

Flanged Pipe Heaters - FPH

Caloritech™ FPH Series Flanged Pipe Insert Heaters consist of closely spaced insert pipes mounted to a common flange. Each pipe in the flange is fitted with an independent heavy duty alloy sheathed heating element. The insert pipes and flange provide the heater with a sealed installation, keeping the elements from contacting the fluid in the tank. Heater elements are individually removable in the event of servicing without draining the tank.

The FPH is suited to applications requiring a higher kW rating than can be achieved with individual pipe insert heaters. This type of heater is particularly suitable for liquid heating applications requiring low watt densities such as in large bunker oil storage tanks.



Application

Flanged pipe heaters are uniquely designed to heat storage tanks containing highly viscous, corrosive or heat sensitive materials.

High viscosity, heavy liquids such as asphalt, molasses, tar, paint, wax and some oils have poor heat transfer at low temperatures.

For these liquids, careful consideration must be given to the rate of heat transfer into the product since boiling and coking of the liquid at the heating surface can occur, spoiling tank contents and shortening heater life.

FPH heaters are specifically engineered to reduce overall watt density by maximizing pipe surface area. The large surface area allows for greater kW ratings while maintaining low surface temperatures and controlled heat transfer.

Construction

Standard heaters listed utilize 2", 2 1/2" or 3" SCH.40 steel pipe welded to a 150 lb ANSI rated steel flange. Stainless steel construction is available depending on the application. Heater sizes and ratings are specified based on flange layouts maximizing pipe surface area.

FPH heaters use heavy duty alloy sheathed elements fitted to a 2" or 2 1/2" NPT screwplug for single pipe insert heaters or networked inside the terminal box for units with multiple pipe inserts. Heaters are available

with single hairpin elements, double hairpin elements, triple hairpin elements or three straight elements.

Moisture resistant and/or explosion resistant terminal housings are available for all flanged pipe insert heater sizes.

Caloritech™ manufactures standard and custom designed control panels, engineered to match the specific requirements of tank heating systems. See Section D for listings of CPA, CPB and CPP panels.

Special Features

- Custom voltage
- Custom wattage
- Custom Materials
- Explosion resistant terminal housings
- Built-in thermostat/limits
- Custom lengths
- Various flange sizes
- Control systems
- Partial U-stamp
- Watt densities available below 5 W/in²

Selection

Flanged pipe insert heaters are listed in ascending flange size. Three specific watt densities are listed although additional watt densities are available through special order.

Flanged pipe insert heaters should be selected based on required heating load, flange size, pipe insert length and the maximum watt density for the application.

Standard heaters are constructed with a moisture resistant terminal housing. Optional explosion resistant terminal housings are available.

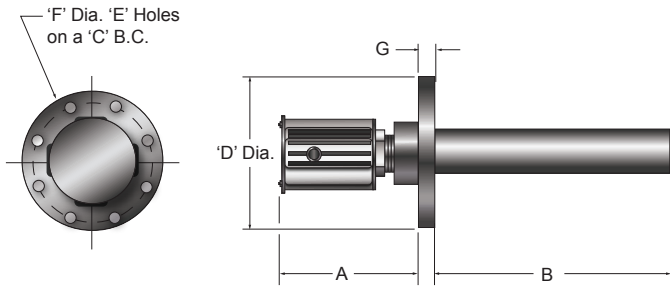


Figure 40

Table 45 – 3" to 4" Flange Heater Dimensions

Flange Size	Flange Rating	A		C		D		E Holes	F		G	
		in	mm	in	mm	in	mm		in	mm	in	mm
3	150	9.625	244	6.000	152	7.500	191	4	0.750	19	0.938	24
	300			6.625	168	8.250	210	8	0.875	22	1.125	29
4	150	9.625	244	7.500	191	9.000	229	8	0.750	19	0.938	24
	300			7.875	200	10.000	254	8	0.875	22	1.250	32

Table 46 – 3" 150 lb (Steel Flange)

	kW	Pipe Length 'B'		Std. Voltages 208, 240, 480, 600	Pipe Surface Watt Density		Catalog No.
		in	mm		W/in ²	W/cm ²	
High Density 7.5 W/in ² (1.2 W/cm ²)	7	140	3556	1 or 3 Phase	7.5	1.2	FPH107F3140
	5	105	2667				FPH105F3105
	5	90	2286				FPH105F390
	3	60	1524				FPH103F360
Medium Density 5 W/in ² (0.8 W/cm ²)	5	140	3556		5.0	0.8	FPH105F3140
	3	105	2667				FPH103F3105
	3	90	2286				FPH103F390
	2	60	1524				FPH102F360
Low Density 3 W/in ² (0.5 W/cm ²)	3	140	3556		3.0	0.5	FPH103F3140
	2	105	2667				FPH102F3105
	2	90	2286				FPH102F390
	1	60	1524				FPH101F360

Table 47 – 4" 150 lb (Steel Flange)

	kW	Pipe Length 'B'		Std. Voltages 208, 240, 480, 600	Pipe Surface Watt Density		Catalog No.
		in	mm		W/in ²	W/cm ²	
High Density 7.5 W/in ² (1.2 W/cm ²)	11	140	3556	1 or 3 Phase	7.5	1.2	FPH111F4140
	8	105	2667				FPH108F4105
	7	90	2286				FPH107F490
	5	60	1524				FPH105F460
Medium Density 5 W/in ² (0.8 W/cm ²)	7	140	3556		5.0	0.8	FPH107F4140
	5	105	2667				FPH105F4105
	5	90	2286				FPH105F490
	3	60	1524				FPH103F460
Low Density 3 W/in ² (0.5 W/cm ²)	4	140	3556		3.0	0.5	FPH104F4140
	3	105	2667				FPH103F4105
	3	90	2286				FPH103F490
	2	60	1524				FPH102F460

To Order Specify

- Quantity
- Catalog number
- Voltage
- Wattage
- Special features

Table 48 – 5" to 10" Flange Heater Dimensions

Flange Size	Flange Rating	A		C		D		E Holes	F		G			
		in	mm	in	mm	in	mm		in	mm	in	mm		
5	150	7.000	178	8.500	216	10.000	254	8	0.875	22	0.938	24		
	300			9.250	235	11.000	279				8	1.375	35	
6	150			9.500	241	11.000	279	8			1.000	25		
	300			10.625	270	12.500	318	12			1.438	37		
8	150			11.750	298	13.500	343	8			0.875	22	1.125	29
	300			13.000	230	15.000	381	12			1.000	25	1.625	41
10	150			14.250	362	16.000	406	12			1.000	25	1.188	30
	300			15.250	387	17.500	445	16			1.125	29	1.875	48

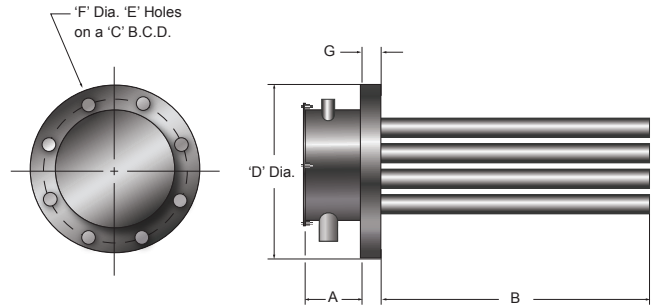


Table 49 – 5" 150 lb (Steel Flange)

	kW	Pipe Length 'B'		Std. Voltages 208, 240, 480, 600	Pipe Surface Watt Density		Catalog No.
		in	mm		W/in ²	W/cm ²	
High Density 7.5 W/in ² (1.2 W/cm ²)	11	140	3556	1 or 3 Phase	7.5	1.2	FPH111F5140
	8	105	2667				FPH108F5105
	7	90	2286				FPH107F590
	5	60	1524				FPH105F560
Medium Density 5 W/in ² (0.8 W/cm ²)	7	140	3556		5.0	0.8	FPH107F5140
	5	105	2667				FPH105F5105
	5	90	2286				FPH105F590
	3	60	1524				FPH103F560
Low Density 3 W/in ² (0.5 W/cm ²)	4	140	3556		3.0	0.5	FPH104F5140
	3	105	2667				FPH103F5105
	3	90	2286				FPH103F590
	2	60	1524				FPH102F560

Table 51 – 8" 150 lb (Steel Flange)

	kW	Pipe Length 'B'		Std. Voltages 208, 240, 480, 600	Pipe Surface Watt Density		Catalog No.
		in	mm		W/in ²	W/cm ²	
High Density 7.5 W/in ² (1.2 W/cm ²)	22	140	3556	1 or 3 Phase	7.5	1.2	FPH322F8140
	16	105	2667				FPH316F8105
	15	90	2286				FPH315F890
	10	60	1524				FPH310F860
Medium Density 5 W/in ² (0.8 W/cm ²)	15	140	3556		5.0	0.8	FPH315F8140
	11	105	2667				FPH311F8105
	10	90	2286				FPH310F890
	6	60	1524				FPH306F860
Low Density 3 W/in ² (0.5 W/cm ²)	9	140	3556		3.0	0.5	FPH309F8140
	7	105	2667				FPH307F8105
	6	90	2286				FPH306F890
	4	60	1524				FPH304F860

Table 50 – 6" 150 lb (Steel Flange)

	kW	Pipe Length 'B'		Std. Voltages 208, 240, 480, 600	Pipe Surface Watt Density		Catalog No.
		in	mm		W/in ²	W/cm ²	
High Density 7.5 W/in ² (1.2 W/cm ²)	11	140	3556	1 or 3 Phase	7.5	1.2	FPH111F6140
	8	105	2667				FPH108F6105
	7	90	2286				FPH107F690
	5	60	1524				FPH105F660
Medium Density 5 W/in ² (0.8 W/cm ²)	7	140	3556		5.0	0.8	FPH107F6140
	5	105	2667				FPH105F6105
	5	90	2286				FPH105F690
	3	60	1524				FPH103F660
Low Density 3 W/in ² (0.5 W/cm ²)	4	140	3556		3.0	0.5	FPH104F6140
	3	105	2667				FPH103F6105
	3	90	2286				FPH103F690
	2	60	1524				FPH102F660

Table 52 – 10" 150 lb (Steel Flange)

	kW	Pipe Length 'B'		Std. Voltages 208, 240, 480, 600	Pipe Surface Watt Density		Catalog No.
		in	mm		W/in ²	W/cm ²	
High Density 7.5 W/in ² (1.2 W/cm ²)	58	240	6096	1 or 3 Phase	7.5	1.2	FPH358F10240
	34	140	3556				FPH334F10140
	26	105	2667				FPH326F10105
	22	90	2286				FPH322F1090
Medium Density 5 W/in ² (0.8 W/cm ²)	38	240	6096		5.0	0.8	FPH338F10240
	22	140	3556				FPH322F10140
	16	105	2667				FPH316F10105
	15	90	2286				FPH315F1090
Low Density 3 W/in ² (0.5 W/cm ²)	22	240	6096		3.0	0.5	FPH322F10240
	13	140	3556				FPH313F10140
	10	105	2667				FPH310F10105
	9	90	2286				FPH309F1090

To Order Specify

- Quantity
- Wattage
- Catalog number
- Special features
- Voltage

Table 53 – 12" to 20" Heater Dimensions

Flange Size	Flange Rating	A		C		D		E Holes	F		G	
		in	mm	in	mm	in	mm		in	mm	in	mm
12	150	9.000	229	17.000	432	19.000	483	12	1.000	25	1.250	32
	300			17.750	451	20.500	524	16	1.250	32	2.000	51
14	150			18.750	476	21.000	533	12	1.375	35	1.375	35
	300			20.250	514	23.000	584	20	1.250	32	2.125	54
16	150			21.250	540	23.500	597	16	1.125	29	1.438	37
	300			22.500	572	25.500	648	20	1.375	35	2.250	57
18	150			22.750	578	25.000	635	16	1.250	32	1.563	40
	300			24.750	629	28.000	711	24	1.375	35	2.375	60
20	150			25.000	635	27.500	699	20	1.250	32	1.688	43
	300			27.000	686	30.500	775	24	1.375	35	2.500	64

Table 54 – 12" 150 lb (Steel Flange)

	kW	Pipe Length 'B'		Std. Voltages 208, 240, 480, 600	Pipe Surface Watt Density		Catalog No.
		in	mm		W/in ²	W/cm ²	
High Density 7.5 W/in ² (1.2 W/cm ²)	94	240	6096	1 or 3 Phase	7.5	1.2	FPH794F12240
	54	140	3556				FPH754F12140
	40	105	2667				FPH740F12105
	34	90	2286				FPH734F1290
Medium Density 5 W/in ² (0.8 W/cm ²)	62	240	6096		FPH762F12240		
	36	140	3556		FPH736F12140		
	26	105	2667		FPH726F12105		
	22	90	2286		FPH722F1290		
Low Density 3 W/in ² (0.5 W/cm ²)	36	240	6096		FPH736F12240		
	22	140	3556		FPH722F12140		
	16	105	2667		FPH716F12105		
	14	90	2286		FPH714F1290		

Table 55 – 14" 150 lb (Steel Flange)

	kW	Pipe Length 'B'		Std. Voltages 208, 240, 480, 600	Pipe Surface Watt Density		Catalog No.
		in	mm		W/in ²	W/cm ²	
High Density 7.5 W/in ² (1.2 W/cm ²)	110	240	6096	1 or 3 Phase	7.5	1.2	FPH7110F14240
	66	140	3556				FPH766F14140
	50	105	2667				FPH750F14105
Medium Density 5 W/in ² (0.8 W/cm ²)	76	240	6096		FPH776F14240		
	44	140	3556		FPH744F14140		
	32	105	2667		FPH732F14105		
Low Density 3 W/in ² (0.5 W/cm ²)	44	240	6096		FPH744F14240		
	26	140	3556		FPH726F14140		
	20	105	2667		FPH720F14105		

Table 56 – 16" 150 lb (Steel Flange)

	kW	Pipe Length 'B'		Std. Voltages 208, 240, 480, 600	Pipe Surface Watt Density		Catalog No.
		in	mm		W/in ²	W/cm ²	
High Density 7.5 W/in ² (1.2 W/cm ²)	160	240	6096	1 or 3 Phase	7.5	1.2	FPH12160F16240
	94	140	3556				FPH1294F16140
	70	105	2667				FPH1270F16105
Medium Density 5 W/in ² (0.8 W/cm ²)	105	240	6096		FPH12105F16240		
	62	140	3556		FPH1262F16140		
	46	105	2667		FPH1246F16105		
Low Density 3 W/in ² (0.5 W/cm ²)	64	240	6096		FPH1264F16240		
	36	140	3556		FPH1236F16140		
	28	105	2667		FPH1228F16105		

Table 57 – 18" 150 lb (Steel Flange)

	kW	Pipe Length 'B'		Std. Voltages 208, 240, 480, 600	Pipe Surface Watt Density		Catalog No.
		in	mm		W/in ²	W/cm ²	
High Density 7.5 W/in ² (1.2 W/cm ²)	185	240	6096	1 or 3 Phase	1.2	1.2	FPH14185F18240
	110	140	3556				FPH14110F18140
	82	105	2667				FPH1482F18105
Medium Density 5 W/in ² (0.8 W/cm ²)	125	240	6096		FPH14125F18240		
	72	140	3556		FPH1472F18140		
	54	105	2667		FPH1454F18105		
Low Density 3 W/in ² (0.5 W/cm ²)	74	240	6096		FPH1474F18240		
	44	140	3556		FPH1444F18140		
	32	105	2667		FPH1432F18105		

Table 58 – 20" 150 lb (Steel Flange)

	kW	Pipe Length 'B'		Std. Voltages 208, 240, 480, 600	Pipe Surface Watt Density		Catalog No.
		in	mm		W/in ²	W/cm ²	
High Density 7.5 W/in ² (1.2 W/cm ²)	255	240	6096	1 or 3 Phase	7.5	1.2	FPH19255F20240
	145	140	3556				FPH19145F20140
	110	105	2667				FPH19110F20105
Medium Density 5 W/in ² (0.8 W/cm ²)	170	240	6096		FPH19170F20240		
	98	140	3556		FPH1998F20140		
	74	105	2667		FPH1974F20105		
Low Density 3 W/in ² (0.5 W/cm ²)	100	240	6096		FPH19100F20240		
	58	140	3556		FPH1958F20140		
	44	105	2667		FPH1944F20105		

To Order Specify

- Quantity
- Wattage
- Catalog number
- Special features
- Voltage