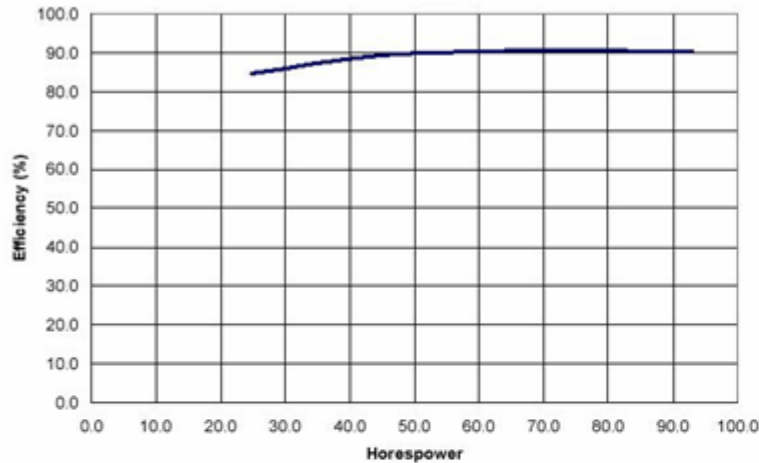


ML Equipment	pf	kva
Motors	0.87	
Magnet Power Supplies	0.849	
COTS Charging PS in Rack	0.85	207.6
COTS Charging PS in Tank	0.74	207.9

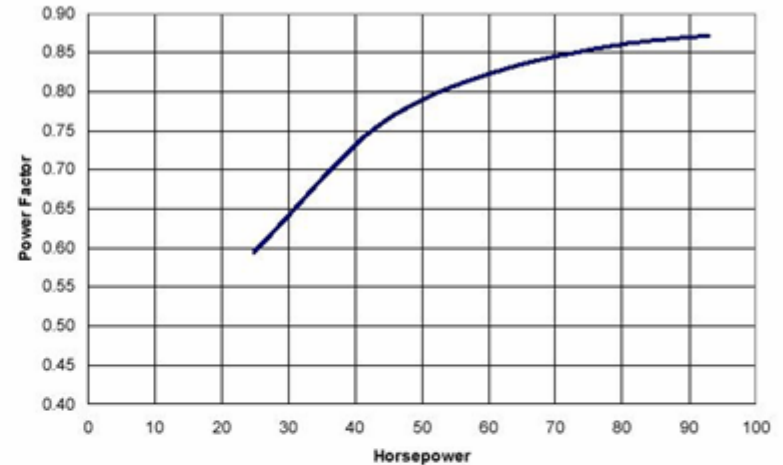
Typical 100 hp Main Linac Motor

Motor Efficiency Versus Output Power



0.90 % eff @ 90% of Full Load

Power Factor vs Output Power



0.87 pf @ 90% of Full Load

1 hp = 746 watts

$$\frac{746 \text{ watts}}{0.9 \text{ eff} \times 0.87 \text{ pf}} = 953 \text{ Volt-Amperes}$$

LINAC Total

**Sum of Total of
All Losses (kW)**

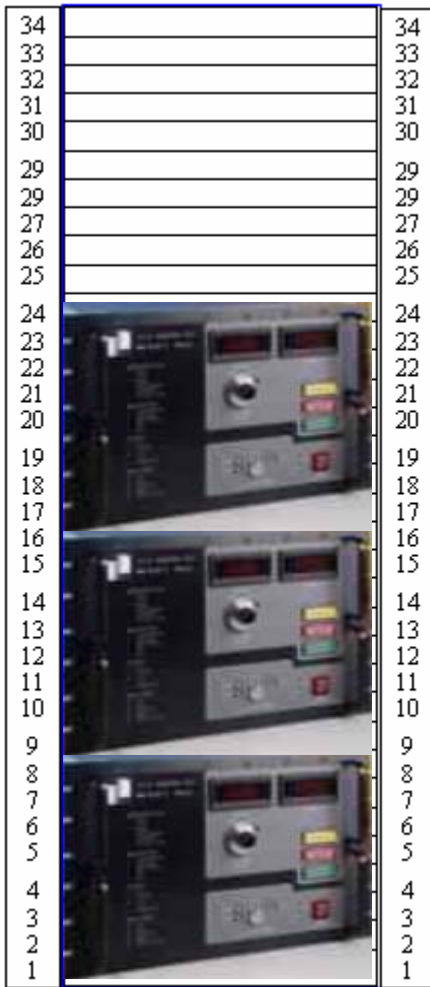
1,172

**Sum of Expected
Running kVA**

1,379

Main Linac Magnet PS's

$$\frac{1,172 \text{ kW}}{1,379 \text{ kVA}} = 0.849 \text{ pf}$$



Power Factor

Passive PFC 0.85 min

Efficiency

Better than 85%

Main Linac COTS Charging Supply Power Factor = 0.85

www.pmpower.co.uk/product58.htm

$$\text{Kva} = \frac{\text{Watts}}{0.85 \text{ pf} \times 0.85 \text{ eff}} = 207.6 \text{ Kva}$$

ILC HLRF RACK PROFILE ID/TITLE:
By _____ Date _____

Main Linac COTS Charging Supply Power Factor = 0.85

$$\frac{\text{Watts}}{\text{volt-amperes}} = \text{pf} = \frac{3 \times 50,000 \text{ Watts}}{1.7321 \times 480 \text{ Volts} \times 212.25 \text{ Amperes}} = 0.85$$

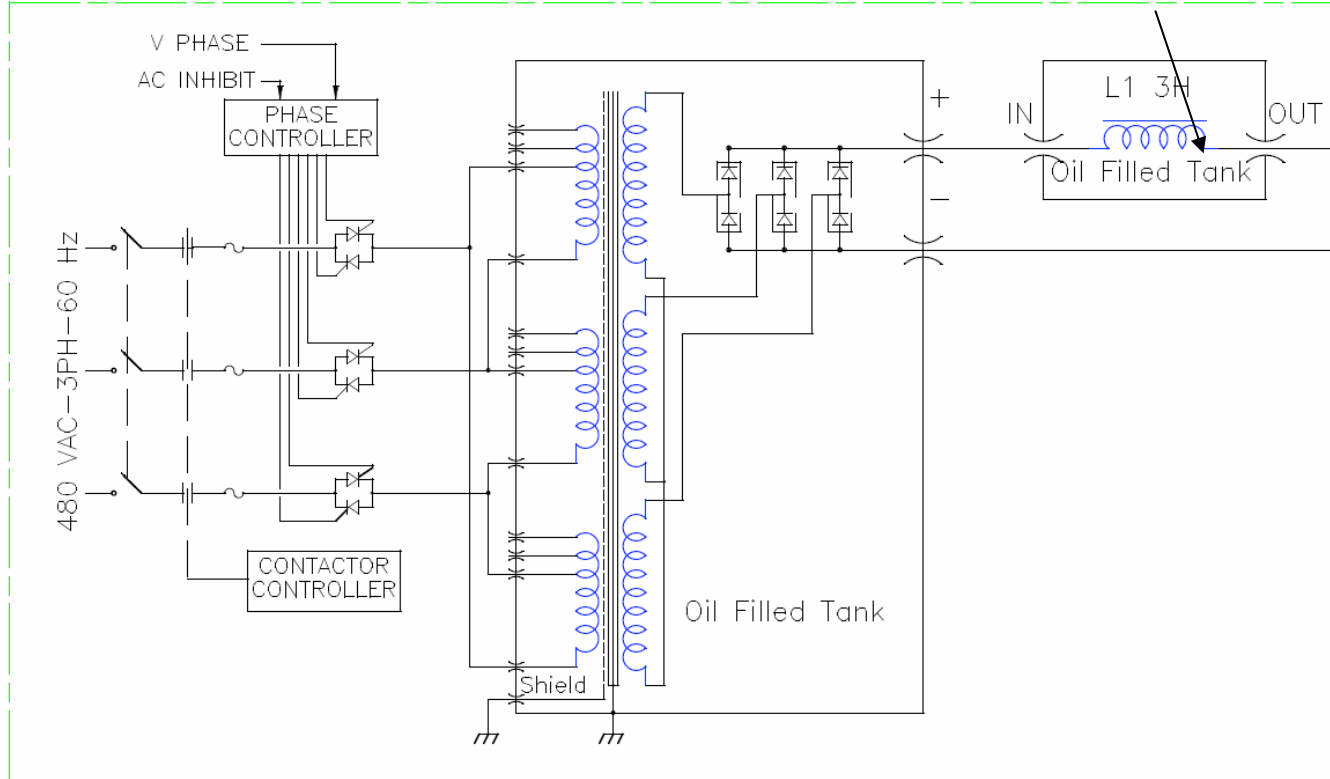
DC CHARGING POWER SUPPLY

INPUT: 480 V @ APPROXIMATELY 250 Arms

OUTPUT: 11 kV @ APPROXIMATELY 14 Arms

APPROXIMATE FOOTPRINT 42" DEEP X 96" LONG X 78" HIGH

(12 H not 3 H)



Main Linac Charging Supply Power Factor = 0.74

$$= \frac{\text{Watts}}{\text{Volt-Amperes}} = \frac{11,000 \text{ Volts} \times 14 \text{ Amperes}}{1.7321 \times 480 \text{ Volts} \times 250 \text{ Amperes}} = 0.74$$

$$\text{Demand at 480 Volts Input} = 208 \text{ kva}$$

$$= \frac{1.7321 \times 480 \text{ Volts} \times 250 \text{ Amperes}}{1,000 \text{ V/kV}} = 207.9 \text{ Kva}$$