

251300 Building Automation Reporting

1.1 Alarming

**** PROJECT NOTE, for the Consultant ****

The Consultant must contact the UF FS group prior to issuing the specification to discuss general alarming requirements appropriate for the project.

- A. In general most of the alarms generated within the BAS shall be set up for graphic display only and shall not be routed to remote notification devices. The only exception is generally with respect to equipment status alarms (i.e. AHU fans, Pumps, Chillers, Condensate Pumps, etc.)
- B. The project shall include enhanced alarm programs for all system points. These points shall be programmed for appropriate seasonal high or low alarm limits. Enhanced alarm programs shall prevent abnormal alarms from occurring when the associated system has been deactivated. For example: air handler, building chilled water, heating water system etc... Alarms shall occur only while systems are active and being supplied with chilled/hot water or steam and at normal operating temperatures and pressures. Alarm destinations, alarm messages, and point graphic assignments shall be included so that alarms are indicated and printed at a pre-defined Owner reporting device and recorded on a transaction log. Alarms shall have accurate descriptions and response instructions, so that alarms may be quickly associated with appropriate graphic display.
- C. The BAS vendor shall define the specific system reactions for each point. Alarms shall be enhanced and prioritized to minimize nuisance reporting and to speed operator response to critical alarms. A minimum of six priority levels shall be provided for each point. The BAS vendor shall initially define all point priority levels for handling of all system alarms. Users shall have the ability to manually inhibit alarm reporting for each point.
- D. Alarm reports and messages shall be directed to a user-defined list of operator devices or PCs based on time (after hour destinations) and/or based on priority.
- E. In addition to the point's descriptor and the time and date, the BAS vendor shall create, print, display and store an alarm message for each point to more fully describe the alarm condition or to direct operator response. Alarm events may be configured to send an alarm message to a specified client e-mail address, cellular phone number via SMS text messaging.
- F. The following alarm table shall be used and edited for each project.

REMOTE ALARM NOTIFICATION REQUIREMENTS			
POINT TYPE	SETUP	REFERENCE POINT	DELAY
FANS	FEEDBACK	STATUS POINT	5 MINUTES
PUMPS	FEEDBACK	STATUS POINT	5 MINUTES
SMK DAMPERS - 2 POSITION	FEEDBACK	STATUS POINT	5 MINUTES
BOILER FAULT	ALARM	FEEDBACK	5 MINUTES
CHILLER FAULT	ALARM	FEEDBACK	5 MINUTES
AHU CHW COIL CONDENSATE	ALARM	FEEDBACK	5 MINUTES
FCU CONDENSATE	ALARM	FEEDBACK	5 MINUTES
FCU FAN	ALARM	FEEDBACK	5 MINUTES
CO2 ALARM	ALARM	FEEDBACK	5 MINUTES

LOCAL GRAPHIC ALARM REPORTING REQUIREMENTS			
POINT TYPE	SETUP	REFERENCE POINT	DELAY
TERMINAL UNIT AIR FLOW	+/- 25%	SETPOINT	15 MINUTES
AHU OUTSIDE AIRFLOW	+/-10%	SETPOINT	15 MINUTES
SPACE TEMPERATURE	+/- 2 DEGF	HTG AND CLG SETPOINT	15 MINUTES
SPACE HUMIDITY	> 70%	HIGH LIMIT	30 MINUTES
SPACE CO2	> 1300 PPM	HIGH LIMIT	30 MINUTES
DISCHARGE AIR TEMPERATURE	+/- 2 DEGF	HTG AND CLG SETPOINT	15 MINUTES
STATIC PRESSURE	+/- 25%	SETPOINT	5 MINUTES
HW SUPPLY TEMPERATURE	+/- 10 DEGF	SETPOINT	15 MINUTES
CHW SUPPLY TEMPERATURE	> 3 DEGF	45 DEGF	15 MINUTES
WATER DIFFERENTIAL PRESSURE	+/- 25%	SETPOINT	15 MINUTES
DAMPERS - MODULATING	+/- 25%	COMMAND VS FEEDBACK	15 MINUTES
CONTROL VALVES - MODULATING	100%	HIGH LIMIT	15 MINUTES
DAMPERS - MODULATING	100%	HIGH LIMIT	15 MINUTES
PRE-FILTERS	> 1.0 INWG	HIGH LIMIT	30 MINUTES
AFTER FILTERS	> 1.5 INWG	HIGH LIMIT	30 MINUTES
LOW LIMIT SAFETY (FREEZESTAT)	ALARM	FEEDBACK	5 MINUTES
VFD FAULT	ALARM	FEEDBACK	5 MINUTES
BUILDING PRESSURE	< .005 INWG; >	SETPOINT	30 MINUTES

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**** PROJECT NOTE, for the Consultant ****

The Consultant must contact the UF FS group prior to issuing the specification to discuss schedules and working hours. The appropriate Occupied/Unoccupied Schedules shall be furnished to the BAS vendor in this specification section or on an appropriate schedule on the drawings.

1.2 Schedules

- A. A list of schedules to be implemented shall be reviewed and approved by the Professional. The list shall also include the schedule times (Occupied and Unoccupied) to be implemented.

1.3 Trends

- A. All input and output control and status points, and setpoints, will have trends set-up and enabled. Each trend will store a minimum of 500 samples in the associated controller utilizing a first-in/first-out algorithm so that the oldest data is over-written as new data is stored. All trended points shall be configured for historical trending at the vendor specific server.
- B. All trends shall be programmed to be triggered according to the type of point, as follows:
 - 1. All equipment start/stop control point trends will be triggered on the control point's change of state.
 - 2. All equipment status point trends will be triggered on the status point's change of state.
 - 3. All space-temperature and outside-air trends will be triggered on any change of value of +/-2 F.
 - 4. All space-humidity and outside-air-humidity trends will be triggered on any change of value of +/- 5% RH.
 - 5. All fan air temperature trends will be triggered on any change of value of +/- 2 F.
 - 6. All water temperature trends will be triggered on any change of value of +/- 2 F.
 - 7. All damper motor control point trends will be triggered on any change of value of 10% of its control range.
 - 8. All air flow trends will be triggered on any change of value of +/- 10% of its control range.
 - 9. All valve control point trends will be triggered on any change of value of +/-10% of its control range.
 - 10. All VFD motor control point trends will be triggered on any change of value of +/- 5% of its control range.
 - 11. All fan air static pressure trends will be triggered on any change of value of +/- .05 inches water column.
 - 12. All water pressure trends will be triggered on any change of value of +/- 3 psi (psid).
 - 13. All steam pressure trends will be triggered on any change of value of +/- 5% of the steam pressure input range.
- C. Custom Trends:
 - 1. The BAS vendor shall provide additional trending as required to support commissioning and performance testing. The trending frequency, change of state filtering and point type requirements shall be defined by the testing authority. These Custom Trends are in addition to the Trends for all input and output control and status points noted above, and will mostly involve display of multiple trends in the same view (i.e. Trend Graph or Trend Study). The Cx-provider will provide 15-calendar-days advance notification of when the Custom Trends need to be fully implemented.

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1.4 Basic System Summary Reports

- A. Basic system summary reports shall be set-up with a minimum of one per system, providing a summary of values of the key points in that system, at the same point-in-time (“snapshot”). Some reports might require multiple “pages” for viewing. Contact UF FS for examples.
- B. Reports shall be presented in a standard table format.
- C. Basic system summary reports for HVAC systems support functional performance & diagnostic activities. The following shall be used for general guidelines
 - 1. Reports shall be organized according to the project specific applications. They shall include summaries such as key setpoints, status, outputs, feedback status.
 - a. For example, a zone terminal report shall provide, at a glance, a summary of the % cooling demand of all zone terminals, and corresponding cooling requests at zone level causing reset of supply air temperature at AHU and unmet SAT setpoint at AHU level, causing DP reset at chilled water pump and/or chilled water supply temperature reset at chiller level.
 - b. Example reports can be found in this section.

1.5 Sample Summary Reports:

A. AHU terminal unit summary screen

Room	Unit #	CFM Actual	CFM Target	Htg Setpt (Effective)	Zone Temp	Clg Setpt (Effective)	Reheat %	Supply Temp
Total								

B. Hot water reheat summary screen

Unit #	Supply Temp	Supply Setpt	HHW Coil EW Temp ²	HHW Coil LW Temp ¹	Delta T	HHW Valve Command

Note 1: Obtained leaving water (LW) directly from the associated AHU return water temperature sensor.

Note 2: Obtained entering water (EW) from the main building hot water supply sensor.

C. AHU laboratory summary screen for each AHU that serves multiple laboratories.

Lab #	Supply CFM ¹ Actual	General CFM ¹ Actual	Fume CFM ¹ Actual	CFM Offset Stpt	CFM Offset Actual	Reheat Valve Command	Htg Coil Sup Temp	Htg Stpt	Temp Actual	Clg Stpt
Total										

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Note 1: Sum all supply air terminal, general exhaust terminals and all fume exhaust terminals as applicable per lab.

D. Chilled water summary screen for each unit utilizing chilled water.

Unit #	Supply Air Temp	Supply Air Setpt	CHW Coil EW Temp ²	CHW Coil LW Temp ¹	Delta T	CHW Valve Command

Note 1: Obtained leaving water (LW) directly from the associated unit return water temperature sensor.

Note 2: Obtained entering water (EW) from the main building chilled water supply sensor.