

# Combustible Single-Point Gas Detection System



**PolyGard  
SPC3-3300**

## DESCRIPTION

Wall-mounted gas monitor with built-in combustible gases and vapor sensor, accepts one analog remote device such as a secondary gas sensor, temperature or humidity sensor.

## APPLICATION

To detect and control levels of combustible gases, vapors, and other gases in a wide variety of commercial and industrial applications such as Combustible gas level in boiler rooms (i.e. Methane), dry cell battery rooms (i.e. Hydrogen), gas/fuel spill locations (i.e. Gasoline, Hexane), laboratories and industries (i.e. Butane, Propane), etc. The controller can communicate with any compatible electronic analog control, DDC/PLC control or automation system via binary and/or analog output signal.



## FEATURES

- Continuous monitoring
- One (1) built-in combustible catalytic bead sensor
- Performance tested sensor to UL 2075
- Easy plug-in sensor
- One (1) remote analog input, 4-20 mA
- One (1) digital input
- Two (2) relay outputs:
  - Four stage control
  - Fail-safe assignable
- One (1) analog output, (0)4-20 mA / (0)2-10 VDC
  - Selectable for low, high, or averaging
- One (1) 24 VDC switched output
- Liquid Crystal Display (LCD)
- LED status indicators
- Accepts toxic or combustible gas, refrigerant, temperature or humidity secondary remote sensor input
- Built-in horn
- Keypad user interface
- Simple menu-driven programming
- Modular technology
- Overload & short-circuit protected
- NEMA 12 enclosure
- Easy maintenance



NRTL Performance Tested & Certified  
Conforms to STD  
**UL 2075**

## SPECIFICATIONS

### Electric

Power Supply 24 VAC/VDC, -20%/+15%  
50/60 Hz,  
reverse polarity protected

Power Consumption 5 VA (0.2 A) w/ (1) remote sensor connected

### Sensor Performance

Gas detected Combustible gases and vapors  
"refer to Ordering Information table"

Sensor element Catalytic bead (pellistor), diffusion

Range 0-100% LEL;

Accuracy ± 1 % of reading

Repeatability ± 2 % of reading

Long term zero point drift < 0.5 % LEL<sub>methane</sub>/month

Long term sensitivity drift < 2 % LEL<sub>methane</sub>/month

Response time  $t_{90}$  < 10 sec.methane

Sensor life expectancy 3 yrs. normal operating environment

Sensor coverage Dependent on the target gas

### Installation Location

Mounting height Dependent on the target gas

Combustible Gases/Vapors		% v/v*
Acetone	(CH <sub>3</sub> ) <sub>2</sub> CO	2.6
Ammonia	NH <sub>3</sub>	15.0
Benzene	C <sub>6</sub> H <sub>6</sub>	1.2
Ethylene	C <sub>2</sub> H <sub>4</sub>	2.3
Ethyl Acetate	CH <sub>3</sub> COOC <sub>2</sub> H <sub>5</sub>	2.2
Ethyl Alcohol	C <sub>2</sub> H <sub>5</sub> OH	3.3
Hydrogen	H <sub>2</sub>	4.0
Isopropyl Alcohol	(CH <sub>3</sub> ) <sub>2</sub> CHOH	2.2
Jet A	-	1.4
JP8	-	0.9
Methane	CH <sub>4</sub>	5.0
Methanol	CH <sub>3</sub> OH	6.7
Methyl Ethyl Ketone	C <sub>4</sub> H <sub>8</sub> O	1.9
n-Butane	C <sub>4</sub> H <sub>10</sub>	1.8
n-Heptane	C <sub>7</sub> H <sub>16</sub>	1.05
n-Hexane	C <sub>6</sub> H <sub>14</sub>	1.1
n-Octane	C <sub>8</sub> H <sub>18</sub>	0.95
n-Pentane	C <sub>5</sub> H <sub>12</sub>	1.4
Propane	C <sub>3</sub> H <sub>8</sub>	2.1
Toluene	C <sub>7</sub> H <sub>8</sub>	1.2

\* x% v/v = 100% LEL  
LEL = Lower Explosive Limit  
v/v = Volume by Volume

**SPECIFICATION**

<b>Type of Control</b>	
General	Four-stage (S1 to S4) control, assignable up to two (2) binary/relay, horn/audible alarm, and 24 VDC / 50 mA switched outputs, i.e. low-high stage for relay output, horn / audible alarm and switched 24 VDC at any stage for remote alarming
Analog input	One (1) 4-20 mA, for additional remote sensor, load < 55 mA / 200 Ω, reverse polarity protected
Analog reading	Current and mean (average) value
Stage level / setpoint	Field adjustable over full range, four (4) stages (S1 to S4) per analog input, assignable to current or mean (average) value
- hysteresis/ switching differential	Selectable for each sensor point
Digital input	One (1); can be assigned to any relay (R1, R2).
- application	Remote audio/visual alarm reset or override function
Relay outputs (R1, R2) w/ status LEDs	(1) SPDT (R1), and (1) SPST-NC or SPST-NO (R2), jumper selectable
Contact rating	30 VAC/VDC, 0.5 A, max.
- each stage level (S1-S4)	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 SP2) 0-9,999 seconds
Analog output	One (1), (0)4-20 mA, load < 500 Ω; (0)2-10 VDC, load > 50K Ω; jumper selectable; polarity protected, assignable to low, high or averaging of sensor inputs
VDC switched output	One (1) 24 VDC, 50 mA max
Audible alarm	83 db @ unit, enabled or disabled, selectable; assignable to stage level S1, S2, S3 or S4
Alarm acknowledgement	Menu-driven and system reset function for latched relays
<b>User Interface</b>	
Keypad type	Refer to "illustration keypad user interface"
Touch buttons	Four (4)
Status LED's	Four (4), for system on, stage status, and failure
Digital display	Liquid Crystal Display (LCD), two lines, 16 characters per line, 1 digit resolution
- unit display	Menu selectable, per sensor; ppm, %v/v, %LEL, °F or % RH

**Environmental**

Permissible ambient	
- working temperature	14°F to 122°F (-10°C to 50°C)
- storage temperature	23°F to 86°F (-5°C to 30°C)
- humidity	15 to 95% RH, non-condensing
- working pressure	Atmospheric ± 10%

**Physical**

Enclosure (panel)	
- material	Polycarbonate, UL 94-HB, fire-retardant
- conformity	UL 50 standards
- 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 5.12 x 2.95 in. (130 x 130 x 75 mm)
Cable entry	3 holes 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 <sup>2</sup> ) Max 14 AWG (2.5 mm <sup>2</sup> )
Wire distance	Max. loop resistance 450 Ω (= wire distance plus controller input resistance)
Weight	0.6 lbs (0.3 kg)

**Approvals / Listings**

- unit rating▲	NRTL Performance Tested & Certified Conforms to STD ANSI/UL 2075 CE EMV-Compliance 2004/108/EWG Low voltage directive 73/23/EWG UL Recognized, E41515 CSA, C22.2 No. 0, No. 14 (File No. LR31928)
- relays (R1-R2)	UL Listed, E208470 CSA Certified, E208470
- enclosure	One year material and workmanship

**Warranty**

**OPTIONS**

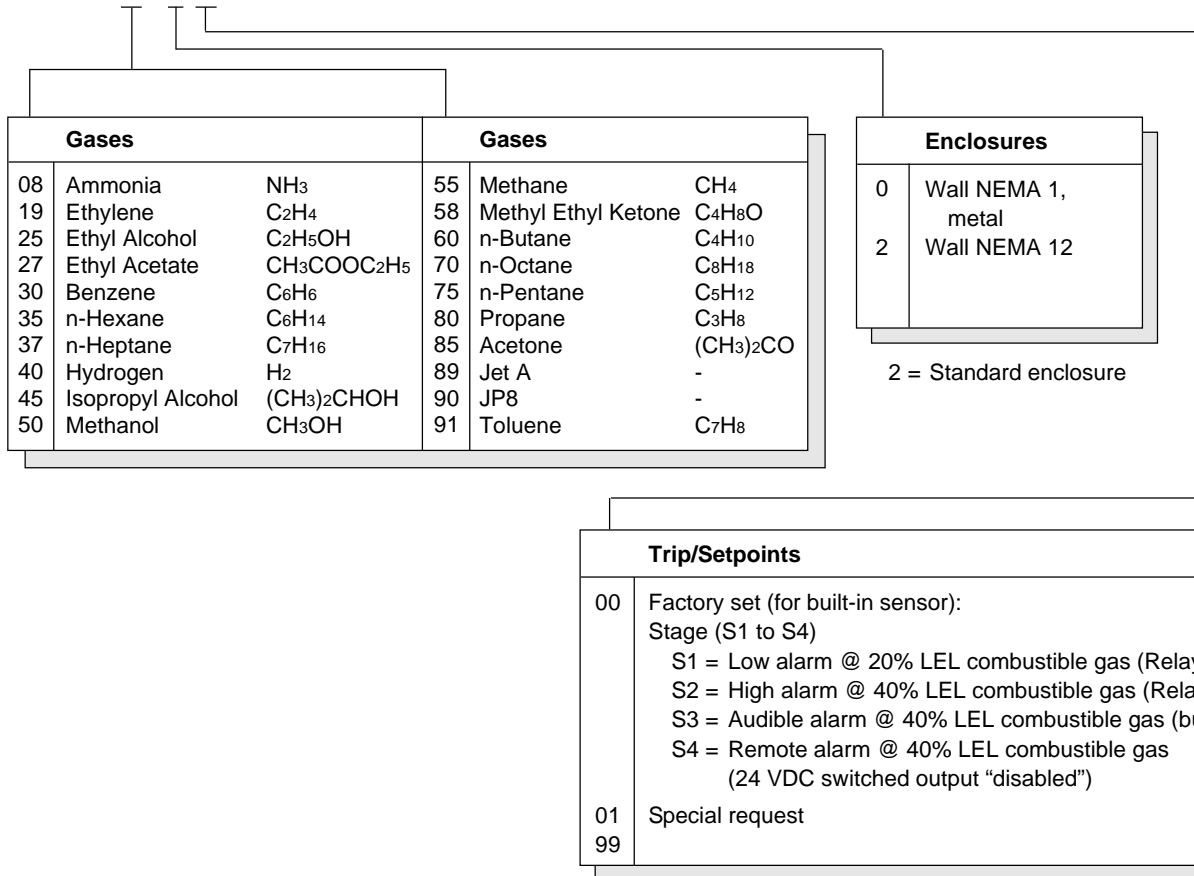
**Enclosure Metal, wall-mount**

- material	Galvanized steel w/zinc coating, corrosion resistant
- color	Light gray
- protection	NEMA 1, general purpose
- installation	Wall (surface) mounted, or single gang electrical box
Dimensions (H x W x D)	5.59 x 5.59 x 2.48 in. (142 x 142 x 63 mm)
Cable entry	3 holes for 1/2 in. conduit for wall (surface) mounting and 1 hole on back side of base plate for single gang electrical box mounting

(▲) Performance tested with Methane and Propane gases

**ORDERING INFORMATION**

**SPC3-3300 - 2 00 US**



Standard control system, ordering part number:

**SPC3 - 3355 - 200 US,**

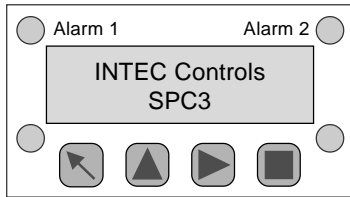
configuration includes:

Digital, programmable controller with menu-driven keypad user interface, LCD & LEDs, 24 VAC/VDC, 50/60 Hz NEMA 12 enclosure

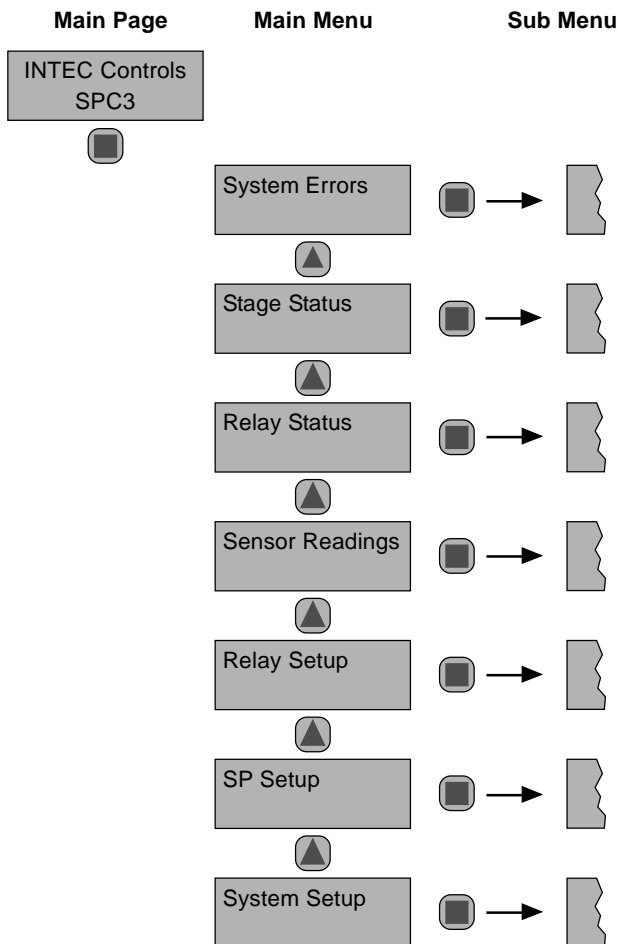
- Built-in: (1) Combustible gas sensor/transmitter for Methane (CH<sub>4</sub>)
- (1) Horn, audible alarm
- Input: (1) 4-20 mA, for remote sensor
- Outputs: (2) Relays, 30 VAC/VDC 0.5 A;  
1-SPDT (R1) and  
1-SPST-NO/NC (R2),  
jumper selectable
- (1) Switched 24 VDC, 50 mA
- (1) (0)4-20 mA or (0)2-10 VDC, selectable

**USER INTERFACE & CONTROLLER**

**Keypad User Interface**



- Alarm 1** "Orange LED" Flashes when any stage level setpoint is exceeded; steady when any relay output is in manual override operation.
- Alarm 2** "Red LED" Flashes when high alarm stage 2 or multiple alarm stage level setpoints are exceeded; steady when any relay output is in manual override operation
- Failure** "Yellow LED" Flashes when system or sensor fails
- Power** "Green LED" Steady when power is ON
- Scroll down in Main menu and Sub menus; decreases a value
- Navigates through menus on the same level; moves cursor when inputting data
- Exits programming and saves settings or return to previous level or menu
- Enter Sub menus or stores data; horn silence (if assigned)



**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 INTEC 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
- Set delay ON/OFF time

**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 4
- 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 4 to any output relay
- Assign to analog output

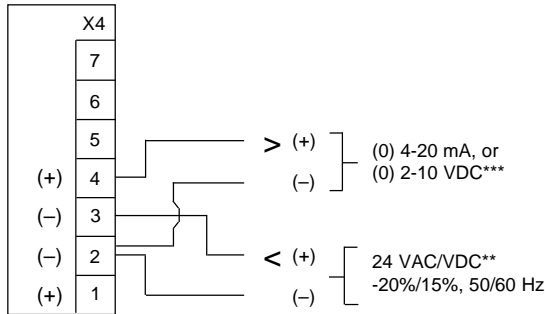
**Sub Menu "System Setup"**

Enter and/or change system parameters.

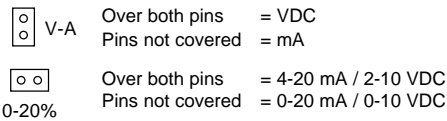
- Select service mode
- Display software version
- Set next maintenance date
- Select service phone number
- Select averaging function, time and overlay, of any SP
- Set date, time and time format
- Change customer password
- Set failure relay
- Select power ON time
- Select analog output function

**WIRING CONFIGURATION**

**24 VAC/VDC Input Power Supply, and Analog Output "AO01"**

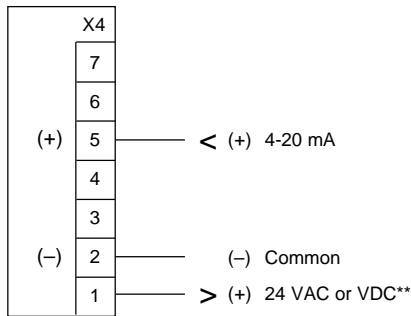


\*\*\*Jumper output signal "AO01" range selectors:

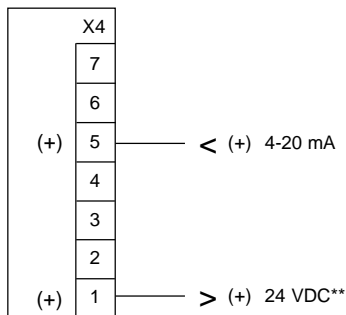


**Optional 4-20 Remote AT-...V3 Series Sensor/Transmitter Input "SP02",**

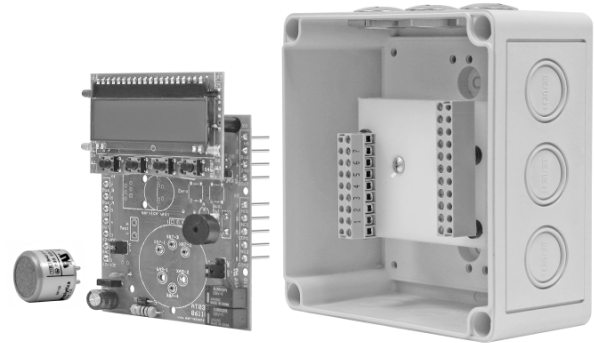
4-20 mA, 3-wire sensor/transmitter



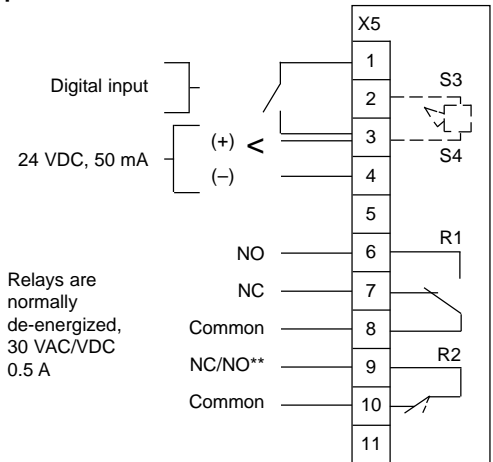
4-20 mA, 2-wire loop-powered sensor/transmitter



*Twisted, shielded wire is recommended for 2- or 3-wire configurations.*



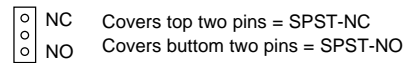
**Binary-Relay Outputs "R01 and R02", 24 VDC switched Output "S4", and Digital Input**



Relays are normally de-energized, 30 VAC/VDC 0.5 A

S3 = Built-in horn  
S4 = Switched output

\*\*Jumper SPST relay (R2) NC/NO selector:



**\*\*/\*\* Be Alert:**

- Only the same type of power, VAC or VDC, as supplied to the unit, is available for the remote transmitter. I. E. When 24 VDC transmitter power is required, the unit must be powered with 24 VDC.
- 2-wire loop powered transmitter transmitter can use the internal power.
- 3-wire transmitters that allow power common to DC common can use the same power supply to power the SPC3 and the transmitter.
- 3-wire transmitters that require separate power common from DC common must use a separate power source.