

Air Quality Monitor / Controller

Environmental, industrial and commercial indoor Air Quality detector. Available in both a space and duct mount version.



IAQ-300

APPLICATION:

Schoolrooms
Office buildings
Parking Garages
Washroom ventilation fans
Cigarette smoke detector

FEATURES:

- True Air Quality Monitor.
- Microprocessor based controller.
- Analog, Stepped and Relay output options.
- 10 bit resolution.
- Able to detect one cigarette in 15 m³ (530 cu. ft.) room.
- Integral sensitivity adjustment.
- Ability to directly control air handling units.
- Visual indication of air quality (internal).
- No calibration required.



Executive Enclosure for IAQ-300 (AE)

SPECIFICATIONS	Air Quality Monitor / Controller – Product # IAQ-300
Measurement	Solid State TGS-800 VOC sensor
Sample Method	Diffusion or flow through, sample tube for duct
Power Supply	20 – 30 Vac/dc
Consumption	100 mA @24 Vdc, 220 mA @24 Vac, 6 VA Max.
Input Voltage Effect	Negligible over specified operating range
Protection Circuitry	Reverse voltage protected and output limited
Operating Conditions	0 – 40°C (32 – 104°F), 0-95% RH non-condensing
Standard Output Signal	Analog Stepped Output (ASO) in four steps representing OK, Low, Medium and High pollution levels (each step is independently adjustable from 0-10 Vdc)
Optional Output Signal	Linear output representing 0 – 100 % pollution level, jumper selectable for either 0 – 5 or 0 – 10 Vdc or 4 –20 mA, the current signal is generated by the sensor (active)
Output Drive Capability	500 ohm maximum for current output, 10k ohm minimum for voltage output
Optional Relay Output	One Form C contact (N.O. and N.C.), status LED, 5 amps @ 250 Vac, 5 amps @30 Vdc, p.f.= 1
Display	5 LED's indicating pollution level, operational mode and programming values
Programming and Selection	Via internal push buttons and jumpers
Wiring Connections	Screw terminal block (14 to 22 AWG)
Enclosures	Executive Space – 70 mm W x 118 mm H x 32 mm D (2.75" x 4.65" x 1.25") Duct ABS c/w sampling tube – 163 mm x 108 mm x 64 mm (6.4" x 4.25" x 2.5")

Operation

The IAQ-300 Air Quality Monitor uses a tin dioxide semiconductor sensor to detect oxidizable gases and is specially designed to have high sensitivity to gaseous organic materials which are components of indoor air pollutants. These air contaminants include cigarette smoke, smoke from cooking, exhaust gases from automobiles, solvents and many others.

Air quality is a term covering a very broad spectrum of definitions and factors such as temperature, humidity, air flow, occupancy and where the air is used all come into play when determining air quality. The air that is considered to be acceptable in a mechanical work-shop may be quite unacceptable in an office environment.

A reliable method of measurement for air quality is found in a gas sensor based on the Taguchi principle. This gas sensor is essentially a heated element inside a porous semiconductive tube. The tube has a large surface area and is able to freely absorb gas molecules on the semiconductor surface. Electron transfer occurs between the gas molecules and the already absorbed oxygen molecules. This causes a relatively large increase in conductivity for a small change in gas concentration. This change occurs quite quickly (within a few seconds) and is completely reversible. Since the element is a semiconductor Taguchi Gas Sensor and has no moving parts, it will operate reliably for many years. The sensor responds with varying degrees of sensitivity to a wide variety of gasses which include hydrogen, hydrocarbons, alcohols, carbon monoxide, benzene, etc.

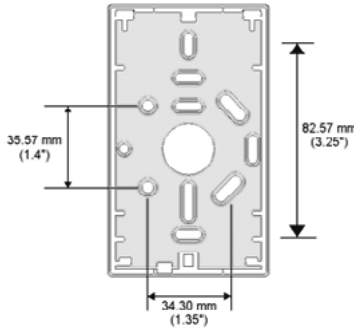
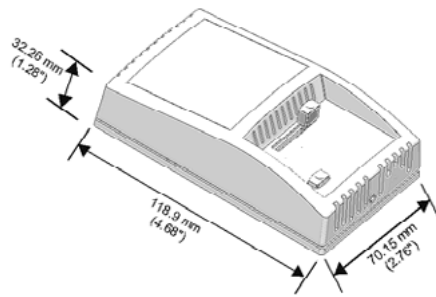
It is readily apparent that this sensor works well in the detection of contaminants such as solvents, but what about carbon dioxide? Although the sensor does not detect carbon dioxide, it is still quite useful in human environments. As well as carbon dioxide; hydrocarbons, body odours and water vapors are emitted by breathing and perspiration. The levels of these other contaminants change at roughly the same rate as the carbon dioxide and the sensor will track these other contaminants at approximately the same rate as the carbon dioxide in occupied spaces.

The IAQ-300 may be used as either stand-alone controller to detect levels of pollution and operate a clean-air damper directly, or it may be used as a monitor where the analog output signal is transmitted to the Building Automation System for further processing.

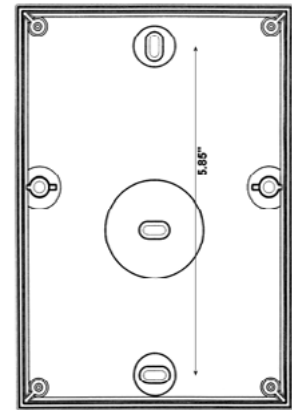
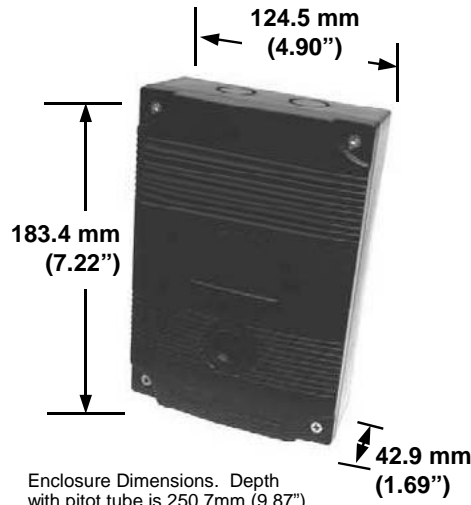
Many different environments can be controlled with careful adjustment of the device parameters. This allows the IAQ-300 to function equally well in a school room where the air is to be kept very clean or a utility room where the fresh air requirements are not as stringent. The air quality monitor can be used to control intake dampers at an airport where jet fumes are periodic contaminants, automatically control exhaust air on an assembly line where epoxies are used or a multitude of other applicants.

Some common pollutants in decreasing order of sensitivity, detectable by the IAQ-300. Most of these chemicals are easily detectable in quantities of 20 ppm or less.

<u>CHEMICAL</u>	<u>SYMBOL</u>	<u>COMMON SOURCE</u>
Methyl Ethyl Ketone	C ₄ H ₈ O	Solvents and cleaning products
Acetone	C ₃ H ₆ O	Solvents and organic synthesis
Ethyl Alcohol	C ₂ H ₆ O	Solvents and liquor fermentation
Formaldehyde	CH ₂ O	Disinfectants and preservatives
Hydrogen	H ₂	Used in synthetics
Methyl Alcohol	CH ₄ O	Solvents, antifreeze and synthetics
Vinyl Chloride	C ₂ HCl	Textiles and polymers
Hydrogen Sulfide	H ₂ S	Water and putrefying matter
Methyl Chloride	CH ₃ Cl	Solvents, paints and refrigerant
Benzene, Toluene, Xylene	C ₆ H ₆ , C ₇ H ₈ , C ₈ H ₁₀	Solvents and motor fuels
Trichloroethylene	C ₂ HC1 ₃	Solvents and cleaning agents
Propane	C ₃ H ₈	Fuels and chemical synthesis
Carbon Monoxide	CO	Combustion of carbon
Freon-22	CHC1F ₂	Refrigerants and aerosols
Ammonia	NH ₃	Solvents and refrigerants
Methane	CH ₄	Decomposition and synthesis



AE Enclosure Dimensions



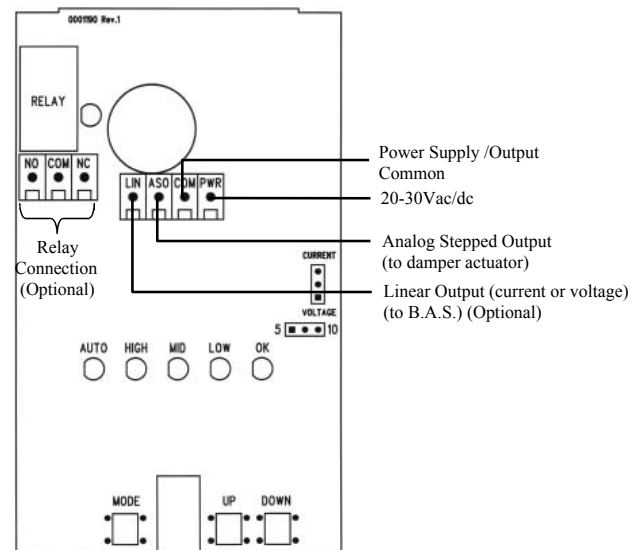
Duct Enclosure Dimensions

AIR QUALITY MONITOR / CONTROLLER: PRODUCT ORDERING INFORMATION

MODEL	Description		
IAQ-300	Air Quality Monitor / Controller		
	CODE	Enclosure	
	AE	Executive Space	
	D	Duct	
	CODE	Output Option	
	-	Analog Stepped Output Only (no designation)	
	R	ASO and Relay outputs	
	A	ASO and Analog outputs	
	AR	ASO, Analog and Relay outputs	
IAQ-300	D	AR	← Typical Part Number

Example: Air Quality Duct c/w ASO, analog and relay outputs

INTEC Controls, Inc. reserves the right to make design modifications without prior notice.



ISO 9001:2000

