



Electric Immersion Heaters

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Heat Exchangers

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In-Line Heaters

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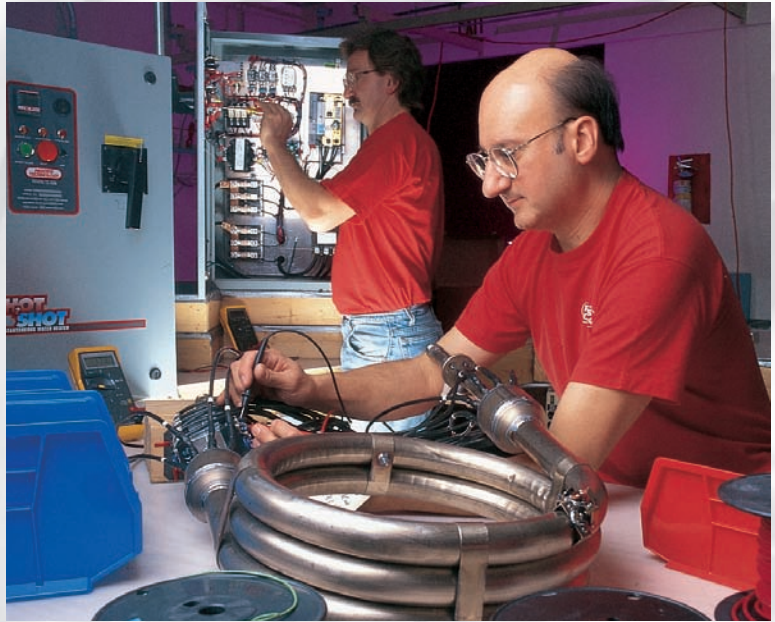
Level and Temperature Controls

**PROCESS  
TECHNOLOGY**

## Leadership defined by performance

Many firms make idealistic (but vague) statements about “excellence” and “leadership.” But Process Technology proves its leadership with performance in several key areas:

- **Quality.** Don't take our word for it. Our reliability is acknowledged by the people who set the standards. We are UL-listed, CSA-certified, and CE-compliant. No other products deliver our combination of performance, reliability and safety.
- **Service.** We have the largest technical support team in the industry. Each member is experienced, knowledgeable and professional. And everyone at Process Technology — from the president's office to the mail room — makes customer satisfaction their number-one priority.



- **Safety.** Safety is built-in, not added-on. Our products are the safest available at any price. We offer more models with overtemperature protection as standard than any other manufacturer.
- **Capabilities.** If you don't see the product you need in this catalog, that's OK — it's possible that it simply hasn't been invented yet. Once you tell us what you want to accomplish, we'll get started on the perfect, custom solution to your needs.

## The best value for your investment

We've been delivering the best value in the industry since 1978. You'll find the industry's most dedicated, knowledgeable and skilled people at Process Technology. Our worldwide distribution network is also ready to serve you.

**PROCESS  
TECHNOLOGY**

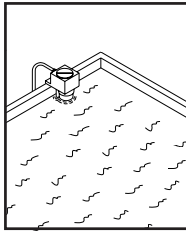


# THERMAL OVERLOAD PROTECTION

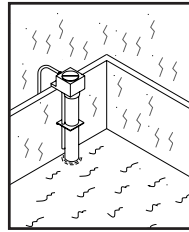
## Protector 1, 2 and 3 Series

### THE PROTECTOR 1 SERIES

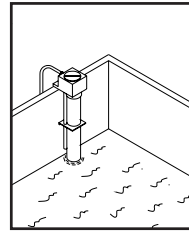
The Protector 1 overtemperature control system utilizes a heat sensitive fuse to detect overheat conditions. The fuse, placed inside a thermowell, positioned in contact with the heater sheath, will cut power to the heater in the event of low liquid level.



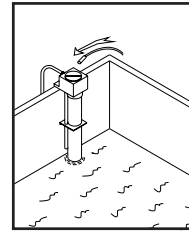
Immersion heater with PROTECTOR 1 working normally.



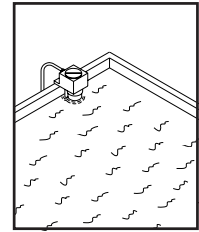
Process bath level drops due to tank leak or evaporation.



PROTECTOR 1 fuse sensor detects elevating temperature and shuts off power to heater.



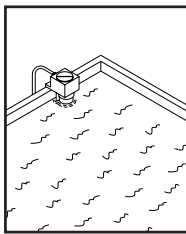
Replace fuse.



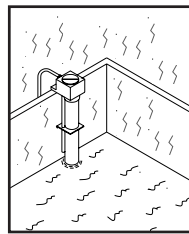
Restore the liquid level and resume operation.

### THE PROTECTOR 2 AND 3 SERIES

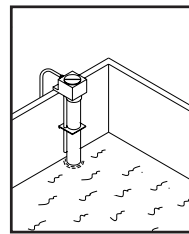
The Protector 2 and Protector 3 systems provide the same reliable overtemperature protection as the Protector 1; however, the control systems feature a heat sensing thermostat. If the liquid level drops and the heater reaches a preset overheat temperature, the thermostat cuts power to the heater and an audible alarm activates. After filling the tank, the immersion heater can quickly be made operational by pushing the reset button on the control to restore power. Protector 3 is designed for flexible lead or high temperature fluoropolymer (PTFE) heater applications only. DO NOT wire P2, P6, P7 or P8 devices directly to power or heater load, as a dangerous short circuit will result with irreparable damage to the heater. Refer to wiring diagrams for proper installation.



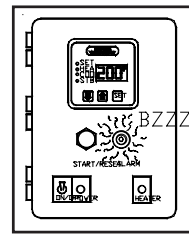
Immersion heater with PROTECTOR 2 working normally.



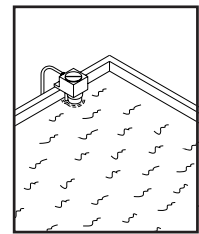
Process bath level drops due to tank leak or evaporation.



PROTECTOR 2's thermostat fuse detects elevated temperature and shuts off power to the heater.



The alarm is activated.



Restore the liquid level and push the reset button to resume operation.

### HEATER THERMAL PROTECTION CHART

PROTECTOR TYPE	TANK TEMP. °F (°C)	METAL OVER-THE-SIDE AND FLANGED	METAL L-SHAPED	METAL FLEX RISER	QUARTZ	OVER-THE-SIDE FLUORO-POLYMER	L-SHAPED FLUORO-POLYMER	FLEX RISER FLUORO-POLYMER
Replaceable	to 180°F (82°C)	P1 White, 6021	P1 White, 6024	---	P1 Red, 6032	P1 to 190°F (88°C) Red, 6032	P1 to 190°F (88°C) Red, 6035	---
	180-230°F (82-110°C)	P4 Blue, 6022	P4 Blue, 6025	---	P4 Blue, 6033	---	---	---
	230-300°F (110-150°C)	P5 Red, 6023	P5 Red, 6026	---	---	---	---	---

### RESETTABLE PROTECTORS REQUIRE ADDITIONAL CONTROL COMPONENTS (CONSULT FACTORY)

Resettable	to 180°F (82°C)	P2 White, 4576	P2 White, 2804	P2 White, 2804	P2 White, 4576	P2 to 190°F (88°C) White, 4576	P2 to 190°F (88°C) White, 4576	P3
	180-230°F (82-110°C)	P6 Blue, 4047	P6 Blue, 4047	P6 Blue, 4047	P6 Blue, 5580	P8 190-210°F (88-99°C) Brown, 5163	P8 190-210°F (88-99°C) Brown, 5163	P3
	230-300°F (110-150°C)	P7 Red, 2805	P7 Red, 2805	P7 Red, 2805	---	P3 210-250°F (99-121°C)	P3 210-250°F (99-121°C)	P3

Color designations indicate lead wire color. Four digit numbers indicate PCN. P3 option not available on 8 and 9 kW elements. Lowest temperature replaceable style Protector standard unless otherwise designated.

### VOLTAGES AVAILABLE (MOST HEATERS AND CONTROLS)

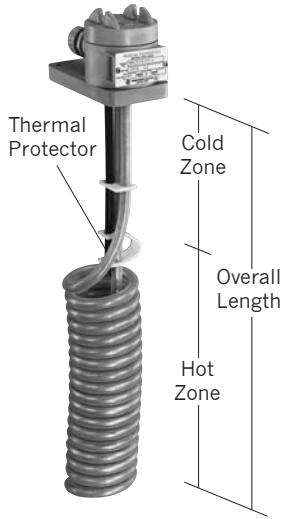
Voltages are designated in Process Technology model numbers as follows:

120 volt = 1	208 volt = 8	240 volt = 2	400 volt = 7	480 volt = 4
200 volt = 0	220 volt = 9	380 volt = 3	415 volt = 5	600 volt = 6

Specify single or three phase when ordering. Consult factory for other voltages.

# FLUOROPOLYMER (PTFE) HEATERS

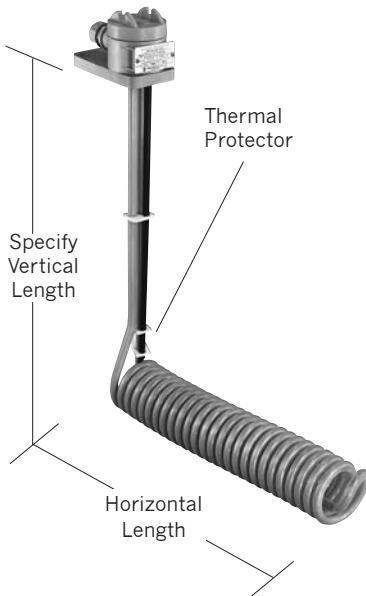
10 Watts Per Square Inch (1.5 w/cm<sup>2</sup>)



## HX SERIES, SPIRAL FLUOROPOLYMER (PTFE) HEATERS

WATTS	VOLTS (See pg.1)	HOT ZONE In./(mm)	OVERALL LENGTH In./(mm)	STD. COLD ZONE In./(mm)	MAX. COLD ZONE In./(mm)	MODEL NUMBER	SHIP WGT. Lbs./(kg)
500	120	5	11	6	41	HX.5111- <sup>**</sup>	6
	240	(125)	(280)	(155)	(1040)	HX.5211- <sup>**</sup>	(2.5)
1000	120	7	11	4	41	HX1111- <sup>**</sup>	7
	240	(180)	(280)	(100)	(1040)	HX1211- <sup>**</sup>	(3.5)
2000	120	12	17	5	40	HX2117- <sup>**</sup>	8
	240	(305)	(430)	(125)	(1015)	HX2217- <sup>**</sup>	(4)
	480					HX2417- <sup>**</sup>	
3000	240	16	23	7	40	HX3223- <sup>**</sup>	13
	480	(405)	(585)	(180)	(1015)	HX3423- <sup>**</sup>	(6)
4000	240	20	29	9	40	HX4229- <sup>**</sup>	15
	480	(510)	(735)	(230)	(1015)	HX4429- <sup>**</sup>	(7)
5000	240	25	35	10	36	HX5235- <sup>**</sup>	18
	480	(635)	(890)	(255)	(915)	HX5435- <sup>**</sup>	(8)
6000	240	29	40	11	30	HX6240- <sup>**</sup>	21
	480	(735)	(1015)	(280)	(760)	HX6440- <sup>**</sup>	(10)
8000	240	37	47	10	32	2HX8247- <sup>**</sup>	25
	480	(940)	(1195)	(255)	(810)	2HX8447- <sup>**</sup>	(12)
9000	240	44	54	10	35	2HX9254- <sup>**</sup>	28
	480	(1120)	(1370)	(255)	(890)	2HX9454- <sup>**</sup>	(13)

Single phase only. Longer vertical lengths and flexible risers available, consult factory.

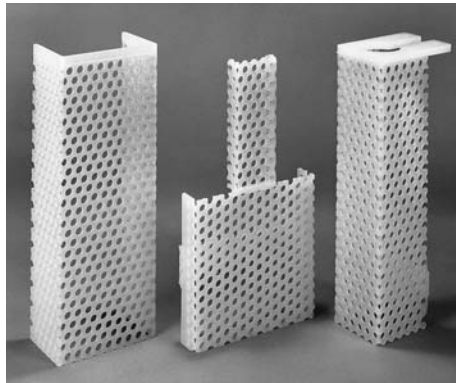


## HXL SERIES, SPIRAL L-SHAPED FLUOROPOLYMER (PTFE) HEATERS

WATTS	VOLTS (See Pg.1)	HOT ZONE In./(mm)	STD. VERT. LENGTH* In./(mm)	MAX. COLD ZONE In./(mm)	MODEL NUMBER	SHIP WGT. Lbs./(kg)
500	120	6	12	41	HXL.5106-R*- <sup>**</sup>	6
	240	(155)	(305)	(1040)	HXL.5206-R*- <sup>**</sup>	(2.5)
1000	120	8	12	41	HXL1108-R*- <sup>**</sup>	7
	240	(205)	(305)	(1040)	HXL1208-R*- <sup>**</sup>	(3.5)
2000	120	12	18	40	HXL2112-R*- <sup>**</sup>	8
	240	(305)	(460)	(1015)	HXL2212-R*- <sup>**</sup>	(4)
	480				HXL2412-R*- <sup>**</sup>	
3000	240	17	18	40	HXL3217-R*- <sup>**</sup>	13
	480	(430)	(460)	(1015)	HXL3417-R*- <sup>**</sup>	(6)
4000	240	20	18	40	HXL4220-R*- <sup>**</sup>	15
	480	(510)	(460)	(1015)	HXL4420-R*- <sup>**</sup>	(7)
5000	240	24	18	36	HXL5224-R*- <sup>**</sup>	18
	480	(610)	(460)	(915)	HXL5424-R*- <sup>**</sup>	(8)
6000	240	29	18	30	HXL6229-R*- <sup>**</sup>	21
	480	(735)	(460)	(760)	HXL6429-R*- <sup>**</sup>	(10)
8000	240	37	18	32	2HXL8237-R*- <sup>**</sup>	26
	480	(940)	(460)	(810)	2HXL8437-R*- <sup>**</sup>	(12)
9000	240	44	18	35	2HXL9244-R*- <sup>**</sup>	29
	480	(1120)	(460)	(890)	2HXL9444-R*- <sup>**</sup>	(13)

\*Specify vertical length by adding height in inches after "R". Example: HXL2212-R24-P2. Single phase only. Longer vertical lengths and flexible risers available, consult factory.

### GUARDS RECOMMENDED FOR ALL FLUOROPOLYMER HEATERS



Standard guards made of polypropylene. Special fluoropolymer (PTFE) guards for chromic acid and temperatures above 180° F (82°C).

GUARDS SOLD SEPARATELY.

\*\*Specify thermal overload protection desired. See page 1. All heaters must be operated in conjunction with appropriate temperature and level controls.

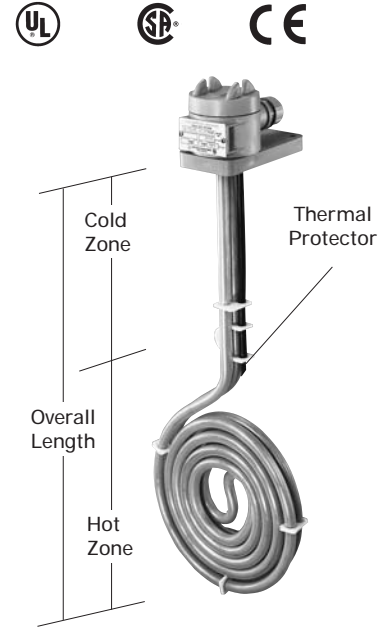
# FLUOROPOLYMER (PTFE) HEATERS

10 Watts Per Square Inch (1.5 w/cm<sup>2</sup>)

## HXF SERIES, LOW PROFILE FLUOROPOLYMER (PTFE) HEATERS

WATTS	VOLTS (See Pg.1)	HOT OVERALL			STD. COLD		MAX. COLD ZONE In./(mm)	MODEL NUMBER	SHIP WGT. Lbs./(kg)
		ZONE LENGTH In./(mm)	LENGTH In./(mm)	DIA. In./(mm)	ZONE LENGTH In./(mm)	LENGTH In./(mm)			
500	120	6	14	5	8	36	HXF.5105-14- <b>**</b>	6	
	240	(155)	(355)	(125)	(205)	(915)	HXF.5205-14- <b>**</b>	(2.5)	
1000	120	7	14	6	7	36	HXF1106-14- <b>**</b>	7	
	240	(180)	(355)	(155)	(180)	(915)	HXF1206-14- <b>**</b>	(3.5)	
2000	120	9	17	8	8	35	HXF2108-17- <b>**</b>	8	
	240	(230)	(430)	(205)	(205)	(890)	HXF2208-17- <b>**</b>	(4)	
	480						HXF2408-17- <b>**</b>		
3000	240	10	23	9	13	35	HXF3209-23- <b>**</b>	13	
	480	(255)	(585)	(230)	(330)	(890)	HXF3409-23- <b>**</b>	(6)	
4000	240	12	29	11	17	35	HXF4211-29- <b>**</b>	15	
	480	(305)	(735)	(280)	(430)	(890)	HXF4411-29- <b>**</b>	(7)	
5000	240	13	35	12	22	31	HXF5212-35- <b>**</b>	18	
	480	(330)	(890)	(305)	(560)	(790)	HXF5412-35- <b>**</b>	(8)	
6000	240	14	40	13	26	25	HXF6213-40- <b>**</b>	22	
	480	(355)	(1015)	(330)	(660)	(635)	HXF6413-40- <b>**</b>	(10)	

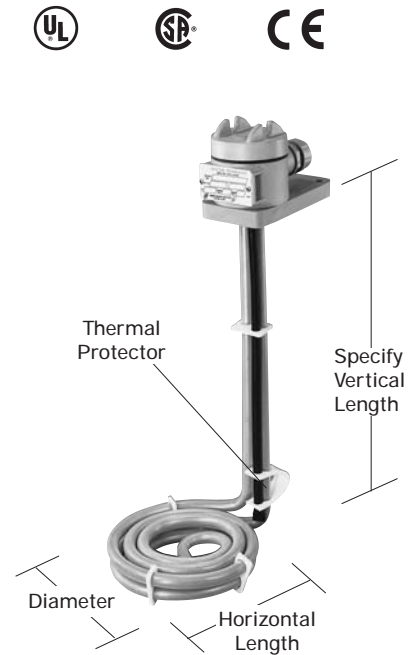
Single phase only. Longer vertical lengths and flexible risers available, consult factory. Double tier space saver 1" thick (with guard 1-1/2" thick). Not recommended for electroless chemistry.



## HXFL SERIES, LOW PROFILE L-SHAPED FLUOROPOLYMER (PTFE) HEATERS

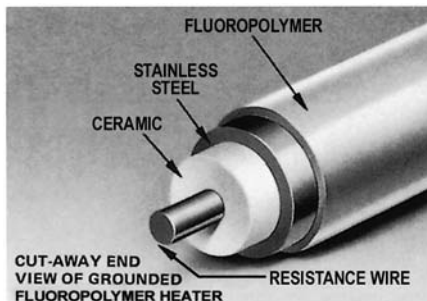
WATTS	VOLTS (See Pg.1)	HORIZ.	STD. VERT.	DIA.	MAX. COLD ZONE	MODEL NUMBER	SHIP WGT. Lbs./(kg)
		LENGTH In./(mm)	LENGTH* In./(mm)				
500	120	5	12	5	36	HXFL.5105-R*- <b>**</b>	6
	240	(125)	(305)	(125)	(915)	HXFL.5205-R*- <b>**</b>	(2.5)
1000	120	6	12	6	36	HXFL1106-R*- <b>**</b>	7
	240	(155)	(305)	(155)	(915)	HXFL1206-R*- <b>**</b>	(3.5)
2000	120	8	18	8	35	HXFL2108-R*- <b>**</b>	8
	240	(205)	(460)	(205)	(890)	HXFL2208-R*- <b>**</b>	(4)
	480					HXFL2408-R*- <b>**</b>	
3000	240	9	18	9	35	HXFL3209-R*- <b>**</b>	13
	480	(230)	(460)	(230)	(890)	HXFL3409-R*- <b>**</b>	(6)
4000	240	11	18	11	35	HXFL4211-R*- <b>**</b>	15
	480	(280)	(460)	(280)	(890)	HXFL4411-R*- <b>**</b>	(7)
5000	240	12	18	12	31	HXFL5212-R*- <b>**</b>	18
	480	(305)	(460)	(305)	(790)	HXFL5412-R*- <b>**</b>	(8)
6000	240	13	18	13	26	HXFL6213-R*- <b>**</b>	22
	480	(330)	(460)	(330)	(660)	HXFL6413-R*- <b>**</b>	(10)

\*Specify vertical length by adding height in inches after "R". Example: HXFL2208-R24-P1. Single phase only. Longer vertical lengths and flexible risers available, consult factory. Double tier space saver 1" thick (with guard 1-1/2" high). Guards recommended. Not recommended for electroless chemistry.



## FLUOROPOLYMER HEATER CONSTRUCTION

Ground wire is welded to stainless steel sheath.



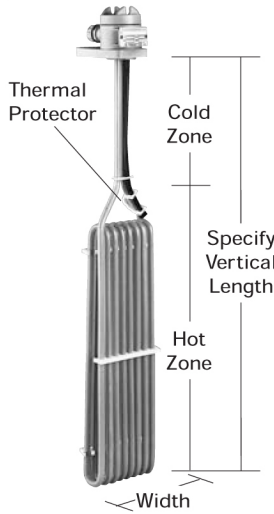
\*\*Specify thermal overload protection desired. See page 1. All heaters must be operated in conjunction with appropriate temperature and level controls.

# FLUOROPOLYMER (PTFE) HEATERS

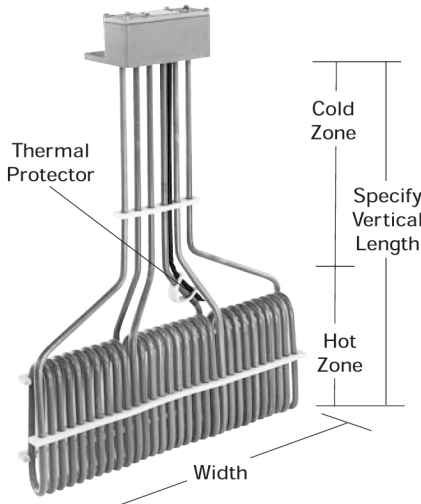
10 Watts Per Square Inch (1.5 w/cm<sup>2</sup>)



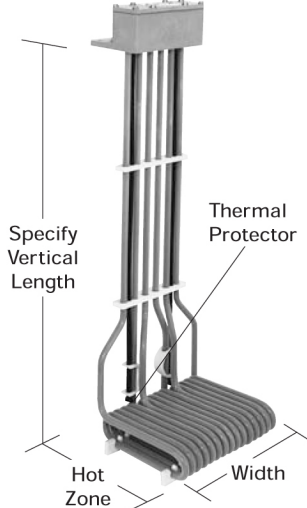
Except 8 kW and 9 kW.



Except 24 kW and 27 kW.



Except 24 kW and 27 kW.



## HXO SERIES, FLUOROPOLYMER (PTFE) HEATERS

WATTS	VOLTS	HOT ZONE		OVERALL LENGTH	STD. COLD ZONE	MAX. COLD ZONE	MODEL NUMBER	SHIP WGT.
		WIDTH	LENGTH					
(See Pg.1)		In./(mm)	In./(mm)	In./(mm)	In./(mm)			Lbs./(kg)
500	120	5	6	11	5	36	HXO.5105-06-11-**	6
	240	(125)	(155)	(280)	(125)	(915)	HXO.5205-06-11-**	(2.5)
1000	120	6	7	11	5	36	HXO1106-07-11-**	7
	240	(155)	(180)	(280)	(125)	(915)	HXO1206-07-11-**	(3.5)
2000	120	6	10	17	7	35	HXO2106-10-17-**	8
	240	(155)	(255)	(430)	(180)	(890)	HXO2206-10-17-**	(4)
	480						HXO2406-10-17-**	
3000	240	6	12	23	11	35	HXO3206-12-23-**	13
	480	(155)	(305)	(585)	(280)	(890)	HXO3406-12-23-**	(6)
4000	240	6	19	29	10	35	HXO4206-19-29-**	15
	480	(155)	(485)	(735)	(255)	(890)	HXO4406-19-29-**	(7)
5000	240	6	20	35	15	31	HXO5206-20-35-**	18
	480	(155)	(510)	(890)	(380)	(790)	HXO5406-20-35-**	(8)
6000	240	6	22	40	18	25	HXO6206-22-40-**	22
	480	(155)	(560)	(1015)	(460)	(635)	HXO6406-22-40-**	(10)
8000	240	6	36	47	11	28	2HXO8206-36-47-**	25
	480	(155)	(915)	(1195)	(280)	(710)	2HXO8406-36-47-**	(11.5)
9000	240	6	40	54	14	30	2HXO9206-40-54-**	28
	480	(155)	(1015)	(1370)	(355)	(760)	2HXO9406-40-54-**	(13)

Single phase only. Longer lengths and flexible risers available, consult factory.

## 3HXO SERIES, MULTI ELEMENT FLUOROPOLYMER (PTFE) HEATERS

WATTS	VOLTS	WIDTH	HOT ZONE	OVERALL LENGTH	MAX. COLD ZONE	MODEL NUMBER	SHIP WGT.
(See Pg.1)		In./(mm)	In./(mm)	In./(mm)	In./(mm)		Lbs./(kg)
1500	120	10	6	11	36	3HXO1.5110-06-11-**	15
	240	(255)	(155)	(280)	(915)	3HXO1.5210-06-11-**	(7)
3000	240	10	6	11	36	3HXO3210-06-11-**	20
	480	(255)	(155)	(280)	(915)	3HXO3410-06-11-**	(9.5)
4500	240	10	9.5	17	35	3HXO4.5210-9.5-17-**	21
	480	(255)	(245)	(430)	(890)	3HXO4.5410-9.5-17-**	(9.5)
6000	240	12	10.5	17	35	3HXO6212-10.5-17-**	22
	480	(305)	(270)	(430)	(890)	3HXO6412-10.5-17-**	(10)
9000	240	12	16	23	35	3HXO9212-16-23-**	36
	480	(305)	(405)	(585)	(890)	3HXO9412-16-23-**	(16.5)
12000	240	12	20.5	29	35	3HXO12212-20.5-29-**	42
	480	(305)	(525)	(735)	(890)	3HXO12412-20.5-29-**	(20)
15000	240	12	25	35	31	3HXO15212-25-35-**	48
	480	(305)	(635)	(890)	(790)	3HXO15412-25-35-**	(22)
18000	240	12	29	40	25	3HXO18212-29-40-**	54
	480	(305)	(735)	(1015)	(635)	3HXO18412-29-40-**	(24.5)

Three phase standard. Single phase available as option. Add "-1" before thermal protector.

## 3HXOL SERIES, MULTI ELEMENT L-SHAPED FLUOROPOLYMER (PTFE) HEATERS

WATTS	VOLTS	WIDTH	HOT ZONE	STD. VERT. LENGTH*	MAX. COLD ZONE	MODEL NUMBER	SHIP WGT.
(See Pg.1)		In./(mm)	In./(mm)	In./(mm)	In./(mm)		Lbs./(kg)
3000	240	7	13	18	36	3HXOL3207-13-R-**	20
	480	(180)	(330)	(460)	(915)	3HXOL3407-13-R-**	(9.5)
4500	240	9	11	18	35	3HXOL4.5209-11-R-**	21
	480	(230)	(280)	(460)	(890)	3HXOL4.5409-11-R-**	(9.5)
6000	240	10	19	18	35	3HXOL6210-19-R-**	22
	480	(255)	(485)	(460)	(890)	3HXOL6410-19-R-**	(10)
9000	240	10	23	18	35	3HXOL9210-23-R-**	36
	480	(255)	(585)	(460)	(890)	3HXOL9410-23-R-**	(16.5)
12000	240	10	30	18	35	3HXOL12210-30-R-**	42
	480	(255)	(760)	(460)	(890)	3HXOL12410-30-R-**	(19.5)
15000	240	10	36	18	31	3HXOL15210-36-R-**	48
	480	(255)	(915)	(460)	(790)	3HXOL15410-36-R-**	(22)
18000	240	10	42	18	25	3HXOL18210-42-R-**	54
	480	(255)	(1070)	(460)	(635)	3HXOL18410-42-R-**	(24.5)

\*Specify vertical length by adding height in inches after "R". Example: 3HXOL3207-13-R24-P1. Flexible risers available, consult factory. Three phase standard. Single phase available as option. Add "-1" before thermal protector designator.

\*\*Specify thermal overload protection desired. See page 1. All heaters must be operated in conjunction with appropriate temperature and level controls.

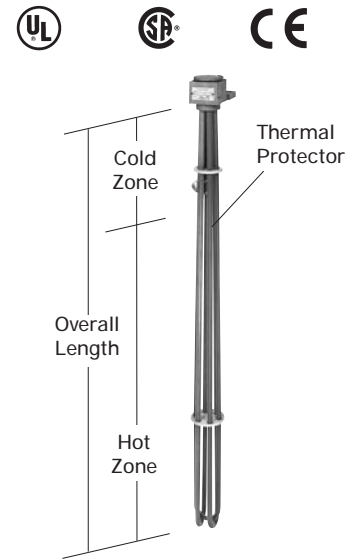
# FLUOROPOLYMER (PTFE) HEATERS

10 Watts Per Square Inch (1.5 w/cm<sup>2</sup>)

## 3HX SERIES, 3 ELEMENT FLUOROPOLYMER (PTFE) HEATERS

WATTS	VOLTS (See Pg.1)	HOT ZONE In./(mm)	OVERALL LENGTH In./(mm)	MODEL NUMBER	SHIP WGT. Lbs./(kg)
1000	120	10	17	3HX1117-1**	10
	240	(255)	(430)	3HX1217-**	(4.5)
1500	120	16	23	3HX1.5123-1**	11
	240	(405)	(585)	3HX1.5223-**	(5)
	480			3HX1.5423-**	
2000	120	22	29	3HX2129-1**	12
	240	(560)	(735)	3HX2229-**	(5.5)
	480			3HX2429-**	
3000	240	29	35	3HX3235-**	14
	480	(735)	(890)	3HX3435-**	(6.5)
4000	240	39	47	3HX4247-**	17
	480	(990)	(1195)	3HX4447-**	(8)
5000	240	48	59	3HX5259-**	20
	480	(1219)	(1500)	3HX5459-**	(9)
6000	240	56	68	3HX6268-**	23
	480	(1422)	(1725)	3HX6468-**	(10.5)

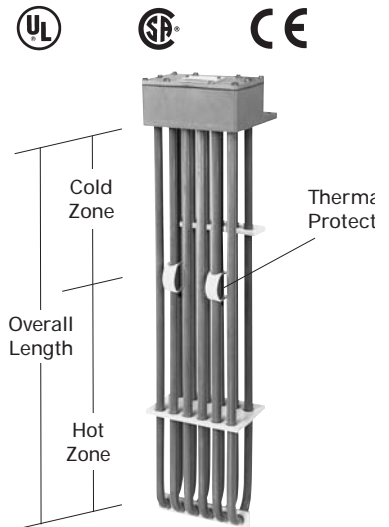
Three phase standard. Single phase available as option. Add "-1" before thermal protector designator.



## 6HX SERIES, 6 ELEMENT FLUOROPOLYMER (PTFE) HEATERS

WATTS	VOLTS (See Pg.1)	HOT ZONE In./(mm)	OVERALL LENGTH In./(mm)	MODEL NUMBER	SHIP WGT. Lbs./(kg)
2000	120	9	17	6HX2117-1**	19
	240	(230)	(430)	6HX2217-**	(8.5)
	480			6HX2417-**	
3000	240	15	23	6HX3223-**	22
	480	(380)	(585)	6HX3423-**	(10)
4000	240	21	29	6HX4229-**	24
	480	(535)	(735)	6HX4429-**	(11)
6000	240	28	35	6HX6235-**	27
	480	(710)	(890)	6HX6435-**	(12.5)
8000	240	38	47	6HX8247-**	33
	480	(965)	(1195)	6HX8447-**	(15)
10000	240	47	59	6HX10259-**	40
	480	(1195)	(1500)	6HX10459-**	(18)
12000	240	55	68	6HX12268-**	45
	480	(1400)	(1725)	6HX12468-**	(20.5)

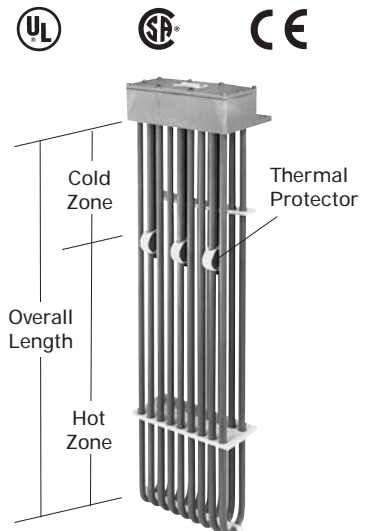
Three phase standard. Single phase available as option. Add "-1" before thermal protector designator.



## 9HX SERIES, 9 ELEMENT FLUOROPOLYMER (PTFE) HEATERS

WATTS	VOLTS (See Pg.1)	HOT ZONE In./(mm)	OVERALL LENGTH In./(mm)	MODEL NUMBER	SHIP WGT. Lbs./(kg)
3000	240	9	17	9HX3217-**	28
	480	(230)	(430)	9HX3417-**	(13)
4500	240	15	23	9HX4.5223-**	33
	480	(380)	(585)	9HX4.5423-**	(15)
6000	240	21	29	9HX6229-**	36
	480	(535)	(735)	9HX6429-**	(16.5)
9000	240	28	35	9HX9235-**	40
	480	(710)	(890)	9HX9435-**	(18)
12000	240	38	47	9HX12247-**	49
	480	(965)	(1195)	9HX12447-**	(22.5)
15000	240	47	59	9HX15259-**	60
	480	(1195)	(1500)	9HX15459-**	(27.5)
18000	240	55	68	9HX18268-**	67
	480	(1400)	(1725)	9HX18468-**	(30.5)

Three phase standard. Single phase available as option. Add "-1" before thermal protector designator.



\*\*Specify thermal overload protection desired. See page 1. All heaters must be operated in conjunction with appropriate temperature and level controls.

# FLUOROPOLYMER (PTFE) HEATERS

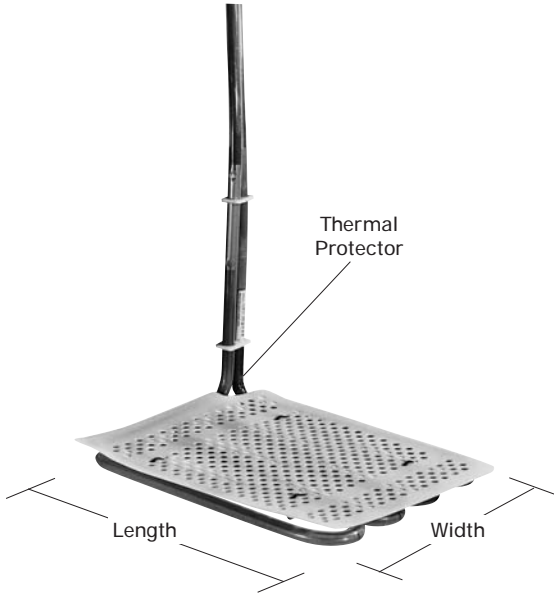
## 10 Watts Per Square Inch (1.5 w/cm<sup>2</sup>)



### HXRL SERIES, FLEX RISER HEATERS

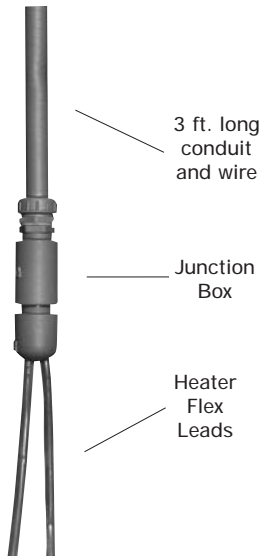
WATT	VOLTS (See Pg.1)	WIDTH In./(mm)	LENGTH In.(mm)	MODEL	SHIP WGT. Lbs./(kg)
				NUMBER	
1000	120	4	19	HXRL1104-19L-**	6
	240	(100)	(485)	HXRL1204-19L-**	(2.5)
1000	120	6	13	HXRL1106-13L-**	6
	240	(155)	(330)	HXRL1206-13L-**	(2.5)
1000	120	8	10	HXRL1108-10L-**	6
	240	(205)	(255)	HXRL1208-10L-**	(2.5)
2000	120	6	25	HXRL2106-25L-**	7
	240	(155)	(635)	HXRL2206-25L-**	(3.5)
	480			HXRL2406-25L-**	
2000	120	8	19	HXRL2108-19L-**	7
	240	(205)	(485)	HXRL2208-19L-**	(3.5)
	480			HXRL2408-19L-**	
2000	120	10	15	HXRL2110-15L-**	7
	240	(255)	(380)	HXRL2210-15L-**	(3.5)
	480			HXRL2410-15L-**	
2000	120	12	13	HXRL2112-13L-**	7
	240	(305)	(330)	HXRL2212-13L-**	(3.5)
	480			HXRL2412-13L-**	
2000	120	14	11	HXRL2114-11L-**	7
	240	(355)	(280)	HXRL2214-11L-**	(3.5)
	480			HXRL2414-11L-**	
3000	240	10	23	HXRL3210-23L-**	12
	480	(255)	(585)	HXRL3410-23L-**	(5.5)
3000	240	12	19	HXRL3212-19L-**	12
	480	(305)	(485)	HXRL3412-19L-**	(5.5)
3000	240	14	16	HXRL3214-16L-**	12
	480	(355)	(405)	HXRL3414-16L-**	(5.5)
3000	240	16	14	HXRL3216-14L-**	12
	480	(405)	(355)	HXRL3416-14L-**	(5.5)
3000	240	18	13	HXRL3218-13L-**	12
	480	(460)	(330)	HXRL3418-13L-**	(5.5)
4000	240	12	25	HXRL4212-25L-**	14
	480	(305)	(635)	HXRL4412-25L-**	(6.5)
4000	240	14	22	HXRL4214-22L-**	14
	480	(355)	(560)	HXRL4414-22L-**	(6.5)
4000	240	18	17	HXRL4218-17L-**	14
	480	(460)	(430)	HXRL4418-17L-**	(6.5)
4000	240	20	15	HXRL4220-15L-**	14
	480	(510)	(380)	HXRL4420-15L-**	(6.5)
5000	240	12	31	HXRL5212-31L-**	17
	480	(305)	(790)	HXRL5412-31L-**	(8)
5000	240	14	27	HXRL5214-27L-**	17
	480	(355)	(685)	HXRL5414-27L-**	(8)
5000	240	16	23	HXRL5216-23L-**	17
	480	(405)	(585)	HXRL5416-23L-**	(8)
5000	240	18	21	HXRL5218-21L-**	17
	480	(460)	(535)	HXRL5418-21L-**	(8)
6000	240	12	36	HXRL6212-36L-**	20
	480	(305)	(915)	HXRL6412-36L-**	(9)
6000	240	14	30	HXRL6214-30L-**	20
	480	(355)	(765)	HXRL6414-30L-**	(9)
6000	240	16	26	HXRL6216-26L-**	20
	480	(405)	(660)	HXRL6416-26L-**	(9)
6000	240	20	21	HXRL6220-21L-**	20
	480	(510)	(535)	HXRL6420-21L-**	(9)

4' continuous fluoropolymer (PTFE) leads standard. Longer lengths available as option. Single phase only. Rigid risers available. Other dimensional configurations available, consult factory. P3 protector standard. Fluoropolymer guards sold separately. Risers pictured in left position, right position available.



### JUNCTION BOX

Provided on all heaters with flexible leads.



\*\*Specify thermal overload protection desired. See page 1. All heaters must be operated in conjunction with appropriate temperature and level controls.



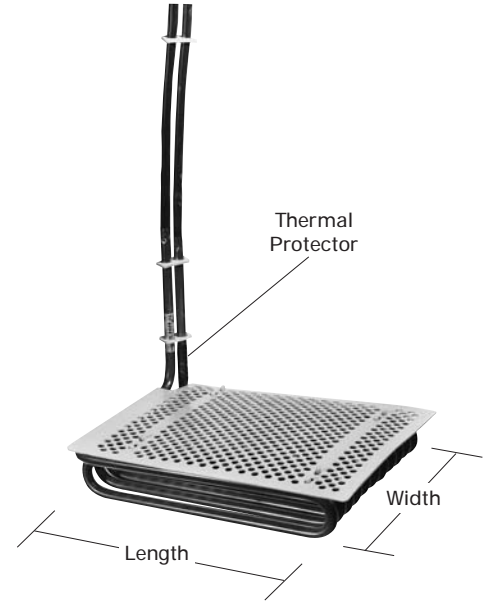
# FLUOROPOLYMER (PTFE) HEATERS

## 10 Watts Per Square Inch (1.5 w/cm<sup>2</sup>)

### HXOL SERIES, FLEX RISER HEATERS



WATTS	VOLTS (See Pg. 1)	WIDTH In./ (mm)	LENGTH In./ (mm)	MODEL	SHIP
				NUMBER	WGT. Lbs./ (kg)
1000	120	2	11	HXOL1102-11L-**	6
	240	(50)	(280)	HXOL1202-11L-**	(2.5)
1000	120	4	8	HXOL1104-08L-**	6
	240	(100)	(205)	HXOL1204-08L-**	(2.5)
2000	120	4	13	HXOL2104-13L-**	7
	240	(100)	(330)	HXOL2204-13L-**	(3.5)
	480			HXOL2404-13L-**	
2000	120	5	10	HXOL2105-10L-**	7
	240	(125)	(255)	HXOL2205-10L-**	(3.5)
	480			HXOL2405-10L-**	
2000	120	6	8	HXOL2106-08L-**	7
	240	(155)	(205)	HXOL2206-08L-**	(3.5)
	480			HXOL2406-08L-**	
3000	240	4	18	HXOL3204-18L-**	12
	480	(100)	(460)	HXOL3404-18L-**	(5.5)
3000	240	5	12	HXOL3205-12L-**	12
	480	(125)	(305)	HXOL3405-12L-**	(5.5)
3000	240	6	11	HXOL3206-11L-**	12
	480	(155)	(280)	HXOL3406-11L-**	(5.5)
3000	240	8	8	HXOL3208-08L-**	12
	480	(205)	(205)	HXOL3408-08L-**	(5.5)
4000	240	5	18	HXOL4205-18L-**	14
	480	(125)	(460)	HXOL4405-18L-**	(6.5)
4000	240	6	14	HXOL4206-14L-**	14
	480	(155)	(355)	HXOL4406-14L-**	(6.5)
4000	240	8	11	HXOL4208-11L-**	14
	480	(205)	(280)	HXOL4408-11L-**	(6.5)
5000	240	6	18	HXOL5206-18L-**	17
	480	(155)	(460)	HXOL5406-18L-**	(8)
5000	240	8	13	HXOL5208-13L-**	17
	480	(205)	(330)	HXOL5408-13L-**	(8)
5000	240	9	11	HXOL5209-11L-**	17
	480	(230)	(280)	HXOL5409-11L-**	(8)
5000	240	10	10	HXOL5210-10L-**	17
	480	(255)	(255)	HXOL5410-10L-**	(8)
6000	240	7	18	HXOL6207-18L-**	20
	480	(180)	(460)	HXOL6407-18L-**	(9)
6000	240	8	15	HXOL6208-15L-**	20
	480	(205)	(380)	HXOL6408-15L-**	(9)
6000	240	9	13	HXOL6209-13L-**	20
	480	(230)	(330)	HXOL6409-13L-**	(9)
6000	240	10	12	HXOL6210-12L-**	20
	480	(255)	(305)	HXOL6410-12L-**	(9)
6000	240	11	11	HXOL6211-11L-**	20
	480	(280)	(280)	HXOL6411-11L-**	(9)

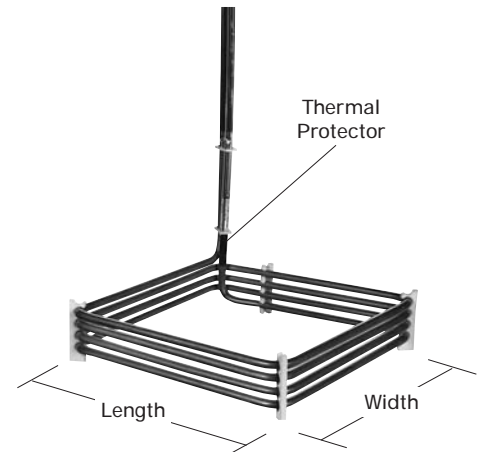


4' continuous fluoropolymer (PTFE) leads standard. Longer lengths available as option. Single phase only. Rigid risers available. Other dimensional configurations available, consult factory. P3 protector standard. Fluoropolymer guards sold separately. Risers pictured in left position, right position available.

### HXSL SERIES, FLEX RISER HEATERS



WATTS	VOLTS (See Pg.1)	WIDTH*	LENGTH*	MODEL	SHIP
				NUMBER	WGT. Lbs./ (kg)
1000	120	*	*	HXSL1**	6
	240	*	*		(2.5)
2000	120	*	*	HXSL2**	7
	240	*	*		(3.5)
	480	*	*		
3000	240	*	*	HXSL3**	12
	480	*	*		(5.5)
4000	240	*	*	HXSL4**	14
	480	*	*		(6.5)
5000	240	*	*	HXSL5**	17
	480	*	*		(8)
6000	240	*	*	HXSL6**	20
	480	*	*		(9)

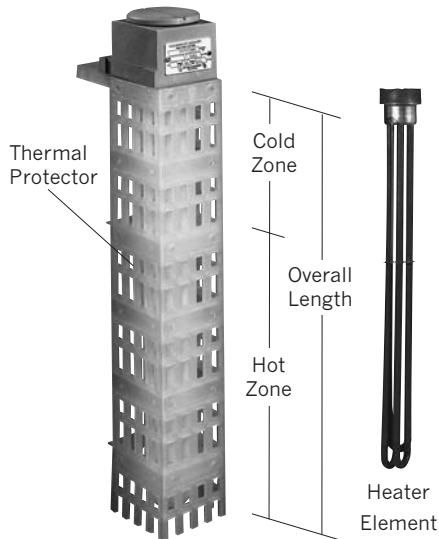


\*Please consult factory for model numbers of specific heaters. Single phase only. Heaters built to conform to tank dimensions. 4' continuous fluoropolymer (PTFE) leads standard, longer lengths available as option. P3 protector standard. Rigid risers available. Guards available as option, consult factory. Risers pictured in left position, right position available.

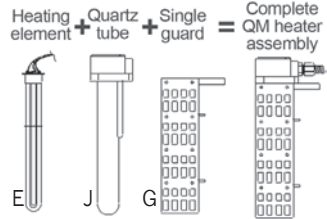
\*\*Specify thermal overload protection desired. See page 1. All heaters must be operated in conjunction with appropriate temperature and level controls.

# QUARTZ HEATERS

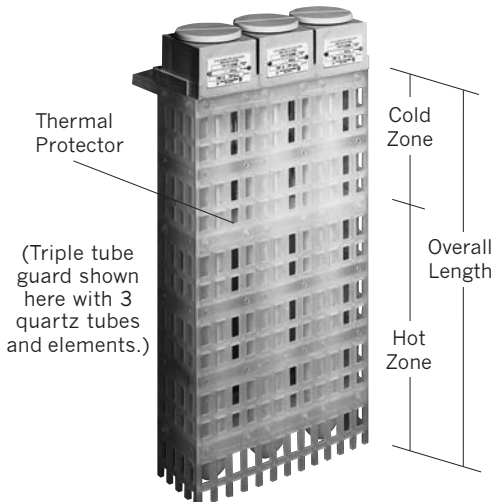
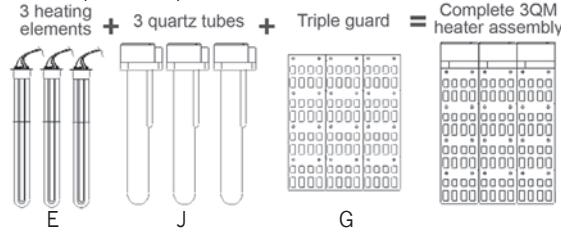
## 25 Watts Per Square Inch (4 w/cm<sup>2</sup>)



Each single tube quartz heater consists of:



Each triple tube quartz heater consists of:



(Triple tube guard shown here with 3 quartz tubes and elements.)

### QM SERIES, QUARTZ HEATERS WITH METAL ELEMENTS

WATTS	VOLTS (See Pg.1)	HOT ZONE In./(mm)	OVERALL LENGTH In./(mm)	MODEL NUMBER	SHIP WGT. Lbs./(kg)
1000	120 240	7 (180)	11 (280)	QM1111-*.*** QM1211-*.***	10 (4.5)
1000	120 240	7 (180)	17 (430)	QM1117-*.*** QM1217-*.***	11 (5)
2000	240 480	12 (305)	17 (430)	QM2217-*.*** QM2417-*.***	11 (5)
2000	240 480	12 (305)	23 (585)	QM2223-*.*** QM2423-*.***	14 (6.5)
3000	240 480	18 (460)	23 (585)	QM3223-*.*** QM3423-*.***	14 (6.5)
3000	240 480	18 (460)	29 (735)	QM3229-*.*** QM3429-*.***	17 (8)
3500	240 480	21 (535)	29 (735)	QM3.5229-*.*** QM3.5429-*.***	17 (8)
4000	240 480	28 (710)	35 (890)	QM4235-*.*** QM4435-*.***	20 (9)
4000	240 480	28 (710)	41 (1040)	QM4241-*.*** QM4441-*.***	23 (10.5)
5000	240 480	33 (840)	41 (1040)	QM5241-*.*** QM5441-*.***	23 (10.5)
5000	240 480	33 (840)	47 (1195)	QM5247-*.*** QM5447-*.***	26 (12)
6000	240 480	39 (990)	47 (1195)	QM6247-*.*** QM6447-*.***	26 (12)
6000	240 480	39 (990)	52 (1320)	QM6252-*.*** QM6452-*.***	29 (13)
8000	240 480	49 (1245)	59 (1500)	QM8259-*.*** QM8459-*.***	31 (14)
10000	240 480	62 (1575)	71 (1900)	QM10271-*.*** QM10471-*.***	34 (15.5)

Single phase standard. Three phase available as option, add ".3" before thermal protector designator. Standard guard is polypropylene. Fluoropolymer (PTFE) guards available for chromic acid and high temperature applications (180° F and higher).

\* Insert "E" for element or "J" for tube. Guard model number below.

### QUARTZ HEATER GUARDS

SINGLE TUBE WATTS	SINGLE GUARD MODEL NUMBER	TRIPLE TUBE WATTS	TRIPLE GUARD MODEL NUMBER	TRIPLE ASSEMBLY SHIP WT. LBS./(kg)
500	QM10G	1500	3QM10G	21 (10)
1000	QM11G	3000	3QM11G	22 (10)
1000	QM17G	3000	3QM17G	26 (12)
2000	QM17G	6000	3QM17G	26 (12)
2000	QM23G	6000	3QM23G	30 (14)
3000	QM23G	9000	3QM23G	30 (14)
3000	QM29G	9000	3QM29G	34 (15.5)
3500	QM29G	10500	3QM29G	34 (15.5)
4000	QM35G	12000	3QM35G	38 (17)
4000	QM41G	12000	3QM41G	44 (20)
5000	QM41G	15000	3QM41G	44 (20)
5000	QM47G	15000	3QM47G	48 (22)
6000	QM47G	18000	3QM47G	48 (22)
6000	QM52G	18000	3QM52G	52 (24)
8000	QM59G	24000	3QM59G	55 (25)
10000	QM71G	30000	3QM71G	65 (30)

\*\*Specify thermal overload protection desired. See page 1. All heaters must be operated in conjunction with appropriate temperature and level controls.

Standard guard is polypropylene. Fluoropolymer (PTFE) guards available for chromic acid and high temperature applications (180° F and higher).

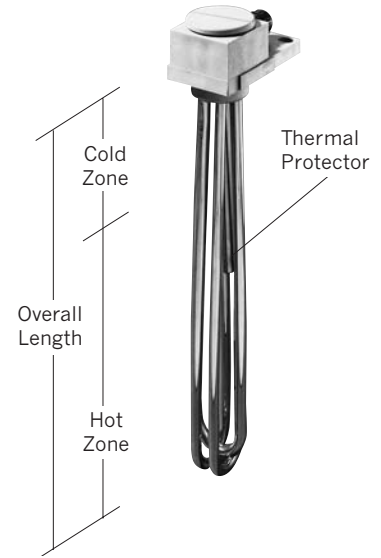
# TUBULAR HEATERS

## 40 Watts Per Square Inch (6.2 w/cm<sup>2</sup>)

### 3HS SERIES, 3 ELEMENT STAINLESS STEEL HEATERS

WATTS	VOLTS (See Pg.1)	HOT ZONE In./(mm)	OVERALL LENGTH In./(mm)	MODEL NUMBER	SHIP WGT. Lbs./(kg)
3000	240	11	17	3HS3217-**	9
	480	(280)	(430)	3HS3417-**	(4)
4500	240	16	23	3HS4.5223-**	10
	480	(405)	(585)	3HS4.5423-**	(4.5)
7500	240	21	29	3HS7.5229-**	12
	480	(535)	(735)	3HS7.5429-**	(5.5)
10500	240	26	34	3HS10.5234-**	14
	480	(660)	(865)	3HS10.5434-**	(6.5)

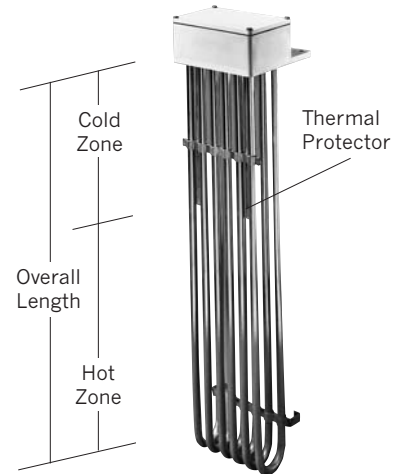
Three phase standard, single phase available as option. Add "-1" before thermal protector designator.



### 6HS SERIES, 6 ELEMENT STAINLESS STEEL HEATERS

WATTS	VOLTS (See Pg.1)	HOT ZONE In./(mm)	OVERALL LENGTH In./(mm)	MODEL NUMBER	SHIP WGT. Lbs./(kg)
6000	240	10	17	6HS6217-**	12
	480	(255)	(430)	6HS6417-**	(5.5)
9000	240	16	23	6HS9223-**	13
	480	(405)	(585)	6HS9423-**	(6)
15000	240	20	29	6HS15229-**	16
	480	(510)	(735)	6HS15429-**	(7.5)
21000	240	25	34	6HS21234-**	18
	480	(635)	(865)	6HS21434-**	(8.5)

Three phase standard, single phase available as option. Add "-1" before thermal protector designator.

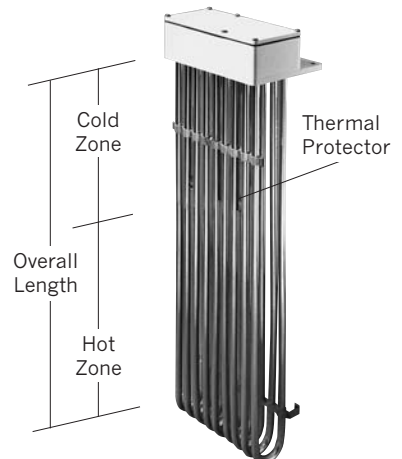


### 9HS SERIES, 9 ELEMENT STAINLESS STEEL HEATERS

WATTS	VOLTS (See Pg.1)	HOT ZONE In./(mm)	OVERALL LENGTH In./(mm)	MODEL NUMBER	SHIP WGT. Lbs./(kg)
9000	240	10	17	9HS9217-**	16
	480	(255)	(430)	9HS9417-**	(7.5)
13500	240	16	23	9HS13.5223-**	19
	480	(405)	(585)	9HS13.5423-**	(9)
22500	240	20	29	9HS22.5229-**	23
	480	(510)	(735)	9HS22.5429-**	(10.5)
31500	240	25	34	9HS31.5234-**	25
	480	(635)	(835)	9HS31.5434-**	(11.5)

Three phase standard, single phase available as option. Add "-1" before thermal protector designator.

\*31500 watt, 240 volt heater requires welded metal junction box and permanent P2 thermal overload protection.



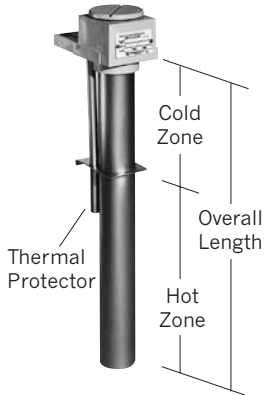
\*\*Specify thermal overload protection desired. See page 1. All heaters must be operated in conjunction with appropriate temperature and level controls.

# METAL OVER THE SIDE HEATERS

35 Watts Per Square Inch (5.4 w/cm<sup>2</sup>) • Derated 18 w/in<sup>2</sup> (2.8 w/cm<sup>2</sup>)



Except Steel All Heaters



## P, F, S & T SERIES, METAL OVER THE SIDE HEATERS

WATTS	VOLTS (See Pg.1)	HOT ZONE		OVERALL LENGTH In./(mm)	STEEL	304 SS	316 SS	TITANIUM	SHIP WTG. Lbs./ (kg)
		In./(mm)	In./(mm)						
1000	120	6	11	P1111-**	F1111**	S1111**	T1111**	7	
	240	(155)	(280)	P1211-**	F1211**	S1211**	T1211**	(3.5)	
	480	(255)	(430)	P2117-**	F2117**	S2117**	T2117**	10	
2000	120	10	17	P2217-**	F2217**	S2217**	T2217**	(4.5)	
	240	(255)	(430)	P2417-**	F2417**	S2417**	T2417**	11	
	480	(405)	(585)	P3223-**	F3223**	S3223**	T3223**	(5)	
3000	120	16	23	P3423-**	F3423**	S3423**	T3423**	13	
	240	(255)	(430)	P4229-**	F4229**	S4229**	T4229**	(6)	
	480	(510)	(735)	P4429-**	F4429**	S4429**	T4429**	15	
4000	120	20	29	P5235-**	F5235**	S5235**	T5235**	(7)	
	240	(635)	(890)	P5435-**	F5435**	S5435**	T5435**	17	
	480	(1015)	(1415)	P6240-**	F6240**	S6240**	T6240**	(8)	
5000	120	25	35	P6440-**	F6440**	S6440**	T6440**	23	
	240	(635)	(890)	P8247-**	F8247**	S8247**	T8247**	(10.5)	
	480	(940)	(1195)	P8447-**	F8447**	S8447**	T8447**	24	
6000	120	30	40	P9254-**	F9254**	S9254**	T9254**	(11)	
	240	(635)	(890)	P9454-**	F9454**	S9454**	T9454**	25	
	480	(1245)	(1500)	P10259-**	F10259**	S10259**	T10259**	(11.5)	
8000	120	37	47	P10459-**	F10459**	S10459**	T10459**	28	
	240	(940)	(1195)	P12468-**	F12468**	S12468**	T12468**	(13)	
	480	(1475)	(1730)						

Three phase available as option. Add "-3" before thermal protector designator.



Except Steel All Heaters

## 3P, 3F, 3S, & 3T SERIES, TRIPLE METAL OVER THE SIDE HEATERS

WATTS	VOLTS (See Pg.1)	HOT ZONE		OVERALL LENGTH In./(mm)	STEEL	304 SS	316 SS	TITANIUM	SHIP WTG. Lbs./ (kg)
		In./(mm)	In./(mm)						
3000	120	6	11	3P3211-*.**	3F3211-*.**	3S3211-*.**	3T3211-*.**	21	
	240	(155)	(280)	3P3411-*.**	3F3411-*.**	3S3411-*.**	3T3411-*.**	(9.5)	
	480	(255)	(430)	3P6417-*.**	3F6417-*.**	3S6417-*.**	3T6417-*.**	30	
6000	120	10	17	3P6217-*.**	3F6217-*.**	3S6217-*.**	3T6217-*.**	(14)	
	240	(255)	(430)	3P9223-*.**	3F9223-*.**	3S9223-*.**	3T9223-*.**	33	
	480	(405)	(585)	3P9423-*.**	3F9423-*.**	3S9423-*.**	3T9423-*.**	(15)	
9000	120	16	23	3P12229-*.**	3F12229-*.**	3S12229-*.**	3T12229-*.**	39	
	240	(405)	(585)	3P12429-*.**	3F12429-*.**	3S12429-*.**	3T12429-*.**	(18)	
	480	(510)	(735)	3P15235-*.**	3F15235-*.**	3S15235-*.**	3T15235-*.**	45	
12000	120	20	29	3P15435-*.**	3F15435-*.**	3S15435-*.**	3T15435-*.**	(20.5)	
	240	(635)	(890)	3P18240-*.**	3F18240-*.**	3S18240-*.**	3T18240-*.**	51	
	480	(760)	(1015)	3P18440-*.**	3F18440-*.**	3S18440-*.**	3T18440-*.**	(23)	
15000	120	25	35	3P24247-*.**	3F24247-*.**	3S24247-*.**	3T24247-*.**	63	
	240	(635)	(890)	3P24447-*.**	3F24447-*.**	3S24447-*.**	3T24447-*.**	(28.5)	
	480	(940)	(1195)	3P27454-*.**	3F27454-*.**	3S27454-*.**	3T27454-*.**	69	
18000	120	30	40	3P30459-*.**	3F30459-*.**	3S30459-*.**	3T30459-*.**	75	
	240	(760)	(1015)	3P36468-*.**	3F36468-*.**	3S36468-*.**	3T36468-*.**	84	
	480	(1120)	(1370)					(31)	
24000	120	37	47					75	
	240	(940)	(1195)					(34)	
	480	(1245)	(1500)					(38)	
27000	120	44	54					84	
	240	(1120)	(1370)					(31)	
	480	(1475)	(1730)					(38)	

Standard units consist of single head with single conduit. Add "-1" for single phase or "-3" for three phase. For individual heads, order 3 single tube heaters.



Except Steel All Heaters

## D SERIES, DERATED METAL OVER THE SIDE HEATERS

WATTS	VOLTS (See Pg.1)	HOT ZONE		OVERALL LENGTH In./(mm)	STEEL	304 SS	316 SS	TITANIUM	SHIP WTG. Lbs./ (kg)
		In./(mm)	In./(mm)						
500	120	6	11	DP.5111-**	DF.5111**	DS.5111**	DT.5111**	7	
	240	(155)	(280)	DP.5211-**	DF.5211**	DS.5211**	DT.5211**	(3.5)	
	480	(255)	(430)	DP1217-**	DF1217**	DS1217**	DT1217**	10	
1000	120	10	17	DP1417-**	DF1417**	DS1417**	DT1417**	(4.5)	
	240	(255)	(430)	DP1.5223**	DF1.5223**	DS1.5223**	DT1.5223**	11	
	480	(405)	(585)	DP1.5423**	DF1.5423**	DS1.5423**	DT1.5423**	(5)	
1500	120	16	23	DP2229**	DF2229**	DS2229**	DT2229**	13	
	240	(510)	(735)	DP2429**	DF2429**	DS2429**	DT2429**	(6)	
	480	(890)	(1245)	DP2.5235**	DF2.5235**	DS2.5235**	DT2.5235**	15	
2000	120	20	29	DP2.5435**	DF2.5435**	DS2.5435**	DT2.5435**	(7)	
	240	(635)	(890)	DP3240**	DF3240**	DS3240**	DT3240**	17	
	480	(760)	(1015)	DP3440**	DF3440**	DS3440**	DT3440**	(8)	
2500	120	25	35	DP4247**	DF4247**	DS4247**	DT4247**	23	
	240	(940)	(1195)	DP4447**	DF4447**	DS4447**	DT4447**	(10.5)	
	480	(1195)	(1645)	DP4.5254**	DF4.5254**	DS4.5254**	DT4.5254**	24	
3000	120	30	40	DP4.5454**	DF4.5454**	DS4.5454**	DT4.5454**	(11)	
	240	(1120)	(1370)	DP5259**	DF5259**	DS5259**	DT5259**	25	
	480	(1245)	(1500)	DP5459**	DF5459**	DS5459**	DT5459**	(11.5)	
4000	120	37	47	DP6268**	DF6268**	DS6268**	DT6268**	28	
	240	(940)	(1195)	DP6468**	DF6468**	DS6468**	DT6468**	(13)	
	480	(1475)	(1730)						

Three phase available as option. Add "-3" before thermal protector designator.

\*\*Specify thermal overload protection desired. See page 1. All heaters must be operated in conjunction with appropriate temperature and level controls.

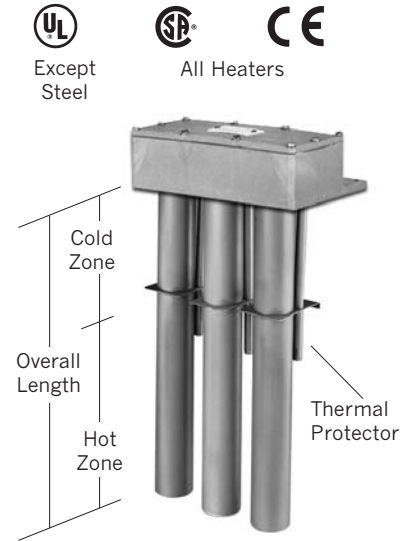
# METAL OVER THE SIDE & L-SHAPED HEATERS

Derated 18 w/in<sup>2</sup> (2.8 w/cm<sup>2</sup>) • 35 Watts Per Square Inch (5.4 w/cm<sup>2</sup>)

## D3 SERIES, DERATED TRIPLE METAL OVER THE SIDE HEATERS

WATTS	VOLTS	HOT		STEEL	304 SS	316 SS	TITANIUM	SHIP WGT.
		ZONE	OVERALL LENGTH					
(See Pg.1)		In./(mm)	In./(mm)					Lbs./kg)
1500	120	6	11	D3P1.5111-*.**	D3F1.5111-*.**	D3S1.5111-*.**	D3T1.5111-*.**	21
	240	(155)	(280)	D3P1.5211-*.**	D3F1.5211-*.**	D3S1.5211-*.**	D3T1.5211-*.**	(9.5)
3000	240	10	17	D3P3217-*.**	D3F3217-*.**	D3S3217-*.**	D3T3217-*.**	30
	480	(255)	(430)	D3P3417-*.**	D3F3417-*.**	D3S3417-*.**	D3T3417-*.**	(14)
4500	240	16	23	D3P4.5223-*.**	D3F4.5223-*.**	D3S4.5223-*.**	D3T4.5223-*.**	33
	480	(405)	(585)	D3P4.5423-*.**	D3F4.5423-*.**	D3S4.5423-*.**	D3T4.5423-*.**	(15)
6000	240	20	29	D3P6229-*.**	D3F6229-*.**	D3S6229-*.**	D3T6229-*.**	39
	480	(510)	(735)	D3P6429-*.**	D3F6429-*.**	D3S6429-*.**	D3T6429-*.**	(18)
7500	240	25	35	D3P7.5235-*.**	D3F7.5235-*.**	D3S7.5235-*.**	D3T7.5235-*.**	45
	480	(635)	(890)	D3P7.5435-*.**	D3F7.5435-*.**	D3S7.5435-*.**	D3T7.5435-*.**	(20.5)
9000	240	30	40	D3P9240-*.**	D3F9240-*.**	D3S9240-*.**	D3T9240-*.**	51
	480	(760)	(1015)	D3P9440-*.**	D3F9440-*.**	D3S9440-*.**	D3T9440-*.**	(23)
12000	240	37	47	D3P12247-*.**	D3F12247-*.**	D3S12247-*.**	D3T12247-*.**	63
	480	(940)	(1195)	D3P12447-*.**	D3F12447-*.**	D3S12447-*.**	D3T12447-*.**	(28.5)
13500	240	44	54	D3P13.5254-*.**	D3F13.5254-*.**	D3S13.5254-*.**	D3T13.5254-*.**	69
	480	(1120)	(1370)	D3P13.5454-*.**	D3F13.5454-*.**	D3S13.5454-*.**	D3T13.5454-*.**	(31)
15000	240	49	59	D3P15259-*.**	D3F15259-*.**	D3S15259-*.**	D3T15259-*.**	75
	480	(1245)	(1500)	D3P15459-*.**	D3F15459-*.**	D3S15459-*.**	D3T15459-*.**	(34)
18000	240	58	68	D3P18268-*.**	D3F18268-*.**	D3S18268-*.**	D3T18268-*.**	84
	480	(1475)	(1730)	D3P18468-*.**	D3F18468-*.**	D3S18468-*.**	D3T18468-*.**	(38)

Standard units consist of single head with single conduit. Add ".1" for single phase or ".3" for three phase. For individual heads, order 3 single tube heaters.



## L SERIES, METAL L-SHAPED HEATERS

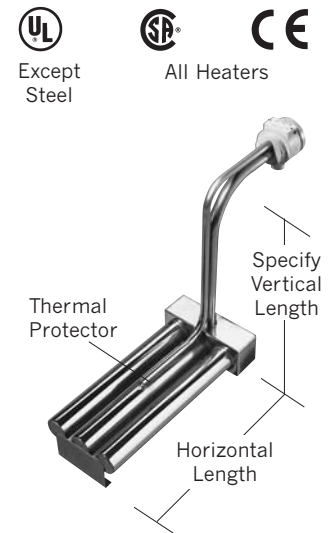
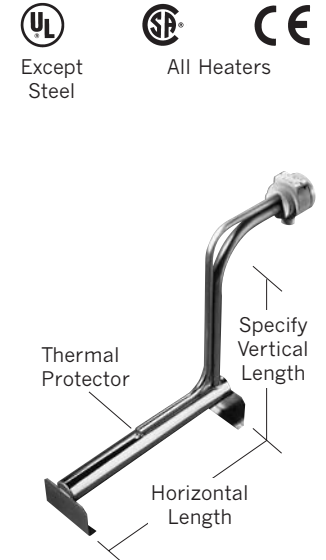
WATTS	VOLTS	STD.		STEEL	304 SS	316 SS	TITANIUM	SHIP WGT.
		HORIZ.	VERT.*					
(See Pg.1)		In./(mm)	In./(mm)					Lbs./kg)
1000	120	13	15	LP1113-R-*.**	LF1113-R-*.**	LS1113-R-*.**	LT1113-R-*.**	10
	240	(330)	(380)	LP1213-R-*.**	LF1213-R-*.**	LS1213-R-*.**	LT1213-R-*.**	(4.5)
2000	120	17	19	LP2117-R-*.**	LF2117-R-*.**	LS2117-R-*.**	LT2117-R-*.**	11
	240	(430)	(485)	LP2217-R-*.**	LF2217-R-*.**	LS2217-R-*.**	LT2217-R-*.**	(5)
3000	240	22	25	LP3222-R-*.**	LF3222-R-*.**	LS3222-R-*.**	LT3222-R-*.**	12
	480	(560)	(635)	LP3422-R-*.**	LF3422-R-*.**	LS3422-R-*.**	LT3422-R-*.**	(5.5)
4000	240	26	25	LP4226-R-*.**	LF4226-R-*.**	LS4226-R-*.**	LT4226-R-*.**	13
	480	(660)	(635)	LP4426-R-*.**	LF4426-R-*.**	LS4426-R-*.**	LT4426-R-*.**	(6)
5000	240	31	37	LP5231-R-*.**	LF5231-R-*.**	LS5231-R-*.**	LT5231-R-*.**	14
	480	(790)	(940)	LP5431-R-*.**	LF5431-R-*.**	LS5431-R-*.**	LT5431-R-*.**	(6.5)
6000	240	36	50	LP6236-R-*.**	LF6236-R-*.**	LS6236-R-*.**	LT6236-R-*.**	15
	480	(915)	(1270)	LP6436-R-*.**	LF6436-R-*.**	LS6436-R-*.**	LT6436-R-*.**	(7)
8000	240	44	50	LP8244-R-*.**	LF8244-R-*.**	LS8244-R-*.**	LT8244-R-*.**	18
	480	(1120)	(1270)	LP8444-R-*.**	LF8444-R-*.**	LS8444-R-*.**	LT8444-R-*.**	(8)
9000	240	50	50	LP9250-R-*.**	LF9250-R-*.**	LS9250-R-*.**	LT9250-R-*.**	20
	480	(1270)	(1270)	LP9450-R-*.**	LF9450-R-*.**	LS9450-R-*.**	LT9450-R-*.**	(9)
10000	240	55	50	LP10255-R-*.**	LF10255-R-*.**	LS10255-R-*.**	LT10255-R-*.**	22
	480	(1400)	(1270)	LP10455-R-*.**	LF10455-R-*.**	LS10455-R-*.**	LT10455-R-*.**	(10)
12000	240	64	50	LP12264-R-*.**	LF12264-R-*.**	LS12264-R-*.**	LT12264-R-*.**	25
	480	(1625)	(1270)	LP12464-R-*.**	LF12464-R-*.**	LS12464-R-*.**	LT12464-R-*.**	(11.5)

\*Specify vertical length by adding height in inches after "-R". Example: LS2217-R24-P1. Single phase standard. Three phase available as option.

## 3L SERIES, TRIPLE METAL L-SHAPED HEATERS

WATTS	VOLTS	STD.		STEEL	304 SS	316 SS	TITANIUM	SHIP WGT.
		HORIZ.	VERT.*					
(See Pg.1)		In./(mm)	In./(mm)					Lbs./kg)
3000	240	13	15	3LP3213-R-*.**	3LF3213-R-*.**	3LS3213-R-*.**	3LT3213-R-*.**	30
	480	(330)	(380)	3LP3413-R-*.**	3LF3413-R-*.**	3LS3413-R-*.**	3LT3413-R-*.**	(14)
6000	240	17	37	3LP6217-R-*.**	3LF6217-R-*.**	3LS6217-R-*.**	3LT6217-R-*.**	33
	480	(430)	(940)	3LP6417-R-*.**	3LF6417-R-*.**	3LS6417-R-*.**	3LT6417-R-*.**	(15)
9000	240	22	37	3LP9222-R-*.**	3LF9222-R-*.**	3LS9222-R-*.**	3LT9222-R-*.**	36
	480	(560)	(940)	3LP9422-R-*.**	3LF9422-R-*.**	3LS9422-R-*.**	3LT9422-R-*.**	(16.5)
12000	240	26	37	3LP12226-R-*.**	3LF12226-R-*.**	3LS12226-R-*.**	3LT12226-R-*.**	39
	480	(660)	(940)	3LP12426-R-*.**	3LF12426-R-*.**	3LS12426-R-*.**	3LT12426-R-*.**	(18)
15000	240	31	37	3LP15231-R-*.**	3LF15231-R-*.**	3LS15231-R-*.**	3LT15231-R-*.**	42
	480	(790)	(940)	3LP15431-R-*.**	3LF15431-R-*.**	3LS15431-R-*.**	3LT15431-R-*.**	(19)
18000	240	36	50	3LP18236-R-*.**	3LF18236-R-*.**	3LS18236-R-*.**	3LT18236-R-*.**	45
	480	(915)	(1270)	3LP18436-R-*.**	3LF18436-R-*.**	3LS18436-R-*.**	3LT18436-R-*.**	(20.5)
24000	240	44	50	3LP24244-R-*.**	3LF24244-R-*.**	3LS24244-R-*.**	3LT24244-R-*.**	54
	480	(1120)	(1270)	3LP24444-R-*.**	3LF24444-R-*.**	3LS24444-R-*.**	3LT24444-R-*.**	(24.5)
27000	480	50	50	3LP27450-R-*.**	3LF27450-R-*.**	3LS27450-R-*.**	3LT27450-R-*.**	60
		(1270)	(1270)					(27.5)
30000	480	55	50	3LP30455-R-*.**	3LF30455-R-*.**	3LS30455-R-*.**	3LT30455-R-*.**	66
		(1400)	(1270)					(30)
36000	480	64	50	3LP36464-R-*.**	3LF36464-R-*.**	3LS36464-R-*.**	3LT36464-R-*.**	75
		(1625)	(1270)					(34)

\*Specify vertical length by adding height in inches after "-R". Example: 3LS6217-R39-P1. Three phase standard. Single phase available as option. Specify vertical length (riser height) greater than or equal to tank depth.

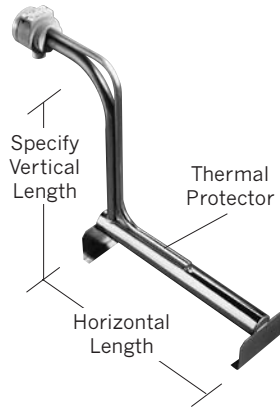


\*\*Specify thermal overload protection desired. See page 1. All heaters must be operated in conjunction with appropriate temperature and level controls.

# METAL VERTICAL & DERATED L-SHAPED HEATERS

35 Watts Per Square Inch (5.4 w/cm<sup>2</sup>) • Derated 18 w/in<sup>2</sup> (2.8 w/cm<sup>2</sup>)

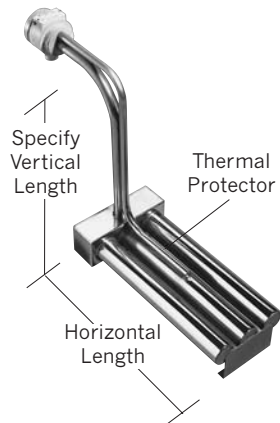
## DL SERIES, DERATED METAL L-SHAPED HEATERS



WATTS	VOLTS	STD.		STEEL	304 SS	316 SS	TITANIUM	SHIP WGT. Lbs./kg)
		HORIZ. In./(mm)	VERT.* In./(mm)					
500	120	13	15	DLP.5113-R**	DLF.5113-R**	DLS.5113-R**	DLT.5113-R**	10
	240	(330)	(380)	DLP.5213-R**	DLF.5213-R**	DLS.5213-R**	DLT.5213-R**	(4.5)
1000	120	17	19	DLP1117-R**	DLF1117-R**	DLS1117-R**	DLT1117-R**	11
	240	(430)	(485)	DLP1217-R**	DLF1217-R**	DLS1217-R**	DLT1217-R**	(5)
1500	120	22	25	DLP1.5122-R**	DLF1.5122-R**	DLS1.5122-R**	DLT1.5122-R**	12
	240	(560)	(635)	DLP1.5222-R**	DLF1.5222-R**	DLS1.5222-R**	DLT1.5222-R**	(5.5)
2000	240	26	25	DLP2226-R**	DLF2226-R**	DLS2226-R**	DLT2226-R**	13
	480	(660)	(635)	DLP2426-R**	DLF2426-R**	DLS2426-R**	DLT2426-R**	(6)
2500	240	31	37	DLP2.5231-R**	DLF2.5231-R**	DLS2.5231-R**	DLT2.5231-R**	14
	480	(790)	(940)	DLP2.5431-R**	DLF2.5431-R**	DLS2.5431-R**	DLT2.5431-R**	(6.5)
3000	240	36	50	DLP3236-R**	DLF3236-R**	DLS3236-R**	DLT3236-R**	15
	480	(915)	(1270)	DLP3436-R**	DLF3436-R**	DLS3436-R**	DLT3436-R**	(7)
4000	240	44	50	DLP4244-R**	DLF4244-R**	DLS4244-R**	DLT4244-R**	18
	480	(1120)	(1270)	DLP4444-R**	DLF4444-R**	DLS4444-R**	DLT4444-R**	(8)
4500	240	50	50	DLP4.5250-R**	DLF4.5250-R**	DLS4.5350-R**	DLT4.5250-R**	20
	480	(1270)	(1270)	DLP4.5450-R**	DLF4.5450-R**	DLS4.5450-R**	DLT4.5450-R**	(9)
5000	240	55	50	DLP5255-R**	DLF5255-R**	DLS5255-R**	DLT5255-R**	22
	480	(1400)	(1270)	DLP5455-R**	DLF5455-R**	DLS5455-R**	DLT5455-R**	(10)
6000	240	64	50	DLP6264-R**	DLF6264-R**	DLS6264-R**	DLT6264-R**	25
	480	(1625)	(1270)	DLP6464-R**	DLF6464-R**	DLS6464-R**	DLT6464-R**	(11.5)

\*Specify vertical length by adding height in inches after "-R". Example: DLS1117-R24-P1.

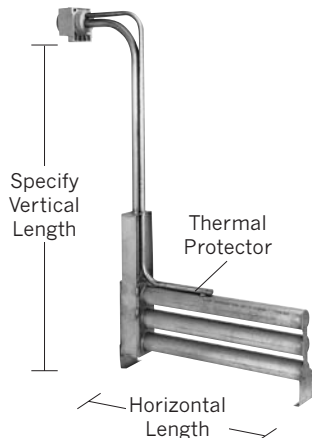
## D3L SERIES, DERATED TRIPLE TUBE METAL L-SHAPED HEATERS



WATTS	VOLTS	STD.		STEEL	304 SS	316 SS	TITANIUM	SHIP WGT. Lbs./kg)
		HORIZ. In./(mm)	VERT.* In./(mm)					
1500	120	13	15	D3LP1.5113-R**	D3LF1.5113-R**	D3LS1.5113-R**	D3LT1.5113-R**	30
	240	(330)	(380)	D3LP1.5213-R**	D3LF1.5213-R**	D3LS1.5213-R**	D3LT1.5213-R**	(14)
3000	240	17	37	D3LP3217-R**	D3LF3217-R**	D3LS3217-R**	D3LT3217-R**	33
	480	(430)	(940)	D3LP3417-R**	D3LF3417-R**	D3LS3417-R**	D3LT3417-R**	(15)
4500	240	22	37	D3LP4.5222-R**	D3LF4.5222-R**	D3LS4.5222-R**	D3LT4.5222-R**	36
	480	(560)	(940)	D3LP4.5422-R**	D3LF4.5422-R**	D3LS4.5422-R**	D3LT4.5422-R**	(16.5)
6000	240	26	37	D3LP6226-R**	D3LF6226-R**	D3LS6226-R**	D3LT6226-R**	39
	480	(660)	(940)	D3LP6426-R**	D3LF6426-R**	D3LS6426-R**	D3LT6426-R**	(18)
7500	240	31	37	D3LP7.5231-R**	D3LF7.5231-R**	D3LS7.5231-R**	D3LT7.5231-R**	42
	480	(790)	(940)	D3LP7.5431-R**	D3LF7.5431-R**	D3LS7.5431-R**	D3LT7.5431-R**	(19)
9000	240	36	50	D3LP9236-R**	D3LF9236-R**	D3LS9236-R**	D3LT9236-R**	45
	480	(915)	(1270)	D3LP9436-R**	D3LF9436-R**	D3LS9436-R**	D3LT9436-R**	(20.5)
12000	240	44	50	D3LP12244-R**	D3LF12244-R**	D3LS12244-R**	D3LT12244-R**	54
	480	(1120)	(1270)	D3LP12444-R**	D3LF12444-R**	D3LS12444-R**	D3LT12444-R**	(24.5)
13500	240	50	50	D3LP13.5250-R**	D3LF13.5250-R**	D3LS13.5250-R**	D3LT13.5250-R**	60
	480	(1270)	(1270)	D3LP13.5450-R**	D3LF13.5450-R**	D3LS13.5450-R**	D3LT13.5450-R**	(27.5)
15000	240	55	50	D3LP15255-R**	D3LF15255-R**	D3LS15255-R**	D3LT15255-R**	66
	480	(1400)	(1270)	D3LP15455-R**	D3LF15455-R**	D3LS15455-R**	D3LT15455-R**	(30)
18000	240	64	50	D3LP18264-R**	D3LF18264-R**	D3LS18264-R**	D3LT18264-R**	75
	480	(1625)	(1270)	D3LP18464-R**	D3LF18464-R**	D3LS18464-R**	D3LT18464-R**	(34)

\*Specify vertical length by adding height in inches after "-R". Example: D3LS3217-R36-P1.

## 3LV SERIES, TRIPLE VERTICAL STACK METAL L-SHAPED HEATERS



WATTS	VOLTS	HORIZ. STD.		STEEL	304 SS	316 SS	TITANIUM	SHIP WGT. Lbs./kg)
		LGTH. In./(mm)	VERT.* In./(mm)					
3000	240	13	19	3LVP3213-R**	3LVF3213-R**	3LVS3213-R**	3LVT3213-R**	30
	480	(330)	(485)	3LVP3413-R**	3LVF3413-R**	3LVS3413-R**	3LVT3413-R**	(14)
6000	240	17	37	3LVP6217-R**	3LVF6217-R**	3LVS6217-R**	3LVT6217-R**	33
	480	(430)	(940)	3LVP6417-R**	3LVF6417-R**	3LVS6417-R**	3LVT6417-R**	(15)
9000	240	22	37	3LVP9222-R**	3LVF9222-R**	3LVS9222-R**	3LVT9222-R**	36
	480	(560)	(940)	3LVP9422-R**	3LVF9422-R**	3LVS9422-R**	3LVT9422-R**	(16.5)
12000	240	26	37	3LVP12226-R**	3LVF12226-R**	3LVS12226-R**	3LVT12226-R**	39
	480	(660)	(940)	3LVP12426-R**	3LVF12426-R**	3LVS12426-R**	3LVT12426-R**	(18)
15000	240	31	37	3LVP15231-R**	3LVF15231-R**	3LVS15231-R**	3LVT15231-R**	42
	480	(790)	(635)	3LVP15431-R**	3LVF15431-R**	3LVS15431-R**	3LVT15431-R**	(19)
18000	240	36	50	3LVP18236-R**	3LVF18236-R**	3LVS18236-R**	3LVT18236-R**	45
	480	(915)	(1270)	3LVP18436-R**	3LVF18436-R**	3LVS18436-R**	3LVT18436-R**	(20.5)
24000	240	44	50	3LVP24244-R**	3LVF24244-R**	3LVS24244-R**	3LVT24244-R**	54
	480	(1120)	(1270)	3LVP24444-R**	3LVF24444-R**	3LVS24444-R**	3LVT24444-R**	(24.5)
27000	480	50	50	3LVP27450-R**	3LVF27450-R**	3LVS27450-R**	3LVT27450-R**	60
			(1270)	(1270)				(27.5)
30000	480	55	50	3LVP30455-R**	3LVF30455-R**	3LVS30455-R**	3LVT30455-R**	66
			(1400)	(1270)				(30)
36000	480	64	50	3LVP36464-R**	3LVF36464-R**	3LVS36464-R**	3LVT36464-R**	75
			(1625)	(1270)				(34)

\*Specify vertical length by adding height in inches after "-R". Example: 3LVF3213-R39-P1.

\*\*Specify thermal overload protection desired. See page 1. All heaters must be operated in conjunction with appropriate temperature and level controls.

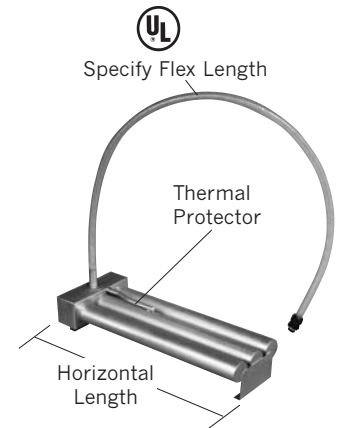
# SPECIAL APPLICATION HEATERS

## FLEX RISER HEATER OPTION FOR METAL L-SHAPED HEATERS

Non-conductive fluoropolymer (PTFE) riser with stainless steel reinforced construction affords versatile installation in various tank depths and enhances delivery time as well. With less bulk and less weight, most heaters can be shipped by a parcel carrier thereby reducing shipping costs.

### Specifications

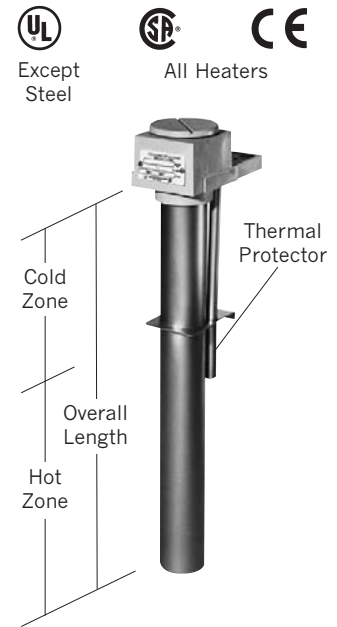
- Patented design.
- Bend radius 7.75" (200 mm) minimum.
- 48" (1220 mm) length standard. Longer lengths available. Consult factory.
- Suitable for process temperatures up to 300°F only. Available with P2 overtemperature protection only. P2 safety components necessary for thermal overtemperature monitoring. (Consult factory)
- To order, specify part number "FR" before riser length. Example: LT3222-FR-25-P2. FR=Flex Riser.



## DEEP TANK HEATERS

WATTS	VOLTS (See Pg.1)	HOT	OVERALL	STEEL	304	316	TITANIUM	SHIP WGT. Lbs./kg)
		ZONE In./(mm)	LENGTH In./(mm)		SS	SS		
12000	240	58	96	P12296-**	F12296-**	S12296-**	T12296-**	37
	480	(1475)	(2440)	P12496-**	F12496-**	S12496-**	T12496-**	(17)
12000	240	58	120	P122120-**	F122120-**	S122120-**	T122120-**	45
	480	(1475)	(3050)	P124120-**	F124120-**	S124120-**	T124120-**	(20)
12000	240	58	144	P122144-**	F122144-**	S122144-**	T122144-**	53
	480	(1475)	(3655)	P124144-**	F124144-**	S124144-**	T124144-**	(24)
15000	240	76	96	P15296-**	F15296-**	S15296-**	T15296-**	37
	480	(1930)	(2440)	P15496-**	F15496-**	S15496-**	T15496-**	(17)
15000	240	76	120	P152120-**	F152120-**	S152120-**	T152120-**	45
	480	(1930)	(3050)	P154120-**	F154120-**	S154120-**	T154120-**	(20)
15000	240	76	144	P152144-**	F152144-**	S152144-**	T152144-**	53
	480	(1930)	(3655)	P154144-**	F154144-**	S154144-**	T154144-**	(24)
18000	480	82	96	P18496-**	F18496-**	S18496-**	T18496-**	37
		(2080)	(2440)					(17)
18000	480	82	120	P184120-**	F184120-**	S184120-**	T184120-**	45
		(2080)	(3050)					(20)
18000	480	82	144	P184144-**	F184144-**	S184144-**	T184144-**	53
		(2080)	(3655)					(24)

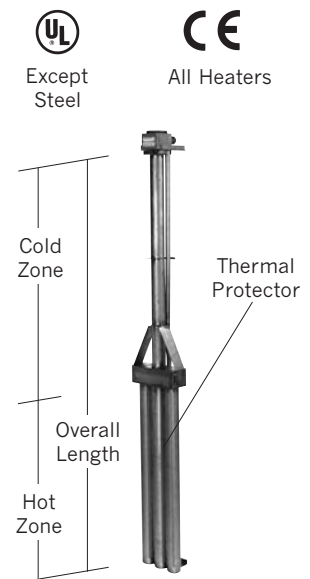
Three phase available as option. Add ".3" before thermal protector designator.



## 3V SERIES, TRIPLE DEEP TANK HEATERS

WATTS	VOLTS (See Pg.1)	HOT	STEEL		304	316	TITANIUM	EST. SHIP WGT. Lbs./kg)
		ZONE In./(mm)	In./(mm)	SS	SS			
18000	240	36	3VP18236-R*-**	3VF18236-R*-**	3VS18236-R*-**	3VT18236-R*-**	70	
	480	(915)	3VP18436-R*-**	3VF18436-R*-**	3VS18436-R*-**	3VT18436-R*-**	(32)	
24000	240	44	3VP24244-R*-**	3VF24244-R*-**	3VS24244-R*-**	3VT24244-R*-**	75	
	480	(1120)	3VP24444-R*-**	3VF24444-R*-**	3VS24444-R*-**	3VT24444-R*-**	(34)	
27000	480	50	3VP27450-R*-**	3VF27450-R*-**	3VS27450-R*-**	3VT27450-R*-**	80	
		(1170)					(36)	
30000	480	55	3VP30455-R*-**	3VF30455-R*-**	3VS30455-R*-**	3VT30455-R*-**	87	
		(1400)					(40)	
36000	480	64	3VP36464-R*-**	3VF36464-R*-**	3VS36464-R*-**	3VT36464-R*-**	100	
		(1625)					(46)	
45000	480	72	3VP45472-R*-**	3VF45472-R*-**	3VS45472-R*-**	3VT45472-R*-**	120	
		(1830)					(55)	
48000	480	76	3VP48476-R*-**	3VF48476-R*-**	3VS48476-R*-**	3VT48476-R*-**	125	
		(1930)					(57)	
54000	480	84	3VP54484-R*-**	3VF54484-R*-**	3VS54484-R*-**	3VT54484-R*-**	40	
		(2135)					(64)	

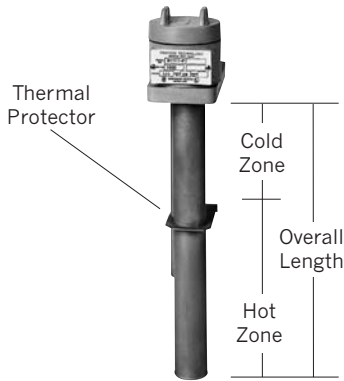
\*P2 thermal protection standard. Specify cold zone required. Example: 3VPI8230-R59-P2.



\*\*Specify thermal overload protection desired. See page 1. All heaters must be operated in conjunction with appropriate temperature and level controls.

# SMALL TANK HEATERS

## B SERIES, SMALL TANK METAL HEATERS (1 1/4" Dia.)



WATTS	VOLTS (See Pg.1)	HOT	LENGTH In./(mm)	304 SS	316 SS	TITANIUM	SHIP WGT. Lbs./(kg)
		ZONE In./(mm)					
500	120	5	10	FB.5110-**	SB.5110-**	TB.5110-**	5
	240	(130)	(255)	FB.5210-**	SB.5210-**	TB.5210-**	(2)
1000	120	8	14	FB1114-**	SB1114-**	TB1114-**	6
	240	(205)	(355)	FB1214-**	SB1214-**	TB1214-**	(3)
1500	120	11	17	FB1.5117-**	SB1.5117-**	TB1.5117-**	8
	240	(280)	(430)	FB1.5217-**	SB1.5217-**	TB1.5217-**	(3.5)

## V SERIES, VARIPOWER HEATERS (1/2" Dia.)



WATTS	VOLTS	HOT	LENGTH In./(mm)	NO. OF ELEMENTS	316 SS	FLUOROPOLYMER (PFA)	SHIP WGT. Lbs./(kg)
		ZONE In./(mm)					
100	120	4	7	1	V.1107	VX.1107	1
	240	(100)	(180)	1	V.1207	VX.1207	(.5)
300	120	6	11	2	V.3111	VX.3111	1
	240	(155)	(280)	2	V.3211	VX.3211	(.5)
500	120	6	11	3	V.5111	VX.5111	2
	240	(155)	(280)	3	V.5211	VX.5211	(1)
1000	120	6	11	6	V1111	VX1111	3
	240	(155)	(280)	6	V1211	VX1211	(1.5)

Vapor tight polypropylene terminal enclosure with 4' cord and plug (100 watt model) and 4' flexible PVC liquid tight conduit (on 300 through 1000 watt models). Designed for vertical installation. **DO NOT** immerse terminal enclosure. Optional 1/2" PVDF screw plug adapter available for side wall mounting (100 watt) (see page 18). Patented self-regulating design protects against overheating and fires. Plug included with 120VAC models only (see page 18).

## PLUG-IN OPTION

Plug-in heater/control option available on 120 VAC quartz, fluoropolymer (PTFE) and metal heaters up to 1500 watts in combination with the NR25 thermostat with 6' (1.8 m) cord and plug.



\*\*Specify thermal overload protection desired. See page 1. All heaters must be operated in conjunction with appropriate temperature and level controls.

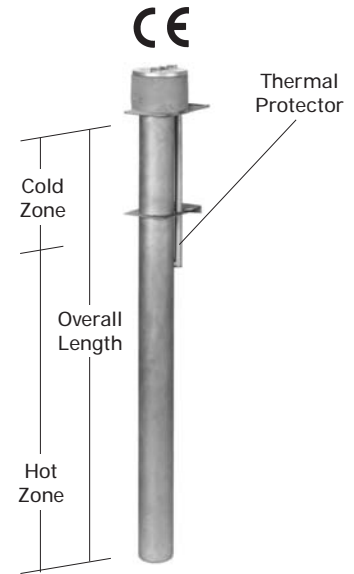


# PHOSPHATE HEATERS/INLINE WATER HEATERS

## DAS SERIES, PHOSPHATE HEATERS

WATTS	VOLTS	HOT ZONE	OVERALL LENGTH	MODEL NUMBER	SHIP WGT.
		In./(mm.)	In./(mm.)		Lbs./(kg.)
1000	120	7	11	DAS1111-P4	17
	240	(180)	(280)	DAS1211-P4	(8)
2000	240	12	17	DAS2217-P4	20
	480	(305)	(430)	DAS2417-P4	(9)
3000	240	18	23	DAS3223-P4	24
	480	(460)	(585)	DAS3423-P4	(11)
3500	240	21	29	DAS3.5229-P4	30
	480	(535)	(735)	DAS3.5429-P4	(14)
4000	240	28	35	DAS4235-P4	36
	480	(710)	(890)	DAS4435-P4	(16)
5000	240	33	41	DAS5241-P4	42
	480	(840)	(1040)	DAS5441-P4	(19)
6000	240	39	47	DAS6247-P4	48
	480	(990)	(1320)	DAS6447-P4	(22)
8000	240	49	59	DAS8259-P4	58
	480	(1245)	(1500)	DAS8459-P4	(27)
10000	240	62	71	DAS10271-P4	64
	480	(1575)	(1900)	DAS10471-P4	(30)

\* Thermal protection designator. Single phase standard. Three phase available as option. Add "-3" before thermal protection designator.



## TYTAN™ ELECTRIC INLINE WATER HEATERS

WATTS	VOLTS	TITANIUM	SHIP WGT.
			Lbs./(kg)
12000	240	TY-012-240	300
	480	TY-012-480	(136)
18000	240	TY-018-240	300
	480	TY-018-480	(136)
24000	240	TY-024-240	300
	480	TY-024-480	(136)
36000	240	TY-036-240	338
	480	TY-036-480	(153)
48000	240	TY-048-240	338
	480	TY-048-480	(153)
72000	240	TY-072-240	350
	480	TY-072-480	(159)
96000	480	TY-096-480	570
			(259)
120000	480	TY-120-480	580
			(263)
144000	480	TY-144-480	590
			(268)



Wall mounted unit pictured.

Consult factory for sizing assistance. Wall mounted up to 72 kW, floor mounted 96 kW and higher. All sizes cUL, CE and Semi S2/S3 compliance available.

## STANDARD FEATURES

- Rapid installation
- No ionic contamination
- Voltages for 208-600 volt
- State of the art controllers
- Redundant safety supervisory circuits

## OPTIONAL FEATURES

- Semi S3 compliance
- CE compliance
- Disconnect and circuit breaker
- Remote interface
- Remote communications
- PLC control
- PLC memory backup
- Casters (floor mount units only)

# SCREW PLUG HEATERS



## 2T SERIES, 2" STAINLESS STEEL SCREW PLUG HEATERS

WATTS	VOLTS (See Pg.1)	OVERALL LENGTH In./(mm)	PIPE THREAD	NO. OF ELEMENTS	MODEL NUMBER	SHIP WGT. Lbs./(kg)
2000	240	8	2	2	2T2208	5
	480	(205)			2T2408	(2.5)
3000	240	12	2	2	2T3212	6
	480	(305)			2T3412	(3)
4000	240	18	2	2	2T4218	7
	480	(460)			2T4418	(3.5)
6000	240	25	2	2	2T6225	8
	480	(635)			2T6425	(4)
8000	240	28	2	2	2T8228	10
	480	(715)			2T8428	(4.5)
10000	240	41	2	2	2T10241	10
	480	(1045)			2T10441	(4.5)
12000	480	48	2	2	2T12448	12
		(1220)				(5.5)
15000	480	54	2	2	2T15454	15
		(1375)				(7)

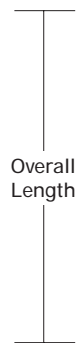
Single phase. Other sizes available, consult factory.



## T2T SERIES, 2" TITANIUM SCREW PLUG HEATERS

WATTS	VOLTS (See Pg.1)	OVERALL LENGTH In./(mm)	PIPE THREAD	NO. OF ELEMENTS	MODEL NUMBER	SHIP WGT. Lbs./(kg)
2000	240	8	2	2	T2T2208	4
	480	(205)			T2T2408	(2)
4000	240	13	2	2	T2T4213	6
	480	(330)			T2T4413	(3)
6000	240	23	2	2	T2T6223	7
	480	(585)			T2T6423	(3.5)
8000	240	28	2	2	T2T8228	8
	480	(715)			T2T8428	(4)

Single phase. Other sizes available, consult factory.



## T SERIES, 2" TUBULAR SCREW PLUG HEATERS

WATTS	VOLTS (See Pg.1)	OVERALL LENGTH In./(mm)	PIPE THREAD	304 SS	316 SS	TITANIUM	SHIP WGT. Lbs./(kg)
1000	120	10	2	FT1110	ST1110	TT1110	11
	240	(255)		FT1210	ST1210	TT1210	(5)
2000	120	14 (355)	2	FT2114	ST2114	TT2114	14
	240			FT2214	ST2214	TT2214	(6.5)
	480			FT2414	ST2414	TT2414	
3000	240	19	2	FT3219	ST3219	TT3219	16
	480	(485)		FT3419	ST3419	TT3419	(7.5)
4000	240	23	2	FT4223	ST4223	TT4223	20
	480	(585)		FT4423	ST4423	TT4423	(9)
6000	240	33	2	FT6233	ST6233	TT6233	26
	480	(840)		FT6433	ST6433	TT6433	(12)
8000	240	40	2	FT8240	ST8240	TT8240	29
	480	(1020)		FT8440	ST8440	TT8440	(13.5)
9000	240	47	2	FT9247	ST9247	TT9247	32
	480	(1195)		FT9447	ST9447	TT9447	(14.5)
12000	480	61	2	FT12461	ST12461	TT12461	37
		(1550)					(17)

Single phase standard, three phase available as option. Add "-3" to end of model number. Other sizes available, consult factory.

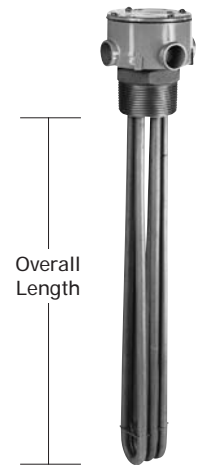
\*\*Specify thermal overload protection desired. See page 1. All heaters must be operated in conjunction with appropriate temperature and level controls.

# SCREW PLUG HEATERS

## 5T SERIES, 2 1/2" STAINLESS STEEL SCREW PLUG HEATERS

WATTS	VOLTS (See Pg.1)	OVERALL LENGTH In./(mm)	PIPE THREAD	NO. OF ELEMENTS	MODEL NUMBER	SHIP WGT. Lbs./(kg)
4500	240	12	2-1/2	3	5T4.5212	7
	480	(305)			5T4.5412	(3.5)
6000	240	17	2-1/2	3	5T6217	8
	480	(435)			5T6417	(4)
9000	240	25	2-1/2	3	5T9225	9
	480	(635)			5T9425	(4.5)
12000	240	32	2-1/2	3	5T12232	10
	480	(815)			5T12432	(4.5)
15000	240	40	2-1/2	3	5T15240	12
	480	(1020)			5T15440	(5.5)
18000	240	48	2-1/2	3	5T18248	15
	480	(1220)			5T18448	(7)

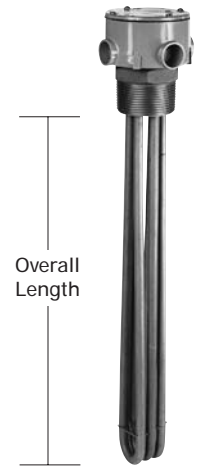
Three phase standard, single phase available as option. Add "-1" to end of model number. Other sizes available, consult factory.



## T5T SERIES, 2 1/2" TITANIUM SCREW PLUG HEATERS

WATTS	VOLTS (See Pg.1)	OVERALL LENGTH In./(mm)	PIPE THREAD	NO. OF ELEMENTS	MODEL NUMBER	SHIP WGT. Lbs./(kg)
6000	240	13	2-1/2	3	T5T6213	6
	480	(330)			T5T6413	(3)
9000	240	23	2-1/2	3	T5T9223	7
	480	(585)			T5T9423	(3.5)
12000	240	28	2-1/2	3	T5T12228	8
	480	(715)			T5T12428	(4)
18000	240	38	2-1/2	3	T5T18238	13
	480	(965)			T5T18438	(6)

Three phase standard, single phase available as option. Add -1 to end of model number. Other sizes available, consult factory.



## HXT SERIES, FLUOROPOLYMER (PTFE) SCREW PLUG HEATERS

WATTS	VOLTS (See Pg.1)	OVERALL LENGTH In./(mm)	PIPE THREAD	MODEL NUMBER	SHIP WGT. Lbs./(kg)
1000	120	9	2-1/2	HXT1109	9
	240	(230)		HXT1209	(4)
2000	120	14	2-1/2	HXT2114	12
	240	(360)		HXT2214	(5.5)
	480			HXT2414	
3000	240	19	2-1/2	HXT3219	15
	480	(485)		HXT3419	(7)
4000	240	26	2-1/2	HXT4226	17
	480	(660)		HXT4426	(8)
5000	240	30	2-1/2	HXT5230	20
	480	(765)		HXT5430	(9)
6000	240	34	2-1/2	HXT6234	23
	480	(865)		HXT6434	(10.5)

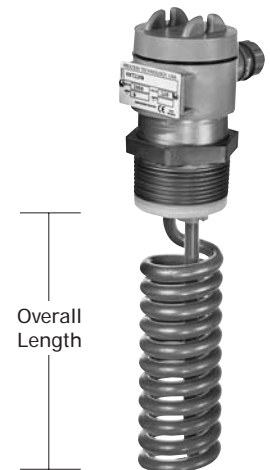
Single phase only.

### STANDARD FEATURES:

UL Type 4 IP62 style plastic heads standard for all metal heaters.

### Optional Features:

- Explosion resistant heads
- Integral thermostats
- Thermowells
- Metric sizes
- Custom sizes



\*\*Specify thermal overload protection desired. See page 1. All heaters must be operated in conjunction with appropriate temperature and level controls.

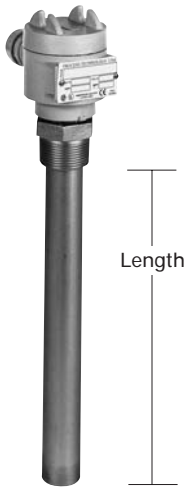
# SCREW PLUG AND FLUOROPOLYMER (PTFE) FLANGED HEATERS



## V\*T SERIES, 1/2" VARIPOWER SCREW PLUG HEATERS

WATTS	VOLTS (See Pg. 1)	LGTH. In./(mm)	NPT	316		FLUORO- POLYMER	SHIP WGT. Lbs./(kg)
				SS	TITANIUM		
100	120	7	1/2"	VST.1107	VTT.1107	VXT.1107	1
	240	(180)		VST.1207	VTT.1207	VXT.1207	(.5)
200	120	10	1/2"	VST.2110	VTT.2110	VXT.2110	1
	240	(255)		VST.2210	VTT.2210	VXT.2210	(.5)

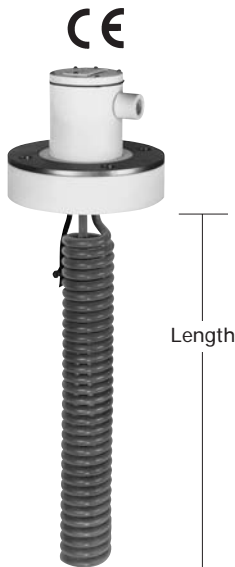
1/2" PVDF screw plug adapter included. Patented self-regulating design protects against overheating and fires. Plug included with 120V models only. Single phase only.



## TB SERIES, 1 1/4" SMALL TANK SCREW PLUG HEATERS

WATTS	VOLTS (See Pg.1)	LGTH. In./(mm)	NPT	304		316		SHIP WGT. Lbs./(kg)
				SS	TITANIUM	SS	TITANIUM	
500	120	8	1-1/4"	FTB.5108	STB.5108	TTB.5108	8	
	240	(205)		FTB.5208	STB.5208	TTB.5208	(4)	
1000	120	10	1-1/4"	FTB1110	STB1110	TTB1110	10	
	240	(255)		FTB1210	STB1210	TTB1210	(4.5)	
1500	120	14	1-1/4"	FTB1.5114	STB1.5114	TTB1.5114	14	
	240	(355)		FTB1.5214	STB1.5214	TTB1.5214	(6.5)	
2000	120	17	1-1/4"	FTB2117	STB2117	TTB2117	17	
	240	(430)		FTB2217	STB2217	TTB2217	(8)	

Single phase only.



## 3FLX SERIES, 3" 150 LB.\* FLUOROPOLYMER (PTFE) FLANGED HEATERS

WATTS	VOLTS (See Pg.1)	NO. OF ELEMENTS	LENGTH In./(mm)	MODEL NUMBER	SHIP WGT. Lbs./(kg)
2000	240	1	16 (405)	3FLX2216-**	23 (11)
	480		3FLX2416-**	(11)	
3000	240	1	21 (535)	3FLX3221-**	26 (12)
	480		3FLX3421-**	(12)	
4000	240	1	28 (710)	3FLX4228-**	29 (13.5)
	480		3FLX4428-**	(13.5)	
5000	240	1	32 (815)	3FLX5232-**	32 (15)
	480		3FLX5432-**	(15)	
6000	240	1	35 (890)	3FLX6235-**	35 (16)
	480		3FLX6435-**	(16)	

\* Note: Heater rated up to 50 PSI working pressure. Single phase only. 6" 150 lb. flanged heaters available, consult factory.

\*\*Specify thermal overload protection desired. See page 1. All heaters must be operated in conjunction with appropriate temperature and level controls.

# FL SERIES, FLANGED HEATERS



## 3" 150 LBS. SS FLANGED 3 SS ELEMENTS

WATTS	VOLTS	OVERALL	MODEL	SHIP
		LGTH.	NUMBER	WGT.
(See Pg.1)		In./(mm)		Lbs./(kg)
3000	240	9	3FLS3209-**	14
		(230)	3FLS3409-**	(6.5)
4500	240	13	3FLS4.5213-**	15
		(330)	3FLS4.5413-**	(7)
6000	240	19	3FLS6219-**	16
		(485)	3FLS6419-**	(7.5)
9000	240	26	3FLS9226-**	17
		(660)	3FLS9426-**	(8)
12000	240	33	3FLS12233-**	18
		(840)	3FLS12433-**	(8.5)
15000	240	41	3FLS15241-**	20
		(1040)	3FLS15441-**	(9)
18000	240	49	3FLS18249-**	21
		(1245)	3FLS18449-**	(10)

## 5" 150 LBS. SS FLANGED 6 SS ELEMENTS

WATTS	VOLTS	OVERALL	MODEL	SHIP
		LGTH.	NUMBER	WGT.
(See Pg.1)		In./(mm)		Lbs./(kg)
6000	240	9	5FLS6209-**	25
		(230)	5FLS6409-**	(11.5)
9000	240	13	5FLS9213-**	28
		(330)	5FLS9413-**	(13)
12000	240	19	5FLS12219-**	30
		(485)	5FLS12419-**	(14)
18000	240	26	5FLS18226-**	33
		(660)	5FLS18426-**	(15)
24000	240	33	5FLS24233-**	37
		(840)	5FLS24433-**	(17)
30000	240	41	5FLS30241-**	40
		(1040)	5FLS30441-**	(18)
36000	240	49	5FLS36249-**	43
		(1245)	5FLS36449-**	(19.5)

## 6" 150 LBS SS FLANGED 12 SS ELEMENTS

WATTS	VOLTS	OVERALL	MODEL	SHIP
		LGTH.	NUMBER	WGT.
(See Pg.1)		In./(mm)		Lbs./(kg)
12000	240	9	6FLS12209-**	48
		(230)	6FLS12409-**	(22)
18000	240	13	6FLS18213-**	54
		(330)	6FLS18413-**	(24.5)
24000	240	19	6FLS24219-**	60
		(485)	6FLS24419-**	(27)
36000	240	26	6FLS36226-**	67
		(660)	6FLS36426-**	(30.5)
48000	240	33	6FLS48233-**	76
		(840)	6FLS48433-**	(34.5)
60000	240	41	6FLS60241-**	84
		(1040)	6FLS60441-**	(38)
72000	240	49	6FLS72249-**	111
		(1245)	6FLS72449-**	(50.5)

## 8" 150 LBS SS FLANGED 18 SS ELEMENTS

WATTS	VOLTS	OVERALL	MODEL	SHIP
		LGTH.	NUMBER	WGT.
(See Pg.1)		In./(mm)		Lbs./(kg)
18000	240	9	8FLS18209-**	84
		(230)	8FLS18409-**	(38)
27000	240	13	8FLS27213-**	92
		(330)	8FLS27413-**	(42)
36000	240	19	8FLS36219-**	100
		(485)	8FLS36419-**	(45.5)
54000	240	26	8FLS54226-**	110
		(660)	8FLS54426-**	(50)
72000	240	33	8FLS72233-**	120
		(840)	8FLS72433-**	(54.5)
90000	240	41	8FLS90241-**	126
		(1040)	8FLS90441-**	(57)
108000	240	49	8FLS108249-**	130
		(1245)	8FLS108449-**	(59)

## 10" 150 LBS. SS FLANGED 27 SS ELEMENTS

WATTS	VOLTS	OVERALL	MODEL	SHIP
		LGTH.	NUMBER	WGT.
(See Pg.1)		In./(mm)		Lbs./(kg)
27000	240	9	10FLS27209-**	91
		(230)	10FLS27409-**	(41.5)
40500	240	13	10FLS40.5213-**	99
		(330)	10FLS40.5413-**	(45)
54000	240	19	10FLS54219-**	108
		(485)	10FLS54419-**	(49)
81000	240	26	10FLS81226-**	120
		(660)	10FLS81426-**	(54.5)
108000	240	33	10FLS108233-**	135
		(840)	10FLS108433-**	(61)
135000	240	41	10FLS135241-**	165
		(1040)	10FLS135441-**	(75)
162000	240	49	10FLS162249-**	200
		(1245)	10FLS162449-**	(91)

### STANDARD FEATURES:

- 316 Stainless Steel Construction
- PI Thermal Overload Protection

### Optional features:

- Materials of construction:  
Titanium = FLT  
Incoloy = FLI  
Steel = FLP
- Resettable thermal protection. (See pg.1)
- Explosion resistant enclosures
- Integral thermostats
- Thermowells
- Custom sizes
- Metric sizes

\*\*Specify thermal overload protection desired. See page 1. All heaters must be operated in conjunction with appropriate temperature and level controls.

# THERMAL PROTECTION ACCESSORIES

## REPLACEABLE THERMAL PROTECTORS

MODEL NUMBER	PCN	HEATER MATERIAL	HEATER STYLE	WIRE COLOR	TEMPERATURE RANGE
P1	6021	Metal	over the side	white	up to 180°F (82°C)
P4	6022	Metal	over the side	blue	180 to 230°F (82 - 110°C)
P5	6023	Metal	over the side	red	230 to 300°F (110 - 150°C)
P1	6024	Metal	L-shaped	white	up to 180°F (82°C)
P4	6025	Metal	L-shaped	blue	180 to 230°F (82 - 110°C)
P5	6026	Metal	L-shaped	red	230 to 300°F (110 - 150°C)
P1	6032	Fluoropolymer	over the side	red	up to 190°F (88°C)
P1	6035	Fluoropolymer	L-shaped	red	up to 190°F (88°C)
P1	6032	Quartz	over the side	red	up to 180°F (82°C)
P4	6033	Quartz	over the side	blue	180 to 230°F (82 - 110°C)

\* Order replacement protectors by PCN.

## RESETTABLE THERMAL PROTECTORS

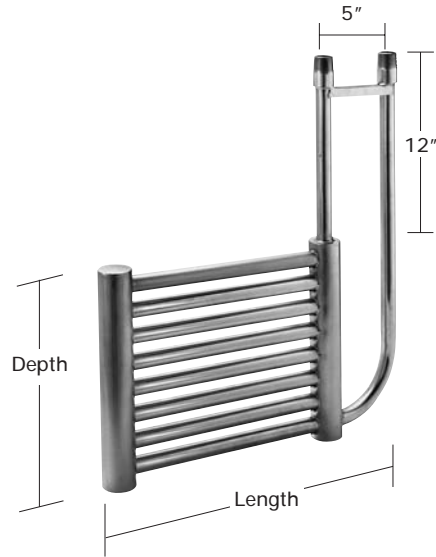
MODEL NUMBER	PCN	HEATER MATERIAL	HEATER STYLE	WIRE COLOR	TEMPERATURE RANGE
P2	4576	Metal	over the side	white	up to 180°F (82°C)
P6	4047	Metal	over the side	blue	180 to 230°F (82 - 110°C)
P7	2805	Metal	over the side	red	230 to 300°F (110 - 150°C)
P2	2804	Metal	L-shaped	white	up to 180°F (82°C)
P6	4047	Metal	L-shaped	blue	180 to 230°F (82 - 110°C)
P7	2805	Metal	L-shaped	red	230 to 300°F (110 - 150°C)
P2	4576	Fluoropolymer	over the side	white	up to 190°F (88°C)
P8	5163	Fluoropolymer	over the side	brown	190 to 210°F (88 - 99°C)
P2	4576	Fluoropolymer	L-shaped	white	up to 190°F (88°C)
P8	5163	Fluoropolymer	L-shaped	brown	190 to 210°F (88 - 99°C)
P2	4576	Quartz	over the side	white	up to 180°F (82°C)
P6	5580	Quartz	over the side	blue	180 to 230°F (82 - 110°C)

\* Order replacement protectors by PCN.

# METAL HEAT EXCHANGERS

## G SERIES, GRID COILS

EXCH. NO. OF AREA (Sq. Ft.)	TUBES	DEPTH In./(mm)	LENGTH In./(mm)	MODEL NUMBER	SHIP WGT. Lbs./(kg)
4.6	8	12.5 (318)	24 (610)	*8G-24	13 (6)
5.6	8	12.5 "	30 (762)	*8G-30	14 (6.5)
6.7	8	12.5 "	36 (915)	*8G-36	15 (7)
8.8	8	12.5 "	48 (1219)	*8G-48	18 (8)
10.9	8	12.5 "	60 (1524)	*8G-60	20 (9)
13.7	8	12.5 "	72 (1829)	*8G-72	25 (11.5)
15.1	8	12.5 "	84 (2134)	*8G-84	30 (13.5)
17.2	8	12.5 "	96 (2438)	*8G-96	35 (16)
19.2	8	12.5 "	108 (2743)	*8G-108	38 (17)
21.3	8	12.5 "	120 (3048)	*8G-120	42 (19)
23.4	8	12.5 "	132 (3353)	*8G-132	45 (20.5)
25.5	8	12.5 "	144 (3658)	*8G-144	50 (22.5)
<hr/>					
6.8	12	18.5 (470)	24 (610)	*12G-24	15 (7)
8.4	12	18.5 "	30 (762)	*12G-30	18 (8)
10.0	12	18.5 "	36 (915)	*12G-36	22 (10)
13.2	12	18.5 "	48 (1219)	*12G-48	28 (13)
16.3	12	18.5 "	60 (1524)	*12G-60	35 (16)
19.5	12	18.5 "	72 (1829)	*12G-72	45 (20.5)
22.6	12	18.5 "	84 (2134)	*12G-84	50 (22.5)
25.7	12	18.5 "	96 (2438)	*12G-96	56 (25.5)
28.9	12	18.5 "	108 (2743)	*12G-108	62 (28)
32.0	12	18.5 "	120 (3048)	*12G-120	68 (31)
35.2	12	18.5 "	132 (3353)	*12G-132	75 (34)
38.3	12	18.5 "	144 (3658)	*12G-144	90 (41)
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9.4	16	24.5 (622)	24 (610)	*16G-24	20 (9)
11.5	16	24.5 "	30 (762)	*16G-30	25 (11.5)
13.6	16	24.5 "	36 (915)	*16G-36	29 (13)
17.8	16	24.5 "	48 (1219)	*16G-48	35 (15.5)
22.0	16	24.5 "	60 (1524)	*16G-60	43 (19.5)
26.1	16	24.5 "	72 (1829)	*16G-72	50 (22.5)
30.3	16	24.5 "	84 (2134)	*16G-84	62 (28)
34.5	16	24.5 "	96 (2438)	*16G-96	70 (32)
38.7	16	24.5 "	108 (2743)	*16G-108	80 (36)
42.9	16	24.5 "	120 (3048)	*16G-120	88 (40)
47.1	16	24.5 "	132 (3353)	*16G-132	97 (44)
51.3	16	24.5 "	144 (3658)	*16G-144	105 (47.5)
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11.5	20	30.5 (775)	24 (610)	*20G-24	23 (10.5)
14.2	20	30.5 "	30 (762)	*20G-30	28 (13)
16.8	20	30.5 "	36 (915)	*20G-36	34 (15.5)
22.0	20	30.5 "	48 (1219)	*20G-48	40 (18)
27.2	20	30.5 "	60 (1524)	*20G-60	48 (22)
32.5	20	30.5 "	72 (1829)	*20G-72	55 (25)
37.7	20	30.5 "	84 (2134)	*20G-84	68 (31)
42.9	20	30.5 "	96 (2438)	*20G-96	75 (34)
48.2	20	30.5 "	108 (2743)	*20G-108	87 (39.5)
53.4	20	30.5 "	120 (3048)	*20G-120	100 (45.5)
58.5	20	30.5 "	132 (3353)	*20G-132	115 (52)
63.9	20	30.5 "	144 (3658)	*20G-144	125 (57)
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13.7	24	36.5 (927)	24 (610)	*24G-24	38 (17)
16.8	24	36.5 "	30 (762)	*24G-30	42 (19)
20.0	24	36.5 "	36 (915)	*24G-36	45 (20.5)
26.3	24	36.5 "	48 (1219)	*24G-48	50 (22.5)
32.5	24	36.5 "	60 (1524)	*24G-60	57 (26)
38.8	24	36.5 "	72 (1829)	*24G-72	65 (29.5)
45.1	24	36.5 "	84 (2134)	*24G-84	75 (34)
51.4	24	36.5 "	96 (2438)	*24G-96	85 (38.5)
57.7	24	36.5 "	108 (2743)	*24G-108	100 (45.5)
64.0	24	36.5 "	120 (3048)	*24G-120	115 (52)
70.3	24	36.5 "	132 (3353)	*24G-132	130 (59)
76.6	24	36.5 "	144 (3658)	*24G-144	150 (68)
<hr/>					
15.8	28	42.5 (1080)	24 (610)	*28G-24	40 (18)
19.5	28	42.5 "	30 (762)	*28G-30	45 (20.5)
23.2	28	42.5 "	36 (915)	*28G-36	50 (22.5)
30.6	28	42.5 "	48 (1219)	*28G-48	58 (26.5)
38.0	28	42.5 "	60 (1524)	*28G-60	65 (29.5)
45.4	28	42.5 "	72 (1829)	*28G-72	75 (34)
52.8	28	42.5 "	84 (2134)	*28G-84	85 (38.5)
60.2	28	42.5 "	96 (2438)	*28G-96	100 (45.5)
67.6	28	42.5 "	108 (2743)	*28G-108	115 (52)
75.0	28	42.5 "	120 (3048)	*28G-120	130 (59)
82.4	28	42.5 "	132 (3353)	*28G-132	150 (68)
89.8	28	42.5 "	144 (3658)	*28G-144	175 (79.5)



### ORDERING EXAMPLE:

Add (H) to end of model number for horizontal style. For vertical style, add (V) to end of model number and reverse dimensions (ie: width becomes coil length and length becomes coil width). Add (S) to end of model number for steam usage. Add (W) to end of model number for water usage.

**Example:** T 8 G - 24 H S

\*Coil Material:  
 T = Titanium  
 S = Stainless  
 H = Hasteloy C®  
 Z = Zirconium

No. of Tubes: 8  
 Grid Style: G  
 Coil Length (Inches): 24  
 H = Horizontal  
 V = Vertical  
 S = Steam  
 W = Water

Consult factory for inlet/outlet sizing assistance.



## THERMAX<sup>2</sup> SERIES, HEAT EXCHANGERS

EXCH. AREA (Sq. Ft.)	OVERALL LENGTH In./(mm)	DIM. DIA. In./(mm)	MODEL NUMBER (316 L Stainless)	SHIP WGT. Lbs./(kg)
1.1	6.25 (159)	2.75 (70)	IS1.1-2.75-6.25	5 (2.5)
2.5	10.25 (261)	2.75 (70)	IS2.5-2.75-10.25	7 (3)
3.8	14.25 (362)	2.75 (70)	IS3.8-2.75-14.25	10 (4.5)
3.8	10.75 (273)	3.75 (96)	IS3.8-3.75-10.75	15 (7)
5.8	15.50 (394)	3.75 (96)	IS5.8-3.75-15.5	20 (9)
7.8	20.25 (515)	3.75 (96)	IS7.8-3.75-20.25	24 (11)
15.0	20.25 (515)	4.75 (121)	IS15.0-4.75-20.25	30 (13.5)

316L stainless steel standard, titanium available.

Hasteloy C® is a registered trademark of Carpenter Technology.

# METAL HEAT EXCHANGERS

## UC SERIES, U COILS

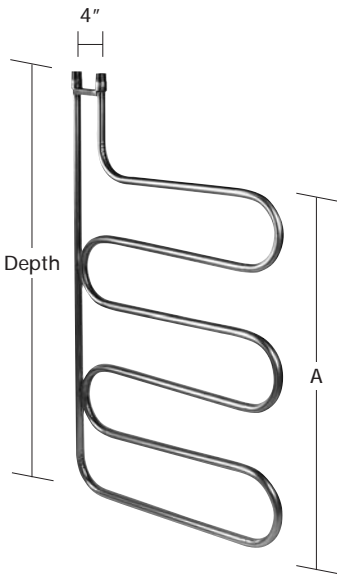


EXCHANGE AREA (Sq. Ft.)	DEPTH In./(mm)	WIDTH In./(mm)	STEEL	316 SS	TITANIUM	SHIP WGT. Lbs./(kg)
.75	18 (460)	12 (305)	UC18P	UC18S	UC18T	3 (1.5)
1.00	24 (610)	12 (305)	UC24P	UC24S	UC24T	4 (2)
1.25	30 (765)	12 (305)	UC30P	UC30S	UC30T	5 (2.5)
1.50	36 (915)	12 (305)	UC36P	UC36S	UC36T	6 (3)
1.75	42 (1070)	12 (305)	UC42P	UC42S	UC42T	7 (3)
2.00	48 (1220)	12 (305)	UC48P	UC48S	UC48T	8 (3.5)
2.25	54 (1375)	12 (305)	UC54P	UC54S	UC54T	9 (4)
2.50	60 (1525)	12 (305)	UC60P	UC60S	UC60T	10 (4.5)

1" dia. tubing with 1" MNPT fittings standard. Bottom coils available. Hastelloy C® and Zirconium coils available, consult factory. 1/2", 5/8", 3/4" and 1 1/4" tubing available. PTFE sleeve for solution interface available.

No. of Passes	"A" Standard	"A" Low Profile
2	8 1/2	8 1/2
4	23	17
6	37	26
8	52	34
10	60 1/2	43

## SP SERIES, SERPENTINE COILS



EXCHANGE AREA (Sq. Ft.)	LENGTH In./(mm)	DEPTH In./(mm)	NO. OF PASSES	STEEL	316 SS	TITANIUM	SHIP WGT. Lbs./(kg)
2.75	24 (610)	36 (915)	4	SP4-24P	SP4-24S	SP4-24T	10 (4.5)
3.75	36 (915)	36 (915)	4	SP4-36P	SP4-36S	SP4-36T	12 (5.5)
4.75	48 (1220)	36 (915)	4	SP4-48P	SP4-48S	SP4-48T	14 (6.5)
5.75	60 (1525)	36 (915)	4	SP4-60P	SP4-60S	SP4-60T	16 (7.5)
7.25	78 (1985)	36 (915)	4	SP4-78P	SP4-78S	SP4-78T	20 (9)
8.75	96 (2440)	36 (915)	4	SP4-96P	SP4-96S	SP4-96T	24 (11)
3.75	20 (510)	48 (1220)	6	SP6-20P	SP6-20S	SP6-20T	12 (5.5)
5.00	30 (765)	48 (1220)	6	SP6-30P	SP6-30S	SP6-30T	14 (6.5)
6.25	40 (1020)	48 (1220)	6	SP6-40P	SP6-40S	SP6-40T	17 (8)
7.50	50 (1270)	48 (1220)	6	SP6-50P	SP6-50S	SP6-50T	20 (9)
8.75	60 (1525)	48 (1220)	6	SP6-60P	SP6-60S	SP6-60T	24 (11)
10.00	70 (1780)	48 (1220)	6	SP6-70P	SP6-70S	SP6-70T	27 (12.5)

Serpentine coil heaters offer lower cost per heating surface area. The design allows them to be installed in tanks with limited space. Bottom coils available. Hastelloy C and Zirconium coils available, consult factory. 1" diameter tubing with 1" MNPT fittings standard. 1/2", 5/8", 3/4" and 1 1/4" tubing available. PTFE sleeve for solution interface available.

## METAL HELICAL COILS



- Custom designed to your specifications
- 3/8" diameter through 1 1/4" diameter tubing (.035 - .065 wall)
- Coil ODs as small as 3 1/4" and as large as 10' diameter (dependent upon tube diameter and wall thickness)
- Materials: Steel, 304 and 316 stainless steel and titanium. Other grades and materials available upon request.
- Single and multiple layer coils.

Hastelloy C is a registered trademark of Carpenter Technology.



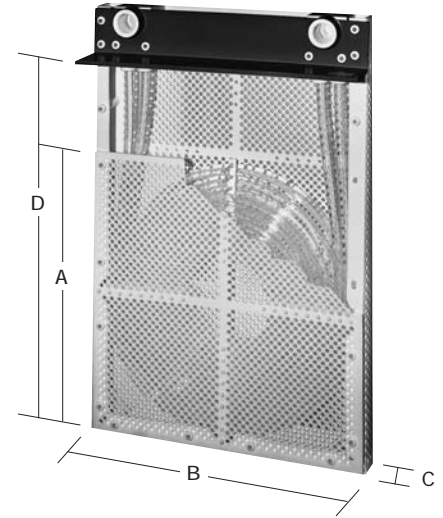
# FLUOROPOLYMER HEAT EXCHANGERS

## X SERIES, FLUOROPOLYMER HEATING/COOLING COILS

EXCHANGE AREA (Sq. Ft.)	DIMENSIONS				MODEL NUMBER	SHIP WGT. Lbs./kg
	A In./mm	B In./mm	C In./mm	D In./mm		
2.25*	11-1/2 (293)	11-1/2 (293)	1-1/2 (38)	17-1/2 (445)	X1-12-12-18-F	10 (4.5)
4.50*	11-1/2 (293)	11-1/2 (293)	2 (51)	17-1/2 (445)	X2-12-12-18-F	12 (5.5)
4.50*	15-1/2 (394)	15-1/2 (394)	1-1/2 (38)	21-1/2 (550)	X2-16-16-22-F	15 (7)
9.25*	15-1/2 (394)	15-1/2 (394)	2 (51)	21-1/2 (550)	X4-16-16-22-F	18 (8)
6.00	17-1/2 (445)	17-1/2 (445)	2 (51)	23-1/2 (597)	X2-18-18-24-F-LP	22 (10)
12.00	17-1/2 (445)	17-1/2 (445)	3-1/4 (82.5)	23-1/2 (597)	X4-18-18-24-F-LP	30 (13.5)
18.00	17-1/2 (445)	17-1/2 (445)	4-1/2 (114)	23-1/2 (597)	X6-18-18-24-F-LP	38 (17.5)
24.00	17-1/2 (445)	17-1/2 (445)	5-3/4 (146)	23-1/2 (597)	X8-18-18-24-F-LP	42 (19)
11.50	23-1/2 (597)	23-1/2 (597)	2 (51)	29-1/2 (750)	X2-24-24-30-F-LP	32 (14.5)
23.00	23-1/2 (597)	23-1/2 (597)	3-1/4 (82.5)	29-1/2 (750)	X4-24-24-30-F-LP	37 (17)
34.50	23-1/2 (597)	23-1/2 (597)	4-1/2 (114)	29-1/2 (750)	X6-24-24-30-F-LP	41 (18.5)
46.50	23-1/2 (597)	23-1/2 (597)	5-3/4 (146)	29-1/2 (750)	X8-24-24-30-F-LP	60 (27)

\* = 1/4" diameter tubing. All other coils have 1/2" diameter tubing.

10 psi minimum steam pressure. Vacuum breakers strongly recommended for all fluoropolymer coils used with steam service. (See page 24).



### STANDARD FEATURES:

- All fluoropolymer construction of wetted parts.
- Non-conductive. Eliminates stray currents in tank.
- Integral inlet and outlet manifolds for single point connections.
- For heating and cooling most acid and alkaline aqueous solutions.
- FEP (Fluorinated Ethylene Propylene) fluoropolymer standard, maximum pressure (steam) 30 psi.
- PTFE (Polytetrafluoroethylene) fluoropolymer guard construction.

### Optional Features:

- PFA (Perfluoroalkoxy) fluoropolymer available, maximum pressure (steam) 60 psi.
- L-shaped configurations available for bottom exchange applications.
- Heating/cooling combination package available. Consult factory.
- Anti-flotation brackets available.

# ACCESSORIES



## IX SERIES, INSULATORS/ISOLATORS

SIZE (NPT)	LENGTH In./(mm)	MODEL NUMBER	SHIP WGT. Lbs./kg)
1/2"	2" (51)	IX-5	1 (.5)
3/4"	2" (51)	IX-3	1 (.5)
1"	2-1/2" (63.5)	IX-1	1 (.5)
1 1/4"	2-1/2" (63.5)	IX-1-1/4	1 (.5)
1 1/2"	2-1/2" (63.5)	IX-1-1/2	1 (.5)
2"	2-1/2" (63.5)	IX-2	1 (.5)

Used to isolate the heat exchanger from stray current. Metric sizes available, consult factory.



## VB SERIES, VACUUM BREAKERS

SIZE (NPT)	MODEL NUMBER	SHIP WGT. Lbs./kg)
1/2"	VB-5	1 (.5)

Recommended for all fluoropolymer heat exchangers used with steam service.

## S SERIES, SOLENOID VALVES



### BRASS (Water Service)

SIZE (NPT)	CV FACTOR	MIN. OPER. PRES. (PSI)	MAX (PSI)	MAX. FLUID TEMP.	MODEL NUMBER	SHIP WGT. Lbs./kg)
1/2"	4	5	125	180°F (82°C)	S-5-W	3 (1.5)
3/4"	5	5	125	180°F (82°C)	S-3-W	4 (2)
1"	13.5	5	125	180°F (82°C)	S-1-W	6 (3)
1 1/4"	15	5	125	180°F (82°C)	S-1-1/4-W	11 (5)
1 1/2"	22.5	5	125	180°F (82°C)	S-1-1/2-W	12 (5.5)
2"	43	5	125	180°F (82°C)	S-2-W	13 (6)

### BRASS (Steam Service)

SIZE (NPT)	CV FACTOR	MIN. OPER. PRES. (PSI)	MAX (PSI)	MAX. FLUID TEMP.	MODEL NUMBER	SHIP WGT. Lbs./kg)
1/2"	4	5	50	300°F (149°C)	S-5-S	3 (1.5)
3/4"	5	5	50	300°F (149°C)	S-3-S	4 (2)
1"	13.5	5	50	300°F (149°C)	S-1-S	6 (3)
1 1/4"	15	5	50	300°F (149°C)	S-1-1/4-S	11 (5)
1 1/2"	22.5	5	50	300°F (149°C)	S-1-1/2-S	12 (5.5)
2"	43	5	50	300°F (149°C)	S-2-S	13 (6)

Normally closed standard. Normally open optional. Stainless steel and zero minimum pressure valves available, consult factory.



## ST SERIES, STRAINERS

SIZE (NPT)	MODEL NUMBER	SHIP WGT. Lbs./kg)
1/2"	ST5	3 (1.5)
3/4"	ST3	3 (1.5)
1"	ST1	4 (2)
1 1/4"	ST1-1/4	5 (2.5)
1 1/2"	ST1-1/2	6 (3)
2"	ST2	10 (4.5)

20 mesh stainless screen. 125 PSI maximum at 400°F (205°C).

UL TYPE 1, IP60



## AHM SERIES, AMP HOUR METERS

VOLTS	MAX. RECTIFIER AMP. RATING	SHUNT SIZES	MODEL NUMBER	SHIP WGT. Lbs./kg)
80-240	10 through 30,000	50 through 150 mV	AHM	3 (1.5)

Resettable counters and amp minute meters available as option, consult factory.

# LEVEL CONTROLS

## LC SERIES, CONDUCTIVITY TYPE LEVEL CONTROLS

PROBE ASSEMBLY	PROBE LENGTH IN. / (mm)	NO. OF PROBES	CIRCUITRY	REPLACEMENT BOARD ONLY	PROBE SHIP WT. LBS. / (kg)	SHIP WEIGHT LBS. / (kg)
2(*) 6	6 (155)	2	LCB	LC	3 (1.5)	5 (2)
2(*) 12	12 (305)	2	LCB	LC	3 (1.5)	5 (2)
2(*) 18	18 (460)	2	LCB	LC	4 (2)	6 (2.5)
2(*) 24	24 (610)	2	LCB	LC	6 (2.5)	7 (3)
2(*) 30	30 (762)	2	LCB	LC	7 (3)	8 (3.5)
2(*) 36	36 (915)	2	LCB	LC	8 (3.5)	9 (4)
2(*) 48	48 (1220)	2	LCB	LC	9 (4)	11 (5)
3(*) 6	6 (155)	3	LCB	LC	3 (1.5)	5 (2)
3(*) 12	12 (305)	3	LCB	LC	3 (1.5)	5 (2)
3(*) 18	18 (460)	3	LCB	LC	4 (2)	6 (2.5)
3(*) 24	24 (610)	3	LCB	LC	6 (2.5)	7 (3)
3(*) 30	30 (762)	3	LCB	LC	7 (3)	8 (3.5)
3(*) 36	36 (915)	3	LCB	LC	8 (3.5)	9 (4)
3(*) 48	48 (1220)	3	LCB	LC	9 (4)	11 (5)

(LC2) two probe units for single level control. (LC3) three probe units for two point control and refill/pump down capabilities. Four and five probe units are available for multiple level requirements, consult factory. Can be ordered as part of a combination temperature control assembly.

### \*STANDARD PROBE MATERIALS:

S = STAINLESS STEEL

H = HASTELLOY C®

T = TITANIUM

G = GRAPHITE

FLUOROPOLYMER (PTFE) COVERED STANDARD

## ESP SERIES, CAPACITIVE TYPE LEVEL CONTROLS

MODEL NUMBER	VOLTS	CONTACTS	MIN. LOAD	MAX. LOAD	MAX AMB. TEMP	SENSING RANGE	SHIP WGT. Lbs./ (kg)
ESP	120/265 VAC (50-60 Hz)	Field selectable N/O-N/C	10 mA	500 mA	176°F (80°C)	.12 to .98" (3-25mm)	1 (.5)

Monitors liquid level from outside of plastic or non-metallic tanks. Polyethylene, CPVC, and fluoropolymer mounting wells available for vertical mounting, consult factory.



UL TYPE 4/4X, IP62  
(indoor)



Complete level consists of one of these:

LCB: LC Circuitry in Enclosure

**PLUS**



either:



or:

LC2: 2 Probe Head

LC3: 3 Probe Head



# NON-INDICATING AND INDICATING CONTROLS



## NR SERIES, NON-INDICATING THERMOSTATS SINGLE PHASE WITH 5 FT. AND 12 FT. FEP SLEEVED SENSOR

MODEL NUMBER	VOLTS	MAX. AMPS	TEMP. RANGE	SENSOR LENGTH Ft. (m)	REPL. SENSOR P/N	SHIP WGT. Lbs./ (kg)
NR25	120/240	25*	30-220°F	5' (1.5)	NR25-5L	3 (1.5)
NR25-12	120/240	25	30-220°F	12' (3.7)	NR25-12L	3 (1.5)
N25H	120/240	25	200-550°F	5' (1.5)	N25H-5L	3 (1.5)

\*For heating only - 15 amp maximum when used in conjunction with protector fuses.

## NR SERIES, NON-INDICATING COMBINATION CONTROLS ONE OR THREE PHASE WITH 5 FT. FEP SLEEVED SENSOR



UL TYPE 1, IP60



MODEL NUMBER	VOLTS (See Pg. 1)	MAX. AMPS	REPL. RELAY P/N	REPL. RELAY P/N LESS TRANS.	REPL. TRANS.	REPL. SENSOR P/N	SHIP WGT. Lbs./ (kg)
NR302	240	30	AH30-1	AH30-2	HD50 2/1	NR25-5L	15
NR304	480	30	AH30-1	---	HD50 4/1	NR25-5L	(7)
NR502	240	50	AH50-1	AH50-2	HD50 2/1	NR25-5L	16
NR504	480	50	AH50-1	---	HD50 4/1	NR25-5L	(7.5)
NR752	240	75	AH75-1	AH75-2	HD100 2/1	NR25-5L	22
NR754	480	75	AH75-1	---	HD100 4/1	NR25-5L	(10)
NR902	240	90	AH90-1	AH90-2	HD100 2/1	NR25-5L	24
NR904	480	90	AH90-1	---	HD100 4/1	NR25-5L	(11)
NR1202	240	120	AH120-1	AH120-2	HD150 2/1	NR25-5L	26
NR1204	480	120	AH120-1	---	HD150 4/1	NR25-5L	(12)
NR1502	240	150	AH150-1	AH150-2	HD150 2/1	NR25-5L	32
NR1504	480	150	AH150-1	---	HD150 4/1	NR25-5L	(14.5)

Combination control consists of gasketed plastic enclosure, thermostat, contactor and optional control transformer. Transformer must be used on 480 volts and is recommended for 240 volts. To omit stepdown transformer, add "LT" to end of model number. See NR25 chart above for thermostat options. Additional control options available, consult factory.



## DLC SERIES, DIGITAL THERMOSTATS SINGLE PHASE WITH 10 FT. FEP SLEEVED SENSOR

MODEL NUMBER	VOLTS (See Pg. 1)	MAX. AMPS	TEMP. RANGE	SENSOR LENGTH	REPL. SENSOR P/N	SHIP WGT. Lbs./ (kg)
DLC16-1	120	16	-58-302°F (-50-150°C)	10' (3m)	DLC-10L	2 (1)
DLC16-2	240	16	-58-302°F (-50-150°C)	10' (3m)	DLC-10L	2 (1)

Direct acting output for cooling applications available. Celsius readout (must specify).

## DLC SERIES, DIGITAL COMBINATION CONTROLS ONE OR THREE PHASE WITH 10 FT. FEP SLEEVED SENSOR



UL TYPE 1, IP60



MODEL NUMBER	VOLTS (See Pg. 1)	MAX. AMPS	REPL. RELAY P/N	REPL. RELAY P/N LESS TRANS.	REPL. TRANS.	REPL. SENSOR P/N	SHIP WGT. Lbs./ (kg)
DLC302	240	30	AH30-1	AH30-2	HD50 2/1	DLC-10L	16
DLC304	480	30	AH30-1	---	HD50 4/1	DLC-10L	(7.5)
DLC502	240	50	AH50-1	AH50-2	HD50 2/1	DLC-10L	17
DLC504	480	50	AH50-1	---	HD50 4/1	DLC-10L	(8)
DLC752	240	75	AH75-1	AH75-2	HD100 2/1	DLC-10L	23
DLC754	480	75	AH75-1	---	HD100 4/1	DLC-10L	(10.5)
DLC902	240	90	AH90-1	AH90-2	HD100 2/1	DLC-10L	25
DLC904	480	90	AH90-1	---	HD100 4/1	DLC-10L	(11.5)
DLC1202	240	120	AH120-1	AH120-2	HD150 2/1	DLC-10L	27
DLC1204	480	120	AH120-1	---	HD150 4/1	DLC-10L	(12.5)
DLC1502	240	150	AH150-1	AH150-2	HD150 2/1	DLC-10L	33
DLC1504	480	150	AH150-1	---	HD150 4/1	DLC-10L	(15)

Combination control consists of gasketed plastic enclosure, thermostat, contactor and optional control transformer. Transformer must be used on 480 volts and is recommended for 240 volts. To omit stepdown transformer, add "LT" to end of model number. See DLC chart above for thermostat options. Additional control options available, consult factory.

FEP is a fluorinated ethylene propylene fluoropolymer.

# DIGITAL AND NON-INDICATING CONTROLS



UL TYPE 4X, IP62 (indoor)

## DSL SERIES, 1/16 DIN DIGITAL THERMOSTATS DUAL SETPOINT WITH 10 FT. FEP SLEEVED SENSOR

MODEL NUMBER	VOLTS	MAX. AMPS	TEMP. RANGE	SENSOR LENGTH Ft./m	REPL. SENSOR P/N	SHIP WGT. Lbs./kg
DSL	85-265	3	-100-500°F (-73-260°C)	10' (3)	RTD1000	2 (1)

Longer sensor lengths and higher temperature ranges available. Many features included as standard. 0-10V, 4-20MA and RS485 outputs optional, consult factory.



## DSL SERIES, DIGITAL COMBINATION CONTROLS ONE OR THREE PHASE WITH 10 FT. FEP SLEEVED SENSOR

MODEL NUMBER	VOLTS (See Pg. 1)	MAX. AMPS	REPL. RELAY P/N	REPL. RELAY P/N LESS TRANS.	REPL. TRANS.	REPL. SENSOR P/N	SHIP WGT. Lbs./kg
DSL302	240	30	AH30-1	AH30-2	HD50 2/1	RTD1000	16
DSL304	480	30	AH30-1	---	HD50 4/1	RTD1000	(7.5)
DSL502	240	50	AH50-1	AH50-2	HD50 2/1	RTD1000	17
DSL504	480	50	AH50-1	---	HD50 4/1	RTD1000	(8)
DSL752	240	75	AH75-1	AH75-2	HD100 2/1	RTD1000	23
DSL754	480	75	AH75-1	---	HD100 4/1	RTD1000	(10.5)
DSL902	240	90	AH90-1	AH90-2	HD100 2/1	RTD1000	25
DSL904	480	90	AH90-1	---	HD100 4/1	RTD1000	(11.5)
DSL1202	240	120	AH120-1	AH120-2	HD100 2/1	RTD1000	27
DSL1204	480	120	AH120-1	---	HD100 4/1	RTD1000	(12.5)
DSL1502	240	150	AH150-1	AH150-2	HD150 2/1	RTD1000	33
DSL1504	480	150	AH150-1	---	HD150 4/1	RTD1000	(15)

Combination control consists of gasketed plastic enclosure, thermostat, contactor and optional control transformer. Transformer must be used on 480 volts and is recommended for 240 volts. To omit step-down transformer, add "LT" to end of model number. See DSL chart for thermostat options. Longer sensor lengths and additional control options available, consult factory.



UL TYPE 1, IP60



## NE SERIES, NON-INDICATING ELECTRONIC THERMOSTATS WITH 10 FT. FEP SLEEVED SENSOR

MODEL NUMBER	VOLTS	MAX. AMPS	TEMP. RANGE	SENSOR LENGTH Ft./m	REPL. SENSOR P/N	SHIP WGT. Lbs./kg
NE20	120/240	20	50-250°F (10-120°C)	10' (3)	RTD1000	3 (1.5)
NE20H**	120/240	20	150-550°F (66-288°C)	10' (3)	RTD1000-10L	3 (1.5)

Specify voltage when ordering (120V or 240V). NE20H not available with Celsius scale. Longer sensor lengths available, consult factory. \*\*High temperature sensor, omit FEP sleeve.



UL TYPE 1, IP60



## NE SERIES, NON-INDICATING ELECTRONIC COMBINATION CONTROLS ONE OR THREE PHASE WITH 10 FT. FEP SLEEVED SENSOR

MODEL NUMBER	VOLTS (See Pg. 1)	MAX. AMPS	REPL. RELAY P/N	REPL. RELAY P/N LESS TRANS.	REPL. TRANS.	REPL. SENSOR P/N	SHIP WGT. Lbs./kg
NE302	240	30	AH30-1	AH30-2	HD50 2/1	RTD1000	15
NE304	480	30	AH30-1	---	HD50 4/1	RTD1000	(7)
NE502	240	50	AH50-1	AH50-2	HD50 2/1	RTD1000	16
NE504	480	50	AH50-1	---	HD50 4/1	RTD1000	(7.5)
NE752	240	75	AH75-1	AH75-2	HD100 2/1	RTD1000	22
NE754	480	75	AH75-1	---	HD100 4/1	RTD1000	(10)
NE902	240	90	AH90-1	AH90-2	HD100 2/1	RTD1000	24
NE904	480	90	AH90-1	---	HD100 4/1	RTD1000	(11)
NE1202	240	120	AH120-1	AH120-2	HD150 2/1	RTD1000	26
NE1204	480	120	AH120-1	---	HD150 4/1	RTD1000	(12)
NE1502	240	150	AH150-1	AH150-2	HD150 2/1	RTD1000	32
NE1504	480	150	AH150-1	---	HD150 4/1	RTD1000	(14.5)

Combination control consists of gasketed plastic enclosure, thermostat, contactor and optional control transformer. Transformer must be used on 480 volts and is recommended for 240 volts. To omit step-down transformer, add "LT" to end of model number. See NE20 chart for thermostat options. Longer sensor lengths and additional control options available, consult factory.



UL TYPE 1, IP60



FEP is a fluorinated ethylene propylene fluoropolymer.

# DIGITAL CONTROLS

UL TYPE 12, IP61 (enclosed) CE



## DE SERIES, 1/8 DIN DIGITAL THERMOSTATS SINGLE SETPOINT WITH 10 FT. FEP SLEEVED SENSOR

MODEL NUMBER	VOLTS	MAX. AMPS	TEMP. RANGE	SENSOR LENGTH Ft./m	REPL. SENSOR P/N	SHIP WGT. Lbs./kg
DE20	90-260	20	0-500°F (0-260°C)	10' (3)	RTD1000	3 (1.5)

Longer sensor lengths, thermocouples, 100 ohm RTDs, voltage, current and frequency inputs available as options, consult factory.

## DE SERIES, DIGITAL COMBINATION CONTROLS ONE OR THREE PHASE WITH 10 FT. FEP SLEEVED SENSOR

UL TYPE 1, IP60



MODEL NUMBER	VOLTS (See Pg. 1)	MAX. AMPS	REPL. RELAY P/N	REPL. RELAY P/N LESS TRANS.	REPL. TRANS.	REPL. SENSOR P/N	SHIP WGT. Lbs./kg
DE302	240	30	AH30-1	AH30-2	HD50 2/1	RTD1000	16
DE304	480	30	AH30-1	---	HD50 4/1	RTD1000	(7.5)
DE502	240	50	AH50-1	AH50-2	HD50 2/1	RTD1000	17
DE504	480	50	AH50-1	---	HD50 4/1	RTD1000	(8)
DE752	240	75	AH75-1	AH75-2	HD100 2/1	RTD1000	23
DE754	480	75	AH75-1	---	HD100 4/1	RTD1000	(10.5)
DE902	240	90	AH90-1	AH90-2	HD100 2/1	RTD1000	25
DE904	480	90	AH90-1	---	HD100 4/1	RTD1000	(11.5)
DE1202	240	120	AH120-1	AH120-2	HD150 2/1	RTD1000	27
DE1204	480	120	AH120-1	---	HD150 4/1	RTD1000	(12.5)
DE1502	240	150	AH150-1	AH150-2	HD150 2/1	RTD1000	33
DE1504	480	150	AH150-1	---	HD150 4/1	RTD1000	(15)

Combination control consists of gasketed plastic enclosure, thermostat, contactor and optional control transformer. Transformer must be used on 480 volts and is recommended for 240 volts. To omit step-down transformer, add "LT" to end of model number. See DE chart for thermostat options. Longer sensor lengths and additional control options available, consult factory.

UL TYPE 12, IP61 (enclosed) CE



## DQ SERIES, 1/4 DIN DIGITAL THERMOSTATS DUAL SETPOINT WITH 10 FT. FEP SLEEVED SENSOR

MODEL NUMBER	VOLTS	MAX. AMPS	TEMP. RANGE	SENSOR LENGTH Ft./m	REPL. SENSOR P/N	SHIP WGT. Lbs./kg
DQ15	85-240	20	0-500°F (0-260°C)	10' (3)	RTD1000	3 (1.5)

Longer sensor lengths, thermocouples, 100 ohm RTDs, voltage, current and frequency inputs as well as 4-20 mA outputs available as options, consult factory.

## DQ SERIES, DIGITAL COMBINATION CONTROLS ONE OR THREE PHASE WITH 10 FT. FEP SLEEVED SENSOR

UL TYPE 1, IP60



MODEL NUMBER	VOLTS (See Pg. 1)	MAX. AMPS	REPL. RELAY P/N	REPL. RELAY P/N LESS TRANS.	REPL. TRANS.	REPL. SENSOR P/N	SHIP WGT. Lbs./kg
DQ302	240	30	AH30-1	AH30-2	HD50 2/1	RTD1000	16
DQ304	480	30	AH30-1	---	HD50 4/1	RTD1000	(7.5)
DQ502	240	50	AH50-1	AH50-2	HD50 2/1	RTD1000	17
DQ504	480	50	AH50-1	---	HD50 4/1	RTD1000	(8)
DQ752	240	75	AH75-1	AH75-2	HD100 2/1	RTD1000	23
DQ754	480	75	AH75-1	---	HD100 4/1	RTD1000	(10.5)
DQ902	240	90	AH90-1	AH90-2	HD100 2/1	RTD1000	25
DQ904	480	90	AH90-1	---	HD100 4/1	RTD1000	(11.5)
DQ1202	240	120	AH120-1	AH120-2	HD150 2/1	RTD1000	27
DQ1204	480	120	AH120-1	---	HD150 4/1	RTD1000	(12.5)
DQ1502	240	150	AH150-1	AH150-2	HD150 2/1	RTD1000	33
DQ1504	480	150	AH150-1	---	HD150 4/1	RTD1000	(15)

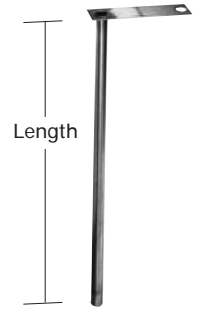
Combination control consists of gasketed plastic enclosure, thermostat, contactor and optional control transformer. Transformer must be used on 480 volts and is recommended for 240 volts. To omit step-down transformer, add "LT" to end of model number. See DQ chart for thermostat options. Longer sensor lengths and additional control options available, consult factory.

FEP is a fluorinated ethylene propylene fluoropolymer.

# ACCESSORIES

## W SERIES, THERMOWELLS

THERMOWELL MATERIAL	DIA.	OVER THE SIDE WELLS			SHIP WGT. Lbs./ (kg)
		MODEL NO. 12" LENGTH (305mm)	MODEL NO. 24" LENGTH (610mm)	MODEL NO. 36" LENGTH (915mm)	
Quartz	1/2"	WQ12	WQ24	WQ36	2 (1)
304 SS	1/2"	WF12	WF24	WF36	2 (1)
316 SS	1/2"	WS12	WS24	WS36	2 (1)
Titanium	1/2"	WT12	WT24	WT36	2 (1)
Fluoropolymer (FEP)	1/2"	WX12	WX24	WX36	2 (1)
1/2" NPT THREADED WELLS					
304 SS	1/2"	WFT12	WFT24	WFT36	2 (1)
316 SS	1/2"	WST12	WST24	WST36	2 (1)
Titanium	1/2"	WTT12	WTT24	WTT36	2 (1)
Fluoropolymer (FEP)	1/2"	WXT12	WXT24	WXT36	2 (1)



 US **UL TYPE 1, IP60**

## ETI SERIES, ELECTRONIC TEMPERATURE INDICATORS

MODEL NUMBER	TEMP. RANGE	VOLTS	SENSOR LENGTH Ft./ (m)	SENSOR P/N	SHIP WGT. Lbs./ (kg)
ETI-1	0-250°F	120	8' (2.4)	ETI-8L	3 (1.5)
ETIH-1	0-999°F	120	10' (3)	ETIH-10L	3 (1.5)

FEP fluoropolymer sleeved sensor standard for ETI-1. Optional with ETIH-1 for applications 0 - 500°



## DTS SERIES, DIGITAL TIME SWITCH

MODEL NUMBER	VOLTAGE	SWITCHING CAPACITY	SHIP WGT. Lbs./ (kg)
DTS-1	120	20A	1 (.5)

Can be ordered as part of a combination temperature control assembly.



# ELECTRIC HEATER SIZING INFORMATION

		TEMPERATURE ° F											
		100	110	120	130	140	150	160	170	180	190	200	210
GALLONS	50	1	1	1	2	2	2	2	3	3	4	4	5
	100	2	2	3	3	3	4	4	5	6	6	8	8
	200	4	4	5	6	6	7	8	9	10	11	12	14
	300	6	6	7	8	9	10	12	14	15	16	18	20
	400	8	8	9	10	12	14	16	19	20	21	24	26
	500	9	10	12	13	15	18	20	24	24	27	30	32
	600	11	12	15	16	18	21	24	28	30	32	36	38
	700	13	14	17	18	21	24	28	32	36	38	42	44
	800	15	16	19	21	24	28	32	36	40	44	48	52
	900	17	18	21	24	27	32	36	40	44	48	54	58
1000	18	21	24	27	30	36	40	44	48	54	58	64	

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

**CAUTION:** This chart is for quick *estimates* only. Use formula below for determining actual heat requirement.

## DETERMINING SPECIFIC HEATING REQUIREMENTS FOR ELECTRIC HEATERS

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

- Total cubic feet of tank. (Multiply the inside dimensions of the tank in feet - length x width x depth.)  
One m<sup>3</sup> = 35.3 ft<sup>3</sup>
- Total gallons of solution. Multiply by 7.48 the cubic feet of the tank occupied by solution. (If the solution is normally 6" below the top of the tank, allow for this when figuring.)
- Average ambient (room) temperature at which tank will be used.
- Temperature level at which solution is to be held.
- Heat up time desired.

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

$$A \times 1.0^* \times 8.35^{**} \times B = \frac{\quad}{3412 \times C}$$

$$D \times E = \frac{\quad}{\quad}$$

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 solution temperature in degrees F.  
 C = Desired heat up time (hours).  
 D = Heat loss of tank. Refer to charts below  
 E = Square feet of top of tank. Multiply length x width.  
 \* = Specific heat of water. Insert specific heat of your solution here.  
 \*\* = Weight of water in pounds. Insert specific weight of your solution here. One kilogram = 2.2 pounds.

Losses due to agitation, ventilation, and work loads should be considered in calculating total kW requirements.

SURFACE LOSSES IN KILOWATTS FROM OPEN HOT WATER TANK (°F)					
75°	.01	125°	.14	175°	.45
80°	.01	130°	.16	180°	.50
85°	.01	135°	.18	185°	.55
90°	.02	140°	.21	190°	.60
95°	.04	145°	.24	195°	.66
100°	.05	150°	.27	200°	.72
105°	.07	155°	.30	205°	.80
110°	.09	160°	.34	210°	.87
115°	.10	165°	.37	215°	.95
120°	.12	170°	.41	220°	1.04

SURFACE LOSSES IN KILOWATTS FROM OPEN HOT WATER TANK WITH MILD AIR AGITATION/VENTILATION (120 FPM, °F)					
80°	.03	130°	.30	180°	1.10
85°	.05	135°	.35	185°	1.30
90°	.07	140°	.41	190°	1.60
95°	.09	145°	.45	195°	1.95
100°	.11	150°	.51	200°	2.35
105°	.13	155°	.58	205°	2.80
110°	.15	160°	.65	210°	3.25
115°	.18	165°	.73	-	-
120°	.21	170°	.83	-	-
125°	.25	175°	.95	-	-

## AMP CALCULATION FOR CONTROL SELECTION

AMPS FOR HEATING LOAD											
Heater Watts	Single Phase						Three Phase (Balanced)				
	120V	208V	230V	240V	460V	480V	208V	230V	240V	460V	480V
1,000	8.4	4.8	4.4	4.2	2.2	2.1	2.8	2.6	2.5	1.3	1.2
2,000	16.7	9.7	8.7	8.4	4.4	4.2	5.6	5.1	4.9	2.6	2.5
3,000	25.0	14.5	13.1	12.5	6.6	6.3	8.4	7.6	7.3	3.8	3.7
4,000	33.4	19.3	17.4	16.7	8.7	8.4	11.2	10.1	9.7	5.9	4.9
6,000	50.0	28.9	26.1	25.0	13.1	12.5	16.7	15.1	14.5	7.6	7.3
8,000	66.7	38.5	34.8	33.4	17.4	16.7	22.3	20.2	19.3	10.1	9.7
9,000	75.0	43.3	39.2	37.5	19.6	18.8	25.1	22.7	21.7	11.4	10.9
12,000	100.0	57.7	52.2	50.0	26.1	25.0	33.4	30.2	29.0	15.1	14.5
18,000	150.0	86.6	78.3	75.0	39.2	37.5	50.1	45.3	43.4	22.7	21.7
27,000	225.0	129.9	117.4	112.5	58.7	56.3	75.1	67.9	65.1	34.0	32.6
36,000	300.0	173.1	156.6	150.0	78.3	75.0	100.1	90.5	86.8	45.3	43.4

For single phase or two wire power supplies to heaters.

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

Example:  $\frac{4000 \text{ watts}}{240 \text{ volts}} = 16.67 \text{ Amps}$

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:  $\frac{4000}{240 \times 1.73} = 9.63 \text{ Amps}$

Contactor sizing:

\*Amp rating per pole X 1.25= contactor rating



# COIL SIZING INFORMATION

## FORMULA FOR STEAM HEATING MEDIA

$$\frac{\text{Gallons to be Heated} \times \text{Temperature Rise Required} \times \text{Steam Pressure Factor (See Chart A)}}{1000} = \text{Square feet of area required for one hour heat-up}$$

$$\frac{A \times B \times C}{1000} = \text{Square feet of area required for one hour heat-up}$$

### Calculation process:

- 1) Determine gallons in tank. Enter this amount at (A).
- 2) Subtract the temperature of the solution to be heated from the temperature to which it must be heated. Enter this amount in (B).
- 3) Locate your useable steam pressure in the Steam Pressure Factor (see chart A) and find the factor number. Enter this at (C).
- 4) Multiply (A) times (B) times (C) and divide by 1000. This is the square foot area you require for a one hour heat-up. If more time is available, coil surface area may be reduced by dividing the square foot area by the heat-up time available, up to 4 hours, maximum.

NOTE: For operating temperatures over 170°F, consult factory.

CHART A							
Steam Pressure Available (PSI)	5#	10#	15#	20#	25#	30#	Above 30#
Steam Pressure Factor (Fluoropolymer)	2.2	2	1.7	1.5	1.3	1.1	Consult Factory
Steam Pressure Factor (Metal)	.55	.50	.42	.37	.30	.27	Consult Factory

## FORMULA FOR HOT WATER HEATING MEDIA

$$\frac{\text{Gallons in tank} \times \text{Temperature Rise Required} \times 8.33}{U \times (\text{Hot Water Temperature} - \text{Required Tank Temperature})} = \text{Square feet of area required for one hour heat-up}$$

$$\frac{A \times B \times 8.33}{U \times D} = \frac{C}{E} = \text{Square feet of area required for one hour heat-up}$$

- 1) Determine gallons in tank. Enter at (A).
- 2) Subtract temperature of solution to be heated from the temperature to which it is to be heated. Enter at (B).
- 3) Multiply (A) times (B) times 8.33. Enter answer at (C).
- 4) Subtract the required tank temperature from the temperature of your hot water supply. Enter this figure at (D).
- 5) Multiply (D) by (U) and enter answer at (E).
- 6) Divide line (C) by line E to determine square feet of area required. If more time is available, coil surface area may be reduced by dividing the square foot area by the heat-up time, up to 4 hours, maximum.

NOTE: For operating temperatures over 170°F, consult factory.

U Factor for Metal Coils = 100  
U Factor for FEP Coils = 30

## FORMULA FOR COOLING WITH ANY MEDIUM

$$\frac{\text{Volts} \times \text{Amps} \times 3.412}{U \times (\text{Required Tank Temperature} - \text{Cooling Liquid Temperature})} = \text{Square feet of surface area required}$$

$$\frac{A}{U \times B} = \frac{A}{C} = \text{Square feet of surface area required}$$

U Factor for Metal Coils = 100  
U Factor for FEP Coils = 30

This formula assumes that all electrical energy is dissipated in the tank as heat. In more efficient electrochemical conversions, the energy dissipated as heat may be less.

- 1) Determine watts by multiplying voltage times amperage delivered by the tank rectifier. Multiply this product times 3.412 to determine BTU's. Enter answer at (A).
- 2) Subtract cooling liquid temperature from required tank temperature. Enter at (B). Caution: If this number is less than 15, consult factory for assistance in determining proper coil size.
- 3) Multiply (B) times (U) and enter answer at (C).
- 4) Divide line (A) by line (C) to determine square feet of surface area required.

Check solution guide for proper sheath material selection.

# IMMERSION HEATER SOLUTION GUIDE

SOLUTION	TYPE OF HEATER	SOLUTION	TYPE OF HEATER	SOLUTION	TYPE OF HEATER
Acetic	PTFE* or Quartz	Copper Bright Acid	PTFE* or Quartz	Nitric Acid	PTFE* or Quartz
Actane 70, 80	PTFE*	Copper Cyanide	304 St. Steel	Nitric Hydrochloric Acids	PTFE* or Quartz
Actane Salt	PTFE*	Copper Fluoborate	PTFE*	<b>Nitric Phosphoric</b>	<b>Quartz</b>
Acid Sulfate	PTFE* or Quartz	Copper Pyrophosphate	304 St. Steel	<b>Oil</b>	<b>Steel</b>
Alcorite	PTFE* or Quartz	Copper Strike	304 St. Steel	Oleic Acid	PTFE* or Quartz
Alkaline Cleaners (Electrified)	304 St. Steel	Copper Sulfate	PTFE* or Quartz	<b>Paint Stripper (Alkaline)</b>	<b>304 St. Steel</b>
Alkaline Soaking Cleaners	304 St. Steel	Cyanide	304 St. Steel	<b>Perchloroethylene</b>	<b>316 St. Steel</b>
Alodine (most formulas)	316 St. Steel	Deionized Water	316 St. Steel or Titanium	<b>Phosphoric Acid (No Fluoride) ...</b>	<b>PTFE* or Quartz</b>
Alstan	304 St. Steel	Deoxidizer (Etching)	Quartz	<b>Phosphate Cleaner</b>	<b>304 St. Steel</b>
Aluminum Bright Dip	PTFE* or Quartz	Dichromic Seal	316 St. Steel	<b>Phosphate</b>	<b>316 St. Steel</b>
<b>Aluminum Cleaners</b>	<b>304 St. Steel</b>	Diethylene Glycol	304 St. Steel	Potassium Acid Sulfate	PTFE* or Quartz
Aluminum Chloride	PTFE* or Quartz	Diversey, 511, 514	PTFE*	Potassium Cyanide	304 St. Steel
Aluminum Sulfate	304 St. Steel	<b>Dow Therm</b>	<b>316 St. Steel</b>	Potassium Hydroxide	304 St. Steel
Ammonia	304 St. Steel	Dye Solutions	304 St. Steel	Potassium Hydrochloric	PTFE* or Quartz
Ammonia Persulfate	PTFE* or Quartz	Ebonal C	Titanium	<b>Potassium Permanganate</b>	<b>PTFE* or Titanium</b>
Ammonium Bi Fluoride	PTFE*	Electroless Copper	PTFE*	Rhodium	PTFE* or Quartz
Ammonium Chloride	Titanium	<b>Electroless Nickel</b>	<b>PTFE* or Titanium</b>	Rochelle Salt Cyanide	304 St. Steel
Ammonium Nitrate	316 St. Steel	Electroless Tin (Acid)	PTFE* or Quartz	Ruthenium	PTFE* or Quartz
Anodizing (Aluminum)	PTFE* or Quartz	Electroless Tin (Alkaline)	316 St. Steel	Salt (Actine)	PTFE*
ARP 28, 80 Blackening Salts	PTFE* or Quartz	Electro Cleaner	304 St. Steel	Sea Water	Titanium
Arsenic	304 St. Steel	Electro Polishing	PTFE* or Quartz	Silver Bromide	316 St. Steel
Barium Chloride	Quartz or Titanium	Enthone 80 Acid	PTFE*	Silver Cyanide	304 St. Steel
Benzoic Acid	Titanium	<b>Ethylene Glycol</b>	<b>Steel</b>	Silver Lume	304 St. Steel
Black Nickel	PTFE* or Quartz	Ferric Nitrate	304 St. Steel	Silver Nitrate	316 St. Steel
<b>Black Oxide (Hi-Temp)</b>	<b>304 St. Steel</b>	Ferric Sulfate	304 St. Steel	Sodium Bisulfate	PTFE* or Quartz
Black Oxide (Low-Temp)	Titanium	Ferric Ammonium Oxide	316 St. Steel	Sodium Carbonate	Titanium
<b>Bonderizing</b>	<b>316 St. Steel</b>	Ferric Chloride	PTFE*, Quartz, Titanium	Sodium Chlorate	Titanium
Boric Acid	Titanium	Fluorurate	PTFE*	Sodium Chloride	Titanium
Brass Cyanide	304 St. Steel	Formic Acid	316 St. Steel	Sodium Cyanide	304 St. Steel
Bright Nickel	PTFE*, Quartz, Titanium	<b>Glycerol</b>	<b>304 St. Steel</b>	Sodium Dichromate (Hot Seal) ...	316 St. Steel
Bright Copper Cyanide	304 St. Steel	Immersion Gold	304 St. Steel	Sodium Hydroxide	Steel
Bronze	304 St. Steel	Gold-Acid	PTFE*, Quartz, Titanium	Sodium Hypochlorite	PTFE*
Brown Oxide	Titanium	Gold Cyanide	304 St. Steel	Sodium Persulfate	PTFE* or Quartz
Burnite	PTFE* or Quartz	Grey Nickel	PTFE*, Quartz, Titanium	Stannate	Steel
Butyric Acid	Titanium	Hot Seal Dichromate	316 St. Steel	Stanostar	PTFE* or Quartz
Cadmium Black	PTFE* or Quartz	<b>Hydrogen Peroxide</b>	<b>PTFE* or Quartz</b>	Stearic Acid	Quartz
Cadmium (Alkaline)	304 St. Steel	Hydrochloric Acid	PTFE* or Quartz	Sulfamate Nickel	PTFE*, Quartz, Titanium
Cadmium Fluoborate	PTFE*	Hydrofluoric Acid	PTFE*	Sulfur	PTFE* or Quartz
Calcium Chloride	Titanium	Indium	PTFE* or Quartz	Sulfuric Acid	PTFE* or Quartz
Calcium Hypochlorite	Titanium	Iridite (4-75,4-73,14,14-2,14-9)	316 St. Steel	Sulfur Peroxide	PTFE* or Quartz
Calcium Acid	Titanium	Iridite (1,2,3,4-C,7,8,15)	PTFE* or Quartz	Sulphamic Acid	PTFE* or Quartz
<b>Caustic Etch</b>	<b>Steel</b>	Iron Fluoborate	PTFE*	Tannic Acid	Titanium
Caustics	Steel	<b>Iron Phosphate</b>	<b>316 St. Steel</b>	Tin Nickel	PTFE*
<b>Caustics (highly concentrated 20% and over)</b>	<b>Steel</b>	Isoprep (186,187,188)	316 St. Steel	Tin Plating (Acid)	
Chlorine/Wet	PTFE* or Quartz	Isoprep Acid Salts	PTFE*	(Stanus/Sulphate)	PTFE* or Quartz
Chloride	PTFE*, Quartz or Titanium	Jetal	304 St. Steel	Tin Plating Acid (Fluorurate)	PTFE*
Chlorosulfuric Acid	Titanium	Lead Acetate	304 St. Steel	Tin Plating (Alkaline)	304 St. Steel
Chromic Anodizing	PTFE* or Quartz	<b>Lime Saturated Water (Alkaline)</b>	<b>316 St. Steel</b>	<b>Trichlorethylene</b>	<b>316 St. Steel</b>
Chromic Acetate	PTFE* or Quartz	Linseed Oil	304 St. Steel	Trioxide (Pickle)	PTFE* or Quartz
Chromic Nickel	PTFE* or Quartz	<b>Magnesium Hydroxide</b>	<b>304 St. Steel</b>	<b>Turco (4181, 4338)</b>	<b>316 St. Steel</b>
Chromium (No Fluorides)	PTFE*, Quartz, Titanium	Magnesium Nitrate	PTFE* or Quartz	Unichrome	PTFE* or Quartz
Chromium (Fluoride)	PTFE*	<b>Manganese Phosphate</b>	<b>316 St. Steel</b>	Water	316 St. Steel or Quartz
Citric Acid	Titanium	McDermid 629	PTFE*	Wood's Nickel Strike	Titanium, PTFE*, Quartz
Clear Chromate	PTFE* or Quartz	Mercuric Chloride	Titanium	Yellow Dichromate	PTFE* or Quartz
Cobalt Nickel	PTFE*, Quartz, Titanium	Muriatic Acid	PTFE* or Quartz	Zinc Acid	PTFE* or Titanium
Cobalt Plating	304 St. Steel	Nickel (Plating Solution)		Zinc Ammonium Chloride	Quartz or Titanium
Cobra Etch	PTFE*	(Watts)	PTFE*, Quartz, Titanium	Zinc Cyanide	304 St. Steel
Copper Acid	PTFE* or Quartz	Nickel Acetate Seal	316 St. Steel	<b>Zinc Phosphate</b>	<b>316 St. Steel</b>
		Nickel Chloride	Titanium	Zinc Phosphate (Fluoride)	PTFE
				Zincate	304 St. Steel

Solutions requiring derated heaters are indicated by **bold, italicized** type.

**THE DATA LISTED IS PROVIDED GRATIS AND IS OFFERED AS A GUIDE ONLY. IT IS NOT INTENDED TO BE USED AS THE SOLE BASIS OF DESIGN OR TO ESTABLISH SPECIFICATION LIMITS. PROCESS TECHNOLOGY ASSUMES NO OBLIGATION OR LIABILITY FOR ANY ADVICE FURNISHED BY IT OR FOR RESULTS OBTAINED FROM USE. DUE TO THE COMPLEXITIES OF SOLUTIONS AND APPLICATIONS. CUSTOMERS MUST CONTACT THEIR CHEMICAL SUPPLIER FOR HEATER MATERIAL COMPATIBILITY AND RECOMMENDATIONS. FOR APPLICATIONS INVOLVING SOLUTION CONCENTRATIONS EXCEEDING 50%, CONSULT FACTORY FOR WATT DENSITY RECOMMENDATIONS.**

**DO NOT USE ELECTRIC IMMERSION HEATERS TO HEAT FLAMMABLE SOLUTIONS!**

\*PTFE is a polytetrafluoroethylene fluoropolymer.



## 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 pro-rated 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 INSURE APPLICABILITY OF HEATER BEFORE INSTALLATION SINCE WE CANNOT GUARANTEE HEATERS AGAINST PREMATURE FAILURE DUE TO CORROSION OR CHEMICAL DESTRUCTION CAUSED BY UNUSUAL CONDITIONS OVER WHICH WE HAVE NO CONTROL SUCH AS:

- Excessively high solution temperatures
- The concentration of the solution
- The presence of inhibitors
- The presence of other acids causing a secondary reaction
- Flux floating on the surface
- The presence of dissolved gases
- Excessive sludge build-up
- Stagnant or turbulent flow of the solution
- Aeration
- Presence of oxygen or an oxidizing agent in the solution
- Erosion

## 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 product. To avoid processing delays, please be sure to include:

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



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

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

W A R N I N G

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



IGNITION SOURCE



SHOCK HAZARD



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