



## Installation and Operation Manual

### TR5000 Series Transient Voltage Surge Suppressors

Model Types: TR5451 and TR5452

#### **IMPORTANT NOTICE**

**THE ENTIRE CONTENT OF THIS INSTRUCTION MUST BE READ AND FULLY UNDERSTOOD BEFORE ATTEMPTING ANY INSTALLATION OR ENERGIZATION OF THE TVSS.**

If the minimum requirements of this manual are not followed, the TVSS could become irreversibly damaged, and/or the electrical system could be left unprotected. Failure to comply with the applicable requirements of this instruction can void the TVSS warranty.

#### **WARNING**

SPECIAL ATTENTION MUST BE GIVEN TO VERIFY THAT A PROPER NEUTRAL-GROUND (XO) BOND HAS BEEN MADE WHEN POWER IS SUPPLIED FROM AN UPSTREAM TRANSFORMER OR ANY OTHER TYPE OF SEPARATELY DERIVED POWER SOURCE.

FAILURE TO PROVIDE THIS BOND, AS REQUIRED PER ARTICLE 250.30 OF THE NATIONAL ELECTRICAL CODE, CAN RESULT IN ELEVATED PHASE TO GROUND SOURCE VOLTAGE POTENTIALS. THESE VOLTAGES CAN CAUSE DAMAGE TO ELECTRICAL EQUIPMENT AS WELL AS SAFETY HAZARDS INCLUDING FIRE, ELECTRICAL SHOCK, SERIOUS INJURY, OR DEATH.

THE EQUIPMENT COVERED BY THESE INSTRUCTIONS SHOULD BE INSTALLED AND SERVICED ONLY BY COMPETENT PERSONNEL UTILIZING PROPER SAFETY PRACTICES AND PROCEDURES. THESE INSTRUCTIONS ARE WRITTEN FOR SUCH PERSONNEL AND ARE NOT INTENDED AS A SUBSTITUTE FOR ADEQUATE TRAINING AND EXPERIENCE IN SAFE PROCEDURES FOR THIS TYPE OF EQUIPMENT.

POWER MUST BE PROVEN DISCONNECTED BEFORE STARTING INSTALLATION, INSPECTION OR MAINTENANCE! FAILURE TO DO SO MAY CAUSE SERIOUS INJURY, DEATH AND/OR PROPERTY DAMAGE.

#### **PRODUCT DESCRIPTION:**

GE TR5451 and TR5452 Model Transient Voltage Surge Suppressors (TVSS) are designed for installation on low voltage electrical distribution systems, protecting electrical equipment loads against the damaging effects of transient voltages.

#### **PRE-INSTALLATION REQUIREMENTS:**

Prior to installation of the TVSS, it is critical that the following items have been addressed. **DO NOT ATTEMPT TO CONTINUE WITH THE INSTALLATION IF ALL OF THESE CONDITIONS HAVE NOT BEEN MET, OR ARE UNKNOWN.**

- Check the configuration and voltage supply ratings that will be feeding the TVSS panel to ensure that the proper TVSS model number has been selected for your

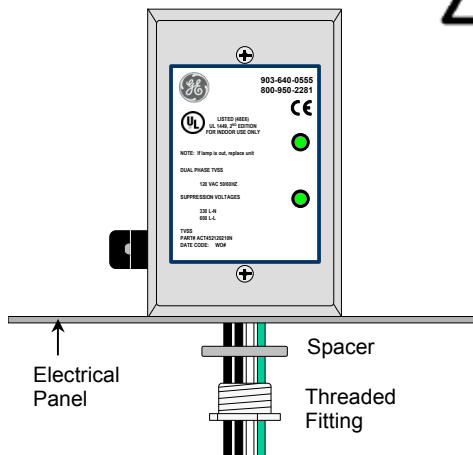
**PRE-INSTALLATION REQUIREMENTS (CONT.):**

system. Refer to the “VOLTAGE RATINGS & POWER SOURCE CONFIGURATIONS” chart below. The TVSS model number can be found on the front of the unit.

- Verify that an NEC (National Electrical Code) compliant X0 bond has been made at the upstream transformer that feeds the electrical supply panel. Per NEC 250.30, this bond must be in place on all grounded electrical systems.
- The TR5451 or TR5452 model TVSS must be installed on a dedicated branch circuit breaker. The maximum allowable rating for the circuit breaker is 30A / 22kAIC.
- Do not attempt to install the TVSS on the upstream (line) side of the Main Breaker or Fuse.
- The TVSS should only be installed indoors in NEMA 1 type locations. Do not install the TVSS outside or in wet locations.

VOLTAGE RATINGS & POWER SOURCE CONFIGURATIONS				
MODEL TYPE	NOMINAL VOLTAGE (50/60Hz)	MAXIMUM CONTINUOUS RMS OPERATING VOLTAGE	SYSTEM TYPE	SOURCE CONFIGURATION
TR5451-120	120V	150V (L-N / L-G)	Single Phase 2 Wire + Ground	
TR5451-240	240V	270V (L-N / L-G)		
TR5452-120	120V	150V (L-N / L-G)	Split Phase 3 Wire + Ground	

**INSTALLATION:**



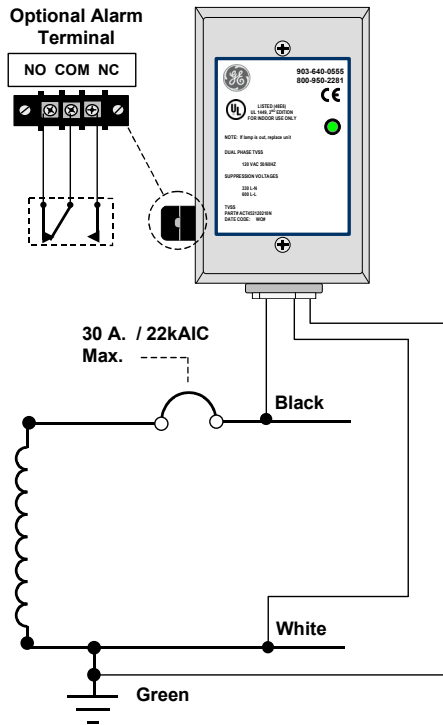
**POWER MUST BE PROVEN DISCONNECTED BEFORE STARTING INSTALLATION, INSPECTION OR MAINTENANCE! FAILURE TO DO SO MAY CAUSE SERIOUS INJURY, DEATH AND/OR PROPERTY DAMAGE.**

Before attempting installation, make sure that the pre-installation requirements of this manual have been satisfied. If the status of the pre-installation requirements are not known, do not attempt to continue.

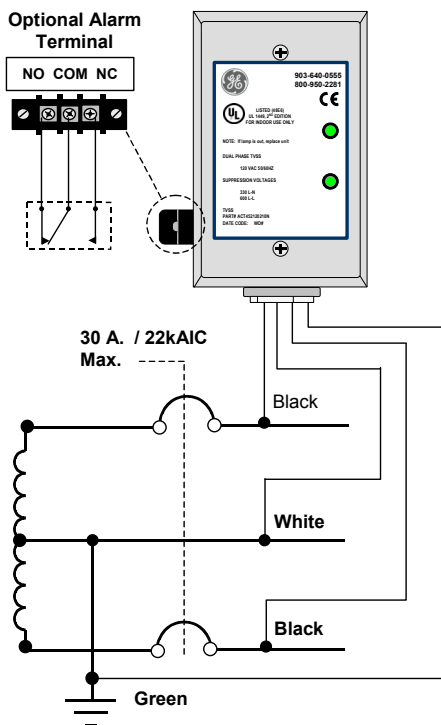
**MOUNTING**

1. TR5451 and TR5452 TVSS units are designed to be mounted directly to the electrical panel through a 1/2” knockout. Mounting feet are also supplied for instances where direct connection to the panel is not practical. Select a location that will allow the closest proximity to the breaker that the TVSS will be connected to.
2. Use the 1/2” threaded fitting and spacer to secure the TVSS to the Electrical Panel that is to be protected.

## INSTALLATION (CONT.):



**TR451 Wiring Diagram**



**TR452 Wiring Diagram**

3. The TVSS can be installed in any orientation, however special consideration should be given to allow periodic visual inspection of the status indicator lamps.

## CONNECTION

1. TR5451 and TR5452 Model TVSS units come equipped with 10 AWG connection wires to allow termination to the electrical system. It is important that the TVSS be installed in a location that is as close to the termination point as possible. Connection wires should be trimmed to prevent excessive lead length. Do not coil, loop or make sharp bends with the connection wires. Every inch of wire that can be trimmed away will aid the TVSS in it's ability to provide the best possible protection level for your system.

2. Refer to the wiring diagrams on the left for your selected model type. The TR5451 and TR5452 models must be connected to a branch circuit breaker. The breaker must not exceed a 30A / 22kAIC rating.

3. Remote Alarm Relay Contacts are provided as an optional feature on some model types. Contacts are standard 1 Form C type, rated 5 A, 250 VAC max. Refer to the wiring diagram on the left for contact configuration. The relay contact will be closed between "NO" and "COM" under normal operation. If the TVSS fails, or if power is lost to the TVSS, the relay contact will open between "NO" and "COM" and close between "NC" and "COM".

4. Model types with 210N and 210S part number suffixes are fitted with jumpers on the alarm terminal block which connects the "COM" and "NC" contacts to the ground terminal of the TVSS. This feature should only be utilized for OEM installations where this type of configuration has been evaluated as suitable. For all other installations, the jumpers should be removed so that the alarm contacts will function normally per paragraph 3 above.

## OPERATION

1. When energized, the green LED status indicator lamps located on the front of the TVSS will be illuminated. For TR5451 models, there is 1 indicator. For TR5452 models, there are 2.

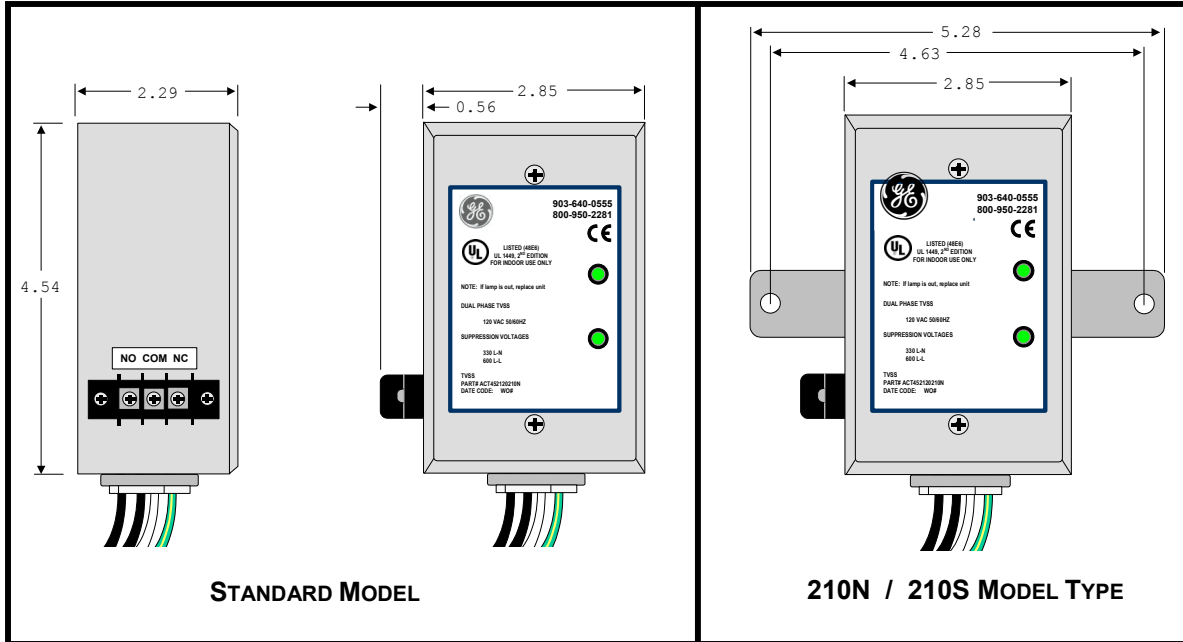
2. If one or both of the of the status indicators are not illuminated, verify the integrity of the connection terminations, breaker status, the electrical supply voltage and the electrical system grounding.

3. If no problems are found, the TVSS could be in failure mode and require replacement. Contact your local GE representative for further assistance.

## MAINTENANCE

1. TR5451 and TR5452 model types contain no user serviceable parts and require no annual maintenance or calibration. Only a periodic visual inspection of the LED indicators is required. Do not attempt to repair or otherwise alter the TVSS unit.

**DIMENSIONS:**



**GENERAL SPECIFICATIONS:**

Max. Surge Rating	40kA /Phase
TVSS Type	One Port / Parallel Connected
Connection Method	10 AWG Conductors
Operating Frequency	50Hz – 60Hz
Operating Temperature	-40° C to +70° C
Installation Location	Indoor / NEMA 1
Status Indication	Green LED Lamps / 1 per phase
Fusing	Thermally Protected MOV's
Circuit Breaker	Required, 30A / 22kAIC Max. Rating
Regulatory	UL, cUL, CE

**CERTIFICATE OF COMPLIANCE:**

GE Zenith Controls hereby certifies that all TVSS products are manufactured in accordance with the applicable drawing, specification and purchase order requirements in compliance with the ISO 9001 Standard. Manufacturing Level Tests are performed on 100% of all units shipped. Verification Level Tests were also conducted on each product family as part of the design verification process and was used to demonstrate that GE Zenith has achieved the published design specifications. A certificate of compliance is available upon request.

**NOTICE:**

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the GE Company.