AIM200 Active Inverted Magnetron Gauge
WRG200 Wide Range Gauge

edwardsvacuum.com



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You must use this product as described in this manual. Read the manual before you install, operate, or maintain the product. For manual enquiries, email *manuals@edwardsvacuum.com*.

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1. Safety and compliance

For safe operation from the start, read these instructions carefully before you install or commission the equipment and keep them safe for future use. Read all the safety instructions in this section and the rest of this manual carefully and make sure that you obey these instructions.

The instruction manual is an important safety document that we often deliver digitally. It is your responsibility to keep the instruction manual available and visible while working with the equipment. Please download the digital version of the instruction manual for use on your device or print it if a device will not be available.

1.1 Definition of Warnings and Cautions

Important safety information is highlighted as warning and caution instructions which are defined as follows. Different symbols are used according to the type of hazard.

WARNING:

If you do not obey a warning, there is a risk of injury or death.

CAUTION:

If you do not obey a caution, there is a risk of minor injury, damage to equipment, related equipment or process.

NOTICE:

Information about properties or instructions for an action which, if ignored, will cause damage to the equipment.

We reserve the right to change the design and the stated data. The illustrations are not binding.

1.2 Trained personnel

For the operation of this equipment “trained personnel” are:

- skilled workers with knowledge in the fields of mechanics, electrical engineering, pollution abatement and vacuum technology and
- personnel specially trained for the operation of vacuum pumps

1.3 Safety symbols

The safety symbols on the products show the areas where care and attention is necessary.

The safety symbols that we use on the product or in the product documentation have the following meanings:

	**Warning/Caution** Risk of injury and/or damage to equipment. An appropriate safety instruction must be followed or a potential hazard exists.
	**Warning - Dangerous voltage** Risk of injury. Identifies possible sources of hazardous electrical shock.
	**Warning - High magnetic field** Risk of injury or damage to equipment. Identifies a possible source of a magnetic field capable of disrupting equipment including pacemakers.
	**Warning - Risk of explosion** Risk of injury or damage to equipment. Identifies a situation that could result in an explosion.
	Warning - Overpressure Risk of increased pressure beyond permissible limit.
	WEEE symbol The equipment must be discarded carefully. Obey local and national regulations for disposal of this equipment.
	Warning - Magnetic field High magnetic fields may be present. Pacemakers or other similar implanted devices may be affected.

2. Introduction

2.1 Description

This document applies to the AIM200 and WRG200 series of products. The AIM200 and WRG200 are inverted magnetron vacuum gauges. The pressure is measured indirectly as a function of the current which flows in a crossed field Townsend discharge generated within the magnetron cell.

The WRG200 is considered a wide range gauge as it additionally incorporates a Pirani filament. Using the principle of thermal conductivity in which the rate of heat loss from a heated filament is dependent on the pressure of the gas surrounding the filament, it is possible to indirectly measure up to atmospheric pressure.

The WRG200 also incorporates a unique striking mechanism consisting of a small incandescent filament mounted adjacent to the magnetron cell. This filament is automatically ignited, providing enough emission electrons to initiate the discharge.

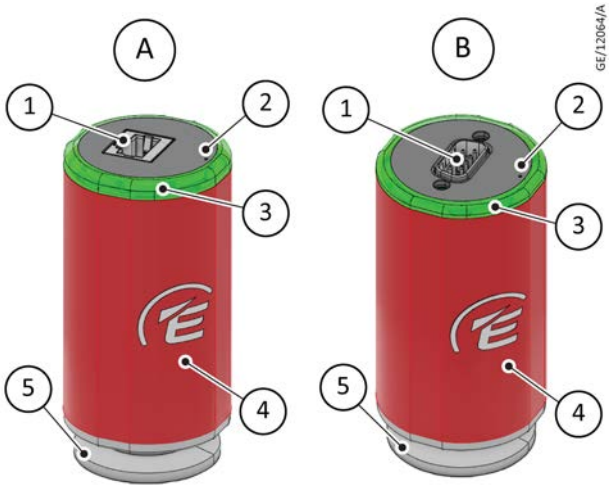
The gauges incorporate microprocessor control of various features:

- Automatic control of the discharge voltage in the magnetron cell during the ignition of the gauge.
- Reduction of the discharge voltage in the magnetron cell after ignition in order to enhance the lifetime of the gauge.
- Error monitoring to help identify the exact cause of failure.
- Simple adjustment of setpoint trip levels.

Referring to *Figure: General view*

- The gauge has a detachable tube that allows the replacement of the tube or electronics housing in the event of failure.
- The gauge has a multi-function button on the top of the gauge for navigation through the various menus within the gauge.
- An LED indicator surrounding the circumference of the top of the gauge provides the status indication and aids the adjustment of the gauge when you navigate through the menus.
- The gauge is available with different electrical connectors, voltage scaling and vacuum flanges to integrate with the customer process.

Figure 1 General view



A. Gauge with RJ45 connector
B. Gauge with 9-pin D-SUB connector
1. Electrical connector
2. Multi function button
3. LED indicator
4. Electronics housing
5. Vacuum flange

2.2 Item number and characteristic matrix

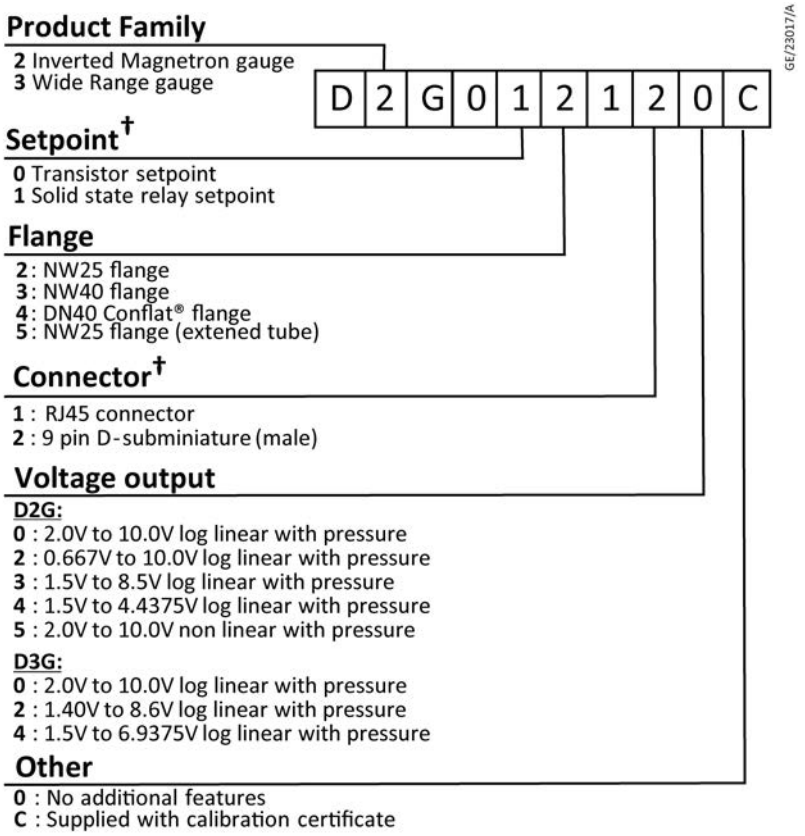
The range of AIM200 and WRG200 is highly configurable. The characteristics of a particular product are defined through the product item number or description. The characteristics in the table that follows can be selected at the point of purchase.

Table 1 Options

Characteristic*	Description
Voltage output	Different transfer functions including matched voltage outputs to ensure compatibility with most vacuum gauges available on the market
Setpoint	Transistor setpoint or solid state relay
Flange	Different vacuum flanges are available
Connector	Different electrical connectors are available
Other	Gauges can be ordered with calibration certificates

** Not all permutations of characteristics are possible. Refer to Figure: Item characteristic matrix and Figure: Item number matrix.*

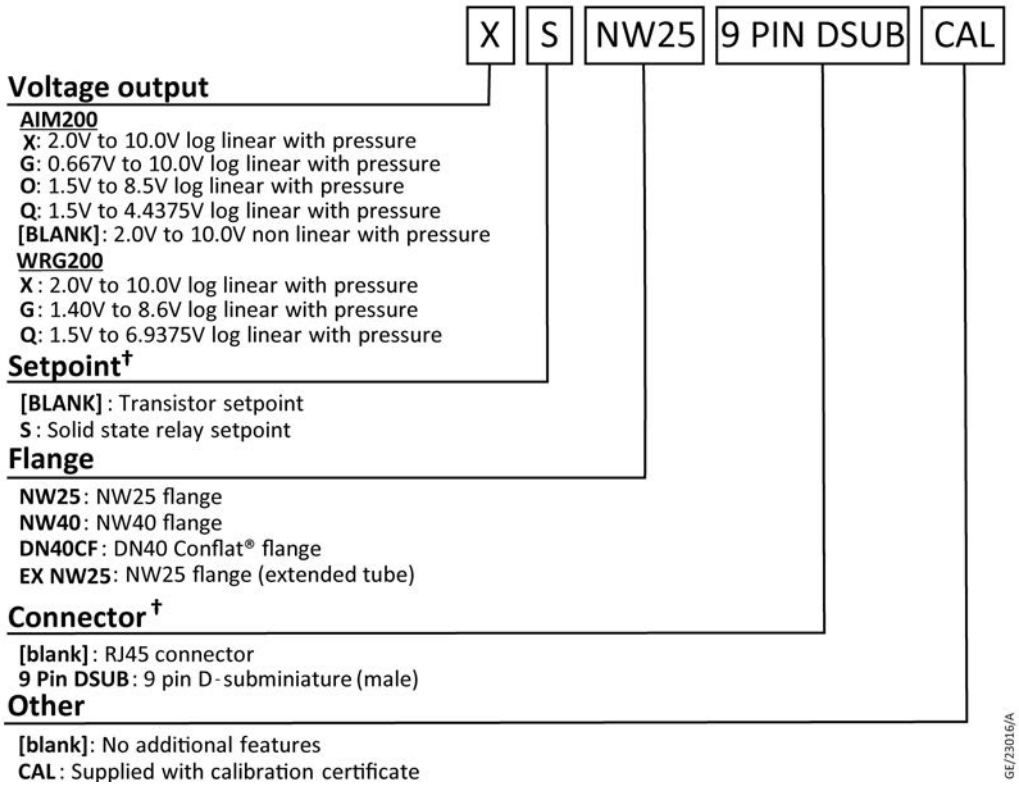
Figure 2 Item number matrix



† AIM200 [9 pin D-SUB] (male) connector option is only available with "solid state relay" setpoint option.

AIM200 RJ45 connector option is only available with "transistor" setpoint option.

Figure 3 Item characteristic matrix



† AIM200 [9 pin D-SUB] (male) connector option is only available with [S] "solid state relay" setpoint option.

AIM200 [blank] RJ45 connector option is only available with [blank] "transistor" setpoint option.

3. Technical data

3.1 Operating and storage conditions

Table 2 Operating and storage conditions

Parameter	Value	
	AIM200	WRG200
Ambient operating temperature range	+5 °C to +60 °C Indoor use only	
Ambient storage temperature range	-30 °C to +70 °C	
Bakeout temperature	150 °C with electronics removed	
Humidity	80% RH up to 31 °C decreasing linearly to 50% RH at 40 °C and above	
Maximum altitude	3000 m	
Maximum internal pressure	10 bar absolute (9 bar gauge)	
Pollution degree	2	
Pirani filament temperature	N/A	≈95 °C
Striking aid temperature	N/A	≈1500 °C

3.2 Manufacturing materials

Table 3 Material exposed to vacuum

Where used	Material exposed to vacuum	
	AIM200	WRG200
Tube	Stainless steel 316L, 304L	
Magnetron cell	Stainless steel 304, 430	
Feedthrough	Stainless steel 304, 347, Ni-Fe, glass	
Pirani filament	N/A	W
Striking aid	N/A	W

3.3 Performance data

Table 4 Performance data AIM200

Characteristic Voltage output	Pressure range	Typical accuracy (N_2)
[X], [G], [O] (log-linear with pressure)	1×10^{-9} – 1×10^{-2} mbar	±30% reading
[Q] (log-linear with pressure)	1×10^{-8} – 7.5×10^{-3} Torr	±30% reading
[blank] (Non-linear)	1×10^{-8} – 1×10^{-2} mbar	±30% reading

Table 5 Performance data WRG200

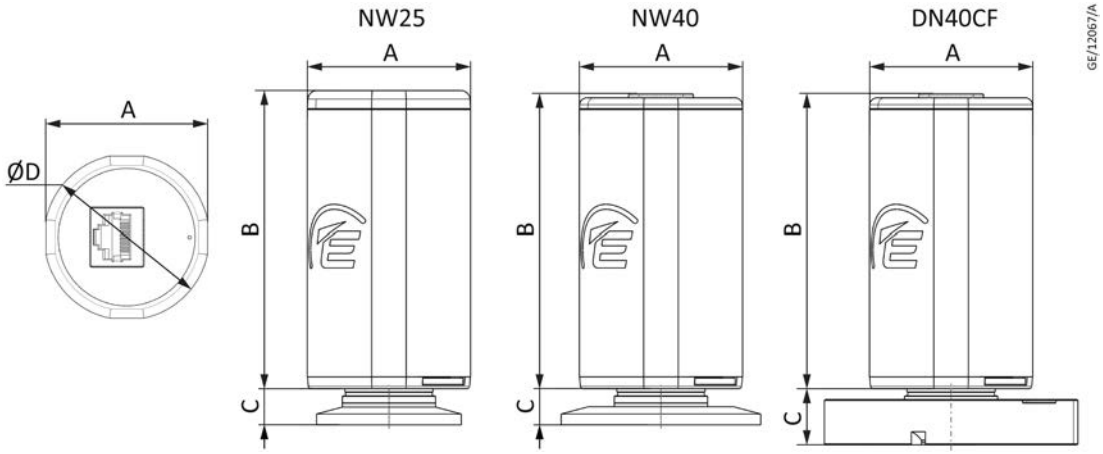
Characteristic Voltage output	Pressure range	Typical accuracy (N_2)
[X], [G] (log-linear with pressure)	1×10^{-9} – 1×10^{3} mbar	±30% reading up to 1×10^{-3} mbar, ±15% reading to 10 mbar
[Q] (log-linear with pressure)	1×10^{-8} – 7.5×10^{2} Torr	±30% reading up to 7.5×10^{-4} Torr, ±15% reading to 7.5 Torr

3.4 Mechanical data

Table 6 Mechanical data

Characteristic		Value	Unit
Dimensions		Refer to *Dimension drawing* on page 15	mm
Enclosure rating		IP40	-
Mass	NW25	350	g
	NW40	380	
	DN40CF	630	
Internal volume of tube			
Flange	NW25	20	cm^3
	NW40		
	DN40CF		

3.5 Dimension drawing



	Dimensions (mm)			
Flange	**A**	**B**	**C**	**D**
NW25	45	82	10	46
NW40	45	81.5*	10	46
DN40CF	45	81.5*	15.5	46
NW25 (extended tube)	45	82	22	46

**The 9 pin D-SUB (male) connector is 0.5 mm shorter than the RJ45 variant.*

3.6 Electrical data

Table 7 Electrical data

Parameter	Data
Electrical supply voltage	15 to 48 V d.c. nominal ±10% Limited-energy circuit/source in accordance with IEC 61010-1
Maximum power consumption	
AIM200	4 W
WRG200	
Maximum inrush current	
AIM200	220 mA
WRG200	270 mA
Electrical connector	9 pin D-SUB male RJ45 8 pin
Minimum load impedance	10 kΩ
Maximum output current	1 mA

Note:

National Electrical Code (NEC) Class 2 or Limited Power Source (LPS) are also accepted.

3.6.1 ID resistor

Table 8 ID resistor AIM200

Characteristic			ID resistor
Voltage output	**Setpoint**	**Connector**	
AIM200 with standard voltage output			
[X] (log-linear with pressure)	[blank] (transistor)	[blank] (RJ45)	110 kΩ
	S (Solid state relay)	9 pin D-SUB	100 kΩ
[blank] (Non-linear)	[blank] (transistor)	[blank] (RJ45)	100 kΩ
AIM200 with matched voltage output			
[G], [O], [Q] (log-linear with pressure)	[blank] (transistor)	[blank] (RJ45)	110 kΩ
	S (Solid state relay)	9 pin D-SUB	100 kΩ

Table 9 ID resistor WRG200

Characteristic			ID resistor
Voltage output	**Setpoint**	**Connector**	
WRG200 with standard voltage output			
[X] (log-linear with pressure)	[blank] (transistor)	[blank] (RJ45)	75 kΩ
	[blank] (transistor)	9 pin D-SUB	
	S (Solid state relay)	9 pin D-SUB	85 kΩ
WRG200 with matched voltage output			
[G], [Q] (log-linear with pressure)	[blank] (transistor)	[blank] (RJ45)	75 kΩ
	[blank] (transistor)	9 pin D-SUB	
	S (Solid state relay)	9 pin D-SUB	85 kΩ

3.6.2 Pressure output signal

Table 10 Pressure output signal AIM200

Characteristic	Pressure measurement output signal	Error voltages	
Voltage output		**Error**	**Voltage**
AIM200 with standard voltage output			
[X] (log linear with pressure)	V = 2.00 – 10.00 V 0.5 V: gauge disabled	EEPROM error	0.90 V
		Failure to strike	1.30 V
[blank] (Non-linear)	V = 2.00 – 10.00 V 0.5 V: gauge disabled	EEPROM error	0.90 V
		Failure to strike	1.30 V
AIM200 with matched voltage output			
[G] (log-linear with pressure)	V = 0.667 – 10.00 V 0.4 V: gauge disabled	Failure to strike	0.15 V
		EEPROM error	0.29 V
[O] (log-linear with pressure)	V = 1.50 – 8.50 V 0.4 V: gauge disabled	Failure to strike	0.15 V
		EEPROM error	0.29 V
[Q] (log-linear with pressure)	V = 1.50 – 4.4375 V 0.5 V: gauge disabled	EEPROM error	0.90 V
		Failure to strike	1.30 V

Table 11 Pressure output signal WRG200

Characteristic	Pressure measurement output signal	Error voltages	
Voltage output		**Error**	**Voltage**
WRG200 with standard voltage output			
[X] (log linear with pressure)	V = 2.00 – 10.00 V	EEPROM error	0.90 V
		Pirani failure	1.00 V
		Striker filament failure	1.20 V
		Failure to strike	1.30 V
WRG200 with matched voltage output			
[G] (log-linear with pressure)	V = 1.40 – 8.60 V	Failure to strike	0.15 V
		EEPROM error	0.29 V
		Pirani failure	10.20 V
[Q] (log-linear with pressure)	V = 1.50 – 6.9375 V	EEPROM error	0.90 V
		Pirani failure	1.00 V
		Striker filament failure	1.20 V
		Failure to strike	1.30 V

3.6.3 Control inputs

Table 12 AIM200 control input - gauge enable

Characteristics	Data
Voltage output	
[X], [blank], [Q]	Gauge enable: < 1.3 V
[G], [O]	Gauge enable: < 2.5 V
	Gauge disable: > 4.0 V

Table 13 WRG200 control input - remote calibration

Characteristics	Data
Voltage output	
[X], [G], [Q]	Remote calibration: < 1.5 V

3.6.4 Setpoint

Table 14 Setpoint AIM200

Characteristic	Setpoint	
Voltage output	**Adjustment range**	**Hysteresis**
AIM200 with standard voltage output		
[X] (log linear with pressure)	1.80 – 10.20 V	0.50 V
[blank] (Non-linear)		
AIM200 with matched voltage output		
[G] (log-linear with pressure)	0.667 V – 10.00 V	10% pressure
[O] (log-linear with pressure)	1.50 – 8.50 V	10% pressure
[Q] (log-linear with pressure)	1.50 – 4.4375 V	10% pressure

Table 15 Setpoint WRG200

Characteristic	Setpoint	
Voltage output	**Adjustment range**	**Hysteresis**
WRG200 with standard voltage output		
[X] (log linear with pressure)	1.80 – 10.20 V	0.33 V
WRG200 with matched voltage output		
[G] (log-linear with pressure)	1.40 – 8.60 V	10% pressure
[Q] (log-linear with pressure)	1.50 – 6.9375 V	10% pressure

Table 16 Transistor setpoint variants ([blank] characteristic)

Parameter	Data
Open collector transistor	1 (quantity)
Maximum external load rating	48 V d.c. maximum, 100 mA
Back EMF suppression diode*	Minimum surge rating 1 A minimum reverse voltage rating 100 V

** Recommended when external d.c. relay is connected, refer to Figure: AIM200 9 pin D-SUB Solid state relay and Figure: WRG200 9 pin D-SUB Solid state relay.*

Table 17 Status output variants (both [S] AND [9 pin D-SUB] characteristic selected)

Parameter	Data
Open emitter transistor	1 (quantity)
Current rating	100 mA
Status output: ▪ Discharge struck ▪ Discharge not struck	 ▪ +15 to +48 V d.c. depending on supply voltage ▪ 0 V d.c.

Table 18 Solid state relay variants ("S" characteristic)

Parameter	Data
Solid state relay	1 (Quantity)
Form	Single Pole Single Throw (SPST), Normally Open (N.O.)
Rating	48 V d.c. maximum, 500 mA
Relay on series resistance	Typical 0.2 Ω, maximum 0.3 Ω

4. Installation

4.1 Unpack and inspect

1. Remove the packing materials and protective covers.
2. Examine the gauge.
3. If the gauge is damaged, tell the supplier and carrier in writing within three days. Provide:
   - item number of the gauge
   - order number
   - supplier invoice number of the gauge.
4. Keep packing materials for inspection.
5. Do not use the product if it is damaged.
6. If the system is not to be used immediately, put the protective cover and packing materials on the gauge.
7. Store the gauge in applicable conditions. Refer to *Operating and storage conditions* on page 13.

Check that your package contains the following items:

Table 19 Checklist of items

Quantity	Description	Check
1	Vacuum gauge	❑
1	Test report	❑
1	Adjustment tool	❑
1	Instruction manual	❑
1	Electronics housing removal tool	❑

4.2 Install the gauge



WARNING: HIGH PRESSURE

Risk of damage to equipment. Use a co-seal or trapped O-ring carrier to connect the gauge to a vacuum system. If the pressure is more than the atmospheric pressure, the standard centering rings are not applicable.



WARNING: CRITICAL APPLICATION

Risk of damage to equipment. Do not use the gauge for safety critical applications. The gauge is not intended to be fail-safe.

To install the gauge, do the procedure as follows:

1. You can install the gauge in any direction.
2. In the factory, the gauge is mounted horizontally and calibrated for nitrogen.

3. Mount the gauge tube in vertical direction to minimise the build up of process particulates and condensable vapours within the gauge.
4. WRG200 only: For the correct pressure indication at the direction of the installed gauge, calibrate the gauge again at atmospheric pressure.
5. WRG200 only: For precision, we recommend that the atmosphere and vacuum adjustment must be done before use. Refer to *Maintenance* on page 45.

4.3 Gauge connections

4.3.1 Connect the gauge to the vacuum system

To connect the gauge to the vacuum system:

1. Use an O-ring with an outer centring ring to connect the gauge with an NW25 or NW40 flange to a similar flange on the vacuum system.
2. Use a new copper gasket to connect the gauge with a DN40CF flange to a similar flange on the vacuum system.
3. Make sure that the vacuum system has a correct earth (ground) connection.
4. Connect the tube of the gauge to the vacuum system.

4.3.2 Connect the gauge to the electrical equipment

CAUTION: GAUGE MALFUNCTION

Risk of damage to equipment. Do not make connections to the gauge identification pin as it can cause the gauge to malfunction.

Refer to *Recommended electrical connections* on page 22 for schematic diagram of the electrical connections to the gauge. Use the pins on the electrical connector as shown in *Table: Pins out AIM200 electrical connectors* and *Table: Pins on the WRG200 electrical connector* respectively.

Refer to *Technical data* on page 13 for more specifications.

Figure 4 Electrical connectors

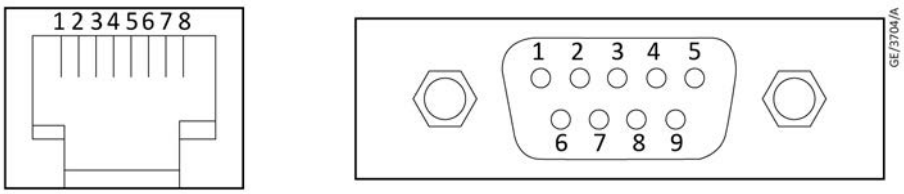


Table 20 Pins on the AIM200 electrical connector

Connector	9 pin D-SUB male	RJ45 8 pin
Characteristic	**[S] Solid state relay**	**[blank] Setpoint transistor**
Pin	**Refer to *Figure: Electrical connectors***	
1	Gauge enable	Electrical supply positive
2	Electrical supply ground (0V)	Electrical supply ground (0V)
3	Pressure measurement output signal	Pressure measurement output signal
4	Electrical supply positive	ID resistor
5	ID resistor	Signal ground
6	Relay N.O.	Setpoint output signal
7	Signal ground	Gauge enable
8	Relay common	Not connected
9	Status	-

Table 21 Pins on the WRG200 electrical connector

Connector	9 pin D-SUB male		RJ45 8 pin	
Characteristic	**[blank] Setpoint transistor**	**[S] Solid state relay**	**[blank] Setpoint transistor**	**[S] Solid state relay**
Pin	**Refer to *Figure: Electrical connectors***			
1	Electrical supply positive	Remote calibration input	Electrical supply positive	
2	Electrical supply ground (0V)		Electrical supply ground (0V)	
3	Pressure measurement output signal		Pressure measurement output signal	
4	ID resistor	Electrical supply positive	ID resistor	
5	Signal ground	ID resistor	Signal ground	
6	Setpoint output signal	Relay N.O.	Setpoint output signal	Relay N.O.
7	Remote calibration input	Signal ground	Remote calibration input	
8	Not connected	Relay common	Not connected	Relay common
9	Not connected	Status	-	-

Note:

Measure the ID resistor with respect to signal ground.

Recommended electrical connections

- Do not connect the electrical supply ground to the signal ground. If you connect the electrical supply ground to the signal ground, the gauge output signal will not be accurate.

- When you use the gauge in an electrically noisy environment, make sure your equipment is immune to the interference.

Note:

All the controllers supplied by us have sufficient immunity.

For setpoint transistor variants only:

- The setpoint output is an active low open-collector transistor applicable to operate a DC relay or control logic. If you connect an external relay, use a suppression diode to protect the gauge from the transient voltages generated when the relay is set to off. Refer to *Table: Transistor setpoint variants ([blank] characteristics)* for information on the electrical requirements.

For AIM200 variants only:

- Referring to *Figure: AIM200 RJ45 Transistor setpoint*, *Figure: AIM200 9 pin D-SUB Solid state relay* connect a switch between gauge enable and electrical supply ground (0V) to enable and disable the gauge. Refer to *Table: AIM200 control input - gauge enable* for information on the electrical requirements for the control input.

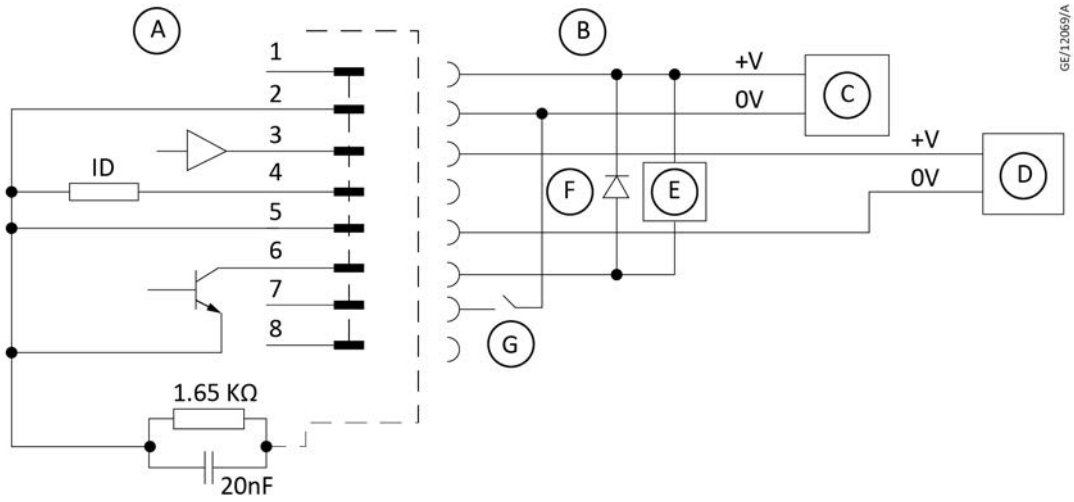
For WRG200 variants only:

- Referring to *Figure: WRG200 RJ45 Transistor setpoint*, *Figure: WRG200 RJ45 Solid state relay*, *Figure: WRG200 9 pin D-SUB Transistor setpoint*, *Figure: WRG200 9 pin D-SUB Solid state relay* connect a switch between remote calibration input and electrical supply ground (0V) to adjust the atmosphere or vacuum reading of the Pirani sensor remotely.
- Connect the power supply ground (0V) to the remote calibration input momentarily (> 50 ms) to automatically adjust the atmosphere or vacuum reading. Refer to *Maintenance* on page 45 for the procedure. Refer to *Table: WRG200 control input - remote calibration* for information on the electrical requirements for the control input.

Status output:

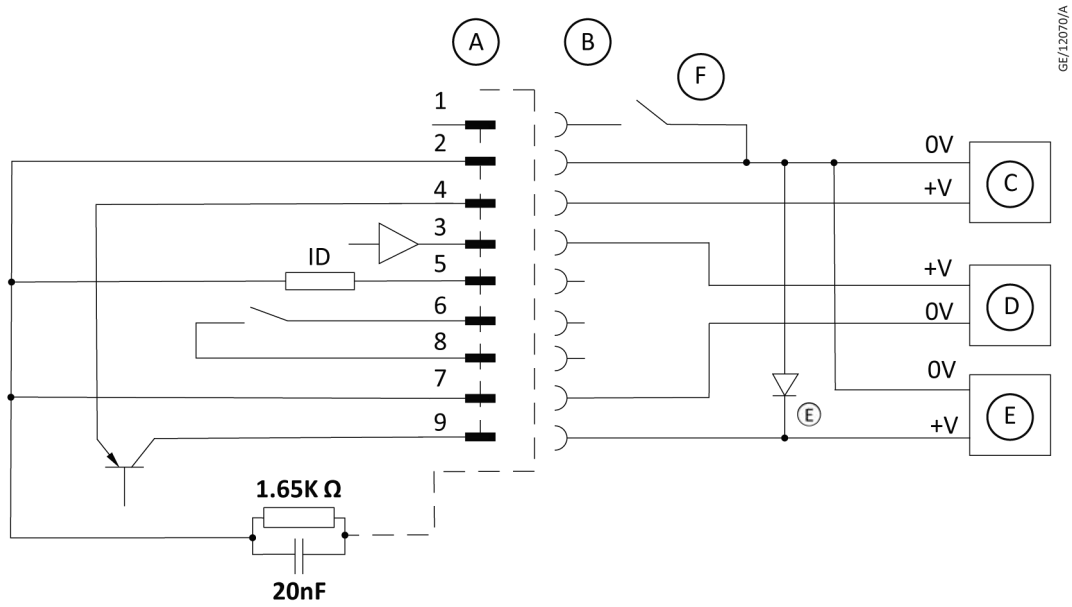
A status output is available on certain variants to indicate that the discharge in the magnetron cell has struck. The status output can be monitored with a voltmeter or similar. Refer to *Figure: AIM200 9 pin D-SUB Solid state relay*, *Figure: WRG200 9 pin D-SUB Solid state relay* and *Table: Status output variants (both [S] AND [9 pin D-SUB] characteristic selected)* for information on the electrical requirements.

Figure 5 AIM200 RJ45 Transistor setpoint



A. Gauge
B. Connector
C. Electrical supply
D. Voltmeter
E. DC relay (optional)
F. Back EMF suppression diode (optional)
G. Gauge enable switch

Figure 6 AIM200 9 pin D-SUB Solid state relay

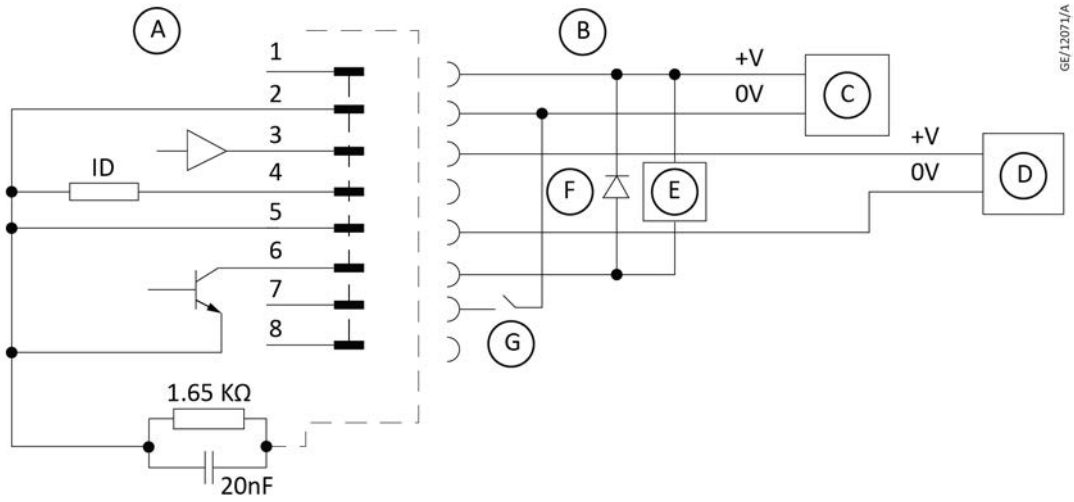


A. Gauge
B. Connector
C. Electrical supply
D. Voltmeter
E. Voltmeter and clamping diode (optional)*
F. Gauge enable switch

Note:

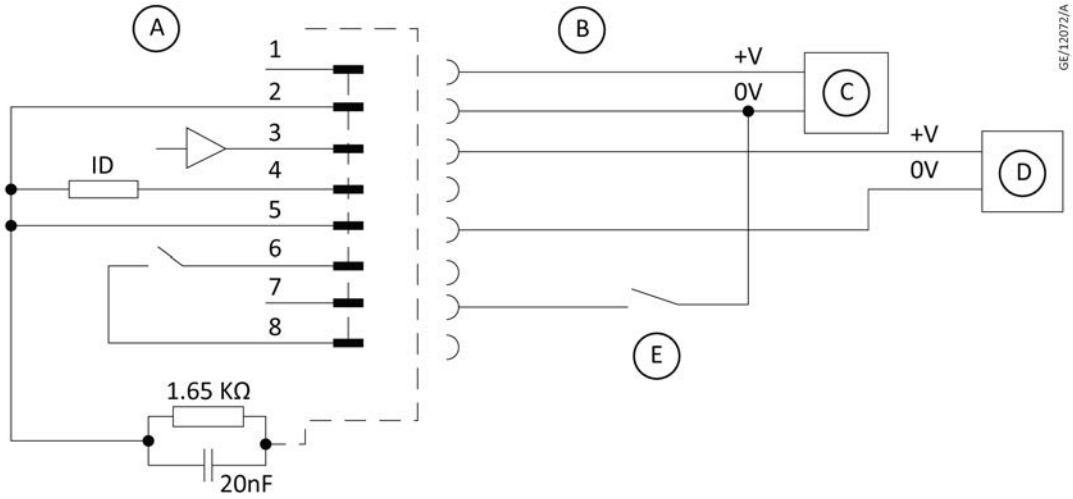
** Refer to Table: Status output variants (both [S] AND [9 pin D-SUB] characteristic selected).*

Figure 7 WRG200 RJ45 Transistor setpoint



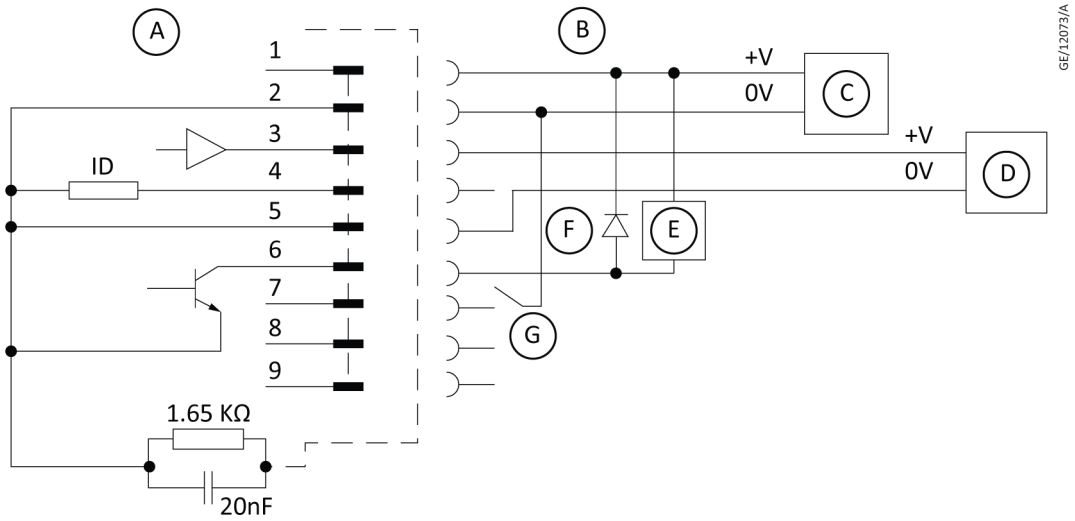
A. Gauge
B. Connector
C. Electrical supply
D. Voltmeter
E. DC relay (optional)
F. Back EMF suppression diode (optional)
G. Grounding switch (optional)

Figure 8 WRG200 RJ45 Solid state relay



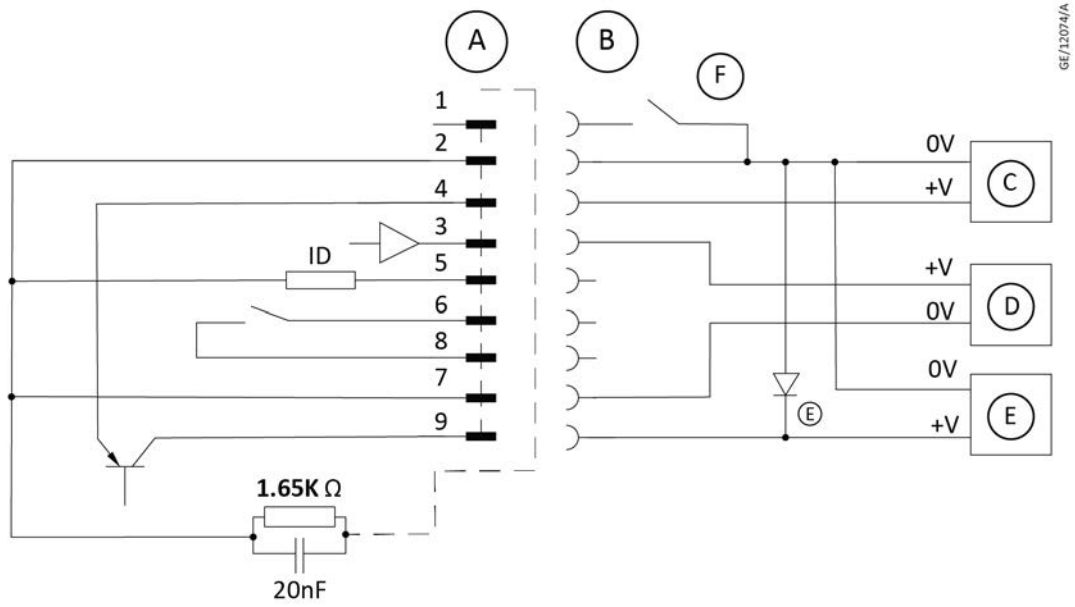
A. Gauge
B. Connector
C. Electrical supply
D. Voltmeter
E. Grounding switch (optional)

Figure 9 WRG200 9 pin D-SUB Transistor setpoint



A. Gauge
B. Connector
C. Electrical supply
D. Voltmeter
E. DC relay (optional)
F. Back EMF suppression diode (optional)
G. Grounding switch (optional)

Figure 10 WRG200 9 pin D-SUB Solid state relay



A. Gauge
B. Connector
C. Electrical supply
D. Voltmeter
E. Voltmeter and clamping diode (optional)*
F. Grounding switch (optional)

Note:

** Refer to Table: Status output variants (both [S] AND [9 pin D-SUB] characteristic selected).*

4.3.3 Maximum cable length

The maximum cable length is dependent on the conductor cross section and the supply voltage used.

Table 22 Maximum cable length

Electrical supply voltage	Maximum cable length (24AWG)
15 V	100 m
48 V	1000 m

The common mode signal voltage (that is, the voltage between the signal common and supply common) can be significant with long cables due to the voltage drop in the cable. For accurate pressure measurements, do not connect the electrical supply ground to signal ground. Both ground connections are linked within the gauge.

5. Operation



WARNING: MAGNETIC FIELD

Risk of injury. Magnetic field may interfere with pacemakers. Maintain a distance of minimum 10 cm between the gauge and the heart pacemaker. Use anti-magnetic shields to prevent the influence of the strong magnetic field.

WARNING: MAGNETIC FIELD

Risk of injury or damage to equipment. The gauge incorporates magnets. Keep away from heart pacemakers, computers, credit cards and any other magnetically sensitive devices.



WARNING: EXPLOSION HAZARD

Risk of injury or damage to equipment. Do not use the gauge to measure explosive or flammable gases or mixtures.



WARNING: ELECTRICAL HAZARD

Risk of electric shock. Do not disconnect the electronics and magnet housing from the body tube when the body tube is connected to the vacuum system. If there is a plasma discharge in the vacuum system near the body tube, the body tube can become electrically charged.

AIM200:



WARNING: ELECTRICAL HAZARD

Risk of injury or damage to equipment. Never operate the AIM200 when is it disconnected from the vacuum system or when there are explosive or flammable gases in the surrounding atmosphere or the vacuum system. High voltages (up to 4.5 kV) are generated inside the body tube of the AIM200; these could cause injury to people or could be a source of ignition.



CAUTION: GAUGE MALFUNCTION

Risk of damage to equipment. Do not operate the gauge at pressures above 1×10^{-2} mbar. If the gauge is operated at pressures greater than 1×10^{-2} mbar it may fail prematurely.

WRG200:



WARNING: OVER-PRESSURISE

Risk of injury or damage to equipment. When you measure the pressure of gases of high molecular weight, the pressure indicated can be below the true pressure. Make sure that the gauge is not over-pressurised when using heavy gases.



WARNING: HIGH FILAMENT TEMPERATURE

Risk of injury or damage to equipment. Do not use the gauge to measure the pressure of explosive or flammable gases or mixtures. The gauge has a heated filament which operates approximately at 100 °C and a striker filament which operates approximately at 1500 °C. The temperature of the filaments can be higher in fault conditions.

5.1 LED indicator

When the gauge is connected to a power supply the LED indicator will illuminate and flash red for approximately 5 seconds while the gauge is initialising. The LED indicator indicates the gauge status:

AIM200:

- Blue - gauge is disabled
- Flashing yellow - gauge initiating discharge in the magnetron cell (striking)
- Green - gauge is operating correctly
- Red - an error is detected. Refer to *Fault finding* on page 48.

WRG200:

- Green - gauge is operating correctly
- Red - an error is detected. Refer to *Fault finding* on page 48.

Normal operation

During normal operation, the LED indicator pulses to provide approximate indication of the measured pressure.

Table 23 LED Pattern AIM200

Pressure band	Colour	Change Rate	
		High intensity (s)	Low intensity (s)
Pressure ≤ 1 x 10^{-6} mbar	Green	Continuous	N/A
1 x 10^{-6} < Pressure ≤ 1 x 10^{-4} mbar		0.5	0.5
Pressure > 1 x 10^{-4} mbar		1	1

Table 24 LED Pattern WRG200

Pressure band	Colour	Change Rate	
		High intensity (s)	Low intensity (s)
Pressure ≤ 1 x 10^{-4} mbar	Green	Continuous	N/A
1 x 10^{-4} < Pressure ≤ 1 x 10^{-1} mbar		0.5	0.5
Pressure > 1 x 10^{-1} mbar		1	1

The pulsing operation (low intensity/high intensity) is switched on by default but can be disabled (refer to *Pulsed LED indicator on/off* on page 42). If pulsing is disabled, the LED will be green continuously during normal operation.

It is possible to switch the green/blue LED indicator off during normal operation by enabling dark mode (refer to *Dark Mode on/off* on page 43).

Note:

The pulsing function and dark mode state is unaffected by power cycling the gauge.

Error indication

If an error occurs within the gauge, the LED indicator will illuminate red and flash. Refer to *Fault finding* on page 48.

5.2 Pressure measurement

Pressure measurement AIM200

In order to measure pressure, the AIM200 must first be enabled. Refer to *Table: Pins on the AIM200 electrical connector* and either *Figure: AIM200 RJ45 Transistor setpoint*, or *Figure: AIM200 9 pin D-SUB Solid state relay* depending on the product; connect gauge enable to supply voltage ground (0V) to enable the gauge. When the connection to supply voltage ground (0V) is removed, the gauge will be disabled.

Alternatively, the AIM200 can be enabled using the multi-function push-button. Refer to *Appendix - Multi function button operation* on page 54. Do the procedure that follows to enable/disable the gauge:

1. Select the gauge enable/disable function using the multi-function push button (LED indicator permanently indicating yellow).
2. Confirm the selection by momentarily pressing and releasing the multi-function push button.
3. The LED indicator will flash yellow while the discharge is initiated (strikes).
4. Once the gauge has struck, the LED indicator will turn green.
5. To disable the gauge, repeat the process. The LED indicator will turn blue when disabled.

Note:

Manually enabling and disabling the gauge using the multi-function push button will change the gauge state from disabled → enabled or from enabled → disabled regardless of the state of the gauge enable connection.

The multi-function push button is disabled while the gauge is attempting to strike and when an error condition is detected.

When using the gauge with our controller, manually enabling and disabling the gauge is not recommended as the controller may not indicate the correct state of the gauge.

Pressure measurement AIM200 and WRG200

The WRG200 gauge is enabled as soon as power is applied to the gauge and the discharge is initiated (strikes) when the pressure is appropriate.

In the event of a gauge not striking within 30 minutes, the gauge displays an error voltage and the LED indicator flashes red. Refer to *Fault finding* on page 48.

It is possible to read the pressure from the gauge using a controller or by reading the gauge voltage with a voltmeter and converting the indicated voltage to pressure.

If the gauge has a standard voltage output characteristic, if connected to our controller, the display will indicate the measured pressure. Refer to *Table: Pressure output signal WRG200*.

Note:

The pressure must be above 1x10^{-9} mbar for the gauge to identify whether it has struck. Ensure that AIM200 is enabled, or power is applied to the WRG200, when the pressure is above 1x10^{-9} mbar.

The WRG200 will display the lower limit of the Pirani (1x10^{-4} mbar) while the gauge attempts to strike.

Note:

The gauge models with matched voltage outputs are not compatible with our controllers. The gauge may not be recognised or the pressure output may not be correct.

5.2.1 Gauges with log-linear pressure output

If the gauge is connected to a voltmeter, convert the voltage (V) to pressure (P) according to the formulae in the following table:

Table 25 Voltage output characteristic formulae AIM200

Characteristic	Formula: $10^{((V-a)/b)}$				
Voltage output		**P (mbar)**	**P (Torr)**	**P (Pascals)**	**Range of formula**
AIM200					
[X] (log-linear with pressure)	a:	12.286	12.428	10.000	V = 2.00 – 10.00
	b:	1.143	1.143	1.143	
[G] (log-linear with pressure)	a:	12.667	12.833	10.000	V = 0.67 – 10.00
	b:	1.333	1.333	1.333	
[O] (log-linear with pressure)	a:	10.500	10.625	8.500	V = 1.50 – 8.50
	b:	1.000	1.000	1.000	
[Q] (log-linear with pressure)	a:	5.438	5.500	4.438	V = 1.50 – 4.44
	b:	0.500	0.500	0.500	

Table 26 Voltage output characteristic formulae WRG200

Characteristic	Formula: $10^{((V-a)/b)}$				
Voltage output		**P (mbar)**	**P (Torr)**	**P (Pascals)**	**Range of formula**
WRG200					
[X] (log-linear with pressure)	a:	8.000	8.083	6.667	V = 2.00 – 10.00
	b:	0.667	0.667	0.667	
[G] (log-linear with pressure)	a:	6.800	6.875	5.600	V = 1.40 – 8.60
	b:	0.600	0.600	0.600	
[Q] (log-linear with pressure)	a:	5.438	5.500	4.438	V = 1.50 – 6.94
	b:	0.500	0.500	0.500	

Voltage to pressure conversion for AIM200 and WRG200

The following figures shows the variation in pressure with voltage for the different output characteristics of the AIM200 and WRG200.

Figure 11 Variant AIM200 [X]

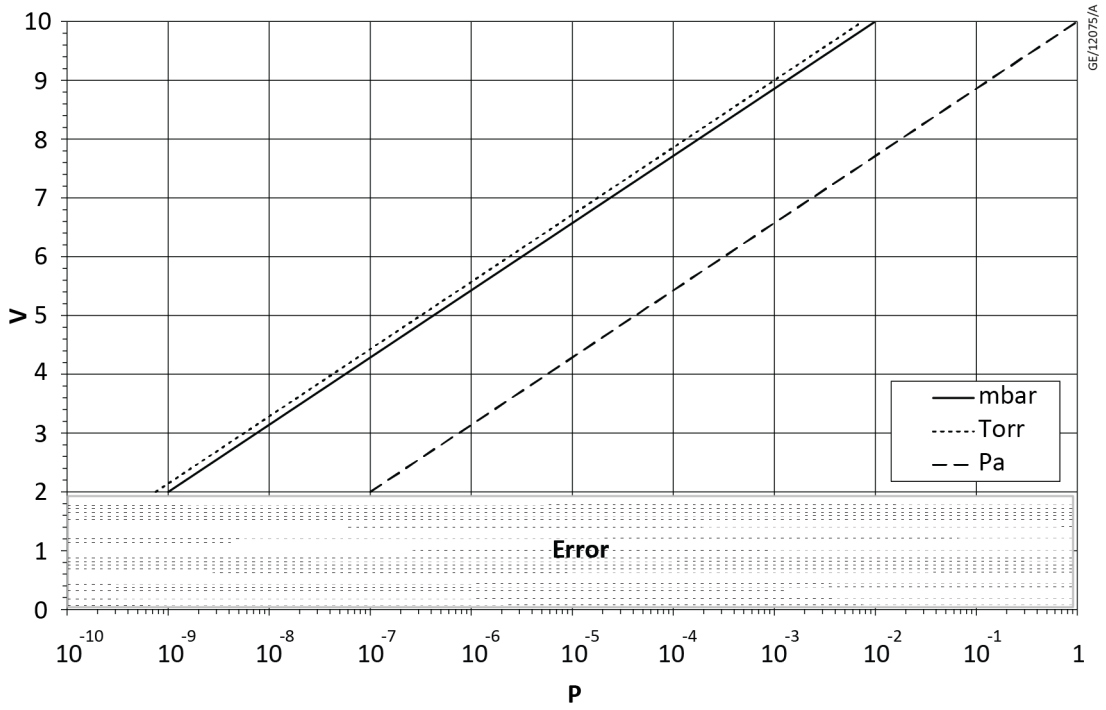


Figure 12 Variant AIM200 [G]

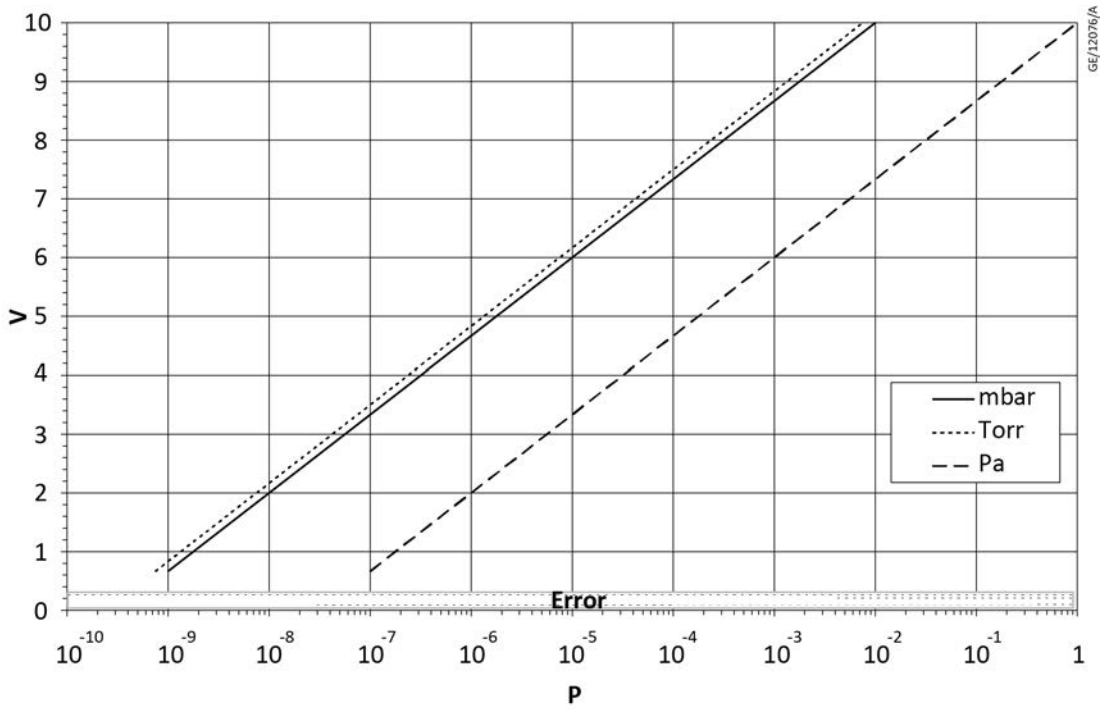


Figure 13 Variant AIM200 [O]

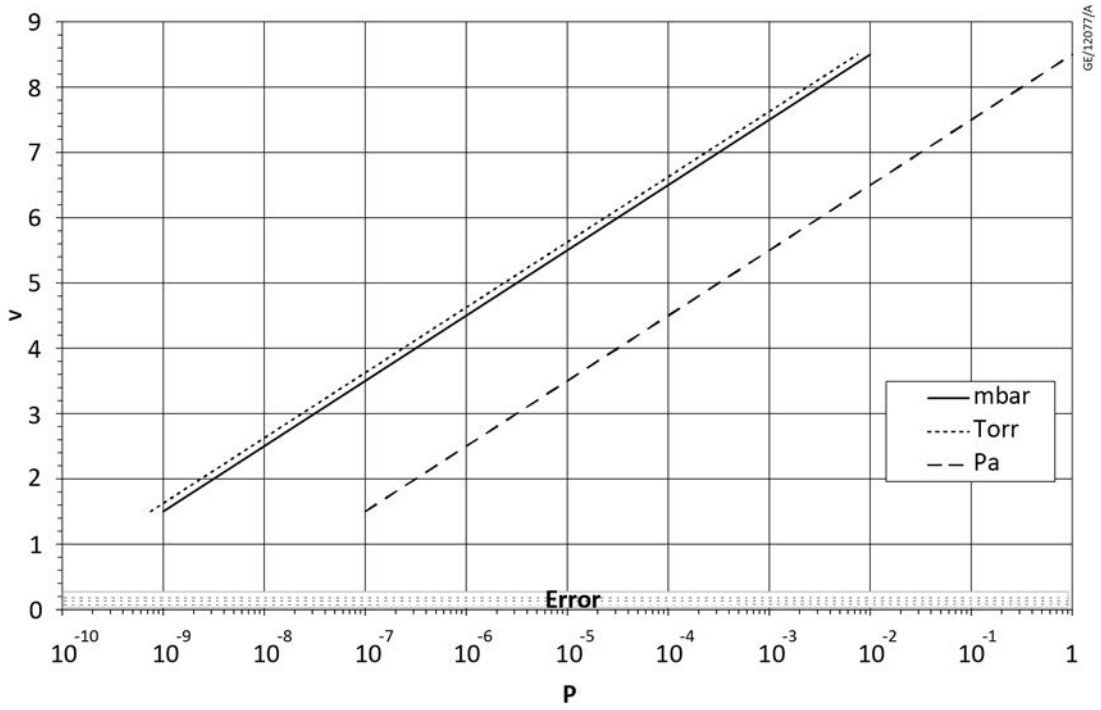


Figure 14 Variant AIM200 [Q]

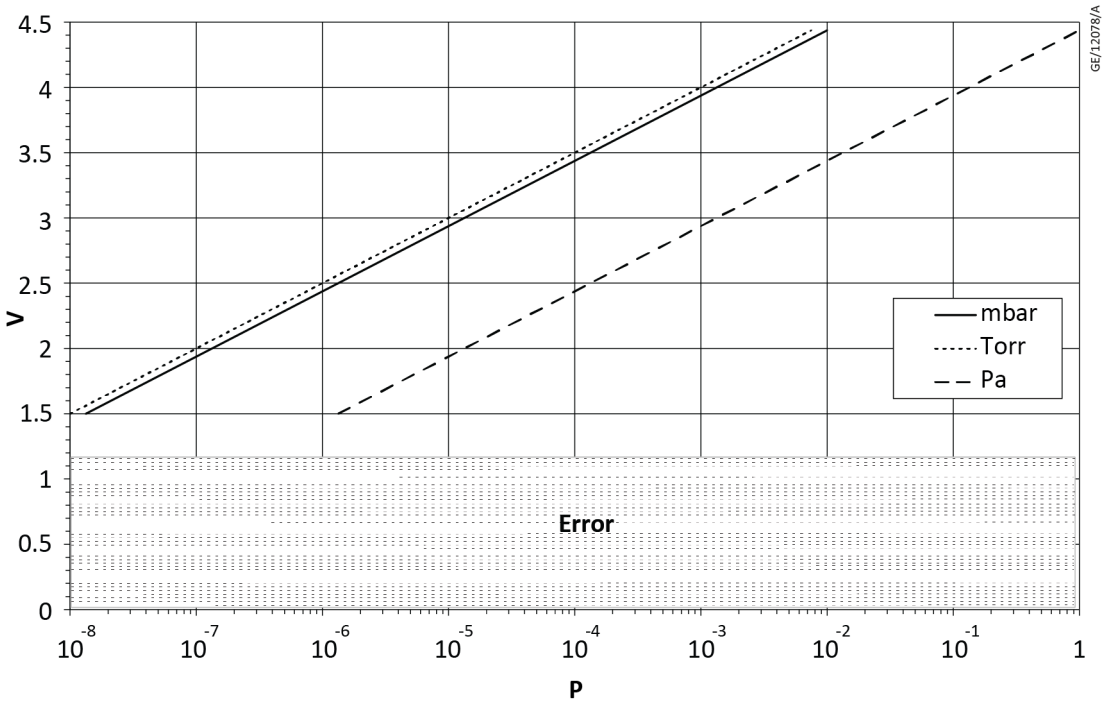


Figure 15 Variant WRG200 [X]

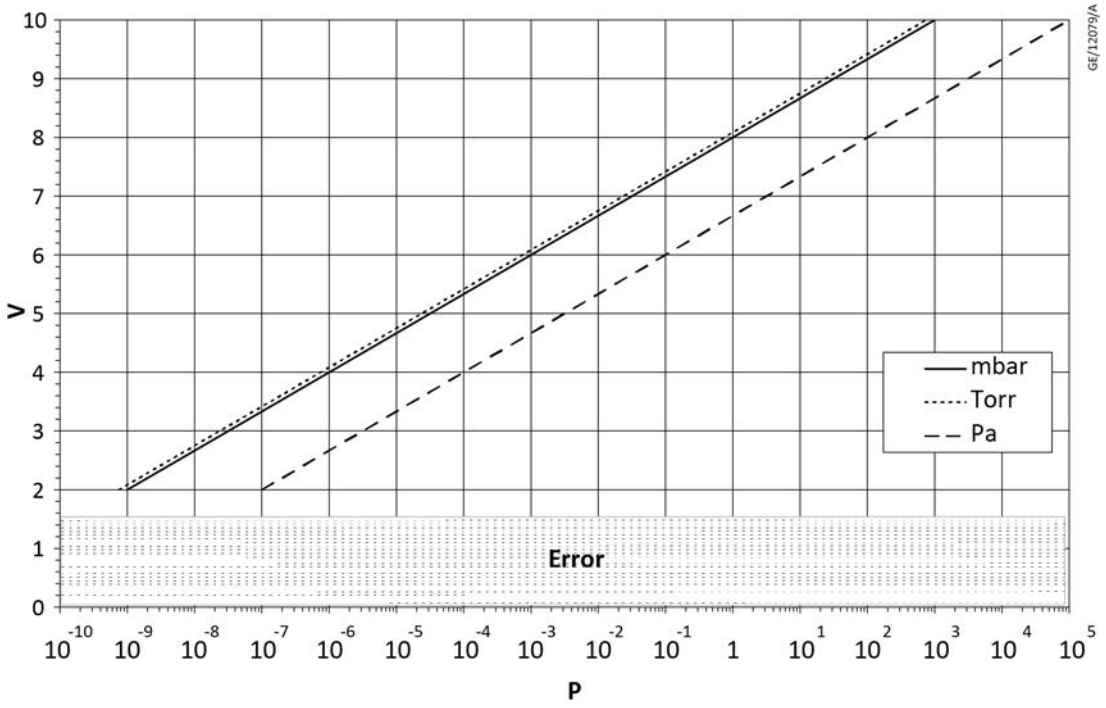


Figure 16 Variant WRG200 [G]

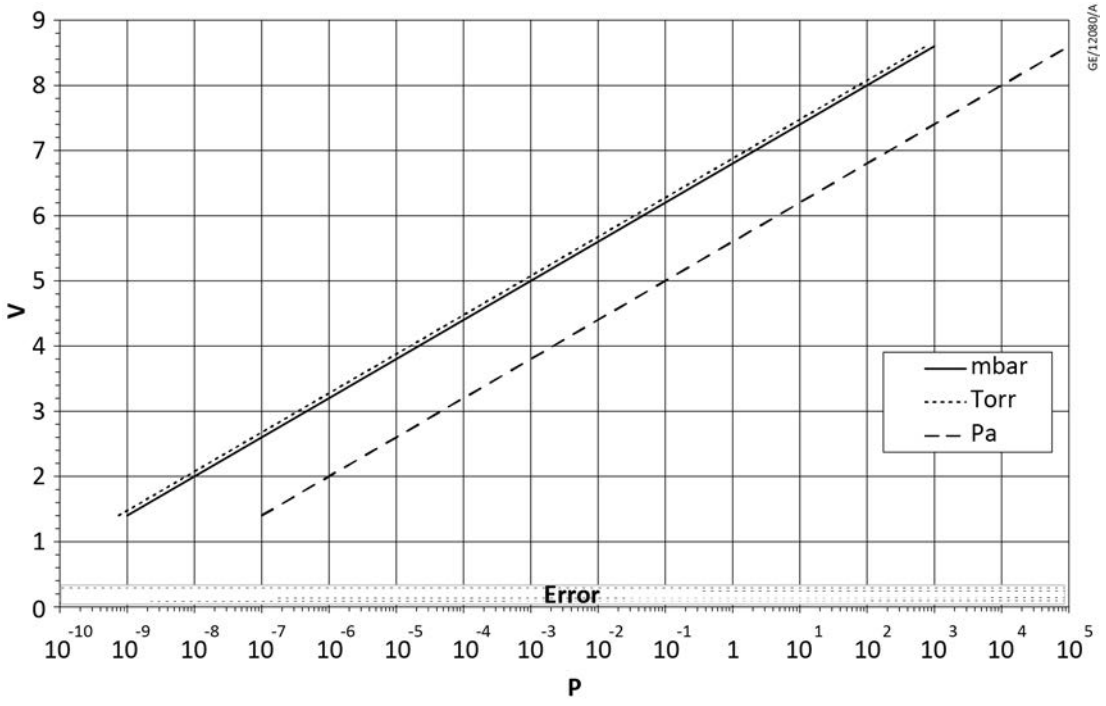
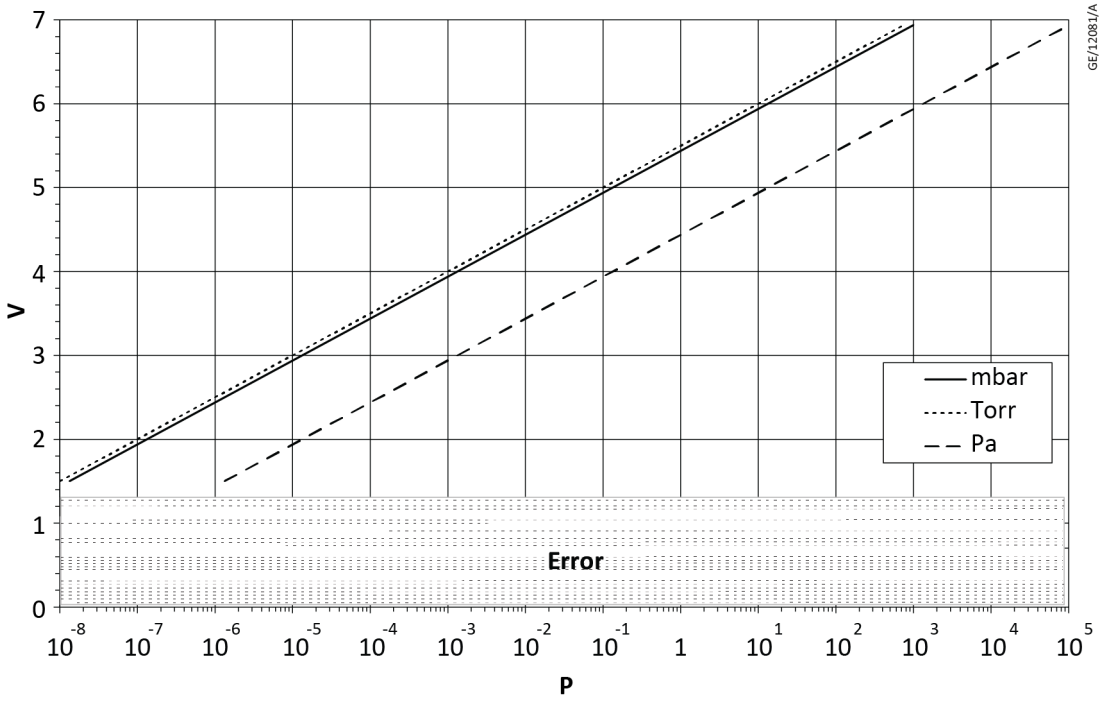


Figure 17 Variant WRG200 [Q]



5.2.2 Gauges with non-linear pressure output

If the gauge is connected to a voltmeter, convert the voltage (V) to pressure (P) according to the following tables.

Table 27 AIM200 non-linear output [blank] characteristic

Voltage (V)	Pressure (mbar)	Voltage (V)	Pressure (mbar)
2.00	1.0×10^{-8}	6.60	8.4×10^{-6}
2.50	2.4×10^{-8}	6.80	1.0×10^{-5}
3.00	5.8×10^{-8}	7.00	1.2×10^{-5}
3.20	8.1×10^{-8}	7.20	1.4×10^{-5}
3.40	1.1×10^{-7}	7.40	1.7×10^{-5}
3.60	1.5×10^{-7}	7.60	2.0×10^{-5}
3.80	2.1×10^{-7}	7.80	2.4×10^{-5}
4.00	2.9×10^{-7}	8.00	2.9×10^{-5}
4.20	4.0×10^{-7}	8.20	3.5×10^{-5}
4.40	5.4×10^{-7}	8.40	4.3×10^{-5}
4.60	7.3×10^{-7}	8.60	5.7×10^{-5}
4.80	9.8×10^{-7}	8.80	7.9×10^{-5}
5.00	1.3×10^{-6}	9.00	1.2×10^{-4}
5.20	1.7×10^{-6}	9.20	1.9×10^{-4}
5.40	2.2×10^{-6}	9.40	3.3×10^{-4}
5.60	2.8×10^{-6}	9.60	6.7×10^{-4}
5.80	3.6×10^{-6}	9.80	1.7×10^{-3}
6.00	4.5×10^{-6}	9.90	3.6×10^{-3}
6.20	5.6×10^{-6}	10.00	1.0×10^{-2}
6.40	6.9×10^{-6}		

5.3 Gas dependency

The gauge is calibrated for the use in nitrogen and will read correctly with dry air. For other gases a conversion is necessary to get the correct pressure reading. The following figures show the variation in indicated pressure for 7 common gas types.

Figure 18 AIM200 and WRG200 gas dependency

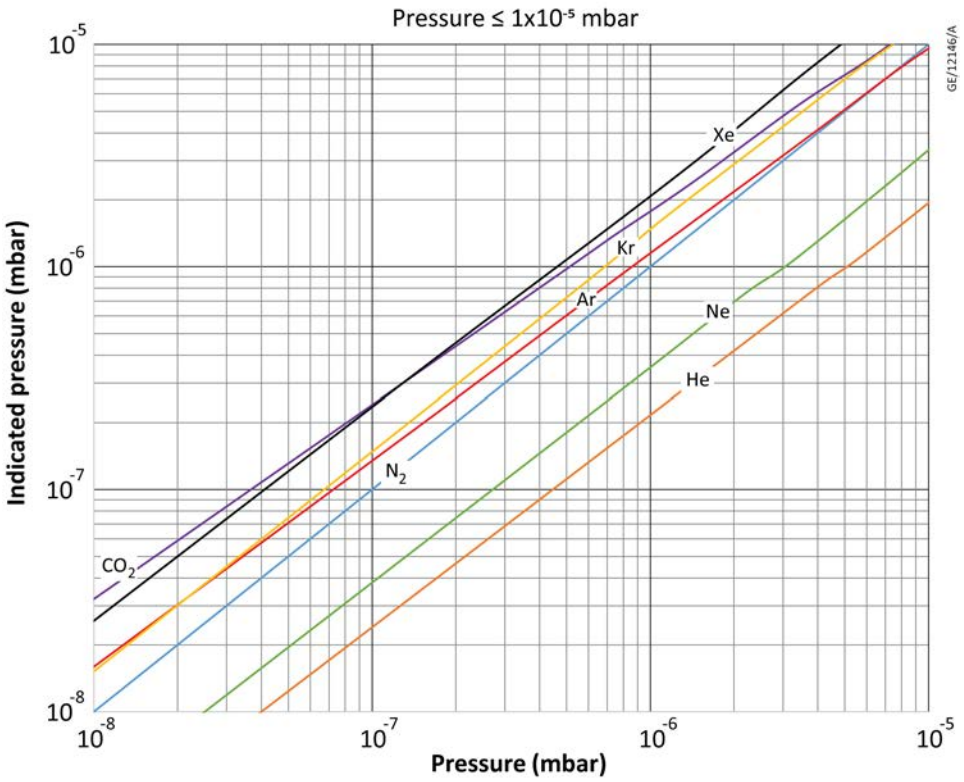


Figure 19 AIM200 gas dependency

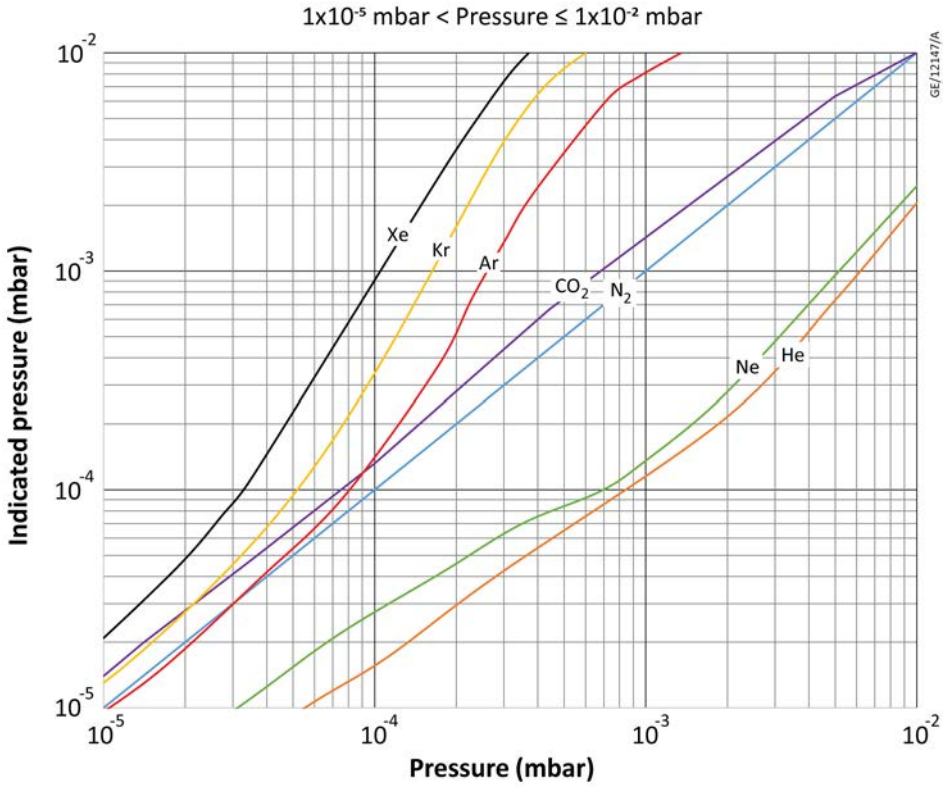


Figure 20 WRG200 gas dependency

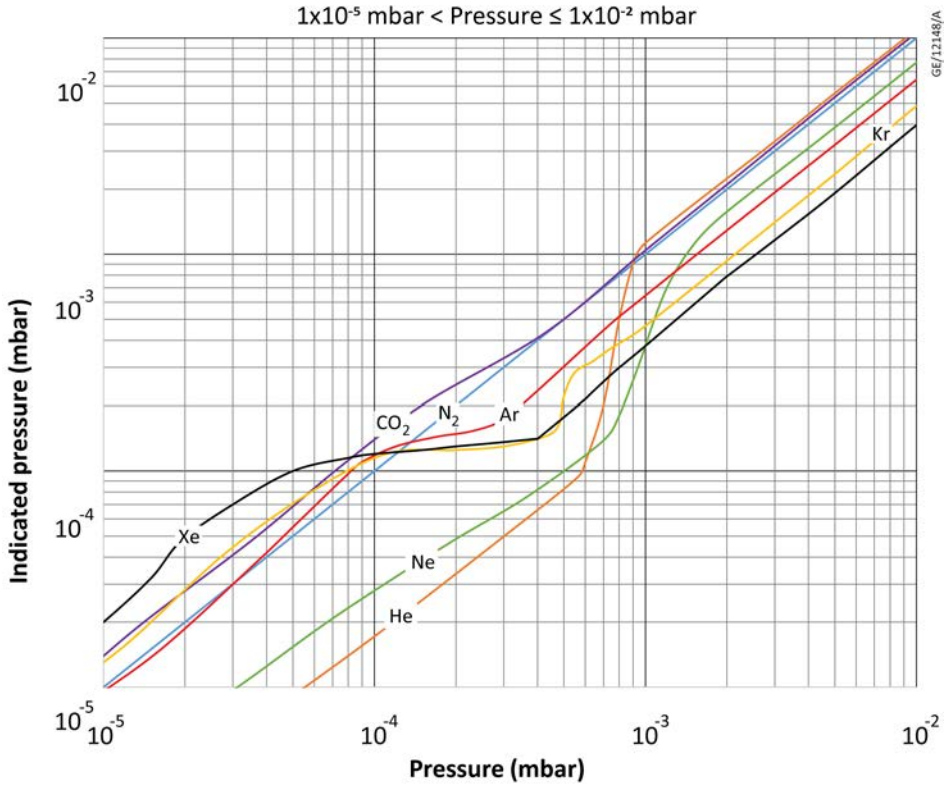
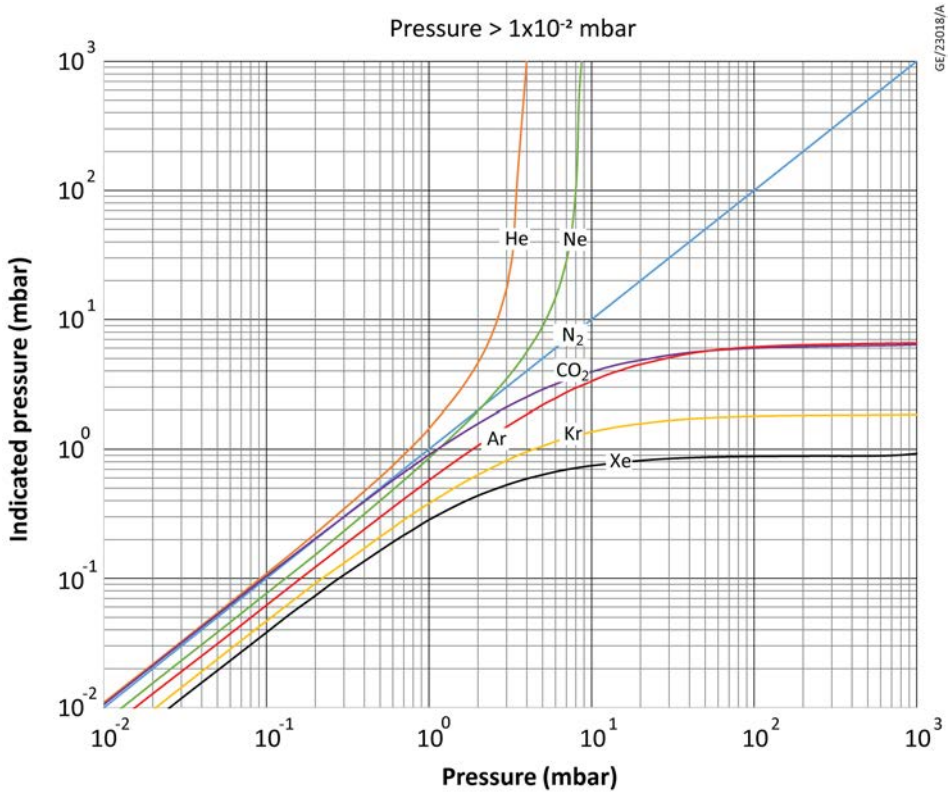


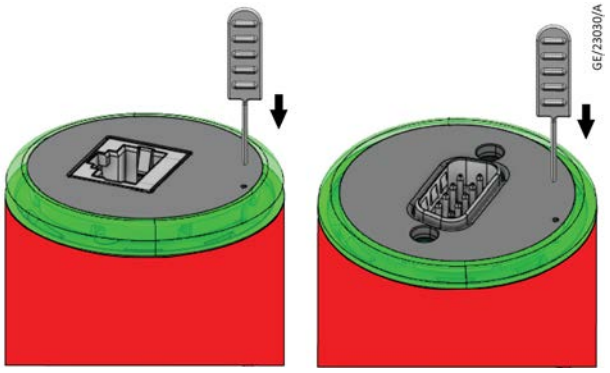
Figure 21 WRG200 gas dependency



5.4 Advanced functions

Access to additional functions can be achieved through the pressing of a multi-function button located on the top of the gauge. The multi-function button can be used during the operation and maintenance of the gauge. A tool for the purpose of adjustment is provided with the product.

Figure 22 Adjustment to AIM200/WRG200



1. Press the button and the LED indicator changes colour and begins flashing. If the button remains depressed, the colour of the flashing indicator changes every 2 seconds to allow the selection of different functions.
2. Release the button when the desired function is reached.
3. When the button is released the LED indicator stops flashing and remains permanently lit. The colour of the indicator signifies the selected function.
4. Press the button momentarily to confirm the selection. If not pressed within 5 seconds, the gauge reverts to normal operation.

Detailed information on how to select the various functions available can be found in *Appendix - Multi function button operation* on page 54.

5.4.1 Setpoint adjustment

CAUTION: SETPOINT MALFUNCTION

Risk of damage to equipment. When you operate the setpoint adjustment function, the pressure measurement output signal will change to indicate the setpoint value. Do not use the setpoint adjustment function if the change in output could cause a malfunction of your system.

Refer to *Appendix - Multi function button operation* on page 54, select the setpoint adjustment function using the push button. Do the procedure that follows for the setpoint adjustment:

1. When the setpoint adjustment function is selected (LED indicator permanently illuminates purple), press momentarily to confirm the selection and release the multi-function push-button.
   - The pressure measurement output signal will change to indicate the setpoint threshold.

- The LED indicator will blink to indicate the commencement of setpoint adjustment.

Note:

If the multi-function button is not released within 5 seconds, the gauge will skip to the next step in the process.

2. To adjust the threshold, press and hold the button.
   - The setpoint threshold will increase steadily. Release the button when the desired threshold is reached.
   - To make finer adjustments, release the button before the desired threshold is reached and then make smaller adjustments by pressing the button several times. The output will step up in increments of approximately 10 mV.
   - When the setpoint threshold reaches the upper limit of the adjustment range (refer to *Setpoint* on page 18) the setpoint will step to the lower limit of the range and start increasing again.
   - The LED indicator will blink to signify the end of the adjustment process and return to normal operation after the button has been released for 5 seconds.
3. When the measured pressure is less than the setpoint pressure the relay closes (low impedance) or the transistor output changes to on.
4. When the pressure rises above the setpoint threshold by the hysteresis value, the relay opens (high impedance) or the transistor output changes to off. Hysteresis values depend on the model of the gauge. Refer to *Setpoint* on page 18 for hysteresis values.
5. For a gauge with a log linear voltage output, the setpoint can be adjusted to values outside the range of the pressure measurement output signal.
   - If the setpoint is set to a value lower than the range of the pressure measurement output signal, the setpoint will be permanently off.
   - If the setpoint is set to a value greater than the range of the pressure measurement output signal, the setpoint will be permanently on as long as the gauge is operating normally.

Note:

By ensuring that the setpoint is permanently on, the setpoint can be used to indicate that the gauge is operating correctly.

5.4.2 Pulsed LED indicator on/off

Select the pulsed LED on/off function using the multi-function push-button. Refer to *Appendix - Multi function button operation* on page 54.

When the function is selected, the LED indicator indicates pink and remains permanently lit. Confirm the selection by momentarily pressing and releasing the multi-function push-button. The LED indicator will flash rapidly for 3 seconds to indicate that the operation is complete before it reverts to illuminating green with the pulsed indicator changed.

5.4.3 Dark Mode on/off

To switch the LED indicator off during normal operation it is possible enable dark mode. Enable dark mode using the multi-function push-button. Refer to *Appendix - Multi function button operation* on page 54.

When the function is selected, the LED indicator indicates rose and remains permanently lit. Confirm the selection by momentarily pressing and releasing the multi-function pushbutton. The LED indicator will flash rapidly for 3 seconds to indicate the operation is complete before entering dark mode. Repeat the process to disable dark mode and switch the LED indicator back on.

5.4.4 Restore user selectable parameters to default/previous values

It is possible to restore the setpoint values, LED indicator pulsing state or dark mode state to default values.

In the event of making an unintentional change to the LED indicator, dark mode state or setpoint values, it is also possible to rectify the error by restoring the previous values / state.

LED/setpoint default

The following procedure restores the LED indicator state to pulsing, dark mode state to disabled and the setpoints to their minimum values:

1. Select the LED/setpoint default function using the multi-function push-button (LED indicator permanently indicating white).
2. Confirm the selection by momentarily pressing and releasing the multi-function push-button.
3. The LED indicator will flash white to indicate the operation is being performed.
4. After 3 seconds, the LED indicator stops flashing and the LED indicator pulsing state, dark mode state and setpoint are restored to factory values.

Restore previous LED/setpoint values

The following procedure restores the LED indicator pulsing state, dark mode state and the setpoints to their previous values:

1. Select the “restore previous LED/setpoint values” function using the multi-function push-button (LED indicator permanently indicating teal).
2. Confirm the selection by momentarily pressing and releasing the multi-function push-button.
3. The LED indicator will flash teal to indicate the operation is being performed.
4. After 3 seconds, the LED indicator stops flashing and the LED indicator pulsing state, dark mode state and setpoint are restored to their previous values.

5.4.5 Operation errors

If a gauge error occurs during operation, then the LED indicator illuminates to signify an error.

When an operational error is detected, the LED indicator will flash red and the pressure measurement output signal will change to signify the error condition. The multi-function

push-button is disabled when the gauge detects an error condition. Any setpoints that are on will switch off automatically. The gauge will remain in the error state until the cause is eliminated and the power to the gauge is cycled.

In the case of the AIM200, the gauge will be disabled and the discharge will be switched off. In the case of the WRG200 the discharge will be switched off automatically if it is currently on.

If the multi-function push-button is held down for more than 1 minute, the LED indicator turns solid red. The pressure measurement output signal and setpoint are unaffected. When the button is released, the LED indicator returns to normal operation.

Table 28 Error indication

LED indication			Meaning	Cause	Error voltage
Colour	Change rate				
	On (s)	Off (s)			
Red	0.5	0.5	EEPROM error	Gauge memory corrupted	Refer to *Pressure output signal* on page 17.
			Pirani failure	Filament broken, temperature compensator broken, tube not fully inserted, calibration could not be achieved, calibration performed at incorrect pressure	
			Striker filament error	Striker filament broken	
			Failure to strike	Inverted magnetron did not strike within 30 minutes of being enabled	
	Permanently on		Button stuck	Multi-function push button has been stuck down for > 60 seconds	N/A

If you use our controller, a message is shown on the display.

5.4.6 Bakeout

In some Ultra High Vacuum (UHV) applications it is desirable to bake the vacuum system components to achieve a lower base pressure. The tube of the gauge can be baked to 150 °C but the electronics housing must be removed.

- Refer to *Figure: Replace the gauge tube*, remove the electronics housing.
- Bake the tube on your vacuum system. Do not exceed 150 °C.
- Allow the tube to cool before refitting the electronics housing.

6. Maintenance

6.1 WRG200 adjustment

Atmosphere and vacuum adjustment

Every gauge is adjusted before shipment however thermal conductivity gauges can drift with time or as contamination builds up on the filament. You can adjust the atmosphere and vacuum settings of the gauge to eliminate the effects of such drift. The frequency of adjustment will vary depending on the level and nature of the contamination associated with the process.

Note:

The gauge can determine whether to perform atmosphere or vacuum adjustment based on the measured pressure. If the adjustment is performed at an inappropriate pressure, the Pirani failure is triggered. Refer to Fault finding on page 48.

6.1.1 Atmosphere adjustment

1. Supply power to the gauge, make sure the LED indicator is green and allow the gauge to warm up at atmospheric pressure in nitrogen or dry air for at least 10 minutes.
2. Refer to *Appendix - Multi function button operation* on page 54, select the atmosphere or vacuum adjustment function using the multi-function push-button.
3. When the atmosphere or vacuum adjustment function is selected (LED indicator is permanently indicating cyan), confirm the selection by momentarily pressing and releasing the multi-function push-button.
4. The LED indicator will flash cyan to indicate the operation is being performed.
5. After 3 seconds, the LED indicator stops flashing and the atmosphere adjustment parameters are stored in the gauge.

6.1.2 Vacuum adjustment

1. Reduce the system pressure to 1 x 10^{-5} mbar (or less).
2. Operate the gauge for at least 10 minutes.
3. Refer to *Appendix - Multi function button operation* on page 54, select the atmosphere or vacuum adjustment function using the multi-function push-button.
4. When the atmosphere or vacuum adjustment function is selected (LED indicator is permanently indicating cyan), confirm the selection by momentarily pressing and releasing the multi-function push-button.
5. The LED indicator will flash cyan to indicate the operation is being performed.
6. After 3 seconds, the LED indicator stops flashing and the vacuum adjustment parameters are stored in the gauge.

6.1.3 Remote adjustment

The WRG200 has a remote adjustment feature. You can perform atmosphere and vacuum adjustment through the appropriate pin on the electrical connector.

1. Refer to *Table: Pins on the WRG200 electrical connector* depending on the electrical connector on your gauge. Refer to *Table: WRG200 control input - remote calibration* for information on the electrical requirements for the control input.
2. Momentarily (> 100 ms) connect the remote calibration input to the electrical supply ground (0V) and the atmosphere or vacuum adjustment will be performed.

6.1.4 Adjustment for new tube

If a replacement tube is installed to the gauge it is necessary to match the characteristics of the gauge with the new tube.

1. Make sure that the gauge is at atmospheric pressure in nitrogen or dry air. Supply power to the gauge.
2. Make sure that the LED indicator is green. Refer to the *Appendix - Multi function button operation* on page 54, select the tube adjustment function using the multi-function push button.
3. When the tube adjustment function is selected (LED indicator is permanently indicating orange), confirm the selection by momentarily pressing and releasing the multi-function push button.
4. The LED indicator will flash orange to indicate the operation is being performed.
5. After 5 minutes, the LED indicator stops flashing and the tube adjustment parameters are stored in the gauge.
6. After performing adjustment for new tube, atmosphere adjustment and vacuum adjustment is recommended.

6.2 Replace the gauge tube

You must install a replacement tube to the gauge if:

- the gauge tube is contaminated
- the atmosphere or vacuum adjustment cannot be achieved (WRG200 only)
- either the Pirani or striker filaments are broken (WRG200 only).

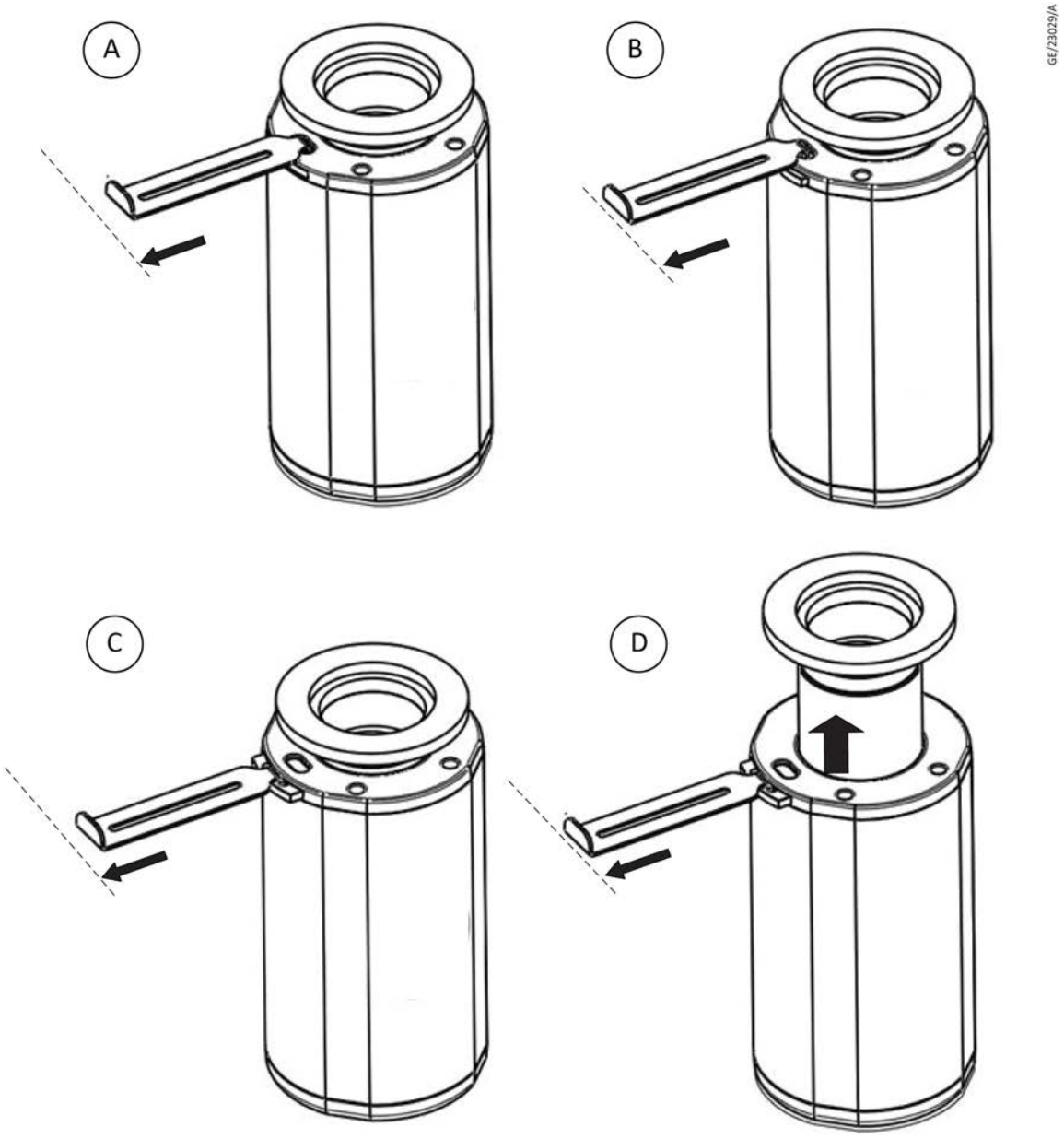
Follow instructions below to replace the tube:

Refer to *Figure: Replace the gauge tube*.

1. Unplug the electrical cable, vent the vacuum system to atmospheric pressure and remove the gauge from the vacuum system.
2. Referring to images A – B, using the electronics housing removal tool supplied with the product, insert the tool into the underside of the electronics housing and partially pull out the retaining clip from the side of the gauge.
3. Referring to image C – D, place the housing removal tool directly into the retaining clip and gently release the clip.
4. Pull the tube from the electronics housing.
5. Install the replacement tube into the electronics housing with the correct alignment ensuring that the tube is pressed fully home.
6. Lock the tube in place by pressing the retaining clip fully home, The clip should appear as in image A.

Whenever a new tube is installed it is necessary to adjust the gauge to match the new tube. Refer to *Adjustment for new tube* on page 46.

Figure 23 Replace the gauge tube



7. Fault finding

Table 29 Faults

Fault
LED not lit on page 48
Pressure reading incorrect on page 48
Gauge shows Pirani failure on page 48
Gauge shows striker filament error on page 49
Gauge shows failure to strike on page 49

Fault	LED not lit
Cause	**Incorrect electrical supply voltage. Supply polarity reversed**
Remedy	Check the electrical supply and connections.

Fault	Pressure reading incorrect
Cause	**Gauge is displaying error voltage**
Remedy	Refer to *Pressure output signal* on page 17.
Cause	**Vacuum leak**
Remedy	Leak check vacuum system.
Cause	**New tube has been installed**
Remedy	Perform *Adjustment for new tube* on page 46.
Cause	**Pirani filament has drifted and requires adjustment**
Remedy	Do the atmosphere and vacuum adjustments.
Cause	**Tube is contaminated**
Remedy	Replace the tube.
Cause	**Gauge is measuring gas with different properties to that of nitrogen or dry air**
Remedy	Refer to *Gas dependency* on page 38.
Cause	**Adjustment undertaken at incorrect pressure**
Remedy	Repeat the adjustment but make sure that the pressure is at atmosphere or vacuum.

Fault	Gauge shows Pirani failure
Cause	**Pirani filament broken**
Remedy	Replace the tube.

Cause	**Tube has not been correctly fitted into electronics housing**
Remedy	Make sure that the tube has been fully pushed home and the retaining clip correctly fitted in place.
Cause	**Temperature compensator open circuit**
Remedy	Replace the tube.
Cause	**Atmosphere adjustment performed at incorrect pressure**
Remedy	Perform atmosphere adjustment at atmospheric pressure.
Cause	**Vacuum adjustment performed at incorrect pressure**
Remedy	Perform vacuum adjustment at correct pressure.
Cause	**Adjustment for new tube has been performed at incorrect pressure**
Remedy	Perform adjustment for new tube at correct pressure.
Cause	**Tube has drifted outside permissible limits and can not be adjusted**
Remedy	Replace the tube.
Cause	**New tube has been installed**
Remedy	Perform adjustment for new tube.
Fault	**Gauge shows striker filament error**
Cause	**Striker filament is broken**
Remedy	Replace the tube.
Fault	**Gauge shows failure to strike**
Cause	**The gauge is contaminated and has not struck within 30 minutes**
Remedy	Replace the gauge tube.
Cause	**The gauge has been switched on at too low a pressure**
Remedy	Raise the pressure to > 1 x 10^{-9} mbar and switch on the gauge.

8. Disposal

- Dispose of the gauge, components and accessories safely as per all local and national safety and environmental requirements.
- You can recycle the gauge and cables. Contact us or the supplier for more information.
- The gauge and cables are in the scope of the European Directive on Waste Electrical and Electronic Equipment, 2012/19/EU.
- For European customers, we offer a recycling service for the gauge and cables at the end of the product's life.
- Be careful if the gauge is contaminated with dangerous process substances.

9. Spares

Order the spare parts and accessories from our nearest company or distributor. When you order provide:

- model and item number of equipment
- serial number (if any)
- item number and description of the part.

Figure 24 Replacement gauge tube

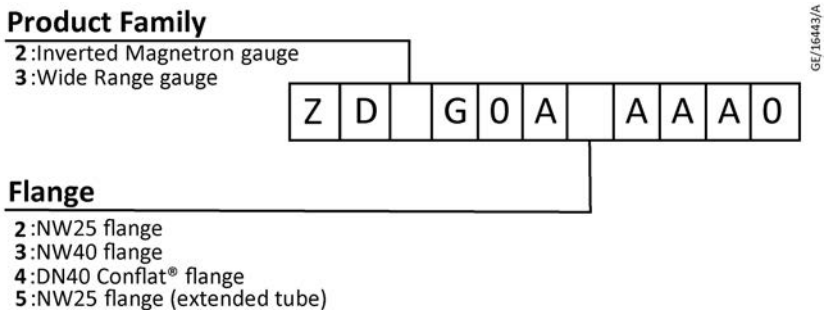
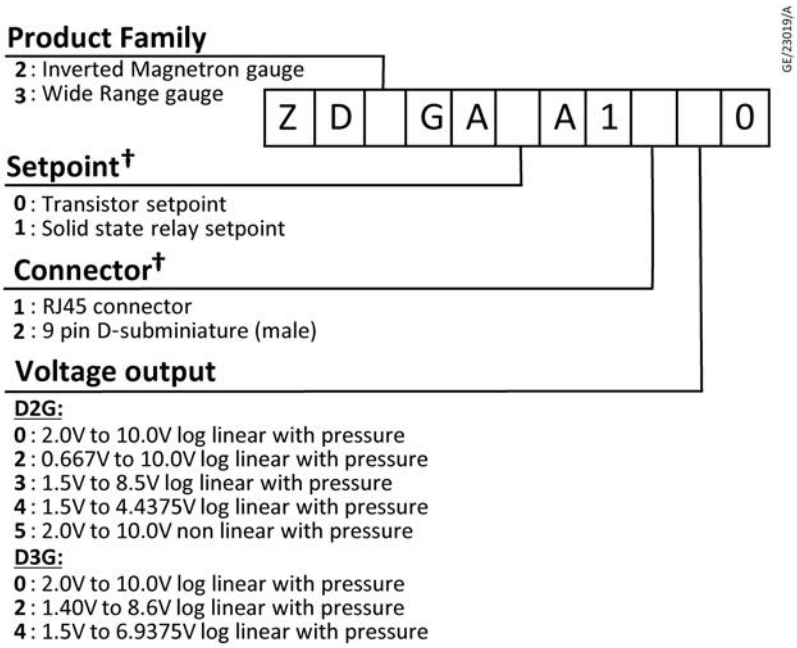


Figure 25 Replacement electronic housing



† AIM200 [9 pin D-SUB] (male) connector option is only available with "solid state relay" setpoint option.

AIM200 RJ45 connector option is only available with "transistor" setpoint option.

10. Accessories

The Active gauge cables suitable for gauges installed with an RJ45 or 9 pin D-SUB connector.

Table 30 Active gauge cable - RJ45

Cable length	Item number
0.5 m (18 inches)	D40001005
1 m (3 feet)	D40001010
3 m (10 feet)	D40001030
5 m (15 feet)	D40001050
10 m (30 feet)	D40001100
15 m (50 feet)	D40001150
25 m (80 feet)	D40001250
50 m (150 feet)	D40001500
100 m (325 feet)	D40001999

Table 31 Active gauge cable - 9 pin D-SUB

Cable length	Item number
5 m (15 feet)	D40002060
10 m (30 feet)	D40002110
20 m (60 feet)	D40002210

11. Service

11.1 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.

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



NOTICE:

If we do not receive a completed HS2 form, your equipment cannot be serviced.

11.2 Calibration

The calibration service is available for all our gauges. The calibration is done by comparison with reference gauges, traceable to national standards. For more information, contact us.

12. Appendix - Multi function button operation

Figure 26 AIM200 Multi function button operation

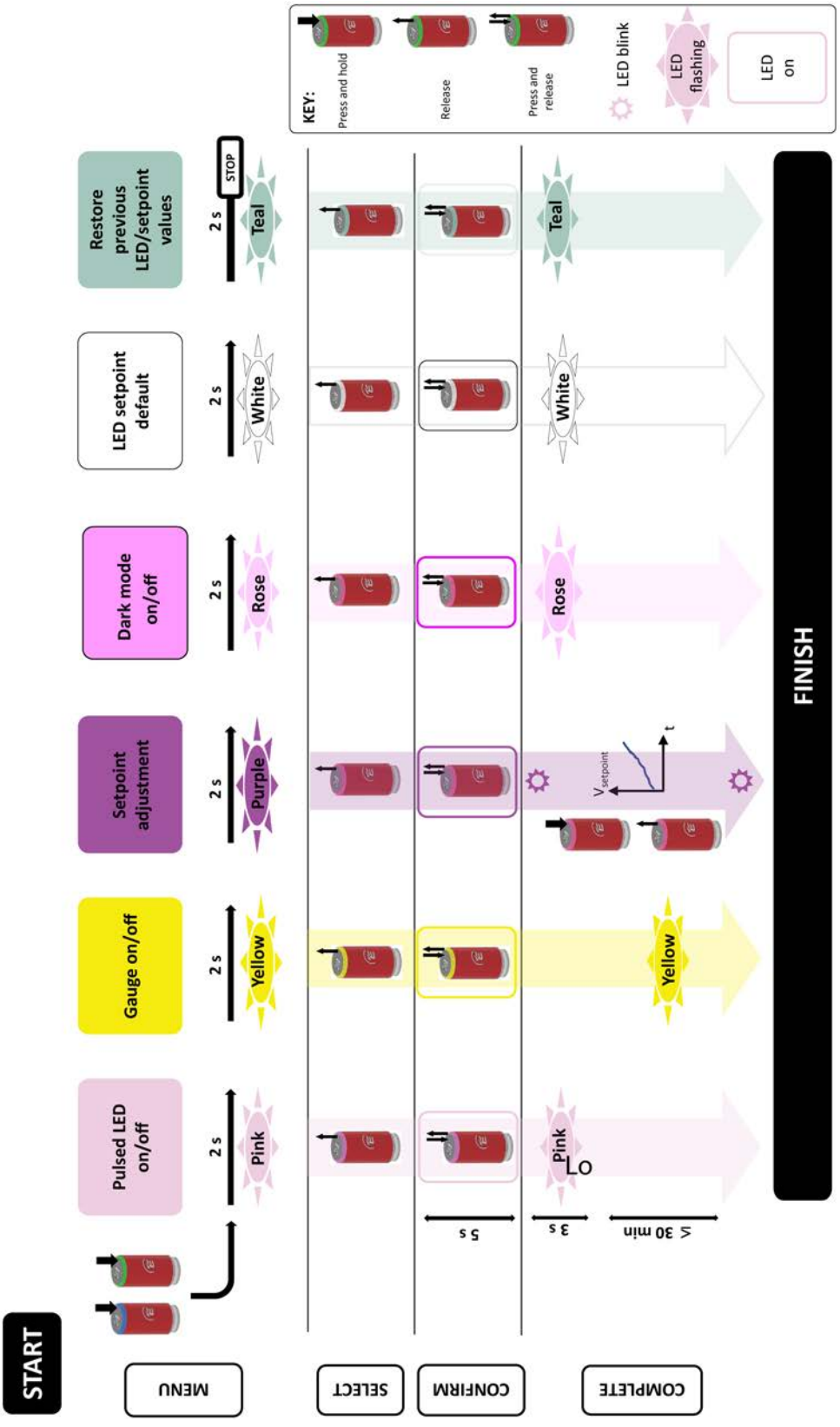
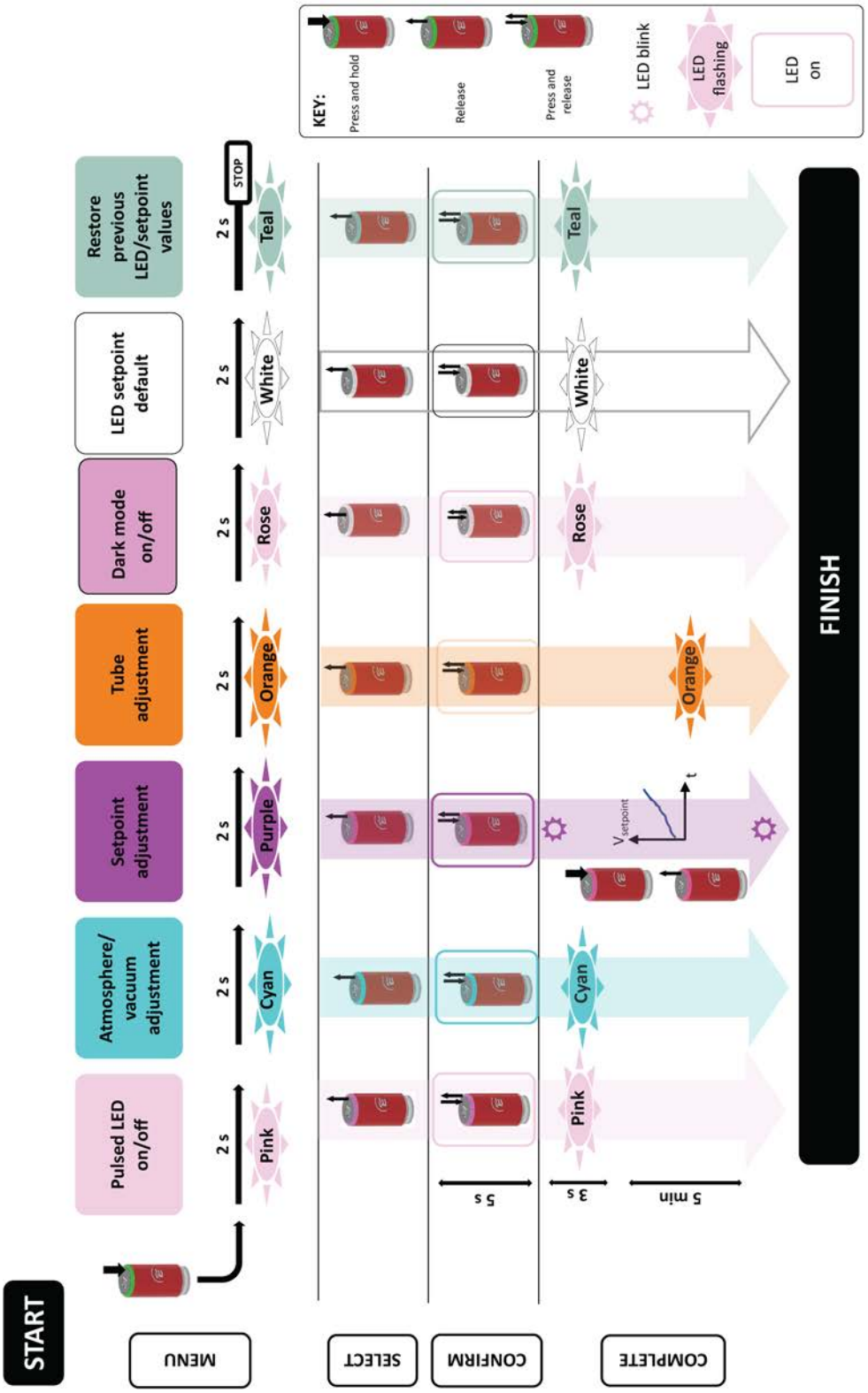


Figure 27 WRG200 Multi function button operation



This product has been manufactured under a quality management system certified to ISO 9001:2015

EU Declaration of Conformity

This declaration of conformity is issued under the sole responsibility of the manufacturer:

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

Documentation Officer
Jana Sigmunda 300
Lutín , 78349
Czech Republic
T: +42(0) 580 582 728
documentation@edwardsvacuum.com

The product specified and listed below:

AIM200 Active Inverted Magnetron Gauge
nAIM200 Digital Active Inverted Magnetron Gauge
WRG200 Wide Range Gauge
nWRG200 Digital Wide Range Gauge

Is in conformity with the relevant Union harmonisation legislation:

2014/30/EU	Electromagnetic compatibility (EMC) directive Class B Emissions, Industrial Immunity
2011/65/EU	Restriction of certain hazardous substances (RoHS) directive as amended by Delegated Directive (EU) 2015/863

Based on the relevant requirements of harmonised standards:

EN IEC 61326-1:2021	Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements

This declaration, based on the requirements of the listed Directives and EN ISO/IEC 17050-1, covers all product serial numbers from this date on: *2025-09-25*

You must retain the signed legal declaration for future reference
This declaration becomes invalid if modifications are made to the product without prior agreement.

Chris Chadwick – Engineering Manager
General Vacuum
Eastbourne, UK

Ed Neuss – General Manager
Product Company Eastbourne

ADDITIONAL LEGISLATION AND COMPLIANCE INFORMATION (EU/UK)

RoHS (EU, UK): Material Exemption Information

This product is compliant with the following Exemptions.
Annex III:

- 6(b) **Lead** as an alloying element in aluminium containing up to 0.4% by weight
- 6(c) Copper alloy containing up to 4% **lead** by weight
- 7(a) **Lead** in in high melting temperature type solder (i.e. lead based alloys containing 85% by weight or more lead)
- 7(c) I Electrical and electronic components containing **lead** in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound

REACH (EU, UK)

This product is a complex article which is not designed for intentional substance release. To the best of our knowledge the materials used comply with the requirements of REACH. The product manual provides information and instruction to ensure the safe storage, use, maintenance and disposal of the product including any substance based requirements.

Article 33.1 Declaration (EU, UK)

This product contains Candidate List Substances of Very High Concern above 0.1%ww by article as clarified under the 2015 European Court of Justice ruling in case C-106/14.

- Lead (Pb)
  This substance is present in certain aluminium / brass / electrical or electronic components.

WASTE FRAMEWORK DIRECTIVE (EU)

SCIP Number:

964ebda5-915d-4264-9333-16aa917c1b3 AIM200, nAIM200

5ba1ff19-574c-4505-9ebf-2231bb88265f WRG200, nWRG200

WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (EU,UK)

This product must be disposed of in accordance with the requirements of the WEEE Directive.

COMPLIANCE INFORMATION – INCORPORATED PRODUCTS AND ASSEMBLIES

ADDITIONAL APPLICABLE REQUIREMENTS

The product is in scope for and complies with the requirements of the following:

Product is certified to CSA-C22.2 No.61010-1-12	Safety requirements for electrical equipment for measurement, control and laboratory use – Part 1: General requirements TÜV Rheinland certificate no. CU72404017
Product is certified to UL61010-1 3rd Edition	Safety requirements for electrical equipment for measurement, control and laboratory use – Part 1: General requirements TÜV Rheinland certificate no. CU72404017
TSCA PBTs	Regulation of Persistent, Bioaccumulative, and Toxic Chemicals under TSCA Section 6(h) The product does not knowingly or intentionally contain substances in contravention with the above requirements.

材料成分声明
China Material 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)	邻苯二甲酸二丁酯 Dibutyl phthalate (DBP)	邻苯二甲酸丁基苄酯 Benzyl butyl phthalate (BBP)	邻苯二甲酸双（2- 乙基己基）酯 Bis(2-ethylhexyl) phthalate (DEHP)	邻苯二甲酸二异丁酯 Diisobutyl phthalate (DIBP)
铸铝及铝合金制品 Aluminium alloys	X	O	O	O	O	O	O	O	O	O
铜接头 Brass connectors	X	O	O	O	O	O	O	O	O	O
印刷电路组件 (PCA) Printed Circuit Assembly (PCA)	X	O	O	O	O	O	O	O	O	O

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/T 26572 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.

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.

This product has been manufactured under a quality management system certified to ISO 9001:2015