

**SEQUENCE OF OPERATION**

THE CONTROLLER SHALL RUN THE RUN-AROUND LOOP PUMP AND MODULATE THE RUN-AROUND LOOP MIXING VALVE FOR ENERGY RECOVERY AS FOLLOWS.

**COOLING RECOVERY MODE WHENEVER:**

- THE SUPPLY FAN IS ON.
- RETURN AIR TEMPERATURE IS 5°F (ADJ.) OR MORE BELOW THE OUTSIDE AIR TEMPERATURE.
- AHU SYSTEM IS IN A COOLING MODE.

WHILE IN COOLING RECOVERY

- THE RUN-AROUND LOOP PUMP SHALL RUN CONTINUOUSLY
- CONTROLLER SHALL MEASURE THE RUN-AROUND LOOP COIL DISCHARGE AIR TEMPERATURE (DOWNSTREAM OF THE OUTSIDE AIR COIL) AND MODULATE THE RUN-AROUND LOOP MIXING VALVE TO MAINTAIN A SETPOINT 2°F (ADJ.) LESS THAN THE UNIT SUPPLY AIR TEMPERATURE SETPOINT.

**HEAT RECOVERY MODE WHENEVER:**

- THE SUPPLY FAN IS ON.
- RETURN AIR TEMPERATURE IS 5°F (ADJ.) OR MORE ABOVE THE OUTSIDE AIRTEMPERATURE.
- AHU SYSTEM IS IN HEATING MODE.

WHILE IN HEAT RECOVERY MODE

- THE RUN-AROUND LOOP PUMP SHALL RUN CONTINUOUSLY
- CONTROLLER SHALL MEASURE THE RUN-AROUND LOOP COIL DISCHARGE AIR TEMPERATURE (DOWNSTREAM OF THE OUTSIDE AIR COIL) AND MODULATE THE RUN-AROUND LOOP MIXING VALVE TO MAINTAIN A SETPOINT 2°F (ADJ.) LESS THAN THE UNIT SUPPLY AIR TEMPERATURE SETPOINT.

**FROST PROTECTION MODE WHENEVER:**

- RUN-AROUND LOOP TEMPERATURE DROPS BELOW 33°F (ADJ.) OR THE EXHAUST AIR TEMPERATURE DROPS BELOW 30°F (ADJ.).

WHILE IN FROST PROTECTION MODE

- THE RUN-AROUND LOOP PUMP SHALL RUN AND THE RUN-AROUND LOOP MIXING VALVE SHALL CLOSE TO 0% (ADJ.) IN ORDER TO CIRCULATE WATER THROUGH THE RUN-AROUND LOOP EXHAUST AIR COIL

**ALARMS SHALL BE PROVIDED AS FOLLOWS:**

- RUN-AROUND LOOP PUMP SYSTEM FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- RUN-AROUND LOOP PUMP IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
- RUN-AROUND LOOP PUMP STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

**WATER PUMP START/STOP AND SPEED CONTROL**

THE RUN-AROUND LOOP PUMP SYSTEM SHALL RUN CONTINUOUSLY WHILE IN RECOVERY MODE

- THE BAS SHALL START/STOP, AND PROVE OPERATION OF THE HOT WATER PUMPS.

**IF REDUNDENT PUMP SYSTEM IS USED THE FOLLOWING SEQUENCE SHALL OCCURE**

**PUMP FAILURE SEQUENCE**

- THE BAS SHALL START/STOP, AND PROVE OPERATION OF THE HOT WATER PUMPS.
- UPON FAILURE OF THE PRIMARY PUMP, BAS SHALL ISSUE A START COMMAND TO THE STANDBY PUMP AND ALARM THE PRIMARY PUMP.
- IF ANY PUMP IS DISABLED LOCALLY AND THE SYSTEM IS ENABLED THE REMAINING PUMP WILL OPERATE AS PRIMARY UNTIL THE DISABLED PUMP IS ENABLED LOCALLY, AT THAT TIME THE SYSTEM WILL REVERT BACK TO THE ORIGINAL RUN TIME SEQUENCE.
- UPON FAILURE OF THE PRIMARY PUMP, AND THE STANDBY PUMP, THE BAS SHALL ALARM BOTH PUMPS.

**PUMP ROTATION SEQUENCE**

THE PUMPS SHALL ALTERNATE ON THE SECOND TUESDAY OF EVERY MONTH AT 10:00 AM BASIS:

- PRIMARY / STANDBY STATUS SHALL BE ANNUNCIATED FOR EACH PUMP AT THE BAS
- THE PRIMARY PUMP SHALL BE SELECTABLE FROM THE BAS
- IF THE STANDBY PUMP IS PUT IN HAND LOCALLY THE PRIMARY PUMP WILL CONTINUE TO RUN

**REPORTS AND TRENDING**

ALL PHYSICAL INPUTS, OUTPUTS, SET POINTS, AND ALARMS SHALL BE TRENDED