



VA Medical Center  
Lebanon, PA

SEMCO order #: 37517 revision #: 01

**SCOPE OF WORK FOR UNIT TAGGED: AC-13-1**

UNIT	Model	EPHCH-09 Energy Recovery System			
	Hand	RIGHT			
CONSTRUCTION	Installed	Outdoors - Self flashing for curb mounting (curb by others)			
	Enclosure Construction	Std. galvanized			
FANS	Supply Air	5,290	CFM		
	Outside Air	6,473	CFM	includes wheel purge	
	Outside / Supply Side Pressure	2.75	in. wg. ESP,	6.2	in. wg. TSP (includes pressure drop for loaded filters)
	Supply Fan Motor	15	HP, ODP Premium Eff.		
	Return Air	5,290	CFM		
	Exhaust Air	6,883	CFM	includes wheel purge	
	Return / Exhaust Side Pressure	2.75	in. wg. ESP,	4.6	in. wg. TSP (includes pressure drop for loaded filters)
	Exhaust Fan Motor	10	HP, ODP Premium Eff.		
	WHEEL	Enthalpy Wheel	Variable speed w/ Rotation Detector		
		Control	of wheel VFD by SEMCO. See Sequence of Operation and Wiring Schematic for additional information.		
FILTERS	ASHRAE test std. 52-96				
	OA filter bank	25-30% efficiency (2" deep)			
	RA filter bank	25-30% efficiency (2" deep)			
	Filter Gauges @ ea. filter bank	Dwyer Magnehelics - std. model 2001LT			
	SA filter bank	80-85% efficiency (12" deep)			
DAMPERS	Filter Gauges @ ea. filter bank	Dwyer Magnehelics - std. model 2003LT			
	Outside Air	Galvanized Steel w/ 24 volt, 2-position actuator			
AUX COOLING & HEATING	Exhaust Air	Aluminum, counter-balanced, back-draft			
	Fluid Cooling	Chilled Water Cooling			
	Steam Pre-Heating	Vertical Steam Pre-Heat Coil 30 psi			
	Steam Re-Heating	Horizontal Steam Re-heat Coil 30 psi			
	Control	by other than SEMCO			
HUMIDIFIER	Steam to Steam	Dri-Steem STS-50C steam to steam generator is factory-mounted in the RA/EA side of the unit and piped to a Dri-Steem Ultra Sorb LV vertical tube steam injection distribution manifold that is factory-mounted in the unit as shown on the General Arrangement drawing.			
		18" absorption distance w/ 5,290 cfm entering air @ 55° F db / 25.8 grains producing air entering reheat coil @ 55° F db/ 33.2 grains and a maximum capacity of 185 lb/hr.			
	Control	by other than SEMCO			
ELECTRICAL	FIELD POWER CONNECTIONS ARE REQUIRED AT THE FOLLOWING:				
	480/3/60	at the main unit electrical panel.			
	120 volt	at the GFI receptacle for the lights and a receptacle			
SPECIAL	SEE THE WIRING DIAGRAM FOR ADDITIONAL DETAILS.				



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**SCOPE OF WORK FOR UNIT TAGGED: AC-13-1 SPECIALS CONTINUED:**

**ACCESS DOOR WINDOWS:**

- The units doors accessing fans, coils, & humidifier will have double pane, wire-glass windows.

**STEAM COIL TUBES:**

- Steam coils are provided with 0.025" tube walls rather than standard 0.020".

**FAN MOTOR VFD'S:**

- One, 15 hp, Yaskawa Model CIMR-E7U-40111 VFD provided by SEMCO for the SUPPLY FAN.
- One, 10 hp, Yaskawa Model CIMR-E7U-47P51 VFD provided by SEMCO for the EXHAUST FAN.
- The VFD body is NEMA 1 and mounted in the RA intake plenum as shown on the GA drawings.
- The VFD keypad is remote mounted in the controls panel on the unit exterior.
- See the electrical wiring diagram for additional information.

**HUMIDIFIER SECTION:**

- Floor of humidifier distribution section will have stainless steel pan with 1½" drain to unit exterior
- Dri-Steem STS (Steam-To-Steam) humidifier will be factory mounted in the RA/EA side of the unit and piped to a Dri-Steem Ultra Sorb LV vertical tube steam injection distribution manifold that is factory-mounted in the unit as shown on the General Arrangement drawing.
- Control panel is wall mounted near the steam generator.
- Humidifier includes the following:
  - Stainless steel evaporating chamber
  - Probe type water level control, electronic level control module and control transformer all mounted and wired in control cabinet.
  - Surface skimmer and manual drain valve mounted
  - Electroless nickel plating on copper heat exchanger
  - Solenoid water fill valve and strainer mounted and wired.
  - Vapor-Logic microprocessor, cabinet mounted keypad, wall mounted room transmitter +3% RH, auto drain and end of season drain
- Dri-Steem Ultra-Sorb LV Vertical Tube Dispersion , including:
  - Steam supply header/seperator and assembled package of stainless steel tubes in galvanized metal casing.
- These parts are shipped loose for field installation by others:
  - Electric modulating steam valve, steam trap, and strainer
  - Duct High Limit
  - Air flow proving switch
  - F&T steam trap – shipped loose.
- All other piping and control connections are field provided by others.

**FIELD UNIT START-UP:**

- SEMCO's factory trained personnel will provide unit start-up service at the job site.
- An appointment should be made with the SEMCO DWP Service Dept. a minimum of two weeks prior to the required start-up date. Contact the DWP Service Dept. at 573-443-1481

**NOTE ON EQUIPMENT SERVICING:**

- Removable panels are provided as shown on GA drawing to facilitate removal of steam and water coils.
- Fan motor, wheel, shaft, and bearings may be removed through unit access doors.



VA Medical Center

SEMCO order #: 00000

revision #:

## Sequence of Operation

Program #: 01-01

### UNIT TAGGED: AC-3-1 & AC-13-1

1. If the outdoor air (input B4) is warmer than the return air (B2) then the mode is **summer cooling**.
2. If condition (1) is not true (outdoor air is cooler than return air) then the mode is **winter heating**.

In **summer cooling mode**, the wheel speed is always 100% and the controller output is 10VDC.

In **winter heating mode**, the output is the minimum of the two following loops:

1. Condensation control - the wheel modulates to maintain the exhaust condensation setpoint. This is a direct (cooling) loop. If the exhaust temperature (B3) drops below the setpoint, the wheel slows down to maintain the setpoint. Except on a very cold day or with a very high setpoint, the wheel cannot reach this setpoint, and this output will be 100%.
2. Supply temperature control - The wheel modulates to maintain the supply setpoint with discharge temperature (B1) as feedback. This is an indirect (heating) loop. If the discharge temperature is below the setpoint, the wheel speeds up; above the setpoint, the wheel slows down.

If the outdoor air is warmer than the heating setpoint, but cooler than the return air, the controller output will be 0% and the wheel will rotate at ¼ RPM (economizer mode).

#### Alternate setpoints:

During normal operation, the controller displays a ☀ symbol. If a contact is made between terminals E1 and G on the controller, a ☾ symbol will appear and an alternate supply temperature setpoint will be used. The condensation control setpoint will not change.

#### Controller Legend:

##### Program 01-01

- B1 - Supply air temperature
- B2 - Return air (space) temperature
- B3 - Exhaust air temperature
- B4 - Outdoor air temperature
- Y1 - Analog output 0-10VDC → ¼ - 20 RPM

To adjust setpoints, hold both + and - keys for 5 seconds until PARA 1 appears. Make desired corrections to the last three screens of the programming code. To access the on delays, minimum time between cycles, or P I constants, hold down the + and - keys 10 seconds until PARA 2 appears. It is recommended that SEMCO Engineering (573/443-1481) be consulted before changing any PARA 2 parameters.