

MUAU Point List																			
Point		System and Service		Sensor						Features							Notes		
Name	Number [BACnet Object ID], Note 7			Type				Accuracy		Alarms		Trending							
										Limit		Warning		Samples1	Commissioning5				Operating5
				Hi	Lo	Hi	Lo	Time2	Local3	Archive4	Time2	Local3	Archive4						
Analog Inputs																			
	Supply filter differential pressure		Supply filter differential pressure	0-2 in.w.c. input,, 4-20 ma output transmitter				+/-1% full scale				24	1 hour	✓	✓	1 day	✓	✓	Note 6
	Supply air temperature		Air temperature leaving the furnace	Flexible averaging 1000 Ω Pt RTD with close coupled transmitter				Note 8, 9				60	1 min	✓	✓	1 min	✓	✓	Note 18
	MUAU-1 amps		MUAU 1 amps for proof of operation and energy	Current transformer								60	1 min	✓	✓	1 min	✓	✓	Note 7, 21, 23
	Exhaust fan amps		Exhaust fan amps for proof of operation and energy	Current transformer								60	1 min	✓	✓	1 min	✓	✓	Note 7, 19, 23
Analog Outputs																			
	Gas Heat Modulation		Modulates gas burner	4-20 ma output				N/A				60	1 min	✓	✓	1 min	✓	✓	
	Supply fan modulation		Modulates the supply fan VFD	4-20 ma output				N/A				60	1 min	✓	✓	1 min	✓	✓	Note 24
Digital Inputs																			
	MUAU-1 safety trip		Annunciates a safety shut down of the AHU	Note 10				N/A				10	COV	✓	✓	COV	✓	✓	
	KEF Fan Selector Switch		Selects the number of KEF fans in operation	IDEC HW45-5TF22N3 with HWAM-"Off-Lo-Hi", Note 18				N/A				10	COV	✓	✓	COV	✓	✓	Note 17, 18, 23
Digital Outputs (All digital outputs to include local override capability and indication)																			
	MUAU Enable		Enables MUAU fan and internal controls	Relay output				N/A				10	COV	✓	✓	COV	✓	✓	Note 12, 23
	KEF Fan 1 Enable		Enables KEF Fan 1	Relay output				N/A				10	COV	✓	✓	COV	✓	✓	Note 16, 23
	KEF Fan 2 Enable		Enables KEF Fan 2	Relay output				N/A				10	COV	✓	✓	COV	✓	✓	Note 16, 23
	KEF Fan 3 Enable		Enables KEF Fan 3	Relay output				N/A				10	COV	✓	✓	COV	✓	✓	Note 16, 23
	KEF Fan 4 Enable		Enables KEF Fan 4	Relay output				N/A				10	COV	✓	✓	COV	✓	✓	Note 16, 23
	KEF Fan 1 and 3 damper		Enables KEF Fan 4	24 vac 2 position damper				N/A				10	COV	✓	✓	COV	✓	✓	Note 16, 25
	KEF Fan 2 and 4 damper		Enables KEF Fan 4	24 vac 2 position damper				N/A				10	COV	✓	✓	COV	✓	✓	Note 16, 25
Hard Wired Points																			
	KEF Light Switch		Light switch to match fan switch	IDEC HW45-2 T-F10 with HWAM-"Lamp On-Off", Note 22				N/A				0	N/A	N/A	N/A	N/A	N/A	N/A	Note 22 23
	Intake damper		Motorized MUAU intake damper	Provided as part of the MUAU factory package				N/A				0	N/A	N/A	N/A	N/A	N/A	N/A	
	Intake damper limit switch		Interlocks MUAU operation with damper	Provided as part of the MUAU factory package				N/A				0	N/A	N/A	N/A	N/A	N/A	N/A	
Safety Interlocks (Hardwired to shut down the system. Safeties shall function no matter what position the equipment's Hand-Off-Auto, Inverter-Bypass, or other selector switches are in)																			
	Fire alarm shut down		Fire alarm system interlock	Software programmed based on fire alarm system input				N/A				0	N/A	N/A	N/A	N/A	N/A	N/A	Note 14
	Freezestat		Low discharge temperature safety	Provided as part of the MUAU factory package				N/A				0	N/A	N/A	N/A	N/A	N/A	N/A	
	Furnace high limit		High limit switch safety on furnace	Provided as part of the MUAU factory package				N/A				0	N/A	N/A	N/A	N/A	N/A	N/A	
Virtual Points																			
	Supply air temperature set point		Set point	Control process set point				N/A				5	COV	✓	✓	COV	✓	✓	
	Power failure recovery		Internal point monitoring controller power	Used to trigger a power failure recovery sequence				N/A				5	COV	✓	✓	COV	✓	✓	
	MUAU Speed Management		MUAU-1	Coordinates MUAU speeds with the number of KEFs running				N/A				5	COV	✓	✓	COV	✓	✓	Note 20, 23
Notes:																			
1.	Samples indicates the minimum number of data samples that must be held in the local controller if it is trending the point.																		
2.	Time indicates the required sampling time for the trending function.																		
3.	A check in the local column indicates that the trending only needs to be running in the local controller and the most recent value can write over the last value when the trend buffer fills up.																		
4.	A check in the archive column indicates that the trend data must be archived to the system hard disc when trend buffer fills up so that a continuous trend record is maintained.																		
5.	Commissioning trending requirements only need to be implemented during the start-up and warranty year. After the start-up and warranty process, the control contractor should set the trending parameters to the operating requirements listed if they differ from the commissioning requirements.																		
6.	Use flow and pressure drop to trend filter life cycle cost and trigger filter changes based on life cycle cost. See control logic and narrative for additional information.																		
7.	Monitor amps to provide a proof of operation in put and create a virtual meter to track energy use. Monitor amps to provide a proof of operation in put and create a virtual meter to track energy use. Accumulate and display current demand level, kWh for the day, and kWh for the previous day, calendar month, and calendar year. Archive data to the data to the dedicated archival data storage drive in the City's Data Center. See Network Diagram.																		
8.	0.75% of span for sensor plus transmitter combined.																		
9.	2 feet of element for every 4 sq.ft. of duct area, 6 ft. minimum length.																		
10.	Wire safety devices to pilot a relay and keep it energized in normal operation so that a safety trip de-energizes the relay. Use relay contacts to interlock the supply fan VFD, the exhaust fan VFD, and to provide a digital status input to the DDC system. Safeties shall function no matter what the position of the starter Hand-Off-Auto selector switch is.																		
11.	Provide interface relay (one per point) wired per vendor wiring diagrams. Verify the interface relay current draw with both relays energized will not overload the vendor's control power transformer.																		
12.	Enable point allows factory control circuit to start and stop the various motors, drives and actautors associated with the AHU.																		
13.	Multistage electric resistance heater shall have an SCR for the first stage. Logic shall be arranged to provide modulated capacity through the entire operating range by coordinating the operation of the SCR controlled stage with the remaining across the line stages.																		
14.	Wire to contacts in a device furnished and installed by fire alarm contractor in the supply duct per the requirements of NFPA 90A, NFPA 72 and the City of Seattle Fire Code.																		
15.	Part of the factory package; set for 38°F with a 10 minute delay on start-up																		
16.	KEF consists of 4 fans which are staged up from 1 to 4 fans as the fan speed switch moves from minimum to maximum speed.																		
17.	This is a 5 position selector switch that will be mounted in the casework below the range hood. The switch is a center off switch but the design intent is for CW rotation to take the KEF fans from 0 to 4 (low to high exhaust). To accomplish this, the switch us used as an input to the Siemens control system and logic in the control system sequences the fans. The narrative sequence includes truth tables and logic for accomplishing this.																		
18.	5 position center off switch, early make, late break contacts, black handle, knob lever with white insert and metal bezel, custom engraved nameplate; see narrative sequence for truth table.																		
19.	Furnish and install one CT that monitors the current to the four fans in the hood, but not the lights. Coordinate with the Cx provider and TAB contractor during start-up to document the current levels associated with 1, 2, 3, and 4 fan operation and include this information in a table on the graphic for the system.																		
20.	See the truth tables and logic in the narrative sequence for details regarding how this point is used. In general terms, it allows a MUAU speed to be associated with the combination of KEF fans that are in operation.																		
21.	Use one CT to monitor the total amps to the unit. Coordinate with the Cx provider and TAB contractor during start-up to document the current levels associated with fan operation and burner blower operation and document them in a table on the system graphic.																		
22.	2 position maintained switch, black handle, knob lever with white insert and metal bezel, custom engraved nameplate;. Furnish and install this switch adjacent to the fan speed switch and wired it to control the hood light directly. Provide a device partition in the electrical box to separate the low voltage and high voltage wiring devices and associated connections. See detail on TC5.11.																		
23.	ASI 049; Reflects the control requirements for a four speed kitchen exhaust hood and variable flow make-up air instead of an "On-Off" hood and make up air.																		
24.	If a 2-10 vdc input is required at the VFD, provide a load resistor terminal block at the VFD location; Entrelec M 4/6.CA I/U - 500 with FEM6b end section or equal. If a variable resistance input is required, furnish and install a Greystone Electronics Analog Resistance Module, Model GT-ARES with the resistance range selected to match the VFD control system requirements.																		
25.	There are two ducts associated with the kitchen exhaust fan. Each duct serves two of the four blowers. Software logic will be used to open the correct damper or dampers based on which fans are in operation. Field verify which fans are associated with which ducts.																		

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ASI 049

100% CONSTRUCTION DOCUMENTS

Weinstein A+U
Architects + Urban Designers LLC
2200 Western Avenue Suite 301
Seattle, WA 98121
T 206 443 8606
F 206 443 1218
Weinsteinau.com

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NW Satellite Office
8560 North Buchanan Avenue
Portland, Oregon, 97203
Phone: (503) 286-1494
DSellers@FacilityDynamics.com








Corporate Office
6760 Alexander Bell Drive, Suite 200
Columbia, MD 21046
Phone: (410) 290-0900
www.FacilityDynamics.com



**CITY OF
SEATTLE**

Fire Station 22
901 E. Roanoke St.
Seattle WA 98102

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PROJECT-NO	13004
DRAWN	DAS
CHECKED BY	CBM
DATE	1/11/16
REVISIONS	DATE
 Revision 1 - ASI 049, 2016-11-14	
	
	
	
	
	
	
SHEET TITLE	
MUAW Point List	
SHEET NUMBER	
TC 0.20	