

Operating Manual and User Guide

FM1KWES

Broadcast Power Amplifier



Specifications	2kW	3Kw	4kW	5kW
Frequency Range	87.7 - 108 MHz	87.7 - 108 MHz	87.7 - 108 MHz	87.7 - 108 MHz
Audio Input Impedance	600 Ohms	600 Ohms	600 Ohms	600 Ohms
Audio Input Level (composite)	-10 dBm	-10 dBm	-10 dBm	-10 dBm
Audio Input Level Right & Left Stereo Er	-10 dBm	-10 dBm	-10 dBm	-10 dBm
Frequency Response (composite)	20Hz - 15(90) KHz	20Hz - 15(90) KHz	20Hz - 15(90) KHz	20Hz - 15(90) KHz
Pre-emphasis	50 or 75 uS	50 or 75 uS	50 or 75 uS	50 or 75 uS
Harmonic Distortion	<0.15 % max.	<0.15 % max.	<0.15 % max.	<0.15 % max.
Signal to Noise Ratio	>80 dB RMS	>80 dB RMS	>80 dB RMS	>80 dB RMS
RF Output Impedance	50 Ohms	50 Ohms	50 Ohms	50 Ohms
Output Connector	7-16 DIN	7-16 DIN	1 5/8" EIA Flange	1 5/8" EIA Flange
RF Power Output	2000W	3000W	4000W	5000W
Harmonic Attenuation	>-70 dB	>-70 dB	>-70 dB	>-70 dB
Power Requirements	200 to 240 VAC Single phase	200 to 240 VAC Single phase	200 to 240 VAC Single phase	200 to 240 VAC Single phase
Size	19" X 24" (deep) X 22" high (12U)	19" X 24" (deep) X 27.25" high (25U)	19" X 24" (deep) X 49" high (28U)	19" X 24" (deep) X 54.25" high (31U)
Packed Size Weight	48 X 40" Pallet 125lbs	48 X 40" Pallet 175lbs	48 X 40" Pallet 225lbs	48 X 40" Pallet 275lbs

Safety

BEFORE APPLYING POWER

Verify that the line voltage is 220V.

GROUND THE POWER AMPLIFIER.

To minimize shock hazard, the power amplifier chassis must be connected to an electrical ground. The power amplifier must be connected to the AC power mains through a three-conductor power cable, with the third wire firmly connected to an electrical ground (safety ground) at the power outlet. Any interruption of the protective (grounding) conductor or disconnection of the protective earth terminal will cause a potential shock hazard that could result in personal injury. If the power amplifier is to be energized by any other source, be certain that the chassis is connected to a separate safety ground.

Fuses

Only fuses with the same required current, voltage rating, and specified type (normal blow, time delay, etc.) should be used. Do not use repaired fuses or short-circuited fuse holders. To do so could cause a shock or fire hazard.

DO NOT OPERATE IN AN EXPLOSIVE ATMOSPHERE

Do not operate the power amplifier in the presence of flammable gases or fumes.

DO NOT REMOVE THE POWER AMPLIFIER COVER

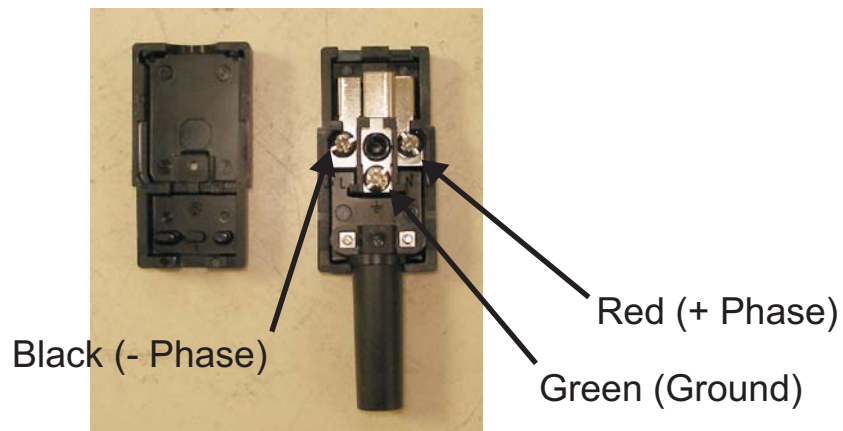
Operating personnel must not remove the power amplifier cover. Component replacement and internal adjustments must be made only by qualified service personnel.

OUTPUT CONNECTOR

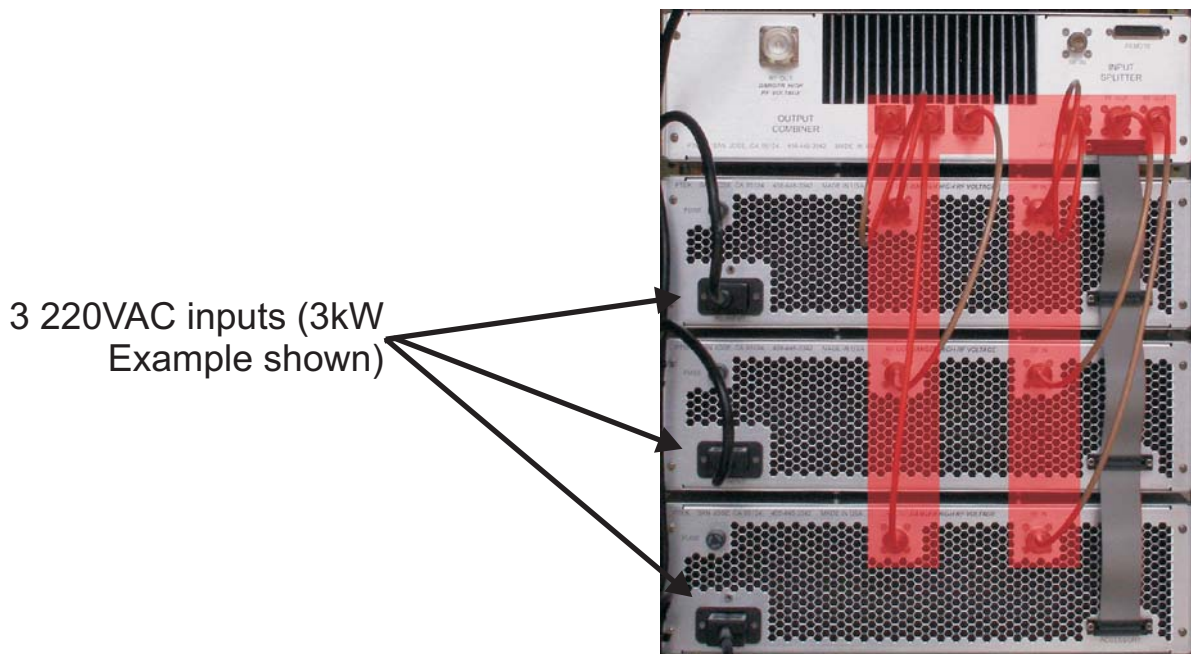
The type N output connector carries dangerously high RF voltages which present a shock and burn hazard. NEVER operate this amplifier without the output connector properly terminated in either an adequately rated load or antenna.

AC Wiring

Each 1kW has an individual AC Input. This is a IEC cord connector C19, it should be wired to a single phase 220VAC source as shown with 3 conductor cord capable of carrying 20A

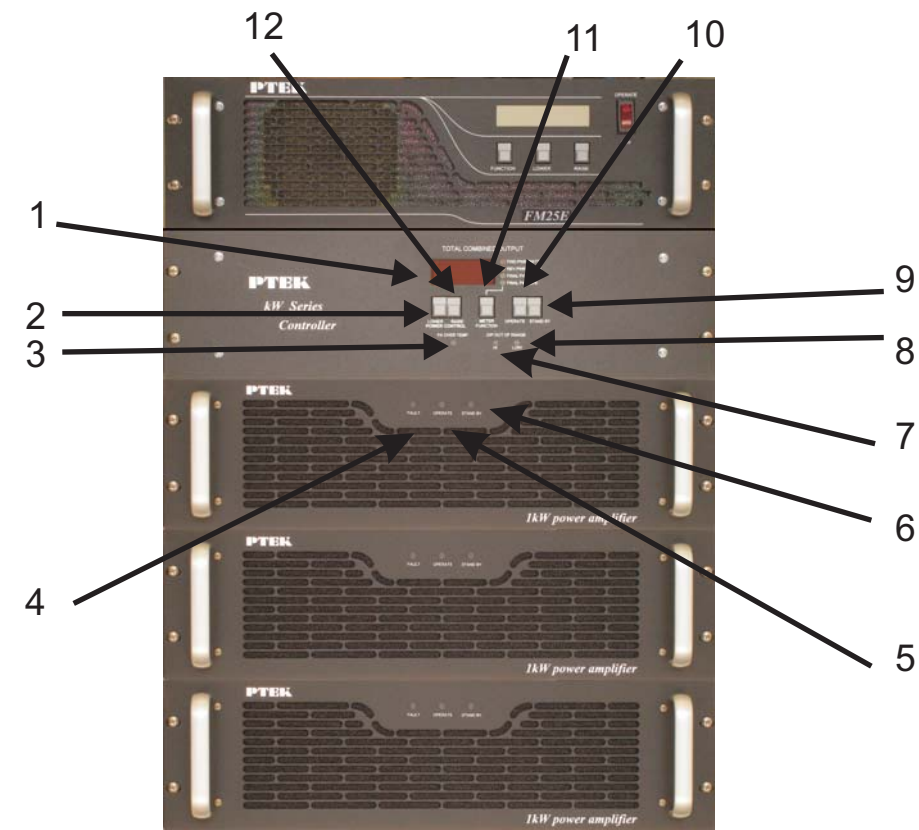


SCHURTER IEC cord connector C19, re-wirable, straight



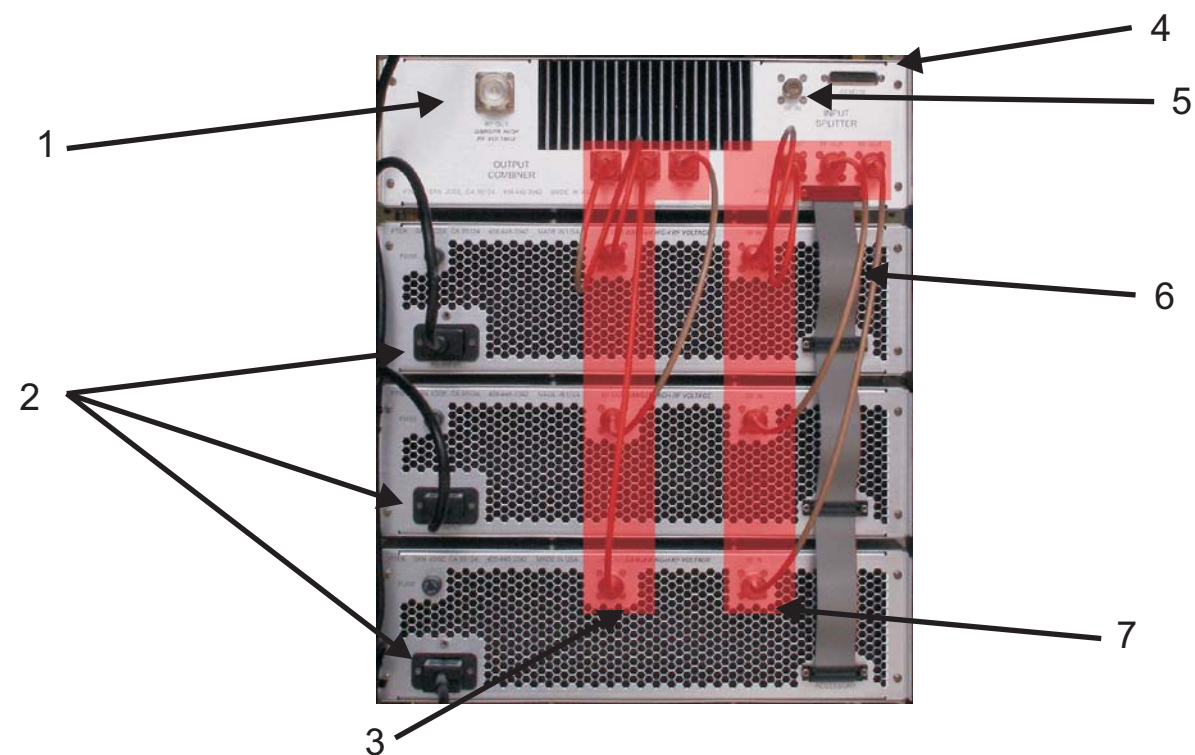
3 220VAC inputs (3kW Example shown)

Front panel layout



Key	Element	Description
1	METER	Indicates Forward Power, Reverse Power, Final Combined Current and Final Voltage
2	Lower	This switch lowers the ouput power
3	PA Over Temp	Illuminates when any of the PA modules has a theremal trip, resets when the temperature is reduced.
4	Fault	Illuminates under any fault condition over temp, high VSWR, overdrive. Resets when fault is removed.
5	Operate	Illuminates when the amplifier is in operate mode
6	Stand by	Illuminates when the amplifier is in stand by mode
7	Out of range Hi	Illuminates when the amplifier output power is higher than the AGC setting
8	Out of range Lo	Illuminates when the amplifier output power is lower than the AGC setting
9	Stand by	Sets the power amplifier in stanby mode, Supply voltage ir removed from the drive cirucits and fans no output power is generated
10	Operate	Sets the power amplifier in opeterate mode
11	Meter Selecton Switch	selects one of the following to be presented on the meter Forward Power, Reverse Power, Final Combined Current and Final Voltage
12	Raise	This switch raises the ouput power

Rear panel layout



Key	Element	Description
1	RF Output	RF Output 7-16 DIN
2	AC Input (220V)	AC input to each individual Amp (220VAC current 20A)
3	RF Outputs	From individual Amplifiers to Output combiner
4	Remote Control Metering	See accessory table for individual pin number and function
5	RF Input	Type N input see individual model Specs for drive level
6	25W Dsub Ribbon Cable	Control cable
7	RF Inputs	From Input splitter to individual Amplifiers

Installation Hardware

(For optional rack sides)

Refer to the figure left and tables below for the following description. The installer will need a normal set of shop tools to perform the installation procedure.

STEP	PROCEDURE
1	Install the right and left Stationary Section into the installation rack with the screws and hardware provided. The amplifier cabinet is 24 inches, it may be necessary to also use an extension to the Stationary Section depending on installation rack dime
2	Install the right and left Chassis Section to the FM Broadcast Amplifier cabinet in the 8-32 holes using the screws provided. IMPORTANT: The amplifier weighs 36 kg (80 lbs) and will require two individuals to pick up and install the amplifier in the inst
3	Install the amplifier cabinet into the Stationary Slides.
4	Install four user provided #10 screws through the front panel holes into the installation rack.

Installation Electrical

Refer to the Table below for the following description. The installer should assure the AC line voltage is turned OFF before performing this procedure. The electrical connections are installed at the FM Broadcast Amplifier read panel.

STEP	PROCEDURE
1	Connect the exciter RF output line to the RF IN connector
2	Connect the load RF line to the RF OUT connector.
3	Connect the AC line power to the AC IN connector.
4	Optional: Connect the remote site metering to the rear 25W D-SUB.

Turn-On Checkout

Refer to the table below for the following procedure. The RF source or exciter should be set to 10W and either mute the output or turn off the exciter.

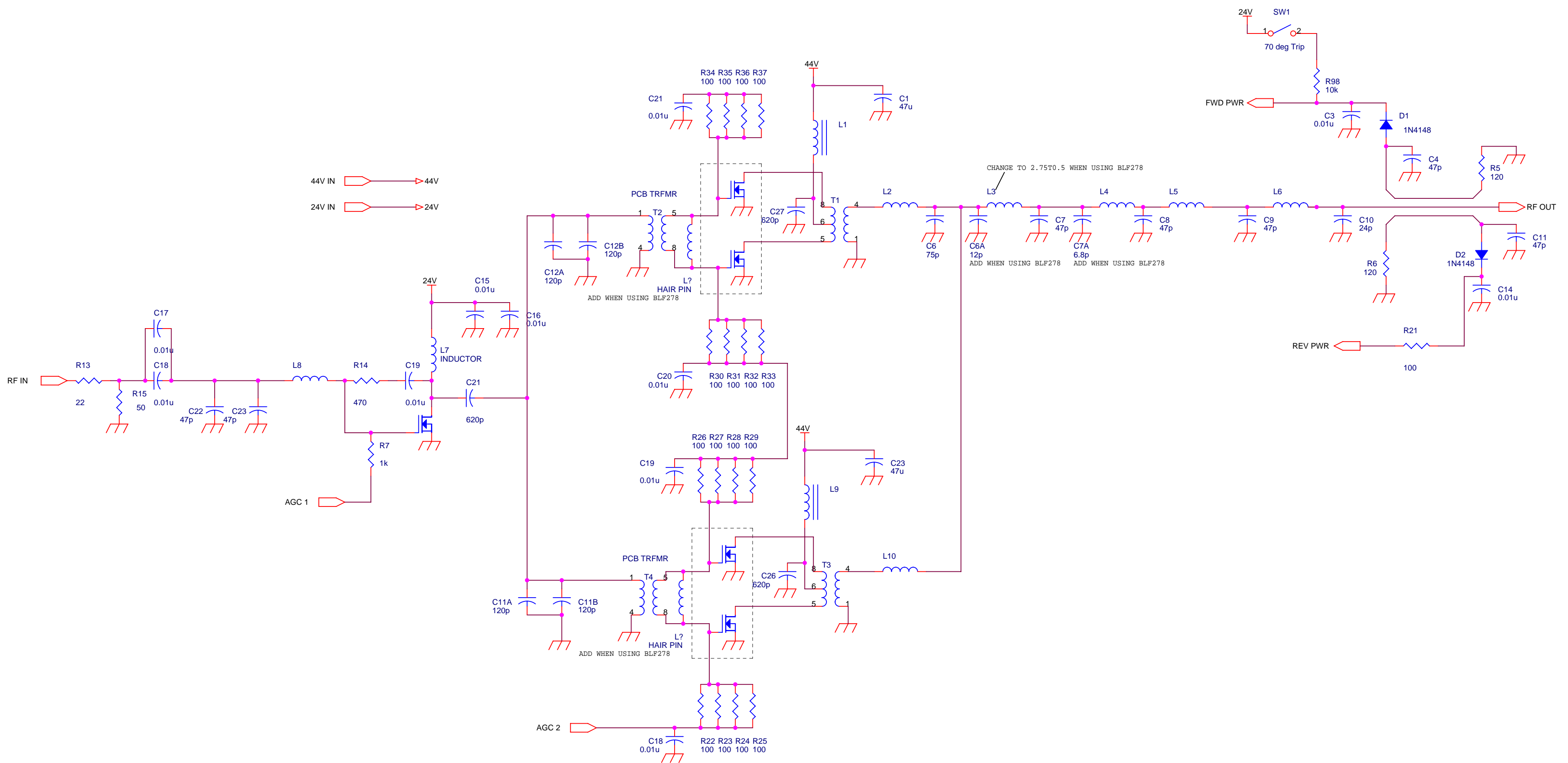
Step	Action	Verification
1	Switch the RF out to a dummy load.	
2	Turn on the ac line power to the FM Broadcast Amplifier.	O/P OUT OF RANGE LO indicator is on. O/P OUT OF RANGE HI is out. REMOTE OFF indicator is out.
3	Enable the exciter	DRIVE LOW indicator goes out
4	Select Meter to read FORWARD POWER	
5	Adjust the RAISE LOWER switch to a reading of 500W.	
6	Select Meter to read FINAL VOLTAGE.	The Meter reads 40~50V. Note the exact value.
7	Select Meter to read FINAL CURRENT.	The The Meter reads 10~20A. Note the exact value.
8	Calculate the dc power input to the PA from the values of step 4 and 5.	$P=VI$ and note the exact value.
9	Select the Meter to read REVERSE POWER.	Check that there is no appreciable reading of reverse power
10	Calculate the PA efficiency.	Step 6 value divided by the value in step 7 or about 60 percent.
11	Adjust the RAISE LOWER switch to set the output to the required output power in the range 250~500W.	

Accessory Connector

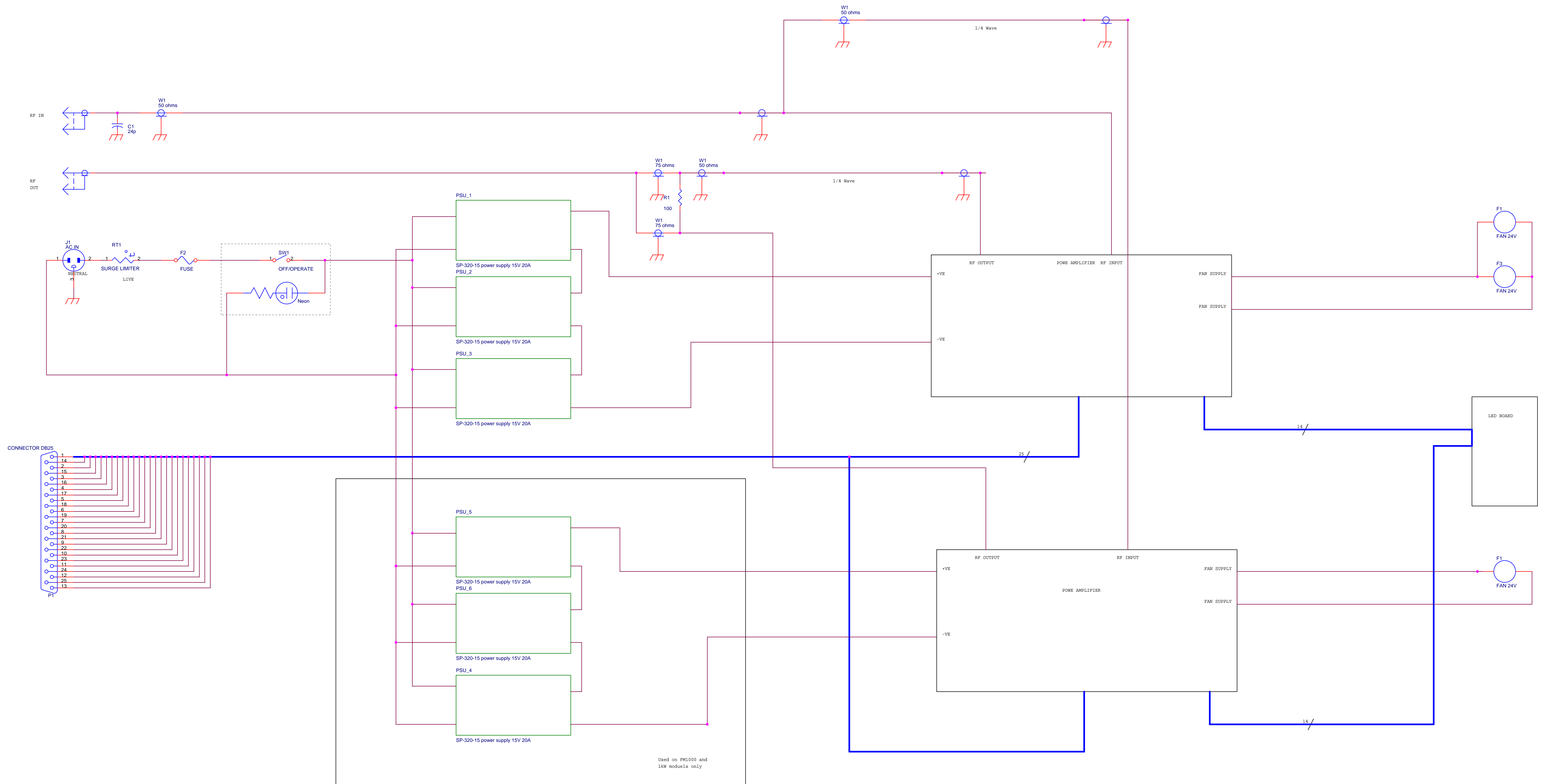
Pin Number(s)	Accessory Function
1	Forward Power DC Indication 2.4V=600W
2	Final Voltage DC Indication V=V/10
3	Output Power out of range Hi (10V)
8	Raise; Ground to raise the output power
10	Serial; Used when 2 or more amplifiers are combined
13	Remote On, Ground to turn the unit on (momentary)
14	Reverse Power DC Indication 2.4V=600W
5,18,6,19	48V Output (Fan supply for combiners)
15	Output Power out of range Lo (10V)
20	Lower; Ground to lower the output power
21	Final Current DC Indication Full scale = 2.5V
22	Talk; Used when 2 or more amplifiers are combined
25	Remote off, Ground to turn the unit off (momentary)
11,12,23,24	Ground

Efficiency Vs Output Power

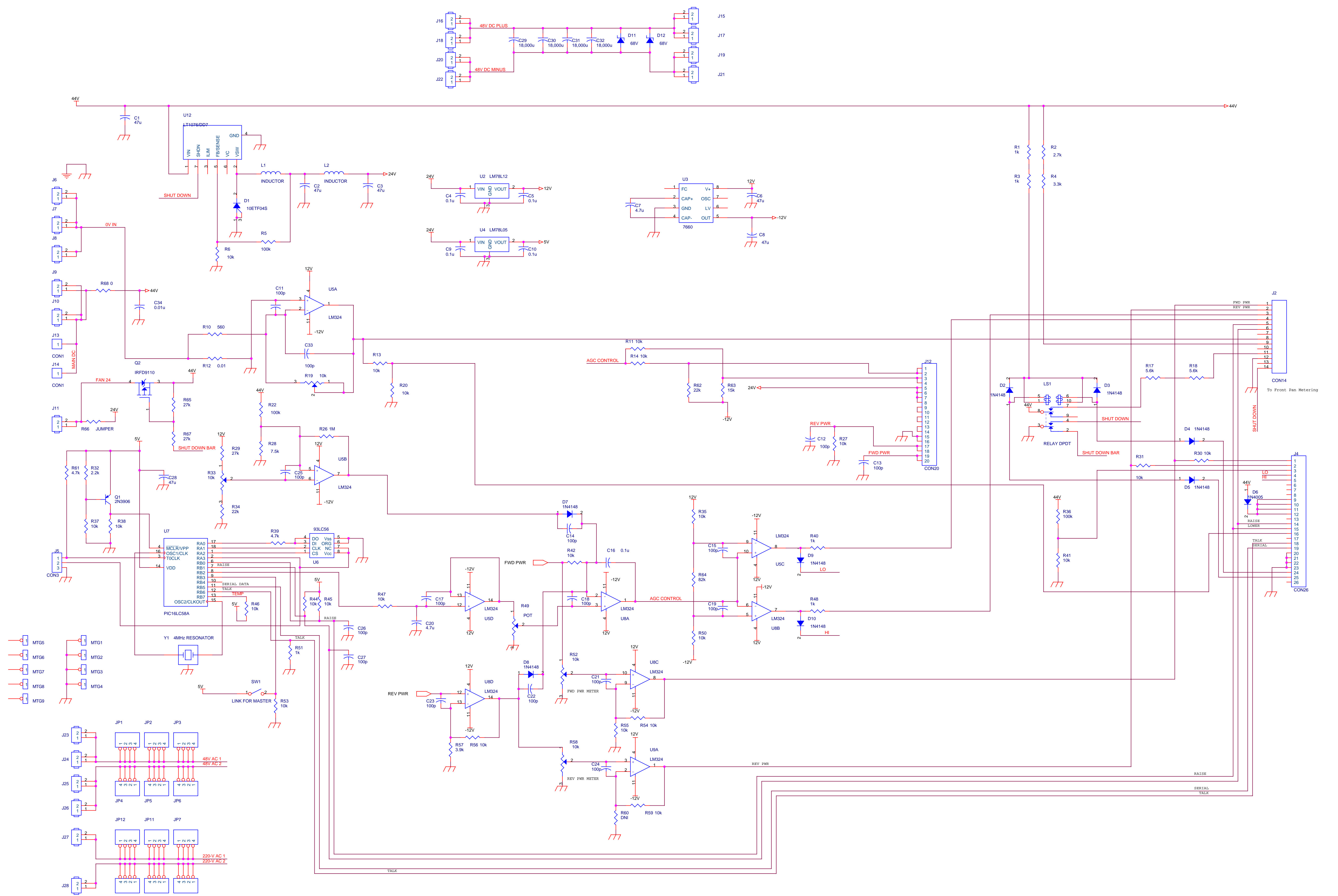
2kW		3kW		4kW		5kW	
Power Output (Watts)	Efficiency (%)	Power Output (Watts)	Efficiency (%)	Power Output (Watts)	Efficiency (%)	Power Output (Watts)	Efficiency (%)
2000	67	3000	67	4000	67	5000	67
1800	66	2700	66	3600	66	4500	66
1600	64	2400	64	3200	64	4000	64
1400	62	2100	62	2800	62	3500	62
1200	60	1800	60	2400	60	3000	60
1000	53	1500	53	2000	53	2500	53



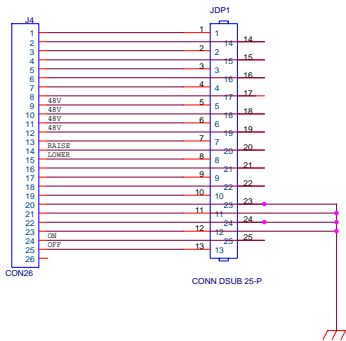
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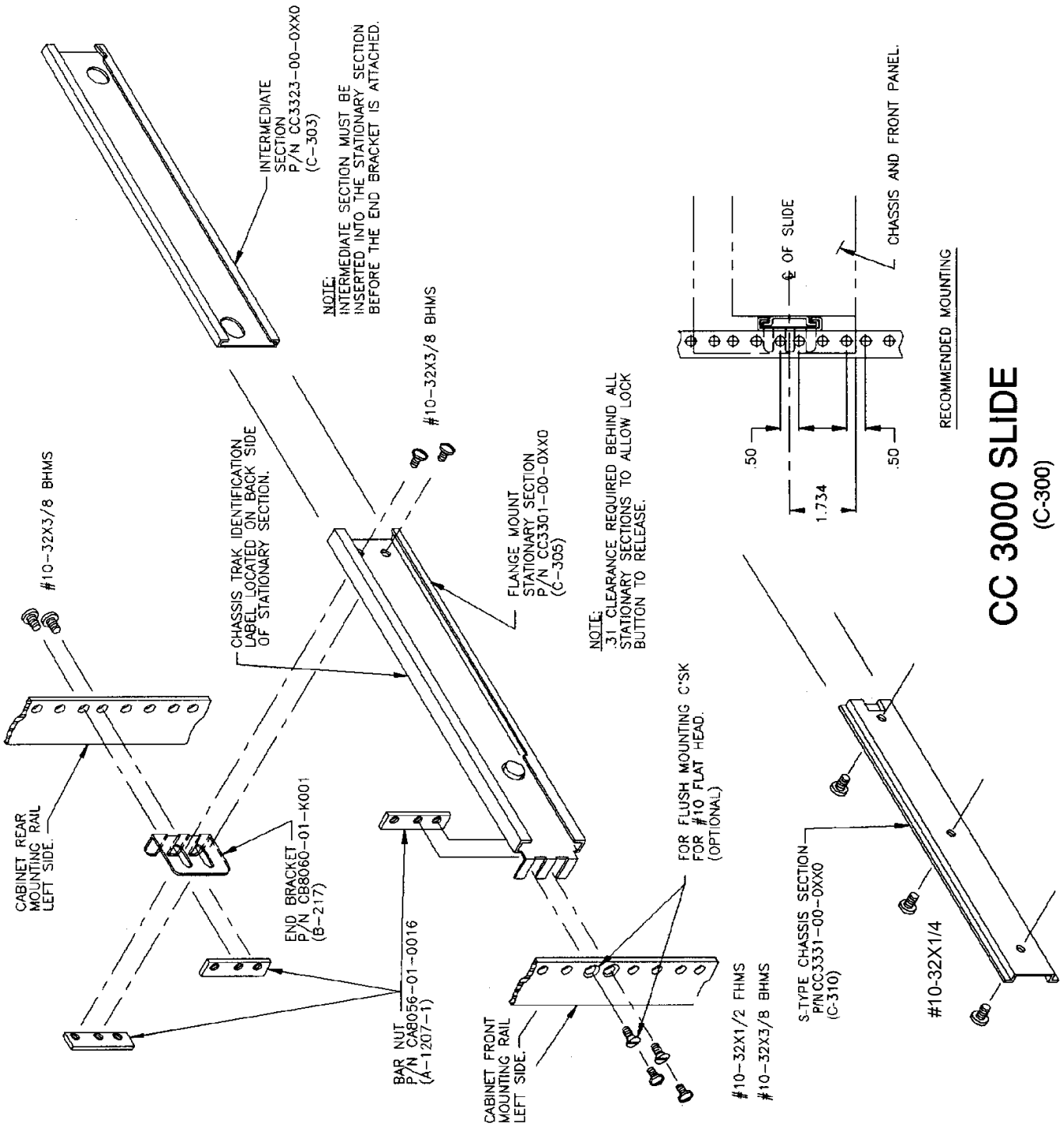


Used on PM1000 and 1KX models only



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