

Specification for Heat Transfer Products, Inc. Vision 3 System

Vision 3 Cascade Boiler Control Guide Specifications

Multiple boiler cascade control:

Control system shall be manufactured by Heat Transfer Products, Inc. as a complete package, encased in a stainless steel cabinet with removable cover, that seamlessly integrates the operation of a minimum of 2 to a maximum of 8 boilers in such a way so as to manage the capacity of each boiler, including each boiler's modulating burner BTU input, as one large boiler to match the system space heating and/or water heating requirement as follows:

- a. The control shall determine the actual load on the basis of a room thermostat, outdoor sensor, or 0-10 volt signal.
- b. The control shall automatically rotate each boiler in the cascade every 24 hours, after the first 48 hours, of operation to equalize the run time of each boiler.
- c. The control shall energize each boiler and circulating pump. The modulating burner firing rate shall be based on the system temperature target set point value while the boiler return sensor reads the system return water temperature to establish the firing rate of each boiler required to match the BTU heating requirement. Regulation of the connected, firing boilers, shall be achieved by dividing the calculated load between the Vision 3 connected boilers.
- d. The control shall send a data ID (poll) to each boiler every 10-15 seconds so as to determine the boiler is: 1) present and ready to operate; 2) Firing and what the current rate of input is; 3) water discharge temperature and return temperature. The constant polling process shall automatically determine if a boiler is not operational and once returned to service, automatically include the boiler in the cascade within 5 seconds of it becoming operational. Likewise, the control shall *skip* the disabled boiler and continue to poll it every 5 seconds so as to include it in the cascade immediately once restored to operational status.
- e. The control shall incorporate a 'system sensor' as standard equipment, which is attached to the system hot water supply for measuring the temperature of the water supplied by the boiler cascade to the space heating/water heating system.
- f. The control shall incorporate the ability to energize a 'back up' or existing boiler system as necessary. The control shall 'turn off' the extra or existing boiler when the calculated load value drops below 85% without overshooting the set point.
- g. The control shall have as standard equipment an LED display, and user interface panel for user developed parameter input for system temperature set point, outdoor reset settings and indirect hot water heater temperature set point with indirect hot water heater temperature display using the factory supplied indirect water heater sensor, cascade temperature display, and all other system status conditions.

- h. The control shall have as standard equipment, an outdoor reset sensor allowing the boiler temperatures to be reset as the outdoor temperature rises and falls. This shall be accomplished with one (1) outdoor sensor, regardless the number of boilers (2 to 8) in the boiler cascade.
- i. The control shall automatically provide for indirect water heater priority control using the factory supplied indirect water heater sensor.
- j. The control shall have the ability to be energized with a standard space thermostat signal or a 0-10 volt signal.
- k. The control shall have as standard equipment an anti-cycle timer function.
- l. The control shall have a maximum 120V/60/1ph 6.3 amp circuit (fused) to power the central heating system circulator or circulator relay.
- m. The control shall have a 1.0 amp 24 VAC output to power auxiliary devices that might be required for the installation.
- n. The control shall have a 6.3 amp 120V/60/1ph auxiliary fan output to energize a fan powered common vent system.
- o. The control shall have a 4.3 amp 120V/60/1ph circuit to power the indirect water heater pump.
- p. The control shall have the capacity to manage all boilers in the cascade so as to achieve a maximum of 100% of installed cascade capacity, and modulate down to a minimum of 30% of the installed cascade capacity.
- q. After the initial call for heat, the control shall have the capacity to switch on the next cascade boiler when the control calculates a load demand greater than 80% of the programmed value and share the load equally between the total boilers in operation at that point in time.
- r. The control shall have the capacity to switch off the last boiler fired in the cascade when the divided load is 60% of the programmed value.
- s. The control shall be compatible and capable of 'plug and play' recognition of all boiler controls in the cascade.
- t. The control communication buss shall be three wire and digital in nature.
- u. The control shall be furnished with factory identified A, B and Common buss "pigtail" wires tipped with Molex Pins for insertion in each of the boiler control Molex Receptacles.
- v. The control package shall be provided in a 4 boiler package or an 8 boiler package with the following: 1) One Supply Sensor (7250P-324); 2) One Outdoor Sensor (7250P-319); 3) One Indirect Sensor (7250P-325); 4) Buss communication wires A, B, Common (4 sets for 4 boiler package or 8 sets for an 8 boiler package); 5) Vision 3 Display Panel (7250P-366); 6) Factory supplied Installation Manual and Wiring diagrams.
- w. The control shall be equipped with wiring terminal strips that are labeled with each wire connection for easy visibility and connection.
- x. The control shall be equipped with a mother board that snaps in and out for easy service without disturbing wired connections.
- y. The control shall be equipped with 4 external green LED lights to signify energized: 1) Heating Pump; 2) Indirect Pump; 3) Extra Boiler; 4) External Vent Fan
- z. The control shall have a 4 pin connection for easy connection to a PC using the Vision 3 software.
- aa. The control shall be totally compatible to operate with a Vision 1 or Vision 2 control system.