



CTS - M20

CTS - M20 SERIES CARBON DIOXIDE TRANSMITTER/SENSOR

The CTS-M20 transmitter/sensor is an industry leader providing a Carbon Dioxide concentration measurement for Indoor Air Quality and ventilation control in commercial office buildings, arenas, gymnasiums, conference centers, greenhouses and other facilities with variable occupancy. The QEL proprietary designed Infra-Red sensing element is the result of extensive research and development by QEL engineers. The NDIR technology is accurate to +/-2% with minimal zero drift. The M20 offers improved performance and standard features that are unmatched by others. A digital display (LCD), push-button programming and onboard meter jacks are all standard. The transmitter provides an analog output of 4-20 mA DC or 2-10 VDC, linear to the measured gas range, for transmission to the Building Automation System (BAS) or controller supplied by QEL to others. The signal is fully user assignable over the gas range and can be configured for rising or falling gas concentration. Input voltages of 24 VDC or 24 VAC with wide tolerances are acceptable. Relay setpoints may be set as increasing or decreasing actuation simply by adjusting the deadband relationship. Set the deactivation point above the actuation setpoint and the M20 will automatically alarm on decreasing concentrations. It also offers "user selectable" time delay settings. Surface mount technology has been used for the circuitry resulting in a reduction of overall size and total number of components. Fewer components increases the mean time between potential failure. Enclosure styles include the office mount for occupied rooms and the duct mount for return or fresh air intake ducts.



MODEL NUMBER ORDERING CODE

C T S - M 2 0 0 0 X - 0 0 0 0 0 0

Revision (Factory Provided) ——— X
 Enclosure - Wall Mount ——— Q
 - Duct Mount ——— D

PRINCIPLE OF OPERATION

An air sample is introduced into the air column within the sensor block by diffusion. At one end of the sensor block a cycling tungsten light source emits Infra-Red energy through the air column. Energy of a specific wavelength is absorbed by any carbon dioxide present. A thermopile element, at the opposite end, senses the remaining Infra-Red energy and provides a DC millivolt signal.

The electronics measures the difference in the thermopile output between the off and the on light source cycle. This signal differential is proportional to the concentration of carbon dioxide. Energy measurement during the off cycle of the lamp provides an absolute reference for compensation of environmental conditions experienced by the block. The measured signal is linearized and converted to a 4-20 mA or 2-10 volt DC output. Zero and span adjustments are provided for accurate calibration.

ATMOSPHERIC CARBON DIOXIDE

Carbon Dioxide (CO₂) is the most abundant greenhouse gas. Major sources of CO₂ include the combustion of fossil fuels and the respiration of human beings. Human exhaled breath contains a concentration of about 40,000ppm (4%) CO₂, while trees and plants consume CO₂ and produce oxygen. The global average background CO₂ level is, at present, approximately 375 ppm and this average has been rising for decades. The background concentration in any one area may vary depending on the environmental conditions. The center of a city will have a much higher level, while the background level in a forested area will be lower. ASHRAE number 62-1989 requires that commercial buildings have an adequate air exchange system to ensure that CO₂ concentrations do not exceed 1000 ppm.

SPECIFICATIONS

Input Power: 24 Volts AC Floating
24 Volts AC One side grounded
24 Volts DC

Enclosure Materials: Polycarbonate / ABS blend
Fire Retardant

Temperature: 5° C to 40° C

Humidity: 0 to 99% RH, non-condensing

Pressure: Atmospheric ±10%

Response Time: Less than 45 seconds
for 90% of step change

Accuracy: ±2% of range

Repeatability: ± 10 ppm

Range:
Standard 0 to 2500 ppm
User Programmable 0 to 5000 ppm

Approval:  (PENDING)

Sensor Type: NDIR - Non-dispersive infra-red
Thermo compensated aluminum block

Output Signal: 4 - 20 mA or 2 - 10 VDC

Display: Alphanumeric - 2 line X 8 digit LCD

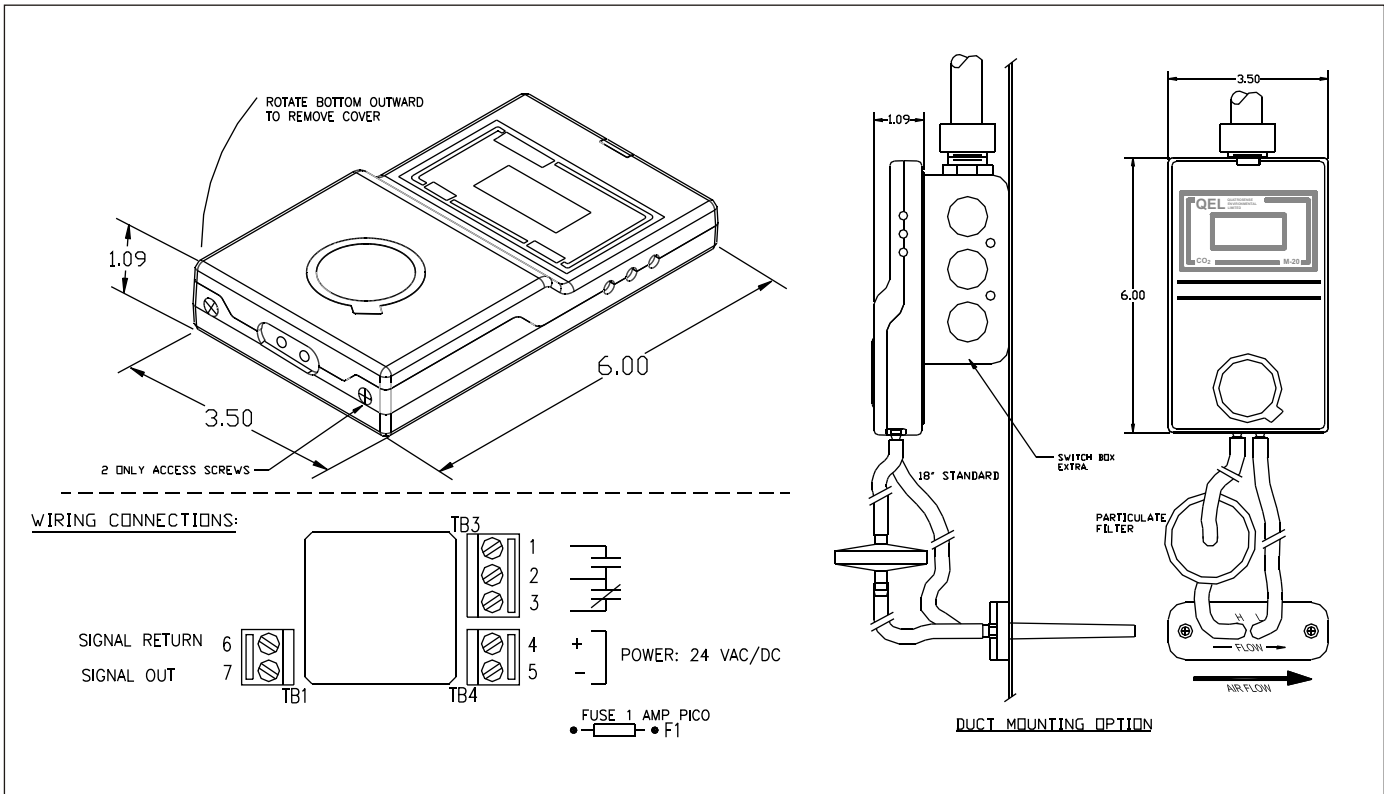
Relay Output: One Single pole double throw (SPDT),
Form C, 1 amp dry contact
CSA 1500 V FCC Part 68



Time Delays: Actuation - 0 to 60 minutes in
5 minute increments
De-Actuation - 0 to 60 minutes in
5 minute increments

Mounting: Screw mounts to a standard 2" X 4"
electrical junction box.

*** FULLY ASSIGNABLE 4-20 mA or 2-10 VDC OVER CHOSEN RANGE**
4 mA / 2 VDC may be set anywhere in range, 20 mA / 10 VDC may be set anywhere in range
Signal is assigned linearly between the two points
Signal may be rising or falling with gas concentration



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Read and understand fully all instructions before using these products

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