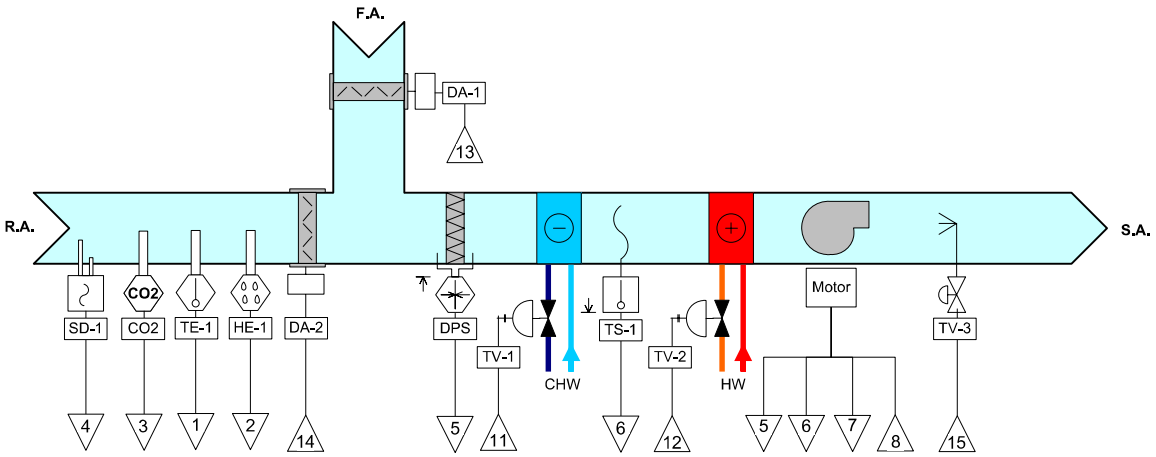
8. CAV AHU Controls

Cooling & Heating with Humidity Control, 4 pipes



	DDC		Equipment List			
			ID	Part Number	Description	Qty
1	AI	Return Air Temp	TE-1	TE-6311M-1 / NS-DTN7083-0*	Duct mount Temp. Sensor	1
2		Return Air RH	HE-1	HT-9000-UD1	Duct RH Sensor	1
3		Return Air CO2*	CO2	CD-P00-00-0*	Duct mount CO2 Transmitter	1
4	BI	Smoke Alarm	SD-1	DH100ACDLP	Smoke Detector	1
5		Filter Alarm	DPS	P233A-10-AKC	Differential Pressure Switch	1
6		Anti-freeze Alarm	TS-1	A11D-4C / 270XT	Low Temp. cutout, manual reset	1
7		Fan Auto / Manual				
8		Fan Run Status	CSD	CSD-SA1E0-1	Current Switch, 1-135 A, Adj setpoint	1
9		Fan Trip Alarm				
10	BO	Fan Start/Stop				
11	AO	Cooling Valve	TV-1	VG1000	Valve & Actuator (by selection)	1
12		Heating Valve	TV-2	VG1000	Valve & Actuator (by selection)	1
13	CO	Fresh Air Damper	DA-1	M91xx-AGA / -GGA*	Damper Actuator (by selection)	1
14		Return Air Damper	DA-2	M91xx-AGA	Damper Actuator on/off (by selection)	1
15		Humidifier			*Configurable Output (AO or BO)*	
			DDC	FEC2610	BACnet Digital controller	1

Remark: * option for FA damper modulation by CO2

Operational Description

For auto mode, direct digital controller (DDC) provides time schedule for start/stop operation of AHU.

Duct type temperature sensor (TE-1) is installed to sense the return air temperature. When the system is in cooling mode, DDC provides modulating (PI) control for the motorized cooling valve (TV-1) based on the sensed return temperature and set point, so as to maintain the desired return air temperature.

When the system is in heating mode, DDC provides modulating (PI) control for the motorized heating valve (TV-2) based on the sensed return temperature and set point, so as to maintain the desired return air temperature.

A low temperature cutout thermostat (TS-1) is installed to sense the low temperature condition. While this signal is active, the heating valve will be driven to fully opened position to avoid icing of the coil.

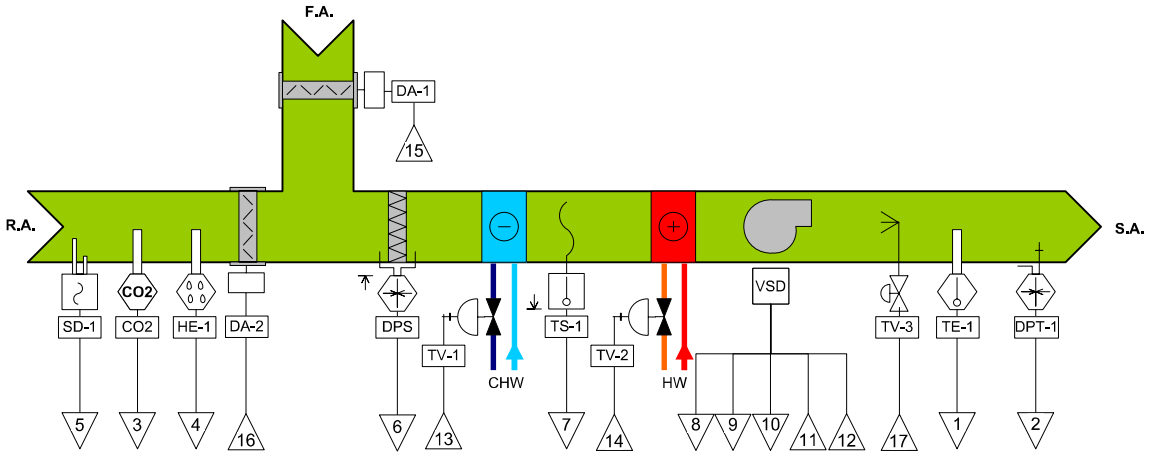
Duct type CO_2 gas detector (CO2) is installed to monitor the CO_2 gas concentration of return air. DDC provides modulating (PI) control for the motorized damper actuators (DA-1) based on the sensed gas concentration and set point, so as to maintain the desired return CO_2 gas concentration.

Current Switch Device (CSD) detects the current of fan motor for status or broken belts. DDC monitors the fan on/off status and trip alarm. The motorized cooling valve and damper actuators interlock with fan status. Both valves and dampers will be driven to fully close position when the fan shut down.

The differential pressure switch (DPS) monitors the status of filter, when the set point is exceeded, a signal will be driven to DDC. The smoke detector (SD-1) monitors the smoke status. Once smoke is detected as fire alarm, the fan will be shut down.

12. VAV AHU Controls

Cooling & Heating with Humidity Control, 4 pipes



	DDC		Equipment List			
			ID	Part Number	Description	Qty
1	AI	Supply Air Temp	TE-1	TE-6311M-1	Duct mount Temp. Sensor	1
2		Supply Air Static Pressure	DPT-1	PS-9101-8001	Differential Pressure Transmitter 750Pa	1
3		Return Air CO2*	CO2	CD-P00-00-0*	Duct mount CO2 Transmitter	1
4		Return Air RH	HE-1	HT-9000-UD1	Duct RH Sensor	1
5	BI	Smoke Alarm	SD-1	DH100ACDLP	Smoke Detector	1
6		Filter Alarm	DPS	P233A-10-AKC	Differential Pressure Switch	1
7		Anti-freeze Alarm	TS-1	A11D-4C / 270XT	Low Temp. cutout, manual reset	1
8		Fan Auto / Manual				
9		Fan Run Status	CSD	CSD-SA1E0-1	Current Switch, 1-135 A, Adj setpoint	1
10		Fan Trip Alarm				
11	BO	Fan Start/Stop				
12	AO	Fan VFD Speed Control				
13		Cooling Valve	TV-1	VG1000	Valve & Actuator (by selection)	1
14	CO	Heating Valve	TV-2	VG1000	Valve & Actuator (by selection)	1
15		Fresh Air Damper	DA-1	M91xx-AGA / -GGA*	Damper Actuator (by selection)	1
16		Return Air Damper	DA-2	M91xx-AGA	Damper Actuator on/off (by selection)	1
17		Humidifier				
			DDC	FEC2610	BACnet Digital controller	1
			IOM	IOM1710	Input / Output Module (4 BI)	1

Remark: * option for FA damper modulation by CO2

Operational Description

For auto mode, direct digital controller (DDC) provides time schedule for start/stop operation of AHU.

Duct type temperature sensor (TE-1) is installed to sense the supply air temperature. When the system is in cooling mode, DDC provides modulating (PI) control for the motorized cooling valve (TV-1) based on the sensed supply temperature and set point, so as to maintain the desired supply air temperature.

When the system is in heating mode, DDC provides modulating (PI) control for the motorized heating valve (TV-2) based on the sensed supply temperature and set point, so as to maintain the desired supply air temperature.

A low temperature cutout thermostat (TS-1) is installed to sense the low temperature condition. While this signal is active, the heating valve will be driven to fully opened position to avoid icing of the coil.

A differential pressure transmitter (DPT-1) measures the supply air duct static pressure. DDC modulate the fan speed via frequency inverter (VFD) to maintain the supply static pressure set point.

Duct type CO_2 gas detector (CO2) is installed to monitor the CO_2 gas concentration of return air. DDC provides modulating (PI) control for the motorized damper actuators (DA-1) based on the sensed gas concentration and set point, so as to maintain the CO_2 gas concentration not excess 1,000 ppm.

Current Switch Device (CSD) detects the current of fan motor for status or broken belts. DDC monitors the fan on/off status and trip alarm. The motorized cooling valve and damper actuators interlock with fan status. Both valves and dampers will be driven to fully close position when the fan shut down.

The differential pressure switch (DPS) monitors the status of filter, when the set point is exceeded, a signal will be driven to DDC. The smoke detector (SD-1) monitors the smoke status. Once smoke is detected as fire alarm, the fan will be shut down.