

Ammonia (NH₃) Single-Point Gas Detection System



**PolyGard
SPC3-1120**

DESCRIPTION

Wall-mounted gas monitor with built-in ammonia (NH₃) sensor, accepts one analog remote device such as a secondary gas sensor, temperature or humidity sensor.

APPLICATION

To detect and control levels of ammonia (NH₃) 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.



NRTL Certification to STD
UL 61010-1
"Pending"

FEATURES

- Continuous monitoring
- One (1) built-in NH₃ 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
- 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

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 (NH₃)

Sensor element Electrochemical, diffusion

Range 0-300 ppm or 0-1000 ppm, fixed
"refer to Ordering Information table"

Resolution 4.0 ppm

Repeatability ± 3.0 % of reading

Long term output drift < 5% / 6 months

Response time t₉₀ < 35 sec.

Sensor life expectancy 2 years, normal operating environment

Sensor coverage 2,000 sq. ft., max 3,000 sq. ft.
(180 m², max 280 m²),
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 acknowledgement 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 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 mm²)
 Max 14 AWG (2.5 mm²)
 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 Certification to STD ANSI/UL 61010-1 – "Pending" 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

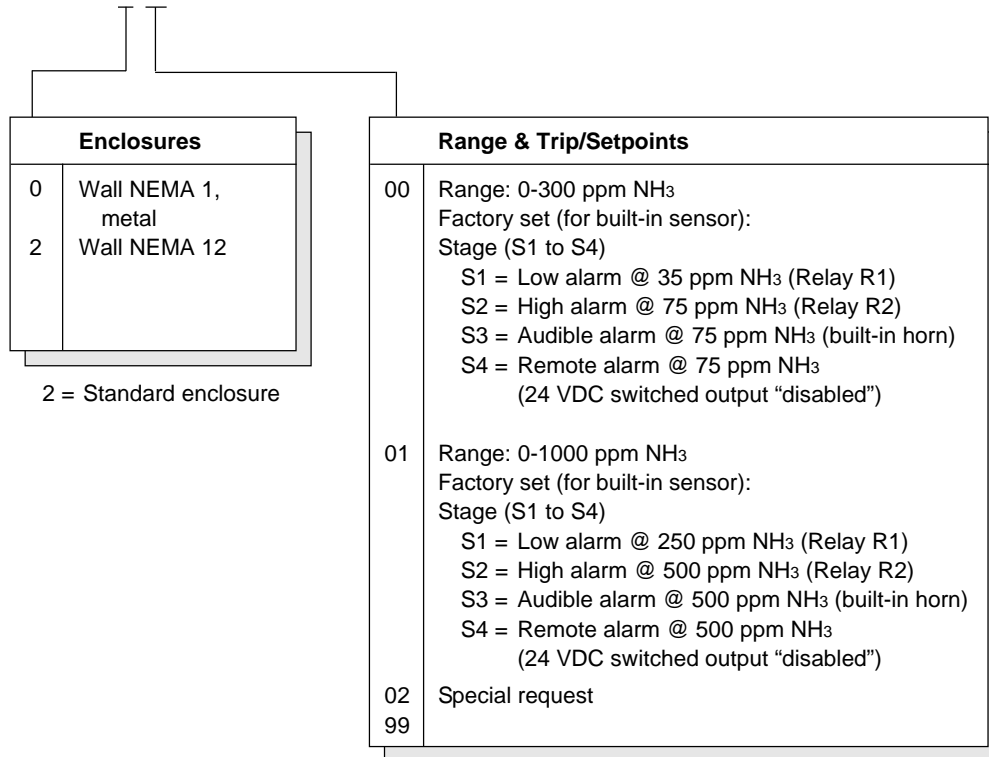
OPTIONS

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

ORDERING INFORMATION

SPC3-1120 - 2 00 US



2 = Standard enclosure

00 = Standard range & trip points
(Trip/setpoints can be changed at time of commissioning)

Standard control system, ordering part number:

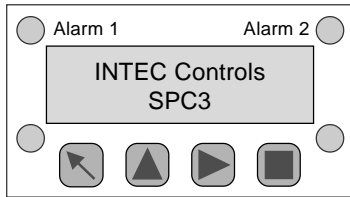
SPC3 - 1120 - 200 US,
configuration includes:

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

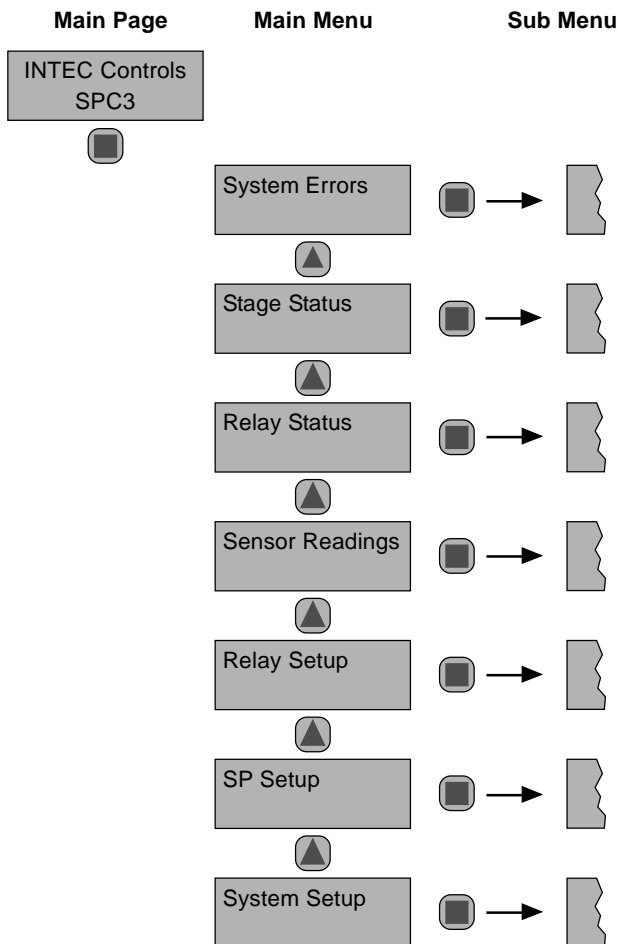
- Built-in: (1) NH₃ sensor/transmitter, range 0-300 ppm NH₃
- (1) Horn, audible alarm
- Input: (1) 4-20 mA, for remote sensor
- Outputs: (2) Relays, 30 VAC/VDC 0.5 A;
1-SPDT (R1) and
1-SPST-NO/NC (R2),
jumper selectable
- (1) Switched 24 VDC, 50 mA
- (1) (0)4-20 mA or (0)2-10 VDC,
selectable

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

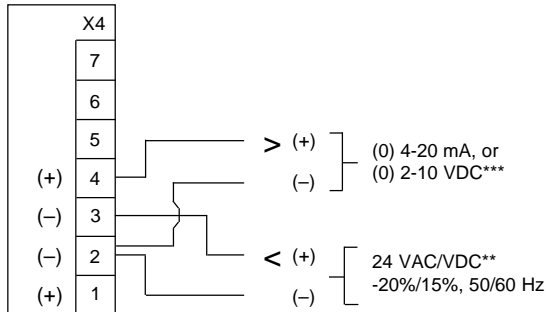
Sub Menu "System Setup"

Enter and/or change system parameters.

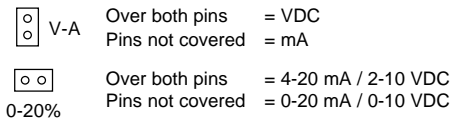
- Select service mode
- Display software version
- Set next maintenance date
- Select service phone number
- Select averaging function, time and overlay, of any SP
- Set date, time and time format
- Change customer password
- Set failure relay
- Select power ON time
- Select analog output function

WIRING CONFIGURATION

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

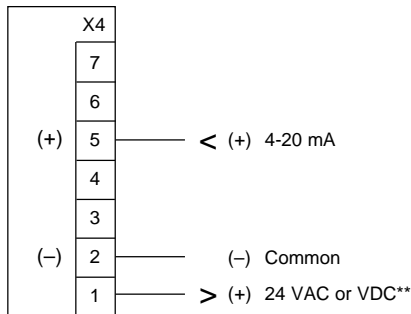


***Jumper output signal "AO01" range selectors:

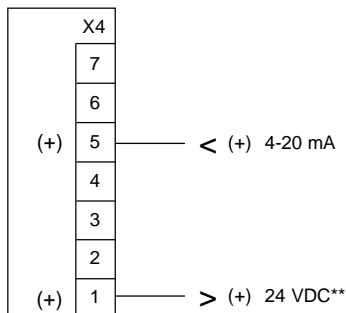


Optional 4-20 Remote AT-...V3 Series Sensor/Transmitter Input "SP02",

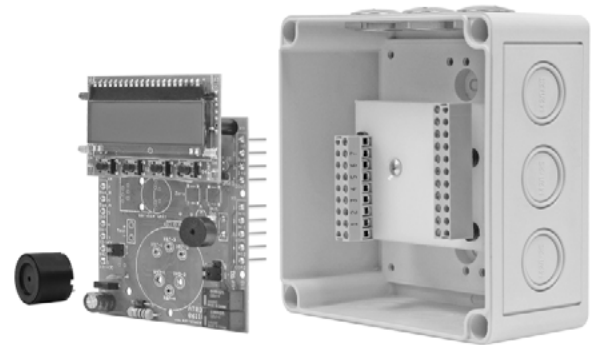
4-20 mA, 3-wire sensor/transmitter



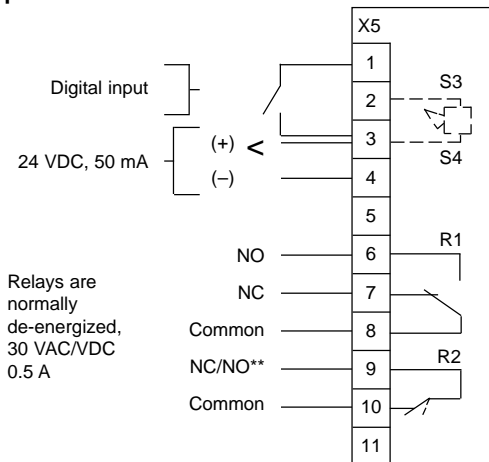
4-20 mA, 2-wire loop-powered sensor/transmitter



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



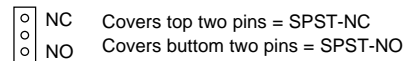
Binary-Relay Outputs "R01 and R02", 24 VDC switched Output "S4", and Digital Input



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.