

BW Technologies

Product Catalogue



"INNOVATORS IN GAS DETECTION"

BW
Technologies

BW Technologies

BW Technologies is the leader in innovative gas monitoring instrumentation. Showcasing a full line of portable, fixed and stand-alone equipment, BW utilizes advanced micro-controllers and sensing technology to design and produce the smallest, most user-friendly and cost-effective instruments in the gas detection industry. An ISO 9001 company, BW provides safety solutions for the monitoring of a range of toxic gases, combustibles and oxygen hazards.

BW is committed to providing industry with only the highest quality gas detection instruments to protect human life and safeguard property.

BW Technologies offers a full line of protection.

Portable Gas Detectors

- Single gas, disposable (maintenance-free) detectors
- Single gas instruments with plug-in, replaceable components
- Multi-gas instruments

Fixed 4-20mA and Digital (RS-485 / MODBUS) Transmitters and Systems

- Combustible, toxic and oxygen systems
- Disposable (maintenance-free) monitors
- AC/DC controllers

Stand Alone Gas Detection Systems

- Wireless, solar-capable, multi-point systems
- Dual-point, solar-capable systems
- AC/DC transportable systems

HVAC Instruments and Systems

- Combustion analyzers
- Fixed transmitters
- Carbon monoxide meters

Vulcain Alarme Inc.

The Vulcain division of BW Technologies designs and manufactures instruments used in parking garages, office towers, schools and other commercial applications. Founded in 1968, Vulcain has a strong network of distribution agents and representatives that readily complement BW's existing distribution channels.



Industry Leader

Serving Industry Worldwide

BW Technologies aims to become the leading supplier of gas detection equipment for the protection of personnel and facilities around the world.

BW Technologies spans the globe with a growing network of sales, service and distribution centers on six continents. BW Technologies is headquartered in Calgary, Alberta, Canada, with manufacturing, service and stocking centers located in the USA, in the UK and in Canada.

Local sales and service support is provided by authorized distribution channels in over 50 countries. BW Technologies has more than 30 regional management offices that provide technical product support and training throughout the world.

At BW, we believe customers deserve personal attention and prompt service. To meet our customers' needs and exceed their expectations, BW provides same-day shipment of standard product through our three stocking centers.

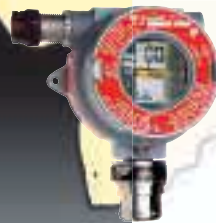
Leader in Gas Detection

Intuitive operation is a hallmark of BW instruments. Our feature-rich detectors are designed for ease of use with field-proven sensor technology.

- Large, status-at-a-glance displays
- Intelligent, automatic calibration—simply apply gas (the instrument checks that the calibration gas applied meets expected parameters)
- Unique, full function self-test verifies the integrity of all internal components
- Advanced programming techniques for user-friendly operational features and low training costs
- Datalogging—use office standard programs (Excel, Access, etc.) to store, manage and display your data

Lower Maintenance Costs

- Easy sensor replacement and field calibration
- Zero-maintenance portable and fixed instruments
- Portable gas detectors use flexible power sources. Convenient local availability reduces operating costs.
- Local servicing available through authorized dealers.



Price Leader

BW has set a new benchmark in the cost of instrument ownership. Modern electronic and industrial design provides a superior safety instrument at a lower manufacturing cost—a benefit that is passed on to you, the customer.

Leader in Customer Care

Dedicated to providing ongoing customer satisfaction, BW Technologies is reaching forward in quality, performance and reliability to ensure trust in personal safety. Third party certifications, classifications and markings provide your global passport to hazardous locations.

- ISO9001:2000 Quality System Certified
- CSA, UL, Cenelec, ATEX, Standards Australia, South African Bureau of Standards, American Bureau of Shipping, and others

Durable and Reliable

- Impact-resistant construction of all portable monitors with advanced industrial design
- On-board RFI protection provides the most complete radio interference protection in industry today
- High-performance microprocessor-based operation for increased accuracy, reliability and power

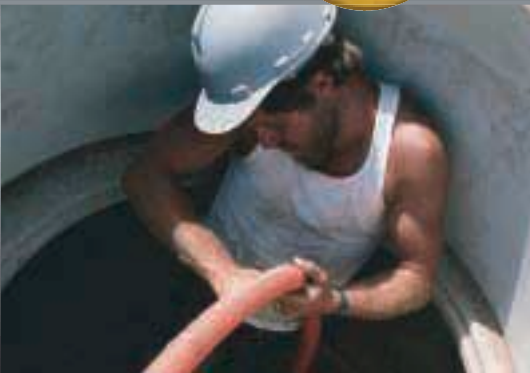
Warranty Protection

We stand behind the reliability and durability of our products with a comprehensive BW warranty.

- Two year sensor warranty on portable, fixed* and stand-alone sensors
- Two year warranty on portable detectors, fixed equipment and stand-alone systems



Portables



BW Technologies

From maintenance-free single-gas to intelligent multi-gas, we offer a full spectrum of portable monitoring instruments.

With advanced sensor technology and the latest in RFI shielding, BW portables provide unequalled protection from toxic gases, combustibles and oxygen hazards.

"INNOVATORS IN GAS DETECTION"

BW
Technologies

For further information:

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www.gasmonitors.com

The BW Portable Advantage

Technology

Just as mobile phones and computers have become smaller, smarter and more affordable, BW has brought the same technological advances to gas detection instrumentation. Cutting-edge technology in sensors, microprocessors, programming features and fiber optics result in a more compact and easier to use safety instrument—at a lower cost.

Full Function Self-Test

BW Technologies' unique, full function self-test automatically checks battery, circuitry and sensor integrity. Our instruments are engineered with self-diagnostic capabilities that verify each sensor's response to gas.

Automatic Calibration

During auto-cal and auto-span procedures, BW instruments advise when to apply gas—no setting adjustments are required. The instrument also checks that the concentration (ppm or %) meets expected criteria. GasAlertClip, GasAlert100, Toxyclip and Toxyclip2 do not require calibration.

Affordability

Sophisticated, feature-rich safety instruments provide superior performance and reliability. Instruments with similar features typically cost up to 50% more than BW portable detectors. Prices quoted include instruments, sensor(s), batteries, pumps, chargers, sampling hoses, filters, etc., (if applicable). No hidden extras. Portables are delivered ready for use.

Durability

BW portables feature advanced industrial design for the rugged conditions of modern industry.

Low Maintenance

State-of-the-art sensor and micro-electronics significantly reduce and often eliminate the need for user maintenance.



GasAlert100

H₂S or CO

INNOVATORS IN GAS DETECTION™

BWF

Technologies



100 Day Disposable Gas Detector



ACTUAL SIZE

**The new disposable
detector in
the GasAlert series**



Protect Yourself

- ▲ 100 days of protection with no maintenance costs—ideal for employees and contractors for short-term work projects
- ▲ Continuous, alphanumeric LCD shows detector life remaining, alarm setpoints and advises self-test status
- ▲ Records and displays the peak alarm encountered and the time elapsed since the event occurred.
- ▲ Confidence LCD display advises instrument is on and functioning
- ▲ Two alarm levels (Low / High)
- ▲ Typical 95 dB
- ▲ Wide-angled visual alarm bar visible from all angles
- ▲ Small size (1.0 x 1.45 x 2.3 inches / 26 x 37 x 58 mm) and lightweight (1 oz. / 30 g)
- ▲ Maintenance free—no sensor or battery replacement, no calibration, no downtime
- ▲ Full function self-test of: audible/visual alarms plus integrity of sensor, battery and circuitry
- ▲ Continuously on—one button activation and test
- ▲ High-tension stainless steel pocket/belt clip
- ▲ Instructions in local languages included



ATEX CE



and others



Ordering Information

GA100-H	100 day H ₂ S detector
GA100-M	100 day CO detector

Note: Models above are available with special alarm setpoints.

Accessories

GA-TS04	GasAlert100 automatic test station
GA-HC-1	Hard hat clip
GA100-CD1	Interactive product demo CD-ROM

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Email: info@bwt.net

GasAlert100

H₂S or CO

100 Day Disposable Gas Detectors

The GasAlert100 is a practical, cost-effective solution to short-term work projects. The GasAlert100 provides 100 days of continuous, maintenance-free operation from the day of activation. Operated by an advanced microcontroller and electrochemical sensor, GasAlert100 is equipped with two levels of alarm and a continuous, alphanumeric confidence LCD.

Simply press the START/TEST button and the GasAlert100 is ready for use. The life remaining is displayed in days and then hours. The full function self-test verifies sensor, circuit and battery integrity and audible/visual alarms. Alarm setpoints are displayed on command.

The rugged, compact GasAlert100 is designed with the most advanced RFI protection available in industry today. Simply clip the instrument to your lapel, pocket, belt or hard hat for unequalled protection.

"INNOVATORS IN GAS DETECTION"



For further information:
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SPECIFICATIONS

DETECTOR: Disposable, zero-maintenance gas detector

Model:	GasAlert100 H ₂ S	GasAlert100 CO
Operational life ¹ :	100 days	100 days
Sensor range:	0-100 ppm	0-300 ppm
Low alarm level ² :	10 ppm	35 ppm
High alarm level ² :	15 ppm	200 ppm
Operating temperature:	-22 to +113 °F -30 to +45 °C	+5 to +113 °F -15 to +45 °C
Calibration:	Not required	

Continuously on: Yes
 One-button control: Activation and self-test
 Full function self-test: Verifies sensor, circuitry and battery integrity and audible/visual alarms
 Sensor: Electrochemical cell (temperature compensated)

INDICATORS AND ALARMS

Visual gas alarm: Flashing, wide-angled alarm lens with dual red LEDs plus ALARM LCD readout
 Audible gas alarm: Pulsing siren ≈95 dB at 1 ft./0.3 m
 Failure alarm: Yes (audible/visual)
 Self-test pass: Yes (audible/visual)
 Other: End of life (audible/visual)

CONTINUOUS LCD DISPLAY:

Alphanumeric status panel LCD advises:
 Gas monitored: H₂S or CO
 Life remaining: Continuously displayed in days and then hours
 Two alarm levels: LOW alarm / HIGH alarm
 Peak alarm levels: Records and displays peak alarm exposure, and time elapsed (up to 24 hrs.)
 Alarm setpoints: High and low (displayed on demand in ppm)
 Self-test status: Advises to "TEST" and that self-test was passed "✓"

TESTS

Full function self-test: On demand, as often as once every 20 hours and on activation
 Battery: Every two hours (auto)

GENERAL SPECIFICATIONS:

Impact-resistant ABS enclosure
 Humidity: 5% to 95% RH (non-condensing)
 EMI/RFI: Complies with EMC Directive 89/336/EEC
 Battery: Lithium, non-replaceable
 Size: 1.0 x 1.45 x 2.3 inches / 26 x 37 x 58 mm
 Weight: 1 oz. / 30 g

WARRANTY: 100 days from activation plus 1 year shelf life

¹Given 3-5 minutes of alarm per day in normal operation

²Customer special alarm settings available

DUE TO ONGOING RESEARCH AND PRODUCT IMPROVEMENT, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

RATINGS AND CERTIFICATIONS: (Intrinsic safety)

UL_{us} Class I, Div. 1, Groups A, B, C, D
 Class I, Zone 0, Gr. IIC

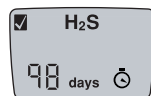
ATEX: CE II 1 G
 EX Approval: EEx ia IIC
 CE: European Conformity

- FULL FUNCTION DAILY SELF-TEST
- ADVANCED MICROCONTROLLER OPERATION
- TWO LEVELS OF GAS ALARM
- 95 dB AUDIBLE ALARM
- BRIGHT, WIDE-ANGLED VISUAL ALARM BAR
- SUPERIOR RFI PROTECTION
- RUGGED ENCLOSURE



Interactive Product Demo CD-ROM

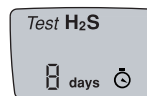
Full Information STATUS Panel



▲ Displays life remaining in days and hours



▲ Advises alarm level encountered (LOW/HIGH)



▲ Display automatically advises self-test is due



▲ Displays alarm setpoints in ppm

Locally distributed by:



GasAlertClip Extreme

H₂S, SO₂, CO, or O₂

"INNOVATORS IN GAS DETECTION"

BW

Technologies



2 Year Disposable Gas Detector



ACTUAL SIZE

Water Resistant

Protect Yourself

- ▲ Two years of protection with zero maintenance costs
- ▲ Continuous, alphanumeric, status LCD shows detector life remaining, alarm setpoints and advises self-test status
- ▲ Rugged, IP-66/67 highly water-resistant design
- ▲ Built-in concussion-proof boot
- ▲ Records and displays the peak alarm encountered and the time elapsed since the exposure occurred
- ▲ Automatic event logging records 10 most recent alarm events that can be downloaded via infrared port
- ▲ Two alarm levels (Low / High)
- ▲ Provides typical 95 dB tone and bright, quad-LED indication on alarm
- ▲ Internal vibrator alarm
- ▲ Small size (1.1 x 2.0 x 3.2 in. / 28 x 50 x 81 mm) and lightweight (2.7 oz. / 76 g)
- ▲ Maintenance free—no sensor or battery replacement, no calibration, no downtime
- ▲ Full-function self-test of audible/visual alarms, plus integrity of sensor, battery and circuitry
- ▲ Continuously ON—one-button activation, test and data transmission
- ▲ Comes complete with rugged, stainless-steel alligator belt clip and test cap
- ▲ Instructions in local languages included
- ▲ Optional hard hat clips available



Ordering Information

2 Year GasAlertClip Extreme Detectors with Event Logging

GA24XT-H	H ₂ S detector
GA24XT-M	CO detector
GA24XT-S	SO ₂ detector
GA24XT-X	O ₂ detector

Accessories

GA-TS02	GasAlertClip automatic test station
GA-HC-1	Hard hat clip (for use with alligator clips GA-AG-1 and GA-AG-3)
GA-AG-1	Alligator clip (non-conductive)
GA-CL-1	Belt Clip (stainless steel)
GA-NS1	Neck strap w/ safety release
GA-USB1	Infrared USB adaptor kit (includes EDM Excel datamanagement software)
GPR-PRINTER	Thermal cordless printer
GA-TC-1	Test cap and hose

Extreme protection!
Extreme durability!
Extreme value!



www.gasmonitors.com

Email: info@bwt.net

GasAlertClip Extreme

H₂S, SO₂, CO, or O₂

2-Year Gas Detection with Event Logging

Simply press the START/TEST button and the GasAlertClip Extreme is ready to use, providing two years of continuous, maintenance-free operation from the day of activation.

The GasAlertClip Extreme is highly water-resistant, with an IP-66 / 67 housing fully immersible to a depth of one full meter. The GasAlertClip-Extreme housing includes a built-in concussion-proof boot, and a heavy-duty, stainless steel, alligator style belt-clip. A large easy-to-read LCD shows detector life remaining, alarm setpoints, peak alarm exposures, and other information.

The detector life remaining is displayed in months, days, then hours. A full-function self-test verifies sensor, circuitry and battery integrity, as well as function of the audible, visual and vibrator alarms.

Stored data can be transmitted directly by IR link to a cordless thermal printer for immediate printout, or to a personal computer by means of an IR adapter connected to the computer's USB port.

The GasAlertClip Extreme is equipped with two alarm setpoints used to activate a high output 95 dB (typical) audible alarm, a bright, wide-angled quad LED visual alarm, and a built-in vibrator alarm.

Simply clip the GasAlertClip Extreme to your lapel, pocket, belt or hard-hat for unequaled, cost-effective protection.

"INNOVATORS IN GAS DETECTION"



For further information:

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BW1067-01-01-01-8.25x11-7/17/2003-5472-0

SPECIFICATIONS

DETECTOR: Zero-maintenance detector

Gas monitored	H ₂ S	CO	SO ₂	O ₂
Sensor range	0-100 ppm	0-300 ppm	0-100 ppm	0-30.0 % by vol.
Low alarm level ¹	10 ppm	35 ppm	5 ppm	19.5%
High alarm level ¹	15 ppm	200 ppm	10 ppm	23.5%
Operating temperature ²	-40 to +122°F -40 to +50°C	-22 to +122°F -30 to +50°C	-22 to +122°F -30 to +50°C	-4 to +122°F -20 to +50°C
Calibration	Not required			Self-calibrating

¹Customized alarm settings available at no extra charge

²Internal vibrator operates to -15 °C / +5 °F

GENERAL SPECIFICATIONS:
Rugged composite material with integral concussion-proof boot
Humidity: 5% to 95% RH (non-condensing)
EMI/RFI: Complies with EMC Directive 89/336/EEC
Ingress protection: IP 66/67
Battery: Lithium, non-replaceable
Continuously On: Yes
One-button control: Activation, self-test and alarm event data transmission
Full Functional self-test: Verifies integrity of sensor, circuitry, battery and audible/visual alarms
Sensor: Electrochemical cell (temperature compensated)
Operational Life: Two years

INDICATORS AND ALARMS:
Visual alarm: Flashing, wide-angled alarm lens with quad red LEDs, plus ALARM LCD readout
Audible alarm: Pulsing, high-output siren at 95 dB (typical) at 1 ft. (0.3 m)
Vibrator alarm: Internal
Failure alarm: Yes (audible/visual/vibration)
Self-test pass: Yes (audible/visual/vibration)
Other: End of life (audible/visual/vibration)

CONTINUOUS LCD DISPLAY:
Status display
Life remaining: Continuously displayed in months, then days, then hours
Two alarm levels: LOW alarm / HIGH alarm
Peak alarm exposure: Records and displays peak alarm exposure, and time elapsed (up to 24 hrs.)
Alarm setpoints: High and low (displayed on demand in ppm or %)
Self-test status: Advises to "TEST" and that self-test was passed

TESTS:
Full function self-test: ON-demand, as often as once every 20 hours and on activation
Battery: Every two hours (auto)

EVENT LOGGING:
Records and transmits up to 10 gas alarm events
Event Information: Gas type, peak exposure level (ppm or %); alarm duration in minutes and seconds; time elapsed since the alarm occurred in days, hours and minutes, life remaining, self-tests, cumulative alarm time
Transmission method: Via infrared port to thermal printer or to USB PC adapter

PHYSICAL SIZE:
Size: 1.1 x 2.0 x 3.2 inches / 28 x 50 x 81 mm
Weight: 2.7 oz. / 76 g

WARRANTY: 2 years from activation, plus 1-year shelf life (given 3-5 minutes of alarm per day in normal operation)

DUE TO ONGOING RESEARCH AND PRODUCT IMPROVEMENT, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

RATINGS AND CERTIFICATIONS:

UL: Class I, Div. 1, Gr. A, B, C, D
Class I, Zone 0, Gr. IIC

ATEX: CE II 2 G
EX Approval: EEx ia IIC T4
CE: European Conformity



- FULL FUNCTION SELF-TEST
- ADVANCED MICROCONTROLLER OPERATION
- TWO LEVELS OF GAS ALARM
- HIGH OUTPUT AUDIBLE ALARM
- BRIGHT, WIDE-ANGLED VISUAL ALARM
- INFRARED DATA PORT
- SUPERIOR RFI PROTECTION
- RUGGED ENCLOSURE



INFRARED USB ADAPTER

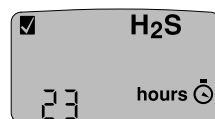


FULL-FUNCTION AUTOMATIC TEST STATION



INFRARED PRINTER

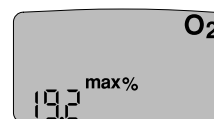
Full information STATUS display



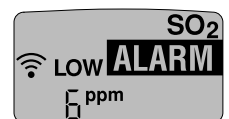
△ Life remaining in months, days and hours



△ Advises alarm level encountered (LOW/HIGH)



△ Records and displays peak alarm exposure in past 24 hrs.



△ Displays alarm setpoints in ppm or %

Locally distributed by:



GasAlertClip

H₂S, CO, SO₂ or O₂

"INNOVATORS IN GAS DETECTION"

BWF

Technologies



2 Year Disposable Gas Detectors



ACTUAL SIZE

Protect Yourself

- ▲ Two years of protection with zero maintenance costs
- ▲ Continuous, alphanumeric LCD shows detector life remaining, alarm setpoints and advises self-test status
- ▲ Records and displays the peak alarm encountered and the time since the exposure occurred
- ▲ Records and transmits gas alarm events encountered and the time elapsed since the event occurred
- ▲ Two alarm levels (Low / High)
- ▲ Provides ~ 90 dB tone and bright LED indication on alarm
- ▲ Internal vibrator alarm
- ▲ Small size (1.1 x 2.0 x 3.2 inches / 28 x 50 x 81 mm) and lightweight (2.6 oz. / 73 g)
- ▲ Maintenance free—no sensor or battery replacement, no calibration, no downtime
- ▲ Full function self-test of: audible/visual alarms plus integrity of sensor, battery and circuitry
- ▲ Continuously on—one button activation, test and data transmission
- ▲ Comes complete with pocket/belt clip and test cap
- ▲ Instructions in local languages included
- ▲ Optional alligator and hard hat clips available

**NOW with
event logging**



GasAlertClip with infrared port now records and transmits event data.



Ordering Information

2 Year GasAlertClip detectors with event logging and internal vibrator

GA24A-H-EL	H ₂ S detector
GA24A-M-EL	CO detector
GA24A-S-EL	SO ₂ detector
GA24A-X-EL	O ₂ detector

Note: Models above are available with special alarm setpoints at no extra charge

Accessories

GA-TS02	GasAlertClip automatic test station
GPR-PRINTER	Thermal cordless printer
GPR-PP-K4	Thermal printer paper (kit of 3)
GA24-BALERT	Concussion-proof boot with alligator clip
GA-HC-1	Hard hat clip
GA-AG-1	Alligator clip (non-conductive)
GA-AG-2	Alligator clip (high-tension metal)
GA-TC-1	Test cap and hose
GACLIP-CD2	Training CD

www.gasmonitors.com

Email: info@bwt.net

GasAlertClip

H_2S , SO_2 , CO or O_2

2 Year Gas Detectors with Event Logging

The GasAlertClip provides two years of continuous maintenance-free operation from the day of activation. Operated by an advanced microcontroller and electrochemical sensor, the GasAlertClip is equipped with two levels of alarm, a full feature LCD status panel and high output audible/visual alarms.

Simply press the START/TEST button and the GasAlertClip is ready for use. The life remaining is displayed in months, then days and then hours. The full function self-test verifies sensor, circuit and battery integrity and audible/visual alarms.

Alarm setpoints, peak alarm and the time elapsed since the peak alarm occurred are displayed on command.

Generate a permanent record of gas alarm events encountered. Transmit stored event data to a cordless printer.

The rugged, compact GasAlertClip is designed with the most advanced RFI protection available in industry today. Simply clip the instrument to your lapel, pocket, belt or hard hat for unequaled cost effective protection.

SPECIFICATIONS

DETECTOR: Disposable, zero-maintenance gas detector

Gas monitored:	H_2S	CO	SO_2	O_2
Sensor range:	0 - 100 ppm	0 - 300 ppm	0 - 100 ppm	0 - 30.0% by vol.
Low alarm level ¹ :	10 ppm	35 ppm	5 ppm	19.5 %
High alarm level ¹ :	15 ppm	200 ppm	10 ppm	23.5 %
Operating Temperature ² :	-40 to +122 °F -40 to +50 °C	-22 to +122 °F -30 to +50 °C	-22 to +122 °F -30 to +50 °C	-4 to +122 °F -20 to +50 °C
Calibration:	Not required			Self-calibrating

¹Special alarm settings available at no extra charge

²Internal vibrating option operates to -15 °C / +5 °F

Operational life: Two years³

Continuously on: Yes

One-button control: Activation, self-test and alarm event data transmission

Full function self-test: Verifies integrity of sensor, circuitry and battery; audible/visual alarms

Sensor: Electrochemical cell (temperature compensated)

INDICATORS AND ALARMS

Visual gas alarm: Flashing, wide-angled alarm lens with dual red LEDs plus ALARM LCD readout

Audible gas alarm: Pulsing siren ≈90 dB at 1 ft. / 0.3 m

Vibrator alarm: Internal

Failure alarm: Yes (audible/visual)

Self-test pass: Yes (audible/visual)

Other: Low battery and end of life (audible/visual)

CONTINUOUS LCD DISPLAY:

Alphanumeric status panel LCD advises:

Life remaining: Continuously displayed in months, then days, then hours

Two alarm levels: LOW alarm / HIGH alarm

Peak alarm exposure: Records and displays peak alarm exposure, and time elapsed (up to 24 hrs.)

Alarm setpoints: High and low (displayed on demand in ppm or %)

Self-test status: Advises to "TEST" and that self-test was passed "✓"

TESTS

Full function self-test: On-demand, as often as once every 20 hours and on activation

Battery: Every two hours (auto)

EVENT LOGGING:

Records and transmits up to 10 gas alarm events

Event information: Gas type, peak exposure level (ppm or %); alarm duration in minutes and seconds; time elapsed since the alarm occurred in days, hours and minutes

Transmission method: Via infrared port to thermal printer

GENERAL SPECIFICATIONS:

Impact-resistant ABS enclosure

Humidity: 5% to 95% RH (non-condensing)

EMI/RFI: Complies with EMC Directive 89/336/EEC

Battery: Lithium, non-replaceable

Size: 1.1 x 2.0 x 3.2 inches / 28 x 50 x 81 mm

Weight: 2.6 oz. / 73 g

WARRANTY:

2 years from activation plus 1 year shelf-life

³Given 3-5 minutes of alarm per day in normal operation

DUO TO ONGOING RESEARCH AND PRODUCT IMPROVEMENT, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

RATINGS AND CERTIFICATIONS:

UL Class I, Div. 1, Gr. A, B, C, D

(Intrinsic safety) Class I, Zone 0, Gr. IIC

ABS

ATEX: CE II 2 G

EX Approval: EEx ia IIC

CE: European Conformity

- FULL FUNCTION SELF-TEST
- ADVANCED MICROCONTROLLER OPERATION
- TWO LEVELS OF GAS ALARM
- HIGH OUTPUT AUDIBLE ALARM
- BRIGHT, WIDE-ANGLED VISUAL ALARM LENS
- INFRARED DATA PORT
- SUPERIOR RFI PROTECTION
- RUGGED ENCLOSURE

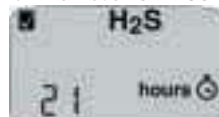


INFRARED PRINTER



FULL FUNCTION AUTOMATIC TEST STATION

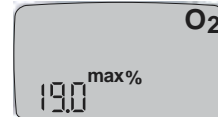
Full Information STATUS Panel



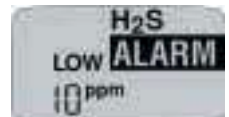
△ Life remaining in months, days and hours



△ Advises alarm level encountered (LOW/HIGH)



△ Records and displays peak alarm exposure in past 24 hrs.



△ Displays alarm setpoints in ppm or %

Locally distributed by:

"INNOVATORS IN GAS DETECTION"



For further information:

1-888-749-8878 USA
1-800-663-4164 Canada
+44 (0) 1869 233004 Europe
+971-4-8871766 Middle East
+61-7-3818-8244 Australia
+1-403-248-9226 other countries

Corporate Headquarters

2840 - 2 Avenue S.E.
Calgary, AB, Canada T2A 7X9
Fax: +1-403-273-3708

E-mail: info@bwnet.com
www.gasmonitors.com

GasAlert

H₂S, CO, SO₂, Cl₂, HCN, NO₂, NH₃, PH₃, or O₂

"INNOVATORS IN GAS DETECTION"



Single-Gas Detectors



ACTUAL SIZE

Now Available for
NH₃ and PH₃

Protect Yourself

- ▲ Continuous LCD shows real-time gas concentration with backlight in low light (auto); in alarm (auto) and on demand
- ▲ Small size (1.1 x 2.0 x 3.75 in. / 28 x 50 x 95 mm) and lightweight (2.9 oz. / 83 g)
- ▲ Provides 90 dB tone and bright LED indication on alarm
- ▲ 3-year battery life (9,000 hours)
- ▲ Available with internal vibrating alarm
- ▲ Equipped with plug-in, replaceable sensor
- ▲ Simple auto-zero and calibration procedure
- ▲ Peak value displayed on command (in ppm or % LEL)
- ▲ LOW, HIGH, TWA and STEL alarms with adjustable setpoints
- ▲ TWA (time weighted average) values are recorded and displayed to evaluate the cumulative exposure danger and to aid regulatory compliance
- ▲ Classified intrinsically safe by UL to U.S. and Canadian standards; Cenelec certified; certified in Australia
- ▲ Full function self-test of: sensor, battery, circuitry integrity and audible/visual alarms
- ▲ Pocket/belt clip, test cap and hose, battery, and instructions in local languages included



ATEX



Plus
Others



Ordering Information

GasAlert Detectors

(Standard)		(with Internal Vibrator Alarm)	
GA-H	H ₂ S	GAA-H	H ₂ S
GA-M	CO	GAA-M	CO
GA-S	SO ₂	GAA-S	SO ₂
GA-C	Cl ₂	GAA-C	Cl ₂
GA-Z	HCN	GAA-Z	HCN
GA-D	NO ₂	GAA-D	NO ₂
GA-A	NH ₃	GAA-A	NH ₃
GA-P	PH ₃	GAA-P	PH ₃
GA-2X	O ₂	GAA-2X	O ₂

Note: For factory password protect option, add suffix: "-5"

Accessories and spares

GA-HC-1	Hard hat clip
GA-AG-1	Alligator clip
GA-BALERT	Concussion-proof boot
GA-VIB3	Remote vibrator arm
GA-HL-R3	Remote audible/visual alarm
GA-SS	Sensor screen (kit of 10)
GALERT-CD1	Training CD
GALERT-VID	Training Video (VHS)
GALERT-VID2	Training Video (PAL)

Replacement Sensors

PS-RH04S	H ₂ S	PS-RC10	Cl ₂	SR-A04	NH ₃
PS-RM04	CO	PS-RD04	NO ₂	SR-X10	O ₂
PS-RS04	SO ₂	PS-RZ10	HCN	SR-PO4	PH ₃

www.gasmonitors.com

Email: info@bwt.net

GasAlert

H_2S , CO , SO_2 , Cl_2 , HCN ,
 NO_2 , NH_3 , PH_3 or O_2

Single-Gas Detector

GasAlert provides extraordinary cost of ownership advantages. These include automated calibration, 3-year lithium battery (available in local stores) and simple, one-button control. Each of these features lowers your training and maintenance costs. Operated by an advanced microcontroller and an electrochemical sensor, the GasAlert is equipped with high output audible/visual alarms.

The bright, large LCD shows real-time gas concentrations and the instrument's status at all times. The full function self-test verifies sensor, circuitry and battery integrity and activates the audible/visual alarms each time you turn the instrument on. The detector clearly advises the gas hazard present—Low, High, TWA and STEL gas alarm. Recorded TWA, STEL and Peak exposures can be displayed on demand.

The compact, rugged GasAlert is designed with the most advanced RFI protection available today. Delivered ready for use, simply clip the instrument to your pocket, belt or hard hat for unequalled protection.

SPECIFICATIONS

DETECTOR: Single-gas detector

GasAlert for:	Measuring Range	Alarm Setpoints ¹ (Factory defaults are shown. Alarm levels are field-adjustable.)				Operating Temperature
		TWA Alarm	STEL Alarm	Low Alarm	High Alarm	
Hydrogen Sulfide (H_2S)	0-100 ppm	10 ppm	15 ppm	10 ppm	15 ppm	-40 to +50 °C -40 to +122 °F
Sulfur Dioxide (SO_2)	0-100 ppm	2 ppm	5 ppm	2 ppm	5 ppm	
Hydrogen Cyanide (HCN)	0-30.0 ppm	4.7 ppm	10.0 ppm	4.7 ppm	10.0 ppm	
Carbon Monoxide (CO)	0-999 ppm	35 ppm	200 ppm	35 ppm	200 ppm	-30 to +50 °C -22 to +122 °F
Chlorine (Cl_2)	0-50.0 ppm	0.5 ppm	1.0 ppm	0.5 ppm	1.0 ppm	
Nitrogen Dioxide (NO_2)	0-99.9 ppm	2.0 ppm	5.0 ppm	2.0 ppm	5.0 ppm	-20 to +50 °C -4 to +122 °F
Ammonia (NH_3)	0-100 ppm	25 ppm	35 ppm	25 ppm	50 ppm	
Oxygen (%by vol.) (O_2)	0-30.0%	N/A	N/A	19.5 %	23.5%	
Phosphine (PH_3)	0-5.0 ppm	0.3 ppm	1.0 ppm	1.0 ppm	2.0 ppm	

Auto zero: Yes
Calibration: Automatic
Backlight: Low light (auto); alarm condition (auto); on demand
Full function self-test: Verifies integrity of sensor, circuitry and battery; audible/visual alarms
Sensor: Plug-in, electrochemical cell (temperature compensated)

INDICATORS AND ALARMS: Clearly advises alarm levels both visually and audibly
Visual alarm: Flashing, wide-angled alarm lens with dual red LEDs, plus alarm LCD readout
Audible alarm: High-output, pulsing 90 dB at 1 ft. / 0.3 m (typically)
Confidence beep: Every 5 seconds (field-selectable)
Other: Low battery; off warning; sensor fail
Optional internal vibrator: Vibrates in sync with audible and visual alarms

CONTINUOUS LCD DISPLAY: Alphanumeric gas readout and status display advises:
Gas ppm or %: Continuously displays gas concentration present
TWA and STEL ppm or %: Records and displays on demand
Peak ppm or %: Records and displays peak (maximum) exposure to gas on demand
Setpoints: Displayed on activation (auto) and on demand in ppm or %

TESTS:
Full function self-test: Full function self-test on activation (auto)
Battery: Continuous (auto)

GENERAL SPECIFICATIONS: Impact-resistant ABS enclosure
Humidity: 5% to 95% RH (non-condensing) (15% to 90% non-condensing for PH_3 and NH_3)
EMI/RFI: Complies with EMC Directive 89/336/EEC
Battery type: 3-volt lithium (camera battery available locally)
Battery life: 3 years (9,000 hours)
Size: 1.1 x 2.0 x 3.75 inches / 28 x 50 x 95 mm
Weight: 2.9 oz. / 83 g

WARRANTY: 2 years including sensor

¹The HIGH Alarm and STEL Alarm have the same highest alarm priority. The LOW Alarm overrides the TWA Alarm.

DUE TO ONGOING RESEARCH AND PRODUCT IMPROVEMENT, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

RATINGS AND CERTIFICATIONS: (Intrinsic safety)

UL: \bullet Class I, Div. 1, Gr. A, B, C, D
Class I, Zone 0, Gr. IIC

ATEX: CE II 2 G

EX Approval: EEx ia d IIC

CE: European Conformity

Australia: AUS Ex ia IIC



- 1 LARGE, ALPHANUMERIC DISPLAY
- 2 ADVANCED, MICROCONTROLLER-BASED OPERATION
- 3 ELECTROCHEMICAL SENSOR
- 4 BRIGHT, WIDE-ANGLED, VISUAL ALARM BAR
- 5 HIGH-OUTPUT, 90 dB AUDIBLE ALARM
- 6 AUTO ZERO
- 7 AUTO BACKLIGHT
- 8 LOW, HIGH AND TWA ALARMS
- 9 RUGGED, COMPACT, LIGHTWEIGHT



"INNOVATORS IN GAS DETECTION"

BW
Technologies

For further information:
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+61-7-3818-8244 Australia
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Corporate Headquarters
2840 - 2 Avenue S.E.
Calgary, AB, Canada T2A 7X9
Phone: +1-403-248-9226
Fax: +1-403-273-3708

E-mail: info@bwnet.com
www.gasmonitors.com

BW1005-01-01-00-8.25x11-5000-7

Full information status panel with easy prompts:



△ Advises alarm level encountered (LOW/HIGH/TWA/STEL)



△ Auto zero and easy prompted calibration



△ Records and displays Peak (Max) exposure



△ LOW battery

Locally distributed by:



GasAlert LEL

Combustible Gas and Vapors

Combustible Gas Detector 0-100% LEL

"INNOVATORS IN GAS DETECTION"

BW

Technologies



ACTUAL SIZE

Protect Yourself

- △ Continuous LCD shows real-time gas concentration with backlight in low light (auto); in alarm (auto) and on demand
- △ Small size (1.5 x 2.0 x 3.75 in / 38.5 x 50 x 95 mm) and lightweight (4.6 oz. /131 g)
- △ Provides 90 dB tone and bright LED indication on alarm
- △ Available with internal vibrating alarm
- △ Simple, automatic calibration procedure
- △ Peak value displayed on command in % LEL
- △ LOW and HIGH alarms with adjustable setpoints
- △ Over Limit alarm and sensor protection
- △ User field options include: Pass Code Protection, Latching High Alarm and Confidence Beep
- △ Equipped with a plug-in replaceable sensor
- △ Powered by a integral rechargeable lithium ion battery
- △ Intrinsically safe to U.S., European and Canadian standards
- △ Full function self-test of: sensor, battery and circuitry integrity; and audible/visual alarms
- △ Pocket/belt clip, test cap and hose, battery, charger and instructions in local languages included



ATEX



Plus
Others

ISO 9001

Ordering Information

GA-W GasAlert LEL 0-100% LEL detector
GAA-W GasAlert LEL detector with internal vibrator alarm

Note: Add suffix for delivery with 220 VAC charger:

Europe: -EU United Kingdom: -UK Australia: -AU

Accessories and Spares

GA-HC-1 Hard hat clip
GA-AG-1 Alligator clip (non-conductive ABS)
GA-AG-2 Alligator clip (high-tension metal)
GA-BALERT2 Shock resistant boot
GA-NS-1 Neckstrap
GA-SPAK SamplerPak motorized sampling pump kit
CG2-J-2.5-34 Methane calibration gas cylinder (34 L)
CG2-R-1.0-34 Propane calibration gas cylinder (34 L)
CG2-K-0.75-34 Pentane calibration gas cylinder (34 L)
D4-RW90 Replacement LEL (0-100%) sensor
GA-CO2 Charger with 110 VAC mains plug
GA-W-CD1 Training CD

Note: Add suffix for delivery with 220 VAC charger:

Europe: -EU United Kingdom: -UK Australia: -AU

www.gasmonitors.com

Email: info@bwt.net

GasAlert LEL

0-100% LEL

Single-Gas Detector

GasAlert LEL provides extraordinary cost of ownership advantages. These include automated calibration, and simple one-button control. Each of these features lowers your training and maintenance costs. GasAlert LEL is operated by an advanced microcontroller and is equipped with a plug-in, poison resistant catalytic bead sensor and high output audible/visual alarms.

The Over Limit alarm is latching and must be acknowledged by the user to shut it OFF. User field options include Pass Code Protection, Latching High Alarm and Confidence Beep.

The bright, large LCD shows real-time gas concentrations and the instrument's status at all times. The full function self-test verifies sensor, circuitry and battery integrity and activates the audible/visual alarms each time you turn the instrument on. The detector clearly advises the gas hazard present—Low and High gas alarms. Recorded Peak exposures can be displayed on demand.

The compact, rugged GasAlert LEL is designed with the most advanced RFI protection available today. Delivered ready for use, simply clip the instrument to your pocket or belt for unequalled protection.

"INNOVATORS IN GAS DETECTION"



For further information:
1-888-749-8878 USA
1-800-663-4164 Canada
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+1-403-248-9226 Other Countries

Corporate Headquarters
2840 - 2 Avenue S.E.
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Phone: +1-403-248-9226
Fax: +1-403-273-3708

E-mail: info@bwtnet.com
www.gasmonitors.com

BW1005-01-01-00-8.25x11-5006-3

SPECIFICATIONS

DETECTOR: Single-gas detector

GasAlert LEL:	Measuring Range	Alarms		
		Low Level	High Level	Over Range
Combustible Gases/Vapors:	0-100%LEL	10% LEL	20% LEL	100% LEL

Auto zero:	Yes
Calibration:	Automatic
Backlight:	Low light (auto); alarm condition (auto); on demand
Full function self-test:	Verifies integrity of sensor, circuitry and battery; audible/visual alarms
Sensor:	Catalytic bead. Poison resistant (equipped with filters to eliminate the poisoning effects of silicone vapors and sulfur compounds).
INDICATORS AND ALARMS:	Clearly advises alarm levels both visually and audibly
Visual alarm:	Wide-angled alarm lens, plus alarm LCD readout
Audible alarm:	High-output, pulsing 90 dB at 1 ft. / 0.3m
Over limit alarm:	Latching alarm at 100% LEL
User field options:	Pass Code Protection, Latching High Alarm and Confidence Beep
Confidence beep:	Every 5 seconds (field-selectable)
Other:	Low battery; off warning; sensor fail
Optional internal vibrator:	Vibrates in sync with audible and visual alarms
CONTINUOUS LCD DISPLAY:	Alphanumeric gas readout and status display advises:
Gas %:	Continuously displays gas concentration present
Peak %:	Records and displays peak (maximum) exposure to gas on demand
Setpoints:	Displayed on activation (auto) and on demand in %
TESTS:	
Full function self-test:	Full function self-test on activation (auto)
Battery:	Continuous (auto)
GENERAL SPECIFICATIONS:	Shock-resistant ABS enclosure
Operating temperature:	-25 to -45 °C / -13 to +114 °F
Humidity:	5% to 95% RH (non-condensing)
EMI/RFI:	Complies with EMC Directive 89/336/EEC
Battery Type:	Rechargeable integral lithium ion
Battery Life:	Up to 14 hours per charge; 500 to 600 charges
Size:	1.5 x 2.0 x 3.75 inches / 38.5 x 50 x 95 mm
Weight:	4.3 oz. / 131 g
WARRANTY:	2 years

¹Factory defaults are shown. Alarm levels are field adjustable.

DUE TO ONGOING RESEARCH AND PRODUCT IMPROVEMENT, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

RATINGS AND CERTIFICATIONS:
(Intrinsic safety)

UL: Class I, Div. 1, Gr. A, B, C, D
Class I, Zone 0, Gr. IIC
BAM: EN 50054, EN 50057

ATEX: CE II 2 G
EX Approval: EEx ia d IIC
CE: European Conformity

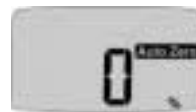


- 1 LARGE, ALPHANUMERIC DISPLAY
- 2 ADVANCED MICROCONTROLLER-BASED OPERATION
- 3 CATALYTIC SENSOR
- 4 BRIGHT, WIDE-ANGLED VISUAL ALARM LENS
- 5 HIGH-OUTPUT 90 dB AUDIBLE ALARM
- 6 AUTO ZERO, AUTO CALIBRATION
- 7 AUTO BACKLIGHT
- 8 LOW, HIGH AND OVER RANGE ALARMS
- 9 ALARM ACKNOWLEDGE FEATURE
- 10 RUGGED, COMPACT, LIGHTWEIGHT

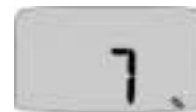
Full Information STATUS Panel with easy prompts:



△ Advises Alarm Level encountered (LOW/HIGH)



△ Auto zero and easy prompted calibration



△ Records and displays Peak (Max) exposure



△ LOW battery

Locally distributed by:



Introducing

GasAlertMicro

H₂S, CO, O₂ and Combustibles

Multi-Gas Detector



ACTUAL SIZE



ATEX



"INNOVATORS IN GAS DETECTION"



www.gasmonitors.com

Email: info@bwt.net



GasAlertMicro

Multi-Gas Detector

Just as cell phones and palm pilots have become smaller, smarter and more affordable, BW Technologies has used the same principles to bring portable gas detection into the 21st century. *GasAlertMicro*, the new safety leader, is designed with cutting-edge technology, ensuring field-friendly operation and a lower cost of ownership.

The *GasAlertMicro* multi-gas detector monitors for 2, 3 or 4 hazardous gases simultaneously and continuously—combustibles, oxygen (deficiency/enrichment), hydrogen sulfide and carbon monoxide.

Triple Alarm System

- ▲ Dual visual alarm bars
- ▲ High-output 95 dB audible
- ▲ Internal vibrator alarm for high noise areas

Tougher

Equipped with integral concussion-proof boot for use in the most rugged environments

Single pushbutton operation

Advanced micro-controller operation

Large High Contrast LCD

shows real-time gas concentrations simultaneously and continuously

Power Choices

- ▲ AA alkaline disposable cells standard (≈18 hours)
- ▲ Optional rechargeable NiMH batteries (≈16 hours) available at local stores

Smaller

weighs only 7.4 oz. / 211 g and fits in the palm on your hand

High-performance plug-in sensors

Peak Values on Command

records and displays exposures encountered:

- ▲ TWA (time-weighted average)
- ▲ STEL (short-term exposure levels)
- ▲ Maximum Gas Exposures

Backlight Auto and On Demand

- ▲ Low light—auto
- ▲ Alarm condition—auto
- ▲ On demand

Field Select to Measure

- combustible gas
- ▲ 0–100% LEL or
 - ▲ 0–5.0% methane

ACTUAL SIZE

Datalogger Models include 32 MB flash MMC data storage card

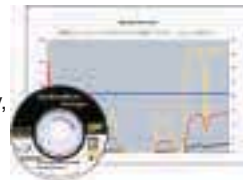
Take the Work Out of Datalogging



With automatic data storage no training is required for operation or data retrieval.

Data is stored on a digital flash MultiMediaCard (32 MB standard). A warning advises if the card is not present. Wraparound memory ensures recent data is always saved. Data storage capacity is extraordinary. Store over 4 months of data given a 5 second recording interval and a 32 MB card. Set the recording interval anywhere from 1 second to 127 seconds per record, as desired.

Using the GasAlertMicro free E.D.M. (Excel Datalog Manager) simplifies data management. Create reports, sort, format and graph data automatically. View history, calculate exposures and archive easily.



UNOBTRUSIVE AND CONVENIENT

Simply press to release the lock and slide open the battery drawer for easy field replacement.



- Larger, User Friendly LCD -

The high-definition alphanumeric display shows all current conditions and advises when automatic functions take place. *Never fear in the dark*—the backlight illuminates automatically in low light conditions and in all alarm conditions.

- Auto ON Functions -

Ensuring the instrument is ready for use, GasAlertMicro tests all features and functions each time it is turned on. Sensors and circuitry integrity are also tested. Current alarm setpoints are displayed, the oxygen sensor is calibrated and all display elements and alarms are activated. Datalogger models display the time and date. You are also advised when the next calibration is due.



- Automatic Sensor Calibration -

Auto zero the sensors, at any time, without calibration gas. Calibrate one or all four sensors automatically, simply apply gas. GasAlertMicro tests the gas applied. If the gas does not meet expected parameters, GasAlertMicro exits calibration mode, preventing improper calibration. All previous data is retained.

- User Field Options -

GasAlertMicro provides the flexibility you require.

- ▲ **Confidence Beep**
- ▲ **Pass Code Protection**—restricts access to user options menu, calibration, alarm setpoint and calibration due functions.
- ▲ **Safe Display Mode**
- ▲ **Latched Gas Alarms**—sound until acknowledged.
- ▲ **Combustibles Selection**—select to measure 0-100% LEL or methane 0-5.0% v/v.
- ▲ **Set Calibration Due Date**



DATALOGGER MODELS

- ▲ **Real-time Clock/Calendar**—Set time and date.
- ▲ **Sampling Interval**—Set from 1 to 127 seconds.

STATUS at a Glance: Information and guidance is provided quickly and clearly.

	Alarm Advise Alarm icons light to advise the alarm level and type: instant LOW, instant HIGH, STEL (short-term exposure level) and TWA (time-weighted average).
	Automatic Calibration Auto zero the sensors at any time. Calibrate one or all four sensors, simply apply gas when the flashing Auto Span icon lights.
	Power Continually tested, the low battery alarm advises when power is low.
	Pass Code Protection for calibration and alarm setpoints and calibration due date.

- Additional Features and Functions -

- Four levels of alarm: instant LOW, instant HIGH, TWA and STEL.
- Low Battery Warning provides a 30 minute alert.
- GasAlertMicro *cannot* be accidentally shut OFF.
- Automatic shutdown prevents unsafe usage.
- Defective or missing sensor alarm.
- Over Limit alarm and Multi-gas alarm protection.

- Tough, Durable Construction -

The compact, lightweight GasAlertMicro fits in the palm of your hand. Water and dust resistant, the GasAlertMicro is designed to withstand a 6 ft. / 2 m drop test, allowing it to perform in the most adverse environments.

- More for Less -

GasAlertMicro provides the most advanced safety protection and the best value in a multi-gas detector on the market today.

- Affordable -

User friendly operation results in lower training, operating and maintenance costs. Coupled with the low purchase price, this advantage makes the GasAlertMicro the most affordable industrial multi-gas detector.

Accessories, Options and Spares — the right tool is available for the job

Rechargeable Power



VAC and VDC Vehicle Kits

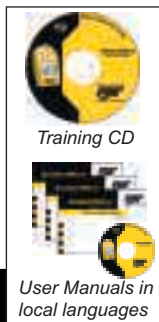
Sampling Options



Aspirator Pump 10 ft. / 3 m Hose

The Sampler motorized pump

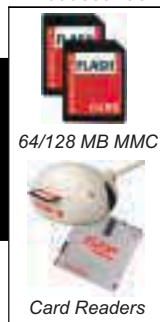
Support Materials



Training CD

User Manuals in local languages

Datalogger Accessories



64/128 MB MMC

Card Readers

Calibration Equipment



Quad Gas Kits
Cylinders
Bump Test Gas

Confined Space Kits



Confined Space Kits with Sampler

SamplerPak Kits



GasAlertMicro

H₂S, CO, O₂
and Combustibles

Multi-Gas Detector

RATINGS AND CERTIFICATIONS:
(Intrinsic safety)

Classified to US and Canadian Standards by CSA:

Class I, Div. 1, Groups A, B, C, D
Class I, Zone 0, Gr. IIC

Combustible Gas Performance Certified to:

ANSI/ISA-S12.13
CSA C22.2 No.152

ATEX Certified

ABS

Australian approval pending

SPECIFICATIONS

Detector: 2, 3 or 4-gas detectors
Auto zero: Yes
Calibration: Automatic
Backlight: Low light (auto); alarm conditions (auto) and on demand
Sensors: Plug-in electrochemical cells (H₂S/CO TWIN TOX, O₂); catalytic bead (LEL)
Field options: Confidence beep, pass code protection, latching alarms, calibration due date, "SAFE" display function, combustibles selection, sensor enable/disable, -DL2 models only: set real-time clock and calendar, sampling rate

ALARMS INDICATORS: Clearly advises alarm levels both audibly and visually
Visual alarms: Two flashing alarm bars visible from all angles
LCD advises gas present and alarm level encountered
Audible alarm: High output, variable pulsed dual beepers 95 dB at 1 ft. / 0.3 m
Vibrator alarm: Pulses warning in all gas alarm conditions and status alarms

ALARM LEVELS/TYPES: All gases: Instant Low; Instant High
Toxic Gases (H₂S and/or CO): TWA (time-weighted average) and STEL (short-term exposure level).
Other alarms: Low battery and missing sensor alarms

LCD DISPLAY: Large, continuous, alphanumeric gas readout and status display
Gases monitored: H₂S (0-100 ppm range); CO (0-500 ppm range); O₂ (0-25% v/v range); combustibles (0-100% LEL or 0-5.0% v/v methane)
TWA and STEL ppm: Records STEL and TWA exposures and displays readings on demand
Peak ppm, %LEL or % v/v: Records peak exposure to gas and displays on demand
Setpoints: Displayed on activation (auto)

TESTS
Full function self-test: On activation (auto) verifies: sensor and circuitry integrity and activates audible/visual/vibrator alarms
Battery: Continuous (auto)

GENERAL SPECIFICATIONS: Rugged, composite material with integral concussion-proof boot
Operating temperature: -4 to +122 °F / -20 to +50 °C
Humidity: 5% to 95% RH (non-condensing)
EMI/RFI: Complies with EMC Directive 89/336/EEC
Battery run time: 16 to 18 hours on two AA alkaline batteries
14 to 16 hours on two NiMH rechargeable batteries
Size: 2.4 x 4 x 1.3 inches / 6 x 10 x 3.3 cm
Weight: 7.4 oz. / 211 g

WARRANTY: Full 2-year warranty including all sensors

DATALOGGER OPTION: User downloadable datalogger
Data recorded: All events and occurrences
Sampling rate: Field-settable sampling intervals from 1 to 127 seconds (factory set at 5 second sampling intervals)
500,000 records (4.4 months given sample rate of 5 seconds and 32 MB MMC)
Storage capacity: Wraparound memory ensures most recent data is saved
Memory type: Standard office spreadsheet programs (Excel™, Access etc.)
Software Required:

DUE TO ONGOING RESEARCH AND PRODUCT IMPROVEMENT, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

Ordering Information: GasAlertMicro is delivered—ready for use—with: sensors, two AA alkaline batteries, stainless steel alligator belt clip, calibration cap with hose and instructions.

Gas Detector in Safety Yellow

GAMIC-4 4-gas: H₂S, CO, O₂, LEL
GAMIC-3H 3-gas: H₂S, O₂, LEL
GAMIC-3M 3-gas: CO, O₂, LEL
GAMIC-3S 3-gas: SO₂, O₂, LEL
GAMIC-2 2-gas: O₂, LEL
GAMIC-2HW 2-gas: H₂S, LEL

Also available in black

Detectors with User Downloadable Datalogger

Includes 32 MB MMC Flash memory card and free software. **Add suffix** "-DL2"

Value Added Confined Space Kits

In addition to the above, kits include a hard-sided carrying case, 10 ft. / 3 m sampling hose, 4-port charger, 4 NiMH batteries, 34 liter calibration gas cylinder and regulator.

with The Sampler motorized sampling pump

GAMIC-4-CK-SP with 4-gas detector
GAMIC-4-CK2-SP with 4-gas datalogging detector

with the manual aspirator sampling pump

GAMIC-4-CK with 4-gas detector
GAMIC-4-CK2 with 4-gas datalogging detector

GasAlertMicro SamplerPak

Includes standard accessories and the SamplerPak. The SamplerPak includes the Sampler (external motorized sampling pump), sampling hoses, sampling tubes and a carrying case.

GAMIC-4-SK with 4-gas detector
GAMIC-4-SKC with 4-gas detector and charger kit

Accessories

GAMIC-C01-K Four NiMH rechargeable batteries with 4-port charger kit
D4-AS01 Aspirator pump with 10 ft. / 3 m hose
GA-SPAK Sampler motorized sampling pump kit
MMC64 64 MB MultiMediaCard (MMC)
CR-MMC-USB1 MMC reader (USB port)
GAMIC-CD1 Training video on CD-ROM

Calibration Equipment

CG-Q58 Quad calibration gas 58 L
CG-Q34 Quad calibration gas 34 L
CG-BUMP1 Alarm test gas 11 L
CK-Q58 Calibration kit with 58 L gas
CK-Q34 Calibration kit with 34 L gas

Locally Distributed By:

"INNOVATORS IN GAS DETECTION"



For further information:
1-888-749-8878 USA
1-800-663-4164 Canada
+44 (0) 1869 233004 Europe
+971-4-8871766 Middle East
+61-7-3818-8244 Australia
+1-403-248-9226 Other Countries

Corporate Headquarters

Tel: +1-403-248-9226
Fax: +1-403-273-3708
2840 - 2 Avenue S.E.
Calgary, AB, Canada T2A 7X9

E-mail: info@bwt.net.com
www.gasmonitors.com

BW1006-01-01-00-8.25x11-5057-4

GASALERTMAX

H₂S, CO, O₂ and %LEL

Multi-Gas Detector



ACTUAL SIZE

   **ATEX** *Plus Others* **ISO 9001**

"INNOVATORS IN GAS DETECTION"



www.gasmonitors.com
Email: info@bwt.net

GASALERTMAX

Multi-Gas Detector

BW Technologies' GasAlertMax multi-gas detector with optional datalogging monitors for 2, 3, or 4 hazardous gases simultaneously and continuously: combustibles, oxygen (deficiency/enrichment), carbon monoxide and hydrogen sulfide. The GasAlertMax is the new benchmark in gas detection, setting the standards for ease of use, reliability and effective protection, using forefront microcontroller and sensor technology.

Wide-angled visual alarm bar, visible from all angles

Plug-in sampling pump and sensor

Large, high-contrast LCD shows real-time gas concentrations for H₂S, CO, O₂ and %LEL

Advanced microcontroller-based operation

Single pushbutton operation

New technology provides the best RFI protection available today

Power
BLACK & DECKER VERSAPAK™ rechargeable battery available worldwide

Rugged ergonomically designed enclosure

Backlight Auto and On Demand
▲ Low light conditions - auto
▲ Alarm condition - auto
▲ On demand

Peak values on command records and displays exposures encountered
▲ TWA (Time Weighted Average)
▲ Maximum gas exposures

Datalogger options
two versions to choose from
▲ Black Box
▲ User-downloadable

High-Output
95 dB audible alarm

Compact
weighs only 15.4 oz. (369 g) including the battery

ACTUAL SIZE

CONVENIENCE and SAFETY:
The VERSAPAK™ battery is easy to replace and provides up to 14 hours of operation.



UNOBTRUSIVE and SIMPLE:
Plug-in sampling pump and sensors housed in a separate compartment are easily changed in the field.



The compact, lightweight GasAlertMax fits in the palm of your hand. The intuitive detector is designed with automatic features and functions.

- Larger, User-Friendly LCD -

GasAlertMax is equipped with a high-definition LCD. The display shows all current conditions and advises the user when automatic functions are taking place. The alphanumeric LCD keeps you advised of any gas hazard present. The backlight illuminates automatically in low light conditions and in all alarm conditions. The backlight also activates on demand.

- Audible/Visual Gas Alarms -

Audible (95 dB) alarms and visual alarms activate, ensuring maximum protection. Visual alarms feature the unique wide-angled alarm bar and flashing screen icons that advise alarm level and type (LOW - TWA - HIGH - Multiple Gas). The LCD gas icon flashes to advise which gas hazard is present.

In **Low Alarm**, the audible alarm sounds in a slow repeating pattern and the visual alarm LEDs flash in sync.

TWA (Time Weighted Average) and **High Alarm** conditions feature urgent, rapid audible/visual patterns. Alarm levels are field-settable.



- Auto ON Functions -

GasAlertMax tests all features and functions each time it is turned on, ensuring the instrument is ready for use.

- ▲ The sensors, battery and data card are tested.
- ▲ The oxygen sensor is calibrated automatically.
- ▲ Current alarm setpoints are displayed.
- ▲ All display elements, the backlight and audible/visual alarms are activated.
- ▲ Current time, day and date are displayed on user-downloadable datalogger models (-DL2).

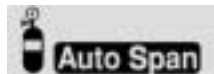


- Automatic Sensor Calibration -

Auto zero the sensors, at any time, without calibration gas. Calibrate one or all four sensors automatically. Simply apply gas when the flashing Auto Span icon lights.



GasAlertMax tests the calibration gas applied. If the calibration gas does not meet expected parameters, the instrument exits Calibration Mode to prevent improper calibration. All the previous calibration data is retained.



- High-Efficiency Sampling Pump -

GasAlertMax is equipped with a high-efficiency, motorized sampling pump. The rotary vane design provides the benefits of a small turbine - *greater reliability with less friction* - and the pump is not pressure sensitive. The detector will automatically advise if the pump or sampling hose is blocked.

Status at a Glance: Information and guidance is provided clearly and quickly by the GasAlertMax:

Alarm Advice: The alarm icons will light to advise the gas level and alarm type encountered: *LOW, HIGH or TWA gas alarms.*

A TWA alarm overrides a LOW alarm, and a HIGH alarm overrides a TWA alarm.

Battery Level: The battery condition is continuously tested and displayed.

Datalogging Advice: The data card icon lights if the data card is present and functioning.

Auto Pump Re-Calibration: Sampling pump calibration is automatic.

- Additional Features and Functions -

- Two (2) levels of alarm for each gas sensed.
- Low battery warning provides a 30-minute alert.
- GasAlertMax *cannot* be accidentally shut off.
- Missing sensor alarm advises which sensor is missing.
- LEL sensor over range alarm protection.
- Gas alarms take priority over all other alarms.
- 2-year warranty on all sensors.

- Lower Capital, Training, Maintenance Costs -

As we all know, cell phones, computers and palm pilots have become smaller, smarter and more affordable. BW Technologies has introduced the same technological advances into the GasAlertMax. Cutting-edge technology in sensors, microcontrollers, program features and fiber optics result in a more compact, affordable and easy-to-use safety instrument.

- User Field Options -

Select any or all of the following:

- ▲ **Confidence Beep** - the detector beeps every 5 seconds when selected on start-up.
- ▲ **Pass Code Protection** - restricts access to calibration and alarm setpoints functions.
- ▲ **Latched Gas Alarms** - Audible/ Visual Alarms will continue to sound until the alarm is acknowledged.
- ▲ **Change Time and Date** - change the time and date on user-downloadable detectors (-DL2) in the field if required.



- Field Upgrade -

If requirements change, 2 and 3-gas detectors can be upgraded in the field to a 3 and/or 4-gas detector by adding a sensor.



Confined Space Kits



Kits include: GasAlertMax, charger, VERSAPAK™ batteries, plus concussion-proof carrying boot 10 ft. (3 m) sampling hose, calibration hose, filter kit, 34 liter calibration gas cylinder, and regulator in a hard-sided carrying case with instructions in local languages.

- GAMAX3-4-CK 4-gas detector: H₂S, CO, O₂, LEL
- GAMAX3-3H-CK 3-gas detector: H₂S, O₂, LEL
- GAMAX3-2-CK 2-gas detector: O₂, LEL

With a Black Box Datalogger Detector
Change suffix: "-CK" to "-CK1"

With a User Downloadable Datalogger Detector
Change suffix: "-CK" to "-CK2"

To include a 230 VAC charger specify version.
Add suffix: "-UK" (United Kingdom); "-EU" (Europe);
"-AU" (Australia); "-NZ" (New Zealand);
"-OR" (Other Countries)



Carrying Cases



Hands-free operation with durable cases to suit your work environment.

- GA-HMAX Holster with belt loop
- Concussion-proof boots**
- GA-BMAX Boot with alligator belt clip
- GA-BMAX-3 Boot with neck strap
- GA-BMAX-4 Boot with neck and waist straps



Remote Sampling Accessories

Sampling hoses and probes are equipped with a quick connect for easy field use.

- D4-PROB1 1 ft. (0.3 m) sampling probe
- D4-PROB3 3 ft. (1 m) sampling probe



External Alarms

The external vibrator alarm provides warning in high noise areas.

- D4-VIB3 Remote vibrator alarm
- D4-HL-R3 Remote audible/visual alarm



Batteries and Fast Chargers

GasAlertMax includes 2 VERSAPAK™ Batteries and a 2-port BLACK & DECKER VAC charger. A vehicle charger is available.

- V-CHRG1 2-port 12 volt vehicle charger
- D4-VP130 110 VAC charger
- D4-VP130-UK 230 VAC charger c/w UK plug
- Mains plugs for: "-EU" (Europe); "-AU" (Australia)
- D4-VP110 NiMH Battery
- D4-VP100 NiCd Battery



Datalogger Options

Both datalogger versions are equipped with a MMC "Flash" memory card.

- MMC32 32 MB MultiMediaCard (MMC)
- CR-MMC-USB1 USB card reader
- CR-MMC-FD1 Floppy disk card reader for use with all computers (PCs/Laptops)
- GAMAX-EDM1 Excel Data Management (E.D.M.) program



Calibration Gases and Kits

Quality test gases are made to the highest accuracy and traceability to N.I.S.T. standards.

BW kits and gas cylinders are available in 2 and 4-gas mixtures. "Bump" test gas comes with the balloon adaptor.

The New Era in Datalogging

GasAlertMax datalogging detectors combine advanced features and functions with ease of use, incorporating the new Flash MultiMediaCard technology that is used in digital cameras and MP3 players.

- Wrap-around memory ensures the latest information is always available
- Automatic operation
- High-density Flash MultiMediaCards



Two datalogging versions to choose from:

Black Box Datalogger

In event of an occurrence or incident, event information and historical data is retrieved by an authorized factory service center.

- ▲ Operation is invisible, requiring no user intervention
- ▲ Tamperproof
- ▲ Continuous datalogging while the instrument is operating
- ▲ Data card icon on the LCD confirms the datalogger is operating and functioning normally

User-Downloadable Datalogger

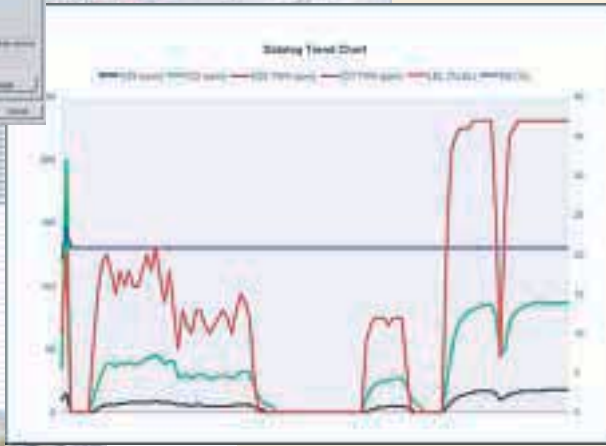
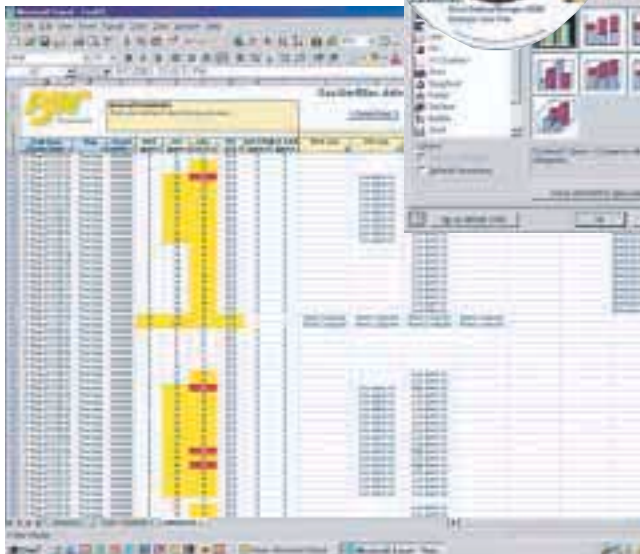
Data management is easier than ever before with GasAlertMax3-DL2 user-downloadable models.

- ▲ Off-the-shelf card readers provide convenient and flexible data transfer to desktop or laptop computers (Windows 95 or higher)
- ▲ Use standard office database or spreadsheet software (Excel, Access etc.) to view the data
- ▲ Seamless downloading in the field or office using USB port, or floppy disk reader

Downloading and Data Analysis Made Easy with E.D.M.

Use BW Technologies' free E.D.M. (**Excel™ Datalog Manager**) to take the work out of data management.

- Create reports automatically
- Sort, format and graph data automatically
- View history
- Calculate exposures
- Real-time trending
- Archive easily



New Datalogger Technology Advantages

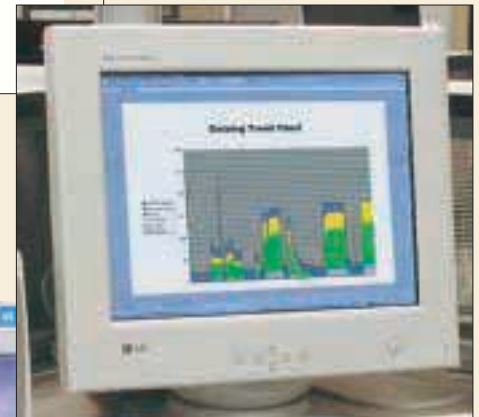
Extraordinary Capacity: Over 4 months of logged data (recorded at 5-second intervals) for all 4 sensors using the standard 32 MB high-density Flash MultiMediaCard (included). Information storage is scalable (up to one year) based on logging intervals and card capacity (64 MB cards available).

All Events and Occurrences are recorded. All information including: sensor readings, alarm setpoints, all alarm conditions, TWA and Peak exposures, calibrations, pump operation, event flags, instrument status and serial number with time and date are recorded.

User Friendly: With automatic storage, no training is required for operation or data retrieval.



Simple MultiMediaCard Installation.



Browse and click in E.D.M. to select worksheets, report types and styles, color-coding, data filtering and automatic charting.

GasAlertMax

H₂S, CO, O₂ and LEL

Multi-Gas Detector with
Internal Sampling Pump

RATINGS AND CERTIFICATIONS:
(Intrinsic safety)

**Classified the US and Canadian
Standards by CSA:**

Class I, Div. 1, Groups A, B, C, D
Class I, Zone 0, Gr. IIC
132 °C ambient 50 °C

ATEX Certified:

EEx ia d IIC ATEX II 2G
184 °C ambient 50 °C

CE Declared for European Conformity

Australia

**Combustible Gas Performance
Certified to:**

ANSI/ISA-S12.13
CSA C22.2 No. 152

EMI/RFI:

Complies with EMC Directive 89/336/EEC

SPECIFICATIONS

DETECTOR: 2, 3 and 4-gas detectors

Gas:	H ₂ S	CO	O ₂ (% by vol.)	Combustibles
Measuring Range:	0 - 100 ppm	0 - 500 ppm	0 - 30.0%	0 - 100% LEL
Low Alarm Level ¹ :	10 ppm	35 ppm	19.5%	10%
TWA alarm level ¹ :	10 ppm	35 ppm	N/A	N/A
High alarm level ¹ :	15 ppm	200 ppm	23.5%	20%

Auto Zero: Yes
Calibration: Automatic
Backlight: Low light (auto) alarm conditions (auto) and on demand
Full function self-test: Verifies: integrity of sensor, battery and circuitry; audible/visual alarms
Sensor: Plug-in, electrochemical cells (H₂S/CO TWIN TOX, O₂); catalytic bead (LEL)
Sampling pump: 250 ml/min
User field options: Confidence Beep, Pass Code Protection, Latching Alarms, Sensor Disable.
-DL2 models only: field-settable real-time clock and calendar

INDICATORS AND ALARMS:

Clearly advises alarm levels both visually and audibly
Visual gas alarm: Flashing, wide-angled alarm lens with dual red LEDs plus alarm LCD readout
Audible gas alarm: High-output, variable, pulsing siren 95 dB at 1 ft. (0.3 m)
Other: Low battery, Off warning, Sensor fail, Multiple gas hazard, Data card fail
Remote jack: Accepts vibrating alarm, remote audible/visual alarm (110 dB) or earphone

LCD DISPLAY:

Continuous, alphanumeric gas readout and status display
Gases monitored: H₂S, CO, O₂ and LEL
Gas ppm or %: Simultaneously and continuously displays gas concentrations present
TWA ppm or %: Records and displays TWA exposure(s) on demand
Peak ppm or %: Records and displays peak exposure to gas and on demand
Setpoints: Displayed on activation (auto) and on demand in ppm or %

TESTS:

Self-test: Full function self-test on activation (auto)
Battery: Continuous (auto)

GENERAL SPECIFICATIONS:

Shock-resistant ABS enclosure
Operating temperature: -20 to +50°C (-4 to +122°F)
Humidity: 5% to 95% RH (non-condensing)
Battery: One 3.6 volt Black & Decker VersaPak™ rechargeable cell
Battery life: NiMH up to 12 hours operation; NiCd up to 8 hours operation
Size: 1.6 x 3.0 x 5.9 inches (40 x 75 x 150 mm)
Weight: 15.4 oz. (396 g)

WARRANTY:

2 years including sensors

DATALOGGER OPTIONS:

Data recorded: All events and occurrences
Sampling rate: One reading every 5 seconds (standard)
Storage: Over 4 months (based on a normal workweek). Scalable up to one year.
32 MB Flash MMC (MultiMediaCard) standard

¹Alarm levels are field-settable. Factory defaults are shown are for US and Canada. Defaults will vary by country and region.
HIGH alarm takes precedence over TWA alarm. TWA alarm takes precedence over LOW alarm.

DUE TO ONGOING RESEARCH AND PRODUCT IMPROVEMENT, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

Ordering Information: GasAlertMax is delivered complete, ready for use with sensors, internal sampling pump, datalogger, BLACK & DECKER 110 VAC 2-port charger, two VERSAPAK™ batteries, 10 ft. (3 m) sampling hose, carrying holster, cal hose, filter kit and instructions in local languages.

"INNOVATORS IN GAS DETECTION"



For Further Information:

1-888-749-8878 USA
1-800-663-4164 Canada
+44 (0) 1869-233004 Europe
+ (971) 4 8871766 Middle East
+1-403-248-9226 Other Countries

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2840 - 2 Avenue S.E.
Calgary, AB, Canada T2A 7X9
Fax: +1-403-273-3708

E-mail: info@bwt.net.com
www.gasmonitors.com

BW1009-01-01-00-8.25x11-123-2

Gas Detectors (Standard)

GAMAX3-4 4-gas: H₂S, CO, O₂, LEL
GAMAX3-3H 3-gas: H₂S, O₂, LEL
GAMAX3-2 2-gas: O₂, LEL

Gas Detectors with Black Box Datalogger

GAMAX3-4-DL1 4-gas detector
GAMAX3-3H-DL1 3-gas detector
GAMAX3-2-DL1 2-gas detector

Gas Detectors with User Downloadable Datalogger

Comes c/w free software and 32 MB MMC Card

GAMAX3-4-DL2 4-gas detector
GAMAX3-3H-DL2 3-gas detector
GAMAX3-2-DL2 2-gas detector

Add suffix for delivery with 230 VAC charger

Add suffix: -EU (European version)
-UK (United Kingdom version)
-AU (Australian version)
-NZ (New Zealand version)
-OR (Other Regions)
Add suffix: -A (to omit VAC charger and batteries)

Calibration Equipment

Kits come complete with regulator, cal hose in carrying case

For 4 and 3-gas detectors (LEL, O₂, H₂S, CO)

CK-Q34 4-gas kit with 34L cylinder
CK-Q58 4-gas kit with 58L cylinder
CG-Q34 Quad gas 34L cylinder
CG-Q58 Quad gas 58L cylinder
CG-BUMP1 Alarm test gas 11L
REG-0.5 0.5 LPM Regulator included in kits

For 2-gas detectors (%LEL, O₂)

CK-T34 2-gas kit with 34L cylinder
CG-T34 2-gas 34L cylinder
REG2-0.5 Regulator included in 2-gas kits

Sensor Replacements

D4-RW90 Combustible (0-100% LEL)
SR-X10 Oxygen (O₂)
D4-RHM04 TWIN TOX (CO, H₂S)
PS-RH04S H₂S (-3H versions)

Locally Distributed By:

Value Added Confined Space Kit

"INNOVATORS IN GAS DETECTION"

BW

Technologies



GasAlertMicro



Motorized Sampling
Pump Kit

Protect Yourself

The presence of hazardous atmosphere is a major threat to workers in confined spaces. Precautions are required to protect workers from flammable or toxic atmospheric hazards and oxygen depletion/enrichment conditions.

The GasAlertMicro Confined Space Kit includes everything you need to safely enter a confined space.

- △ GasAlertMicro multi-gas detector
- △ The Sampler motorized sampling pump or manual aspirator pump
- △ 10 ft. / 3.3 m sampling hose
- △ 4-port charger kit with rechargeable NiMH batteries
- △ Quad calibration gas (34 L) and regulator
- △ Calibration hose
- △ Support CD-ROM with instruction manuals, quick reference cards, training video, and datalogging software
- △ Hard-sided carrying case with removable shoulder strap



Manual Aspirator Kit

Ordering Information

Confined Space Kits with the Sampler external motorized sampling pump

- GAMIC-4-CK-SP Confined Space Kit with 4-gas detector
- GAMIC-4-CK2-SP Confined Space Kit with 4-gas detector and user downloadable datalogger

Confined Space Kits with manual aspirator pump

- GAMIC-4-CK Confined Space Kit with 4-gas detector
- GAMIC-4-CK2 Confined Space Kit with 4-gas detector and user downloadable datalogger

Add suffix for delivery in: Europe: -EU United Kingdom: -UK Australia: -AU

For further information:
1-888-749-8878 America
1-800-663-4164 Canada
+44 (0) 1869 233004 Europe
+971-4-8871766 Middle East
+61-7-3818-8244 Australia
+1-403-248-9226 Other Countries
Fax: +1-403-273-3708

www.gasmonitors.com

Email: info@bwt.net

Value Added Confined Space Kit

"INNOVATORS IN GAS DETECTION"

BW

Technologies



GasAlertMax



Protect Yourself

The presence of a hazardous atmosphere is a major threat to workers in confined spaces. Precautions are required to protect workers from flammable or toxic atmospheric hazards and oxygen depletion or enrichment conditions.

The GasAlertMax Confined Space Kit includes everything you need to safely enter a confined space.

- ▲ GasAlertMax multi-gas detector with built-in motorized sampling pump
- ▲ 10 ft. / 3.3 m sampling hose with quick connector
- ▲ Concussion-proof boot
- ▲ Black & Decker fast charger (holds two batteries)
- ▲ Two VERSAPAK™ rechargeable NiHM batteries
- ▲ Quad calibration gas (34 L) and regulator
- ▲ Calibration hose with quick connect
- ▲ Support CD-ROM with instruction manuals, quick reference cards, training video, and datalogging software
- ▲ Hard-sided carrying case with removable shoulder strap



ATEX

Plus
Others



Ordering Information

GAMAX3-4-CK	Confined Space Kit with 4-gas detector
GAMAX3-4-CK1	Confined Space Kit with 4-gas detector with Black Box Datalogger
GAMAX3-4-CK2	Confined Space Kit with 4-gas detector with User Downloadable Datalogger

Add suffix for delivery in: Europe: -EU United Kingdom: -UK Australia: -AU

Accessories Available

GA-VIB3	Remote Vibrator Alarm
GA-HL-R3	Remote Audible/Visual Alarm
GA-BMAX	Concussion-proof boot with alligator clip
GAMAX-CD1	GasAlertMax training CD-ROM
D4-PROB3	3 ft. / 1 m sampling probe
CG-Q34	Quad calibration gas cylinder (34 L)
CG-Q58	Quad calibration gas cylinder (58 L)
CG-BUMP1	Quad Bump test gas aerosol (11 L)

For further information:

1-888-749-8878 America
1-800-663-4164 Canada
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+971-4-8871766 Middle East
+61-7-3818-8244 Australia
+1-403-248-9226 Other Countries
Fax: +1-403-273-3708

www.gasmonitors.com

Email: info@bwt.net

MicroDock

Automated Instrument Docking Station



Fully automatic!
Fully portable!
Fully affordable!



GasAlertMicro

Cost-Effective Instrument Management

The MicroDock calibration, test and record storage system provides automated calibration and bump-testing for the GasAlertMicro multi-gas detector. Expandable to include up to 10 docking modules, the MicroDock is the world's most advanced, compact and affordable automatic calibration and testing system for the ultimate confined space gas detector.

- △ Fully automatic "hands-free" calibration and functional bump test
- △ Automatically verifies performance of audible and visual alarms
- △ Stores and updates calibration records in both the GasAlertMicro and the MicroDock
- △ No computer required
- △ Entirely self-contained
- △ Fully portable
- △ Operates via line power or set of four C-cell batteries
- △ Add additional self-contained docking modules to system via simple, plug-in connections—no external pressure transducers or gas lines necessary
- △ Expandable to include up to 10 GasAlertMicro docking modules
- △ Simplify record keeping
- △ Verify proper performance
- △ Reduce maintenance costs



Ordering Information

Basic One-Module MicroDock System

Includes base station, one GasAlertMicro docking module (installed), 110 VAC line power adapter, 32 MB MultiMediaCard (installed), Excel Datalog Manager software, USB connector cable, fresh air inlet filter, four C-cell alkaline batteries, two 2 ft./0.6 m calibration gas hoses, two gas cylinder inlet fittings and instructions.

GAMIC-DOCK-1

Portable MicroDock System Kit

Includes Basic MicroDock System components, plus 34 L quad calibration gas cylinder, demand flow regulator, all in a convenient hard-sided carrying case.

GAMIC-DOCK-2

Accessories/Options

GAMIC-MOD GasAlertMicro Docking Module
REG-DF-1 Demand Flow Regulator

www.gasmonitors.com

Email: info@bwt.net

MicroDock

Automated Calibration/Bump Test Station for GasAlertMicro

The new MicroDock station is a cost-effective way to manage calibration and bump-testing of the GasAlertMicro multi-gas detector. Fully portable and easily expandable, the MicroDock requires no computer and provides simultaneous management of up to 10 GasAlertMicro docking modules.

Costs and time requirements for routine maintenance are reduced through the MicroDock's sophisticated automatic calibration and test procedures. Instrument records are stored for easy retrieval in the MicroDock and each individual GasAlertMicro.

Minimize expenses and maximize productivity with the MicroDock.

"INNOVATORS IN GAS DETECTION"



For further information:
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Fax: +1-403-273-3708

E-mail: info@bwnet.com
www.gasmonitors.com

BW1066-01-01-00-8.25x11-5396-0

SPECIFICATIONS

INSTRUMENT: Automated calibration/bump-test station for GasAlertMicro multi-gas detector

GENERAL SPECIFICATIONS

Microcontroller:	SPI 12C interface 4 analog inputs USB interface
Power Supply:	6V wall adapter or C-cell batteries
Real-time Clock:	Provides time and date stamp for "last calibration" data
MultiMediaCard:	4-signal SPI interface, capable of multiple data rates
External Port/USB Interface:	Provides communication between master module and host
Pump:	DC motor, micro-diaphragm; 6V PCB mount
Flow Rate:	600 mL/min
Flow Sensor:	Verifies flow of test-gas/air supply
Calibration Gas Cylinder Inputs:	2 inlets plus purge (standard) 4 inlets plus purge (maximum)
Automatic Tests:	Functional bump, calibration, audible alarm, visual alarm
Configuration Recognition:	Automatic (instrument and sensor)
Alarm/Calibration Parameters:	User-settable
Calibration Gas Connections:	Built-in (base station)
Solenoid:	Built-in (docking modules)
Data Storage:	Automatic (instrument and base station)
LED INDICATORS:	Yellow - TEST Green - PASS Red - FAIL
SWITCHES:	Bump-test initiation Calibration initiation
COMMUNICATIONS METHOD:	Infrared (two-way)
SENSORS:	Audio Optical
PHYSICAL Size:	8.3 x 10.4 x 3.2 in. / 21.2 x 26.3 x 8.2 cm (base station plus one docking module)
WARRANTY:	2 years

DUE TO ONGOING RESEARCH AND PRODUCT IMPROVEMENT, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.



- Test, pass and fail LED indicators
- Large, alphanumeric status LCD
- Fully automatic, "hands-free" management
- Built-in pump for gas delivery
- Easy expansion for multiple networks
- Completely modular

Locally distributed by:



SamplerPak

External Motorized Sampling Pump Kit

"INNOVATORS IN GAS DETECTION"

BW
Technologies



Reliability Plus Flexibility

The BW Sampler is a motorized sampling pump that provides remote sample draws for many applications, including pre-entry and/or continuous confined space work.

- △ Compact (7.4 x 1.3 x 2.1 in. / 18.8 x 3.35 x 5.4 cm) and lightweight (6.2 oz. / 175 g)
- △ Compatible with most BW single-gas and multi-gas detectors, including GasAlert and GasAlertMicro
- △ Pump constantly monitors itself for proper performance
- △ Low flow alarm, battery alarm and system fault alarm with audible/visual warnings
- △ Unique, manual flow-block test verifies proper performance
- △ Up to 30 hours of continuous operation on a single set of AA alkaline or rechargeable NiMH batteries
- △ Built-in water trap and particulate filters
- △ Optional extra-long probes and sampling hoses available



Value-added *SamplerPaks* include detector and additional accessories



GasAlertMicro SamplerPak

Ordering Information

GA-SPAK SamplerPak

Complete with: the Sampler motorized sampling pump, two rigid sample tubes with barbed fitting (small: 4.65 in. / 11.8 cm; medium: 10.25 in. / 26 cm), flexible sampling hose (10 ft. / 3 m) with airstone water/particulate filter, connector hose (3 ft. / 0.9 m), two AA alkaline batteries, two extra particulate filters, instructions and a hard-sided, foam-lined carrying case

Value-added SamplerPak Kits - include SamplerPak, gas detector and other accessories.

GAMIC-4-SK GasAlertMicro SamplerPak
GA-(x)-SK GasAlert and GasAlertLEL SamplerPaks

Note: Additional kits available on request.

Accessories

GAMIC-C01-K Four NiMH rechargeable batteries with 4-port charger
GAMIC-V-CHRG1 Four NiMH rechargeable batteries with 4-port vehicle charger

Note: Add suffix for delivery with 220 VAC charger:
Europe: -EU United Kingdom: -UK Australia: -AU

M1806 Sampling hose (order per foot)
SP-T1-2 Sampling probe (2 ft. / 61 cm)

Note: Longer sampling probes available upon request.

Spares and Replacements

GA-SP01 Sampler - replacement motorized sampling pump
SP-T2-S Small sample tube (4.65 in. / 11.8 cm)
SP-T2-M Medium sample tube (10.25 in. / 26 cm)
D4-PF-1 Airstone water/particulate filter replacement
SP-PF-1 Sampler particulate filter replacements, kit of 5

www.gasmonitors.com

Email: info@bwt.net

SamplerPak

Motorized Sampling Pump Kit

The **Sampler** motorized sampling pump provides a continuous draw from remote locations up to 50 ft. / 15.5 m away. The **Sampler** is compatible with BW single-gas detectors as well as the GasAlertMicro and the BW Defender multi-gas confined space monitors.

The intrinsically safe, the **Sampler** operates continuously once activated. Built-in low flow alarms and a unique self-test feature ensure peak performance. The robust and ergonomic design makes "pick hole" sampling simple to accomplish, with easily interchangeable sample probes and hoses.

The value-added **SamplerPaks** include a gas detector, the **Sampler**, all standard accessories and a hard-sided, foam-lined carrying case. Value-added **SamplerPaks** are available with a range of additional accessories, from battery chargers to Confined Space Kits.

SPECIFICATIONS

Sample flow rate:	300 ml/min (typical)
Sample distance:	50 ft. / 15.5 m
Sample delay time:	3 seconds per 1 ft. / 0.3 m
Outlet connection:	1/8 in. / 0.32 cm barbed fitting for flexible sampling hose
Inlet connection:	Flexible sampling hose: 1/8 in. / 0.32 cm Rigid sample tube: 1/4 in. / 0.63 cm O.D.

DISPLAY:

Visual alarm:	3 high-intensity LEDs
Audible alarm:	90 dB at 1 ft. / 0.3 m
Warning conditions:	Low flow, low battery, system fault

GENERAL SPECIFICATIONS:

Operating temperature:	-4 to 122 °F / -20 to +50 °C
Operating humidity:	5% to 95% relative humidity (non-condensing)
Battery:	2 AA alkaline batteries; or 2 AA NiMH rechargeable batteries
Battery life:	30 hours
Size:	7.4 x 1.3 x 2.1 in. / 18.8 x 3.35 x 2.1 cm
Weight:	6.2 oz. / 175 g

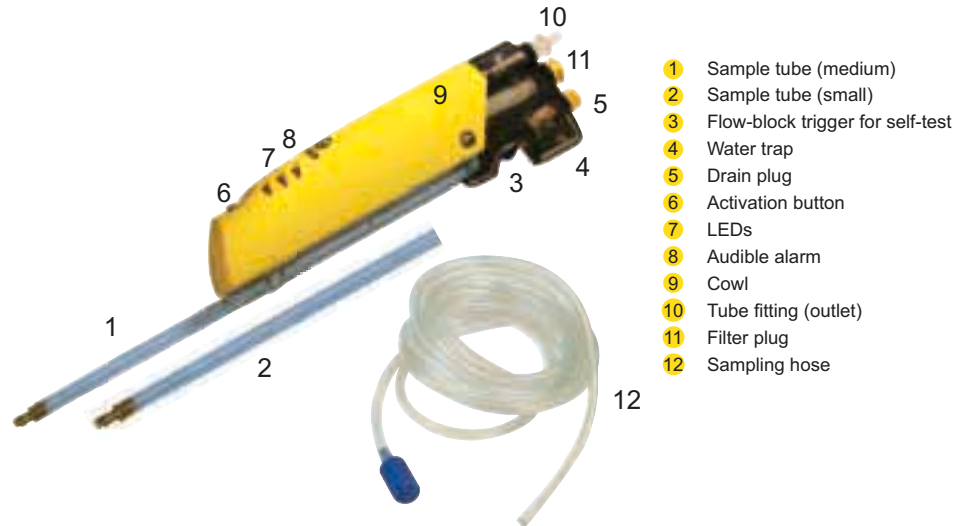
WARRANTY: 2 years

DUE TO ONGOING RESEARCH AND PRODUCT IMPROVEMENT, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

RATINGS AND CERTIFICATIONS:

 Class I, Div. 1, Groups A, B, C and D
Class I, Zone 0, Group IIC

ATEX: CE 0539  II 2 G (in progress)
EX Approval: EEx ia IIC (in progress)
CE: European Conformity (in progress)



"INNOVATORS IN GAS DETECTION"



For further information:
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+61-7-3818-8244 Australia
+1-403-248-9226 Other countries

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2840 - 2 Avenue S.E.
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Fax: +1-403-273-3708

E-mail: info@bwnet.com
www.gasmonitors.com

GasAlertMicro SamplerPak (GAMIC-4-SK)



GasAlert LEL SamplerPak (GA-W-SK)



Additional value-added kits are available in a variety of combinations.

Locally distributed by:



Automatic Full-Function Test Stations

for GasAlert100, GasAlertClip, GasAlert, and GasAlert LEL

"INNOVATORS IN GAS DETECTION"

BW
Technologies



Safe and Economical

BW Technologies Gas Detectors (GasAlert100, GasAlertClip, GasAlert, and GasAlert LEL) are the most advanced portables in the world.

The only way to verify that *any* gas detector will respond to gas is to test it with gas—a sensor may become plugged with dirt or debris, and gas will not enter. All detectors should be periodically tested with gas.

Automatic full-function Test Stations are an economical solution for companies that use a large number of gas detectors. Designed specifically for testing numerous units, Test Stations eliminate the risk of exposing personnel to toxic test-gas by providing a fast, safe and easy method of testing a detector's response to gas.

- ▲ Detector fully tested in 10-30 seconds
- ▲ Easy and fully automatic
- ▲ PASS/FAIL advice on each test
- ▲ Test Stations verify all functions:
 - Sensor response to gas
 - Speed of response
 - Visual LED alarm activation
 - Audible alarm activation
- ▲ Economical use of test-gas
- ▲ Test Stations come complete with regulator, reinforced Teflon test-hose, AC wall-mount adaptor and 9-volt battery
- ▲ Over 350 units tested on one 9-volt battery

Ordering Information

GA-TS04	GasAlert100 test station (for H ₂ S, CO)
GA-TS02	GasAlertClip test station (for H ₂ S, CO, O ₂)
GA-TS03	GasAlert & GasAlert LEL test station (for single gas detectors)

* Order gas separately

* For Test Stations with other mains plugs (230 VAC), add suffix:

- "-UK" (UK/Ireland mains plug)
- "-EU" (Continental Europe mains plug)
- "-AU" (Australia mains plug)

Accessories

Test-Gas Cylinders—Order Gas Separately

G0042-H25	25 ppm H ₂ S, balance nitrogen (58 L)
G0041-M100	100 ppm CO, balance nitrogen (130 L)
G0043-N2	100% nitrogen for oxygen units (103 L)

For additional gases and/or concentrations please contact BW Technologies

www.gasmonitors.com

Email: info@bwt.net

Automatic Full-Function Test Stations

For zero-maintenance and single gas detectors

Safe and Automatic

Test Stations are engineered for ease-of-use—simply insert the detector into the test well and press the red button. The station first verifies that the detector is installed, then tests the sensor response time, speed of response, alarm LED operation and the audible alarm activation. Watch the color coded PASS/FAIL advice LEDs as the test quickly progresses. If all tests are successful, the green PASS light activates to confirm the detector is ready for use.

Convenient and Economical

When a test is initiated, the solenoid automatically releases test gas to the detector. The flow of gas shuts off automatically when the test is complete, preventing any waste of test gas and protecting personnel from exposure to the gas. The AC adaptor allows an unlimited number of units to be tested without the need for battery replacement.

Test Stations can be conveniently hung on a wall to be a conspicuous reminder for individuals to test their detectors before entering a potentially hazardous area.

The BW Test Station makes a significant contribution towards safety in the work environment.

For further information:

1-888-749-8878 America
1-800-663-4164 Canada
+44 (0) 1869 233004 Europe
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+61-7-3818-8244 Australia
+1-403-248-9226 Other Countries

Corporate Headquarters

2840 - 2 Avenue S.E.
Calgary, AB, Canada T2A 7X9
Tel: +1-403-248-9226
Fax: +1-403-273-3708

E-mail: info@bwtnet.com
www.gasmonitors.com

SPECIFICATIONS

TEST STATIONS:	Tests operation of BW zero-maintenance and single gas detectors
Self-test:	Station verifies own operational status
Test sequence verifies:	1. Sensor response to gas 2. Response time meets specifications 3. Visual alarm activation 4. Audible alarm activation 5. General PASS/FAIL
Test time:	Less than 30 seconds per unit
DISPLAY INDICATORS:	Testing ON LED flashes RED throughout test
Test activated:	Six color coded LEDs
PASS/FAIL advice:	Five LEDs advise each test result. Green = PASS; Red = FAIL 1. Visual Alarm 2. Audible Alarm 3. Sensor Response 4. Pass 5. Fail
CONTROLS	
Pushbutton:	Activates test sequence
Power ON/OFF:	Automatic
Test-gas flow:	Automatic ON/OFF (solenoid-controlled)
REGULATOR:	Vertical-type constant flow with pressure gauge (included)
POWER:	110 to 230 AC or DC (9-volt battery is included)
AC:	110 AC or 230 AC wall-mount adaptor is included
DC:	Over 350 units tested on one 9-volt battery
PHYSICAL	
Size:	18.5 x 8 x 2.5 in. / 47 x 20 x 6 cm
Weight:	2.85 lb. / 1.3 kg
Test-well:	Model GA-TS04: Holds GasAlert100 Model GA-TS02: Holds GasAlertClip Model GA-TS03: Holds GasAlert and GasAlert LEL
Cylinder holder:	Fits standard size gas cylinders with two straps
Enclosure:	Rugged, composite materials Equipped with back slots to wall-mount the test station if desired
WARRANTY:	2 years non-prorated

DUE TO ONGOING RESEARCH AND PRODUCT IMPROVEMENT, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.



SIMPLE AND EASY

Simply insert the detector into the test-well and press the red button. Quality test-gases are available for all BW Technologies gas detection instruments.

Locally distributed by:

GasProbe IAQ

T°, RH, CO, CO₂

"INNOVATORS IN GAS DETECTION"

BW

Technologies



Air Quality Monitor



Versatile IAQ Monitoring

Engineered for environments that require reliable, multi-parameter monitoring, the GasProbe IAQ is industry's most versatile portable instrument. Ergonomically designed and user-friendly, the GasProbe IAQ delivers peak performance that's second to none.

- △ Simultaneous monitoring of up to four parameters: carbon monoxide (CO), carbon dioxide, (CO₂), relative humidity (RH) and temperature (T°)
- △ Datalogging models available with minimum 77 days of datalogging capacity
- △ Download data to your computer via infrared port
- △ Field-proven sensing technology
- △ Compact and lightweight
- △ Audible, visual and vibrating alarms
- △ Comprehensive display of data
- △ Simple automatic calibration procedure
- △ Peak readings on demand: STEL and TWA
- △ Menu-driven operation
- △ Full array of accessories, including datalogging software in deluxe and standard versions
- △ Plug-in AC power adaptor, CO and CO₂ sensors, lithium battery and instructions included



Ordering Information

GasProbe IAQ Air Quality Monitor

IAQ-4	T°, RH, CO ₂ , CO
IAQ-3	T°, RH, CO ₂
IAQ-2	CO ₂ , CO
IAQ-1	CO ₂

Datalogging Versions

Comes with standard software.

IAQ-4-DL	T°, RH, CO ₂ , CO
IAQ-3-DL	T°, RH, CO ₂
IAQ-2-DL	CO ₂ , CO
IAQ-1-DL	CO ₂

Accessories and Spares

IAQ-DLX	Deluxe datalogging software
IAQ-CC1	Hard-sided carrying case
IAQ-BC1	Desktop battery charger
IAQ-IC	USB/IRDA interface cable
IAQ-PA-1	Power adaptor
IAQ-BAT	Lithium ion battery

www.gasmonitors.com

Email: info@bwt.net

GasProbe IAQ

T^o, RH, CO, CO₂

Air Quality Monitor

The GasProbe IAQ simultaneously and continuously monitors up to four parameters: carbon monoxide (CO), carbon dioxide (CO₂), relative humidity (RH), and temperature (T^o). Instantaneous readings are displayed on a large, alphanumeric LCD.

Compact and lightweight, the GasProbe IAQ is loaded with practical features. A real-time clock calculates and records STEL and TWA readings. Additional features include audible, visual and vibrator alarms, one-button calibration and peak reading memory.

A minimum 77-day datalogging capacity is complemented by user-friendly Windows-based data management software, which provides direct access to the GasProbe IAQ and enables data downloading with a few clicks of a mouse.

Once the data is downloaded, the data management software analyzes the information and compiles it in an easy-to-read format. All vital statistics are sorted by date and time. The deluxe software enables interactive graphing and trending through powerful charting tools.

With a full line of accessories to add even more versatility, the GasProbe IAQ is an ideal tool for indoor air quality management.

"INNOVATORS IN GAS DETECTION"



For further information:
1-888-749-8878 USA
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E-mail: info@bwt.net
www.gasmonitors.com

BW1065-01-01-00-8.5x11-5125-0

SPECIFICATIONS

DETECTOR: Four-parameter monitor

Gas Detected	Range	Accuracy
CO	0-250 ppm or 0-500 ppm (user selectable)	3%
CO ₂	0-5,000 ppm or 0-10,000 ppm (user selectable)	3%
Temperature	32 °F-104 °F 0 °C-40 °C	0.2 °F 0.1 °C
Relative humidity	0-95%	2%

GENERAL SPECIFICATIONS:

Power Supply: Vibrating lithium ion battery
Runtime: 16 hours fully charged
Sensing Technologies: Electrochemical (CO)
Infrared (CO₂)
RTD (Temperature)
Capacitive polymer (relative humidity)
Humidity Range: 0-95% non-condensing
Operating Temperature: -20 to 50 °C / -4 to 122 °F Toxic
Tests: Self-test of sensors, battery and memory (on startup)
Unit continually monitors battery

SAMPLING METHOD: Diffusion (standard)

LCD DISPLAY: Parameter displayed, unit of measurement, data transfer status, gas concentration, memory capacity, battery status
Alarm Setpoints: Fully adjustable for CO
TWA and STEL: Displayed on demand

INDICATORS AND ALARMS:

Audible Alarm: 85 dB at 4 in./10 cm
Visual Alarm: Three LED alarms
Vibrator Alarm: Internal
Other: Low battery warning
Two special alarms for CO

DATALOGGING: Stores real-time information and values
Internal memory: 4 MB (2.5 million total samples)

PHYSICAL:

Size: 1.6 x 6.6 x 3.4 in. / 4.0 x 16.5 x 18.5 cm
Weight: 14.65 oz. / 415 g

WARRANTY: 1 year, including sensors

DUE TO ONGOING RESEARCH AND PRODUCT IMPROVEMENT, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.



- 1 LARGE, ALPHANUMERIC DISPLAY
- 2 BRIGHT, WIDE-ANGLED, VISUAL ALARM BAR
- 3 HIGH-OUTPUT, 85 dB AUDIBLE ALARM
- 4 RUGGED, COMPACT, LIGHTWEIGHT
- 5 PROGRAMMING KEYS



DELUXE SOFTWARE

Locally distributed by:



GasProbe CO

Carbon Monoxide Meter

"INNOVATORS IN GAS DETECTION"

BW
Technologies



**One-button
operation**



Measure CO Levels

- △ LCD displays CO levels from 0-1,000 ppm
- △ The higher the concentration of CO, the faster the beeper sounds
- △ LCD backlight activates automatically in lowlight conditions
- △ Automatic sensor zeroing and self-test sequence upon startup
- △ Stores and displays the maximum CO levels encountered (MAXHOLD)
- △ CO level beeper can be silenced if desired
- △ Automatic power-off after 20 minutes extends battery life
- △ Simple, automatic calibration procedure
- △ Easy-to-replace 9 VDC battery (battery life 500 hours)
- △ Stabilized electrochemical CO specific sensor
- △ Typical three year sensor life, one year calibration cycle
- △ Manuals available in local languages
- △ One year warranty including sensors

CE ISO 9001

Ordering Information

CO-PROBE Handheld Carbon Monoxide Meter

Accessories and Spares

CO-CASE1	Carrying Case
GA-SPAK	Motorized Sampling Pump Kit
CO-AK1	Manual Aspirator Kit
SR-M2FL	Carbon Monoxide (CO) Sensor

www.gasmonitors.com

Email: info@bwt.net

GasProbe CO

Carbon Monoxide Meter

Compact and lightweight, the GasProbe CO provides fast, accurate sampling of CO concentrations from 0 to 1,000 parts per million (ppm).

GasProbe CO is ideal for technicians, fire department personnel and other professionals who need to measure CO levels where accumulation of combustion gas is possible, such as industrial environments, commercial buildings, or residential dwellings.

Additional Features:

LCD Display: Large, continuous, alphanumeric display advises in ppm

Audible Indicator:

The beeper functions much like the clicking of a Geiger counter:

- The higher the concentration of CO, the faster the beeper sounds.
- Above 200 ppm, the beeper sounds continuously. The frequency of the tone increases with the concentration of CO.

"INNOVATORS IN GAS DETECTION"



For further information:

1-888-749-8878 USA

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BW1010-01-01-00-8.25x11-5126-3

SPECIFICATIONS

GasProbe CO Carbon Monoxide Meter	
Operating Temperature:	32 to 122 °F / 0 to 50 °C
Operating Humidity:	0% to 99% RH (non-condensing)
Gas Sensors:	Electrochemical (carbon monoxide)
Measuring Range:	0-1,000 ppm
Indicators:	Beeper tone and ppm readout
BATTERY:	Standard 9-volt
Battery life:	500 hours typical
DISPLAY:	Status-at-a-glance alphanumeric LCD
Backlight:	Automatically turns on in low light conditions
Records/Displays:	Maximum CO exposure encountered on demand
SELF-TESTS:	On activation (auto): verifies sensor integrity and battery
Continuous:	battery operation is continuously monitored
PHYSICAL:	Shock resistant ABS enclosure
Size:	1.75 x 2.0 x 7.0 inches / 45 x 50 x 180 mm
Weight:	5.2 oz. / 147 g including battery
WARRANTY:	1 year including sensors (typical sensor life 3 years)

DUE TO ONGOING RESEARCH AND PRODUCT IMPROVEMENT, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.



- 1 LARGE, HIGH-CONTRAST LCD
- 2 AUTO BACKLIGHT IN LOW LIGHT CONDITIONS
- 3 SIMPLE CONTROLS
- 4 ADVANCED MICROCONTROLLER BASED OPERATION
- 5 9 VDC BATTERY
- 6 COMPACT AND LIGHTWEIGHT

Accessories Available



Locally distributed by:



GasProbe

CO, O₂, CO₂, CO/CO₂, in. WC/mbar, °F/°C

Combustion Gas Analyzer

"INNOVATORS IN GAS DETECTION"

BW

Technologies



Deluxe Kit includes
cordless infrared printer
and surface probe

FIVE in ONE

The **NEW** low-cost handheld **GASPROBE** is five instruments in one:

1. Combustion Gas Analyzer
 2. Gas Appliance Tester
 3. Ambient Air Monitor
 4. Draft Measurement Device
 5. Temperature Thermometer
- △ Real-time digital readings of O₂, CO, CO₂, CO/CO₂ Ratio and Stack Air Temperatures
 - △ Calculation of combustion efficiency for five fuels (Natural Gas, LPG, Light Oil, Heavy Oil, Solids)
 - △ Small, compact and lightweight—a true handheld
 - △ 15 hours (typical) continuous use on one Black & Decker VersaPak™ NiCd rechargeable battery
 - △ Large, multi-parameter display
 - △ Automatic, continuous backlight in low light conditions
 - △ Download data via infrared printer at the touch of a button
 - △ Datalogging of readings for later recall with time and date
 - △ Measurement of ambient CO and oxygen levels in air
 - △ Electrochemical sensors
 - △ Automatic calibration of O₂ sensor, sampling pump and pressure sensor each time the instrument is turned on
 - △ External water trap/filter in combination with internal pump filter prolongs instrument life
 - △ Simple, intuitive operation
 - △ Two year warranty including sensors

ISO 9001

Ordering Information

GPROB-SK1 GasProbe Analyzer Kit Standard Kit includes:

- GasProbe Combustion Gas Analyzer
- Flue Gas Temperature and Sample Probe
- Draft/Differential Pressure Probe
- 2-Port Black & Decker AC charger
- 2 NiCd VersaPak™ batteries
- Pump filters (kit of 5)
- Convenient hard-sided carrying case

Note: For delivery with 220 VAC charger add suffix:

Europe: -EU United Kingdom: -UK Australia -AU

GPROB-DK1 The Deluxe Kit includes all of the above plus:

- Infrared HP Handheld Cordless Printer
- Surface/Air/Water Temperature Probe
- Concussion-proof boot
- 2 rolls of printer paper

Accessories and Spares

- GA-B2MAX Concussion-proof boot
- D4-VP100 VersaPak NiCd rechargeable battery
- GA-VP110 VersaPak NiMH rechargeable battery
- V-CHRG1 2-port, 12 volt, vehicle charger
- D4-VP130 Two port, 110 VAC charger
- GA-PFMAX Pump filters (kit of 5)

www.gasmonitors.com

Email: info@bwt.net

GASPROBE Combustion Gas Analyzer

GasProbe provides extraordinary cost of ownership advantages. These include a choice of economically priced professional kits (Standard or Deluxe), long-life VersaPak™ battery power (available in local stores) and user-friendly operation.

Additional Features:

Sampling Pump: Internal, pulse-free rotary vane pump (250 ml/min.)

LCD Display: Large continuous alphanumeric display advises: ppm, % of gas; temperature and draft readings, as well as, time and date

Alarm Indicators:

Visual: Flashing wide-angled alarm bar plus alarm LCD
Audible: Variable pulsed 70 dB
Alarms: Over Limit alarm (protects sensor); low battery and sensor fail

Two Operating Modes:

Combustion Gas Analyzer Mode
 Ambient Air Safety Mode with factory set low and high alarm levels for carbon monoxide and oxygen

"INNOVATORS IN GAS DETECTION"



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www.gasmonitors.com

BW1005-01-01-00-8.25x11-5000-5

SPECIFICATIONS

GasProbe Combustion Gas Analyzer

Operating Specifications:	Measuring Range	Resolution
Oxygen:	0 - 25.0%	0.1 %
Carbon Monoxide:	0 - 2,000 ppm	1 ppm
Carbon Dioxide (calculated):	0 - 13.5%	0.1 %
CO/CO ₂ Ratio:	0 - 0.9999	0.0001
Combustion Efficiency:	0 - 99.9%	0.1 %
Flue Gas Temperature Probe:	41 - 1,832 °F / 5 °C - 1,000 °C	1 °F / °C
Draft/Differential Pressure:	0 - 40.1 in. WC, (0-100 mbar)	0.004 in. WC, (0.1 mbar)
Surface/Air/Water Probe:	41 - 482 °F, (5-250 °C)	1 °F / °C

Operating humidity: 5% to 95% RH (non-condensing)
Gas sensors: Electrochemical (oxygen and carbon monoxide)
Fuel types: Five fuel types, field-selectable
 Natural Gas, LPG, Light Oil, Heavy Oil, and Solid Fuel (Bituminous Coal)

OPERATING MODES: Combustion Gas Analyzer Mode or Ambient Air Monitoring Mode

BATTERY: One 3.6 volt Black & Decker VersaPak™ rechargeable cell
Battery life: NiCd 15 hours typical (3 hour charge time)
Charger input voltage: Black & Decker 2-port charger: 115 AC 50/60 Hz

DISPLAY: Status-at-a-glance alphanumeric LCD
Backlight: Low light (continuous auto) and/or all alarm conditions (auto)

SELF-TEST: On activation (auto): verifies sensor integrity, battery and sampling pump
 Continuous: Battery and sampling pump

PHYSICAL: Shock-resistant ABS enclosure
Size: 1.6 x 3.0 x 5.9 inches / 40 x 75 x 150 mm
Weight: 13.1 oz / 375 g including battery

TEMPERATURE/EFFICIENCY: Dual temperature and sampling probe
Sensor: K-type thermocouple
Insertion lengths: Temperature probe: 10 in. / 26 cm; sampling hose: 58.5 in. / 150 cm

Construction: Stainless steel shaft and rubber hose with pistol grip

WARRANTY: 2 years including sensors

DUE TO ONGOING RESEARCH AND PRODUCT IMPROVEMENT, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

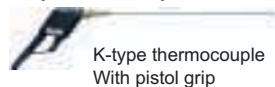


- 1 LARGER, HIGH-CONTRAST LCD
- 2 AUTO BACKLIGHT IN LOW-LIGHT CONDITIONS
- 3 SIMPLE CONTROLS
- 4 ADVANCED MICROPROCESSOR
- 5 VersaPak™ RECHARGEABLE BATTERY
- 6 COMPACT AND LIGHTWEIGHT HANDHELD



Deluxe Kit includes cordless infrared printer and surface probe

Temperature/Sample Dual Probe



K-type thermocouple
 With pistol grip

Pressure Hose (Optional)



3 ft. (1 m)
 teflon hose

Surface Temp. Probe (Optional)



K-type thermocouple

Locally distributed by:



Fixed Systems



BW Technologies

From single-point applications to integrated facility systems, our fixed monitoring equipment provides maximum protection from toxic gases, combustibles and oxygen hazards—with excellent cost of ownership advantages.



For further information:

1-888-749-8878 USA
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+61-7-3818-8244 Australia
+1-403-248-9226 Other Countries
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Email: info@bwt.net

www.gasmonitors.com

"INNOVATORS IN GAS DETECTION"

BW
Technologies

The BW Fixed Equipment Advantage

Technologies and Products

BW fixed products incorporate advanced sensor technologies:

- Point IR
- Catalytic bead
- Electrochemical

All transmitters come complete with sensors. The right monitor type is available for your application:

- Explosion-proof
- Intrinsically safe design
- General purpose
- Zero-maintenance
- Stand-alone/solar powered
- Analog or digital outputs (4-20 mA, MODBUS, etc.)
- Local alarm capability
- Systems integration

We design and manufacture four primary fixed product lines:

- Combustible gas monitors
- H₂S gas monitors
- Toxic gas monitors
- Oxygen gas monitors

Advanced Self-Diagnostics

Internal fault diagnostics result in easier troubleshooting and lower maintenance costs.

Versatility

BW systems, controllers and transmitters are designed with built-in flexibility for immediate needs and future requirements. Ease of installation and use are hallmarks of our fixed equipment.

Customer Support

BW is committed to providing ongoing customer support through our sales and service departments. We work with our customers every step of the way to ensure total satisfaction.



CR-4000

"The Independent"

Four Channel Gas Detection Controller

"INNOVATORS IN GAS DETECTION"

BW
Technologies



Loop Powered

Provides 24 VDC power to the gas sensing transmitter



Fixed Gas Monitoring Systems

FEATURES:

For continuous monitoring and control of toxic gases, combustible gases and oxygen hazards, the CR-4000 is designed for installation and operational simplicity.

- △ Individual, continuous, alphanumeric "status" LCD for each channel
- △ Slim profile: depth only 2.4 inches/(6.35 cm)
- △ Easy installation - simply hang on the wall, connect the power (AC or DC) and gas transmitters
- △ Local 85 dB audible alarm
- △ Field programmable alarm levels on each channel
- △ Simple operation
- △ Mix, match or change the gases monitored
- △ Three standard common, 10 amp SPDT relays. Low, High and Fault general Alarms
- △ Up to eight additional discrete relays - two per channel for LOW and HIGH alarms. Each channel is programmable for energized/de-energized, latching/non-latching and audible ON/OFF
- △ Multi-functional external RESET. Can be used to reset or cancel all latched alarms; displays Peak (maximum) gas detected on each channel and tests all audible/visual alarms
- △ Accepts 4-20 mA signal input from any 4-20 mA gas transmitter

Ordering Information

CR-4000	4-20 mA AC/DC Controller with common relays (fault, low and high alarm)
CR4-R1000	4-20 mA AC/DC Controller with common relays plus discrete relays, low and high, on Channel 1
CR4-R1200	4-20 mA AC/DC Controller with common relays plus discrete relays, low and high, on Channels 1 & 2
CR4-R1230	4-20 mA AC/DC Controller with common relays plus discrete relays, low and high, on Channels 1,2 & 3
CR4-R1234	4-20 mA AC/DC Controller with common relays plus discrete relays, low and high, on Channels 1,2,3 & 4

Note: Discrete relays 10 amp SPDT discrete low and high alarm relays

Accessories and Options

CR4-BAT1	Battery Back-up (110/220 VAC or 24 VDC)
CR-ALH05	External Audible/Visual Alarm

Compatible with BW 4-20 mA Gas Transmitters

GasPoint	CD-420
GasPoint IR	ToxyPoint
I.S. Plant Rat	RRJ Monitors

www.gasmonitors.com

Email: info@bwt.net

CR-4000

Four Channel Gas Detection Controller

Simply select the pre-programmed channel switch for:

- △ Gas type
- △ Sensor range
- △ Alarm level

Standard Common Relays (included)
High alarm, Low alarm and Fault

Special Features

Records and Displays Peak (Max) gas detected by each channel on demand.

Auto Fuses protect all circuits.
Fuses reset automatically when the circuit power returns to normal. No fuse replacement required.

Accessories and Options

Relays (up to eight)

Two (2) factory installed 10 amp SPDT relays per channel. The Low Alarm/High Alarm independent discrete relays are user adjustable for power and assignment, including normally energized/de-energized, latching/non-latching, zoning (Park) and audible alarm activation.

Battery Backup

The two (2) 1.2 amp hr., 12 volt batteries can be installed at any time in the field.

Select from the BW family of 4-20 mA gas transmitters:

- GasPoint • CD-420
- I.S. Plant Rat • RRJ

Gas Detection Measuring Ranges

Combustibles: 0-100% LEL

O₂: 0-25% v/v

H₂S: 0-20, 0-50, 0-100, 0-500 ppm

CO: 0-50, 0-100, 0-200, 0-500, 0-1000 ppm

SO₂: 0-10, 0-20, 0-50, 0-100 ppm

NH₃: 0-50, 0-100 ppm

Cl₂: 0-5.0, 0-10.0, 0-100 ppm

HCN: 0-20.0, 0-50.0, 0-100 ppm

NO: 0-50, 0-100 ppm

NO₂: 0-10.0 ppm

"INNOVATORS IN GAS DETECTION"



For further information:
1-888-749-8878 USA
1-800-663-4164 Canada
+44 (0) 1869 233004 Europe
+971-4-8871766 Middle East
+61-7-3818-8244 Australia
+1-403-248-9226 Other Countries

Corporate Headquarters

2840 - 2 Avenue S.E.
Calgary, AB, Canada T2A 7X9
Phone: +1-403-248-9226
Fax: +1-403-273-3708

E-mail: info@bwtnet.com
www.gasmonitors.com

SPECIFICATIONS

POWER: Field selectable for AC (115 and 230 VAC) or DC (24 VDC)
AC Input: 110 VAC 50-60 Hz standard; 220 VAC 50-60 Hz
DC Input: 24 VDC (18 to 28 VDC)
Backup: Optional battery backup 24 VDC supply. Approx. 3 hours in normal operation

ENVIRONMENTAL

Operating Temperature: -4 to +122°F/-20 to +50°C
Relative Humidity: 5 to 99% non-condensing
Enclosure Rating: Nema 12

PHYSICAL

Dimension (dwxh): 2.4 x 13 x 9.5 inches/6 x 33 x 24 cm
Weight: 4.85 lb./2.2 kg
Enclosure: Enameled steel RFI/EMI protected
Wire Terminations: Screw type terminal blocks
Wiring Ports: Seven (7) each 3/4 inch/22 mm NPT ports
Mounting: Wall mounted—equipped with hanging slots and hinged door

ALARMS:

Two set points—user programmable—with simple rotary switch

Audible: 85 dB buzzer

OUTPUTS:

Alarm Relays: SPDT relays; 10 amp @ 110 VAC/24 VDC, 8 amp @ 230 VAC
Standard: One (1) common low gas alarm, de-energized, non-latching
One (1) common high gas alarm, de-energized, latching
One (1) common fault alarm, normally energized, non-latching
Optional: Two (2) per channel; one (1) low gas and one (1) high gas alarm
Field selectable: energized/de-energized; latching/non-latching; zoning (Park) function and audible alarm ON/OFF

DISPLAY PANEL

Backlit LCDs: Four (4) independent 3 digit alphanumeric status displays
Field selectable readouts for: %LEL, ppm and/or O₂ % v/v.

LED Indicators:

Alarms: Three (3) - "LOW" (red), "HIGH" (red), "FAULT" (amber)
Power: Two (2) "ON" AC icon (green), DC icon (green)
Gas: Concentration icons-ppm, %LEL, %O₂,

CONTROLS:

Two (2) large pushbuttons: Alarm Reset/Acknowledge, Peak Exposures,
Lamp Test (audible/visual alarm test)
Alarm setpoints: simple up/down buttons

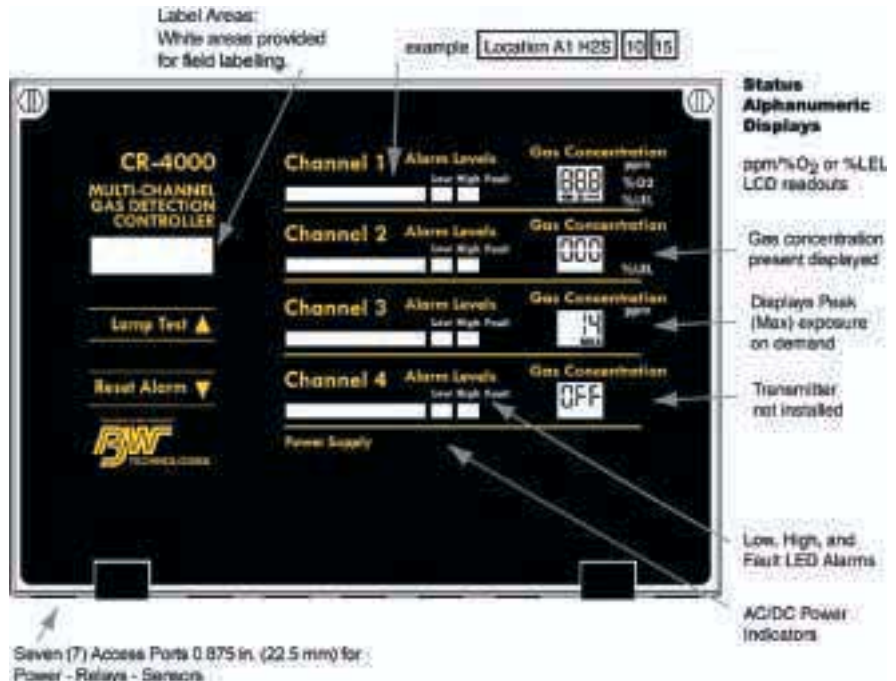
WARRANTY:

Two (2) years non-prorated

DUE TO ONGOING RESEARCH AND PRODUCT IMPROVEMENT, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

RATINGS AND CERTIFICATIONS:
(INTRINSICALLY SAFE W/ BARRIER)

CSA USA
International Electrical Code: IEC No. 1010
U.S. Standard: ANSI/ISA S82.01
Canadian Standard Electrical Code: C22.2 No. 1010



Locally distributed by:



RRJ-4000

Stainless Steel

"INNOVATORS IN GAS DETECTION"

BW

Technologies



Four Channel Gas Detection Controller



Optional remote alarm bar available

ISO 9001

Features and Benefits

For continuous monitoring and control of toxics, combustibles and oxygen hazards, the stainless steel RRJ-4000 is built for outdoor or indoor installation in the most rugged environments. Compatible with any 4-20 mA gas transmitter, the RRJ-4000 controller is designed for simple set-up and operation, reliable performance and minimal cost of ownership.

- ▲ Easy installation, simple operation
- ▲ Rugged, stainless steel construction—truly field tough (NEMA 4X)
- ▲ AC/DC power input, solar capable
- ▲ Battery back-up included
- ▲ Multi-functional external reset—can be used to reset or cancel all latched alarms, displays peak (maximum) gas detected on each channel and tests all audible/visual alarms
- ▲ Individual continuous alphanumeric status LCD for each channel
- ▲ Four 10 amp SPDT common relays included. Three gas alarm relays (Low, High and High/High) and one fault relay
- ▲ Simple setup of alarm levels and measuring ranges with no tools or meters required
- ▲ Local audible alarm included
- ▲ Mix, match or change the gas monitored at any time
- ▲ The controller accepts any 4-20 mA gas transmitter

Fixed Gas Monitoring System

Ordering Information

Includes two 3/4 in. (19 mm) conduit fittings and installation plus operating manual.

RRJ-4000 AC/DC 4-20 mA stainless steel controller

Options

RRJ-ALH05 Dual audible/visual alarm bar
RRJ-SC010-K 10 ft. (3 m) plug-in factory sensor cables
RRJ-SC###-K Other lengths up to 1,000 ft. (305 m) order in 10 ft. (3 m) increments

Compatible with all BW 4-20 mA gas transmitters

GasPoint CD-420
GasPoint IR RRJ Series sensor/transmitters
I.S. Plant Rat ToxyPoint sensor/transmitters

www.gasmonitors.com

Email: info@bwt.net

RRJ-4000

Four Channel Gas Detection Controller

Each channel is equipped with three preprogrammed selection switches for easy setup or change. Select:

- △ Gas type
- △ Measuring range
- △ Alarm levels
- △ Latching gas alarm relays
- △ Audible activation
- △ Remote visual alarm activation

Special Features

Records and Displays

Records peak (maximum) gas concentrations detected by each channel and displays peak concentration on demand.

Auto Fuses

Fuses reset automatically when the circuit power returns to normal. No fuse replacement required.

Options

Dual audible/visual

alarm with remote capability

Solar Capable

Contact BW Technologies

Transportable system available

Select from the BW family of 4-20 mA gas transmitters:

GasPoint, GasPoint IR, CD-420, I.S. Plant Rat, ToxyPoint, RRJ Series

"INNOVATORS IN GAS DETECTION"



For further information:

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+971-4-8871766 Middle East
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+1-403-248-9226 Other Countries

Corporate Headquarters

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E-mail: info@bwnet.com
www.gasmonitors.com

BW1024-01-01-00-8.25x11-5248-1

SPECIFICATIONS

Four channel AC/DC 4-20 mA controller

POWER: Field selectable for AC or DC
AC input: 110 VAC 50-60 Hz or 230 VAC 50-60 Hz
DC input: 16-24 VDC, minimum 3 amp output current
Battery backup: 12 VDC supply; hours of operation dependent on transmitter current draw

ENVIRONMENTAL

Relative humidity: 5 to 99% non-condensing
Operating temperature: VDC: -40 to +122°F/-40 to +50°C; VAC and battery backup: -4 to +122°F/-20 to +50°C
Enclosure rating: NEMA 4X

PHYSICAL:

Stainless steel w/ carrying handles, predrilled mounting flanges, RF/EMI protected
Dimensions (d x w x h): 3.75 x 15.75 x 9.5 in. / 9.5 x 40.0 x 24.1 cm
Weight: 17.8 lb/8.1 kg
Wire terminations: Screw-type terminal blocks
Wiring ports: Six (0.875 in./19 mm) accept conduit or compression fittings
Channel setup switches: Three preprogrammed switches per channel. Select: gas type, measuring range, alarm levels, latching feature for gas alarm relays, audible alarm activation and activation of optional remote audible/visual alarm bar

AUDIBLE ALARM:

85 dB (activation field selectable on each channel)

ALARM RELAY OUTPUTS:

Four SPDT relays; 10 amp @ 110 VAC/24 VDC, 8 amp @ 230 VAC
Gas alarms: Three: Low, High and High/High common, de-energized relays; gas relays are field selectable for alarm level and latching or non-latching
Fault alarm: One normally energized and non-latching common relay

DISPLAY PANEL

LCDs: Four independent 3-digit alphanumeric gas concentration display and status indicators; field selectable for % LEL, ppm and/or O₂ % v/v
In VAC operation
Backlight:
LED indicators: Gas alarms: Three: LOW (red), HIGH (red), HIGH/HIGH (red) per channel
Fault alarm: Common amber LED
Gas type: Combustibles (% LEL), toxic (ppm), or oxygen (% by volume)
Power: Two "ON" AC icon (green), DC icon (green)
Gas: Concentration icons—ppm, % LEL and other

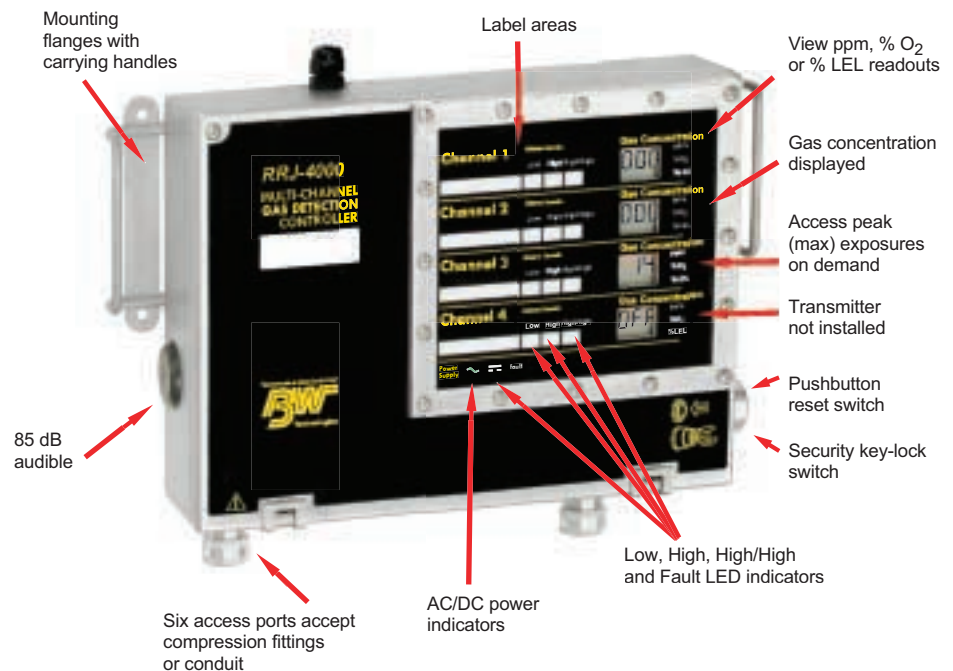
MULTI-FUNCTION CONTROLS:

Security key lock switch (three positions): ON/OFF; lamp test; calibration and alarm setpoints
Pushbutton switch: Alarm acknowledge (reset); audible mute; displays peak (maximum) exposures and alarm setpoints

OPTIONAL REMOTE ALARM BAR:

Stainless steel enclosure with variable angle mounting predrilled flanges; mounts remotely or directly on RRJ controller
Audible: 101 dB siren High, High/High and Fault alarm; field selectable for each channel
Visual: 60,000 candlepower strobe (all alarm conditions); field selectable for each channel
Physical: Size: 4.5 x 8.3 x 6.5 in./11.4 x 21.1 x 16.5 cm
Weight: 4.0 lb/1.8 kg
Standard cable length: 5 ft./1.5 m included, longer lengths available

DUE TO ONGOING RESEARCH AND PRODUCT IMPROVEMENT, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.



Locally distributed by:



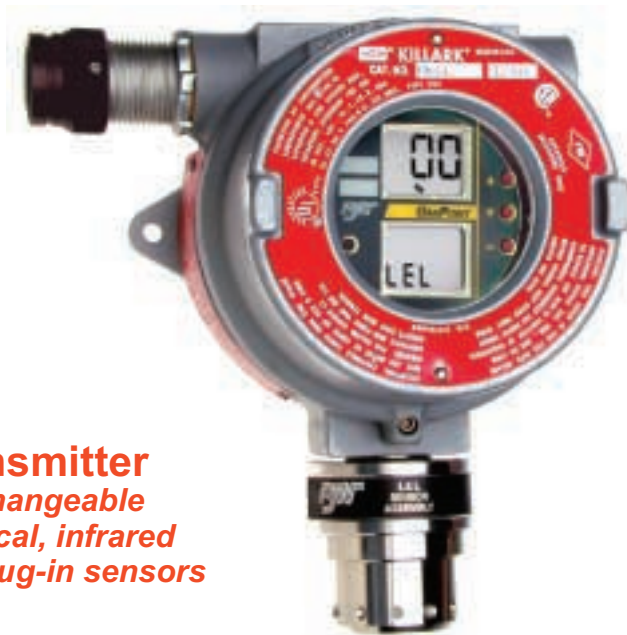
GasPoint

H₂S, CO, NH₃, HCN, NO₂, SO₂, O₂, Cl₂
Combustibles (Catalytic 0-100% LEL) or
Combustibles (IR 0-100% LEL)

Gas Transmitter with Internal Alarm Relays

"INNOVATORS IN GAS DETECTION"

BW
Technologies



**One Transmitter
with interchangeable
electrochemical, infrared
and catalytic plug-in sensors**



Fixed Gas Monitoring Systems

FEATURES:

The GasPoint transmitter provides a 4-20 mA output signal that can be connected to any control system (DCS, PLC, etc.). With advanced sensor technology and microcontroller based operation, the GasPoint provides continuous monitoring of hazardous gases.

- △ The GasPoint transmitter can accept any GasPoint sensor type: electrochemical, catalytic or IR (infrared). All plug-in sensor assemblies are field-interchangeable.
- △ Full function sensor integrity test (auto) continuously advises gas sensing ability and life ended
- △ Non-intrusive, one-person calibration with auto zero and auto span
- △ Equipped with three 5-amp relay contacts—two gas alarm relays (low/high) and fault alarm. Field-selectable normally energized/de-energized and latching/non-latching alarm relay functions.
- △ Two backlit alphanumeric LCDs advise all environmental and gas hazard conditions as well as instrument and sensor status
- △ Remote toxic/oxygen sensors can be installed over 3,900 ft./1,100 m away; combustible sensors over 1,550 ft./475 m. Kit can be installed at any time.
- △ Alarm setpoints displayed on demand—simply press the external button
- △ Field programmable alarm levels
- △ Backlight (auto) in low light conditions and alarm
- △ Extensive fault diagnostics
- △ 2-way digital communication using MODBUS module

Ordering Information

GP-WD	Gas Transmitter with Combustible Catalytic Sensor
GP-IR-WD	Gas Transmitter with Combustible Infrared Sensor
GP-HD	Gas Transmitter with H ₂ S Sensor
GP-MD	Gas Transmitter with CO Sensor
GP-AD	Gas Transmitter with NH ₃ Sensor
GP-ZD	Gas Transmitter with HCN Sensor
GP-DD	Gas Transmitter with NO ₂ Sensor
GP-SD	Gas Transmitter with SO ₂ Sensor
GP-XD	Gas Transmitter with O ₂ Sensor
GP-CD	Gas Transmitter with Cl ₂ Sensor

Accessories and Spares

GP-POWER1	120-240 VAC Power Supply
GP-MBUS3	2-wire MODBUS Communication Expansion Module
GP-MBUS3-4	4-wire MODBUS Communication Expansion Module
GP-SEP	Sensor Separation Kit
GP-1	Gas Transmitter
SS-RW02	Combustible Catalytic Sensor Assembly
IR-RW03	Combustible IR Sensor Assembly
GP-SSPB	Stainless Steel Process Baffle
GP-SSCAL4	Stainless Steel GasPoint Splash Guard
GP-DUC-K1	Duct Mount Adaptor

Replacement Sensor Assemblies

SS-RH02.....H ₂ S	SS-RM02.....CO	SS-RA02.....NH ₃
SS-RZ02.....HCN	SS-RD02.....NO ₂	SS-RS02.....NO ₂
SS-RS02.....SO ₂	SS-RX02.....O ₂	SS-RC02.....Cl ₂

www.gasmonitors.com

Email: info@bwt.net

GasPoint

LEL, H₂S, CO, NH₃, HCN, NO₂, SO₂, Cl₂ or O₂

4-20 mA Gas Transmitter

Display advises:

- △ Gas type monitored
- △ Continuous (%LEL, %v/v or ppm) readout of gas concentration
- △ Alarm level and type encountered - LOW/HIGH or FAULT
- △ When sensor has failed its automatic daily self-test
- △ "Sensor Replacement" and "Sensor Expired" indications
- △ When to apply gas during calibration

Special Features

Change gases monitored in the field at any time. The GasPoint Transmitter will recognize the sensor installed and test and reset itself to that sensor type.

No junction box connection required.

Daily sensor integrity test (auto) monitors sensor operation, length of time sensor has been in service and advises when sensor requires replacement.

GasPoint allows you to set or change calibration time and gas alarm setpoints in the field.

Select or modify the measuring range using a simple dipswitch.

The optional plug-in MODBUS expansion module provides an addressable communications interface (1-247).

"INNOVATORS IN GAS DETECTION"



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 1-888-749-8878 USA
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 Ph: +1-403-248-9226
 Fax: +1-403-273-3708

E-mail: info@bwt.net.com
 www.gasmonitors.com

SPECIFICATIONS

MONITOR: 3-wire, 4-20 mA gas transmitter with advanced microcontroller-based circuitry
Power Input: 12 to 32 volts DC
Output Current: Normal Operation: Isolated linear 4-20 mA output
 Calibration Mode: Steady 3 mA (auto reset to normal operation)
 Fault Mode: 2 mA signal (and less)
Power Consumption: Toxic Versions: 40 mA at 24 VDC
 Combustible Version: 100 mA at 24 VDC
 Relays: 50 mA per relay at 24 VDC

SENSORS: Plug-in, smart sensors
Detection Type: Combustible gases: catalytic or IR; Toxic gases and Oxygen: electrochemical
Self-Test: Automatic daily self-test of sensor integrity and sensor life
Relative Humidity: 5 to 95% RH non-condensing
Drift: Zero: <5% per year; Span: <10% per year

Gas Monitoring Specifications	Detectable Accuracy	LCD Increment	Temperature Range	Units	Programmed Measuring Ranges
Combustibles - Catalytic	1%	1	-40 to +90°C / -40 to +194°F	%LEL	0-100
Combustibles - Infrared	1%	1	-40 to +70°C / -40 to +150°F	%LEL	0-100
H ₂ S	0.25 ppm	1	-40 to +50°C / -40 to +122°F	ppm	0-20, 0-50, 0-100, 0-500
CO	1 ppm	1	-20 to +50°C / -4 to +122°F	ppm	0-50, 0-100, 0-500, 0-1,000
NH ₃	1 ppm	1	-10 to +50°C / +14 to +122°F	ppm	0-200, 0-50, 0-500, 0-1,000
HCN	0.1 ppm	0.1	-20 to +50°C / -4 to +122°F	ppm	0-20.0, 0-50.0, 0-100
NO ₂	0.1 ppm	0.1	-20 to +50°C / -4 to +122°F	ppm	0-50.0, 0-10.0, 0-20.0, 0-99.9
SO ₂	1 ppm	1	-20 to +50°C / -4 to +122°F	ppm	0-100, 0-50, 0-20, 0-10
O ₂	0.1%	0.1	-20 to +50°C / -4 to +122°F	%v/v	0-30.0%
Cl ₂ *	0.1 ppm	0.1	-20 to +50°C / -4 to +122°F	ppm	0-5.0, 0-10.0, 0-100.0

*Note: Cl₂ not rated for Class I, Div. 1

CALIBRATION: Non-intrusive, via pushbutton
 Auto zero and auto span

DISPLAYS: Two backlit liquid crystal displays
LCD 1 3-digit continuous readout of the gas present (ppm, % LEL or %v/v)
LCD 2 Alphanumeric diagnostic status display
 Two setpoints: user-selectable

Alarm Setpoints: Two setpoints: user-selectable

RELAY CONTACTS: Three SPDT relays; 5 amps at 250 VAC
 LOW/HIGH: Field selectable for normally energized/de-energized and latching/non-latching
 FAULT: Normally energized and non-latching

TRANSMISSION RANGES: Relay contacts not considered. (For ranges with relays see manual.)

Conductor Size		Toxic/Oxygen Sensors		Combustible Sensors	
22 AWG	0.64 mm	6,712 ft.	2,045 m	3,356 ft.	1,022 m
20 AWG	0.75 mm	10,953 ft.	3,253 m	5,336 ft.	1,626 m
18 AWG	1.0 mm	16,953 ft.	5,167 m	8,476 ft.	2,583 m

CONTROLS: Calibration: Non-intrusive via external pushbutton
 Alarm Setpoints: Simple up/down pushbuttons with LCD readout of setpoints

PHYSICAL: Size: 6.8 x 7 x 4.3 inches / 17 x 17.8 x 10.8 cm (approx.)
 Weight: 4.85 lb. / 2.2 kg (approx.)

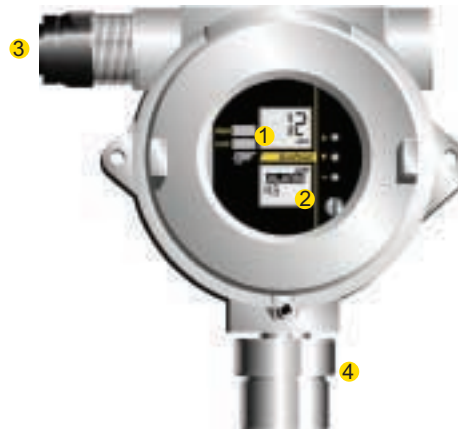
Transmitter: Nema 4, explosion-proof, anodized aluminum enclosure with mounting flanges
Sensor: Stainless steel enclosure

WARRANTY: Instrument: 2 years non-prorated; Sensor: 2 years full replacement warranty

DUE TO ONGOING RESEARCH AND PRODUCT IMPROVEMENT, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

RATINGS AND CERTIFICATIONS: Class I, Div. 1, Groups B, C, D
 Explosion-proof: ANSI/ISA: UL 1203; CSA: C22.2 No 30
 Combustible Performance Standards: ANSI/ISA: ISA-S12.13; CSA: C22.2 No 152

- 1 Large, backlit LCD readout of gas concentration
- 2 Alphanumeric LCD showing transmitter STATUS and diagnostics
- 3 Non-intrusive calibration via simple pushbutton
- 4 Interchangeable sensor types: LEL (catalytic or IR), toxic gas or oxygen with common transmitter assembly
- 5 Three relays: two gas alarm relays, one fault relay



Locally distributed by:

I.S. Plant Rat

Intrinsically Safe

Toxic/O₂ 4-20 mA 2-Wire Gas Transmitters

"INNOVATORS IN GAS DETECTION"

BW
Technologies



Fixed Gas Monitoring Systems

FEATURES:

The I.S. Plant Rat Transmitter provides continuous monitoring for oxygen or toxic gas hazards in ambient air. Leading the field in accuracy and speed of response, I.S. Plant Rat is engineered to provide the ultimate in flexibility and low maintenance.

- △ Modular engineered design provides the ultimate in flexibility. In the field you can easily change the gas monitored and/or the measuring range, and add a sensor separation kit or a duct mount kit.
- △ Encapsulated, plug-in, electronic modules protect against corrosive environments, moisture invasion and tampering
- △ Direct linear 4-20 mA output for industry standard compatibility
- △ Wide supply voltage range: 12 to 35 volts
- △ Backlit LCD readout (standard)
- △ Eliminate the requirement for hot work permits. I.S. Plant Rat uses low power technology therefore is not capable of igniting in an explosive atmosphere when it forms part of an intrinsically safe installation.
- △ Exterior hinged door for non-intrusive calibration
- △ Calibrate Mode simplifies system start-up and calibration. I.S. Plant Rat features a timed automatic reset to normal operation that ensures system integrity.
- △ Low operating, maintenance and installation costs

Ordering Information

Transmitter with Sensor, Digital Display and Measuring Range Module

ISPR2-DX(#)	O ₂	ISPR2-DE(#)	C ₂ H ₄ O
ISPR2-DH(#)	H ₂ S	ISPR2-DY(#)	H ₂
ISPR2-DM(#)	CO	ISPR2-DZ(#)	HCN
ISPR2-DS(#)	SO ₂	ISPR2-DL(#)	HCl
ISPR2-DA(#)	NH ₃	ISPR2-DN(#)	NO
ISPR2-DC(#)	Cl ₂	ISPR2 DD(#)	NO ₂
ISPR2-DV(#)	ClO ₂		

Note: # = Measuring Range. To specify see table on back page.

Accessories and Options

UA-SEP-K2	Sensor Separation Kit
UA-DUC-K2	Sensor Duct Mount Kit
UA-SEP-F5	Flue Vessel Mount Sensor Separation Unit
SG-CAL-1	Splash Guard/Remote Calibration Cup
PB-CAL-1	Process Baffle/Remote Calibration Cup
FRM-1	VDC Field Relay Module
FRM-AC	VAC (110-230) Field Relay Module
E0519K	I.S. Barrier (MTL 787)

Replacement Sensors

PS-RX01	O ₂	PS-RC01	Cl ₂	PS-RZ01	HCN
PS-RH01	H ₂ S	PS-RV01	ClO ₂	PS-RN01	NO
PS-RM01	CO	PS-RE01	C ₂ H ₄ O	PS-RD01	NO ₂
PS-RS01	SO ₂	PS-RY01	H ₂		
PS-RA01	NH ₃	PS-RL01	HCl		

www.gasmonitors.com

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I.S. Plant Rat

4-20mA 2-Wire Gas Transmitter

The I.S. Plant Rat is powered by a 2-wire loop, providing a direct linear output for industry-standard compatibility.

The I.S. Plant Rat's intrinsically safe design provides the ultimate in flexibility.

Encapsulated electronics provide protection against moisture invasion and corrosive environments. The rugged housing is a composite material that provides RFI/EMI protection.

Plug-in sensor and modular plug-in electronics make it a simple operation to:

- △ Change the gas monitored
- △ Change the measuring range
- △ Add a sensor separation kit
- △ Add a duct mount kit

The I.S. Plant Rat features non-intrusive, one person calibration. Simply open the hinged door to activate calibration mode (auto).

False system alarms are eliminated during setup and calibration.

The transmitter resets to normal operation automatically to ensure system integrity.

Sensors, including oxygen and hydrogen sulfide, are warranted for two years. With greater accuracy, a faster speed of response and a stable zero, the I.S. Plant Rat provides increased reliability and early hazard warning.

SPECIFICATIONS

TRANSMITTER: 2-wire, 4-20 mA intrinsically safe transmitter
Power Input: 12 to 35 volts DC; loop resistance 650 ohms (max) at 24 VDC
Output Current: Normal operation: linear 4-20mA
Calibrate Mode: Steady 4 mA, automatic reset to normal operation
Fault Mode: 3.5 mA signal
Current Draw: 35 mA (max)

SENSOR: Plug-in electrochemical cell
Humidity: 5 to 95% RH non-condensing
Operating Temperature: -25 to +35 °C / -13 to +86 °F - NH₃
 -40 to +40 °C / -40 to +104 °F - H₂S
 -20 to +40 °C / -4 to +104 °F - Other toxics and O₂
Drift: Zero drift: nominal; span drift: <10% per year
Calibration: Non-intrusive; with auto calibrate mode

Gas Monitoring Specifications	Detectable Accuracy	LCD Increments	Standard Measuring Ranges Available							
			Units	#=1	#=2	#=3	#=4	#=5	#=6	
O ₂	0.1%	0.1%	%v/v	0-25.0%	0-30.0%					
H ₂ S	0.25 ppm	1 ppm	ppm	0-100	0-50	0-500	0-20	0-30		
CO	1 ppm	1 ppm	ppm	0-500	0-1000	0-100	0-50	0-200	0-600	
SO ₂	0.5 ppm	1 ppm	ppm	0-100	0-50	0-20	0-10			
NH ₃	0.5 ppm	1 ppm	ppm	0-50	0-100			0-150		
Cl ₂	0.1 ppm	0.1 ppm*	ppm	0-5.0	0-10.0	0-100				
ClO ₂	0.01 ppm	0.01 ppm	ppm	0-5.00	0-1.00					
C ₂ H ₄ O	0.1 ppm	0.1 ppm*	ppm	0-10.0	0-20.0	0-100				
H ₂	1 ppm	1 ppm	ppm	0-100	0-200	0-800				
HCl	0.1 ppm	0.1 ppm*	ppm	0-10.0	0-20.0	0-100				
HCN	0.1 ppm	0.1 ppm*	ppm	0-20.0	0-50.0	0-100				
NO	0.5 ppm	1 ppm	ppm	0-50	0-100					
NO ₂	0.1 ppm	0.1 ppm	ppm	0-10.0	0-20.0					

* Note: LCD Increments vary according to the measuring range specified on these units

DISPLAY: Large, backlit LCD readout

PHYSICAL: Size: 4.7 x 4.7 x 3 in. / 12 x 12 x 7.5 cm

Weight: 1.65 lb. / 750 g

Hinged Door: Secures calibration access

Enclosure: Rugged, Nema 4, RFI/EMI shielded composite material 2-part case with 2 cable ports

WARRANTY: Instrument: 2 year non-prorated warranty (NH₃ sensor: 1 year)

Sensors: 2 year full replacement warranty (NH₃ sensor: 1 year)

Life expectancy: Toxics > 3 years; O₂ > 2 years; NH₃ > 1 year

DUE TO ONGOING RESEARCH AND PRODUCT IMPROVEMENT, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

RATINGS AND CERTIFICATIONS:  to both U.S. and Canadian standards
 (Intrinsically safe with barrier) Class I, Div. 1, Gr. A, B, C, D
 Class II, Div. 2, Gr. E, F, G

"INNOVATORS IN GAS DETECTION"



For further information:
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 Fax: +1-403-273-3708

E-mail: info@bwt.net.com
 www.gasmonitors.com

BW1005-01-01-00-8.25x11-5127-2



- 1 Inhibited output during calibration prevents false system alarms
- 2 Non-intrusive, one-person calibration
- 3 Intrinsically safe: sensor and electronic modules can be changed or serviced under power
- 4 Faster speed of response ensures early, reliable detection and warning
- 5 Backlit display
- 6 Hinged door protects calibration
- 7 Low maintenance and installation costs

Locally distributed by:

CD-420

CO, NH₃, Cl₂, H₂S, NO₂, SO₂, HCN, or O₂

4-20 mA 2-Wire Gas Transmitter

"INNOVATORS IN GAS DETECTION"



plus others



Fixed Gas Monitoring Systems

FEATURES:

The CD-420 4-20 mA, 2-wire transmitter provides continuous monitoring for toxic and oxygen gas hazards in ambient air. Engineered with BW field-proven industrial sensing and instrument technology, the CD-420 is virtually maintenance free.

- △ Reduced operating, maintenance and installation costs
- △ Accurate, reliable performance that eliminates false alarms
- △ Modular, plug-in encapsulated components and plug-in sensor
- △ Linear 4-20 mA output with a wide supply voltage range (12 to 35V)
- △ Electrochemical sensor
- △ Micropower analog technology, draws only 20 mA in operation
- △ Hinged operations door
- △ Power ON LED
- △ If a system fault occurs or the sensor is degrading, the CD-420 will transmit a signal to the controller.
- △ Change the measuring range or gas sensed in the field (all models except CD-420-3M# carbon monoxide models)
- △ 2 year, non-prorated instrument and sensor warranty

Ordering Information

Transmitter c/w Sensor and Measuring Range Module Selected

- CD-420-3M(#) CO "-3M models "
- CD-420-3H(#) H₂S
- CD-420-3A(#) NH₃
- CD-420-3C(#) Cl₂
- CD-420-3S(#) SO₂
- CD-420-3D(#) NO₂
- CD-420-Z(#) HCN
- CD-420-X(#) O₂
- CD-420-M(#) CO

Note: # = Measuring Range. To specify see table on back page. For other gases contact BW Technologies.

Accessories and Spares

- CD-SEP-K3 Sensor Separation Kit
- UA-DUC-K2 Remote Duct Mount Kit
- FRM-1 VDC Field Relay Module
- FRM-AC VAC (110-230) Field Relay Module
- PS-RM01 CO sensor
- PS-RH01 H₂S sensor
- PS-RA01 NH₃ sensor
- PS-RC01 Cl₂ sensor
- PS-RS01 SO₂ sensor
- PS-RD01 NO₂ sensor
- PS-RZ01 HCN sensor
- PS-RX01 O₂ sensor

www.gasmonitors.com

Email: info@bwt.net

CD-420

4-20 mA 2-Wire Gas Transmitter

The CD-420 Transmitter is shipped factory tested and calibrated, ready for immediate installation.

Gas detection equipment is only as good as its sensor. BW electrochemical sensors provide:

- △ Reliable protection
- △ Accurate performance
- △ Long life

Advanced micropower electronic technology delivers superior performance, eliminating false alarms and providing a linear output for direct compatibility with existing control systems.

In the event of power outages, troublesome start-up alarms are eliminated. The CD-420 resets automatically back into the system loop, ensuring system integrity.

With a faster response time, the CD-420 provides reliable early hazard warnings at an affordable price.

Note: CD-420-3M models for CO are equipped with two 250 mA auxiliary outputs. Output 1 is activated by low alarm. Output 2 is activated by high alarm, sensor expired advice, system fault or sensor fault alarms.

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www.gasmonitors.com

BW1005-01-01-00-8.25x11-5006-3

SPECIFICATIONS

TRANSMITTER: 2-wire, 4-20 mA Industrial Micropower Transmitters

	CD-320-3M Models	Standard Models		
Supply Voltage:	10-28V	12-35V		
Loop Resistance (max):	650 ohms at 28 VDC; 50 ohms at 10 VDC	650 ohms at 24 VDC		
Current Consumption:	20 mA (max)	20 mA		
Signal Range (18 AWG):	31,300 ft / 9,600 m	31,300 ft / 9,600 m		
Status Indicator (internal):	LED Indicator	Current Output	Indicators	Current Output
Normal Operation:	Power ON	4-20 mA	Power ON	4-20 mA
Power Off:	LED Off	0 mA	LED Off	0 mA
Sensor Fault:	Slow flashes	≈ 2 mA	—	3.5 mA
Overrange:	—	24 mA	—	24 mA
Auxilliary Outputs (2):	—	250 mA at VDC	—	—
Daily Sensor Self Test:			N/A	

SENSOR: Plug-in, industrial gas specific, electrochemical cell
Drift: Zero drift: nominal; Span drift: <10% of reading per year

Humidity: 5 to 95% RH non-condensing

Operating Temperature: NH₃: -25 to +35°C / -13 to +86°F
 H₂S: -40 to +50°C / -40 to +122°F
 Other toxics and O₂: 20 to +50°C / -4 to +122°F

Gas Monitoring Specifications	Detectable Accuracy	Standard Measuring Ranges Available						
		Units	#=1	#=2	#=3	#=4	#=5	#=6
CO (-3M)	1 ppm	ppm	0-500	0-1000	0-100		0-200	
CO	1 ppm	ppm	0-500	0-1000	0-100	0-50	0-200	0-600
NH ₃	0.5 ppm	ppm	0-50	0-100	0-350		0-150	
Cl ₂	0.1 ppm	ppm	0-5.0	0-10.0	0-100			
H ₂ S	1 ppm	ppm	0-100	0-50	0-500	0-20	0-30	
NO ₂	0.1 ppm	ppm	0-10.0	0-20.0				
SO ₂	1 ppm	ppm	0-50	0-20	0-10.0	0-2.0		
HCN	0.1 ppm	ppm	0-20.0	0-50.0	0-100			
O ₂	0.1 %	%v/v	0-25.0%	0-30 %				

FEATURES: Power-up delay: eliminates start-up alarms
 Auto reset: automatically resets back in system loop after power failures and/or brownouts

PHYSICAL: Rugged, RFI/EMI shielded enclosure with 2 cable ports
 Size: 6.1 x 5 x 2.3 in. / 15.25 x 12.5 x 5.75 cm; weight: 1.65 lb. / 750 g

WARRANTY: 2 year non-prorated warranty (NH₃ sensor: 1 year)

Sensors: 2 year full replacement warranty (NH₃ sensor: 1 year)

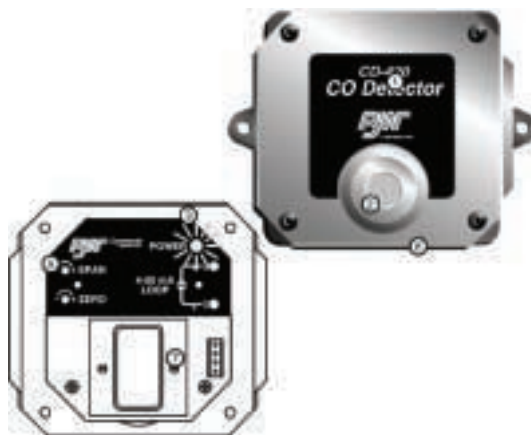
Life Expectancy: Toxics > 3 years; O₂ > 2 years

DUE TO ONGOING RESEARCH AND PRODUCT IMPROVEMENT, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

RATINGS AND CERTIFICATIONS:

Standard Models:
 CSA to both U.S. and Canadian Standards General Purpose

CD-420-3M Models:
 CSA to both U.S. and Canadian Standards: General Purpose
Certified to IEC Standard: No. 61010-1
CE: Conforms to European Union directives
Enclosure: Type IP46 (NEMA 4 equivalent)



- 1 Eliminate false alarms
- 2 Electrochemical sensor
- 3 Power ON LED
- 4 Direct linear output
- 5 Secure hinged door access
- 6 Lower operating costs
- 7 Measuring range module
- 8 Rugged, modular design

Locally distributed by:

RRJ Series

H₂S or Combustible Gases

Zero-Maintenance Gas Transmitters

"INNOVATORS IN GAS DETECTION"



An Industry First Maintenance-free 4-20 mA Gas Transmitter



FEATURES:

The rugged, zero-maintenance RRJ Series Transmitters for H₂S or combustible gases come complete with sensor and provide a 4-20 mA signal that is compatible with any 4-20 mA control system (DCS, PLC, BW RRJ-4000 and CR-4000 controllers, etc.).

- △ Eliminate maintenance—no calibration required, no sensor replacement required, no downtime
- △ Rugged, durable, polyurethane encapsulated transmitter with sensor
- △ Quick disconnect with military-style plug-in wiring connector during installation and decommissioning
- △ 2 year operational life
- △ Daily, automatic, full-function self-test of sensor and circuitry integrity
- △ LED red visual alarm
- △ Electrochemical sensor (H₂S) or Catalytic bead sensor (combustible gases)
- △ Wide supply voltage range—10 to 28 VDC for industry-standard compatibility
- △ Low initial cost—competitively priced

4-20 mA Transmitter with Sensor

Ordering Information

Zero-maintenance, 2-year, 4-20 mA transmitter with sensor, and field-replaceable sensor screen

RRJ-RH04 2-wire Hydrogen Sulfide (0-100 ppm)
RRJ-RW04 3-wire Combustible (0-100% LEL)

Accessories and Options

RRJ-SC010-K 10 ft. / 3 m plug-in factory built sensor cables
RRJ-SC###-K Other lengths up to 1,000 ft. / 305 m in
10 ft. / 3 m increments
RRJ-FW1-K Field wiring plug-in connector kit
RRJ-PT1-K Pigtail connector
RRJ-FIL-K5 Sensor screen replacements (kit of 5)

Compatible with all 4-20 mA Controllers and the following BW Controllers:

RRJ-4000 4 Channel AC/DC Stainless Steel Controller
CR-4000 4 Channel AC/DC Controller

www.gasmonitors.com

Email: info@bwt.net

RRJ Transmitters with Sensor

H₂S or Combustibles

BW Technologies introduces the first zero-maintenance, 4-20 mA transmitters on the market. BW Technologies has applied cutting-edge science developed for the world's most advanced disposable gas detector—the GasAlertClip—to the RRJ Series of transmitters.

Daily Automatic Self-Test

The full function self-test is a unique safety advantage that verifies circuitry integrity and checks the sensor's response to gas.

Operational Life

The operational life is two years in normal use. The life counter is activated when power is applied and runs continuously while the transmitter is operating. If power is interrupted, the counter stops and will resume counting when power is restored.

Life-Ended Warning and Alarm

One month prior to the end of the transmitter's operational life, the LED will begin a slow flash warning. When the 2 year operational life is over, the monitor will send a 2 mA signal to the controller advising that the monitor is now disabled and requires replacement.

"INNOVATORS IN GAS DETECTION"



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www.gasmonitors.com

BW1019-01-01-00-8.25x11-5131-4

SPECIFICATIONS

Transmitter with Sensor: 4-20 mA gas transmitter with advanced microprocessor-based circuitry
 Supply Voltage: 10 VDC (min.) to 28 VDC (max.)
 Supply Current: H₂S: 50 mA; Combustibles: 100 mA
 EMI/RFI: Complies with EMC Directive 89/336/EEC

TRANSMISSION RANGE: 1,000 feet / 305 m with 22 AWG / 0.64 mm cable

SENSORS:

Gases Monitored	Sensor Type	Measuring Range	Temperature Range	Cable
H ₂ S	Electrochemical	0-100 ppm	-40 to + 122°F; -40 to + 50°C	2-wire
Combustibles	Catalytic	0-100% LEL	-40 to + 122°F; -40 to + 50°C	3-wire

Humidity: 5 to 90% non-condensing
 Calibration: Factory calibrated. Not required for operational life.

FULL FUNCTION SELF-TEST: Daily (auto) and each time power is applied (auto)
 Verifies: Sensor integrity and circuitry integrity

VISUAL ALARM: Red light emitting diode (LED)

STATUS ADVISE:

Advise Signals	LED Indicator	Current Output*
Normal Operation	ON	4-20 mA
Over Range Alarm	ON	21 mA
Fault: Self-Test Fail	Fast flashes (1 per 0.5 seconds)	2 mA
Life Ending Warning	Slow flashes (1 per 2 seconds)	4-20 mA
Operational Life Ended	OFF	2 mA
Power OFF	OFF	0 mA

*Current Output: Signal to control system (DDC, PLC, etc.)

ALARM OUTPUTS: Two are available if required; rated 250 mA @ 24 VDC
 Two factory specified alarm levels (LOW and HIGH)

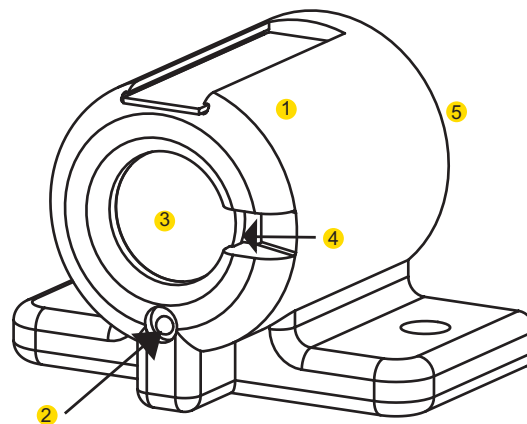
PHYSICAL: Rugged polyurethane encapsulated enclosure
 Size: 2.65 x 2.3 x 3.25 in. / 6.73 x 5.84 x 8.25 cm
 Weight: approx. 6.2 oz. / 175 g

Connector: Plug-in, military-style, 6-pin connector
 Accepts field wiring kit, pigtail assembly or optional BW plug-in remote RRJ sensor cables

OPERATING LIFE: 2 years
 Warranty: 2 years including sensors

DUE TO ONGOING RESEARCH AND PRODUCT IMPROVEMENT, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

RATINGS AND CERTIFICATIONS:  to both U.S. and Canadian Standards
 (INTRINSICALLY SAFE WITH BARRIER) Class I, Div. 1, Gr. A, B, C, D
 Class I, Zone 0, Gr. IIB



- 1 Rugged, encapsulated enclosure with predrilled mounting flanges—only the sensor is exposed
- 2 LED alarm indicator
- 3 Sensor (behind sensor screen)
- 4 Washable, replaceable second sensor screen
- 5 Plug-in field wiring connector

Locally distributed by:



"INNOVATORS IN GAS DETECTION"



Alarm Rat

Single Point AC or DC Gas Alarm

Stand-Alone Monitor for Toxic and Oxygen Hazards



Self Contained -
Simply Connect Power

FEATURES:

The Alarm Rat is the complete, stand-alone single-point monitor alarm system that's delivered ready for use. Full flexibility is built-in, change the gas sensed or the measuring range at any time. Equipped with **four relays to control** and activate remote alarms and other field interfaces.

- △ Three alarm levels and power failure alarm
- △ Four 15 amp SPDT normally energized relays
- △ 101 dB siren and LED alarms
- △ Modular engineered design provides the ultimate in flexibility. In the field, change the gas monitored and/or the measuring range, add a sensor separation kit or duct mount kit
- △ AC and DC compatible, 4-20 mA output option
- △ Failsafe calibration reset
- △ Accurate, reliable performance
- △ Exterior hinged door for non-intrusive calibration
- △ Lower operating, maintenance and installation costs



Fixed Gas Monitoring Systems

Ordering Information

Monitor with Sensor, Digital Display, Relays, Audible/Visual

Alarms

AR-PRX(#)-2D	O ₂	AR-PRE(#)-2D	C ₂ H ₄ O
AR-PRH(#)-2D	H ₂ S	AR-PRY(#)-2D	H ₂
AR-PRM(#)-2D	CO	AR-PRZ(#)-2D	HCN
AR-PRS(#)-2D	SO ₂	AR-PRL(#)-2D	HCl
AR-PRA(#)-2D	NH ₃	AR-PRN(#)-2D	NO
AR-PRC(#)-2D	Cl ₂	AR-PRD(#)-2D	NO ₂
AR-PRV(#)-2D	ClO ₂		

Note: # = Measuring Range. To specify see table on back page.

Accessories and Options

UA-SEP-K2	Sensor Separation Kit
UA-DUC-K2	Sensor Duct Mount Kit
UA-SEP-F5(x#)	Flue Vessel Mount Sensor Separation Unit
SG-CAL-1	Splash Guard/Remote Calibration Cup
PB-CAL-1	Process Baffle/Remote Calibration Cup

Replacement Sensors

PS-RX01....O ₂	PS-RC01...Cl ₂	PS-RZ01....HCN
PS-RH01...H ₂ S	PS-RV01...ClO ₂	PS-RN01....NO
PS-RM01...CO	PS-RE01...C ₂ H ₄ O	PS-RD01....NO ₂
PS-RS01....SO ₂	PS-RY01...H ₂	
PS-RA01....NH ₃	PS-RL01....HCl	

www.gasmonitors.com

Email: info@bwt.net

Alarm Rat

Stand-Alone Gas Monitor

The Alarm Rat, with all the features built-in, is delivered ready for use. Designed for easy operation, no special knowledge is required, simply plug in power.

With three alarm levels, you will be immediately warned of a gas hazard by the built-in visual and audible alarms. Simple slide switches are used to set alarm levels.

Dangerous levels of gas and/or a power failure activate four 15 amp, SPDT relays. These relays trigger remote alarms, control functions or other field interfaces.

The plug-in sensor and modular electronics make it simple to:

- ▲ Change the gas monitored
- ▲ Change the measuring range
- ▲ Add a Sensor Separation Kit

All sensors, including oxygen, have a two year warranty. With greater accuracy and a faster speed of response, the BW sensor provides increased reliability and early warning.

"INNOVATORS IN GAS DETECTION"



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E-mail: info@bwnet.com
www.gasmonitors.com

BW1022-01-01-00-8.25x11-5217-2

SPECIFICATIONS

MONITOR: Stand Alone Single Point Hazardous Gas Alarm
Power Input: 115 VAC and 24 VDC compatible (230 VAC optional)
SENSOR: Plug-in, gas specific, electrochemical cell
Humidity: 5 to 95% RH non-condensing
Operating Temperature: -25 to +30°C (-13 to +86°F) - Ammonia
-40 to +50°C (-40 to +122°F) - Hydrogen Sulfide
-20 to +50°C (-4 to +122°F) - Oxygen and other Toxics
Drift: Zero: Nominal Span: <5% per year

Gas Monitoring Specifications	Detectable Accuracy	LCD Increments	Standard Measuring Ranges Available							
			Units	#=1	#=2	#=3	#=4	#=5	#=6	
Oxygen	0.1 %	0.1%	%v/v	0-25.0%	0-30.0%					
Hydrogen Sulfide	0.25 ppm	1 ppm	ppm	0-100	0-50	0-500	0-20	0-30		
Carbon Monoxide	0.5 ppm	1 ppm	ppm	0-500	0-1000	0-100	0-50	0-200	0-600	
Sulfur Dioxide	0.5 ppm	1 ppm	ppm	0-100	0-50	0-20	0-10			
Ammonia	0.5 ppm	1 ppm	ppm	0-50	0-100			0-150		
Chlorine	0.1 ppm	0.1 ppm*	ppm	0-5.0	0-10.0	0-100				
Chlorine Dioxide	0.01 ppm	0.01 ppm	ppm	0-5.00	0-1.00					
Ethylene Oxide	0.1 ppm	0.1 ppm*	ppm	0-10.0	0-20.0	0-100				
Hydrogen	1 ppm	1 ppm	ppm	0-100	0-200	0-800				
Hydrogen Chloride	0.1 ppm	0.1 ppm*	ppm	0-10.0	0-20.0	0-100				
Hydrogen Cyanide	0.1 ppm	0.1 ppm*	ppm	0-20.0	0-50.0	0-100				
Nitric Oxide	0.5 ppm	1 ppm	ppm	0-50	0-100					
Nitrogen Dioxide	0.1 ppm	0.1 ppm	ppm	0-10.0	0-20.0					

* NOTE: LCD Increments may vary according to the Measuring Range specified

DISPLAY: Large 3.5 digit backlit LCD readout module

ALARM: Three (3) user settable alarm Levels (Low, Mid, High)

Visual: Four (4) LEDs, color-coded (Power/ON: Low, Mid, High alarms)

Audible: High output fast pulsed siren 101 dB @ 3 ft. (1 m)

RELAYS: Four 15 amp SPDT normally energized (3-Gas Alarms, 1-Fault)

PHYSICAL: Size: 9.5 x 4.7 x 3 inches (24 x 12 x 7.5 cm)

Weight: 3.25 lbs. (1.5 kg)

Enclosure: Rugged, RFI/EMI shielded enclosure c/w 3 cable ports

Options: 4-20 mA output, Splash Guards, Process Baffles

Remote: Standard Sensor Separation Kit, Duct Mount Kit, Flue Vessel Mount

WARRANTY: 2 Year non-prorated warranty

DUE TO ONGOING RESEARCH AND PRODUCT IMPROVEMENT, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

DESIGNED FOR: Ordinary Locations

- 1 Four 15 AMP SPDT relays
- 2 101dB siren and large LED visual alarms
- 3 Three gas alarm levels and power failure alarm
- 4 Plug-in sensor and electronic modules increase flexibility
- 5 Easy installation and lower maintenance costs
- 6 Backlit large LCD display

The Complete Monitor
-delivered ready to use
-simply connect power



Locally distributed by:



Stand-Alone Systems

BW Technologies

With applications ranging from deserts to the Arctic, BW's stand-alone systems feature real-time data transmission between remotely located detector, sensor and base controller up to 4.5 miles / 7.25 km away. The easy-to-install systems come complete with zero-maintenance, intrinsically safe classified sensors and provide continuous monitoring for toxic gases, combustibles and oxygen hazards—at an affordable price.



"INNOVATORS IN GAS DETECTION"

BW
Technologies

For further information:

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The BW Stand-Alone Advantage

Performance

BW's performance standards lead the industry. Our wireless systems operate in extreme environments, have low drift rates and are virtually unaffected by humidity. Long-life poison-resistant electrochemical and catalytic sensors ensure accurate, reliable performance.

Flexibility

Industry requires a flexible approach to gas monitoring. You require an application-specific monitoring system that has the versatility to evolve and grow as your requirements change. A building block approach has been used in the design of all BW gas detection systems. Our systems can be easily reconfigured as your needs change and grow.

Cost Effectiveness

BW stand-alone systems provide an efficient solution to gas monitoring needs. Rapid response time, high circuit stability and simplicity of use ensure confidence and reduce maintenance costs. Our battery-powered, solar-capable systems operate independently, allowing fast and easy installation, removal and relocation.

Power

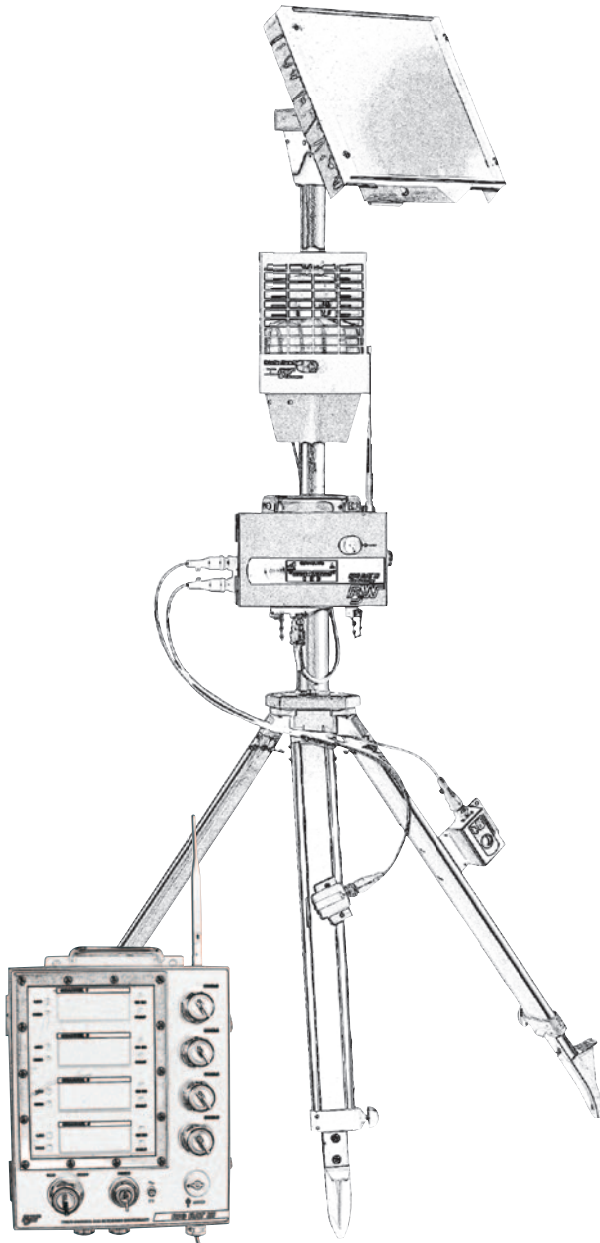
Variable power sources ensure continuous monitoring capabilities and provide flexible protection on any site. A full range of power options are available:

- Battery
- Solar
- 110, 230 VAC
- 24 VDC direct



STAND ALONE GAS DETECTION SYSTEM

Information Library Service and Repair Training Services



RIG RAT III WIRELESS MULTI-POINT SYSTEMS

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RIG RAT III DETECTOR

PLUG-IN REMOTE ACCESSORIES AND OPTIONS

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RIG RAT III CONTROLLER AND SYSTEM OPTIONS

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SYSTEM OVERVIEW

RIG RAT III - WIRELESS SYSTEM

Order No: RR-3000

BW Technologies has taken state-of-the-art detection to another level with the new Rig Rat III stand-alone system. Self-powered and solar-capable, the Rig Rat III provides wireless monitoring for toxic gases, combustibles and oxygen hazards—with maximum efficiency.

Meeting Industry's Needs

Industry requires a flexible approach to gas monitoring. Each site and application is different and constantly undergoing change.



Hazardous Gas Measurement: Monitor Combustibles, Oxygen and/or Toxic gases. Change the gas monitored at any time. Sensors may be remotely placed up to 250 ft (75 meters) away from the Detector.

Performance

BW has set rigorous performance standards that lead the industry. The Rig Rat III Wireless System is virtually unaffected by humidity, operates in extreme environments and has a low drift rate. Long-life, poison-resistant electrochemical and catalytic sensors ensure accurate, reliable performance. The power-efficient units use less than 1% of the power required by conventional equipment.

Modular Design

BW has designed the Rig Rat III System so that all components are modular. Compatible plug-in components let you customize the total system and each individual detection point. The system can be easily reconfigured as your needs change and grow. Two plug-in Option Ports are provided per Detector.

Audible and Visual Alarms

A full range of plug-in audible and visual alarms, as well as receiving alarms for both Detectors and Controllers are available to customize an installation to the specific requirements of your site.

Building Block Approach

A building block approach has been used in the design of all BW gas detection systems. Rig Rat III systems have the versatility to evolve and grow as your requirements change.

Cost Effectiveness

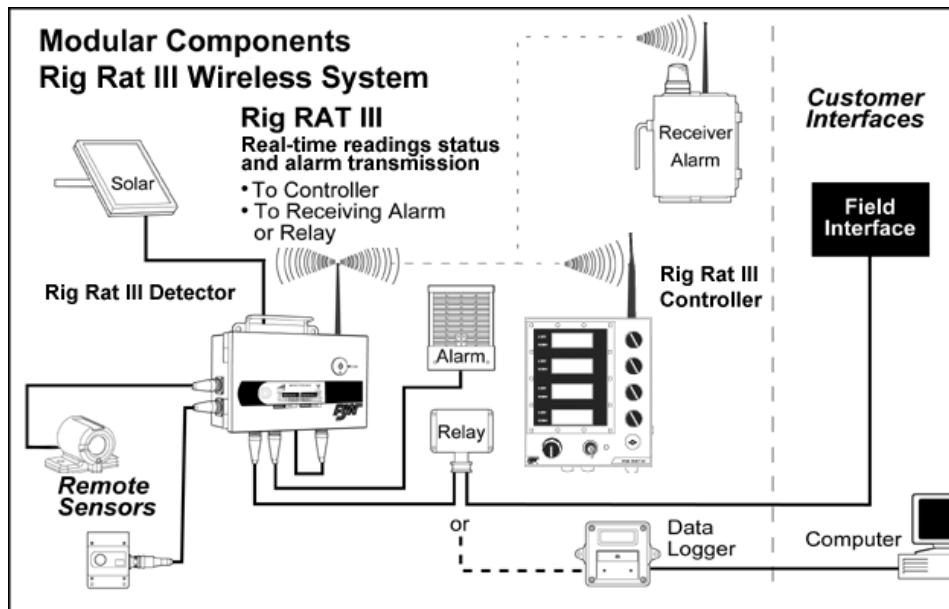
Instantaneous communication of sensor readings and system status information between the Controller and remotely located Detectors and other system elements is by means of real-time radio frequency (RF) link. Use of real-time RF communication to link system elements eliminates the need for expensive hard-wired connection. Rapid response time, high circuit stability and user simplicity ensure confidence as well as reduced maintenance costs. The battery powered, solar capable Detector operates independently, allowing fast and easy installation, removal and relocation.

Power

A full range of Power Options are available from:

- ▲ Battery
- ▲ Solar
- ▲ 110, 230 VAC
- ▲ 24 VDC direct

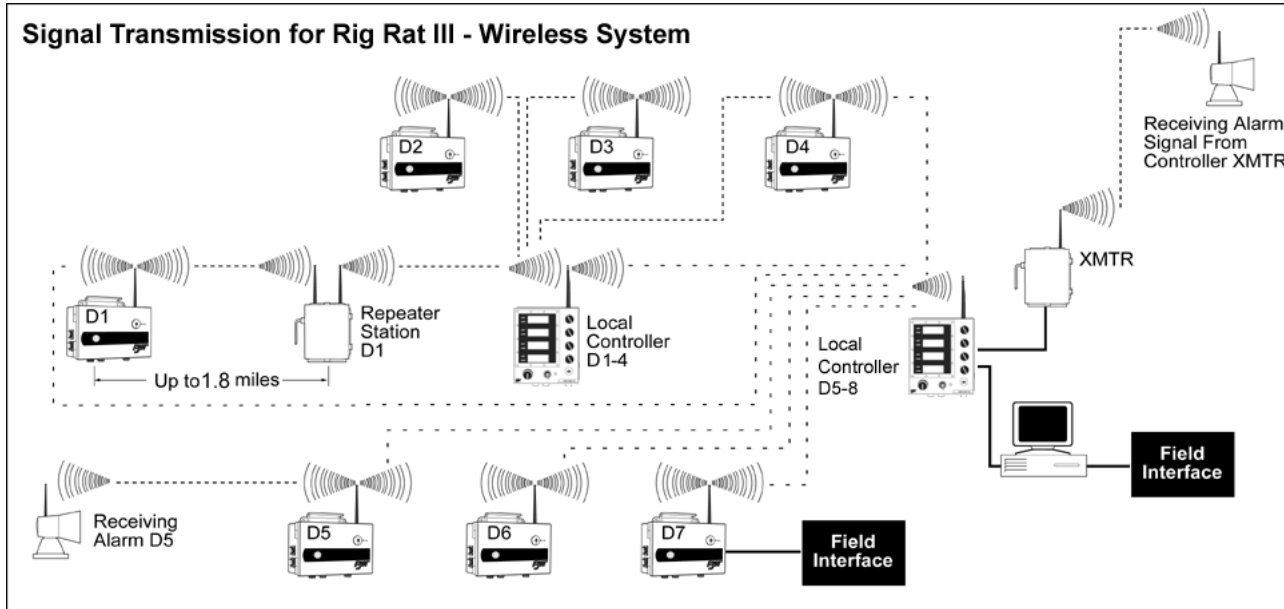
Giving you complete flexibility to provide monitoring protection on any type of site.



RIG RAT III

WIRELESS INTEGRATED MULTI-POINT HAZARDOUS GAS DETECTION SYSTEM

The Rig Rat III is suited to dozens of industrial applications, including drilling rigs, HAZMAT and perimeter monitoring. Modular, plug-in ports allow quick installation of all components and field interfaces, so system requirements are easily accommodated as they evolve. Remote sensors, alarms and relays can be added at will. This flexibility extends to power options —select independent battery, solar or line power at any time.



Signal Transmission

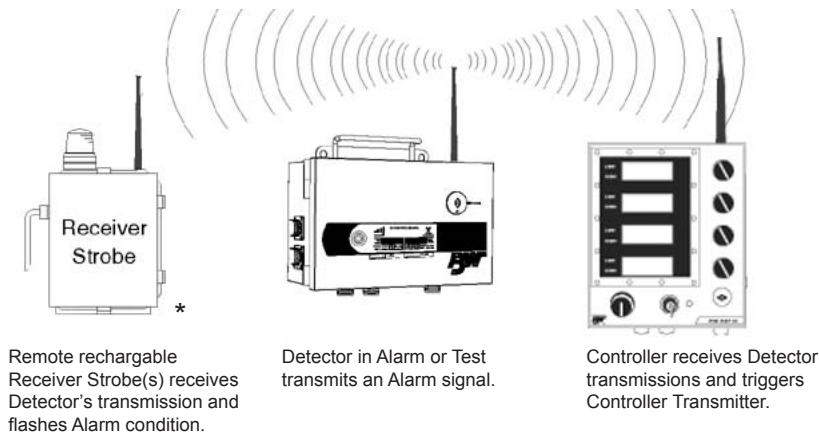
The Rig Rat III Controller is in constant two-way communication with all remotely located system elements. Radio transmission signals from Detectors to a Central Controller and Receiving Alarms allow you the flexibility to place or move your detection points as required, and eliminate the need for expensive hard-wired connection. Rig Rat III Controllers include outputs that allow readings and alarm state information to be directly communicated to site telemetry PLC or DTS systems.

Relays

Plug-in relays for Controllers and Detectors control and trigger site-specific field interfaces and alarms.

Other Options

Dataloggers, Repeater Stations and Solenoid Drivers, etc. are available for you to customize the system for specific applications.



RIG RAT III APPLICATION PHOTOS

WIRELESS AND NON-WIRELESS SYSTEM



VERSATILITY - Systems can be readily installed, expanded or modified without disturbing the workplace.

FLEXIBILITY - Independent compatible sensors, Detectors, Controllers, alarms, and relays can be easily added or removed to customize the system in response to on-going change.

REDUCED COSTS - Dramatically lower installation and maintenance costs.



Facility Monitoring: Rig Rat III provides complete flexibility. Operate via line, battery, or solar power. Communication via wireless RF link. Components can be permanently installed or system can be portable, for easy relocation or deployment.



Residential Monitoring: This system provides permanent monitoring in a 1.8 mile / 3 km radius around the plant.

RIG RAT III

CONTINUOUS CONFINED SPACE ENTRY Compressor Building



REMOTE MONITORING

Oxygen and Toxic sensors can be remotely placed up to 250 feet or 75 meters (combustible sensors up to 100 feet or 33 meters) away from the Detector for optimum results when monitoring Hazardous gases.

The Detector can then be conveniently placed for accessibility.



Sensor Mounted Under Pipeline

RELIABILITY and ACCURACY

We brought together the world's foremost sensing and microelectronics technology for your safety and piece of mind. Our field-proven sensors offer unsurpassed excellence in accuracy, speed and stability. BW's sensors will not "go to sleep", are poison resistant, and will not fail to recognize the presence of gas. BW's sensors offer the reliability and accuracy demanded in today's marketplace, and for the protection of your working environment.

COST EFFICIENT

All gas detection instruments require periodic verification of proper performance. BW's sensors have a lower drift rate of +/- 1% per month which is considerably less than other competitor's sensors on the market. The result is major cost savings over the long term in maintenance and operation.



Remote Sensor mounted on wall.

UNPRECEDENTED FLEXIBILITY

All remote Rig Rat III Combustible, Oxygen, and Toxic Sensors are fully compatible with BW Detectors. The full range of sensors are completely interchangeable, allowing you the option to select and change the gas being monitored as your site requirements change. Equipped with quick connectors, you simply plug in a new sensor unit and calibrate the Detector to the new gas.

SYSTEM OVERVIEW

RIG RAT III NON-WIRELESS SYSTEM Order no. RR-3000S

Rig Rat III systems are available in wireless and non-wireless versions.

GENERAL

The Rig Rat III Non-Wireless is a self-contained Stand Alone Gas Monitoring System that provides continuous single or multi-point protection for a full range of toxic, oxygen and combustible hazardous gases.

The intrinsically safe c-CSA-us classified Rig Rat III uses advanced electronic and sensing technology to provide instantaneous detection and warning.



PERFORMANCE

BW has set rigorous performance standards that lead the industry. The Rig Rat III has a low drift rate, wide temperature operating range and is virtually unaffected by humidity. The field proven Rig Rat III provides the reliability and accuracy demanded by industry today. The power efficient units use less than 1 % of the power required by conventional equipment.

MODULAR DESIGN

The modular stainless steel Rig Rat III is designed for the most rugged environments. Compatible plug-in components let you customize each individual detection point. The system can be easily reconfigured as your needs change and grow.

1) STAND ALONE SYSTEM

Rig Rat III Non-Wireless systems are ideal for single or dual point, independent and/or remote location installation. The system's stability and power independence permit long term unattended operation. Solar powered for year round maintenance-free operation, the system provides continuous monitoring at sites where conventional power is unavailable or cost prohibitive.

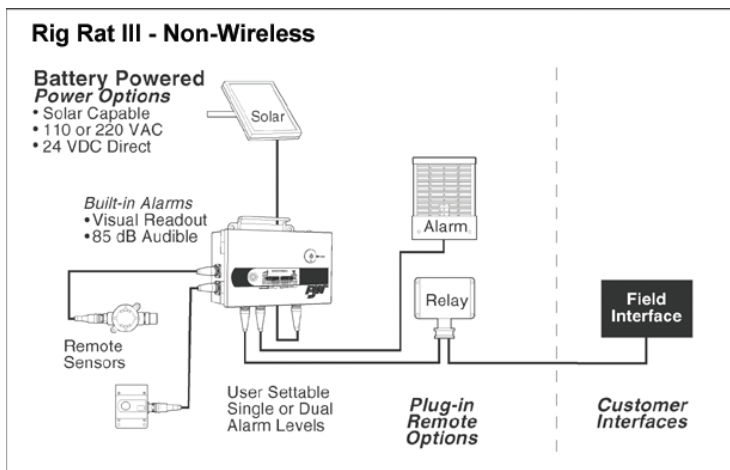
VERSATILE

The Rig Rat III is designed to provide the utmost in versatility and flexibility. The Rig Rat III includes a built-in backup power supply, audible and visual alarms, two sensor ports for remote sensors, as well as solar and line power connections. The Rig Rat III is a complete Stand Alone system.

Two option ports and a charger port are provided to expand the capabilities of the system with off-the-shelf components. Each point can be easily configured as requirements change. Not dependant on line power, it provides reliable, high performance monitoring in remote locations.

COST EFFECTIVE

The system is virtually maintenance-free. Rapid response time, high circuit stability and user simplicity ensure confidence. The battery powered, solar capable and independent Rig Rat III is easily maintained by field personnel. Zero-maintenance combustible sensors generally do not require calibration over their entire 2-year operational life. All that is necessary to verify proper performance is a simple functional "bump test."



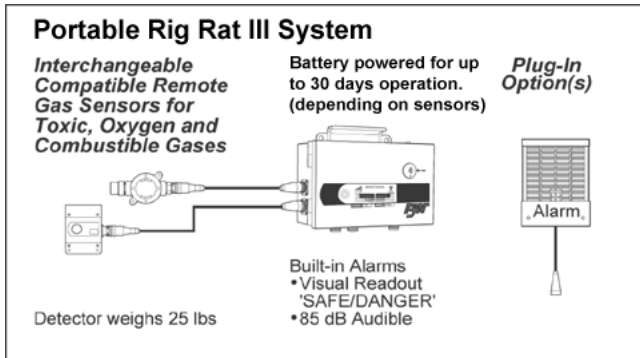
RIG RAT III NON WIRELESS

STAND-ALONE INDEPENDENT GAS MONITORING SYSTEM

The Rig Rat III non wireless gas detection system is a:

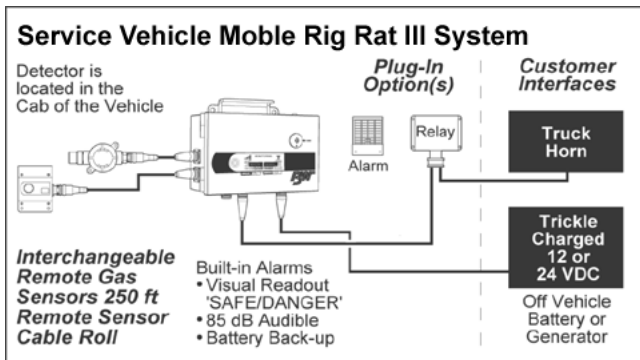
1) PORTABLE SYSTEM:

The system is designed for portability. Completely self-contained with built-in alarms, the Rig Rat III takes under 5 minutes to set-up. All gas specific sensors are compatible, permitting the system to be used for a wide variety of applications.



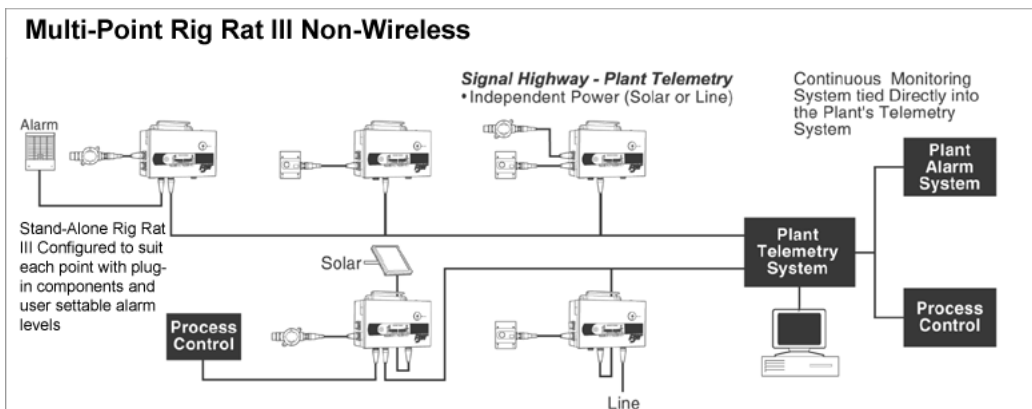
2) SERVICE VEHICLE MOBILE MONITORING SYSTEM:

The Rig Rat III provides continuous protection for personnel at sites they are servicing. Two sensors (one located in the cab and the second on a 250 ft. (75 m) cable roll), powered by 24 VDC direct from the truck, the Rig Rat III is an ideal mobile monitor.



3) MULTI-POINT STAND-ALONE MONITORING SYSTEM:

The alarm outputs of the Rig Rat III Detector can be tied directly into existing site telemetry, PLC or DIS systems. The Rig Rat III design allows the easy integration of independently solar powered or permanently installed Detectors into existing overall site monitoring systems.



Audible & Visual Alarms

The Rig Rat III has built-in audible and visual alarms. A wide variety of remote audible and visual alarms equipped with quick connects are available to alert personnel as they approach the area.

Sensing Capability

The Rig Rat III Detector is fully compatible with all 16 available gases monitored by the remote sensing units, providing the flexibility to easily change the hazardous gas(es) being monitored.

Each Detector is equipped with two sensor ports, for connection with any two remotely located sensors. The Remote Sensor Units and sensing cables (up to 250 ft. or 75 m long) are RFI/EMI protected.

Power Flexibility

Independent of line power, your gas monitoring system will still be operating in the event of a power failure or brownout. A full range of power choices are available to provide monitoring protection in any locale or on any type of site.

- ▲ Battery operated
- ▲ Solar charged for maintenance-free operation
- ▲ Line 110, 230 VAC
- ▲ 12 or 24 VDC direct

Other Equipment

Plug-in relays control and trigger site specific field interfaces and alarms.

RIG RAT III



Wireless Multi-Point Gas Detection System

NEW!

The Stand-Alone Solution

The rugged Rig Rat III detection system provides multi-point monitoring for toxic gases, combustibles and oxygen hazards. Self-powered and solar-capable, the Rig Rat III features unequalled versatility, with an extensive range of field configurations. With real-time, two-way data transmission and remote sensing capabilities, the Rig Rat III represents the new generation of stand-alone system technology.

Self-contained and intrinsically safe, the Rig Rat III is the ultimate in stand-alone detection.

Now with real-time data transmission



"INNOVATORS IN GAS DETECTION"

BWF
Technologies

www.gasmonitors.com

Email: info@bwt.net

RIG RAT III

Wireless Multi Point Gas Detector with Sensors

Rig Rat III is completely modular in design, with plug-in ports for all system components and field interfaces: remote sensors, remote alarms, relays, solar power, etc. Microprocessor-based operation and advanced sensor technology ensure reliability and performance.

Cost-effectiveness is a hallmark of the Rig Rat III. Trenching and cabling costs are eliminated through wireless, two-way digital RF data transmission. Maintenance-free combustible sensors reduce the need for costly upkeep requirements.

Signal Transmission:

Digital, 2.4 GHz, license-free ISM band radio frequency (RF) transceiver provides two-way, real-time communication with the controller located up to 1.8 mi. / 3 km away. Encoded digital signal is RFI protected.

Simple push-button interface for automatic calibration and setup choices

Rugged and Durable:

Stainless steel enclosure with mounting flanges and carrying handle.

Security Keylock:

Protects access to operations bay.

Flashing Visual Alarms:

Bright alarm light advises alarm levels, type and sensors affected.

Alphanumeric Display:

Two continuous LCD gas readouts show local real-time concentrations present in ppm, % LEL and/or O₂ % by volume.

Two Sensor Ports:

Install one or two sensors as needed.

Audible Alarm:

Built-in 85 dB alarm.

Plug-in Sensor Cables:

Place sensor at the optimal location, up to 250 ft. / 76 m away from the detector.

Power Port:

Battery powered, solar and line-capable.

New Zero-maintenance Sensor:

Intrinsically safe combustible sensor (0-100 % LEL). No calibration or sensor replacement required, no downtime.

Two Option Ports: Plug-in ports accept remote alarms, relays, etc.

Plug-in Remote Sensors:

Intrinsically safe, stainless steel toxic gas and oxygen sensors.

Eliminate Power and Signal Lines

Cut installation costs by up to 75% by removing the need for trenching, cabling and wiring conduit.



Alarm Status

The large LCD keeps you advised of any gas hazard present. The intelligent LCD readouts provide instant diagnostic information.



In the event of an alarm condition:

- ▲ Alarm signal is transmitted
- ▲ The RED alarm LED flashes
- ▲ DANGER icon lights and flashes
- ▲ The audible alarm pulses
- ▲ Alarm port option(s) trigger
- ▲ The LCD readouts show the concentration of gas(es) present



Low or High Gas Alarm

A LOW alarm condition triggers:

- ▲ Alarm signal transmission to the controller
- ▲ Alarm port options
- ▲ Built-in audible 85 dB alarm

Users can field-select, if desired, the above functions to activate during HIGH alarm only instead of during LOW alarm.

The LOW ALARM or HIGH ALARM gas icon will light, advising alarm level and sensor affected. The field functions will activate on the alarm level selected. Current alarm setpoints can be viewed at any time.

Sensor Integrity Alarm

The integrity alarm is triggered if a sensor is missing or a sensor cable is damaged. In addition to the above alarm notification, sensor 1 or sensor 2 **FAIL** icon will light to advise which sensor or cable is affected.



Low Battery Alarm

The battery level is continuously displayed. The longest bar indicates a fully charged battery. If battery power drops below usable levels a low battery alarm will activate the above alarm signals, the **Arrow** will be under the shortest bar and the **Battery Bar** will flash.



Transmitter Status

The Rig Rat III controller is in constant two-way communication with all remotely located system elements. The radio transmitter (**XMTR**) icon is continuously displayed to indicate system communication status.



XMTR

In the event of an alarm condition, the digitally coded signal is transmitted to the appropriate controller channel (and/or receiver alarm). The **XMTR** icon changes and flashes to advise transmission mode.



XMTR



**XMTR
DISABLED**

If the transmitter has been turned OFF to prevent false alarms during calibration or service, the **DISABLED** icon will appear below the **XMTR** icon. The disable button is located in the operation bay.

In the event that communication is lost between the detector and controller, or other system elements, the appropriate alarms will be activated both at the controller and the remotely located detectors.

Detector Configuration

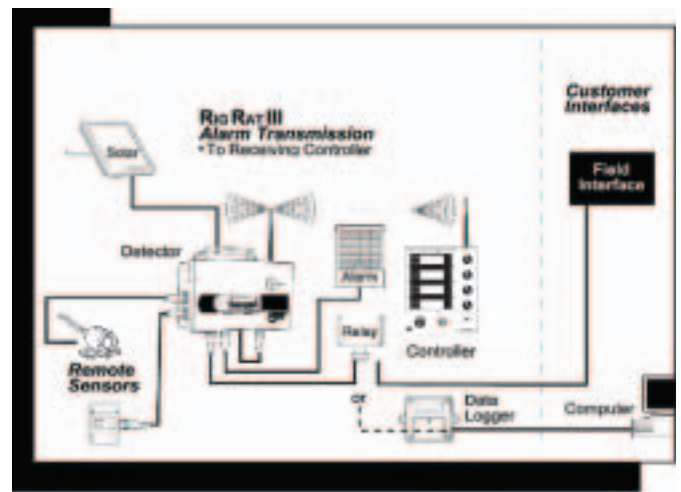
The detector can be equipped with one or two remote gas sensor heads in any gas combination desired. A simple rotary switch is used to choose the sensor type and the measuring range for the sensor head. Alarm setpoints can be field-assigned to desired levels.

Security, Durability, Simplicity

Housed in a rugged, corrosion-resistant, 14 gauge stainless steel enclosure, the tamper-proof, external hinged door is secured with a key lock and high-tension latch, which protects the control bay. The inner control door is equipped with slip hinges for easy access to the setup and service bay. All electronics are sealed in weatherproof enclosures - only the sensor is exposed to the environment.

Flexibility and Versatility - Building Block Approach

Modular Rig Rat III Systems are readily installed, modified and expanded without disturbing the worksite.



Facility Monitoring

Any size of system is possible. A system can be readily expanded and changed as site requirements evolve.

Perimeter Monitoring

Rig Rat III provides a cost-effective solution to perimeter monitoring on large sites.

Portable Monitoring

Field proven on mobile worksites and by disaster response teams, Rig Rat III is the only truly portable, independent, multi-point system in the world.

Applications

Some common applications include:

- Drilling Rigs
- Service Rigs
- Offshore Platforms
- Refineries
- Petrochemical Plants
- Gas Plants
- Perimeter Monitoring
- Plant Turnarounds/Shutdowns
- Pipelines
- Tank Farms
- Wellheads and Pump Jacks
- Pulp and Paper Mills
- Hazardous Waste Sites
- Sewage Treatment Facilities
- Loading Docks
- Ammonia Plants
- Nuclear Plants
- Emergency Response Teams
- Fire/HAZMAT

Radio Signal - The Practical Solution

For optimal signal transmission and reception, a variety of antennas are available.



RIG RAT III

Wireless Independent Receiver Controllers with Remote Plug-in Options

The Rig Rat III stainless steel controllers are the central communication center for the Rig Rat III gas detection system. The standard Rig Rat III controller allows the simultaneous display of readings and alarm state messages for up to eight remotely located sensors. The system uses a built-in digital 2.4 GHz, license-free ISM band (RF) transceiver, which allows two-way real-time communication with system elements located up to 1.8 miles (3 km) away. The controller is in constant communication with system elements. Detectors transmit a discretely coded radio signal to the controller, advising the detector of a gas alarm or integrity alarm condition.

Rugged and Durable:

Rugged, stainless steel enclosure

Alphanumeric

Display: Real-time readings for all detectors and sensors.

Channel alarm LCD indicator flashes and latches to indicate alarm condition.

Each channel receives unique digitally coded alarm signals from the detector.

System Reset:

Alarm acknowledge reset button

Two Option Ports:

Two plug-in option ports accept external audible/visual alarms and relays to control site interfaces.

Status LED:

Advises power status:
Green - A/C
Red - Battery

Signal Transmission:

2.4 GHz digital, spread-spectrum, ISM band RF transceiver with 1.8 mile (3 km) transmission radius

Antennas:

Wide selection of antennas and antenna cable connectors

Channel Activation:

Individual enable/disable channel control switches

Audible:

Built-in audible (85 dB) and visual alarms

Security Locks:

Heavy duty stainless steel latches.

Security ON/OFF Keylock:

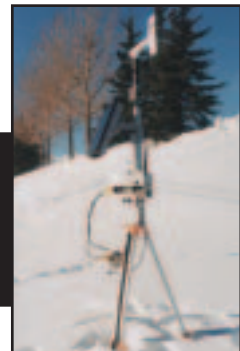
Protects access to operations bay

Power Port:

Operate controller via line power, or connect to external emergency power supply. Battery backup with auto recharge.

Multi-Point Systems:

The system can be expanded to include up to several hundred individual monitoring points. *Larger systems require more than one controller.*



Remote Plug-In Accessories and Options

A wide range of rugged, versatile, plug-in options enable you to configure a system to meet your specific monitoring needs. Add, change or move system components as requirements evolve.

Remote Sensors

Maintenance-free
Combustible



Toxics/Oxygen

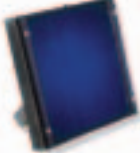


Select cable length:
up to 250 ft. / 76 m



Power Choices

Independent
battery power



Solar-capable:
5, 10, 20 or 30 watt



120/230 VAC
line chargers

24 VDC Direct

Audible/Visual Alarms

Controller

Detector

Alarm Bar



High-output
audible



60,000
candlepower



160,000
candlepower



101 dB siren



112 dB bullhorn



10 Amp AC/DC Relays

Controller

Detector

Discrete alarm relay



Weatherproof



Explosion-proof



Other

Solenoid Driver



Datalogger



Mounting Kits

Wall mount



Tripod mount



Increased Flexibility

Rig Rat III provides continuous monitoring for combustibles (0-100 %LEL), oxygen hazards and toxic gases.

Remote Sensors

Mix, match or change the gas type and/or measuring range. Install one or two sensors as desired. Configuration is simple with plug-in, rugged sensor units and simple rotary switch to change type of sensor and range. The detector is equipped with 10 ft. / 3.3 m plug-in remote cables (standard).

Remote Sensor Cables

Toxics and oxygen: 250 ft. / 76 m
Combustibles: 100 ft. / 30 m
Optional cables of up to 250 ft. / 76 m are available.

Continuous Power

Solar: Plug-in, stainless steel, solar panels allow continuous operation in remote and isolated locations. Available in 5, 10 and 20 watt versions to accommodate system power requirements.

Line Power: 12 or 24 VDC direct or 110/230 VAC trickle chargers power each detector at an adjacent power supply, with short cable runs.

Independent Battery: Detector will operate on battery for up to 30 days depending on sensors and transmission interval.

Audible/Visual Alarms

Remote, plug-in audible/visual alarms alert personnel that there is an alarm condition on site. Alarms are powered by the controller or detector.

Relays

Plug-in, 10-amp SPDT AC/DC single and dual relays trigger site-specific interfaces and are powered by the controller or detector.

Solenoid Driver

Activates process or fluid control systems, if required.

Datalogger

Data collected is expressed in % LEL, ppm or % by volume, as required. IBM compatible.

Note: The detector is equipped with two option ports. A 4-port MOB (multiple option box) is available for the inclusion of additional interfaces.

Mounting Kits

Tripod and wall mount kits are available to simplify installation. Tripod kits accept 5, 10 and 20 watt solar panels.

Rig Rat III

Multi-Point Wireless Gas Detection System

Gases Monitored: Change the gas monitored and/or the measuring range at any time.

- Combustible Gases/Vapors
- Oxygen
- Toxics: Hydrogen Sulfide
Carbon Monoxide
Sulfur Dioxide
Ammonia
Chlorine
Chlorine Dioxide
Ethanol
Ethylene Oxide
Hydrogen
Hydrogen Chloride
Hydrogen Cyanide
Nitric Oxide
Nitrogen Dioxide
Ozone

Power Independence: The following sensor configuration lists the duration of the internal, rechargeable battery life (per charge):

- 2 toxic sensors: Up to 30 days
- 1 toxic, 1 LEL: Up to 5 days
- 2 LEL sensors: Up to 3 days

Order Information

For full system order information and system configuration, contact BW Technologies.

RR-3000: Rig Rat III Gas Detector (standard) comes complete with one or two 10 ft. / 3 m sensor cables as required, plus one antenna. *Longer sensor cables and different antennas available.*

RR-3000S: Rig Rat III Non-Wireless Gas Detector comes complete with all standard Rig Rat III components, except antenna and transceiver.

RR-3C04: Rig Rat III 4-Channel Controllers are capable of simultaneous display and annunciation of up to 8 remotely located sensors.

"INNOVATORS IN GAS DETECTION"



For further information:

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SPECIFICATIONS

- SYSTEM:** Modular Multi-Point Wireless Gas Detection System
Signal Transmission: 2.4 GHz licence free, ISM band spread-spectrum RF transceiver. User-settable discrete codes.
Distance: Up to 1.8 mi. / 3 km, depending upon antenna configuration
- GAS DETECTOR:** Independent Rig Rat III detector with radio transceiver
Power: 12 volt, 3.4 amp hr. rechargeable battery
Battery Life: Up to 30 days, without active recharge (dependent on sensors)
Recharge: Via solar power; line (24 VDC direct, 110/230 VAC) or bench chargers
- ALARMS:** Clearly advises alarm levels both audibly and visually
Visual Alarms: Large, red flashing light
LCD: alarm level present, sensor affected and alarm type
Audible Alarm: Oscillating 85 dB at 3 ft. / 1 m (typical)
Gas Alarm Levels: Two per sensor (LOW, HIGH) with field-settable setpoints
Other Alarms: Fault advises missing sensor, damaged cable and/or low battery alarm
- LCD DISPLAYS:** Two continuous, alphanumeric gas readouts and status displays:
Gas ppm or %: Simultaneously and continuously displays gas concentration(s) present
Status Indicators Advise: Transmitter status, battery level, sensor fault, alarm level setpoints
- CONTROLS:** Three:
1. Power ON/OFF
2. Transmitter (XMTR) DISABLE
3. Transmission TEST
- PORTS:** Two sensor ports; two option ports; charger port; TNC antenna port
- SECURITY:** Keylock access to control panel
- GENERAL SPECIFICATIONS:** 14 gauge stainless steel, Nema 4, RFI/EMI shielded
Humidity: 5% to 95% RH (non-condensing)
Size: 8.46 x 11.26 x 4.53 in. / 21.49 x 28.6 x 11.51 cm
Weight: 11 lbs. 6 oz. / 5.15 kg
- GAS SENSORS:** Remote interchangeable plug-in units
Type: Combustibles: catalytic bead; toxics and oxygen: electrochemical
Powered: By the detector
Humidity: 5% to 95% RH (non-condensing)
Temperature Range: Combustibles: -40 to +50 °C / -40 to +122 °F
Hydrogen Sulfide: -40 to +50 °C / -40 to +122 °F
Ammonia: -25 to +35 °C / -13 to +95 °F
Other toxics and oxygen: -20 to +50 °C / -4 to +122 °F
Physical: Toxic/O₂: stainless steel, Nema 4
Combustible: maintenance-free, encapsulated, Nema 4
- Warranty: 2 years, including all sensors (except NH₃ and PH₃- 1 year)

Gas Monitoring Specifications	LCD Increments	Standard Measuring Ranges Available						
		Units	#=1	#=2	#=3	#=4	#=5	#=6
Combustibles (encapsulated)	1 % LEL	%	0-100					
Hydrogen Sulfide	1 ppm	ppm	0-100	0-50	0-500	0-20	0-30	
Sulfur Dioxide	1 ppm	ppm	0-100	0-50	0-20	0-10		
Ammonia	1 ppm	ppm	0-50	0-100			0-150	
Carbon Monoxide	1 ppm	ppm	0-500	0-1000	0-100	0-50	0-200	0-600
Chlorine	0.1 ppm	ppm	0-5.0	0-10.0	0-100			
Oxygen	0.1%	%v/v	0-25.0%	0-30.0%				
Other Gases	Contact BW Technologies							

- CONTROLLERS:** Standard controller (RR-3C04) for up to 4 Rig Rat III detectors
Signal Input: Discretely coded radio signals from each detector
Power: 110 VAC; 230 VAC (selectable)
Battery Backup: Two 12 VDC rechargeable batteries (normal operation: up to 4 hrs.)
- ALARMS:** Visual: LCD displays alarm level present, sensor affected and alarm type
Audible: 85 dB at 3 ft. / 1 m (typical)
- INDICATORS:** LEDs (four / channel): 3 alarm indicator, 1 channel enable
- CONTROLS:** One ON/OFF switch; one ENABLE/DISABLE switch per channel and one momentary reset/test switch
- PORTS:** Antenna port: TNC (reverse polarity)
Alarm bar port: 12VDC output per channel
External relay port: alarm specific relay option
Common relay port: low, high and fault (latching configurable)
- Humidity: 5% to 95% RH (non-condensing)
Enclosure: Self-contained 14 gauge stainless steel with mounting flanges
Physical: 14.95 x 11.16 x 5.15 in. / 37.97 x 28.35 x 13.08 cm; weight 19 lb. / 8.7 kg

DUE TO ONGOING RESEARCH AND PRODUCT IMPROVEMENT, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

RATINGS AND CERTIFICATIONS:
(INTRINSICALLY SAFE WITH BARRIER)



RR-3000 Gas Detector: Class I, Div. 1, Groups C, D
Class II, Div. 1, Group G

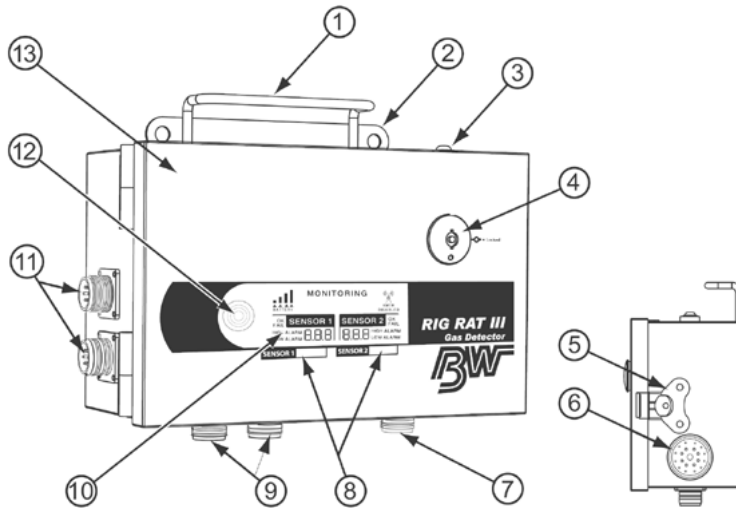
Sensors (Toxics, Oxygen and LEL): Class I, Div. 1, Groups C, D
Class II, Div. 1, Group G

Locally distributed by:

RIG RAT III

DETECTOR ELEMENTS
 RR 3000 Wireless Detector
 RR 3000 S Non-Wireless Detector

DETECTOR COMPONENTS AND ELEMENTS



DETECTOR COMPONENTS

- | | |
|---------------------|--------------------------|
| 1. Carrying Handle | 8. Gas Label Bars |
| 2. Mounting Bracket | 9. Alarm Ports (two) |
| 3. Antenna Port* | 10. LCD Display Panel |
| 4. Security Keylock | 11. Sensor Ports (two) |
| 5. External Latch | 12. Visual Alarm Light |
| 6. Audible Alarm | 13. External Hinged Door |
| 7. Charger Port | |

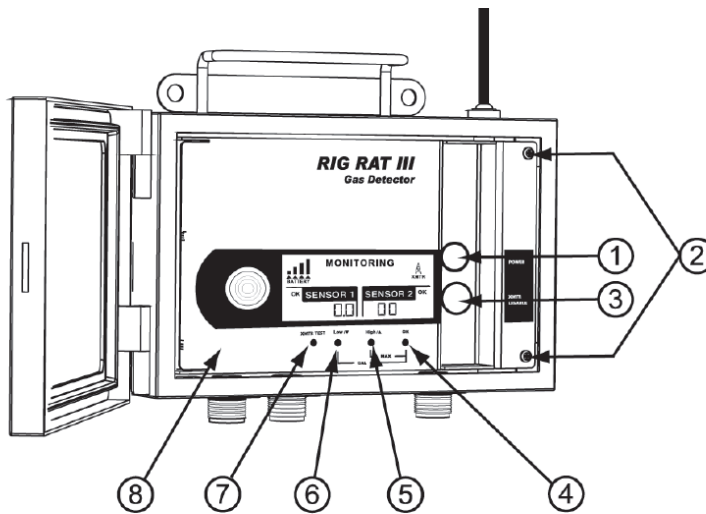
Rig Rat III wireless Detectors maintain constant, two-way communication via real-time RF link with the system Controller. Discrete readings for each remotely located sensor, as well as alarm state and system status information are constantly updated on a real-time basis. Accurate, rugged and corrosion resistant, the monitors are designed for continuous, virtually maintenance-free operation.

Rig Rat III Detectors

Rig Rat III Detectors include a newly enhanced push-button operation interface. All normal field operation and test procedures, including calibration, alarm adjustment, and transmitter test function, are made by means of easy to use push-button controls.

Detectors may be equipped with one or two remote gas Sensor Heads in any gas combination desired. A rotary dial switch inside the Detector configures the Detector and LCD to the full measuring range of the Sensor Head. Alarms set points are set in the field to the desired levels.

The concentration present is simultaneously and continuously displayed for each sensor locally at the Detector on Sensor 1 LCD and Sensor 2 LCD.



OPERATIONS BAY

1. Power push-button
2. #6-32x1/4" Phillips Screw SS
3. Transmitter (XMTR) ON/Disabled Push-button*
4. OK push-button
5. Low Alarm setpoint/decrement value push button
6. High Alarm setpoint/increment value push-button*
7. Transmitter (XMTR) Test Push-button
8. Service bay hinged door

*is not used on RR 3000S non-wireless version of Detector

DESCRIPTION

The new maintenance-free Rig Rat III fully encapsulated combustible (LEL) gas sensor provides continuous monitoring of environments where combustible gases and vapors may be present. The SAI-L3W1 Gas Sensing Unit may be used to detect all of the combustible gases likely to be encountered.

The intrinsically safe, catalytic sensor transmits an electronic signal to the Detector providing a readout of the %LEL gas present. In the event of an alarm condition, local alarms, relays etc. are activated.

The remote combustible sensor is linked to the Detector with RFI shielded cable. The Combustible Sensor can be placed at the optimum monitoring point and the Detector itself can then be conveniently placed for accessibility. The combustible sensor can be located up to 100 ft (30 m) away from the Rig Rat III Detector.

The Unit comes complete with a calibration cup. Splash Guards, Process Baffles and Remote Calibration Cups are available. (See section 4.)

INTERCHANGEABLE GAS SENSING UNITS: The Combustible, Toxic and Oxygen sensing units are interchangeable. Simply unplug one sensor unit and plug in another sensor and configure the rotary dial switch inside the Rig Rat III Detector.

COMPATIBILITY: The SAI-L3W1 0 - 100% LEL Remote Sensor is designed for use with:

- ▲ Rig Rat III
- ▲ Remote plug-in sensor cables (UC2-S(###)) — up to 100 ft. / 30 m.)

LEL SENSOR EFFECT ON BATTERY POWER: The LEL sensor requires more operating power than toxic or oxygen units. Therefore, dependent on the total draw on the Detector (i.e. alarms relays etc.), special consideration must be given to solar powered installations. The 10 watt (min.) solar panel is required to power a Detector equipped with LEL sensor(s).

Detector battery life is trickle charged by solar or line power:

- ▲ One (1) LEL sensor (SAI-L3W1) - battery life up to 4.7 days
- ▲ Two (2) LEL sensors (SAI-L3W1) - battery life up to 2.4 days



Features

- ▲ Faster response to full alarm
- ▲ Reliable, accurate monitoring
- ▲ Plug-in Sensing Units are equipped with a rugged weatherproof mil-style connector
- ▲ Plug-in Combustible Sensor assembly for easy replacement
- ▲ Remote Combustible Sensor units can be installed up to 100 ft. / 30 m from the Detector for LEL
- ▲ Change the gas monitored at any time
- ▲ Highly poison resistant sensor
- ▲ Intrinsically safe
- ▲ Maintenance-free



Relative Sensitivity Chart of Combustible Gases/Vapors

Combustible sensor on exposure to various gases/vapors at the same %LEL concentration. Relative to Methane Signal (Methane = 100 %)

Gas/Vapor	(%) Relative Sensitivity	Gas/Vapor	(%) Relative Sensitivity
Methane	100	Carbon monoxide	110
Propane	65	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 1: Each sensitivity has been rounded to the nearest 5%
 NOTE 2: For gases not listed contact BW

SPECIFICATIONS

SAI-L3W1

Powered By:	The Detector
Current Draw:	25 mA typical at 12 volts
Sensor Type:	Catalytic
Gases Detected:	0-100% Combustible Gases/Vapors
Measuring Range:	0-100% LEL
Response Time:	6 sec. at T ₅₀ (max.); typically 2 seconds
Temp. Range:	-40 to +194°F (-40 to +90°C)
Mounting Flanges:	Two (2) - predrilled for mounting
Port:	One 6-pin plug-in port for sensor cable
Enclosure:	Nema 4, Explosion-proof
Dimensions:	6.75 x 3.5 x 3.25 in. (17.1 x 8.9 x 8.3 cm)
Weight:	3.3 lbs (1.5 kg)

NOTE: Operating Specifications see page 3.33

CSA APPROVED: Class I, Div. 1, Groups C & D
 Class II, Div. 1, Group G Nema 4

WARRANTY: 2 Years incl. Sensor

DESCRIPTION

BW Technologies offers a wide variety of technologically advanced, low maintenance remote sensors for the measurement specific toxic gases, vapors, and hazardous conditions. The plug-in remote toxic and oxygen sensors provide reliable continuous monitoring to protect personnel and facilities.

The gas specific, stabilized, electrochemical sensor, housed in a stainless steel enclosure, transmits an electronic signal to the Rig Rat III Detector, activating local alarms, relays and field interfaces in the event of an alarm condition.

The Remote Sensor is linked to the Detector with RF shielded cable that plugs directly into the Detector and Remote Sensors. Remote oxygen and toxic sensors can be placed up to 250 feet (75 meters) from the Detector at the optimum monitoring point. The Detector can then be conveniently placed for accessibility.

A Detector equipped with two toxic and/or oxygen sensors will operate up to 28 days on its internal, backup battery.

Splash guards, process baffles and remote calibration cups are available (see Page 3.47).

INTERCHANGEABLE GAS SENSING UNITS: All LEL, oxygen and toxic Sensors can be interchanged. Simply unplug one gas specific unit and plug in another.

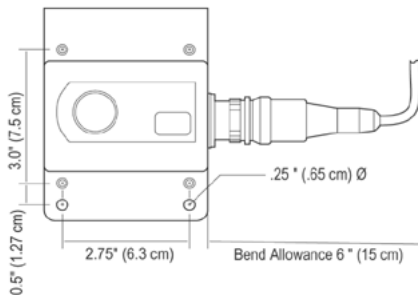
MEASURING RANGES: Change the measuring range at any time in the field. A simple to use rotary dial switch inside the Detector is used to configure the Detector and LCD with the selected sensor type range.

COMPATIBILITY: All toxic and oxygen remote sensors (SA-L2x#) are compatible with:

- ▲ Rig Rat III
- ▲ Remote plug-in Sensor cables (UC2-S(###))

GASES MONITORED:

Oxygen	Hydrogen
Hydrogen Sulfide	Hydrogen Chloride
Carbon Monoxide	Hydrogen Cyanide
Sulfur Dioxide	Nitric Oxide
Ammonia	Nitrogen Dioxide
Chlorine	Chlorine Dioxide
Ethanol	Ethylene Oxide
Ozone	



CSA APPROVED: Class I, Div. 1, Groups C & D
Class II, Div. 1, Group G Nema 4

WARRANTY: 2 Years incl. Sensor*

(expected sensor life 3-5 yrs)

*ammonia sensors warrantied for 1 year from date of purchase



Features

- ▲ Faster response to full alarm.
- ▲ Gas specific stabilized electrochemical cells.
- ▲ Rugged weatherproof Stainless Steel enclosures.
- ▲ All sensors are equipped with a rugged weatherproof plug-in pin, military-style quick connector.
- ▲ Change the gas monitored at any time.
- ▲ Change the measuring range at any time.
- ▲ Remote sensor units can be installed up to 250 feet (76 m) from the Detector.
- ▲ Cannot "go to sleep" and are poison resistant.
- ▲ Low maintenance.

Maintenance

The electrochemical sensor is sealed in a weatherproof, 16 gauge, stainless-steel housing that is fully protected from the elements. Only periodic calibration is required to ensure optimum performance.

SPECIFICATIONS

Powered By:	The Detector
Current Draw:	2 mA at 12 volts
Sensor Type:	Electrochemical
Mounting Flanges:	Two (2) - predrilled for mounting
Port: (Plug-in)	One (1) 6-pin, female, accepts sensor cable
Enclosure:	16 gauge stainless steel, Nema 4
Dimensions:	4.5 x 3.5 x 3.1 inches (11.5 x 9.1 x 8.0 cm)
Weight:	1.9 lbs. (0.8 kg)

NOTE: Operating Specifications see opposite page.

GAS SPECIFIC OPERATING SPECIFICATIONS

The Detector provides continuous monitoring of the environment. The gas monitored and the measuring range are readily changed, at any time. The Rig Rat III Remote Sensor is relatively unaffected by temperature, humidity or pressure variations. All BW sensors are temperature compensated ensuring optimum performance. Stable performance and low drift rate ensure low maintenance, trouble free operation. The Rig Rat III Remote Sensors offer unsurpassed accuracy, speed, and stability.

OPERATING SPECIFICATIONS

Specification	Gas Monitored											
	%LEL	O ₂ % by V.	H ₂ S ppm	CO ppm	SO ₂ ppm	Cl ₂ ppm	NH ₃ ppm	HCN ppm	HCl ppm	H ₂ ppm	NO ₂ ppm	H ₂ S ppm High Gain
Response (seconds @ T ₅₀)	6*	<2%	<6	<5	<4	<8	<19**	<9	<15	<4	<8	<6
Operating Temp. Range	°C -40 to +90-40 to +194	°C -20 to +50-4 to +122	°C -40 to +50-40 to +122	°C -20 to +50-4 to +122	°C -20 to +50-4 to +122	°C -20 to +50-4 to +122	°C -25 to +30-13 to +86	°C -20 to +50-4 to +122	°C -20 to +50-4 to +122	°C -20 to +50-4 to +122	°C -20 to +50-4 to +122	°C -40 to +50-40 to +122
Operating Humidity	15 — 90% non-condensing											
Long Term Drift (% signal loss/mth)	ZERO: Nominal<1	SPAN: Nominal<1	Nominal<2	Nominal<2	Nominal<2	Nominal<2	Nominal<2	Nominal<2	Nominal<2	Nominal<2	Nominal<2	Nominal<2
Repeatability % of signal	1%	0.1%	1	1	1	2	10	2	2	2	2	1
LCD Increments	1%	0.1%	1 ppm	1 ppm	1 ppm	0.1 ppm	1 ppm	0.01 ppm	0.1 ppm	1 ppm	0.1 ppm	1 ppm

* LEL Response Typically < 2 sec. ** NH₃ Response Typically < 15 sec.

MEASURING RANGES AVAILABLE and BW GAS CODES

Gas	BW Gas CODE	Units	Measuring Ranges Available (#)					
			1	2	3	4	5	6
LEL	W	% LEL	0-100%					
Oxygen (O ₂)	X	% by vol.	0-25%	0-30%				
Hydrogen Sulfide (H ₂ S)	H	ppm	0 to 100	0 to 50	0 to 500	0 to 20	0 to 30	
Carbon Monoxide (CO)	M	ppm	0 to 500	0 to 1000	0 to 100	0 to 50	0 to 200	0 to 600
Sulfur Dioxide (SO ₂)	S	ppm	0 to 100	0 to 50	0 to 20	0 to 10		
Chlorine Dioxide (ClO ₂)	V	ppm	0 to 5.0	0 to 1.00				
Chlorine (Cl ₂)	C	ppm	0 to 5.0	0 to 10.0	0 to 100			
Ammonia (NH ₃)	A	ppm	0 to 50	0 to 100	0 to 350	0 to 600	0 to 150	
Hydrogen Cyanide (HCN)	Z	ppm	0 to 20.0	0 to 50.0	0 to 100			
Hydrogen Chloride (HCl)	L	ppm	0 to 10.0	0 to 20.0	0 to 100			
Hydrogen (H ₂) (ppm)	Y	ppm	0 to 100	0 to 200	0 to 800			
Nitrogen Dioxide (NO ₂)	D	ppm	0 to 10.0	0 to 20.0				
Hydrogen Sulfide (H ₂ S) High Gain	HG	ppm	0 to 50	0 to 20				
Nitric Oxide (NO)	N	ppm	0 to 50	0 to 100				
Ethanol (C ₂ H ₅ O)	B	ppm	0 to 500	0 to 1000	0 to 250			
Ethylene Oxide (C ₂ H ₄ O)	E	ppm	0 to 10.0	0 to 20.0	0 to 10.0			
Ozone (O ₃)	G	ppm	0 to 1.00	0 to 2.00				

NOTE:

- For Physical Specifications and Current Draw see pages 3.31 and 3.32.
- Contact BW Technologies for specifications for additional measurable gases.

BW GAS CODES: (X) = GAS CODE

The gas monitored is indicated in each Order Number for Sensor Units, measuring range modules, and replacement sensors.

MEASURING RANGE: (#) = MEASURING RANGE

Each sensor is available in a number of measuring ranges. Select from the table above and specify the measuring range required in the model number. The measuring range can be changed at any time by means of a rotary dial switch located in the Detector. If the measuring range you require is not listed, contact BW for availability.

Order Info:

SENSOR UNITS: SA-L2(x)(#)

REPLACEMENT TOXIC AND OXYGEN SENSORS: PS-R(x)01

MEASURING RANGE CHANGE KIT: PL(x)S-50-(#)-2K

COMBUSTIBLE SENSOR UNIT: SAIL-L3W1

RIG RAT III

REMOTE VISUAL ALARMS
Order No: UR-L600, UR-LR60

DESCRIPTION

Rugged, weatherproof Remote Strobe Alarms provide a flashing, visual warning when an alarm condition exists. Simply plug the Alarm Light into one of the Rig Rat III Detector's option ports or the multiple option box (UR-J950). The strobe will trigger a visual alarm on high or low (field selected by the user). Each Visual Alarm is equipped with a standard 10 ft (3m) cable (longer lengths available), plug-in connector and mounting flanges. The Remote Strobes are compatible with all Stand-Alone Detectors.

UR-L600: The cost-effective 60,000 candle power strobe is powered by two 6 volt, field-replaceable, lantern batteries. The lens is protected by a wire cage.

- ▲ Approved by CSA to U.S.A. and Canadian Standards c-CSA-us:
 - Class I, Div. 1, Groups C & D
 - Class II, Div. 1, Group G

UR-LR60 RECHARGEABLE: The 160,000 candle power strobe is powered by two 12 volt rechargeable batteries. The UR-LR60 battery is continuously maintained by the Detector except during an alarm condition. A 5 watt solar panel (SP-U300-S) can be used to provide year-round, maintenance-free operation. Install in a non-hazardous area as per CSA installation instructions.

60,000 Candle power

URL-600



160,000 Candle power

UR-LR60



SPECIFICATIONS	UR-L600	UR-LR60
Alarm Output:	60,000 candle power	160,000 candle power
Lens:	Impact resistant poly carbonate	Impact resistant poly carbonate
Color (Standard)	Red (amber, clear or blue available)	Red (amber, clear or blue available)
Power:	Two (2) 6 volt dry cell replaceable lantern batteries, available locally	Two - 12 volt 3.2 ampr. rechargeable batteries Solar capable
Current draw:	N/A (self powered)	500 mA at 12 VDC
Temperature Range:	-40 to +140 °F (-40 to +60 °C)	-40 to +140 °F (-40 to +60 °C)
Operating humidity:	0 - 99% non-condensing	0 - 99% non-condensing
Enclosure:	14 gauge steel (weatherproof) Nema 4	Fiberglass (weatherproof) Nema 4
Cable length:	10 feet (3m)	10 feet (1m)
Plug-in connector:	6-pin male mil style	6-pin male mil style
Charger port:	Not applicable	5-pin, female
Dimensions (H x W x D):	9.5 x 7.25 x 3.88 in (24 x 19.75 x 10 cm)	18 x 10 x 6 in. (45.7 x 25.5 x 15 cm)
Weight:	7.2 lbs. (3.3 kg) approx	12 lbs. (5.44 kg) approx

WARRANTY: 2 Years Non-prorated

RIG RAT III

REMOTE AUDIBLE ALARMS

Order No: UR-H700, UR-HR70, UR-HR60

DESCRIPTION

High output, weatherproof Remote Audible Alarms provide an audible warning when an alarm condition exists. Simply plug into one of the Detector's option ports or the multiple option box (UR-J950). The siren will trigger an audible alarm on high or low (field selected by the user).

Each Remote Audible Alarm is equipped with a standard cable (longer lengths are available) complete with plug-in connector. Pre-drilled mounting flanges simplify installation. The Remote Audible Alarms are compatible with all Stand-Alone Detectors.

UR-H700: The fast pulsed, high intensity 101 dB siren is powered by the Detector (no additional power source is required). The low current requirements of the siren ensure only a minimal current drain on the Detector's batteries.

UR-HR70: The rechargeable version of the UR-H700 is equipped with one 12 volt 3A battery and a charger port.

UR-HR60 (-T1): The 112 dB dual tone, steady yelp, rechargeable bullhorn is powered by two 12 volt batteries. It can operate up to six hours in continuous alarm. The UR-HR60 draws power from the Detector to recharge itself. It cannot draw power from the Detector during an alarm condition, thus protecting the Detector's battery from being drained.

UR-H700 101 dB Siren



UR-HR60 112 dB Bullhorn



SPECIFICATIONS	UR-H700 (-T1)	UR-HR60 (-T1)
Alarm output:	101 dB at 3 ft (1m) fast pulsed siren	112 dB at 10 ft (3m) (steady-yelp) bullhorn
Power:	12 VDC (supplied by Detector)	Two - 12 volt 3.2 ampr. rechargeable batteries Solar capable
Current draw:	18 mA at 12 VDC	1.6 amps at 12 VDC
Temperature range:	-40 to +140 °F (-40 to +60 °C)	-40 to +140 °F (-40 to +60 °C)
Operating humidity:	0 - 99% non-condensing	0 - 99% non-condensing
Enclosure:	14 gauge steel (weatherproof) Nema 4	Fiberglass (weatherproof) Nema 4
Cable length:	3 feet (1 m)	10 feet (1m)
Plug-in connector:	6-pin male mil style	6-pin male mil style
Charger port:	Not applicable	5-pin, female
Dimensions (L x W x D):	6 x 6 x 7 in. (15 x 15 x 17 cm)	18 x 10 x 6 in. (45.7 x 25.5 x 15 cm)
Weight:	6.5 lbs. (3 kg) approx	16 lbs. (7.25 kg) approx

WARRANTY: 2 Years Non-prorated

RIG RAT III

AUDIBLE AND MOB OPTIONS

Order No: UR-B600

REMOTE 85 dB AUDIBLE ALARM

The intrinsically safe UR-B600 85 dB alarm, plugs directly into a Detector's Option Port. It does not generate RFI/EMI interference and has nominal low current drain.

APPROVALS:

- UL: Class I, Div. 1, Groups C & D
Class II, Div. 1, Groups E, F & G
- CSA: Class I, Div. 1, Groups C & D
Class II, Div. 1, Groups G

SPECIFICATIONS:

- Audible Alarm: 85 dB at 3 feet (1 m)
- Powered By: 12 VDC (supplied by the Detector)
- Current Draw: 5 mA
- Temp. Range: -40 to +80°C (-40 to +187°F)
- Cable Length: 5 ft. (1.5 m) Standard
- Connector: One (1) 6-pin MIL-style, male
- Enclosure: Nema 4, 14 gauge Stainless Steel
- Dimensions: 3.5 x 4.5 x 3.5 in. (9 x 11.5 x 9 cm)
- Weight: 1.75 lb. (0.8 kg)

WARRANTY: 2 Years Non-prorated



MULTIPLE OPTION BOX

Order No: UR-J950

The intrinsically safe UR-J950 Multiple Option Port is equipped with 4 plug-in ports and a plug-in connector. Add option ports to your Detector easily. The UR-J950 plugs directly into one of the Detector's two option ports. The UR-J950 adds four ports.

Certain restrictions apply depending on the zone and the number and type of devices. The UR-J950 should be connected according to the BW manual and local electrical regulations to maintain its rating.

APPROVALS:

- UL: Class I, Div. 1, Groups C & D
Class II, Div. 1, Groups E, F & G
- CSA: Class I, Div. 1, Groups C & D
Class II, Div. 1, Groups G

SPECIFICATIONS:

- Output: 12 VDC
- Powered By: 12 VDC (supplied by the Detector)
- Temp. Range: -40 to +80°C (-40 to +187°F)
- Humidity: 0 - 99% non-condensing
- Connector: One 6-pin MIL-style quick connect male
- Output Receptacles: Four (4) 6-pin MIL-style female
- Cable Length: 5 ft. (5 m)
- Enclosure: Nema 4, 14 gauge Stainless Steel
- Dimensions: 5.7 x 4.5 x 4.25 in. (14 x 11.5 x 10.5 cm)
- Weight: 2.2 lbs. (1 kg)

WARRANTY: 2 Years Non-prorated



RIG RAT III

SOLENOID DRIVER

Order No: UA-ST24 (-T1)

DESCRIPTION

The UA-ST24 solenoid driver, complete with 24 volt rechargeable power supply, is designed to activate solenoids which in turn activate process or fluid control systems. The UA-ST24 can be configured to activate on High or Low alarm either by Sensor #1, or Sensor #2 on a dual sensor unit.

The UA-ST24 is equipped with two 3.2 amp hour, 12 volt, rechargeable batteries that automatically switch to run in series when an alarm condition occurs, providing 24 volts of power to drive the solenoid.

The batteries run in parallel while charging and are charged by the Rig Rat III Detector. The solenoid driver will only accept a charge from the Detector while the Detector is being charged (by a solar panel for example). It will not draw from the Detector during an alarm condition. The UA-ST24 may be charged directly by solar or line power.

The UA-ST24 plugs directly into the Detector's option port or into the multiple option box (UR-J950), and is equipped with an access port c/w compression fitting to connect the solenoid.

COMPATIBLE

With all: Rig Rat III Detectors

and all: ASCO solenoids or their equivalent

Two- or three-way solenoids with either normally open or closed or universal operation as needed. Requires electrical standard voltage of 24 volts or less with a current draw not exceeding 400 mA.



SOLENOID SPECIFICATIONS	
Powered by:	Two 12 volt 3.2 amphr. Rechargeable batteries. Solar capable
Trickle charged:	By the Detector 12 VDC
Output to solenoid:	24 VDC at up to 400 milliamps
Current draw:	Not to exceed 400 mA
Temperature range:	-40 to +140°F (-40 to +60°C)
Enclosure	Fiberglass (weatherproof) Nema 4
Dimensions (L x W x D):	12 x 10 x 6 in. (30.5 x 25.5 x 15 cm)
Weight:	14 lbs. (6.35 Kg)
Plug-in connector:	6 pin, male, MIL-style c/w 3 ft. shielded cable
Ports: access	One 1/2" N.P.T. conduit opening with compression fitting
Charger	5 pin, female, MIL-style with cover

WARRANTY: 2 Years Non-prorated

Plug-in single and dual Rig Rat III Detector relays control and trigger site-specific field interfaces and alarms customizing each detection point to your requirements. Choose between explosion-proof, weatherproof enclosures, or relay cards.

Note: For Controller Relays see page 3.14

Time-Out Function

The optional Time-Out function triggers a field interface or alarm for a set period of time and then shuts off. The relay resets itself automatically to trigger the interface again on the next occurrence of an alarm condition, (Low and/or High and Fault). The Time-Out function is field settable, (1 to 5 minutes).

ALARM FUNCTION (TRIGGERING) CONFIGURATIONS FOR STANDARD RELAYS

The Table below outlines the triggering functions for the standard single and dual relays when used with Rig Rat III Detectors. For other triggering functions and custom relays contact BW.

Note: If LOW alarm is selected the relay will remain triggered in the event of a HIGH alarm condition.

Relay Type	One Sensor Installed	Two Sensors Installed
SINGLE RELAY	Integrity alarm triggered. <i>Select</i> Low or High alarm.	Not Applicable
DUAL RELAY	Relay 1: Integrity alarm triggered. <i>Select</i> Low or High alarm.	Sensor 2: <i>Select</i> Low or High alarm. Integrity alarm triggered.
	Relay 2: Triggers High and Integrity alarm.	Sensor 2: <i>Select</i> Low or High alarm. Integrity alarm triggered.

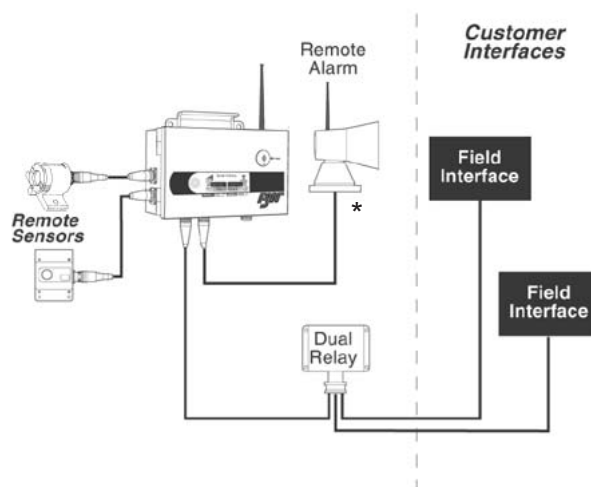
Order Info:

AC/DC 10 AMP DETECTOR RELAYS

Model Number Configuration

UD-RWS0	Single Relay in weatherproof enclosure
UD-RWD0	Dual Relay in weatherproof enclosure
UD-RES0	Single Relay in explosion-proof enclosure
UD-RED0	Dual Relay in explosion-proof enclosure
UD-RCS0	Single Relay Card (no enclosure) with plug-in cable
UD-RCD0	Dual Relay Card (no enclosure) with plug-in cable

RELAY SYSTEM INTERCONNECTION DIAGRAM



RIG RAT III

10 AMP SINGLE and DUAL SPDT AC/DC RELAYS for Rig Rat III, Shack Rat II and SR11 Analyzer

DESCRIPTION

Rig Rat III Relays increase the flexibility of your gas monitoring system, customizing detector interfaces to your needs. Relays are powered by the Rig Rat III Detector. AC/DC compatible 10 Amp relays in weatherproof or explosion proof enclosures can be used to activate and control Rig Rat III alarms and options or site specific field interfaces (control systems, ESD's, fire protection, etc.).

INSTALLATION: The Rig Rat III relays plug directly into a Detector Option Port or the Multiple Option Box (UR-J950). The Relay comes with a 1/2" n.p.t. conduit access to wire it to the interface. When the relay is used with a line powered interface, we suggest that a certified electrician perform the installation.

UD-RW(x#)

Rugged, weatherproof relay for use in general purpose areas.

UD-RE(x#)

Explosion-proof enclosure

Approved by CSA to meet Explosion-proof criteria for:
 Class I, Div. 1, Group C,D

UD-RW(x#) WEATHERPROOF RELAY



UD-RE(x#) EXPLOSION-PROOF RELAY



SPECIFICATIONS	UD-RW(x#)	UD-RE(x#)
Enclosure:	14 gauge steel (weatherproof) Nema 4	Explosion –proof Nema 4
Wiring access	1/2 inch n.p.t.	Accepts 1/2 inch conduit (7 thread)
Cable length:	5 feet (1.5 m)	5 feet (1.5m)
Plug-in connector:	6-pin male Mil Style	6-pin male Mil style
Dimensions (L x W x D):	6 x 6 x 4 in. (15 x 15 x 11 cm)	4.75 x 7 x 4.5 in. (12 x 18 x 11.5 cm)
Weight:	3 lbs. (1.4 kg) approx	8 lbs. (3.7 kg) approx
Operating:		
Type:	10 SPDT non latching relay	
Contact rating per relay:	10 A at 130 VAC; 8A at 220 VAC; 8A at 24 VDC	
Outputs per relay	Three (3): 1 Normally open, 1 normally closed and 1 common 10 amp contacts	
Coil current draw per relay	33.3 mA @ 12 VDC	
Power:	12 VDC (supplied by Detector)	
Temperature range:	-40 to +140 °F (-40 to +60 °C)	
Operating humidity:	0 - 99% non-condensing	

WARRANTY: 2 Years Non-prorated

DESCRIPTION

The BW Datalogger is a worry free, cost effective answer to data collection. Designed to work in tough industrial environments, the rugged NEMA 4 weatherproof Datalogger has no moving parts. With no buttons or switches, your information is safe from tampering. The Datalogger plugs into a Detector Option Port. Order datalogger, software and RS232 Port Cable separately.

DATALOGGERS: **GAS RS-DAT7-II**

Used with any Detector to collect data on the hazardous gas(es) present from each sensor. The data collected will be expressed in ppm or % as required.

Note: For other models contact BW Technologies

DATALOGGER TRENDREADER

SOFTWARE: **UAI-DATS2**

The data analysis software is easy to set up and operate. Connection to PC is via RS-232 compatible serial port interface cable.

The data will be expressed on screen in whatever measuring units required (i.e. PPM, %, miles per hour and/or direction 0 to 360 degrees). The datalogger automatically assigns a time and date stamp to each reading.

Datalogger software allows easy generation of historical data reports and detailed time-based graphs, as well as transfer of stored information to other software applications. The software includes easy to use analytical tools that facilitate detailed evaluation of gas exposure incidents and time history records.

RS232 PORT CABLE: **UA-DATC2**

- One IC-101 interface cable that connects the datalogger to the computer serial port. (RS232 compatible).
- Includes one 25 to 9 pin adapter (in case your computer has a 25 pin serial port).



Minimum Requirements

The Trendreader software requires a 386 PC or higher including:

- Windows 3.1 running in enhanced mode, 95, 98 or NT
- 2 MB of Hard Drive Space
- 2 MB of RAM memory
- A 3 1/2" floppy drive

SPECIFICATIONS

Memory Size:	32 KB capable of storing 32,768 readings
Sampling Methods:	Continuous (first in, first out) Stop when full
Rates of Sampling:	User programmable intervals between Every 8 sec. to once every 5 days
Accuracy:	+/- 1 % of Full Scale
Power Requirements:	
Battery:	3.6 volt lithium, 1 Amp Hour
Battery Life:	Ten Years (factory replaceable)
Current Draw:	<5 mA on the Detector
Temperature:	-40 to +160 °F (-40 to +70 °C)
Relative Humidity:	0 - 95 % non-condensing
Enclosure:	Rugged Nema 4 RFI/EMI shielded composite case c/w mounting brackets
Connector:	One (1) 6-pin MIL male c/w 5 ft cable
Size:	6.2 x 3 x 5 in. (15.5 x 7.6 x 12.7 cm)
Weight:	26 oz (740 grams) approximate

WARRANTY: 2 Years Non-prorated

Modular Power Choices Provide Complete Flexibility

Low Power Technology

Rig Rat III Stand Alone systems require less than 1% of the electrical power used by conventional hard-wired monitoring systems. Complete versatility in power options allows you to provide continuous monitoring no matter what your application is, or where your job site is located.

Unprecedented Flexibility

The unique BW Stand Alone systems offer complete flexibility. They provide continuous monitoring in plants and refineries. They are ideally suited for perimeter monitoring, pipelines, offshore sites, compressor stations, etc. They are used for mobile monitoring by the service trucking industry and at temporary work sites.

Battery or solar-powered units are also being used in residential areas, independent sites and remote locations - whenever gas monitoring may be needed.

Assured Continuous Protection

Battery powered Detectors and Controllers with battery back-up assure you of continuous protection in the event of a line power interruption.

Cost Effective

Stand Alone Detectors significantly reduce operating and installation costs. Detectors can be easily added or relocated without any modifications to the work site or your power grid.

Independent Battery Power

STAND ALONE DETECTORS will operate off of their own internal battery when equipped as follows:

2 Toxic Gas Sensors	Up to 28 days operation
1 Toxic and 1 Combustible Gas Sensor	Up to 5 days operation
2 Combustible Gas Sensors	Up to 3 days operation

Solar Power

BW's solar panel trickle chargers provide continuous, maintenance-free gas monitoring. They allow a Detector to operate continuously year-round as a completely stand alone system. Solar panels are a cost-effective, practical energy alternative.

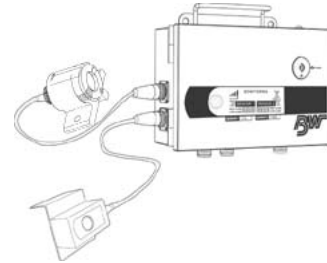
Line Power 24 VDC Direct, 110/ 230 VAC Line Chargers

Stand Alone systems can be run off 110 and 230 VAC and are directly compatible with 24 VDC allowing you to line-power each unit at adjacent power sources with only short cable runs.

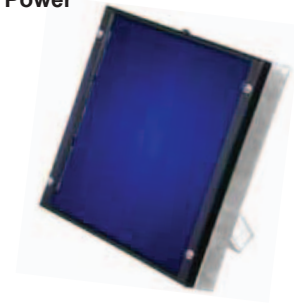
Charger Compatibility

- ▲ Rig Rat III
- ▲ All BW Rechargeable Options: Audible and Visual Alarms, Repeater Stations, Solenoid Driver, etc.

▲ Independent Battery



▲ Solar Power



- ▲ Line Power: 24 VDC Direct
- 110 VAC 50 to 60 Hz
- 230 VAC 50 to 60 Hz
- 230 VAC 50 to 60 Hz



Charger Order Info:

Solar:

5 Watt Charger	SP-U300-S
10 Watt Charger	SP-U310-S
20 Watt Charger	SP-U320-S
30 Watt Charger	SP-U330

Line Trickle Chargers:

24 VDC Direct Line	UC-SCAB2
110 or 230 VAC Explosion-proof	UR-TC10
110 or 230 VAC Weatherproof	UR-S600
Single Bench Charger (110/ 230 VAC)	UR-C-300
Quad Bench Charger (110 VAC/ 230 VAC)	UR-C404

RIG RAT III

SOLAR PANEL CHARGERS for All Stand-Alone Detectors and All BW Rechargeable Options

Rig Rat III solar panel charging systems eliminate the need for expensive hard-wired power line connections. Rig Rat III Detectors can be located anywhere—no matter how remote from the nearest power source. Solar panel powered Rig Rat III detection systems are totally flexible. Rig Rat III systems can be expanded, reconfigured or moved without the need for expensive wiring, cabling, or other installation modifications.

The 5, 10, 20 and 30 Watt Solar Trickle Chargers provide assured cost-effective protection in a wide variety of applications (solar powered detectors, rechargeable alarms, etc.). BW's wireless, stand alone, solar powered systems are field proven in thousands of installed detection systems over the last 14 years.

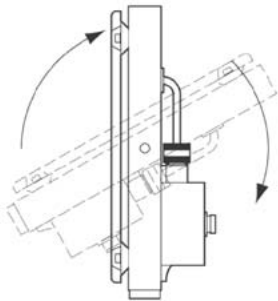
INSTALLATION

Solar Chargers operate most effectively when they receive direct sunlight. Mount the bottom plate at the highest convenient location. The custom mounting frame rotates to the correct angle for your degree of latitude. When the unit is aligned, the panel plugs directly into rechargeable detectors or options charger port. Performance of this or any solar electric module is dependent on local conditions. Maximum performance requires measurement of local solar irradiance and proper orientation of the panel (i.e. positioned within 5° of South and an optimal tilt angle).

MAINTENANCE

The Solar Chargers maintenance requirements are minimal. The solar panel is designed so that water will not sit on the glass. Simply clean with water and a soft cloth or sponge when required.

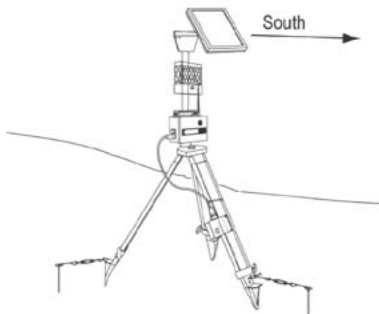
SOLAR PANEL MOUNTING DIAGRAMS



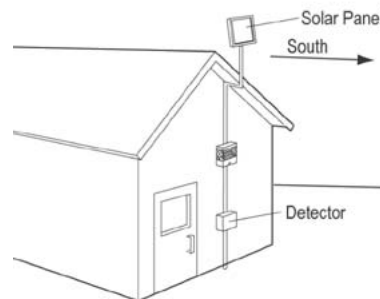
Set to optimal Tilt Angle (dependent on latitude).

Approximately 180° Rotation

Position within 5° of True South



5 and 10 Watt



20 Watt



RIG RAT III

5, 10, 20 AND 30 WATT SOLAR PANEL CHARGES

Order No: SP-U300-S (5W); SP-U310-S (10W); SP-U320-S (20W); SP-U330 (3W)

All Detectors and Rechargeable Options

Solar panels are solid state generators with a DC current output requiring only sunlight as an energy source. The Solar Panels function as trickle chargers that keep the Detector battery and rechargeable option's battery(s) topped up. Clean, renewable and virtually maintenance-free, solar panels provide practical and dependable power. They are a cost-effective answer for continuous monitoring in many field applications.

The rugged and weatherproof solar charger rotates on every axis for easy installation and optimum positioning.

Sufficient power is available to charge batteries efficiently in virtually any climate for a maintenance-free installation of any size or location. BW solar panels will maintain a continuous charge even in cloudy weather.

APPLICATIONS

BW solar chargers are compatible with all BW rechargeable Detectors, and rechargeable options that are equipped with a 12 volt rechargeable battery.

NOTE - Combustible Sensors: Detectors equipped with combustible sensors require at least a 10 W panel for continuous long term operation. A 5 W panel is normally sufficient for Detectors equipped with one or two toxic or oxygen sensors. Add up the current draw from all devices powered by the Detector to determine which solar panel to specify.

Solar Characteristics:

SP-U300-S, SP-U310-S, SP-U320 and SP-U330 solar panels meet or exceed:

- ▲ Complete environmental requirements of JPL specification No. 5101-61 (Block V)
- ▲ Wind loading exceeding 125 mph (201 km/h)
- ▲ Impact of one-inch hail at terminal velocity (52 mph (82 km/h)) without breakage
- ▲ Laboratory tested for wide range of operating conditions (-40 to +194°F (-40 to +90°C) and (0-85% humidity)



SPECIFICATIONS	SP-U300-S (5 watt)	SP-U310-S (10 watt)*	SP-U320-S (20 watt)*	SP-U330 (30 watt)
Solar Panel Rated at:	5 watts DC	10 watts DC	20 watts DC	30 watts DC
Power Output:	5 watts @ 35A	10 watts @ 58A	20 watts @ 1.38A	30 watts @ 1.75A
Current @ Peak power:	0.27 A	0.58 A	1.38 A	1.75 A
Voltage @ Peak power:	16.8 V	17.1 V	17.1 V	17.1 V
Enclosure:	14 gauge stainless steel	14 gauge stainless steel	14 gauge stainless steel	14 gauge steel powder-coated
Size: (W x H x D) inches:	14 x 16 x 4	14 x 16 x 4	13.25 x 27.5 x 6.2	20 x 30 x 8
cm:	35.5 x 40.5 x 10	35.5 x 40.5 x 10	33.7 x 69 x 15.7	52 x 76.5 x 20
Weight:	8 lbs. (3.6 kg)	10 lbs. (4 kg)	17 lbs. (7.94 kg)	19 lbs. (8.6 kg)
General:				
Temperature Range:	-50 to +194 °F (-45.6 to +90 °C)			

*CSA Approval, Class I, Div I Group C,D

Ratings given at Industry Standard Conditions:

1000 W/m² irradiance, 25°C cell temperature and solar spectral irradiance per ASTM E 892.

Conditions will vary at each latitude and location.

WARRANTY: 2 Years Non-prorated

TRICKLE AC/DC LINE AND BENCH CHARGERS All Stand Alone Detectors, and Rechargeable Options

General: All BW rechargeable units are self-regulating. BW Line and Bench Chargers are 110 VAC (230 VAC available) powered. Fuses protect the circuitry against power fluctuations or short circuits.

24 VDC Direct

UC-SCAB2

All Rig Rat III and Shack Rat II Detectors and rechargeable units can be charged 24 VDC direct. The UC-SCAB2 interface cable is equipped with a 5-pin, male connector that plugs directly into the Detector.



UR-S600
AC Trickle Charger

AC Line Trickle Chargers

Line Trickle Chargers continuously trickle charge BW Detectors and all BW rechargeable options. Line Chargers may also be used to recharge units that have lost their charge. Install according to local electrical and safety codes for hazardous areas and the BW manual. Installation should be performed by a certified electrician when connecting line power in hazardous areas.

Weatherproof AC Line Charger

UR-S600

Explosion-Proof AC Line Charger

UR-TC10

UL, CSA and FM: Class I, Div. 1 & 2, Group D
 Class II, Div. 1 & 2, Groups E, F, G
 Class III

UR-TC10
AC Trickle Charger



Single Bench Charger

UR-C300

The compact single bench charger comes equipped with an "ON" LED indicator. It is an excellent back-up on sites with one or more BW rechargeable units. Two fuses protect the circuitry against power fluctuations or short circuits. The in-line fuse is 500 mA for a 110 VAC charger and 250 mA for a 230 VAC unit. The on-board fuse is 3 amps.



UR-C300
Bench Charger

Quad Bench Charger

UR-C404

The UR-C404 quad charger is equipped with four charging ports, an LED "ON" indicator and four charging cables. Three fuses protect the circuitry against power fluctuations or short circuits. The 110 VAC charger has two 3A fuses and one 1A fuse. For a 230 VAC charger there are two 3A fuses and one 500 mA fuse.

UR-C404
Bench Charger



SPECIFICATIONS	AC Line Chargers		Bench Chargers	
General:				
Power Input:	110 VAC (230 VAC available) 50 to 60 Hz			
Power output:	24 volts (rechargeable units are self regulating)			
Temp. Range:	-40 to +140°F (-40 to +60°C)			
Models:	UR-S600	UR-TC10	UR-C300	UR-C404
Output Cable:	1.5 feet (0.5 m)		N/A	N/A
Cable Connector:	5-pin male Mil-style		N/A	N/A
Line Access:	0.5 in. (1.3 cm) n.p.t.	0.5 in. (1.3 cm) n.p.t. conduit 7 thread	N/A	N/A
Power Cord:	N/A	N/A	1.5 feet (0.5 m)	1.5 feet (0.5 m)
Charging Cables:	N/A	N/A	One (1) 5 ft. (1.5 m)	Four (4) 5 ft. (1.5 m)
Receptacles:	N/A	N/A	N/A	Four (4) 5-pin female
LED ON Indicators:	N/A	N/A	One (1)	Four (4)
Enclosure:	14 gauge steel	Explosion-proof	14 gauge steel	14 gauge steel
Size: (L x W x D)	8 x 6.25 x 4.5 in. 20.3 x 15.9 x 11.4 cm	12 x 7 x 6.5 in. 30.5 x 17.8 x 16.5 cm	5 x 5 x 4 in. 12.7 x 12.7 x 10.2 cm	4.25 x 12 x 10 in. 10.8 x 30.5 x 25.4 cm
Weight:	5 lbs. (2.3 kg)	14 lbs. (6.3 kg)	2 lbs. (0.9 kg)	8 lbs. (3.6 kg)

WARRANTY: 2 Years Non-prorated

TRIPOD KITS

The tripod is ideal for independent installation. The durable construction of steel and anodized aluminum make it usable in the most rugged environments. Sensors mount directly on the extendable tripod legs. The legs can be anchored to withstand high wind factors. Extensions may be added to mount solar panels, alarms, etc.

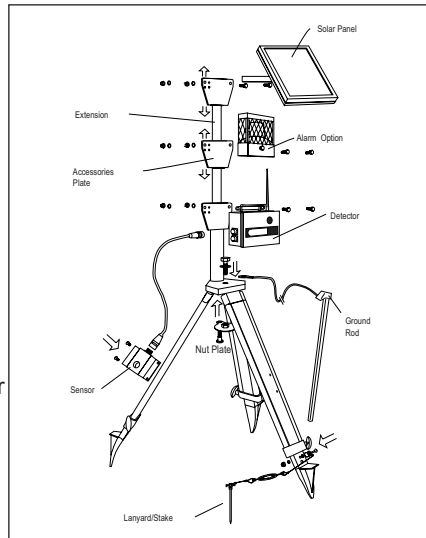
- ▲ Extendable legs
- ▲ Carrying Strap
- ▲ Light weight
- ▲ Portable

Order No:

Model # Description

TRIPOD1	Folding Field Tripod holds Detector and Sensor(s)
TRIPOD2	Tripod holds Detector, Sensor(s) and 20 watt Solar Panel
TRIPOD3	Tripod holds Wind Detector Assembly (not shown)
TRI-EXT1	Tripod Extension pole c/w Tri-Plate2 accepts one option (5 or 10 watt Solar Panel and most other options)
TRI-PLATE2	Tripod Option Plate accepts 5 or 10 watt solar panel and most accessories and options
TRI-PLATE3	Accepts rechargeable options

NOTE: 30 watt Solar Panels are only applicable to Wall Mount Kits and custom Stand-Alone Stands.



WALL-MOUNT KITS

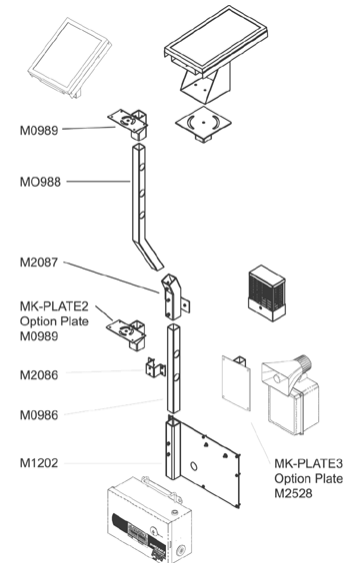
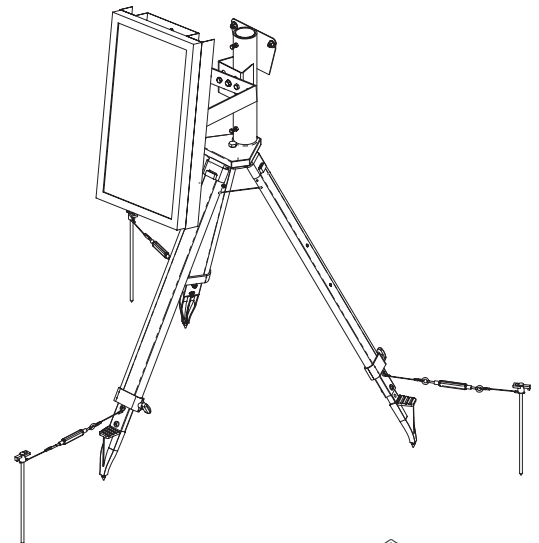
Wall-mount Kits are available for mounting on the sides of buildings. Black tubular metal sections fit almost all building types. The Detector, Alarms, Relays, Solar Panels, etc. mount on pre-drilled mounting plates. Cables for the plug-in accessories run inside the square steel tube.

Model # Description

MK-U600	Standard Wall Mounting Kit holds Detector, Solar Panel, and one Option. It includes M0989 x 2, and 1 each of the following sections M0988, M2087, M2086, M0986 and M1202.
MK-PLATE2	Wall Mounting Kit Option Plate for second option (M0989)
MK-PLATE3	Option Plate for rechargeable accessories (M2528—order separately)
M2087	Elbow Kit for angled soffits

Note 1: 20 and 30 watt solar panels come c/w with a M1240 mounting plate.

Note 2: Overall MK-U600 height is approximately 11 feet (3.35 m). For buildings requiring longer extension poles contact factory for quote with measurements.



DESCRIPTION

RIG RAT III stainless steel Controllers are designed as the communication center for the wireless RIG RAT III gas detection systems. Each Detector transmits a discretely coded radio signal to the Controller, the Controller then advises you of any gas or integrity alarm occurrence. The independent control channel activates a visual LED alarm, as well as, remote discrete or general alarms and field interfaces.

WIRELESS MONITORING - Cut costs - Increase flexibility.

ELIMINATE SIGNAL AND POWER LINES Real-time readings for each remotely located sensor are individually received and displayed on the Controller LCD displays. Controllers are independently powered via 110 VAC; 220 VAC or 24 VDC.

Battery Back-Up: Rig Rat III Controllers are equipped with two internal batteries to provide power in the event of a power failure. Batteries recharge automatically once power has been restored.
Battery Power: Up to 4 hours

MULTI-POINT SYSTEMS: Multi-point systems can be expanded to over 50 individual monitoring points with each Detector coded to a separate discrete Controller channel. *Larger systems use more than one Controller.*

USER FRIENDLY: The RIG RAT III Controller's large LCD displays provide information at a glance.

LED Power Indicator: The LED lights green when the Controller is operated by a VAC source. If the AC power is interrupted it will change from green to red to indicate battery back-up (DC) operation. On a Controller that is powered continuously by a 24 VDC source, the power LED will be red.

LOCAL AUDIBLE ALARM: The optional 85 dB audible activates when an alarm condition is met on any channel.

DATA ACQUISITION: Download alarm data into your central computer system to integrate information systems.

ALPHANUMERIC DISPLAY: Real-time readings for all Detectors and sensors. Channel alarm LCD indicator flashes and latches to indicate alarm condition. Each channel receives unique digitally coded alarm signals from the Detector.

SECURITY ON/OFF KEY LOCK SWITCH: Security Key lock ON/OFF switch provides security.

INDIVIDUAL CHANNEL CONTROL SWITCHES: Enable/Disable switches provide individual channel control. The switches turn off the channel's output to the option ports, "disabling" external devices during testing, calibration or an alarm condition if desired.

TEST/RESET MOMENTARY SWITCH:

Alarm Acknowledge: Resets the latching visual and audible alarms. Alarms cannot be reset if an alarm condition is still present.

Test Function: Tests Controller alarms and external devices. When the button is pressed, the red alarm LED's on the control panel will flash. Any external alarms or controls connected to the option ports will also be tested.



FEATURES

- ▲ Wireless, coded radio signal linkage between Detectors/ Controller
- ▲ 2.4 GHz digital spread spectrum, ISM band, RF transceiver
- ▲ Eliminates wiring cabling and dredging costs
- ▲ Alphanumeric Display
- ▲ Signal transmission up to 1.8 miles / 3.0 km
- ▲ Simple, straight forward, user-friendly operation
- ▲ Latching, highly visible, red LED visual alarms (each channel)
- ▲ Simple Installation
- ▲ RESET/TEST switch - alarm acknowledge reset switch
- ▲ Individual Enable/Disable channel control switches
- ▲ Integrity alarm triggers if there is a problem at the Detector
- ▲ Computer compatible for tracking information

WARRANTY: 2 Years Non-Prorated

RIG RAT III

4 CHANNEL CONTROLLER

Order No: RR-3C04

Antennas:
Wide selection of antennas and antenna cable connectors

Signal Transmission:
2.4 GHz digital, spread-spectrum, ISM band RF transceiver with 1.8 mile (3 km) transmission radius

Rugged and Durable:
Rugged, stainless steel enclosure

Channel Activation:
Individual enable/disable channel control switches

Alphanumeric Display: Real-time readings for all Detectors and sensors.

Channel alarm LCD indicator flashes and latches to indicate alarm condition.

Each channel receives unique digitally coded alarm signals from the Detector.

Audible:
Built-in audible (85 dB) and visual alarms

Security Locks:
Heavy duty stainless steel latches.

System Reset:
Alarm acknowledge reset button

Security ON/OFF Keylock
Protects access to operations bay

Two Option Ports:
Two plug-in option ports accept external audible/visual alarms and relays to control site interfaces.

Status LED:
Advises power status:
Green - A/C
Red - Battery

Power Port:
Operate Controller via line power, or connect to external emergency power supply. Battery backup with auto recharge.



FIELD INTERFACES: Plug-in ports provide discrete and zoned channel signal and 12 volt power outputs..

OPTION PORTS: The option ports accept a variety of external visual/audible alarms and relays to interface with telemetry systems, emergency shut-down systems, exhaust fans.

OPERATING SPECIFICATIONS:

POWER:
Input: 110 VAC/220 VAC; 24 VDC optional
Battery Back-up: Two (2) 12 VDC 2A hr. rechargeable batteries
Operation: Non-alarm - 48 hrs; Alarm - 10 hrs
Power Output: 12 volts DC to option ports
Signal Input: Discretely coded radio signal from gas Detector
Frequency: 2.4 GHz
Signal Range: Up to 1.8 miles (3.0 km)
Antenna Port: UHF with protective cap
Signal Output: Discrete and Zoned channel alarm signals

INDICATORS: Color-coded super-bright large LEDs ON/Power interrupt; Alarm; Channel ON/Disabled

ALARMS:
Visual: LCD display
Audible: 85 dB @ 3 ft (1m) Models SE-C04/C08

Signal Transmission:
RR-AN8 Antenna: Distance: Up to 1.8 miles (3.0 km)

INSTALLATION: Controllers signal channels are factory coded prior to shipping. The enclosures are 16 gauge stainless steel with built-in mounting flanges. Simply mount the Controller to the wall and supply power.

MAINTENANCE: Rig Rat III Controllers require no maintenance. All option ports have protective caps to ensure their integrity when not in use. Fuses protect the circuitry.

CONTROLS:
Power: ON/OFF Keylock security switch
Channel Controls: 4 ENABLE/ DISABLE switches
Reset/Test: Momentary switch

OPTION PORTS: Female plug-ins with protective cap. 12 VDC output at each pin w/ common ground

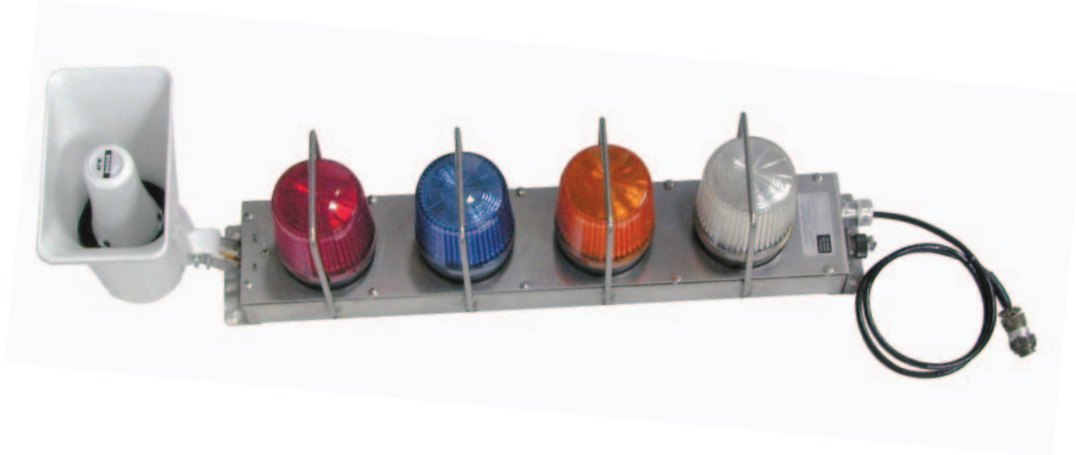
Discrete Ports:
1 - for alarm relays
1 - for alarm bar

TEMP. RANGE: -5 to +140°C (-20 to +60°F)

ANTENNA: RR-AN8 Antenna

PHYSICAL:: Self Contained 14 gauge Stainless Steel c/w mounting flanges

Power Cable: 8 ft. (2.5 m) c/w wall plug
4 Channel: Size: 14 x 12 x 4 in. (35.5 x 30.5 x 10 cm)
Weight: 19.1 lbs (8.7 kg)



The Alarm Bar provides a highly visible, color-coded discrete (4 Channel Controllers) visual alarm advise, as well as a general audible alarm. The SE-A200 has a 112 dB siren horn and four color-coded 160,000 candle power strobes. Over each strobe is a protective steel bar. The dual tone steady-yelp siren pivots in a 45 degree arc for best positioning.

The SE-A200 is powered by the Rig Rat III Controller. The Alarm Bar comes with a 33 foot (10 m) cable (other lengths are available). The mil-style quick connect on the cable plugs directly into the Controller's 6-pin option port.

Virtually no maintenance required.

FEATURES

- ▲ 4 color-coded 160,000 candle power strobes
- ▲ 112 dB steady help siren
- ▲ Rugged, industrial designed, stainless steel enclosures with protective bars over each strobe
- ▲ Built-in mounting flanges
- ▲ Equipped with a quick connect, the Alarm Bar plugs directly into the Controller and is powered by the Controller
- ▲ Option Port available to extend alarm coverage

SPECIFICATIONS

Visual Alarms:	Four (4) 160,000 candle power strobes
Lens:	High impact resistant poly carbonate plastic
Colors:	Clear, Amber, Red, Blue
Flash Rate:	50 to 120 per minute
Operational Life:	In excess of 200 alarm hours
Audible Alarm:	112 dB at 10 ft. (3 m)
Type:	Steady-yelp, dual tone bullhorn
Horn:	Weatherproof, tough ABS plastic
Temp. Range:	-40 to +140°F (-40 to +60°C)
Option Port:	6-pin MIL-C-50155 (14S) male
Cable Length:	33 ft. (10 m) standard, other lengths available
Connector:	6-pin MIL-C-5015
Dimensions:	30 x 5 x 8 in. (76 x 12.5 x 25 cm)
Weight:	14.5 lbs. (6.5 kg)

WARRANTY: 2 Years Non-prorated

The Practical, and Economical Alternative to Hard-wired Gas Detection Systems

Cut Installation Costs—Up to 75%

Eliminate signal and power lines. Signals are transmitted via coded radio channels and each unit in a Rig Rat III system is independently powered. Installation costs are cut up to 75% by eliminating the costs of cabling, wiring, conduit and dredging. Therefore there is no need to dig a trench, there is no need for expensive, shielded, underground wire or even subcontracting for a backhoe or operator. There is also no worry about cutting into existing underground lines. Installation time is therefore reduced proportionately.

Rig Rat III system components, Detectors, sensors, Controllers, remote alarms, relays etc. are all independent of system signals and power lines.

Wireless means no hardware headaches:

The Rig Rat III Systems are designed to use *radio frequency communications or wireless communication*. BW continues to pioneer many of today's most advanced mid-range transmission technologies. Our experience with mid-range wireless gas detection systems is extensive and exclusive to BW Technologies. At present, there is no product on the market that competes with our wireless gas detection and wind multi-point systems.

Transmission Ranges—up to 1.8 miles / 3 km enables wide application range.

The standard antenna RR-AN5 has a transmitting/reception capability of up to 0.6 miles / 1 km depending on optimal antennae and transmission-line-of-sight. RR-AN8 has a transmitting/reception capability of up to 1.8 miles / 3 km. Distances can be multiplied using repeater stations.

Flexibility

The independently powered Detectors are linked to the Controllers by radio signal. Radio linkage allows for increased flexibility. The entire system can be easily moved to a new work site or individual system components (detectors, sensors, alarms relays etc.) can be quickly and easily moved or changed without site modifications. Systems are readily expanded as well.

Remote Locations and Independent Sites:

Rig Rat III Systems provide continuous perimeter monitoring of hazardous gases. They can be located in remote locations where line power and signal transmission is impractical.

Transmit to local area Controllers, receiving alarms, as well as, the central Controller.

Rig Rat III Systems provide continuous protection for personnel and site facilities and offer unmatched flexibility.

Proven Reliability

BW wireless systems have been in use at sites all over the world for over 16 years. Originally designed for use in the rugged and varying applications present in the oil and gas industry, systems are now in use by a wide variety of industries, including pulp and paper mills, waste treatment facilities, cargo docks, etc.

Installation

Radios: Radios operate on the 2.4 GHz ISM band width. There is nothing to be tuned up by the installer. All tuning is done and QC is checked at the factory.

Antennas and Extension Kits—to meet varied requirements:

A standard Antenna RR-AN5 is included with each Rig Rat III Detector. An RR-AN8 high gain Antenna is required with each Controller. Due to specific site conditions other RR-AN8 Antennas may be required with the Detector. Antennas must be ordered separately for receiving and transmitting alarm options and repeater stations.

The type of antenna that is required depends on many factors that affect the range of reception. Radio reception varies from site to site and within locations on the site. If possible, line-of-site installations are optimum. Antenna extension cables are available to mount the antenna more conveniently or to avoid dead signal areas, obstructions, etc. BW recommends an on-site transmission survey or that installation technicians have an assortment of antennas and extension Kits available to during installation. Factors effecting transmission include terrain, obstructions, line of sight, quality of ground, radio activity in the area, and atmospheric conditions.

As part of a wireless system, the Rig Rat III can be used for indoor (i.e. in plants) as well as outdoor applications, provided that the receiving antenna is also indoors.

Transmission test function— provides peace of mind

The Detector test function "de-rates" the power of the transmitter by more than 10%. This is to ensure that there is more than sufficient power available in normal operation to transmit in all events. The test function must be used to individually test each Detector during installation.

RIG RAT III

WIRELESS TECHNOLOGY Applied to Gas Detection Systems

TRANSCIEVERS send coded signals and Detectors are equipped with transceivers . Each Detector has its own distinct code that activates a separate channel on the Controller. The Detector can also communicate with a repeater station, a remote alarm simultaneously if they are coded to receive the Detector's discrete signal.

Discrete Signals: The Rig Rat III Detectors are each equipped with two rotary dial switches which allow configurations from 64 codes to choose.

Secure Access: Signal codes are protected from tampering. The Detector's outer door is equipped with a Security Key Lock allowing only authorized site personal access to the operations and service bay of the Detector.

Transmitter System Code Switch Setting: The transceiver is located in the Detector service bay. Open the inner hinged operations bay door and simply loosen the thumbscrew and slide the door open. You will find the rotary dial switches (A and B). Turn the dial and select the channel. Select 0-9, A-F on channel A or B.

Match the System's Code of the Detector to the System Codes of the Controller. System Codes can be changed whenever required (i.e. moving, changing or adding equipment).

SPECIFICATIONS

Powered by:	The Rig Rat III
Carrier Frequency:	2.4 GHz
Channels:	4
	System Codes: 64 available
Power Output:	4 Watts
Transmit Current:	250 mA
Frequency Tolerance:	+/- 0.005%
Modulation:	PM 100%



ORDERING INFORMATION

FOR COMMON STAND-ALONE EQUIPMENT AND ACCESSORIES

ORDERING INFORMATION - Short List of Common Stand Alone Equipment & Accessories			
Detectors		Controllers	
RR-3000	Rig Rat III Gas Detector wireless version	RR-3C04	4 Channel Controller - for use with RR3000
RR-3000S	Rig Rat III Gas Detector non-wireless version		
		Relays	
Remote Sensor Units		UD-RWS(0)	Detector-Single Relay (weatherproof)
SA-L2H#	Hydrogen Sulfide (H ₂ S)	UD-RWD(0)	Detector-Dual Relay (weatherproof)
SA-L2W1	Combustible (0-100% LEL)	UD-RES(0)	Detector-Single Relay (explosion-proof)
SA-L2X#	Oxygen Deficiency (O ₂)	UD-RED(0)	Detector-Dual Relay (explosion-proof)
SA-L2M#	Carbon Monoxide (CO)	UC-RWS0	Controller-Single Relay
SA-L2S#	Sulfur Dioxide (SO ₂)	UC-RWD0	Controller-Dual Relays
SA-L2C#	Chlorine (Cl ₂)		
SA-L2A#	Ammonia (NH ₃)	Other	
SA-L2V#	Chlorine Dioxide (ClO ₂)-Stainless steel enclosure	RS-DAT7-II	Datalogger
SA-L2Z#	Hydrogen Cyanide (HCN)	UA-ST24	Solenoid Driver
SA-L2D#	Nitrogen Dioxide (NO ₂)	TRIPOD1	Tripod Kit (for units with 5/10 Watt Solar Panel)
SA-L2N#	Nitric Oxide (NO)	TRIPOD2	Tripod Kit (for units with 20 Watt Solar Panel)
SA-L2L#	Hydrogen Chloride (HCl)	MK-U600	Wall-Mount Kit
SA-L2B#	Ethanol (C ₂ H ₅ OH)		
SA-L2E#	Ethylene Oxide (C ₂ H ₄ O)	Replacement Sensors	
SA-L2Y#	Hydrogen (H ₂)	PS-RH01	Hydrogen Sulfide (H ₂ S)
SA-L2G#	Ozone (O ₃)	PS-RX01	Oxygen (O ₂)
		PS-RM01	Carbon Monoxide (CO) (H ₂ Filtered)
Chargers		PS-RS01	Sulfur Dioxide (SO ₂)
SP-U300-S	5 W Solar Panel	PS-RC01	Chlorine (Cl ₂)
SP-U310-S	10 W Solar Panel	PS-RA01	Ammonia (NH ₃)
SP-U320-S	20 W Solar Panel	PS-RV01	Chlorine Dioxide (ClO ₂)
SP-U330	30 W Solar Panel	PS-RZ01	Hydrogen Cyanide (HCN)
UR-C300	Single Bench Charger (one cable)	PS-RD01	Nitrogen Dioxide (NO ₂)
UR-C404	Quad Bench Charger (four cables)	PS-RN01	Nitric Oxide (NO)
UC-SCAB2	Interface for 24 VDC direct operation	PS-RL01	Hydrogen Chloride (HCl)
UR-S600	Weatherproof Line Trickle Charger	PS-RB01	Ethanol (C ₂ H ₆ O)
		PS-RE01	Ethylene Oxide (C ₂ H ₄ O)
Remote Alarms		PS-RA01	Hydrogen (H ₂)
UR-L600	Detector -Strobe (60,000 Candle power)	PS-RA01	Ozone (O ₃)
UR-LR60	Detector-Strobe (Rechargeable, 160,000 Candle power)		
UR-H700	Detector-Siren (101 dB)		
UR-HR60	Detector-Bullhorn (Rechargeable, 112 dB)		
SE-A200	Controller-4 Channel Alarm Bar		
CR-H600	Controller-Siren (12 dB)		
CR-L160	Controller-Strobe (60,000 Candle power)		

For a complete list of products and instrument configurations please contact BW Technologies.

* Check with BW Technologies for availability of remote alarms and relays

Vulcain



A division of BW Technologies

Vulcain is a leading manufacturer of portable and fixed gas detection systems for commercial and industrial markets. With a full range of products for a variety of applications, Vulcain provides cost-effective air quality solutions.

For further information:

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The Vulcain Advantage

Technology

Each year, Vulcain produces thousands of gas detection networks and a broad array of stand-alone gas monitors to meet a diverse and expanding worldwide demand. An expert team at our main facility combines creative engineering ideas with cutting-edge technology to produce outstanding products. The diversity and quality of our product range is a direct reflection of our concerted R&D efforts.

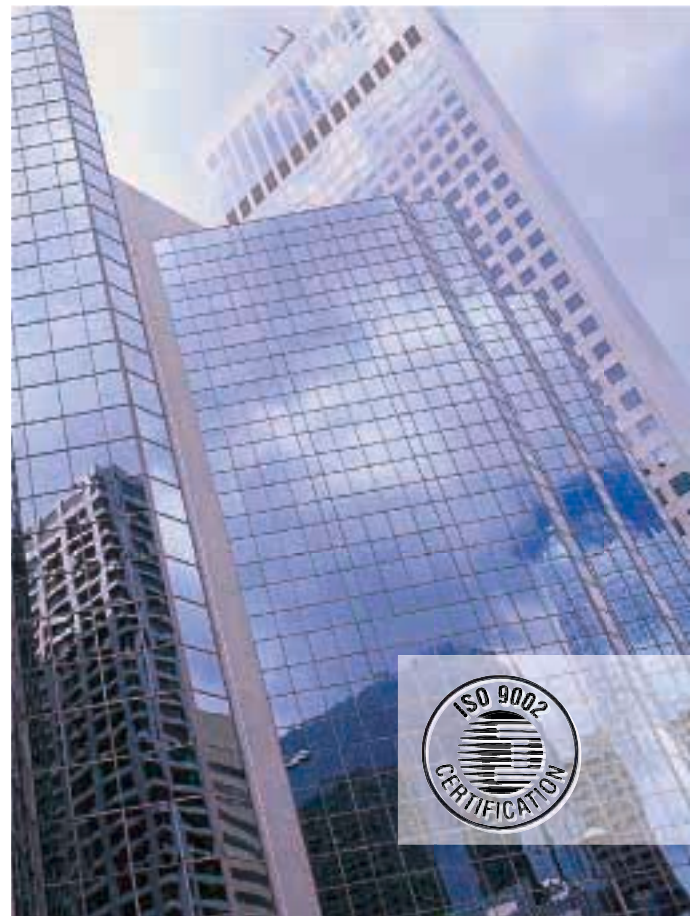
Customer Support

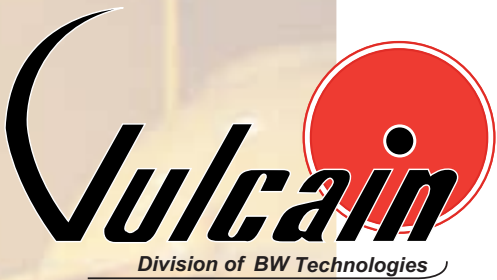
Vulcain supports its customers through an extensive network of sales agents and regional support centres located throughout North America. Our sales and service specialists are continuously trained and updated on all products and technologies, thus ensuring prompt and effective customer service.

Individual Solutions

Vulcain's highly trained application engineers work closely with end users to develop customized applications for gas detection needs. Whether you require a fully engineered gas detection network or a more modest detection solution, Vulcain offers an extensive selection of products and services.

If you have any technical questions or require any special product modifications or unique applications, Vulcain's team of technical support staff is always available to assist you.





Gas Detection Controller

VA201C

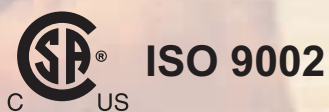
Vulcain Inc., a company that prides itself on innovation and product excellence, is pleased to offer a gas detection system of exceptional quality. The product of many years of extensive research, makes the VA201 Detection System extremely flexible compared to its competitors.

The VA201C controller can manage 32 gas transmitters and 32 relay modules, through two RS-485 channels, up to 2000 feet of distance from the controller.

- Visual indicators and audible alarm
- 2 or 3 alarm levels
- Programmable time delays
- Failure indicator
- Optional LCD display and keypad
- Up to 32 transmitters and relay modules
- Up to 4 actions per alarm level per transmitter
- No moving parts
- Trouble-free operation
- Quick self-test and warm-up
- RS-232C transmission port

Ordering Information

VA201C	Controller
Options:	
AC	LCD display and keypad
3L	3 Alarm Levels
RS-232	RS-232 output
4XC	Nema 4 enclosure
C/Guard	Metal guard



Protecting your health and your environment.

VA201C

Gas Detection Controller

Ease of installation

The VA201C controller minimizes installation costs by using an addressable RS-485 communication protocol. Only two pairs of wires are required to connect all the gas transmitters and relay modules to one of the controller's two channels. With a total of 32 gas transmitters and 32 relay modules that can be linked to one controller, the VA201 Detection System represents the most affordable protection for your gas monitoring requirements.

The VA201T series and the VA301D are fully compatible with the VA201C controller

VA201C SPECIFICATIONS

VISUAL INDICATORS:	
Normal Operation:	Green LED
Alarm Level 1:	Red LED
Alarm Level 2:	Red LED
Failure Indication:	Yellow LED
User Interface:	Alphanumeric display and keypad
Data Output:	RS-232 (ASCII)
Distance Between Controller and Transmitter:	Up to 2000 feet (600m)
Relay Output Rating:	5A, 30Vdc or 250 Vac (resistive load)
Alarm Levels:	2 with high and low set points 3 (optional)
Audible Alarm:	65 dBA at 3 feet (1 metre)
Time Delays:	0-99 minutes before and after an alarm
Outputs:	3 DPDT relays (2 alarms and 1 fault or 3 alarms)
Operating Humidity Range:	0-95% RH, non-condensing
Operating Temperature Range:	32 °F to 100 °F (0 °C to 40 °C)
GENERAL SPECIFICATIONS	
Size:	8.5 x 11 x 2.0 inches 22.2 x 26.1 x 5 cm
Weight:	3.5 lbs. (1.58 Kg)
Power Requirement:	17-27 Vac, 24-38 Vdc, 250 mA
	Certified to UL and CSA standards

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

The VSQNA provides an efficient interface between the gas transmitters and controller.



VASQNA



VA301D

VA201T

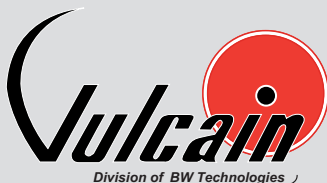
The VA301D and VA201T series are compatible for most commercial and industrial applications. These transmitters can also work in a stand-alone mode with 4-20mA output and feature a range of other capabilities.

In addition to the three relays already included in the controller, other outputs are also available with the VA201R relay module.



VA201R

Locally Distributed by:



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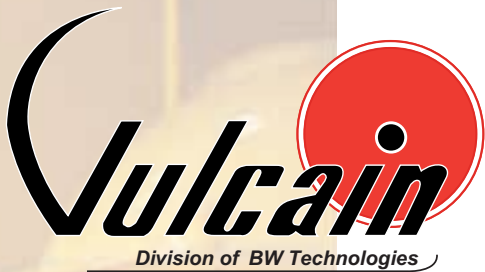
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Toxic and Flammable Gas Transmitters

VA201T Series

Vulcain Inc., a world leader in gas detection for over three decades, has designed the VA201T series to meet or exceed safety requirements in a variety of commercial and industrial applications. These transmitters can work in a network mode with our VA201C controller through their RS-485 link, or can be used in a stand-alone configuration offering 4-20mA and alarm relay outputs.



Vulcain's sensors' inherent reliability and stability characteristics have accounted for the universal acceptance within a broad spectrum of commercial and industrial applications. Catalytic gas sensors are used to detect hundreds of different flammable gases and vapor concentrations. Toxic gases are detected through electrochemical cells, while fuel cells are used for oxygen detection. Moreover, a second generation of semi-conductor sensors provides a highly effective solution for a range of different applications.

- Proven sensing technology
- 10-step LED display
- Stand-alone or network configuration
- Optional 4-20 mA and relay output
- Optional audible alarm and LCD display
- One-man remote calibration
- Field-proven protection
- Innovative and compact case design
- Easy installation and operation
- Full compatibility with VA-201C

Ordering Information

VA201TQ1-xxx*

Gas transmitter with Q1-type sensor

VA201TQ2-xxx*

Gas transmitter with Q2-type sensor

VA420TQ1-xxx*
*gas to be detected

Two wire gas transmitter

Options:

A Audible alarm
R Relay output
C 4-20 mA output
D LCD display
RS Remote sensor

DT Duct type
4X Nema 4 (N/A for Q2)
ECLAB Splash guard
TM/Guard Metal guard
LTA Low temp. assembly

ISO 9002

Protecting your health and your environment.

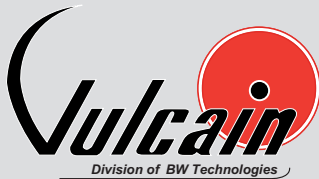
VA201T Series

Toxic and Flammable Gas Transmitters

VA420T Two-Wire 4-20 mA Configuration

A two-wire version of the VA201T series is available for most toxic gases detected by our Q1-type sensor. When the unit is powered, it enables the 4-20 mA analogic loop to vary in proportion with the level of gas detected.

Offering comparable characteristics as the VA201T series except for the LED indicators and the available options, the VA-420T ensures substantial saving on the installation cost.



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www.vulcaininc.com

VA201T SPECIFICATIONS

SENSING TECHNOLOGY	
Q1-type Sensor:	Electrochemical (toxic) Catalytic combustion (combustibles) Diffusion fuel cell (oxygen)
Q2-type Sensor:	Solid-state Electrochemical (Carbon Monoxide)
DISPLAY	
Visual Indicators:	10-step LED, LCD Failure Indication : Yellow LED (Available in network configuration only)
Normal Operation:	Green LED
Relay Output Rating:	5A, 30Vdc or 250 Vac (resistive load)
†Audible Alarm:	65 dBA at 3 feet (1 metre)
Outputs:	RS-485, *4-20mA, *Alarm relay
Operating Humidity Range:	0 - 95% RH, non-condensing
Operating Temperature Range:	32°F to 100°F (0°C to 40°C) Low temperature range available 4°F (-20°C)

GENERAL SPECIFICATIONS

Size:	8.4 in.(H) x 5.3 in.(W) x 2.25 in.(D) (21.3 cm x 13.4 cm x 5.7 cm)
Weight:	0.86 lbs. (0,350Kg)
Power Requirement:	17-27 Vac, 24-38 Vdc, 250 mA

Certified to UL and CSA standards

†See options on previous page.

Gas Detected	Detection Range		Accuracy	
	Q1-type sensor	Q2-type sensor	Q1-type sensor	Q2-type sensor
CO	0-50 ppm 0-100 ppm 0-250 ppm(std) 0-500 ppm	0-250 ppm	3%	5%
NO ₂	0-10 ppm	-	3%	-
H ₂	0-2.5%	0-100% LEL	3%	5%
CL ₂	0-15 ppm	-	3%	-
Combustibles	0-100% LEL	0-100% LEL	3%	5%
NH ₃	0-100 ppm	-	5%	-
Refrigerants	-	0-2000 ppm *N/A R123	-	10%
H ₂ S	0-50 ppm	-	3%	-
O ₂	0-25%	-	3%	-
SO ₂	0-10 ppm	-	3%	-
ETO	0-20 ppm	-	3%	-
HCN	0-50 ppm	-	3%	-

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



VA201T

- ① Sensor
- ② 10 LED 1-10 (1=10%)
- ③ Unit status
- ④ Multimeter ports
- ⑤ Calibration port

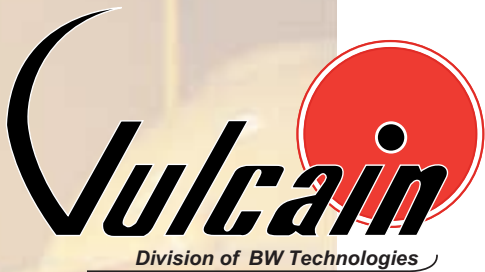


VA420T

- ① Sensor
- ② Unit status
- ③ Multimeter ports
- ④ Calibration port

Locally Distributed by:





Explosion Proof Toxic and Combustible Gas Transmitters

VA301D Series



Combining state of the art technology with a rugged explosion-proof housing, the VA301D analyzes a wide variety of both toxic and combustible gases to high levels of precision. Engineered to rigorous specifications, the unit is specifically designed to provide enhanced performance and reliability in the most adverse industrial conditions.

Smart sensing technology

Inherent smart sensing technology permits the VA301D's transmitter module to instantly recognize and adjust to a range of targeted gases. In addition, depending on the unit's configuration, an internal clock measures the elapsed time that the sensor has been in use. Other routines allow for the rating of the time remaining before calibration and the performing of built-in zero adjustment—features that virtually eliminate downtime.

- Integrated LCD
- Secured Non-intrusive calibration
- Proven sensing technology
- Optional Modbus communication
- Fail safe contact closures
- Optional dual alarm levels
- Optional remote sensing
- 4-20mA analog output
- Explosion-proof housing
- Calibration port makes for easy maintenance

Ordering Information

VA301Dxxx*
*gas to be detected

Gas transmitter with Q1-type Sensor

Options:

- O** Fail safe alarm relay output Alr 1 & Alr 2
- F** Fail safe alarm relay output Alr 2 & Fault
- M** Modbus
- SD** Remote sensing
- PC** Calibration port

ISO 9002

Protecting your health and your environment.

VA301D

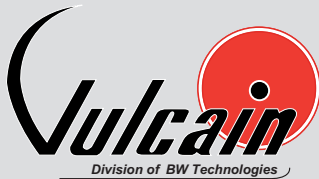
Explosion Proof Toxic and Combustible Gas Transmitters

Durable Design

The VA301D is housed in a rugged, explosion-proof enclosure specially designed for operation in hazardous locations. An integrated sensor guard protects the sensor from dust or dirt, keeping reading as accurate as possible.

Superior Versatility

To optimize environmental control, the VA301D is fully compatible and can be used in conjunction with the Vulcain VA201C controller



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www.vulcaininc.com

VA301D SPECIFICATIONS

SENSING TECHNOLOGY	Electrochemical (toxic)
SENSING TECHNOLOGIES:	Catalytic combustion (combustibles) Diffusion fuel cell (oxygen) Alpha numeric LCD display
DISPLAY:	
VISUAL INDICATORS:	
Normal Operation:	Green LED
ALARMS:	Red LED
FAULT:	Yellow LED
RELAY OUTPUT RATING:	5A, 30 Vdc or 250 Vac (resistive load)
OUTPUTS:	RS-485, *Modbus, 4-20 mA or †2 SPDT fail safe relays
OPERATING HUMIDITY RANGE:	0 - 95% RH, Non-condensing
OPERATING TEMPERATURE RANGE:	-40°F to 100°F (-40°C to 40°C) Toxic -40°F to 112°F (-40°C to 50°C) Combustibles

GENERAL SPECIFICATIONS

POWER REQUIREMENTS:	17-27 Vac, 24-38 Vdc, 250 mA
SIZE:	6.5 in (H) x 4.8 in (W) x 3.9 in (D) 17 cm x 12 cm x 10 cm
WEIGHT:	3.5 lbs (1.6 Kg)

Certified to UL and CSA standards
Class 1 Div 1 Groups B, C, D

†See options on previous page.

Gas Detected	Detection Range	Accuracy
CO	0-250 ppm	3%
NO ₂	0-10 ppm	3%
H ₂	0-2.5% LEL	3%
CL ₂	0-15 ppm	3%
Combustibles	0-100% LEL	3%
NH ₃	0-100 ppm	5%
H ₂ S	0-50 ppm	3%
O ₂	0-25%	3%
SO ₂	0-10 ppm	3%
ETO	0-10 ppm	3%
HCN	0-50 ppm	3%
HCL	0-50 ppm	3%

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



VA301D

- 1 Smart sensor
- 2 Menu key
- 3 Visual indicators
- 4 LCD display

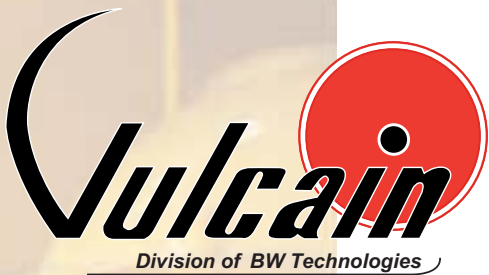


VA201C

- 1 Programming keypad
- 2 Visual indicators
- 3 LCD display
- 4 Key locked enclosure

Locally Distributed by:





Infrared Refrigerant Gas Transmitter

VA201TQ1

Firmly committed to continuous product innovation, and subsequent to major investments in its research facilities, Vulcain has developed a highly reliable refrigerant gas transmitter which represents one of the most important technological advances of the past decade.

Featuring its proven infrared sensor and the latest digital filter technology, Vulcain's VA201TQ1 transmitter is a microprocessor-based device using complex mathematical algorithms and state-of-the-art low-noise components to offer remarkably accurate readings of the lowest gas concentrations, ensuring maximum safety and environmental protection.

- Specific refrigerant monitoring
- Proven infrared technology
- Built-in microprocessor
- Stand-alone or network operation
- Optional relay
- 4-20 mA and 0-10 Vdc outputs
- Temperature compensation
- Easy calibration
- Trouble-free operation
- No moving parts
- Superior cost-effectiveness
- Optional LCD display



Ordering Information

VA201TQ1-xxx* Refrigerant gas transmitter
*gas to be detected

Options:

DY	LCD display
RY	Relay output
REF/Guard	Metal Guard

ISO 9002

Protecting your health and your environment.

VA201TQ1

Infrared Refrigerant Gas Transmitter

VA201TQ1 SPECIFICATIONS

Gases Detected:	R-11, R-12, R-22, R-123, R-125, and R-134a (mixes also available)
Sensing Technology:	Vulcain infrared sensor
Measurement Range:	0-1000 ppm
Resolution:	1 ppm
Response Time:	30 sec. (100% of variation)
Cold to Start:	5 minutes
Outputs:	DPDT relay RS-485 0-10 Vdc 4-20 mA
Display:	4-digit LCD
Relay Output Rating:	5A, 30 Vdc or 250 Vac (resistive load)
Power Requirement:	17-27 Vac, 24-38 Vdc, 250 mA
Operating Temperature Range:	32°F to 100°F (0°C to 40°C)
Operating Humidity Range:	0 - 95% RH, non-condensing
Enclosure:	Metal Nema 2
Size:	10 in.(H) x 9 in.(W) x 2.5 in.(D) (25 cm x 22.5 cm x 6.3 cm)
Weight:	5.17 lbs. (2.35 Kg)

The VA201T series is fully compatible with the VA201C controller

VA201C TECHNICAL SPECIFICATIONS

User Interface :	Alphanumeric display and keypad
Visual Indicators :	Normal operation: Green LED
Alarm Level 1:	Red LED
Alarm Level 2:	Red LED
Failure:	Yellow LED
Power Requirement :	17-27 Vac, 24-38 Vdc, 200 mA
Audible Alarm :	65 dBA at 3 feet (1 metre)
Number of Sensing points :	Up to 32 transmitters
Number of Outputs :	3 DPDT relays
Relay Output Rating :	5A, 30 Vdc or 250 Vac (resistive load)
Alarm Levels :	2 with high and low set points 3 (optional)
Time Delays :	0-99 minutes before and after an alarm
Data Output :	RS-232C
Distance Between Controller and Transmitter:	Up to 2000 feet (600 meters)
Size :	8.5 in.(H) x 11 in.(W) x 2 in.(D) (22 cm x 26 cm x 5 cm)
Weight:	3.5 lbs. (1.58 Kg)

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



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www.vulcaininc.com



VA201TQ1 transmitter

- 1 Infrared sensor
- 2 Key locked enclosure

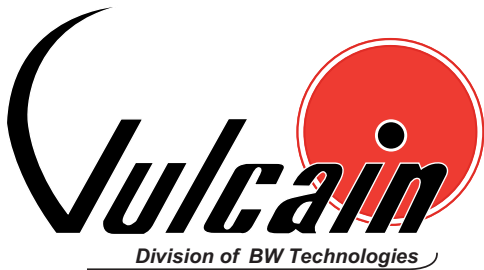


VA201C controller

- 1 Programming keypad
- 2 Visual indicators
- 3 LCD display
- 4 Key locked enclosure

Locally Distributed by:





Infrared CO₂ Gas Monitor

90DM₃A

With an unparalleled reputation for product innovation, reliability and excellence, Vulcain Inc. is once again setting industry standards with the latest generation Infrared CO₂ Gas Monitor - the 90DM₃A.

The product of the most rigorous research and industrial design, the 90DM₃A, incorporates Vulcain's unique infrared sensing technology and state of the art microprocessor controlled digital transmission into a CO₂ gas monitor, offering a level of precision and efficiency second to none.



- Proven infrared technology
- Specific CO₂ monitoring
- Built-in microprocessor
- Optional relay contact closure (fail safe)
- 4-20mA or 0-5 Vdc or 0-10 Vdc output
- Temperature compensation
- Trouble-free operation
- No moving parts
- Menu driven easy calibration
- Optional 0-2% or 0-5% detection range

Ordering Information

90DM₃A	CO ₂ Transmitter with 4-20 mA, or 0-5 Vcd or 0-10 Vdc output
90DM₃ADT	Unit with a housing for duct-mount applications
90DM₃ASM	Unit with a housing for surface-mount applications

Options:

D3	LCD Display for surface mount applications
O3	Fail safe relay output
2	0-2% detection range
5	0-5% detection range
VU	Vulbus communication
MU	Modbus communication

ISO 9002

Protecting your health and your environment.

90DM₃A Infrared CO₂ Gas Monitor

Mounting Made Unique and Easy

To provide maximum versatility, the 90DM₃A is available with two different housing configurations, making it ideally suited to virtually any commercial or industrial gas detection application. Both enclosures are made of ABS plastic, offering maximum durability.

Designed to accurately detect the presence of CO₂ in air-handling systems, the DT Model represents a radical innovation in housing design. Unlike other units on the market today, the enclosure is totally airtight, more compact, and extremely lightweight, with a convenient mounting bracket to improve installation. All in all, its superior operational and cost efficiency make the DT Model the only choice for larger-scale CO₂ detection applications.

The SM Model is a wall-mounted unit with a compact and an aesthetically pleasing design which blends perfectly and discretely with any room decor. Easily installed directly onto drywall or other surfaces, the SM Model allows for superior gas circulation and airflow.



For further information:

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Fax: 1-888-976-2967

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Tel: 1-905-660-6544
Fax: 1-905-660-7362

MONTREAL
4005 Matte boulevard
Brossard, QC
J4Y 2P4

Tel: 1-800-563-2967
Fax: 1-450-632-9938

E-mail: sales@vulcaininc.com

www.vulcaininc.com

90DM₃A SPECIFICATIONS

Gas Detected:	CO ₂
Detection Range:	0-2000 ppm, *0-2% or *0-5%
Accuracy:	+/- 3%
Response Time:	35 sec. (for 90% of the reading)
Sensor Life Expectancy:	> 10 years
Relay Output Rating:	5A, 30 Vdc or 250 Vac (resistive load)
*Display:	LCD
Outputs:	4-20 mA or 0-5 Vdc or 0-10 Vdc *1 SPDT Relay
Operating Humidity Range:	0-95% RH, Non-condensing
Operating Temperature Range:	32°F to 100°F (0°C to 40°C)

GENERAL SPECIFICATIONS

Size:	5.25 x 3.5 x 2 inches/ 11.5 x 7.5 x 4.4 cm
Weight:	SM: 0.55 lbs. (0.20 kg) DT: 0.66 lbs. (0.30 kg)
Power Requirement:	17-27 Vac or 24-38 Vdc, 200 mA

Certified to UL and CSA standards

Exclusive 5-Year Limited Warranty

Thanks to its exceptionally high-grade components and strict quality control, Vulcain's 90DM₃A CO₂ Gas Monitor comes with an exclusive 5-year warranty covering all parts and labor for the full length of the guarantee. Built to last and outperform competitive units, the 90DM₃A is the first product of its kind to come with such a comprehensive warranty, ultimately decreasing the expense of owning the equipment through significantly less downtime and major operating and maintenance cost savings.

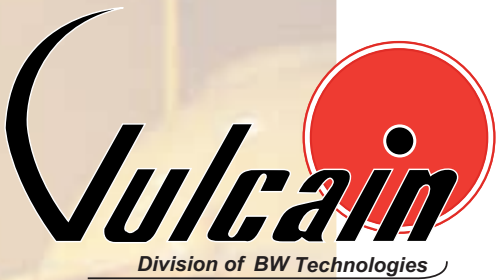
DUE TO ON-GOING RESEARCH AND PRODUCT IMPROVEMENT, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.



- ① Optional LCD display
- ② Air inlet for surface Mount housing
- ③ Duct mount housing

Locally Distributed by:





4-20 mA 2-Wire Gas Transmitters Carbon Monoxide

ToxyPoint

Eliminate Maintenance



BENEFITS:

The ToxyPoint 2-wire transmitter provides continuous monitoring for carbon monoxide in ambient air. Engineered with field-proven industrial sensing and instrument technology, the ToxyPoint is maintenance-free.

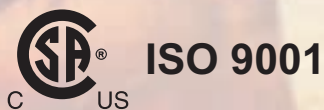
- No calibration, no sensor replacement, no downtime
- Low initial cost—competitively priced
- Lower electrical and heating bills with highly accurate electrochemical industrial sensor
- Security and reliability. Automatic full function sensor integrity test performed daily and on activation.
- Improved air quality (IAQ) with accurate, reliable detection of carbon monoxide
- Easy, fast installation. The 2-wire monitor fits into a standard, single-outlet electrical box.
- 2-wire, loop-powered. No extra transformer required. Power consumption only 50 mA.
- Unobtrusive design with rugged sintered stainless steel sensor screen.
- Industrial technology now available to the commercial market
- 3 year operational life; 2 year warranty

Ordering Information

TP1-M: 3 year 4-20 mA Gas Transmitter with CO sensor and ToxyPoint mounting plate
Fits into standard, single-outlet (1 gang) electrical box.

Specify special alarm setpoints, if required, at time of order.

**Compatible with any
4-20 mA Control System (DDC, PLC, etc.)**



Protecting your health and your environment.

ToxyPoint

Carbon Monoxide

Three Year Disposable
Zero-Maintenance
4-20 mA Gas Transmitter

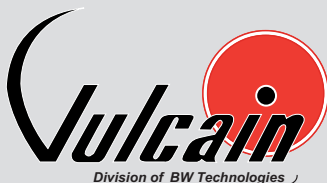
ToxyPoint is designed to reduce the overall cost of ownership with a lower initial investment, eliminating maintenance costs and minimizing building electrical operating costs. Designed to meet the same high standards as the BW portable gas detectors and fixed systems, ToxyPoint delivers accurate, reliable protection from carbon monoxide.

ToxyPoint provides an alternative to high-maintenance, solid-state sensors and standard electrochemical monitors, which require constant and often expensive maintenance.

- Carbon monoxide detector (0-500 ppm)
- Wide supply voltage range: 10 to 28 VDC, and a linear 4-20 mA output
- Two factory set alarm levels: Low and High (customer specified)
- Two alarm outputs
- No extra transformer required

Special Feature

The full function sensor integrity test is a unique safety advantage of BW Technologies equipment. The automatic daily self-test verifies sensor operation and advises the control system if the sensor is defective.



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SPECIFICATIONS

MONITOR: 2-wire, 4-20 mA CO gas transmitter with advanced microcontroller based circuitry
Supply Voltage: 10 to 28 VDC; (24 VDC nominal)
Power Supply: 50 mA
Power Consumption: Maximum: 24 mA @ 24 VDC Nominal: 4 mA @ 24 VDC
Alarm Outputs O/P1 and O/P2: 0.25 A (Max) @ 24 VDC supply
EMI/RFI: Complies with EMC Directive 89/336/EEC

Monitor	Operational Life ^{N.1}	Measuring Range	Temperature Range	Alarm Levels ^{N.2}	
				LOW	HIGH
ToxyPoint CO	3 years	0-500 ppm	0 to +40°C +32 to +104°F	35 ppm	200 ppm

SENSOR: Zero-maintenance Electrochemical

Humidity: 15 to 90% non-condensing

Calibration: Not Required

ALARM OUTPUTS: Two (2) trigger field interface(s) (slave relay, fan, strobe, etc.) rated 250 mA at 24 VDC

Gas Alarms: Two (2) factory set (customer specified) gas alarms: LOW (O/P1); HIGH (O/P2)

Fault Alarm: Activates both Low and High alarm outputs

CURRENT OUTPUT: Signal output to control System (DDC, PLC etc):

Normal Operation: 4-20 mA linear signal

Self-Test Fail: 2 mA signal

Sensor Expired: 2 mA signal

Over Range Gas Alarm: 24 mA signal (maximum)

Power Off: 0 mA signal

Power ON: On

No Power: Off

Self-Test Fail: Fast flash (1 flash every 0.5 seconds)

Life ending warning: Slow flash (1 flash every 2 seconds)

(Provides one month warning prior to expiry date)

Operational life ended: Off

SELF-TEST: On activation (Auto) and Daily (Auto)

Verifies: Sensor Integrity and operation

TRANSMISSION RANGES:	2-Wire Conductor Size:		Distance	
	22 AWG	0.64 mm	6,712 ft.	2,045 m
20 AWG	0.75 mm	10,953 ft.	3,253 m	
18 AWG	1.0 mm	16,953 ft.	5,167 m	

PHYSICAL: Size: 1.36 x 1.75 x 2.56 in. (3.5 x 4.5 x 6.5 cm)

Weight: 1.34 oz. (38 g)

Cover: ToxyPoint aluminum cover mounting plate fits standard single outlet electrical box

Wire Terminations: Screw type terminals

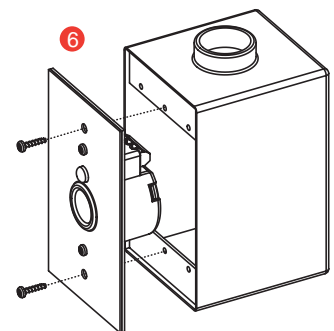
WARRANTY: Two (2) year (3 year operational life)

^{N.1}One year shelf life before activation

^{N.2}Customer special alarm settings available at time of order

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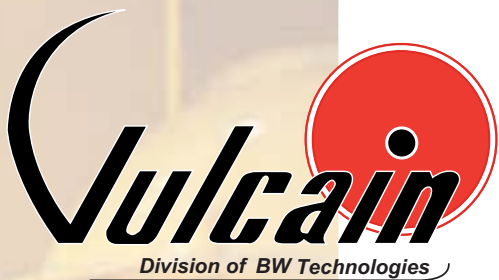
RATINGS AND CERTIFICATIONS: cCSA_{us} Ordinary locations
International Electrical Code: IEC No. 61010
U.S. Standard: ANSI/ISA S82.01
Canadian Standard Electrical Code: C22.2 No. 1010



- ① Zero-maintenance
- ② Electrochemical CO sensor
- ③ Sintered screen protects sensor from damage
- ④ Red LED status indicator
- ⑤ Mounting plate fits single outlet electrical box
- ⑥ Simple installation

Locally Distributed by:





Stand-Alone Gas Monitor

VA201M Series

The product of years of research and innovative technological development, Vulcain's VA201M series is an advanced microprocessor-based system featuring a high quality stand-alone controller, a unique high-tech enclosure, and all the necessary characteristics to provide continuous, effective and fully integrated monitoring of toxic and combustible gases.



- Two alarm levels
- 10-step LED display
- 2 high/low DPDT alarm relays
- Audible/visual alarms
- Programmable time delays
- Quick self-test and warm-up
- Calibration status warning
- Innovative and attractive case design
- Simple installation and operation
- Easy field verification
- Remote sensor configuration available
- Cost-effective

Ordering Information

VA201MQ1-xxx*

Complete gas monitor with Q1-type sensor

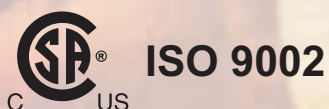
VA201MQ2-xxx*

Complete gas monitor with Q2-type sensor

*gas to be detected

Options:

D	LCD display
RS	Remote sensor
DT	Duct type
4X	Nema 4 (N/A for Q2)
ECLAB	Splash guard
TM/Guard	Metal guard
LTA	Low temperature assembly



Protecting your health and your environment.

VA201M Series Stand-Alone Gas Monitor

Innovative Architecture

The result of extensive experimentation and the most rigorous testing, the VA201M's highly advanced enclosure is designed to provide maximum effectiveness and durability. As such, all contours and surfaces have been carefully conceived and constructed to allow optimal gas flow and ensure total precision in detection.



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VA201M SPECIFICATIONS

SENSING TECHNOLOGY	
Q1-type Sensor:	Electrochemical (toxic) Catalytic combustion (combustibles) Diffusion fuel cell (oxygen)
Q2-type Sensor:	Solid-state Electrochemical (Carbon Monoxide)
DISPLAY	
Visual Indicators:	10-step LED, *LCD
Normal Operation:	Failure Indication : Yellow LED Green LED
Relay Output Rating:	5A, 30Vdc or 250 Vac (resistive load)
Alarm Levels:	High and Low
Time Delays:	0, 1, 5 or 10 minutes
Audible Alarm:	65 dBA at 3 feet (1 metre)
Outputs:	2 DPDT relays
Operating Humidity Range:	0 - 95% RH, Non-condensing
Operating Temperature Range:	32 °F to 100 °F (0 °C to 40 °C) Low temperature range available -4 °F (-20 °C)

GENERAL SPECIFICATIONS

Size:	8.4 x 5.3 x 2.25 inches 21.3 cm x 13.4 cm x 5.7 cm
Weight:	0.86 lbs. (0.350Kg)
Power Requirement:	17-27 Vac, 24-38 Vdc, 250 mA

Certified to UL and CSA standards

Gas Detected	Detection Range		Accuracy	
	Q1-type sensor	Q2-type sensor	Q1-type sensor	Q2-type sensor
CO	0-50 ppm 0-100 ppm 0-250 ppm(std) 0-500 ppm	0-250 ppm	3%	5%
NO ₂	0-10 ppm	-	3%	-
H ₂	0-2.5%	0-100% LEL	3%	5%
CL ₂	0-15 ppm	-	3%	-
Combustibles	0-100% LEL	0-100% LEL	3%	5%
NH ₃	0-100 ppm	-	5%	-
Refrigerants	-	0-2000 ppm *N/A R123	-	10%
H ₂ S	0-50 ppm	-	3%	-
O ₂	0-25%	-	3%	-
SO ₂	0-10 ppm	-	3%	-
ETO	0-20 ppm	-	3%	-
HCN	0-50 ppm	-	3%	-
HCL	0-50 ppm	-	3%	-

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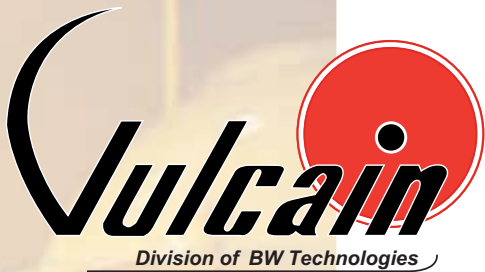


VA-201M

- ① Sensor
- ② 10 LED 1-10 (1=10%)
- ③ Unit status
- ④ Multimeter ports
- ⑤ Calibration port

Locally Distributed by:





Multi-Point Sample Draw Gas Monitor

VASQN8X Series



The new generation of VASQN Series combines Vulcain's long proven sensing capability along state of the art pumping technology with constant high accuracy and full reliability sample draw gas detector system.

The VASQN8X offers notably accurate monitoring of the presence of a wide variety of refrigerants, or other toxic and explosive gases, in a surveillance area of up to 8 different zones. A low maintenance diaphragm pump draws ambient air to the sensor from a maximum distance of 1000 feet. A high performance sequencer synchronizes the mechanics and the electronics so that the levels of detectable gases are properly registered for each of the 8 zones. The unit is fully operational from the box, making for simple hassle free installation. The new generation of VASQN8X provides an excellent cost-effectiveness centralized solution.

- Wide area of coverage
- 3 alarm relays
- Audible alarm
- LCD display
- LED status indicators
- Integrated flow loss surveillance
- 1 to 8 sample points
- Early low level warning alarm
- Proven sensing technology
- Up to 2 gases

Ordering Information

VASQN8XG1-G2*

*X: Number of zones
G1: First Target Gas
G2: Second Target Gas

Advanced Multi-Point Gas Monitor

ISO 9002

Protecting your health and your environment.

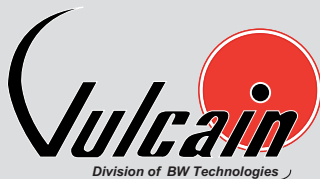
VASQN8X

Multi-Point Gas Draw Gas Monitor

Each VASQN8X is equipped with a built-in noise immune RS-485 communication network providing the ability to transmit long distances with the VA201C controller. The VA201C accommodates up to 2 VASQN8X. Features of the VA201C controller include:

- Capacity to monitor 32 transmitters and 32 relay modules
- Visual Indicators and audible alarm
- Multiple alarm levels
- Programmable time delays
- LCD display
- RS-232C transmission port

The VASQN8X Series, with its unsurpassed network expandability, offers a cost-effective centralized solution.



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Fax: 1-450-632-9938

E-mail: sales@vulcaininc.com
www.vulcaininc.com

VASQN8X SPECIFICATIONS

SENSING TECHNOLOGY:
Refrigerant (infrared)
Electrochemical (toxic)
Catalytic combustion (combustibles)
Diffusion fuel cell (oxygen)

VISUAL INDICATORS:
Normal Operation: Green LED
Alarm Level 1: Red LED
Alarm Level 2: Red LED
Failure Indication: Yellow LED
Aspirated Zone: Green LED

Relay Output Rating: 5A, 30 Vdc or 250 Vac (resistive load)
Audible Alarm: 110 dBA at 3 feet (1 meter)
Alarm Levels: 3
Number of Sample Points: Up to 8, including 1/8" polymer tubing
Outputs: 3 DPDT relays
(3 alarms level or 2 alarm levels and Fault)
RS-485
Operating Humidity Range: 0 - 95% RH, Non-condensing
Operating Temperature Range: 32°F to 100°F (0°C to 40°C)
Maximum Sampling Distance: 1000 Feet (335 meter)

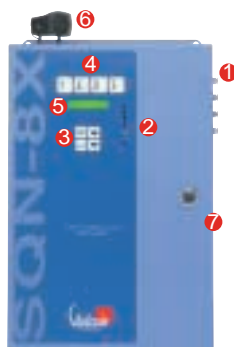
GENERAL SPECIFICATIONS
Size: 19 x 11.75 x 4.5 inches
48.3 x 30 x 11.4 cm
Weight: 22.4 lbs. (10.17 Kg)

Power Requirement: 120 Vac, 2A

Certified to UL and CSA standards

Gas Detected	Detection Range	Sensitivity	Accuracy
R11, R12, R22, R123, R125, R134A	0-1000 ppm	4ppm	3%
CO	0-50 ppm 0-100 ppm 0-250 ppm(std) 0-500 ppm	1 ppm	3%
NO ₂	0-10 ppm	0.04 ppm	3%
H ₂	0-2.5% LEL	0.4%	3%
CL ₂	0-15 ppm	0.06 ppm	3%
Combustibles	0-100% LEL	0.4%	3%
NH ₃	0-100 ppm	0.4 ppm	5%
H ₂ S	0-50 ppm	0.2 ppm	3%
O ₂	0-25%	0.1%	3%
SO ₂	0-10 ppm	0.04 ppm	3%
HCN	0-50 ppm	0.2 ppm	3%

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- 1 Air inlet port
- 2 Sampling port LED
- 3 Programming keys
- 4 Visual indicators
- 5 LCD display
- 6 Audible alarm
- 7 Key locked enclosure

Locally Distributed by:



VA420I Converter

The VA420I communicates digitally with transmitters (VA201T, VA301D and the VASQN8X), within a true daisy chain network, to convert the transmitters digital signals to analog outputs. This allows each transmitter to provide a 4-20mA signal to a BMS from one central location. The unit can accommodate up to 8 transmitters installed at distances of up to 2000 feet from the unit.

To avoid expensive DDC hook-ups and BMS software upgrades the unit even comes with internal logic that will provide either minimum/maximum/average reading for up to 16 transmitters.

- Easy installation through daisy chain hook-up (RS-485)
- Provides dedicated 4-20mA outputs for up to 8 transmitters or either Min/Max/Avg for up to 16 transmitters
- Fully compatible with the VA201T and VA301D series as well as the VASQN8X
- Communicates with transmitters at distances of up to 2000 feet

VA201R Relay Module

The VA201R acts as an output to the VA201C. The Relay Module provides up to 8 relays (DPDT 5A, 30 Vdc or 250 Vac resistive load) for the indirect activation of fans, louvers, etc at programmable alarm levels. Since the relay module is an output to the controller it can be located at any point within the gas detection network.

- Fully compatible with the VA201C Controller
- Offers either 2, 4 or 8 DPDT relays
- Easy daisy chain installation (RS-485)
- LED visual indication of status next to each relay

VASQNA Annunciator Panel

The VASQNA remote Annunciator Panel provides an efficient interface between the gas transmitters and controller. It provides visual indicators, multiple alarm levels and fault alarm within a location. The unit allows users to "listen" in to the gas network.

- Operates within a fully addressable gas monitoring system (RS-485)
- Audible and visual alarms
- 3 DPDT relays
- LED of unit status
- LCD display and keypad



Network Accessories

VA420I SPECIFICATIONS

POWER REQUIREMENTS: 17-27 Vac, 24-38 Vdc
NUMBER OF INPUTS: One RS-485
NUMBER OF OUTPUTS: 8 dedicated 4-20 mA outputs
1 min/max or average for up to 16 different transmitters
HUMIDITY RANGE: 0-95% RH, non condensing
OPERATING TEMPERATURE: -40 °F to 185 °F / -40 °C to 85 °C
DIMENSIONS: 8.4 x 8.6 x 2.5 inches / 21.3 x 13.4 x 5.7 cm
WEIGHT: 3.5 lbs / 1.58 kg
MAXIMUM DISTANCE BETWEEN CONTROLLER AND CONVERTER: up to 2000 feet

ORDERING INFORMATION
Description: Digital Converter
Part Number: VA420I

VA201R SPECIFICATIONS

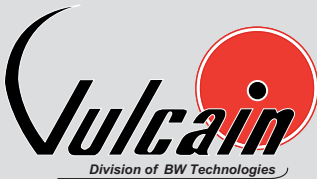
POWER REQUIREMENTS: 17-27 Vac, 24-38 Vdc
NUMBER OF OUTPUTS: 2, 4 or 8DPDT relays
RATING: 5 amps, 30 Vdc or 250 Vac (resistive load)
VISUAL INDICATOR: 1 status LED next to each relay
MAXIMUM DISTANCE BETWEEN CONTROLLER AND CONVERTER: up to 2000 feet
HUMIDITY RANGE: 0-95% RH, non condensing
OPERATING TEMPERATURE: -40 °F to 185 °F / -40 °C to 85 °C
DIMENSIONS: 8.4 x 8.6 x 2.5 inches / 21.3 x 13.4 x 5.7 cm
WEIGHT: 3.5 lbs / 1.58 kg

ORDERING INFORMATION
Description: Relay Module
Part Number: VA201R-X= number of relays (2,4,8)

VASQNA SPECIFICATIONS

POWER REQUIREMENTS: 17-27 Vac, 24-38 Vdc
NUMBER OF OUTPUTS: 3 DPDT relays (2 alarm, 1 fault)
RATING: 5 amps, 30 Vdc or 250 Vac (resistive load)
HUMIDITY RANGE: 0-95% RH, non condensing
OPERATING TEMPERATURE: 32 °F to 100 °F / 0 °C to 40 °C
AUDIBLE ALARM: 65 dBA at 3 feet
NUMBER OF ZONES: 32
DIMENSIONS: 8.4 x 8.6 x 2.5 inches / 21.3 x 13.4 x 5.7 cm
WEIGHT: 3.5 lbs / 1.58 kg

ORDERING INFORMATION
Description: Annunciator
Part Number: VASQNA



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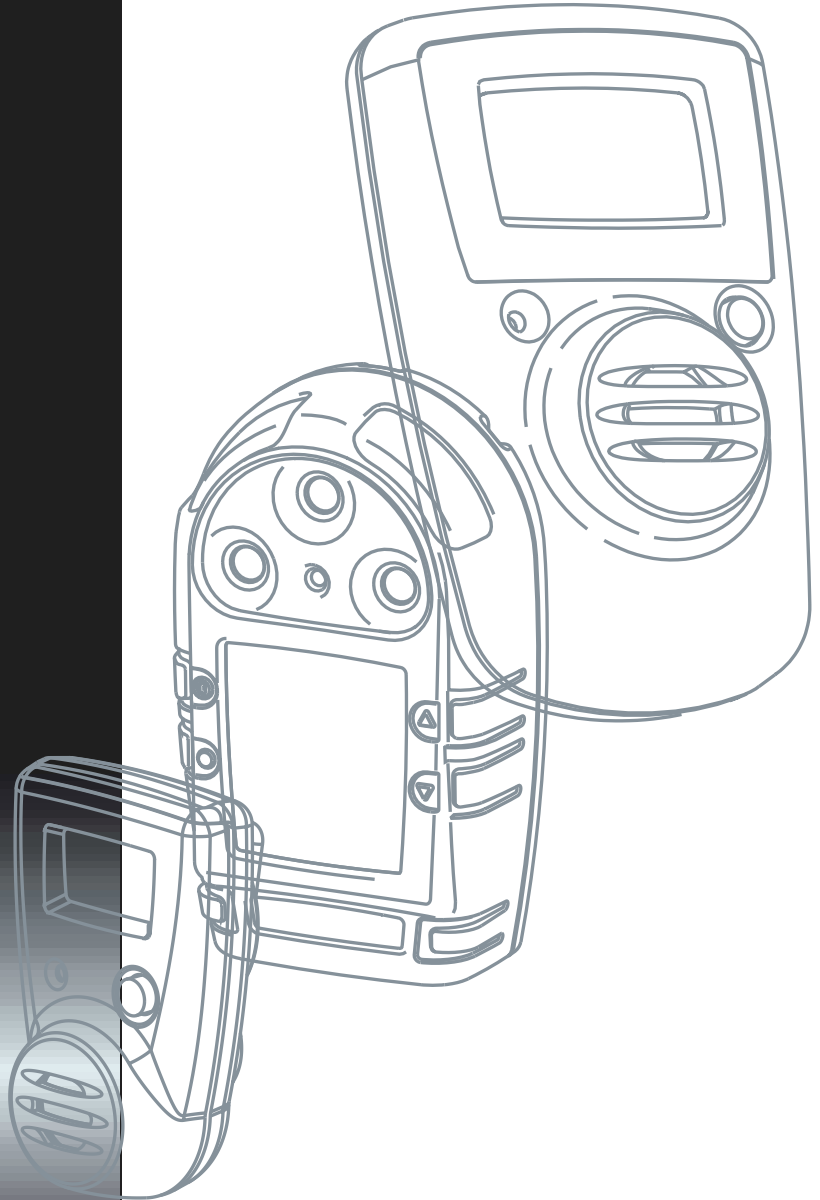
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Locally Distributed by:



Miscellaneous



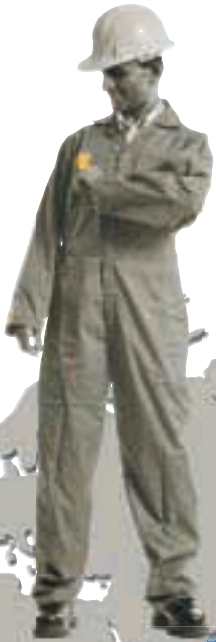
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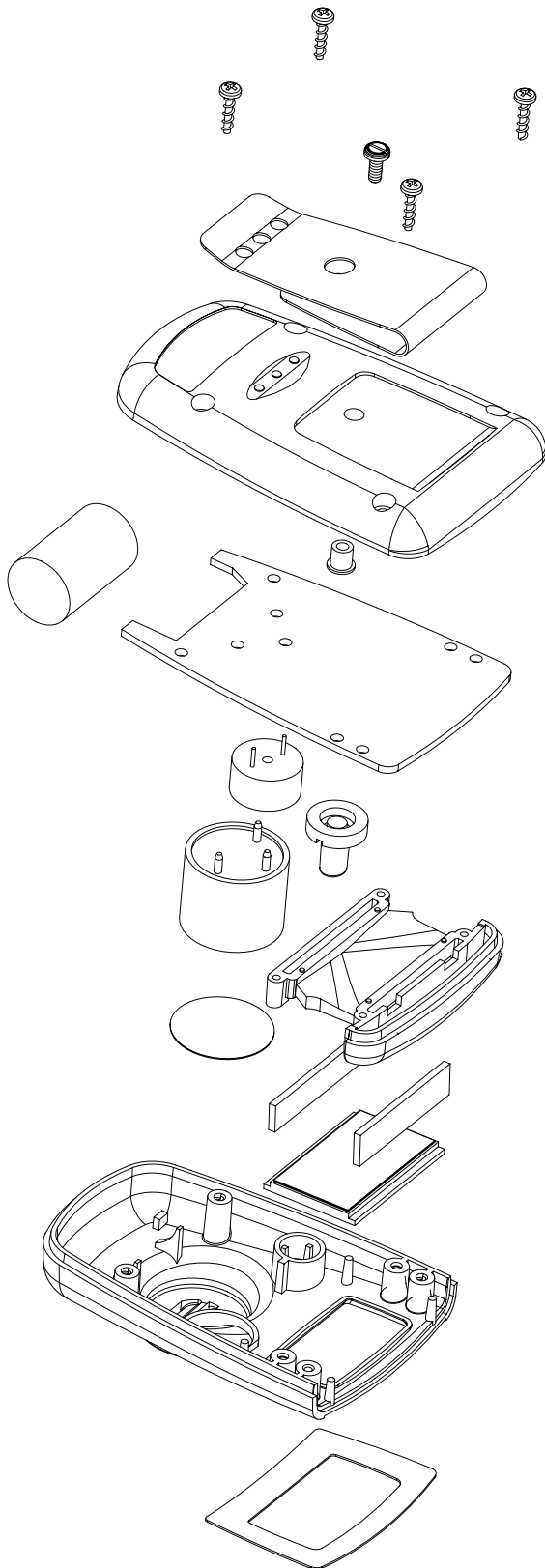
"INNOVATORS IN GAS DETECTION"

BWT
Technologies



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CALIBRATION EQUIPMENT

INFORMATION LIBRARY

Properties, Applications of Common Gases

Reference Guide to Hazardous Locations

Approvals Agencies and Regulatory Bodies

Intrinsic Safety

Gases Lighter and Heavier than Air

Combustible Gases Explosive Limits

Technical Terms

SERVICE AND REPAIR

TRAINING SERVICES

CALIBRATION EQUIPMENT

All gas detection instrumentation on the market requires periodic calibration to accurately measure gas. Calibration is only as accurate as the test gas used. BW Technologies quality test gases are made to the highest accuracy and traceability to N.I.S.T. standards. Non-refillable disposable cylinders are the convenient, cost-effective way to handle calibration gas mixtures. Lightweight cylinders combine accuracy and ease of use. The standard calibration gas concentrations are designed to provide proper calibration of BW instruments. Other concentrations are available for BW monitors with specialized measuring ranges.

BW Technologies recommends routine calibration of all instruments.

Quad calibration gas is available in both 34 and 58 liter kits and cylinders. The BW quad gas is designed for use with BW multi-gas detectors - GasAlertMicro, GasAlertMax and BW Defender2.



BW has a variety of single-gas calibration kits and cylinders to meet your needs. Single-gas calibration cylinders are available in 34, 58 and 103 liter sizes.



BW "bump" gas is available for both single and multi-gas detectors in 11 liter aerosol cylinders. Regular "bump" testing verifies a sensor's response to gas.



CALIBRATION EQUIPMENT

A QUICK REFERENCE OF HAZARDOUS GASES IN COMMON APPLICATIONS

<p>COMBUSTIBLE GASES</p> <p><i>Colorless explosive gases.</i></p> <ul style="list-style-type: none"> ▲ Refineries and Petrochemical Plants ▲ Natural Gas Limits ▲ Pipeline Compressor Stations ▲ Sewers 	<p>LEL</p> <p>% LEL</p> <p>0-100% LEL</p>
<p>OXYGEN</p> <p><i>Colorless, odorless and tasteless gas. Life threatening when atmosphere is deficient. Supports combustion.</i></p> <ul style="list-style-type: none"> ▲ Confined Spaces ▲ Cargo Holds and Storage Tanks ▲ Underground Vaults - Utilities/Telecom ▲ Petrochemical Plants 	<p>O₂</p> <p>% v/v</p> <p>19.5% deficiency 23.5% enrichment</p>
<p>AMMONIA</p> <p><i>Colorless toxic gas with a highly pungent odor.</i></p> <ul style="list-style-type: none"> ▲ Fertilizer Plants ▲ Refrigeration Facilities and Cold Storages ▲ Production of Explosives ▲ Chemical and Pharmaceutical Industries 	<p>NH₃</p> <p>STEL: 50 ppm TWA: 25 ppm IDLH: 300 ppm LEL: 15% of vol.</p>
<p>CARBON MONOXIDE</p> <p><i>Colorless, odorless, toxic gas absorbed by the blood, displacing oxygen.</i></p> <ul style="list-style-type: none"> ▲ Parking Garages, Engine Test Facilities ▲ Steel Mills ▲ Coke Plants ▲ Power Station (Boilerhouse) 	<p>CO</p> <p>STEL: 200 ppm TWA: 35 ppm TWA: 30 ppm* IDLH: 1,200 ppm LEL: 12.5% of vol.</p>
<p>CHLORINE</p> <p><i>Greenish-yellow, toxic gas with an irritating odor.</i></p> <ul style="list-style-type: none"> ▲ Pulp and Paper Mills ▲ Water Treatment and Chlorination Plants ▲ Swimming Pools ▲ Nuclear Reactors 	<p>Cl₂</p> <p>STEL: 1 ppm TWA: 0.5 ppm IDLH: 10 ppm</p>
<p>CHLORINE DIOXIDE</p> <p><i>Yellowish-red toxic gas. More reactive and severe than chlorine.</i></p> <ul style="list-style-type: none"> ▲ Pulp and Paper Mills ▲ Chemical Processing 	<p>ClO₂</p> <p>STEL: 0.3 ppm TWA: 0.1 ppm</p>
<p>HYDROGEN</p> <p><i>Colorless, odorless, tasteless, explosive gas.</i></p> <ul style="list-style-type: none"> ▲ Refining and Treatment of Metals ▲ Underground Vaults/Transformers ▲ Battery Charging Stations ▲ Semiconductor Plants 	<p>H₂</p> <p>LEL: 4% of vol.</p>
<p>HYDROGEN CHLORIDE</p> <p><i>Colorless, toxic gas with a sharp, irritating odor and acidic taste.</i></p> <ul style="list-style-type: none"> ▲ Manufacture of Rubber, Dyes, and Fertilizers ▲ Pharmaceutical and Chemical Plants ▲ Aluminum Finishing Plants ▲ Pickling of Metals 	<p>HCl</p> <p>STEL: 5 ppm TWA: 1 ppm</p>

<p>HYDROGEN CYANIDE</p> <p><i>Colorless, toxic gas with a bitter almond odor at 1 ppm.</i></p> <ul style="list-style-type: none"> ▲ Manufacture of Nylon, Dyes, Fumigants and Rubber ▲ Production of Acrylic Plastics ▲ Gold Plating ▲ Precious Metal Mining Recovery 	<p>HCN</p> <p>STEL: 4.7 ppm TWA: 10 ppm IDLH: 50 ppm LEL: 5.6% of vol.</p>
<p>HYDROGEN SULFIDE</p> <p><i>Colorless, toxic gas with a rotten egg odor.</i></p> <ul style="list-style-type: none"> ▲ Oilfields and Refineries ▲ Water Treatments Plants and Sewer Maintenance ▲ Pulp and Paper Mills and Tanneries ▲ Steel Plants 	<p>H₂S</p> <p>STEL: 15 ppm TWA: 10 ppm IDLH: 100 ppm LEL: 4.3% of vol.</p>
<p>NITRIC OXIDE</p> <p><i>Colorless, toxic gas with a pungent odor.</i></p> <ul style="list-style-type: none"> ▲ Fertilizer Plants ▲ Food and Fabric Bleaching ▲ Agriculture-Silos (Organic decomposition) ▲ Diesel Emissions – Garages 	<p>NO</p> <p>TWA: 25 ppm IDLH: 100 ppm</p>
<p>NITROGEN DIOXIDE</p> <p><i>Reddish-brown, toxic gas with a pungent odor.</i></p> <ul style="list-style-type: none"> ▲ Boilers and Furnaces ▲ Diesel Emissions–Garages ▲ Manufacture of Explosives, Rocket Propellants and Dyes ▲ Semiconductor Plants 	<p>NO₂</p> <p>STEL: 5 ppm TWA: 3 ppm IDLH: 20 ppm</p>
<p>SULFUR DIOXIDE</p> <p><i>Colorless, toxic gas with strong suffocating odor and an acidic taste.</i></p> <ul style="list-style-type: none"> ▲ Pulp and Paper Mills ▲ Waste and Water Treatment Plants ▲ Coal Fired Generation Stations ▲ Refining of Light Lubricants and Kerosene 	<p>SO₂</p> <p>STEL: 5 ppm TWA: 2 ppm IDLH: 100 ppm</p>

STEL and TWA

STEL (short term exposure limit) represents the average gas concentration a worker has been exposed to over a 15 minute period. If this amount exceeds the stated limit, the worker must remove himself/herself from the hazard for at least 1 hour before re-entry. STEL values may only be exceeded 4 times during a normal work shift. TWA (time weighted average) literally means the average amount of gas a worker has been exposed to over a given period of time. The period is usually an 8 hour normal work day. If the predetermined value is exceeded, a worker may not re-enter the space for the balance of the work day.

*Carbon Monoxide (Europe and U.K.). TWA standard is 30 ppm.

INFORMATION LIBRARY



Hazardous Locations

Area Classification - Division versus Zone		
	NEC & CEC (North American)	IEC
Continuous Hazard	Division 1 or Zone 0	Zone 0
Intermittent Hazard	Division 1 or Zone 1	Zone 1
Hazard Under Abnormal Conditions	Division 2 or Zone 2	Zone 2

Definitions and Comparisons	
Class I	Locations in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive atmospheres.

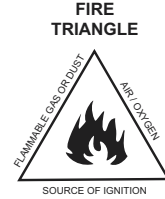
Comparisons of Classification Systems Between Division Codes (North America) and IEC Zone Codes (Worldwide)

North American Division Codes	IEC and North American Zone Codes
<p>Class I, Division 1: Where ignitable concentrations can exist under normal operating conditions; may exist frequently because of repair, maintenance or leakage; or may exist due to breakdown of equipment in conjunction with an electrical failure.</p>	<p>Class I, Zone 0: Where ignitable concentrations are present continuously or for long periods of time.</p> <p>Class I, Zone 1: Where ignitable concentrations are likely to exist under normal operations; may exist frequently because of repair, maintenance or leakage; may exist due to breakdown of equipment in conjunction with an electrical failure; or adjacent to Class I, Zone 1 locations.</p>
<p>Class I, Division 2: Where volatile flammable liquids are stored, etc., in closed containers; where ignitable concentrations are normally prevented by positive pressure ventilation; or adjacent to Class I, Division 1 locations.</p>	<p>Class I, Zone 2: Where ignitable concentrations are not likely to exist in normal operations or may exist for a short time only; where volatile liquids are stored, etc., in closed containers; where ignitable concentrations are normally prevented by positive pressure ventilation; or adjacent to Class I, Zone 1 locations.</p>

Approval Agencies and Regulatory Bodies

- ACGIH:** American Conference of Government Industrial Hygienists
- ABS:** American Bureau of Shipping
- ASHRAE:** American Society of Heating, Refrigeration and Air Conditioning Engineers
- BAM:** Federal Institute for Materials Research and Testing (Germany)
- CE:** European Conformity
- CEC:** Canadian Electrical Code
- CENELEC:** European Committee for Electrotechnical Standardization
- CSA:** CSA - International
- FM:** Factory Mutual Research Corporation
- IEC:** International Electrotechnical Commission
- MSHA:** Mine Safety and Health Administration
- NEC:** U.S. National Electrical Code
- NIOSH:** National Institute for Occupational Safety and Health
- NRTL:** National Recognized Testing Laboratory pointed by OSHA
- OSHA:** Occupational Safety and Health Administration
- SABS:** South African Bureau of Standards
- SAA:** Standards Association Australia
- UL:** Underwriters Laboratory
- WHMIS:** Workplace Hazardous Materials

Gases and Vapors Classification		
Gas	CEC/NEC Code	IEC Code
Acetylene	Group A	Group IIC
Hydrogen	Group B	Group IIB + H ₂
Ethylene	Group C	Group IIB
Propane	Group D	Group IIA
Coal Mines	Gaseous Mines	Group I



INTRINSIC SAFETY

Intrinsic Safety Defined

Under normal or abnormal conditions, intrinsically safe equipment and wiring shall be incapable of releasing sufficient electrical or thermal energy to cause ignition of a flammable or combustible material in air under prescribed test conditions.

How Does Intrinsic Safety Apply?

Intrinsic safety applies to the design of electrical equipment and wiring for hazardous locations. The design/technique is based on limiting the electrical and thermal energy to a level below that required to ignite any specific hazardous mixture.

Who Tests and Certifies Equipment for Intrinsic Safety?

Independent third party agencies test and certify equipment for intrinsic safety. Independent testing ensures that your equipment is designed intrinsically safe and meets all required safety standards.

UL (Underwriters Laboratories), FM (Factory Mutual Corporation), CSA (Canadian Standards Association), Cenelec (European Committee for Electrotechnical Standardization), ABS (American Bureau of Shipping), SAS (Standards Association of Australia) are all third party agencies.

COMBUSTIBLE GASES

If fuel, oxygen (usually air) and a source of ignition are present in the right mixture, a serious explosion or fire will be the result.

The three elements are known as the Fire Triangle. As the ratio of fuel to oxygen changes, the atmosphere passes through three ranges:

- 1) Lean
- 2) Explosive
- 3) Rich

In the lean range below the Lower Explosive Limit (LEL), there is not enough fuel (gas) to burn.

In the rich range above the Upper Explosive Limit (UEL), there is too much fuel (gas) and not enough oxygen to burn.

A gas is combustible only between its LEL and UEL. The range between these two points includes all concentrations in which a flash will occur or a flame will travel if the mixture is ignited.

Different gases require a different percent by volume concentration to reach 100% LEL. The monitoring range of most instruments is 0-100% LEL. Some models measure percent by volume of a particular gas.

LEL and UEL of Some Combustible Gases

LEL = Lower Explosive Limit
UEL = Upper Explosive Limit

Gas	LEL (% of volume)	UEL (% of volume)
Acetone	2.5	12.8
Acetylene	2.5	100.0
Benzene	1.2	7.8
Butane	1.6	8.4
N-Butyl Acetate	1.7	7.6
Ethane	3.0	12.5
Ethanol	3.3	19.0
Ethylene Oxide	3.0	100.0
Gasoline (100 octane)	1.4	7.6
Heptane	1.05	6.7
Hexane	1.1	7.5
Hydrogen	4.0	75.0
Isopropyl Alcohol	2.0	12.0
Methane	5.0	15.00
Methyl Ethyl Ketone	1.4	11.4
Pentane	1.5	7.8
Propane	2.1	9.5
Propylene Oxide	2.3	36.0
Styrene	0.9	6.8
Toluene	1.1	7.1
Xylene	0.9	6.7

A Short List of GASES LIGHTER AND HEAVIER THAN AIR

Density <1.0 = Lighter than Air		Air = 1		Density >1.0 = Heavier than Air	
Lighter than air	Density	Approximately equal to air	Density	Heavier than air	Density
Acetylene	0.9	Ethane	1.0	Acetone	2.0
Ammonia	0.8	Nitric Oxide	1.0	Benzene	2.6
Carbon Monoxide	0.97			Butane	2.0
Ethylene	0.97			Carbon Dioxide	1.5
Hydrogen	0.1			Chlorine	2.5
Hydrogen Cyanide	0.9			Ethanol	1.6
Methane	0.6			Ethyl Acetate	3.0
				Ethylene Oxide	1.5
				Gasoline (100 Octane)	3-4.0
				Hexane	3.0
				Hydrogen Chloride	1.3
				Hydrogen Sulfide	1.2
				Methyl Mercaptan	1.66
				Nitrogen Dioxide	1.6
				Oxygen	1.1
				Pentane	2.5
				Propane	1.6
				Sulfur Dioxide	2.2
				Toluene	3.1
				Turpentine	4.7
				Xylene	3.7

Note: The glossary terms are used in the context of gas detection and gas detection only. There may exist alternative meanings to some of the terms listed; however, the terms listed have been delineated according to an electrical engineer's perspective.

Accessory equipment: Items such as alarms, relays, etc., not part of a detector or system but activated by it.

Accuracy: The preciseness of a reading in relation to the actual concentration.

Acknowledge: The temporary silencing of audible alarm signal, while the condition causing alarm is being corrected.

Alarm: Visual or audible signal triggered by the exceeding of a preset gas concentration.

Automatically reset: The return of a system to normal operation after gas alarm diminishes below a set level, no manual setting of relays is required.

Background: Gases, other than those intended to be measured, that are present in a space or environment.

Calibrate: Adjusting the gain or span of an instrument to indicate the actual concentration of a gas present.

Catalytic: A method of measuring gases using a sensing element responsive to combustible gases.

Combustible: Capable of being ignited with resultant burning or explosion.

Concentration: The amount of gas present in a defined space, expressed in percent of total volume, parts per million (ppm), or percent of the lower explosive limit (LEL).

Continuous: Uninterrupted in time; without cessation. Usually used with temperature and humidity specifications.

Density: The weight of a volume of a gas compared to the weight of equal volume of dry air, properly known as specific density.

Diffusion detection: Detection method utilizing the normal movement of gases around a detector exposed directly in a space; no mechanical means bring gas into sensor contact.

Diffusion rate: The time required for a given gas to mix and spread with no mechanical or convection help.

Drift: The gradual change in a readout caused by aging of some components, variations in power, warm up characteristics, etc.

EMI: Electromagnetic interference (also known as radio frequency interference or RFI).

Electrochemical: Method of measuring gases using a sensing element responsive to oxygen and toxic gases.

Explosive gas: Any combustible gas capable of being ignited and burned under certain conditions of quantity and/or confinement; normally used as a synonym for flammable gas.

Explosion-proof: An enclosure designed to contain an explosion and prevent its propagation to the outside atmosphere; usually implies the use of a heavy metal enclosure.

Flammable: Capable of being ignited and burned; commonly used as a synonym for combustible.

Flammable range: The range of a concentration in air or oxygen of a flammable gas between the LEL and the UEL within which it can be ignited and burned with the propagation of a flame.

Flash point: The lowest temperature at which a liquid (and certain solids) will give off an ignitable vapor.

General purpose area: All areas where explosion-proof or intrinsically safe construction is not required.

Halogenated: Usually applied to hydrocarbons that are combined with halogens, such as fluorine, bromine, chlorine, etc.

Hazardous area: An area where combustible gases are actually present or likely to be. Generally such areas are classified as hazardous and are the opposite of general purpose areas. (See *National Electrical Code, Article 500.*)

Hydrocarbons: Any gas compound principally formed of hydrogen and carbon. Common examples are natural gas, methane and gasoline vapor.

IDLH: Immediately dangerous to life and health. The maximum concentration of gas (in ppm) from which a worker could escape within 30 minutes without experiencing any escape-impairing or irreversible health effects.

Ignition temperature: A term generally used to mean the lowest temperature that will cause gas to ignite and burn; not a precise term; subject to several variables.

Inert gas: Gases that will not burn, will support combustion (oxygen) and are not toxic, such as nitrogen, helium and argon.

Inflammable: Capable of being ignited and burning; synonym for flammable and combustible.

Interference: Gases, other than the gas to be measured, that are present in a mixture and affect readout (on a meter, etc.).

Intermittent: Alternately stopping (ceasing) and beginning again; used with humidity and temperature specifications.

Intrinsically safe: An instrument designed and constructed to practically preclude the possibility of igniting a combustible mixture. (See *National Electrical Code, Article 500-1* for complete definition and *NFPA Bulletin 493* for details).

IR: Infrared. A type of radiation within certain wavelength ranges used to detect hazardous gases.

Isolated contacts: A term usually applying to relays (or switches) supplied with no instrument power to them and available to the user for switching power circuits of his or her choice.

Lag time: Time to transport a gas sample to the measuring element, as in a sample-draw system.

LEL: Lower explosive limit. Denotes the minimum concentration of combustible gas that will ignite and burn (propagate a flame). Synonymous with LFL (lower flammable limit).

Linear: Generally used to mean a readout (meter indication, for example) in which all divisions are equal; a signal whose output follows a straight arithmetic line.

Loop resistance: The total resistance of everything connected to the detector: power wires, controller, etc.

mA: Milliamp. A unit of electric current expressed in amperes.

Manual reset: Return of a system to normal operation by a positive action of the operator - usually the pushing of a reset button. The opposite of automatic reset.

Modbus: A communications protocol used for collecting/distributing small amounts of data over networks in industrial environments. A multi-drop, master/slave, token passing protocol often used over low speed RS485, 422, 232 connections.

Monitor: Implies the continuous surveillance of an area or facility for the presence of hazardous gas, rather than intermittent or random sampling.

Noise: Electrical or electronic interference with the signal of interest.

Non-incendive: Equipment and wiring that will not ignite an explosive under normal operating conditions; less stringent than intrinsically safe and considered adequate for Division 2 locations. (See *Electric Code, Article 500-1.*)

Output: The signal produced by a sensor or other component of a system and available for further use.

Oxygen deficient: A mixture of gases containing too little oxygen to adequately support life; set by OSHA at 19.5% by volume.

Oxygen enriched: A mixture having an oxygen concentration greater than that of air; normally more than 21% oxygen.

PEL: Permissible exposure limit. Level of gas (in ppm) a worker can be exposed to 8 hours per day/40 hours per week for the rest of his or her life with no long term health effects.

Poisoning: The term applied to catalytic-type sensors for their contamination by certain chemical elements or compounds, principally silicones and tetraethyl lead (TEL). A reduction or complete loss of sensitivity can result from contamination.

ppm: Parts per million. A measure of gas concentration used for very small quantities. A measurement of 1% by volume equals 10,000 ppm.

Propagation: The spread of flame through a flammable mixture from a source of ignition.

Purge: The flushing or pressurizing of an instrument with air or an inert gas, such as nitrogen, to remove all other gases or to maintain a constant pressure higher than atmospheric, thus precluding entry of external atmosphere.

Rx: Radio frequency receiver.

Readout: The indication by an instrument of the conditions prevailing at the sensor.

Relative response: The response of a sensor to a particular gas or mixture relative to a known response to some other specific gas; usually expressed as a decimal ratio and applied to the readout as a multiplier.

Relay: A small, electrically activated switching device with one or more sets of contacts.

Repeatability: The characteristic of a system to always produce the same readout under the same conditions.

Response time: The time required to obtain a useful indication after the sensor is exposed to the gas of interest; frequently confused with lag time.

RFI: Radio frequency interference; usually caused by certain emissions from radio equipment and causing false signals and incorrect readouts in some gas detection instruments.

Sample: Denotes the portion of a gas mixture introduced to the sensor on an instrument.

Sensor: Any device that responds to a gas and produces an output of sufficient strength to measure a concentration or activate a signal.

Setpoint: Used primarily to describe the gas concentration at which an alarm will be activated or triggered.

Shielded: A wire or group of wires insulated from and protected by a metallic covering; may be a metal braid or a foil.

Signal: Any visual or audible indication of the conditions at the sensor.

Span: Calibration adjustment to set the linearity of an instrument against a known sample.

Specific gravity: The ratio of the weight of a solid or liquid to an equal volume of water.

STEL: Short term exposure limit. Usually a 15 minute time weighted average exposure that should not be exceeded.

Time constant: The time required for a signal which changes unevenly with time to reach 63.2% of its final value.

TLV: Threshold limit value; a measure of toxicity expressed in ppm or milligrams per cubic meter and based on any discernible physiological symptoms over a given time period.

Transmitter: A component that passes a signal onto a signal wire or cable. Also an RF transmitter.

TWA/TLV: Time weighted average; exposure concentration to a toxic gas for a conventional 8 hour workday (PEL) or 10 hour (REL) workday.

UEL/UFL: Upper explosive limit: The maximum concentration at which a gas will explode.

VAC: Voltage, alternating current.

VDC: Voltage, direct current.

Warmup time: The time required for the components of an instrument to reach equilibrium and produce a reliable signal after activation.

Warning: A signal denoting that a gas is present but not in a critical concentration.

XMTR: Radio frequency transmitter for wireless telemetry; also referred to as an RF transmitter. Xmtr equals Tx.

SERVICE and REPAIR

BW Technologies designs, manufactures and sells the most advanced gas monitoring equipment on the market. BW Technologies' commitment to quality adheres to the strictest standards in the industry. We take pride in the instruments we sell and are dedicated to long-term support of you, our customer, and your BW gas detection instrument.

What BW Technologies Repair Service Does for You

- △ Have your monitors and detectors serviced by the people who know them best - BW Technologies Service Staff
- △ Turnaround averages 1 to 3 days - the shortest time in the industry. In an emergency we repair your instrument the same day it is received - no extra charges apply.
- △ Every instrument receives a certificate of calibration upon completion of repair. The instrument is labeled with the date of calibration. This verifies that you are diligently maintaining your instruments in the event of safety audit.
- △ Only BW Technologies can assure that your original intrinsic safety approvals are not voided.
- △ All repairs are personally signed by the technician performing the work. BW Technologies technicians are continuously trained with changes to products.
- △ BW Technologies uses only NIST traceable calibration gas to assure accuracy of your instruments.
- △ Repaired components are warranted for one full year. Labor is warranted for six months.
- △ No surprises when you receive the invoice - with no-risk estimates. BW Technologies will honor the estimate with no additional charges.

TRAINING SERVICES

The BW Technologies Training Services offers valuable information to our customers. Some of the key topics covered are:

- △ Are you utilizing your instruments to their fullest capacity? Learn the features and capabilities of each instrument in our product line.
- △ Do you know how to replace sensors/batteries and properly calibrate your instruments? Extend the life of your instrument.
- △ How do electrochemical sensors work?
- △ What are the applications of electrochemical, catalytic and infrared sensors and their differences?
- △ What you should know about toxic gases?
- △ How proper maintenance makes your instruments easier to use and more cost-efficient.
- △ How to use your BW gas detection equipment more effectively.
- △ What are the current regulations regarding confined space entry and how do these apply to gas detection?

Hands-on Training: Use our instruments or bring your own for hands-on instruction on proper instrument use and maintenance. Hands-on training will lead you to a better awareness of the dangers associated with hazardous gas atmospheres and help you to use and maintain your gas detection instruments effectively.



Thank you for using
BW TECHNOLOGIES
gas detection instruments.

BW TECHNOLOGIES
is dedicated to providing ongoing customer satisfaction.

- ▲ *Electrochemical Oxygen Sensors*
- ▲ *Hydrogen Sulfide Detection:
Electrochemical vs. Solid State
Semiconductor Sensors*
- ▲ *Electro-catalytic Combustible Sensors*
- ▲ *Electrochemical "TwinTox" Sensors*

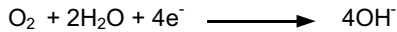
ELECTROCHEMICAL OXYGEN SENSORS

Technical Discussion

The oxygen sensors used in BW instruments are of the self-powered, diffusion-limited, metal-air battery type. They are comprised of an anode, an electrolyte and an air cathode, as shown in Figure 1.

Oxygen sensors are current generators, and the current is proportional to the rate of oxygen consumption (Faraday's Law). This current can be measured by connecting a resistor across the output terminals to produce a voltage signal. If the passage of oxygen into the sensor is purely diffusion-limited, the signal is a measure of oxygen concentration.

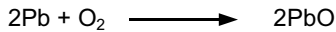
At the cathode, oxygen is reduced to hydroxyl ions according to the equation:



The hydroxyl ions in turn oxidize the metal anode as follows:



Overall, the cell reaction may be represented as:



Capillary-pore oxygen sensors, such as the ones used in BW instruments, utilize a narrow diameter tube through which oxygen diffuses into the sensor. Oxygen is drawn into the sensor by capillary action in much the same way that water or fluid is drawn up into the fibers of a paper towel.

Capillary-pore sensors are minimally influenced by changes in atmospheric pressure. Although rapidly changing pressure leads to a change in sensor output, once the diffusion barrier capillary has stabilized at the new pressure, the output will return to the previous level. Because the volume of atmosphere contained in the diffusion barrier capillary is very small, stabilization at the new pressure is usually achieved within 10 to 30 seconds. This effect can be seen clearly when a properly calibrated capillary-pore oxygen sensor is taken on board a commercial jet. Initially the sensor reads 20.9%. As the jet takes off and begins to gain altitude, the pO₂ drops, causing a drop in oxygen sensor readings. When the jet reaches cruising altitude (actually, when cabin pressure is stabilized at normal operational levels), the readings return to 20.9%. As the jet begins its descent prior to landing, pO₂ increases causing a rise in readings. As soon as the sensor is back at ground level (and the cabin is once again depressurized), readings will return to 20.9%.

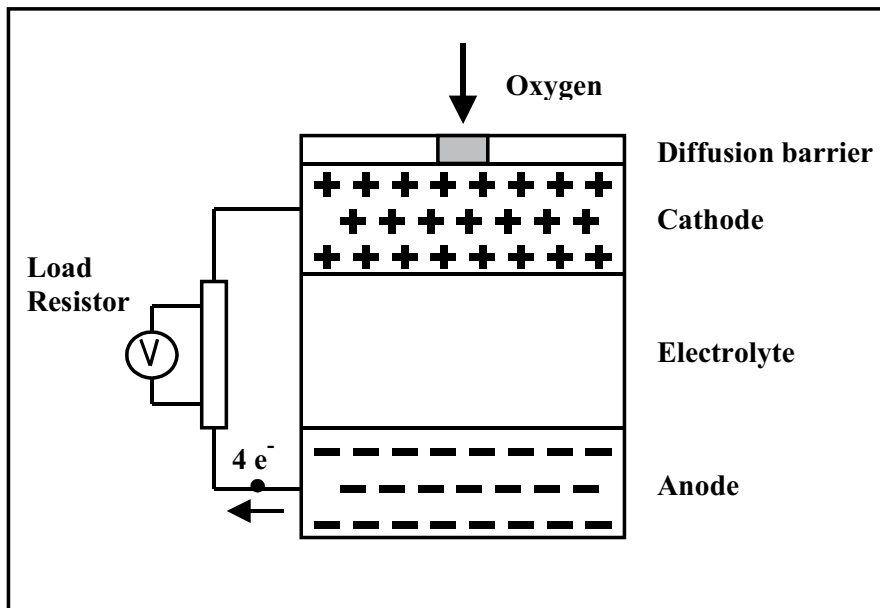


Figure 1. Capillary-pore oxygen sensor

HYDROGEN SULFIDE DETECTION: Electrochemical vs. Solid State Semiconductor Sensors

Technical Discussion

Hydrogen sulfide (H₂S) is one of the most common chemicals used or encountered by industry. Well over 150,000 workers in North America are exposed or potentially exposed to this flammable and highly poisonous gas every year. Hydrogen sulfide is also known for its corrosive effects, particularly on sensitive electronic equipment.

Hydrogen sulfide is a common hazard in a wide range of industries, including oil and gas drilling and production, oil refining, petrochemical processing, gas transmission and storage, chemical processing, wastewater treatment, pulp and paper production and mining.

To avoid the hazards associated with possible personnel exposure, H₂S sensors are provided by industry in portable and fixed detection systems to give an early and reliable warning that H₂S is present in ambient air. This paper discusses two H₂S detection techniques: electrochemical sensors and solid state sensors.

Principles of Operation

To fully appreciate the relative merits of each of these detection techniques, it is important to have a basic understanding of each technique's principle of operation.

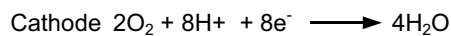
The solid state semiconductor consists of four main parts: the substrate, a ceramic wafer on which the other parts are built; the heater, to maintain proper operating temperature; the interdigitated track, which contains the electrodes for sensing purposes; and the semiconductor layer—usually a metal oxide film, such as tungsten oxide or tin oxide.

Normally, the semiconductor layer has a low electrical conductivity, but in the presence of H₂S, a surface reaction occurs, which releases electrons within the semiconductor layer dropping its resistance. This fall in resistance is registered via a sensor signal output change in H₂S gas concentration.

Electrochemical sensors are classified as fuel cells. They may have either two or three electrodes. In the three-electrode cells, the third electrode acts as a reference. The principle of operation is the same for each type.

In electrochemical sensors, H₂S enters the cell through a diffusion barrier and gas-permeable membrane. A reaction takes place at the working electrode (anode), releasing electrons that flow to the counter electrode (cathode), where a counter reaction occurs. These reactions may or may not

consume the electrolyte. It reacts as follows (see also Figure 1):



This flow of electrons is registered as a concentration value, which is commonly displayed on a local LCD or LED transmitter readout—a companion control module or PLC/DCS control system.

Response Characteristics

Figures 2 and 3 show samples response curves for solid state and electrochemical sensors, respectively. Solid state sensors are typically logarithmic in response, while electrochemical sensors exhibit a linear response curve.

The normal resistance (no H₂S present) of a solid state sensor can be as high as 20 meg ohms. The resistance needs to decrease to about 100K ohms before the instrument will move off the meter zero point. Full scale deflection (100 ppm H₂S) is approximately 10 to 15K ohms.

The logarithmic response of a solid state sensor can lead to significant problems. One problem is that either a linearized circuit or a non-linear scale must be implemented in the control circuitry. Another inconvenience is the need to expose the sensor to two different concentrations of gas during calibration for "low span" and "high span" adjustment, as there is no true zero point on the logarithmic curve.

An additional problem is the inherent instability of the semiconductor layer, which results in a changing baseline resistance. The results are barely noticeable at the zero end of the scale, where large resistance changes represent small concentration changes; however, the results are significant at the high end of the scale, where small resistance changes represent large concentration changes. In electrochemical sensors, the number of electrons released in the chemical reaction is linearly dependent on gas concentration. A significant feature is the gas diffusion controlled operation of the working electrode. The design of this barrier allows only a small quantity of sample atmosphere to reach the electrode. As a result, only a small fraction of the active electrolyte is reacted, leaving a large quantity "in reserve" for higher concentrations of H₂S. Cell output remains linear at concentrations of 1,000 ppm and above.

HYDROGEN SULFIDE DETECTION: Electrochemical vs. Solid State Semiconductor Sensors

Technical Discussion (cont'd)

The currents generated by the oxidation reaction are quite low—typically 0.4 $\mu\text{A/ppm H}_2\text{S}$. However, the intrinsically low background current and low noise output of the cell results in excellent repeatable sensitivity to H_2S .

External Influences on Response

Sensor response may also be influenced by a variety of environmental conditions. Solid state semiconductor and electrochemical detectors vary quite differently in how they are affected by these often uncontrollable environmental factors.

Lack of H_2S Exposure – A common trait of solid state semiconductor sensors is their tendency to “go to sleep” when exposed to H_2S free air for prolonged periods of time. This effect is generally caused by the localizing of electrons within the metal oxide film, which drives the zero resistance into the high meg ohm range. This normally high zero resistance prevents a quick or repeatable response. Most electrochemical cells have an absolute zero, which eliminates the “going to sleep” syndrome.

Rain and Humidity – The metal oxide film on a solid state semiconductor sensor is vulnerable to changes caused by exposure to water. A gradual conversion of the film to a metal hydroxyl state occurs, which eventually deadens the sensor's sensitivity to H_2S .

Even brief exposures to water through rain or washdown will cause surface changes that prevent absorption of hydrogen sulfide; recalibration of the sensor is advisable after exposure to moisture. To minimize susceptibility to moisture damage, surface temperature should be greater than 100 °C. This is often accomplished with a built-in heater.

Changes in humidity or direct exposure to moisture have little effect on the electrochemical cells. All reactions take place at the working electrode, where moisture is continually present. The electrolyte reservoir has sufficient overcapacity to allow the cell to accommodate all but the most prolonged periods of very high or very low humidity. The cell has been tested for three months at a relative humidity of 0% without ill effects. In addition, once the RH was increased, the cell reabsorbed all lost moisture.

Temperature – Maintaining a constant chip surface temperature is important to keeping the response time and stability of solid state sensors within acceptable limits. For this reason, heaters are often built into the sensor surface.

Equally important is the need to set each individual sensor's operational temperature to compensate for

variations in chip manufacturing and the process of metal oxide deposition. A sensor operating too cold will respond very slowly; a sensor operating too hot will respond very quickly but will also demonstrate a tendency toward non-repeatability. However, only a few manufacturers address the critical importance of this issue by thermostatically controlling the heater to prevent surface temperature fluctuations.

The temperature effects on the sensitivity of the electrochemical sensor are predictable and repeatable from cell to cell. From 0 °C to 40 °C, the span changes by less than $\pm 10\%$ of the reading given at 20 °C. From 0 °C to -40 °C, there can be a further fall of 5% of the reading.

The zero shifts by less than 3 ppm for a temperature change from 20 °C to 40 °C. Below 20 °C, baseline shifts are negligible. The electrolyte does not freeze at -40 °C.

Operating Considerations

There are certain operational costs affected with any gas monitoring system. Calibration and power consumption are two of the major factors that should be considered in the selection process.

Calibration – In general, the manufacturers of solid state sensors recommend monthly or three-month calibration intervals. However, many companies have adopted a daily calibration schedule for these systems. This is due primarily to the lack of repeatability caused by the sensor's vulnerability to surface changes. In addition, and as previously mentioned, calibration at two or more concentration levels is required to assure proper response all along the logarithmic response curve; this multi-concentration calibration process often requires 15 minutes or more per sensor.

The linear nature of the electrochemical sensor, along with its absolute zero and excellent repeatability, allows single point calibration at up to six-month intervals.

Reproduceability between electrochemical cells is outstanding. Direct replacement without calibration will produce a response within 10% of the original; with calibration, the response will be within 2% of the original.

Power Consumption – The sensor heater and associated circuitry is a major power draw in solid state semiconductor systems. This can be major drawback in applications for portable monitors or for fixed systems needing solar power or battery backup. Power consumption for systems using the electrochemical sensor is significantly reduced.

HYDROGEN SULFIDE DETECTION: Electrochemical vs. Solid State Semiconductor Sensors

Technical Discussion (cont'd)

Summary

There are inherent weaknesses in the design and response of semiconductor sensors. Temperature, humidity and other ambient conditions can significantly affect detection and measurement performance. Their logarithmic nature and tendency to “go to sleep” necessitate frequent calibration. Finally, power consumption may be substantial.

Electrochemical devices are better suited to the realities of modern H₂S monitoring applications.

They can withstand environmental extremes with little or no loss of detection accuracy, require less frequent calibration and have significantly lower operating costs.

While each application should be judged on its merits, electrochemical cells generally prove more reliable, offer greater operator confidence and provide maximum performance in early warning detection of hazardous concentrations of hydrogen sulfide.

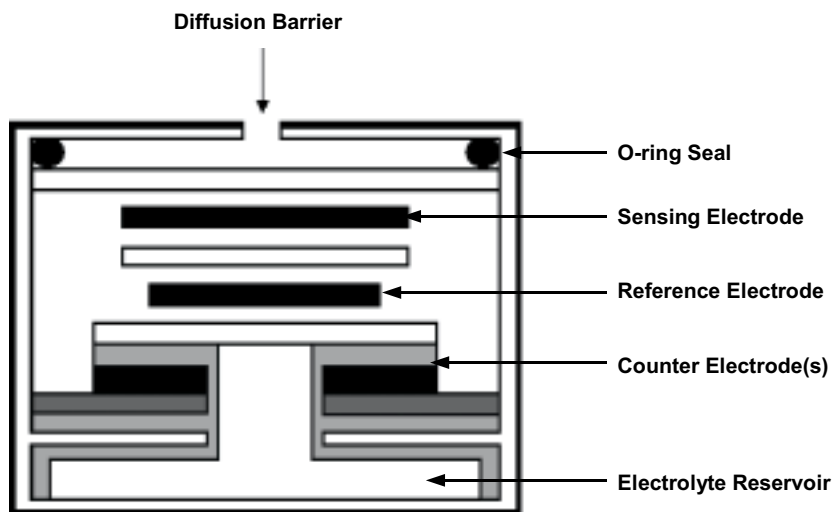
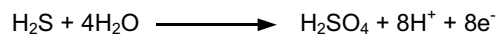
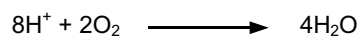


Figure 1. Electrochemical sensor

Working Electrode Reaction:



Countering Electrode Reaction:



0.35 microAmps per ppm H₂S

**HYDROGEN SULFIDE DETECTION:
Electrochemical vs. Solid State Semiconductor Sensors**

Technical Discussion (cont'd)

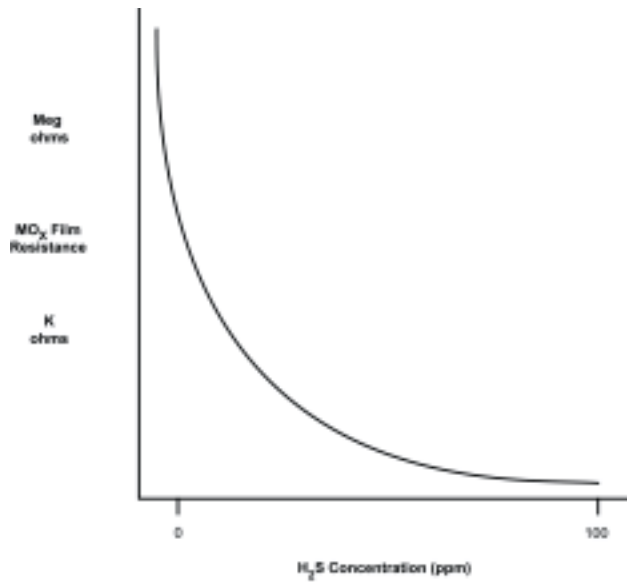


Figure 2. Sample solid state sensor response curve (simplified)

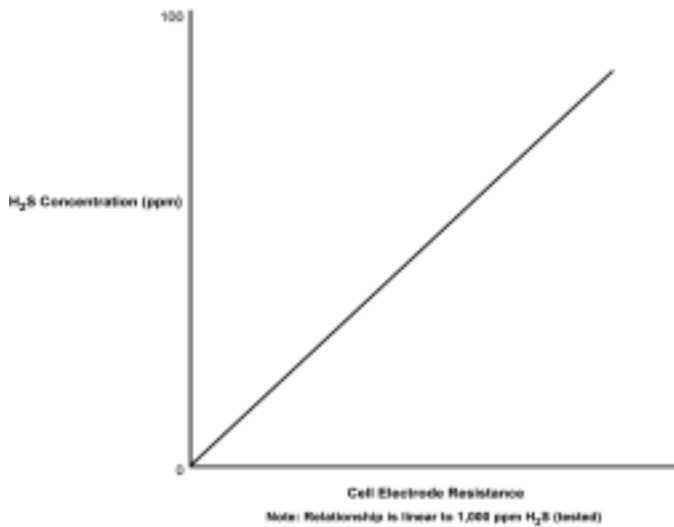


Figure 3. Sample electrochemical sensor response curve (simplified)

ELECTRO-CATALYTIC COMBUSTIBLE SENSORS

Technical Discussion

Combustible gases and vapors may be ignited and propagate flame only between the limits of flammability known as the Lower Explosive Limit (LEL) and the Upper Explosive Limit (UEL). Mixtures of combustible gases in air below the LEL are too lean to permit propagation of flame, while mixtures above the UEL are too rich to permit combustion due to the lack of oxygen. The LEL and the UEL are usually expressed as percentages, by volume, of combustible gas in air. These values differ from gas to gas. In practice, values of LEL and UEL are established empirically, and different authorities have established different values for the same gases.

While some industrial gas alarm systems are required to indicate alarms at preset levels above the limits of flammability (e.g. as for use with methane drainage systems in coal mines), most are required to indicate alarms at preset levels below the LEL. The gas detection technology adopted in each case is different—thermal conductivity or infrared detectors are commonly used for the detection of high concentrations (above the LEL), and electro-catalytic detectors being very widely used for the detection of concentrations below the LEL. This paper is concerned only with the latter. The principles of operation and some practical examples are described.

Principle of Operation

Despite a great deal of research and development in the field of gas detection during the past decade or so, industry has yet to devise a more cost-effective form of a selective combustible gas detector for use at sub-LEL levels than that of the long established electro-catalytic detector. Such detectors have been in widespread use for more the 50 years—in portable, transportable and fixed, multi-point gas alarms. Although many design improvements have been made to detectors of this type over the years, in essence, the basic concept has not changed.

The principle of operation depends upon the oxidation of combustible gases on an electrically heated catalytic “filament” (otherwise known as the “sensitive,” “active” or “detector” element), which causes the temperature of this filament to rise so as to electrically unbalance a Wheatstone bridge circuit of which it forms a part (see Figure 1). This sensitive filament may take the form of a simple length of platinum wire or it may be in the form of a coil of platinum wire coated with a suitable noble metal oxide, e.g. palladium/ thoria on an alumina base. The latter configuration is designed to enhance the catalytic activity at lower filament temperatures and so to extend the life of the filament. A second

filament, made inactive to gas by sealing or “poisoning” but electrically matched with the sensitive filament, is connected electrically with the latter as part of the Wheatstone bridge and is located adjacent to it in the detector housing so as to provide compensation for the effects of ambient temperature variations upon the sensitive filament. This second filament is known as the “non-sensitive” or “compensator” element.

When such a gas detector is exposed to increasing concentrations of a combustible gas in air, its response (as measure electrically across the Wheatstone bridge) typically increases approximately linearly through the LEL, peaking at around the stoichiometric mixture, and then falls to zero when the combustible gas concentration reaches 100% by volume (see Figure 2). From this, it will be evident that the gas detector is coherent only with the LEL range, and that anomalous response can occur at gas concentrations greater than the stoichiometric mixture. This defines its limitation of measurement, although it is possible to devise a means of preventing anomalous readings of the gas detection system at concentrations in excess of the LEL.

Detection Elements

The detection elements may take various forms according to the origin of their design. The simplest form is the platinum wire filament, still used in some gas detection instruments. However, this has the disadvantage of requiring a high operating temperature for efficient combustion (methane –900 °C), resulting in short life to failure due to evaporation of the platinum wire.

The two particular forms of detection considered in this paper are the “filament” and the “bead.” Each has unique characteristics.

The filament configuration is generally as shown in Figure 3. It is comprised of a silica fiber tubular former upon which is spirally wound a length of fine gauge platinum wire. The spaces between the turns of the wire are critical to the performance of the detector. The sensitive (active) filament is coated with one of several alternative palladium/platinum/thoria catalysts, each designed to give the best possible relative response to a particular range of gases. The non-sensitive filament is made chemically inert to gas or is sealed with, for example, glass. The sensitive filament is electrically self-heated to a temperature between 300 °C and 600 °C, according to the gas(es) to be detected. Both filaments are mounted in ceramic or similar frames to suit the various designs of gas detection instruments.

ELECTRO-CATALYTIC COMBUSTIBLE SENSORS

Technical Discussion (cont'd)

The "bead" (see Figure 4) takes the form of a ceramic pellet supported on a platinum wire coil and/or in the case of the sensitive element, coated with a palladium thoria, or other catalyst, or in the case of the non-sensitive element, deactivated with potassium hydroxide, glass or similar material. This glass or ceramic pellet works to minimize coil wire evaporation as well as to provide mechanical support. The sensitive element is normally electrically self-heated to between 400 °C and 600 °C for methane and other gases.

Much has been said of the effects of "poisons" or "inhibitors" on electro-catalytic beads. The most common poisons are silicons, sulfides, phosphates and leads. These materials exhibit an affinity for the catalyst and tend to coat the sensor bead, which prevents the gas being monitored from reaching the sensing element. In some cases, the effect is so dramatic that some sensors have been rendered useless in a matter of a few days.

This problem has been resolved by using a method to apply a sponge-like coating around the glass bead and applying the catalyst throughout the porous coating. This greatly increases catalytic surface area, thereby increasing the amount of poison that can be tolerated and extending sensor life.

Usually the bead is much smaller than the filament, and it operates at lower input power with correspondingly lower output sensitivity (usually stated in terms of millivolts bridge out-put per percent LEL or percent volume of gas in the air).

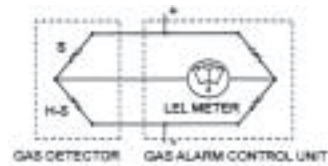


Figure 1. Basic gas detection circuit (The Wheatstone Bridge)

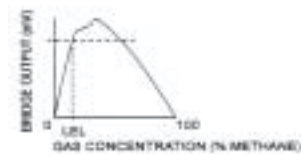


Figure 2. Typical response characteristic (bead)

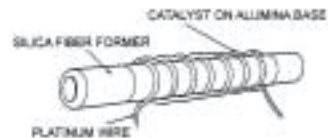


Figure 3. The filament (sensitive)



Figure 4. The bead (sensitive)

ELECTROCHEMICAL “TWIN TOX” SENSORS

Technical Discussion

The “Twin Tox” gas sensor used in BW Technologies BW Defender multi-gas detection instruments is a unique approach for sensing hazardous levels of hydrogen sulfide (H₂S) and carbon monoxide (CO) gas.

The “Twin Tox” is basically two gas sensors in one. It utilizes toxic gas sensing technology that has been field proven over the last decade and is the present standard for the detection of hazardous gases in the industrial hygiene industry, particularly those found in the oil and gas, municipal, pulp and paper, fire/hazmat sectors and other confined space entry applications.

The BW Technologies “Twin Tox” has two separate chambers within the single sensor package, which provide independent gas sensing and resulting signal outputs for H₂S and CO. This allows the “Twin Tox” to be gas specific to either H₂S or CO or both simultaneously. Figure A graphically illustrates the inner workings of the sensor. Note that there are two layered and independent sensing chambers, each containing a sensing electrode (S1 & S2). The first sensing electrode chamber (S1) will react only to H₂S gas molecules and the second sensing electrode chamber (S2) reacts with CO. Both S1 and S2 sensing electrodes share a reference electrode and the common electrolyte solution reservoir.

The gas sensing reactions are shown at the bottom section of Figure 1. The key advantages are that:

- 1) sensor signal output is linear to the exposed gas concentration;
- 2) power consumption is minimal because the actual sensing chemical reaction creates the base sensing signal—each molecule of H₂S produces 8 electrons of signal (the sensing circuitry is normally quiescent); and
- 3) the working electrode reaction regenerates the exact amount of water (H₂O) that was used on the sensing electrode to react with the target gas (H₂S or CO) (it refills itself).

The “Twin Tox” sensor should not be confused with the Dual Tox type sensor, which is simply a non-filtered CO electrochemical cell that will indiscriminately detect H₂S and/or CO based on its cross-interfering response. Unlike the BW Technologies “Twin Tox,” the Dual Tox type sensor contains only one sensing electrode chamber, gives only one gas sensing signal output and cannot distinguish between H₂S and CO.

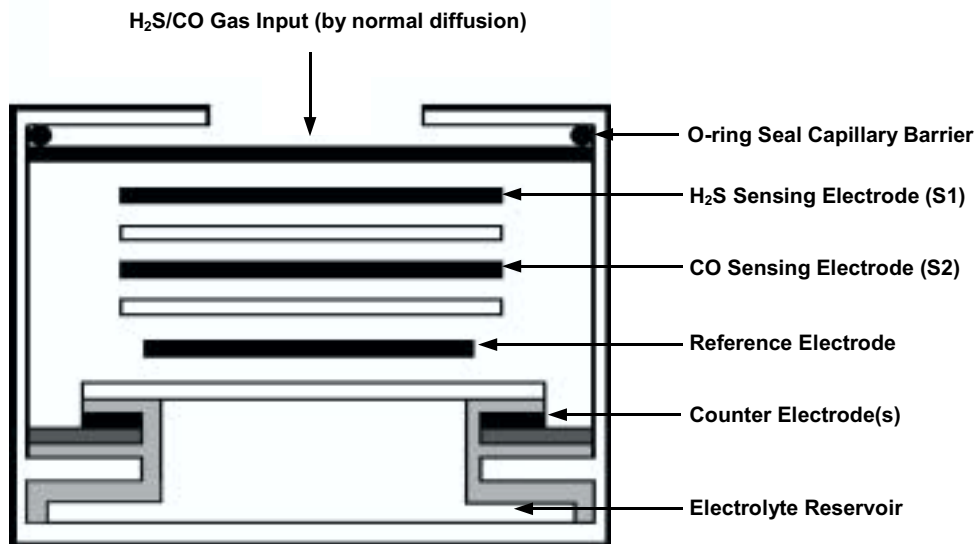
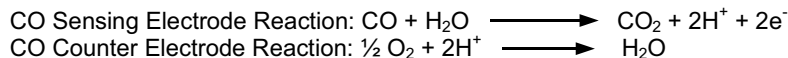
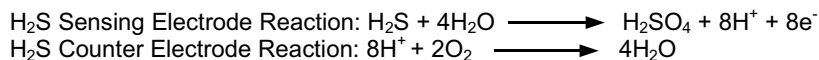


Figure 1. Electrochemical “Twin Tox” Sensor





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