





## Appendix A

<b>GUI Parameters</b>	<b>TPC Parameter Ranges</b>	<b>TPC Default</b>	<b>TPC Descriptions</b>
<b>System Parameters</b>			
<b>Design Inputs</b>			
Units	Fahrenheit, Celsius	Fahrenheit	Choose the convention in which you would like to display system information.
Sum Reporting Zone Loads	Enable / Disable	Disable	Choose "Enable" if you are using multiple flow meters attached to "Zone Load Controllers" to report back loads in one or more zones. Chose "Disable" if using single point flow measurement attached to the "System Information Field Device"
Outdoor Design Temperature	-40 - 40 F	0	Choose the outdoor air temperature this system was designed to overcome worst case. This will be the coldest temperatures you would expect to see in this climate.
Indoor Design Temperature	60 - 80 F	70	Choose the indoor temperature the building is designed to maintain under full-load conditions.
Redundancy Factor	1.00 - 10.00	4	Choose the factor by which the design MBH input (sum of boiler MBH inputs) is greater than the required MBH needed under maximum load conditions.
System Circulation Delay minutes	1 - 30 Min	10	Chose the delay time desired from the start of the system pumps until the selection and start of the first boiler stage.
Initial Delay Minutes	10 - 240 Min	60	Choose the number of minutes you desire to delay an additional boiler staging on when the outdoor air temperature has reached just reached the "Winter Heat On Set-point". This delay is designed to allow a single boiler stage to gradually warm the system during light load times only. This delay is linked to the initial switching from off to on of a call for heat and will not affect control action as long as heat remains enabled.
Minimum Hysteresis	2 - 40 F	5	Chose the maximum number of degrees that you desire to allow the system temperature to drop below set-point and sustain for the "Stage Delay Time" before enabling another stage of heat.
Maximum Hysteresis	5 - 80 F	15	Chose the maximum number of degrees that you desire to allow the system temperature to overshoot set-point before disabling all boilers on the system.

Minimum Stage Delay Minutes	1 - 60 Min	30	Choose the number of minutes conditions ( load deficit ) must persist before activating the next stage of heat. This delay will work between every stage selection except in the case of a heating emergency as defined in the O&M manual
System Delta T Set-point	0-50 F	10	Enter the Delta T you wish to keep across the system. To use this feature you must also designate a system pump for Delta T operation.
Pipe Type	Steel, Copper, CPVC-	Steel	Enter the type of pipe in which the flow meter is inserted
Pipe Schedule	20, 40, 80	40	Enter the code of construction of the pipe in which the flow meter is inserted.
Pipe Size	2 - 48 In	8	Enter the diameter of the pipe in which the flow meter is inserted.
Default Flow Rate GPM	10 - 150,000 GPM	500	Enter the estimated maximum flow rate of this system.
Manual Override of System Flow Input	Enable / Disable	Disable	Choose to manually override the flow meter by enabling this function. If you enable this function then the control will choose to read the maximum flow rate. You will only want to enable this function when you are servicing the flow meter or if it otherwise not operating.
<b>Heat Priority</b>			
Winter Heat On Set-point	30 - 150 F	60	Choose the outdoor air temperature at which you desire to enable the heating plant.
NonCondensing Outdoor Set-point	-20 - 80 F	0	Choose the outdoor air temperature at which you desire to begin utilizing the non-condensing control loop Reset 2.
Heat Reset 1 - Condensing			
Maximum System Supply Set-point	60 - 210 F	120	Choose the maximum supply temperature allowed on this system while the condensing reset loop is active.
Minimum System Supply Set-point	40 - 200 F	80	choose the minimum supply temperature allowed while the condensing reset loop is active.
Maximum Outdoor Temperature Set-point	30 - 150 F	60	Choose the maximum outdoor air temperature which the condensing reset loop will use to calculate the Supply water temperature set-point.
Minimum Outdoor Temperature Set-point	-40 - 40 F	0	Choose the minimum outdoor air temperature which the condensing reset loop will use to calculate the Supply water temperature set-point.
Reset Shift Degrees	0 - 40 F	0	After the system has been in operation you may further fine tune this reset loop by shifting the slope up or down. This is a linear function which means the entire reset slope will shift.
Heat Reset 2 - NonCondensing			
Maximum System Supply Set point	60 - 210 F	180	Choose the maximum supply temperature allowed on this system while the Non-condensing reset slope is active.

Minimum System Supply Set point	40 - 200 F	140	Choose the minimum supply temperature allowed while the Non-condensing reset slope is active.
Maximum Outdoor Temperature Set point	30 - 150 F	60	Choose the maximum outdoor air temperature which the Non-condensing reset loop will use to calculate the Supply water temperature set-point.
Minimum Outdoor Temperature Set point	-40 - 40 F	0	Choose the minimum outdoor air temperature which the Non-condensing reset loop will use to calculate the Supply water temperature set-point.
Reset Shift Degrees	0 - 40 F	0	After the system has been in operation you may further fine tune this reset loop by shifting the slope up or down. This is a linear function which means the entire reset slope will shift.
Heat Reset 3 - Reheat			
Maximum System Supply Set point	60 - 210 F	120	Choose the maximum supply temperature allowed on this system while the Reheat reset slope is active.
Minimum System Supply Set point	40 - 200 F	100	Choose the minimum supply temperature allowed while the Reheat reset slope is active.
Maximum Outdoor Temperature Set point	80 - 160 F	100	Choose the maximum outdoor air temperature which the Reheat reset slope will use to calculate the Supply water temperature set-point.
Minimum Outdoor Temperature Set point	40 - 100 F	70	Choose the minimum outdoor air temperature which the Reheat reset slope will use to calculate the Supply water temperature set-point.
Reset Shift Degrees	0 - 40 F	0	After the system has been in operation you may further fine tune this reset slope by shifting the line up or down. This is a linear function which means the entire reset slope will shift.
Optimum Stop / Start			
Night Setback Value	0 - 40 F	10	Choose the number of degrees you wish to let the system fall to under night setback conditions.
Boost Value	0 - 40 F	0	Choose the number of degrees you wish to allow the control to take the system above the set point at morning warm up. A value greater than zero may or may not be required for optimum start.
Boost Runtime Minutes	0 - 120 Min	60	Choose the number of minutes you wish for boost above the active reset to operate before returning to the calculated reset value.
Monday			
Night Setback	Enable / Disable	Disable	Choose to enable or disable this operation.
Begin Setback Hour / Minute	0:00 - 23:59	1	Choose the time before the unoccupied period you wish to allow the control to begin a "controlled descent" to the unoccupied temperature.
Complete Setback Hour / Minute	0:00 - 23:59	1	Enter the time you expect the building to be unoccupied for this day of the week.
Day Return	Enable / Disable	Disable	Choose enable if you desire to bring the system back up to temperature from the previous day. If you choose to designate this day of the week as unoccupied simply disable day return.

Begin Return Hour / Minute	0:00 - 23:59	0	Choose the time before the building is occupied that you desire to start a controlled ramp up to the calculated reset + Boost value temperature.
Complete Return Hour / Minute	0:00 - 23:59	0	Choose the time of day you expect the building to be occupied.
Tuesday			
Night Setback	Enable / Disable	Disable	Choose to enable or disable this operation.
Begin Setback Hour / Minute	0:00 - 23:59	1	Choose the time before the unoccupied period you wish to allow the control to begin a "controlled descent" to the unoccupied temperature.
Complete Setback Hour / Minute	0:00 - 23:59	1	Enter the time you expect the building to be unoccupied for this day of the week.
Day Return	Enable / Disable	Disable	Choose enable if you desire to bring the system back up to temperature from the previous day. If you choose to designate this day of the week as unoccupied simply disable day return.
Begin Return Hour / Minute	0:00 - 23:59	0	Choose the time before the building is occupied that you desire to start a controlled ramp up to the calculated reset + Boost value temperature.
Complete Return Hour / Minute	0:00 - 23:59	0	Choose the time of day you expect the building to be occupied.
Wednesday			
Night Setback	Enable / Disable	Disable	Choose to enable or disable this operation.
Begin Setback Hour / Minute	0:00 - 23:59	1	Choose the time before the unoccupied period you wish to allow the control to begin a "controlled descent" to the unoccupied temperature.
Complete Setback Hour / Minute	0:00 - 23:59	1	Enter the time you expect the building to be unoccupied for this day of the week.
Day Return	Enable / Disable	Disable	Choose enable if you desire to bring the system back up to temperature from the previous day. If you choose to designate this day of the week as unoccupied simply disable day return.
Begin Return Hour / Minute	0:00 - 23:59	0	Choose the time before the building is occupied that you desire to start a controlled ramp up to the calculated reset + Boost value temperature.
Complete Return Hour / Minute	0:00 - 23:59	0	Choose the time of day you expect the building to be occupied.
Thursday			
Night Setback	Enable / Disable	Disable	Choose to enable or disable this operation.
Begin Setback Hour / Minute	0:00 - 23:59	1	Choose the time before the unoccupied period you wish to allow the control to begin a "controlled descent" to the unoccupied temperature.
Complete Setback Hour / Minute	0:00 - 23:59	1	Enter the time you expect the building to be unoccupied for this day of the week.
Day Return	Enable / Disable	Disable	Choose enable if you desire to bring the system back up to temperature from the previous day. If you choose to designate this day of the week as unoccupied simply disable day return.
Begin Return Hour / Minute	0:00 - 23:59	0	Choose the time before the building is occupied that you desire to start a controlled ramp up to the calculated reset + Boost value temperature.
Complete Return	0:00 - 23:59	0	Choose the time of day you expect the building to be occupied.

Hour / Minute			
Friday			
Night Setback	Enable / Disable	Disable	Choose to enable or disable this operation.
Begin Setback Hour / Minute	0:00 - 23:59	1	Choose the time before the unoccupied period you wish to allow the control to begin a "controlled descent" to the unoccupied temperature.
Complete Setback Hour / Minute	0:00 - 23:59	1	Enter the time you expect the building to be unoccupied for this day of the week.
Day Return	Enable / Disable	Disable	Choose enable if you desire to bring the system back up to temperature from the previous day. If you choose to designate this day of the week as unoccupied simply disable day return.
Begin Return Hour / Minute	0:00 - 23:59	0	Choose the time before the building is occupied that you desire to start a controlled ramp up to the calculated reset + Boost value temperature.
Complete Return Hour / Minute	0:00 - 23:59	0	Choose the time of day you expect the building to be occupied.
Saturday			
Night Setback	Enable / Disable	Disable	Choose to enable or disable this operation.
Begin Setback Hour / Minute	0:00 - 23:59	0:00	Choose the time before the unoccupied period you wish to allow the control to begin a "controlled descent" to the unoccupied temperature.
Complete Setback Hour / Minute	0:00 - 23:59	0:00	Enter the time you expect the building to be unoccupied for this day of the week.
Day Return	Enable / Disable	Disable	Choose enable if you desire to bring the system back up to temperature from the previous day. If you choose to designate this day of the week as unoccupied simply disable day return.
Begin Return Hour / Minute	0:00 - 23:59	1	Choose the time before the building is occupied that you desire to start a controlled ramp up to the calculated reset + Boost value temperature.
Complete Return Hour / Minute	0:00 - 23:59	1	Choose the time of day you expect the building to be occupied.
Sunday			
Night Setback	Enable / Disable	Disable	Choose to enable or disable this operation.
Begin Setback Hour / Minute	0:00 - 23:59	0:00	Choose the time before the unoccupied period you wish to allow the control to begin a "controlled descent" to the unoccupied temperature.
Complete Setback Hour / Minute	0:00 - 23:59	0:00	Enter the time you expect the building to be unoccupied for this day of the week.
Day Return	Enable / Disable	Disable	Choose enable if you desire to bring the system back up to temperature from the previous day. If you choose to designate this day of the week as unoccupied simply disable day return.
Begin Return Hour / Minute	0:00 - 23:59	1	Choose the time before the building is occupied that you desire to start a controlled ramp up to the calculated reset + Boost value temperature.
Complete Return Hour / Minute	0:00 - 23:59	1	Choose the time of day you expect the building to be occupied.
<b>Winter Priority</b>			



Winter Priority Staging	Enable / Disable	Disable	Choose to enable Winter Priority if you have a large mass boiler that you desire to put into the lead position for a portion of the heating season.
Winter Priority Start Date	mm/dd	12/25	Choose the date you would like to begin Winter Priority
Winter Priority Stop Date	mm/dd	2/14	Choose the date you would like to stop Winter Priority.
Winter Boilers Rotation Hours	24 - 720 Hours	168	If you have more than one large mass boiler that will be designated as Winter Priority choose the number of hours you would like for each boiler to be in the lead position.
<b>Reheat</b>			
Reheat	Enable / Disable	Disable	Choose to enable the reheat reset slope if you are using reheat in this application.
Reheat On Set point	60 - 90 F	70	Choose the outdoor air temperature at which you desire the reheat reset slope to be enabled.
Reheat Warm Weather Shutdown	80 - 160 F	100	Choose the outdoor air temperature at which you desire the reheat to be disabled due to warm weather.
<b>System Pump Parameters</b>			
Activation	Enable / Disable	Enable	Choose Enable to activate this pump to be used in this system.
Dedicated Lead	Enable / Disable	Enable	Choose Enable to always use this pump as the lead pump in this system. Pump = on when heating operations are on
Lead-Lag / Lead-Help	Lead-Lag / Lead-Help	Lead-Lag	Choose "Lead/Lag" if this pump will be rotated into the lead position as an either or pumping scenario. For lead/lag switching + help when using variable speed pumping chose "Lead/Help" in order to meet flow requirements of the system based on Delta P or Delta T system needs.
Lead Shutdown Delay (for Lead-Lag)	10 - 120 Sec	30	Choose the number of seconds you would like to delay the shutdown of the lead pump in this system.
Lag Help Enable Output % (for Lead-Help)	51-100%	100	Choose the percentage of sustained pump output required to enable the lag pump.
Lag Help Disable Output % (for Lead-Help)	1-50%	40	Choose the percentage of sustained pump output required to disable the lag pump.
Lag Help Delay (for Lead-Help)	1 - 60 Min	30	Choose the number of minutes the conditions (Output %) for lag help Enable/Disable must be sustained before action is taken to Enable or Disable the lag pump
Rotation Hours (for Lead-Lag or Lead-Help)	12 - 720 Hrs	168	Choose the number of hours you desire this pump to stay in the lead position.

Heat Enable Shutdown Delay Time	1 - 120 Min	60	Choose the number of minutes you would like the pumps to continue to operate after the system has been shut down on outdoor air temperature.
System Pump Maximum Modulation Percentage	50 - 100 %	100	Choose the maximum modulation signal expressed as a percentage you desire to be sent to this pump.
System Pump Minimum Modulation Percentage	0 - 50 %	35	Choose the minimum modulation signal expressed as a percentage you desire to be sent to this pump.
System Pump Process Acceleration	0 - 100.0	20	Select the process acceleration speed. (Lower numbers cause faster response to changes)
System Pump Modulation Signal	0-10 Vdc, 4-20mA	0-10 Vdc	Choose the type of signal you desire to be sent to modulate this pump, 0-10 Vdc or 4-20mA. (also requires wiring to the correct terminal on the control)
System Pump Delta T Operations	Enable / Disable	Disable	Choose enable if you desire to modulate this pump based on the system Delta T.
System Pump Delta P Operations	Enable / Disable	Disable	Choose enable if you desire to modulate this pump based on the system Delta P.
Delta P Transducer Pressure at 10Vdc (20mA) Input	0-50 Psi	30	Input the value of the pressure (in Psig 0.0) the transducer will experience at 20mA or 10Vdc
Delta P Transducer Pressure at 0Vdc (4mA) Input	0-10 Psi	0	Input the value of the pressure (in Psig 0.0) the transducer will experience at 4mA or 0Vdc
Delta P Pressure Set point	0-50 Psi	10	Choose the differential pressure the pump is modulated to maintain
Delta P Pressure Transducer Input Signal	0-10 Vdc, 4-20mA	0-10 Vdc	Choose the input signal of the pressure transducer (0-10 Vdc or 4-20mA)
<b>Zone Pump Parameters</b>			
Activation	Enable / Disable	Enable	Choose Enable to activate this pump to be used in this system.
Dedicated Lead	Enable / Disable	Enable	Choose Enable to always use this pump as the lead pump in this system. Pump = on when heating operations are on
Lead-Lag / Lead-Help	Lead-Lag / Lead-Help	Lead-Lag	Choose "Lead/Lag" if this pump will be rotated into the lead position as an either or pumping scenario. For lead/lag switching + help when using variable speed pumping chose "Lead/Help" in order to meet flow requirements of the system based on Delta P or Delta T system needs.
Lead Shutdown Delay (for Lead-Lag)	10 - 120 Sec	30	Choose the number of seconds you would like to delay the shutdown of the lead pump in this system.
Lag Help Enable Output % (for Lead-Help)	51-100%	100	Choose the percentage of sustained pump output required to enable the lag pump.
Lag Help Disable Output % (for Lead-	1-50%	40	Choose the percentage of sustained pump output required to disable the lag pump.

Help)			
Lag Help Delay (for Lead-Help)	1 - 60 Min	30	Choose the number of minutes the conditions (Output %) for lag help Enable/Disable must be sustained before action is taken to Enable or Disable the lag pump
Rotation Hours (for Lead-Lag or Lead-Help)	12 - 720 Hrs	168	Choose the number of hours you desire this pump to stay in the lead position.
Heat Enable Shutdown Delay Time	1 - 120 Min	60	Choose the number of minutes you would like the pumps to continue to operate after the system has been shut down on outdoor air temperature.
Zone Pump Maximum Modulation Percentage	50 - 100 %	100	Choose the maximum modulation signal expressed as a percentage you desire to be sent to this pump.
Zone Pump Minimum Modulation Percentage	0 - 50 %	35	Choose the minimum modulation signal expressed as a percentage you desire to be sent to this pump.
Zone Pump Process Acceleration	0 - 100.0	20	Select the process acceleration speed. (Lower numbers cause faster response to changes)
Zone Pump Modulation Signal	0-10 Vdc, 4-20mA	0-10 Vdc	Choose the type of signal you desire to be sent to modulate this pump, 0-10 Vdc or 4-20mA. (also requires wiring to the correct terminal on the control)
Zone Pump Delta T Operations	Enable / Disable	Disable	Choose enable if you desire to modulate this pump based on the Zone Delta T.
Zone Pump Delta T Set-point	0 - 100 F	10	Choose the Delta T you desire to be kept across this zone.
Zone Pump Delta P Operations	Enable / Disable	Disable	Choose enable if you desire to modulate this pump based on the system Delta P.
Delta P Transducer Pressure at 10Vdc (20mA) Input	0-50 Psi	30	Input the value of the pressure (in Psig 0.0) the transducer will experience at 20mA or 10Vdc
Delta P Transducer Pressure at 0Vdc (4mA) Input	0-10 Psi	0	Input the value of the pressure (in Psig 0.0) the transducer will experience at 4mA or 0Vdc
Delta P Pressure Set point	0-50 Psi	10	Choose the differential pressure the pump is modulated to maintain
Delta P Pressure Transducer Input Signal	0-10 Vdc, 4-20mA	0-10 Vdc	Choose the input signal of the pressure transducer (0-10 Vdc or 4-20mA)
<b>Boiler Parameters</b>			
Activation	Enable / Disable	Enable	Choose enable to activate this boiler for use in this system.

Flow Sensitive	Yes/No	Yes	Choose Yes unless the boiler you are configuring is rated by its manufacturer as having no minimum flow requirements. Choosing "No" allows boiler secondary pump modulation off the boiler device. It allows another Field Device dedicated to boiler secondary pumping to control boiler pump modulation through wireless network traffic of boiler inlet and outlet temperatures. Choosing "Yes" forces boiler secondary pump modulation to occur local on the Boiler Field Device only.
Boiler Type - Cond / NonCond	Cond / NonCond	Cond	Choose Cond. For condensing boilers, Choose NonCond for non-condensing boilers
Boiler Fire Delay Seconds	30 - 300 Sec	90	Choose the number of seconds between when this boiler is enabled until it has established main flame.
Boiler Low Fire Hold Minutes	5 - 60 Min	15	Choose the number of minutes you desire for the control to keep this boiler in low fire at the beginning of every cycle
Boiler Maximum Runtime Hours	1 - 24 Hrs	12	Choose the maximum number of hours you desire for this boiler to run in any single cycle.
Maximum Boiler MBH Output	1 - 52,000 MBH	3000	Enter in MBH the maximum output of this boiler. (Mbh = Btu/1000)
Minimum Boiler MBH Output	1 - 26,000 MBH	1500	Enter in MBH the minimum output of this boiler. (Mbh = Btu/1000)
Maximum Boiler Outlet Temperature	160 - 210 F	180	Enter the maximum outlet water temperature allowed to be supplied by this boiler.
Minimum Boiler Inlet Temperature	20 - 150 F	130	Enter the minimum inlet water temperature allowed to be returned to this boiler.
Maximum Boiler Output Percentage	50 - 100 %	100	Enter the maximum output percentage signal that you would like to send this boiler. This is used to help establish the relationship between output signal and Mbh output value of the boiler. ( If 9.00 Vdc = maximum boiler output then enter 90%)
Minimum Boiler Output Percentage	0 - 50 %	18	Enter the minimum output percentage signal that you would like to send this boiler. This is used to help establish the relationship between output signal and Mbh output value of the boiler. ( If 1.80 Vdc = minimum boiler output then enter 18%)
Boiler Ignition Output Percentage	0 - 50 %	0	Enter the output percentage at which main flame is ignited. Some boilers light off at greater than minimum signal. If light off of the boiler is 50% of output then enter 50%. This modulation signal will be sent to the boiler during the entire fire delay.
Boiler Next Stage Percentage	10 - 100 %	85	This is the percentage of boiler output that must be sustained for the entire "Stage Delay Time" before another boiler is enabled.
Boiler Turn Down	2:1-10:1	0	Enter the turn-down of this boiler. For turn-down's greater than 5:1 check with the start-up technician to confirm the field configured turn-down for the boiler.
Boiler Maximum Output Manual Limit	10 - 100 %	100	This is the maximum output signal to the boiler. It is not linked to the load calculation. It is used to limit a boilers output. Suggested use is a limit for output during start up and combustion analization.
Boiler Maximum Allowable Delta T.	2 - 160 F	20	Enter the maximum allowable Delta T for this boiler. This is the manufacturers maximum allowable Delta T the boiler is allowed to achieve.
Boiler Maximum operating Delta T.	0 - 158 F	15	Enter the maximum operating Delta T for this boiler. This is the set-point for the user to choose a number at least 2 degrees Fahrenheit below maximum allowable boiler Delta T. This number shall be used for modulation limits and error calculations

Standby Mode	Enable / Disable	Disable	Choose enable if you desire this boiler to be used as a standby boiler. A standby boiler is the lowest priority for operation and will be selected if all other boilers on the network are failing to meet the load requirements
Winter Priority Mode	Enable / Disable	Disable	Choose enable if you desire this boiler to be a "Winter Priority" boiler. Note: You must have activated winter priority under system settings and chosen a date to put this boiler into priority to use this feature.
Boiler Water Volume Gallons	1 - 12,000 Gal	100	Enter the volume of water in this boiler.
Maximum Rated Efficiency	65 - 99 %	85	Enter the maximum rated efficiency for this boiler
Process Output Acceleration	1 - 100.0	30	Select the process acceleration speed. (Lower numbers cause faster response to changes)
Boiler Modulation Signal	0-10 Vdc, 4-20mA	0-10 Vdc	Choose the type of signal you desire to be sent to modulate this boiler, 0-10 Vdc or 4-20mA. (also requires wiring to the correct terminal on the control)
DHWP (on-board or Network)	Enable / Disable	Disable	Select to enable this boiler for DHWP operations. This must be selected of either on board priority or Network priority
DHWP Set-point (on-board only)	110-240F	140F	Provide the outlet water temperature this boiler will be asked to provide when producing domestic hot water.
DHWP Maximum Hysteresis (on-board only)	5-30F	10F	This is the maximum allowable overshoot of the DHWP set-point for boiler water temperature. Outlet temperatures exceeding this value will cause the boiler to disable until the DHWP Minimum Hysteresis value has been reached
DHWP Minimum Hysteresis (on-board only)	3-20F	3F	This is the minimum allowable under-shoot of the DHWP set-point for boiler water temperature. Outlet temperatures less than or equal to this value will cause the boiler in priority to enable until the DHWP Maximum Hysteresis value has been reached or until the priority has ended
DHWP Override (on-board only)	15 - 181 Min	30	Choose the maximum number of minutes this boiler can be used to provide DHW when there is simultaneously a call for comfort heat.
<b>Boiler Pump Parameters</b>			
Activation	Enable / Disable	Enable	Choose enable to activate this boiler pump for use in this system.
Pump control / Valve control	Pump / Valve	Pump	Choose the device that is being controlled
Boiler Pump Off Delay	1 - 15 Min	10	Enter the number of minutes you would like this pump to run after the boiler has finished a cycle.
Boiler Pump Modulation	Enable / Disable	Disable	Enter "enable" if this pump is connected to a frequency drive and you wish to modulate that drive based on boiler Delta T
Boiler Delta T Set point	0 - 158 F	20	Enter the Delta T that you desire across this boiler. This number needs to be less than or equal to the value chosen as the maximum operating Delta chosen under Boiler Parameters for the boiler assigned to this pump.
Boiler Pump Maximum Modulation	50 - 100 %	100	Choose the maximum modulation signal expressed as a percentage you desire to be sent to this pump.

Percentage			
Boiler Pump Minimum Modulation Percentage	0 - 50 %	30	Choose the minimum modulation signal expressed as a percentage you desire to be sent to this pump.
Boiler Pump Process Acceleration	1 - 100.0	30	Select the process acceleration speed. (Lower numbers cause faster response to changes)
Boiler Pump Modulation Signal	0-10 Vdc, 4-20mA	0-10 Vdc	Choose the type of signal you desire to be sent to modulate this pump, 0-10 Vdc or 4-20mA. (also requires wiring to the correct terminal on the control)
<b>Damper Parameters</b>			
Activation	Enable / Disable	Enable	Choose enable to allow this damper to be used in this system.
Boiler Association	1-1, 1-16 Range	(1 - 1)	Identify the boiler(s) that this damper will work with. Boilers must be in sequential order. For example: Inputting 1-3 will not enable the damper on just 1 and 3. If 1-3 is chosen then boiler 1,2 & 3 will enable this damper if any or all of these boilers are enabled.

## Appendix B

ADDRESS	TAG NAME		TAG DATATYPE	NOD E
405000	MODBUS_ON_OFF_WRITE		UNSIGNED_16	PLC1
405001	BMS_ENABLE_CONTROL_WRITE		UNSIGNED_16	PLC1
405002	SYSTEM_SETPOINT_WRITE		UNSIGNED_16	PLC1
405003	REMOTE_ENABLE		UNSIGNED_16	PLC1
405004	SYSTEM_SETPOINT_READ		UNSIGNED_16	PLC1
405005	CONDENSING		UNSIGNED_16	PLC1
405006	OPTIMUM_STOP		UNSIGNED_16	PLC1
405007	OPTIMUM_START		UNSIGNED_16	PLC1
405008	OCCUPIED_OPERATIONS		UNSIGNED_16	PLC1
405009	UNOCCUPIED_OPERATIONS		UNSIGNED_16	PLC1
405010	WINTER_HEAT		UNSIGNED_16	PLC1
405011	SUMMER_HEAT		UNSIGNED_16	PLC1
405012	WINTER_PRIO		UNSIGNED_16	PLC1
405013	SYSTEM_SUPPLY_TEMP		SIGNED_16	PLC1
405014	SYSTEM_RETURN_TEMPERATURE		SIGNED_16	PLC1
405015	OUTDOOR_AIR_TEMPERATURE		SIGNED_16	PLC1
405016	SYSTEM_GPM_FLOW		UNSIGNED_16	PLC1
405017	SYSTEM_MBH_LOAD		UNSIGNED_32	PLC1
405018				PLC1
405019	MBREG_MAX_HYST		SIGNED_16	PLC1
405020	MBREG_MIN_HYST		SIGNED_16	PLC1
405021	SYSTEM_DELTA_T		SIGNED_16	PLC1
405022	WINTER_HEAT_ON_SP		SIGNED_16	PLC1
405023	WINTER_HEAT_OFF_SP		SIGNED_16	PLC1
405024	REHEAT_ON_SETPOINT		SIGNED_16	PLC1
405025	REHEAT_OFF_SETPOINT		SIGNED_16	PLC1
405026	DATE		UNSIGNED_16	PLC1
405027	24HR_TIME		UNSIGNED_16	PLC1



405028	SYS_7		UNSIGNED_16	PLC1
405029	SYS_8		UNSIGNED_16	PLC1
405030	SYS_9		UNSIGNED_16	PLC1
405031	MBREG_TPCMODBUS_VERSION		UNSIGNED_16	PLC1
405032	MBREG_NUM_MAIN_PUMPS		UNSIGNED_16	PLC1
405033	MBREG_FIRST_MAIN_PUMP_ADDR		UNSIGNED_16	PLC1
405034	MBREG_NUM_BOILERS		UNSIGNED_16	PLC1
405035	MBREG_FIRST_BOILER_ADDR		UNSIGNED_16	PLC1
405036-405099	Reserved			PLC1
405100	MP_EXISTING	PUMP1	UNSIGNED_16	PLC1
405101	MP_ON		UNSIGNED_16	PLC1
405102	MP_LEAD		UNSIGNED_16	PLC1
405103-405105	Reserved			PLC1
405106	MP_EXISTING	PUMP2	UNSIGNED_16	PLC1
405107	MP_ON		UNSIGNED_16	PLC1
405108	MP_LEAD		UNSIGNED_16	PLC1
405109-405111	Reserved			PLC1
405112	MP_EXISTING	PUMP3	UNSIGNED_16	PLC1
405113	MP_ON		UNSIGNED_16	PLC1
405114	MP_LEAD		UNSIGNED_16	PLC1
405115-405117	Reserved			PLC1
405118	MP_EXISTING	PUMP4	UNSIGNED_16	PLC1
405119	MP_ON		UNSIGNED_16	PLC1
405120	MP_LEAD		UNSIGNED_16	PLC1
405121-405123	Reserved			PLC1
405124	MP_EXISTING	PUMP5	UNSIGNED_16	PLC1
405125	MP_ON		UNSIGNED_16	PLC1
405126	MP_LEAD		UNSIGNED_16	PLC1
405127-405129	Reserved			PLC1
405130	MP_EXISTING	PUMP6	UNSIGNED_16	PLC1
405131	MP_ON		UNSIGNED_16	PLC1
405132	MP_LEAD		UNSIGNED_16	PLC1
405133-40	Reserved			PLC1

5135				
405136	MP_EXISTING	PUMP7	UNSIGNED_16	PLC1
405137	MP_ON		UNSIGNED_16	PLC1
405138	MP_LEAD		UNSIGNED_16	PLC1
405139-40 5141	Reserved			PLC1
405142	MP_EXISTING	PUMP8	UNSIGNED_16	PLC1
405143	MP_ON		UNSIGNED_16	PLC1
405144	MP_LEAD		UNSIGNED_16	PLC1
405145-40 5147	Reserved			PLC1
405148	MP_EXISTING	PUMP9	UNSIGNED_16	PLC1
405149	MP_ON		UNSIGNED_16	PLC1
405150	MP_LEAD		UNSIGNED_16	PLC1
405151-40 5153	Reserved			PLC1
405154	MP_EXISTING	PUMP10	UNSIGNED_16	PLC1
405155	MP_ON		UNSIGNED_16	PLC1
405156	MP_LEAD		UNSIGNED_16	PLC1
405157-40 5159	Reserved			PLC1
405160	MP_EXISTING	PUMP11	UNSIGNED_16	PLC1
405161	MP_ON		UNSIGNED_16	PLC1
405162	MP_LEAD		UNSIGNED_16	PLC1
405163-40 5165	Reserved			PLC1
405166	MP_EXISTING	PUMP12	UNSIGNED_16	PLC1
405167	MP_ON		UNSIGNED_16	PLC1
405168	MP_LEAD		UNSIGNED_16	PLC1
405169-40 5171	Reserved			PLC1
405172	MP_EXISTING	PUMP13	UNSIGNED_16	PLC1
405173	MP_ON		UNSIGNED_16	PLC1
405174	MP_LEAD		UNSIGNED_16	PLC1
405175-40 5177	Reserved			PLC1
405178	MP_EXISTING	PUMP14	UNSIGNED_16	PLC1
405179	MP_ON		UNSIGNED_16	PLC1
405180	MP_LEAD		UNSIGNED_16	PLC1

405181-40 5183	Reserved			PLC1
405184	MP_EXISTING	PUMP15	UNSIGNED_16	PLC1
405185	MP_ON		UNSIGNED_16	PLC1
405186	MP_LEAD		UNSIGNED_16	PLC1
405187-40 5189	Reserved			PLC1
405190	MP_EXISTING	PUMP16	UNSIGNED_16	PLC1
405191	MP_ON		UNSIGNED_16	PLC1
405192	MP_LEAD		UNSIGNED_16	PLC1
405193-40 5199	Reserved			PLC1
405200	B_EXISTING	BOILER1	UNSIGNED_16	PLC1
405201	B_ACTIVE		UNSIGNED_16	PLC1
405202	B_ALARM		UNSIGNED_16	PLC1
405203	B_CON_NON		UNSIGNED_16	PLC1
405204	B_WINTER		UNSIGNED_16	PLC1
405205	B_DHWP		UNSIGNED_16	PLC1
405206	B_ON		UNSIGNED_16	PLC1
405207	B_PUMP_EXISTING		UNSIGNED_16	PLC1
405208	B_PUMP_ON		UNSIGNED_16	PLC1
405209	B_VALVE_EXISTING		UNSIGNED_16	PLC1
405210	B_VALVE_ON		UNSIGNED_16	PLC1
405211	B_DAMPER_EXISTING		UNSIGNED_16	PLC1
405212	B_DAMPER_ON		UNSIGNED_16	PLC1
405213	B_DAMPER_PROVE		UNSIGNED_16	PLC1
405214	B_OUTLET_TEMP		SIGNED_16	PLC1
405215	B_INLET_TEMP		SIGNED_16	PLC1
405216	B_STACK_TEMP		SIGNED_16	PLC1
405217	B_CYCLE_TIME		UNSIGNED_16	PLC1
405218	B_CYCLE_COUNT		UNSIGNED_32	PLC1
405219				PLC1
405220	B_HOURS_OF_OPERATION		UNSIGNED_32	PLC1
405221				PLC1
405222	B_MBH_LOAD_ASSIGNMENT		UNSIGNED_32	PLC1
405223				PLC1
405224	B_MBH_OUTPUT		UNSIGNED_32	PLC1
405225				PLC1

405226-40 5249	Reserved			PLC1
405250	B_EXISTING	BOILER2	UNSIGNED_16	PLC1
405251	B_ACTIVE		UNSIGNED_16	PLC1
405252	B_ALARM		UNSIGNED_16	PLC1
405253	B_CON_NON		UNSIGNED_16	PLC1
405254	B_WINTER		UNSIGNED_16	PLC1
405255	B_DHWP		UNSIGNED_16	PLC1
405256	B_ON		UNSIGNED_16	PLC1
405257	B_PUMP_EXISTING		UNSIGNED_16	PLC1
405258	B_PUMP_ON		UNSIGNED_16	PLC1
405259	B_VALVE_EXISTING		UNSIGNED_16	PLC1
405260	B_VALVE_ON		UNSIGNED_16	PLC1
405261	B_DAMPER_EXISTING		UNSIGNED_16	PLC1
405262	B_DAMPER_ON		UNSIGNED_16	PLC1
405263	B_DAMPER_PROVE		UNSIGNED_16	PLC1
405264	B_OUTLET_TEMP		SIGNED_16	PLC1
405265	B_INLET_TEMP		SIGNED_16	PLC1
405266	B_STACK_TEMP		SIGNED_16	PLC1
405267	B_CYCLE_TIME		UNSIGNED_16	PLC1
405268	B_CYCLE_COUNT		UNSIGNED_32	PLC1
405269				PLC1
405270	B_HOURS_OF_OPERATION		UNSIGNED_32	PLC1
405271				PLC1
405272	B_MBH_LOAD_ASSIGNMENT		UNSIGNED_32	PLC1
405273				PLC1
405274	B_MBH_OUTPUT		UNSIGNED_32	PLC1
405275				PLC1
405276-40 5299	Reserved			PLC1
405300	B_EXISTING	BOILER3	UNSIGNED_16	PLC1
405301	B_ACTIVE		UNSIGNED_16	PLC1
405302	B_ALARM		UNSIGNED_16	PLC1
405303	B_CON_NON		UNSIGNED_16	PLC1
405304	B_WINTER		UNSIGNED_16	PLC1
405305	B_DHWP		UNSIGNED_16	PLC1
405306	B_ON		UNSIGNED_16	PLC1
405307	B_PUMP_EXISTING		UNSIGNED_16	PLC1

405308	B_PUMP_ON		UNSIGNED_16	PLC1
405309	B_VALVE_EXISTING		UNSIGNED_16	PLC1
405310	B_VALVE_ON		UNSIGNED_16	PLC1
405311	B_DAMPER_EXISTING		UNSIGNED_16	PLC1
405312	B_DAMPER_ON		UNSIGNED_16	PLC1
405313	B_DAMPER_PROVE		UNSIGNED_16	PLC1
405314	B_OUTLET_TEMP		SIGNED_16	PLC1
405315	B_INLET_TEMP		SIGNED_16	PLC1
405316	B_STACK_TEMP		SIGNED_16	PLC1
405317	B_CYCLE_TIME		UNSIGNED_16	PLC1
405318	B_CYCLE_COUNT		UNSIGNED_32	PLC1
405319				PLC1
405320	B_HOURS_OF_OPERATION		UNSIGNED_32	PLC1
405321				PLC1
405322	B_MBH_LOAD_ASSIGNMENT		UNSIGNED_32	PLC1
405323				PLC1
405324	B_MBH_OUTPUT		UNSIGNED_32	PLC1
405325				PLC1
405326-405349	Reserved			PLC1
405350	B_EXISTING	BOILER4	UNSIGNED_16	PLC1
405351	B_ACTIVE		UNSIGNED_16	PLC1
405352	B_ALARM		UNSIGNED_16	PLC1
405353	B_CON_NON		UNSIGNED_16	PLC1
405354	B_WINTER		UNSIGNED_16	PLC1
405355	B_DHWP		UNSIGNED_16	PLC1
405356	B_ON		UNSIGNED_16	PLC1
405357	B_PUMP_EXISTING		UNSIGNED_16	PLC1
405358	B_PUMP_ON		UNSIGNED_16	PLC1
405359	B_VALVE_EXISTING		UNSIGNED_16	PLC1
405360	B_VALVE_ON		UNSIGNED_16	PLC1
405361	B_DAMPER_EXISTING		UNSIGNED_16	PLC1
405362	B_DAMPER_ON		UNSIGNED_16	PLC1
405363	B_DAMPER_PROVE		UNSIGNED_16	PLC1
405364	B_OUTLET_TEMP		SIGNED_16	PLC1
405365	B_INLET_TEMP		SIGNED_16	PLC1
405366	B_STACK_TEMP		SIGNED_16	PLC1
405367	B_CYCLE_TIME		UNSIGNED_16	PLC1

405368	B_CYCLE_COUNT		UNSIGNED_32	PLC1
405369				PLC1
405370	B_HOURS_OF_OPERATION		UNSIGNED_32	PLC1
405371				PLC1
405372	B_MBH_LOAD_ASSIGNMENT		UNSIGNED_32	PLC1
405373				PLC1
405374	B_MBH_OUTPUT		UNSIGNED_32	PLC1
405375				PLC1
405376-405399	Reserved			PLC1
405400	B_EXISTING	BOILER5	UNSIGNED_16	PLC1
405401	B_ACTIVE		UNSIGNED_16	PLC1
405402	B_ALARM		UNSIGNED_16	PLC1
405403	B_CON_NON		UNSIGNED_16	PLC1
405404	B_WINTER		UNSIGNED_16	PLC1
405405	B_DHWP		UNSIGNED_16	PLC1
405406	B_ON		UNSIGNED_16	PLC1
405407	B_PUMP_EXISTING		UNSIGNED_16	PLC1
405408	B_PUMP_ON		UNSIGNED_16	PLC1
405409	B_VALVE_EXISTING		UNSIGNED_16	PLC1
405410	B_VALVE_ON		UNSIGNED_16	PLC1
405411	B_DAMPER_EXISTING		UNSIGNED_16	PLC1
405412	B_DAMPER_ON		UNSIGNED_16	PLC1
405413	B_DAMPER_PROVE		UNSIGNED_16	PLC1
405414	B_OUTLET_TEMP		SIGNED_16	PLC1
405415	B_INLET_TEMP		SIGNED_16	PLC1
405416	B_STACK_TEMP		SIGNED_16	PLC1
405417	B_CYCLE_TIME		UNSIGNED_16	PLC1
405418	B_CYCLE_COUNT		UNSIGNED_32	PLC1
405419				PLC1
405420	B_HOURS_OF_OPERATION		UNSIGNED_32	PLC1
405421				PLC1
405422	B_MBH_LOAD_ASSIGNMENT		UNSIGNED_32	PLC1
405423				PLC1
405424	B_MBH_OUTPUT		UNSIGNED_32	PLC1
405425				PLC1
405426-405449	Reserved			PLC1

405450	B_EXISTING	BOILER6	UNSIGNED_16	PLC1
405451	B_ACTIVE		UNSIGNED_16	PLC1
405452	B_ALARM		UNSIGNED_16	PLC1
405453	B_CON_NON		UNSIGNED_16	PLC1
405454	B_WINTER		UNSIGNED_16	PLC1
405455	B_DHWP		UNSIGNED_16	PLC1
405456	B_ON		UNSIGNED_16	PLC1
405457	B_PUMP_EXISTING		UNSIGNED_16	PLC1
405458	B_PUMP_ON		UNSIGNED_16	PLC1
405459	B_VALVE_EXISTING		UNSIGNED_16	PLC1
405460	B_VALVE_ON		UNSIGNED_16	PLC1
405461	B_DAMPER_EXISTING		UNSIGNED_16	PLC1
405462	B_DAMPER_ON		UNSIGNED_16	PLC1
405463	B_DAMPER_PROVE		UNSIGNED_16	PLC1
405464	B_OUTLET_TEMP		SIGNED_16	PLC1
405465	B_INLET_TEMP		SIGNED_16	PLC1
405466	B_STACK_TEMP		SIGNED_16	PLC1
405467	B_CYCLE_TIME		UNSIGNED_16	PLC1
405468	B_CYCLE_COUNT		UNSIGNED_32	PLC1
405469				PLC1
405470	B_HOURS_OF_OPERATION		UNSIGNED_32	PLC1
405471				PLC1
405472	B_MBH_LOAD_ASSIGNMENT		UNSIGNED_32	PLC1
405473				PLC1
405474	B_MBH_OUTPUT		UNSIGNED_32	PLC1
405475				PLC1
405476-405499	Reserved			PLC1
405500	B_EXISTING	BOILER7	UNSIGNED_16	PLC1
405501	B_ACTIVE		UNSIGNED_16	PLC1
405502	B_ALARM		UNSIGNED_16	PLC1
405503	B_CON_NON		UNSIGNED_16	PLC1
405504	B_WINTER		UNSIGNED_16	PLC1
405505	B_DHWP		UNSIGNED_16	PLC1
405506	B_ON		UNSIGNED_16	PLC1
405507	B_PUMP_EXISTING		UNSIGNED_16	PLC1
405508	B_PUMP_ON		UNSIGNED_16	PLC1
405509	B_VALVE_EXISTING		UNSIGNED_16	PLC1

405510	B_VALVE_ON		UNSIGNED_16	PLC1
405511	B_DAMPER_EXISTING		UNSIGNED_16	PLC1
405512	B_DAMPER_ON		UNSIGNED_16	PLC1
405513	B_DAMPER_PROVE		UNSIGNED_16	PLC1
405514	B_OUTLET_TEMP		SIGNED_16	PLC1
405515	B_INLET_TEMP		SIGNED_16	PLC1
405516	B_STACK_TEMP		SIGNED_16	PLC1
405517	B_CYCLE_TIME		UNSIGNED_16	PLC1
405518	B_CYCLE_COUNT		UNSIGNED_32	PLC1
405519				PLC1
405520	B_HOURS_OF_OPERATION		UNSIGNED_32	PLC1
405521				PLC1
405522	B_MBH_LOAD_ASSIGNMENT		UNSIGNED_32	PLC1
405523				PLC1
405524	B_MBH_OUTPUT		UNSIGNED_32	PLC1
405525				PLC1
405526-405549	Reserved			PLC1
405550	B_EXISTING	BOILER8	UNSIGNED_16	PLC1
405551	B_ACTIVE		UNSIGNED_16	PLC1
405552	B_ALARM		UNSIGNED_16	PLC1
405553	B_CON_NON		UNSIGNED_16	PLC1
405554	B_WINTER		UNSIGNED_16	PLC1
405555	B_DHWP		UNSIGNED_16	PLC1
405556	B_ON		UNSIGNED_16	PLC1
405557	B_PUMP_EXISTING		UNSIGNED_16	PLC1
405558	B_PUMP_ON		UNSIGNED_16	PLC1
405559	B_VALVE_EXISTING		UNSIGNED_16	PLC1
405560	B_VALVE_ON		UNSIGNED_16	PLC1
405561	B_DAMPER_EXISTING		UNSIGNED_16	PLC1
405562	B_DAMPER_ON		UNSIGNED_16	PLC1
405563	B_DAMPER_PROVE		UNSIGNED_16	PLC1
405564	B_OUTLET_TEMP		SIGNED_16	PLC1
405565	B_INLET_TEMP		SIGNED_16	PLC1
405566	B_STACK_TEMP		SIGNED_16	PLC1
405567	B_CYCLE_TIME		UNSIGNED_16	PLC1
405568	B_CYCLE_COUNT		UNSIGNED_32	PLC1
405569				PLC1



405570	B_HOURS_OF_OPERATION		UNSIGNED_32	PLC1
405571				PLC1
405572	B_MBH_LOAD_ASSIGNMENT		UNSIGNED_32	PLC1
405573				PLC1
405574	B_MBH_OUTPUT		UNSIGNED_32	PLC1
405575				PLC1
405576-405599	Reserved			PLC1
405600	B_EXISTING	BOILER9	UNSIGNED_16	PLC1
405601	B_ACTIVE		UNSIGNED_16	PLC1
405602	B_ALARM		UNSIGNED_16	PLC1
405603	B_CON_NON		UNSIGNED_16	PLC1
405604	B_WINTER		UNSIGNED_16	PLC1
405605	B_DHWP		UNSIGNED_16	PLC1
405606	B_ON		UNSIGNED_16	PLC1
405607	B_PUMP_EXISTING		UNSIGNED_16	PLC1
405608	B_PUMP_ON		UNSIGNED_16	PLC1
405609	B_VALVE_EXISTING		UNSIGNED_16	PLC1
405610	B_VALVE_ON		UNSIGNED_16	PLC1
405611	B_DAMPER_EXISTING		UNSIGNED_16	PLC1
405612	B_DAMPER_ON		UNSIGNED_16	PLC1
405613	B_DAMPER_PROVE		UNSIGNED_16	PLC1
405614	B_OUTLET_TEMP		SIGNED_16	PLC1
405615	B_INLET_TEMP		SIGNED_16	PLC1
405616	B_STACK_TEMP		SIGNED_16	PLC1
405617	B_CYCLE_TIME		UNSIGNED_16	PLC1
405618	B_CYCLE_COUNT		UNSIGNED_32	PLC1
405619				PLC1
405620	B_HOURS_OF_OPERATION		UNSIGNED_32	PLC1
405621				PLC1
405622	B_MBH_LOAD_ASSIGNMENT		UNSIGNED_32	PLC1
405623				PLC1
405624	B_MBH_OUTPUT		UNSIGNED_32	PLC1
405625				PLC1
405626-405649	Reserved			PLC1
405650	B_EXISTING	BOILER1 0	UNSIGNED_16	PLC1

405651	B_ACTIVE		UNSIGNED_16	PLC1
405652	B_ALARM		UNSIGNED_16	PLC1
405653	B_CON_NON		UNSIGNED_16	PLC1
405654	B_WINTER		UNSIGNED_16	PLC1
405655	B_DHWP		UNSIGNED_16	PLC1
405656	B_ON		UNSIGNED_16	PLC1
405657	B_PUMP_EXISTING		UNSIGNED_16	PLC1
405658	B_PUMP_ON		UNSIGNED_16	PLC1
405659	B_VALVE_EXISTING		UNSIGNED_16	PLC1
405660	B_VALVE_ON		UNSIGNED_16	PLC1
405661	B_DAMPER_EXISTING		UNSIGNED_16	PLC1
405662	B_DAMPER_ON		UNSIGNED_16	PLC1
405663	B_DAMPER_PROVE		UNSIGNED_16	PLC1
405664	B_OUTLET_TEMP		SIGNED_16	PLC1
405665	B_INLET_TEMP		SIGNED_16	PLC1
405666	B_STACK_TEMP		SIGNED_16	PLC1
405667	B_CYCLE_TIME		UNSIGNED_16	PLC1
405668	B_CYCLE_COUNT		UNSIGNED_32	PLC1
405669				PLC1
405670	B_HOURS_OF_OPERATION		UNSIGNED_32	PLC1
405671				PLC1
405672	B_MBH_LOAD_ASSIGNMENT		UNSIGNED_32	PLC1
405673				PLC1
405674	B_MBH_OUTPUT		UNSIGNED_32	PLC1
405675				PLC1
405676-405699	Reserved			PLC1
405700	B_EXISTING	BOILER1 1	UNSIGNED_16	PLC1
405701	B_ACTIVE		UNSIGNED_16	PLC1
405702	B_ALARM		UNSIGNED_16	PLC1
405703	B_CON_NON		UNSIGNED_16	PLC1
405704	B_WINTER		UNSIGNED_16	PLC1
405705	B_DHWP		UNSIGNED_16	PLC1
405706	B_ON		UNSIGNED_16	PLC1
405707	B_PUMP_EXISTING		UNSIGNED_16	PLC1
405708	B_PUMP_ON		UNSIGNED_16	PLC1
405709	B_VALVE_EXISTING		UNSIGNED_16	PLC1

405710	B_VALVE_ON		UNSIGNED_16	PLC1
405711	B_DAMPER_EXISTING		UNSIGNED_16	PLC1
405712	B_DAMPER_ON		UNSIGNED_16	PLC1
405713	B_DAMPER_PROVE		UNSIGNED_16	PLC1
405714	B_OUTLET_TEMP		SIGNED_16	PLC1
405715	B_INLET_TEMP		SIGNED_16	PLC1
405716	B_STACK_TEMP		SIGNED_16	PLC1
405717	B_CYCLE_TIME		UNSIGNED_16	PLC1
405718	B_CYCLE_COUNT		UNSIGNED_32	PLC1
405719				PLC1
405720	B_HOURS_OF_OPERATION		UNSIGNED_32	PLC1
405721				PLC1
405722	B_MBH_LOAD_ASSIGNMENT		UNSIGNED_32	PLC1
405723				PLC1
405724	B_MBH_OUTPUT		UNSIGNED_32	PLC1
405725				PLC1
405726-405749	Reserved			PLC1
405750	B_EXISTING	BOILER1 2	UNSIGNED_16	PLC1
405751	B_ACTIVE		UNSIGNED_16	PLC1
405752	B_ALARM		UNSIGNED_16	PLC1
405753	B_CON_NON		UNSIGNED_16	PLC1
405754	B_WINTER		UNSIGNED_16	PLC1
405755	B_DHWP		UNSIGNED_16	PLC1
405756	B_ON		UNSIGNED_16	PLC1
405757	B_PUMP_EXISTING		UNSIGNED_16	PLC1
405758	B_PUMP_ON		UNSIGNED_16	PLC1
405759	B_VALVE_EXISTING		UNSIGNED_16	PLC1
405760	B_VALVE_ON		UNSIGNED_16	PLC1
405761	B_DAMPER_EXISTING		UNSIGNED_16	PLC1
405762	B_DAMPER_ON		UNSIGNED_16	PLC1
405763	B_DAMPER_PROVE		UNSIGNED_16	PLC1
405764	B_OUTLET_TEMP		SIGNED_16	PLC1
405765	B_INLET_TEMP		SIGNED_16	PLC1
405766	B_STACK_TEMP		SIGNED_16	PLC1
405767	B_CYCLE_TIME		UNSIGNED_16	PLC1
405768	B_CYCLE_COUNT		UNSIGNED_32	PLC1

405769				PLC1
405770	B_HOURS_OF_OPERATION		UNSIGNED_32	PLC1
405771				PLC1
405772	B_MBH_LOAD_ASSIGNMENT		UNSIGNED_32	PLC1
405773				PLC1
405774	B_MBH_OUTPUT		UNSIGNED_32	PLC1
405775				PLC1
405776-405799	Reserved			PLC1
405800	B_EXISTING	BOILER1 3	UNSIGNED_16	PLC1
405801	B_ACTIVE		UNSIGNED_16	PLC1
405802	B_ALARM		UNSIGNED_16	PLC1
405803	B_CON_NON		UNSIGNED_16	PLC1
405804	B_WINTER		UNSIGNED_16	PLC1
405805	B_DHWP		UNSIGNED_16	PLC1
405806	B_ON		UNSIGNED_16	PLC1
405807	B_PUMP_EXISTING		UNSIGNED_16	PLC1
405808	B_PUMP_ON		UNSIGNED_16	PLC1
405809	B_VALVE_EXISTING		UNSIGNED_16	PLC1
405810	B_VALVE_ON		UNSIGNED_16	PLC1
405811	B_DAMPER_EXISTING		UNSIGNED_16	PLC1
405812	B_DAMPER_ON		UNSIGNED_16	PLC1
405813	B_DAMPER_PROVE		UNSIGNED_16	PLC1
405814	B_OUTLET_TEMP		SIGNED_16	PLC1
405815	B_INLET_TEMP		SIGNED_16	PLC1
405816	B_STACK_TEMP		SIGNED_16	PLC1
405817	B_CYCLE_TIME		UNSIGNED_16	PLC1
405818	B_CYCLE_COUNT		UNSIGNED_32	PLC1
405819				PLC1
405820	B_HOURS_OF_OPERATION		UNSIGNED_32	PLC1
405821				PLC1
405822	B_MBH_LOAD_ASSIGNMENT		UNSIGNED_32	PLC1
405823				PLC1
405824	B_MBH_OUTPUT		UNSIGNED_32	PLC1
405825				PLC1
405826-405849	Reserved			PLC1

405850	B_EXISTING	BOILER1 4	UNSIGNED_16	PLC1
405851	B_ACTIVE		UNSIGNED_16	PLC1
405852	B_ALARM		UNSIGNED_16	PLC1
405853	B_CON_NON		UNSIGNED_16	PLC1
405854	B_WINTER		UNSIGNED_16	PLC1
405855	B_DHWP		UNSIGNED_16	PLC1
405856	B_ON		UNSIGNED_16	PLC1
405857	B_PUMP_EXISTING		UNSIGNED_16	PLC1
405858	B_PUMP_ON		UNSIGNED_16	PLC1
405859	B_VALVE_EXISTING		UNSIGNED_16	PLC1
405860	B_VALVE_ON		UNSIGNED_16	PLC1
405861	B_DAMPER_EXISTING		UNSIGNED_16	PLC1
405862	B_DAMPER_ON		UNSIGNED_16	PLC1
405863	B_DAMPER_PROVE		UNSIGNED_16	PLC1
405864	B_OUTLET_TEMP		SIGNED_16	PLC1
405865	B_INLET_TEMP		SIGNED_16	PLC1
405866	B_STACK_TEMP		SIGNED_16	PLC1
405867	B_CYCLE_TIME		UNSIGNED_16	PLC1
405868	B_CYCLE_COUNT		UNSIGNED_32	PLC1
405869				PLC1
405870	B_HOURS_OF_OPERATION		UNSIGNED_32	PLC1
405871				PLC1
405872	B_MBH_LOAD_ASSIGNMENT		UNSIGNED_32	PLC1
405873				PLC1
405874	B_MBH_OUTPUT		UNSIGNED_32	PLC1
405875				PLC1
405876-405899	Reserved			PLC1
405900	B_EXISTING	BOILER1 5	UNSIGNED_16	PLC1
405901	B_ACTIVE		UNSIGNED_16	PLC1
405902	B_ALARM		UNSIGNED_16	PLC1
405903	B_CON_NON		UNSIGNED_16	PLC1
405904	B_WINTER		UNSIGNED_16	PLC1
405905	B_DHWP		UNSIGNED_16	PLC1
405906	B_ON		UNSIGNED_16	PLC1
405907	B_PUMP_EXISTING		UNSIGNED_16	PLC1

405908	B_PUMP_ON		UNSIGNED_16	PLC1
405909	B_VALVE_EXISTING		UNSIGNED_16	PLC1
405910	B_VALVE_ON		UNSIGNED_16	PLC1
405911	B_DAMPER_EXISTING		UNSIGNED_16	PLC1
405912	B_DAMPER_ON		UNSIGNED_16	PLC1
405913	B_DAMPER_PROVE		UNSIGNED_16	PLC1
405914	B_OUTLET_TEMP		SIGNED_16	PLC1
405915	B_INLET_TEMP		SIGNED_16	PLC1
405916	B_STACK_TEMP		SIGNED_16	PLC1
405917	B_CYCLE_TIME		UNSIGNED_16	PLC1
405918	B_CYCLE_COUNT		UNSIGNED_32	PLC1
405919				PLC1
405920	B_HOURS_OF_OPERATION		UNSIGNED_32	PLC1
405921				PLC1
405922	B_MBH_LOAD_ASSIGNMENT		UNSIGNED_32	PLC1
405923				PLC1
405924	B_MBH_OUTPUT		UNSIGNED_32	PLC1
405925				PLC1
405926-405949	Reserved			PLC1
405950	B_EXISTING	BOILER1 6	UNSIGNED_16	PLC1
405951	B_ACTIVE		UNSIGNED_16	PLC1
405952	B_ALARM		UNSIGNED_16	PLC1
405953	B_CON_NON		UNSIGNED_16	PLC1
405954	B_WINTER		UNSIGNED_16	PLC1
405955	B_DHWP		UNSIGNED_16	PLC1
405956	B_ON		UNSIGNED_16	PLC1
405957	B_PUMP_EXISTING		UNSIGNED_16	PLC1
405958	B_PUMP_ON		UNSIGNED_16	PLC1
405959	B_VALVE_EXISTING		UNSIGNED_16	PLC1
405960	B_VALVE_ON		UNSIGNED_16	PLC1
405961	B_DAMPER_EXISTING		UNSIGNED_16	PLC1
405962	B_DAMPER_ON		UNSIGNED_16	PLC1
405963	B_DAMPER_PROVE		UNSIGNED_16	PLC1
405964	B_OUTLET_TEMP		SIGNED_16	PLC1
405965	B_INLET_TEMP		SIGNED_16	PLC1
405966	B_STACK_TEMP		SIGNED_16	PLC1

405967	B_CYCLE_TIME		UNSIGNED_16	PLC1
405968	B_CYCLE_COUNT		UNSIGNED_32	PLC1
405969				PLC1
405970	B_HOURS_OF_OPERATION		UNSIGNED_32	PLC1
405971				PLC1
405972	B_MBH_LOAD_ASSIGNMENT		UNSIGNED_32	PLC1
405973				PLC1
405974	B_MBH_OUTPUT		UNSIGNED_32	PLC1
405975				PLC1
405975-409999	Reserved			PLC1

## Appendix C



GROUP	Parameter	Logging Type	Sample Size
Design Inputs	SUPPLY TEMP	HOURLY AVERAGE	>= 10 SAMPLES/HOUR
Design Inputs	RETURN TEMP	HOURLY AVERAGE	>= 10 SAMPLES/HOUR
Design Inputs	OUTDOOR AIR TEMP	HOURLY AVERAGE	>= 10 SAMPLES/HOUR
Design Inputs	GPM FLOW	HOURLY AVERAGE	>= 10 SAMPLES/HOUR
Design Inputs	SET POINT	HOURLY AVERAGE	>= 10 SAMPLES/HOUR
Design Inputs	DISPLAY LOAD (SUPPLY - RETURN * GPM)	HOURLY AVERAGE	>= 60 SAMPLES/HOUR
Heat Priority	WINTER HEAT ON SET POINT	EVENT DRIVEN	ON DATA
Heat Priority	NON CONDENSING OUTDOOR SET POINT	EVENT DRIVEN	ON DATA
Heat Reset 1 (Condensing)	OPERATION IN RESET	EVENT DRIVEN	ON DATA
Heat Reset 2 (NonCondensing)	OPERATION IN RESET	EVENT DRIVEN	ON DATA
Heat Reset 3 (Reheat)	OPERATION IN RESET	EVENT DRIVEN	ON DATA
Winter Priority	ACTIVE / INACTIVE	EVENT DRIVEN	ON DATA
System Pumps	ALARM STATUS	EVENT DRIVEN	ON DATA
System Pumps	ON/OFF STATUS	EVENT DRIVEN	ON DATA
System Pumps	OUTPUT PERCENTAGE (MODULATION)	HOURLY AVERAGE	>= 60 SAMPLES/HOUR
Zone Pump	ALARM STATUS	EVENT DRIVEN	ON DATA
Zone Pump	ON/OFF STATUS	EVENT DRIVEN	ON DATA
Zone Pump	OUTPUT PERCENTAGE (MODULATION)	HOURLY AVERAGE	>= 60 SAMPLES/HOUR
Boiler Pump	ALARM STATUS	EVENT DRIVEN	ON DATA
Boiler Pump	ON/OFF STATUS	EVENT DRIVEN	ON DATA
Boiler Pump	OUTPUT PERCENTAGE (MODULATION)	HOURLY AVERAGE	>= 60 SAMPLES/HOUR
Boilers	HOURS OF OPERATION	EVENT DRIVEN	TO A MINUTE
Boilers	ALARM STATUS	EVENT DRIVEN	ON DATA
Boilers	ON/OFF STATUS	EVENT DRIVEN	ON DATA
Boilers	OUTPUT PERCENTAGE (MODULATION)	HOURLY AVERAGE	>= 60 SAMPLES/HOUR
Damper	ALARM STATUS	EVENT DRIVEN	ON DATA

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