



RESIDUAL GAS ANALYZER (RGA)

QUICK START MANUAL

Publication Number: D05001880

Issue: A

Original Instructions

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Associated publications

Residual Gas Analyzer (RGA) Hardware Manual (D05002880)

Residual Gas Analyzer (RGA) Software Manual (D05000880)

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Product warranty and limit of liability are dealt with in Edwards standard terms and conditions of sale or negotiated contract under which this document is supplied.

You must use the Residual Gas Analyzer as described in this manual. Read this manual before you install, operate and maintain the Residual Gas Analyzer.



Declaration of Conformity

Edwards Ltd,
Innovation Drive,
Burgess Hill,
West Sussex,
RH15 9TW, UK

P200-10-213-A

The following products:

Residual Gas Analyser:

<i>PRA100</i>	<i>D05001101</i>
<i>PRA100S</i>	<i>D05001102</i>
<i>PRA200</i>	<i>D05001201</i>
<i>PRA200S</i>	<i>D05001202</i>
<i>WRA200S</i>	<i>D05002202</i>
<i>WRA300S</i>	<i>D05002302</i>

Is in conformity with the relevant requirements of European CE legislation:

2014/35/EU	Low voltage directive
2014/30/EU	Electromagnetic compatibility (EMC) directive
2011/65/EU	Restriction of certain hazardous substances (RoHS) directive

Based on the relevant requirements of harmonised standards:

EN 61010-1:2010	Safety requirements for electrical equipment for measurement, control and laboratory use. General requirements
EN 61326-1:2013	Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements Class A Emissions, Industrial Immunity

This covers all product serial numbers from the date of this declaration onwards.

Mr Larry Marini
Senior Technical Manager


22.10.2018, Eastbourne

Date and Place

This product has been manufactured under a quality management system certified to ISO 9001:2015.
This declaration is based on the requirements of EN ISO 17050-1 and the relevant directives.

Material Declaration

In accordance with the requirements of the Chinese regulatory requirement on the Management Methods for the Restriction of the Use of Hazardous Substances in Electrical and Electronic Products Order No. 32 (also known as 'China RoHS2') and SJ/T 11364 Marking for the Restricted Use of Hazardous Substances in Electronic and Electrical Products:

Product	Product Labels	Meaning
Residual Gas Analyser - PRA100, PRA100S, PRA200, PRA200S, WRA200S, WRA300S		This product contains hazardous substances in at least one of the homogeneous materials used which are above the limit requirement in GB/T 26572 as detailed in the declaration table below. These parts can safely be used for the environmental protection use period as indicated.

材料成分声明

Materials Content Declaration

部件名称 Part name	有害物质 Hazardous Substances					
	铅 Lead (Pb)	汞 Mercury (Hg)	镉 Cadmium (Cd)	六价铬 Hexavalent Chromium (Cr VI)	多溴联苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
印刷□路板 Printed circuit board	X	O	O	O	O	O
底□ Chassis	X	O	O	O	O	O
□接 Connector	X	O	O	O	O	O
<p>O: 表示该有害物质在该部件的所有均质材料中的含量低于 GB/T26572 标准规定的限量要求。 O: Indicates that the hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in GB/T 26572.</p> <p>X: 表示该有害物质在该部件的至少一种均质材料中的含量超出 GB/T26572 标准规定的限量要求。 X: Indicates that the hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T26572.</p>						

NOTE: These products are EU RoHS compliant, the following Exemptions apply:

Annex III:

- 6(b) **Lead** as an alloying element in aluminium containing up to 0.4% by weight
- 15 **Lead** in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit flip chip packages

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Introduction

This manual is to be used as a quick check of the operation and display of the Residual Gas Analyzer.

Refer to the instruction manual located on the CD for detailed information on proper operation, precautions and safe use of the unit.

Before use

Confirm that the PC has a LAN port. To use a USB/LAN converter, install a driver.

The sensor unit is a 24 V d.c. drive. Prepare the AC/DC adaptor or 24 V a.c./d.c. power supply (more than 50 W).

Confirm the model to be used. The model can be found on the sensor connector panel side of the sensor unit and flange.

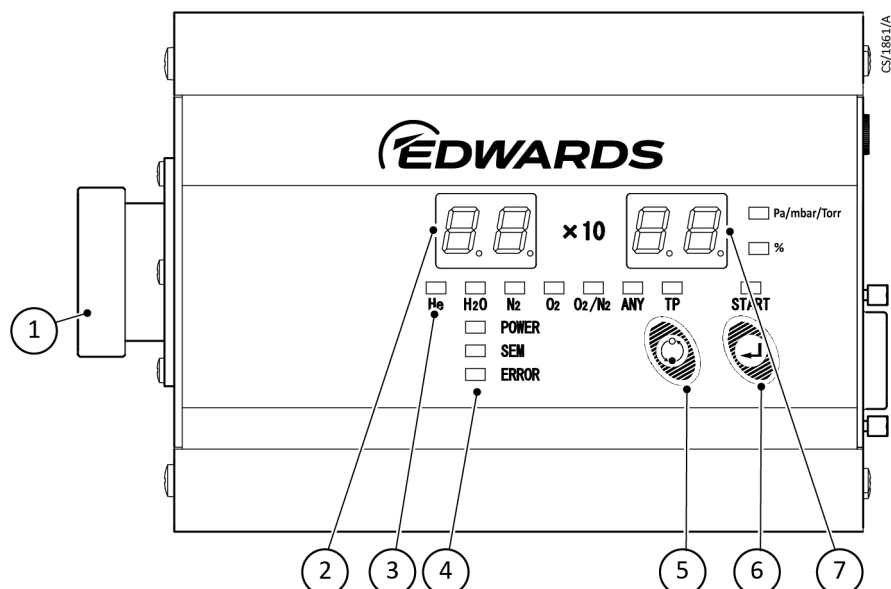
Equipment configuration

Standard equipment configuration

Item	Quantity
Sensor unit	1 piece
Sensor tube	1 piece
Software and instruction manual CD	1 piece
AC/DC adaptor	1 piece
LAN cable	1 piece

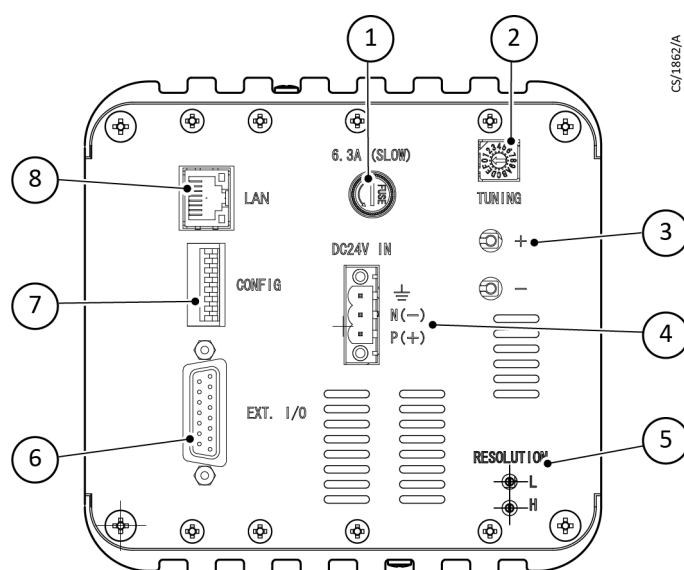
Part name and component function

Operation switches and LEDs



Item		Description
1	Analyzer tube connector	For connection to the analyzer tube.
2	Measurement value/fault display	Shows measured partial pressure value. For faults, displays the error code.
3	Gas species/total pressure display LED	Displays the gas species and total pressure being measured.
4	POWER	POWER LED (green) comes on when power is applied.
	SEM	Secondary Electron Multiplier (SEM) LED (green) comes on when SEM is used.
	ERROR	ERROR LED (red) comes on if a fault occurs.
5	Gas species/total pressure selection button (CH)	Select the gas species you want to measure or total pressure. The orange LED shows the current selection.
6	Measurement start button (START)	Starts measurement. The upper orange LED indicates that measurement has started.
7	Measurement value units display LED	The unit of measured partial pressure. For O ₂ /N ₂ the display shows a percentage (%).

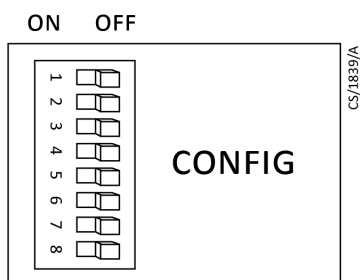
Rear panel



Item	Name	Function
1	Power fuse holder (FUSE)	Over-current protection (Time lag type 6.3 A).
2	Rotary switch for regulating tuning voltage (TUNING)	Regulates RF voltage tuning with the analyzer tube.
3	Tuning voltage check terminal (+, -)	Terminal for checking RF voltage tuning with the analyzer tube.
4	Power inlet connector (POWER IN)	Power cable connector (includes ground).
5	Resolution adjustment potentiometer (RESOLUTION L, H)	L: Adjusts the resolution of the low mass number.
		H: Adjusts the resolution of the high mass number.
6	External input/output connector (EXT-I/O)	Signal I/O connector (D-sub 15-pin male).
7	Initial setting DIP switch (CONFIG)	DIP switch for SEM selection, IP address setting, the unit address setting and local/remote selection.
8	Ethernet connector (LAN)	RJ45 connector (8-pole 8-wire) for connecting the LAN cable

DIP switch

Set up the DIP switch numbers 1, 3, and 4 through 8 with the power supply OFF.



No.	Function
1	To change IP address between "Fixed IP address" or "Automatic IP address". ON = automatic OFF = fixed
2	Can be changed with power on and measurement stopped. To select between secondary electron multiplier (SEM) or Faraday Cup (FC). ON = SEM OFF = FC
3	Not used.
4	Can be changed with power on and measurement stopped. To set local and remote operation. ON = Local mode (control panel operation only). OFF = Remote mode (PC operation)
5	To set the sensor address for this RGA unit. See the table below for switch settings.
6	
7	
8	

Address	S5	S6	S7	S8	Address	S5	S6	S7	S8
1	0	0	0	1	9	1	0	0	1
2	0	0	1	0	10	1	0	1	0
3	0	0	1	1	11	1	0	1	1
4	0	1	0	0	12	1	1	0	0
5	0	1	0	1	13	1	1	0	1
6	0	1	1	0	14	1	1	1	0
7	0	1	1	1	15	1	1	1	1
8	1	0	0	0	16	0	0	0	0

The following table shows the settings before shipment from the factory.

PRA100S/200S & WRA200S/300S

S1	S2	S3	S4	S5	S6	S7	S8
OFF	ON	OFF	OFF	OFF	OFF	OFF	ON

PRA100/200

S1	S2	S3	S4	S5	S6	S7	S8
OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON

IP address setting : OFF (fixed)

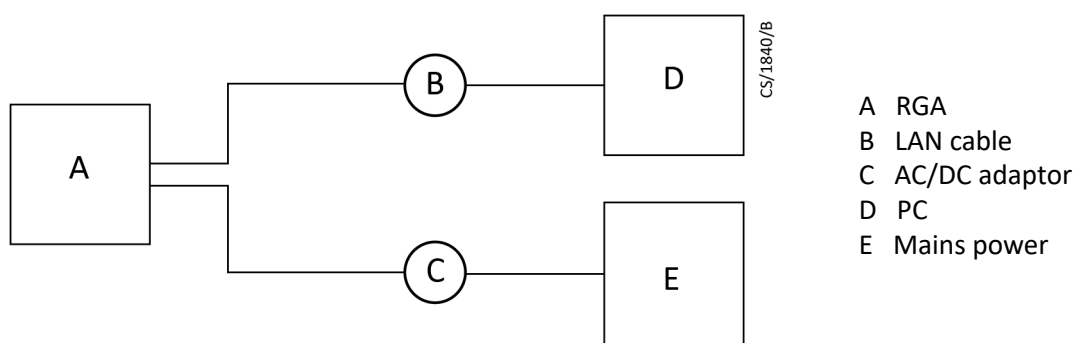
LOCAL/REMOTE : REMOTE

Address : 1

List of fixed IP addresses:

Sensor1	: 192.168.250.11	Sensor9	: 192.168.250.19
Sensor2	: 192.168.250.12	Sensor10	: 192.168.250.20
Sensor3	: 192.168.250.13	Sensor11	: 192.168.250.21
Sensor4	: 192.168.250.14	Sensor12	: 192.168.250.22
Sensor5	: 192.168.250.15	Sensor13	: 192.168.250.23
Sensor6	: 192.168.250.16	Sensor14	: 192.168.250.24
Sensor7	: 192.168.250.17	Sensor15	: 192.168.250.25
Sensor8	: 192.168.250.18	Sensor16	: 192.168.250.26

Installation and connection



** This figure is for the single sensor type.*

Preliminary operation

1. Unpack the instrument and check quantities.
2. Check if any components are damaged.

Installation

Install the sensor

1. Measuring position
 - This product measures pressure by measuring the static pressure in the position where the analyzer tube is connected. Take care in selecting the measuring position because the measurement value is affected if there is a flow in the vacuum system, source of out-gas or source of high intensity electrons or ions.
 - The correct pressure measurement cannot be made or the analyzer tube may fail if the analyzer tube is subject to vibration, heat radiation, high intensity electromagnetic field or high intensity radiation.
 - The RGA must be connected to power supplies or instruments that conform to the requirements of a grounded protective extra-low voltage (SELV-E according to EN 61010).
 - Keep enough room around the unit as to not cover panel vents and allow for sufficient heat dissipation.
2. Installing the analyzer tube
 - Install the analyzer tube so that the aperture plane of the analyzer tube is installed in parallel to the flow of gas. Especially, see to it that gas is not introduced into the analyzer tube in a beam form. Also make sure that foreign objects cannot fall into the analyzer tube by installing a mesh if the aperture faces up.
 - If you touch the gasket with bare hands or use a contaminated gasket it can cause measurement errors. Use a new gasket and, before use, wipe it with a clean cloth wetted with alcohol. To avoid leaks, never reuse gaskets.
 - If the filament is subjected to strong lateral impact or vibration when it is hot, it may break or contact the grid electrode.

- If the analyzer tube is connected at the end of a long or thin pipe, the pressure in the analyzer tube will increase because of the reduced conductance. This can cause measurement errors or filament burnout.
- As indicated in *Operation switches and LEDs* on page 9, fix the analytical tube after paying attention to the orientation of the operation panel on the sensor unit. To assist you, a "DisplaySide" label is attached to the flange of the analyzer tube.

CAUTION:

After fixing the analysis tube, do not attempt to twist it in order to change the orientation of the sensor unit. This can cause the sensor unit to malfunction.

Install the sensor unit**CAUTION:**

Ensure the sensor unit does not strike other structures.

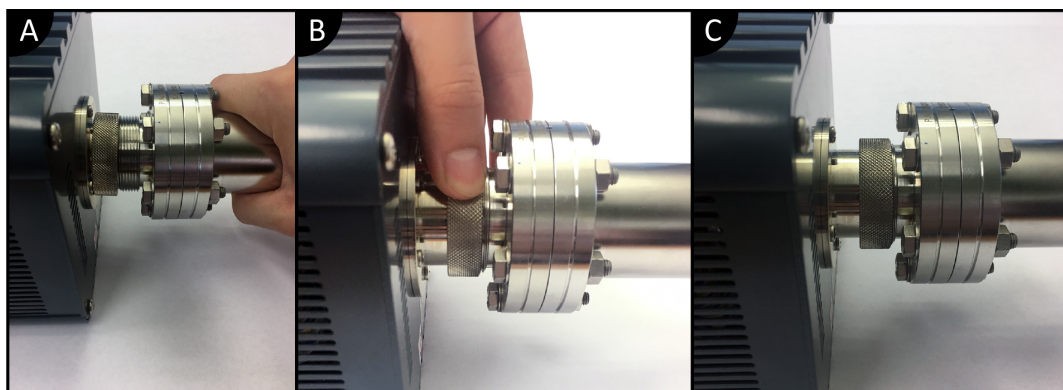
CAUTION:

Attach or detach the sensor unit from the analyzer tube using the knurled ring. Do not rotate the sensor unit, this can break the connector or the wiring.

CAUTION:

Only ever tighten the knurled ring by hand. If you use tools, there is a risk of making it impossible to detach, breaking the connector, or damaging the internal wiring.

1. Attach the sensor unit and the analyzer tube and tighten the knurled ring by hand.



CS/1841/B

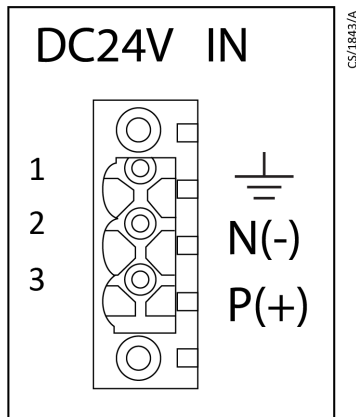
Install the power connector

CAUTION:

Make connections to the correct pins when wiring the power connector. If you apply power to the incorrect pins internal damage could result.

1. Wire the power connector as follows:

- Power +24 V
Pin that supplies 24 V d.c. power.
- Power GND
GND when +24 V d.c. power is supplied.
- Frame GND
Frame ground. Connect it to the instrument frame.
Connect the earth connection to Class A ground to prevent leakage currents.



Item	Function	Description
1	Frame GND	Frame ground. Connect it to the instrument frame. (AC adaptor code; Black + Green dot)
2	Power GND	GND when +24 Vd.c. power is supplied. (AC adaptor code; black)
3	Power +24 V	Pin that supplies 24 Vd.c. power. (AC adaptor code; white)

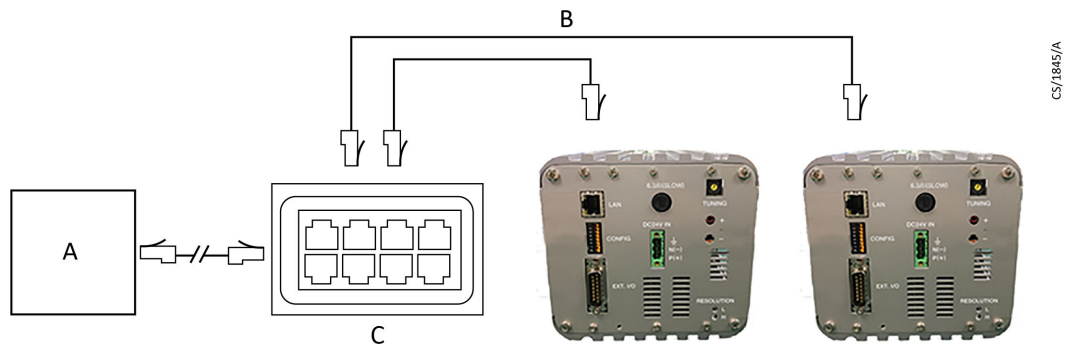
RS232C cable connection

To connect a single sensor, select RS232C. Connect the cable, as shown in the figure below.



RS485 cable connection

To connect multiple sensors, select RS232C/485, set the address and RS485 terminator and connect the cable.



- A To LAN connector of PC
- B LAN cable
- C Switching hub

Measurement

There are 2 measurement methods you can use on the Residual Gas Analyser:

1. Connect the unit to a computer (PC) in which the Edwards Control and Analytics gas analysis software is installed.
2. Use the push button, indicator light and partial pressure display value on the sensor unit.

Using a computer

1. Set the PC's IP address. When using the fixed IP address of the sensor unit (192.168.250.11 in case of Sensor 1), open the property of the IP address (TCP / IP-Ver4) from the network setting of the PC and set the IP address = 192.168.250. xxx (xxx is a numerical value other than "11" of the sensor unit). Refer to the instruction manual for details such as setting variable IP address.
 - When connecting to a PC, confirm the setting of both IP addresses.
 - Turn off the Windows Firewall.
 - Communication can only be used with a wired connection with Windows PC and the dedicated software installed. Communication with communication devices other than a Windows PC is not supported.
2. Install the Edwards Control and Analytics (called ECA in this manual) gas analysis software on your PC.
3. Use a LAN cable to connect the LAN port (RJ45) of the PC to the LAN connector of the sensor unit.
4. After supplying power to the RGA unit, double-click the ECA icon on the desktop of the PC and run the ECA software.
5. Enter the sensor number and type in the sensor type dialog, displayed first, and press the "OK" button.
6. When communication between the PC and the RGA is established, ECA loads the default recipe or the recipe used last.
7. Press the "FIL" button to turn on the filament of the analyzer tube. The "F" and "R" lights come on.
 - Before pressing the START button, check the operating pressure (about 1×10^{-3} Pa) on a separate gauge.
 - If the filament is turned on too soon after pumping, the high pressure protection of the RGA might work because of the emitted gas of the filament. In that case, confirm operating pressure again and turn on the filament several times to reduce the emitted gas.
8. Press the "MES" button to start gas analysis. The "S" and "M" lights come on. (Whether the F, R and S lights are on or off depends on the settings on the control panel.)



9. To terminate gas analysis, press the "MES" button again.
10. Turn off the "FIL" button and then turn off the analyzer tube filament.
11. Exit the software when measurement is completed.

Using the sensor unit

Refer to the operation manual supplied on the software installation CD.

Warranty

This product was shipped after company inspection. However, if a failure occurs such as a defect in manufacturing or damage during transportation, contact your supplier.

Items covered under warranty

This unit.

Duration of guarantee

One (1) year after shipping date.

Scope

1. Damage to product caused by a failure on delivery.
2. Product not meeting the standard specifications when used under normal service conditions as stated in the manual.

Failures which void the warranty

1. Failure occurred after expiration of the warranty period.
2. Failure caused by force of nature, such as fire, storm and flood damage, earthquake, lightning strike, and so forth.
3. Failure occurred due to careless handling or incorrect usage.
4. Product is refurbished, disassembled or repaired without supplier acceptance.
5. Failure occurred in an abnormal environment, such as an intense electromagnetic field, radiation, high temperature, high humidity, flammable gases, corrosive gases, dust, and so forth.
6. Failure due to noise.
7. Ion source and secondary electron multiplier and sensor being used (expiration of life, measurement error, and so forth).
8. Cable in use (cable burnout due to improper installation, poor contact, and so forth).

Other

1. For questions and consultation, the customer can check the model and serial number and ask the local supplier representative.
2. The content of this document is subject to change without notice.

Certificate of decontamination

All material must be certified as decontaminated and this certificate must be submitted to the closest supplier service centre or sales office before shipment. Refer to the CD.

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Return the equipment or components for service

Before you send your equipment to us for service or for any other reason, you must send us a completed Declaration of Contamination of Vacuum Equipment and Components - Form HS2. The HS2 form tells us if any substances found in the equipment are hazardous, which is important for the safety of our employees and all other people involved in the service of your equipment. The hazard information also lets us select the correct procedures to service your equipment.

We provide instructions for completing the form in the Declaration of Contamination of Vacuum equipment and Components - Procedure HS1.

If you are returning a vacuum pump, note the following:

- If a pump is configured to suit the application, make a record of the configuration before returning the pump. All replacement pumps will be supplied with default factory settings.
- Do not return a pump with accessories fitted. Remove all accessories and retain them for future use.
- The instruction in the returns procedure to drain all fluids does not apply to the lubricant in pump oil reservoirs.

Download the latest documents from www.edwardsvacuum.com/HSForms/, follow the procedure in HS1, fill in the electronic HS2 form, print it, sign it, and return the signed copy to Edwards.

Note: *If we do not receive a completed HS2 form, we will not accept the return of the equipment.*

