

AIR HANDLING UNITS OPERATING SCENARIO (Rev. 0 / 25.01.2005)

Related Control Drawing : CITY B-ACD-106

AHU-5/EF-15	For Basement Floor Machine Room Ventilation
AHU-6/EF-16	For 13 th Floor Machine Room Ventilation
AHU-7/EF-17	For 27 th Floor Machine Room Ventilation

General :

- ❑ The air handling unit (AHU) and its exhaust fan (EF) will be started or stopped by the digital controller as a weekly user determined time schedule.
- ❑ System operator can also be started or stopped AHU manually from central, using graphic operator terminal.
- ❑ AHU is also started or stopped from the local electric panel for maintenance or repair purposes.
- ❑ Main (2 duty and 1 stand-by) circulation pumps (PU-ACH1.1 / PU-ACH1.2 / PU-ACH-1.3 are running into operation during heating season. These pumps have their frequency inverter. When the 2-way valves are opened the speed of the pumps is increased, otherwise decreased. Duty pumps are rotated with stand-by pump weekly.

Winter Operation :

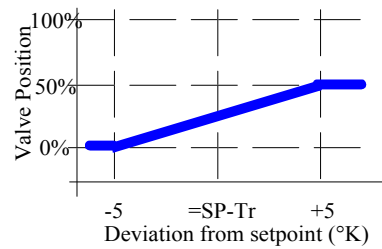
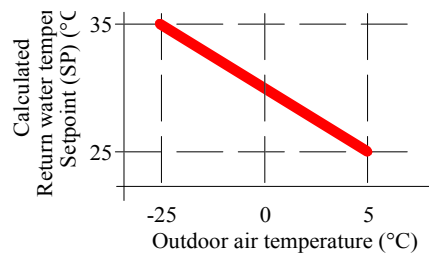
- ❑ Whenever AHU started, first of all heating valve (CV-HC) is fully opened.
- ❑ The heating coil will be warmed-up 30-60 seconds, then supply fan run into operation.
- ❑ Fresh air (DA01) / exhaust air (DA02) dampers are electrically interlocked with supply fan (SF) / exhaust fan (EF). Fresh/exhaust air dampers have got an end switch for damper status (open/close). Whenever supply/exhaust fan run into operation, first damper actuator begin to open. When the damper actuator fully opened end switch enable to supply/exhaust fan run into operation.
- ❑ Supply/exhaust fans will not be run into operation if damper actuator not to be fully opened. This operation prevents AHU and damper from vacuum condition.
- ❑ After the supply fan has been started, DPS02 will send “supply fan running” signal to the controller. As soon as the controller receive this information, it enable to exhaust fan run into operation
- ❑ Whenever supply/exhaust fan stopped, damper actuator will closed via its spring return mechanism, circulation pump will stopped and control valve will be closed. *(for exceptional cases see frost protection section)*
- ❑ Supply air temperature (TS1) is kept constant at set point (+16 ° C) by positioning the heating coil control valve (CV-HC) in proportional+integral (PI) mode.
- ❑ Return air temperature (TS2) is monitored from the central. Also if required cascade control will be done.

Summer Operation :

- ❑ Fresh air (DA1)/exhaust air (DA2) dampers are electrically interlocked with supply (SF) / exhaust (EF) fans. Fresh/exhaust air dampers have got an end switch for damper status (open/close). Whenever supply/exhaust fan run into operation, first damper actuator begin to open. When the damper actuator fully opened end switch enable to supply fan run into operation.
- ❑ Supply/exhaust fans will not be run into operation if damper actuator not to be fully opened. This operation prevents AHU and damper from vacuum condition.
- ❑ Whenever supply (SF) / exhaust (EF) fans stopped, damper actuator will closed via its spring return mechanism and control valve (CV-HC) will keep closed.
- ❑ Outdoor air supplied at ambient temperature.
- ❑ In summer, the manual valves serving the heating coils are closed so that there is no water circulation through the heating coils.

Frost Protection :

- ❑ To prevent frost for air handling unit, two stage safety thermostats has placed on the units.
- ❑ A capillary tube frost protection thermostat (FT) has placed just after the heating battery.
- ❑ This thermostat has to be manually resettable type. Also capillary tube can sense along the all tube.
- ❑ Second safety step is another thermostat (temperature sensor-TR) which is placed on the return pipe of the heating coil.
- ❑ Air side thermostat (FT) shall be set +8°C. Water side thermostat (sensor) (TR) shall be set +20°C. When the air temperature after the heating coil falls below +8°C, or return water temperature of the heating coil falls below +20°C (which is first) a frost alarm has to send dispatcher room and also protection steps of the unit has activated by the controller automatically.
- ❑ As soon as a frost alarm happens, supply fan is stopped, damper will be closed, heating coil control valve CV-HC will be fully opened and enabled to circulate hot water inside of the heating battery by the controller.
- ❑ In case of the air handling unit is not running (there is no frost alarm) and the outdoor temperature equal or below +5°C heating valve keep open required position for regulating return water temperature.



Tr : Heating coil return water temperature

Monitoring :

- ❑ Supply/exhaust fan status, filter dirty alarms, fan failure alarms, pump status, pump faults, supply/exhaust air temperatures and valve positions shall be monitored at the dispatcher room by the operator with a graphic operator terminal (PC).
- ❑ Fan and circulation pumps running times monitored for maintenance purposes.
- ❑ All points shall be monitored and maintained from dispatcher room and also controller locally.

Fire Mode :

- ❑ In case of fire, all air handling units will be stopped by the controller automatically.
- ❑ Fire alarm information will be taken from fire alarm panel for each fire zone.