CLICK TO JUMP TO INDEX

Dedicated Outside Air Unit w/Energy Recovery Sequence of Operation
(Constant Volume ERU)

The Building Management System (BMS) will send the controller a user definable run schedule. If the BMS is not present, or communication is lost, the controller will operate using last known sequence.

Run Conditions - Schedule:
The unit shall run according to a user definable time schedule in the following modes:

Occupied Mode:
The supply fan will run continuously at constant speed after O.A. damper has fully open. The exhaust fan will run continuously at constant speed with E.A. damper open. The energy recovery wheel will be activated. Controller will modulate/stage DX cooling, enable hot gas reheat, and/or gas heat to discharge neutral air to space at 70°F (adj.) and 55%RH (adj.) when OAT is greater than 60° F or 74°F (adj.) when OAT is less than 60°F. The compressor/gas heat shall operate subject to its own internal safeties and controls.

Unoccupied Mode:
The unit is disabled, supply/exhaust fans off; and the outside air/exhaust air dampers shall close. Unit can be enabled to occupied mode from BMS for 2 hour(s) (adj.).

Staggered start:
This application shall prevent all controlled equipment from simultaneously restarting after a power outage or fire alarm restart. The order in which equipment (or groups of equipment) is started and the time delay between starts shall be user-selectable.

Morning Warm-Up/Cool-down/Optimal Start:
The unit does not run during morning warm-up, cool down, or optimal start..

Supply Fan Operation:
The supply fan shall be enabled during occupied mode and disabled during the unoccupied mode. The controller monitors fan operation.

Exhaust Fan Status:
The exhaust fan shall be enabled during occupied mode and disabled during the unoccupied mode. The controller monitors fan operation.

Building Pressurization:
Supply fan CFM is balanced per contract documents. Exhaust fan CFM is balanced per contract documents.

System Shutdown:
On a signal from the BMS or from the fire alarm system the RTU shall be shutdown with the supply and exhaust fans de-energized; and the O.A. and E.A. damper shall be closed. Upon fire alarm reset, unit shall return to operating mode.

Smoke Control:
Duct mounted smoke detectors located in the supply air ductwork shall shutdown the unit with the supply and return fans de-energized and closing the O.A. and E.A. damper upon sensing smoke. A signal from the duct smoke detector shall activate the fire alarm system.

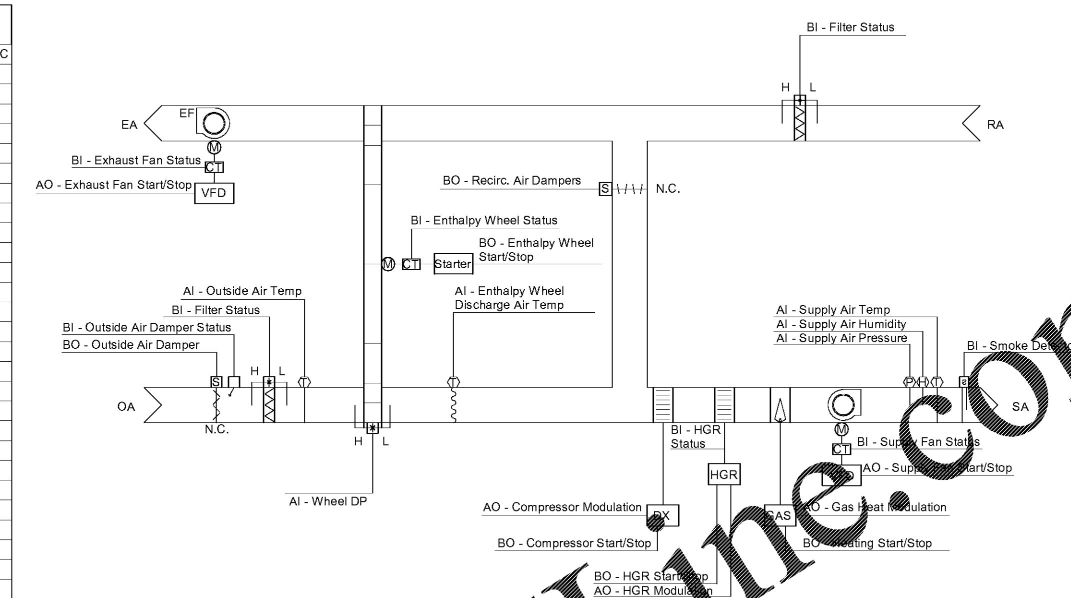
Condensate Overflow Switch Status:
Unit shuts down and BMS alarms upon activation of condensate overflow switch.

Filter status:
A differential pressure switch will monitor the differential pressure across the filter when the fan is running. If the switch closes for 2 minutes after a request for fan operation a dirty filter alarm will be annunciated at the BMS. Set the differential pressure switch to close at a differential pressure of 0.9" WC (adj.).

Supply Fan Alarms:
Alarms shall be provided as follows:
- Failure: Commanded on, but the status is off.
- Running in Hand: Commanded off, but the status is on.

Constant Volume ERU

POINT NAME	HARDWARE POINTS				SOFTWARE POINTS						
	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM	SHOW ON GRAPHIC
DISCHARGE AIR TEMP	X								X		X
DISCHARGE AIR HUMIDITY	X								X		X
DISCHARGE HUMIDITY SETPOINT									X		X
DISCHARGE TEMP. SETPOINT									X		X
SUPPLY AIR SMOKE DETECTOR			X						X	X	X
SUPPLY FAN START/STOP				X					X		X
SUPPLY FAN STATUS		X	X						X		X
EXHAUST FAN START/STOP				X					X		X
EXHAUST FAN STATUS			X						X		X
SENS. /ENTH. WHEEL START/STOP				X					X		X
SENS. /ENTH. WHEEL STATUS			X						X		X
COMPRESSOR 1 START/STOP				X					X		X
COMPRESSOR 1 STATUS			X						X		X
COMPRESSOR MODULATION		X							X		X
GAS HEAT START/STOP				X					X		X
GAS HEAT MODULATION		X							X		X
HOT GAS REHEAT STATUS			X						X		X
HOT GAS REHEAT MODULATION		X							X		X
O.A. DAMPER ENABLE/DISABLE				X					X		X
O.A. DAMPER STATUS			X						X		X
RECIR. DAMPER ENABLE/DISABLE				X					X		X
RECIR. DAMPER STATUS			X						X		X
WHEEL DIFFERENTIAL PRESSURE			X						X	X	X
FILTER DIFFERENTIAL PRESSURE			X						X	X	X
SUPPLY AIR SMOKE DETECTOR			X						X	X	X
SUPPLY AIR PRESSURE	X		X						X		X
CONDENSATE OVER FLOW SWITCH STATUS			X						X		X
UNIT ALARM			X						X		X
SCHEDULE								X			



1 CONTROLS - ERU (CONSTANT VOLUME)
NOT TO SCALE

Variable Refrigerant System Sequence of Operation (VRFC/VRHP)

Run Conditions:
Each indoor fan coil will be controlled by a low voltage wall mounted controller, provided with the equipment. Units in corridors and bathrooms shall be controlled off of a wall mounted remote thermostor. The controller will activate cooling and heating to maintain space set-point, it will provide fan speed selection and automatic change over control. Each system control will be tied into the manufacturer VRS controller (i-touch manager or equivalent) for setpoint, monitoring, scheduling, and alarms.

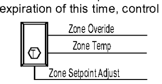
Run Conditions - Schedule:
The unit shall run according to a user definable time schedule in the following modes:

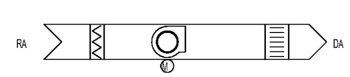
Occupied Mode:
The unit shall maintain the following space temperature setpoints: A 74°F (adj.) cooling setpoint and a 70°F (adj.) heating setpoint. Controller shall modulate, and/or cycle DX cooling or DX heatpump heat to maintain the occupied space temperature setpoint.

Unoccupied Mode:
The unit shall maintain the following NSB space temperature setpoints: An 78°F (adj.) cooling setpoint and a 65°F (adj.) heating setpoint.
The unit shall be disabled. When the space temperature drifts out of the NSB setpoint range, the unit shall be enabled and cycles to satisfy set point.

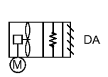
Zone Setpoint Adjust:
The occupant shall be able to adjust the zone temperature heating and cooling setpoints +/- 3°F at the zone sensor.

Zone Unoccupied Override:
A timed local override control shall allow an occupant to override the schedule and place the unit into an occupied mode for 2 hours (adj.). At the expiration of this time, control of the unit shall automatically return to the schedule.





2 CONTROLS - VARIABLE REFRIGERANT SYSTEM
NOT TO SCALE



Run Conditions - Cycle:
The built-in thermostat shall be calibrated to maintain a heating setpoint of 72°F (adj).

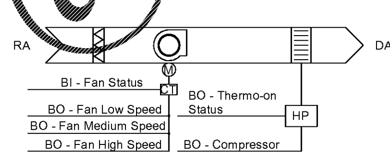
3 CONTROLS - EH (INTEGRAL T-STAT)
NOT TO SCALE

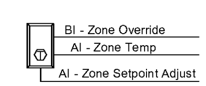
MAHU Sequence of Operation (MAHU)

Run Conditions:
Each system will be controlled by a low voltage wall mounted thermostat controller, provided with the equipment. Thermostat will activate cooling and heating to maintain space set-point, it will provide fan speed selection and automatic change over control. Each system control will be tied into the VRS controls for setpoint, monitoring, and alarms.

MAHU-XXX

POINT NAME	HARDWARE POINTS				SOFTWARE POINTS						
	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM	SHOW ON GRAPHIC
ZONE TEMPERATURE	X								X		X
ZONE TEMPERATURE SETPOINT					X				X		X
FAN STATUS				X					X		X
UNIT ALARM			X						X		X
OPERATION MODE				X					X		X





4 CONTROLS - MAHU
12" = 1'-0"

PLAN NORTH
8 0 8 16
SCALE: 1/8" = 1'-0"

SA&E PROJECT NUMBER	01-615-057
BID PACKAGE / PHASING	BP-1
ISSUED FOR CONSTRUCTION	10/15/2019

REVISIONS

R #	Doc #	Date

Southern A&E LLC
7951 Troon Circle
Austell, Ga 30168
(770) 819-7777
architects & engineers

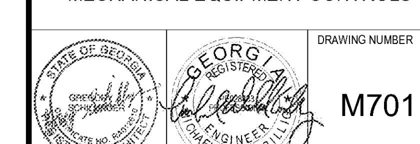
ADD ALTERNATE #1
BOARD OF EDUCATION OFFICE FOR:

HEARD COUNTY SCHOOLS

4647 PEA RIDGE ROAD, FRANKLIN, GA 30217

HEARD COUNTY SCHOOL SYSTEM
FRANKLIN, GEORGIA

MECHANICAL EQUIPMENT CONTROLS



DRAWING NUMBER
M701

ORIGINAL SHEET SIZE: ARCH E1 (30" X 42")