TRANSTECTOR
an INFINITE brand

Series 700 AV/T Power Conditioner

Designed for the Varian On Board Imager™

Input Voltages: 208VAC, 240VAC, 480VAC or 600 VAC (60 Hz)
Output Voltage:480/277 VAC

- Input Circuit Breaker
- Intelligent Voltage Regulation (±2.0% Output)
- Internal Bypass Switch
- Triple Shielded Isolation Transformer
- Internal TVSS



60 kVA(I) Power Conditioner with Voltage Regulation

Submittal Package and Specifications

TRANSTECTOR SERIES 700 AV/T

Specifications for Varian (OBI) On Board Imaging Imager™ 60 K(I) Power Line Conditioner

1.0 SCOPE

This specification covers the electrical characteristics of the 60 K(I) Power Conditioner which provides clean regulated power for Varian On Board Imager™.

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 ±2.0 % of nominal, correcting for voltage disturbances within one cycle. Digital processing technique provides fast and accurate regulation without output voltage over or undershoot.

2.0.1 MODEL NUMBERS

MODEL INPUT VOLTAGE OUTPUT VOLTAGE

Model	Input Voltage	Output Voltages
8BNX-60K(I)-700AV/T	208 volts nominal input	480/277 volts output
8CNX-60K(I)-700AV/T	240 volts nominal input	480/277 volts output
8DNX-60K(I)-700AV/T	480 volts nominal input	480/277 volts output
8ENX-60K(I)-700AV/T	600 volts nominal input	480/277 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)
- UL 1449, 1012
- FCC Article 15, Section J, Class A
- ISO 9001

2.1.2 LISTINGS / COMPLIANCE

- The system shall be listed to UL/cUL standards UL1012 or ESA approved
- The system shall comply to: FCC Article 15, Section J, Class A
- ANSI C62.14 (electromagnetic compatibility)

3.0 DYNAMIC ELECTRICAL CHARACTERISTICS

3.1 OPERATING VOLTAGE

The input voltage shall be 208 VAC, 240 VAC, 480 VAC or 600 VAC input, three phase 60 Hz. The output shall be a WYE derived 7 tap regulating system at 480/277VAC, rated for 60 KVA intermittent load and 30 KVA continuous load. The standard transformer design shall be capable of accepting three (3) input voltages, 208 VAC, 240 VAC or 480 VAC. Each unit will be pre-wired at the factory to accommodate the alternative nominal input voltage. The input voltage and input breaker can be changed in the field to accommodate an alternative input voltage.

3.2 LINE VOLTAGE REGULATION

Usable Input Line Voltage +15 %, -23 %.

Output Line Voltage ±2.0 % 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 voltage shall be 480/277 VAC derived from a WYE configuration.

3.4 OUTPUT CONNECTIONS

An output terminal strip is provided for the 480/277 VAC three phase power.

3.5 INPUT/OUTPUT WIRING

The Allen Bradley 1492-CE 2 terminals allow wire sizes from # 12 to # 1/0 to be connected to the input and output terminals. The ILSCO TA-2/0 terminal allows wire sizes from # 14 to #2/0 to be connected to the 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 %.

3.10 OPERATING FREQUENCY

60 Hertz ±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 minutes.
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 55 dB measured @1 meter

3.16 EFFICIENCY

98 % Typical at full load. Excitation losses shall be less than 0.75 % of KVA rating

3.17 HEAT OUTPUT

Nominal 1,545 BTU/hour

Maximum 3,090 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 MEAN TIME BEFORE FAILURE

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

3.21 SURGE and SPIKE SUPPRESSION

A Transtector model SPD SP 60 TVSS shall be installed parallel to the secondary output of the power line conditioner to provide all-mode, bi-directional and bi-polar surge protection. The SPD is rated for 120 kA per phase, 60 kA per mode capacity. (L-L, L-N, L-G, N-G) The suppression network system shall conform to UL 1449 ratings when subjected to ANSI/IEEE C62.41-1991 category C3 waveforms. Units shall provide attenuation against EMI/RFI noise up to 50 dB at 1 MHz. The surge suppressor is installed on the load side of the transformer, connected in parallel by a 30 Amp circuit breaker.

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 14 k 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. Fans are located on the front of the unit.

4.6 OPERATING TEMPERATURE

The system operating range: 0 to 40 degrees C, 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 a 240 VAC input and a 60 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 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 of copper stand off bus.

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”.

8.2 VENTILATION

Ventilation originates from the bottom of the cabinet and exhausts at the front of the cabinet.

8.3 MOBILITY

The Power Line Conditioner cabinets are equipped with fixed casters located so as not to exceed 600 lbs/sq inch on any one caster.

8.4 ACCESSIBILITY

The cabinet is constructed with lift off side panels for ease of access. The right side is the access panel for the SCR controller boards.

8.5 WEIGHT

Unit weight: 720 lbs (325.2 kg)

8.6 DIMENSIONS

21.5" W X 29" D X 44" H (54.6 cm x 73.6 cm x 111.8 cm)

9.0 CONTROLS

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

10.0 WARRANTY

Units shall include a comprehensive warranty for the first year, covering all parts and workmanship, inclusive of on site labor and travel expenses in geographic areas covered. Consult factory for details. All units are provided with a standard two year warranty covering parts and workmanship.

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.

12.0 CONTACT

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Transtector Systems

10701 Airport Dr.

Hayden Lake ID 83835

INPUT WIRE SIZE, GROUNDING AND OUTPUT WIRING

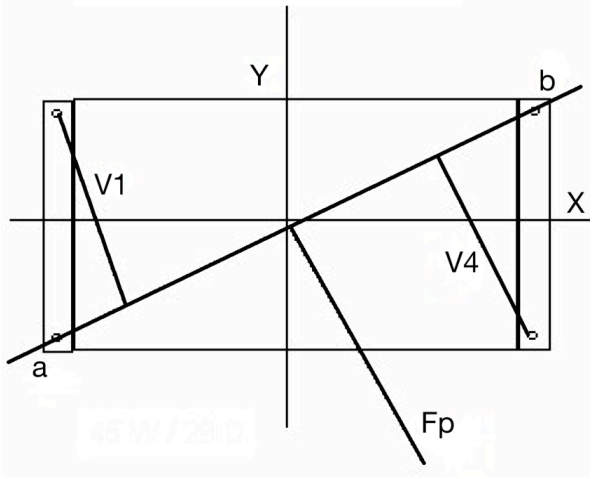
UNIT CONTINUOUS KVA	OUTPUT KVA CONTINOUS	INPUT BREAKER SIZE	MAX OUTPUT CURRENT
60 K(I)	30 kVA	110 A for 208 V 100 for 240 V 60 for 480 V 40 A for 600 V	36 A continuous for 480 V 72 A intermittent for 480 V

WEIGHT, BTU AND DIMENSIONS

UNIT SIZE IN KVA (I)	WEIGHT	OPERATIONAL BTU	MAXIMUM BTU/HOUR	DIMENSIONS
60 k(I)	720 lbs 325.2 kg	1,545	3,090	21.5" W x 29" D x 44" H 54.6 cm x 73.6 cm x 111.8 cm

SEISMIC CALCULATIONS

Coastal California, Zone 4	Z = 0.4
Equipment Anchorage	I = 1.5
Uniform Building Code, Table 160	Cp = 0.75
	Fp = Z x I x (Cp) x Wp = 0.45 x Wp
Cabinet Weight	774 lbs.
Center of Gravity Height	19.00 in.
	Wp(max) = 890.1 lbs.
	Wp(min) = 657.9 lbs.
Vertical Force	Fp = 0.45 x 890 = 400.5 lbs.
Moment	(Fp) = 0.15 x 890 = 133.5 lbs.
	Mo = 19 x 400.5 = 7610.4 in. lbs.

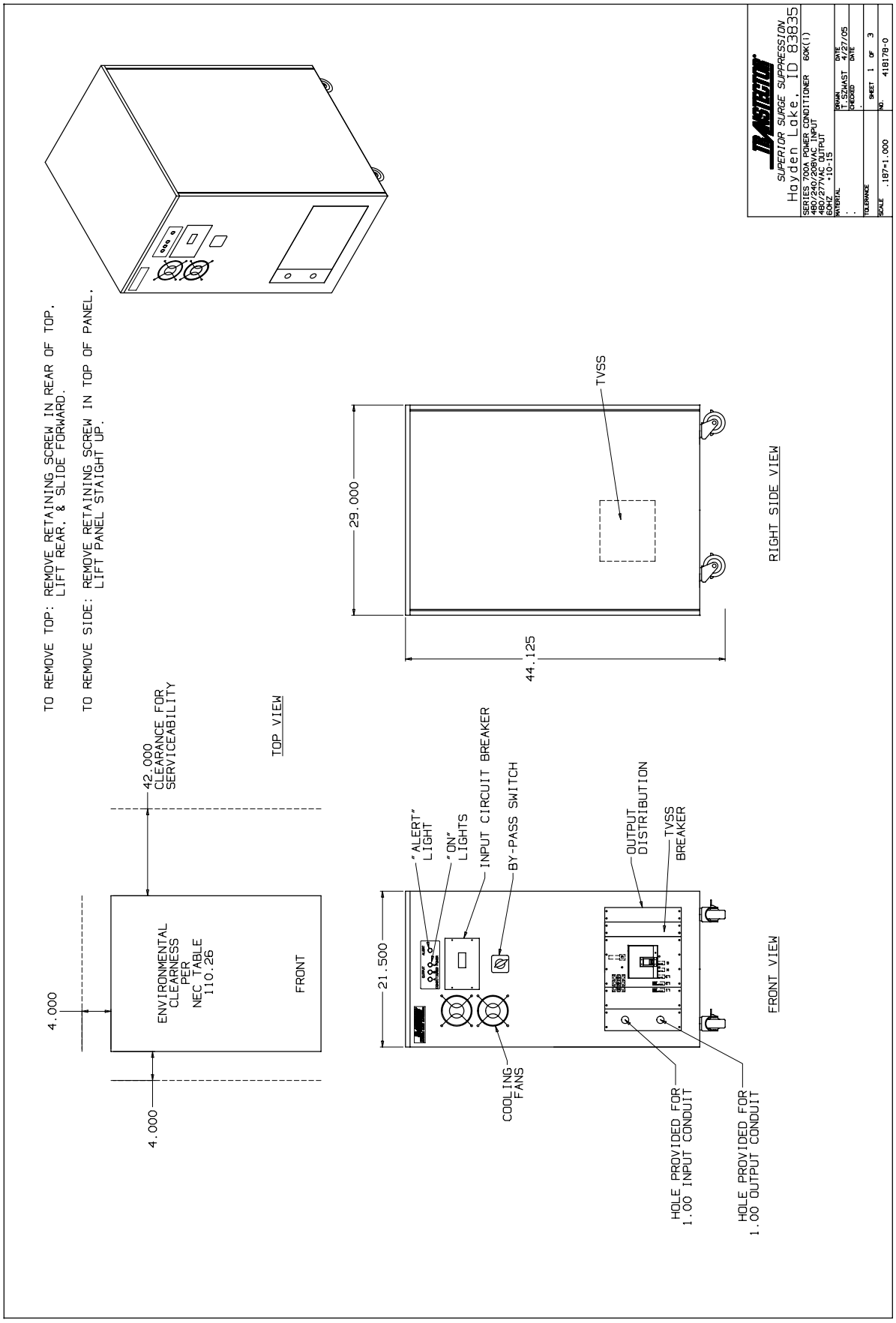


Corners (a,b) 36.0 in.
V1 =V4 = 16.5 in.
Tension = Fp x Cg /V4 = 890.9 lbs
Shear = Wp(max)Fp/4 lbs., each anchor = 222.5 lbs.

EXAMPLE: <Rawl Power Bolt # 6913>
3/8” embedded 2.5” in minimum 2000psi concrete
Tension Rating of bolt: 5200 lbs.
Shear Rating of bolt: 7270 lbs.

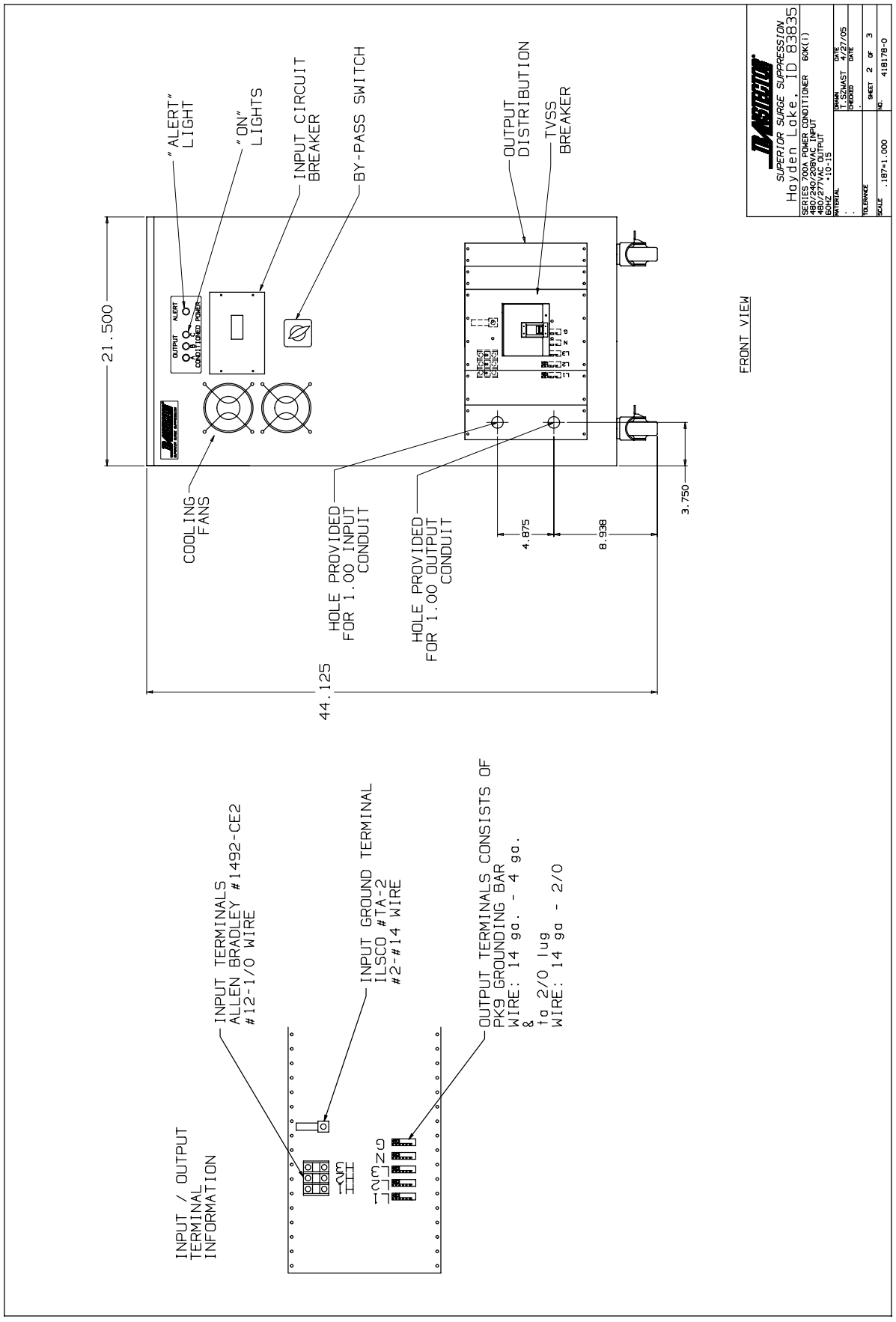
Interaction = (T/Tbolt) + (S/Sbolt)
Interaction = .2
Interaction = < 1 (OK)

COMPONENT LOCATION DIAGRAM I



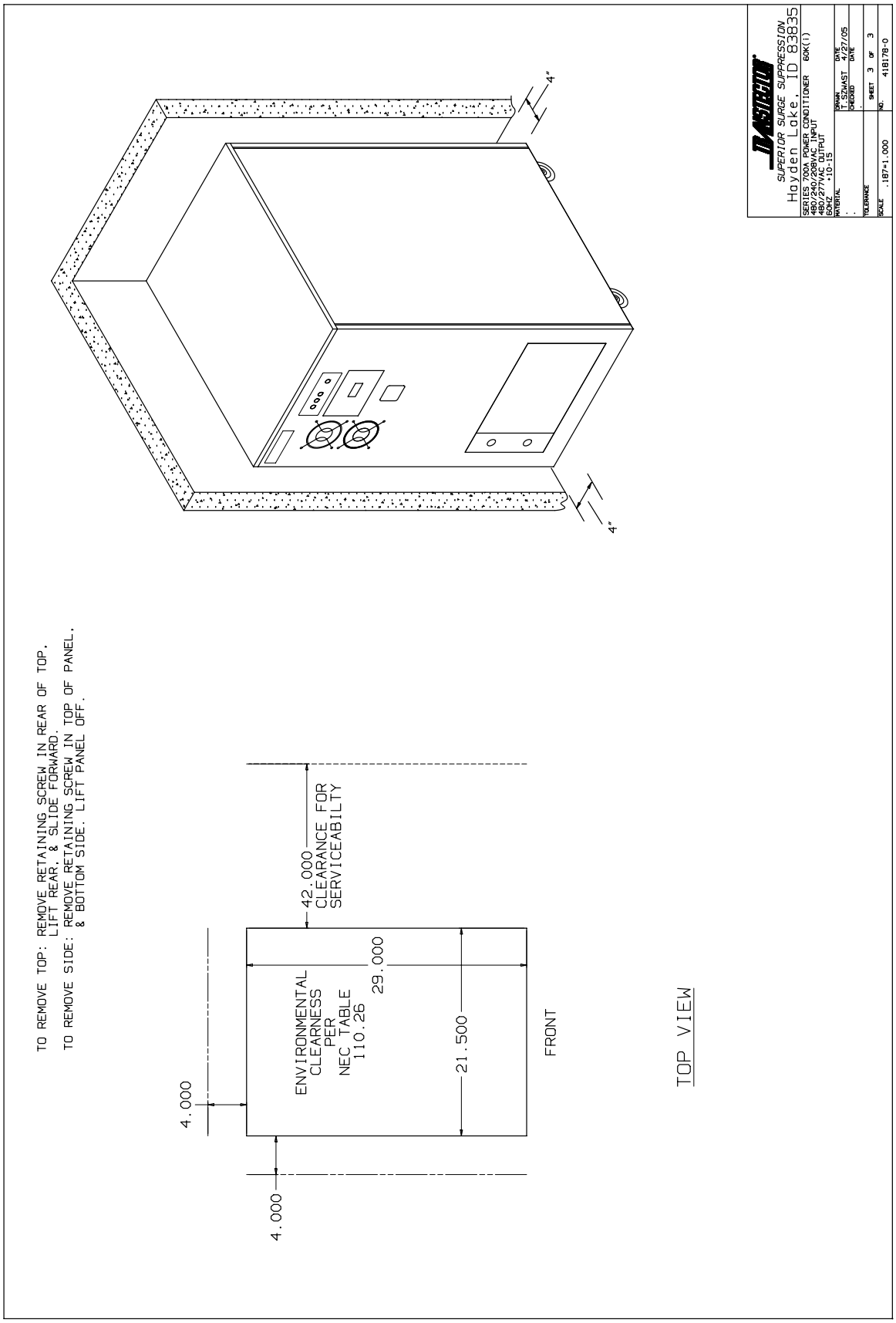
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COMPONENT LOCATION DIAGRAM II



INSTALLATION CLEARANCE DIAGRAM

All connections for customer inputs and outputs are front access for ease of installation.



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