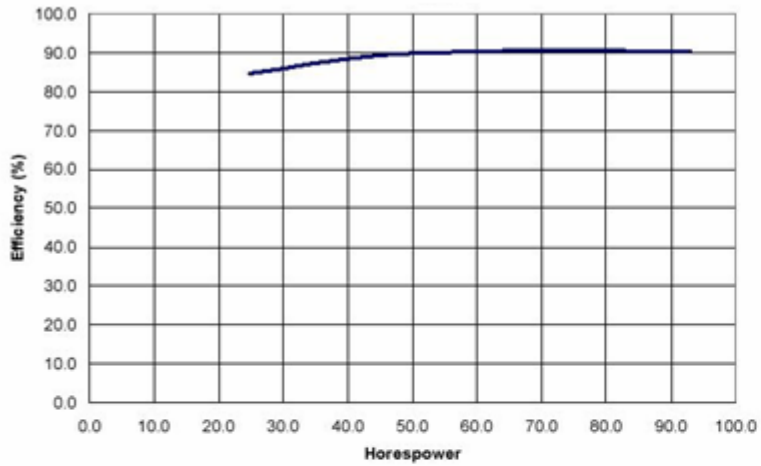
ML Equipment	pf	kva
Motors	0.87	
Magnet Power Supplies	0.849	
COTS Charging PS in Rack	0.85	207.6
~~COTS~~ Charging PS in Tank	0.74	207.9

Typical 100 hp Main Linac Motor

Motor Efficiency Versus Output Power



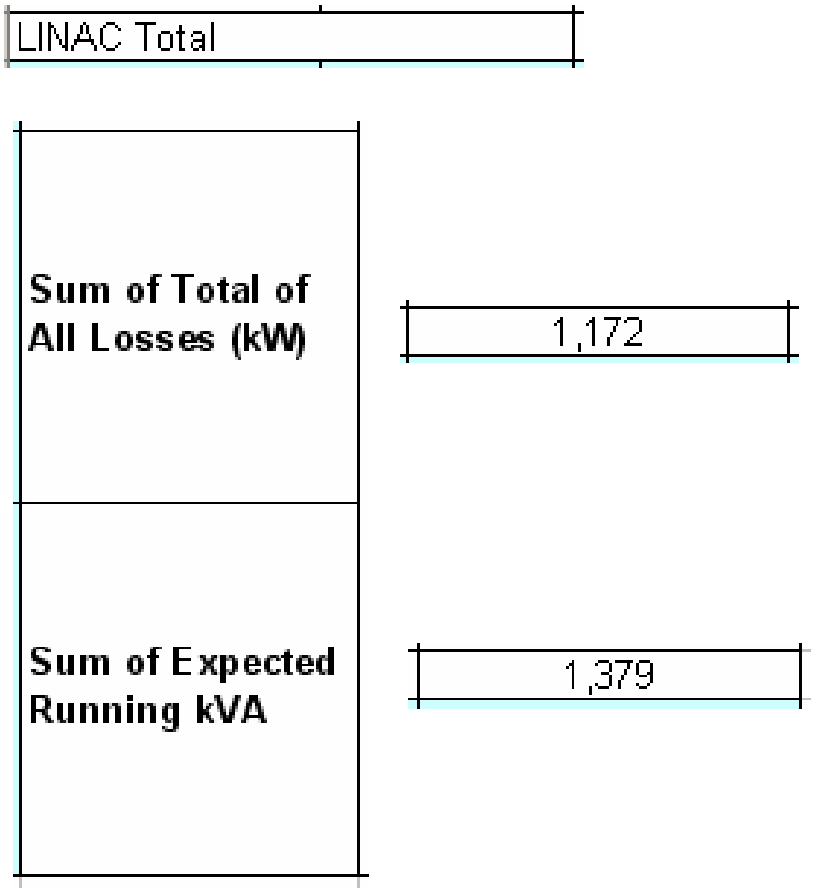
0.90 % eff @ 90% of Full Load

Power Factor vs Output Power

0.87 pf @ 90% of Full Load

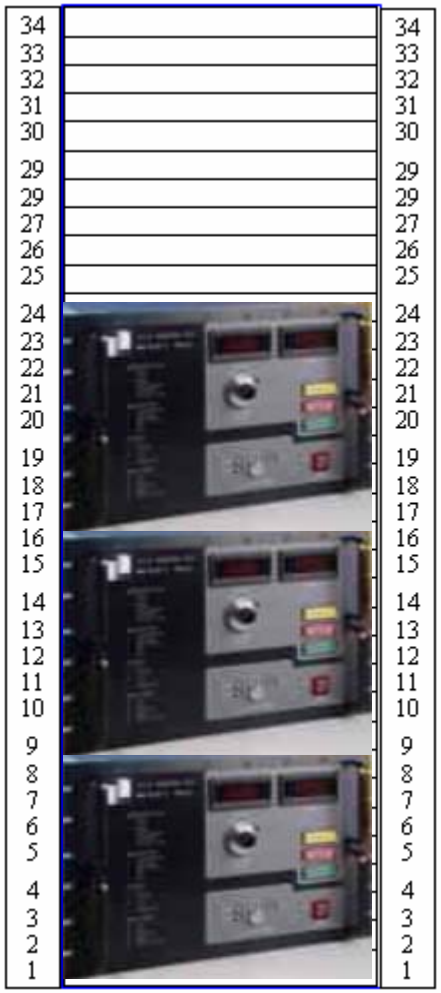
1 hp = 746 watts

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



Main Linac Magnet PS's

1,172 kw = 0.849 pf
1,379 kva



Power Factor
Passive PFC 0.85 min

Efficiency
Better than 85%

Main Linac COTS Charging Supply Power Factor = 0.85

www.ppmpower.co.uk/product58.htm

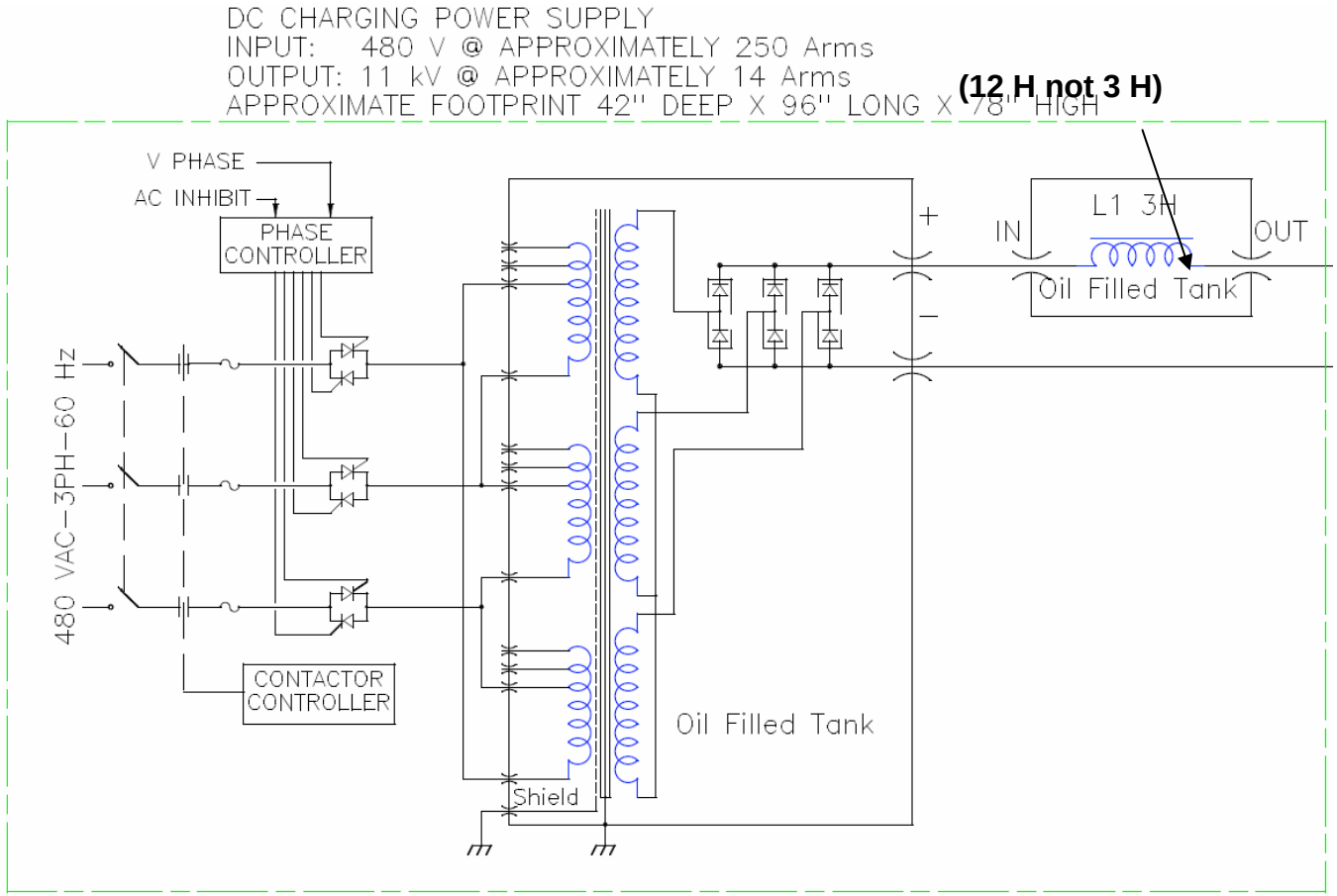
$$\text{Kva} = \frac{\text{Watts}}{0.85 \text{ pf} \times 0.85 \text{ eff}} = 207.6 \text{ Kva}$$

ILC HLRF RACK PROFILE ID/TITLE:

By _____ Date _____

Main Linac COTS Charging Supply Power Factor = 0.85

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



Main Linac Charging Supply Power Factor = 0.74

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

Demand at 480 Volts Input = 208 kva

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