



Toxic (E-), Combustible (P-) and Infrared (I-CO₂) Gases
PolyGard®2 SC2 & AT6 Sensors

User Manual

November 2019

April 28, 2022 – *Revision*

1	Functional Description	3
1.1	General	3
1.2	Measuring Mode	3
1.3	Special Mode	3
1.4	Sensor Element for Toxic Gases and Oxygen	3
1.5	Sensor Element for Combustible Gases	4
1.6	Infrared Sensor Element for CO ₂	4
2	Installation	5
2.1	Mounting Instructions	5
3	Electrical Connection	6
3.1	Plug Connection (SC2)	6
3.2	Terminal Connection (AT6)	6
4	Commissioning	6
4.1	Installation of Sensor Cartridge	7
4.2	Registration of the Sensor Cartridge	7
5	Calibration	7
5.1	Calibration Process	8
5.2	Exchange of Sensor Cartridge	9
6	Inspection and Service	9
6.1	Inspection	9
6.2	Service and Calibration	10
7	Troubleshooting	11
7.1	Indicators at the SC2	11
7.2	Indicators at the AT6	11
7.3	Printed Circuit Board	11
7.4	Sensor Cartridge (Messages at the Tool / Controller)	11
8	Cross-sensitivity Data	12
9	Technical Data	12
9.1	SC2 (Sensor Cartridge)	12
9.2	AT6	12
9.3	Sensor Element	13
9.4	Cross Sensitivity - Sensor Cartridge (SC2 / AT6) / Sensor Element	15
10	Figures	16
11	Part Disposal	17
12	Notes and General Information	17
13	Intended Product Application	17
13.1	Installers' Responsibilities	17
13.2	Maintenance	17
13.3	Limited Warranty	17

Intended Use

The SC2 sensors are designed for the measurement of toxic gases and oxygen in a wide range of applications with the PolyGard®2 Series. The AT6 sensor/transmitter operates with 24 VDC and outputs an analog 4-20 mA standard signal. Both the SC2 sensor cartridge and AT6 sensor/transmitter utilizes similar technologies and thus collectively referred to as same (“sensor cartridge,” “sensors”) in this document unless otherwise noted.

The sensors must not be used in potentially explosive atmospheres. They must only be employed in areas within the environmental conditions as specified in the Technical Data.

1 Functional Description

1.1 General

The SC2 sensor includes a microprocessor for measurement value processing in addition to the gas sensor element and the measuring amplifier. All data and measured values of the sensor element are stored in a fail- safe way in the microprocessor and are digitally transferred via the local bus to the PG2 devices. The calibration management is also integrated in the microprocessor of the sensor cartridge.

The AT6 sensor/transmitter works according to the same principle as the SC2 series with the exception that the AT6 outputs an analog signal of 4-20 mA (2-10 V as an option).

1.2 Measuring Mode

See description on datasheet for the specific PG2 device.

1.3 Special Mode

See description on datasheet for the specific PG2 device.

1.4 Sensor Element for Toxic Gases and Oxygen

The sensor element is a sealed electro-chemical cell with three electrodes, sensing, reference and counter or with two electrodes, sensing and reference. The ambient air to be monitored diffuses through a membrane filter into the liquid electrolyte of the sensor. The chemical process of the measurement is one of oxidation where one molecule of the target gas is exchanged for one molecule of oxygen. The reaction drives the oxygen molecule to the counter electrode, generating a DC microampere signal between the sensing and reference electrodes. This signal is linear to the volume concentration of the sensed gas. The signal is evaluated by the connected amplifier and transformed into a linear output signal.

Electrochemical processes always lead by-and-by to a loss of sensitivity. Therefore regular calibration of zero- point and gain is necessary. See section 5.



There is a small quantity of corrosive liquid in the sensor element. If in case of damage persons or objects touch the liquid, clean the affected areas immediately and carefully as possible with tap water. Out of use sensors must be disposed in the same way as batteries.

Certain substances and gases in the ambient air to be monitored can affect the sensitivity of the sensor element or destroy the sensor completely. This is considered sensor poisoning.

The following are currently known:

- Polymerizing substances, such as ethylene oxide, acrylonitrile, butadiene, styrene, silicone.
- Corrosive substances, such as halogenated hydrocarbons.
- Catalytic poisons, such as sulfur and phosphor compounds, silicon compounds, metal vapors.

1.5 Sensor Element for Combustible Gases

The integrated sensor works according to the catalytic bead principle. The ambient air to be monitored diffuses through a sintered metal disk into the sensor. Here the combustible gases and vapours are burned catalytically at a heated detector element (pellistor). The resulting combustion heat also heats up the detector element. This heating changes the resistance of the detector element which is proportional to the partial pressure of the combustible gases.

In addition to the catalytic detector element, the sensor also has a similarly heated inactive compensator element. Both elements are part of a Wheatstone measuring bridge. Environmental influences such as temperature, air humidity or thermal conductivity of the ambient air to be monitored affect both elements to the same extent so that these influences have no significant effect on the measuring signal.



Certain substances and gases in the ambient air to be monitored can affect the sensitivity of the sensor element or destroy the sensor completely. This is called poisoning.

The following are currently known:

- Polymerising substances, such as ethylene oxide, acrylonitrile, butadiene, styrene, silicone.
- Corrosive substances, such as halogenated hydrocarbons.
- Catalytic poisons, such as sulphur and phosphor compounds, silicon compounds, metal vapours.
- Organic solvents

For testing the sensor, do **not** use a lighter. If gassed with a lighter the sensor cannot be employed for reliable measurement and must first be recalibrated. The sensor may be damaged, and the calibration should then be repeated at much shorter intervals. In addition, the resulting amount of heat can lead to the mechanical destruction of the sensor. The product warranty is void by fumigation with a lighter.

1.6 Infrared Sensor Element for CO₂

The integrated sensor is based on the principle of the infrared absorption of gases and accomplishes highest requirements concerning accuracy, reliability and economy. The sensor technology uses the individual absorption spectrum of the carbon dioxide gas and determines its exact concentration through its accurate, quantitative analysis. The infrared principle nearly eliminates the cross-sensitivity to other gases.

An integrated evaluation electronic system reliably compensates all drift and temperature influences and therefore a genuine measurement result is guaranteed.



Certain substances and gases in the monitored ambient can affect the sensitivity of the sensor element or destroy the sensor completely. This is called poisoning.

The following are currently known:

- Polymerising substances, such as ethylene oxide, acrylonitrile, butadiene, styrene, silicone
- Corrosive substances, such as halogenated hydrocarbons
- Catalytic poisons, such as sulphur and phosphor compounds, silicon compounds, metal vapours
- **SC2 infrared sensors are incompatible with the DR6 module**

2 Installation



Electronics can be destroyed by electrostatic discharge (ESD). Therefore installation work should be done only by persons connected to ground, e. g. by standing on a conductive floor or by taking appropriate grounding measures (acc. to DIN EN 100015).

2.1 Mounting Instructions

- Choose mounting location of the sensor according to the local regulations.
- Consider ventilation conditions! Do not mount the sensor near the airflow (air passages, suction holes etc.).
- Mount the sensor at a location with minimum vibration and minimum variation in temperature (avoid direct sunlight).
- Avoid locations where water, oil etc. may influence proper operation and where mechanical damage might be possible.
- Provide adequate space around the sensor for maintenance and calibration work.

Gas Sensor & Range					
#	TOXIC GASES AND OXYGEN			Coverage Area (ft ²), Max.	Mounting Height (ft)
E1110-E	Carbon Monoxide	CO	0-250 ppm	7,500	5-6
E1110-F	Carbon Monoxide	CO	0-300 ppm	7,500	5-6
E1130-A	Nitrogen Dioxide	NO ₂	0-10 ppm	7,500	5-6
E1130-B	Nitrogen Dioxide	NO ₂	0-20 ppm	7,500	5-6
E1130-C	Nitrogen Dioxide	NO ₂	0-30 ppm	7,500	5-6
E1130-D	Nitrogen Dioxide	NO ₂	0-500 ppm	7,500	5-6
E1125-C	Ammonia	NH ₃	0-300 ppm	4,000	Ceiling
E1125-D	Ammonia	NH ₃	0-1000 ppm	4,000	Ceiling
E1193-C	Chlorine	Cl ₂	0-10 ppm	Near Source	Floor
E1183-C	Hydrogen Cyanide	HCN	0-100 ppm	Near Source	Ceiling
E1189-C	Ethylene	C ₂ H ₄	0-200 ppm	5,000	5-6
E1185-B	Formaldehyde	CH ₂ O	0-10 ppm	Contact Rep	Floor
E1190-A	Ozone	O ₃	0-5 ppm	5,000	Floor
E1196-B	Sulfur Dioxide	SO ₂	0-20 ppm	5,000	Floor
E1197-A	Hydrogen Sulfide	H ₂ S	0-50 ppm	5,000	Floor
E1195-A	Oxygen	O ₂	0-25 Vol%	5,000	5-6
#	INFRARED SENSORS <i>(Incompatible with DR6 module)</i>			Coverage Area (ft ²), Max.	Mounting Height (ft)
I1164-B	Carbon Dioxide	CO ₂	0-5 Vol%	7,500	5-6
I1164-C	Carbon Dioxide	CO ₂	0-2 Vol%	7,500	5-6
#	COMBUSTIBLE GASES			Coverage Area (ft ²), Max.	Mounting Height (ft)
P3485-A	Acetone	C ₃ H ₆ O	0-100% LEL	4,000	Floor
P3408-A	Ammonia	NH ₃	0-100% LEL	4,000	Ceiling
P3496-A	Gasoline Vapors	-	0-100% LEL	4,000	-
P3460-A	Butane	C ₄ H ₁₀	0-100% LEL	4,000	Floor
P3472-A	Cyclopentane	C ₅ H ₁₀	0-100% LEL	4,000	Floor
P3427-A	Ethyl Acetate	C ₄ H ₈ O ₂	0-100% LEL	4,000	Floor
P3425-A	Ethyl Alcohol	C ₂ H ₅ OH	0-100% LEL	4,000	Floor
P3410-A	Ethylene	C ₂ H ₄	0-100% LEL	4,000	Ceiling
P3491-A	Heptane	C ₇ H ₁₆	0-100% LEL	4,000	Floor
P3435-A	Hexane	C ₆ H ₁₄	0-100% LEL	4,000	Floor
P3476-A	Isopentane	C ₅ H ₁₂	0-100% LEL	4,000	Floor
P3482-A	Isopropyl Alcohol	C ₃ H ₈ O	0-100% LEL	4,000	Floor
P3498-A	JP8	-	0-100% LEL	4,000	-
P3402-A	LPG	-	0-100% LEL	4,000	-
P3400-A	Methane	CH ₄	0-100% LEL	4,000	Ceiling
P3450-A	Methanol	CH ₃ OH	0-100% LEL	4,000	Floor
P3458-A	Methyl Ethyl Ketone	C ₄ H ₈ O	0-100% LEL	4,000	Floor
P3475-A	Pentane	C ₅ H ₁₂	0-100% LEL	4,000	Floor
P3480-A	Propane	C ₃ H ₈	0-100% LEL	4,000	Floor
P3480-C	Propane	C ₃ H ₈	0-5000 ppm	4,000	Floor
P3484-A	Propyl Alcohol	C ₃ H ₈ O	0-100% LEL	4,000	Floor
P3490-A	Toluene	C ₇ H ₈	0-100% LEL	4,000	Floor
P3440-A	Hydrogen	H ₂	0-100% LEL	4,000	Ceiling

3 Electrical Connection

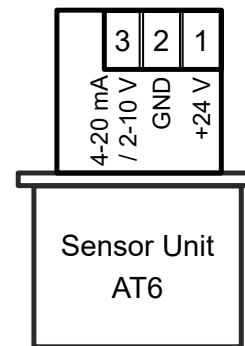
3.1 Plug Connection (SC2)

SC2 sensors are equipped with a reverse polarity protected connector (3-pin). It mustn't be plugged in the wrong position by force (already clamped at the factory).

All black plugs are connected in parallel, so it is irrelevant which plug to use.

3.2 Terminal Connection (AT6)

- Open cover.
- Insert field bus cable from above, cut and strip it.
- Connect it to the terminal (only 3-wire connection possible).
- For the 4-20 mA operating mode, please remove the built-in 500 ohm resistor between terminals 2 and 3.



4 Commissioning

Only **trained technicians** should perform the following when commissioning:

- Check for correct mounting location.
- Check if connection is correct.
- Check power voltage (for AT6).
- Install the Sensor Cartridge(s) if not already installed ex works.
- Check Sensor Cartridge connector for correct engagement.
- Calibration; note that new sensors are pre-calibrated at the factory.

Within the first weeks after commissioning, there may be a deviation in the sensor behavior. Required instruments for commissioning (calibration):

- Service Tool STL6 or
- DPT6 kit (DGC6 EasyConf Software incl. USB/RS-485 adapter)
- Calibration Gases:
 - For toxic and oxygen sensors
 - Zero gas bottle with synthetic air (20% oxygen, 80% nitrogen)
 - Span gas bottle of target gas in the range of 30-90% of the measuring range. Rest is synthetic air.
 - For combustible sensors
 - Zero gas bottle with synthetic air (20% oxygen, 80% nitrogen)
 - Span gas bottle of target gas in the range of 30-70% of the measuring range. Rest is synthetic air.
 - For infrared CO₂ sensors
 - Zero gas bottle with pure nitrogen 5.0 for zero-point calibration
 - Span gas bottle with CO₂ in the range of 30-90% of the measuring range. Rest is synthetic air.
- Extraction set consisting of gas pressure regulator and flow meter
- Calibration adapter with tube; CONKIT-PG2.

4.1 Installation of Sensor Cartridge

The Sensor Cartridges are provided already installed to the PG2 devices and capped to protect against dirt and damage. Replacement sensors are available individually:

- Check gas type, range and calibration date of Sensor Cartridge.
- Define installation place on the housing of the basic or remote sensor and break out knockouts.
- Tighten the Sensor Cartridge with M32 hexagon lock nut.
- Plug in the Sensor Cartridge at X2 or X3 of the sensor board. Observe plug polarity, the plug must engage.

4.2 Registration of the Sensor Cartridge

Registration and addressing of the field bus can be read in the manual for the specific PG2 transmitter or controller.

5 Calibration

The service tool STL6 or DPT6 (DGC6 EasyConf software) are available for convenient on-site calibration. See their respective datasheet.

A sensor exchange program is also available, consult your account executive.



Prior to calibration the Sensor Cartridge must be supplied with power voltage without interruption for warm-up and stabilization. The warm-up time depends on the sensor element and is shown in the following tables:

Gas type	Formula	Calibration with replacement gas (Sensitivity in %)	Warm-up (h)	Flow rate (ml/min)	Calibration interval in months
Ammonia	NH ₃	-	18	300	See Specification section later in this document
Chlorine	Cl ₂	-	6	150	
Hydrogen cyanide	HCN	-	6	300	
Formaldehyde	CH ₂ O	-	24	300	
Carbon monoxide	CO	-	1	150	
Ozone	O ₃	-	6	150	
Sulfur dioxide	SO ₂	-	6	300	
Hydrogen sulphide	H ₂ S	-	6	150	
Nitrogen dioxide	NO ₂	-	6	500	
Oxygen (-A/-A2)	O ₂	-	1	150	

Gas type	Stabilization time to spec (min)	Warm-up (h)	Flow rate (ml/min)	Calibration interval in months
All (combustible) pellistor sensors	60	24	150	See Specification section later in this document

Gas type	Stabilization time to spec (min)	Warm-up (h)	Flow rate (ml/min)	Calibration interval in months
Carbon dioxide	10	24	1500	See Specification section later in this document



Please observe proper handling procedures for compressed gas and test gas bottles.

Test gas can be toxic; never inhale it!

- Symptoms: Dizziness, headache and nausea.
- Procedure if exposed: Remove victim to fresh air at once, seek medical attention.

5.1 Calibration Process

Prior to calibration, activate the mode “Special Mode” at the basic device via tool or software: only then the calibration menu is enabled. During the special mode the basic device doesn’t issue alerts.

For visual illustrations, consult the online document “PolyGard2-Sensor-Calibration-Procedure.”

- Connect calibration adapter carefully to the sensor cartridge
- Connect calibration tool to the printed circuit board
- Select the Sensor Cartridge to be calibrated by selecting the gas type

Zero calibration

- For toxic, oxygen & combustible sensors
 - Apply synthetic air (flow rate according to the table “calibration”, 1 bar \pm 10%) to the Sensor Cartridge.
- For infrared CO₂ sensors
 - Apply pure nitrogen 5.0 (flow rate according to the table “Calibration”, 1 bar \pm 10%) to the Sensor Cartridge.
- The current zero offset and the offset value of the first calibration is read with “Read”.
- When the value is stable, the new zero offset factor is calculated with “Calibration”.

The new offset factor is checked for plausibility and stored in the buffer memory. The current measured value is output with the new offset factor and the offset display is updated.

- With “Save” the new offset factor is written in the SC memory, only then the Zero calibration has been successfully completed. If you exit the menu without pressing “Save”, the original offset data for the measured value calculation will continue to be used.
 - ALERT: With a zero reading > 10% of measuring range during the zero calibration, zero calibration is not possible.

Gain calibration

- Enter test gas concentration:
 - For toxic, oxygen and CO₂, value between 30-90% of the measuring range.
 - For combustibles, value between 30-70% of the measuring range.
- The current sensor element sensitivity is read with “Read”.
- Apply test gas (flow rate according to the table “Calibration”, 1 bar \pm 10%) to the Sensor Cartridge.
- When the value is stable, the new gain factor is calculated with “Calibration”.

The new gain factor is checked for plausibility and stored in the buffer memory. The current measured value is output with the new gain factor and the sensor element sensibility is updated.

- With “Save” the new gain factor is written in the module’s memory, only then the gain calibration has been successfully completed. If you exit the menu without pressing “Save”, the original gain data for the measured value calculation will continue to be used.



Calibration will not be possible when the sensitivity of the sensor drops to 40% or lower; the Sensor Cartridge must be replaced.

5.2 Exchange of Sensor Cartridge

Instead of the on-site calibration, the used SC can be replaced simply and conveniently by a calibrated one.



The communication of the sensor cartridge to the sensor board is continuously monitored during operation and results in an immediate error message on the gas controller in case of fault or interruption. When replacing the sensor unit, the communication of the local bus is interrupted when unplugging the SC connector which leads to an immediate triggering of the error message.

- Disconnect the SC connector from the printed circuit board (error message will be activated).
- Loosen the locknut.
- Remove used SC.
- Take calibrated SC out of the original packaging, check for gas type, measuring range and valid calibration date.
- Insert the SC and re-tighten with lock nut.
- Insert the SC plug into the socket at the circuit board. Check plug for proper connection.

The local bus communication is automatically established and tested. At the same time the gas type and the measuring range of the “new” SC are compared with the data stored in the circuit board. If they match and the communication is correct, the error message will be automatically acknowledged in the Gas Controller.

The yellow LED of the circuit board flashes with a pulse of 1 sec. as long as the SC connector is disconnected (communication error). After the local bus communication has been re-established and the conformity test has been successful, the LED goes into flashing mode with 3 sec. pulse duration until the sensor’s warm-up time is over.

Apply a defined gas concentration on the sensor element with the help of the gas generator and check the measurement signal at the analog output or at the relay outputs.

The entire cycle “Sensor Element > Sensor Cartridge > Local Bus > Sensor Board > Field Bus > Controller” is observed and completed.

6 Inspection and Service

Inspection, service and calibration of the sensor should be done by trained technicians at regular intervals. We therefore recommend concluding a service contract with INTEC Controls or one of their authorized partners.

According to EN 45544-4, inspection and service have to be executed at regular intervals. The maximum intervals have to be determined and respected by the person responsible for the gas warning system according to the legal requirements. INTEC Controls recommends employing the common inspection and service intervals as specified in the general regulations of the gas measuring technique. The recommended calibration intervals depend on the sensor element and can be read from the table “Calibration”. If there are different intervals, always observe the shortest one.

Inspections and services must be documented. The date for the next maintenance has to be affixed to the sensor.

6.1 Inspection

Gas sensors should be controlled regularly by a competent person according to EN 45544-4. The following has to be checked in particular:

- Maintenance/ calibration interval not exceeded.
- Visual inspection of the sensor including cable for damage etc.
- Remove dust deposits, especially at the gas inlet.
- The filter at the gas inlet has to be replaced if extremely dirty.

6.2 Service and Calibration

When performing the maintenance you have to do the calibration and the functional test, see chapter 5, in addition to the inspection.

A fixed calibration interval is stored for each sensor type.

SC2 Sensor heads:

If this interval is exceeded, a digital maintenance message is generated and forwarded. Performing the calibration automatically deletes this message.

AT6 Sensor heads:

If this interval is exceeded, the current output of the AT6 goes to a fixed 19 mA signal. For new devices (factory calibration), the interval may be exceeded by a factor of 1.5.

After voltage recovery, there is a defined interruption of this message. This can be of use in order to employ the device without the maintenance message for a few days (adjustable in system parameters -> error time, value range > 1) until the calibration is repeated.

Performing the calibration automatically deletes this message.

7 Troubleshooting

7.1 Indicators at the SC2

The SC2 head does not have diagnostic indicators; messages are relayed from the attached PG2 devices.

7.2 Indicators at the AT6

The 4-20 mA output of the AT6 can be used as diagnostic indicators.

Output current

Restart:	1 mA
Device error:	2 mA
Tolerable negative sensor drift:	3-4 mA
Normal measurement mode:	4-20 mA
Tolerable overrange:	20-21 mA
Overrange error:	>21 mA
Maintenance message:	19 mA

7.3 Printed Circuit Board

Trouble	Cause	Solution
Green LED isn't on.	Power voltage not applied	Measure tension at X4: (16-28 V DC) Pin 1 (+) and 2 (-)
	Polarity not correct at X4	Connect correctly
	Connector X4 not plugged in	Check the plug
	Wire breakage	Check the wiring
Green LED doesn't flash.	PCB: no address	Check PCB address, address correctly
	PCB: no field bus communication	Check field bus wiring, topology and termination
No measured value at the Tool or Controller	SC not or wrongly plugged in	Check SC plug
	SC not registered	Register SC
	SC gas type/measuring range doesn't match with registered ones	Check SC data<> registration data for conformity
Message at the Tool / Controller: - 24 VDC voltage <range> - 5 VDC voltage <range> - Temp. <range> - WatchDog triggered	Internal error	Replace PCB

7.4 Sensor Cartridge (Messages at the Tool / Controller)

Measuring signal <range>	Internal error	Replace SC
5 VDC voltage < range >		
Temperature < range >		
WatchDog triggered		
SC Input 1 ≠ stored type	Wrong SC type at input 1	Check SC at input 1, replace it
SC Input 2 ≠ stored type	Wrong SC type at input 2	Check SC at input 2, replace it
SC Input 3 ≠ stored type	Wrong SC type at input 3	Check SC at input 3, replace it

8 Cross-sensitivity Data

The cross sensitivity depends on the used transmitter type and can be read from the table Cross Sensitivity (see section 9.4). Other gases can have an influence on the sensitivity, too. The table does not claim to be complete. The indicated sensitivity data are only standard values referring to new sensor elements.

9 Technical Data

All specifications were collected under optimal test conditions.

We confirm compliance with the minimum requirements of the applicable standard.

9.1 SC2 (Sensor Cartridge)

Please check the SC2 datasheet for the latest specifications. Available at:

<http://inteccontrols.com/gas-detection/SC2.html>

<http://inteccontrols.com/gas-detection/SC2.pdf>

9.2 AT6

Please check the AT6 datasheet for the latest specifications. Available at:

<http://inteccontrols.com/gas-detection/AT6.html>

<http://inteccontrols.com/gas-detection/AT6.pdf>

9.3 Sensor Element

Sensor Cartridge (SC2 / AT6) Technical Data

Part Number	Molecular Formula	Measuring Range	Accuracy	Resolution	Repeatability	Response Time	Zero Point Variation	Long Term Drift		Working Temperature	Humidity Range (non-condensing)	Sensor Life Expectancy ¹ , Normal Conditions	Relative Gas Density	Mounting Height	Calibration Interval ¹
								Zero	Gain						
TOXIC GASES AND OXYGEN															
		ppm	< ± % sig.	ppm	< ± % sig.	t90 < sec.	± ppm	< % signal/ mo.		°F	% RH	> mo.	Air = 1	ft	mo.
E1110-E	CO	0-250	3	0.5	5	50	4	0.4	0.4	-4/149	10-95	72	0.97	5-6	12
E1110-F	CO	0-300	3	0.5	5	50	4	0.4	0.4	-4/149	10-95	72	0.97	5-6	12
E1130-A	NO ₂	0-10	0.5	0.1	2	25	0.2	1	2	-4/149	15-90	24	1.59	5-6	12
E1130-B	NO ₂	0-20	0.5	0.1	2	25	0.2	1	2	-4/149	15-90	24	1.59	5-6	12
E1130-C	NO ₂	0-30	0.5	0.1	2	25	0.2	1	2	-4/149	15-90	24	1.59	5-6	12
E1130-D	NO ₂	0-500	20	2	2	25	0.2	1	2	-4/149	15-90	24	1.59	5-6	12
E1125-C	NH ₃	0-300	30	2	10	120	50	1	2	-22/122	15-90	24	0.59	Ceiling	12
E1125-D	NH ₃	0-1000	30	4	10	120	50	1	2	-22/122	15-90	24	0.59	Ceiling	12
E1193-C	Cl ₂	0-10	0.1	0.1	2	90	0.2	1	2	-4/122	15-90	24	2.4	Floor	6
E1183-C	HCN	0-100	0.2	0.1	2	20	1	1	2	-4/122	15-90	24	0.93	Ceiling	6
E1189-C	C ₂ H ₄	0-200	1.0	0.3	1	60	4	1	3	-4/122	15-90	24	0.97	5-6	12
E1185-B	CH ₂ O	0-10	0.5	0.01	2	50	0.2	1	2	14/122	15-90	36	1.09	Floor	6
E1190-A	O ₃	0-5	0.1	0.05	5	60	0.15	1	2	14/122	15-90	24	1.66	Floor	12
E1196-B	SO ₂	0-20	0.2	0.2	2	20	0.1	1	2	14/122	15-90	24	2.26	Floor	12
E1197-A	H ₂ S	0-50	0.2	0.1	2	60	0.1	1	2	14/122	15-90	24	1.19	Floor	12
		% Vol													
E1195-A	O ₂	0-25	0.5	0.05	--	15	--	--	0.3	-13/122	5-95	24	--	5-6	6
INFRARED SENSORS (Incompatible with DR6 module)															
		% Vol													
I1164-B	CO ₂	0-5	< 10% ²	--	--	100	--	--	--	31/104	0-95	180	1.67	5-6	60
I1164-C	CO ₂	0-2	< 10% ²	--	--	100	--	--	--	31/104	0-95	180	1.67	5-6	60

¹ Manufacturer-recommended calibration interval for normal environmental conditions
² of Reading

SC2-AT6 – UserManual



Specifications subject to change without notice. | Tox_D_1119, Ex_D_1119, CO2_D_0320 | USA 220428 | Page 14 of 17

Part Number	Molecular Formula	Measuring Range	Accuracy	Resolution	Repeatability	Response Time	Zero Point Variation	Long Term Drift		Working Temperature	Humidity Range (non-condensing)	Sensor Life Expectancy ¹ , Normal Conditions	Relative Gas Density	Mounting Height	Calibration Interval ¹
								Zero	Gain						
COMBUSTIBLE GASES ²															
		% LEL	< % sig. (CH ₄)	%LEL	< % sig. (CH ₄)	t90 < sec.	% (CH ₄)	< % LEL / mo. (CH ₄)		°F	% RH	> mo.	Air = 1	ft	mo.
P3485-A	C ₃ H ₆ O	0-100	1	0.2	1	15	0.5	0.3	1	-4/122	5-95	36	2.00	Floor	6
P3408-A	NH ₃	0-100	1	0.2	1	15	0.5	0.3	1	-4/122	5-95	36	0.60	Ceiling	6
P3496-A	vapors	0-100	1	0.2	1	15	0.5	0.3	1	-4/122	5-95	36	-	-	6
P3460-A	C ₄ H ₁₀	0-100	1	0.2	1	15	0.5	0.3	1	-4/122	5-95	36	2.11	Floor	6
P3472-A	C ₅ H ₁₀	0-100	1	0.2	1	15	0.5	0.3	1	-4/122	5-95	36	-	Floor	6
P3427-A	C ₄ H ₈ O ₂	0-100	1	0.2	1	15	0.5	0.3	1	-4/122	5-95	36	3.04	Floor	6
P3425-A	C ₂ H ₅ OH	0-100	1	0.2	1	15	0.5	0.3	1	-4/122	5-95	36	1.59	Floor	6
P3410-A	C ₂ H ₄	0-100	1	0.2	1	15	0.5	0.3	1	-4/122	5-95	36	0.98	Ceiling	6
P3491-A	C ₇ H ₁₆	0-100	1	0.2	1	15	0.5	0.3	1	-4/122	5-95	36	3.46	Floor	6
P3435-A	C ₆ H ₁₄	0-100	1	0.2	1	15	0.5	0.3	1	-4/122	5-95	36	2.98	Floor	6
P3476-A	C ₅ H ₁₂	0-100	1	0.2	1	15	0.5	0.3	1	-4/122	5-95	36	2.48	Floor	6
P3482-A	C ₃ H ₈ O	0-100	1	0.2	1	15	0.5	0.3	1	-4/122	5-95	36	2.08	Floor	6
P3498-A	JP8	0-100	1	0.2	1	15	0.5	0.3	1	-4/122	5-95	36	-	-	6
P3402-A	LPG	0-100	1	0.2	1	15	0.5	0.3	1	-4/122	5-95	36	-	-	6
P3400-A	CH ₄	0-100	1	0.2	1	15	0.5	0.3	1	-4/122	5-95	36	0.55	Ceiling	6
P3450-A	CH ₃ OH	0-100	1	0.2	1	15	0.5	0.3	1	-4/122	5-95	36	1.11	Floor	6
P3458-A	C ₄ H ₈ O	0-100	1	0.2	1	15	0.5	0.3	1	-4/122	5-95	36	1.15	Floor	6
P3475-A	C ₅ H ₁₂	0-100	1	0.2	1	15	0.5	0.3	1	-4/122	5-95	36	2.49	Floor	6
P3480-A	C ₃ H ₈	0-100	1	0.2	1	15	0.5	0.3	1	-4/122	5-95	36	1.55	Floor	6
P3484-A	C ₃ H ₈ O	0-100	1	0.2	1	15	0.5	0.3	1	-4/122	5-95	36	2.08	Floor	6
P3490-A	C ₇ H ₈	0-100	1	0.2	1	15	0.5	0.3	1	-4/122	5-95	36	3.18	Floor	6
P3440-A	H ₂	0-100	1	0.2	1	15	0.5	0.3	1	-4/122	5-95	36	0.07	Ceiling	6
		ppm	< % sig. (C ₃ H ₈)	ppm	< % sig. (C ₃ H ₈)										
P3480-C	C ₃ H ₈	0-5000	2	1	2	15	0.5	0.3	1	-4/122	5-95	36	1.55	Floor	6

¹ Manufacturer-recommended calibration interval for normal environmental conditions

² The sensitivity of Pellistor sensors can be influenced by substances containing silicon compounds and even poisoned/destroyed by them.

9.4 Cross Sensitivity - Sensor Cartridge (SC2 / AT6) / Sensor Element

Ordering No.	Gas type	Alcohols	Chlorine, Cl ₂	Ethanol, C ₂ H ₆ O	Ethylene, C ₂ H ₄	Carbon monoxide, CO	Carbon dioxide, CO ₂	Sulfur dioxide, SO ₂	Hydrogen sulphide, H ₂ S	Nitrogen dioxide NO ₂	Nitrogen monoxide, NO
SC2- / AT6-		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
E1125-AX	NH ₃	10/0	100/0	100/0	200/0	5000/0	10/<10	10/<20	20/<2	20/0	1000/-10
E1125-BX	NH ₃	10/0	100/0	100/0	200/0	5000/0	10/<12	10/<30	20/0	20/0	1000/-150
E1125-CX	NH ₃	10/0	100/0	100/0	200/0	5000/0	10/<12	10/<30	20/0	20/0	1000/-150
E1125-DX	NH ₃	10/0	100/0	100/0	200/0	5000/0	10/<12	10/<30	20/0	20/0	1000/-150
E1125-EX	NH ₃	10/0	100/0	100/0	200/0	5000/0	10/<12	10/<30	20/0	20/0	1000/-150
E1193-XX2	Cl ₂				300/0		5/0		20/20	35/0	300/0
E1183-XX2	HCN			100/0	100/2		20/38	15/25	5/-12	35/0	100/2
E1185-BX	CH ₂ O				10-18%						1-3%
E1110-XX2	CO	2/0	2000/5			5000/0	50/0.5	25/0	50/-1	50/8	100/20
E1190-XX2	O ₃	5/45/4	100/0		300/0		5/0		20/10	35/0	300/0
E1196-BX	SO ₂		100/0		100/1			10/0	100/-125	100/0	100/1
E1197-XX2	H ₂ S				100/2		100/20		5/1	35/2	100/20
E1130-XX2	NO ₂	1/1	100/0	500/0	400/0	5000/0	30/-0.6	20/-25		50/0	1000/0
E1195-XX2	O ₂					5 Vol%/					

Illustration: Gas concentration of interference gas / reaction of sensor

1 The table doesn't claim to be complete. Other gases, too, can have an influence on the sensitivity. The mentioned cross sensitivity data are only reference values valid for new sensors.
 2 Cross sensitivities valid for all measuring ranges of the sensor.

10 Figures

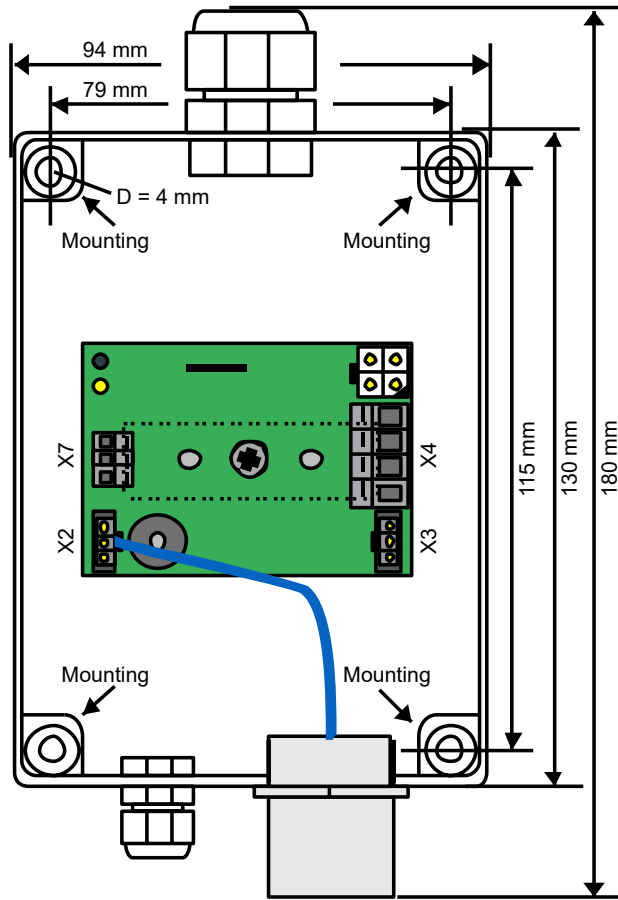


Fig. 1
Printed Circuit Board with Sensor Cartridge

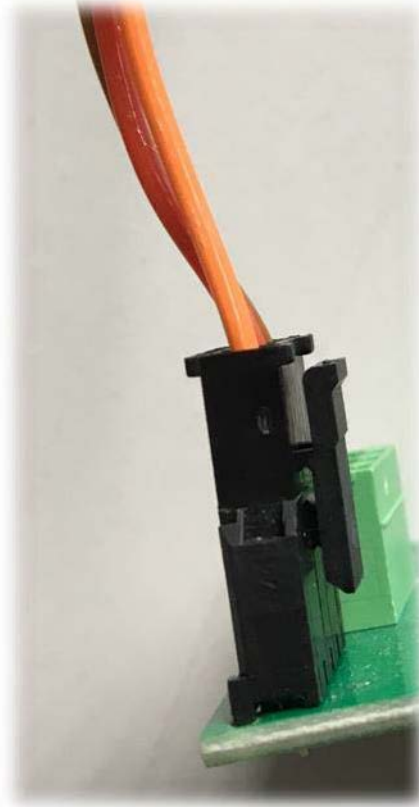


Fig. 3
SC2 connection to Printed Circuit Board



Fig. 2
Calibration adapter, CONKIT-PG2

11 Part Disposal

Observe all disposal codes.

12 Notes and General Information

It is important to read this user manual thoroughly and clearly in order to understand the information and instructions. The SC2 / AT6 devices must be used within product specification capabilities. The appropriate operating and maintenance instructions and recommendations must be followed.

Due to on-going product development, INTEC Controls reserves the right to change specifications without notice. The information contained herein is based upon data considered to be accurate. However, no guarantee is expressed or implied regarding the accuracy of these data.

13 Intended Product Application

The SC2 / AT6 devices are designed and manufactured for control applications and air quality compliance in commercial buildings and manufacturing plants.

13.1 Installers' Responsibilities

It is the installer's responsibility to ensure that all SC2 / AT6 devices are installed in compliance with all national and local codes and OSHA requirements. Installation should be implemented only by technicians familiar with proper installation techniques and with codes, standards and proper safety procedures for control installations and the latest edition of the National Electrical Code (ANSI/NFPA70).

The equipotential bonding required (also e.g. secondary potential to earth) or grounding measures must be carried out in accordance with the respective project requirements. It is important to ensure that no ground loops are formed to avoid unwanted interference in the electronic measuring equipment.

It is also essential to follow strictly all instructions as provided in the user manual.

13.2 Maintenance

It is recommended to check the SC2 / AT6 devices regularly. Due to regular maintenance any performance deviations may easily be corrected. Re-calibration and part replacement in the field may be implemented by a qualified technician and with the appropriate tools. Alternatively, the easily removable plug-in sensor cartridge with the sensor element may be returned for service to INTEC Controls.

13.3 Limited Warranty

INTEC Controls warrants the SC2 / AT6 devices for a period of one (1) year from the date of shipment against defects in material or workmanship. Should any evidence of defects in material or workmanship occur during the warranty period, INTEC Controls will repair or replace the product at their own discretion, without charge. This warranty does not apply to units that have been altered, had attempted repair, or been subject to abuse, accidental or otherwise. The warranty also does not apply to units in which the sensor element has been overexposed or gas poisoned. The above warranty is in lieu of all other express warranties, obligations or liabilities.

A pre-authorized RMA number is required for returns.

This warranty applies only to the SC2 / AT6 devices. INTEC Controls shall not be liable for any incidental or consequential damages arising out of or related to the use of the SC2 / AT6 devices.