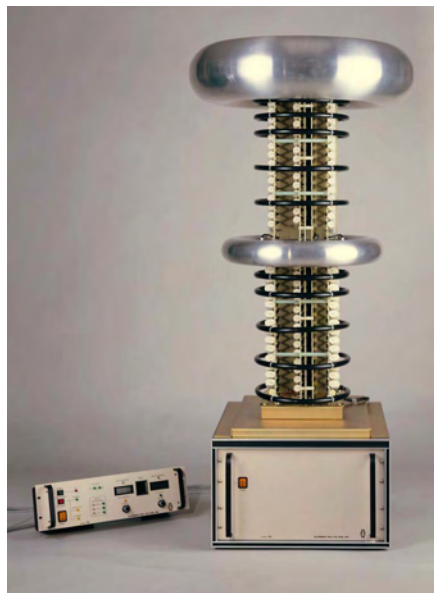


PK Series 4 kW & 8 kW Regulated High Voltage DC Power Supplies 3 kV to 125 kV Rack Mount 150 kV to 400 kV Open Stack

The PK family of power supplies are sophisticated, 4 and 8 kW air insulated high voltage DC power supplies offering low ripple and noise, fast response, and tight regulation.

Complies with the European harmonized low voltage (safety) directive, 73/23/EEC. Compliance with the EMI directive, EN50082-2 is available.



Open Stack Models from 0 to 150 kV through 0 to 400 kV.



Models from 0 to 3 kV through 0 to 125 kV are fully enclosed.

Features:

Pulse-Width Modulation. Off-the-line pulse-width modulation provides high efficiency and a reduced parts count for improved reliability.

Air Insulated. The PK Series features "air" as the primary dielectric medium. No oil or encapsulation is used to impede serviceability, or increase weight.

Constant Voltage/Constant Current Operation. Automatic crossover from constant-voltage to constant-current regulation provides protection against overloads, arcs, and short circuits.

Current Trip. This feature may be substituted for constant-current operation by a jumper on the rear panel interface connector.

Tight Regulation. Voltage regulation is typically better than 0.01% for allowable line and load variations. Current regulation is better than 0.1% from short circuit to rated voltage.

Higher Power Capability. Power supply modules can be paralleled for 8 kW output power utilizing one master control module and one slave module.

Operating Parameters at a Glance.

Output voltage and current are displayed on separate 3 1/2 digit LCD displays with selectable damping. Dual LED bar graphs provide "analog" indication of rapidly changing output level. A full set of indicators are provided to determine the status of the supply at a glance. These include indicators for AC power on, high voltage on, standby, safety interlock, external trip, output polarity, regulating mode (voltage or current) and remote control status of mA program, kV program, and HV enable.

Warranty. Standard power supplies are warranted for three years; OEM and modified power supplies are warranted for one year. A formal warranty statement is available.



Designing Solutions for High Voltage Power Supply Applications

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Specifications

(Specifications apply from 5% to 100% of rated voltage. Operation is guaranteed down to zero with a slight degradation of performance.)

Input: 4/8 kW, 3-phase: 187-228 V RMS, 48-63 Hz, fused for 20 A (per 4 kilowatt module), derate for line unbalance > 2%. 5-position terminal block, with cover, provided. 8 kW supplies have one additional terminal block for the slave.

Output: Continuous, stable adjustment from 0 to rated voltage/current by means of panel mounted 10-turn potentiometers with 0.05% resolution, or by external 0-10 V signals. Repeatability better than 0.1% of full scale. Voltage accuracy is 0.5% of setting, 0.2% of rated.

Voltage Regulation: Load, better than 0.01% for no load to full load variations; Line, better than $\pm 0.01\%$ over specified input range.

Current Regulation: Load, better than 0.1% +100 μ A, from short circuit to rated voltage at any rated load condition; Line, better than $\pm 0.01\%$ over specified input range.

Ripple: Better than 0.1% RMS of rated voltage at full load up to 125 kV. Better than 0.05% RMS for 150 kV and higher.

Stability: 0.01% per hour after 1/2 hour warm-up; 0.05% per 8 hours.

Temperature Coefficient: 0.01%/°C.

Ambient Temperature: -20 to +50°C, operating; -40 to +85°C, storage.

Protection: Automatic current regulation protection reduces output voltage as required for all arc, overload and short circuit conditions. Fuses, surge-limiting resistors, and low energy components provide the ultimate protection.

Accessories: Detachable, 8 foot, shielded high voltage coaxial cable provided with fully enclosed models (see models chart for cable type). Enclosed 8 kW models are provided with an additional HV cable for the slave module. A 25 pin D-subminiature connector for customer interface is provided. Harness and/or inter-connection cables supplied for 8 kW models as required.

Polarity: Available with either Positive, Negative, or Reversible polarity with respect to chassis ground.

Current Limit: In current limit mode the power supply will regulate the load current at the programmed current level with automatic crossover between voltage and current regulating modes.

Current Trip: A jumper installed on the 25 pin interface connector located on the rear of the control panel assembly allows the selection of current trip operation. When in current trip mode, the HV output will disable and latch off when the load current reaches the programmed current level. Reset is accomplished by either cycling the AC power, toggling the HV enable signal, or by pushing the HV off/reset and then the HV on switches.

Analog Monitors: Current and voltage, 0 - 10 V equivalent to 0 - rated output. 10 k ohm (1%), output impedance. Voltage accuracy: 0.5% reading +0.2% of rated voltage. Current accuracy: 1% reading +0.05% of rated current. Reversible polarity models: 1% of reading + 0.1% of rated.

Digital Monitor Signals: Four functions as follows - Milliampere Control, Kilovolt Control, High Voltage Enable, No Fault. High active, TTL or 5 V CMOS compatible. Typical signal compatibility; source = 1.0 mA at 2.5 V, sink = 2.5 mA at 0.4 V.

Digital HV On/Off Control:

HV Enable: Remote signal to activate high voltage (front panel switch selectable). High, on; low, off.

External: Remote signal to disable high voltage (overrides local or remote enable); High, disable. External has two user programmable modes; level-controlled interrupt or momentary-triggered shutdown.

Both inputs are TTL or 5 V CMOS compatible. Input is active upon application of 2.2 - 15 V signal. Approx input impedance: 100 k ohms @ 0 - 5 V; 10 k ohms @ 15 V.

4 kW Models, Fully Enclosed

Positive Polarity	Negative Polarity	Reversible Polarity	Output Voltage	Output Current	Output Cable	Panel Height
Reversible Only		PK3R1300	0-3 kV	0-1300 mA	RG-59U	10.5 in.
		PK6R650	0-6 kV	0-650 mA	RG-58U	10.5 in.
PK8P450	PK8N450	PK8R450	0-8 kV	0-450 mA	DS2124	10.5 in.
PK10P400	PK10N400	PK10R400	0-10 kV	0-400 mA	DS2124	10.5 in.
PK12P330	PK12N330	PK12R330	0-12 kV	0-330 mA	DS2124	10.5 in.
PK15P260	PK15N260	PK15R260	0-15 kV	0-260 mA	DS2124	10.5 in.
PK20P200	PK20N200	PK20R200	0-20 kV	0-200 mA	DS2124	10.5 in.
PK30P130	PK30N130	PK30R130	0-30 kV	0-130 mA	DS2124	10.5 in.
PK40P100	PK40N100	PK40R100	0-40 kV	0-100 mA	DS2124	10.5 in.
PK50P80	PK50N80	PK50R80	0-50 kV	0-80 mA	DS2124	10.5 in.
PK60P65	PK60N65	PK60R65	0-60 kV	0-65 mA	DS2124	10.5 in.
PK75P50	PK75N50	PK75R50	0-75 kV	0-50 mA	DS2124	10.5 in.
PK80P50	PK80N50	PK80R50	0-80 kV	0-50 mA	DS2121	15.75 in.
PK100P40	PK100N40	PK100R40	0-100 kV	0-40 mA	DS2121	15.75 in.
PK125P30	PK125N30	PK125R30	0-125 kV	0-30 mA	DS2121	15.75 in.

Maximum weight is 62 lbs. to 75 kV, 85 lbs. to 125 kV.

4 kW Models, Open Stack

Positive Polarity	Negative Polarity	Reversible Polarity	Output Voltage	Output Current	Panel Height	Stack Height
PK150P25	PK150N25	PK150R25	0-150 kV	0-25 mA	5.25 in.	35.1 in.
PK200P18	PK200N18	PK200R18	0-200 kV	0-18 mA	5.25 in.	40.1 in.
PK250P14	PK250N14	PK250R14	0-250 kV	0-14 mA	5.25 in.	45.9 in.
PK300P10	PK300N10	PK300R10	0-300 kV	0-10 mA	5.25 in.	60.2 in.
PK350P8	PK350N8	PK350R8	0-350 kV	0-8 mA	5.25 in.	68.6 in.
PK400P6	PK400N6	PK400R6	0-400 kV	0-6 mA	5.25 in.	68.6 in.

Maximum weight is 125 lbs.

External Interlock: Contact closure to common = enable; contact open = disable. Latching with reset via the HV off/reset switch or HV enable signal.

Opto-Output: An opto-isolated NPN transistor output is provided that can be controlled by any one of the Digital Monitor signals. This is not intended to be used for high potential isolation.

Front Panel Elements:
(See outline drawing)

AC Power: On/Off rocker switch and pilot lamp.

HV Enable: Momentary push-button and indicator.

HV Off/Reset: Momentary push-button and associated pilot lamps: Standby, Interlock, External.

Output Meters: Kilovolts, Milliamperes, 3 1/2 digit LCD displays, accuracy 1% of full scale.

Output Controls: Kilovolts, Milliamperes, 10-turn with locking vernier dials.

Polarity: Indicators for positive or negative output with respect to ground.

Trend Indicators: 10 segment bar graphs to provide indication of rapidly moving output parameters

Mode Indicators: LED's for indication of regulating mode (voltage and current).

Remote Programming: Selector switches with indicators for remote/local selection of voltage, current, and HV enable.

Slave Front Panel Elements:
(When applicable)

Indicators: Bias, Tracking, & Overvoltage.

Service Testpoints:
TP-I - Slave Current
TP-V - Slave Voltage
TP-C - Common

Rear Panel Elements:
(See outline drawing)

DS1: Power On indicator

E1: Chassis ground

F1, 2, 3: Input line fuses

J1: Customer interface connector

JHV1: HV Output connector

TB1: AC Input connector

TB2: Ground, Common, Interlock connector

Options

Symbol Description

ZA Zero start interlock. Voltage control, local or remote, must be at zero before HV will enable.

SS Slow start ramp. Specify standard times of 5, 10, 15, 20, or 30 seconds \pm 20%.

D Differential control interface for remote analog I/O signals. Provides a \pm 3 V DC common mode rejection.

LA Low active HV Enable and External inputs, low active digital monitor outputs.

LR Low output ripple version.

CE CE Marked. Complies with the European harmonized EMI directive, EN50082-2, and with the low voltage (safety) directive, 73/23/EEC.

Please consult factory for special requirements.

8 kW Models, Fully Enclosed

Positive Polarity	Negative Polarity	Reversible Polarity	Output Voltage	Output Current	Output Cable	Panel Height
Reversible Only		PK3R2600	0-3 kV	0-2600 mA	RG-59U	21 in.
		PK6R1300	0-6 kV	0-1300 mA	RG-58U	21 in.
PK8P900	PK8N900	PK8R900	0-8 kV	0-900 mA	DS2124	21 in.
PK10P800	PK10N800	PK10R800	0-10 kV	0-800 mA	DS2124	21 in.
PK12P660	PK12N660	PK12R660	0-12 kV	0-660 mA	DS2124	21 in.
PK15P520	PK15N520	PK15R520	0-15 kV	0-520 mA	DS2124	21 in.
PK20P400	PK20N400	PK20R400	0-20 kV	0-400 mA	DS2124	21 in.
PK30P260	PK30N260	PK30R260	0-30 kV	0-260 mA	DS2124	21 in.
PK40P200	PK40N200	PK40R200	0-40 kV	0-200 mA	DS2124	21 in.
PK50P160	PK50N160	PK50R160	0-50 kV	0-160 mA	DS2124	21 in.
PK60P130	PK60N130	PK60R130	0-60 kV	0-130 mA	DS2124	21 in.
PK75P100	PK75N100	PK75R100	0-75 kV	0-100 mA	DS2124	21 in.
PK80P100	PK80N100	PK80R100	0-80 kV	0-100 mA	DS2121	31.5 in.
PK100P80	PK100N80	PK100R80	0-100 kV	0-80 mA	DS2121	31.5 in.
PK125P60	PK125N60	PK125R60	0-125 kV	0-60 mA	DS2121	31.5 in.

Maximum weight is 125 lbs. to 75 kV, 170 lbs. to 125 kV.

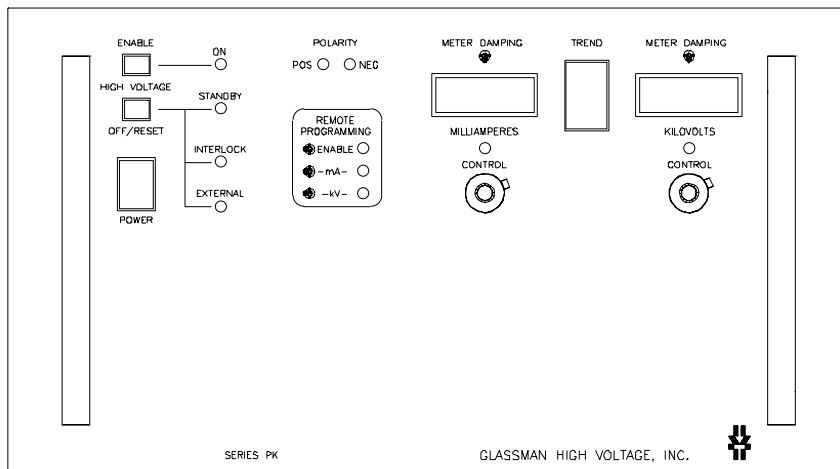
8 kW Models, Open Stack

Positive Polarity	Negative Polarity	Reversible Polarity	Output Voltage	Output Current	Panel Height	Stack Height
PK150P50	PK150N50	PK150R50	0-150 kV	0-50 mA	5.25 in.	35.1 in.
PK200P36	PK200N36	PK200R36	0-200 kV	0-36 mA	5.25 in.	40.1 in.
PK250P28	PK250N28	PK250R28	0-250 kV	0-28 mA	5.25 in.	45.9 in.
PK300P20	PK300N20	PK300R20	0-300 kV	0-20 mA	5.25 in.	60.2 in.
PK350P16	PK350N16	PK350R16	0-350 kV	0-16 mA	5.25 in.	68.6 in.
PK400P12	PK400N12	PK400R12	0-400 kV	0-12 mA	5.25 in.	68.6 in.

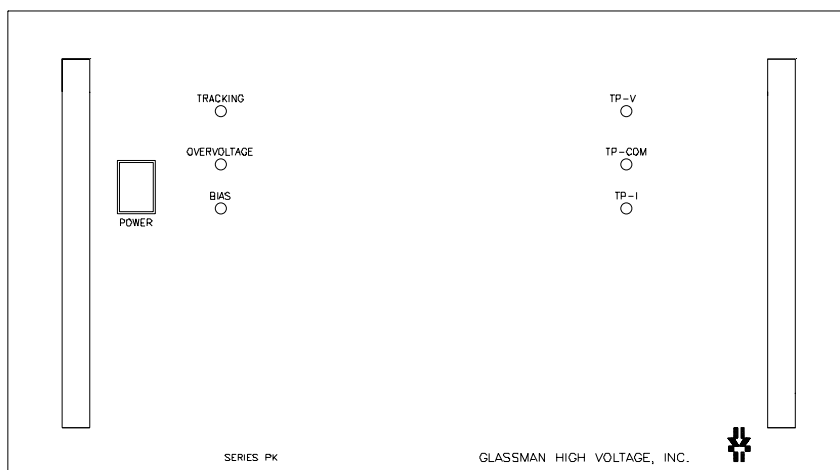
Maximum weight is 200 lbs.

Please contact the factory for information regarding 12 kW models (Master with 2 Slaves) and 16 kW models (Master with 3 Slaves).

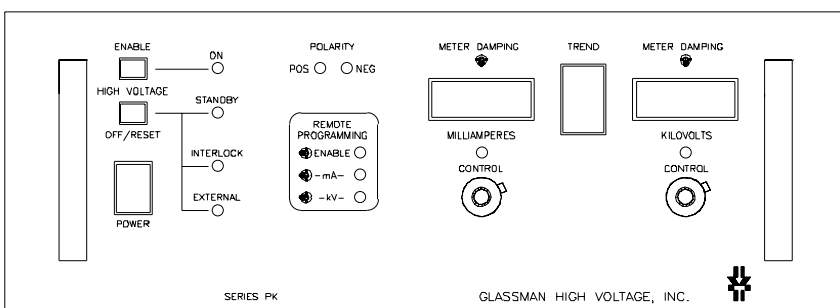
Front Panel Controls & Indicators



**4 kW SUPPLY OR
8 kW MASTER
(POWER SWITCH ONLY
ON 150-400 kV)**



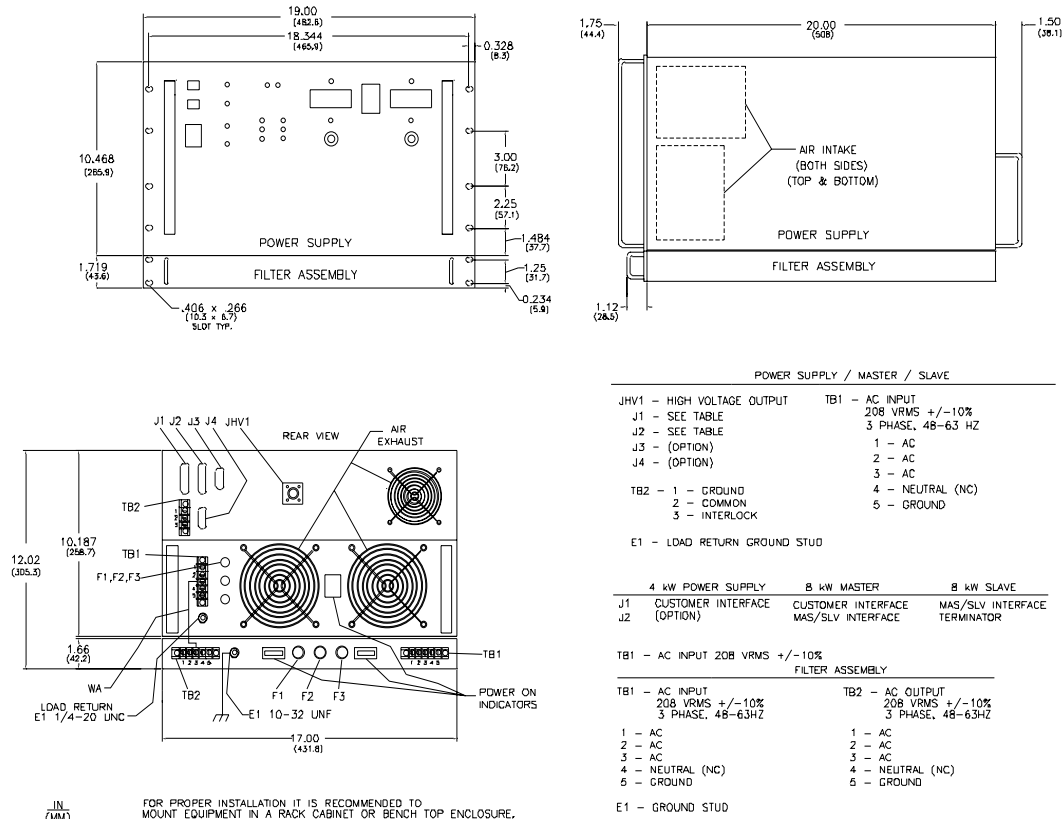
8 kW SLAVE



**REMOTE CONTROL PANEL
4 kW OR 8 kW UNITS
150-400 kV**

Outline Drawing 3-75 kV

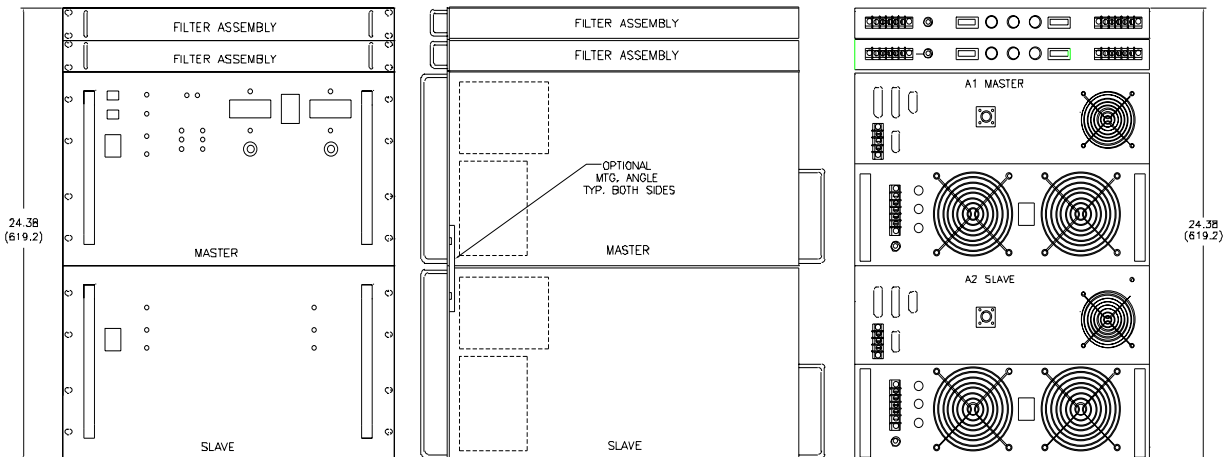
4 kW POWER SUPPLY



INL (MM) FOR PROPER INSTALLATION IT IS RECOMMENDED TO MOUNT EQUIPMENT IN A RACK CABINET OR BENCH TOP ENCLOSURE.

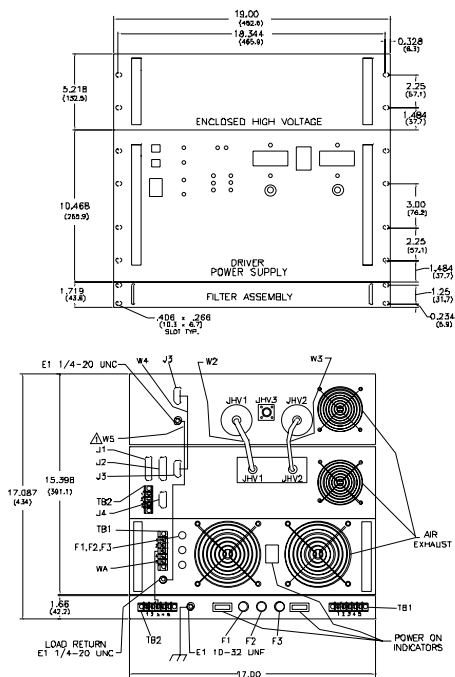
FILTER ASSEMBLY PROVIDED FOR 3 PHASE CE COMPLIANT UNITS ONLY.

8 kW SYSTEM

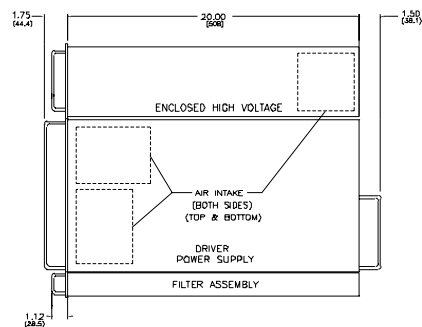


Outline Drawing 80 - 125 kV

4 kW POWER SUPPLY



FOR PROPER INSTALLATION IT IS RECOMMENDED TO
MOUNT EQUIPMENT IN A RACK CABINET OR BENCH TOP ENCLOSURE.



DRIVER POWER SUPPLY/ MASTER/ SLAVE

JW1 - HVAC #1	1B1 - AC INPUT
JW2 - HVAC #2	20B VRMS +/- -10%
J1 - SEE TABLE	3 PHASE, 48-65 HZ
J2 - SEE TABLE	1 - AC
J3 - EXTERNAL HV INTERFACE	2 - AC
J4 - AC INTERFACE REMOTE PANEL	3 - AC
	4 - NEUTRAL (NC)
1B2 - 1 - GROUND	5 - GROUND
2 - COMMON	
3 - INTERLOCK	E1 - LOAD RETURN
	GROUND STUD

4 KW POWER SUPPLY		8 KW MASTER	8 KW SLAVE
J1	CUSTOMER INTERFACE	CUSTOMER INTERFACE	MAS/SLV INTERFACE
J2	(OPTION)	MAS/SLV INTERFACE	TERMINATOR

FILTER ASSEMBLY

TB1 - AC INPUT
208 VRMS +/-10%
3 PHASE, 48-63 HZ
1 - AC
2 - AC
3 - AC
4 - NEUTRAL (NC)
6 - GROUND

ENCLOSED HIGH VOLTAGE

J3 - HIGH VOLTAGE INTERFACE
JHV1 - HV AC #1
JHV2 - HV AC #2
JHV3 - HIGH VOLTAGE OUTPUT
E1 - GROUND STUD

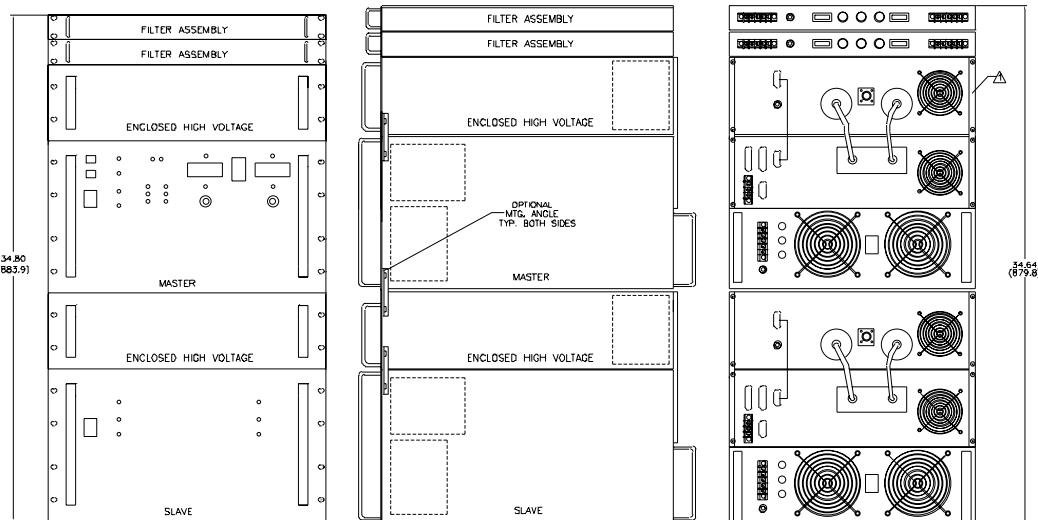
FILTER ASS
PROVIDED FO
PHASE CE C
UNITS ONLY.

NOTES:

△ - WS IS REPLACED BY
GROUND STRAPS ON
MASTER AND SLAVE SUPPLIES

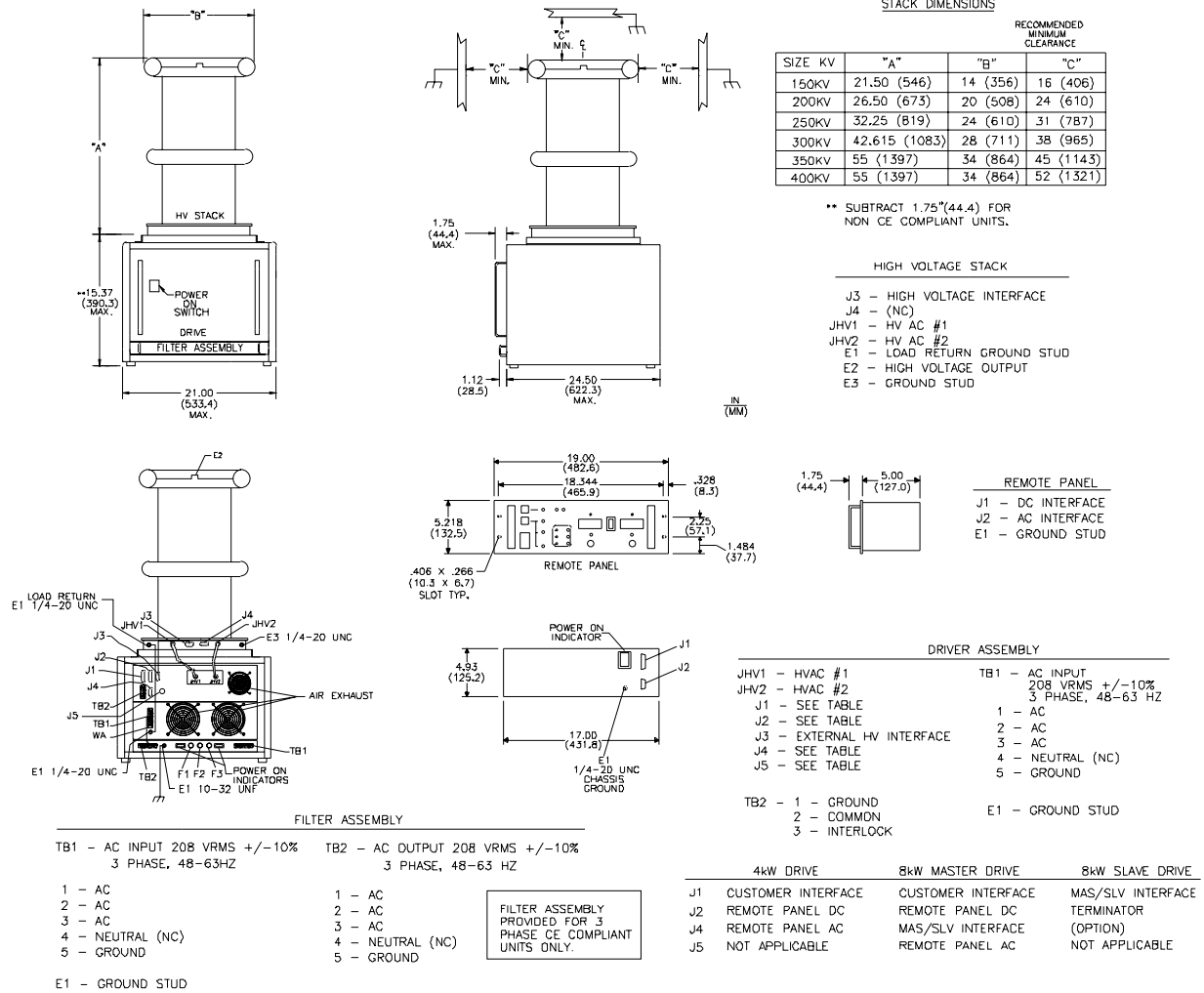
E1 - GROUND STUD

8 kW SYSTEM

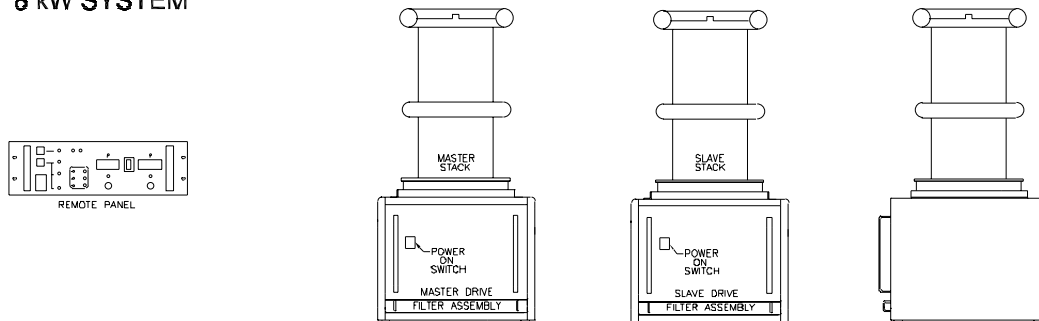


Outline Drawing 150 - 400 kV

4 kW POWER SUPPLY



8 kW SYSTEM



Designing Solutions for High Voltage Power Supply Applications

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