



Technical Specifications

Temperature Controllers

Royal Series Water Temperature Control Units

Tel (414) 354-0970 • Fax (414) 354-6421 • www.sterlco.com • Bulletin: SC1-510.8 • Effective: December 1, 2004 • Supersedes: SC1-510.7

Royal Series Water Temperature Control Units

All Royal Series water temperature control units have an operating **leaving water temperature range of 32°F to 250°F (0°C to 121°C)**. For applications outside this range, consult factory. Royal Series water temperature control units come standard with:

- Compact, rugged cabinet with easy-access side panels
- Cast-and-flange design to reduce connection points
- Half- and full-heat capability
- Dual stage Incoloy™ immersion heater with IEC contactors
- NEMA 12 electrical enclosure
- ¼" cooling solenoid valve on ¾ to 3 hp (0.56 to 2.24 kW) models; ½" slow-close cooling solenoid valve on 5, 7.5, & 10 hp (3.73, 5.60, & 7.46 kW) models
- Forward-facing liquid-filled To and From Process pressure gauges
- Independent high temperature safety thermostat
- Non-fused lockable rotary disconnect
- M2B+ microprocessor controller includes diagnostics features with 2 line x 20 character LCD display
- Graphic control panel with indicator and warning status lights
- Adjustable low supply water pressure switch; factory-set at 16 psig (110 kPa/1.1 bars)
- 150 psig (1,034 kPa/10.3 bars) pressure relief valve
- SICB/carbon pump seal
- ¾" water supply connection, 1.5" process connections; valve size matches drain size
- Motor circuit protection
- Automatic vent sequence
- **3" (76 mm) casters**
- **Operating range of 32°F to 250°F (0°C to 121°C)**
- 3-year parts and labor warranty at the factory
- 5-year controller warranty
- Lifetime warranty on wetted cast components
- Lifetime pump seal (subject to factory review)

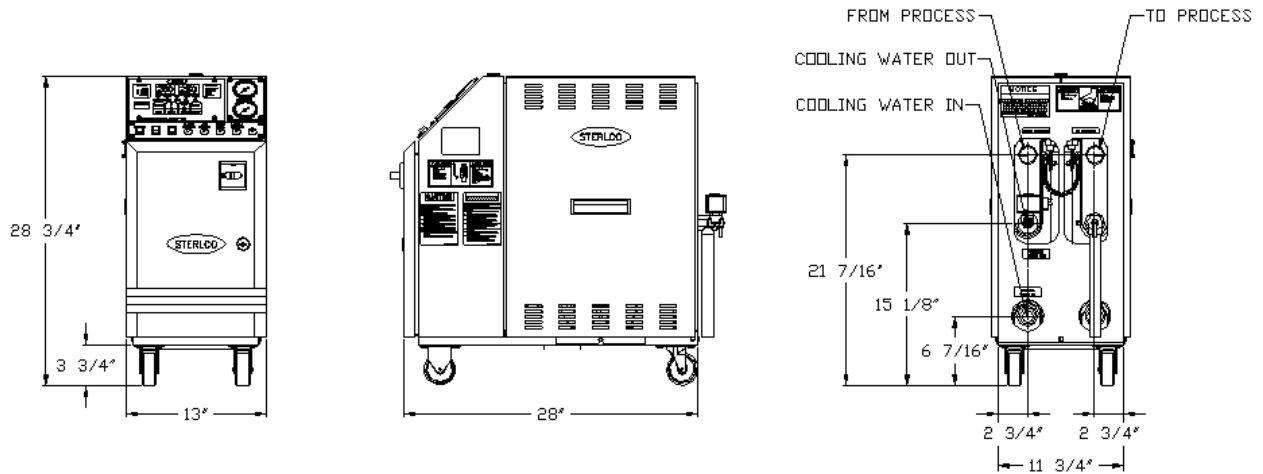
Model number 460 230	Pump							Dimensions						Shipping weight	
	letter	hp	kW	gpm	lpm	psig	kPa	H in.	cm	W in.	cm	D in.	cm	lbs.	Kg
2010, 9 kW heater	C	¾	0.56	30	113.6	25	172.4	28¾	73.0	13	33	28	71.1	210	96
	D	1	0.75	35	132.5	30	206.9								
	F	2	1.50	50	189.3	30	206.9								
	G	3	2.24	60	227.1	40	275.8								
	H	5	3.73	75	283.9	54	372.3							240	109
	J	7½	5.60	90	340.7	63	434.4								

Model number 460 230	Pump							Dimensions						Shipping weight	
	letter	hp	kW	gpm	lpm	psig	kPa	H in.	cm	W in.	cm	D in.	cm	lbs.	Kg
2012, 9 kW heater	C	¾	0.56	30	113.6	25	172.4	48	122	13	33	28	71.1	210	96
	D	1	0.75	35	132.5	30	206.9								
	F	2	1.50	50	189.3	30	206.9								
	G	3	2.24	60	227.1	40	275.8								
	H	5	3.73	75	283.9	54	372.3							240	109
	J	7½	5.60	90	340.7	63	434.4								
	K	10	7.46	120	454.2	55	379.2								

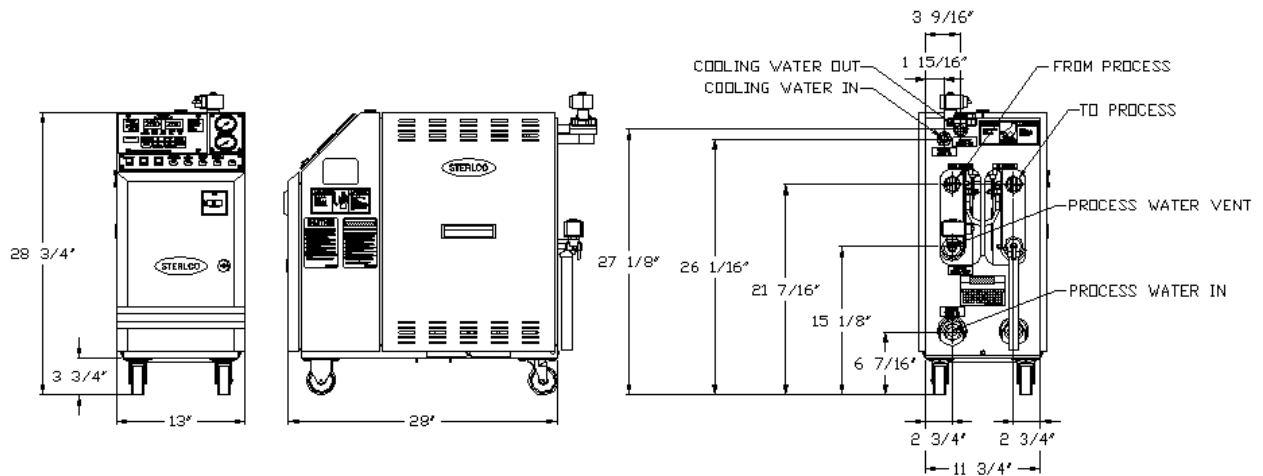


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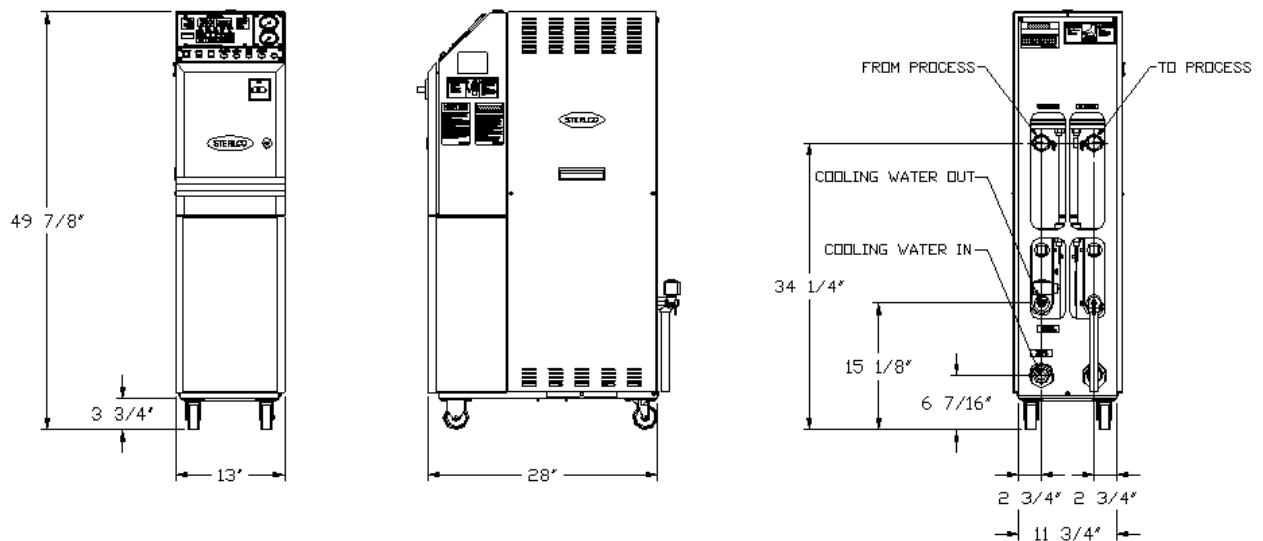
Royal Series Compact Outline Drawing Direct Injection



Closed Circuit

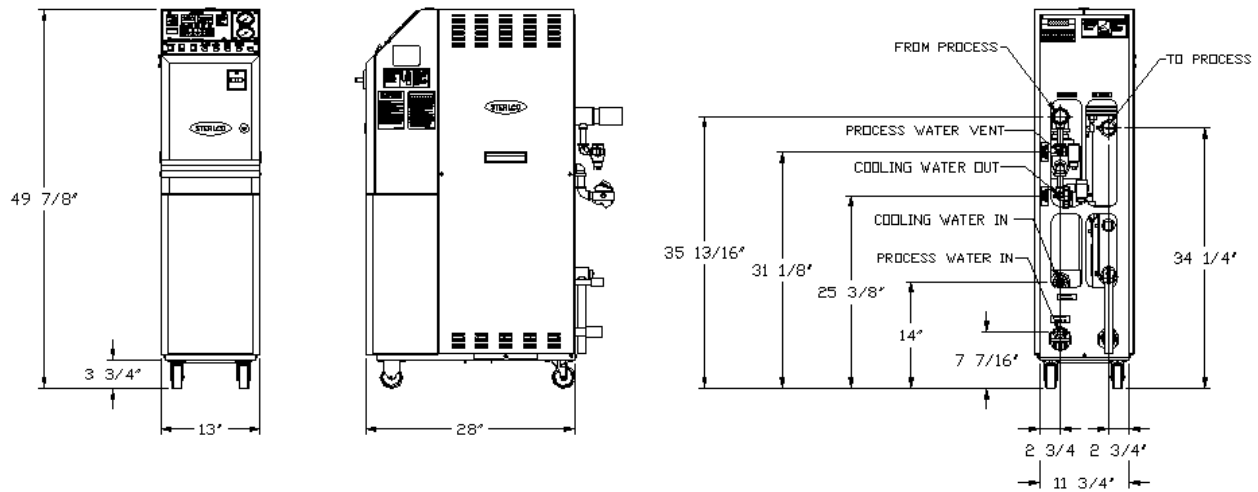


Royal Series Upright Outline Drawing Direct Injection



Note: Picture depicts unit with 24, 36 or 48 kw heater options. For piping dimension for a unit with less than 24 kW please refer to the compact unit above.

Closed Circuit



Note: Picture depicts unit with 24, 36 or 48 kw heater options. For piping dimension for a unit with less than 24 kW please refer to the compact unit above.

Additional Specifications

Model		Full-load amps at 460 volts					
hp	kW	9 kW htr	12 kW htr	18 kW htr	24 kW htr	36 kW htr	48 kW htr
0.75	0.56	12.7	16.5	24.0	31.6	47.4	62.4
1.00	0.75	13.1	16.9	24.4	32.0	47.8	62.8
2.00	1.50	14.7	18.5	26.0	33.6	49.4	64.4
3.00	2.24	16.1	19.9	27.4	35.0	50.8	65.8
5.00	3.73	18.9	22.7	30.2	37.8	56.6	71.6
7.50	5.60	22.3	26.1	33.6	41.2	57.0	72.0
10.00	7.46	25.3	30.0	37.0	45.0	60.0	75.0

Model		Pressure drop flow and loss				Recommended NPT pipe size for flow rate
hp	kW	flow gpm	flow lpm	loss psi	loss kPa	
0.75	0.56	30	113.6	0.0	0.0	1-1/4"
1.00	0.75	35	132.5	1.0	6.9	1-1/4"
2.00	1.50	50	189.3	1.5	10.3	1-1/2"
3.00	2.24	60	227.1	2.0	13.8	1-1/2"
5.00	3.73	75	283.9	2.5	17.2	2"
7.50	5.60	90	340.7	3.0	34.4	2"
10.00	7.46	120	454.2	5.0	34.4	2-1/2"

Note: recommended pipe size based on flow rate producing less than 10 ft/sec velocity through pipe diameter.

Option Availability

✓ denotes availability

Option		Availability		
M2B+ Options	4 to 20 mA remote setpoint and retransmission of process variable, setpoint, or flow rate	✓		
	Communications	RS-232 Modbus, RS-485 Modbus, or RS-485 SPI	✓	
		Ethernet IP via Modbus RTU	✓	
	Remote probe ^①		NC	
	Digital flow meter	Up to 30 gpm	✓	
30 to 60 gpm		✓		
> 60 gpm (up to 200 °F)		✓		
> 60 gpm (up to 300 °F)		✓		
Remote control enclosure with 20 ft. cable (additional cable available/ft)		✓		
Heaters	12 kW	✓		
	18 kW ^②	✓		
	24 kW ^②	✓		
	36 kW ^③	✓		
	48 kW ^③	✓		
Unit less heater (includes ½" slow-close solenoid valve)		NC		
Maintained START switch (push to stop, twist to start)		NC		
Manual bypass		✓		
Brass construction	Compact unit	¾ to 3 hp	✓	
		5 to 7½ hp	✓	
	Upright unit	¾ to 3 hp	9 & 12 kW	✓
			18 & 24 kW	✓
			36 & 48 kW	✓
		5 to 7½ hp	9 & 12 kW	✓
			18 & 24 kW	✓
36 & 48 kW	✓			
Closed loop heat exchanger, with ½" solenoid	3.7 sq. ft. U-tube	✓		
	7.4 sq. ft. shell & tube ^④	✓		
	11.2 or 18.1 sq. ft. shell & tube ^④	✓		
	27.1 sq. ft. shell & tube ^④	✓		
Quick Cool switch		✓		
Pressure regulator/relief valve; for water supply, shipped loose ^⑤		✓		
Auto system water purge; shipped loose		✓		
Y-strainer; shipped loose ^⑥		✓		
Hammer arrestor		✓		
Ten-foot power cord; no plug, shipped loose		✓		
Rubber feet; in lieu of casters		NC		
Cooling solenoid slow-close valve	½" x 9/16" (Cv = 3.5)	✓		
	¾" x ¾" (Cv = 5.5)	✓		
	1" x 1" (Cv = 11.5)	✓		
	1½" x 1¼" (Cv = 24)	✓		
Modulating valve, body size; specify Cv valve when ordering	½" (Cv = 0.4, 1.3, 2.2, or 4.4)	✓		
	¾" (Cv = 5.5 or 7.5)	✓		
	1" (Cv = 10 or 14)	✓		
	1¼" (Cv = 20)	✓		
Stack rack with casters	Two-zone w/o manifold ^⑦	✓		
	Three- or four-zone ^⑦	✓		
Side-by-side dolly	Two-zone w/manifold	✓		
	Three-zone w/manifold	✓		
Common wiring for two zone		✓		
Common piping for two zone		✓		
TEFC motor		✓		
300 °F operations; includes silicon carbide/silicon carbide seal (requires 55 psig water supply pressure minimum)		✓		
General fault alarm; audible & visual		✓		
208/3/60 VAC		✓		
200-400/3/50 VAC ^⑧		✓		
575/3/60 VAC		✓		
UL-, cUL-listed subpanel		✓		
CE certification ^⑨		✓		
Ontario Hydro specifications ^⑩		✓		
Descaler; part no. 602.88905.00		✓		
Descaler fluid; part no. 692.88904.00 (5 gallons)		✓		

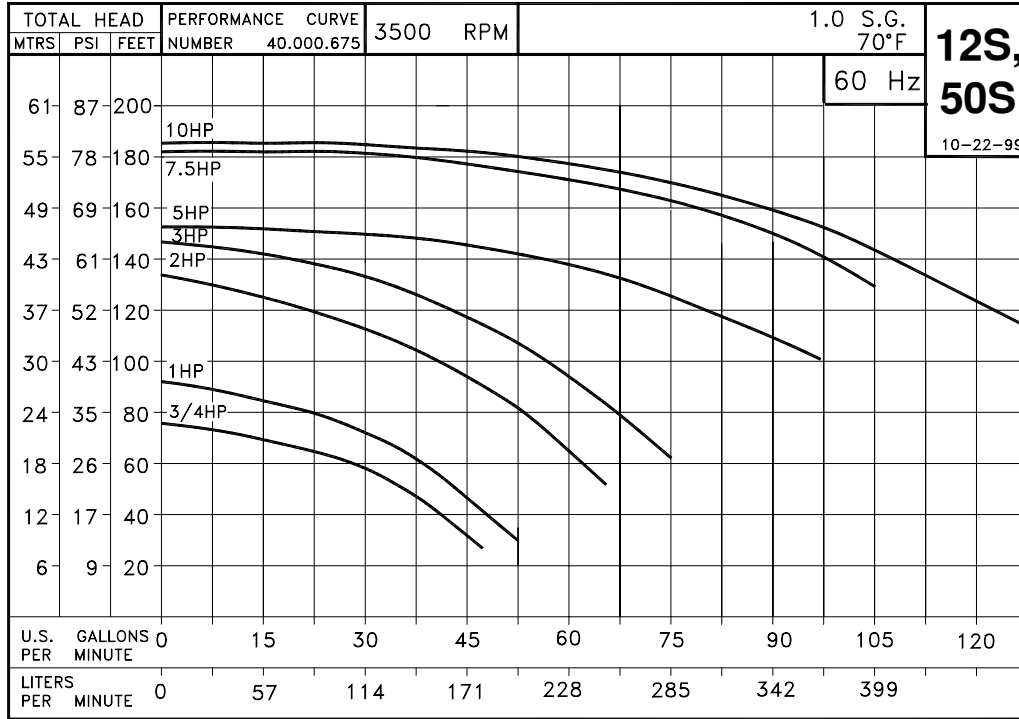
① Remote probe with M2B+ controller allows customer to either monitor or control from a customer supplied type J or K thermocouple or 100 or 1,000 ohm RTD. Additional cost to have supplied by manufacturer.

② Direct injection for compact units; direct injection and closed loop for upright units.

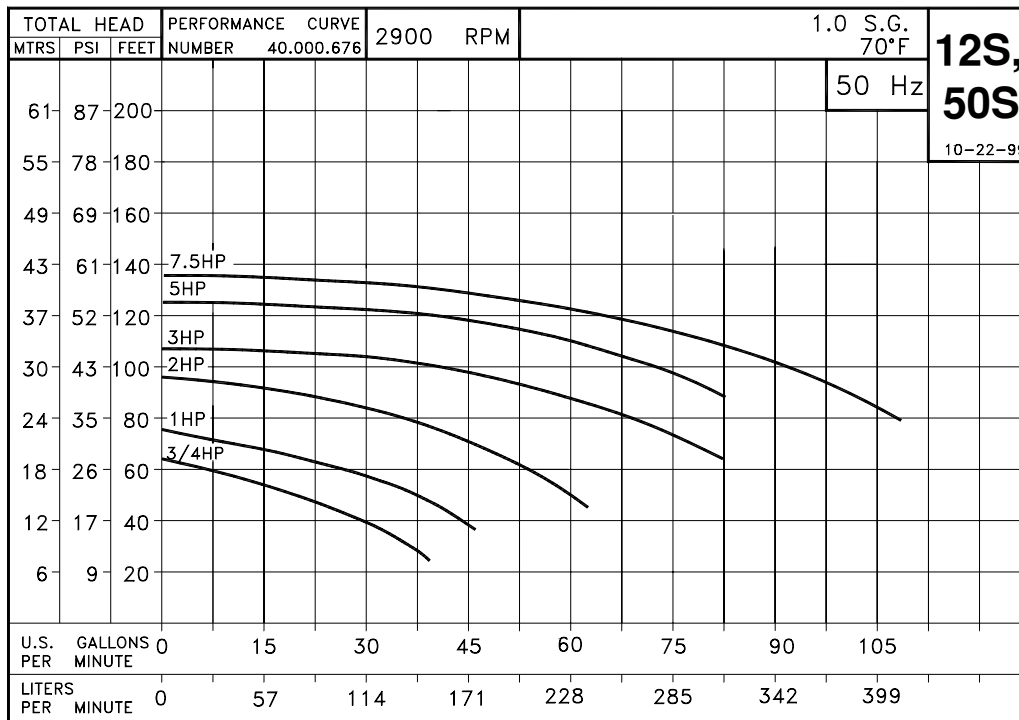
- ③ Direct injection for upright units. Not available in 200/3/50, 208-230/3/60 VAC voltages.
- ④ Available on upright units with 9 to 24 kW heaters only. For units above 24 kW, consult factory for correct model configuration and pricing.
- ⑤ Specify desired incoming water supply pressure.
- ⑥ Specify desired location-water supply, To Process or From Process.
- ⑦ Compact units only. Three- and four-zone stack racks are a 2 x 2 configuration.
- ⑧ Circuit breakers replace primary transformer fuses.
- ⑨ Inspection to be done by others.

Royal Series Pump Curves

60 Hz



50 Hz • Consult factory for 10 hp curves



-Notes-