



SureImage
IMAGING & TREATMENT SERIES

Seismic-Rated
Models Available!
OSHDP Seismic Preapproval (OSP)
CBC 2013 IBC 2015



Power Conditioner
MODEL ULTRA-K/M
THREE PHASE ISOLATION TRANSFORMER

POWER PROCESSOR

MODEL 700F/M

THREE PHASE VOLTAGE REGULATOR, WITH ISOLATION

Designed specifically to provide voltage regulation, isolation, and power distribution for medical imaging diagnostics / treatment equipment.

Superior protection against voltage spikes, sags and surges.

Applications:

- MRI
- CT
- PET
- Molecular Imaging
- X-Ray
- Cardiology
- Linear Accelerator
- Simulator



UL 1012 (Model 700F/M)
UL 1561 (Model Ultra-K/M)

MEDICAL-GRADE POWER QUALITY

Trystar engineers and manufactures the industry's highest quality electrical power solutions, capitalizing on many years of expertise. We have an enviable reputation for quality, which is reflected in the design, workmanship, and performance of our products.

The SureImage Power Conditioner (Model Ultra-K/M) and the SureImage Power Processor (Model 700F/M) are the ideal power quality solutions for medical imaging and treatment systems. The voltage regulation, isolation, and performance characteristics of the SureImage Power Conditioner and Power Processor products offer significant advantages over competing products. Both models provide superior load regulation and proven performance that extends the life of your medical equipment. Our Model 700F/M assures steady, regulated-voltage of $\pm 2\%$.

Medical-Grade Power Quality for Imaging and Treatment Systems

"Power quality" refers to all electrical environment issues that affect the performance and reliability of electronics-based equipment, systems, and networks prevalent in hospitals and imaging / treatment centers. These issues include grounding and bonding, electrical wiring, electrical disturbances (outages, brownouts, surges, voltage spikes, harmonics, and high-frequency electrical noise), and radiated emissions (EMI, RFI, and ESD). Industry experts believe that as many as 75% of electronics-based equipment disruptions and failures are attributed to power quality issues. Think about it: what would it mean to a hospital or imaging / treatment center, if 7 out of 10 equipment problems were prevented? If power quality is affecting equipment performance, it's costing money!

"K(i) Rated" For Increased Surge Capability and High Efficiency

"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 to 5 times the steady state current, or higher! SureImage medical K(i) rated power conditioners and voltage regulators are designed to supply this demand, while continuing to provide tightly-regulated voltage. Most manufacturers of "standard" transformers, power conditioners, and voltage regulators "over-size" their units to regulate voltage well under these dynamic load conditions. This approach results in increased operating costs, a more expensive installation, and typically a larger unit footprint. Other manufacturers "over-size" their units to prevent automatic bypassing, misinterpreting this normal operation as a system overload. Such an approach results in exposing critical medical equipment to unregulated, unconditioned power.

In contrast, the SureImage products are sized properly for the continuous load rating, providing high efficiency and lower operating costs. In addition, all models are surge-rated to optimize performance, providing your medical equipment with exactly the power it needs.



Optional Power Metering and Data Logging

Standard Features:

- Real-time voltage, current, power, and energy measurements.
- Real-time remote monitoring.
- Programmable out-of-limit alarms.
- MODBUS RS485 communications.
- 3-line, bright LED display.
- IrDA port for PDA remote read.

Options:

- MODBUS TCP Ethernet connection.
- Integrated web server for real-time monitoring.
- Real-time waveform viewing.
- Power quality harmonic recording.
- Contact closure outputs.
- Power quality metering with waveform capture.
- Local event logging.

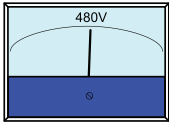
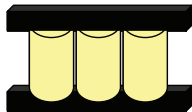
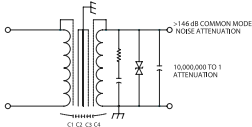
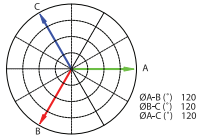
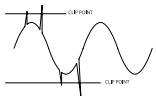


TYPICAL INPUT POWER REQUIREMENTS

Healthcare engineers, responsible for meeting the electrical needs of medical imaging and treatment equipment, must look closely at the OEM specified maximum allowable input voltage requirements. While the high line and low line limits may be stated at $\pm 10\%$, this does not reflect the stability or regulation of the line voltage that must be met during equipment operation. OEM's will specify the source impedance and other ratings, all of which point to a minimum variation in voltage when going from the steady state to maximum current draw of their equipment. Even more stringent, is the typical maximum phase imbalance specification of 2%. Still other OEM's specify line voltage regulation of $\pm 5\%$ or less!

So, is voltage regulation important? The answer is YES!

The SureImage Power Conditioner (Model Ultra-K/M) enables OEM and site engineers to meet and exceed the minimum recommended power requirements and provide additional power quality. For the optimum medical imaging / treatment power quality solution, the SureImage Power Processor (Model 700F/M) is recommended.

Power Elements	Typical OEM Power Requirements	Oversized Distribution Transformer	Ultra-K/M	700F/M
	Line Voltage Regulation Sags no more than 8% – 10% below nominal. Surges no more than 8% – 10% above nominal			✓
	Load Regulation Size of facility transformer and feeder wires determine load regulation to the system. Total load regulation must not exceed 6%.	✓	✓	✓
	Common Mode & Transverse Mode Noise When the primary is exposed to a 6000 V, 3000 A (Cat. B) waveform, the secondary output increases 330 V peak, maximum.		✓	✓
	Phase Imbalance Resulting from utility / generator line voltage imbalance			✓
	Resulting from step load change or load imbalance. The difference between the highest line-to-line voltage and the lowest line-to-line voltage must not exceed 2%.	✓	✓	✓
	Transient Voltage Limits the maximum transient voltage to 1500 V, peak.		✓	✓

Note: Power requirements stated are typical minimum OEM requirements. Modality-specific power requirements must be verified with medical equipment manufacturer.

Product Specifications for Both the Ultra-K/M and 700F/M

- Low Output Impedance: 2% typical
- Phase Imbalance: <2% typical
- Electrostatic Shielding: Triple shielded
- Reflected Harmonics: Load-generated triplen harmonics not reflected to input source
- Model 700F/M Line Voltage Regulation: $\pm 2\%$
- Meets ANSI / IEEE C62.41 cat B-3 surge capability

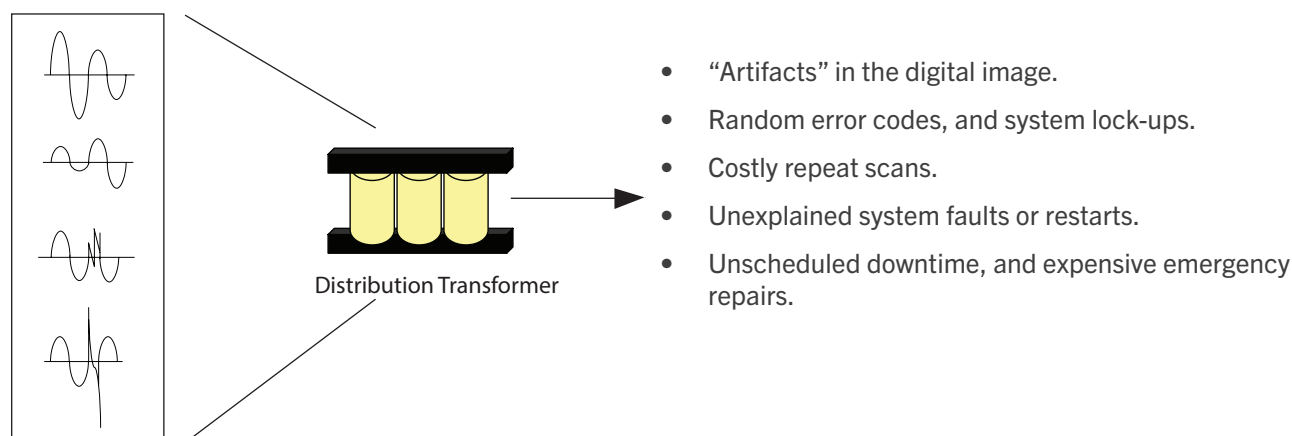
See our **Ultra-K/M** and **700F/M** webpages for detailed specifications, or consult factory for application assistance

PERFECT FIT FOR IMAGING & TREATMENT EQUIPMENT

“Image Quality” Is By Design Not By Accident

One inclination is to try to meet the power quality needs of medical imaging and treatment equipment by simply wiring to an existing up-stream distribution transformer. Even if care is taken to not exceed the maximum allowable feeder (voltage) regulation, **poor power quality can still exist**. Power disturbances such as high frequency voltage spikes, transients, and line voltage sags and surges must be eliminated. It is critical to take control of the electrical environment, making “bad power” a non-issue.

Poor Power Quality Often Translates Into:



Significant Benefits of Installing the Ultra-K/M Power Conditioner Near the Imaging / Treatment Equipment:

Isolation, superior “step load” voltage regulation, re-established N-G bond, and attenuation of voltage spikes result in:

- Significant reduction / elimination of “artifacts” in the digital image.
- Enhanced workflow and processing time.
- Preventing premature failure of imaging / treatment equipment.
- Lower cost to maintain imaging / treatment equipment.

As well as:

- Reduced installation expenses.
- Higher power efficiency, and lower operating costs.



Optimum Benefit of Installing the 700F/M Power Processor:

Tight line voltage regulation, combined with all the benefits of the Ultra-K/M Power Conditioner, result in:

- Highest level of image quality and diagnostic reliability.
- Optimum workflow and patient satisfaction.
- Removal of voltage sags and surges associated with system restarts.
- Compensation for generator power voltage drops during scans.
- Ultimate component and system reliability.
- Permanent location or portable (optional casters).



SUREIMAGE MODEL ULTRA-K/M POWER CONDITIONER

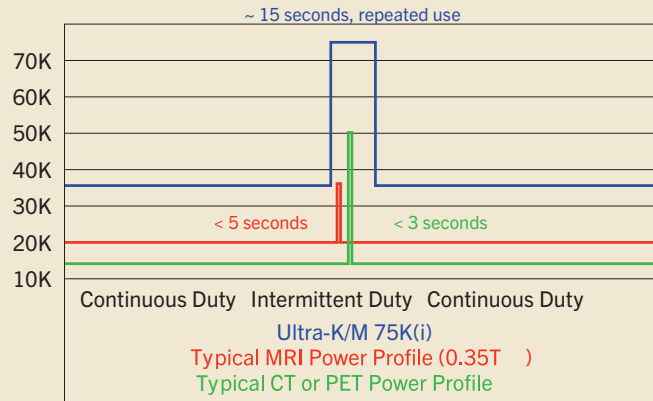
Ultra-K/M — Additional Product Specifications

- Output Load Regulation: $\leq 2\%$ 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): Secondary-connected, 40kA per mode; with high frequency filter, status indicator
- Optional SPD, 100kA per phase, UL 1449 Listed; with EMI/RFI filtering, form C rely contacts, LED status indicators
- 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

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)

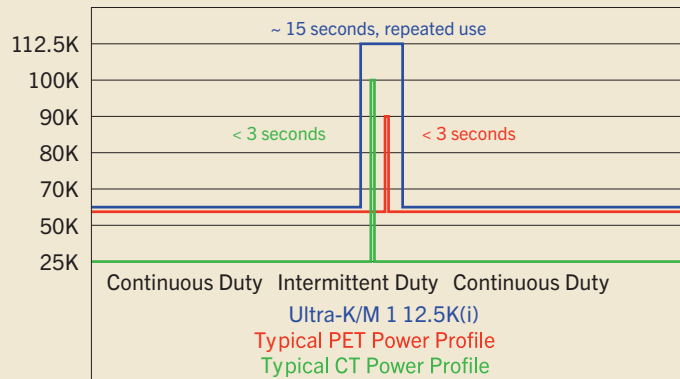
Power Profile Characteristics



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

Model Ultra-K/M 112.5K(i)

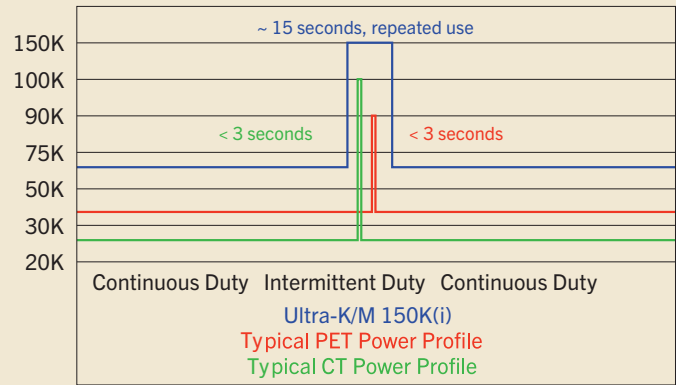
Power Profile Characteristics



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

Model Ultra-K/M 150K(i)

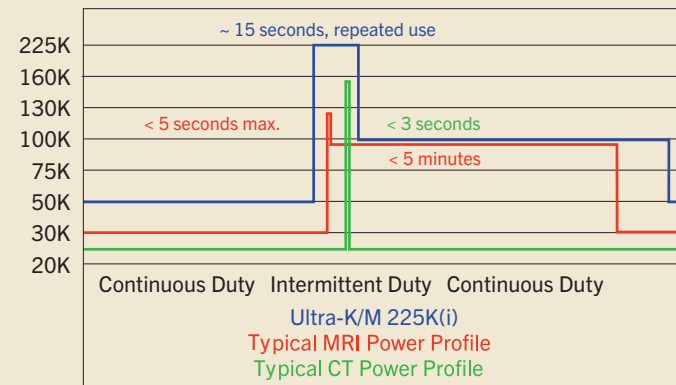
Power Profile Characteristics



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

Model Ultra-K/M 225K(i)

Power Profile Characteristics



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

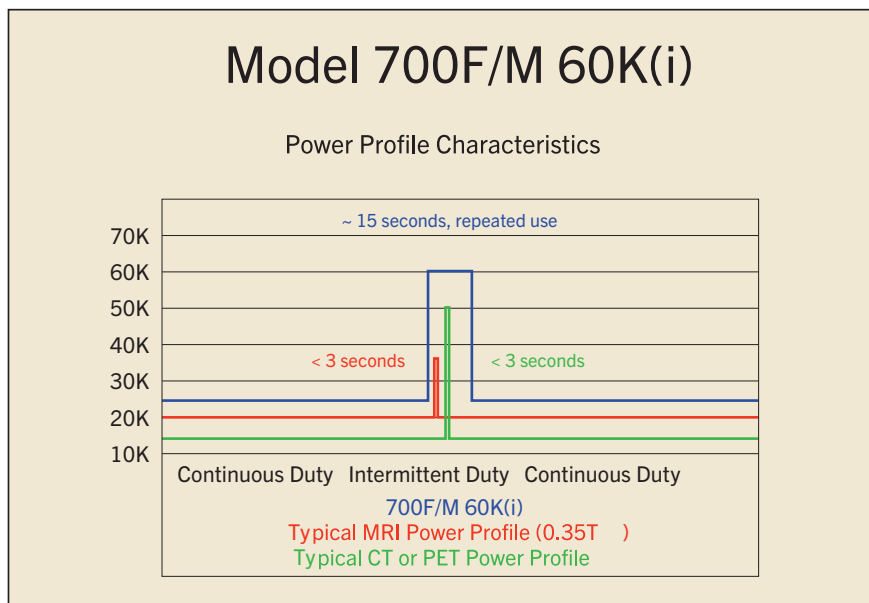
Notes: Stated BTU's / Hr is at rated load, 100% duty cycle. Operational BTU's / Hr is typical at 50% of rated load. ** Input breaker provided by others. Intermittent KVA ratings are shown for a duration of 15 seconds,

repeated use at 10% duty cycle. Time durations shown are not to scale, and are for illustration purposes only. See Back Cover for Maximum Continuous kVA rating of each Ultra-K/M model.

SUREIMAGE MODEL 700F/M POWER PROCESSOR

700F/M — Additional Product Specifications

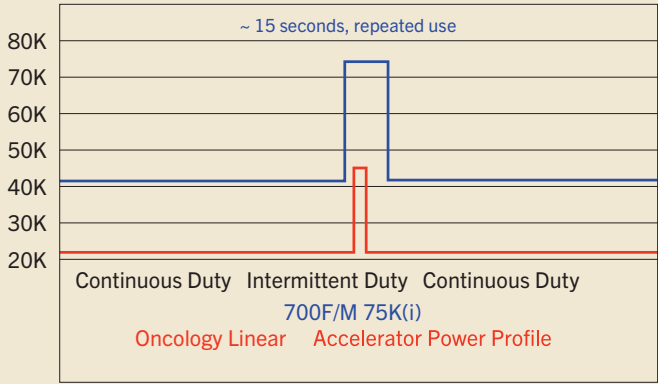
- Output Line Voltage Regulation: $\pm 2\%$
- Output Load Regulation: $< 2\%$ from typical steady state load to intermittent power demand
- K-Factor Rating: K13 design for power profiles illustrated below
- Output Impedance: 2% typical at rated load
- Common Mode Noise Attenuation: 146 dB
- Transverse Mode Noise Attenuation: 3 dB down at 1 KHz, 40 dB down per decade
- Efficiency: 97% typical at full load, continuous rating
- Internal regulator bypass
- Standard Surge Protection Device (SPD): Secondary-connected, 40kA per mode; with high frequency filter, status indicator
- Optional SPD, 100kA per phase, UL 1449 Listed; with LED status indicators
- Optional input and output digital metering
- Optional output circuit breakers (up to 2)



MODEL	INPUT VOLTAGE	* OUTPUT VOLTAGE	**INPUT REAKER	BTU'S / HR
8B*X-60K(i)-7F/M	208V	L = 208V/120V N = 480V/277V	110A	3,069
8C*X-60K(i)-7F/M	240V		100A	
8D*X-60K(i)-7F/M	480V		50A	
8E*X-60K(i)-7F/M	600V		40A	

Model 700F/M 75K(i)

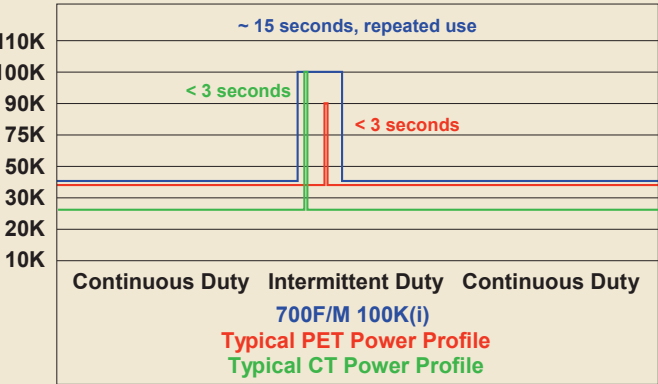
Power Profile Characteristics



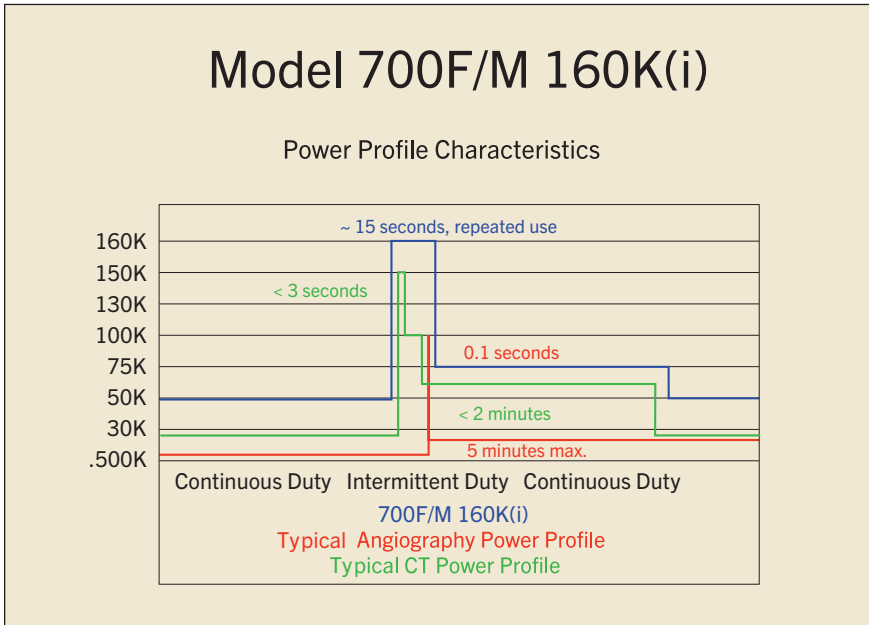
MODEL	INPUT VOLTAGE	* OUTPUT VOLTAGE	**INPUT REAKER	BTU'S / HR
8B*X-75K(i)-7F/M	208V	L = 208V/120V N = 480V/277V	200A	5,115
8C*X-75K(i)-7F/M	240V		175A	
8D*X-75K(i)-7F/M	480V		80A	
8E*X-75K(i)-7F/M	600V		70A	

Model 700F/M 100K(i)

Power Profile Characteristics



MODEL	INPUT VOLTAGE	* OUTPUT VOLTAGE	**INPUT REAKER	BTU'S / HR
8B*X-100K(i)-7F/M	208V	L = 208V/120V N = 480V/277V	200A	5,115
8C*X-100K(i)-7F/M	240V		175A	
8D*X-100K(i)-7F/M	480V		80A	
8E*X-100K(i)-7F/M	600V		70A	



MODEL	INPUT VOLTAGE	* OUTPUT VOLTAGE	**INPUT REAKER	BTU'S / HR
8B*X-160K(i)-7F/M	208V	L = 208V/120V N = 480V/277V	300A	7,673
8C*X-160K(i)-7F/M	240V		250A	
8D*X-160K(i)-7F/M	480V		125A	
8E*X-160K(i)-7F/M	600V		100A	

Notes: Stated BTU's / Hr is at rated load, 100% duty cycle. Operational BTU's / Hr is typical at 50% of rated load. Intermittent KVA ratings are shown for a duration of 15 seconds, repeated use at 10% duty cycle. Time durations shown are not to scale, and are for illustration purposes only. See Back Cover for Maximum Continuous kVA rating of each **700F/M** model.

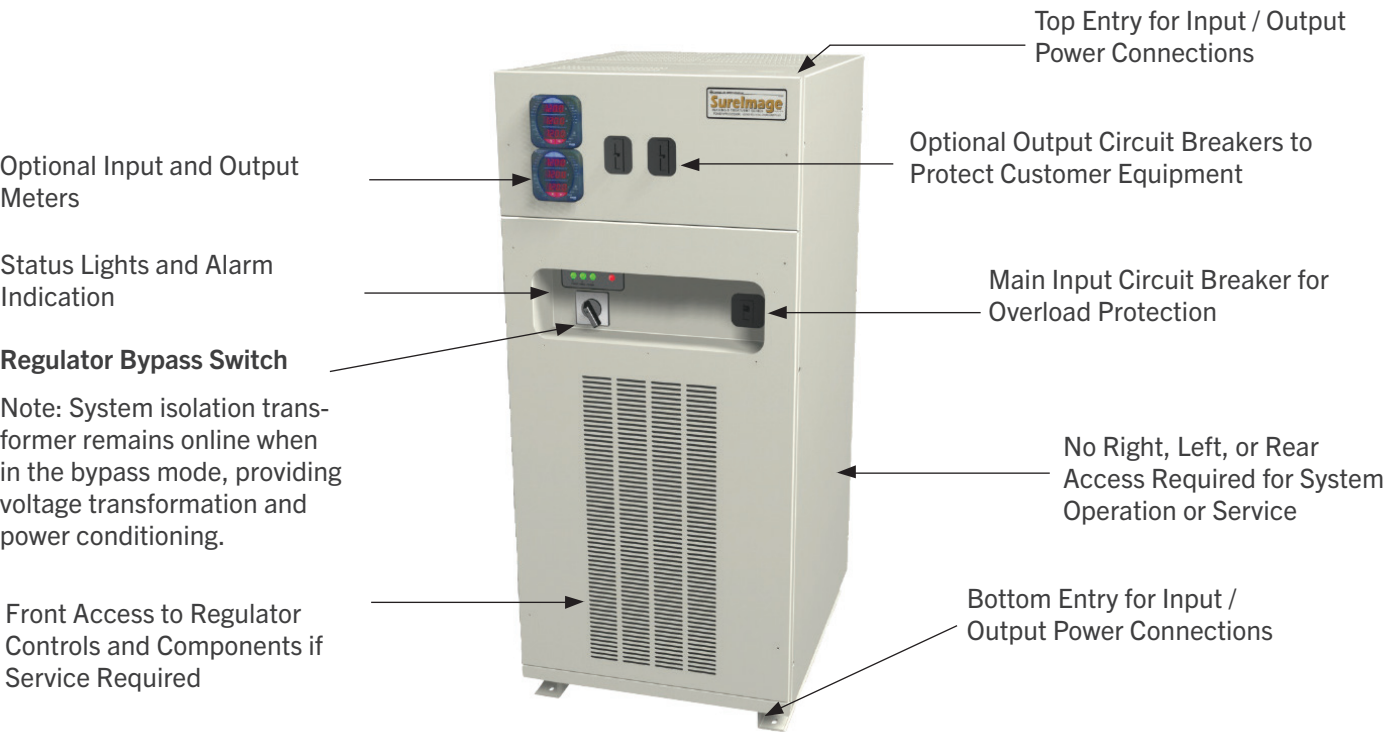
Note: Seismic-rated units with an input nominal voltage of 208VAC, 240VAC, or 480VAC are designed and tested in accordance with applicable portions of the following standards:

- OSHPD Special Seismic Certification Preapproval (OSP)
- ICC - AC156: "Acceptance Criteria for Seismic Certification by Shake-Table Testing of Nonstructural Components and Systems"
- California Building Code – CBC 2013
- International Building Code – IBC 2015

Seismic unit provided on floor mounting channels. Unit weight and dimensions are the same as the standard unit.

700F/M DIMENSION AND WEIGHTS		
K(i) RATING	DIMENSIONS (IN INCHES)	WEIGHT
60K(i)	29" W x 24" D x 59" H	890 lbs
75K(i)	29" W x 36" D x 66" H	1,176 lbs
100K(i)	29" W x 36" D x 66" H	1,176 lbs
160K(i)	34.5" W x 36" D x 76" H	1,575 lbs
210K(i)	34.5" W x 36" D x 76" H	2,014 lbs
260K(i)	34.5" W x 36" D x 76" H	2,398 lbs

Advantages of Front Access



SureImage Output Power Ratings

The matrices below list the Intermittent kVA and the Maximum Continuous kVA for each SureImage Ultra-K/M and 700F/M model. Refer to the power profile illustrations on Pages 5 (Ultra-K/M) and 6 – 7 (700F/M) to see how each model accommodates the steady state and momentary (intermittent) power demand of medical imaging and treatment equipment.

ULTRA-K/M		
MODEL	INTERMITTENT KVA	MAXIMUM CONTINUOUS KVA
75K(i)	75	45
112.5K(i)	112.5	75
150K(i)	150	75
225K(i)	225	112.5

700F/M		
MODEL	INTERMITTENT KVA	MAXIMUM CONTINUOUS KVA
60K(i)	60	30
75K(i)	75	50
100K(i)	100	50
160K(i)	160	75
210K(i)	210	100
260K(i)	260	125

WARRANTIES: 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. These warranty periods begin following the original factory ship date.

Trystar warrants the Model 700F/M to be free from defects in material and workmanship for a period of 1 year. This warranty period begins following the original factory ship date.



TRYSTAR®