# BW TECHNOLOGIES

ToxyPoint

## *4-20 mA Gas Monitors*

*Installation and Instruction Sheet*

### *Introduction*

The ToxyPoint gas monitor ("the monitor") warns of hazardous gas at levels above a factory set alarm setpoint. The monitor is a 2-wire 4-20 mA transmitter c/w sensor. The ToxyPoint is factory calibrated and tested.

| Modèle | Gaz contrôlé | Maximum Operating Life |
|---|---|---|
| ToxyPoint CO | monoxyde de carbone (CO) | 3 ans |

### *Symboles internationaux*

| Symbole | Signification |
|---|---|
| | Approved to both U.S. and Canadian Safety standards<br>IEC No. 1010 (International Electrical Code)<br>ANSI/ISA S82.01<br>C22.2 No. 1010 (Canadian Standards Electrical Code) |
| ⏚ | Earth (ground) Terminal |
| ⚠ | Caution (refer to accompanying documents) |

D1??? (French) December 2000



***ISO 9001***

### ⚠ *Consignes de sécurité à lire d'abord*

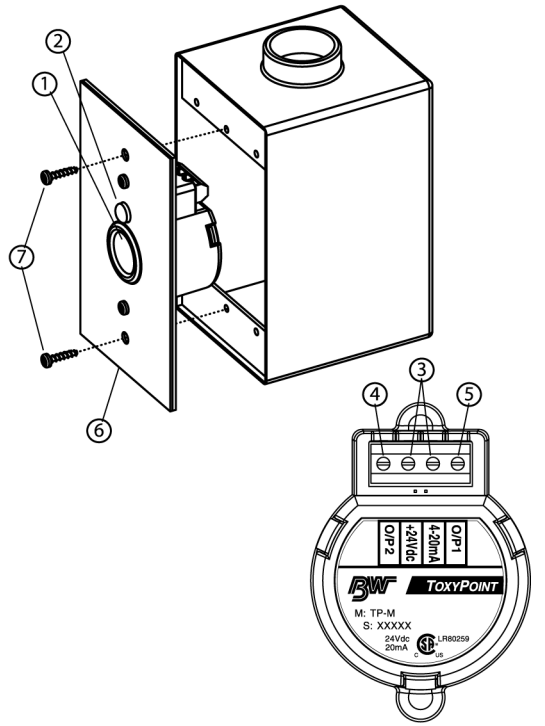
***Users of the ToxyPoint require a full understanding of the installation, operating and maintenance instructions, otherwise protection provided by the monitor may be impaired. Read the following Warnings before using the monitor.***

- ⇒ **Install according to local electrical regulations and codes.**
- ⇒ **Installation should be performed by qualified personnel.**
- ⇒ **Do Not Paint over the Sensor grill.**
- ⇒ **Do Not activate the monitor after the date on the package.**
- ⇒ **Make sure the sensor screen is free of dirt and debris.**
- ⇒ **Make sure the sensor screen is not covered.**
- ⇒ **Ne pas exposer le détecteur aux chocs électriques et/ou à des chocs mécaniques importants et répétés.**
- ⇒ **Do not expose the sensor to high pressure water spray.**
- ⇒ **Do not use the monitor if it is damaged. Before use inspect the monitor. Look for cracks, missing metals or plastics. If the monitor is damaged, contact BW Technologies immediately.**
- ⇒ **The warranty will be voided if the customer or any unauthorized service personnel attempts to repair the unit.**
- ⇒ **The ToxyPoint should be interfaced to a Class 2 or Limited circuit.**

NOTE:
A limited circuit is a circuit supplied by sources such as a battery or a transformer winding where the open-circuit potential is not more than 30 V r.m.s or 42.4 V.d.c., and the energy available to the circuit is limited according to one of the following:

- the current under any condition of load, including short circuit, is not more than 8A measured after 1 minute of operation;
- the source is RATED or set to limit its power output to 150 VA under any condition of load including short circuit;
- an overload protector or circuit component opens to interrupt the power output at a lower value than 150 VA under any condition of load including short circuit.

### *Elements Drawing*




| | |
|---|---|
| 1 | Sensor c/w stainless steel sintered sensor screen |
| 2 | LED Indicator |
| 3 | Sensor Wiring Terminals 4-20 mA and 24 VDC |
| 4 | O/P1: Alarme Basse Output One |
| 5 | O/P2: Alarme Haute Output Two |
| 6 | Mounting Plate Cover Plate |
| 7 | Mounting Screws x 2 |

## *Installation – Sensor Locations*

The following suggestions should be considered to assure detection of the target gas. Select the most suitable location for each sensor.

- *Air Currents:* If there are fans, wind, or other sources of air movement, gases may tend to rise or collect in certain areas of a facility. The local air currents should be assessed to aid in selecting the sensor location. Air convection can often be *more* important in determining gas concentration areas than factors of Vapor Density.
- *Gas Emission Sources:* As a rule, at least one sensor should be located in close proximity to each point where an emission is likely to occur.
- *Height:* We suggest, dependent of air currents, that the ToxyPoint be installed at approximately 3 to 5 feet above ground or higher where CO emission is likely to accumulate.

## *Mounting the Enclosure:*

ToxyPoint is mounted in a standard single outlet (gang1) electrical box supplied by the customer. The ToxyPoint Mounting Plate fits boxes mounted in drywall (new construction) or is surface mounted.

1. Install an electrical box (gang1), according to local electrical codes.

## *System Design Specifications*

| | |
|---|---|
| **Supply Voltage:** | 10 to 28 Vdc (24 VDC nominal) |
| **Power Consumption:** | 24 mA @ 24 VDC maximum<br>4 mA @ 24 VDC nominal |
| **Power Supply:** | 50 mA |
| **Loop Resistance:** | 650 ohms maximum |
| **Output current:** | Normal Operation: 4-20 mA |
| | Fault: 2 mA signal |
| | Sensor Expired: 2 mA signal |
| | Over Range: 24 mA signal (maximum) |
| **Cable:** | 2-wire 18 to 24 AWG |

| | |
|---|---|
| **Alarm Outputs:**<br>**O/P1 (**Alarme Basse**)**<br>**O/P2 (**Alarme Haute**)** | Not to exceed:<br>Alarm Output: 250 mA @ 24 VDC |

## *Cable Installation*

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

*The table below assumes a constant 24 volt power supply (at 20°C), copper wire and a Controller resistance of 250 ohms. The signal range from the Controller/PLC etc. to the ToxyPoint takes into account the return loop. The distance shown is from the Controller to the Transmitter.*

*(Note: The BW CR-4000 Controller has a resistance of* only*120 ohms.)*

**Tableau 1:**

| **Maximum cable lengths between Controller and ToxyPoint** | | | |
|---|---|---|---|
| **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 |

***Recommended:*** Use shielded cable, or cable in conduit to avoid electrical interference. The shield (including mylar) must be grounded. Keeping the shield as short as possible, tie the shield and extra wires to the electrical box grounding screw. Pull 2-wire cable into the enclosure(s).

*Output Signals: If accessing the output signal(s) at O/P1 and/or O/P2 additional wire(s) will be required from the sensor. Wire as shown in Figure 2.*

1. Using the two screws provided fix the ToxyPoint to the mounting plate.

## *4-20 mA Loop Installation*

***Cable Routing:*** Separate cables are required for each ToxyPoint.

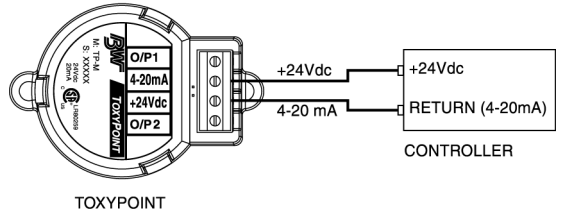
***Power Supply:*** Ensure power supply meets the minimum requirements of all components of your system (i.e. monitors, alarms, relays, fans, etc.)

***Recommend:*** BW recommends that the power supply be regulated.

***Important:*** Supply voltage to be 24 V nominal. Fluctuations not to exceed 28 Vdc or go below 10 Vdc

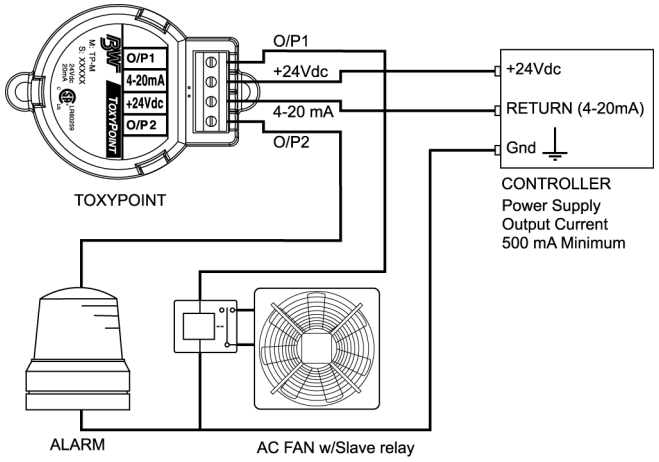
## *System Wiring Diagrams*

**Figure 1. 2-wire ToxyPoint Installation**




TOXYPOINT

**Figure 2. ToxyPoint with Alarm Outputs Installation**




Alarm Outputs: Not to exceed 250mA @ 24VDC

## *4-20 mA loop installation (continued)*

***Caution:*** Polarity must be observed. If the RETURN and +24 volt wires are reversed the ToxyPoint transmitter will not work.

***Connect the Transmitter: (See Figure 1 and 2 and labeled terminals)***

**4-20 mA**: Connect Return 4-20 mA signal
**+24 VDC**: (+) positive (10-28 volts) to the supply terminal

***Alarm Output(s):*** ToxyPoint is equipped with two (2) alarm outputs O/P1 and O/P2, rated at 0.25 A each. The alarm outputs can be slaved out to a higher amperage rated relay and used to trigger other alarm accessories. Also they can be used to trigger BW Audible/Visual DC alarm accessories direct. The alarm output setpoints are pre-calibrated at the factory.

***Connect the Controller (PLC etc.) and Power Supply***

Ensure that all connections are made and the ToxyPoint is complete with external cover in place before applying power. Follow the procedures and recommendations in the Control Systems Manual to complete installation.

Shields and any unused wires should be tied to the Controller ground as outlined in the National Electrical Code Practices.

1. Attach wires to the Controller and Power supply as shown.

## *Power-up*

Apply power. The monitor sets the operational life clock and then performs the full function sensor integrity self-test.

If the monitor passes the self-test, the sensor will stabilize in under 30 seconds. Upon a successful self-test, the status red LED will light and the transmitter will send a 4-20 mA current output to the controller equivalent to the ppm level measured by the monitor. Instructions describing what to do in the event of a self-test failure appear in the section "Self-Test".

## *Calibrate the Controller and Test with Gas*

Follow the procedures and recommendations in the Control System manual to calibrate the Control system:

4 mA = Zero; 20 mA = full scale

To ensure proper operation, test with gas. Apply a known concentration of quality test gas to the ToxyPoint sensor for 2 minutes to allow the sensor response to stabilize. The control system should read the same as the ppm of the gas being applied.

| | |
|---|---|
| Resolution: | 2 ppm < @ 0 - 250 ppm |
| | 4 ppm < @ 250 - 500 ppm |

Note: Allow a ±3% tolerance in some cases due to sensor repeatability.

***The ToxyPoint is now ready for use.***

## *Instrument Status Advice*

| **Advice** | **LED Indicator** | **Output to Controller** | **Alarm Output Signal** Triggers Field devices |
|---|---|---|---|
| ON | ON | 4-20 mA | |
| Fault: Self-test fail: | *Fast flashes* 1 every 0.5 seconds | 2 mA | Triggers low alarm O/P1 and high alarm O/P2 |
| Life ending warning | *Slow flashes* 1 every 2 seconds | 4-20 mA | |
| en fin de vie | Off | 2 mA | |
| Alarme Basse | On | 4-20 mA | Triggers O/P1 |
| Alarme Haute | On | 4-20 mA | Triggers O/P1 and O/P2 |
| Over Range Alarm | On | 24 mA | Triggers O/P1 and O/P2 |
| Power OFF | OFF | 0 mA | |

## *Alarm Output Setpoints*

Gas alarm setpoints at Alarm output 1 and alarm output 2 activate field relays, alarms etc. Special setpoints are available.

| **Order Number** | **Low Alarm Setpoint** | **High Alarm Setpoint** |
|---|---|---|
| TP-M | 35 ppm | 200 ppm |

*When the gas levels return to acceptable ranges, the gas alarm stops.*

## *Automatic Self-Test*

The sensor is tested automatically every 24 hours while in operation and every time power is applied.

Note: A high risk gas alarm will take precedence, therefore the self-test will not be performed in the event of a concentration greater than 50 ppm for CO.

## *Echec de l'auto-test*

If the sensor fails the test the LED will flash quickly, the monitor will send a 2 mA signal to the controller and any devices connected to the alarm outputs O/P1 and O/P2 will be activated.

## *Operational Life*

The operational life of the ToxyPoint is three years in normal operation. The ToxyPoint Life counter is activated when power is applied and runs continuously while the monitor is operating. If the power is interrupted or turned off, the counter will stop and resume counting once power is restored. The ToxyPoint will not reset, but continue counting from the point where it was stopped.

## *Life-Ended Warning*

When one month of the instrument life is remaining, the LED flashes slowly to advise the unit will soon require replacement.

## *Alarme en fin de vie*

The life-ended alarm occurs when the ToxyPoint's useful life is ended. The transmitter sends a 2 mA signal to the controller and the LED is off. The ToxyPoint is disabled. Replace the monitor.

## *Operation*

The ToxyPoint is factory calibrated. No further calibration is required. The sensor is equipped with a stainless steel sintered screen to protect it from tampering.

## *Care*

Visually inspect the sensor on a regular schedule. Make certain the sensor grill is clean. If dirty, clean the sintered stainless steel screen with a soft brush using warm, clean water.

In the event, the screen still appears plugged with dirt or particulate, expose the sensor to a carbon monoxide test gas. Verify the response to gas, to ensure the sensor is functioning. Replace a plugged or damaged monitor.

## *Spécifications de sécurité:*

| | |
|---|---|
| **Monitor:** | 4-20 mA transmitter c/w CO sensor |
| **Maximum operating life:** | 3 ans |
| **Detection range:** | 0-500 ppm |
| **Calibration:** | Not required |
| **Alarm setpoints:** | 35 ppm and 200 ppm OSHA standard (Special setpoints available) |

## *Spécifications générales:*

| | |
|---|---|
| **Shelf Life:** | 1 an |
| **Température de fonctionnement :** | 0 à +40 °C (+32 à +104 °F) |
| **Humidité de fonctionnement :** | 15 % à 90 % d'humidité relative (sans condensation) |
| **Altitude :** | Up to 2,000 m (6,562 ft.) |
| **Visual alarm:** | Red light emitting diode (LED) |
| **Monitor type:** | Zero-maintenance Disposable |
| **Sensor type:** | Electrochemical cell |
| **Sensor screen:** | Sintered stainless steel |
| **Detection technique:** | Instantaneous alarm |
| **Calibration:** | Not required |
| **Alarm outputs:** | Two (2) 0.25 Amp outputs activated by Low and High gas alarms, and Fault alarm |
| **Physical:** Size (dxwxh): | 1.36x1.75x2.56 in. (3.5x4.5x6.5 cm) |
| Weight: | 1.34 oz. (38 g) |
| **Ratings and Certifications** | |
| Area Classification: | Approved to both U.S. and Canadian standards by CSA for use in General Purpose locations |
| Pollution Degree: | 2 |
| Installation Category: | I |
| **Warranty:** | 1 an |

## *Pour contacter BW Technologies*

Pour prendre contact avec BW Technologies, appelez :

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+1-403-248-9226 dans les autres pays

Ou bien visitez notre site Web : **www.gasmonitors.com**

## *Garantie*

**LIMITES DE GARANTIE ET DE RESPONSABILITE**

BW Technologies garantit l'absence de vices de matériaux et de fabrication sur le GasAlertClip pendant une période à compter de la date de mise en service. Cette garantie ne s'applique que si le détecteur est activé avant la date indiquée sur l'emballage. Elle ne s'applique pas aux fusibles, aux piles jetables ni à tout produit mal utilisé, modifié, négligé ou endommagé par accident ou soumis à des conditions anormales d'utilisation et de manipulation. Les distributeurs agréés par BW Technologies ne sont pas autorisés à appliquer une garantie plus étendue au nom de BW Technologies. Pour bénéficier de la garantie, envoyer l'appareil de test défectueux au Centre de service BW Technologies le plus proche, accompagné d'une description du problème.

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