

## Single Point Toxic Gas Detection System

A Single point gas detector shall be supplied for monitoring the concentration of (Specify Gas) in (specify location). The system shall consist of a NEMA 4X alarm module and a remote mounted gas sensor/transmitters, The gas detection system shall be ATI Series A14 or approved equal.

The alarm module shall consist of a NEMA 4X enclosure containing one modular receiver, one power supply, and an audible horn. The enclosure shall contain a hinged window to allow access to controls without tools, and shall be suitable for wall or surface mounting.

The receiver module shall provide a high intensity digital LED display of gas concentration, plus alarm indicator LED's for Warning, Alarm, and Trouble. Two programmable alarm setpoints shall be provided for warning personnel of differing levels of leakage. Gas leak alarms shall be indicated by flashing LED indicators on the alarm receiver and activation of the audible horn. The concentration of the gas shall be displayed directly in PPM units. Three alarm relays shall be provided for external alarming functions. Each alarm relay shall be independently assignable to either the low or the high alarm setpoint, and shall also be programmable for latching and/or fail-safe operation. In addition, a separate Trouble alarm shall be provided on each receiver to indicate the loss of signal from the sensor/transmitter, or to alarm the loss of sensitivity of the gas sensor if Auto-Test is supplied on the sensor. Each receiver shall provide an isolated 4-20 mA output signal proportional to gas concentration, and shall also contain remote reset input terminals to allow alarm acknowledgment from a remote location.

A sensor/transmitter shall provide the gas measurement function for the system. The sensor/transmitter shall consist of a stable electrochemical gas sensor that shall generate a signal linearly proportional to gas concentration. The sensor shall be close coupled to an electronic amplifier to boost the signal level, and the entire assembly shall be coated to minimize potential RFI interference. Sensor/transmitters shall transmit gas concentration data digitally to avoid electrical interference, and shall be capable of communicating over a minimum of 1000 feet of two conductor cable.

**OPTIONAL:** Each sensor/transmitter shall be supplied with an electrochemical gas generator closely coupled to the sensor which shall automatically generate a small concentration of gas every 24 hours to verify sensor operation. During the verification test, alarm relays shall be inhibited. Should the sensor not respond to the gas test, the Trouble alarm on the receiver shall be activated.

The power supply in the receiver module shall be a modular design providing DC power to up to two receiver modules. A third DC output shall be provided to float charge a standby battery system to provide battery backup to the entire detection system in the event of power failure. The power supply shall be capable of operation from any voltage from 85-250 volts, AC or DC, without adjustment, and shall also contain a power failure relay for remote power failure indication.

**OPTIONAL:** A battery backup module shall be supplied to provide standby power to the gas detector. The battery backup module shall be housed in a NEMA 4X enclosure and shall be suitable for operating the detector for at least 4 hours in the event of power outage. Battery backup units shall contain protective circuitry to isolate the battery in the event that battery voltage drops to levels where battery damage might result.

## Two Point Toxic Gas Detection System

A two point gas detector shall be supplied for monitoring the concentration of chlorine and ammonia gas in \_\_\_\_\_ (specify location) \_\_\_\_\_. The system shall consist of a NEMA 4X alarm module, one chlorine gas sensor/transmitter, and one ammonia gas sensor/transmitter. The gas detection system shall be ATI Series A14 or approved equal.

The alarm module shall consist of a NEMA 4X enclosure containing two modular receivers, one for chlorine and one for ammonia, one power supply, and an audible horn. The enclosure shall contain a hinged window to allow access to controls without tools, and shall be suitable for wall or surface mounting.

Each receiver module shall provide a high intensity digital LED display of gas concentration, plus alarm indicator LED's for Warning, Alarm, and Trouble. Two programmable alarm setpoints shall be provided for warning personnel of differing levels of leakage. Gas leak alarms shall be indicated by flashing LED indicators on the alarm receiver and activation of the audible horn. The concentration of the gas shall be displayed directly in PPM units. Three alarm relays shall be provided for external alarming functions. Each alarm relay shall be independently assignable to either the low or the high alarm setpoint, and shall also be programmable for latching and/or fail-safe operation. In addition, a separate Trouble alarm shall be provided on each receiver to indicate the loss of signal from the sensor/transmitter, or to alarm the loss of sensitivity of the gas sensor. Each receiver shall provide an isolated 4-20 mA output signal proportional to gas concentration, and shall also contain remote reset input terminals to allow alarm acknowledgment from a remote location.

A sensor/transmitter shall provide the gas measurement function for the system. One chlorine sensor/transmitter (0-10 PPM) and one ammonia sensor/transmitter (0-100 PPM) shall be supplied, each connected to a separate receiver in the alarm module. Chlorine sensors shall be located approximately 2 feet off the floor of the chlorine storage room. Ammonia sensor/transmitters shall be located near the ceiling of the storage room. Sensor/transmitters shall transmit gas concentration data digitally over a 2-wire connection to avoid electrical interference, and shall be capable of communicating over a minimum of 1000 feet of cable.

**OPTIONAL:** Each sensor/transmitter shall be supplied with an electrochemical gas generator closely coupled to the sensor which shall automatically generate a small concentration of gas every 24 hours to verify that the gas sensor is operational. During this verification test, alarm relays in the receiver shall be inhibited. Should the sensor not respond to the gas test, the Trouble alarm on the receiver shall be activated.

The power supply in the receiver module shall be a modular design providing DC power to up to two receiver modules. A third DC output shall be provided to float charge a standby battery system to provide battery backup to the entire detection system in the event of power failure. The power supply shall be capable of operation from any voltage from 85-250 volts, AC or DC, without adjustment, and shall also contain a power failure relay for remote power failure indication.

**OPTIONAL:** A battery backup module shall be supplied to provide standby power to the gas detector. The battery backup module shall be housed in a NEMA 4X enclosure and shall be suitable for operating the two channel detector for at least 8 hours in the event of power outage. Battery backup units shall contain protective circuitry to isolate the battery in the event that battery voltage drops to levels where battery damage might result.

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## Multi-Point Toxic Gas Detection System

A multi-point gas detector shall be supplied for monitoring the concentration of       (Specify Gases)       in       (specify locations)      . The system shall consist of a NEMA 4X alarm module and sensor-transmitters for each specified gas. The gas detection system shall be ATI Series A14 or approved equal.

The alarm system shall consist of a NEMA 4X enclosure containing       (Specify 2, 3, or 4)       modular receivers, one for each point of detection, one power supply module for every 2 receivers, and an audible horn. The enclosure shall contain a hinged window to allow access to controls without tools, and shall be suitable for wall or surface mounting. The system shall monitor the following gases and ranges.

	<u>GAS</u>	<u>RANGE</u>
Point # 1	_____	_____
Point # 2	_____	_____
Point # 3	_____	_____
Point # 4	_____	_____

Each receiver module shall provide a high intensity digital LED display of gas concentration, plus alarm indicator LED's for Warning, Alarm, and Trouble. Two programmable alarm setpoints shall be provided for warning personnel of differing levels of leakage. Gas leak alarms shall be indicated by flashing LED indicators on the alarm receiver and activation of the audible horn. The concentration of the gas shall be displayed directly in PPM units. Three alarm relays shall be provided for external alarming functions. Each alarm relay shall be independently assignable to either the low or the high alarm setpoint, and shall also be programmable for latching and/or fail-safe operation. In addition, a separate Trouble alarm shall be provided on each receiver to indicate the loss of signal from the sensor/transmitter, or to alarm the loss of sensitivity of the gas sensor. Each receiver shall provide an isolated 4-20 mA output signal proportional to gas concentration, and shall also contain remote reset input terminals to allow alarm acknowledgment from a remote location.

Sensor/transmitters shall provide the gas measurement function for the system using stable electrochemical gas sensors close coupled to a digital transmitter. One sensor/transmitter shall be supplied for each point of detection. Sensor/transmitters shall transmit gas concentration data digitally over a 2-wire connection to avoid electrical interference, and shall be capable of communicating over a minimum of 1000 feet of cable.

**OPTIONAL:** Each sensor/transmitter shall be supplied with an electrochemical gas generator closely coupled to the sensor which shall automatically generate a small concentration of gas every 24 hours to verify that the gas sensor is operational. During this verification test, alarm relays in the receiver shall be inhibited. Should the sensor not respond to the gas test, the Trouble alarm on the receiver shall activate.

The power supply in the receiver module shall be a modular design providing DC power to up to two receiver modules. A third DC output shall be provided to float charge a standby battery system to provide battery backup to the entire detection system in the event of power failure. The power supply shall be capable of operation from any voltage from 85-250 volts, AC or DC, without adjustment, and shall also contain a power failure relay for remote power failure indication.

**OPTIONAL:** A battery backup module shall be supplied to provide standby power to the gas detector. The battery backup module shall be housed in a NEMA 4X enclosure and shall be suitable for operating the two channel detector for up to 8 hours or a 4 channel system for up to 4 hours in the event of power outage. Battery backup units shall contain protective circuitry to isolate the battery in the event that battery voltage drops to levels where battery damage might result.

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