

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	APPROVED

DESCRIPTION: Constant Current Power Supply for superconductivity magnets

DATA:

Regulation topology : Linear regulation with a series transistor bank

Output power : #1. Bender: 5,000A / ±6V  
 #2. Q1: 3,200A / ±5V  
 #3. Q2 & Q3: 5,100A /±6V  
 #4: Dipole: 4,500A /±11V

Ramp down voltage : 2 quadrant operation

Operation range : 0 to 100 % output current

Output ripple voltage (peak to peak) : 10 mV + 0.01 %

Current setting : 18 bit DAC

Current readback : 16 bit ADC

Stability class : < 3 ppm (30 minutes)  
 < 10 ppm (8 hours)

Temperature coefficient : 1ppm/° C

Remote control interface : RS-232 / RS-422 / RS-485  
 with optional ethernet connection

AC mains input : 480 V ±10%, 3 phase and ground, 50/60 Hz.  
 Or to specified.

AC max. input power : TBD

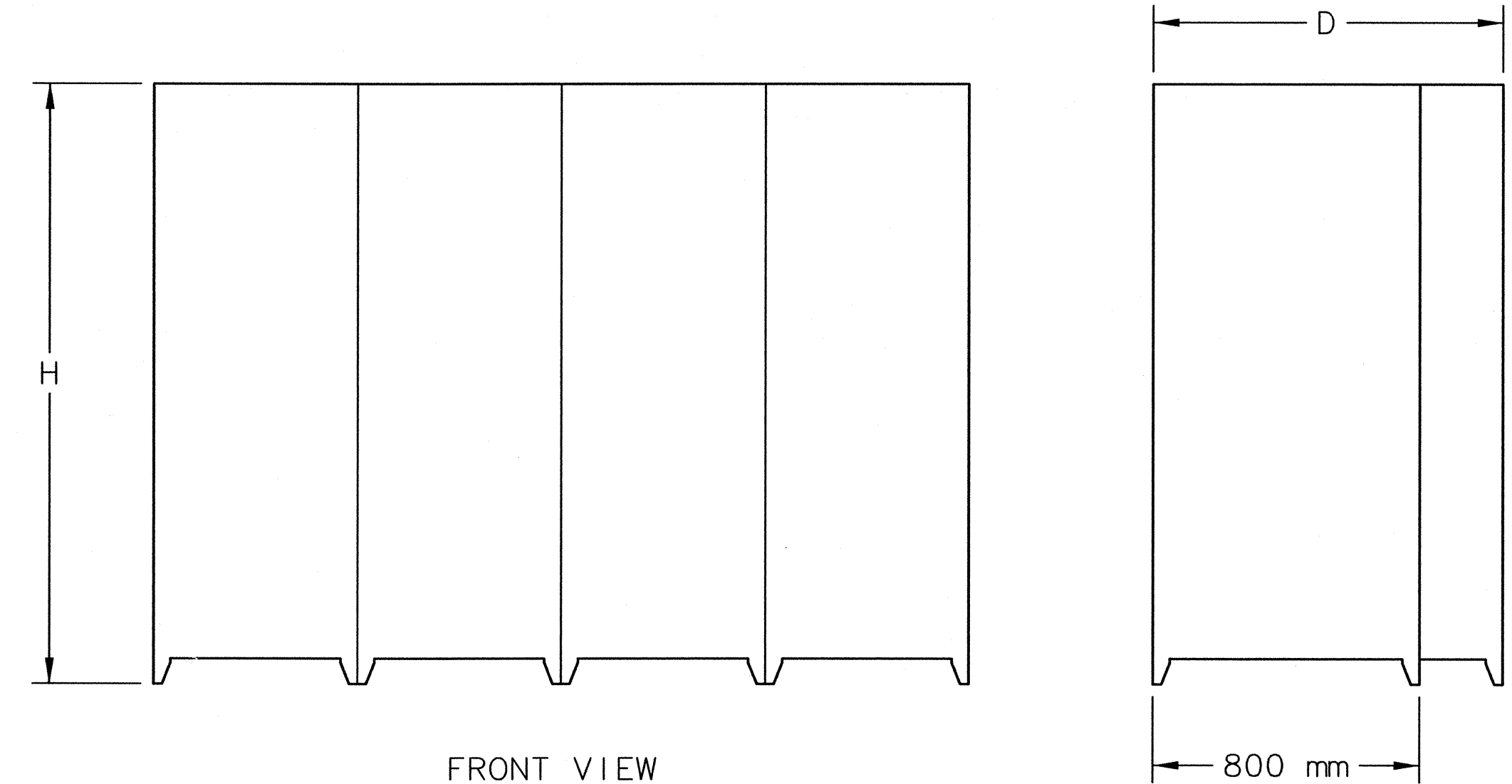
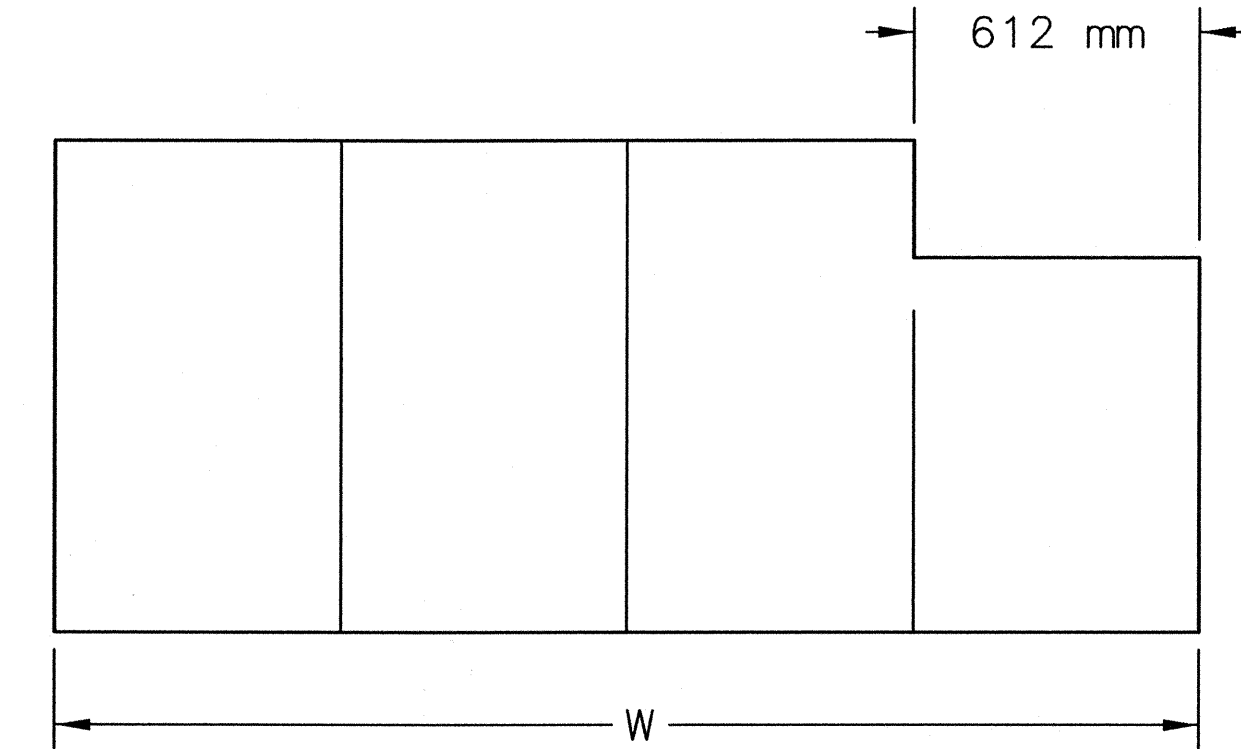
Cooling water requirement : TBD

Number of cooling water circuit with monitors : Up to 6

Dimensions (W x D x H) : #1: 1,836x1,050x1,800 mm - (4 racks total)  
 #2: 1,836x1,050x1,800 mm - (4 racks total)  
 #3: 1,836x1,050x1,800 mm - (4 racks total)  
 #4: 2,448x1,050x1,800 mm - (5 racks total)

Weight, approx. : TBD

Quench / dump circuit : Fast DC output breaker and energy dump load



Description: Magnet Power Supply

The power supplies will be equipped with a local control panel, which is a complete separate unit (19-inch standard rack type) that can be placed at a distance of up to 120 meters from the power supply.

Analog instruments will be used for indication of AC input voltage and current.

For limiting the inrush current, the power supplies will be provided with a soft start circuit.

A DCCT (transducer) will be used for the current measurement and regulation feedback.

Interlocks

The following interlocks will shut down the power supplies and give indication in the local control panel and via the remote control line:

- AC input over current
- AC input voltage failure
- DC output over current
- Over temperature on power components
- Cooling water failure
- Series transistor bank failure
- Cabinet door open
- Regulation failure
- Emergency push button
- 2 externally inputs

DOCUMENT CONTROL STAMP <b>IOC</b>	DIM & TOL PER ASME Y14.5 - UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMAL ANGLES ± N/A .X ±N/A ± N/A .XX ±N/A .XXX ±N/A	TRACKING NO. N/A		United States Department of Energy <b>Jefferson Lab</b> Thomas Jefferson National Accelerator Facility Newport News Virginia
		APPROVALS	DATE	
MATERIAL VARIOUS	THIRD ANGLE PROJECTION	DRAWN GARY VATELANA	MAY 21, 09	HALL C SHMS CONSTANT CURRENT POWER SUPPLY
FINISH MACHINED SURFACES DEBURR & BREAK ALL SHARP EDGES		CHECKED <i>Bar</i>	5/22/09	
DO NOT SCALE DRAWING		APPROVED <i>Sim</i>	5/22/09	SIZE DWG. NO. <b>D</b> 67185-00001
		APPROVED <i>CB</i>	5/22/09	REV. -
		SCALE N/A	USED ON ASSY NO. NA	SHEET 1 OF 1