Model NG-1 100, NG-1 250, and NG-1 500 Wall-Mounted Nitrogen Generator

IMPORTANT
Refer to Technical Data Sheet TFP2300 for warnings pertaining to regulatory and health information.

Scan the QR code or enter the URL in a web browser to access the most up-to-date electronic version of this document. Data rates may apply.

docs.jci.com/tycofire/tfp1251

General Description

The TYCO NG-1 100, NG-1 250, and NG-1 500 Wall-Mounted Nitrogen Generators are designed to facilitate the Dry Pipe Nitrogen Inerting (DPNI) process for controlling oxygen corrosion in dry and preaction fire sprinkler systems, and provide supervisory maintenance gas. Designed for "plug and play" performance in a typical dry or preaction fire sprinkler system, the nitrogen generator utilizes membrane separation technology that produces 98%+ nitrogen on demand without the need for nitrogen storage.

The nitrogen generator can be used to provide DPNI for single or multiple zones depending on the following factors:

- Number of systems
- Volume of the largest system
- Cumulative volume of all systems being supplied

The generator includes an internal bypass valve to allow for maintenance or "fast fill" needs to meet the NATIONAL FIRE PROTECTION AGENCY (NFPA) 13 30-minute fill requirement for dry pipe and preaction fire protection systems.

The nitrogen generator is designed to nitrogen inert all of the zones being served within 14 days. Thereafter, it will continue to automatically provide supervisory nitrogen gas sufficient for pressure maintenance of the fire sprinkler system(s).

The nitrogen generator facilitates the patented "fill and purge" breathing process in the fire sprinkler system when paired with an oxygen removal vent installed on the sprinkler riser such as the TYCO Dry Air Vent (TAV-D) or the TYCO Dry SMART Vent (TSV-D). Refer to TFP1262 for more information on TYCO Dry Air Vent (TAV-D), and to TFP1263 for more information on TYCO SMART Air Vent (TSV-D).

System Assembly

The nitrogen generator is a self-contained wall-mounted unit that includes the following components:

- Steel enclosure cabinet with membrane type nitrogen generator - no nitrogen gas storage - and manual bypass
- Power supply:
  120 VAC/1 phase/60Hz
  (230 VAC/1 phase/50Hz)
- Single point nitrogen/air discharge – 1/2 in. NPT
- Oil-less air compressor
- Hour Run Meter
- Cycle Counter

System Status

The nitrogen generator includes the following system status indicators:

- Bypass Mode Alarm Indicator - Nitrogen generator is in the bypass mode (flashing indicator). See Figure 4.
- Leak Monitoring Alarm - Nitrogen generator is running excessively (audible signal).

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System Input/Output Signals

The nitrogen generator includes the following output signals:

Digital Outputs

- Power On/Off
- Bypass Mode Alarm
- Nitrogen Generator Running
- Leak Monitoring

Analog Outputs

- Nitrogen Supply Line Pressure

The nitrogen generator is designed to be used in conjunction with the TYCO AMD-1 Air Maintenance Device, the TYCO Handheld Gas Analyzer (THGA), and the Riser-mounted TYCO Dry Air Vent (TAV-D), or TYCO SMART Vent (TSV-D), as part of the complete Dry Pipe Nitrogen Inerting (DPNI) system.

Note: *The air maintenance device is not required when the NG-1 100 or NG-1 250 is connected to a single dry pipe or preaction sprinkler system.*

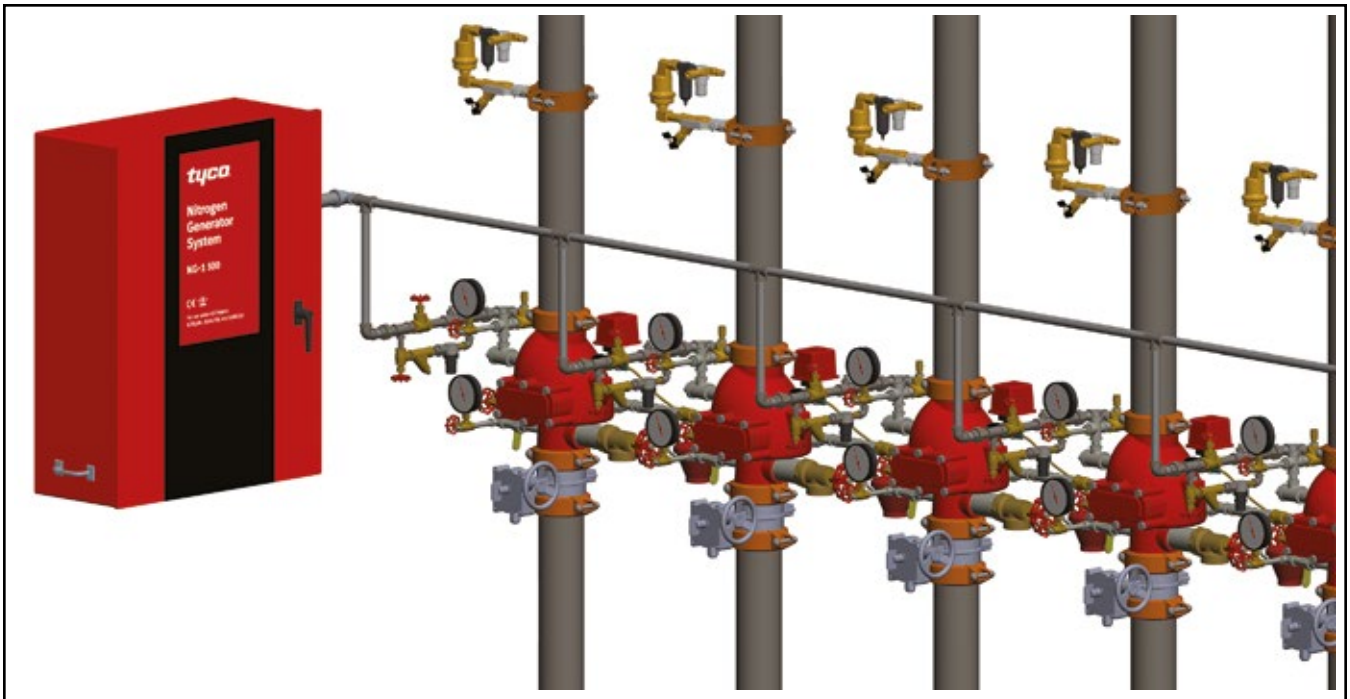


FIGURE 1
MODEL NG-1 100, NG-1 250 AND NG-1 500 WALL-MOUNTED NITROGEN GENERATOR INSTALLATION SCHEMATIC

The nitrogen generator can be used with the following optional equipment:

- TYCO SMART Gas Analyzer (TSGA) - one per nitrogen generator is recommended. Refer to Technical Data Sheet TFP1270 for the SMART Gas Analyzer for more information.
- TYCO In-Line Corrosion Detector (TILD) - at least one per sprinkler system is recommended. Refer to Technical Data Sheet TFP1261 TYCO In-Line Corrosion Detector for more information.

NOTICE

The TYCO Wall-Mounted Nitrogen Generators described herein must be installed and maintained in compliance with this document, in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the performance of the related devices.

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. Contact the installing contractor or product manufacturer with any questions.

Model Number	Width Inches (mm)	Height Inches (mm)	Depth Inches (mm)	Weight Lbs (kg)
NG-1 100	24.5 (622)	36.5 (927)	9.25 (235)	125 (57)
NG-1 250	24.5 (622)	36.5 (927)	9.25 (235)	125 (57)
NG-1 500	28.5 (724)	36.5 (927)	11.5 (292)	175 (79)

TABLE A
MODEL NG-1 100, NG-1 250 AND NG-1 500 WALL-MOUNTED NITROGEN GENERATOR DIMENSIONS AND WEIGHT

Technical Data

Approvals
FM Approved
Compliance with CE Pressure Equipment
UL508A Listed Industrial Control Panel

Cabinet Dimensions
See Table A

Weight
See Table A

Temperature Range
40°F (5°C) to 105°F (40°C)

Power Supply
Two dedicated circuits are available:

- 120 VAC/Single phase/60Hz
- 230 VAC/Single phase/50Hz

Power Consumption
NG-1 100 and NG-1 250: 6 A
NG-1 500: 14.5 A

Nitrogen/Air Connection
1/2 in. NPT Female

Drain Connection
1/4 in. NPT Connection

Optional Configuration
Cold Storage Installation

Nitrogen Quality
N_2 Purity at Discharge: 98% or greater (maximum of 2.0% oxygen)

N_2 Pressure at Discharge: Minimum of 15 psig (1 bar); Max of feed air pressure minus 15 psig (1 bar)

N_2 Water Dew Point: Typically less than -70°F (-57°C)

Note: *When connecting a TYCO Wall-Mounted Nitrogen Generator to an existing dry pipe/preaction fire sprinkler system, the existing fire sprinkler system(s) must be limited to a maximum leak rate of less than 6 psig (0.4 bar) within a 24 hour period, per system.*

Model Number	Min. Supply Air SCFM (L/min)	Total System Capacity Gal (L)	Single System Capacity[a] at 40 psig (2,8 bar) Gal. (L)	Single System Capacity at 20 psig (1,4 bar) Gal. (L)	Sound Level dBA @ 10 ft
NG-1 100	2.5 (71)	675 (2555)	215 (814)	540 (2044)	56
NG-1 250	3.3 (94)	950 (3596)	265 (1003)	590 (2233)	57
NG-1 500	5.7 (161)	2000 (7571)	560 (2120)	1120 (4240)	73

a. Capacity based on NFPA 13 30-minute fill requirement of largest single system.

TABLE B
MODEL NG-1 100, NG-1 250, AND NG-1 500 WALL-MOUNTED NITROGEN GENERATOR OPERATING PERFORMANCE

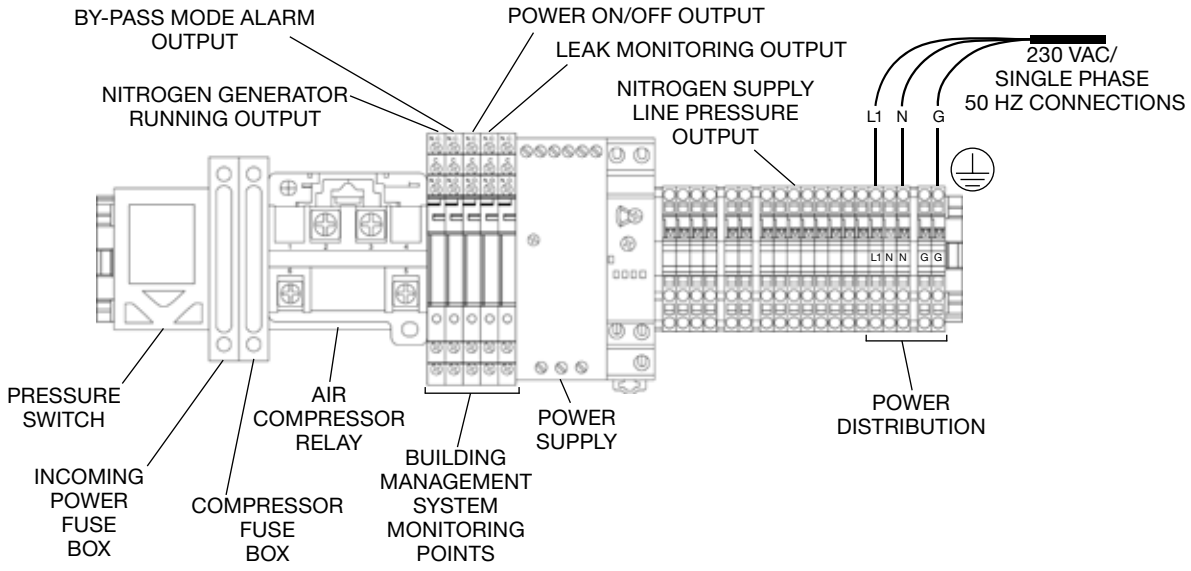


FIGURE 2A
MODEL NG-1 100 AND NG-1 250 WALL-MOUNTED NITROGEN GENERATOR SYSTEM SIGNAL MONITOR AND 50 HZ POWER SUPPLY CONNECTION

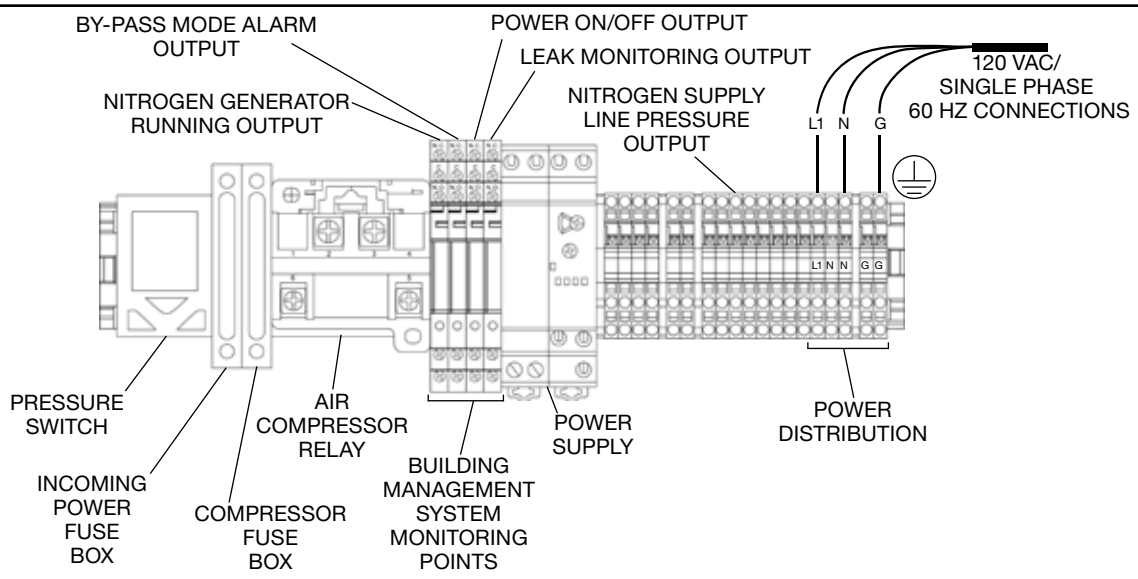


FIGURE 2B
MODEL NG-1 100 AND NG-1 250 WALL-MOUNTED NITROGEN GENERATOR SYSTEM SIGNAL MONITOR AND 60 HZ POWER SUPPLY CONNECTION

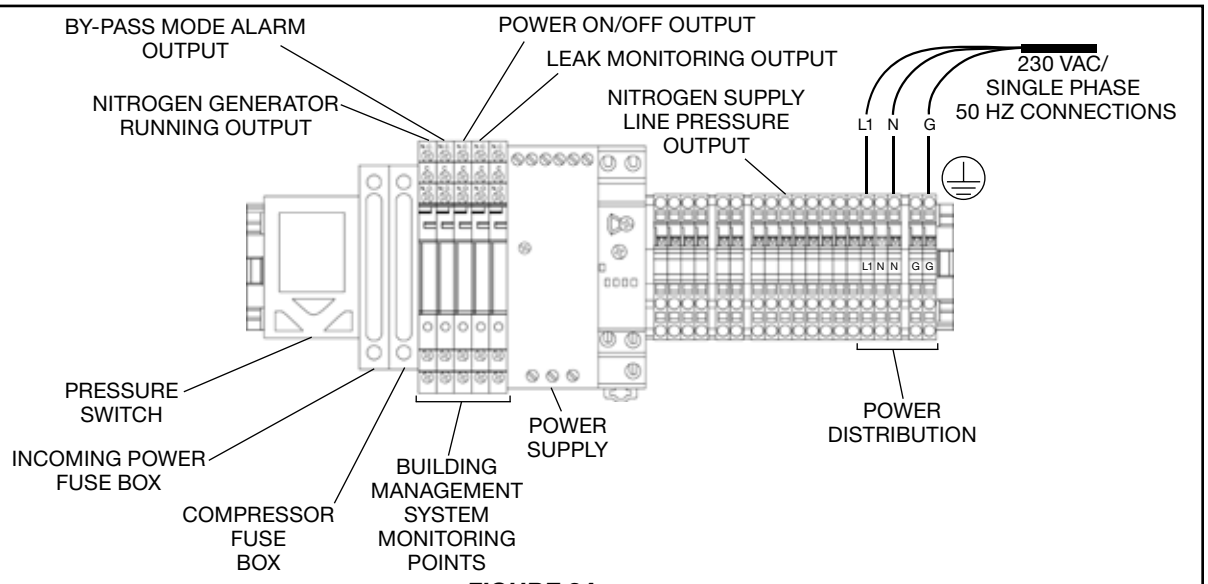


FIGURE 3A
MODEL NG-1 500 WALL-MOUNTED NITROGEN GENERATOR
SYSTEM SIGNAL MONITOR AND 50 HZ POWER SUPPLY CONNECTION

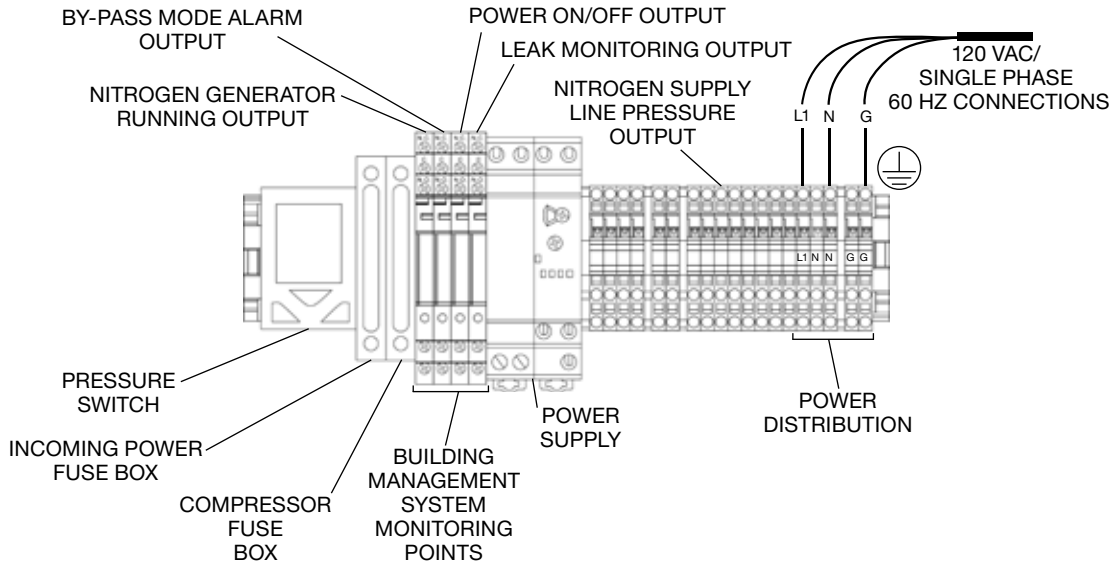


FIGURE 3B
MODEL NG-1 500 WALL-MOUNTED NITROGEN GENERATOR
SYSTEM SIGNAL MONITOR AND 60 HZ POWER SUPPLY CONNECTION

Installation

The TYCO NG-1 100, NG-1 250, and NG-1 500 Wall-Mounted Nitrogen Generators must be installed in accordance with this section.

WARNING

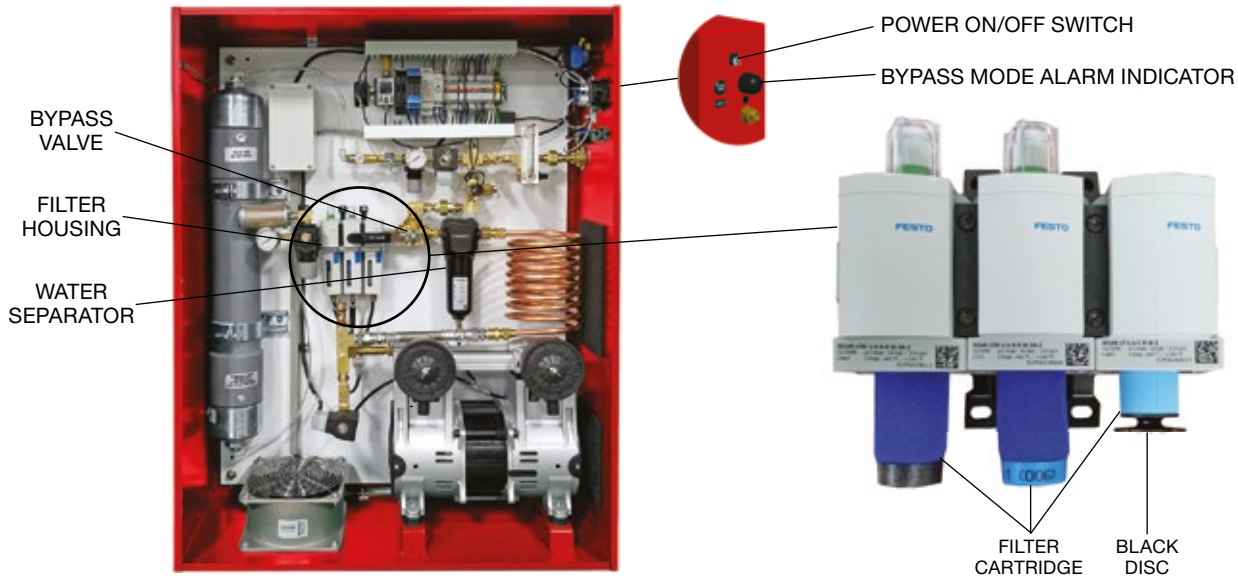
Do not operate the TYCO Nitrogen Generator if damaged during shipment, handling or use. Failure to do so may result in personal injury or property damage.

Operation of the nitrogen membrane above the rated design pressure could be hazardous. Do not connect the nitrogen generation equipment to compressed air sources that can exceed the maximum rated pressure without installing pressure controls and safety relief devices in the compressed air supply line.

Specific procedures must be developed for maintenance and servicing of the equipment where the nitrogen membrane is located. Appropriate labels must be continuously displayed in all areas where personnel might be exposed to a nitrogen atmosphere under normal and abnormal conditions. Nitrogen is nontoxic and largely inert. Rapid release of nitrogen gas into an enclosed space displaces the oxygen and can cause an asphyxiation hazard.

CAUTION

Do not install the TYCO Nitrogen Generator or air compressor package in an area where ammonia, sulfur dioxide, hydrogen sulfide, mercaptans, chlorides, chlorine, oxides of nitrogen, acid fumes, solvent vent vapors, and ozone vapors or similar contaminates exist. The equipment can be damaged by ammonia and other vapors shortening membrane life.



Note:
1. Filter Housing shown with Lower Housing removed
2. The Water Separator is not required for the NG-1 100 or NG-1 250 Nitrogen Generator

FIGURE 4
MODEL NG-1 100, NG-1 250 AND NG-1 500 WALL-MOUNTED NITROGEN GENERATOR
FILTER CARTRIDGE REPLACEMENT

Step 1. Mounting the Wall-Mounted Nitrogen Generator
The wall-mounted nitrogen generator is designed to be mounted directly to the wall at the installation location. Several factors should be considered in choosing the proper mounting location for the nitrogen generator:

- Access to the power supply (dedicated circuit)
- Access to the sprinkler riser being supplied from the nitrogen generator
- Access to the condensate drain discharge line
- Clearance at the front of the unit to open the cabinet door
- Clearance around ventilation vents on side and bottom for proper cabinet ventilation
- Ability to support cabinet weight at mounting location The nitrogen generator cabinet assembly includes a mounting rail for wall mounting using standard anchors.

Step 2. Power Supply
The nitrogen generator requires a dedicated power supply that connects to the terminal blocks in the nitrogen generator cabinet. See Figures 2A, 2B, 3A, and 3B.

Step 3. Plumb the Nitrogen/Air Supply Line
The nitrogen/air discharge plumbing from the nitrogen generator is to be connected directly to the sprinkler system valve trim using a minimum of 1/2 in. black steel, galvanized steel or copper piping. The size of the nitrogen/air supply line is to be based on the length of pipe between the nitrogen generator and the fire sprinkler systems along with the total volume of the fire sprinkler systems being supplied. The nitrogen generator requires an in-line air maintenance device (AMD) that is equipped with an on board field adjustable pressure regulator for each zone being served. The preferred AMD is the TYCO AMD-1. Refer to TFP1221.

Note: *When both dry pipe and preaction fire sprinkler systems are connected to one nitrogen generator, additional equipment may be required if the fire sprinkler systems operate at different supervisory gas pressures.*

Step 4: Plumb the Condensate Drain Line
The TYCO Nitrogen Generator will occasionally discharge a small amount of condensate water from the coalescing filters inside the cabinet. It is recommended that the 1/4 in. drain connection be plumbed to a floor drain or building exterior. When plumbing to a drain is not feasible an evaporative collection chamber can be used.

Step 5: System Signals and Monitoring (where used)
The nitrogen generator cabinet has two system signals and five outputs that can be monitored by the facility's BMS or fire alarm system as shown in Figures 2A, 2B, 3A, and 3B.

- Bypass Alarm - The nitrogen generator is operating in the bypass mode which is activated when the bypass valve is in the "FAST FILL" position to fast fill the fire sprinkler system and the air supplied directly from the air compressor has reached a pressure of 20 psig (1,4 bar). (Flashing amber light)
- Leak Monitor - The nitrogen generator is equipped with a leak monitor audible signal which is activated when the nitrogen generator runs excessively.

The nitrogen generator cabinet includes system monitoring signals which can be monitored through a building monitoring system, if desired:

- Nitrogen Generator Running - Form C contacts
- Bypass Mode Alarm - Form C contacts
- Power On/Off - Form C contacts
- Leak Monitoring - Form C contacts
- Nitrogen System Supply Line Pressure - Analog signal

Care and Maintenance

The TYCO NG-1 100, NG-1 250, and NG-1 500 Wall-Mounted Nitrogen Generators must be maintained and serviced in accordance with this section.

Before closing a fire protection system main control valve for maintenance work on the fire protection system that it controls, permission to shut down the affected fire protection systems must first be obtained from the proper authorities. All personnel who may be affected by this decision must be notified.

Inspection, testing, and maintenance must be performed in accordance with the requirements of the NFPA, and any impairment must be immediately corrected.

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of any authorities having jurisdiction. Contact the installing contractor or product manufacturer with any questions.

Automatic sprinkler systems are recommended to be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

Maintenance of the Nitrogen Generator

The nitrogen generator cabinet contains three separate cartridge filters. It is recommended that each of the filter cartridges be replaced as part of an annual preventative maintenance program. In some environments it may be necessary to replace filters more frequently. When maintained properly the nitrogen separation membrane will provide up to 20 years of service life.

Cartridge Filter Replacement Procedure

Perform the following steps when replacing the cartridge filters located in the filter housing. See Figure 4.

Step 1. Turn the power supply to the unit OFF.

Step 2. Close the air supply control valves on fire sprinkler system's air maintenance device(s).

Step 3. Turn the bypass valve in the nitrogen generator to the "FAST FILL" position.

Step 4. The nitrogen generator is designed to depressurize the inlet piping through the permeate of the nitrogen separation membrane when the nitrogen generator automatically shuts off.

Step 5. Remove the filter housing by pulling down on the blue housing lock and turning the filter housing counter-clockwise.

Step 6. Once the filter housing has been removed, the filter cartridge inside is removed by first unscrewing the black retaining disc at the base of the cartridge and then pulling down on the cartridge. Discard the old filter cartridge and replace it with the appropriately marked filter cartridge from the filter replacement kit by pushing up so that it fits snugly onto the receiving cylinder in the upper part of the filter housing. Hand tighten the black retaining disc back onto the central metal threaded rod.

Step 7. Replace the filter housing by pushing up into position and turning housing clockwise until blue housing lock locks into place.

Step 8. Repeat Step 5 through Step 7 for each additional filter.

Note: *Filters 2 & 3 do not have a black retaining disc, filters screw directly into housing.*

The water separator is found only in the NG-1 500 Wall-Mounted Nitrogen Generator. If replacing the filter cartridges in the NG-1 500 Wall-Mounted Nitrogen Generator, continue on to Step 9. Otherwise, proceed to Step 13 for the NG-1 100 and NG-1 250 Wall-Mounted Nitrogen Generators.

Step 9. Disconnect the water separator drain tube from the bottom of the separator bowl by pushing up on the push fitting.

Step 10. Unscrew the separator bowl and then pull out the separator element for inspection and cleaning.

Step 11. Replace the separator element and screw the separator bowl back into place.

Step 12. Reconnect the water separator drain tube back into the push fitting at the bottom of the separator bowl.

Step 13. Close the depressurization ball valve. The nitrogen generator can now be placed back into service.

Step 14. Turn the power supply to the unit ON.

Step 15. Open the air supply control valve on fire sprinkler system's air maintenance device(s).

Step 16. Turn the bypass valve in the nitrogen generator to the "NITROGEN GENERATION" position.

Limited Warranty

For warranty terms and conditions, visit www.tyco-fire.com.

Ordering Procedure

Based on information provided by the customer, TYCO will supply a list of required part numbers to order through regular sales channels. To properly select a nitrogen generator, contact your local business manager or sales person and specify the following information:

Sizing of Nitrogen Generator

- Total cumulative size of all dry/preaction sprinkler systems
- Size of the largest single dry/preaction sprinkler system
- Total number of dry/preaction sprinkler systems
- Supervisory pressure of all dry/preaction sprinkler systems

Select a Vent (Required)

Model TAV-D Dry Air Vent TAVD02
Model TSV-D SMART Dry Air Vent
120 VAC/60Hz TSVD02
230 VAC/50Hz TSVD02E

Note: *Part numbers TSVD02 and TSVD02E replace the legacy part numbers TSVD01 and TSVD01E respectively.*

Filter Replacement Kit

Filter Replacement Kit . . . . . TNGFLTW

Optional Monitoring Equipment

Model THGA Handheld
Gas Analyzer THGA01
Model TSGA SMART
Gas Analyzer TSGA01

Model TILD In-Line Corrosion Detector

Refer to Technical Data Sheet TFP1261 for ordering instructions.

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Johnson Controls

TFP1251
Change History Appendix

ISSUE DATE	NOTES
03-23	Page 2, Technical Data Optional Configuration sub-section, changed configuration to Cold Storage Installation, formerly Cold Environment Installation.
08-22	Page 1, added QR code and URL to allow convenient access to electronic version from printed document; Page 6, changed corporate address and telephone number to 1467 Elmwood Avenue, Cranston, RI 02910 | Telephone +1-401-781-8220, formerly 1400 Pennbrook Parkway, Lansdale, PA 19446 | Telephone +1-215-362-0700.
06-21	Changed part numbers in Ordering Procedure Select a Vent sub-section for Model TSV-D SMART Dry Air Vent: 120 VAC/60Hz type now TSVD02, formerly TSVD01; 230 VAC/50Hz type now TSVD02E, formerly TSVD01E; Added note indicating new part numbers replace legacy part numbers.
12-20	Changed NG-1 500 power consumption to 14.5 amps, formerly shown as 24 amps.
06-20	Separated combined electrical signal and power connection diagrams into individual diagrams for 230 VAC/50 Hz and 120 VAC/60 Hz, each featuring air compressor relays; Added set of diagrams with same power capacities but without air compressor relays.
11-19	Updated Table B, Model NG-1 250, reducing Single System Capacity at 40 psig (2,8 bar) to 265 gal (1003 L), formerly shown as 365 gal (1382 L).
09-19	New Technical Data Sheet TFP1251 describes Model NG-1 100, 250, 500 Nitrogen Generator, Wall-Mounted.