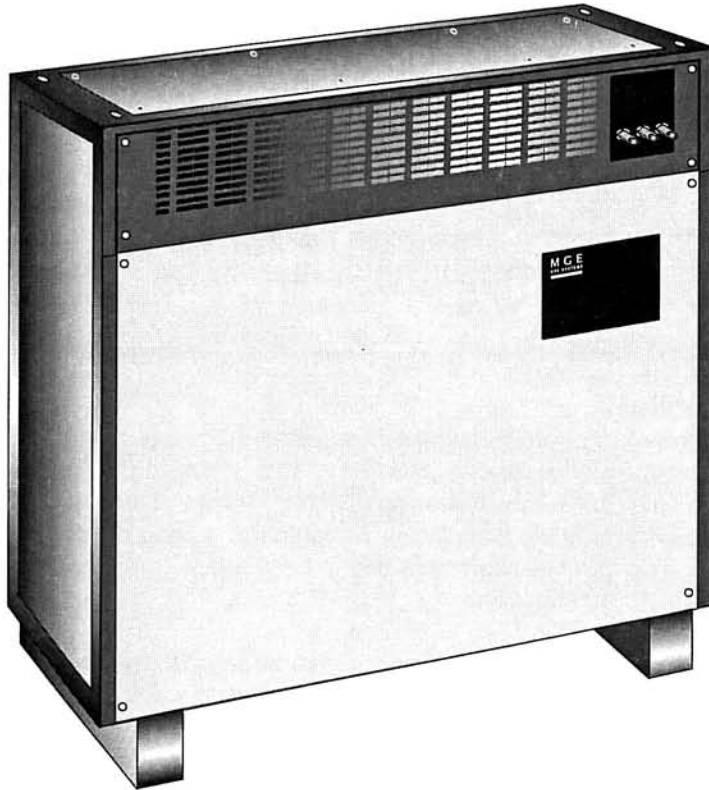

Installation Instructions

Figure 1-1 Ultraguard isolation transformer



1.0 Scope of instructions

These instructions explain how to install, operate, and maintain the MGE ULTRAGUARD transformer. The instructions do not replace national, state, or local electrical codes. Check the applicable electrical codes in your area to ensure compliance.

1.1 Description

The ULTRAGUARD transformer isolates sensitive equipment from transients, spikes, and electrical noise that may appear on commercial power lines. An unique electrostatic shield design eliminates this interference while providing complete electrical isolation between the power line and attached load equipment. ULTRAGUARD also features transient suppression with status indicators, that blocks high energy surges from harming attached load equipment.

Ultraguard Isolation Transformer

1.2 Receipt of equipment

Upon arrival, inspect the unit for any damage that may have occurred during shipment. Unpack and examine the unit for broken or loose parts. Inspect the transformer coils and wiring carefully for any damage or abrasion. If any damage is apparent, file a claim with the transportation company, and notify your nearest MGE representative.

1.3 Handling



CAUTION

The ULTRAGUARD transformer has a high center of gravity, and is top heavy. Use extreme caution when lifting or moving the transformer.

The ULTRAGUARD transformer must be kept upright at all times. The transformer can be moved with a fork lift under its base (the forks must extend completely under the base and out the other side), or by lifting. Lifting holes are provided on the transformer's top core clamps, accessible by removing the top cover.

1.4 Storage

Store the transformer in a clean and dry environment with no extreme temperature variations. Leave all packing materials and protective wrapping intact until the transformer is installed in its permanent location. If dry-type transformers are stored for any extended length of time in extreme environmental conditions, cleaning and drying must be performed before the unit can be safely energized. Refer to ANSI Standard C57.94, Guide for installation and maintenance of dry-type transformers.

1.5 Location

ULTRAGUARD transformers are designed for installation in a protected environment. The transformer is designed for a maximum ambient temperature that should not exceed 40° C (104° F.) Factors to be considered in locating the ULTRAGUARD are ventilation and environmental conditions.

- The highest degree of noise suppression is obtained by locating the ULTRAGUARD transformer as near as possible to the load.
- The ULTRAGUARD transformer is cooled by convection. Allow at least six (6) inches between the ULTRAGUARD transformer and nearby walls or equipment.

- The ULTRAGUARD transformer should be installed in a location free of excessive dust and chemical fumes.
- For outdoor installations, it is recommended that the transformer be installed on a suitable concrete pad, approximately four inches above grade, with adequate drainage.

1.6 Surge protection

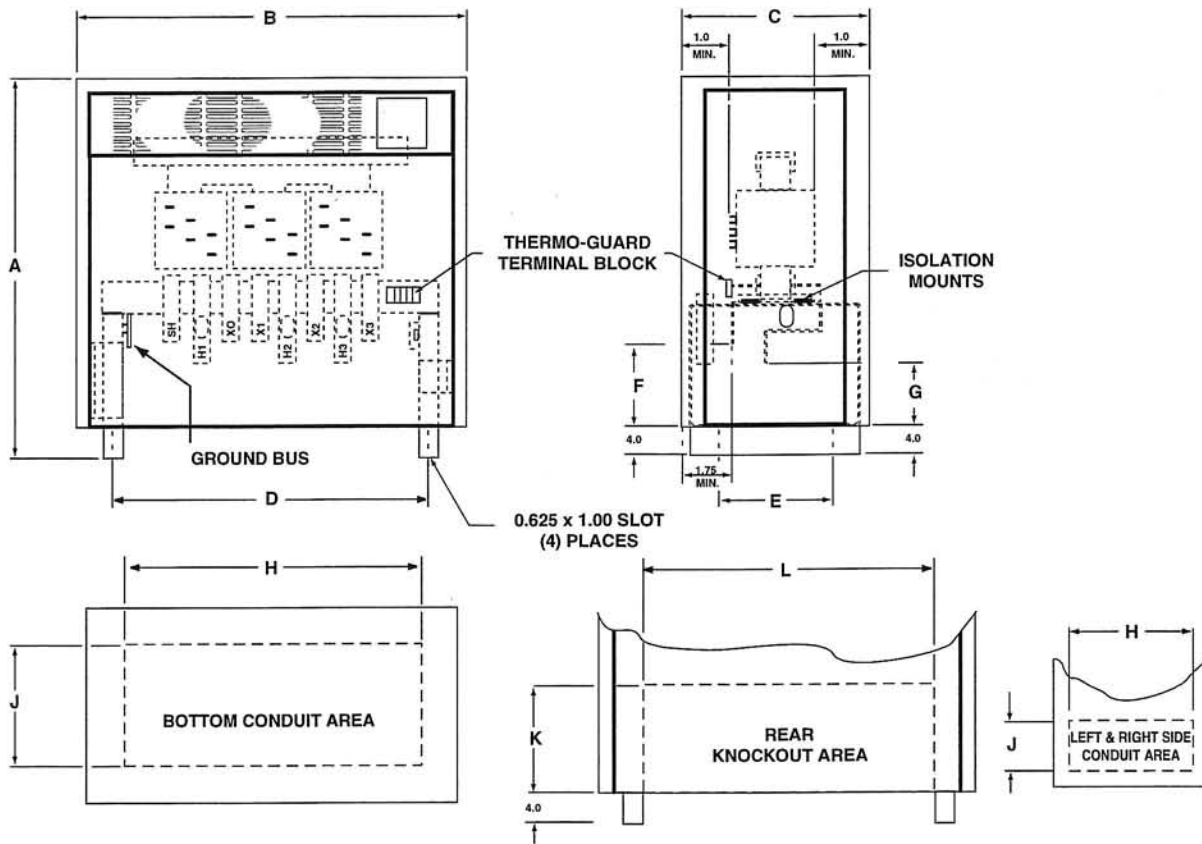
When the incoming power line is subject to lightning or voltage surges, consideration must be given to transformer surge protection. Arrestors should be the type designed for the protection of dry-type transformers or utility power service (building service entrance).

1.7 Audible noise

Audible transformer noise is primarily produced by the core, with a fundamental frequency of twice the applied frequency. Care should be taken in the selection of the transformer location, since noise is too often unintentionally amplified by improper installation. This unintentional amplification can make the transformer appear to be considerably louder than the noise generated by the core. MGE should be consulted for specific recommendations for a quiet installation. The need for an exceptionally quiet transformer can often be avoided by proper installation.

Ultraguard Isolation Transformer

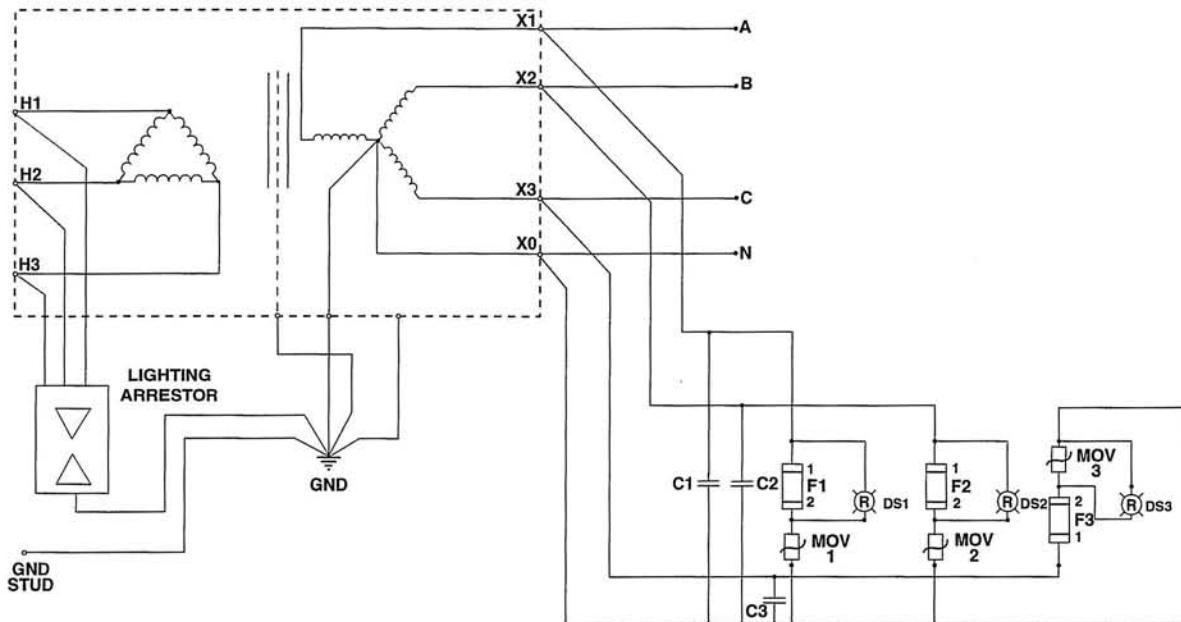
Figure 1-2 Installation drawing, ULTRAGUARD transformer



1.8 Transient suppression status indicator

ULTRAGUARD's exclusive transient suppression status indicators permit easy, accurate monitoring of system status. An illuminated red light alerts the users to replace the metal-oxide varistor (MOV) and fuse stressed by high energy impulses (see the schematic diagram below). This monitoring feature ensures protection of critical loads against future high energy impulses.


Figure 1-3 Schematic drawing, ULTRAGUARD transformer



1.9 Grounding

For proper operation of the ULTRAGUARD and prevention of electrostatic discharge, proper grounding is required. A separate grounding electrode conductor should be connected from the ground lug in the input bay to a nearby grounding electrode. The grounding electrode should be grounded to the structural metal of the building, grounded metal water pipe, or a suitable ground rod (National Electrical Code, article 250-26). The grounding electrode should be as near as possible to the load.

1.10 Connection



CAUTION

While the transformer is energized, do not remove any enclosure access panels, and do not change any connections.

1. Verify that the applied voltage to the primary of the transformer matches the input voltage rating shown on the nameplate.
2. Remove the enclosure top cover and front panel.
3. See the drawings for the conduit knockout area. Side or bottom access is possible.

Ultraguard Isolation Transformer

Figure 1-4
Input terminations

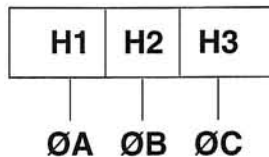
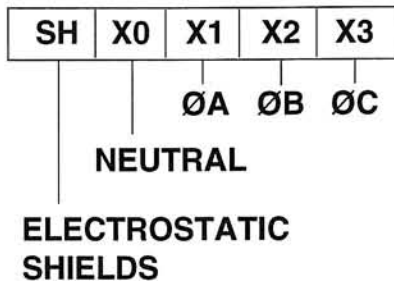


Figure 1-5
Output terminations



1.11 Output voltage adjustment

4. If conduit is used for the input cables, route the conduit to the conduit knockout area.
5. Connect the input cables to the input termination as shown in figure 1.

6. Connect the input ground wire to the ground stud.
7. Reconnect the voltage adjustment jumper if required. See "output voltage adjustment."
8. If conduit is used for the output cables, route the conduit to the conduit knockout area.
9. Connect the output cables to the output termination as shown in figure 2.

10. Connect the ground wire from the load equipment to the ground stud. The output neutral (X0) and electrostatic shields (SH) should be connected to the ground stud.
11. Replace enclosure front panel and top cover.


The output voltage adjustment taps are designed to maintain the rated output voltage shown on the ULTRAGUARD nameplate.

The ULTRAGUARD transformer can boost the output voltage by either 2-1/2%, 5%, 7-1/2%, or 10%; or reduce it by 2-1/2% or 5%. A jumper connected to taps on each of the three primary input coils provides this voltage adjustment. The three jumpers are connected at the factory to taps 4 and 6 (see table 1). Taps 4 and 6 are intended for use with nominal input voltages. To select a different output level, disconnect the jumper from taps 4 and 6, and connect it to the desired tap. Be sure to select the same tap for all three phases.

Table 1-1 **Jumper connections**

Tap	Effect on output voltage
4 to 5	5% voltage reduction
3 to 5	2-1/2% voltage reduction
4 to 6	No effect (nominal)
3 to 6	2-1/2% voltage boost
3 to 7	5% voltage boost
2 to 6	7-1/2% voltage boost
2 to 7	10% voltage boost

1.12 **Thermo-guard
overtemperature
sensors**



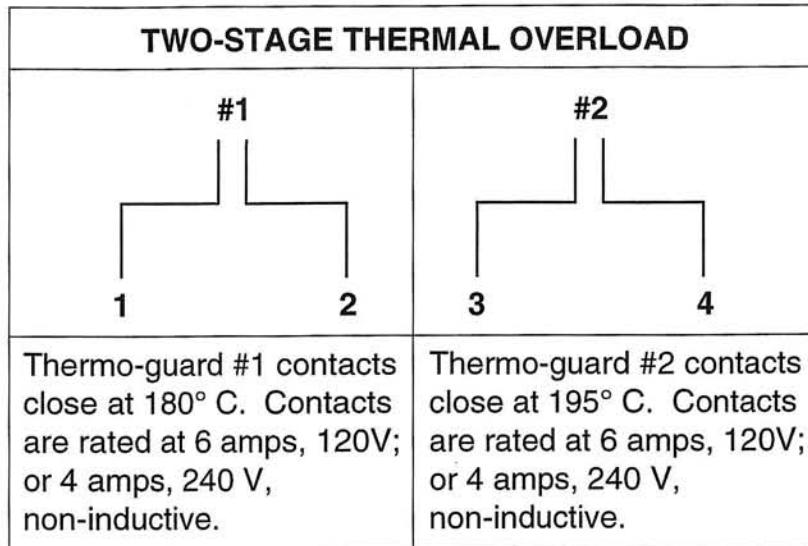
CAUTION

While the transformer is energized, do not remove any transformer enclosure access panels, and do not make or change thermo-guard overtemperature sensor connections.

Two thermal switches are wound into the center coil of the transformer to provide two-stage thermal alarm sensing. This monitoring feature allows first stage early warning of any transformer malfunction or output overload, and second stage shutdown under severe conditions. The thermo-guard switches are normally-open (NO) contacts, one set for 180° C, and the other set for 195° C. The thermo-guard switches are wired to a terminal block mounted inside the transformer cabinet, as shown in figure 3.

Ultraguard Isolation Transformer

Figure 1-6 Thermo-guard terminal block



1.13 Operation

Switch on the ac input power to the ULTRAGUARD transformer.

The ULTRAGUARD operates automatically; there are no controls.

1.14 Maintenance

All electrical equipment requires periodic maintenance to assure continuous successful operation. Cleaning and inspection should be performed about once a year; more often in severe installations.

De-energize the transformer and check for loose connections and accumulation of dirt on insulating surfaces (which tends to restrict air flow). Use a dry cloth to wipe and clean connections and surfaces. Do not use liquid cleaners; they may degrade insulation materials.

If the transformer is de-energized for extended periods of time, it should be inspected before re-energizing. If moisture is noted, it should be removed by drying the transformer with heated air. The heat must be distributed in the enclosure (not applied directly to the transformer), and cannot exceed 110° C (230° F.) under any circumstances.

During routine maintenance, the transformer input and output voltage and load current should be checked. Record these values for future reference. Should the input voltage be below the nameplate rating, adjust the taps to correct for the low input voltage. Calculate the load level and compare it with the nameplate rating. If the load level of the transformer is close to 90% of the nameplate rating, check

load requirements and make sure no additional load is applied to this unit. Short-time overloads can be applied to the transformer without damage, but the transformer must be kept within its designed temperature limits.