

## DESCRIPTION

Digital RS-485 communicating, addressable toxic and combustible gas sensor/controller with digital inputs, programmable relays and analog output for direct connection to the DGC6-Series Digital Gas Controller. The standard configuration includes (2) 4-20 mA inputs, (3) SPDT signal relays, (2) digital inputs and (1) analog output.

Each DC6 may be configured with one or two integrated SC2 sensor modules with X-Change sensor technology. The analog input channel may be used for a third gas sensor (AT6-Series) or any other transmitter type including temperature, humidity air flow, etc. The relays may be programmed to operate in response to readings from the "local" sensors or they may be activated by the DGC6 Controller in response to gas levels anywhere within the "zone" or "system." An optional horn/light module provides caution and alarm warning of high gas levels, system faults, and service due.

Advanced, microprocessor-based X-Change sensor modules meet or exceed the EN 50545-1 self-diagnostic standards including notifying the controller when calibration is due. Although field calibration is possible, X-Change technology allows fast and cost-effective sensor module swaps minimizing field service time, eliminating system downtime and ensuring peak system performance for many years.

Compliant with Safety Integrity Level 2 (SIL 2) and rigorous international standard EN 50545-1 for parking garages and tunnels, DC6-Series sensor/controllers utilize advanced self-diagnostics and flexible ventilation control functions to ensure maximum human safety without compromising energy efficiency.

## APPLICATION

DC6 sensor/controllers in combination with DT6 sensors and DGC6 Digital Gas Controllers provide scalable solutions for monitoring and controlling toxic and/or combustible gas levels. DC6-CO (single gas) and DC6-CO-NO2 (dual gas) sensor/controllers are economical electrochemical sensors ideally suited to parking garage, vehicle maintenance shops, package sorting and distribution facilities and tunnel applications.

Methane monitoring is an economical addition with the AT6-COMB analog sensor/transmitter.

## PolyGard®2 DC6



- EMC Directive 2014/30/EU
- Low Voltage Directive 2014/35/EU
- CE
- EN 50271 ■ EN 61508
- EN 60079-29-1
- EN 61010-1:2010
- ANSI/UL 61010-1
- CAN/CSA-C22.2 No. 61010-1
- City of Los Angeles Approved

## FEATURES

- Sensor node for 1 or 2 SC2-Series digital gas sensor modules
- (2) 4-20 mA analog inputs (max. 3 sensor inputs total; AT6-Series or other)
- (3) SPDT signal relays, max. 250 VAC / 5 A
- (2) Digital inputs
- (1) 4-20 mA analog output
- Warning horn and tri-color LED status module, optional
- Two-line LCD/keypad, optional
- X-Change toxic and combustible gas sensor modules for reliable operation and easy maintenance
- RS-485 serial communications to DGC6-Series Digital Gas Controllers
- Internal diagnostics including integrated hardware watchdog
- High-impact NEMA 4X (IP65) enclosure
- Hardware & software conforms to SIL 2 standard

**SPECIFICATIONS**

**Electrical**

Power supply	24 VDC, polarity protected
Power consumption	24 VDC
- base	55 mA
- sensors	See <i>SC2 datasheet</i>
- horn & multi-status LED	5 mA
- analog output	22 mA
Signal relays	Three (3), 250 VAC, 5 A, potential-free, contacts (SPDT); 2 programmable & 1 fault; programmability is determined by the number of connected sensors
Transistor output	Two (2), 24 VDC / 0.1 A (switching to plus)
Digital inputs	Two (2), potential-free
Analog inputs	Two (2), 4-20 mA overload and short-circuit proof, input resistance 200 Ω
Analog output signal	One (1), proportional, overload and short-circuit proof, load ≤ 500 Ω 4-20 mA = measuring range; 3.0 < 4 mA = under range; > 20-21.2 mA = over range; 2.0 mA = fault
Output for local bus	5 VDC, 250 mA max. Overload, short-circuit and polarity protected

Output signal for serial communication

Digital, RS-485, proprietary DGC6 protocol, 19200 baud

**Sensor Performance**

See *SC2 datasheet for specific gases*

Sensor coverage

See *SC2 datasheet for specific gases*

Storage time

6 months (for sensor elements)

**Environmental**

Permissible ambient

See *SC2 datasheet for specific gases*

**Serial Interface**

- local bus	1-wire / 19200 Baud
- field bus	RS-485 / 19200 Baud
- tool bus	2-wire / 19200 Baud

**Physical**

Enclosure "C", standard

- material	Polycarbonate, UL94 V-2, fire retardant
- color	Light gray
- protection	NEMA 4X (IP65)
- installation	Wall (surface) mounted, or single gang electrical box

Dimensions (H x W x D)

- base unit	5.12 x 5.12 x 2.95 in (130 x 130 x 75 mm)
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Weight

1.32 lb (0.6 kg)

Cable entry, knock outs

3 holes for 1/2 in. conduit, closed with silver "plugs"

Wire connection

3-pin connector

- local bus (SC2)  
- digital input & analog output

Screw-type terminal; 24 AWG (0.25 mm<sup>2</sup>), min. 16 AWG (1.3 mm<sup>2</sup>), max.

- power supply, relays

Screw-type terminal; 24 AWG (0.25 mm<sup>2</sup>), min. 14 AWG (2.5 mm<sup>2</sup>), max.

Weight

1.32 lb (0.6 kg)

**Conforms to**

EMC Directive 2014/30/EU  
Low Voltage Directive 2014/35/EU  
CE  
EN 50271  
EN 61508  
EN 60079-29-1  
EN 61010-1:2010  
ANSI/UL 61010-1  
CAN/CSA-C22.2 No. 61010-1  
City of Los Angeles

**Warranty**

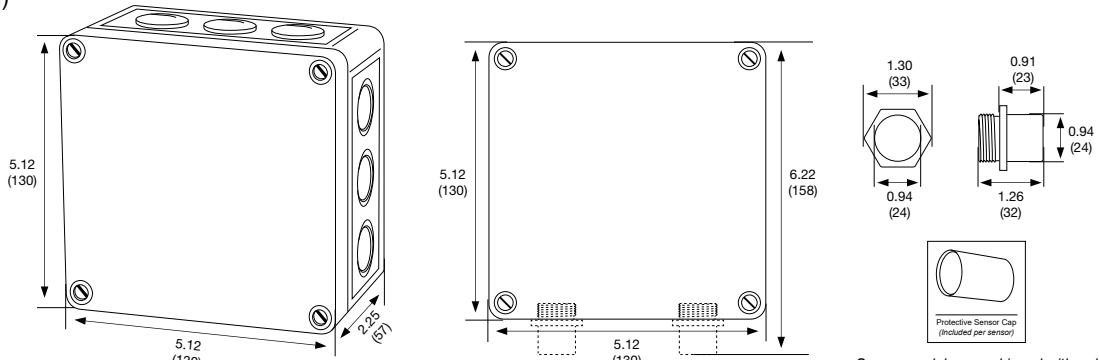
Two years material and workmanship, 12 months normal exposure for sensor element

## OPTIONS & ACCESSORIES

<b>Horn &amp; Status LED</b>	Configurable by local thresholds or remote DGC6 parameters
Horn	
- acoustic pressure	> 85 dB (A) (dist. 0.1 m / 0.3 ft)
- frequency	2300 Hz
- protection class	NEMA 4X (IP65)
Status LED	
- color / mode	Red = Alarm; Yellow = Fault; Green = Power (Normal); Green (flashing) = Service
- protection class	NEMA 4X (IP65)
<b>Liquid Crystal Display</b>	
LCD	Two lines, 16 characters each, illuminated
<b>Duct Mounting Kit</b>	<b>PG2-DUCTKIT</b>
- flow rate	Min. 3.1 mph (5000 m/h), max. 12.4 mph (20,000 m/h)
- air duct diameter	Min. 3.94 in. (0.1 m), max. 39.37 in. (1.0 m)
- length of sampling tube	9.84 in. (250 mm), adaptable
- hose length	2 x 39.37 in. (1000 mm)
<b>Calibration Kits</b>	
- carbon monoxide	<b>CALKIT-PG2-CO</b> Calibration Kit includes: Sensor calibration adapter w/ tube and cup, 150 mL/min regulator, 17 L 200 ppm carbon monoxide gas bottle, 17 L 99.99% nitrogen gas bottle, carrying case
- nitrogen dioxide	<b>CALKIT-PG2-NO2</b> Calibration Kit includes: Sensor calibration adapter w/ tube and cup, 500 mL/min regulator, 58 L 5 ppm nitrogen dioxide gas bottle, 58 L 99.99% nitrogen gas bottle, carrying case
- combustible gases	<b>CALKIT-PG2-COMB</b> Calibration Kit includes: Sensor calibration adapter w/ tube and cup, 150 mL/min regulator, 17 L 2.5% methane gas bottle, 17 L 99.99% nitrogen gas bottle, carrying case

**DIMENSIONS**

inches (mm)



Sensor modules are shipped with red protective cap. Remove cap to place sensor into service. Re-install cap to protect sensor from construction dust, power-washing or other excessive dirt/moisture.

**Short Description of the Function: Digital Outputs With Three Relays**

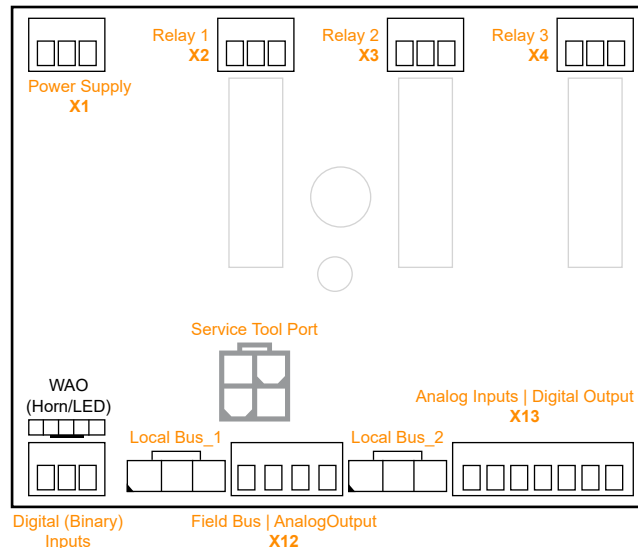
Action	Reaction Relay 1 (Alarm 1)	Reaction Relay 2 (Alarm 2)	Reaction Strobe Light (Alarm 2)	Reaction Horn (Alarm 2)	Reaction Relay 3 (Alarm 2 + fault)	Reaction LED
Gas signal < alarm threshold 1	OFF	OFF	OFF	OFF	ON	GREEN
Gas signal > alarm threshold 1	ON	OFF	OFF	OFF	OFF	RED
Gas signal > alarm threshold 2	ON	ON	ON	ON	ON	RED
Gas signal ≥ alarm threshold 2, but button Horn OFF activated	OFF		ON	OFF after delay ON		RED
Gas signal < (alarm threshold 2 - hysteresis) but ≥ alarm threshold 1	ON	OFF	OFF	OFF	OFF	RED
No alarm, no fault	OFF	OFF	OFF	OFF	ON	GREEN
No fault, but service due	OFF	OFF	OFF	OFF	ON	GREEN (flashing)
Internal error	OFF	OFF	ON	OFF	OFF	YELLOW

Note 1: Status OFF = Relay is configured "Alarm ON = Relay" or in the event of a power failure.

Note 2: Alarm thresholds can have the same value, therefore the relays and/or the horn and strobe can be triggered together.

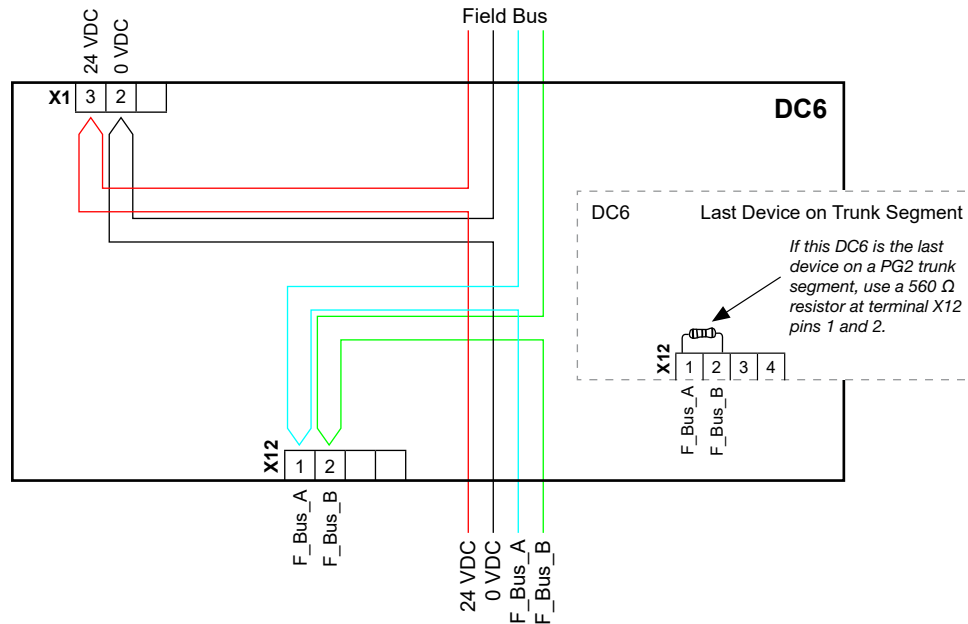
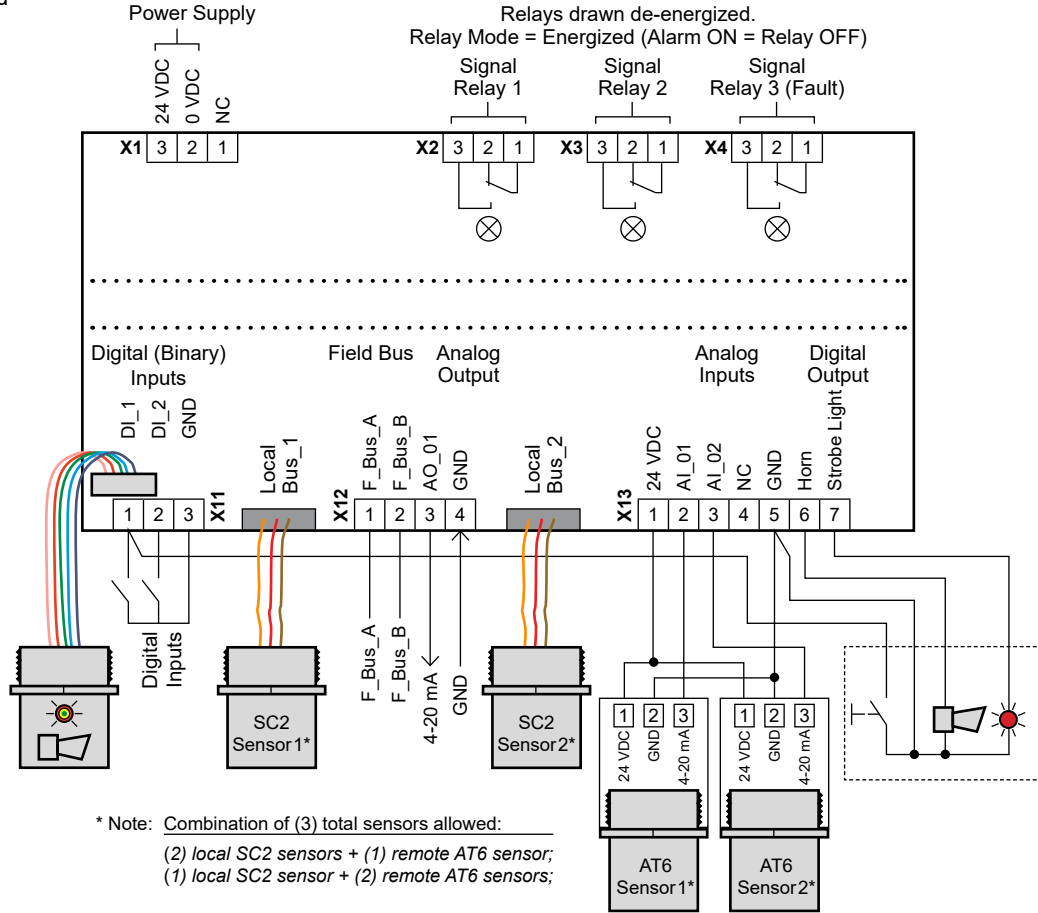
**SENSOR BOARD COMPONENTS**

DC6 Sensor Board



WIRING CONFIGURATION

DC6 Sensor Board



ORDERING INFORMATION	
PART NUMBER	DESCRIPTION
<b>BUNDLED SENSORS AND CONTROLS</b>	
<b>DC6-E1110-E-03</b>	DC6, DGC6 Protocol, (1) 0-250 ppm CO sensor
<b>DC6-E1110-E-E1130-B-03</b>	DC6, DGC6 Protocol, (1) 0-250 ppm CO sensor, (1) 0-20 ppm NO <sub>2</sub> sensor
<b>DC6-E1110-E-E1130-B-43</b>	DC6, DGC6 Protocol, (1) 0-250 ppm CO sensor, (1) 0-20 ppm NO <sub>2</sub> sensor, horn & status LEDs
<b>SENSOR PLATFORM</b>	
<b>DC6-03</b>	DC6, DGC6 Protocol; up to (3) sensor inputs capable; (3) SPDT relays; (2) digital inputs; (1) 4-20 mA analog output; includes "C" enclosure; sensor cartridges ordered separately
□□□-4□ □□□-□□- <b>D</b>	<u>OPTIONS:</u> Horn & status LED Display & keypad

**SC2 Sensor Cartridges available separately.** See SC2 datasheet for specifications.

The DC6 accepts up to (2) SC2 Sensor Cartridges simultaneously.

*In a 2-sensor configuration, both sensor modules (a) must have the same mounting height requirements and (b) sensor-1 and sensor-2 module cannot be identical part numbers.*

A 3-sensor configuration is possible with a remote AT6. The AT6's chosen sensor module cannot be an identical part number to ones that already exists on the connected DC6 transmitter.

Gas Sensor & Range				
#	TOXIC GASES AND OXYGEN			Mounting Height (ft)
E1110-E	Carbon Monoxide	CO	0-250 ppm	5-6
E1110-F	Carbon Monoxide	CO	0-300 ppm	5-6
E1130-A	Nitrogen Dioxide	NO <sub>2</sub>	0-10 ppm	5-6
E1130-B	Nitrogen Dioxide	NO <sub>2</sub>	0-20 ppm	5-6
E1130-C	Nitrogen Dioxide	NO <sub>2</sub>	0-30 ppm	5-6
E1130-D	Nitrogen Dioxide	NO <sub>2</sub>	0-500 ppm	5-6
E1125-C	Ammonia	NH <sub>3</sub>	0-300 ppm	Ceiling
E1125-D	Ammonia	NH <sub>3</sub>	0-1000 ppm	Ceiling
E1193-C	Chlorine	Cl <sub>2</sub>	0-10 ppm	Floor
E1183-C	Hydrogen Cyanide	HCN	0-100 ppm	Ceiling
E1189-C	Ethylene	C <sub>2</sub> H <sub>4</sub>	0-200 ppm	5-6
E1185-B	Formaldehyde	CH <sub>2</sub> O	0-10 ppm	Floor
E1190-A	Ozone	O <sub>3</sub>	0-5 ppm	Floor
E1196-B	Sulfur Dioxide	SO <sub>2</sub>	0-20 ppm	Floor
E1197-A	Hydrogen Sulfide	H <sub>2</sub> S	0-50 ppm	Floor
E1195-A	Oxygen	O <sub>2</sub>	0-25 Vol%	5-6
#	INFRARED SENSORS			Mounting Height (ft)
I1164-B	Carbon Dioxide	CO <sub>2</sub>	0-5 Vol%	5-6
I1164-C	Carbon Dioxide	CO <sub>2</sub>	0-2 Vol%	5-6
#	COMBUSTIBLE GASES			Mounting Height (ft)
P3485-A	Acetone	C <sub>3</sub> H <sub>6</sub> O	0-100% LEL	Floor
P3408-A	Ammonia	NH <sub>3</sub>	0-100% LEL	Ceiling
P3496-A	Gasoline Vapors	-	0-100% LEL	-
P3460-A	Butane	C <sub>4</sub> H <sub>10</sub>	0-100% LEL	Floor
P3472-A	Cyclopentane	C <sub>5</sub> H <sub>10</sub>	0-100% LEL	Floor
P3427-A	Ethyl Acetate	C <sub>4</sub> H <sub>8</sub> O <sub>2</sub>	0-100% LEL	Floor
P3425-A	Ethyl Alcohol	C <sub>2</sub> H <sub>5</sub> OH	0-100% LEL	Floor
P3410-A	Ethylene	C <sub>2</sub> H <sub>4</sub>	0-100% LEL	Ceiling
P3491-A	Heptane	C <sub>7</sub> H <sub>16</sub>	0-100% LEL	Floor
P3435-A	Hexane	C <sub>6</sub> H <sub>14</sub>	0-100% LEL	Floor
P3476-A	Isopentane	C <sub>5</sub> H <sub>12</sub>	0-100% LEL	Floor
P3482-A	Isopropyl Alcohol	C <sub>3</sub> H <sub>8</sub> O	0-100% LEL	Floor
P3498-A	JP8	-	0-100% LEL	-
P3402-A	LPG	-	0-100% LEL	-
P3400-A	Methane	CH <sub>4</sub>	0-100% LEL	Ceiling
P3450-A	Methanol	CH <sub>3</sub> OH	0-100% LEL	Floor
P3458-A	Methyl Ethyl Ketone	C <sub>4</sub> H <sub>8</sub> O	0-100% LEL	Floor
P3475-A	Pentane	C <sub>5</sub> H <sub>12</sub>	0-100% LEL	Floor
P3480-A	Propane	C <sub>3</sub> H <sub>8</sub>	0-100% LEL	Floor
P3480-C	Propane	C <sub>3</sub> H <sub>8</sub>	0-5000 ppm	Floor
P3484-A	Propyl Alcohol	C <sub>3</sub> H <sub>8</sub> O	0-100% LEL	Floor
P3490-A	Toluene	C <sub>7</sub> H <sub>8</sub>	0-100% LEL	Floor
P3440-A	Hydrogen	H <sub>2</sub>	0-100% LEL	Ceiling
ACCESSORIES				
<b>PG2-DUCTKIT</b>	(1) Duct mounting kit for SC2 / AT6 sensor			
<b>CALKIT-PG2-CO</b>	Carbon monoxide calibration kit for SC2 / AT6 sensors			
<b>CALKIT-PG2-NO2</b>	Nitrogen dioxide calibration kit for SC2 / AT6 sensors			
<b>CALKIT-PG2-COMB</b>	Combustible calibration kit for SC2 / AT6 sensors			