



Series 700A/VE-S Power Conditioner

Designed for Elekta Accelerators with KV Imaging

Input Voltages: 208 VAC, 240 VAC or 480 VAC (60 Hz)

Output Voltages: 400/230 VAC and 480/277 VAC

- Integrated Input and Output Breakers
(1 input breaker - 3 output breakers)
- Intelligent Voltage Regulation (+/- 2.0% Output)
- Internal Bypass Switch
- Triple Shielded Isolation Transformer
- Internal TVSS
- User-Friendly LED Monitor Panel
- Front Access "Zero Clearance" Cabinet

Submittal Package and Specifications



30 kVA (60k(i)) Power
Conditioner with Voltage
Regulation (60 Hz)

115487 - 8(BCD)(SNX)-60k(i)-700A/VE-S

TRANSTECTOR SERIES 700 A/VE-S

Specifications for 30kVA (60K(i)) Power Conditioner with Voltage Regulator (60Hz)

1.0 SCOPE

This specification covers the electrical characteristics of the Transtector Power Conditioner which provides clean regulated power for imaging systems.

2.0 GENERAL

The Power Line Conditioner consists of an all copper, multiple tapped, triple shield isolation transformer. The low output impedance of the transformer in conjunction with the electrostatic shields assures precision hospital grade performance with excellent noise and transient attenuation. Independently controlled inverse parallel electronic switches for each of the 7 taps per phase provide tight regulation over a wide input range. Linear devices are used for line synchronization to prevent phase shift errors normally associated with simple CT zero current crossing acquisition. The microprocessor control accurately selects the correct tap to maintain the output no greater than +2.5% of nominal, correcting for voltage disturbances within one cycle. Digital processing techniques provide fast and accurate regulation without output voltage over or undershoot.

2.01 MODEL NUMBERS

MODEL	INPUT VOLTAGE	OUTPUT VOLTAGES
Standard models		
8BSNX-60k(i)-700 A/VE-S	208 VAC nominal input (60Hz)	400/230 and 480 volts output
8CSNX-60k(i)-700-A/VE-S	240 VAC nominal input (60Hz)	400/230 and 480 volts output
8DSNX-60k(i)-700-A/VE-S	480 VAC nominal input (60Hz)	400/230 and 480 volts output

2.1 AGENCIES**2.1.1 STANDARDS**

The systems shall be designed in accordance with:

- American National Standards Institute
- Institute of Electrical and Electronic Engineers
- National Electric Code (NEC)
- National Fire Protection Association (NFPA Article 70)
- Underwriters Laboratories (U/L) 1449, 1012
- FCC Article 15, Section J, Class A
- ISO 9001

2.1.2 LISTINGS

- The system shall be listed to UL standard UL1012
- The system shall comply to: FCC Article 15, Section J, Class A and ANSI C62.14 (electromagnetic compatibility)

3.0 DYNAMIC ELECTRICAL CHARACTERISTICS

3.1 OPERATING VOLTAGE AND OUTPUTS

The input voltage shall be 208 VAC, 240 VAC or 480 VAC input, three phase 60Hz. The output shall be a WYE derived 7 tap regulating system at 400/230V, 480/277V and 230V, rated for 60 KVA intermittent load and 30 KVA continuous load. Each unit will be pre-wired at the factory to accommodate the nominal input voltage.

3.2 LINE VOLTAGE REGULATION

Nominal Input Line Voltage +10%, -15% Output Line Voltage +2.0% to 2.5% typical.

The design of the system shall indicate that with an input voltage of -10% of nominal, increasing the load to 1000% shall cause the output voltage to fall no lower than -6%.

3.3 OUTPUT VOLTAGE

Output voltages shall be 400/230 V, 480/277 V and 230 V derived from a WYE configuration, allowing utilization of the outputs fed from three phase or single phase breakers.

3.4 OUTPUT CONNECTIONS

Output circuit breakers are provided for the 400 VAC, 480 VAC three phase power and 230 VAC single phase power.

3.5 INPUT/OUTPUT WIRING

Input and output wiring sizes are dependant upon the terminals provided by the circuit breakers.

Input Wiring Size:

480 VAC 50 A CB	#14 AWG to #3/0 AWG
240 VAC 100 A CB	#14 AWG to #3/0 AWG
208 VAC 110 A CB	#14 AWG to #3/0 AWG

Output Wiring Size:

400 VAC 45A 3 Pole CB	#14 AWG to #3/0 AWG
480 VAC 20A 3 Pole CB	#14 AWG to #3/0 AWG
230 VAC 15A 1 Pole CB	#14 AWG to #2 AWG

The ILSCO TA-2/0 terminal allows wire sizes from # 14 AWG to # 2/0 AWG to be connected to the input ground.

3.6 RESPONSE TIME

Response time is less than 1/2 cycle.

3.7 CORRECTION TIME

The output voltage is corrected within 1 cycle.

3.8 LOAD REGULATION

The output is maintained to within 2% of nominal or less, from no load to full load.

3.9 IMPEDANCE

Output impedance shall be less than 2.0%.

3.10 OPERATING FREQUENCY

60 Hertz \pm 3 Hertz.

3.11 HARMONIC DISTORTION

Less than 1% THD added to the output waveform under any dynamic linear loading conditions presented to the line regulator.

3.12 TURN-ON CHARACTERISTICS

When energized the voltage overshoot is 5% or less of the nominal voltage for less than 1 cycle.

3.13 OVERLOAD RATING

200% for ten seconds.

1000% for one cycle.

3.14 NOISE ATTENUATION

Common mode noise attenuation is typically 140 dB or greater.

Transverse mode noise attenuation is 3 dB down at 1000 Hertz, 40 dB down per decade to below 50 dB with a resistive load.

3.15 AUDIBLE NOISE

Not to exceed 55dB measured @1 meter.

3.16 EFFICIENCY

Efficiency shall be > 96% typical at full load. Excitation losses shall be less than 0.75% of KVA rating.

3.17 BTU

The Power Line conditioner shall generate no more than 4,090 BTU/Hour @ full load.

Median Operational BTU: 2,045 BTU/Hour.

3.18 POWER FACTOR

Input power factor shall be greater than .95 with a resistive load and reflect no triplen harmonics to the utility under non-linear loads.

3.19 LINE TO LINE BALANCE

The Power Line Conditioner shall not produce more than a 2% phase to phase unbalance.

3.20 MTBF

The system shall exhibit a MTBF > 10,000Hr.

3.21 SURGE and SPIKE SUPPRESSION

A high capacity 75 kA SPD shall be installed parallel to the secondary output of the power line conditioner to provide all-mode, bi-directional and bi-polar spike/surge protection. The suppression network system is listed to UL 1449 4th Edition/Type 1/Type 2/IEEE C62.41-1991 category C3 waveforms. The surge suppressor is installed on the load side of the transformer internal to the unit.

4.0 MAIN TRANSFORMER

4.1 BASIC CONSTRUCTION

The transformer windings are of all copper conductor construction with separate primary and secondary isolated windings.

4.2 MAGNETIC

Grain oriented, stress relieved silicon transformer steel is utilized to minimize losses and provide maximum efficiency. Flux density will not exceed 14k gauss.

4.3 INSULATION

Class N (200° C) insulation is utilized throughout.

4.4 SHIELDING

The transformer has multiple (three) copper shields to minimize inner winding capacitance, transient and noise coupling between primary and secondary windings. Inner winding capacitance is limited to .001 pf or less.

4.5 COOLING

The transformer is designed for natural convection cooling. A blower is located inside the unit to direct airflow upward.

4.6 OPERATING TEMPERATURE

The system operating range: 0 to 40 degrees Celsius, 32 to 104 degrees Fahrenheit

4.7 OPERATING HUMIDITY

0-95% relative humidity, non-condensing.

5.0 MAIN INPUT BREAKER

A main input molded case, thermal magnetic circuit breaker, rated at 125 % of the full load input current, is furnished as an integral part of the unit. For example, a 110 Amp breaker will be provided for 208 VAC input, a 100 Amp breaker will be provided for 240 VAC and a 50 Amp breaker will be provided for a 480 VAC input.

6.0 BY-PASS SWITCH

A manually operated rotary bypass switch provides bypassing of the SCR regulator portion of the Power Line Conditioner. The regulator can be either on-line or bypassed with one turn of the switch. The transformer and suppression circuitry remains in the circuit when in the bypass mode. The bypass switch is located on the front of the unit.

7.0 MONITORING

7.1 ALERT LIGHT

An indicator light shall annunciate that the output has been disabled by one of the following conditions.

- (1) Transformer over-temperature.
- (2) SCR thermal over-temperature.

7.2 INDICATING LAMPS

Output "ON" indicating lamps shall provided for each phase.

8.0 CABINET

8.1 TERMINATION

Termination is front access with input and output connections made to the circuit breakers.

The unit is constructed using an isolation transformer and is considered to be a “separately derived system”. It should be grounded in accordance with the NFPA 70 article 250.20 “Alternating-Current Circuits and Systems to be Grounded”, article 250.20 (D) “Separately Derived Systems” and article 250.30 “Grounding Separately Derived Alternating-Current Systems”.

The Output Neutral and Ground is bonded at the output of the transformer and is considered a single, separately derived, power source and should be wired accordingly.

8.2 VENTILATION

Ventilation originates from the front of the cabinet and exhausts out the top of the cabinet.

8.3 MOBILITY

The Power Line Conditioner cabinet is equipped with angle iron supports that allow for transport by pallet jack or fork lift. These can be used for the unit to the floor in seismic zones.

8.4 ACCESSIBILITY

The cabinet is constructed with lift off front and side panels for ease of access. The front is the access panel for connection and service. The back of the unit may be set next to a wall without impeding access. Clearance is not required for the back or sides.

8.5 WEIGHT

Unit weight: 970 lbs. (439.985 Kg)

8.6 DIMENSIONS

29" W X 24" D X 59" H (73.6 cm X 60.9 cm X 149.7 cm)

9.0 CONTROLS

The control portion of the cabinet containing the circuit boards and connection to the semi- conductor devices is separate from the transformer and input / output termination.

10.0 WARRANTY

All units shall be covered under a standard commercial one year warranty covering parts and workmanship. Units within the contiguous US shall include a comprehensive warranty in the first year covering on site labor and expenses.

11.0 SERVICE

Transtector shall provide immediate phone support/consultation and if possible, same day parts shipment. (contact must be prior to 12:00 PM PST). If necessary, on site service shall be scheduled the same day for service to be conducted within 24 to 48 hours, based on customer requirements. Typical service hours are 8 AM to 5 PM Monday through Friday. All services outside the US and Canada are subject to the availability of local service agents.

12.0 CONTACT

Rick Ribbeck
Transtector Systems
10701 Airport Dr.
Hayden Lake ID 83835
Phone: 1-800-882-9110 X 5867
Cell: 208-762-6112
Email: rribbeck@transtector.com

INPUT AND OUTPUT BREAKER SIZE

OUTPUT KVA CONTINUOUS	OUTPUT KVA INTERMITTENT	INPUT BREAKER SIZE	OUTPUT BREAKER SIZE
30 kVA	60 kVA	110A @ 208V 100A @ 240V 50A @ 480V	45A, 3P @ 400V 20A, 3P @ 480V 15A, 1P @ 230V

WEIGHTS, BTU AND DIMENSIONS

OUTPUT KVA	WEIGHT	OPERATIONAL BTU/HR TYPICAL	MAXIMUM BTU/HR	DIMENSIONS
30 kVA (60k(i))	970 lbs 439.985 kg	2,045*	4,090	29" W X 24" D X 59" H (73.6 cm X 60.9 cm X 149.7 cm)

* Stated BTU's / Hr is at 30KVA rated load, 100% duty cycle. Operational BTU's / Hr is typically at 50% of rated load. Input over current protection provided by others.

SEISMIC CALCULATIONS

Coastal California, Zone 4

Equipment Anchorage

Uniform Building Code, Table 160

$$Z = 0.4$$

$$I = 1.5$$

$$C_p = 0.75$$

$$F_p = Z \times I \times (C_p) \times W_p = 0.45 \times W_p$$

Cabinet Weight

970 lbs.

Center of Gravity Height

23.75 in.

$$W_p (\text{max}) = 970 \text{ lbs} \times 1.15 = 1313.3 \text{ lbs.}$$

$$W_p (\text{min}) = 1065.9 \text{ lbs.} \times 0.85 = 970.7 \text{ lbs.}$$

Vertical Force

$$F_p = 0.45 \times 1313.3 = 591 \text{ lbs.}$$

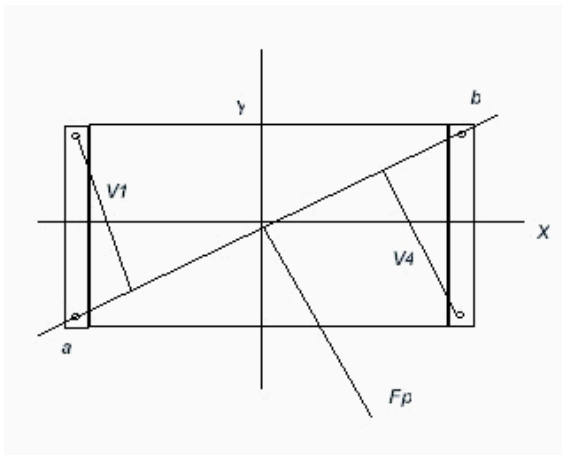
$$(F_p) = 0.15 \times 1313.3 = 197 \text{ lbs.}$$

Moment

$$M_o = 23.75 \times 591 = 14036.25 \text{ in. lbs.}$$

$$\text{Tension} = F_p \times C_g / V_4 = 1406.7 \text{ lbs.}$$

$$\text{Shear} = W_p(\text{max})F_p/4 \text{ lbs., each anchor} = 328.3 \text{ lbs.}$$



Corners (a,b) 39.5 in
 $V_1 = V_4 = 19.3 \text{ in.}$

EXAMPLE: <Rawl Power Bolt # 6913>

3/8" embedded 2.5" / min 2000 psi concrete

Tension rating of bolt: 5200 lbs.

Shear rating of bolt: 7270 lbs.

$$\text{Interaction} = (T/T_{\text{bolt}}) + (S/S_{\text{bolt}})$$

$$\text{Interaction} = 0.32$$

$$\text{Interaction} = < 1.00 \text{ (OK)}$$

NOTE:

- LIFT OFF ACCESS PANELS REQUIRE COMMON HAND TOOL FOR ACCESS.
- 36" CLEARANCE REQUIRED ON FRONT SIDE FOR SERVICE OF REGULATOR SECTION

FRONT VIEW

REMOVABLE TOP PANELS PROVIDES ACCESS TO TRANSFORMER, OUTPUT FILTER

TOP INPUT/OUTPUT TERMINATION ACCESS AREA W/ (4) 0.875 KNOCK-OUTS

TVSS

BYPASS SWITCH

MONITOR ALERT LIGHTS

OUTPUT CIRCUIT BREAKERS
45AMP 3P @ 400VAC
20AMP 3P @ 480VAC
15AMP 1P @ 230VAC
(CUSTOMER CONNECTS TO BOTTOM)

OUTPUT TERMINATIONS NEUTRAL AND GROUND COPPER BUS

INPUT GROUND LUG (1) TA 2/0 WIRE RANGE: 2/0-#14 STR.

INPUT CIRCUIT BREAKER (CUSTOMER CONNECTS TO TOP)

AIR INLET

59.000

29.000

24.000

Ø 0.313

0.750

0.750

RIGHT SIDE VIEW

AIR FLOW

LEFT SIDE VIEW

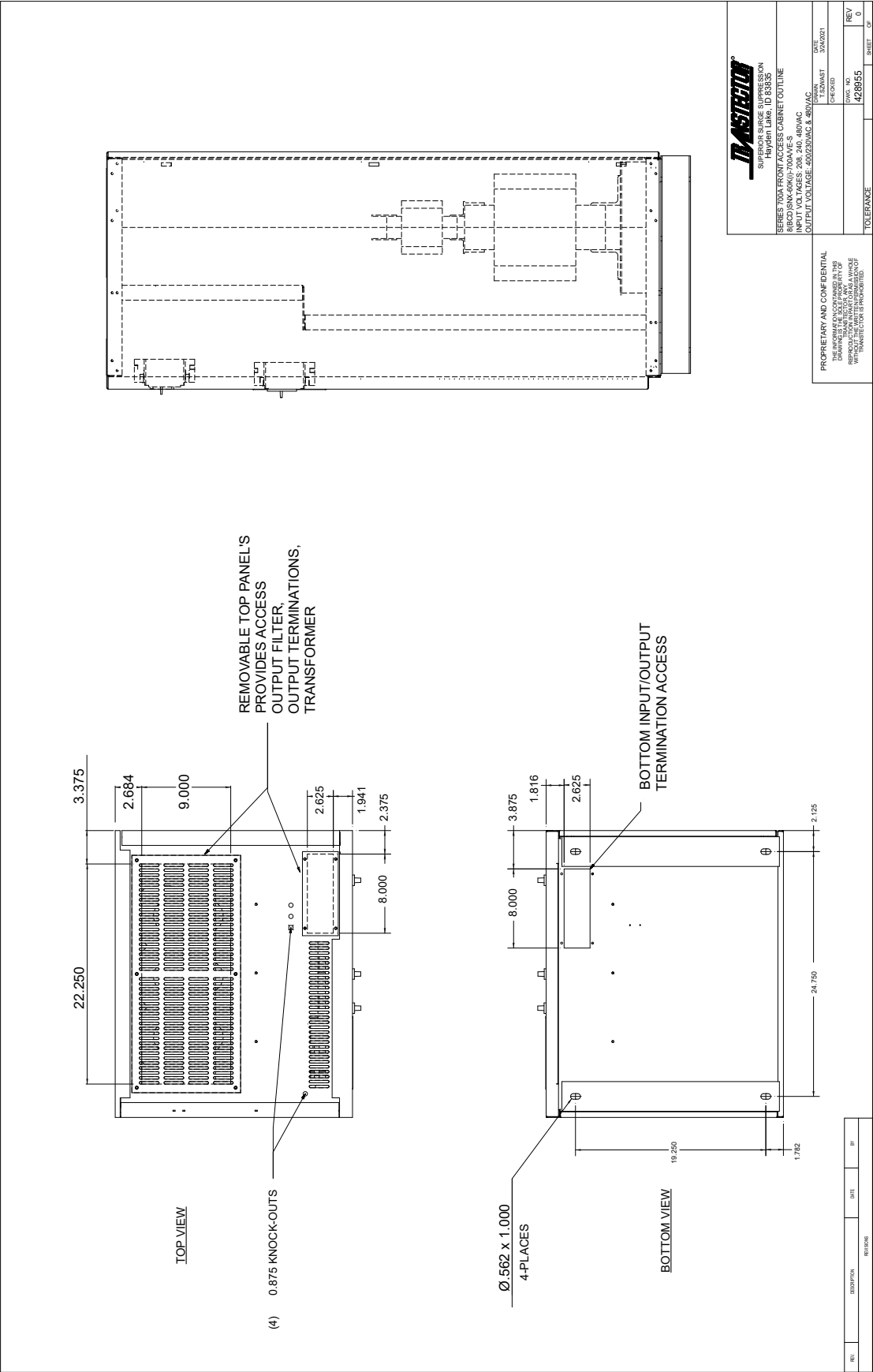
AIR FLOW

REAR VIEW

BOTTOM VIEW

BOTTOM INPUT/OUTPUT TERMINATION ACCESS AREA

CABINET OUTLINE



CABINET OUTLINE

