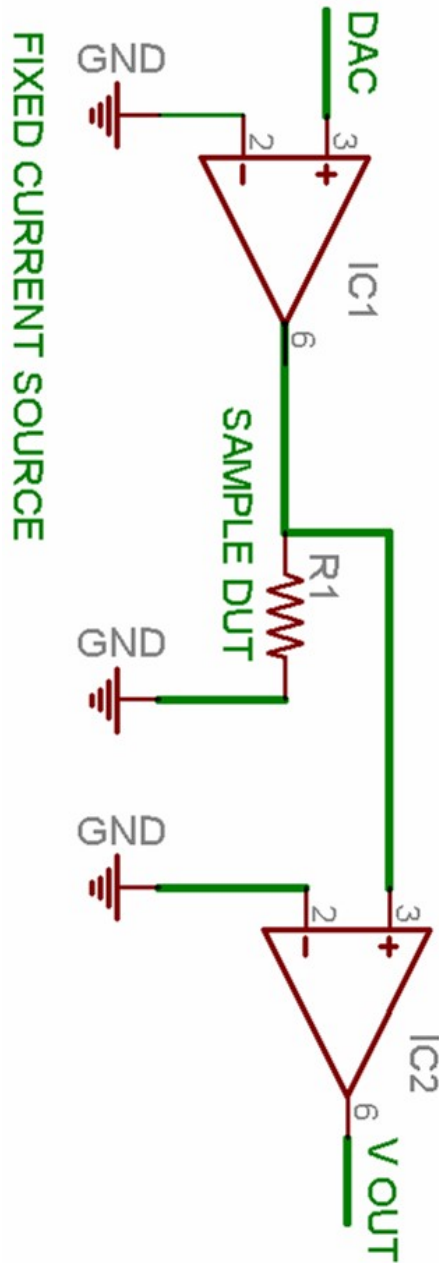
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Block diagram of the DC resistance measurement setup

Following is the block diagram of the basic system

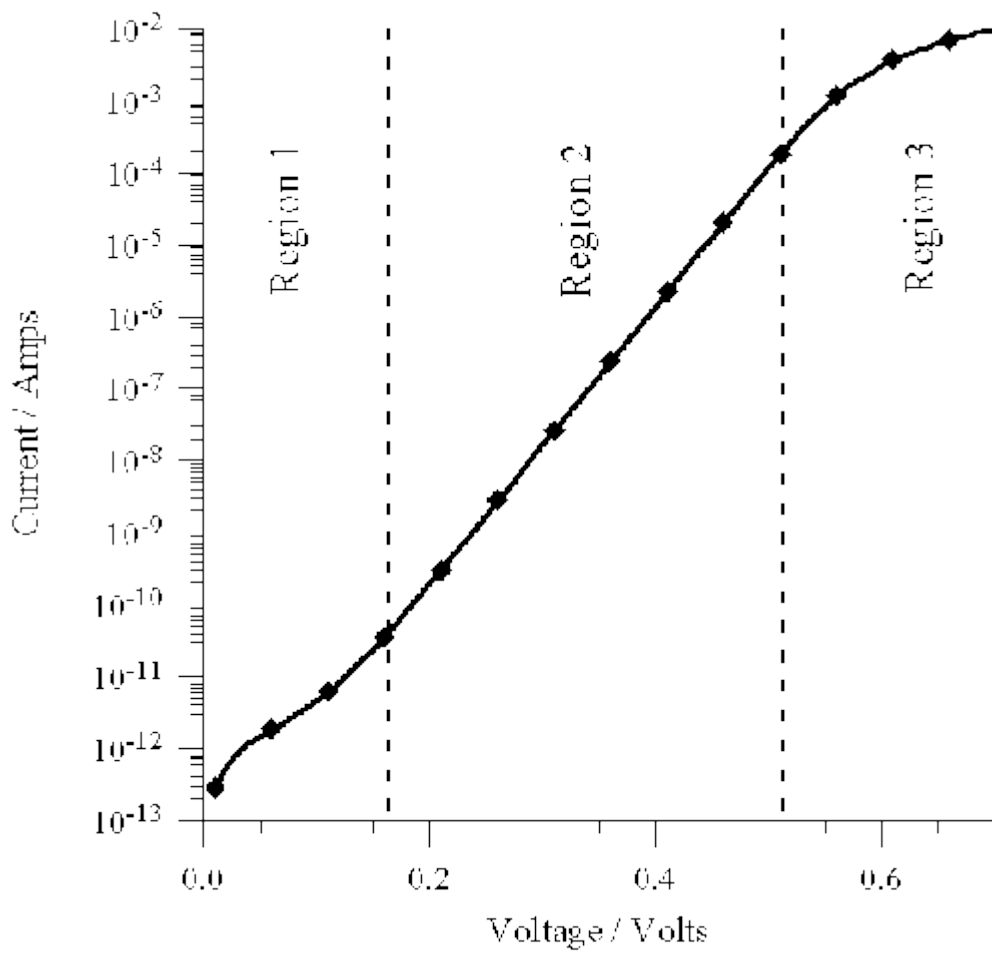


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Sub components photos/dimensions

Following are the photos of sub systems, such as Unit photo, sample/material photo, heating arrangement, actual data loop.



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Data file of DC resistance

Following is the data file of the DC resistance measurement system

Sr no.	TIME LOG ROH	TEMPRATURE	VOLTAGE	CURRENT	RESISTANCE	RESISTIVITY	
0	10.0	3.180E-3	10.021	+1.359941E-09A	7.369E+9	7.368588E+9	9.867384E+0
1	10.7	3.180E-3	10.021	+1.355281E-09A	7.394E+9	7.393924E+9	9.868875E+0
2	11.0	3.181E-3	10.021	+1.360248E-09A	7.367E+9	7.366925E+9	9.867286E+0
3	11.3	3.181E-3	10.021	+1.356373E-09A	7.388E+9	7.387972E+9	9.868525E+0
4	11.6	3.181E-3	10.021	+1.356382E-09A	7.388E+9	7.387923E+9	9.868522E+0
5	11.9	3.181E-3	10.021	+1.353999E-09A	7.401E+9	7.400925E+9	9.869286E+0
6	12.2	3.181E-3	10.021	+1.349778E-09A	7.424E+9	7.424069E+9	9.870642E+0
7	12.5	3.181E-3	10.021	+1.352823E-09A	7.407E+9	7.407359E+9	9.869663E+0
8	15.2	3.181E-3	10.021	+1.324546E-09A	7.565E+9	7.565494E+9	9.878837E+0
9	15.5	3.181E-3	10.021	+1.321090E-09A	7.585E+9	7.585286E+9	

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Screen Shots of Computer Software

Following are the screen shots of computer software

