AIR-COOLED ROOFTOP UNITS

ALL RTU ZONE SETPOINTS FROM THE EMS ARE AS FOLLOWS

RTU ZONE SETPOINTS													
	OCCUPIED							UNOCCUPIED					
SPACE	SCHEDULE	EMS SETPOINT	OEM CHANGE-OVER DB	OEM COOLING DB	OEM HEATING DB	EFFECTIVE COOLING SETPOINT	EFFECTIVE HEATING SETPOINT	SCHEDULE	EMS SETPOINT	OEM CHANGE-OVER DB	OEM COOLING DB	OEM HEATING DB	EFFECTIVE COOLING SETPOINT	EFFECTIVE HEATING SETPOINT
GROCERY SALES	24/7	71.5	9	1	1	76	67	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RECV'G/STKRM	24/7	71.5	9	1	1	76	67	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OFFICES	24/7	71.5	9	1	1	76	67	N/A	N/A	N/A	N/A	N/A	N/A	N/A
UPC ROOM	24/7	70	6	1	1	73	67	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PHARMACY	6 AM-10 PM	70	6	1	1	73	67	10 PM-6 AM	66.5	13	1	1	73	60

SUPPLY FAN OPERATION
FOR RTUS IDENTIFIED IN THE MECHANICAL SCHEDULE TO BE "CONT" FAN CONTROL, THE EMS SHALL ENERGIZE THE SUPPLY FAN TO OPERATE CONTINUOUSLY.

FOR RTUS IDENTIFIED IN THE MECHANICAL SCHEDULE TO BE "AUTO" FAN CONTROL, THE OEM CONTROLLER SHALL ENERGIZE THE SUPPLY FAN TO OPERATE ONLY ON A CALL FOR HEATING OR COOLING.

FOR RTUS WITH VARIABLE SPEED FAN OPERATION, THE FAN SPEED SHALL BE CONTROLLED BY THE OEM CONTROLLER BASED ON AMOUNT OF OPERATING COMPRESSOR CAPACITY. VARIABLE SPEED FAN CONTROL SHALL RANGE LINEARLY OR IN DISCRETE STAGES FROM MINIMUM SETTING UP TO DESIGN AIRFLOW AS DETERMINED BY OEM BASED ON COMPRESSOR CAPACITY CONTROL. SUPPLY FAN SPEED DURING ECONOMIZER OPERATION SHALL BE CONTROLLED BY THE OEM CONTROLLER AND SHALL BE AT DESIGN AIRFLOW FROM MECHANICAL SCHEDULE.

OUTSIDE AIR DAMPER OPERATION
WHEN THE SUPPLY FAN IS OFF, THE OUTSIDE AIR DAMPER SHALL GO TO THE 0% OPEN POSITION.

UNLESS OPERATING IN ECONOMIZER MODE, WHEN THE SUPPLY FAN IS ON THE OUTSIDE AIR DAMPER SHALL GO TO THE MINIMUM POSITION SET BY TEST AND BALANCE PER THE OUTSIDE AIR QUANTITY ON THE MECHANICAL SCHEDULE AND IS ADJUSTABLE FROM 0 TO 100%.

ECONOMIZER OPERATION
THE EMS SHALL SEND AN ECONOMIZER ENABLE SIGNAL TO THE OEM CONTROLLER WHEN BOTH OF THE FOLLOWING OUTSIDE AIR CONDITIONS ARE MET:

OUTSIDE DRY BULB TEMPERATURE > 0 DEG F AND < 68 DEG F
OUTSIDE DEWPOINT TEMPERATURE < 48 DEG DP

ECONOMIZER COOLING OPERATION (ECONOMIZER ENABLED)
UPON AN ECONOMIZER ENABLE SIGNAL FROM THE EMS TO THE OEM CONTROLLER AND A CALL FOR COOLING BASED ON SPACE TEMPERATURE SENSOR INPUT TO THE OEM CONTROLLER, ECONOMIZER COOLING SHALL BE ENERGIZED AND THE OEM CONTROLLER SHALL MODULATE THE OUTSIDE AIR AND RETURN AIR DAMPERS TO MAINTAIN A SUPPLY AIR TEMPERATURE OF 55 DF. THE UNIT SHALL RUN IN ECONOMIZER MODE FOR A MINIMUM OF 3 MINUTES AFTER THE ECONOMIZER DAMPER HAS MODULATED TO THE 100% OPEN POSITION BEFORE ENERGIZING THE FIRST STAGE MECHANICAL COOLING. THE OEM CONTROLLER SHALL DISABLE MECHANICAL COOLING WHEN OUTSIDE AIR TEMPERATURE FROM THE OEM OUTDOOR AIR SENSOR IS LESS THAN 45 DF.

IF THE SPACE TEMPERATURE INCREASES TO >= 0.5 DEG ABOVE SPACE COOLING SETPOINT, THE OEM CONTROLLER SHALL ENERGIZE FIRST STAGE MECHANICAL COOLING AND MODULATE THE DAMPERS TO MAINTAIN 55 F SUPPLY AIR TEMPERATURE.

IF THE SPACE TEMPERATURE CONTINUES TO INCREASE AFTER MECHANICAL COOLING IS ENERGIZED, THE OEM CONTROLLER SHALL CONTINUE TO ENERGIZE ADDITIONAL STAGES OF MECHANICAL COOLING IN 0.5 DEG F INCREMENTS OF SPACE TEMPERATURE, IF AVAILABLE.

IF THE CUTOUT TEMPERATURE FOR ANY STAGE OF COOLING IS NOT REACHED WITHIN 15 MINUTES, THE NEXT STAGE OF COOLING SHALL BE ENERGIZED TO SATISFY THE CUTOUT TEMPERATURE.

COOLING STAGES SHALL DE-ENERGIZE AS THE COMPRESSOR CUTOUT TEMPERATURES ARE SATISFIED IN 0.5 DEGREE INCREMENTS.

COOLING STAGES		
STAGE #	ON	OFF
ECONOMIZER	SP+.5	SP-.5
1	SP+1.0	SP
2	SP+1.5	SP+.5
3 & 4	SP+2.0	SP+1.0

COOLING OPERATION (ECONOMIZER DISABLED)
IF THERE IS NO ECONOMIZER ENABLE SIGNAL FROM THE EMS TO THE OEM CONTROLLER AND UPON A CALL FOR COOLING BASED ON THE SPACE TEMPERATURE SENSOR INPUT TO THE OEM CONTROLLER, THE OEM CONTROLLER SHALL ENERGIZE FIRST STAGE MECHANICAL COOLING AND MODULATE THE OUTSIDE AIR DAMPER TO THE MINIMUM POSITION.

IF THE SPACE TEMPERATURE CONTINUES TO INCREASE AFTER MECHANICAL COOLING IS ENERGIZED, THE OEM CONTROLLER SHALL CONTINUE TO ENERGIZE ADDITIONAL STAGES OF MECHANICAL COOLING IN 0.5 DEG INCREMENTS OF SPACE TEMPERATURE, IF AVAILABLE.

IF THE CUTOUT TEMPERATURE FOR ANY STAGE OF COOLING IS NOT REACHED WITHIN 15 MINUTES, THE NEXT STAGE OF COOLING SHALL BE ENERGIZED TO SATISFY THE CUTOUT TEMPERATURE.

COOLING STAGES SHALL DE-ENERGIZE AS THE COMPRESSOR CUTOUT TEMPERATURES ARE SATISFIED IN 0.5 DEGREE INCREMENTS.

COOLING STAGES		
STAGE #	ON	OFF
1	SP+.5	SP-.5
2	SP+1.0	SP
3	SP+1.5	SP+.5
4	SP+2.0	SP+1.0

HEATING OPERATION
UPON A CALL FOR HEATING BASED ON THE SPACE TEMPERATURE SENSOR INPUT TO THE OEM CONTROLLER, THE OEM CONTROLLER SHALL ENERGIZE FIRST STAGE HEATING AND MODULATE THE OUTSIDE AIR DAMPER TO THE MINIMUM POSITION.

IF THE SPACE TEMPERATURE CONTINUES TO DECREASE AFTER ENERGIZING HEATING, THE OEM CONTROLLER SHALL CONTINUE TO ENERGIZE ADDITIONAL STAGES HEATING IN 0.5 DEG INCREMENTS OF SPACE TEMPERATURE, IF AVAILABLE.

IF THE CUTOUT TEMPERATURE FOR ANY STAGE OF HEATING IS NOT REACHED WITHIN 15 MINUTES, THE NEXT STAGE OF HEATING SHALL BE ENERGIZED TO SATISFY THE CUTOUT TEMPERATURE.

HEATING STAGES SHALL DE-ENERGIZE AS THE HEATER CUTOUT TEMPERATURES ARE SATISFIED IN 0.5 DEGREE INCREMENTS.

HEATING STAGES		
STAGE #	ON	OFF
1	SP-.5	SP+.5
2	SP-1.0	SP
3	SP-1.5	SP-.5
4	SP-2.0	SP-1.0

DEMAND CONTROL VENTILATION
FOR UNITS SPECIFIED WITH OEM SPACE CO2 SENSORS, UPON EXCEEDING THE UPPER THRESHOLD LIMIT FOR SPACE CO2 LEVELS THE OEM CONTROLLER SHALL ENERGIZE THE RTU SUPPLY FAN TO DESIGN AIRFLOW AND OVERRIDE THE ECONOMIZER DAMPER TO THE 100% OPEN POSITION UNTIL THE SPACE CO2 LEVELS DROP TO THE LOWER THRESHOLD LIMIT AT WHICH TIME THE UNIT SHALL RESUME NORMAL OPERATION. OEM CONTROLLER SHALL ENERGIZE COOLING OR HEATING BASED ON SPACE TEMPERATURE DURING DEMAND CONTROL VENTILATION OPERATION.

DEMAND CONTROL VENTILATION		
DAMPER POSITION		CO2 LEVEL (PPM)
OPEN	1100	1100
CLOSED	1000	1000

SMOKE DETECTORS

FOR UNITS EQUIPPED WITH SMOKE DETECTORS (DUCT MOUNTED OR SPACE MOUNTED) THE SMOKE DETECTOR SHALL SHUT-DOWN THE UNIT UPON SMOKE DETECTOR ACTIVATION. IF REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION, UPON SMOKE DETECTOR ACTIVATION ADDITIONAL UNITS SHALL SHUT-DOWN UPON A SIGNAL FROM EITHER THE WAL-MART ALARM SYSTEM OR EMS TO THE OEM CONTROLLER. THE OEM CONTROLLER SHALL CLOSE THE OUTSIDE AIR DAMPER TO THE 0% OPEN POSITION, SHUT-DOWN ALL STAGES OF COOLING OR HEATING AND TURN OFF THE SUPPLY FAN. OEM CONTROLLER SHALL OVERRIDE ALL OTHER SPACE CONDITION DEMANDS WHEN UNIT HAS RECEIVED A SMOKE DETECTOR ACTIVATION ALARM.

RTU PROTECTION
ALL EQUIPMENT SAFETY SEQUENCES, I.E. COMPRESSOR RESET, GAS BURNER RESET, ETC SHALL BE CONTROLLED BY THE OEM CONTROLLER.

ALARMS

OEM CONTROLLER SHALL COMMUNICATE THE REQUIRED ALARM LIST TO THE EMS. EMS SHALL COMMUNICATE ALARMS TO THE WAL-MART ALARM REPORTING PROGRAM (WARP).

RTU LOAD ALARM LIST			
ERROR CODE	FROM IMC TO EMS	FROM EMS TO WALMART ALARM REPORTING PROGRAM (WARP)	EMS PRIORITY
4	SMOKE ALARM	YES	DAILY
5	AIR FLOW SWITCH	YES	DAILY
13	COMPRESSOR 1 HIGH DISCHARGE	NO	DAILY
15	COMPRESSOR 2 HIGH DISCHARGE	NO	DAILY
17	COMPRESSOR 3 HIGH DISCHARGE	NO	DAILY
19	COMPRESSOR 4 HIGH DISCHARGE	NO	DAILY
21	INPUT ERROR, PHASE LOSS OR VFD FAIL	YES	DAILY
23	COMPRESSOR 1 LOW SUCTION	NO	DAILY
25	COMPRESSOR 2 LOW SUCTION	NO	DAILY
27	COMPRESSOR 3 LOW SUCTION	NO	DAILY
29	COMPRESSOR 4 LOW SUCTION	NO	DAILY
33	FREEZESTAT CIRCUIT 1	NO	DAILY
35	FREEZESTAT CIRCUIT 2	NO	DAILY
37	FREEZESTAT CIRCUIT 3	NO	DAILY
39	FREEZESTAT CIRCUIT 4	NO	DAILY
51	PRIMARY HEAT 1 LIMIT EXCEEDED	NO	DAILY
53	SECONDARY HEAT 1 LIMIT EXCEEDED	NO	DAILY
55	ROLL OUT SWITCH 1 FAIL	NO	DAILY
59	GAS VALVE 1 FAIL	NO	DAILY
61	PRIMARY HEAT 2 LIMIT EXCEEDED	NO	DAILY
63	SECONDARY HEAT 2 LIMIT EXCEEDED	NO	DAILY
65	ROLL OUT SWITCH 2 FAIL	NO	DAILY
74	ZONE SENSOR PROBLEM	YES	DAILY
77	DISCHARGE AIR TEMP SENSOR PROBLEM	NO	DAILY
78	RETURN AIR TEMP SENSOR PROBLEM	NO	DAILY
93	BACK-UP MODE OPERATION	YES	DAILY
95	ECTO CHANGED AT UNIT	NO	DAILY

THE EMS SHALL COMMUNICATE THE REQUIRED ALARM LIST TO THE WAL-MART ALARM REPORTING PROGRAM (WARP).

RTU MONITORING ALARM LIST			
DESCRIPTION	FROM EMS TO WALMART ALARM REPORTING PROGRAM (WARP)	EMS PRIORITY	ALARM LEVEL
SPACE TEMP-SALES FLOOR	YES	DAILY	SPACE TEMP <65 DF OR >80 DF FOR 60 MIN
SPACE TEMP-OFFICES	YES	DAILY	SPACE TEMP <65 DF OR >78 DF FOR 60 MIN
SPACE TEMP-PHARMACY & UPC	YES	HOURLY	SPACE TEMP <65 DF OR >78 DF FOR 30 MIN
CO2 LEVEL	YES	DAILY	CO2 > 1400 PPM FOR 60 MIN
NOTE: ALARMS SHALL BE IDENTIFIED BY UNIT.			

I/O CONTROL POINT LIST
THE UNIT CONTROLLER AND EMS SHALL TRANSFER THE INPUT/OUTPUT CONTROL POINTS BASED ON THE FOLLOWING SCHEDULE.

FROM EMS TO OEM CONTROLLER				
LON NAME	SNVT INDEX	SNVT TYPE	SNVT UNIT	DESCRIPTION
nviApplicMode	0	SNVT_hvac_mode		Unit application mode
0-Auto				Heating or cooling. Default after reset.
1-Heat				Heating only
3-Cool				Cooling only
6-Off				Unit off
9-Fan only				No heating or cooling allowed
255-Null				No heating or cooling alowed
nviOAMinPos	1	SNVT_lev_percent		Min economizer damper position
nviOccManCmd	2	SNVT_occupancy		Zone occupied status
nviOccSchedule	3	SNVT_tod_event		Occupancy scheduler input used to put controller unit into different occupancy modes
nviOccSensor	4	SNVT_occupancy		Occupancy sensor input. Used to indicate the presence of occupants
nviSetpoint	6	SNVT_temp_p	Deg_F	Zone temperature setpoint
nviSeptOffset	7	SNVT_temp_p	Deg_F	Zone temperature setpoint offset
nviSpaceTemp	8	SNVT_temp_p	Deg_F	Remote zone temperature
nviEmergoferride	9	SNVT_hvac_emerg		Emergency smoke override
nviComprEnable	10	SNVT_switch		Compressor enable
nviPrIHeatEnable	11	SNVT_switch		Primary heat enable
nviSupFanCap	61	SNVT_lev_cont_f		Supply fan capacity setting
nviEconEnable	63	SNVT_switch		Economizer enable input

FROM OEM CONTROLLER TO EMS				
LON NAME	SNVT INDEX	SNVT TYPE	SNVT UNIT	DESCRIPTION
snvoCommStatus	13	SNVT_count		IMC Communicating
snvoIMCVersion	14	SNVT_str_asc		IMC firmware version. D0-D3 (ASCII)
snvoUnitID	15	SNVT_count		Unit ID
				$3x-Gas/Elect
				$4x-Elect/Elect
				$5x-Heat Pump
nvoUnitStatus:	16			
1-HVAC heat		SNVT_hvac_status		Unit operation mode i.e. cool, heat, etc
2-HVAC morning warmup				
3-HAVC cool				
5-HVAC pre-cool				
6-HVAC off				
7-HVAC test				
8-HVAC emergency heat				
9-HVAC fan only				
12-HVAC max heat				
14-HVAC dehumidification				
129-HVAC fresh air				
131-HVAC fresh air				
145-HVAC defrost 1				
161-HVAC defrost 2				
177-HVAC defrost 1				
nvoSpaceTemp	17	SNVT_temp_p	Deg_F	Zone temperature, effective
nvoDischAirTemp	18	SNVT_temp_p	Deg_F	Supply air temperature
nvoEffectOccup	19	SNVT_occupancy		Zone occupied status
nvoLocalOATemp	20	SNVT_temp_p	Deg_F	Outdoor air temperature
nvoLocalSpaceTemp	21	SNVT_temp_p		Zone Temperature, local
nvoOADamper	22	SNVT_lev_percent		Economizer damper position
nvoHeatPrimary	23	SNVT_lev_percent		Primary heating status
nvoCoolPrimary	25	SNVT_lev_percent		Cooling compressor 1-4 status (on/off)
nvoEconEnabled	26	SNVT_switch	.	Economizer outdoor air suitable
nvoSupFanStatus	27	SNVT_switch		Supply fan status
nvoEffectSetpt	28	SNVT_temp_p	Deg_F	Zone temperature set points
snvoCurrentError	29	SNVT_count		Currently displayed error code
snvoErrorPointer	30	SNVT_count		Error pointer. This value points to the next available alarm code location. It runs from 0 to 83 and then returens to tracking this value and using the ten most recent IMC error codes (next variable) allows an appliation to 1) determine when new errors are logged by the IMC, 2) what those erros are, and 3) if any errors have been missed due to network delays or other reasons.
snvoMostRecErr1-10	31-40	SNVT_count		Alarm codes listed in the IMC manual
snvoSpaceCO2Eff	41	SNVT_ppm		
nvoSpaceCO2	42	SNVT_ppm		Zone CO2 level (PPM), local
nvoRATemp	47	SNVT_temp_p	Deg_F	Return air temperature

AIR-COOLED AIR HANDLING UNITS

ALL ZONE SETPOINTS ARE AS FOLLOWS:

AHU ZONE SETPOINTS								
	OCCUPIED				UNOCCUPIED			
SPACE	SCHEDULE	COOLING SETPOINT	HEATING SETPOINT	DEWPOINT SETPOINT	SCHEDULE	COOLING SETPOINT	HEATING SETPOINT	DEWPOINT SETPOINT
SALES	24/7	76	67	52	N/A	N/A	N/A	N/A

SUPPLY FAN OPERATION
THE EMS SHALL SEND AN ENABLE SIGNAL TO THE AHU OEM CONTROLLER FOR SUPPLY FAN OPERATION. UPON AN ENABLE SIGNAL FROM THE EMS, THE OEM CONTROLLER SHALL ENERGIZE THE SUPPLY FAN TO RUN CONTINUOUSLY.

COOLING MODE OPERATION
WHEN SPACE TEMPERATURE EXCEEDS THE COOLING SETPOINT, FIRST STAGE MECHANICAL COOLING SHALL BE ENERGIZED. IF THE COOLING SETPOINT IS NOT MET WITH FIRST STAGE MECHANICAL COOLING, THE OEM CONTROLLER SHALL BRING ON ADDITIONAL COMPRESSORS IN 10 MINUTE INTERVALS. COMPRESSOR STAGING FOR COOLING IS IN THE ORDER OF COMPRESSOR D, C, B, AND A. WHEN SPACE TEMPERATURE DROPS BELOW COOLING SETPOINT MINUS INDOOR TEMPERATURE DEADBAND, OEM CONTROLLER SHALL DE-ENERGIZE COOLING. COMPRESSORS STAGE OFF IN THE ORDER A, B, C, AND D IN 10 MINUTE INTERVALS.

COOLING STAGES (SPACE)		
STAGE #/COMP	ON	OFF
1/(D)	CLG SP	CLG SP-DB
2/(C)	CLG SP	CLG SP-DB
3/(B)	CLG SP	CLG SP-DB
4/(A)	CLG SP	CLG SP-DB

DEHUMIDIFICATION MODE
DEHUMIDIFICATION MODE SHALL BE ENERGIZED BY EITHER A CALL FOR DEHUMIDIFICATION BASED ON OUTSIDE AIR DEWPOINT TEMPERATURE OR SPACE DEWPOINT TEMPERATURE.

DEHUMIDIFICATION BASED ON OUTSIDE AIR DEWPOINT TEMPERATURE

IF THE OUTDOOR DEWPOINT TEMPERATURE EXCEEDS THE OUTDOOR DEWPOINT SETPOINT, THE OEM CONTROLLER SHALL ENERGIZE DEHUMIDIFICATION MODE.

DEHUMID STAGES (OSAT)		
STAGE #/COMP	ON	OFF
1/(A)	AMB DH SP	AMB DH SP-DB

DEHUMIDIFICATION BASED ON INDOOR DEWPOINT TEMPERATURE

WHEN THE SPACE DEWPOINT TEMPERATURE EXCEEDS THE SPACE DEWPOINT SETPOINT, THE OEM CONTROLLER SHALL ENERGIZE DEHUMIDIFICATION MODE. IF AFTER 10 MINUTES THE SPACE DEWPOINT SETPOINT IS NOT MET WITH FIRST STAGE DEHUMIDIFICATION, THE OEM CONTROLLER SHALL BRING ON ADDITIONAL DEHUMIDIFICATION STAGES IN 10 MINUTE INTERVALS. COMPRESSOR STAGING FOR DEHUMIDIFICATION IS IN THE ORDER OF COMPRESSOR A, B, C, AND D. WHEN SPACE DEWPOINT DROPS BELOW THE SPACE DEWPOINT SETPOINT MINUS INDOOR DEWPOINT TEMPERATURE DEADBAND, THE OEM CONTROLLER SHALL DE-ENERGIZE DEHUMIDIFICATION. COMPRESSORS STAGE OFF IN THE ORDER D, C, B, AND A IN 10 MINUTE INTERVALS.

DEHUMID STAGES (SPACE)		
STAGE#/COMP	ON	OFF
1/(A)	SPACE DH SP	SPACE DH SP-DB
2/(B)	SPACE DH SP	SPACE DH SP-DB
3/(C)	SPACE DH SP	SPACE DH SP-DB
4/(D)	SPACE DH SP	SPACE DH SP-DB

HEATING MODE OPERATION
HEATING MODE SHALL BE ENERGIZED BY EITHER A CALL FOR HEATING BASED ON OUTSIDE AIR TEMPERATURE OR SPACE TEMPERATURE.

HEATING BASED ON OUTSIDE AIR TEMPERATURE
WHEN OUTSIDE AIR TEMPERATURE DROPS BELOW THE HEAT STAGING SETPOINTS IN THE TABLE BELOW, THE OEM CONTROLLER SHALL ENERGIZE THE CORRESPONDING HEAT STAGE. HEAT STAGING FOR GAS HEAT BURNERS IS IN THE ORDER OF BURNER 1 FIRE THEN BURNER 2. EACH HEAT STAGE SHALL RUN FOR A MINIMUM OF 10 MINUTES BEFORE DE-ENERGIZING. IF AT ANY TIME THE SPACE TEMPERATURE RISES ABOVE SPACE TEMPERATURE SETPOINT, THE LAST HEAT STAGE ON SHALL BE DE-ENERGIZED.

HEATING STAGES (OSAT)		
STAGE #	ON	OFF
1	< AMB TEMP HT1	=>AMB TEMP HT 1
2	< AMB TEMP HT2	=>AMB TEMP HT 2

HEATING STAGES SHALL BE DE-ENERGIZED IN REVERSE ORDER ON OUTSIDE AIR TEMPERATURE BASED ON THE ABOVE SCHEDULE.

HEATING BASED ON SPACE TEMPERATURE
WHEN SPACE TEMPERATURE DROPS BELOW THE SPACE HEATING SETPOINT, FIRST STAGE HEATING SHALL BE ENERGIZED. IF HEATING SETPOINT IS NOT MET WITH FIRST STAGE HEAT, THE OEM CONTROLLER SHALL BRING ON ADDITIONAL HEAT STAGES IN 10 MINUTE INTERVALS. HEAT STAGING FOR GAS HEAT BURNERS IS IN THE ORDER OF BURNER 1 FIRE THEN BURNER 2. WHEN SPACE TEMPERATURE INCREASES ABOVE HEATING SETPOINT PLUS INDOOR TEMPERATURE DEADBAND, THE OEM CONTROLLER SHALL DE-ENERGIZE HEATING IN REVERSE ORDER IN 10 MINUTE INTERVALS.

HEATING STAGES (SPACE)		
STAGE #	ON	OFF
1	HTG SP	HTG SP+DB
2	HTG SP	HTG SP+DB

I/O CONTROL POINT LIST
THE UNIT CONTROLLER AND EMS SHALL TRANSFER THE INPUT/OUTPUT CONTROL POINTS BASED ON THE FOLLOWING SCHEDULE.

FROM EMS TO OEM CONTROLLER					
pCO Index	LON NAME	EMS Name	DESCRIPTION	Initial Value	Upper Limit	Lower Limit
5	nvi_Amb_Temp	BMS Amb Temp	Ambient Temperature from BMS			
6	nvi_Amb_DP	BMS Amb DP	Amb Dewpoint from BMS			
9	nvi_Zone_Temp	BMS Zone Temp	Zone Temperature from BMS			
10	nvi_Zone_DP	BMS Zone DP	Zone Dewpoint from BMS			
11	nvi_Zn_DP_On	Zone DH sp	Zone DH Setpoint	52 F DP	52 F DP	50 F DP
12	nvi_Zn_DP_Dbnd	Zone DH db	Zone DH Deadband	2 F	2 F	2 F
13	nvi_Amb_DP_On	Amb DH setpoint	Amb DH Override Setpoint	48 F DP	52 F DP	48 F DP
15	nvi_Zn_Cool_On	Zone Cool sp	Zone Cool Setpoint	76 F	76 F	75 F
16	nvi_ZnT_Dband	Zone Cool db	Zone Temp Deadband	2 F	2 F	2 F
21	nvi_AmT_Ht_St1	Heat 1 Amb SP	Ambient Temp Std Heat Stage 1 Setpoint	<55 F	58 F	50 F
22	nvi_AmT_Ht_St2	Heat 2 Amb SP	Ambient Temp Std Heat Stage 2 Setpoint	<30 F	33 F	25 F
23	nvi_Zn_Heat_On	Zone Heat sp	Zone Heat Setpoint	67 F	68 F	67 F
1	nvi_Stg_On_Delay	Stage On Delay	DH/Cool stage on delay	10 Min		
2	nvi_Stg_Off_Delay	Stage Off Delay	DH/Cool stage off delay	10 Min		
1	nvi_Suply_Fn_On	Supply Fan On	BMS Turn Unit On (Call for Supply Fan)			
8	nvi_Flt_Reset	Fault Reset	Fault Reset			

FROM OEM CONTROLLER TO EMS						
pCO Index	LON NAME	EMS Name	DESCRIPTION	Initial Value	Upper Limit	Lower Limit
1	nvo_Amb_Temp	AHU Amb Temp	Amb Temperature from AHU			
2	nvo_Amb_DP	AHU Amb DP	Amb Dewpoint from AHU			
3	nvo_Leaving_Temp	AHU Leaving Tmp	Leaving Temperature from AHU			
4	nvo_Leaving_DP	AHU Leaving DP	Leaving Dewpoint from AHU			
7	nvo_Zone_Temp	AHU Zone Temp	Zone Temperature from AHU			
8	nvo_Zone_DP	AHU Zone DP	Zone dewpoint from AHU			
3	nvo_React_Fan_p	React Fan Out %	% Output of React Fan			
4	nvo_Supply_Fan_p	Supply Fan Out %	%Output of Supply Fan			
2	nvo_Suply_Fn_Flt	Supply Fan Fault	Fault on: Supply Fan			
3	nvo_Comp_Flt	Comp Fault	Fault on: Compressor Fail			
4	nvo_Sensor_Fail	Sensor Fault	Fault on: Non-critical sensor Fail			
5	nvo_Heater_Fault	Heater Fault	Fault on: Heater			
6	nvo_React_Fn_Flt	React Fan Fault	Fault on: Reactivation Fan			
7	nvo_Wheel_Flt	DH Wheel Fault	Fault on: Desiccant Wheel			
9	nvo_AFS_Conf	Air flow switch	Critical Fault On: Air flow switch confirmation			
10	nvo_CompA_On	Comp A on	Compressor A on			
11	nvo_CompB_On	Comp B on	Compressor B on			
12	nvo_CompC_On	Comp C on	Compressor C on			
13	nvo_CompD_On	Comp D on	Compressor D on			
15	nvo_Aux_Ht1_On	Aux Heat 1 on	Aux Heat Stage 1 on			
16	nvo_Aux_Ht2_On	Aux Heat 2 on	Aux Heat Stage 2 on			
17	nvo_DH_On	Desiccant Wheel on	Desiccant Wheel on			
18	nvo_React_Fan_On	Reactivation Fan on	Reactivatin Fan on			
19	nvo_Ret_Dpr_On	Return Damper	Return Air Damper			

SMOKE DETECTOR
FOR UNITS EQUIPPED WITH SMOKE DETECTORS (DUCT MOUNTED OR SPACE MOUNTED) THE SMOKE DETECTOR SHALL SHUT-DOWN THE UNIT UPON SMOKE DETECTOR ACTIVATION. IF REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION, UPON SMOKE DETECTOR ACTIVATION ADDITIONAL UNITS SHALL SHUT-DOWN UPON A SIGNAL FROM EITHER THE WAL-MART ALARM SYSTEM OR EMS TO THE OEM CONTROLLER. THE OEM CONTROLLER SHALL TURN OFF THE SUPPLY FAN. OEM CONTROLLER SHALL OVERRIDE ALL OTHER SPACE CONDITION DEMANDS WHEN UNIT HAS RECEIVED A SMOKE DETECTOR ACTIVATION ALARM.

AHU PROTECTION
ALL EQUIPMENT SAFETY SEQUENCES, I.E. COMPRESSOR RESET, GAS BURNER RESET, ETC SHALL BE CONTROLLED BY THE OEM CONTROLLER.

ALARMS
OEM CONTROLLER SHALL COMMUNICATE THE REQUIRED ALARM LIST TO THE EMS. EMS SHALL COMMUNICATE ALARMS TO THE WAL-MART ALARM REPORTING PROGRAM (WARP).

AHU LOAD ALARM LIST		
FROM CAREL TO BMS	FROM EMS TO WALMART ALARM REPORTING PROGRAM (WARP)	EMS PRIORITY
AIRFLOW CONFIRMATION ERROR	YES	DAILY

THE EMS SHALL COMMUNICATE THE REQUIRED ALARM LIST TO THE WAL-MART ALARM REPORTING PROGRAM (WARP).

AHU MONITORING ALARM LIST			
DESCRIPTION	FROM EMS TO WALMART ALARM REPORTING PROGRAM (WARP)	EMS PRIORITY	ALARM LEVEL
SPACE TEMP-SALES FLOOR	YES	DAILY	SPACE TEMP <65 DF OR >80 DF FOR 60 MIN
SPACE DEWPOINT TEMP-GR SALES	YES	DAILY	SPACE DP TEMP > 56 DP FOR 30 MIN
NOTE: ALARMS SHALL BE IDENTIFIED BY UNIT.			

INTERIOR SCHEDULED LIGHTING

ALL INTERIOR LIGHTING SCHEDULES FROM THE EMS ARE AS FOLLOWS:

SCHEDULED LIGHTING ON/OFF TIMES			
PROGRAM NAME	AREA SERVED	ON	OFF
PERIMETER LTS	PERIMETER SALES FLOOR LIGHTS	24 HOURS	
INT PHRMCY LTS	PHARMACY LIGHTS	6:00 AM	10:00 PM
FREEZ CASE LTS	FREEZER CASE DOORS	7:00 AM	11:00 PM
1/3 SALES FLOOR	1/3 SALES FLOOR LIGHTS	8:00 AM	10:00 PM
2/3 SALES FLOOR	2/3 SALES FLOOR LIGHTS	24 HOURS	

EXTERIOR LIGHTING

ALL EXTERIOR LIGHTING ENABLE SCHEDULES FROM THE EMS ARE AS FOLLOWS:

EXTERIOR LIGHTING ENABLED TIMES			
PROGRAM NAME	AREA SERVED	ON	OFF
BLD FAÇADE LTS	FLAG POLE AND AWNING LIGHTS	4:00 PM	8:00 AM
BLD SEC LTS	BUILDING SECURITY LIGHTING - BUILDING BACK AND SIDE SECURITY LIGHTING - TRUCKWELL LIGHTING - PHARMACY DRIVE-THRU - BUILDING FRONT SECURITY LIGHTS	4:00 PM	8:00 AM
PARKING LOT LTS	PARKING LOT LIGHTING	4:00 PM	8:00 AM
BLD SIGN LTS	BUILDING WALMART SIGN	4:00 PM	8:00 AM
WALMART SIGN	WALMART ENTRANCE SIGNS	4:00 PM	8:00 AM

WHEN ENABLED, THE EMS SHALL ENERGIZE LIGHTING WHEN THE OUTSIDE NATURAL LIGHTING LEVEL MEASURED BY THE ALS LOCATED ON THE ROOFTOP SENSOR MAST IS LESS THAN 40 FC. THE EMS SHALL DE-ENERGIZE LIGHTING WHEN THE OUTSIDE NATURAL LIGHTING LEVEL IS GREATER THAN 45 FC.

ALARMS

THE EMS SHALL COMMUNICATE THE REQUIRED ALARM LIST TO THE WAL-MART ALARM REPORTING PROGRAM (WARP).

LIGHTING MONITORING ALARM LIST			
ALARM NAME	FROM EMS TO WAL-MART ALARM REPORTING PROGRAM (WARP)	EMS PRIORITY	ALARM LEVEL
BREAKER CONFIRMATION STATUS FAULT OFF	YES	DAILY	LIGHT BREAKER OUTPUT IS ON BUT FEEDBACK IS OFF
BREAKER CONFIRMATION STATUS FAULT ON	YES	DAILY	LIGHT BREAKER OUTPUT IS OFF BUT FEEDBACK IS ON
TVSS ALARM (HIP)	YES	DAILY	TVSS INPUT IS ON

STIPULATION FOR REUSE
THIS