

## Model NG-1 1000 Skid-Mounted Nitrogen Generator Available In North America Only

### General Description

The TYCO NG-1 1000 Skid-Mounted Nitrogen Generator is 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 external by-pass valve for maintenance or for “fast fill” needs to meet the 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 Manual 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).

#### IMPORTANT

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

### System Assembly

The Nitrogen Generator is a self-contained skid mounted unit that includes the following components:

- 2 hp air compressor power supply:  
460 VAC/Three phase/60 Hz - Standard  
208 VAC/Three phase/60Hz - Optional
- Oil less air compressor with after cooler
- 20 gallon horizontal air receiver tank with automatic condensate blow down – 1/2 in. NPT Male
- Steel enclosure cabinet with membrane type nitrogen generator (no nitrogen gas storage) and manual by-pass
- Power supply  
120 VAC/Single phase/60 Hz
- Single point nitrogen/air discharge  
1/2 in. NPT Female
- Hour Run Meter
- Cycle Counter

### System Status

The Nitrogen Generator includes the following system status indicators:

- By-pass Mode Alarm Indicator - Nitrogen generator is in the By-Pass mode (flashing indicator). See Figure 5.
- Leak Monitoring Alarm - Nitrogen generator is running excessively (audible signal).

### System Input/Output Signals

The Nitrogen Generator includes the following output signals:

#### Digital Outputs

- Power On/Off
- By-pass 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 and the Riser-mounted TYCO Dry Air Vent



(TAV-D), or TYCO Dry SMART Vent (TSV-D), as part of the complete Dry Pipe Nitrogen Inerting (DPNI) system.

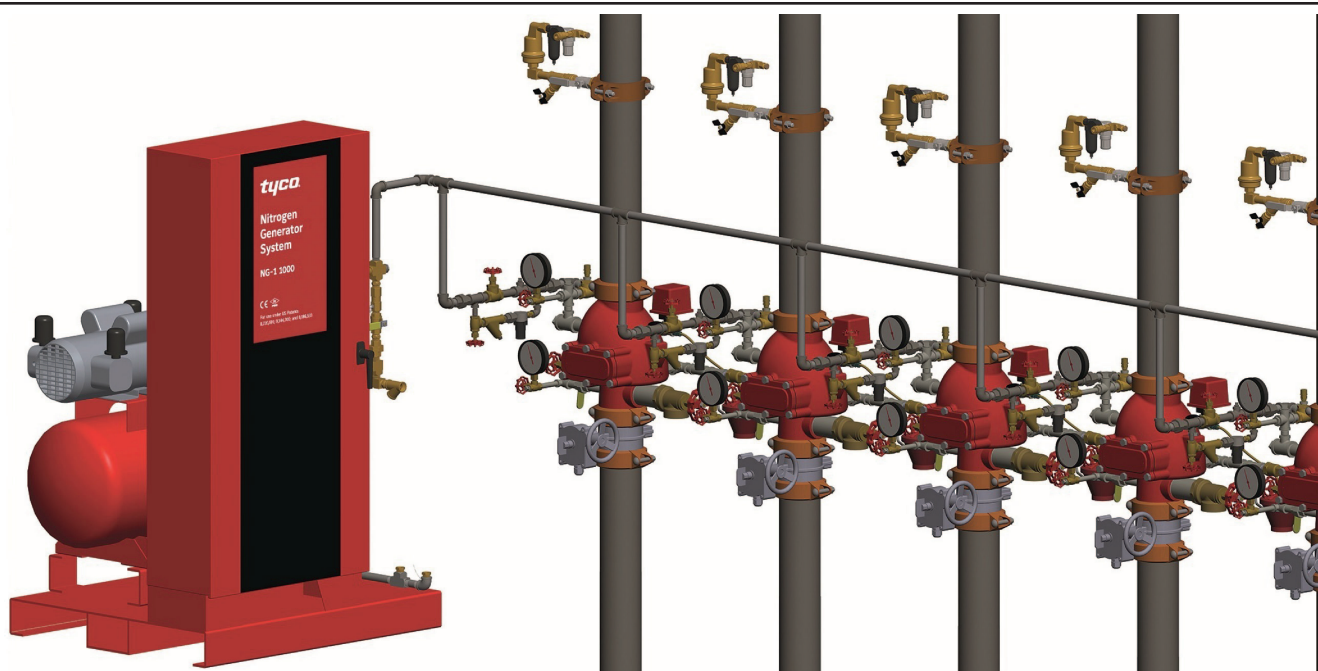
The Nitrogen Generator can be used with the following optional equipment:

- TYCO SMART Gas Analyzer (TSGA) - one per nitrogen generator is recommended. Refer to TFP1267 for more information on the TYCO Handheld Gas Analyzer, and to TFP1270 for the SMART Gas Analyzer.
- TYCO In-Line Corrosion Detector (TILD) - monitoring at least one per sprinkler system is recommended. Refer to TFP1261 TYCO In-Line Corrosion Detector for more information.

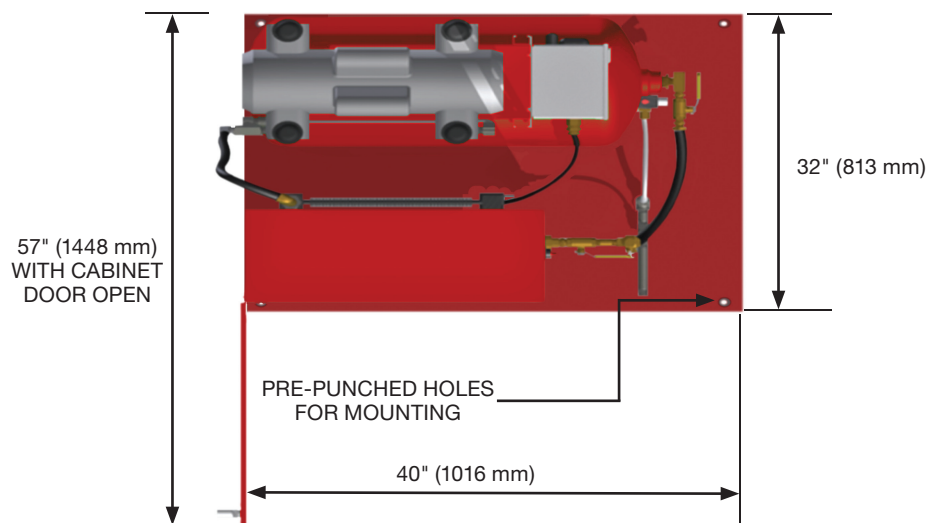
#### NOTICE

The TYCO NG-1 1000 Skid-Mounted Nitrogen Generator 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.



**FIGURE 1**  
**MODEL NG-1 1000 SKID-MOUNTED NITROGEN GENERATOR**  
**RISER ARRANGEMENT**



**FIGURE 2**  
**MODEL NG-1 1000 SKID-MOUNTED NITROGEN GENERATOR**  
**SKID MOUNTING**

Model Number	Min. Supply Air SCFM (L/min)	Total System Capacity Gal (L)	Single System Capacity <sup>a</sup> at 40 psig (2,8 bar) Gal. (L)	Single System Capacity <sup>a</sup> at 20 psig (1,4 bar) Gal. (L)	Sound Level dBa @10 ft
NG-1 1000	10.0 (283)	3200 (12113)	950 (3596)	1800 (6814)	74

**Notes:**

- a. Capacity based on NFPA 13 30-minute fill requirement of largest single system  
b. Capacity based on using 7.5 hp air compressor provided by TYCO

**TABLE A**  
**NG-1 1000 SKID-MOUNTED NITROGEN GENERATOR**  
**OPERATING PERFORMANCE**

Model Number	Width Inches (mm)	Height Inches (mm)	Length Inches (mm)	Weight Lbs (kg)
NG-1 1000	32.0 (813)	57.0 (1448)	40.0 (1016)	425 (193)

**TABLE B**  
**NG-1 1000 SKID-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 B

### Weight

See Table B

### Temperature Range

40°F (5°C) to 105°F (40°C)

### Compressor Power Supply

460 VAC/Three phase/60 Hz (Standard)  
208 VAC/Three phase/60 Hz (Optional)

### Compressor Power Consumption

460 VAC/Three phase/60 Hz - 6 amps  
208 VAC/Three phase/60 Hz - 9 amps

### Generator Power Supply

120 VAC/Single phase/60Hz (dedicated circuit)

### Generator Power Consumption

2 amps

### Nitrogen/Air Connection

1/2 in. NPT Female

### Drain Connection

1/4 in. NPT Male

## Installation

The TYCO NG-1 1000 Skid-Mounted Nitrogen Generator must be installed in accordance with this section.

### WARNING

*Do not operate the TYCO Skid-Mounted Nitrogen Generator System 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 or 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 contaminants exist. The equipment can be damaged by ammonia and other vapors shortening membrane life.*

### Step 1: Mounting the Skid-Mounted Nitrogen Generator

The TYCO Skid-Mounted Nitrogen Generator is designed to be mounted directly to the floor in the fire sprinkler riser room as shown in Figure 1. Several factors should be considered in choosing the proper mounting location for the nitrogen generator:

- Access to the power supply (dedicated circuits as per above)
- Access to the sprinkler risers being supplied from the nitrogen generator
- Access to a drain for the condensate discharge line
- Clearance at the front of the unit to open the cabinet door
- Clearance from the side of the unit to access the power box

The skid base comes with pre-punched holes in the skid feet for easy mounting to the floor using standard anchors as shown in Figure 2. The anchors can be tightened through the pre-punched access holes located at the corners of the skid.

### Step 2: Power Supply

The nitrogen generator requires two dedicated power supply circuits as shown in Figure 3. Both circuits connect to the terminal blocks inside the power supply box.

#### 1. 2 hp compressor power supply

460 VAC/Three phase/60 Hz dedicated 20 amp circuit (Standard)

208 VAC/Three phase/60 Hz dedicated 20 amp circuit (Optional)

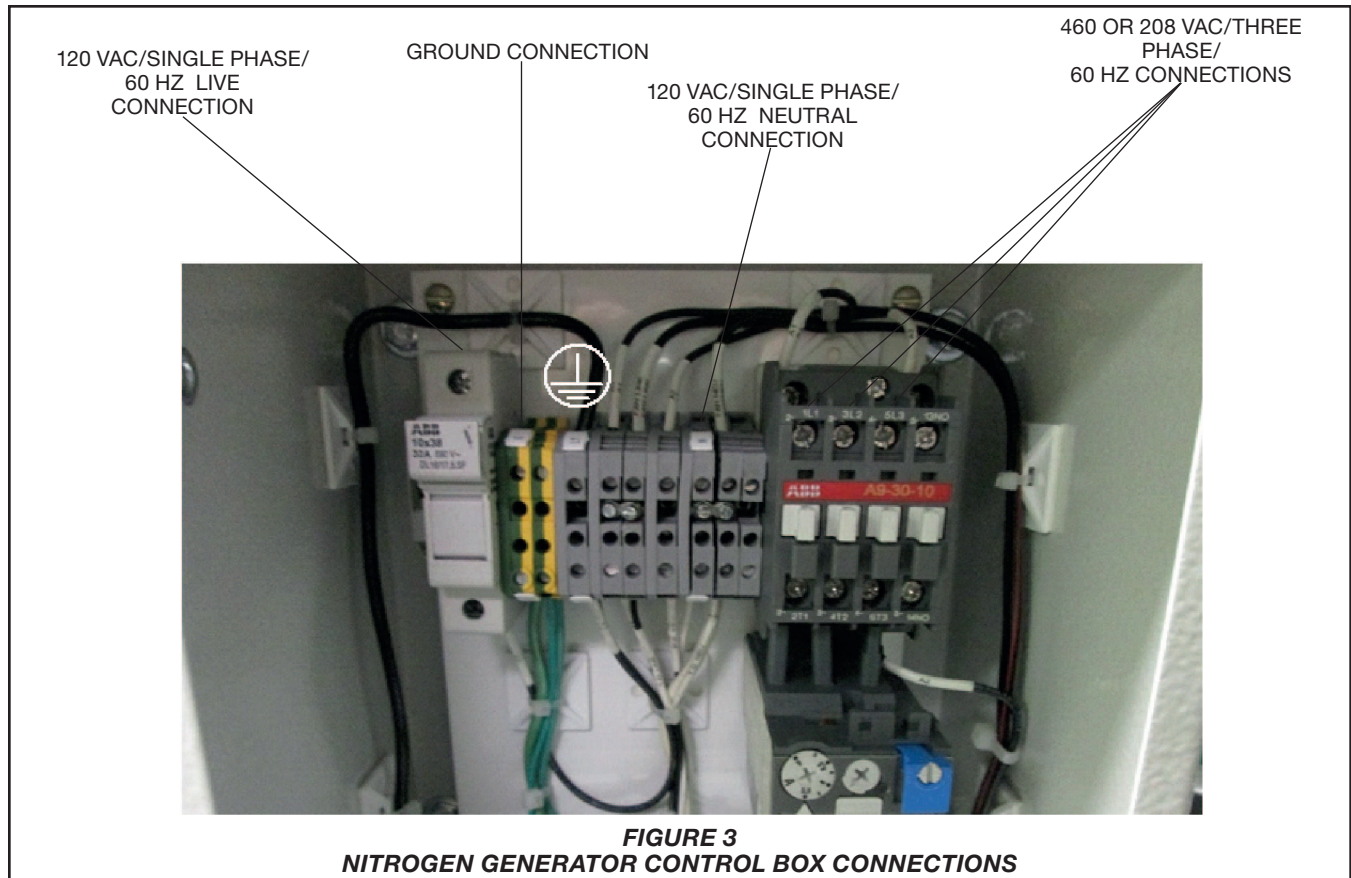
**Note:** When providing 208 VAC/Three Phase/60 Hz to the control box, verify the compressor and the motor starter have been reconfigured for operating at 208 VAC/Two Phase/ 60 Hz.

#### 2. Nitrogen generator power supply

120 VAC/Single phase/60 Hz dedicated 20 amp circuit

### 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. to 1 in. black steel, galva-



nized 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 Skid-Mounted Nitrogen Generator will occasionally discharge a small amount of condensate water from the coalescing filters inside the cabinet and the air compressor tank. It is recommended that the 1/2 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 Figure 4.

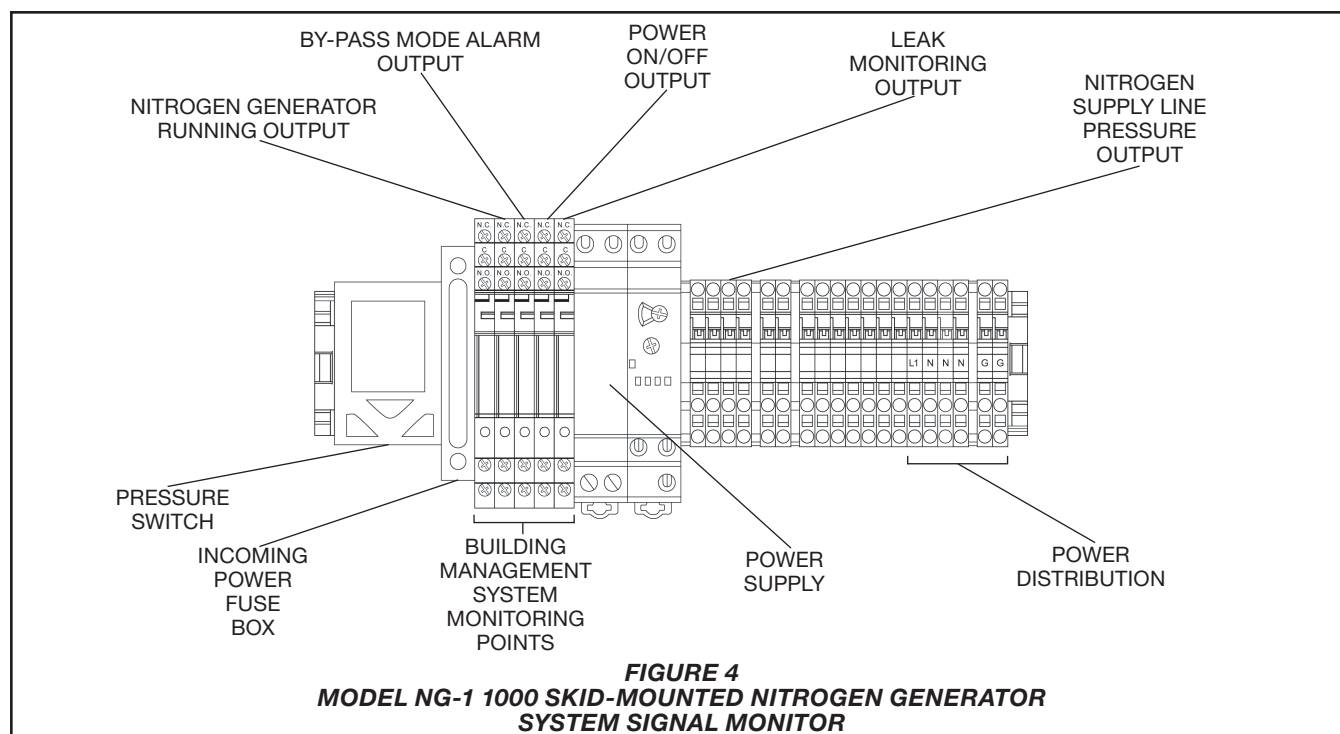
- By-pass Mode Alarm - The nitrogen generator is operating in the by-pass mode which is activated when the by-pass valve is in the "FAST FILL" position to fast fill the fire sprinkler system and the air supplied directly from the air compressor has reached a pressure of 20 psig (1,4 bar). (Flashing amber light)

- Leak Monitoring - The nitrogen generator is equipped with a leak monitor audible signal which is activated when the nitrogen generator runs excessively. (Audible signal)

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
- By-pass Mode Alarm - Form C contacts
- Nitrogen Generator Running - Form C contacts
- Leak Monitoring - Form C contacts
- Nitrogen Supply Line Pressure - Analog Signal





## Care and Maintenance

The TYCO NG-1 1000 Skid-Mounted Nitrogen Generator 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.

#### Filter Replacement Procedure

With reference to Figure 5, perform the following steps when taking the Nitrogen Generator out of service.

**Step 1.** Turn the power supply to the unit off.

**Step 2.** Close the Inlet and Outlet Ball Valves, and open the By-pass Ball Valve.

**Step 3.** Depressurize the nitrogen generator internal inlet piping by slowly opening the Depressurization Ball Valve in the cabinet to the left of the filter housing.

**Step 4.** Remove the filter housing by pulling down on the blue housing lock and turning the filter housing counter-clockwise.

**Step 5.** 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 6.** Replace the filter housing by pushing up into position and turning housing clockwise until blue housing lock locks into place.

**Step 7.** Repeat Step 4 through Step 6 for each additional filter.

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

**Step 8.** Remove the Water Separator housing by pulling down on the blue housing lock and turning the housing counter-clockwise. Inspect the Water Separator and clean as necessary.

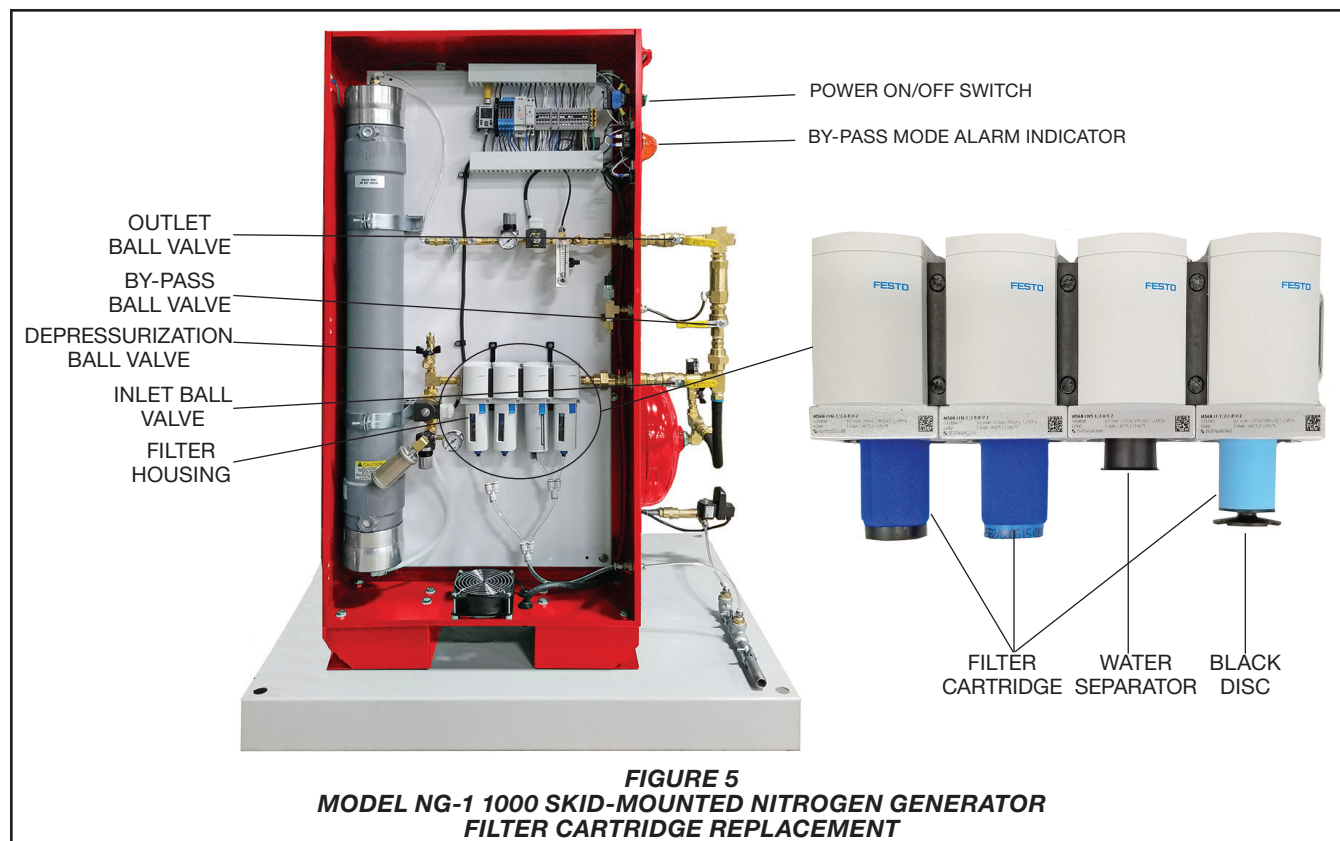
**Step 9.** Replace the Water Separator housing by pushing up into position and turning the housing clockwise until blue housing lock locks into place.

**Step 10.** Close the Depressurization Ball Valve. The Nitrogen Generator can now be placed back into service.

**Step 11.** Turn the power supply to the unit ON.

**Step 12.** Close the By-pass Ball Valve.

**Step 13.** Close the Inlet and Outlet Ball Valves.



## Limited Warranty

For warranty terms and conditions, visit [www.tyco-fire.com](http://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/pre-action sprinkler systems
- Size of the largest single dry/preaction sprinkler system
- Total number of dry/preaction sprinkler systems
- Supervisory pressure of all dry/pre-action sprinkler systems

### Filter Replacement Kit

Filter Replacement Kit . . . . . TNGFLT5

### Optional Monitoring Equipment

Model THGA Handheld Gas Analyzer . . THGA01  
 Model TSV-D SMART Gas Analyzer . . . TSGA01

### TYCO In-Line Corrosion Detector

Refer to Technical Data Sheet TFP1261 for ordering instructions.