

# GasPoint

Gas Transmitter

## Installation and Operating Instructions

4-20mA Fixed Gas Monitor





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## **Safety Information — Read First**

### **IMPORTANT**

Users of the GasPoint require a full understanding of the operating and maintenance instructions. Use the monitor only as specified in this manual, otherwise the protection provided by the monitor may be impaired. Read the following **Warnings** and **Cautions** before using the monitor:

#### **Warning**

**Do not paint the sensor assembly or the transmitter.**

**Calibrate the monitor at start-up and BW recommends a calibration check on a regular schedule, once at least every 90 days. More frequent checks or inspections are encouraged to spot problems such as mud collections on the sensor head, accidental painting over the sensor head, etc.**

**Do not use the monitor if it is damaged. Before you use the monitor, inspect the case. Look for cracks or missing metals or plastics. If the monitor is damaged or something is missing, contact BW Technologies immediately.**

**Make sure the cover is properly fastened before you operate the monitor.**

**Use only a sensor assembly specifically designed for your GasPoint model. (See the section, "Replacement Parts and Accessories.")**

**Periodically test the sensor's response to gas by exposing the monitor to a targeted gas concentration that exceeds the High Alarm setpoint. Manually verify that visual alarms are activated.**

#### **Caution**

**Do not expose the monitor to electrical shock and/or severe continuous mechanical shock.**

**Do not attempt to disassemble, adjust, or service the monitor unless instructions for that procedure are contained in the manual and/or that part is listed as a replacement part.**

**Do not allow liquids to condense and/or use high power sprays on the instruments.**

**The Warranty will be voided if customer personnel or third parties damage the monitor during repair attempts. Non-BW Technologies repair/service attempts void this Warranty.**

#### **Important**

**The Gaspoint is only to be used for the purposes specified in this manual. BW Technologies' authorized service representatives and parts must be employed in carrying out repairs to the unit in order to maintain the validity of the warranty. Modification of components, use of non-BW parts, or use of incomplete or used parts will also invalidate the warranty.**

**CAUTION: FOR SAFETY REASONS THIS EQUIPMENT MUST BE OPERATED AND SERVICED BY QUALIFIED PERSONNEL ONLY. READ AND UNDERSTAND INSTRUCTION MANUAL COMPLETELY BEFORE OPERATING OR SERVICING.**

**ATTENTION: POUR DES RAISONS DE SÉCURITÉ, CET ÉQUIPEMENT DOIT ÊTRE UTILISÉ, ENTRETENU ET RÉPARÉ UNIQUEMENT PAR UN PERSONNEL QUALIFIÉ. ÉTUDIER LE MANUEL D'INSTRUCTIONS EN ENTIER AVANT D'UTILISER, D'ENTREtenir OU DE RÉPARER L'ÉQUIPEMENT.**

### **Contacting BW Technologies**

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# Installation and Operating Instructions

## ***Manufacturer's Notes and Warnings***

1. Read the Safety Warnings and Cautions at the beginning of this manual.
2. The GasPoint is fully tested and calibrated in the factory.  
Installation of the GasPoint should be done by qualified personnel.

## Introduction

### Introduction

The GasPoint provides continuous monitoring of the atmosphere for hazardous gases in the workplace and is virtually maintenance-free. Its revolutionary design utilizes advanced microcontrollers and allows for enhanced diagnostics and fault analysis. Advanced design features make installation and operation simpler than ever - saving you time and money.

The GasPoint transmitter provides a 4-20 mA output signal which can be connected to any control system (DCS, PLC, etc.). Designed with non-volatile memory, the GasPoint has total memory retention.

The pushbutton, non-intrusive calibration can be easily performed by one person with no tools or magnets. Normally, only a periodic calibration check is needed to assure dependable performance. The backlit will light automatically in low light conditions and in an alarm condition.

The LCD is an intuitive user interface, indicating:


- gas type monitored and concentration level (%LEL or ppm)
- alarm level (field settable) and the type encountered (LOW, HIGH or FAULT)
- when to apply gas during calibration
- when a toxic or combustible sensor has "failed" its daily automatic full function self-test
- when the sensor's useful life has "expired" and needs replacement.

The flexibility of the GasPoint's modular design affords efficient installation. Wiring of the transmitter itself is straightforward. Field interchangeable plug-in sensor assemblies enable you to change the gas monitored at any time. The GasPoint Transmitter will recognize the sensor installed and test and reset itself to that sensor type.

The poison-resistant sensors have the fastest response times available. GasPoint is capable of responding to a momentary puff of gas that would otherwise remain undetected. The sensors have a proven history of reliable, long-term performance and are relatively unaffected by temperature or humidity variations. Gas enters the GasPoint's sensor by convection and diffusion through a sintered stainless steel or wire-mesh screened opening.

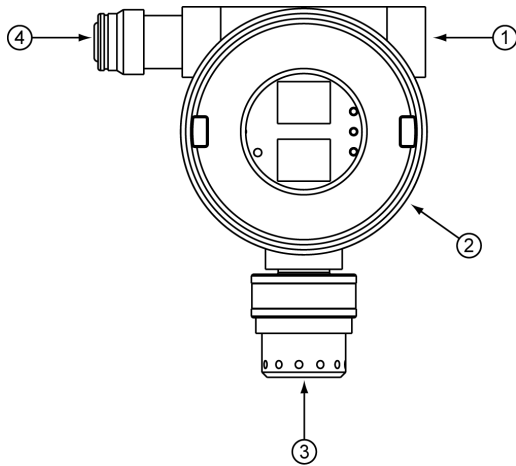
The GasPoint's explosion-proof design allows operation in areas where the combustible gas concentration may exceed the lower-explosive limit (LEL). Its rugged construction ensures a long life span in almost any environment.

The GasPoint Monitor incorporates the best of both proven and new technologies that offer versatility in addition to reliable safety mechanisms.

<b>Ratings and Certifications</b>	
	Approved by CSA (Canadian Standards Association) for use in both the USA and Canada Class I, Div. 1, Groups B, C, D Explosion Proof: ANSI/ISA: UL1203; CSA : C22.2 No. 30 Combustible Performance Standards: ANSI/ISA. ISA—S12.13 CSA: C22.2 No 152 ANSI/ISA (American National Standard Institute)
	Approved Non-Incendive for installation's in Class I, Division 2, Groups B, C, D, Location's when both input power and relay outputs are connected to Non-Incendive sources not to exceed 32 Vdc( Power input) and 24 Vdc (Relay output) CSA: C22.2 No.213, UL: 1604

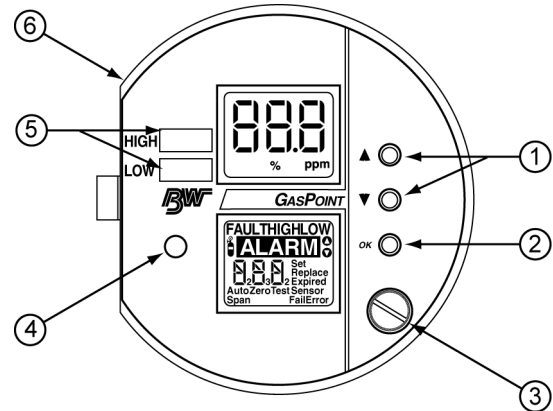
Elements Drawings 1a, 1b, 1c

1a GasPoint Monitor



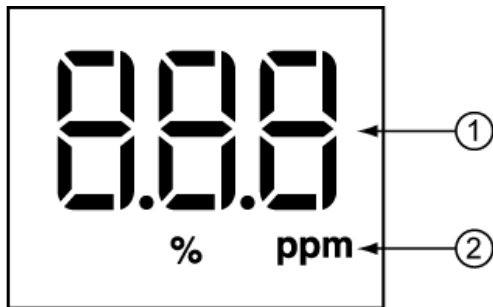
Item	Description
1	Cable Conduit Access
2	Explosion-proof Enclosure
3	Sensor
4	Calibration Pushbutton

1b Control Bay



Item	Function
1	Edit buttons: Increment / Decrement Value
2	OK button: Access User Setpoints, or Save Displayed Values
3	Faceplate Security Screw
4	Low Light Sensor
5	High / Low Alarm Settings: User Label
6	Slip Hinge

1c Liquid Crystal Displays



Item	Function
1	Numeric Reading
2	Units of Measure (ppm or %)
3	Alarm Level / Type
4	Increment / Decrement Prompt Arrows
5	Set Value Arrow Prompts
6	Sensor Advice
7	Span Advise Icon
8	Automatic Zero Advise Icon
9	Apply Gas Advise Icon

## Installation — Sensor Location

### ***Sensor Location***

Several factors should be considered when selecting locations to install sensors. The following general suggestions should be considered to assure the detection of the target gas. Select the most suitable location for each sensor.

**Air Currents:** If there are fans, wind, or other sources of air movement, gases may tend to rise or collect in certain areas of a facility. The local air currents should be assessed to aid in selecting the sensor location. In outdoor situations considerations such as prevailing winds should be accounted for. Air convection can often be more important in determining gas concentrated areas than factors of Vapor Density.

**Vapor Density:** When there are no air currents in the area, sensor placement may be affected where the gas (vapor) to be monitored is lighter or heavier than air. For gases lighter than air, we suggest approx. 12 in. (30 cm) above the level of a potential gas release, or close to the ceiling or roof in indoor installation. For gases heavier than air, we suggest 12 in. (30 cm) below the release site, or near the floor or ground. Gases with a density equal to air or slightly greater than air will tend to rise, particularly when air currents are present.

**Gas Emission Sources:** As a rule, at least one sensor should be located in close proximity to each point where a leak is likely to occur. This is particularly important when a liquid having a low volatility is monitored.

**Environmental Factors:** Designed for rugged outdoor use consider the following in selecting locations. Install sensors where they will be protected from wind, dust, snow, water, vibration and /or shock. Observe the operating temperature range of the sensor (listed in the specifications).

**Mounting the Enclosure**

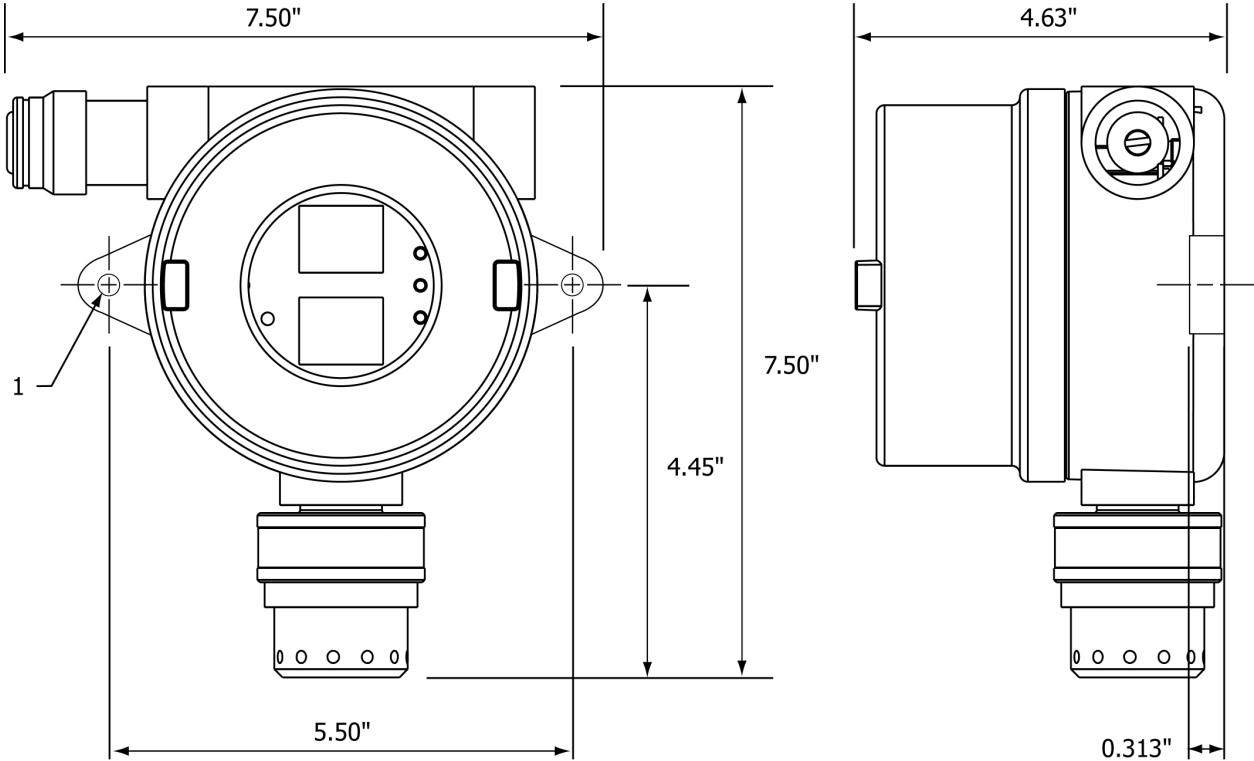
Modular design simplifies installation of the GasPoint. The transmitter main board is mounted to the inner control door which is equipped with slip hinges. The transmitter back enclosure contains the relays and power board and is equipped with a threaded 3/4 in. NPT conduit fitting outlet and pre-drilled mounting flanges. Power and signal lines connect to the plug-in terminal block on the power board. The GasPoint may be disassembled, simplifying installation.

**Recommend:** Qualified personnel should perform the installation according to applicable electrical codes, regulations and safety standards. Ensure correct cabling and sealing fitting practices are implemented.

- 1. Install the GasPoint. The predrilled mounting flanges: I.D. 0.25 on 5.5 inch centers.

*It is preferable to attach the transmitter to a wall or bracket, using bolts through the two mounting holes. These mountings however, may be omitted if the electrical conduit is sufficiently rigid to support the weight of the transmitter. The sensor should never be installed pointing upwards.*

**Figure 2: Outline Drawing**



1 Mounting Holes (0.250 inch diameter)

# Installation — System Design Specifications

## System Design Specifications:

- Supply Voltage: 12 to 32 volts
- Power Consumption: Catalytic Combustible Sensors: 100 mA @ 24 VDC  
 IR Combustible Sensors: 75 mA @ 24 VDC  
 Toxic /Oxygen Sensors: 40 mA @ 24 VDC  
 Relays: 50 mA per relay (150 mA total)
- Memory: Non-volatile memory, a battery back-up is not necessary to retain values in the event of power outages.
- Loop Resistance: 650 ohms maximum
- Cable 4-20 mA: 3 conductor, 14 to 24 AWG; Relays: 3 conductor, 14 to 24 AWG  
 Sensor Separation Kit: 4 conductor, 16 to 22 AWG
- Relays: 5 amp at 24 VDC or 115 VAC SPDT; LOW, HIGH and FAULT  
 Low/High Relays: Field selectable for normally energized/de-energized; latching/non-latching  
 Fault Relay: Energized; Non-latching
- Sensor Separation Kit:** Transmission Distances. See Table

## Cable Installation

**Transmission Range:** The distance the 4-20 mA signal can travel is dependent on several factors including the cable gauge. Maximum cable resistance is 650 ohms less the controller resistance.

The Tables below assume a constant 24 volt power supply (at 20°C), copper wire and a Controller resistance of 250 ohms. The signal range from the Controller to the GasPoint takes into account the return loop, the distance shown is from the Controller to the Transmitter. (Note the BW CR-4000 Controller has a resistance of only 120 ohms)

**Table 1A: Transmitter with Catalytic/IR Combustible Sensor**  
 (Maximum cable Lengths between Controller and Transmitter)

Conductor Size		Relays Not Used		One Relay Connected		Two Relays Connected		Three Relays Connected	
Sq mm	AWG	feet	meters	feet	meters	feet	meters	feet	meters
0.64	22	3,356	1,022	2,368	722	1,830	557	1,491	454
0.75	20	5,336	1,626	3,767	1,148	2,910	887	2,371	722
1.0	18	8,476	2,583	5,983	1,823	4,623	1,409	3,767	1,148
1.5	16	13,474	4,106	9,511	4,106	7,749	2,240	5,988	1,825
I <sub>c</sub> Current Factor		0.12		0.17		0.23		0.28	

**Table 1B: Transmitter with Toxic/Oxygen Sensor**  
 (Maximum cable Lengths between Controller and Transmitter)

Conductor Size		Relays Not Used		One Relay Connected		Two Relays Connected		Three Relays Connected	
Sq mm	AWG	feet	meters	feet	meters	feet	meters	feet	meters
0.64	22	6,712	2,045	3,661	1,115	2,517	767	1,917	584
0.75	20	10,953	3,253	5,821	1,774	4,002	1,219	3,049	929
1.0	18	16,953	5,167	9,247	2,818	6,357	1,937	4,843	1,476
1.5	16	26,948	8,213	14,699	8,213	10,105	3,080	7,699	2,346
I <sub>c</sub> Current Factor		0.06		0.110		0.160		0.210	

For other operating parameters use the formula below to establish the transmission range.

Formula: Maximum Distance =  $\frac{\{(V_P - V_T)/I_c\} - R_C}{(2 \times R_L)}$

- Where:
- V<sub>P</sub> = power supply voltage (minimum)
  - V<sub>T</sub> = transmitter supply voltage (minimum) 12 volt
  - I<sub>c</sub> = current through conductor See table 1A and 1B for factors
  - R<sub>C</sub> = total controller resistance
  - R<sub>L</sub> = line resistance per 350 meters (1,160 ft)

## 4-20 mA Loop Installation

**Cable Routing:** Separate cables are required for each GasPoint. In classified areas cable should be in conduit or be approved hazardous location cable.

**Power Supply:** Ensure power supply meets the minimum requirements of all components of your system (i.e. alarms, relays, etc.). BW recommends that the power supply be regulated.

**Caution:** Polarity must be observed. If the RETURN and +24 volt wires are reversed the GasPoint transmitter will not work. Do not apply electrical power to the GasPoint until all connections are made, the sensor is in place and the transmitter is complete.

1. Remove the GasPoint cover, open the inner hinged control door and remove, if desired.
2. Attach the conduit if applicable and pull cable(s) into the enclosure.
3. **Connecting the 3-pin Power Terminal Block**

Return (R): 4-20 mA signal to the labeled terminal  
 Supply (V): (+) positive (12-32 volts) to the labeled terminal  
 Ground (G): Ground wire to the labeled terminal

*Note 1:* (If using shielded Cable): To avoid radio frequency interference, the shield (including mylar) must be grounded. Simply tying a bare drain wire to ground will not ground a shield. Keeping the shield as short as possible, tie the shield to the internal grounding screw. Tie any unused wires to ground.

## Relay Cable Installation

GasPoint is equipped with three relays: Low Gas Alarm, High Gas Alarm and Fault Alarm. Select to connect the applicable relays required in each situation. Relay connections are labeled: NO (Normally Open), C (Common), NC (Normally Closed). Attach wires as required to the applicable terminals.

*Note 2:* The Fault relay connections are reversed.

*Note 3:* Set Alarm Dipswitches before applying power. Once power is applied, if desired, change the Alarm Setpoints

## Connecting the Controller and Power Supply

Ensure the GasPoint transmitter is complete with external cover in place before applying power. Follow the procedures and recommendations in the Control Systems Manuals to complete installation.

1. Ensure the GasPoint is tied to the Controller ground, to the Earth ground and to the Negative Terminal of the power supply.
2. Attach wires to the Controller and Power Supply as shown in the wiring diagram.

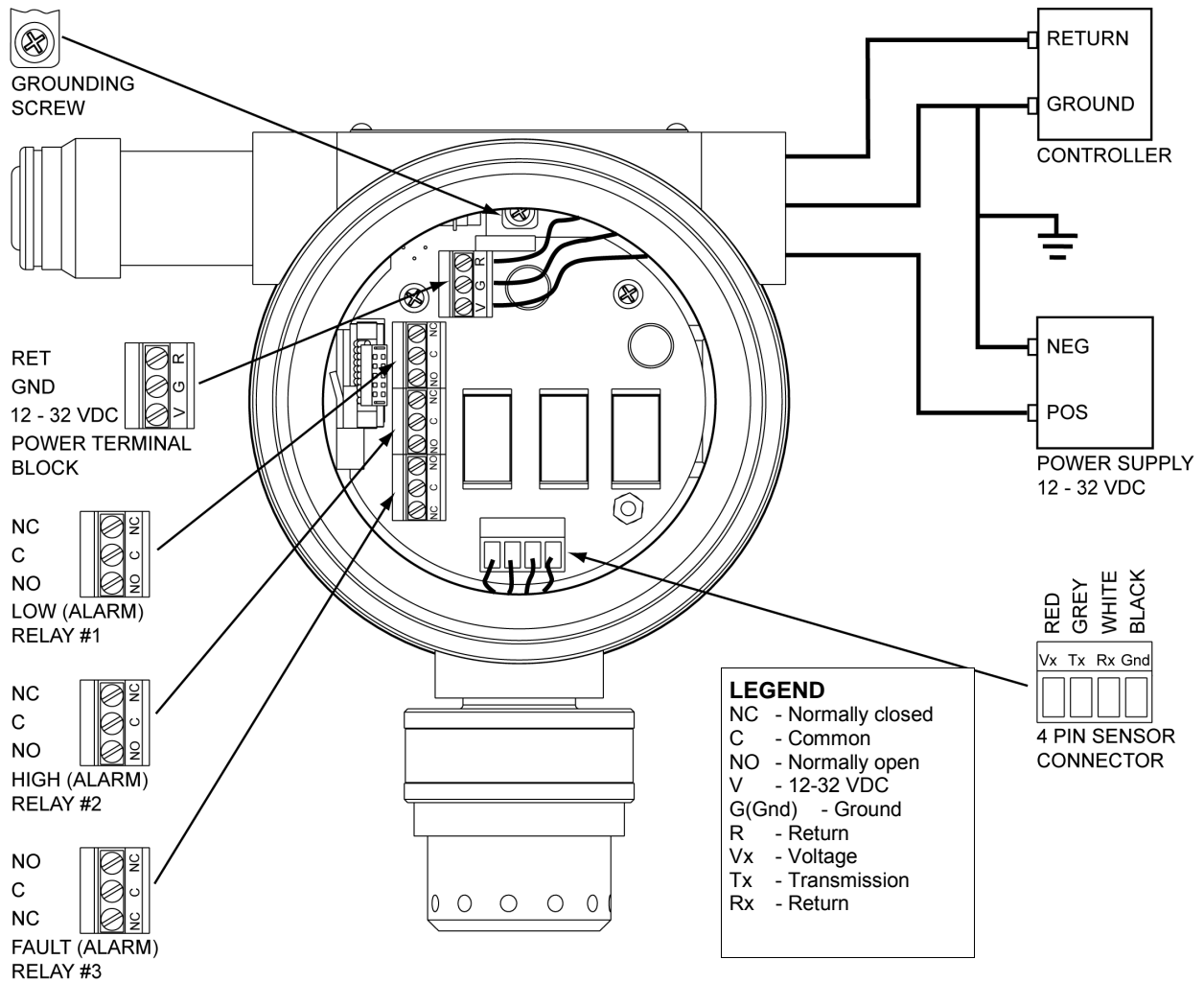
## Remote Sensor Separation Kit

The GasPoint Sensor Separation Kit can be mounted at the following distances dependent of cable size.

Conductor Size		Catalytic/IR Combustible Sensor		Toxic/O2 Sensor	
Sq mm	AWG	feet	meters	feet	meters
0.64	22	619	188.5	1,548	472
0.75	20	985	300	2,463	750
1.0	18	1,564	476	3,912	1,174
1.5	16	2,487	758	6,218	1,895

# Installation — System Wiring

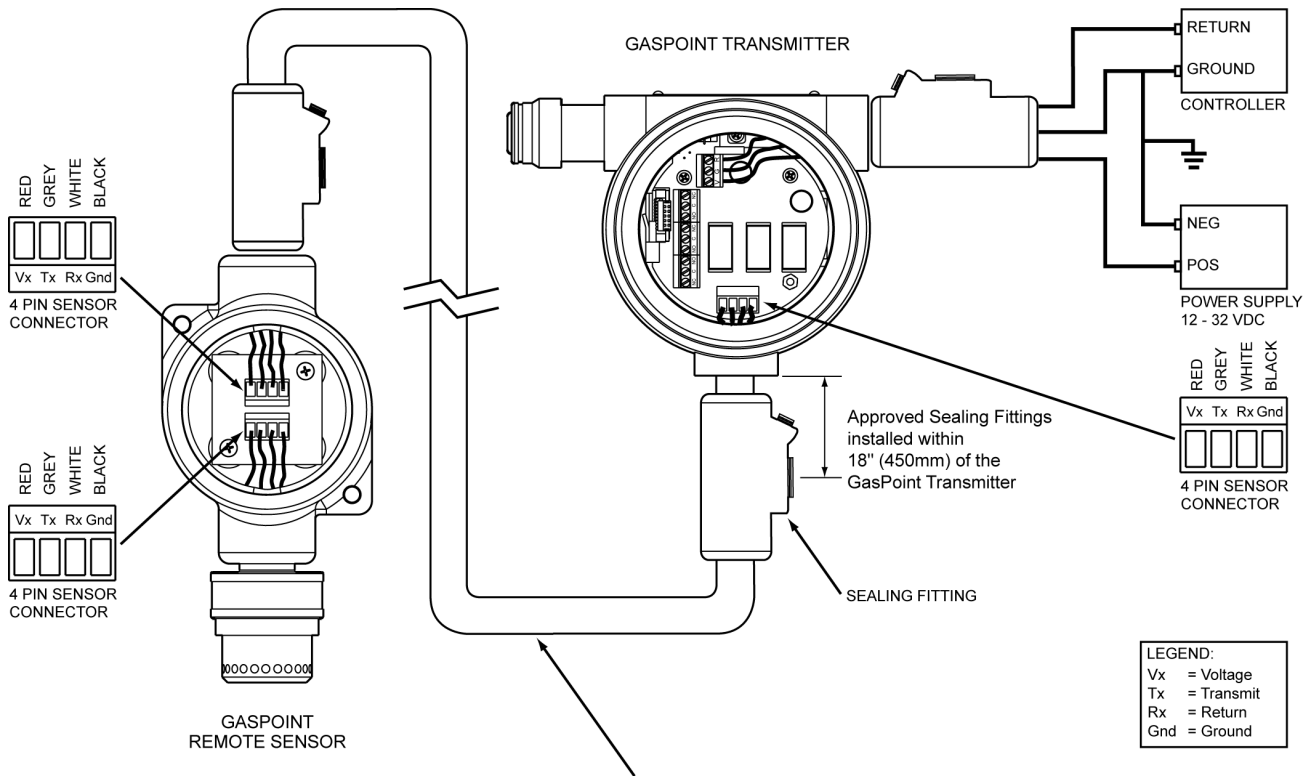
**Figure 3: System Wiring Diagram (Exception GasPoints equipped with Communication Modules)**



**Exception Note:** For wiring GasPoints equipped with the MODBUS Communication Expansion Module see applicable Manual.

## Installation — Remote Sensor Separation Kit

**Figure 4: Sensor Separation Kit Wiring Diagram**



**APPROVED NATIONAL ELECTRICAL CODE INSTALLATION**  
**CONDUIT** or **APPROVED HAZARDOUS LOCATION CABLE** connecting the Remote Sensor and Transmitter must have Sealing Fittings at both ends within 18" (450mm) of each unit.  
**HAZARDOUS LOCATION CABLE** and **SEALING FITTINGS** must be approved for Class 1, Div. 1 Gr. B,C,D Hazardous Locations.

### Mounting the Sensor Separation Kit Enclosure

1. The Separation Kit is equipped with predrilled flanges: I.D. 3065 (7.68 mm) on 4.35 in (10.6 mm) centers.
2. Disconnect the wires from the Transmitter terminal block and remove the sensor from the Transmitter. Screw the sensor fully into the Separation Kit housing and install the wires as shown on the diagram to the adjacent terminal block in the Separation Kit.
3. Install cable as shown. Ensure correct cabling and sealing fitting practices are implemented.

## Installation — Select Field Settings

**Factory Settings:** The GasPoint is calibrated and tested before shipping. Prior to shipping they are factory set to the commonly used values. To change the factory default settings see the applicable section:

The following settings are field selectable:

### Dip Switch Overview

**1. Calibration Time Delay:** To set span, select a time delay of 30 seconds or 6 minutes. For remote calibration use the 6 minute setting to allow time for the gas to reach the sensor. To save time and calibration gas, GasPoint will begin the Span procedure when it senses the calibration gas.

Note: The factory default is 0.5 minutes (30 seconds). See Dipswitch 3 (CAL TIME) to change to 6 minutes.

**2. Measuring Range:** Select from up to four measuring ranges by setting Block 1 switch 4 and switch 5 to open or closed. Both switch 4 and 5 are factory set to "open". See table below for selections

**3. LOW and/or HIGH Relays:** Select Non-latching or Latching. Factory default is set to open (non-latching).

**4. LOW and/or HIGH Relays:** Select De-energized or Energized. Factory default is set to open (de-energized).

### Changing the Alarm and Calibration Gas Setpoints

**5. Gas Alarms:** Gas alarm levels are set to OSHA (Occupational Health and Safety of America) standards prior to shipping. GasPoint is equipped with two alarm levels LOW and HIGH. To set, select (two, one or none) alarm levels and set selected levels to any values desired. To change them see *Setting Alarm Setpoints*. Factory defaults are listed below

**6. Calibration Gas Concentration Level:** To facilitate Auto Span, the calibration gas concentration expected is preset. It can be changed at any time for the toxic and combustible gas Sensors. Set the standard generally used in your facility. See *Automatic Calibration Routine* to change the value.

The Oxygen Sensor span is set to 20.9% and cannot be adjusted (For O2 calibrate in normal 20.% ambient air or if the atmosphere may be deficient or enriched use Pure Air calibration gas).

**Table 3: Factory Default Settings; Select Measuring Ranges**

Gas Sensed	Units of Measure	Select Measuring Range:				Alarm Setpoints		Calibration Gas  Factory Default Value Level Expected Note1:
		Factory Default 0—0	Or Select 4. Closed 5. Open	Or Select 4. Open 5. Closed	Or Select 4. Closed 5. Closed	Factory Defaults (Field Settable)		
		1	2	3	4	LOW	HIGH	
Combustibles 0-100% LEL	% LEL	0 to 100	N/A	N/A	N/A	10%	20%	50% LEL
Hydrogen Sulfide	ppm	0 to 100	0 to 50	0 to 500	0 to 20	10 ppm	15 ppm	20 ppm
Carbon Monoxide	ppm	0 to 500	0 to 1000	0 to 100	0 to 50	35 ppm	200 ppm	200 ppm
Ammonia	ppm	0 to 50	0 to 100	0 to 500	0 to 999	25 ppm	50 ppm	50 ppm
Nitrogen Dioxide	ppm	0 to 50.0	0 to 10.0	0 to 20	0 to 99.9	2.0 ppm	5.0 ppm	10.0 ppm
Hydrogen Cyanide	ppm	0 to 20.0	0 to 50.0	0 to 100	N/A	4.7 ppm	10 ppm	15 ppm
Sulfur Dioxide	ppm	0 to 100	0 to 50	0 to 20	0 to 10	2 ppm	5 ppm	20 ppm
Oxygen	% by vol.	0 to 30.0%	N/A	N/A	N/A	19.5%	18.5%	20.9% Ambient air or pure air

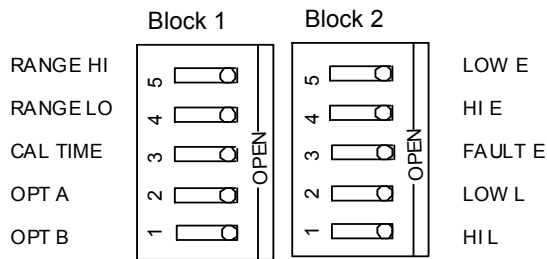
Note 1: Calibration Gas Factory Default Values — It is recommended that the default values be changed if selecting higher measuring ranges than the factory default measuring range. See page 13 and page 26 (Note 2).

## Dip Switches

The dipswitches are located on the upper control board. To access the dipswitch banks, remove the top of the explosion-proof enclosure, loosen the control board access screw (located just below the buttons) and open the control door which is on slip hinges. The dipswitches are clearly labeled.

Caution: The GasPoint must be powered down before removing the outer cover. If it is in a classified area either remove the GasPoint or declassify the area.

**Note: Any latched relay will be released upon one push of the external button.**



**Table 4:**

Dip Switch		Function
Block 1: Calibration and Measuring Ranges		
1	OPT B	Not used
2	OPT A	Not used
3	CAL TIME	Calibration wait period Open—0.5 min. Closed—6 min.
4	RANGE LO	Set Measuring Range
5	RANGE HI	Set Measuring Range
Block 2: Gas Alarm Relay Settings		
1	HI L (High alarm)	Open—Non-latching relay Closed—Latching relay
2	LOW L (Low alarm)	Open—Non-latching relay Closed—Latching relay
3	FAULT E	Not used. (See Specifications)
4	HI E (High alarm)	Open—De-energized relay Closed—Energized relay
5	LOW E (Low alarm)	Open—De-energized relay Closed—Energized relay

## Power-Up

### Connecting the Controller and Power Supply

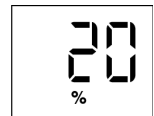
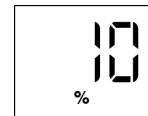
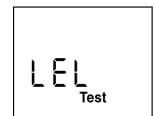
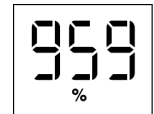
Ensure the GasPoint transmitter is complete with its external cover in place before applying power. Follow the procedures and recommendations in the Control Systems Manuals to complete installation.

**Note:** Ensure the GasPoint is tied to the Controller ground, to the Earth ground and to the Negative Terminal of the power supply.

1. Attach wires to the Controller and Power Supply as shown in the wiring diagram (page 6). When power is applied the GasPoint automatically turns on.
  - All elements of the LCD will light and flash twice. Then each icon will light separately and stay on until all are displayed. The LCD backlight will activate.
  - The word **Test** will appear on the LCD. The GasPoint then begins a 2 minute countdown from 999 to 000.

During the countdown to normal operations the GasPoint will communicate with the sensor, determine the sensor type, test sensor integrity of the Toxic and/or combustibile sensors (Not applicable to oxygen sensor) test all circuitry and allow the sensor to stabilize before normal operation begins. The transmitter will determine the sensor range and the sensor life remaining. Once the initialization is complete, the GasPoint enters normal operational mode (in the system loop) providing a signal to the controller of the gas present.

- After countdown, the LCD will display the current LOW alarm and HIGH Alarm Setpoints. Each Alarm setpoint is displayed for 4 seconds. To review them, press and release the external pushbutton after normal operation begins.
- Upon a successful Self-Test, the transmitter will automatically enter normal operation and display the ambient gas present. The backlight remains on for 5 seconds after normal operation begins. In the event the unit fails the self-test (see Fault Alarm Conditions).



### Controller Calibration

Follow the procedures and recommendations in the Control System Manual to calibrate the Control System.

1. Calibrate the Control System (see your Control Manuals). Set the controller as follows:
  - 4 mA = ZERO
  - 20 mA = FULL SCALE

**Next, calibrate the GasPoint with gas. Then, see Changing the Alarm Setpoints.**

## Changing the Alarm Setpoints and Calibration Gas Setpoints







The Setpoint Mode allows the user to change the calibration gas concentration level, the low alarm setpoint and the high alarm setpoint. See "Select Field Settings" (page 8) for factory default settings. To change the values:

1. Screw off the enclosure top. (Allows access to edit buttons).
2. Press OK button for 2 seconds to access Setpoint Mode and change factory default settings.

- GAS ALARM SETPOINTS:**
1. GasPoint is equipped with two setpoints LOW and HIGH.
  2. If only one setpoint is required, set one level to zero to turn it OFF. Set the other setpoint as desired.

Note: If both LOW and HIGH are set to the same value, the Gaspoint will trigger a HIGH alarm condition if that setpoint is met or exceeded.

3. To turn OFF both alarm levels set both setpoints to zero.

Changing Setpoints	LCD Icons Displayed	Display
<p><b>CHANGE THE CAL GAS CONCENTRATION LEVEL</b></p> <p>1. The LCD will first display the current cal gas concentration value. Press OK to accept the current displayed value or proceed to change the value.</p> <p><b>Set new Calibration Gas Level</b></p> <p>Press ▲ up button to increase value. Press ▼ down button to decrease value. Press OK button to accept the new value displayed on the screen and end set calibration gas level.</p> <p><b>Note:</b> O<sub>2</sub> The factory default Span is set at 20.9%</p>	<p>Numeric display shows current calibration gas value expected.</p> <p><b>“Set Span” advice flashes</b></p> <p>Gas Cylinder icon flashes Up/down arrow icons flash Gas monitored is constantly displayed</p>	 
<p><b>CHANGE THE LOW ALARM SETPOINT</b></p> <p>1. The next screen displays the current Low Alarm Setpoint as shown. Press OK to accept the current displayed value or proceed to change the value.</p> <p><b>Set new Low Alarm Setpoint</b></p> <p>Press ▲ up button to increase value. Press ▼ down button to decrease value. Press OK button to accept the new low alarm value displayed on the screen.</p>	<p>Numeric display shows current Low Alarm Setpoint</p> <p><b>“LOW ALARM Set” advice lights</b></p> <p>Up/down arrow icons flash Gas monitored is constantly displayed</p>	 
<p><b>CHANGE THE HIGH ALARM SETPOINT</b></p> <p>1. The next screen displays as shown.</p> <p><b>Set new High Alarm Setpoint</b></p> <p>Press ▲ up button to increase value. Press ▼ down button to decrease value.</p> <p>2. Press OK button to accept the new high alarm value displayed on the screen. GasPoint will return automatically to normal operation and display gas currently present.</p>	<p>Numeric display shows current High Alarm Setpoint</p> <p><b>“HIGH ALARM Set” advice lights</b></p> <p>Up/down arrow icons flash Gas monitored is constantly displayed</p>	 

### 3. Settings Complete—Verification (optional)

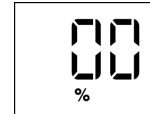
Test the GasPoint using a gas cylinder other than the one used in the calibration steps. The gas concentration should not exceed the sensor's detection range (see page 8). Confirm that the display shows the expected concentration.

**O<sub>2</sub> (Oxygen) Note 1:** Oxygen Low and/or High gas alarm setpoints can be set to either enrichment and/or deficiency alarms as desired. If the alarm setpoint is set to below 20.9% (deficiency alarm) an alarm will be triggered if the concentration present is below 20.9%. If the alarm setpoint is set to above 20.9%, an alarm will be triggered if the concentration present exceeds 20.9%. You can choose to set both alarms above or below 20.9% or one alarm above and one below 20.9 % as desired.

## Operation

### Normal Operation

The GasPoint provides continuous monitoring for the target gas. In the event of power failure, the GasPoint will automatically reset itself back into the system loop after power is restored. The GasPoint has non-volatile memory and will not be affected by a power disruption. All programmed information is protected with total memory retention.



### Operation

**Recommend:** BW recommends GasPoint be calibrated before first time use

The GasPoint runs a daily self-diagnostics including a Toxic and combustible sensor integrity test (Not applicable to oxygen sensors). If the GasPoint fails any of the diagnostics, the transmitter will then provide the proper output and LCD display screen for that particular fault.

**LCD:** The LCD shows the current ppm or % reading of the target gas present.

**View Alarm Setpoints:** To view the alarm setpoints at any time:

1. Press the external pushbutton (one second only) and release. The LCD will display current alarm setpoints LOW and then HIGH.

### Relays:

- **Fault:** The fault relay will always be energized under normal operations. The relay will de-energize only if the GasPoint is addressing a fault condition or when power is released.
- **Low/High Gas Alarms:** The gas alarm relays connected will be energized or de-energized (latching or non-latching) according to the GasPoint dipswitch settings you have selected.

**Reset Latched Relay Alarm (Alarm Acknowledge):** If a gas alarm relay has been set to latching mode, acknowledge the alarm condition:

1. Press the external pushbutton (for one second only) until the display reads Low Alarm setpoint, *then release* the external button. The GasPoint will release the latched alarm(s), and display the current LOW and HIGH alarm setpoints.

**Note:** If an alarm condition exists, GasPoint will not allow the user to reset a latched alarm or display the alarm setpoints.

**Output:** The 4-20 mA loop output will be normal (from 4 to 20 mA according to calibrated values) except in a fault condition.

**Backlight:** The backlight will activate in low light conditions. When ambient light conditions return to normal the backlight will turn off automatically.

**Gas Alarm Conditions and Advice**

If the current gas concentration meets or exceeds either alarm setpoint, the GasPoint gas alarm functions will activate.

**Note:** If both or either gas alarm is turned OFF (set to zero or set to the same value) then no gas alarm condition will exist for that alarm level.

The following alarm advice will activate in any gas alarm condition (LOW or HIGH):

The backlight will activate.

The 4-20 mA loop output will be normal (from 4 to 20 mA according to calibrated values)..

When the alarm condition no longer exists, GasPoint will exit alarm mode and enter normal operations.

**Exception:** If a relay is set to the latching position on either Low or High gas alarm, the relay will remain “on” until the alarm is reset (ACKNOWLEDGED). Press the external button to reset the relay.

Alarm Condition	Alarm Relay	LCD Icons Displayed	Display
<p><b>LOW GAS ALARM</b> If the current gas concentration present meets or exceeds the low alarm setpoint.  *See O2 Note below</p>	<p>Low Alarm Relay triggers a field interface if the relay is connected and a low alarm setpoint is entered.</p>	<p>Numeric display will show the gas currently present (ppm/%) <b>LOW</b> icon lights <b>ALARM</b> icon flashes Gas type monitored is constantly displayed</p>	
<p><b>HIGH GAS ALARM</b> If the current gas concentration present meets or exceeds the high alarm setpoint.  *See O2 Note below</p>	<p>High Alarm Relay triggers a field interface if the relay is connected and a high alarm setpoint is entered.</p>	<p>Numeric display will show the gas currently present (ppm/%) <b>HIGH</b> icon lights <b>ALARM</b> icon flashes Gas type monitored is constantly displayed</p>	
<p><b>OVER RANGE (over level or over range) GAS CONDITION</b> If the gas concentration present meets or exceeds the full measuring range.</p>		<p><b>OL</b> icon lights Gas type monitored is constantly displayed Note: If the alarms are turned OFF, then no alarm icons will display</p>	

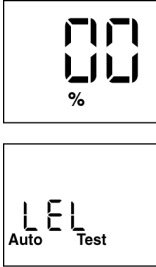
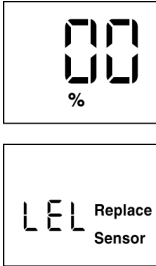
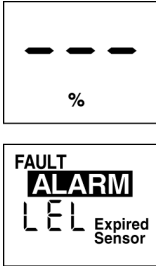
**O2 (Oxygen) Note: (See Oxygen note 1 on page 13)** An oxygen alarm level will depend on which alarm setpoints have been set to Low and High. The oxygen Low and/or High gas alarm setpoints are user selectable for either enrichment and/or deficiency alarms as desired.

**CAUTION: HIGH OFF-SCALE READINGS MAY INDICATE AN EXPLOSIVE CONCENTRATION.**

# Automatic Daily Test and Sensor Advice

## GasPoint Sensor Advice

The GasPoint sensor communicates constantly with the GasPoint transmitter, providing gas level concentrations and sensor status information such as, self-test pass/fail, sensor replacement, life expired and other status information to the transmitter.

Sensor	LCD Icons Displayed	Display
<p><b>AUTOMATIC DAILY SENSOR SELF-TEST</b> (FOR COMBUSTIBLE AND TOXIC SENSORS ONLY)</p> <p>The self-test will not be run if background gas is present. The self-test is run upon:                      initialization and                      on a daily basis.</p> <p>The self-test period lasts for 45 seconds. <b>While the self-test is running, the GasPoint does not respond to gas.</b> The GasPoint can not be calibrated during a self-test or 10 minutes before the self-test begins.</p> <p>Note: Sensor Fail Advice: If the unit fails the self-test. The GasPoint will enter Self-Test Fail Mode. See Fault Alarm Conditions.</p>	<p>Numeric display will read "00"                      "Auto Test" advice icons light</p>	
<p><b>SENSOR REPLACEMENT ADVISE</b></p> <p>The sensor provides the expiry information to the transmitter. Once the sensor has reached the expiry date, the GasPoint transmitter will display "<b>Replace Sensor</b>" on its LCD. This will last for 90 days and the transmitter will send a 3.8 mA signal from its 4-20 mA output when there is no background gas. Otherwise the GasPoint will function normally.</p>	<p>Numeric display shows gas currently present                      "Replace Sensor" advice lights                      Gas monitored is constantly displayed</p>	
<p><b>EXPIRED SENSOR ADVISE</b></p> <p>Once the 90-day period is complete the GasPoint system will display "<b>Expired Sensor</b>", the monitor will shutdown and the GasPoint triggers fault mode (2 mA output and the fault relay de-energized).</p> <p><b>The sensor must then be replaced.</b></p>	<p><b>FAULT</b> icon lights  <b>ALARM</b> icon flashes                      3 bar ( - - - ) icon flashes                      "Expired Sensor" advice lights                      Gas monitored is constantly displayed</p>	

### ***Fault Alarm Conditions and Advice***

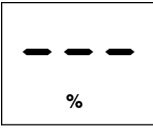



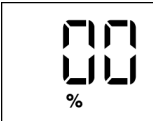

In the event of a fault condition, the fault alarm will trigger activating any connected field interface. GasPoint will advise which fault condition has occurred.

Under Fault Alarm conditions:

The non-latching fault relay be "on" de-energized during a fault condition.

The backlight will activate.

When the problem is corrected, GasPoint automatically returns to normal operation.

Fault Condition	4-20 mA Output	LCD Icons Displayed	Display
<b>SENSOR SELF-TEST FAIL</b> (The self-test has failed)	2.00 mA	Three (3) bars will flash on numeric display. <b>FAULT</b> icon lights <b>ALARM</b> icon flashes <b>"Sensor Fail" advice lights</b> Gas type monitored is constantly displayed	 
<b>SENSOR FAULT</b> (no communications)	2.00 mA	Numeric display will read the last value (ppm/%) present before sensor fault occurs <b>FAULT</b> icon lights <b>ALARM</b> icon flashes <b>"Sensor Fail" advice lights</b> Gas type monitored is constantly displayed	 
<b>SENSOR DRIFT</b>	2.00 mA	Numeric Display will read "00" <b>FAULT</b> icon lights <b>ALARM</b> icon flashes <b>"Sensor Error" advice lights and flashes</b> Gas type monitored is constantly displayed	 

# Calibration

## Calibration Guidelines

When calibrating the GasPoint, adhere to the following guidelines.

- Calibration accuracy is never better than the calibration gas accuracy. BW Technologies recommends a premium-grade calibration gas. Gases with NIST (National Institute of Standards and Technology) traceable accuracy will improve the validity of the calibration. Do not use a gas cylinder beyond its expiration date.
- Calibrate a new sensor before use. Allow the sensor to stabilize before starting calibration (approx. 5 minutes).
- Calibrate the GasPoint on a regular schedule. (BW recommends once every 3 months, depending on use and sensor exposure to poisons and contaminants.)
- Calibrate the GasPoint if the ambient gas display value varies at startup.
- It is best to calibrate the sensor before changing alarm setpoints.
- Calibrate only in a clean atmosphere, which is free of background gas.

Calibration Diagnostics Protection	
<i>If calibration is incomplete the GasPoint automatically returns to normal operation, all prior (former), calibration data is retained. Common cause for the GasPoint to refuse calibration or for an incomplete calibration include:</i>	
<b>Background Interfering gas is present</b> If interfering gas is present during Auto Zero. GasPoint will refuse to Auto Zero and exit calibration routine.	Combustible and Toxic Sensors: Wait for GasPoint to return to normal operation. Apply Pure Air (Zero gas) and repeat calibration.
<b>Calibration Gas cylinder runs empty during calibration</b>	Wait for unit to return to normal operation. Replace empty gas cylinder with full cylinder and repeat calibration.
<b>Calibration Gas concentration is too low or too high</b> Calibration gas concentration is not within expected parameters—either the concentration of applied gas (ppm or %) is too high or too low. GasPoint will refuse to set span if the calibration gas is not within expected parameters and will exit.	Change the value to equal the calibration gas concentration being applied.
<b>Gas applied at the wrong time.</b> Gas is applied before requested to do so, or if, gas is applied during auto zero, GasPoint will refuse to proceed and exit the calibration routine. The prior (former) auto zero value will be retained.	Restart the calibration routine and apply gas only when the gas bottle icon flashes.

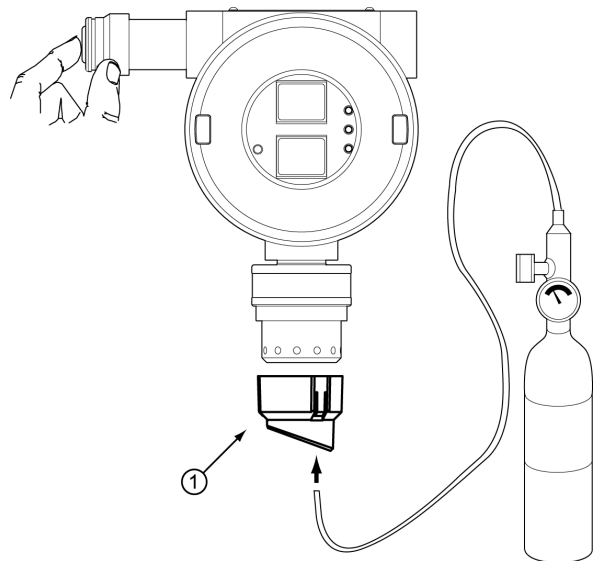
**Calibration Tubing:** Use teflon, or stainless steel hose on all electrochemical sensors.

Caution: Tygon will poison a Catalytic Combustible sensor over time.

**Remote Calibration:** The length of time depends on the length of hose the calibration gas must travel. If the wait period is longer than 30 seconds, the CAL TIME Dipswitch must be set to 6 minutes.

To save gas and time, GasPoint will begin span when it senses calibration gas.

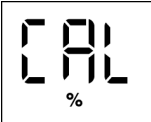

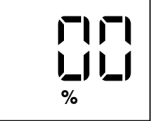


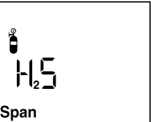
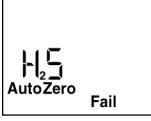
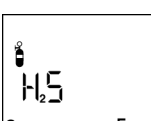
Apply calibration gas for approximately 2 minutes plus the time estimated for the gas to reach the sensor.



### Automatic Calibration Routine

Calibration can be run at any time during normal operation except the self-test period (from 10 minutes before the self-test until the self-test is complete). Calibration is a one man operation and virtually automatic.

**Note:** For Calibration gas concentrations and flowrates for each gas, see Appendix A (page 25)

To Calibrate perform the following steps:	LCD Icons Displayed	Display
<p><b>START CALIBRATION</b></p> <p>1. Press and hold the external button down while the LCD displays the Alarm Setpoints. Continue to hold down until the display reads "CAL" (approx. 5 seconds) and then release the button.</p> <p>The 4-20 mA output will be 3 mA throughout calibration. Calibrating the GasPoint will not cause false alarms at the controller.</p>	<p>First, the LOW and HIGH alarm setpoints will be displayed (8 seconds approx)</p> <p><b>Next, the CAL</b> icon lights for 3 seconds</p> <p>Gas type is constantly displayed</p> <p>Backlight is activated</p>	 
<p><b>AUTO ZERO</b></p> <p>The GasPoint will then take a zero level reading. The display is as shown.</p> <p>2. <i>Combustible and Toxic Sensors:</i> If background gas is present, apply zero gas (pure air or 100% nitrogen) to zero the sensor. Restart the Calibration sequence.</p> <p>3. <i>Oxygen Sensor:</i> Gas is not required. Auto Zero sequence will take 30 to 60 seconds.</p>	<p>Numeric display will read "00"</p> <p><b>"Auto Zero" advice flashes</b></p> <p>Gas monitored is constantly displayed</p>	 
<p><b>AUTO SPAN</b></p> <p>3. Insert cal cap (1) and apply gas to the sensor for approx. 2 minutes (Ammonia 5 minutes). See <i>Appendix A</i> for concentrations and flowrates.</p> <p>4. When the countdown "300" to "00" begins Span is complete, disconnect the gas.</p> <p>If Span Fails: Check calibration gas cylinder used and concentration expected. Replace the cylinder and/or change the cal gas expected value, if required. <i>Recalibrate.</i></p> <p><i>Oxygen Sensor: Use Pure Air Calibration Gas (20.9% O<sub>2</sub>) in case of deficient or enriched</i></p>	<p>Numeric display will show calibration gas value expected</p> <p>Gas cylinder icon flashes</p> <p><b>"Span" advice lights</b></p> <p>Gas type is constantly displayed</p> <p>After a successful calibration GasPoint automatically returns to normal operation and displays the current reading ppm or % present.</p>	 
<p><b>Exiting Calibration Routine (Fail or Error):</b></p> <p><b>Auto Zero Fail:</b> If the "Fail" icon lights, the LCD will display a countdown from "300" to "00", before GasPoint begins normal operation.</p> <p><b>AutoSpan Error:</b> If the "Error" icon lights, the LCD will display a countdown from "300" to "00", before GasPoint begins normal operation.</p> <p>Note: In either fail condition occurs, all previous information values are retained. Retry.</p>	<p><b>Auto Zero:</b> If the target or an interfering gas is present GasPoint will refuse to auto zero. The "Fail" icon lights. The "Fail" icon will also light if the external pushbutton is pressed during auto zero.</p> <p><b>Span:</b> If the cal gas is not within expected values, the GasPoint will refuse to span. The "Error" icon will light.</p>	 



# MAINTENANCE SERVICE

## Maintenance

To keep the GasPoint in good operating condition, perform the following basic maintenance as required:

- Calibrate, test, and inspect the GasPoint at regular intervals and after exposure to high concentrations.
- Keep an Operations Log of all maintenance, calibrations, and alarm events.
- Clean the exterior with a soft damp cloth. Do not use solvents, soaps, or polishes.
- Do not immerse the GasPoint in liquids.

### **Cleaning a Sensor**

The sensors are equipped with a stainless steel sintered or a hastelloy sintered flame arrestor screen (dependent on gas). Clean only with a dry brush being careful not to clog the screen. Replace the sensor if the screen is plugged.

### **Clearing a Sensor**

The sensor has a high degree of resistance to common vapors and gases. The sensor will most likely clear itself if you remove the GasPoint to a clean environment and wait 10 to 30 minutes. *Do not expose a sensor to the fumes of inorganic solvents (such as paint fumes) or organic solvents.*

## **Troubleshooting**

With enhanced diagnostics GasPoint provides extensive fault analysis and fault advice, see *Fault Alarm Conditions and Advice*. The troubleshooting chart deals with other factors and is to be used a guide. Prior to reaching any conclusion that problem may exist, check the following.

- All terminal blocks are fully seated on the boards.
- Power and signal connections are correct and complete.

<b>Troubleshooting Chart</b>		
<b>Fault</b>	<b>Probable Cause</b>	<b>Solution</b>
No response to gas	Sensor screen dirty	Clean or replace sensor
Apparent false alarm	Puff of gas Not properly calibrated Solvent fumes or interference from high levels of interfering gas Radio frequency interference	Monitor is functioning Re-calibrate Remove source Check grounds and shielding and correct.
No signal at controller	Maximum distance reached	Verify loop resistance, change wire AWG or increase supply

## SERVICE

**Disassembling:** Observe all safety and electrical codes and regulations before removing front cover. Unscrew the thumbscrew and open the service bay door.

**Assembling:** When re-assembling the GasPoint ensure that it is electrically complete. Close the Service Bay Door. Ensure the thumbscrew is aligned and tighten it down. Replace the outside glass cover. Re-apply power and re-initialize the transmitter Power-Up procedure (see Power-Up). Change the Alarm setpoints if desired.

**Important:** Calibrate the GasPoint whenever a component is replaced.

### Sensor Assembly Replacement

To replace the entire sensor assembly:

1. Disconnect the wires from the 4-pin plug-in terminal block at J5 on the power board and remove the old sensor.
2. Feed the new wires through the opening. Fully screw in the new sensor. Attach the wires to the plug-in terminal block. Ensure that all colored wires are correctly matched to the board labels from left to right. See Figure 4.

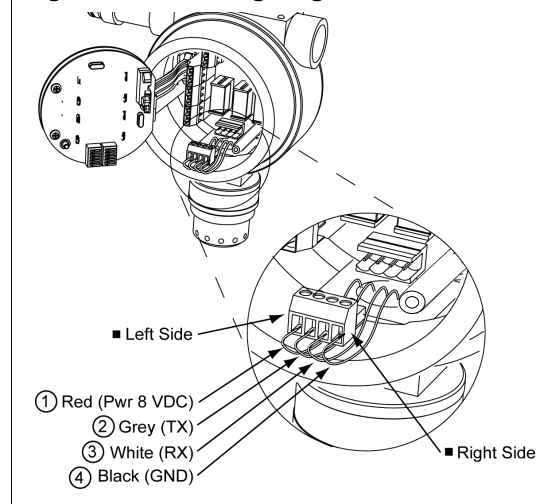
**Caution:** Check that all connections are correct. Incorrect wiring may damage the sensor and/or the power board.

4. See Transmitter Dipswitch Settings (Table 4) to select a measuring range if required.

For sensor replacement part numbers see Appendix A.

Sensor Wiring Configuration			
#	Board Label	Wire Color	Description
1	Pwr 8 VDC	Red	Power 8 VDC (left)
2	TX	Grey	Transmission
3	RX	White	Signal
4	GND	Black	Ground (right)

Fig. 5: Sensor Wiring Diagram



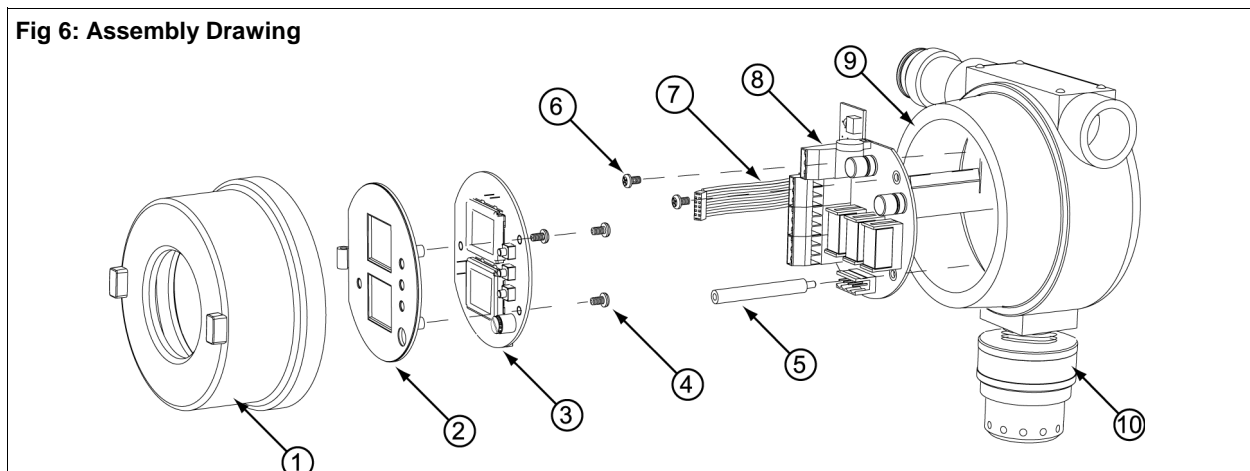
### Other Component Replacement

1. Unplug the sensor terminal block from the power board if required.
2. Replace component, ensuring all wiring connections are complete and re-assemble as shown. See Installation.
3. Ensure all field selectable options are set (measuring range, etc.).
4. Apply power and re-initialize Power-Up.
5. Set the alarm setpoints if required.

Table 5: GasPoint Replacement Parts

#	QTY.	DESCRIPTION RATING/TOL	Part #
1	1	External faceplate window cover	M1147
2	1	Internal hinged door faceplate cover	M2345
3	1	Transmitter main LCD board (PCB)	E2737/2
4	3	#6-32 x 1/4 inch machine Phillips screws	M0262
5	1	Threaded stand-off –accepts thumbscrew	M2394
6	2	#6-32 x 1/4 inch machine Phillips screws	M0262
7	1	Plug-in ribbon cable	E2802
8	1	Power/Relay Board (PCB)	E2739/1
9	1	Transmitter housing c/w external switch	M2346K
10	1	Sensor Assembly	Appendix A

Fig 6: Assembly Drawing





# APPENDIX A

Sensor Information

Sensor Specifications .....	26
Order Numbers .....	26
Relative Sensitivity of combustible gases . . . . .	27
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## Sensor Specifications

Operating and Calibration Specifications										
Specifications	IR Combustibles %LEL	Catalytic Combustibles %LEL	Hydrogen Sulfide H <sub>2</sub> S ppm	Carbon Monoxide CO ppm	Sulfur Dioxide SO <sub>2</sub> ppm	Ammonia NH <sub>3</sub> ppm	Hydrogen Cyanide HCN ppm	Nitrogen Dioxide NO <sub>2</sub> ppm	Oxygen O <sub>2</sub> ppm	
Repeatability % of signal	1	1	1	1	1	<10	0.5	0.2	0.1	
Op Temperature Range °C °F	-40 to +70 -40 to +150	-40 to +90 -40 to +194	-40 to +50 -40 to +122	-20 to +50 -4 to +122	-20 to +50 -4 to +122	-10 to +50 +14 to +122	-20 to +50 -4 to +122	-20 to +50 -4 to +122	-20 to +50 -4 to +122	
Operating Humidity	0 to 100% Non Condensing 5 to 95 % non condensing									
Long Term Drift % of signal loss per month	Zero: Nominal Span: <1	Nominal <1	Nominal <2	Nominal <2	Nominal <2	Nominal <2	Nominal <2	Nominal <2	Nominal <1%	
LCD Increments	1%	1%	1 ppm	1 ppm	1 ppm	1 ppm	0.1 ppm	0.1 ppm	0.1%	
<b>Calibration:</b> Note2										
Flow Rate (min) mls/minute at a % or ppm reading of:	250 50% LEL	250 50% LEL	250 20 ppm	150 200 ppm	250 20 ppm	500 50 ppm	250 15 ppm	1,000 10 ppm	250 Note:3: 20.9 %	
<b>Sensor:</b>	IR-RW03	SS-RW02	SS-RH02	SS-RM02	SS-RS02	SS-RA02	SS-RZ02	SS-RD02	SS-RX02	
Replacement Part Numbers										

Note 1: Performance data is based on conditions at 20 °C, 50% RH, 1013 mBar.

Note 2: Calibration Gases: It is recommended that the Calibration Gas concentration for toxic sensors be 50% of the selected measuring range. (Factory default values are shown. )  
Auto span. Values expected by the GasPoint for toxic gases can be changed at any time (See page 13).

Note: 3 Oxygen Use Pure Air calibration Gas

Note 4: Do not adjust the oxygen sensor span value.

### Sensors:

Toxic and Oxygen: Electrochemical

Combustible: Catalytic or Infrared (IR)

Position Sensitivity: None

Operation Pressure Range: 900 to 1100 mBar  
(Atmospheric +/- 10%)

**Calibration Notes:** For maximum accuracy calibrate with a mixture in the range most measurements will be made. For most purposes a 2 minute exposure is satisfactory.

**Relative Sensitivity of Combustible Gases/Vapors**

**Recommend:** For the most accurate measurements calibrate using the gas or vapor under investigation. Where this is not possible see the applicable “Catalytic or Infrared Relative Sensitivity table for Combustible Gases/Vapors”. The GasPoint catalytic and combustible sensors are calibrated to Methane (with 50% methane calibration gas) at the factory prior to shipping.

**Catalytic Sensor Relative Sensitivity of Common Combustible Gases/Vapors**

Gas/Vapor	Relative Sensitivity	Gas/Vapor	Relative Sensitivity
Methane	100	Carbon monoxide	110
Propane	60	Acetone	75
n-Butane	60	Methyl ethyl ketone	60
n-Pentane	50	Toluene	60
n-Hexane	50	Ethyl acetate	65
n-Heptane	50	Hydrogen	100
n-Octane	50	Ammonia	145
Methanol	115	Cyclohexane	65
Ethanol	85	Leaded petrol	60
iso-Propyl Alcohol	70	Unleaded petrol	60

**NOTE:** Each sensitivity has been rounded to the nearest 5%.

**Standard Model IR GasPoint Relative Sensitivity to Applicable Combustible Gases/Vapors**

Gas/Vapor	Relative Sensitivity	Gas/Vapor	Relative Sensitivity
Acetone	60	n-Hexane	325
n-Butane	450	Methane	100
iso-Butane	450	n-Pentane	390
Butane-1	450	iso-Pentane	390
cis-Butane-2	450	Propane	410
trans-Butane-2	450	Propanol	230
Ethane	450	Propylene	310
Ethanol	330	o-Xylene	100
Ethylene	80	m-Xylene	100
n-Heptane	325	p-Xylene	100

**NOTE:** This table is intended for guidance only. Always calibrate using the gas or vapor under investigation.

change in pressure.

**Catalytic Bead Combustible Sensor**

The table shows the variation of the catalytic combustible sensor on exposure to a range of gases and vapors at the same %LEL concentration. The figures are expressed relative to the methane signal (=100).

The results are intended for guidance only. *For a more accurate measurement calibrate using the gas or vapor under investigation.*

**Special Note on the Combustible Sensor:** Catalytic Poisons - Certain substances have a detrimental effect on *all* catalytic bead sensors. The GP-WD combustible sensor has a higher degree of poison resistance and will outperform other catalytic bead sensors in poisonous atmospheres. However, catalytic sensors should not be exposed for prolonged periods of time to lead or sulfur containing compounds, silicones or phosphates. Action is cumulative and may result in an irreversible decrease in sensitivity. Certain other compounds such as halogenated hydrocarbons and hydrogen sulfide, may temporarily inhibit the sensor performance, but in most cases it will recover after a period in clean air.

**Infrared Combustible Sensor**

The standard model IR Combustible GasPoint is calibrated to Methane. The table shows the variation of the IR (infrared) combustible sensor on exposure to applicable group combustible hydrocarbon gases and vapors at the same %LEL concentration. The figures are expressed relative to the methane signal (=100).

The results are intended for guidance only. *For a more accurate measurement calibrate using the gas or vapor under investigation.*

*Note: If the hydrocarbon desired is not listed, special models are available for other groups of hydrocarbons*

For IR sensors, use the specified gas to calibrate the system. IR sensors work very well in Low or NO Oxygen Conditions. IR sensors monitors the molar concentration of the specific gases by a physical method. No chemical reaction takes places inside the sensor.

**Caution:** IR Systems should always be calibrated as soon as you install the system to compensate for any

## **Specifications:**

<b>MONITOR:</b>	3-wire, 4-20 mA gas transmitter with advanced micro-controller based circuitry
<b>Power Input:</b>	12 to 32 volts DC
<b>Output Current:</b>	Normal Operation: Isolated linear 4-20 mA output Calibration Mode: Steady 3 mA (Automatic reset to normal operation) Fault Mode: 2 mA signal (and less)
<b>Current Consumption:</b>	Toxic Versions: 40 mA at 24 VDC Catalytic Combustible Version: 100 mA at 24 VDC Infrared Combustible Version: 75 mA at 24 VDC Relays: 50 mA per relay @ 24 VDC Accuracy: $\pm 0.1$ mA @ 10°C to 50 °C (50°F to 122°F)
<b>SENSORS:</b>	Pug-in, Logic sensors
<b>Self-Test:</b>	Automatic daily self-test of toxic and combustible sensor integrity and sensor life Oxygen: Not required
<b>CALIBRATION:</b>	Non-intrusive, via push-button Auto Zero and Auto Span
<b>DISPLAYS:</b>	Two backlit Liquid Crystal Displays
<b>LCD 1:</b>	3 digit continuous readout of the gas present (ppm or % LEL)
<b>LCD 2:</b>	Alphanumeric diagnostic Status display
<b>ALARM SETPOINTS:</b>	Two (2) setpoints - User selectable
<b>RELAY CONTACTS:</b>	Three field retro-fittable SPDT relays; 5 amps @ 250 VAC
<b>LOW/HIGH:</b>	Field selectable for normally energized/de-energized and latching/non-latching
<b>FAULT:</b>	Normally energized and non-latching
<b>CONTROLS:</b>	
<b>Calibration:</b>	Non-Intrusive via external pushbutton
<b>Alarm Setpoints:</b>	Simple Up/Down push-buttons with LCD readout of setpoints
<b>PHYSICAL:</b>	
<b>Size:</b>	6.8 x 7 x 4.3 in. (17 x 17.8 x 10.8 cm) including sensor
<b>Weight:</b>	4.85 lb. (2.2 kg) approx.
<b>Enclosure:</b>	Explosion-proof, anodized aluminum enclosure c/w mounting flanges
<b>Sensor:</b>	Stainless Steel enclosure
<b>Wiring Port:</b>	3/4 inch n.p.t.
<b>WARRANTY:</b>	
<b>Instrument:</b>	2 years non-prorated
<b>Sensor:</b>	2 years warranty.
<b>APPROVAL:</b>	Approved by CSA to both U.S. and Canadian Standards: Class I, Groups, B, C, D Approved Explosion Proof Standards UL1203; C22.2 No 152 Approved to Combustible Performance Standards ISA-S12.13 and C22.2 No. 152

*DUE TO ON-GOING RESEARCH AND PRODUCT IMPROVEMENT, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.*

## ORDER NUMBERS

### Transmitters c/w Sensor Assemblies and Relays

GP-WD	Transmitter c/w Combustible Sensor
GP-IR-WD	Transmitter c/w IR Combustible Sensor
GP-HD	Transmitter c/w Hydrogen Sulfide Sensor
GP-MD	Transmitter c/w Carbon Monoxide Sensor
GP-SD	Transmitter c/w Sulfur Dioxide Sensor
GP-ZD	Transmitter c/w Hydrogen Cyanide Sensor
GP-XD	Transmitter c/w Oxygen Sensor
GP-AD	Transmitter c/w Ammonia Sensor
GP-DD	Transmitter c/w Nitrogen Dioxide Sensor
Add Suffix "-SS"	For optional Stainless Steel Transmitter enclosure

*Note: Sensor Assembly enclosures are stainless steel (standard)*

### Accessories and Spares:

GP-1	Gas Transmitter only c/w LCD's and Relays (No Sensor)
GP-SEP	Sensor Separation Kit
GP-MBUS1	MODBUS Communication Expansion Module
SS-RW02	Combustible Sensor Assembly
IR-RW03	IR Combustible Sensor Assembly
SS-RH02	Hydrogen Sulfide Sensor Assembly
SS-RM02	Carbon Monoxide Sensor Assembly
SS-RS02	Sulfur Dioxide Sensor Assembly
SS-RA02	Ammonia Sensor Assembly
SS-RZ02	Hydrogen Cyanide Sensor Assembly
SS-RD02	Nitrogen Dioxide Sensor Assembly
SS-RX02	Oxygen Sensor Assembly
GP-CAL-3	Non-conductive Remote Calibration Cup and Splash Guard
GP-SSCAL4	Stainless Steel Remote Calibration Cup and Splash Guard
GP-SSPLASH4	Stainless Steel Splash Guard
GPOINT-B	GasPoint Pushbutton protective boot
D1374/2	Manual

## BW Technologies Limited Warranty

BW Technologies warrants this product to be free from defects in material and workmanship under normal use and service for a period of two years, beginning on the date of shipment. Parts, product repairs and services are warranted for 90 days. This warranty extends only to the original buyer or end-user customer of a BW Technologies authorized reseller. It does not apply to any product which, in BW Technologies' opinion, has been misused, altered, neglected or damaged by accident or abnormal conditions of operation or handling. BW Technologies warrants that software will operate substantially in accordance with its functional specifications for 90 days and that it has been properly recorded on non-defective media. BW Technologies does not warrant that software will be error free or operate without interruption.

BW Technologies authorized resellers shall extend this warranty on new and unused products to end-user customers only but have no authority to extend a greater or different warranty on behalf of BW Technologies. Warranty support is available if product is purchased through a BW Technologies authorized sales outlet or Buyer has paid the applicable international price. BW Technologies reserves the right to invoice Buyer for importation costs of repair/replacement parts when product purchased in one country is submitted for repair in another country.

BW Technologies' warranty obligation is limited, at BW Technologies' option, to refund of the purchase price, free of charge repair, or replacement of a defective product which is returned to a BW Technologies authorized service center within the warranty period.

To obtain warranty service, contact your nearest BW Technologies authorized service center or send the product, with a description of the difficulty, postage and insurance prepaid (FOB Destination), to the nearest BW Technologies authorized service center. BW Technologies assumes no risk for damage in transit. Following warranty repair, the product will be returned to Buyer, transportation prepaid (FOB Destination). If BW Technologies determines that the failure was caused by misuse, alteration, accident or abnormal condition of operation or handling, BW Technologies will provide an estimate of repair costs and obtain authorization before commencing the work. Following repair, the product will be returned to the Buyer transportation prepaid and the Buyer will be billed for the repair and return transportation charges (FOB Shipping Point).

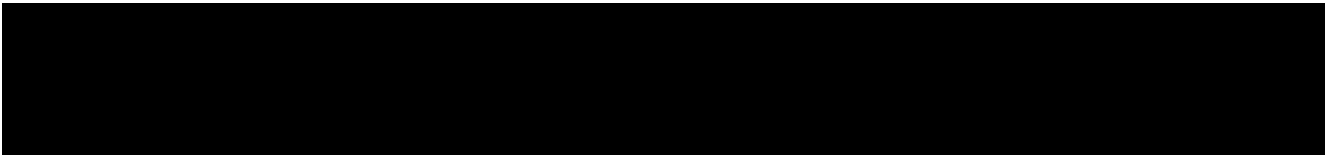
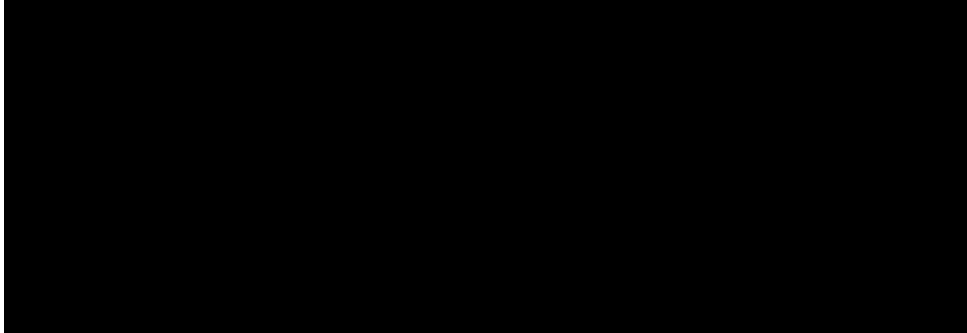
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**Notes:**





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