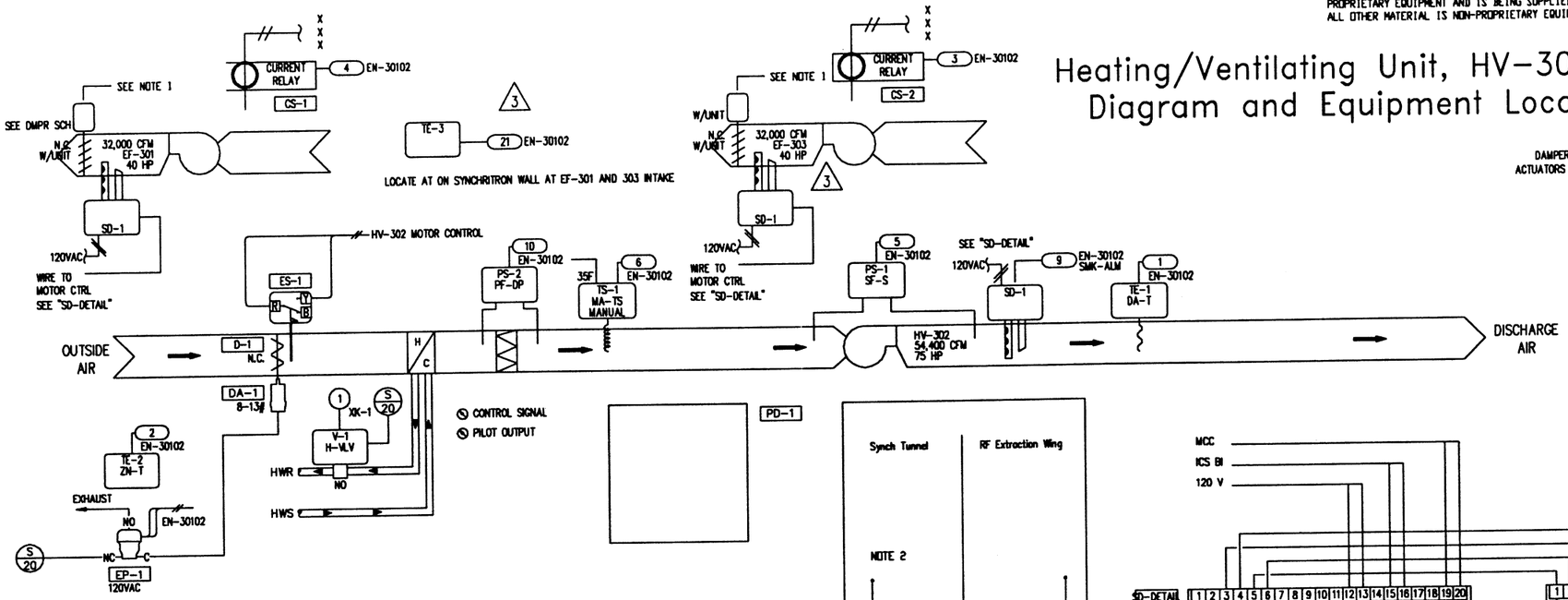
Heating/Ventilating Unit, HV-302 Flow Diagram and Equipment Locations



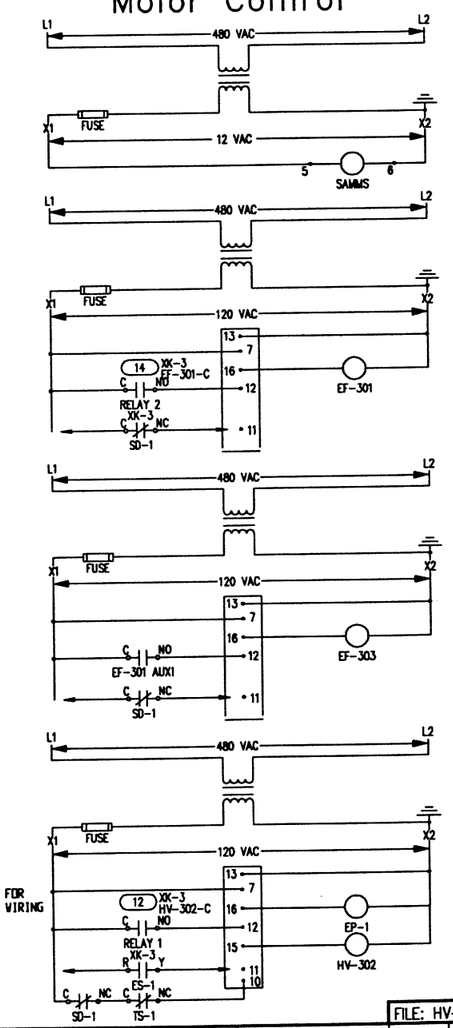
ANY MATERIAL WITH A (P) PRECEEDING THE DEVICE TAG IS CONSIDERED PROPRIETARY EQUIPMENT AND IS BEING SUPPLIED BY JOHNSON CONTROLS, INC. ALL OTHER MATERIAL IS NON-PROPRIETARY EQUIPMENT.

DAMPERS BY OTHERS
ACTUATORS BY THIS CONTACT

FIELD MATERIAL

DEVICE TAG	QTY	CODE NUMBER	DESCRIPTION
ACC	2	G-2010-5	AIR GAGE 1-1/2"
D-1-D-2		---	SEE DAMPER SCHEDULE
DA-1		---	SEE DAMPER SCHEDULE
EP-1	1	V-2410-2	VALVE, SOL.AIR, 3-WAY
ES-1	1	802I-CWP	END SWITCH-A/B
PS-1	1	P32AF-2C	SENSITIVE DIFF PRES CTL
	2	FTG18A-600R	REMOTE MTD PROBE
SD-1	3	DH400ACDC1	DUCT DETECTOR, ION,
	3	ST-10	SAMPLING TUBE FOR
	3	RTS-451	RESET/TEST
TE-1	1	TE-6100-1	TEMP SENSING ELEMENT 17'
TS-1	1	A70HA-1C	TEMP CONTROL 4 WIRE, 2-C
V-1	1	---	SEE VALVE SCHEDULE
TE-2,3,4	3	TE-6000-4	1000 OHM, .25% RTD
	3	TE-4000-2139	PLASTIC COVER/HORZ/CONC/NO-TEMP
	3	TE-6001-4	ELEMENT HOLDER
PT-1	1	DPT-2641-21	DIFF PRESSURE TRANS, -.1 TO +.1 INWG
P-1	1	BZ-1000-6	ENCLOSURE
CS-1-2	2	705-MD	CURRENT SWITCH
TE-5	1	TE-6000-4	1000 OHM, .25% RTD
	1	TE-6001-3	MOUNTING HARDWARE
	1	VZ-1000-2	S.S WELL

Motor Control



Sequence Of Operations

SYSTEM: 100 Percent Outside Air Constant Volume Air Handling Unit HV-302

CONFIGURATION: Constant Discharge Air Setpoint
Constant air supply and exhaust fans

Discharge Air Temperature Setpoint

The building operating engineer will set the discharge air temperature by adjusting the discharge air setpoint, DA-SP form any ISC terminal. The digital controller will modulated controlled devices as described below to maintain a fan discharge temperature of 65 F.(adjustable at any ICS terminal)

Discharge Temperature Loop

The discharge cooling deadband is added to the discharge air setpoint. This value establishes the point at which mechanical cooling begins when the controller uses proportional only control. The digital controller will continually adjust the heating command according to the controller's result of the proportional-integral heating loop calculation. The digital controller will modulate the heating control valve, V-1, until the discharge air temperature equals the setpoint. The controller will provide an output between 0 and 100 percent as the discharge air temperature travels through the proportional bands.

Fans' Status

Sensitive differential pressure switches, PS-1(supply fan) and PS-2(exhaust fan) will close upon air flow being present, this will set fan status ON. The digital AHU controller switch to normal control.

Fan failure will be set if the binary feed back does not match the start/stop command or the discharge flow rate drops below 85 percent of the fan's design capacity.

Power Fail Restart

The power fail restart will delay the startup of the digital controller for 1 minute(adjustable at the operator workstation) after a power failure for controller reset condition. This logic will hold the controller in the sutdown mode until the restart timer has expired.

Electric low limit

Heating discharge low limit temperature switch, TS-1 will stop the supply fan, close the mixed air dampers and the AHU digital controller will issue an alarm to the ISC network in the event that the heating discharge temperature drops below 35 F.(Adj.)

Supply smoke detectors, SD-1 and SD-2 stop the supply or exhaust fan and the ASC controller will issue and alarm to the ISC network in the event the respective device senses smoke at the location.

Mixed air filter alarm

The mixed air filter condition will be monitored by differential pressure switch, PS-2. The switch will close in the event that the pressure drop exceeds .8 inches WG(adjustable) and an alarm will be sent to the ICS network, 'Dirty Mixed air Filter'.

Exhaust Control

The exhaust fans are interlocked in the following manner:

EF-301 w/ HV-302
EF-303 w/ HV-302

In the event that the respective supply fan fails, as sensed by sensitive differential pressure switches, PS-1 and PS-2, or analog air flow measuring stations, the digital controller will stop the associated exhaust fan.

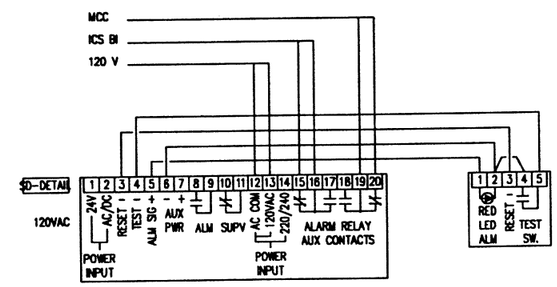
Fan failure will be set if the binary feed back does not match the start/stop command or the pressure difference between the synch tunnel and RF Extraction drops below .05 IN WG.(Adjustable)

The following point objects will be adjustable from any ICS terminal:

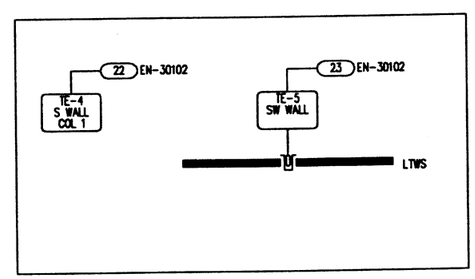
- -Discharge air setpoint
- -Heating lockout setpoint
- -User start/stop time

The following objects will be monitored/alarmed at an ISC terminal:

Fan Discharge Air Temperature
Filter Status
Supply Fan Status
Exhaust Fan Status
Smoke Detectors' Status
Synchrotron Tunnel/RF Extraction Wing Differential Pressure



ICS ALARM POINTS



NOTES:

1. INSTALLATION CONTRACTOR IS RESPONSIBLE FOR TERMINATING UNIT SUPPLIED DAMPER MOTOR WIRING TO THE FAN MOTOR POWER FEED CIRCUIT.
2. EXACT LOCATION OF PT-1 PROBES TO BE DETERMINED BY ANL AND THE PROJECT CFR.

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REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY
	3	ADD ICS ALM		11/10/92	SF
	2	GENERAL		10/10/92	SF
	1	GENERAL		06/11/92	SF

SALES ENGR: DB | PROJECT MGR: SP | APPL. ENGR: SF | DRAWN: BY SF DATE 02/21/92 | APPROVED: BY DATE

DRAWING TITLE
Heating/Ventilating Unit
HV-302
100 Percent Outside Air
Single Path Htg Unit

PROJECT
The Argonne National Labs
Advanced Photon Source Campus
9700 Cass Avenue South
Argonne, IL 60439

JOHNSON CONTROLS
Systems & Services Division
3007 MALMO ROAD
ARLINGTON HEIGHTS
ILLINOIS 60005
708/364-1500 Main
708/808-4438 Eng

FILE: HV-302

CONTRACT NUMBER: 91390-0009

DRAWING NUMBER: 91-9-D-04A