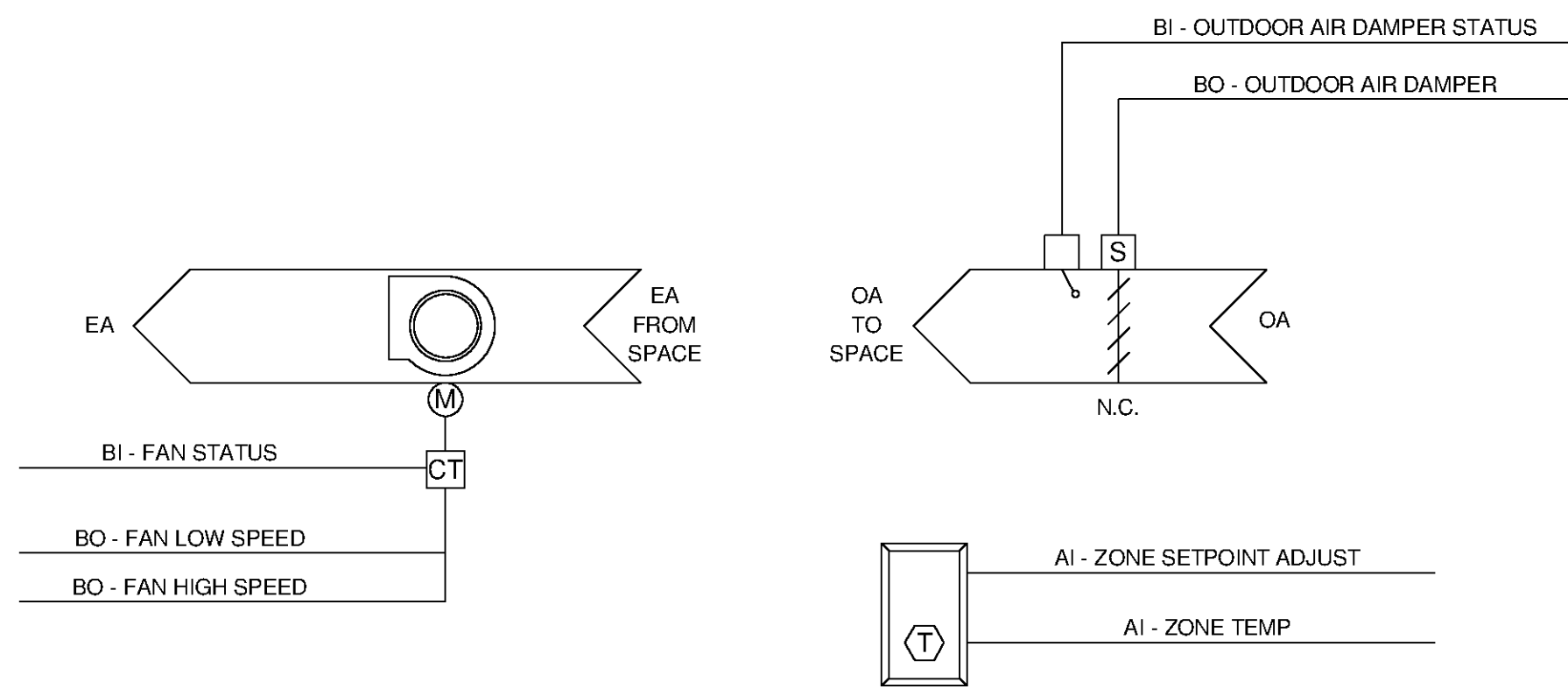


EXHAUST FAN - 2-STAGE COOLING

APPLICABLE UNITS:

EF-4-1, EF-4-2, EF-4-3, EF-4-4, EF-4-5, EF-4-6, EF-4-7
 INTERLOCKED W/ L-4-1, L-4-2, L-4-3, L-4-4, L-4-5
 EF-8-2 INTERLOCKED W/ L-8-1, L-8-2, L-8-3, L-8-4



1 EXHAUST FAN - 2-STAGE COOLING
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RUN CONDITIONS - CONTINUOUS:

THE UNIT SHALL RUN TO MAINTAIN A ZONE TEMPERATURE COOLING SETPOINT OF 80°F (ADJ.).

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH ZONE TEMP: IF THE ZONE TEMPERATURE IS GREATER THAN THE COOLING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).

ZONE SETPOINT ADJUST:

THE OCCUPANT SHALL BE ABLE TO ADJUST THE ZONE COOLING SETPOINT AT THE ZONE TEMPERATURE SENSOR.

FAN:

THE FAN SHALL RUN ANYTIME THE ZONE TEMPERATURE RISES ABOVE COOLING SETPOINT, UNLESS SHUTDOWN ON SAFETIES. THE FAN SHALL RUN UNTIL ZONE TEMPERATURE DROPS TO 75°F (ADJ.) TO PREVENT SHORT CYCLING. THE FAN SPEEDS SHALL BE INDEXED AS FOLLOWS:

- LOW SPEED SHALL RUN ANYTIME THE ZONE TEMPERATURE RISES ABOVE SETPOINT.
- HIGH SPEED SHALL RUN ANYTIME THE ZONE TEMPERATURE RISES FURTHER ABOVE SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).

EF-8-2 SHALL BE INTERLOCKED WITH GENERATORS SUCH THAT THE FAN SHUTS DOWN WHEN THE GENERATORS ARE ENABLED.

FAN OVERRIDE SWITCH:

OCCUPANT SHALL BE ABLE TO TURN FAN ON AND OFF AND SWITCH FAN SPEEDS WITH A HAND-OFF-AUTO SWITCH MOUNTED ON THE WALL.

MULTIPLE FAN OPERATION (EF-4-1 THROUGH EF-4-7):

CONTROLLER SHALL OPERATE FANS IN A LEAD/LAG FASHION, STAGING ADDITIONAL FANS ON AS ZONE COOLING REQUIRES. LEAD FAN SHALL ALTERNATE ON A WEEKLY (ADJ.) BASIS.

OUTDOOR AIR DAMPER:

THE OUTDOOR AIR DAMPER SHALL OPEN ANYTIME THE UNIT RUNS AND SHALL CLOSE ANYTIME THE UNIT STOPS. THE OUTDOOR AIR DAMPER SHALL CLOSE 30 SEC (ADJ.) AFTER THE FAN STOPS. WHERE MULTIPLE DAMPERS ARE INTERLOCKED WITH A SINGLE FAN, ALL DAMPERS SHALL OPEN WHEN THE UNIT RUNS AND ALL DAMPERS SHALL CLOSE WHEN THE UNIT STOPS. WHERE MULTIPLE FANS ARE INTERLOCKED WITH THE SAME DAMPERS, THE DAMPERS SHALL OPEN WHEN ANY FAN RUNS, AND SHALL ONLY CLOSE WHEN ALL FANS HAVE STOPPED.

OUTDOOR AIR DAMPER STATUS:

THE FAN SHALL BE ENABLED AFTER THE DAMPER STATUS HAS PROVEN.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- DAMPER FAILURE: COMMANDED OPEN, BUT THE STATUS IS CLOSED.
- DAMPER IN HAND: COMMANDED CLOSED, BUT THE STATUS IS OPEN.

FAN STATUS:

THE CONTROLLER SHALL MONITOR THE FAN STATUS.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
- FAN RUNTIME EXCEEDED: FAN STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

EXHAUST FAN - 2-STAGE COOLING

POINT NAME	HARDWARE POINTS				SOFTWARE POINTS				SHOW ON GRAPHIC	
	AI	AO	BI	BO	AV	BV	SCHED	TREND		ALARM
ZONE TEMP	X							X		X
ZONE SETPOINT ADJUST	X									X
OUTDOOR AIR DAMPER STATUS			X					X		X
FAN STATUS			X					X		X
FAN LOW SPEED				X				X		X
FAN HIGH SPEED				X				X		X
OUTDOOR AIR DAMPER			X					X		X
COOLING SETPOINT					X			X		X
HIGH ZONE TEMP									X	
OUTDOOR AIR DAMPER FAILURE									X	
OUTDOOR AIR DAMPER IN HAND									X	
FAN FAILURE									X	
FAN IN HAND									X	
FAN RUNTIME EXCEEDED									X	
TOTALS	2	0	2	3	1	0	0	7	6	8
TOTAL HARDWARE (7)					TOTAL SOFTWARE (14)					

EXHAUST FAN - 2 STAGE COOLING AND VENTILATION

APPLICABLE UNITS:

EF-2-1 INTERLOCKED W/ L-2-2 EF-2-4 INTERLOCKED W/ L-2-6
 EF-2-2 INTERLOCKED W/ GH-2-1 EF-5-1 INTERLOCKED W/ L-5-1 AND L-5-2
 EF-2-3 INTERLOCKED W/ L-2-3

RUN CONDITIONS - SCHEDULED:

THE UNIT SHALL BE ENABLED ACCORDING TO A USER DEFINABLE TIME SCHEDULE IN THE FOLLOWING MODES:

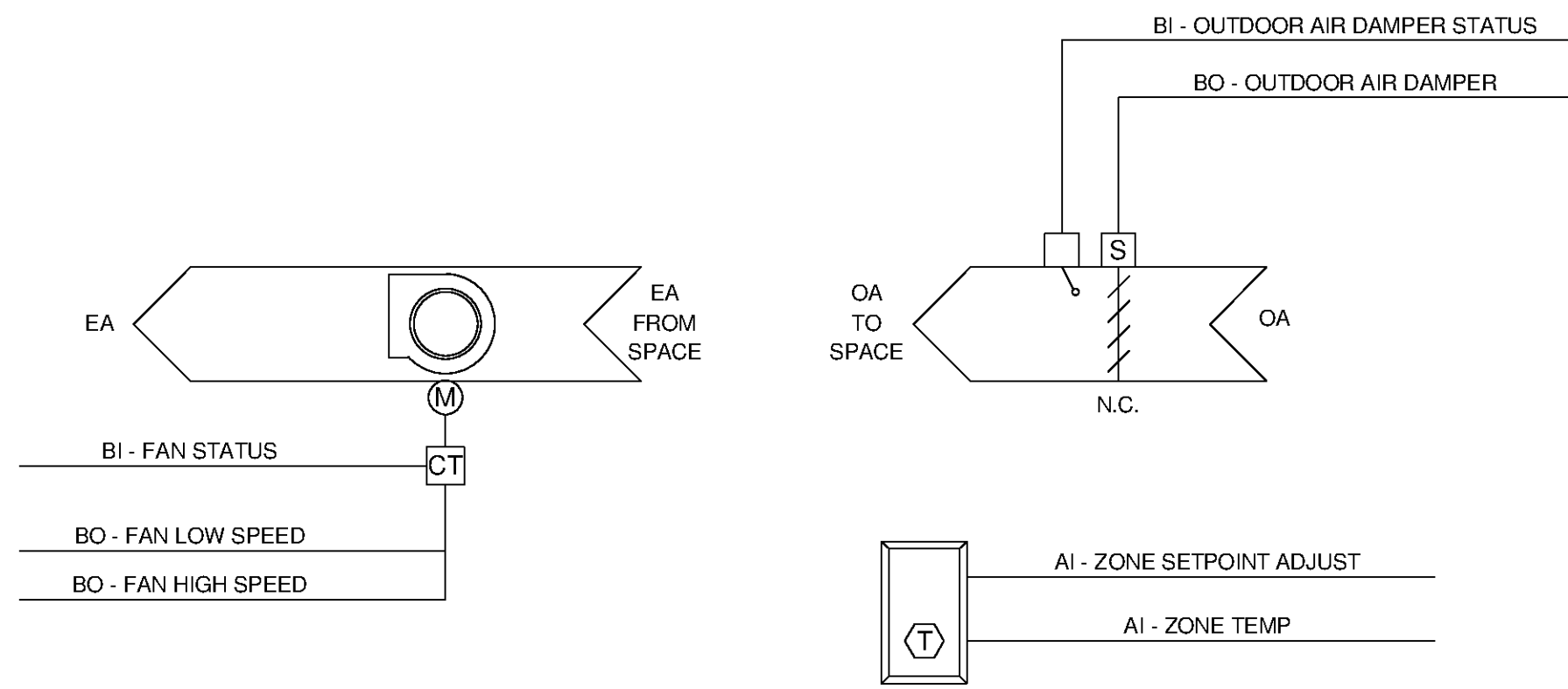
- OCCUPIED MODE: THE UNIT SHALL MAINTAIN MINIMUM VENTILATION AND A ZONE TEMPERATURE COOLING SETPOINT OF 80°F (ADJ.).
- UNOCCUPIED MODE (NIGHT SETBACK): THE UNIT SHALL MAINTAIN A ZONE TEMPERATURE COOLING SETPOINT OF 85°F (ADJ.).

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH ZONE TEMP: IF THE ZONE TEMPERATURE IS GREATER THAN THE COOLING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).

ZONE SETPOINT ADJUST:

THE OCCUPANT SHALL BE ABLE TO ADJUST THE ZONE COOLING SETPOINT AT THE ZONE TEMPERATURE SENSOR.



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EXHAUST FAN - 2-STAGE COOLING AND VENTILATION

POINT NAME	HARDWARE POINTS				SOFTWARE POINTS				SHOW ON GRAPHIC	
	AI	AO	BI	BO	AV	BV	SCHED	TREND		ALARM
ZONE TEMP	X							X		X
ZONE SETPOINT ADJUST	X									X
OUTDOOR AIR DAMPER STATUS			X					X		X
FAN STATUS			X					X		X
FAN LOW SPEED				X				X		X
FAN HIGH SPEED				X				X		X
OUTDOOR AIR DAMPER			X					X		X
COOLING SETPOINT					X			X		X
SCHEDULE							X			
HIGH ZONE TEMP									X	
OUTDOOR AIR DAMPER FAILURE									X	
OUTDOOR AIR DAMPER IN HAND									X	
FAN FAILURE									X	
FAN IN HAND									X	
FAN RUNTIME EXCEEDED									X	
TOTALS	2	0	2	3	1	0	1	7	6	8
TOTAL HARDWARE (7)					TOTAL SOFTWARE (15)					

TETRA TECH

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BID SET

ALABAMA
 BUSINESS SYSTEMS
 No. 16553
 PROFESSIONAL ENGINEER
 DONALD S. BORTON
 12/24/2014

BY	DATE	DESCRIPTION

HUNTSVILLE UTILITIES
 SOUTHEAST WATER TREATMENT PLANT
MECHANICAL HVAC CONTROLS

Project No.: 200-11740-10003
 Designed By: SBR
 Drawn By: BJZ
 Checked By: DSB

M-9907

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