

Gas monitor

Belimo gas monitors are factory calibrated and can monitor up to two gases simultaneously. All monitors feature audible and visual alarms, and CAN bus communication, allowing for standalone operation and networking of up to 32 devices. Select models feature relays and analog outputs to control ventilation directly, as well as BACnet MS/TP allowing for integration into a BMS. All gas monitors are wired via a daisy chain and are backed by a five-year warranty.



5-year warranty



Gas Monitor



Type Overview

Type	Measured values	Number of relays	Number of analogue outputs	Communication
22G02-5A	CO	1	2	CAN bus, BACnet MS/TP
22G02-5B	CO	2	0	CAN bus, BACnet MS/TP
22G02-5C	CO	0	0	CAN bus

Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage note	Please see remarks section for nominal voltage details and nominal voltage range.
	Nominal voltage frequency	50/60 Hz
	Power consumption AC	5 VA
	Power consumption DC	1.7 W
	Cable entry	2 top, 2 bottom, 1 rear – 1/2" EMT
	Cable specification	Power cable: 18...20 AWG Communication cable: 22...24 AWG twisted pair, shielded jacketed, low capacitance Please see the remarks section for more information about cable size and polarity.
	Fuse	Thermal PTC, auto-reset
Data bus communication	Communication	CAN bus BACnet MS/TP

Functional data	Application	Air
	Output signal active note	Analog outputs: 2...10 V or 4...20 mA, user selectable with jumper
	Output signal relay note	Relays: SPDT, 5A @ AC 125 V, non-inductive Please see remarks section for relay rating.
	Mounting	Please see installation notes section for mounting height recommendations.
	Max. altitude	2000 m [6562 ft] above sea level
	Max. altitude note	Calibration verification is recommended above 610 m [2000 ft]
	Coverage area	Radius: 15 m [50 ft] Area: 700 m ² [7500 ft ²] There can be no obstructions such as walls, elevators, stairs, shelving with solid fill, tool chests, etc. Otherwise the time weighted average (TWA) for the gas to reach the monitor will increase.
	Display	LCD with backlight showing gas type, gas concentration, alarm level status
	Alarm	Alarm level 1: Visual alarm (red LED) Alarm level 2: Visual alarm (red LED) Alarm level 3: Visual and audible alarm (flashing white strobe LED and horn) Horn: 80 dB @ 1 m [3.3ft]
	Warm-up time	5 minutes
Measuring data	Measured values	CO
Specification Gas	Sensing element technology	Electro-chemical
	Measuring range	CO: 0...250 ppm
	Accuracy	CO: $\pm 3\%$ FS from 0...75 ppm @ 23.5°C [74°F] FS: Full scale of the measuring range Please see the remarks section for more information about the accuracy for CO sensors.
	Measurement repeatability	< $\pm 3\%$ CO equivalent
	Long term stability	CO: <5% per year
	Calibration	Non-interactive zero and span Sensor modules are required to be calibrated annually.
	Typical response time	<30 s (T90)
Specification Temperature	Measuring range	-20...40°C [-4...104°F] Please see the remarks section for the application notice for temperature sensor
	Accuracy temperature passive	$\pm 7^\circ\text{C}$ @ 23.5°C [13°F @ 74°F] Please see remarks section under application notice for more information about temperature accuracy
Safety data	Degree of protection IEC/EN	IP44
	Degree of protection NEMA/UL	NEMA 2

Technical data

Safety data	Agency Listing	cULus listed to UL2075, ULC-S588 cCSAus listed to C22.2 No. 61010-1-12, UL Std. No. 61010-1 (3rd Edition), harmonized under IEC/EN 61010-1 BTL listed No. BTL-30001
	Pollution degree	2
	Ambient humidity	15...90% RH continuous, 0...99% RH intermittent, non-condensing
	Ambient temperature	-20...40°C [-4...104°F]
Materials	Housing	UL94 5VA

Remarks

Nominal voltage details All Belimo gas monitors, communication modules, and relay units can be powered by AC/DC 24 V. Under CSA/UL 61010-1 all gas monitors and communication modules are rated to AC 24 V only. Under ULC-S588 and UL 2075 all vehicle emissions gas monitors (CO, NO₂, CO + NO₂) are rated to AC/DC 24 V.

Nominal voltage range All Belimo gas monitors, communication modules, and relay units have a nominal voltage range of AC 17...28/DC 21...38 V (not UL or CSA tested), AC/DC 20.4...26.4 V (UL tested).

Power cable size and polarity Terminal blocks can accommodate one 14...20 AWG wire, or two 18...20 AWG wires in the same terminal. Please consider cable and transformer size to provide adequate voltage. For all power (AC/DC 24 V) maintain the same polarity between devices.

Communication cable size and polarity CAN bus and BACnet MS/TP communication cables should be 22...24 AWG, twisted pair, shielded jacketed, low capacitance. Please consider CAN bus baud rate (programmable setting No. 68) and BACnet MS/TP baud rate (programmable setting No. 48) to provide working communication. For all communication wiring, maintain the same polarity and baud rate between all devices on the network.

Relay rating All relays used in Belimo gas monitors, communication modules, and relay units are rated for: SPDT, 5 A @ AC 125 V, non-inductive (UL/CSA tested), SPDT, 5 A @ AC 240 V, non-inductive, (not UL/CSA tested), and SPDT, 4 A @ DC 24 V, non-inductive (not UL/CSA tested).

Application notice for temperature sensor All Belimo gas monitors and communication modules come with an internal temperature sensor. The purpose of this temperature sensor is to protect an enclosed parking garage from overheating or freezing, by activating relay 1. When using this feature, it is recommended to calibrate the temperature sensor to the ambient temperature (programmable setting No. 50), after the gas monitor has been powered for 24 hours. For freeze protection, it is recommended to set the temperature set point (programmable settings No. 55) at or over 40°F [4°C].

Please note that this temperature sensor is located on the gas monitor printed circuit board (PCB). Therefore, it needs to be calibrated after 24 hours of normal operation to offset the heat generated by the PCB. It is not intended to be used as a room temperature sensor because of its limited accuracy and slow response time due to its location on the PCB. This temperature sensor accuracy of ±13°F @ 74°F [7°C @ 23.5°C] was not certified by UL.

Accuracy for gas monitors CO and NO₂ sensor accuracies are not certified by UL. Both accuracies were internally tested and validated in an environmental chamber and compared to a high accuracy reference device (analyzer).

Installation notes

Mounting height recommendations

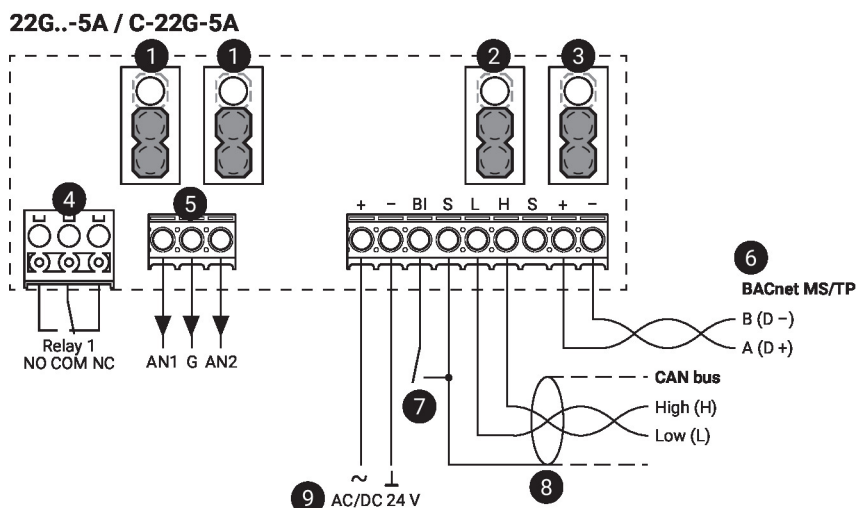
CO mounting height recommendations in an enclosed parking garage are the same regardless of the types of vehicles being stored and the height of the parking garage.

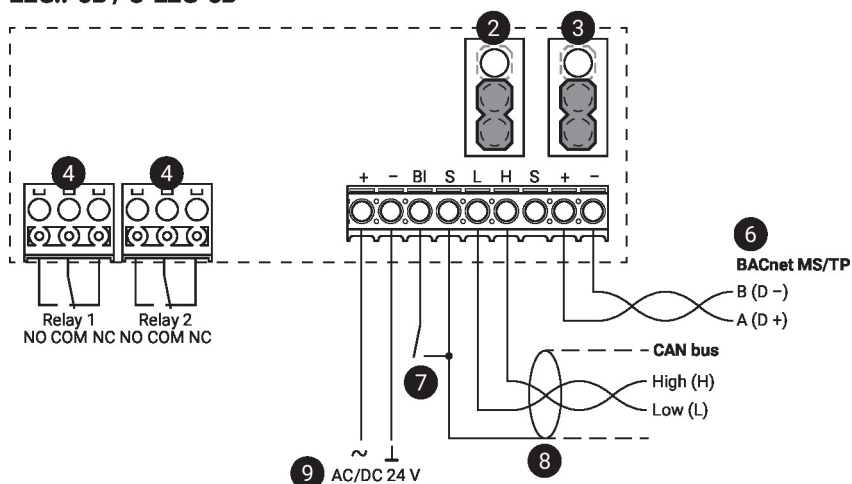
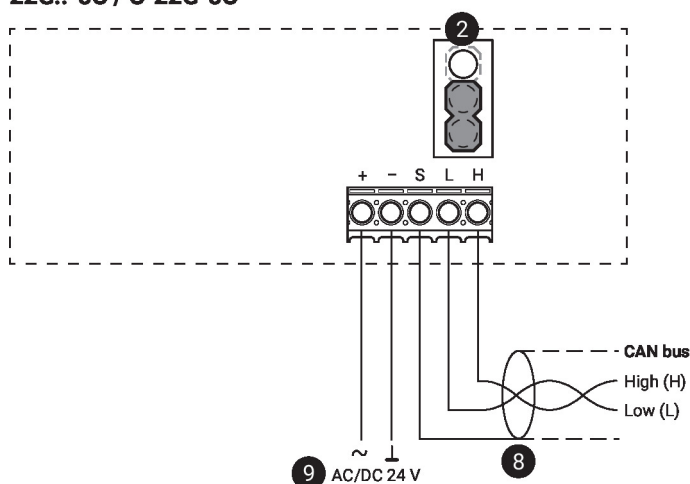
It is recommended to place a CO gas monitor at 0.9...2.1 m [3...7 ft] from the floor. The ideal location for monitoring CO is 1.5 m [5 ft]. When the monitor is located at the correct height, it is less likely to be damaged by passing cars and trucks, and it is in a good location to be serviced.

Accessories

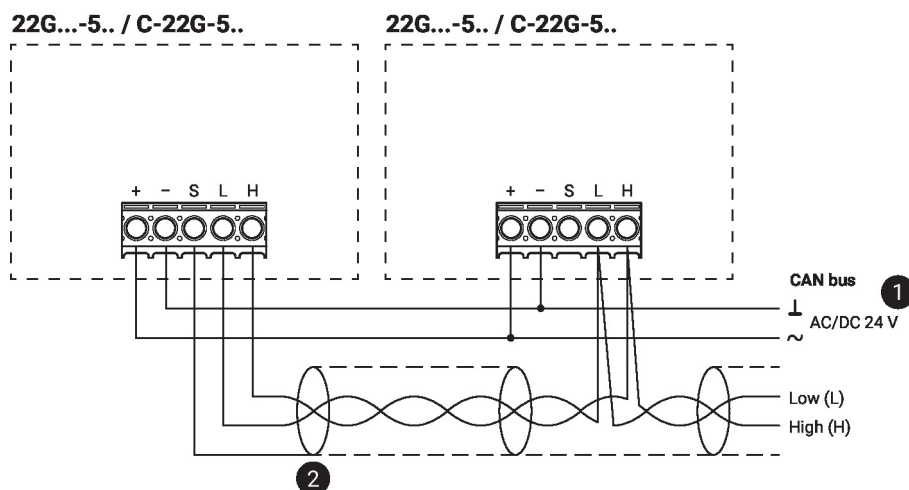
Replacement sensor modules	Description	Type
	Sensor module CO (Carbon Monoxide), 0...250 ppm,	R-G02
Electrical accessories	Description	Type
	Communication module, CAN bus, BACnet MS/TP, 1 relay, 2 analog outputs	C-22G-5A
	Communication module, CAN bus, BACnet MS/TP, 2 relays	C-22G-5B
	Communication module, CAN bus	C-22G-5C
	Relay unit, CAN bus, 4 relays	C-22G-50
	High-low mounting kit	A-22G-A14
	External visual alarm	A-22G-A15
	External audible alarm	A-22G-A16
	Transformer, 50 VA	A-22G-A50
	Transformer, 100 VA	A-22G-A100
Mechanical accessories	Description	Type
	Splash proof enclosure	A-22G-A12
	Duct mount enclosure	A-22G-A13
	Calibration kit,	A-22G-A22

Wiring diagram



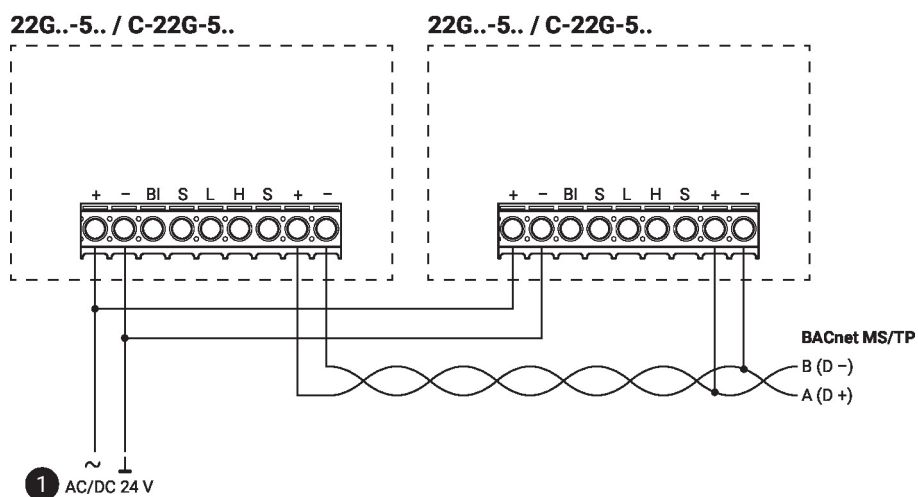
22G..-5B / C-22G-5B

22G..-5C / C-22G-5C


- 1 **Analog outputs**
Down position: 2....10 V (factory setting)
Up position: 4...20 mA
- 2 **End of line (EOL) jumper: CAN bus**
Down position: Termination OFF (factory setting)
Up position: Termination ON (first and last unit only should have this jumper in the up position)
- 3 **End of line (EOL) jumper: MS/TP**
Down position: Termination OFF (factory setting)
Up position: Termination ON (first and last unit only should have this jumper in the up position)
- 4 **Relay output**
- 5 **Analog output**
- 6 **Shield connected at the first unit only, at others only looped through**
- 7 **Binary input to limit switch**
- 8 **Shield connected at the first unit only, at others only looped through**
- 9 **Binary input to limit switch**

Wiring diagram
Wiring CAN bus


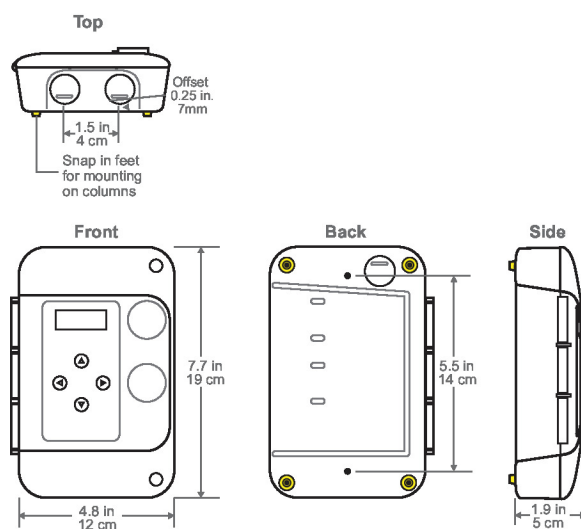
1 No connection to the ground

2 Shield connected at the first unit only, at others only looped through

Wiring RS-485 BACnet MS/TP


1 No connection to the ground

Dimensions



Type

22G02-5A

22G02-5B

22G02-5C

Weight

0.43 kg

0.43 kg

0.43 kg

Further documentation

- Installation instructions
- Operating instructions