Web: www.AdvantageEngineering.com Phone: 317-887-0729

SENTRA® SERIES

Technical Data

The Sentra® water temperature control unit is used to preheat a process to the desired operating temperature by engaging the unit's electric immersion heater and recirculating the water in the system.

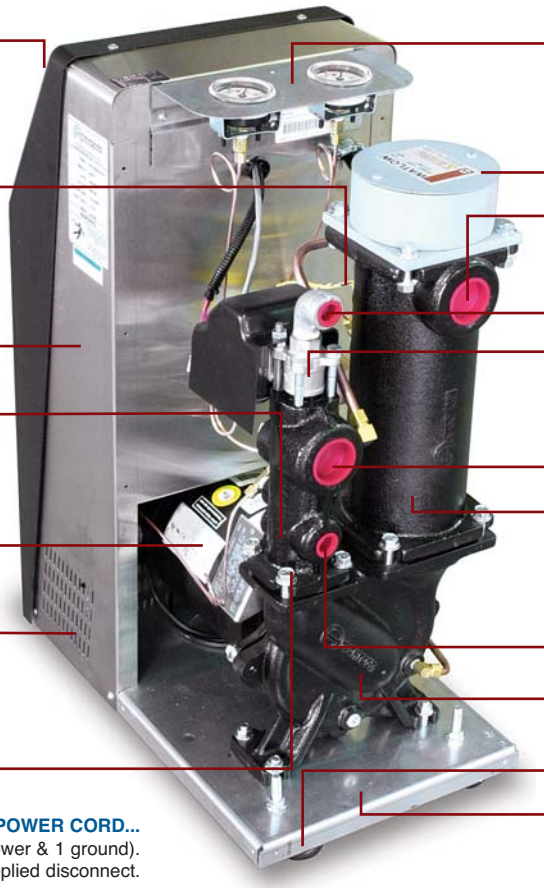
Upon reaching the operating temperature, the Sentra® water temperature control unit can continue to add heat or become a cooling device by exchanging a small amount of recirculated water with cooling water from an external source.

Tight temperature control is achieved by adding just the right amount of heat or by precisely metering cooling water into the system.

Package for standard units having 16 kW and smaller heaters and 3 horsepower and smaller pumps. Approximate dimensions: 29" H x 12.5" W x 19.5" D.

Package for standard units having 24 & 34 kW heaters and 5 & 7.5 horsepower pumps. Approximate dimensions: 44" H x 16" W x 24" D.

THE SENTRA SYSTEM



CONTROL INSTRUMENT... choice of microprocessor instrument offers precise temperature control, machine status and diagnostic information presented in an easy-to-understand interface (not visible from this angle).

SENSOR PROBE... placed in the fluid steam for accurate temperature monitoring. The **To Process** sensor reads process temperature delivered to process. The **High Temperature Limit** protects against overheating. HE & 300° Instruments include a From Process sensor probe.

ELECTRICAL CABINET... hinged door opens to allow full access to electrical components.

FLOW METER... included with HE instruments to monitor process flow. Flow is displayed in GPM (gallons per minute) or LPM (liters per minute). Knowing the process flow is critical for fine tuning heat transfer efficiency.

MOTOR... horizontal orientation extends pump seal service life and assures that water and debris will not foul motor windings.

STAINLESS STEEL CABINET... durable and sturdy construction, vented to dissipate excess process heat, and easy to clean. Rear cover panel is easy-to-remove for access to the mechanical components (panel removed in photo).

COOLING CYLINDER

POWER CORD... 10' factory installed 4 wire power cord (3 power & 1 ground). Ready for installation to customer supplied disconnect. Supplied on units up to 3hp and 16kW. (Not shown in picture).

PRESSURE GAUGES... indicates 'to process' and 'from process' pressure. The operator can determine ΔP, pump direction and other operating characteristics from these gauges.

HEATER... flange mounted for easy service.

TO PROCESS CONNECTION... all unit connection ports are machined into reinforced bosses to provide strong and rigid connections.

COOLING WATER DRAIN CONNECTION

COOLING VALVE... provides precise control and easy maintenance. AVT™ modulating valve on LE & HE models. Solenoid valve on VE and 300° units.

FROM PROCESS CONNECTION

HEATING CYLINDER... cylinder castings are custom designed to eliminate leak-prone pipe fittings found on competitive models. The Heating and Cooling cylinders are flange mounted to the pump casing.

COOLING WATER SUPPLY CONNECTION

PUMP CASING... with built-in seal flush for extended pump seal service life.

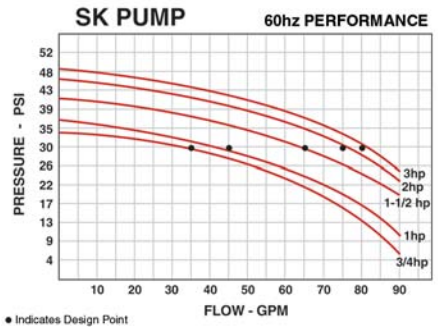
CASTERS... swivel casters allow easy mobility.

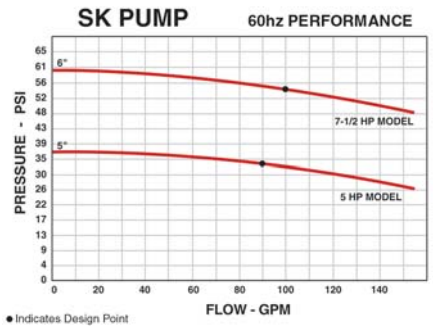
GALVANIZED STEEL BASE... provides a rigid, strong, and long lasting support structure.

Made in the U.S.A.

CENTRIFUGAL PUMP

The custom designed casing and impeller generates 20% more flow with the same horsepower as compared to many competitive machines. Standard 3/4 hp pumps produce 35 gpm at 30 psi. Refer to the pump curves for more details. The pump casing has vertically facing machined ports that receive the heating and cooling cylinder assemblies. This eliminates dozens of flow restricting and leak prone pipe fittings found on some competitive machines. The motor is mounted horizontally to extend bearing and seal life. All Sentra® temperature control units have an open drip proof motor with a stainless steel shaft. A pump seal flush line diverts a portion of the water flow over the pump seal to wash away solids and debris that may damage the seal. The standard shaft seal is covered by a lifetime warranty on most standard models.

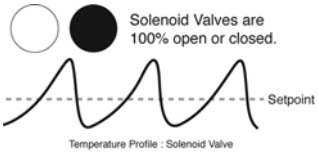


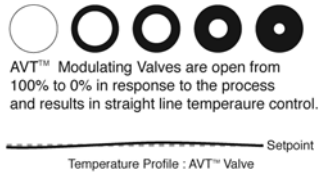


COOLING VALVES

A standard feature of all units with the LE or HE controller is the **AVT™ (Advanced Valve Technology)**, the industry's first and only modulating cooling valve designed for temperature control units. The AVT™ cooling valve offers straight line temperature control by opening or closing in 2000 steps, from 0% to 100% to pass a precise flow to drain. This introduces cooling water from plant supplies with no water hammer pressure spikes or temperature swings. At start-up the AVT™ valve opens for about 30 seconds so that trapped air can be purged from the process piping.
A 1/2" modulating cooling valve has the approximate cooling capacity of a 1" solenoid valve.

A standard feature of all units with the VE or 300°F controller is the solenoid controlled cooling valve. Pulsed by the microprocess controller, the solenoid cooling valve provides good temperature control and is best applied on applications with small cooling loads and when a large temperature difference exists between the set point and cooling water temperatures.





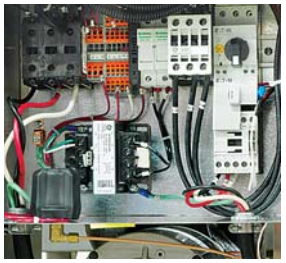
Straight line control is difficult to achieve with a solenoid valve because it is either fully open or closed. As it opens, it passes a slug of over-temperature water to drain and introduces an equal portion of cooling water. As it closes, it creates a pressure spike known as water hammer sending shock waves across the process and rapidly decreasing the useful life of pump seals, O-rings, and other system components. The over-cooling pulse creates wasteful heater operation and consumes electrical energy. The AVT™ modulating cooling valve eliminates this.

The AVT™ valve provides precise cooling with no water hammer.

The Sentra® cannot achieve temperatures below the cooling water supply temperature and generally will provide slightly warmer water to process compared to the cooling water temperature even with the cooling valve fully open. Your Advantage sales representative can help you select the proper cooling valve for your application.

ELECTRICAL PANEL

DIN rail mounted electrical components are selected for reliability and are UL approved. Color coded numbered wires are easy to identify for service purposes. A 10' power cord is included on standard models up to 3HP and 16kW. The transformer supplies power to the control circuit. The pump motor starter is a high grade contactor type and includes over current, phase loss and short circuit protection. A long life mechanical contactor is standard for the heater. NEMA 1 electrical construction is standard and suitable for the majority of applications. NEMA 12 electrical construction is available.



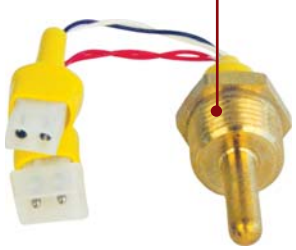
COMPONENTS

Phone: 317-887-0729 ***Web: www.AdvantageEngineering.com***

HEATER... 6 kW to 34 kW are offered. The heater is made with a stainless steel sheath. The stainless steel sheath minimizes 'pitting' damage from dissolved chemicals in the process water. The stainless steel sheath also performs well during high temperature duty when compared to copper heating elements. The heater has a flange for bolt-in mounting and an O'ring seal to prevent leaking. The heater is easy to replace if needed.

MECHANICAL CONTACTOR... engages the heater to add heat to the process circulation. Solid state contactors are optional and recommended for applications where frequent heater cycling is anticipated.

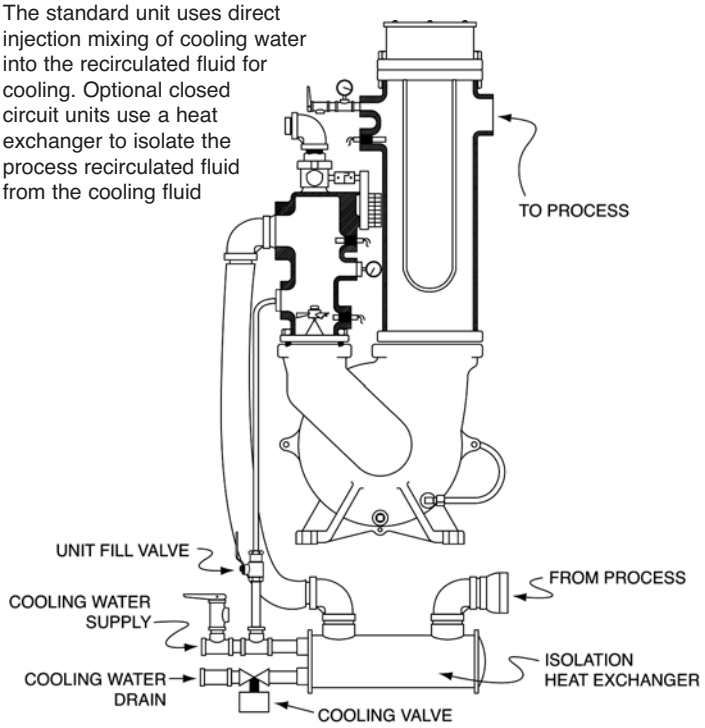
PROBES... solid state temperature sensors are embedded in a threaded bulbwell. All probes are terminated with quick-disconnect plugs to ease service and maintenance.



WATER PRESSURE SWITCH... monitors water supply pressure. Minimum supply pressure of 20 PSI is required to maintain process temperatures over 100°F. For process temperatures over 250°F minimum water supply pressure of 55 PSI is critical.

OPTIONAL CLOSED CIRCUIT SYSTEMS

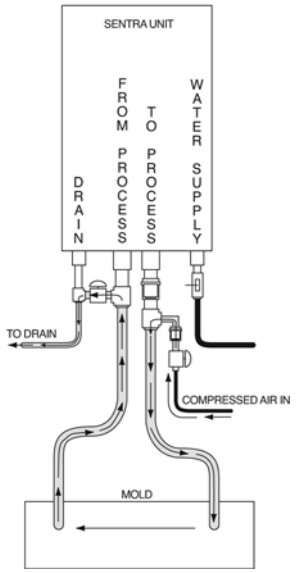
The standard unit uses direct injection mixing of cooling water into the recirculated fluid for cooling. Optional closed circuit units use a heat exchanger to isolate the process recirculated fluid from the cooling fluid



OPTIONAL MOLD PURGE

The mold purge system removes process water from the process to the unit drain. The optional mold purge system is supplied as a factory installed option.

AIR AND WATER MOVEMENT DURING MOLD PURGE OPERATION



OPTIONAL DUAL ZONE DOLLY

Processors often want to run different temperatures on each mold half to produce the best part quality. A dual zone dolly that holds two standard single zone units adds convenience by providing a common castered dolly with optional single cooling water supply and drain connection and optional electrical junction box where both units can be connected with a single power supply.

Shown in photos are two Advantage Sentra temeprature control units with VE microprocessor control instruments on a dual zone dolly with optional single cooling water supply and drain connection and optional single power supply connection.

OPTIONAL NON FERROUS COMPONENTS

Reduce ferrous metals in your system by selecting optional non-ferrous pump casing and suction and discharge tanks.

OPTIONAL VISUAL ALARM BEACON

Pressure and temperature deviations can be signaled by the optional Alarm Beacon. Factory or field installed.

OTHER OPTIONS

- 3/4" AVT™ modulating cooling valve (LE & HE models)
- 1/2" - 1" solenoid cooling valve (VE & 300°F models)
- Power disconnect switch

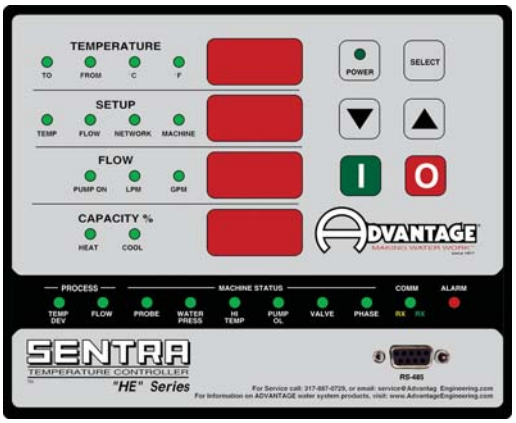
HEATING & COOLING CYLINDERS... separate heating and cooling cylinders are required for precise blending of process and cooling water. Cylinders are cast iron from custom molds with reinforced bosses for process and ancillary connections. The tanks are flange mounted to the pump casing.

PRESSURE GAUGES... 'To' and 'From' process pressure gauges are standard and are placed across the process to provide full process performance information. Pump generated pressure is determined by the difference between the two pressure readings. Plant water supply pressure is indicated when the unit is off and the plant's water supply pressure is on.

CUSTOM UNIT DESIGNS

Advantage staffs an Engineering Department with experienced water system designers. Working from customer supplied facility and process information, our designers can customize a temperature control unit to your exact specifications, including higher flows and greater heater capacities.

CONTROL INSTRUMENTS



FLOW METER SENSOR... made of high quality elastomer to operate under high temperature and a wide range of flows.

HE Series Controller ... For Process Temperatures up to 250°F.

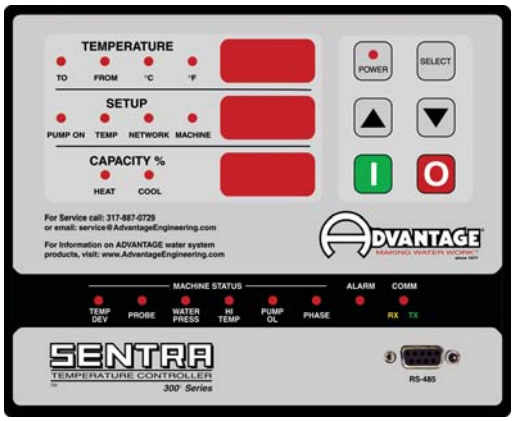
- Four large display windows with continuous display of *To Process* temperature, *Setup* parameters, unit *Flow* and unit *Capacity*
- Process temperature display in Fahrenheit or Celsius
- Selectable *From Process* temperature display
- Easy to program set up parameters for *Temperature*, *Flow*, *Network* and *Machine*
- Built-in flow meter display unit flow in GPM or LPM
- Capacity indication in real time "%" of capacity or actual
- Green (ok) - Red (fault) status indicating lights for *Probe*, *Water Pressure*, *High Temp*, *Pump Overload*, *Cooling Valve* and *Phase (pump rotation)*
- Out-of-spec alarms for temperature and flow
- Built-in SPI communications. Modbus™ RTU & TCP/IP protocol are optional
- A 20' communications cable is optional
- A remoteable display panel with 20' - 200' cable is optional
- The AVT™ modulating cooling valve is used with this instrument

VE Series Controller ... For Process Temperatures up to 250°F.

- Single large display window with continuous display of *To Process* temperature
- Status indicating lights for *Power, Pump, Heat and Cool*
- On - Off rocker switch
- Pulsed solenoid cooling valve is used with this instrument

LE Series Controller ...For Process Temperatures up to 250°F.

- Two large display windows with continuous display of *To Process* and *Setpoint* temperatures
- Process temperature display in Fahrenheit or Celsius
- Momentary display of setup parameters in Setpoint display window
- Status indicating lights for *Power, Safety, Alarm, Pump, Heat and Cool*
- Built-in SPI communications. Modbus™ and other interface methods are optional
- A 20' communications cable is optional
- The AVT™ modulating cooling valve is used with this instrument



The unit requires an external source of water for system filling, pressurizing and cooling. The minimum water supply pressure is 55 psi to operate up to 300°F. A pulsed 3/8" solenoid cooling valve is used with this instrument.

300°F Series Controller ... For Process Temperatures up to 300°F.

- Three large display windows with continuous display of *To Process* temperature, *Setup* parameters and unit *Capacity*
- Process temperature display in Fahrenheit or Celsius
- Easy to program setup parameters for *Pump On, Temperature*, *Network* and *Machine*
- Green (ok) - Red (fault) status indicating lights for *Temperature Deviation, Probe, Water Pressure, High Temperature, Pump OL* and *Phase*
- Visual alarm output provided on temperature deviation
- Built-in SPI communications. Modbus™ and other interface methods are optional
- A 20' communications cable is optional
- Pulsed solenoid cooling valve is used with this instrument

ADVANTAGE MAKING WATER WORK.

Phone: 317-887-0729 ***Web: www.AdvantageEngineering.com***

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