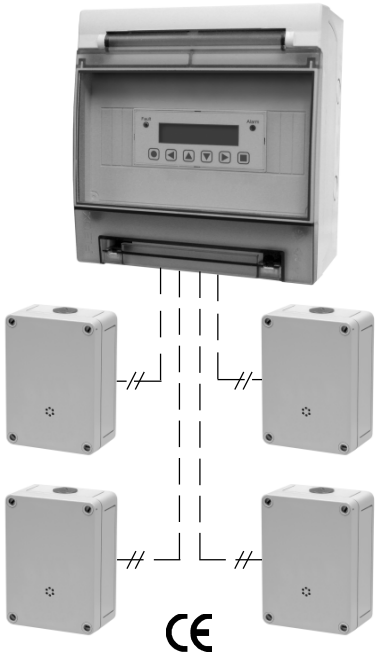
Carbon Monoxide (CO) Gas Detection and Control System

DESCRIPTION

PolyGard
LGC-CO

Carbon monoxide (CO) detection and control system, wall-mounted, with one, two, three or four remote sensors/transmitters.



City of Los Angeles Approved

NRTL Performance Tested & Certified
Conforms to STD
UL 2075 / UL 2017

BACnet Upwards Communication Option

APPLICATION

To detect and control levels of carbon monoxide (CO) in a wide variety of commercial and industrial applications such as vehicle exhaust in parking structures, engine repair shops, equipment rooms and ventilation systems, etc. The controller can interface via binary outputs and up to (2) 4-20 mA signals with any compatible electronic analog control, DDC/PLC control or automation system.

FEATURES

- *Continuous monitoring*
- *CO electrochemical sensor, gas specific*
- *Polarity protected*
- *Up to (4) sensor inputs*
- *Four (4) digital inputs*
- *Five (5) relay outputs:*
  - *Five-stage control*
  - *Fail-safe assignable*
- *Two (2) analog outputs, 4-20 mA*
  - *Selectable for low, high or averaging*
- *Optional BACnet coupler upwards communication to BAS*
- *Liquid Crystal Display (LCD)*
- *LED status indicators*
- *Built-in horn*
- *Keypad user interface*
- *Simple menu-driven programming*
- *RFI/EMI protected*
- *Modular plug-in technology*
- *Overload & short-circuit protected*
- *NEMA 12, transmitter enclosure*
- *NEMA 4X, controller enclosure*
- *Easy maintenance*

ORDERING INFORMATION

Carbon Monoxide (CO) Detection and Control System Package			
Controller	**Sensor(s) / Transmitter(s)**		**Part Numbers**
Digital programmable menu-driven keypad user interface LCD & LEDs, 24 VAC/VDC, NEMA 4X enclosure Inputs: (4) 4-20 mA Outputs: (5) Relays, SPDT, 8 A (2) 4-20 mA Built-in (1) Horn	Sensor range: 0-250 ppm CO, 4-20 mA, 2-wire, loop powered 24 VDC, NEMA 12 wall mount enclosure	Incl. (1) CO remote sensor	**LGC-CO-01**
		Incl. (2) CO remote sensors	**LGC-CO-02**
		Incl. (3) CO remote sensors	**LGC-CO-03**
		Incl. (4) CO remote sensors	**LGC-CO-04**
BACnet upwards communication coupler “C5-BAC-98” (add-on option)			**LGC-CO-0_-B0**
Factory configured CO alarm levels/setpoints: • Low alarm @ 25 ppm (relay #01) • High alarm @ 100 ppm (relay #05) • High alarm @ 100 ppm (relay #02) Other setpoints/programming are available on special request. All devices are field programmable and adjustable.			

SPECIFICATIONS

Electric	
Power supply	
- controller	24 VAC/VDC, -15%/+20%, 50/60 Hz, auto-resettable fuse
- sensor(s)/transmitter(s)	24 VDC from controller, loop powered, polarity protected
Power consumption	13 VA (0.5 A), w/max sensor connections
RF/EMI protected	4.0 W @ 3 ft. (1 m) radiated
Sensor Performance	
Gas detected	Carbon monoxide (CO)
Sensor element	Electrochemical, diffusion
Range	Span field adjustable from 0-200 to 0-300 ppm via calibration, 0-250 ppm factory set
Resolution	± 3.0 ppm of reading
Repeatability	± 3.0% of reading
Long term output drift	< 0.4% signal loss/month
Response time	t_{90} < 50 sec.
Sensor element life expectancy	3-5 years, normal operating environment
Sensor coverage	5,000 sq.ft., max. 10,000 sq.ft. (465 m^2, max. 930 m^2), under “ideal conditions”
Installation Location	
Sensor mounting height	5 to 6 ft. (1.5 to 1.8 m) above floor
Type of Control	
General	Five-stage (S1 to S5) control, assignable up to five (5) binary/ relay output, i.e. Low-med-high-fault/fail-horn*, or low1-low2-med1-med2-high, or any other combinations (* = horn/audible alarm built-in and factory pre-configured to relay output “R05”)
Analog inputs	Four (4) 4-20 mA, for remote sensors
Analog reading	Current and mean (average) value
Stage level / setpoint	Field adjustable over full range, five (5) per analog input, assignable to current or mean (average) value
- hysteresis/ switching differential	Selectable for each sensor point
Digital inputs	Four (4), each can be individually assigned to any relay (R1...R5).
- application	Remote audio/visual alarm reset or override function
Relay outputs (R1-R5) w/ status LEDs	Five (5) SPDT, 8A 24 VAC/VDC-250 VAC contact resistance 100 mΩ, max.
- each stage level (S1-S5)	Assignable to any relay
- sensor fail-safe	Assignable to any stage level
Time delay switching	Selectable for make and brake of each sensor point (SP1 to SP4) 0-9,999 seconds
Analog output	Two (2) independent 4-20 mA signal, 500 Ω max. load, selectable as low, high or averaging of sensor inputs
Audible alarm	85 db (10 ft), enabled or disabled, selectable; assignable to stage level S1, S2, S3, S4 or S5
Alarm acknowledgement	Menu-driven and system reset function for latched relays
User Interface	
Keypad type	Refer to “illustration keypad user interface”
Touch buttons	Six (6)
Status LED’s	Red: Alarm Yellow: Fault (fail)
Digital display	Liquid Crystal Display (LCD), two lines, 16 characters per line, 1 digit resolution, backlit
- unit display	Menu selectable, per sensor
BACnet Interface, optional*	Read status information via BACnet coupler and BACnet-Profile, BACnet-Services and BACnet BIBBs
Coupler module	C5-BAC-98 (B)
Communication	TCP/IP 10/100 Mbits/sec
Connector	Ethernet RJ45
Interface	BACnet-Profile
Description	BACnet-Services “Who-is (execute)” “I-am (initiate)” “ReadProperty” “WriteProperty”
Object types	Version B1.2, B2.2
Environmental	
Permissible ambient controller	
- working temperature	23°F to 104°F (-5°C to 40°C)
- storage temperature	23°F to 86°F (-5°C to 30°C)
- humidity	15 to 95% RH, non-condensing
Permissible ambient sensor/transmitter	
- working temperature	14°F to 122°F (-10°C to 50°C)
- intermitted temperature	-4°F to 122°F (-20°C to 50°C)
- storage temperature	41°F to 86°F (5°C to 30°C)
- humidity, continuous	15 to 90% RH, non-condensing
- humidity, intermitted	0 to 99% RH, non-condensing
- working pressure	Atmospheric ± 10%

(*) BACnet Interface: NRTL Certification to UL STD 61010-1 – “Pending”

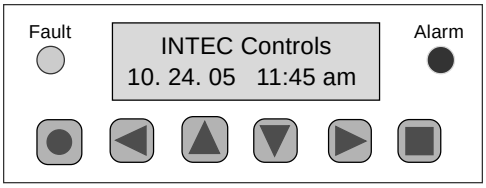
SPECIFICATIONS

Physical, Controller	
Enclosure (panel)	
- material	Polycarbonate, impact resistance EN 50102/IK08, flammability rating UL 94-5V
- conformity	UL Type 1, UL 508/UL 50 standards
- color	Light gray, smoked gray for cover
- protection	NEMA 4X (IP 65)
- installation	Wall (surface) mounted
Dimensions (H x W x D)	
- base	7.9 x 7.5 x 4.1 in. (200 x 190 x 105 mm)
Cable entry	5 holes for 1/2 in. conduit, covered
Wire connection	Terminal blocks, Push-on connect and screw type for lead wire
Wire size	
- input	Min. 22 AWG (0.34 mm^2) Max. 16 AWG (1.50 mm^2)
- output	Min. 24 AWG (0.25 mm^2) Max. 14 AWG (2.50 mm^2)
Weight	4.5 lbs. (2.0 kg)
Enclosure (panel) approval	UL Listed, E75645
Physical, Sensor/Transmitter	
Enclosure, standard	
- material	Polycarbonate, UL 94-HB, fire-retardant
- conformity	UL 50
- color	Light gray
- protection	NEMA 12 (IP55)
- installation	Wall (surface) mounted, or single gang electrical box
Dimensions (H x W x D)	5.12 x 3.31 x 2.95 in. (130 x 84 x 75 mm)
Cable entry	1 hole for 1/2 in. conduit for wall (surface) mounting and 1 hole on back side of base plate for single gang electrical box mounting
Wire connection	Terminal blocks, screw type for lead wire
Wire size	Min. 24 AWG (0.25 mm^2), Max. 14 AWG (2.5 mm^2)
Wire distance	Max. loop resistance 500 Ω (= wire resistance plus controller input resistance)
Weight	0.6 lbs. (0.25 kg)
Enclosure approval	UL Listed, E208470 CSA Certified, E208470

Approvals / Listings	
System	NRTL Performance Tested & Certified:
- sensor/transmitter	Conforms to ANSI/STD UL 2075
- controller	Conforms to ANSI/STD UL 2017
- transmitter & controller	City of Los Angeles CE VDI 2053, air treatment systems for garages and tunnels EMV-Compliance 89/336/EWG, low voltage directives 73/23/EWG
Warranty	One year material and workmanship

USER INTERFACE & CONTROLLER

Keypad User Interface



Fault "Yellow LED" Flashes at system / sensor failed

Alarm "Red LED" Flashes when any stage level setpoint is exceeded; steady when any relay output is in manual override operation

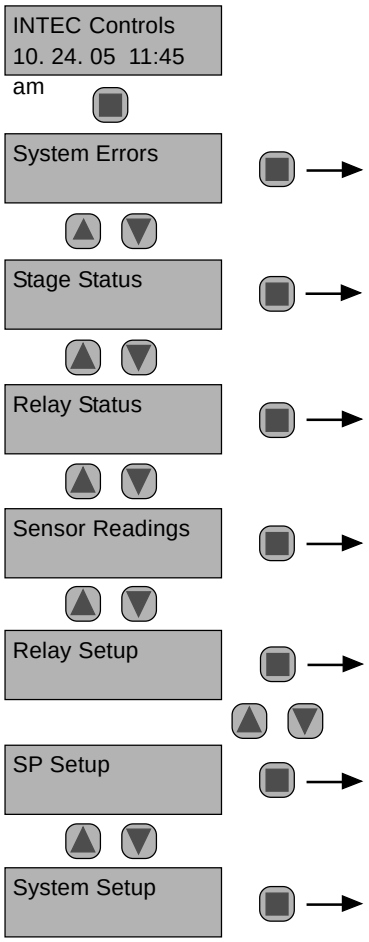
Scroll down & up in Main menu and Sub menus; increases or decreases a value

Navigates through menus on the same level; moves cursor when inputing data

Exits programming and saves settings or return to previous level or menu

Enter Sub menus or stores data; horn silence (if assigned)

Main Page & Main Menu



System Operation

All Programming is made via the keypad user interface in combination with the display screen. Security is provided via two password levels. The lower level password allows to override or to reset system status functions. The upper level password allows all programming and override functions.

Main Page Display

After powered on, displays IN*TEC* and part number and changes to sensor reading display unless a system error occurs; then the error is displayed.

Main Menu

Displays headings of "System Errors", "Stage Status" "Relay Status", "Sensor Readings", "Relay Setup", "SP (Sensor Point) Setup", and "System Setup".

Sub Menu "System Errors"

Displays errors, reset corrected errors, and historical error summary.

Sub Menu "Stage Status"

Displays status of each "SP" sensor point, stage level/ setpoint exceeded.

Sub Menu "Relay Status"

Displays status and manual control of each output relay.

Sub Menu "Sensor Readings"

The current and mean/average values are displayed for each "SP" sensor point with sensing type and engineering unit (ppm, %v/v, %LEL, F, %RH).

Sub Menu "Relay Setup"

Enter and /or change parameters of each relay.

- Assign de-energized or energized normal operation
- Select steady or flashing function
- Select horn function
- Select latching or non-latching mode
- Select digital input usage, and assign to any output relay

Sub Menu "SP Setup"

Enter and/or change parameters of each sensor point.

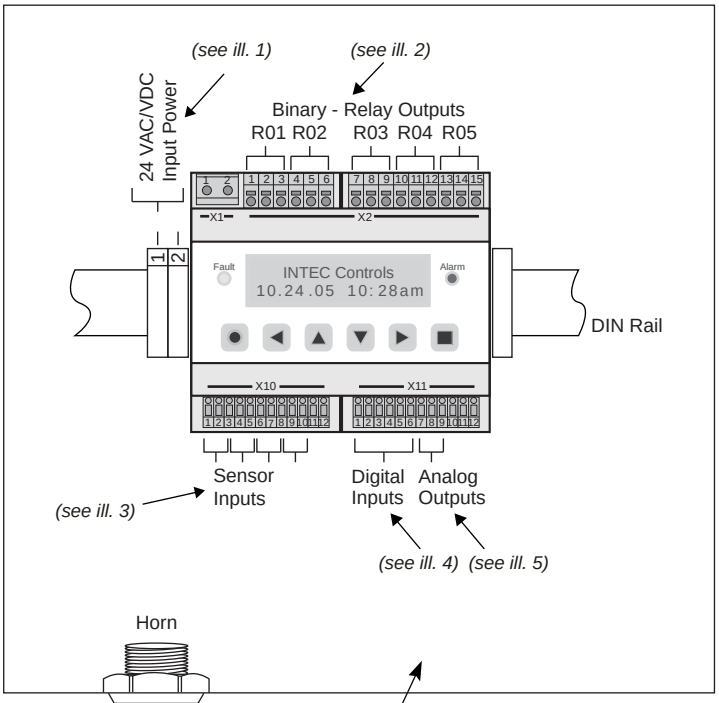
- Activate sensor point
- Select sensor point type (gas, temperature, humidity)
- Select measuring range
- Select sensor signal
- Select stage/setpoint 1 to 5
- Select hysteresis
- Set delay ON/OFF time
- Select current or mean/average value
- Assign sensor point fault to stage level setpoint
- Assign setpoint 1 to 5 to any output relay
- Assign to analog Output

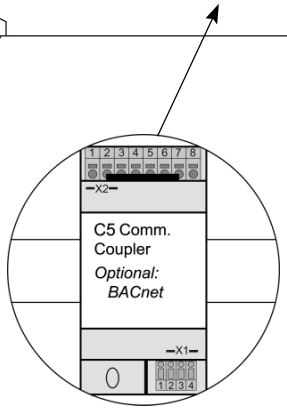
Sub Menu "System Setup"

Enter and/or change system parameters.

- Select service mode
- Set next maintenance date
- Select service phone number
- Select averaging function, time and overlay, of any SP
- Set date, time and time format
- Change customer password
- Select analog output function
- Set failure relay
- Select power ON time
- Select apporpriate hardware configuration

FIELD WIRING CONFIGURATION





Recommended

- **Twisted, shielded wire for analog inputs** (Shield to be terminated and connected only at the sensor/transmitter location)
- **Grounded housing**

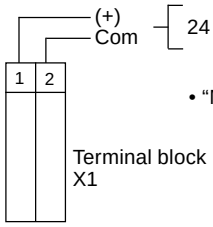
Caution:
The non-metallic enclosure does not provide grounding between conduit connections. Use grounding bushings and jumper wires.

The enclosure is to be mounted using the mounting holes located in the base external to the equipment cavity, or the equivalent.

The conduit hubs must be connected to the conduit before connected to the enclosure.

When connecting conduit to the enclosure use only UL listed or UL recognized conduit hubs that have the same environmental type rating as the controller enclosure.

24 VAC/VDC Input Power Supply

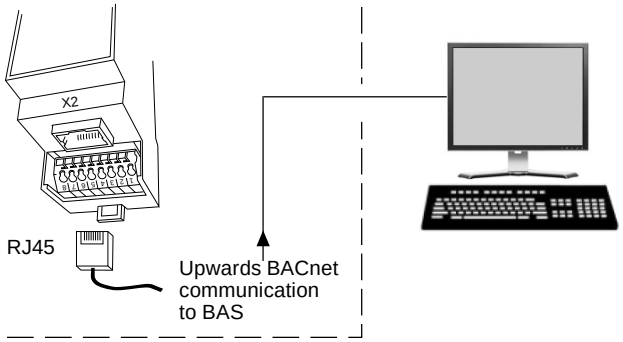


24 VAC/VDC, -15%/+20%, 50/60 Hz

• "Min wire size 16 AWG (1.5 mm²)"

ill. 1

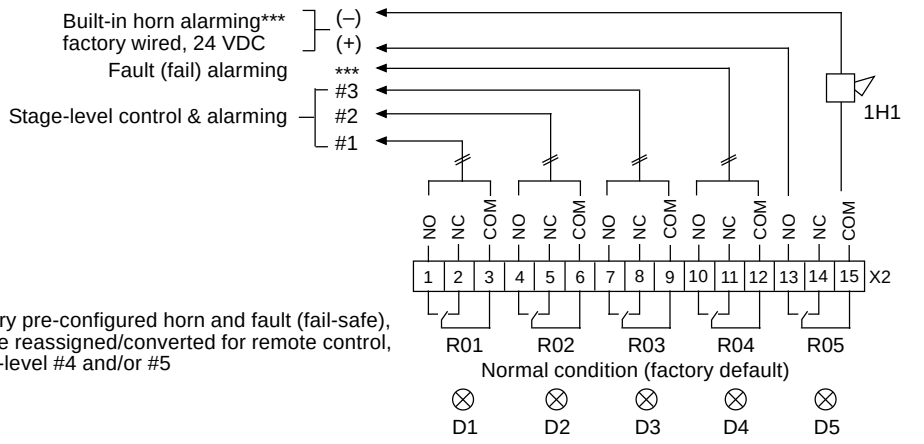
C5 BACnet Communication Coupler, optional



ill. 6

FIELD WIRING CONFIGURATION (cont...)

Binary - Relay Outputs "R01 to R05"

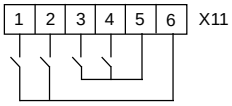


*** Factory pre-configured horn and fault (fail-safe), can be reassigned/converted for remote control, stage-level #4 and/or #5

⊗ = Relay status LEDs D1 to D5 located below terminal connection of sensor inputs (X10)

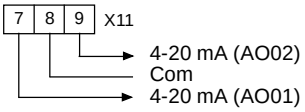
ill. 2

Digital Inputs "DI01 to DI04"



ill. 4

Analog Outputs "AO01 and AO02"

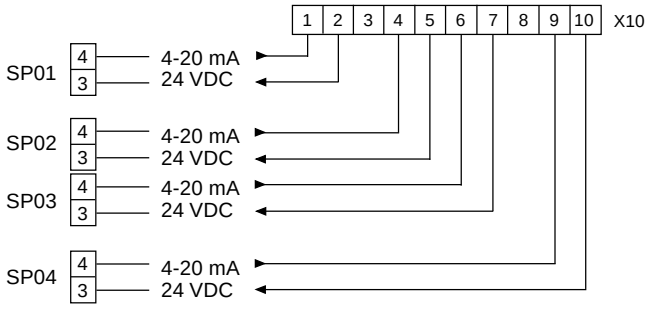


4-20 mA signal
to remote control or BAS,
selectable low, high or
averaging of (4) analog (sensor)
inputs, 500 Ω max. load

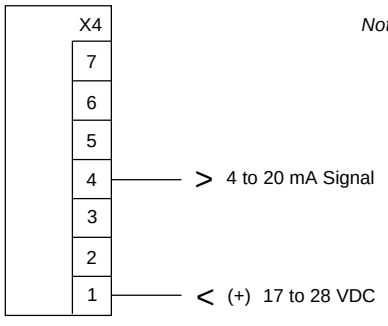
The current signal is sourced
by the LGC system

ill. 5

Sensor Inputs "SP01 to SP04"



Remote CO sensor/transmitter "SP"



Note: Twisted, shielded wire is recommended for 2-wire configurations.

Shield should be grounded only at the controller. DO NOT ground shield at both ends!

ill. 3