

NPL Polarized Source Group Technical Note #89-2

Nitrogen Heater Temperature Controller

by

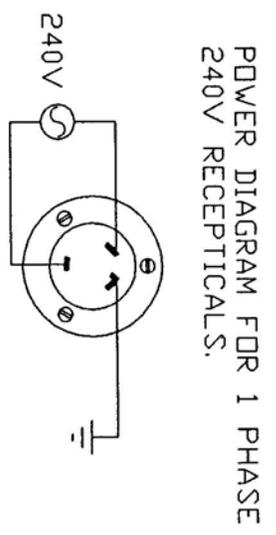
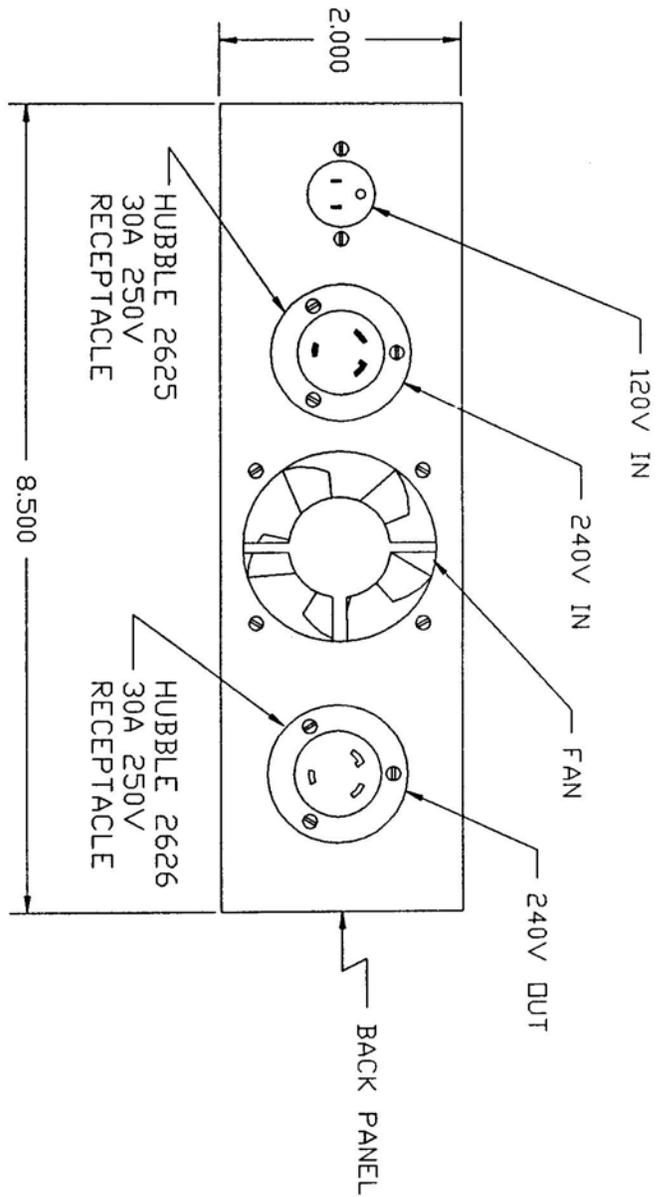
Nick Sereno

January 1989

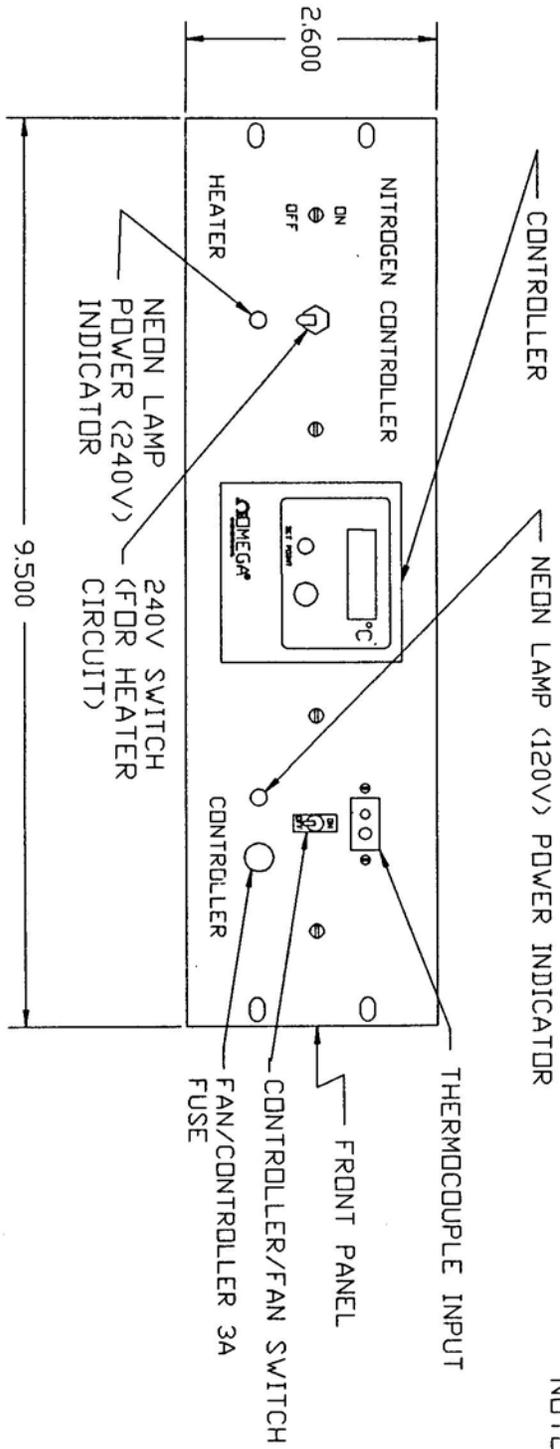
This note describes the chassis constructed to control the temperature of liquid nitrogen boiloff used for cleaning vacume components for the polarized source and for nitrogen flow in the gun stalk during bakeout and cathode preparation.

The nitrogen controller consists of two main circuits separated by a solid state relay (SSR) which plugs into the controller from the rear (see drawing two and note that the controller and SSR are one unit inside the chassis). The high voltage circuit (240V 1 phase) powers the heater. The heater circuit consists of a high capacity DPST 25A 250V switch, 120V neon lamp power indicator with current limiting 100K resistor, 30A fuse and fuse holder, and special 14 gauge cables with L6-30 (250V 30A) Plugs to get the power to the relay and out again to the heater (see drawing one). The cables plug into special Hubble 2625 and 2626 30A 250V receptacles as shown in drawing one. Simply turning the DPST switch off disables the heater circuit. The SSR acts as a switch controlled by the controller thus turning the heater on and off as needed to regulate temperature.

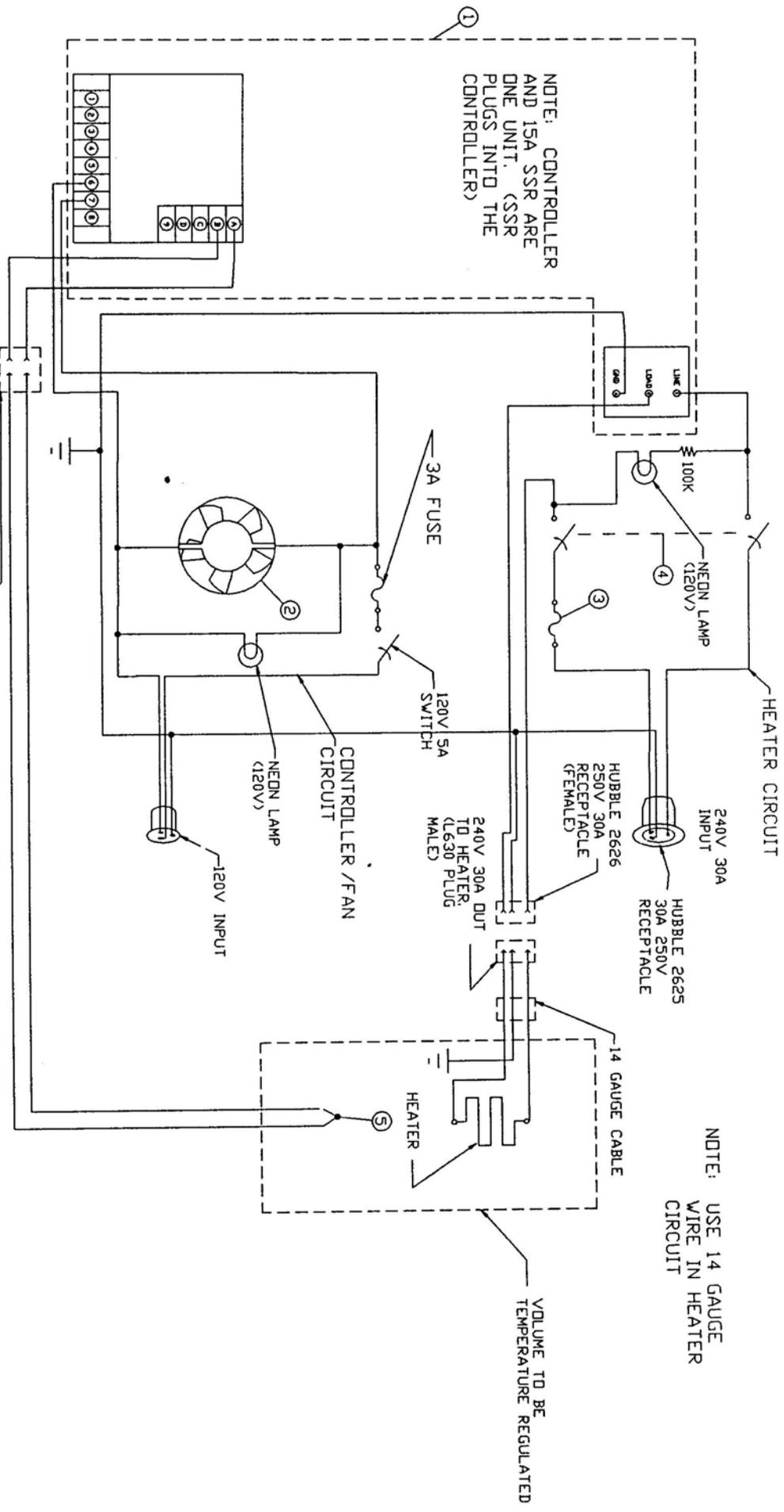
The controller circuit operates on common 120V service which is fed through the back panel as is the 240V service (see drawing one). The controller circuit consists of a fan, 120V 5A switch, 120V neon lamp power indicator, and one 3A fuse for the fan and controller (see drawing 2). The temperature input to the controller is through an OMEGA K type thermocouple. When the controller is running it continually cycles the SSR on and off as needed to regulate temperature. When the controller is not running the SSR is in the off state and the heater circuit is disabled. The DPST switch is an added feature to manually disable the heater circuit and must be on when the controller is running. The complete instruction manual for the controller is included after the drawings.



NOTE: USE 14 GAUGE
CABLES FOR 240V
POWER



DRAWN BY		NUCLEAR PHYSICS LABORATORY		PART NO.		SCALE		FILE	
CHECKED BY		UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN		ND. RECD.		1:2			
APPROVED BY		UNLESS OTHERWISE SPECIFIED		DIMENSIONS IN INCHES		3 PLACES DECIMAL		DATE	
		BREAK SHARP CORNERS		3 PLACES DECIMAL		4577		DWG. NO.	
		FRACTIONAL 1/32"		ANGULAR 1/32"				1	
NITROGEN CONTROLLER									



NITROGEN CONTROLLER CIRCUIT

MAJOR PARTS LIST

ITEM	DESCRIPTION
1	OMEGA CNS5001K2 TEMP. CONTROLLER AND 15A SSR.
2	PANMOTOR #8506D
3	30A 250V FUSE AND HOLDER
4	25A 250V DPST SWITCH (ALLIED ELECTRONICS #41-10494-2MRV)
5	OMEGA TYPE THERMOCOUPLE

DATE: 5/62	DESIGNED BY: [Signature]	CHECKED BY: [Signature]	APPROVED BY: [Signature]
NITROGEN CONTROLLER			
4577 2			