

Web: www.AdvantageEngineering.com

Phone: 317-887-0729

Temperature Control Units
Water & Oil
30° - 500°F

- **Portable Chillers**
Air & Water-Cooled
20° - 70°F
- **Central Chillers**
Air & Water-Cooled
Packages & Modules
20° - 70°F
- **Pump Tank Stations**
Chilled or Tower Water
200 - 3600 gallons
- **Cooling Tower Cells**
45 - 540 tons
- **Filters**
- **Heat Exchangers**

WARRANTIES

- **Models with LE & HE Control Instruments:**
2 Years covering the entire machine.
4 Years covering the AVT™ valve, control instrument and heater.
Lifetime covering the pump seal.
- **Models with VE Control Instrument:**
2 Years covering the entire machine.
4 Years covering the control instrument.
Lifetime covering the pump seal.
- **Models with 300° Control Instrument:**
2 Years covering the entire machine.
4 Years covering the control instrument.
2 Year covering the pump seal.

SENTRA® SERIES



Sentra® Series temperature control unit, model SK-1035-HE shown with 10 KW heater and 3/4 HP pump.

YOUR PROCESS DEMANDS THE MOST DEPENDABLE TEMPERATURE CONTROL UNIT AVAILABLE.

Advantage Sentra® Series temperature control units won't let you down. Every Advantage temperature control unit is supported by application expertise, engineering know how, and un-surpassed service support from experienced technicians.

Since 1977 Advantage has been applying, designing and servicing the best chillers available.

WATER UNITS

- **30° to 300°F Process Temperatures**
- **1/2 to 7.5 HP Centrifugal Pumps (20 - 100 GPM)**
- **10 to 34 KW Incoloy Heaters**
- **1/2" & 3/4" AVT™ Modulating Cooling Valves (LE & HE models)**
- **3/8" - 1" PVT™ Solenoid Cooling Valves (VE & 300°F models)**

CHOOSE THE CONTROL INSTRUMENT THAT FITS YOUR NEEDS



'LE' Series



'HE' Series



'VE' Series

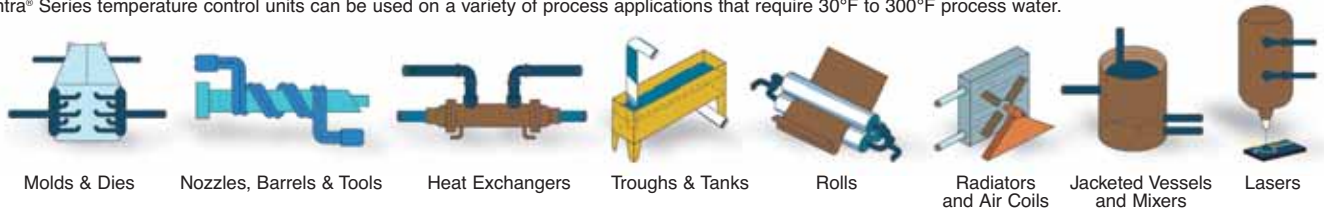


'300' Series

Advantage provides 4 control instrument choices... to fit everyone's unique needs... for every application. From basic temperature control and monitoring to advanced machine diagnostics and primary machine interface, Sentra® temperature control units include accurate and user-friendly control instruments.

APPLICATIONS

Sentra® Series temperature control units can be used on a variety of process applications that require 30°F to 300°F process water.



THE SENTRA® SYSTEM

The Sentra® is used to preheat a process to the desired operating temperature by engaging the unit's electrical immersion heater and recirculating the water in the system. Upon reaching the operating temperature the Sentra® can continue to add heat or becomes a cooling device by exchanging a small amount of recirculated water with cooling water from an external source. The cooling water is precisely metered into the system by cooling valve.

INSTRUMENTATION... 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 stream 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... optional accessory on HE instruments monitors 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. The 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. (Not shown in picture).

CLOSED CIRCUIT SYSTEMS... use to isolate the process loop from the cooling loop. The closed circuit kit can be field or factory installed.

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. PVT™ 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.

WATER PURGE KITS... removes process water from the process to the unit drain. The purge kit is supplied as a factory installed option or a field retrofitted kit.

COMPONENTS

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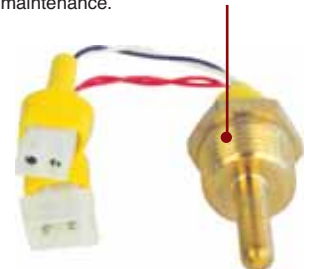
HEATER... 6 KW to 34 KW are offered. The heater is made with an incoloy sheath. The incoloy sheath minimizes 'pitting' damage from dissolved chemicals in the process water. The incoloy sheath also performs well during high temperature duty when compared to copper heating elements. The heater has a flange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



MERCURY CONTACTOR... engages the heater to add heat to the process circulation. Mercury contactors are more reliable and last longer compared to conventional mechanical contactors.

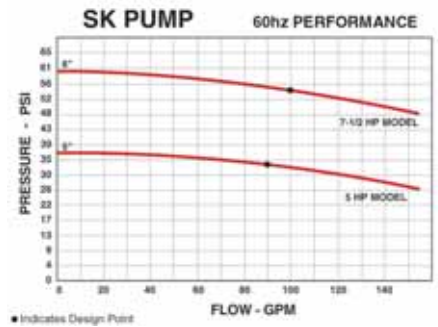
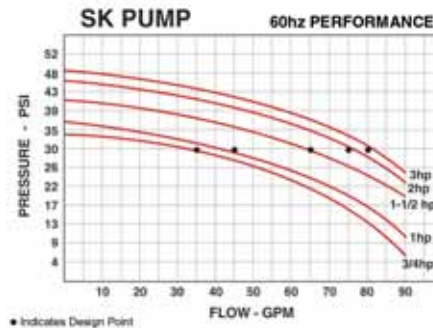


PROBES... solid state temperature sensors are embedded in a threaded bulbwell. All probes are terminated with quick-disconnect plugs to ease service and maintenance.



CENTRIFUGAL PUMP

The custom designed casing and impeller generates 20% more flow with the same horsepower as compared to 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.



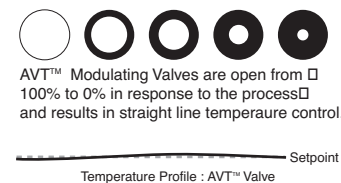
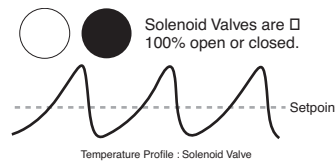
AVT™ MODULATING COOLING VALVE

(LE & HE Models Only)



The Sentra® temperature control unit relies on an external source of cooling water. The patent pending **AVT™ (Advanced Valve Technology)** is the industry's first and only modulating cooling valve designed specifically 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

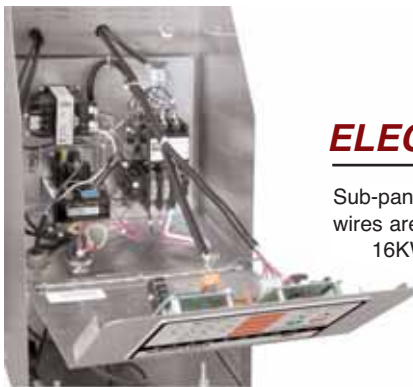
pressure spikes or temperature swings. At start-up the **AVT™** valve opens for about 30 seconds so that trapped air can be purged from the process piping. A 1/2" modulating cooling valve has the approximate cooling capacity of a 1" solenoid valve.



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

Sub-panel 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 **motor starter** is a high grade contactor type, tested for over 10,000 cycles. A **mercury contactor** is standard for the heater and is more reliable and lasts longer than mechanical contactors. **NEMA 1** electrical construction is standard and suitable for the majority of applications. **NEMA 12** electrical construction is available.

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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.



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.



CONTROL INSTRUMENTS



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



For Process Temperatures up to 250°F.

The **HE Series** provides **Four Large Display Windows** showing 'Temperature', 'Setup', 'Flow', and 'Capacity'. **Process temperatures** can be displayed in Fahrenheit or Celsius. **Setup parameters** are easily programmed. The built-in **flow meter** displays process flow in gallons per minute (gpm) or liters per minute (lpm). **Capacity** displays the heating or cooling capacity in use. Six **OK - Fault Indicators** monitor unit operation and display green for Ok conditions and Visual alarm outputs are provided for temperature and flow deviations. An optional audible alarm is available. **Machine Status Indicators** are provided for 'probe', 'water pressure', 'high temp', 'pump overload', 'valve' and 'phase'. Built-in **SPI Communications** allow for set up and monitoring from a control network. A 20' communications cable is available as an option. The Advantage AVT™ modulating cooling valve is used with this instrument.



For Process Temperatures up to 250°F.

The **VE Series** provides **One Large Display Window** showing 'To Process Temperature'. Status indicators lights show 'Power On', 'Pump On', 'Cool On', and 'Heat On'. The PVT™ pulsed solenoid Cooling is used with this instrument.



For Process Temperatures up to 250°F.

The **LE Series** instrument provides **Two Large Display Windows** showing 'To Process' and 'Setpoint' temperatures. Setup parameters are displayed when necessary. The proximity of these display windows allow instant analysis of unit performance. Temperatures can be displayed in Fahrenheit or Celsius. **Machine Status Indicators** are provided for 'power', 'safety', 'alarm', 'pump', 'heat' and 'cool'. Built-in **SPI Communications** allow for set up and monitoring from a control network. A 20' communications cable is available as an option. The Advantage AVT™ modulating cooling valve is used with this instrument.



For Process Temperatures up to 300°F.

The **300°F Series** is the instrument of choice when the required process temperature exceeds 250°F up to 300°F. Providing **Three Large Display Windows** showing 'Temperature', 'Setup', and 'Capacity'. **Process temperatures** can be displayed in Fahrenheit or Celsius. **Setup parameters** are easily programmed. Six **OK - Fault Indicators** monitor unit operation and display green for Ok conditions and red for Fault conditions. Visual alarm outputs are provided for temperature deviation. **Machine Status Indicators** are provided for 'probe', 'water pressure', 'high temp', 'pump overload' and 'phase'. Built-in **SPI Communications** allow for set up and monitoring from a control network. Modbus™ and other interface methods are optional. A 20' remote communications cable is optional.

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.

STANDARD FEATURES

TANK CONSTRUCTION:

- Twin tanks - separate heating and cooling tanks
- Cast iron material
- Mild steel on models with 5 and 7.5 hp pumps and 24 and 34 kw heaters
- Machined process connections
- Flange mounted to pump casing
- Replaceable

PUMP:

- Cast iron casing - custom design for increased flow
- High efficiency impeller
- Pump seal flush
- Stainless steel pump motor shaft
- ODP pump motor

COOLING VALVE (LE & HE Models):

- AVT™ modulating valve
- 0 - 100% aperture range
- Microprocessor controlled
- Integral to the cooling tank
- Field serviceable
- Stainless steel construction

COOLING VALVE (VE & 300° Models):

- 3/8" PVT™ solenoid valve
- Microprocessor controlled
- Integral to cooling cylinder
- Field serviceable

HEATER:

- Flanged bolt-in mounting
- Incoloy sheath
- Mercury heater contactor

CABINETY:

- Stainless steel
- Thermoformed polymer front panel (models up to 3HP and 16KW)
- Hinged electrical cabinet door
- Lift-off mechanical cover
- Portable, on casters

LIMIT DEVICES:

- Water supply pressure
- Motor overloads
- Pressure relief valve
- High temperature
- Fused control circuit

PRESSURE GAUGES:

- To process
- From process

ELECTRICAL:

- Process pump motor starter
- Fused transformer
- 10' power cord (models up to 3HP and/or 16KW)
- 110 volt alarm output (HE, LE, and 300° models)

'LE' SERIES CONTROL INSTRUMENT:

- Continuous *to process* and *setpoint* temperature display
- Temperature display in Fahrenheit or Celsius
- Status indicators for *power on, pump on, heat on, cool on, safety condition* and *alarm*
- RS-485 SPI communications via a DB-9 receptacle

'HE' SERIES CONTROL INSTRUMENT:

- Digital flow indication (gpm / lpm)
- Capacity indication (% or actual)
- Out-of-spec alarms for temperature and flow
- Ok-fault status display for *probe, water pressure, high temp, pump overload, cooling valve* and *phase (pump rotation)*
- Continuous *to process* temperature display
- Continuous *setpoint* temperature display
- Selectable from process temperature display
- Temperature display in Fahrenheit or Celsius
- Setup display for *temperature, flow, network* and *machine*
- RS-485 SPI communications via a DB-9 receptacle

'300°' SERIES CONTROL INSTRUMENT:

- Continuous *to process* and *setpoint* temperature display
- Continuous *capacity* display for heating and cooling
- Temperature display in Fahrenheit or Celsius
- Setup display for *pump on, temperature, network* and *machine*
- Machine status indicators for *temperature deviation, probe, water pressure, high temperature, pump OL* and *phase*
- Status indicators for *Alarm* and *Communications*
- RS-485 SPI communications via a DB-9 receptacle

'VE' SERIES CONTROL INSTRUMENT:

- Continuous *To Process* temperature display
- Selectable *Setpoint* temperature display
- Status indicators for *Power On, Pump On, Heat On,* and *Cool On*

OPTIONS

INSTRUMENTATION:

- HE remote display - 20' cable
- SPI communications cable - 20'

COMMUNICATIONS PROTOCOLS:

- Modbus™ RTU (HE instruments only)
- Modbus™ TCP/IP (HE instruments only)

COOLING VALVE:

- 3/4" AVT™ (LE & HE Models)
- 1/2" - 1" PVT™ (VE Models)

WATER PURGE:

- 1-1/4" for 1/2 - 3HP models
- 1-1/2" for 5 & 7.5 HP models

ELECTRICAL:

- Nema 12 construction

TANK CONSTRUCTION:

- Non ferrous tanks
- Bronze pumps and/or piping
- Total non ferrous units
- Closed circuit designs

SYSTEM ALARMS:

- Audible alarm
- Visual/audible alarm beacon

UNIT:

- Dual zone dolly with water manifold or with electrical junction box
- Stacking stand with water manifold or with electrical junction box

CUSTOM UNIT DESIGNS



Sentra® Series temperature control unit with Nema 12 electrical specifications, master start switch and emergency stop switch..

Advantage staffs a complete CAD based **Engineering Department** with experienced water system designers. Working from customer supplied facility and process information, Our designers can custom design a temperature control unit to your exact specifications, including higher flows and greater heater capacities.

SPECIFICATIONS

	SK-	620	635	645	665	675	680	1020	1035	1045	1065	1075	1080	1090	10100	1620	1635	1645	1665	
Heater ¹	KW	6	6	6	6	6	6	10	10	10	10	10	10	10	10	16	16	16	16	
Process Pump	HP	1/2	3/4	1	1 1/2	2	3	1/2	3/4	1	1 1/2	2	3	5	7 1/2	1/2	3/4	1	1 1/2	
	GPM	20	35	45	62	75	80	20	35	45	62	75	80	90	100	20	35	45	62	
	PSI	30	30	30	30	30	30	30	30	30	30	30	30	30	34	54	30	30	30	30
Full Load Amperage	230 volt	17.0	17.8	18.6	20.2	21.8	24.6	27.0	27.8	28.6	30.2	31.8	34.6	40.3	47.1	42.0	42.8	43.6	45.2	
	@3ø/60hz ²	460 volt	8.5	8.9	9.3	10.1	10.9	12.3	13.5	13.9	14.3	15.1	15.9	17.3	20.2	23.5	21.0	21.4	21.8	22.6
Dimensions (inches)	Height	28 1/4	28 1/4	28 1/4	28 1/4	28 1/4	28 1/4	28 1/4	28 1/4	28 1/4	28 1/4	28 1/4	28 1/4	28 1/4	44	44	28 1/4	28 1/4	28 1/4	28 1/4
	Width	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	16	16	12 1/2	12 1/2	12 1/2	12 1/2
	Depth	19 1/2	19 1/2	19 1/2	19 1/2	19 1/2	19 1/2	19 1/2	19 1/2	19 1/2	19 1/2	19 1/2	19 1/2	19 1/2	24	24	19 1/2	19 1/2	19 1/2	19 1/2
Connections (inches)	T/F ³	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/2	1 1/4	1 1/4	1 1/4	1 1/4	
	S/D ⁴	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	
Weight (pounds)	Shipping ⁵	195	200	205	205	210	220	198	200	208	208	213	223	275	290	200	205	210	210	

	SK-	1675	1680	1690	16100	2435	2445	2465	2475	2480	2490	24100	3435	3445	3465	3475	3480	3490	34100
Heater ¹	KW	16	16	16	16	24	24	24	24	24	24	24	34	34	34	34	34	34	34
Process Pump	HP	2	3	5	7 1/2	3/4	1	1 1/2	2	3	5	7 1/2	3/4	1	1 1/2	2	3	5	7 1/2
	GPM	75	80	90	100	35	45	65	75	80	90	100	35	45	65	75	80	90	100
	PSI	30	30	34	54	30	30	30	30	30	34	54	30	30	30	30	30	34	54
Full Load Amperage	230 volt	46.8	49.6	55.4	62.2	63.1	63.9	65.5	67.1	69.9	75.5	82.3	88.2	89.0	90.6	92.2	95.0	100.6	107.4
	@3ø/60hz ²	460 volt	23.4	24.8	27.7	31.1	31.6	32.0	32.8	33.6	35.0	37.8	41.2	44.1	44.5	45.3	46.1	47.5	50.3
Dimensions (inches)	Height	28 1/4	28 1/4	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44
	Width	12 1/2	12 1/2	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Depth	19 1/2	19 1/2	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Connections (inches)	T/F ³	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/2	1 1/2	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/2	1 1/2
	S/D ⁴	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
Weight (pounds)	Shipping ⁵	220	225	285	300	270	275	280	285	290	295	310	280	285	290	295	300	305	320

Notes: 1. Derate heater output by 25% for 208/3/60 operation. 2. Consult factory for 50hz operations. 3. T - to process; F - from process. 4. S - water supply; D - drain. 5. Approximate unit shipping weight.

INSTALLATION

Sentra® temperature control units provide control process temperatures to a wide variety of applications. Pictured are two Sentra® units providing two separate temperatures to a plastics injection molding machine.



OTHER PRODUCTS



Model Designator for Sentra® Series Temperature Control Units

SK - 1035-HE

Sentra® Series
Heater KW
Flow Rate GPM

Instrument
• HE : HE Series
• LE : LE Series
• VE : VE Series
• 300° : 300° Series



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ADVANTAGE PRODUCTS: TEMPERATURE CONTROLLERS · PORTABLE CHILLERS · CENTRAL CHILLERS · PUMP TANK STATIONS · TOWER SYSTEMS · FILTERS

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