

Process Water Flow Diagram for Building 400 Experiment Hall DI Water Segments

Sequence of Operations

Process Water Control

Primary process water will be provided through the system in building 450, Utilities, see Johnson Controls, Inc. drawing 91-9-A-01A for the Sequence of Operations.

Local chilled process water bridges will provide a secondary loop for each of the APS areas. The building operating engineer will enable the individual system by setting binary data point, 'System-C', DN from their appropriate ICS network terminal. The digital control panel, EN-4XXXX will open process water isolation valve, V-2 and place the three way mixing valve under control and start the secondary circulating pump. Three way process water control valve, V-1 will be modulated by digital control panel, EN-4XXXX to maintain a process water temperature setpoint of 90 F. (adjustable at an ICS terminal)

The digital controller panel will provide the start/stop command for each process water circulating pump and will monitor their status through feedback devices, differential pressure switches, PS-2 and PS-3. An alarm, 'Pump, P-# Failure' will be issued to the ICS network in the event of failure.

The status of the secondary filter system will be monitored by differential pressure switch, PS-1. In the event that the differential pressure exceeds 20 PSI, an alarm, 'Dirty Filter Condition' will be sent to the ICS network.

High Process Water Supply Temperature Event

The digital controller will monitor the process water supply temperature through temperature element, TE-1. In the event that the supply water temperature exceeds 92 F. (adjustable) an alarm will be issued to the ICS network 'High Proc Wtr Sply Temp'

Process Water Bypass Control

As the two way valves to the APS equipment are operated, the flow demand to the system changes. Differential pressure transmitter, DPT-1 will read the differential pressure across the supply and return water lines. The digital controller will modulate the process water bypass valve through its proportional band to maintain the a differential setpoint of 90 PSI. (Adjustable at an ICS terminal)

Process Water Standby

In the event that the principle process water circulating pump fails, the standby pump may be enabled. The controller will automatically activate the standby mode by setting binary data point, 'Sys-Standy', DN. The controller will perform the following sequence of events if this mode is activated.

1. Check if the High Flow Event is set DN, if so, do not activate standby mode.
2. Disable principle circulating pump.
3. Enable standby process water pump.

High process water flow event

In the event that the process water flow difference between the supply and the return segments of the system, as read by flow transmitters, FT-1-1 FT-1-2 exceeds a difference of 5 percent (adjustable), the digital controller will set a High Flow Event. The system will be isolated by closing two position valve, V-2 and disabling the circulating pump. The controller will also position the three way mixing valve to zero percent so that the normally closed part is closed. An alarm, 'High process water flow' will be sent to the ICS network.

The following points will be adjustable from any ICS terminal:

- Process (DI) supply water temperature setpoint.
- Process water circulating pump standby designation.
- Process water differential flow setpoint.

The following points will be monitored and alarmed to the ICS network:

- Process water circulating, standby pumps status.
- Process water supply filter status.
- High process water supply temperature event.
- High process water flow rate event.
- UV Lamp alarms

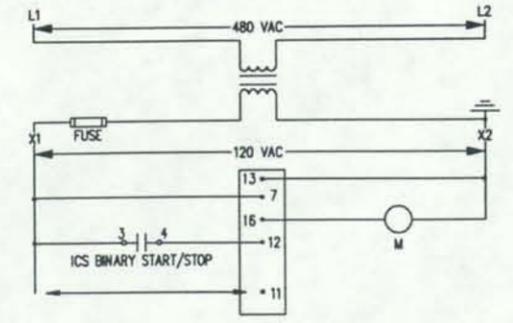
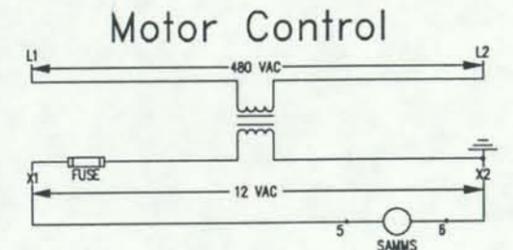
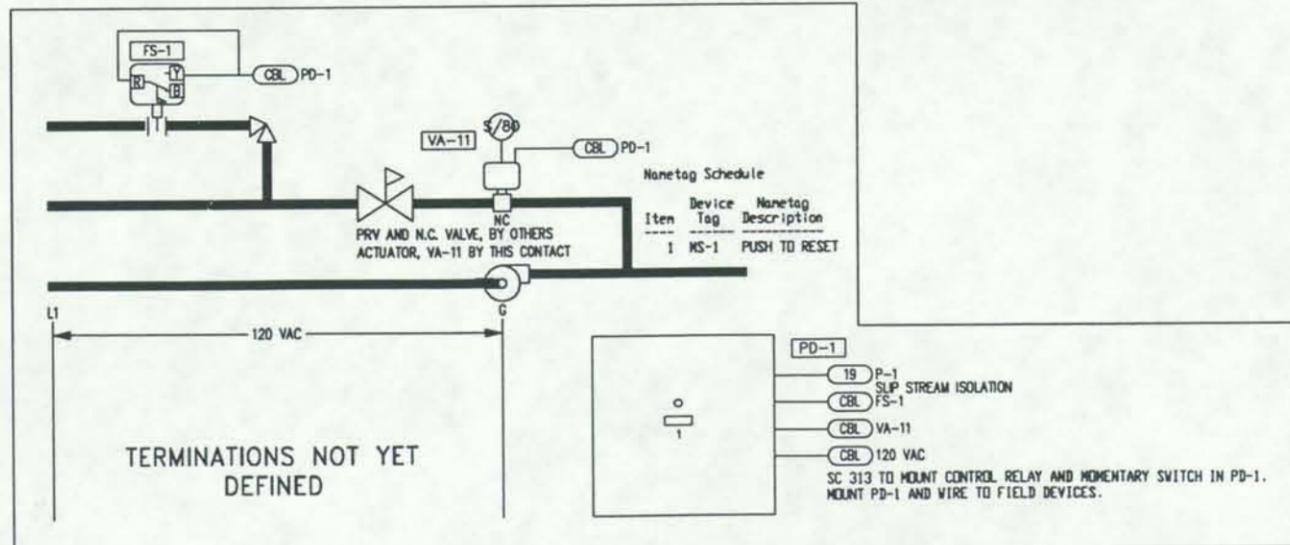
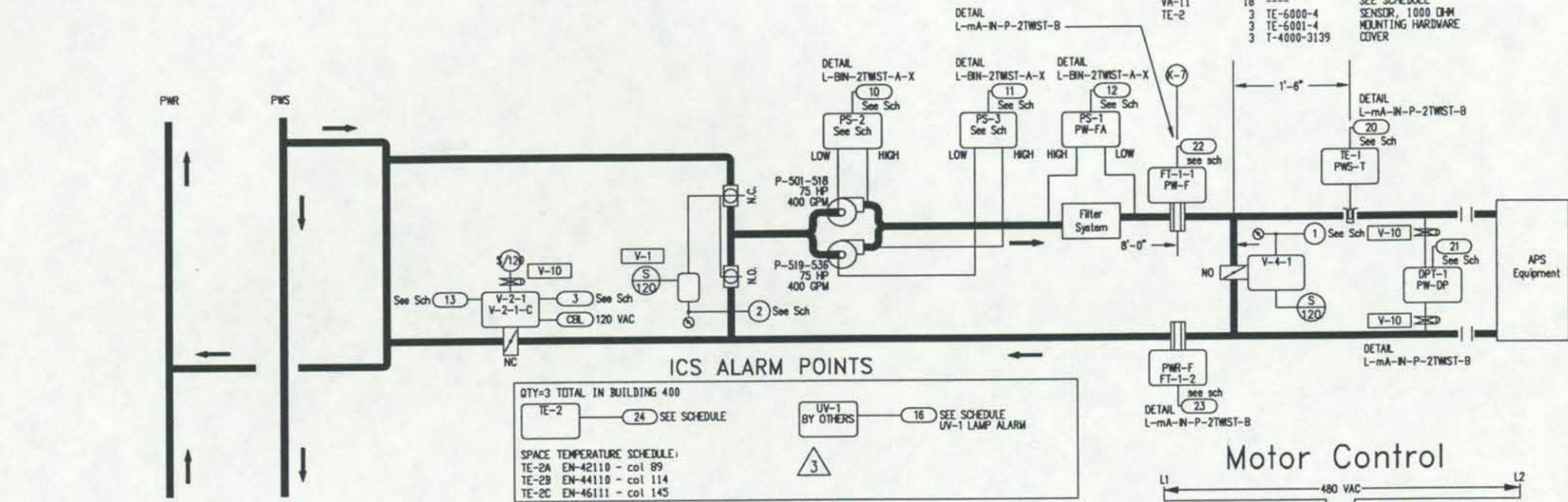
In the event that flow is detected at flow switch, FS-1, control valve actuator VA-11 will close and isolate the DI water slip stream. The valve will reopen after the building engineer resets the control by pressing manual switch, MS-1.

The ICS will monitor space temperatures at col 89, 114 and 145 through TE-2.

Slip stream isolation status will be alarmed to the ICS.

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

FIELD MATERIAL	DEVICE TAG	QTY	CODE NUMBER	DESCRIPTION
	DPT-1	18	PT-350-3-5-D	DIFFERENTIAL PRESS TRANSMITTER-TRIAD
	FT-1	36	YF115-ALS	FLOW METER-JYC
	PS-1-PS-3	54	P74BA-1C	DIFFERENTIAL PRESSURE CONTROL
	TE-1	18	TEP-1000000	SENSOR, 100 OHM
		18	TE-6001-3	PACKING NUT & FTG. S
		18	VZ-1000-2	STAINLESS STEEL WELL 1/2"
		18	TQ-6000	TEMP/CURRENT TRANSMITTER
		18	BZ-1000-3	ENCLOSURE
	V-1	54	----	SEE VALVE SCHEDULE
	V-2	54	BS4802AHC	FILTER/PRV
	V-4	36	G-2010-5	AIR GAGE 1-1/2"
	V-10	54	----	1/4 INCH BRASS NEEDLE VALVE
	PD-1	18	BZ-1000-6	ENCLOSURE
	FS-1	18	FS4-3F	FLOW SWITCH-ITT
	R-1	18	RR2B-UL-120VAC	CONTROL RELAY-1DEK
		18	SH2B-05	
	MS-1	18	PD-105-1	MDN SWITCH
	VA-11	18	----	SEE SCHEDULE
	TE-2	3	TE-6000-4	SENSOR, 1000 OHM
		3	TE-6001-4	SENSOR, 1000 OHM
		3	T-4000-3139	COVER



LEADER LINE INDICATES POSSIBLE FUTURE CONNECTION FOR SAFETY CONTACTS.

FILE: PW-F_400

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