

**PROCESS
TECHNOLOGY**

Aquaculture

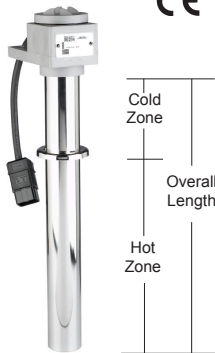
Heating & Cooling Products



SmartOne[®] self-limiting PTC (positive temperature coefficient) electric immersion heaters offer significant advantages over traditional heaters:

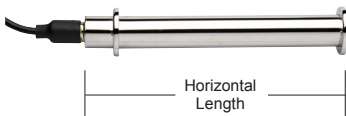
- 1) **LONG LASTING:** Continues working in air or with solids buildup (periodic cleaning recommended).
- 2) **SAFER:** Will not ignite plastic tanks.
- 3) **SIMPLER:** No thermal protectors to replace.
- 4) **FLEXIBLE:** Heaters operate in wide voltage ranges: 100-120 volts, 200-240 volts, and 380-480 volts.
- 5) **EASYPLUG[™]:** Simple, easy plug-in installation.

SmartOne[®] EASYPLUG[™] PTC HEATERS



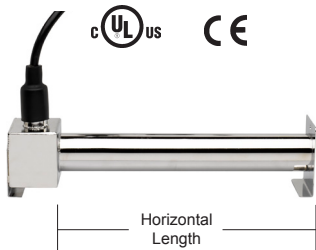
SmartOne [®] EASYPLUG [™] METAL OVER-THE-SIDE HEATERS						
WATTS	VOLTAGE	HOT ZONE In./(mm)	LENGTH In./(mm)	316SS MODEL NUMBER	TITANIUM MODEL NUMBER	SHIP WEIGHT Lbs./(kg)
1000	100-120	7 (180)	11 (280)	S1ES1111	S1ET1111	7 (3)
	200-240			S1ES1211	S1ET1211	
1700	100-120	12 (305)	17 (432)	S1ES1.7117	S1ET1.7117	10 (4.5)
	200-240			S1ES1.7217	S1ET1.7217	

Single phase only. 10 foot (3m) cord and EASYPLUG[™] connection included. Purchase temperature control separately.



SmartOne [®] EASYPLUG [™] AXIAL FLEXIBLE CORD METAL BOTTOM HEATERS						
WATTS	VOLTAGE	HOT ZONE In./(mm)	HORIZ. LENGTH In./(mm)	316SS MODEL NUMBER	TITANIUM MODEL NUMBER	SHIP WEIGHT Lbs./(kg)
1000	100-120	6 (150)	14 (355)	S1EBS1114A	S1EBT1114A	6 (2.5)
	200-240			S1EBS1214A	S1EBT1214A	
1700	100-120	10 (255)	18 (455)	S1EBS1.7118A	S1EBT1.7118A	8 (3.5)
	200-240			S1EBS1.7218A	S1EBT1.7218A	

Single phase only. 10 foot (3m) cord and EASYPLUG[™] connection included. Purchase temperature control separately.



SmartOne [®] EASYPLUG [™] 90° FLEXIBLE CORD METAL BOTTOM HEATERS						
WATTS	VOLTAGE	HOT ZONE In./(mm)	HORIZ. LENGTH In./(mm)	316SS MODEL NUMBER	TITANIUM MODEL NUMBER	SHIP WEIGHT Lbs./(kg)
1000	100-120	6 (150)	12 (305)	S1EBS1112	S1EBT1112	7 (3)
	200-240			S1EBS1212	S1EBT1212	
1700	100-120	14 (355)	16 (405)	S1EBS1.7116	S1EBT1.7116	10 (4.5)
	200-240			S1EBS1.7216	S1EBT1.7216	

Single phase only. 10 foot (3m) cord and EASYPLUG[™] connection included. Purchase temperature control separately.

1 Products listed in this catalog are designed for service in aquaculture-related applications only, not for use in chemical applications.

SmartOne® PTC HEATERS

SmartOne® S1 SERIES, METAL OVER-THE-SIDE HEATERS

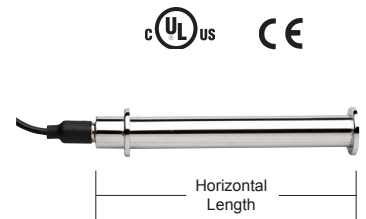
WATTS	VOLTS	HOT ZONE	OVERALL LENGTH	316 STAINLESS MODEL NUMBER	TITANIUM MODEL NUMBER	SHIP WEIGHT Lbs./(kg)
		In./(mm)	In./(mm)			
1000	100-120	7 (178)	11 (279)	S1S1111	S1T1111	7 (3.2)
	200-240			S1S1211	S1T1211	
2000	100-120	13 (330)	17 (432)	S1S2117	S1T2117	10 (4.5)
	200-240			S1S2217	S1T2217	
3000	200-240	18 (457)	23 (584)	S1S3223	S1T3223	11 (5)
4000	200-240	24 (610)	29 (737)	S1S4229	S1T4229	13 (5.9)
5000	200-240	30 (762)	35 (889)	S1S5235	S1T5235	15 (6.8)
6000	200-240	35 (889)	41 (1041)	S1S6241	S1T6241	17 (7.7)
1600	380-480	13 (330)	17 (432)	S1S1.6417	S1T1.6417	10 (4.5)
2400	380-480	18 (457)	23 (584)	S1S2.4423	S1T2.4423	11 (5)
3200	380-480	24 (610)	29 (737)	S1S3.2429	S1T3.2429	13 (5.9)
4000	380-480	30 (762)	35 (889)	S1S4.435	S1T4.435	15 (6.8)
4800	380-480	35 (889)	41 (1041)	S1S4.8441	S1T4.8441	17 (7.7)
5600	380-480	41 (1041)	47 (1194)	S1S5.6447	S1T5.6447	23 (10.4)



Single phase standard, add -3 for three phase. 80" (2m) wire and conduit standard.

SmartOne® AXIAL FLEXIBLE CORD METAL BOTTOM HEATERS

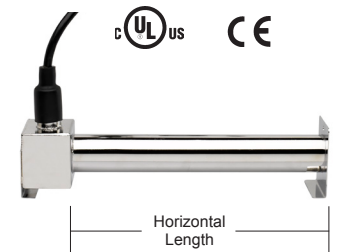
WATTS	VOLTAGE	HOT ZONE	HORIZ. LENGTH	316SS MODEL NUMBER	TITANIUM MODEL NUMBER	SHIP WEIGHT Lbs./(kg)
		In./(mm)	In./(mm)			
1000	100-120	7 (180)	14 (355)	S1ABS1114A	S1ABT1114A	6 (2.5)
	200-240			S1ABS1214A	S1ABT1214A	
1700	100-120	12 (305)	18 (455)	S1ABS1.7118A	S1ABT1.7118A	8 (3.5)
	200-240			S1ABS1.7218A	S1ABT1.7218A	



10 foot (3m) cord standard (no plug), longer lengths available.

SmartOne® 90° FLEXIBLE CORD METAL BOTTOM HEATERS

WATTS	VOLTAGE	HOT ZONE	HORIZ. LENGTH	316SS MODEL NUMBER	TITANIUM MODEL NUMBER	SHIP WEIGHT Lbs./(kg)
		In./(mm)	In./(mm)			
1000	100-120	6 (150)	12 (305)	S1ABS1112	S1ABT1112	7 (3)
	200-240			S1ABS1212	S1ABT1212	
1700	100-120	14 (355)	16 (405)	S1ABS1.7116	S1ABT1.7116	10 (4.5)
	200-240			S1ABS1.7216	S1ABT1.7216	
3000	200-240	18 (455)	23 (585)	S1ABS3223	S1ABT3223	12 (5.5)
4000	200-240	23 (585)	29 (735)	S1ABS4229	S1ABT4229	14 (6.5)
5000	200-240	29 (735)	34 (865)	S1ABS5234	S1ABT5234	16 (7.5)



10 foot (3m) cord standard (no plug), longer lengths available.

SmartOne® S1L SERIES, METAL BOTTOM HEATERS

WATTS	VOLTS	HORIZ. LENGTH	VERTICAL LENGTH	316SS MODEL NUMBER	TITANIUM MODEL NUMBER	SHIP WEIGHT Lbs./(kg)
		In./(mm)	In./(mm)			
1000	100-120	13 (330)	15 (381)	S1LS1113-R**	S1LT1113-R**	10 (4.5)
2000	100-120	17 (432)	19 (483)	S1LS2117-R**	S1LT2117-R**	11 (5)
	200-240			S1LS2217-R**	S1LT2217-R**	
3000	200-240	23 (584)	25 (635)	S1LS3223-R**	S1LT3223-R**	12 (5.4)
4000	200-240	29 (737)	25 (635)	S1LS4229-R**	S1LT4229-R**	13 (5.9)
5000	200-240	35 (889)	37 (940)	S1LS5235-R**	S1LT5235-R**	14 (6.4)
6000	200-240	41 (1041)	50 (1270)	S1LS6241-R**	S1LT6241-R**	15 (6.8)
1600	380-480	17 (432)	19 (483)	S1LS1.6417-R**	S1LT1.6417-R**	11 (5)
2400	380-480	23 (584)	25 (635)	S1LS2.4423-R**	S1LT2.4423-R**	12 (5.4)
3200	380-480	29 (737)	25 (635)	S1LS3.2429-R**	S1LT3.2429-R**	13 (5.9)
4000	380-480	35 (889)	37 (940)	S1LS4.435-R**	S1LT4.435-R**	14 (6.4)
4800	380-480	41 (1041)	50 (1270)	S1LS4.8441-R**	S1LT4.8441-R**	15 (6.8)
5600	380-480	47 (1194)	50 (1270)	S1LS5.6447-R**	S1LT5.6447-R**	18 (8.2)



Single phase standard, add -3 for three phase. 8-0" (2m) wire and conduit standard.

Note: Larger, 3 tube heater available.

ELECTRIC INLINE WATER HEATERS



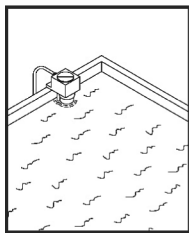
Wall mounted up to 72kW, floor mounted 96kW and higher (wall mounted unit pictured). Custom sizes and voltages are available, consult factory. CE compliance available, consult factory.

TYTAN™ WATER HEATERS				
WATTS	VOLTS	316 STAINLESS STEEL		SHIP WEIGHT
		MODEL NUMBER (FOR FRESH WATER)	TITANIUM MODEL NUMBER (FOR SALT WATER)	
12000	240	TY-012-240-3-S	TY-012-240-3	300
	480	TY-012-480-3-S	TY-012-480-3	(136)
18000	240	TY-018-240-3-S	TY-018-240-3	300
	480	TY-018-480-3-S	TY-018-480-3	(136)
24000	240	TY-024-240-3-S	TY-024-240-3	300
	480	TY-024-480-3-S	TY-024-480-3	(136)
36000	240	TY-036-240-3-S	TY-036-240-3	338
	480	TY-036-480-3-S	TY-036-480-3	(153)
48000	240	TY-048-240-3-S	TY-048-240-3	338
	480	TY-048-480-3-S	TY-048-480-3	(153)
72000	240	TY-072-240-3-S	TY-072-240-3	350
	480	TY-072-480-3-S	TY-072-480-3	(159)
96000	240	TY-096-240-3-S	TY-096-240-3	570
	480	TY-096-480-3-S	TY-096-480-3	(259)
120000	480	TY-120-480-3-S	TY-120-480-3	580
				(263)
144000	480	TY-144-480-3-S	TY-144-480-3	590
				(268)

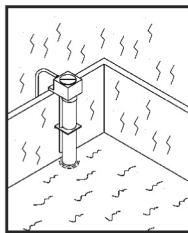
RESISTANCE IMMERSION HEATERS

THERMAL OVERLOAD PROTECTION

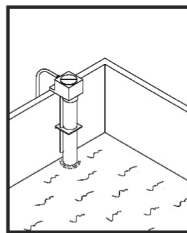
The Protector 1 over-temperature control system utilizes a heat sensitive thermal protector to detect overheat conditions. The thermal protector, placed inside a thermowell and positioned in contact with the heater sheath, will stop power to the heater in the event of low liquid level.



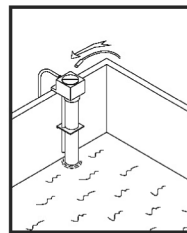
Immersion heater with Protector 1 working normally.



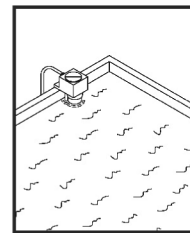
Water level drops due to tank leak or evaporation.



Protector 1 thermal sensor detects elevating temperature and shuts off power to heater.



Replace thermal protector.



Restore the liquid level and resume operation.



REPLACEMENT HEATER THERMAL PROTECTORS		
PROTECTOR TYPE	METAL OVER-THE-SIDE AND FLANGED	MODEL NO. 36" LENGTH
Replaceable	P1	P1
	6021-18-R	6021-84-R
Resettable	P2	P2
	2804-18-R	2804-84-R

* Optional resettable thermal sensor requires special control components, consult factory.

VOLTAGES AVAILABLE (MOST HEATERS AND CONTROLS)

Voltages are designated in Process Technology model numbers as follows:

1 = 120 volt
5 = 415 volt

2 = 240 volt
6 = 600 volt

3 = 380 volt
8 = 208 volt

4 = 480 volt
9 = 220 volt

Please specify voltage and single or three phase when ordering. Consult factory for other voltages.



WARNING

ELECTRIC IMMERSION HEATERS MAY DAMAGE MANY PLASTIC TANKS SUCH AS POLYPROPYLENE AND POLYETHYLENE, AND SUBJECT PERSONNEL TO SHOCK HAZARD IF NOT PROPERLY INSTALLED AND MAINTAINED.



EASYPLUG™ RESISTANCE HEATERS & CONTROLS

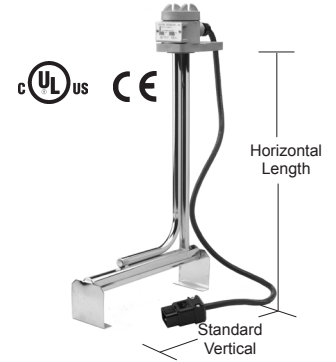
EASYPLUG™ ESA & ETA SERIES, OVER THE SIDE HEATERS						
WATTS	VOLTS	HOT ZONE	OVERALL LENGTH	316L STAINLESS	TITANIUM	SHIP WEIGHT
				HEATER ONLY	HEATER ONLY	
		In./(mm)	In./(mm)	MODEL NUMBER	MODEL NUMBER	Lbs./(kg)
1000	120	7 (180)	11 (280)	ESA1111-P1	ETA1111-P1	6 (3)
	240			ESA1211-P1	ETA1211-P1	
1800	120	12 (305)	17 (430)	ESA1.8117-P1	ETA1.8117-P1	9 (4)
	240			ESA1.8217-P1	ETA1.8217-P1	

Single phase only. 10' (3m) flexible cord with EASYPLUG™ connector standard, longer lengths available. Heater mounting clip included.



EASYPLUG™ ELSA & ELTA SERIES, REPLACEMENT BOTTOM HEATERS						
WATTS	VOLTS	HORIZONTAL LENGTH	STANDARD VERTICAL	316L STAINLESS	TITANIUM	SHIP WEIGHT
		LENGTH	VERTICAL	HEATER ONLY	HEATER ONLY	
		In./(mm)	In./(mm)	MODEL NUMBER	MODEL NUMBER	Lbs./(kg)
1000	120	11 (280)	24 (610)	ELSA1111-R24S-P1	ELTA1111-R24S-P1	8 (4)
	240			ELSA1211-R24S-P1	ELTA1211-R24S-P1	
1800	120	16 (405)	24 (610)	ELSA1.8116-R24S-P1	ELTA1.8116-R24S-P1	11 (5)
	240			ELSA1.8216-R24S-P1	ELTA1.8216-R24S-P1	

Longer vertical lengths and special configurations available, consult factory. Single phase only. 10' (3m) flexible cord with EASYPLUG™ connector standard, longer lengths available.



EASYPLUG™ DRAE SERIES, REPLACEMENT DIGITAL THERMOSTATS					
VOLTS	MAX. AMPS	THERMOSTAT ONLY MODEL NUMBER	SENSOR LENGTH	TEMP. RANGE	REPLACEMENT SENSOR P/N
120	15	DRAE15-1	8' (2.4 m)	-30°-220°F (-34°-104°C)	DRA-8L
240	8	DRAE15-2	8' (2.4 m)	-30°-220°F (-34°-104°C)	DRA-8L

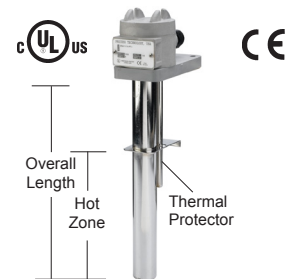
Includes 8' (2.4m) vinyl sleeved sensor. 6' (1.8m) flexible power cord and plug included. Indoor use only. Consult factory for outdoor applications.



RESISTANCE IMMERSION HEATERS

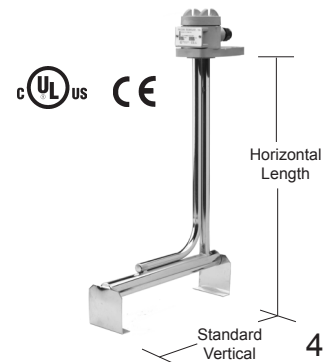
SA & TA SERIES, SINGLE TUBE OVER THE SIDE HEATERS						
WATTS	VOLTS	HOT ZONE	OVERALL LENGTH	316L STAINLESS	TITANIUM	SHIP WGT.
				MODEL NUMBER	MODEL NUMBER	
		In./(mm)	In./(mm)	(FOR FRESH WATER)	(FOR SALT WATER)	Lbs./(kg)
1000	120	7 (180)	11 (280)	SA1111-P1	TA1111-P1	5 (2.5)
	240			SA1211-P1	TA1211-P1	
1800	120	12 (305)	17 (430)	SA1.8117-P1	TA1.8117-P1	8 (4)
	240			SA1.8217-P1	TA1.8217-P1	
2500	240	17 (430)	23 (585)	SA2.5223-P1	TA2.5223-P1	10 (4.5)
3500	240	23 (585)	29 (735)	SA3.5229-P1	TA3.5229-P1	13 (6)
5000	240	32 (815)	39 (990)	SA5239-P1	TA5239-P1	16 (7.5)
6000	240	40 (1015)	47 (1195)	SA6247-P1	TA6247-P1	19 (8.5)

Single phase only. 10' (3m) flexible cord standard. Wire and conduit provided on 5 and 6 kW models. Mounting clip, longer cord lengths and protective guards available.

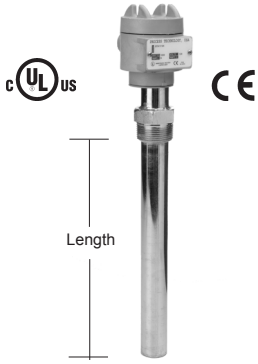


LSA & LTA SERIES, SINGLE TUBE BOTTOM HEATERS						
WATTS	VOLTS	HORIZONTAL LENGTH	STANDARD VERTICAL	316L STAINLESS	TITANIUM	SHIP WGT.
		LENGTH	VERTICAL	MODEL NUMBER	MODEL NUMBER	
		In./(mm)	In./(mm)	(FOR FRESH WATER)	(FOR SALT WATER)	Lbs./(kg)
1000	120	11 (280)	24 (610)	LSA1111-R24S-P1	LTA1111-R24S-P1	7 (3.5)
	240			LSA1211-R24S-P1	LTA1211-R24S-P1	
1800	120	16 (405)	24 (610)	LSA1.8116-R24S-P1	LTA1.8116-R24S-P1	10 (4.5)
	240			LSA1.8216-R24S-P1	LTA1.8216-R24S-P1	
2500	240	21 (535)	24 (610)	LSA2.5221-R24S-P1	LTA2.5221-R24S-P1	12 (5.5)
3500	240	27 (685)	24 (610)	LSA3.5227-R24S-P1	LTA3.5227-R24S-P1	15 (7)
5000	240	36 (915)	48 (1220)	LSA5236-R48S-P1	LTA5236-R48S-P1	18 (8)
6000	240	44 (1120)	48 (1220)	LSA6244-R48S-P1	LTA6244-R48S-P1	21 (9.5)

Single phase only. 10 foot (3m) flexible cord standard. Wire and conduit on 5 and 6kW models.



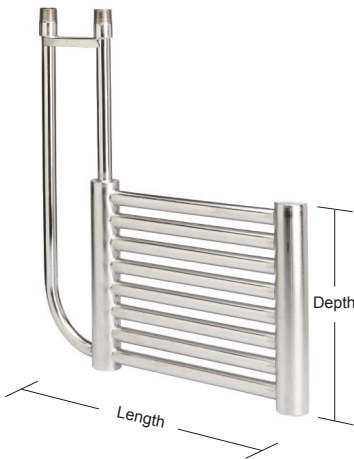
RESISTANCE IMMERSION HEATERS



TA SERIES, 1 1/4" NPT SCREW PLUG HEATERS					
WATTS	VOLTS	OVERALL	316L STAINLESS	TITANIUM	SHIP WGT.
		LENGTH	MODEL NUMBER	MODEL NUMBER	
		In./(mm)	(FOR FRESH WATER)	(FOR SALT WATER)	Lbs./ (kg)
1000	120	10 (255)	STA1110	TTA1110	6 (3)
	240		STA1210	TTA1210	
1800	120	15 (380)	STA1.8115	TTA1.8115	8 (4)
	240		STA1.8215	TTA1.8215	
2500	240	20 (510)	STA2.5220	TTA2.5220	11 (5)
3500	240	26 (660)	STA3.5226	TTA3.5226	13 (6)
5000	240	35 (890)	STA5235	TTA5235	15 (7)
6000	240	43 (1090)	STA6243	TTA6243	18 (8)

Single phase only. Other sizes available, consult factory. 10' (3m) flexible cord standard, longer lengths available. Wire and conduit provided on 5 and 6 kW models. 2" 2-1/2" screw plugs and 3", 5", and 6" flanged heaters also available.

HEAT EXCHANGERS



- 316 stainless steel for fresh water
- Titanium for salt water
- Standard and custom configurations
- Steam or water (heating or cooling) styles available
- Grid, serpentine, u-coil, and helical coils available
- Available accessories: solenoid hangers, shut off valves, strainers, hangers, liquid level controls, thermowells

TEMPERATURE CONTROLS



DRA SERIES, DIGITAL COMBINATION CONTROLS						
VOLTS	MAX. AMPS	MODEL NUMBER	SENSOR LENGTH	TEMP. RANGE	REPLACEMENT SENSOR P/N	SHIP WGT.
						Lbs./ (kg)
120	15	DRA15	8' (2.4 m)	-30°-220°F (-34°-104°C)	DRA-8L	3 (1.5)
240	8	DRA15	8' (2.4 m)	-30°-220°F (-34°-104°C)	DRA-8L	3 (1.5)

8' (2.4m) vinyl sleeved sensor standard, longer sensor lengths available. Indoor use only. For outdoor applications, consult factory.



DRA SERIES, DIGITAL COMBINATION CONTROLS						
VOLTS	MAX. AMPS	MODEL NUMBER	REPLACEMENT RELAY P/N	REPLACEMENT SENSOR P/N	SHIP WGT.	
					Lbs./ (kg)	
120	30	DRA301	AH30-1	DRA-8L	15 (7)	
240	30	DRA302-LT	AH30-2	DRA-8L	15 (7)	
120	50	DRA501	AH50-1	DRA-8L	16 (7.5)	
240	50	DRA502-LT	AH50-2	DRA-8L	16 (7.5)	
240	75	DRA752-LT	AH75-2	DRA-8L	23 (10.5)	
240	90	DRA902-LT	AH90-2	DRA-8L	25 (11.5)	

One or three phase. 8' (2.4m) vinyl sleeved sensor standard. Combination control consists of gasketed plastic enclosure, thermostat, contactor and optional control transformer. Transformer must be used on 480 volt controls and is recommended for 240 volt applications. To add transformer, omit "LT" from end of model number. Indoor use only. For outdoor applications, longer sensor lengths and additional control options, consult factory.

Determining Heating Requirements for Electric Immersion Heaters

To determine the heating requirement of a tank, first obtain the following information:

- 1) Total cubic feet of tank (1m³ = 35 ft³). Multiply the inside dimensions of the tank in feet - length x width x depth.
- 2) Total gallons of water. Multiply by 7.48 the cubic feet of the tank occupied by water. (If the water is normally 6" below the top of the tank, allow for this when figuring.) (1 liter = .264 gallons)
- 3) Average ambient (room) temperature at which tank will be used.
- 4) Temperature level at which water is to be held.
- 5) Heat-up time desired.

Losses due to agitation and ventilation should be considered in calculating total kW requirements. After this information is known, the following calculations can be made:

$$\frac{A \times 1.0 \times 8.35 \times B}{3412 \times C} = \underline{\hspace{2cm}}$$

$$D \times E = \underline{\hspace{2cm}}$$

Add the results of both calculations. The total is the Kilowatt requirement of the tank.

- A = Total gallons of solution. One liter = .264 gallons.
 B = Difference from ambient temperature and desired water temperature in degrees F. °C=5/9(°F-32).
 C = Desired heat-up time (hours).
 D = Heat loss of tank. Refer to chart below.
 E = Square feet of top of tank. Multiply length x width.

SURFACE LOSSES IN WATTS FROM OPEN HOT WATER TANK (F°)					
75°	100	80°	200	85°	300

Based on 70°F (21°C) ambient temperature.

Return/Repair Inquiries

Please direct all in-and-out-of-warranty repairs to Process Technology's Customer Service Department. Before returning any equipment, please contact the Customer Service Department to obtain a Return Material Authorization (RMA) number and form. The designated RMA number should then be marked on the outside of the return package and completed forms returned with the product. To avoid processing delays, please be sure to include:

- 1) Completed RMA form
- 2) Purchase order number and invoice number
- 3) Returnee's name, address and phone number
- 4) Model and serial number
- 5) Repair instructions

Items returned to Process Technology for any reason shall be via freight prepaid, unless prior arrangements have been made.

Warranty

All Process Technology equipment, heaters and controls have been carefully inspected before shipping and are warranted to be free from defects in workmanship and material for a period of one year from date of purchase on a prorated basis. At its option, Process Technology will repair or replace any defects which are exhibited under proper and normal use. Process Technology disclaims any responsibility for misuse, misapplication, negligence or improper installation of equipment. Process Technology makes no warranty or representation regarding the fitness for use or the application of its products by the purchaser.

Please ensure applicability of heater before installation since we cannot guarantee heaters against premature failure due to corrosion caused by unusual conditions over which we have no control, such as:

- Excessive sludge buildup
- Stagnant or turbulent flow of the solution
- Aeration
- Erosion

Process Technology is not liable for costs incurred in removal, reinstallation, or unauthorized repair of the product, or for damage of any type whatsoever including incidental or consequential damage.

Amp Calculation for Control Selection

Heater Watts	AMPS FOR HEATING LOAD							
	Single Phase				Three Phase (Balanced)			
	120V	208V	240V	480V	208V	240V	480V	
1,000	8.4	4.8	4.2	2.1	2.8	2.5	1.2	
1,800	15	8.6	7.5	3.8	5	4.4	2.2	
2,500	20.9	12	10.4	5.2	6.9	6	3	
3,500	29.2	16.8	14.6	7.3	9.7	8.4	4.2	
5,000	41.7	24	20.9	10.4	13.9	12	6	
6,000	50	28.9	25	12.5	16.7	14.5	7.3	
7,500	62.5	36	31.7	15.8	20.9	18.1	9	
10,500	87.5	50.5	43.8	21.9	29.2	25.3	12.6	
15,000	125	72.1	62.5	31.3	41.7	36.1	18.1	
18,000	150	86.6	75	37.5	50.1	43.4	21.7	

For single phase or two wire power supplies to heaters.

$$\text{AMP RATING PER POLE*} = \frac{\text{Total capacity (watts)}}{\text{line voltage}}$$

Example: $\frac{3500 \text{ watts}}{240 \text{ volts}} = 14.58 \text{ Amps}$

For three phase balanced power supplies (Delta or Wye connections) to heaters using a three-pole contactor.

$$\text{AMP RATING PER POLE*} = \frac{\text{Total capacity (watts)}}{\text{line voltage} \times 1.73}$$

Example: $\frac{3500 \text{ watts}}{240 \text{ amps} \times 1.73} = 8.43 \text{ Amps}$

Contactor sizing:

*Amp rating per pole x 1.25 = contactor rating

TEMPERATURE	GALLONS									
	50	100	250	500	750	1000	2000	3000	4000	5000
70°	0.15	0.3	0.75	1.5	2.25	3	6	9	12	15
75°	0.2	0.4	1	2	3	4	8	12	16	20
80°	0.25	0.5	1.25	2.5	3.75	5	10	15	20	25
85°	0.3	0.6	1.5	3	4.5	6	12	18	24	30

CAUTION: This chart is for quick *estimates* only.

Use formula above for determining actual heat requirement.

This chart provides an easy reference to estimate the kW required to heat a tank. Heat loss from the surface of the water and from the sides of the tank have been taken into account. Find the gallons at the top, move down the chart to the temperature at which you will be heating the water. The number indicated here is the kW required for the heating job. This kW figure assumes a heat-up period of twelve hours; for a six hour heat-up time, simply double the kW figure.

**PROCESS
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