



TRYSTAR®

SUREIMAGE
IMAGING & TREATMENT SERIES
OWNERS MANUAL

ULTRA K/M
75K(I) - 225K(I)

POWER CONDITIONER
THREE PHASE
ISOLATION
TRANSFORMER



TABLE OF CONTENTS

GENERAL DESCRIPTION -----	1
RECEIVING THE UNIT -----	4
SAFETY PRECAUTIONS-----	5
PRELIMINARY INSTALLATION -----	6
INSTALLATION -----	8
START-UP AND PREVENTIVE MAINTENANCE -----	9
WARRANTY-----	10
CUSTOMER SUPPORT -----	11
SPECIFICATIONS -----	13
APPENDIX A -----	17
CABINET OUTLINE-----	18
NOTES -----	20

IMPORTANT - SAVE THESE INSTRUCTIONS - PLEASE READ THIS
MANUAL BEFORE USING EQUIPMENT



CAUTION

The following symbol indicates that caution should be taken when performing the process required in this manual. Damage to the unit or personal harm could happen if proper precautions are not taken.



SHOCK HAZARD

The following symbol indicates that there is a risk of electrical shock if proper precautions are not followed. Only qualified personnel should perform the actions required in this manual.

GENERAL DESCRIPTION

The Sure Image Ultra-K/M is a medical grade power conditioner/isolation transformer for MRI/CT/PET/Linear Accelerator/X-Ray equipment. The Sure Image Ultra-K/M conditions and isolates power, protecting the medical imaging equipment from spikes, harmonics and ground noise, thus ensuring clear and accurate image scans.

Features:

- Output Load Regulation: 2% from typical steady state load to intermittent power demand
- Voltage Compensation Taps: Full capacity taps at 2.5% increments, 2 FCAN and 4 FCBN (Exception: 225K(i) at 208 VAC or 240 VAC input — taps at 5% increments, 1 FCAN and 2 FCBN)
- K-Factor Rating: K13
- Output Impedance: 2% typical at 50% of rated load
- Common Mode Noise Attenuation: 146 dB
- Transverse Mode Noise Attenuation: 3 dB down at 10 KHz, 40 dB down per decade
- Standard Surge Protection Device (SPD) with High Frequency Filter: Secondary-connected, 40kA per mode
- Optional SPD, 100kA per phase, UL 1449 Listed, Type 2, EMI/RFI filtering, form C relay contacts
- Optional main input / output CB provided in separate NEMA1 enclosure for external mounting and installation
- Optional high / over temperature alarm contacts for customer's hard-wired connection
- Optional IR window(s) for safe routine thermal scanning of transformer connections under load
- Optional mechanical (screw-type) lugs shipped for installer convenience
- Meets and exceeds the U.S. Department of Energy (DOE) 2016 Minimum Efficiency Standard, and complies with the Canadian Energy Efficiency Standard C802.2-12.

What is a K(i) Rating?

A "K(i) rating" refers to the intermittent kVA or momentary power demand rating. When performing an imaging scan or treatment procedure, most medical equipment has a high inrush current - meaning that the current will rise 3-5 times the steady state current, or higher! SureImage medical K(i) rated Ultra-K/M models are designed to supply this demand, while continuing to provide stable voltage.

How do I know I need a power conditioner for my imaging system?

In most cases if image scans are of poor quality or the equipment is not functioning properly on a frequent basis or even sporadic occurrences, then the power going to the imaging equipment could be out of specification and may need a power conditioner.

How does the Ultra-K/M Power Conditioner differ from other power conditioners?

The Ultra-K/M has many different features that set it apart from other power conditioning transformers. #1) Low Output Impedance. The Ultra-K/M has a 2% output impedance. This provides higher inrush capability, while delivering a more stable voltage and a lower vTHD during an imaging scan. #2) Line noise and ground noise attenuation. Many power conditioners do not have high levels of ground and line noise attenuation. The Ultra-K/M Power Conditioner is triple shielded, and provides common mode (line to ground) noise attenuation of 146dB, simply the highest in the industry. Factoring in the leakage inductance of the transformer and output filtering, there exists a high level of transverse mode noise attenuation as well: 3dB down at 10kHz, 40dB down per decade. #3) Isolation. Some power conditioning products do NOT provide isolation. In fact, isolation is critical for the successful installation of medical imaging and treatment equipment. With isolation, a new neutral to ground bond is established, which prevents disruptive and sometimes damaging ground noise. Classified as a newly derived power source, OEM specified Total Load Regulation specifications can be met, and crucial common mode noise attenuation can be accomplished.

How does the Ultra-K/M Power Conditioner improve quality of the image scans?

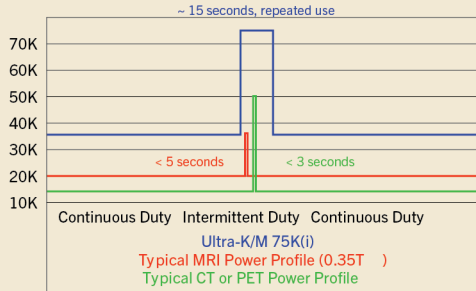
The Ultra-K/M improves the quality of image scans because of its isolation, superior “step load” voltage regulation, re-established N-G bond, and attenuation of voltage spikes. When the power is clean, the imaging device will operate at its optimum level.

POWER PROFILE CHARACTERISTICS

Meets and exceeds the U.S. Department of Energy (DOE) 2016 Minimum Efficiency Standard, and complies with the Canadian Energy Efficiency Standard C802.2-12.

Model Ultra-K/M 75K(i)

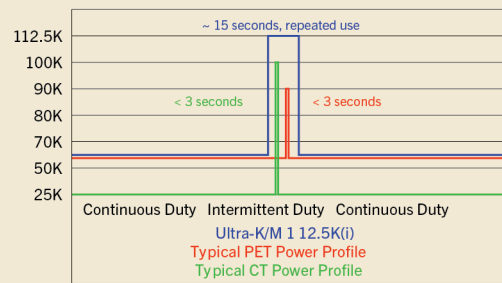
Power Profile Characteristics



MODEL	INPUT VOLTAGE	* OUTPUT VOLTAGE	** INPUT BREAKER	BTU'S/ HR	DIMS	WEIGHT
8B*X-75K(i)HE-K/M	208V	L = 208V/120V	175A	4,600	28"W 25"D 39"H	700 lbs
8C*X-75K(i)HE-K/M	240V		150A			
8D*X-75K(i)HE-K/M	480V	N = 480V/277V	70A			
8E*X-75K(i)HE-K/M	600V		60A			

Model Ultra-K/M 112.5K(i)

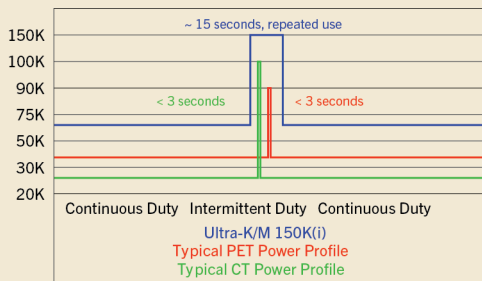
Power Profile Characteristics



MODEL	INPUT VOLTAGE	* OUTPUT VOLTAGE	** INPUT BREAKER	BTU'S/ HR	DIMS	WEIGHT
8B*X-112.5K(i)HE-K/M	208V	L = 208V/120V	300A	7,650	28"W 25"D 39"H	830 lbs
8C*X-112.5K(i)HE-K/M	240V		250A			
8D*X-112.5K(i)HE-K/M	480V	N = 480V/277V	125A			
8E*X-112.5K(i)HE-K/M	600V		100A			

Model Ultra-K/M 150K(i)

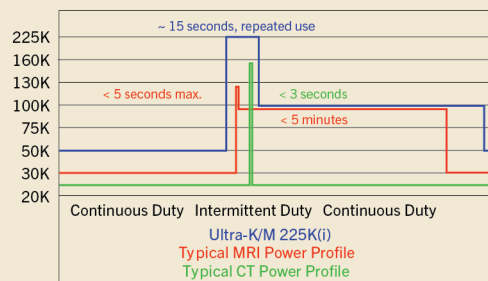
Power Profile Characteristics



MODEL	INPUT VOLTAGE	* OUTPUT VOLTAGE	** INPUT BREAKER	BTU'S/ HR	DIMS	WEIGHT
8B*X-150K(i)HE-K/M	208V	L = 208V/120V	300A	7,650	28"W 25"D 39"H	830 lbs
8C*X-150K(i)HE-K/M	240V		250A			
8D*X-150K(i)HE-K/M	480V	N = 480V/277V	125A			
8E*X-150K(i)HE-K/M	600V		100A			

Model Ultra-K/M 225K(i)

Power Profile Characteristics



MODEL	INPUT VOLTAGE	* OUTPUT VOLTAGE	** INPUT BREAKER	BTU'S/ HR	DIMS	WEIGHT
8B*X-225K(i)HE-K/M	208V	L = 208V/120V	400A	11,500	38"W 32"D 57"H	1,210 lbs
8C*X-225K(i)HE-K/M	240V		350A			
8D*X-225K(i)HE-K/M	480V	N = 480V/277V	175A			
8E*X-225K(i)HE-K/M	600V		150A			

Note: Stated BTU's / Hr is at rated load, 100% duty cycle. Operational BTU's / Hr is typical at 50% of rated load. ** Input breaker provided by others. Intermittent KVA ratings are shown for a duration of 15 seconds, repeated use at 20% duty cycle. Time durations shown are not to scale, and are for illustration purposes only. See product Specifications on page 15, section 3.0 D, for Maximum Continuous kVA rating of each Ultra-K/M model.

Note: Stated BTU's / Hr is at rated load, 100% duty cycle. Operational BTU's / Hr is typical at 50% of rated load. ** Input breaker provided by others. Intermittent KVA ratings are shown for a duration of 15 seconds, repeated use at 20% duty cycle. Time durations shown are not to scale, and are for illustration purposes only. See product Specifications on page 15, section 3.0 D, for Maximum Continuous kVA rating of each Ultra-K/M model.

RECEIVING THE UNIT



Inspection, placement, installation, setup and start-up should be performed by qualified personnel only

Note: Open the enclosure(s) and inspect inside the unit for shipping damage.

INSPECTION

Upon receipt of your unit, visually inspect the unit(s) for shipping damage. If shipping damage has occurred, the purchaser should promptly notify the carrier and file a claim with the carrier. The factory should be notified if the damages may impair the operation of the unit. Reference front cover or accompanying paper work for factory contact information.

Note: Open the enclosure(s) and inspect inside the unit for shipping damage.

IMPORTANT NOTICE

This shipment has been carefully inspected, checked and properly packaged at our company.

When it was delivered to the carrier it was in good condition and technically it became your property at that time. Thus, any damage, whether obvious or hidden, must be reported to the transportation company within FIVE days of receipt of the shipment at your premises to avoid forfeiting claims for damages.

FOR ALL SHIPMENTS DAMAGED IN TRANSIT

Leave the items, packing material and carton "AS IS". Notify your carrier's local office and ask for immediate inspection of the carton and contents.

After inspection has been made by the carrier, and you have received acknowledgment in writing as to the damage, notify our Customer Service Department to make any required repair arrangements.

It is your responsibility to follow the above instructions or the carrier will not honor any claims for damage. Also, if there are any shortages or questions regarding this shipment, please notify us within FIVE days.

Please note that we cannot be responsible for any service work or back-charges unless authorized by us in writing, before the work is performed.

STORING

If it is necessary to store the unit for a period of time before it is installed, be sure to place the unit in a clean, dry area. To prevent excessive dust from accumulating on the unit, it is advisable to protect it by replacing it in the original container (if possible). If the original container is not

available it is recommended that all openings that lead internally into the unit are covered so that dust, water or any other substance cannot enter the internal components of the system. The unit must be handled at all times with the same care you would give to any piece of precision industrial equipment.

SAFETY PRECAUTIONS

WARNING

There are dangerously high voltages present within the Enclosure of the power supply system.

Caution must be taken when working with the system. It is recommended that all work be performed by qualified Electrical personnel only.

CAUTION

Risk of electrical shock and high short circuit current.

The following precautions should be observed When working on the unit:

- 1) Remove watches, rings, or other metal objects.
- 2) Use tools with insulated handles.
- 3) Wear rubber gloves and boots.

CAUTION

- Follow all standard and local electrical codes.
- Do not allow water or foreign objects to get inside the unit.
- Do not place objects or liquids on top of the unit.
- Do not locate the unit near running water.

PRELIMINARY INSTALLATION

SIZING THE POWER CONDITIONER

When sizing the Sure Image Ultra-K/M, be sure to take into consideration all loads and circuits the Ultra-K/M is to supply. A good way to insure that the Sure Image Ultra-K/M is sized properly is to use the following guide lines.

- List each piece of medical equipment, include model, voltage, current and KVA.
- Consult the medical imaging equipment manufacturer's documentation regarding the maximum steady state load current with all equipment on. Calculate the KVA (power demand). It should not exceed the continuous KVA rating of the Ultra-K/M and is typically <50% of the continuous KVA rating for most applications. *See note.

Consult the medical imaging equipment manufacturer's documentation regarding the maximum "momentary power demand (KVA)" required during an imaging scan. It should not exceed the K(i) rating of the Ultra-K/M and should not be maintained for more than 30 seconds before returning to the steady state load conditions (if <50% of the continuous KVA rating), or 15 seconds before returning to the steady state load conditions (if <80% of the continuous KVA rating).

- The K(i) rating is the maximum "intermittent (momentary) KVA" rating of the Ultra-K/M and reflects the maximum "momentary power demand (KVA)" allowed.
- The K(i) duty cycle rating is 20%, defined as the K(i) rating for a maximum of 30 seconds, followed by steady state load conditions of <50% of the continuous KVA rating for 2 minutes, repeated use.
- The K(i) duty cycle rating is 10%, defined as the K(i) rating for a maximum of 15 seconds, followed by steady state load conditions of <80% of the continuous KVA rating for 2 minutes, repeated use.

* Note: Steady state load conditions may exceed 50% of the continuous KVA rating when the maximum momentary power demand of the equipment is less than the K(i) rating of the Ultra-K/M and/or is maintained for less than 30 seconds. For example, if the maximum momentary power demand is something less than the K(i) rating, lasting for <30 seconds, the steady state KVA load may be higher than 50% of the Ultra-K/M's continuous KVA rating.

CONSULT THE FACTORY FOR ANY ASSISTANCE NEEDED IN PROPERLY SIZING THE ULTRA-K/M.

INSTALLATION CONSIDERATIONS

Prior to installing the Sure Image Ultra-K/M, be sure to take into consideration the site you have selected. Power Conditioners produce heat and therefore require ventilation as well as accessibility. Consider these factors.

- Input Source Voltage matches input

voltage requirements of the Ultra-K/M

- Receiving Facilities
- Input Circuit Breaker Protection
- Distribution of Power
- Output Voltage of the Ultra-K/M matches the voltage requirements of the load
- Room Ambient Temperature
- Size and Weight of the Ultra-K/M
- Ventilation
- Audible Noise Requirements
- Clearances
- Proper Grounding Techniques
- Accessibility
- Excessively Long Power Runs
- Clean Environment

CHOICE OF LOCATION

The unit has been completely inspected and extensively tested under various load conditions prior to shipment. Care to install it at a proper location will assure long trouble-free operation. The unit is air cooled with the air intake at the bottom and exhausts at the top, front or at the sides. Therefore, it should be installed in a clean, dry place with enough clearance to allow a free flow of air. Allow at least 6 inches of space between the unit and the wall or other equipment. Allow enough space for maintenance.

INSTALLATION



Before installing the Power Conditioner make sure that the input voltage and the output voltages match the unit's specification plate.



INPUT / OUTPUT WIRE SIZE, AND GROUNDING

1. Conduit should be used for both input and output wiring.
2. Minimum ground wire size is based on 1990 Nation Electric Code. Full current ground conductors while not required by code are a good practice for power conditioning equipment.
3. Input wire size is based on NEC Table 310-16 specifying not more than 3 conductors in a raceway based on ambient of 30° Celsius, and wire rated at 75° Celsius.
4. Output neutral to ground is already bonded during manufacturing of the Power Conditioner.
5. Output requires 3 (4 including ground wire) conductors in a raceway assuming neutral as a current carrying conductor.

Note: Installation is subject to local codes - verify with a local electrical inspector.

NOTE: Installation is subject to local codes - verify with a local electrical inspector.

REFER TO "APPENDIX A - CABINET OUTLINE" FOR CONDUIT ENTRY POINTS AND INPUT/OUTPUT TERMINAL LOCATION.

START-UP AND PREVENTIVE MAINTENANCE

WARNING

There are dangerously high voltages present within the enclosure of the power Supply system. Caution must be taken when working with the enclosure. It is Recommended that all work be performed by qualified electrical personnel only.

NOTE: INITIAL START-UP SHOULD BE PERFORMED UNDER NO LOAD CONDITIONS. LOAD SHOULD BE DISCONNECTED FROM THE ULTRA-K/M.

1. Re-install all Ultra-K/M enclosure panels that may have been removed during installation.
2. With input power connections secure and the load disconnected, apply power by turning on the input source AC breaker.
3. Verify output phase rotation is correct.
4. Verify that the output voltage of the Ultra-K/M is within the specified range and meets the voltage requirements of the load.
5. Turn off the input source AC breaker.
6. Connect the loads one at a time at repeat Step 4.

WARNING

Danger of electrical shock, turn off all power supplying this equipment prior to maintenance.

PREVENTIVE MAINTENANCE

To ensure longer component life and trouble-free operation, minor preventive maintenance procedures should be performed at regular intervals, for example once every year. More frequent inspection intervals would be needed for more severe operating conditions and larger number of hours of continuous operation. At each service inspection any accumulated dust, dirt or foreign particles should be carefully removed. A light pull should be used to test if there is any loose electrical connections which need to be tightened.

WARRANTY

This Warranty applies only to the original purchaser who must properly register the product within thirty (30) days of receipt.

Trystar warrants that the Model Ultra-K/M transformer (core and coil) to be free from defects in material and workmanship for a period of 1 full year, and an additional 24 years prorated from the date of shipment and agrees to replace, F.O.B. its factory, any parts which fault through defect in material or workmanship during such period. All other unit components are covered by a 2 year full replacement warranty. Non payment for the product to either the reseller, rep, distributor or the factory direct will result in revocation of warranty, technical support and service contracts. **Warranty begins from date of shipment unless a factory start-up is purchased, then the warranty begins from date of Start-up or 90 days from ship date; whichever comes first.**

If a Start-Up is purchased with the unit(s) or within 30 days from original ship date, the 1st year warranty is upgraded to include onsite labor and expenses during normal business hours (Monday - Friday, 8AM - 4PM). Start-up includes all travel and living expenses. Start-up description: Visual Inspection - Input and output parameter check - Air intake / exhaust check - Re-torque all high current terminals - Input/Output verification - Written report. User training to be done at time of start-up (no return visits). Product installation is required to be complete before start-up can be scheduled.

Products:

- SureImage Ultra K/M / 1 Year Transformer (Core and Coil), with an addition 24 years prorated. All other components are covered for 2 Years parts only.*

* From original shipment date / Excludes on site labor and expenses unless otherwise noted.

-
1. This Warranty shall be effective only if and so long as the system is installed and operated in the manner specified in the manual which accompanied the product, and is operated within the ratings on the nameplate of the system.
 2. This Warranty shall be effective provided the purchaser pays the cost of transporting the faulty component(s) to and from Trystar's factory at the purchaser's own expense, unless the item covered under service contract with Trystar. There is no cost for installation of the replacement component(s) when done at the factory. Otherwise installation of the replacement component(s) are the responsibility of the purchaser, unless the item is covered under service contract with Trystar. If after inspection the faulty component has been caused by

misuse or abnormal conditions in the judgment of Trystar, the purchaser will be charged for repairs based on parts and labor required. This Warranty does not cover fuses, light bulbs, and other normally expendable items. Trystar service personnel are not included in this warranty unless covered by a Trystar service contract.

3. This Warranty shall be void if any alteration is made to the system, or any of its components are altered by anyone other than an authorized Trystar service person, without the written permission of Trystar.
4. This Warranty is in lieu of all other warranties, expressed or implied. Trystar neither assumes, nor authorizes any person to assume for it, any liability other than that specifically set forth in this Warranty. Except for its obligations, Trystar assumes no liability or responsibility for personal injury, loss of life, consequential or other damages resulting from defects in, or failure of, the system or any of its components.

CUSTOMER SUPPORT

SURE IMAGE ULTRA-K/M POWER CONDITIONER

PRODUCT SUPPORT SERVICES

Contact Trystar.

TRYSTAR NATIONWIDE CUSTOMER SUPPORT

Trystar offers total customer support that assures your critical equipment is maintained properly for troublefree operation.

RESPONSE TIME: Immediate 24 hour phone support. If problem is not solved, we will make every effort to have your system running within 48 hours.

***START-UP:** On site start-up assures equipment is installed and operating properly.

FIELD REPAIRS: Customer Support Plans cover parts, labor, travel, living and freight expenses.

PREVENTIVE MAINTENANCE: Optional scheduled preventive maintenance includes the following:

- Inspection
- Exercising all circuit breakers.
- Re-torquing all high current terminals and connectors.
- Testing all emergency circuitry.
- Calibration
- Clean internal and external

- Verify Cooling System

- Written Report

*Start-up may be substituted for preventive maintenance on new units.

PLAN	ON SITE COVERAGE	PARTS COVERED	FIELD REPAIR LABOR COVERED	FACTORY REPAIR LABOR COVERED	FREIGHT COVERED	TRAVEL EXPENSES COVERED
SILVER	NONE	YES	NO	YES	NO	NO
GOLD	M-F 8AM-4PM	YES	YES	YES	YES	YES
PLATINUM	24-7	YES	YES	YES	YES	YES

TRAINING AND PARTS

For customers who maintain their own equipment, Trystar offers hands on training at our facility and part kits.

Individual components are available upon request, please contact the factory for specific part numbers and prices. When contacting the Parts Department, please have the unit's full model number and serial or system number.

SPECIFICATIONS

SureImage

Imaging and Treatment Series

Power Conditioner Model Ultra-K/M

75K(i) – 225K(i)

Power Conditioning for Medical Imaging & Treatment Equipment

General Specifications

1.0 General

This specification defines the electrical and mechanical characteristics of a medical imaging and treatment power conditioning system. The Model Ultra-K/M as specified herein includes all the components required to meet the basic power requirements of medical imaging and treatment equipment. The power conditioning system's transformer is 3 phase, K13 rated, constructed using all copper windings, triple-shielded, and provided with an output voltage surge protection device (SPD) and high frequency filter. The Ultra-K/M's output impedance is 2% typical and is continuous duty cycle rated and intermittent duty cycle rated, 600 volt class, convection cooled. The power conditioning system's transformer meets and exceeds U.S. Department of Energy (DOE) 2016 high efficiency standards identified under DOE 10 CFR Part 431, and complies with the Canadian Energy Efficiency Standard C802.2-12.

2.0 Standards

The power conditioning system is designed in accordance with applicable portions of the following standards:

- A. U.S. Department of Energy (DOE) 2016 high efficiency standards identified under DOE 10 CFR Part 431
- B. Canadian Energy Efficiency Standard C802.2-12
- C. American National Standards Institute (ANSI C57.110 & C62.41-1991)
- D. Institute of Electrical and Electronic Engineers (IEEE 519-1992)
- E. National Fire Protection Association (NFPA) 70, National Electrical Code (NEC)
- F. Federal Information Processing Standards Publication 94 (FIPS Pub 94)
- G. UL Listed to Standard 1561
- H. C-UL listed to CSA Standard C22.2, No. 47-13
- I. RoHS compliant

3.0 Manufactured Units

The power conditioning system is designed to meet IEC 601-1, Medical Electrical Equipment – Part 1 General Requirements for Safety.

A. Input Specifications

1. Nominal AC input voltage ratings: 600 VAC, 480 VAC, 240 VAC or 208VAC, 3 phase with sufficient margin to sustain a constant input of +10% without saturation.
2. The nominal operating frequency: 60 hertz + 5%.
3. The power conditioning system's primary is configured in a three phase delta and includes the following full capacity voltage compensation taps: 75K(i) to 150K(i): (2) above and (4) below the nominal voltage tap at 2.5% increments. 225K(i) at 208 VAC or 240 VAC: (1) above and (2) below the nominal voltage tap at 5% increments. 225K(i) at 480 VAC or 600 VAC: (2) above and (4) below the nominal voltage tap at 2.5% increments.
4. Energizing inrush current does not exceed a maximum of 10 times the full load input current for 1/2 cycle.

B. Output Specifications

1. Nominal AC output voltage ratings: 480 VAC or 208 VAC, wye derived, 60 hertz.
2. Output impedance: 2% typical at 50% of rated load.
3. Harmonic K-Rating: 13.

C. Performance Specifications

1. Dynamic load voltage regulation: < 4% from no load to intermittent rating and < 2% from typical steady state load to intermittent power demand.
2. Intermittent kVA rating duration: 15 seconds when followed by a steady state load of <80% of the continuous KVA rating for 2 minutes, repeated use. Lower steady state load conditions allow for a longer Intermittent kVA duration.
3. Overload: 500% for 10 seconds, and 1000% for 1 cycle.
4. THD: $\leq 1\%$ added to the output voltage waveform.
5. Harmonic attenuation: Load generated triplen harmonics are attenuated at the primary.
6. Output voltage: Sinusoidal with no flat topping when high crest factor (3.0 : 1), non-linear loads are present at the output.
7. Audible noise: 50dBA when measured at one meter distance.
8. Efficiency: Meets and exceeds U.S. Department of Energy (DOE) 2016 high efficiency standards. All efficiency values are at 35% of nameplate-rated load with a transformer operating temperature of 75°C, determined according to the DOE Test Method for Measuring the Energy Consumption of Distribution Transformers under Appendix A to Subpart K of 10 CFR part 431.
9. Electrostatic shielding: Incorporates 3 solid copper foil electrostatic

shields which minimize inner winding capacitance and noise coupling between primary and secondary windings.

10. 1Common mode noise attenuation: 146dB.
11. Transverse mode noise attenuation: 3dB down at 10K Hertz, decaying 40dB per decade.
12. SPD with high frequency filter: Integral, fused, 3 phase, secondary connected, 6 mode surge protection device (SPD). The SPD is a transient voltage suppression network comprised of high energy metal oxide varistors with less than a 5 nanosecond response time and a maximum peak current handling capability of 40,000 amps (8x20μsec) per mode. The suppression network will remain functional when subjected to ANSI/IEEE C62.41 Category B-3 waveforms. The SPD includes a high frequency noise filter that increases the transverse mode noise attenuation to 3dB down at 10kHz, decaying 40dB per decade. A single status indicator light is provided to show that the SPD and filter are fully operational and functioning properly.

D. Output Power Ratings, BTU's, Dimensions and Weights

Model	Intermittent kVA	Operational BTU's / hr.	Continuous kVA	Full Load BTU's / hr	Dimensions (in)	Weight (lbs.)
75K(i)	75	2300	45	4600	28"W x 25"D x 39"H	700
112.5K(i)	112.5	3825	75	7650	28"W x 25"D x 39"H	830
150K(i)	150	3825	75	7650	28"W x 25"D x 39"H	830
225K(i)	225	5750	112.5	11,500	38"W x 32"D x 57"H	1210

4.0 Construction

A. Main Transformer

1. Transformer windings: All copper conductor construction, with separate primary and secondary isolated windings. The transformer conforms to NEC article 250-5D that specifies a separately derived power source. The neutral conductor is sized for 200% of the ampacity of the phase conductor.
2. Copper bus connections are provided for isolated three phase output conductors, neutral conductor, and ground.
3. All leads, wires and terminals are labeled to correspond with the circuit wiring diagram.
4. Basic impulse level: No less than 10,000 Volts.
5. MTBF: $\geq 200,000$ hours.
6. Transformer steel: Grain oriented, M3 grade, silicon steel, miter cut joint construction.
7. Flux density: $\leq 15k$ gauss.
8. Core losses: 0.2% to 0.4% of the continuous KVA rating, model dependent.

9. Insulation: Class N, 200°C with a temperature rise of 115°C above ambient, not exceeding 135°C under non-linear loading per UL 1561 standard.
10. Cooling: Natural convection.

B. Cabinet

1. Enclosure: NEMA type 2 general purpose, floor mounted, and indoor enclosure.
2. Construction: Cabinets are manufactured from 14 gauge steel with base sub-structure suitable for fork lifting.
3. Paint: Baked on, powder coat paint finish with proper pre-treatment.
4. Provisions exist to hardwire input and output to copper bus connections located behind the front panel of the transformer cabinet. Input and output landing locations are available on either side of the transformer cabinet.

5.0 Environment

A. Operating Conditions

1. Operating temperature range: -25°C to +40°C.
2. Humidity: 0 to 95% non-condensing.
3. Altitude: Up to 5000 feet above sea level without de-rating.
4. Audible noise: < 50dBA at 1 meter.

6.0 Options

A. Optional Equipment

1. Output Voltage SPD with a peak surge current capacity rating of 100kA per phase, UL 1449 Listed, Type 2. The SPD has a nominal discharge current rating of 20kA, and a short circuit current rating (SCCR) of 200kA. Includes EMI/RFI filtering, Form C relay contacts rated for 2 amps at 30VDC or 250VAC, and LED protection status indicators.
2. Main input or output circuit breaker: Molded case, 3 pole circuit breaker provided in a separate NEMA 1 enclosure for external mounting and installation.
3. High temperature / over temperature alarm contacts: Thermal warning alarm contacts provided for customer hardwired connection. Thermal sensors at 180°C and 200°C.
4. IR scanning window: Infrared transparent polymer IR window(s) for safe routine thermal scanning of transformer connections under load, without exposing personnel to arc flash hazards (one or two 4" viewing windows provided, model dependent). Durable IR windows are industrial-grade with a patented reinforced grill, are fully impact-resistant, and are UL and C-UL Listed. This option adds 2" to the depth of the 225K(i) enclosure.
5. Lug kit: Mechanical (screw-type) lugs shipped for installer convenience. Consult factory for number of conductors per lug and wire range.

7.0 Warranty

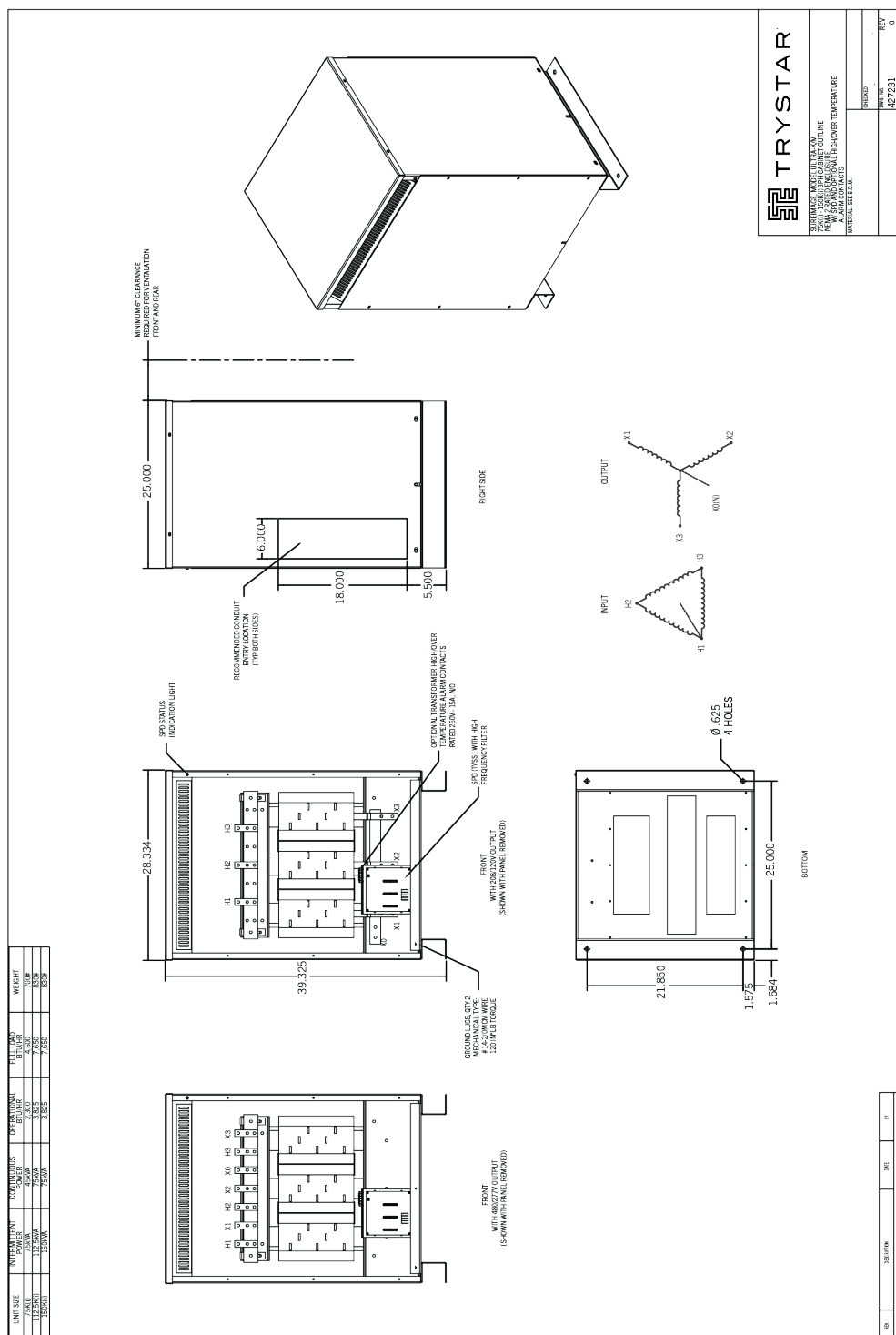
Trystar warrants the Model Ultra-K/M transformer (core and coil) to be free from defects in material and workmanship for a period of 1 year full, and an additional 24 years prorated. All other unit components are covered by a 2 year full replacement warranty. The warranty periods begin following the original factory ship date.

APPENDIX A

RELATIVE DRAWINGS & SCHEMATICS

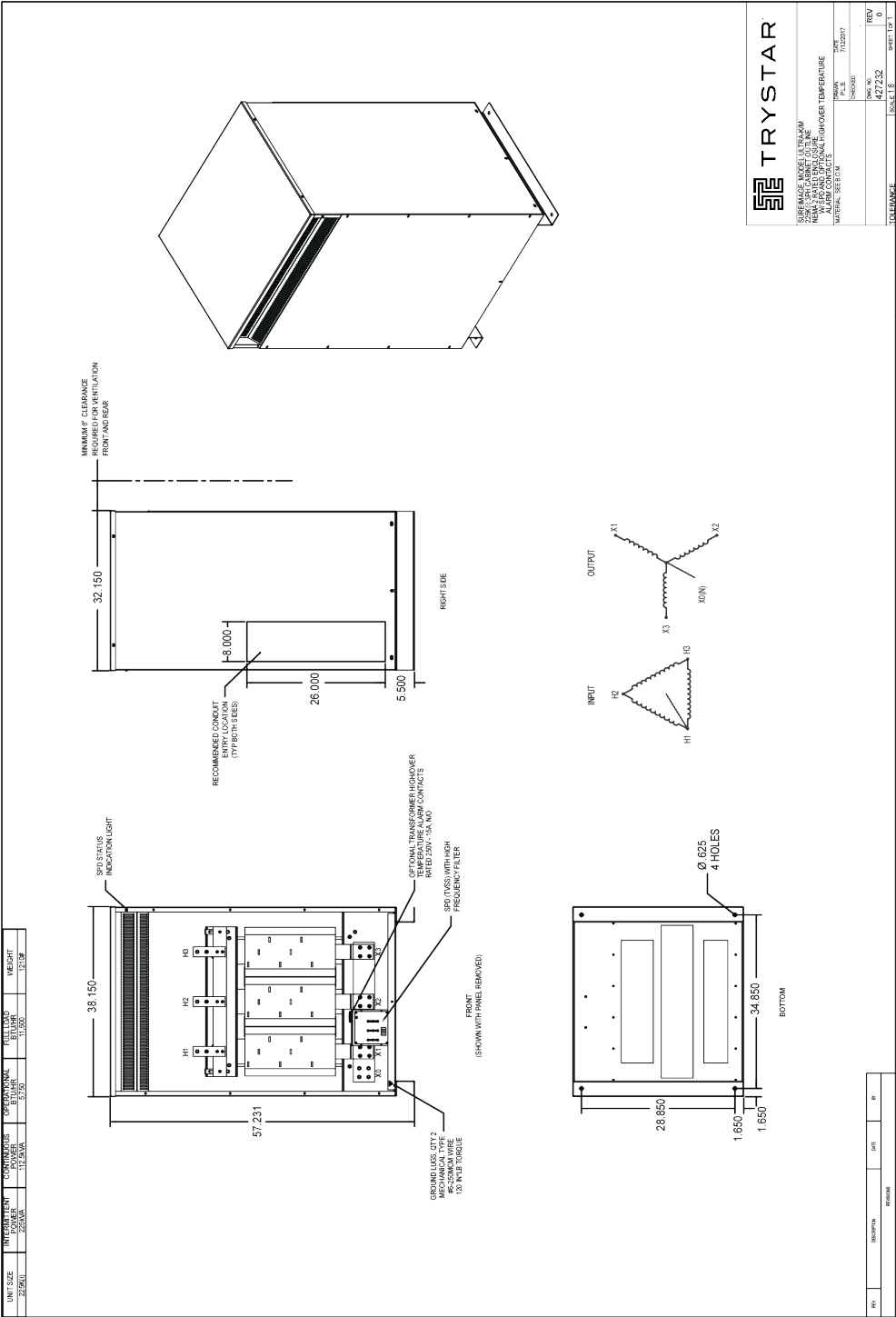
CABINET OUTLINE

CABINET OUTLINE 75K(i) - 150K(i)



CABINET OUTLINE

CABINET OUTLINE 225K(i)



NOTES

