Ammonia (NH_3) Single-Point Gas Detection System

PolyGard
SPC3-1120

DESCRIPTION

Wall-mounted gas monitor with built-in ammonia (NH_3) sensor, accepts one analog remote device such as a secondary gas sensor, temperature or humidity sensor.

APPLICATION

To detect and control levels of ammonia (NH_3) and other gases in a wide variety of commercial and industrial applications such as the ammonia level in chiller equipment rooms, food storages, freezers, arenas, breweries, and ventilation systems, etc. The controller can communicate with any compatible electronic analog control, DDC/PLC control or automation system via binary and/or analog output signal.

CE

NRTL Certification to STD
UL 61010-1

FEATURES

- *Continuous monitoring*
- *One (1) built-in NH_3 electrochemical sensor*
- *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, 50 mA max.*
- *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 4X enclosure*
- *Easy maintenance*

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	Ammonia (NH_3)
Sensor element	Electrochemical, diffusion
Range	0-300 ppm or 0-1000 ppm, fixed "*refer to Ordering Information*"
Resolution	4.0 ppm
Repeatability	± 3.0 % of reading
Long term output drift	< 5% / 6 months
Response time	t_{90} < 35 sec.
Sensor life expectancy	2 years, normal operating environment
Sensor coverage	2,000 sq. ft., max 3,000 sq. ft. (180 m^2, max 280 m^2), under "ideal conditions"
Installation Location	
Mounting height	1 ft. (0.3 m) below ceiling

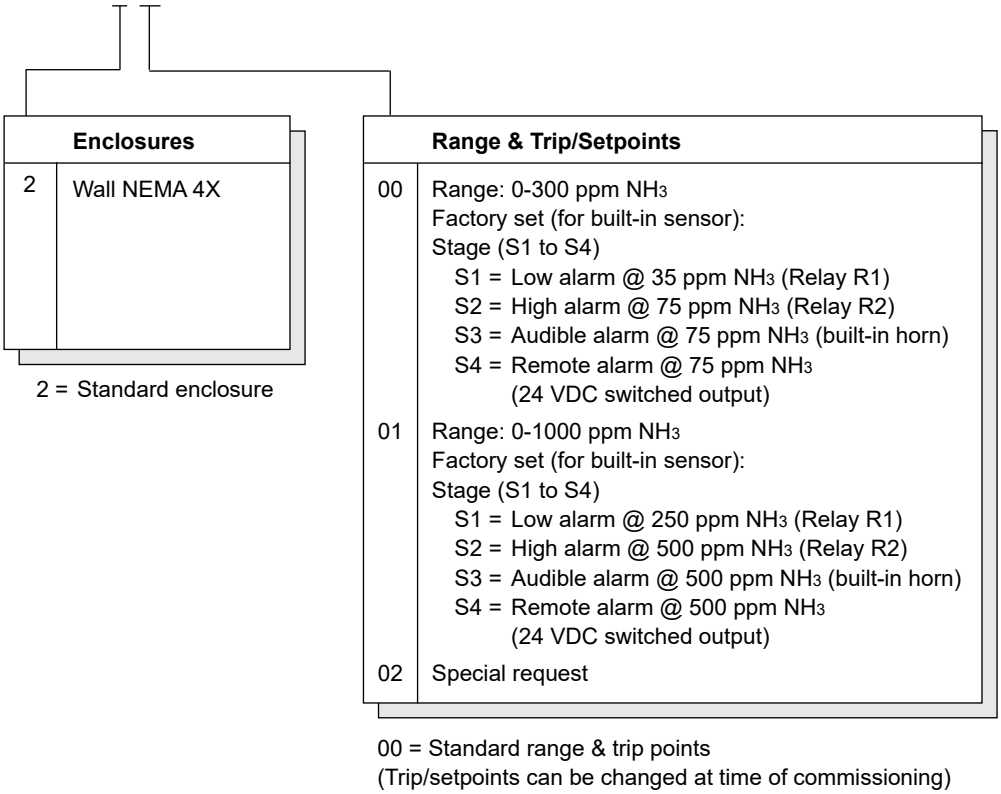
Type of Control	
General	Four-stage (S1 to S4) control, assignable up to two (2) binary/ relay, horn/audible alarm, and 24 VDC / 50 mA switched outputs, i.e. low-high stage for relay output, horn / audible alarm and switched 24 VDC at any stage for remote alarming
Analog input	One (1) 4-20 mA, for additional 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

SPECIFICATION

Type of Control (cont...)	
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 acknowledgment	Menu-driven and system reset function for latched relays
User Interface	
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 4X (IP65)
- 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^2) Max 14 AWG (2.5 mm^2)
Wire distance	Max. loop resistance 450 Ω (= wire distance plus controller input resistance)
Weight	0.6 lb (0.3 kg)
Approvals / Listings	
- unit rating	NRTL Certification to STD ANSI/UL 61010-1 CE EMC-Compliance 2004/108/EWG LVD 73/23/EWG
- relays (R1-R2)	UL Recognized, E41515 CSA, C22.2 No. 0, No. 14 (File No. LR31928)
- enclosure	UL Listed, E208470 CSA Certified, E208470
Warranty	Two years material and workmanship, 12 months normal exposure for sensor element

ORDERING INFORMATION

SPC3-1120 - 2 00 US



Standard control system, ordering part number:

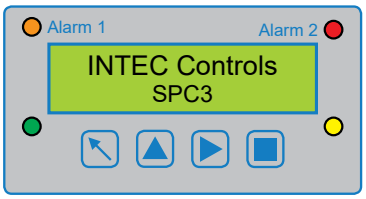
SPC3 - 1120 - 200 US,
configuration includes:

Digital, programmable controller with
menu-driven keypad user interface,
LCD & LEDs, 24 VAC/VDC, 50/60 Hz
NEMA 4X enclosure

Built-in: (1) NH_3 sensor/transmitter, range 0-300 ppm NH_3
(1) Horn, audible alarm
Input: (1) 4-20 mA, for remote sensor
Outputs: (2) Relays, 30 VAC/VDC, 0.5 A max.; 1-SPDT (R1) and 1-SPST-NO/NC (R2), jumper selectable
(1) Switched 24 VDC, 50 mA max.
(1) (0)4-20 mA or (0)2-10 VDC, selectable

USER INTERFACE & CONTROLLER

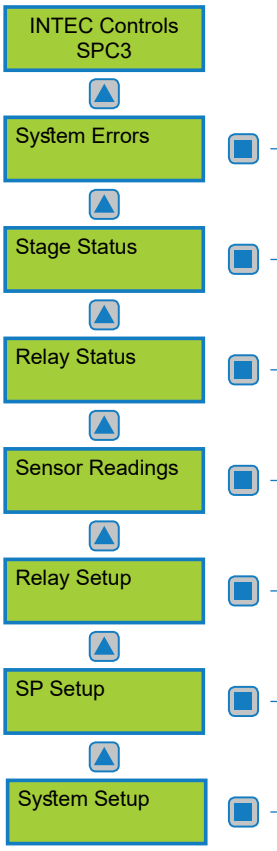
Keypad User Interface



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

	Exit programming mode and saves settings; return to previous level or menu
	Enter Main Menus; scrolls through Main Menus and Sub Menus; increase or decrease a value
	Navigates through menus on the same level; moves cursor when inputing data
	Enter Sub Menus; accepts and stores data; silence horn (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 (1234) allows to override or to reset system status functions. The upper level password (9001) 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
- 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

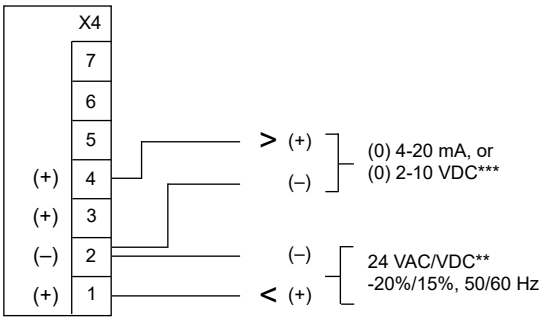
Sub Menu "System Setup"

Enter and/or change system parameters.

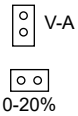
- Select service mode
- Display software version
- Set maintenance after days
- Select service phone number
- Select averaging function, time and overlay, of any SP
- Set maintenance period days
- Change customer password
- Set failure relay
- Select power ON time
- Select analog output function

WIRING CONFIGURATION

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



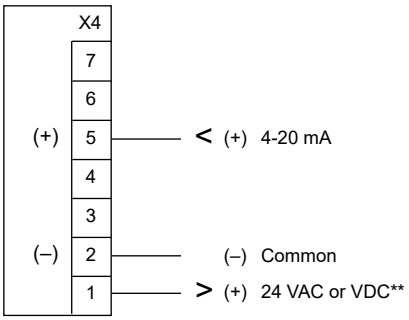
***Jumper output signal "AO01" range selectors:



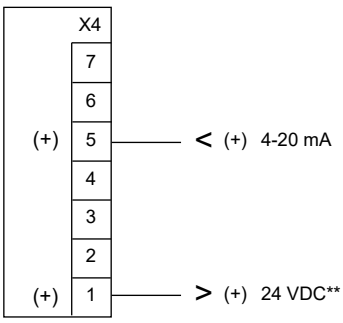
Over both pins	= VDC
Pins not covered	= mA
Over both pins	= 4-20 mA / 2-10 VDC
Pins not covered	= 0-20 mA / 0-10 VDC

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

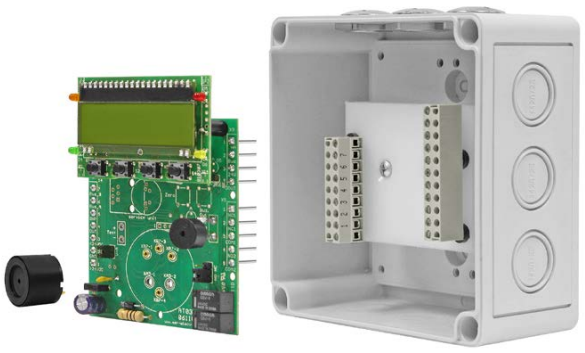
4-20 mA, 3-wire sensor/transmitter



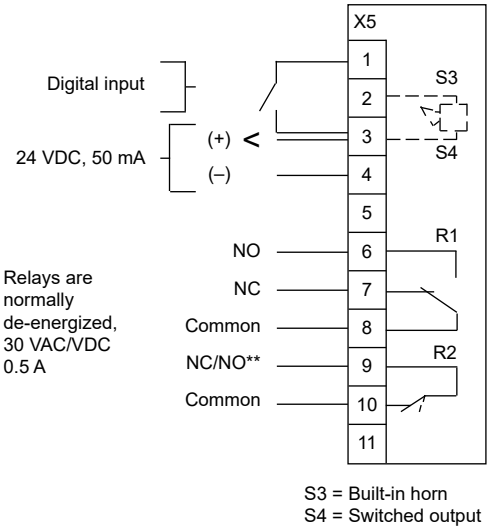
4-20 mA, 2-wire loop-powered sensor/transmitter



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



S3 = Built-in horn
S4 = Switched output

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

Covers top two pins = SPST-NC
Covers bottom two pins = SPST-NO

/ Attention:***

- 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 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.