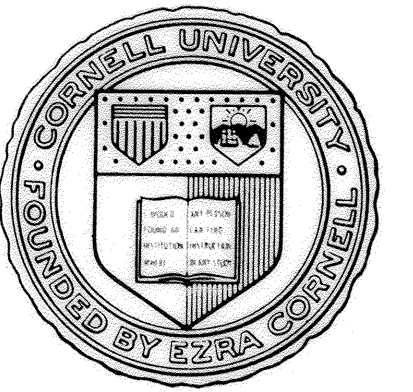
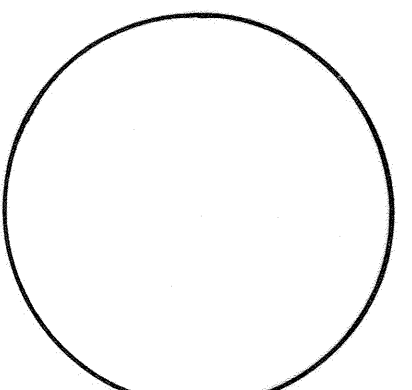




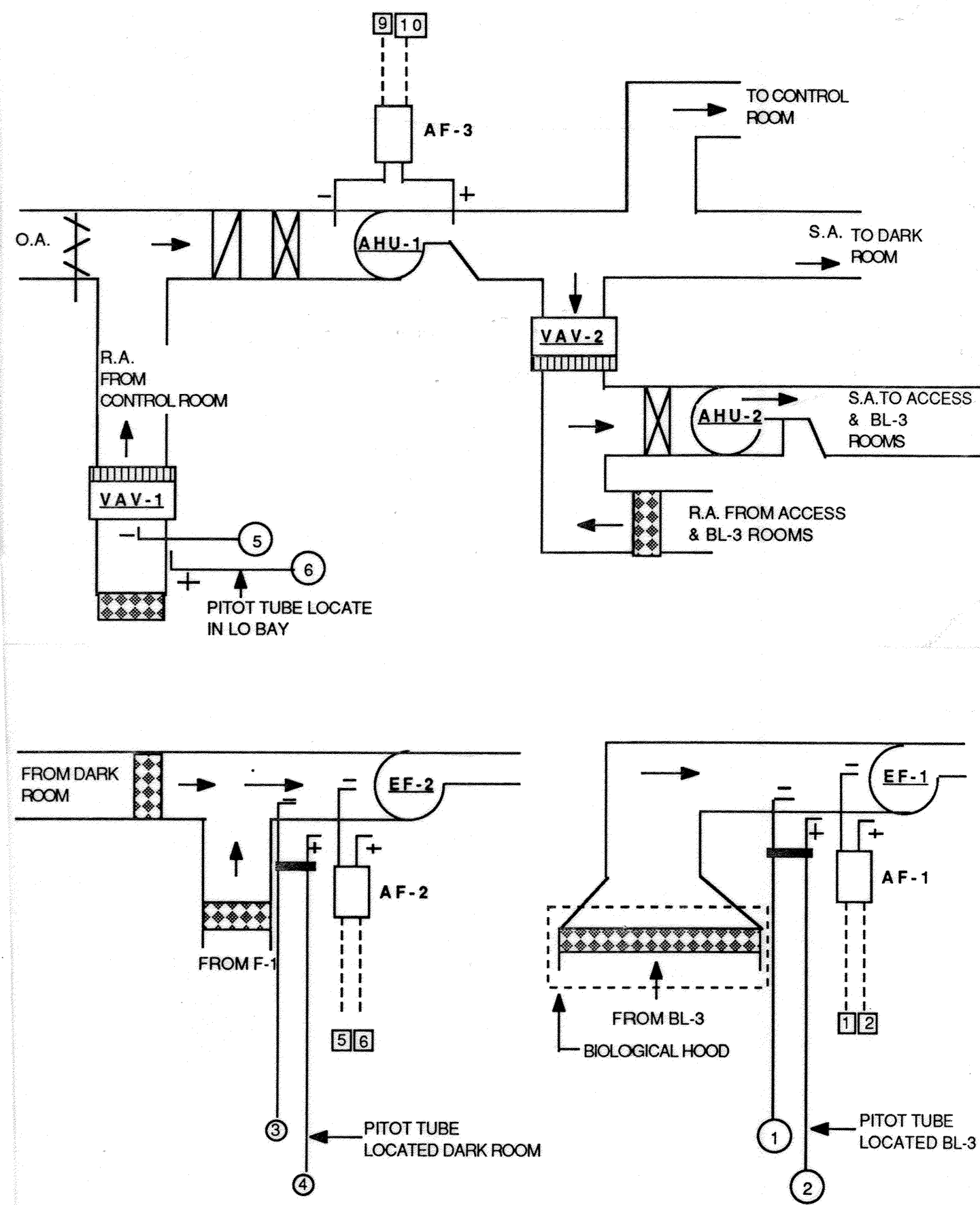
APPROVAL	DATE
<i>Philip L. Cox</i>	11 May 89
FACILITIES ENGINEERING	
LIFE SAFETY	
DRAWN BY	DATE
D. SMITH	05/10/89
CHECKED BY	
ARCH	ENERGY
CIVIL	ENVR
ELEC	
MECH	
STRUCT	

REV	DATE	BY	DESCRIPTION

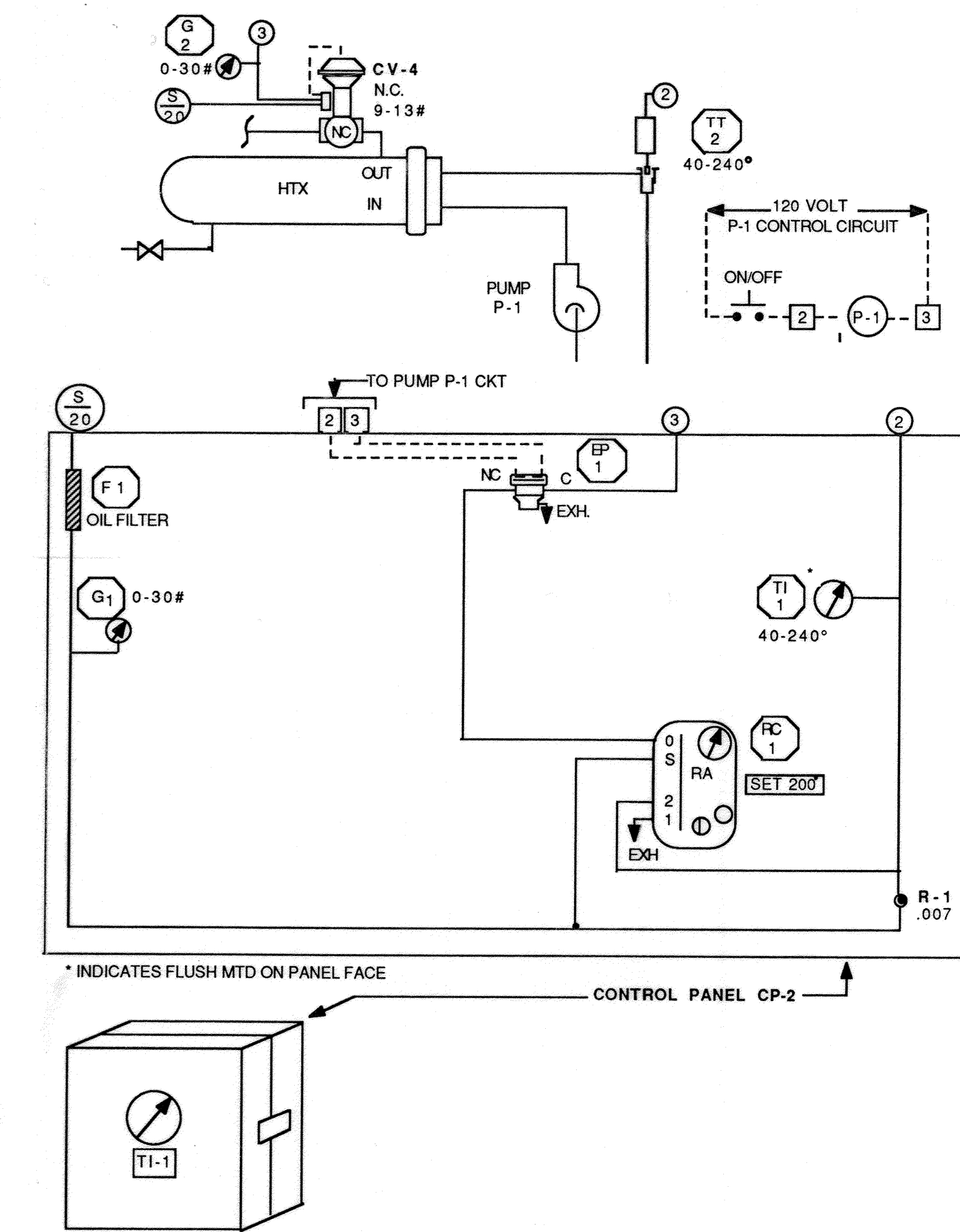
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CONTROL DIAGRAMS
PROJECT
WILSON LAB
BL-3 FACILITY
LOCATION NO. 2085



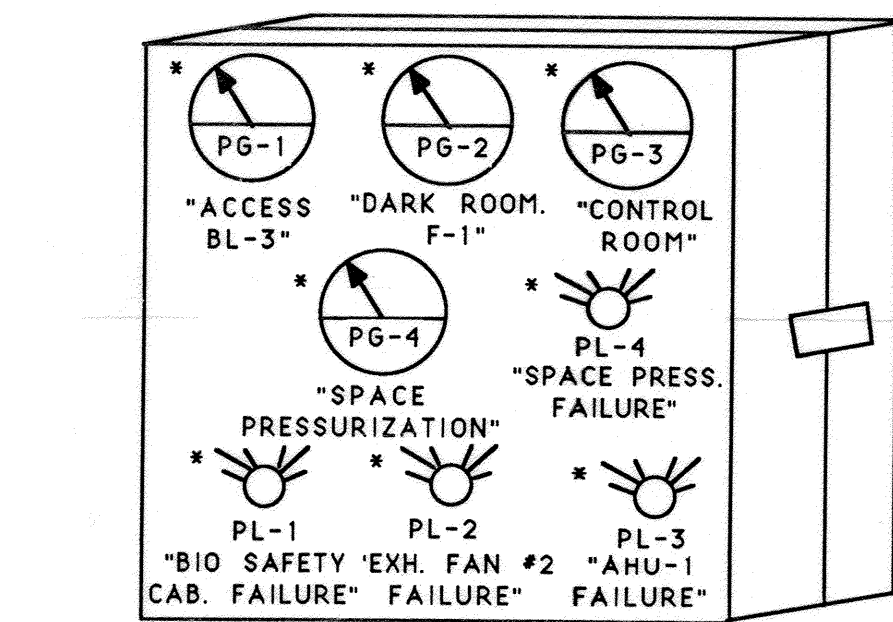
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FILE NO.	095-125
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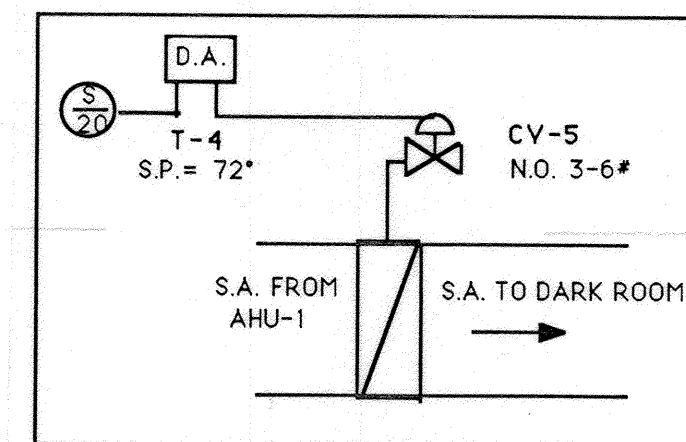
FAN AND HEPA FILTER ALARM DETAIL
NOT TO SCALE



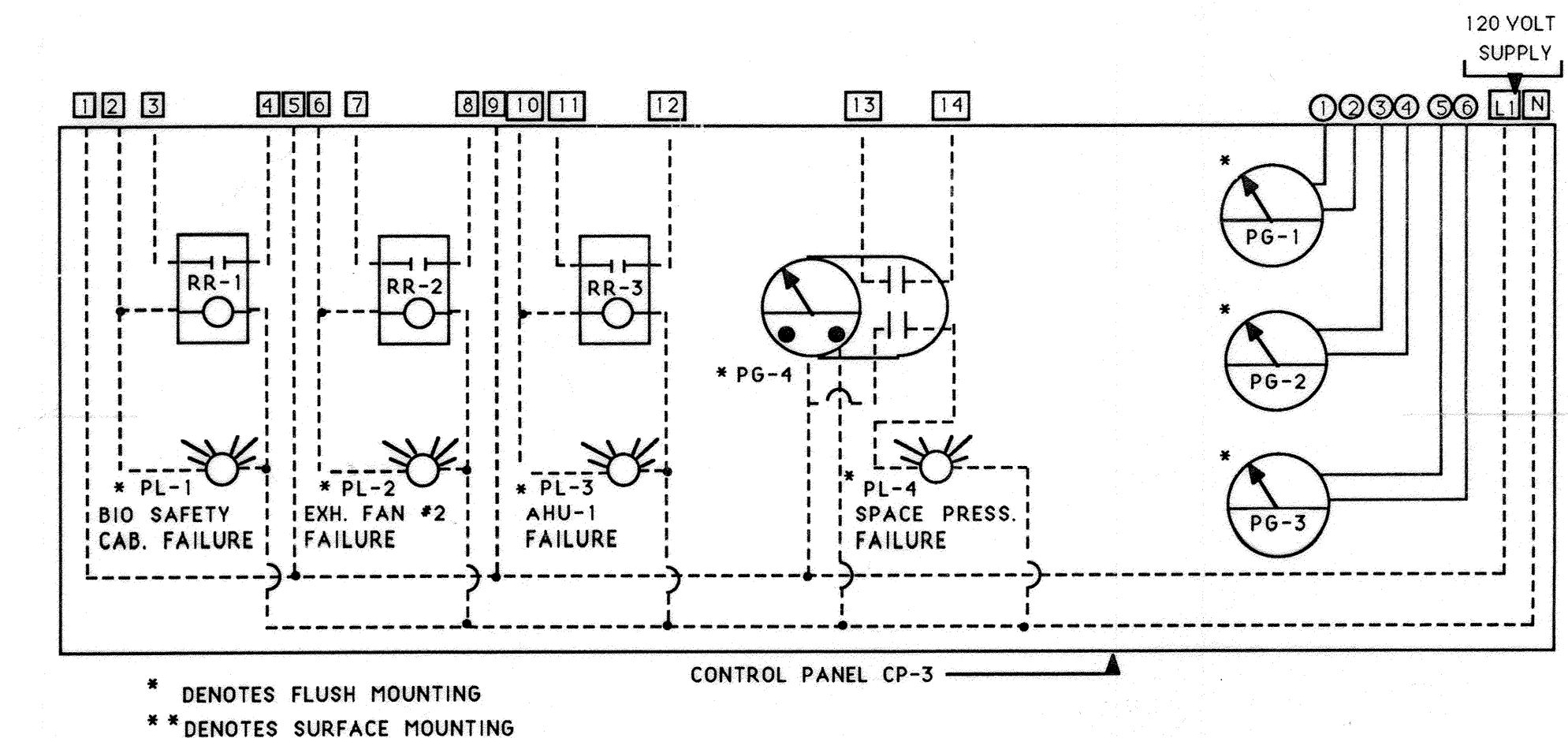
AHU-1, AHU-2, AND HEAT EXCHANGER CONTROL DETAIL
NOT TO SCALE



ALARM PANEL DETAIL
NOT TO SCALE



REHEAT COIL CONTROL DETAIL
NOT TO SCALE



* DENOTES FLUSH MOUNTING
** DENOTES SURFACE MOUNTING

Wilson BL-3

Sequence of Operation

- Exhaust fans EF-1 and EF-2 and AHU-1 will have a manual disconnect and run continuously.
- AHU-1
 - Automatic damper on the outside air duct to AHU-1 shall be interlocked to close when AHU-1 is off.
 - Provide and install a freeze-stat after the heating coil to shut off AHU-1 at a temperature of 40 F.
 - Control valves for glycol, CV-1, and chilled water, CV-2, shall sequence in response to an adjustable, wall mounted room thermostat in the control room. Provide high and low limits for discharge air temperature of 80 and 55 F. Control valves CV-1 and CV-2 shall be interlocked to close when AHU-1 is off.
 - A duct mounted smoke detector in the discharge duct will shut off AHU-1 and provide a contact closure for connection to the building fire alarm system.
 - Constant volume box, VAV-1, will be adjusted to maintain a constant flow of 1100 cfm.
- Access Room and BL-3 Room
 - A selector switch mounted in the access room will be labeled "Low Temperature" and "Normal" and will control operation of AHU-2 and Condensing unit CU-1.
 - In the "Low Temperature" position AHU-2 will run continuously and the condensing unit will cycle in response to T-1 to maintain space temperature. Thermostat T-1 will be wall mounted in the Access Room and be adjustable between 55 and 50 F. This thermostat will be labeled "Low Temperature Setpoint" and initial setpoint will be 40 F. VAV-2 will open fully to an adjustable maximum flow (300 cfm initially).
 - Refrigeration control shall employ a pump-down cycle. Thermostat T-1 shall cycle a normally closed liquid line solenoid and the compressor shall be cycled by a low pressure control. Provide and install a high pressure cutout on the compressor discharge. Coolant water flow shall be regulated by a head pressure control that provides tight shut-off when the compressor is not operating.
 - In the "Normal" position AHU-2 and the condensing unit will be off and VAV-2 will modulate in response to T-2 to maintain space temperature. Thermostat T-2 will be wall mounted and be adjustable between 55 and 80 F. This thermostat will be labeled "Normal Temperature Setpoint" and initial setpoint will be 72 F.
 - A duct mounted smoke detector in the discharge duct will shut off AHU-2 and provide a contact closure for connection to the building fire alarm system.
- Dark Room
 - Heating valve for reheat coil, RH-1, will modulate in response to an adjustable, wall mounted thermostat to maintain space temperature. Initial setpoint will be 72 F.
- Heat Transfer Unit
 - Steam control valve, CV-4, will modulate in response to leaving glycol temperature to maintain a temperature of 200 F (adjustable).
 - Glycol pump, P-1, will run at all times. Control valve, CV-4 will be interlocked to close if P-1 is off.
- Alarms
 - All alarm conditions shall be indicated on a display panel and will cause closure of an auxiliary contact.
 - Status of EF-1 shall be determined by a pressure switch in the biosafety cabinet exhaust duct and will alarm when the fan is off. Panel indicator light will be labeled "Biosafety Cabinet Exhaust Failure".
 - Status of EF-2 shall be determined by a pressure switch in the dark room exhaust duct and will alarm when the fan is off. Panel indicator light will be labeled "Exh. Fan 2 Failure".
 - Status of AHU-1 shall be determined by a differential pressure switch across the fan and will alarm when the fan is off. Panel indicator light will be labeled "AHU-2 Failure".
 - The pressure drop across exhaust filters F-1, F-2, and F-5 shall be monitored using panel mounted Photohelic gauges. These gauges shall indicate a range of 0-2 iwc and be set to close contacts when a differential of 1.25 iwc is exceeded. On the panel these gauges shall be labeled, "ACCESS/BL-3", "DARK RM/F-1", AND "CONTROL ROOM" respectively.
 - Proper pressurization of the suite shall be determined by a differential pressure switch, and Photohelic gauge with a range of 0-.25 iwc, across the wall of the control room to the Lo Bay. The switch will initiate an alarm when a differential pressure of at least .05 iwc (control room negative to Lo Bay) is not met. Panel indicator light will be labeled "Space Pressurization Failure".