Flanged Immersion Heaters

Flanged Immersion Heaters are designed for use in tanks and pressurized vessels to heat both liquids and gases. They mate to a companion flange that is either welded to a tank wall or, for circulating type heaters, to a pipe. See pages 11-46 through 11-69 for TEMPCO circulation heaters, which consist of a flange heater and a pipebody pressure vessel assembly.

Design Features

The catalog items listed on pages 11-32 through 11-44 have the following features, making them suitable for many applications:

- ✳ *150-lb forged steel or 316 stainless steel flanges*
- ✳ *Gasket Supplied*
- ✳ *Incoloy® 800, 316 stainless steel, steel or copper tubular elements*
- ✳ *Element hairpin bends are spanked in specially designed dies to re-compact the MgO insulating powder*
- ✳ *Silicone resin seal of elements standard*
- ✳ *1/2" OD thermowell for a 3/8" diameter sensing bulb*
- ✳ *NEMA 1 electrical enclosure*
- ✳ *Standard heaters have elements wired into branch circuits having a maximum current of 48 Amps*

The items listed in this catalog are only a small sample of the heaters that can be supplied by TEMPCO. The next few pages will describe both standard and optional materials and features available to meet the requirements of your application.

Checklist — Selecting the Proper Flanged Heater

☑ Determine a Safe and Efficient Element Watt Density

Element Watt Density is the wattage dissipated per square inch of the element sheath surface and is calculated with the following formula:

$$\text{Watt Density} = \frac{\text{element wattage}}{\pi \times \text{element dia.} \times \text{element heated length}}$$

For a particular application, element watt density will govern element sheath temperature. Factors to consider when choosing a suitable watt density are:

1. Many materials are heat sensitive and can decompose or be damaged if the element is running too hot.
2. Air and other gases that are poor conductors of heat require watt densities matched to the velocity of the gas flow to prevent element overheating.
3. When heating hard water and cleaning solutions mineral deposits can build up on the element sheath, acting as a heat insulator and raising the internal element temperature. If these deposits cannot be periodically removed, use a lower watt density element to increase heater life expectancy.

☑ Determine Pressure-Temperature Rating of Flange Required

NOTE: Catalog heaters listed on pages 11-32 through 11-44 have Class 150-lb flanges. For heaters with a higher Pressure-Temperature Rating consult Tempco.

Pressure-Temperature Ratings Class 150-LB *(Pressure in PSIG)*

Flange Material	Temperature °F (°C)													
	-20 to 100 (-28.9 to 37.8)	200 (93.3)	300 (148.9)	400 (204.4)	500 (260.0)	600 (315.6)	650 (343.3)	700 (371.1)	750 (398.9)	800 (426.7)	850 (454.4)	900 (482.2)	950 (510.0)	1000 (537.8)
A105 Steel	285	260	230	200	170	140	125	110	95	80	—	—	—	—
316 Stainless	275	240	215	195	170	140	125	110	95	80	65	50	35	20
304 Stainless	275	235	205	180	170	140	125	110	95	80	65	50	35	20

Checklist — Selecting the Proper Flanged Heater, *continued*

☑ Select the Element Sheath Material

Sheath Material Selection

CORROSION. In addition to selecting a sheath material that is compatible with the heated medium, other factors that affect corrosion need to be considered:

1. **The temperature of the corrodent** — As temperature increases the degree of corrosion increases. Also remember that usually the element temperature is higher than the material it is heating.
2. **The degree of aeration to which a corrodent is exposed** — Stagnant conditions can deprive the stainless steels of oxygen, which is required to maintain their corrosion resistant surface.
3. **Velocity of the corrodent** — Increased velocity can increase the corrosion rate.

Note: **See pages** 16-12 through 16-20 for the recommended sheath materials for many immersion heating applications. If you are purchasing the material you are heating, check with the supplier for their recommendations.

Standard Element Sheath Materials

Incoloy® 800 — A Nickel (30-35%), Chromium (19-23%), Iron alloy. The high nickel content of this alloy contributes to its resistance to scaling and corrosion. Used in air heating (also see Incoloy® 840) and immersion heating of potable water and other liquids that are not corrosive to an Incoloy® 800 sheath.

Low Carbon Steel — Applications include fluid heat transfer media, tar, high to low viscosity petroleum oils, asphalt, wax, molten salt, and other solutions not corrosive to a steel sheath.

316 Stainless Steel — A Chromium (16-18%), Nickel (11-14%), Iron Alloy with Molybdenum (2-3%) added to improve corrosion resistance in certain environments, especially those that would tend to cause pitting due to the presence of chlorides. Applications include deionized water.

Copper — Mainly used in clean water heating for washrooms, showers, rinse tanks and freeze protection of storage tanks.

Optional Element Sheath Materials

304 Stainless Steel — A Chromium (18-20%), Nickel (8-11%), Iron Alloy used in the food industry, sterilizing solutions, air heating and many organic and inorganic chemicals.

321 Stainless Steel — A Chromium (17-20%), Nickel (9-13%), Iron Alloy modified with the addition of titanium to prevent carbide precipitation and the resulting intergranular corrosion that can take place in certain mediums when operating in the 800-1200°F (427-649°C) temperature range.

Incoloy® 840 — A Nickel (18-20%), Chromium (18-22%), Iron alloy. Incoloy 840® has about 10% less nickel than Incoloy 800. Used in many air heating applications where it has exhibited superior oxidation resistance at less cost than Incoloy 800®.

Incoloy® 825 — A Nickel (38-46%), Chromium (19.5-23.5%), Molybdenum (2-3%) Iron alloy. Consult Tempco for more information.

Surface Treatments for Stainless Steel and Incoloy® Elements and other Wetted Parts to Improve Corrosion Resistance

Flanged Immersion Heater surfaces in contact with the material being heated can be passivated or electro-polished to improve their resistance to corrosion.

Passivation removes surface contamination, usually iron, so that the optimum corrosion resistance of the stainless steel is maintained. Surface contamination would come from the small amount of steel that may be worn off a tool during the manufacturing process. Passivating is accomplished by dipping the heater in a warm solution of nitric acid.

Electro-Polishing is an electrochemical process that removes surface imperfections and contaminants, enhancing the corrosion resisting ability of the stainless steels. The resultant surface is clean, smooth and bright. Many medical and food applications require this finish.

☑ Select Optional Flange and Gasket Materials

Optional flange materials include:

- ✳ *304, 304L Stainless Steel*
- ✳ *316L Stainless Steel*
- ✳ *Incoloy® 800*

Gaskets of different types, including spiral wound metal with non-metallic filler, are available to properly seal any flanged heater. Gasket material choice depends on operating conditions and fluid compatibility. Consult TEMPCO for help with your selection.

CONTINUED

Checklist — Selecting the Proper Flanged Heater, *continued*

☑ Select Standard Terminal Housing

Standard catalog flanged immersion heaters are supplied with the general purpose **Type 1N** (NEMA 1) terminal housing as shown below. If an optional thermostat is installed, the housing supplied is the **Type 1T** (NEMA 1). See pages 11-6 through 11-10 for thermostats and accessories.

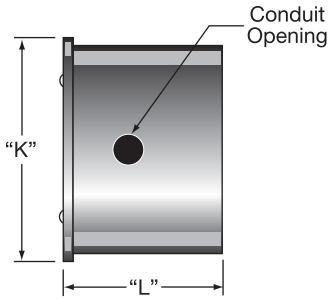
Additional housing types for use with and without a thermostat include:

Moisture Resistant (NEMA 4)
Explosion Resistant (NEMA 7)
Moisture/Explosion Resistant (NEMA 4/7).

If the housings on this and the following page do not meet the size, construction or other criteria of your application, consult Tempco with your requirements.

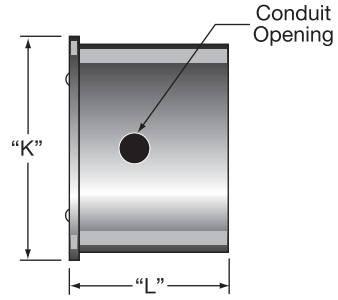
Standard NEMA 1 Terminal Housings for all Size Flanges

TYPE 1N (For use with heaters having no thermostat)



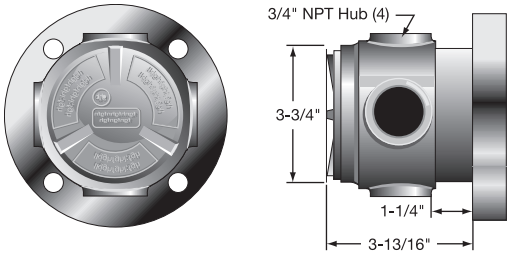
Flange Size	"K" in	"K" mm	"L" in	"L" mm	Conduit Opening
3	4-1/8	105	3-1/16	78	1-1/8
4	6	152	4	102	1-1/8
5	6-3/8	162	4	102	1-1/8
6	7-13/16	198	5-3/8	137	1-1/8
8	9-7/8	251	5-3/8	137	1-3/8
10	11-3/4	298	6	152	1-3/4
12	13-3/4	349	6	152	1-3/4
14	15-1/4	387	6	152	1-3/4

TYPE 1T (For use with heaters with a thermostat)



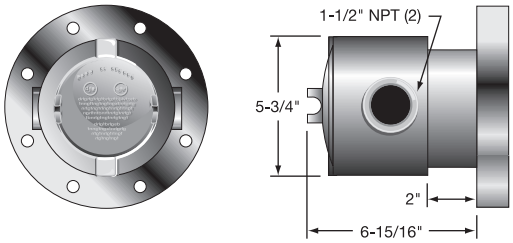
Flange Size	"K" in	"K" mm	"L" in	"L" mm	Conduit Opening
3	4-1/8	105	6	152	1-1/8
4	6	152	6	152	1-1/8
5	6-5/8	168	6	152	1-1/8
6	7-13/16	198	6	152	1-1/8
8	9-7/8	251	6	152	1-3/8
10	CALL TEMPCO				
12					
14					

Standard NEMA 4 and/or 7 Terminal Housings for 3" Flanges



TYPE 2N (For use with heaters having no thermostat)

NEMA 4 rating requires the use of the cover gasket.



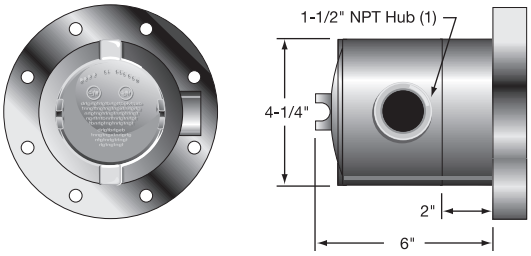
TYPE 2T (For use with heaters with thermostat)

NEMA 4 rating requires the use of the cover gasket.

Standard NEMA 4 and/or 7 Terminal Housings for 4" and 5" Flanges

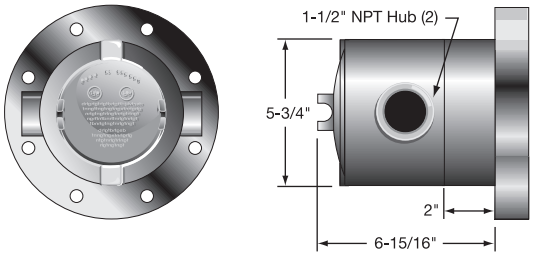
TYPE 3N (heaters having no thermostat)

NEMA 4 rating requires the use of the cover gasket.



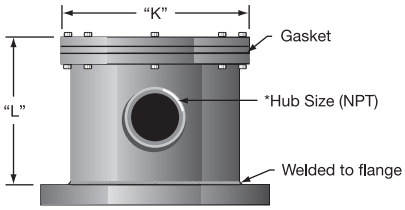
TYPE 3T (heaters with thermostat)

NEMA 4 rating requires the use of the cover gasket.



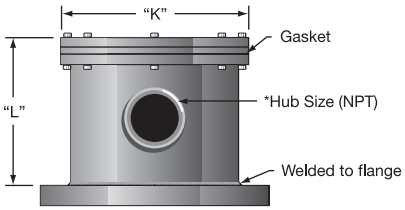
Standard NEMA 4 Terminal Housings for 6" through 14" Flanges

TYPE 4N (For use with heaters with no thermostat)



Flange Size	"K" in	"K" mm	"L" in	"L" mm	Hub Size (NPT)
6	8	203	6	152	2
8	10	254	6	152	2
10	13-3/4	349	6	152	2-1/2
12	15-5/8	397	6	152	2-1/2
14	17-1/4	438	6	152	2-1/2

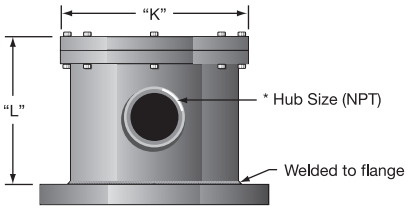
TYPE 4T (For use with heaters with thermostat)



Flange Size	"K" in	"K" mm	"L" in	"L" mm	Hub Size (NPT)
6	8	203	6	152	2
8	10	254	6	152	2
10	13-3/4	349	7-1/2	191	2-1/2
12	15-5/8	397	7-1/2	191	2-1/2
14	17-1/4	438	7-1/2	191	2-1/2

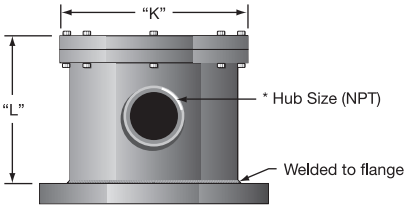
Standard NEMA 7 Terminal Housings for 6" through 14" Flanges

TYPE 5N (For use with heaters with no thermostat)



Flange Size	"K" in	"K" mm	"L" in	"L" mm	Hub Size (NPT)
6	9-3/8	203	6	152	2
8	11-1/2	254	6	152	2
10	13-3/4	349	6	152	2-1/2
12	13-5/8	397	6	152	2-1/2
14	17-1/2	438	6	152	2-1/2

TYPE 5T (For use with heaters with thermostat)

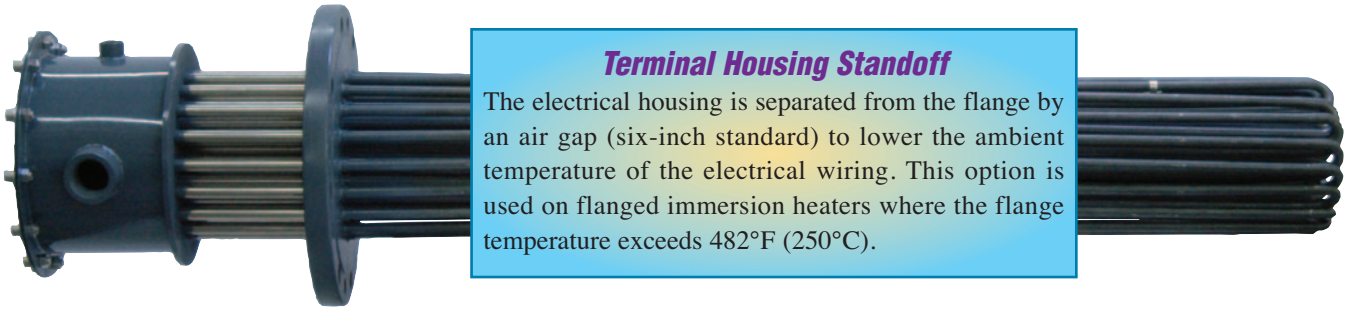


Flange Size	"K" in	"K" mm	"L" in	"L" mm	Hub Size (NPT)
6	9-3/8	203	7-1/2	191	2
8	11-1/2	254	7-1/2	191	2
10	13-3/4	349	7-1/2	191	2-1/2
12	13-5/8	397	7-1/2	191	2-1/2
14	17-1/2	438	7-1/2	191	2-1/2

CAUTION

Explosion resistant terminal housings are intended to provide containment of an explosion in the enclosure only. No portion of the heater assembly outside the enclosure is covered under this NEMA rating. Abnormal use of a heater which results in excessive temperature can create hazardous conditions such as a fire. Never perform any type of service nor remove the housing cover prior to disconnecting all electrical power to the heater.

Optional Terminal Housing Standoff Construction



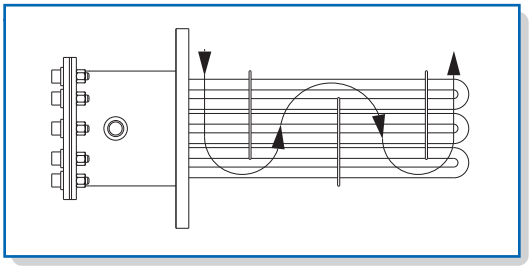
Terminal Housing Standoff

The electrical housing is separated from the flange by an air gap (six-inch standard) to lower the ambient temperature of the electrical wiring. This option is used on flanged immersion heaters where the flange temperature exceeds 482°F (250°C).

Optional Flanged Heater Features

Flow Control Baffles

For flange heaters used in circulation tanks, to aid heat transfer by forcing the liquid or gas back and forth across the elements. Baffles can be custom designed and positioned for your application.



Temperature Control

Thermostats

Thermostats are an optional feature for flanged immersion heaters. This type of control operates by expansion and contraction of a liquid in response to temperature change. Liquid contained within the sensing bulb and capillary flexes a diaphragm, causing the opening and closing of a snap action switch. For heating applications the contacts are normally closed, and open on temperature rise.

Installation Warnings and Recommendations

CAUTION

1. ***Do not use the thermostat as a power switch. Use some other means of disconnecting power to the heater for servicing.***
2. ***A thermostat is not a fail-safe device. Use an approved high temperature limit control and/or pressure limit control for safe operation.***
3. ***Avoid kinking or bending the capillary tube too sharply as this will alter the calibration and/or render the thermostat inoperable.***
4. ***Excess capillary tube should be coiled neatly in junction box.***
5. ***The capillary tube must never touch the thermostat contacts as this will create an electrical short capable of harming personnel and/or equipment.***

Thermocouples

Type J or Type K thermocouples can be supplied for process temperature or over-temperature control. Type J is reliable and accurate for temperatures up to 1000°F (537.8°C). Type K should be used for higher temperatures.

For measuring process temperatures, the thermocouple can be mounted in a thermowell in the center of the element bundle. Note that a location somewhere away from the heater may give a more accurate measurement of process temperature.

For over-temperature protection, the thermocouple is usually attached to one of the elements and any unusual rise in element temperature would shut the heater down. This thermocouple may also be mounted in a thermowell, which is then attached to one of the heating elements if desired. This protects the thermocouple from the solution being heated and allows you to replace it without removing the heater, but does increase its response time.

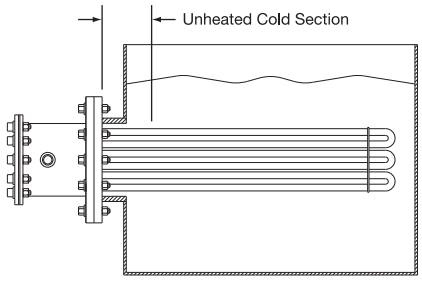
Temperature and over-temperature controls and how to choose the best control for your application can be found in Section 14.

Flanged Heater Installation and Maintenance

1. Immersion heaters should be positioned to insure they are completely covered with the liquid they are heating. However, do not position the unit too low in structures where sludge buildup could cover it. Either of these conditions could cause overheating and subsequent premature failure of the elements.
2. Heated section should start sufficiently inside tank to assure good heat transfer. On large tanks, use several smaller KW rated heaters rather than one large heater for uniform heat and watt density distribution.
3. Install adequate controls and safety devices to prevent build-up of temperature and/or pressure.
4. Make sure gasket surface is clean and dry before seating the heater.
5. Do not operate heater at a voltage in excess of that stamped on the heater. A heater can be run at a reduced voltage, remembering that this will decrease the heater's output wattage.
6. A wiring diagram is supplied in the electrical enclosure and as required, circuits on the heater are labeled.
7. All heater terminal connections should be wrench or screwdriver tight with maximum torque consistent with terminal strength. To prevent twisting heater terminals when tightening connections, use backup wrench for countertorque. Periodically check that electrical connections are clean and tight.

Quality Assured Through 100% Final Inspection

1. Resistance test — to verify wattage
2. Insulation test — to measure leakage current resistance
3. High voltage test — to "proof-test" the insulation against grounds and short circuits
4. Hydrostatic or air pressure testing — to leakproof test all welding of the elements to the flange



8. The electrical insulating material used in electric heaters is hygroscopic and may absorb moisture when subjected to a humid environment during shipping, while in storage or during long equipment shutdowns. This moisture may lower the insulation resistance enough to cause heater failure.

   A meg-ohmmeter should be used to check the insulation resistance before applying power to any questionable heater.

   If a moisture condition exists it can be corrected by baking the heater in an oven at approximately 350°F (176.7°C) until the moisture is expelled and the meg-ohms have risen to an acceptable level.
9. For heaters supplied with an integral thermostat, this thermostat functions as a temperature control only and is not a fail-safe device.
10. For TFP flanged heaters used in UL recognized oil heating applications:
    - The heated oil temperature cannot exceed 257°F (125°C)
    - TFP designs with ASA pressure rated flanges are UL rated to a maximum operating pressure of 150 psig
    - Steel sheath elements are limited to 60 watts/in^2
    - Maximum Wattage/Voltage: 45KW/480V, in 5" and smaller flange sizes with 9 elements maximum

    Contact Tempco for other application specific UL file information.

Agency Approvals

The tubular heating elements used in type TFP Flanged Immersion Heaters are UL component recognized and CSA certified in most design variations for general immersion heater use. The UL File Number is E90771 (CCN UBJY2/8) and the equivalent CSA File Number is 043099. They are also UL recognized under UL standard UL574 File Number MP4154 (CCN MDS2/8) for oil heating.

If you require UL, CSA, or other NRTL agency approvals, please specify when ordering.

Ordering Information

Catalog Heaters

Catalog Part Numbers are stocked as sub-assemblies for 2-3 week delivery.

Custom Engineered/Manufactured Heaters

An electric heater can be very application specific; for sizes and ratings not listed, **TEMPCO** will design and manufacture a Flanged Immersion Heater to meet your requirements. ***Standard lead time is 4 weeks.***

Please Specify the following:

- ❑ Wattage, Voltage and Phase
- ❑ Flange Size and Material
- ❑ Element Sheath Material
- ❑ Element Watt Density
- ❑ Element Immersion Length
- ❑ Electrical Enclosure Type
- ❑ Thermostat— if required
- ❑ Optional Features

⚠ **WARNING:** Cancer and Reproductive Harm - www.P65Warnings.ca.gov.

Made in USA

Standard Flanged Immersion Heaters

8 watts/in² (1.3 watts/cm²) — Typical Applications: Fuel Oils (Bunker C and Number 6)

✳ *150-lb Raised Face Forged Carbon Steel Flange* ✳ *Steel Sheath Heating Elements*

NOTE: Wired for 3-Phase only.

ANSI Flange Size	Immersed Length in	Immersed Length mm	KW	Part Number 240V-1Ph	Circuits	240V-3Ph	Circuits	480V-1Ph	Circuits	480V-3Ph	Circuits	Approximate Net Weight lbs	Approximate Net Weight kgs
3"—150lb 3 elements	33	838	2	—		TFP02001	(1)	—		TFP02002	(1)	18	8
	48	1219	3	—		TFP02003	(1)	—		TFP02004	(1)	21	10
	64½	1638	4	—		TFP02005	(1)	—		TFP02006	(1)	24	11
	77	1956	5	—		TFP02007	(1)	—		TFP02008	(1)	26	12
4"—150lb 6 elements	40½	1029	5	—		TFP02009	(1)	—		TFP02010	(1)	35	16
	48	1219	6	—		TFP02011	(1)	—		TFP02012	(1)	38	17
	64½	1638	8	—		TFP02013	(1)	—		TFP02014	(1)	44	20
	77	1956	10	—		TFP02015	(1)	—		TFP02016	(1)	48	22
5"—150lb 6 elements	40½	1029	5	—		TFP02017	(1)	—		TFP02018	(1)	39	18
	48	1219	6	—		TFP02019	(1)	—		TFP02020	(1)	42	19
	64½	1638	8	—		TFP02021	(1)	—		TFP02022	(1)	48	22
	77	1956	10	—		TFP02023	(1)	—		TFP02024	(1)	52	24
5"—150lb 9 elements	40½	1029	7.5	—		TFP02025	(1)	—		TFP02026	(1)	46	21
	48	1219	9	—		TFP02027	(1)	—		TFP02028	(1)	50	23
	64½	1638	12	—		TFP02029	(1)	—		TFP02030	(1)	59	27
	77	1956	15	—		TFP02031	(1)	—		TFP02032	(1)	65	29
6"—150lb 12 elements	32⅞	835	8	—		TFP02033	(1)	—		TFP02034	(1)	56	25
	40⅜	1026	10	—		TFP02035	(1)	—		TFP02036	(1)	61	28
	47⅞	1216	12	—		TFP02037	(1)	—		TFP02038	(1)	66	30
	64⅜	1635	16.5	—		TFP02039	(1)	—		TFP02040	(1)	78	35
	76⅞	1953	20	—		TFP02041	(1)	—		TFP02042	(1)	86	39
6"—150lb 15 elements	32⅞	835	10	—		TFP02043	(1)	—		TFP02044	(1)	62	28
	40⅜	1026	12.5	—		TFP02045	(1)	—		TFP02046	(1)	68	31
	47⅞	1216	15	—		TFP02047	(1)	—		TFP02048	(1)	75	34
	64⅜	1635	21	—		TFP02049	(5)	—		TFP02050	(1)	89	40
	76⅞	1953	25	—		TFP02051	(5)	—		TFP02052	(1)	99	45
8"—150lb 18 elements	43¼	1099	12.5	—		TFP02053	(1)	—		TFP02054	(1)	99	45
	51¼	1302	16.5	—		TFP02055	(1)	—		TFP02056	(1)	107	49
	61¾	1569	20	—		TFP02057	(1)	—		TFP02058	(1)	117	53
	70¼	1784	24	—		TFP02059	(2)	—		TFP02060	(1)	126	57
	79¼	2013	27	—		TFP02061	(2)	—		TFP02062	(1)	136	62
8"—150lb 24 elements	43¼	1099	17	—		TFP02063	(1)	—		TFP02064	(1)	114	52
	51¼	1302	22	—		TFP02065	(2)	—		TFP02066	(1)	125	57
	61¾	1569	27	—		TFP02067	(2)	—		TFP02068	(1)	139	63
	70¼	1784	32	—		TFP02069	(2)	—		TFP02070	(1)	151	68
	79¼	2013	36	—		TFP02071	(2)	—		TFP02072	(1)	162	73
10"—150lb 27 elements	51¾	1314	25	—		TFP02073	(3)	—		TFP02074	(1)	155	70
	62¼	1581	30	—		TFP02075	(3)	—		TFP02076	(1)	171	78
	70¾	1797	35	—		TFP02077	(3)	—		TFP02078	(1)	184	83
	78¾	2000	40	—		TFP02079	(3)	—		TFP02080	(1)	196	89
12"—150lb 36 elements	51⅜	1311	34	—		TFP02081	(2)	—		TFP02082	(1)	216	98
	62⅛	1578	40	—		TFP02083	(2)	—		TFP02084	(1)	239	108
	70⅝	1794	47	—		TFP02085	(3)	—		TFP02086	(2)	267	121
	78⅝	1997	54	—		TFP02087	(3)	—		TFP02088	(2)	273	124
14"—150lb 45 elements	51½	1308	42	—		TFP02089	(3)	—		TFP02090	(3)	282	128
	62	1575	50	—		TFP02091	(3)	—		TFP02092	(3)	309	140
	70½	1791	60	—		TFP02093	(3)	—		TFP02094	(3)	330	150
	78½	1994	67	—		TFP02095	(5)	—		TFP02096	(3)	351	159

NOTE: Flanges 8" and larger are 7 watts/in² (1.1 watts/cm²)

Standard Flanged Immersion Heaters

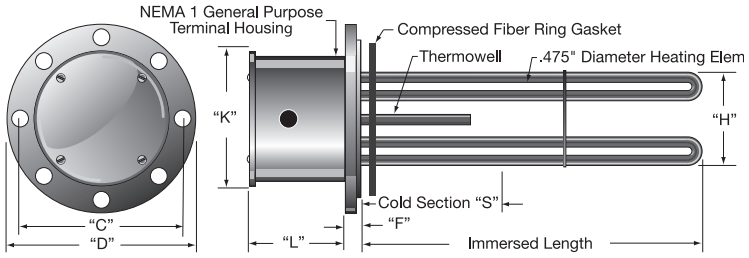
15 watts/in² (2.3 watts/cm²) — Typical Applications: Fuel Oils (Number 4&5)

✳ *150-lb Raised Face Forged Carbon Steel Flange* ✳ *Steel Sheath Heating Elements*

ANSI Flange Size	Immersed Length in	Immersed Length mm	KW	Part Number 240V-1Ph	Circuits	240V-3Ph	Circuits	480V-1Ph	Circuits	480V-3Ph	Circuits	Approximate Net Weight lbs	Approximate Net Weight kgs
3"—150lb 3 elements	25 3/16	640	3	TFP02097	(1)	TFP02098	(1)	TFP02099	(1)	TFP02100	(1)	17	8
	33 1/16	840	4	TFP02101	(1)	TFP02102	(1)	TFP02103	(1)	TFP02104	(1)	18	8
	48 1/16	1221	6	TFP02105	(1)	TFP02106	(1)	TFP02107	(1)	TFP02108	(1)	21	10
5"—150lb 6 elements	33 1/16	840	8	—		TFP02109	(1)	—		TFP02110	(1)	37	17
	40 9/16	1030	10	—		TFP02111	(1)	—		TFP02112	(1)	39	18
	48 1/16	1221	12	—		TFP02113	(1)	—		TFP02114	(1)	42	19
	57 1/16	1449	15	—		TFP02115	(1)	—		TFP02116	(1)	45	20
	68 1/16	1729	18	—		TFP02117	(1)	—		TFP02118	(1)	49	22
8"—150lb 18 elements	32 7/8	835	20	—		TFP02119	(1)	—		TFP02120	(1)	89	40
	43 11/16	1110	25	—		TFP02121	(2)	—		TFP02122	(1)	100	45
	51 7/8	1318	30	—		TFP02123	(2)	—		TFP02124	(1)	108	49
	61 7/8	1559	35	—		TFP02125	(2)	—		TFP02126	(1)	118	54
	69 7/8	1775	40	—		TFP02127	(2)	—		TFP02128	(1)	125	57
	78 7/8	2003	45	—		TFP02129	(3)	—		TFP02130	(2)	135	61

NOTE: Flanges 8" and larger are 12 watts/in² (1.9 watts/cm²)

Flange Heater Dimensions



Flange size in	Flange Mounting Hole Size in	Hole Size mm	No.	Flange Thickness "F" in	Flange Thickness "F" mm	Mounting Bolt Circle "C" in	Mounting Bolt Circle "C" mm	Flange Diameter "D" in	Flange Diameter "D" mm	Cold Section "S" in	Cold Section "S" mm	Bundle Diameter "H" in	Bundle Diameter "H" mm	NEMA 1 Housing "K" in	NEMA 1 Housing "K" mm	NEMA 1 Housing "L" in	NEMA 1 Housing "L" mm	Number of Elements Std.	Number of Elements Max.
3	3/4	19	4	15/16	24	6	152	7-1/2	191	4	102	2-3/4	70	4-5/8	117	2-5/8	67	3	6
4	3/4	19	8	15/16	24	7-1/2	191	9	229	4	102	3-7/8	98	6	152	4	102	6	6
5	7/8	22	8	15/16	24	8-1/2	216	10	254	4	102	5	127	7	178	4	102	6	9
6	7/8	22	8	1	25	9-1/2	241	11	279	4	102	6	152	8	203	6	152	12	15
8	7/8	22	8	1-1/8	29	11-3/4	298	13-1/2	343	6	152	7-13/16	198	10	254	6	152	18	24
10	1	25	12	1-3/16	30	14-1/4	362	16	406	6	152	9-3/4	248	11-5/8	295	6	152	27	36
12	1	25	12	1-1/4	32	17	432	19	483	6	152	11-3/4	298	13-1/2	343	6	152	36	54
14	1-1/8	29	12	1-3/8	35	18-3/4	476	21	533	6	152	12-3/4	324	15-1/8	384	6	152	45	72

Ordering Information

See Page 11-31 for complete Ordering Information.

Made in USA

Standard Flanged Immersion Heaters

23 watts/in² (3.6 watts/cm²) — Typical Applications: Lightweight Oils • Heat Transfer Oils • Degreasing Solutions

✴ *150-lb Raised Face Forged Carbon Steel Flange* ✴ *Steel Sheath Heating Elements*

ANSI Flange Size	Immersed Length in	Immersed Length mm	KW	Part Number 240V-1Ph	Circuits	240V-3Ph	Circuits	480V-1Ph	Circuits	480V-3Ph	Circuits	Approximate Net Weight lbs	Approximate Net Weight kgs
3"—150lb 3 elements	18	457	3	TFP02131	(1)	TFP02132	(1)	TFP02133	(1)	TFP02134	(1)	16	7
	25½	648	4.5	TFP02135	(1)	TFP02136	(1)	TFP02137	(1)	TFP02138	(1)	17	8
	33	838	6	TFP02139	(1)	TFP02140	(1)	TFP02141	(1)	TFP02142	(1)	18	8
	40½	1029	7.5	TFP02143	(1)	TFP02144	(1)	TFP02145	(1)	TFP02146	(1)	19	9
	48	1219	9	TFP02147	(1)	TFP02148	(1)	TFP02149	(1)	TFP02150	(1)	21	10
	64½	1638	12.5	—		TFP02151	(1)	TFP02152	(1)	TFP02153	(1)	24	11
	77	1956	15	—		TFP02154	(1)	TFP02155	(1)	TFP02156	(1)	26	12
4"—150lb 6 elements	18	457	6	TFP02157	(1)	TFP02158	(1)	TFP02159	(1)	TFP02160	(1)	28	13
	25½	648	9	TFP02161	(1)	TFP02162	(1)	TFP02163	(1)	TFP02164	(1)	30	14
	33	838	12	TFP02165	(2)	TFP02166	(1)	TFP02167	(1)	TFP02168	(1)	33	15
	40½	1029	15	TFP02169	(2)	TFP02170	(1)	TFP02171	(1)	TFP02172	(1)	35	16
	48	1219	18	TFP02173	(2)	TFP02174	(1)	TFP02175	(1)	TFP02176	(1)	38	17
	64½	1638	25	—		TFP02177	(2)	TFP02178	(2)	TFP02179	(1)	44	20
	77	1956	30	—		TFP02180	(2)	TFP02181	(2)	TFP02182	(1)	48	22
5"—150lb 6 elements	18	457	6	TFP02183	(1)	TFP02184	(1)	TFP02185	(1)	TFP02186	(1)	32	15
	25½	648	9	TFP02187	(1)	TFP02188	(1)	TFP02189	(1)	TFP02190	(1)	34	15
	33	838	12	TFP02191	(2)	TFP02192	(1)	TFP02193	(1)	TFP02194	(1)	37	17
	40½	1029	15	TFP02195	(2)	TFP02196	(1)	TFP02197	(1)	TFP02198	(1)	39	18
	48	1219	18	TFP02199	(2)	TFP02200	(1)	TFP02201	(1)	TFP02202	(1)	42	19
	52 1/16	1322	20	TFP02203	(2)	TFP02204	(1)	TFP02205	(1)	TFP02206	(1)	43	20
	64½	1638	25	—		TFP02207	(2)	TFP02208	(2)	TFP02209	(1)	48	22
	77	1956	30	—		TFP02210	(2)	TFP02211	(2)	TFP02212	(1)	52	24
5"—150lb 9 elements	18	457	9	TFP02213	(1)	TFP02214	(1)	TFP02215	(1)	TFP02216	(1)	35	16
	25½	648	14	TFP02217	(3)	TFP02218	(1)	TFP02219	(1)	TFP02220	(1)	39	18
	33	838	18	TFP02221	(3)	TFP02222	(1)	TFP02223	(1)	TFP02224	(1)	43	20
	40½	1029	23	TFP02225	(3)	TFP02226	(3)	TFP02227	(1)	TFP02228	(1)	46	21
	48	1219	27	TFP02229	(3)	TFP02230	(3)	TFP02231	(3)	TFP02232	(1)	50	23
	64½	1638	38	—		TFP02233	(3)	TFP02234	(3)	TFP02235	(1)	59	27
	77	1956	45	—		TFP02236	(3)	TFP02237	(3)	TFP02238	(3)	65	30
6"—150lb 12 elements	17⅞	454	12	TFP02239	(1)	TFP02240	(1)	TFP02241	(1)	TFP02242	(1)	46	21
	25⅜	645	18	TFP02243	(2)	TFP02244	(1)	TFP02245	(1)	TFP02246	(1)	51	23
	32⅞	835	24	TFP02247	(2)	TFP02248	(2)	TFP02249	(1)	TFP02250	(1)	56	25
	40⅜	1026	30	TFP02251	(2)	TFP02252	(2)	TFP02253	(2)	TFP02254	(1)	61	28
	47⅞	1216	36	TFP02255	(3)	TFP02256	(2)	TFP02257	(2)	TFP02258	(1)	66	30
	64⅜	1635	50	—		TFP02259	(4)	TFP02260	(4)	TFP02261	(2)	78	35
	76⅞	1953	60	—		TFP02262	(4)	TFP02263	(4)	TFP02264	(2)	86	39
6"—150lb 15 elements	17⅞	454	15	TFP02265	(3)	TFP02266	(1)	TFP02267	(1)	TFP02268	(1)	49	22
	25⅜	645	23	TFP02269	(3)	TFP02270	(5)	TFP02271	(1)	TFP02272	(1)	55	25
	32⅞	835	30	TFP02273	(3)	TFP02274	(5)	TFP02275	(3)	TFP02276	(1)	62	28
	40⅜	1026	38	TFP02277	(5)	TFP02278	(5)	TFP02279	(3)	TFP02280	(1)	68	31
	47⅞	1216	45	TFP02281	(5)	TFP02282	(5)	TFP02283	(3)	TFP02284	(5)	75	34
	64⅜	1635	63	—		TFP02285	(5)	TFP02286	(3)	TFP02287	(5)	89	40
	76⅞	1953	75	—		TFP02288	(5)	TFP02289	(5)	TFP02290	(5)	99	45
8"—150lb 18 elements	32¾	832	30	TFP02291	(3)	TFP02292	(2)	TFP02293	(2)	TFP02294	(1)	88	40
	43¼	1099	40	—		TFP02295	(2)	TFP02296	(2)	TFP02297	(1)	99	45
	51¼	1302	50	—		TFP02298	(3)	TFP02299	(3)	TFP02300	(2)	107	49
	61¾	1568	60	—		TFP02301	(3)	TFP02302	(3)	TFP02303	(2)	117	53
	70¼	1784	70	—		TFP02304	(6)	TFP02305	(3)	TFP02306	(2)	126	57
	79¼	2013	80	—		TFP02307	(6)	—		TFP02308	(2)	136	62
8"—150lb 24 elements	32¾	832	40	TFP02309	(4)	TFP02310	(2)	TFP02311	(2)	TFP02312	(1)	100	45
	43¼	1099	53	—		TFP02313	(4)	TFP02314	(3)	TFP02315	(2)	114	52
	51¼	1302	67	—		TFP02316	(4)	TFP02317	(3)	TFP02318	(2)	125	57
	61¾	1568	80	—		TFP02319	(4)	TFP02320	(4)	TFP02321	(2)	139	63
	70¼	1784	93	—		TFP02322	(8)	TFP02323	(6)	TFP02324	(4)	151	68
	79¼	2013	107	—		TFP02325	(8)	—		TFP02326	(4)	162	73

NOTE: Flanges 8" and larger are 20 watts/in² (3.1 watts/cm²)

CONTINUED

Standard Flanged Immersion Heaters

Continued from previous page...

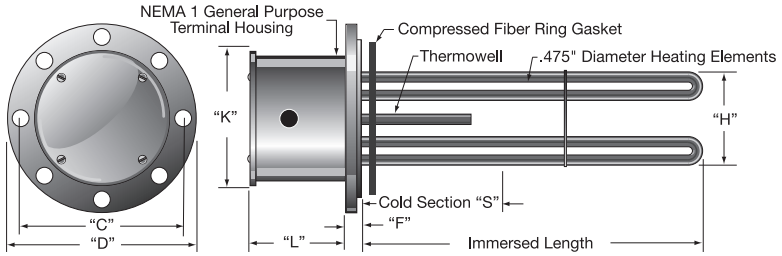
23 watts/in² (3.6 watts/cm²) — Typical Applications: Lightweight Oils • Heat Transfer Oils • Degreasing Solutions

✳ *150-lb Raised Face Forged Carbon Steel Flange* ✳ *Steel Sheath Heating Elements*

ANSI Flange Size	Immersed Length in	Immersed Length mm	KW	Part Number 240V-1Ph	Circuits	240V-3Ph	Circuits	480V-1Ph	Circuits	480V-3Ph	Circuits	Approximate Net Weight lbs	Approximate Net Weight kgs
	33¼	845	45	—		TFP02327	(3)	—		TFP02328	(3)	127	58
	43¾	1111	60	—		TFP02329	(3)	—		TFP02330	(3)	143	65
10"—150lb	51¼	1314	75	—		TFP02331	(9)	—		TFP02332	(3)	155	70
27 elements	62¼	1581	90	—		—		—		TFP02333	(3)	171	78
	70¾	1797	105	—		—		—		TFP02334	(3)	184	83
	78¾	2000	120	—		—		—		TFP02335	(3)	196	89
	33⅛	841	60	—		—		—		TFP02336	(3)	180	82
	43⅜	1108	80	—		—		—		TFP02337	(3)	201	91
12"—150lb	51⅛	1311	100	—		—		—		TFP02338	(3)	216	98
36 elements	62⅛	1578	120	—		—		—		TFP02339	(3)	239	108
	70⅞	1794	140	—		—		—		TFP02340	(4)	267	121
	78⅞	1997	160	—		—		—		TFP02341	(4)	273	124
	33	838	75	—		—		—		TFP02342	(3)	235	107
	43½	1105	100	—		—		—		TFP02343	(3)	262	119
14"—150lb	51½	1308	125	—		—		—		TFP02344	(5)	282	128
45 elements	62	1575	150	—		—		—		TFP02345	(5)	309	140
	70½	1791	175	—		—		—		TFP02346	(5)	330	150
	78½	1994	200	—		—		—		TFP02347	(5)	351	159

NOTE: Flanges 8" and larger are 20 watts/in² (3.1 watts/cm²)

Flange Heater Dimensions



Flange size in	Flange Mounting Hole Size in	Flange Mounting Hole Size mm	Flange Mounting No.	Flange Thickness "F" in	Flange Thickness "F" mm	Mounting Bolt Circle "C" in	Mounting Bolt Circle "C" mm	Flange Diameter "D" in	Flange Diameter "D" mm	Cold Section "S" in	Cold Section "S" mm	Bundle Diameter "H" in	Bundle Diameter "H" mm	NEMA 1 Housing "K" in	NEMA 1 Housing "K" mm	NEMA 1 Housing "L" in	NEMA 1 Housing "L" mm	Number of Elements Std.	Number of Elements Max.
3	3/4	19	4	15/16	24	6	152	7-1/2	191	4	102	2-3/4	70	4-5/8	117	2-5/8	67	3	6
4	3/4	19	8	15/16	24	7-1/2	191	9	229	4	102	3-7/8	98	6	152	4	102	6	6
5	7/8	22	8	15/16	24	8-1/2	216	10	254	4	102	5	127	7	178	4	102	6	9
6	7/8	22	8	1	25	9-1/2	241	11	279	4	102	6	152	8	203	6	152	12	15
8	7/8	22	8	1-1/8	29	11-3/4	298	13-1/2	343	6	152	7-13/16	198	10	254	6	152	18	24
10	1	25	12	1-3/16	30	14-1/4	362	16	406	6	152	9-3/4	248	11-5/8	295	6	152	27	36
12	1	25	12	1-1/4	32	17	432	19	483	6	152	11-3/4	298	13-1/2	343	6	152	36	54
14	1-1/8	29	12	1-3/8	35	18-3/4	476	21	533	6	152	12-3/4	324	15-1/8	384	6	152	45	72

Ordering Information

See Page 11-31 for complete Ordering Information.

Made in USA

Standard Flanged Immersion Heaters

16 watts/in² (2.5 watts/cm²) — Typical Applications: Heat Transfer Oils • Liquid Paraffin

✳ *150-lb Raised Face Forged Carbon Steel Flange*

✳ *Incoloy®800 sheath heating elements*

NOTE: 3-Phase only. Cannot be rewired for single phase.

ANSI Flange Size	Immersed Length in	Immersed Length mm	KW	Part Number 240V-1Ph	Circuits	240V-3Ph	Circuits	480V-1Ph	Circuits	480V-3Ph	Circuits	Approximate Net Weight lbs	Approximate Net Weight kgs
3"—150lb 3 elements	13½	343	1.5	—		TFP02348	(1)	—		TFP02349	(1)	15	7
	18	457	2	—		TFP02350	(1)	—		TFP02351	(1)	16	7
	20½	521	2.5	—		TFP02352	(1)	—		TFP02353	(1)	16	7
	25½	648	3	—		TFP02354	(1)	—		TFP02355	(1)	17	8
	33	838	4	—		TFP02356	(1)	—		TFP02357	(1)	18	8
	40½	1029	5	—		TFP02358	(1)	—		TFP02359	(1)	19	9
	48	1219	6	—		TFP02360	(1)	—		TFP02361	(1)	21	10
4"—150lb 6 elements	13½	343	3	—		TFP02362	(1)	—		TFP02363	(1)	26	12
	18	457	4	—		TFP02364	(1)	—		TFP02365	(1)	28	13
	20½	521	5	—		TFP02366	(1)	—		TFP02367	(1)	29	13
	25½	648	6	—		TFP02368	(1)	—		TFP02369	(1)	30	14
	33	838	8	—		TFP02370	(1)	—		TFP02371	(1)	33	15
	40½	1029	10	—		TFP02372	(1)	—		TFP02373	(1)	35	16
	48	1219	12	—		TFP02374	(1)	—		TFP02375	(1)	38	17
5"—150lb 6 elements	13½	343	3	—		TFP02376	(1)	—		TFP02377	(1)	30	14
	18	457	4	—		TFP02378	(1)	—		TFP02379	(1)	32	15
	20½	521	5	—		TFP02380	(1)	—		TFP02381	(1)	33	15
	25½	648	6	—		TFP02382	(1)	—		TFP02383	(1)	34	15
	33	838	8	—		TFP02384	(1)	—		TFP02385	(1)	37	17
	40½	1029	10	—		TFP02386	(1)	—		TFP02387	(1)	39	18
	48	1219	12	—		TFP02388	(1)	—		TFP02389	(1)	42	19
5"—150lb 9 elements	13½	343	4.5	—		TFP02390	(1)	—		TFP02391	(1)	33	15
	18	457	6	—		TFP02392	(1)	—		TFP02393	(1)	35	16
	20½	521	7.5	—		TFP02394	(1)	—		TFP02395	(1)	36	16
	25½	648	9	—		TFP02396	(1)	—		TFP02397	(1)	39	18
	33	838	12	—		TFP02398	(1)	—		TFP02399	(1)	43	20
	40½	1029	15	—		TFP02400	(1)	—		TFP02401	(1)	46	21
	48	1219	18	—		TFP02402	(1)	—		TFP02403	(1)	50	23
6"—150lb 12 elements	13⅜	340	6	—		TFP02404	(1)	—		TFP02405	(1)	43	20
	17⅞	454	8	—		TFP02406	(1)	—		TFP02407	(1)	46	21
	20⅜	518	10	—		TFP02408	(1)	—		TFP02409	(1)	48	22
	25⅜	645	12	—		TFP02410	(1)	—		TFP02411	(1)	51	23
	32⅞	835	16	—		TFP02412	(1)	—		TFP02413	(1)	56	25
	40⅜	1026	20	—		TFP02414	(1)	—		TFP02415	(1)	61	28
	47⅞	1216	24	—		TFP02416	(2)	—		TFP02417	(1)	66	30
6"—150lb 15 elements	13⅜	340	7.5	—		TFP02418	(1)	—		TFP02419	(1)	45	20
	17⅞	454	10	—		TFP02420	(1)	—		TFP02421	(1)	49	22
	20⅜	518	12.5	—		TFP02422	(1)	—		TFP02423	(1)	51	23
	25⅜	645	15	—		TFP02424	(1)	—		TFP02425	(1)	55	25
	32⅞	835	20	—		TFP02426	(5)	—		TFP02427	(1)	62	28
	40⅜	1026	25	—		TFP02428	(5)	—		TFP02429	(1)	68	31
	47⅞	1216	30	—		TFP02430	(5)	—		TFP02431	(1)	75	34
8"—150lb 18 elements	25¾	654	17	—		TFP02432	(1)	—		TFP02433	(1)	81	37
	35¾	908	25	—		TFP02434	(2)	—		TFP02435	(1)	91	41
	44¼	1124	33	—		TFP02436	(2)	—		TFP02437	(1)	100	45
	54¼	1378	42	—		TFP02438	(3)	—		TFP02439	(2)	110	50
	63¼	1607	50	—		—		—		TFP02440	(2)	119	54
	72¾	1848	58	—		—		—		TFP02441	(2)	129	59
	82¼	2089	67	—		—		—		TFP02442	(2)	139	63
8"—150lb 24 elements	25¾	654	23	—		TFP02443	(2)	—		TFP02444	(1)	90	41
	35¾	908	33	—		TFP02445	(2)	—		TFP02446	(1)	104	47
	44¼	1124	44	—		TFP02447	(4)	—		TFP02448	(2)	115	52
	54¼	1378	56	—		TFP02449	(4)	—		TFP02450	(2)	129	59
	63¼	1607	67	—		—		—		TFP02451	(2)	141	64
	72¾	1848	77	—		—		—		TFP02452	(2)	154	70
	82¼	2089	89	—		—		—		TFP02453	(4)	167	76

CONTINUED

Standard Flanged Immersion Heaters

Continued from previous page...

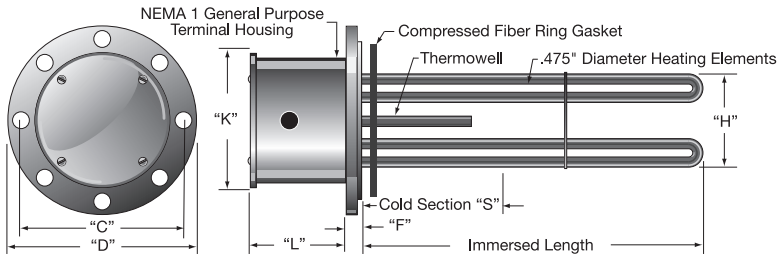
16 watts/in² (2.5 watts/cm²) — Typical Applications: Heat Transfer Oils • Liquid Paraffin

✳ *150-lb Raised Face Forged Carbon Steel Flange* ✳ *Incoloy®800 sheath heating elements*

NOTE: 3-Phase only. Cannot be rewired for single phase.

ANSI Flange Size	Immersed Length in	Immersed Length mm	KW	Part Number 240V-1Ph	Circuits	240V-3Ph	Circuits	480V-1Ph	Circuits	480V-3Ph	Circuits	Approximate Net Weight lbs	Approximate Net Weight kgs
10"—150lb 27 elements	54¾	1391	63	—		—		—		TFP02454	(3)	160	73
	63¾	1619	75	—		—		—		TFP02455	(3)	173	78
	73¼	1861	87	—		—		—		TFP02456	(3)	188	85
12"—150lb 36 elements	54⅜	1387	83	—		—		—		TFP02457	(3)	224	102
	63¾	1619	100	—		—		—		TFP02458	(3)	242	110
	73⅛	1857	117	—		—		—		TFP02459	(3)	262	119
14"—150lb 45 elements	54½	1384	105	—		—		—		TFP02460	(3)	290	132
	63½	1613	125	—		—		—		TFP02461	(5)	313	142

Flange Heater Dimensions



Flange size in	Flange Mounting Hole Size in	Hole Size mm	No.	Flange Thickness "F" in	"F" mm	Mounting Bolt Circle "C" in	"C" mm	Flange Diameter "D" in	"D" mm	Cold Section "S" in	"S" mm	Bundle Diameter "H" in	"H" mm	NEMA 1 Housing "K" in	"K" mm	"L" in	"L" mm	Number of Elements Std.	Max.
3	3/4	19	4	15/16	24	6	152	7-1/2	191	4	102	2-3/4	70	4-5/8	117	2-5/8	67	3	6
4	3/4	19	8	15/16	24	7-1/2	191	9	229	4	102	3-7/8	98	6	152	4	102	6	6
5	7/8	22	8	15/16	24	8-1/2	216	10	254	4	102	5	127	7	178	4	102	6	9
6	7/8	22	8	1	25	9-1/2	241	11	279	4	102	6	152	8	203	6	152	12	15
8	7/8	22	8	1-1/8	29	11-3/4	298	13-1/2	343	6	152	7-13/16	198	10	254	6	152	18	24
10	1	25	12	1-3/16	30	14-1/4	362	16	406	6	152	9-3/4	248	11-5/8	295	6	152	27	36
12	1	25	12	1-1/4	32	17	432	19	483	6	152	11-3/4	298	13-1/2	343	6	152	36	54
14	1-1/8	29	12	1-3/8	35	18-3/4	476	21	533	6	152	12-3/4	324	15-1/8	384	6	152	45	72

Ordering Information

See Page 11-31 for complete Ordering Information.

Made in USA

Standard Flanged Immersion Heaters

23 watts/in² (3.6 watts/cm²) — Typical Applications: Forced Air • Caustic Solutions • Degreasing Solutions

✳ *150-lb Raised Face Forged Carbon Steel Flange* ✳ *Incoloy®800 Sheath Heating Elements*

ANSI Flange Size	Immersed Length in	Immersed Length mm	KW	Part Number 240V-1Ph	Circuits	240V-3Ph	Circuits	480V-1Ph	Circuits	480V-3Ph	Circuits	Approximate Net Weight lbs	Approximate Net Weight kgs
3"—150lb 3 elements	18	457	3	TFP02462	(1)	TFP02463	(1)	TFP02464	(1)	TFP02465	(1)	16	7
	25½	648	4.5	TFP02466	(1)	TFP02467	(1)	TFP02468	(1)	TFP02469	(1)	17	8
	33	838	6	TFP02470	(1)	TFP02471	(1)	TFP02472	(1)	TFP02473	(1)	18	8
	40½	1029	7.5	TFP02474	(1)	TFP02475	(1)	TFP02476	(1)	TFP02477	(1)	19	9
	48	1219	9	TFP02478	(1)	TFP02479	(1)	TFP02480	(1)	TFP02481	(1)	21	10
	64½	1638	12.5	—		TFP02482	(1)	TFP02483	(1)	TFP02484	(1)	24	11
	77	1956	15	—		TFP02485	(1)	TFP02486	(1)	TFP02487	(1)	26	12
4"—150lb 6 elements	18	457	6	TFP02488	(1)	TFP02489	(1)	TFP02490	(1)	TFP02491	(1)	28	13
	25½	648	9	TFP02492	(1)	TFP02493	(1)	TFP02494	(1)	TFP02495	(1)	30	14
	33	838	12	TFP02496	(2)	TFP02497	(1)	TFP02498	(1)	TFP02499	(1)	33	15
	40½	1029	15	TFP02500	(2)	TFP02501	(1)	TFP02502	(1)	TFP02503	(1)	35	16
	48	1219	18	TFP02504	(2)	TFP02505	(1)	TFP02506	(1)	TFP02507	(1)	38	17
	64½	1638	25	—		TFP02508	(2)	TFP02509	(2)	TFP02510	(1)	44	20
	77	1956	30	—		TFP02511	(2)	TFP02512	(2)	TFP02513	(1)	48	22
5"—150lb 6 elements	18	457	6	TFP02514	(1)	TFP02515	(1)	TFP02516	(1)	TFP02517	(1)	32	15
	25½	648	9	TFP02518	(1)	TFP02519	(1)	TFP02520	(1)	TFP02521	(1)	34	15
	33	838	12	TFP02522	(2)	TFP02523	(1)	TFP02524	(1)	TFP02525	(1)	37	17
	40½	1029	15	TFP02526	(2)	TFP02527	(1)	TFP02528	(1)	TFP02529	(1)	39	18
	48	1219	18	TFP02530	(2)	TFP02531	(1)	TFP02532	(1)	TFP02533	(1)	42	19
	64½	1638	25	—		TFP02534	(2)	TFP02535	(2)	TFP02536	(1)	48	22
	77	1956	30	—		TFP02537	(2)	TFP02538	(2)	TFP02539	(1)	52	24
5"—150lb 9 elements	18	457	9	TFP02540	(1)	TFP02541	(1)	TFP02542	(1)	TFP02543	(1)	35	16
	25½	648	14	TFP02544	(3)	TFP02545	(1)	TFP02546	(1)	TFP02547	(1)	39	18
	33	838	18	TFP02548	(3)	TFP02549	(1)	TFP02550	(1)	TFP02551	(1)	43	20
	40½	1029	23	TFP02552	(3)	TFP02553	(3)	TFP02554	(1)	TFP02555	(1)	46	21
	48	1219	27	TFP02556	(3)	TFP02557	(3)	TFP02558	(3)	TFP02559	(1)	50	23
	64½	1638	38	—		TFP02560	(3)	TFP02561	(3)	TFP02562	(1)	59	27
	77	1956	45	—		TFP02563	(3)	TFP02564	(3)	TFP02565	(3)	65	30
6"—150lb 12 elements	17⅞	454	12	TFP02566	(2)	TFP02567	(1)	TFP02568	(1)	TFP02569	(1)	46	21
	25⅜	645	18	TFP02570	(2)	TFP02571	(1)	TFP02572	(1)	TFP02573	(1)	51	23
	32⅞	835	24	TFP02574	(2)	TFP02575	(2)	TFP02576	(2)	TFP02577	(1)	56	25
	40⅜	1026	30	TFP02578	(3)	TFP02579	(2)	TFP02580	(2)	TFP02581	(1)	61	28
	47⅞	1216	36	TFP02582	(3)	TFP02583	(2)	TFP02584	(2)	TFP02585	(1)	66	30
	64⅜	1635	50	—		TFP02586	(4)	TFP02587	(3)	TFP02588	(2)	78	35
	76⅞	1953	60	—		TFP02589	(4)	TFP02590	(3)	TFP02591	(2)	86	39
6"—150lb 15 elements	17⅞	454	15	TFP02592	(3)	TFP02593	(1)	TFP02594	(1)	TFP02595	(1)	49	22
	25⅜	645	23	TFP02596	(3)	TFP02597	(5)	TFP02598	(1)	TFP02599	(1)	55	25
	32⅞	835	30	TFP02600	(3)	TFP02601	(5)	TFP02602	(3)	TFP02603	(1)	62	28
	40⅜	1026	38	TFP02604	(5)	TFP02605	(5)	TFP02606	(3)	TFP02607	(1)	68	31
	47⅞	1216	45	TFP02608	(5)	TFP02609	(5)	TFP02610	(3)	TFP02611	(5)	75	34
	64⅜	1635	63	—		TFP02612	(5)	TFP02613	(3)	TFP02614	(5)	89	40
	76⅞	1953	75	—		TFP02615	(5)	TFP02616	(5)	TFP02617	(5)	99	45

CONTINUED

Standard Flanged Immersion Heaters

Continued from previous page...

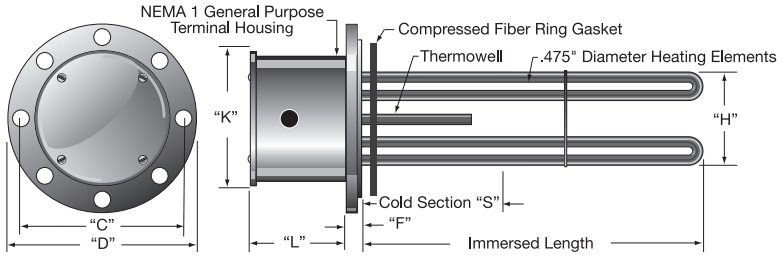
23 watts/in² (3.6 watts/cm²) — Typical Applications: Forced Air • Caustic Solutions • Degreasing Solutions

✳ *150-lb Raised Face Forged Carbon Steel Flange* ✳ *Incoloy®800 Sheath Heating Elements*

ANSI Flange Size	Immersed Length in	Immersed Length mm	KW	Part Number 240V-1Ph	Circuits	240V-3Ph	Circuits	480V-1Ph	Circuits	480V-3Ph	Circuits	Approximate Net Weight lbs	Approximate Net Weight kgs
8"—150lb 18 elements	32¾	832	30	TFP02618	(3)	TFP02619	(2)	TFP02620	(2)	TFP02621	(1)	88	40
	43¼	1099	40	—		TFP02622	(2)	TFP02623	(2)	TFP02624	(1)	99	45
	51¼	1302	50	—		TFP02625	(3)	TFP02626	(3)	TFP02627	(2)	107	49
8"—150lb 24 elements	32¾	832	40	TFP02628	(4)	TFP02629	(2)	TFP02630	(2)	TFP02631	(1)	100	45
	43¼	1099	53	—		TFP02632	(4)	TFP02633	(3)	TFP02634	(2)	115	52
	51¼	1302	67	—		TFP02635	(4)	TFP02636	(3)	TFP02637	(2)	125	57
10"—150lb 27 elements	33¼	845	45	—		TFP02638	(3)	—		TFP02639	(3)	127	58
	43¾	1111	60	—		TFP02640	(3)	—		TFP02641	(3)	143	65
	51¾	1314	75	—		TFP02642	(9)	—		TFP02643	(3)	155	70
12"—150lb 36 elements	33⅛	841	60	—		—		—		TFP02644	(3)	180	82
	43⅝	1108	80	—		—		—		TFP02645	(3)	201	91
	51⅛	1311	100	—		—		—		TFP02646	(3)	216	98
14"—150lb 45 elements	33	838	75	—		—		—		TFP02647	(3)	235	107
	43½	1105	100	—		—		—		TFP02648	(3)	262	119
	51½	1308	125	—		—		—		TFP02649	(5)	282	128

NOTE: Flanges 8" and larger are 20 watts/in² (3.1 watts/cm²)

Flange Heater Dimensions



Flange size in	Flange Mounting Hole Size in	Hole Size mm	No.	Flange Thickness "F" in	"F" mm	Mounting Bolt Circle "C" in	"C" mm	Flange Diameter "D" in	"D" mm	Cold Section "S" in	"S" mm	Bundle Diameter "H" in	"H" mm	NEMA 1 Housing "K" in	"K" mm	"L" in	"L" mm	Number of Elements Std.	Max.
3	3/4	19	4	15/16	24	6	152	7-1/2	191	4	102	2-3/4	70	4-5/8	117	2-5/8	67	3	6
4	3/4	19	8	15/16	24	7-1/2	191	9	229	4	102	3-7/8	98	6	152	4	102	6	6
5	7/8	22	8	15/16	24	8-1/2	216	10	254	4	102	5	127	7	178	4	102	6	9
6	7/8	22	8	1	25	9-1/2	241	11	279	4	102	6	152	8	203	6	152	12	15
8	7/8	22	8	1-1/8	29	11-3/4	298	13-1/2	343	6	152	7-13/16	198	10	254	6	152	18	24
10	1	25	12	1-3/16	30	14-1/4	362	16	406	6	152	9-3/4	248	11-5/8	295	6	152	27	36
12	1	25	12	1-1/4	32	17	432	19	483	6	152	11-3/4	298	13-1/2	343	6	152	36	54
14	1-1/8	29	12	1-3/8	35	18-3/4	476	21	533	6	152	12-3/4	324	15-1/8	384	6	152	45	72

Ordering Information

See Page 11-31 for complete Ordering Information.

Made in USA

Standard Flanged Immersion Heaters

48 watts/in² (7.4 watts/cm²) — Typical Applications: Process Water

✳ *150-lb Raised Face Forged Carbon Steel Flange* ✳ *Incoloy® 800 Sheath Heating Elements*

ANSI Flange Size	Immersed Length in	Immersed Length mm	KW	Part Number 240V-1Ph	Circuits	240V-3Ph	Circuits	480V-1Ph	Circuits	480V-3Ph	Circuits	Approximate Net Weight lbs	Approximate Net Weight kgs
3"—150lb 3 elements	13½	343	4.5	TFP02650	(1)	TFP02651	(1)	TFP02652	(1)	TFP02653	(1)	15	7
	18	457	6	TFP02654	(1)	TFP02655	(1)	TFP02656	(1)	TFP02657	(1)	16	7
	20½	521	7.5	TFP02658	(1)	TFP02659	(1)	TFP02660	(1)	TFP02661	(1)	16	7
	25½	648	9	TFP02662	(1)	TFP02663	(1)	TFP02664	(1)	TFP02665	(1)	17	8
	33	838	12	—		TFP02666	(1)	TFP02667	(1)	TFP02668	(1)	18	8
	40½	1029	15	—		TFP02669	(1)	TFP02670	(1)	TFP02671	(1)	19	9
	48	1219	18	—		TFP02672	(1)	TFP02673	(1)	TFP02674	(1)	21	10
4"—150lb 6 elements	13½	343	9	TFP02675	(1)	TFP02676	(1)	TFP02677	(1)	TFP02678	(1)	26	12
	18	457	12	TFP02679	(2)	TFP02680	(1)	TFP02681	(1)	TFP02682	(1)	28	13
	20½	521	15	TFP02683	(2)	TFP02684	(1)	TFP02685	(1)	TFP02686	(1)	29	13
	25½	648	18	TFP02687	(2)	TFP02688	(1)	TFP02689	(1)	TFP02690	(1)	30	14
	33	838	24	TFP02691	(2)	TFP02692	(2)	TFP02693	(2)	TFP02694	(1)	33	15
	40½	1029	30	—		TFP02695	(2)	TFP02696	(2)	TFP02697	(1)	35	16
	48	1219	36	—		TFP02698	(2)	TFP02699	(2)	TFP02700	(1)	38	17
5"—150lb 6 elements	13½	343	9	TFP02701	(1)	TFP02702	(1)	TFP02703	(1)	TFP02704	(1)	30	14
	18	457	12	TFP02705	(2)	TFP02706	(1)	TFP02707	(1)	TFP02708	(1)	32	15
	20½	521	15	TFP02709	(2)	TFP02710	(1)	TFP02711	(1)	TFP02712	(1)	33	15
	25½	648	18	TFP02713	(2)	TFP02714	(1)	TFP02715	(1)	TFP02716	(1)	34	15
	33	838	24	TFP02717	(2)	TFP02718	(2)	TFP02719	(2)	TFP02720	(1)	37	17
	40½	1029	30	—		TFP02721	(2)	TFP02722	(2)	TFP02723	(1)	39	18
	48	1219	36	—		TFP02724	(2)	TFP02725	(2)	TFP02726	(1)	42	19
5"—150lb 9 elements	13½	343	14	TFP02727	(3)	TFP02728	(1)	TFP02729	(1)	TFP02730	(1)	33	15
	18	457	18	TFP02731	(3)	TFP02732	(1)	TFP02733	(1)	TFP02734	(1)	35	16
	20½	521	23	TFP02735	(3)	TFP02736	(3)	TFP02737	(1)	TFP02738	(1)	36	16
	25½	648	27	TFP02739	(3)	TFP02740	(3)	TFP02741	(3)	TFP02742	(1)	39	18
	33	838	36	—		TFP02743	(3)	TFP02744	(3)	TFP02745	(1)	43	20
	40½	1029	45	—		TFP02746	(3)	TFP02747	(3)	TFP02748	(3)	46	21
	48	1219	54	—		TFP02749	(3)	TFP02750	(3)	TFP02751	(3)	50	23
6"—150lb 12 elements	13⅜	340	18	TFP02752	(2)	TFP02753	(1)	TFP02754	(1)	TFP02755	(1)	43	20
	17⅞	454	24	TFP02756	(2)	TFP02757	(2)	TFP02758	(2)	TFP02759	(1)	46	21
	20⅜	518	30	TFP02760	(3)	TFP02761	(2)	TFP02762	(2)	TFP02763	(1)	48	22
	25⅜	645	36	TFP02764	(3)	TFP02765	(2)	TFP02766	(2)	TFP02767	(1)	51	23
	32⅞	835	48	—		TFP02768	(4)	TFP02769	(3)	TFP02770	(2)	56	25
	40⅜	1026	60	—		TFP02771	(4)	TFP02772	(3)	TFP02773	(2)	61	28
	47⅞	1216	72	—		TFP02774	(4)	—		TFP02775	(2)	66	30
6"—150lb 15 elements	13⅜	340	23	TFP02776	(3)	TFP02777	(5)	TFP02778	(1)	TFP02779	(1)	45	20
	17⅞	454	30	TFP02780	(3)	TFP02781	(5)	TFP02782	(3)	TFP02783	(1)	49	22
	20⅜	518	38	TFP02784	(5)	TFP02785	(5)	TFP02786	(3)	TFP02787	(1)	51	23
	25⅜	645	45	TFP02788	(5)	TFP02789	(5)	TFP02790	(3)	TFP02791	(5)	55	25
	32⅞	835	60	—		TFP02792	(5)	TFP02793	(3)	TFP02794	(5)	62	28
	40⅜	1026	75	—		TFP02795	(5)	TFP02796	(5)	TFP02797	(5)	68	31
	47⅞	1216	90	—		TFP02798	(5)	—		TFP02799	(5)	75	34
8"—150lb 18 elements	25¾	654	50	—		TFP02800	(3)	TFP02801	(3)	TFP02802	(2)	81	37
	35¾	908	75	—		TFP02803	(6)	—		TFP02804	(2)	91	41
	44¼	1124	100	—		TFP02805	(6)	—		TFP02806	(3)	100	45
	54¼	1378	125	—		TFP02807	(6)	—		TFP02808	(6)	110	50
	63¼	1607	150	—		—		—		TFP02809	(6)	119	54
	72¾	1848	175	—		—		—		TFP02810	(6)	129	59
	82¼	2089	200	—		—		—		TFP02811	(6)	139	63
8"—150lb 24 elements	25¾	654	67	—		TFP02812	(4)	TFP02813	(3)	TFP02814	(2)	90	41
	35¾	908	100	—		TFP02815	(8)	—		TFP02816	(4)	104	47
	44¼	1124	133	—		TFP02817	(8)	—		TFP02818	(4)	115	52
	54¼	1378	167	—		TFP02819	(8)	—		TFP02820	(8)	129	59
	63¼	1607	200	—		—		—		TFP02821	(8)	141	64
	72¾	1848	233	—		—		—		TFP02822	(8)	154	70
	82¼	2089	267	—		—		—		TFP02823	(8)	167	76

CONTINUED

Standard Flanged Immersion Heaters

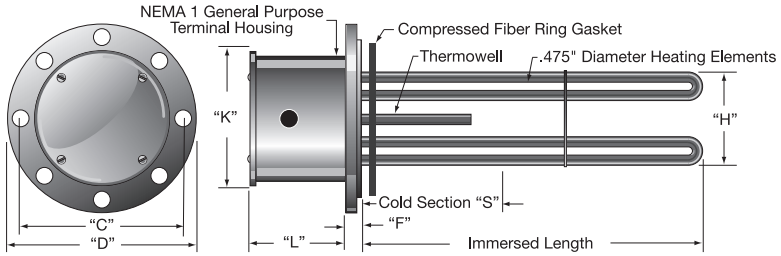
Continued from previous page...

48 watts/in² (7.4 watts/cm²) — Typical Applications: Process Water

✳ *150-lb Raised Face Forged Carbon Steel Flange* ✳ *Incoloy®800 Sheath Heating Elements*

ANSI Flange Size	Immersed Length in	Immersed Length mm	KW	Part Number 240V-1Ph Circuits	Part Number 240V-3Ph Circuits	Part Number 480V-1Ph Circuits	Part Number 480V-3Ph Circuits	Approximate Net Weight lbs	Approximate Net Weight kgs
10" — 150lb 27 elements	54¾	1391	190	—	—	—	TFP02824 (9)	160	73
	63¾	1619	225	—	—	—	TFP02825 (9)	173	78
	73¼	1861	262	—	—	—	TFP02826 (9)	188	85
12" — 150lb 36 elements	54⅝	1387	250	—	—	—	TFP02827 (6)	224	102
	63⅜	1616	300	—	—	—	TFP02828 (12)	242	110
	73⅛	1857	350	—	—	—	TFP02829 (12)	262	119
14" — 150lb 45 elements	54½	1384	315	—	—	—	TFP02830 (15)	290	132
	63⅛	1603	375	—	—	—	TFP02831 (15)	312	142

Flange Heater Dimensions



Flange size in	Flange Mounting Hole Size in	Flange Mounting Hole Size mm	Flange Mounting No.	Flange Thickness "F" in	Flange Thickness "F" mm	Mounting Bolt Circle "C" in	Mounting Bolt Circle "C" mm	Flange Diameter "D" in	Flange Diameter "D" mm	Cold Section "S" in	Cold Section "S" mm	Bundle Diameter "H" in	Bundle Diameter "H" mm	NEMA 1 Housing "K" in	NEMA 1 Housing "K" mm	NEMA 1 Housing "L" in	NEMA 1 Housing "L" mm	Number of Elements Std.	Number of Elements Max.
3	3/4	19	4	15/16	24	6	152	7-1/2	191	4	102	2-3/4	70	4-5/8	117	2-5/8	67	3	6
4	3/4	19	8	15/16	24	7-1/2	191	9	229	4	102	3-7/8	98	6	152	4	102	6	6
5	7/8	22	8	15/16	24	8-1/2	216	10	254	4	102	5	127	7	178	4	102	6	9
6	7/8	22	8	1	25	9-1/2	241	11	279	4	102	6	152	8	203	6	152	12	15
8	7/8	22	8	1-1/8	29	11-3/4	298	13-1/2	343	6	152	7-13/16	198	10	254	6	152	18	24
10	1	25	12	1-3/16	30	14-1/4	362	16	406	6	152	9-3/4	248	11-5/8	295	6	152	27	36
12	1	25	12	1-1/4	32	17	432	19	483	6	152	11-3/4	298	13-1/2	343	6	152	36	54
14	1-1/8	29	12	1-3/8	35	18-3/4	476	21	533	6	152	12-3/4	324	15-1/8	384	6	152	45	72

Ordering Information

See Page 11-31 for complete Ordering Information.

Made in USA

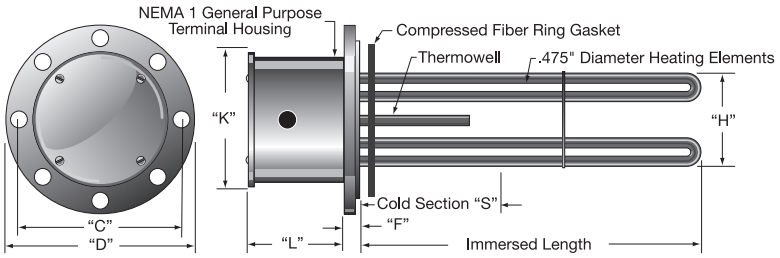
Standard Flanged Immersion Heaters

60 watts/in² (9.3 watts/cm²) — Typical Applications: Deionized Water

✳ *150-lb Raised Face 316 Stainless Steel Flange* ✳ *316 Stainless Steel Sheath Heating Elements*

ANSI Flange Size	Immersed Length in	Immersed Length mm	KW	Part Number 240V-1Ph	Circuits	240V-3Ph	Circuits	480V-1Ph	Circuits	480V-3Ph	Circuits	Approximate Net Weight lbs	Approximate Net Weight kgs
4"—150lb 6 elements	16	406	12	TFP02960	(2)	TFP02961	(1)	TFP02962	(1)	TFP02963	(1)	27	12
	22	559	18	TFP02964	(2)	TFP02965	(1)	TFP02966	(1)	TFP02967	(1)	29	13
	27½	699	24	TFP02968	(2)	TFP02969	(2)	TFP02970	(1)	TFP02971	(1)	31	14
	33	838	30	—		TFP02972	(2)	TFP02973	(2)	TFP02974	(1)	32	15
	38½	978	36	—		TFP02975	(2)	TFP02976	(2)	TFP02977	(1)	35	16
	51½	1308	50	—		—		—		TFP02978	(2)	39	18
	61	1549	60	—		—		—		TFP02979	(2)	42	19
6"—150lb 12 elements	15¾	400	24	TFP02980	(3)	TFP02981	(2)	TFP02982	(2)	TFP02983	(1)	45	20
	21¾	552	36	TFP02984	(3)	TFP02985	(2)	TFP02986	(2)	TFP02987	(1)	49	22
	27¼	692	48	—		TFP02988	(4)	TFP02989	(3)	TFP02990	(2)	52	24
	32¾	832	60	—		TFP02991	(4)	TFP02992	(3)	TFP02993	(2)	56	25
	38¼	972	72	—		TFP02994	(4)	—		TFP02995	(2)	60	27
	51¼	1302	100	—		—		—		TFP02996	(4)	69	31
	60¾	1543	120	—		—		—		TFP02997	(4)	75	34
6"—150lb 15 elements	15¾	400	30	TFP02998	(3)	TFP02999	(5)	TFP03000	(3)	TFP03001	(1)	47	21
	21¾	552	45	TFP03002	(5)	TFP03003	(5)	TFP03004	(3)	TFP03005	(5)	52	24
	27¼	692	60	—		TFP03006	(5)	TFP03007	(3)	TFP03008	(5)	57	26
	32¾	832	75	—		TFP03009	(5)	TFP03010	(5)	TFP03011	(5)	62	28
	38¼	972	90	—		TFP03012	(5)	—		TFP03013	(5)	66	30
	51¼	1302	125	—		—		—		TFP03014	(5)	77	35
	60¾	1543	150	—		—		—		TFP03015	(5)	86	39

Flange Heater Dimensions



Flange size in	Flange Mounting Hole Size in	Hole Size mm	No.	Flange Thickness "F" in	"F" mm	Mounting Bolt Circle "C" in	"C" mm	Flange Diameter "D" in	"D" mm	Cold Section "S" in	"S" mm	Bundle Diameter "H" in	"H" mm	NEMA 1 Housing "K" in	"K" mm	"L" in	"L" mm	Number of Elements Std.	Max.
3	3/4	19	4	15/16	24	6	152	7-1/2	191	4	102	2-3/4	70	4-5/8	117	2-5/8	67	3	6
4	3/4	19	8	15/16	24	7-1/2	191	9	229	4	102	3-7/8	98	6	152	4	102	6	6
5	7/8	22	8	15/16	24	8-1/2	216	10	254	4	102	5	127	7	178	4	102	6	9
6	7/8	22	8	1	25	9-1/2	241	11	279	4	102	6	152	8	203	6	152	12	15
8	7/8	22	8	1-1/8	29	11-3/4	298	13-1/2	343	6	152	7-13/16	198	10	254	6	152	18	24
10	1	25	12	1-3/16	30	14-1/4	362	16	406	6	152	9-3/4	248	11-5/8	295	6	152	27	36
12	1	25	12	1-1/4	32	17	432	19	483	6	152	11-3/4	298	13-1/2	343	6	152	36	54
14	1-1/8	29	12	1-3/8	35	18-3/4	476	21	533	6	152	12-3/4	324	15-1/8	384	6	152	45	72

Standard Flanged Immersion Heaters

60 watts/in² (9.3 watts/cm²) — Typical Applications: Clean Water

✳ *150-lb Raised Face Forged Carbon Steel Flange* ✳ *Copper Sheath Heating Elements*

ANSI Flange Size	Immersed Length in	Immersed Length mm	KW	Part Number 240V-1Ph	Circuits	240V-3Ph	Circuits	480V-1Ph	Circuits	480V-3Ph	Circuits	Approximate Net Weight lbs	kgs
3"—150lb 3 elements	15½	394	6	TFP02832	(1)	TFP02833	(1)	TFP02834	(1)	TFP02835	(1)	15	7
	21½	546	9	TFP02836	(1)	TFP02837	(1)	TFP02838	(1)	TFP02839	(1)	16	7
	27	686	12	—		TFP02840	(1)	TFP02841	(1)	TFP02842	(1)	17	8
	32½	826	15	—		TFP02843	(1)	TFP02844	(1)	TFP02845	(1)	18	8
	38	965	18	—		TFP02846	(1)	TFP02847	(1)	TFP02848	(1)	19	9
	51	1295	25	—		—		TFP02849	(1)	TFP02850	(1)	21	10
	60½	1537	30	—		—		TFP02851	(1)	TFP02852	(1)	23	10
4"—150lb 6 elements	15½	394	12	TFP02853	(2)	TFP02854	(1)	TFP02855	(1)	TFP02856	(1)	27	12
	21½	546	18	TFP02857	(2)	TFP02858	(1)	TFP02859	(1)	TFP02860	(1)	29	13
	27	686	24	TFP02861	(2)	TFP02862	(2)	TFP02863	(2)	TFP02864	(1)	31	14
	32½	826	30	—		TFP02865	(2)	TFP02866	(2)	TFP02867	(1)	33	15
	38	965	36	—		TFP02868	(2)	TFP02869	(2)	TFP02870	(1)	35	16
	51	1295	50	—		—		—		TFP02871	(2)	39	18
	60½	1537	60	—		—		—		TFP02872	(2)	42	19
5"—150lb 6 elements	15½	394	12	TFP02873	(2)	TFP02874	(1)	TFP02875	(1)	TFP02876	(1)	31	14
	21½	546	18	TFP02877	(2)	TFP02878	(1)	TFP02879	(1)	TFP02880	(1)	33	15
	27	686	24	TFP02881	(2)	TFP02882	(2)	TFP02883	(2)	TFP02884	(1)	35	16
	32½	826	30	—		TFP02885	(2)	TFP02886	(2)	TFP02887	(1)	37	17
	38	965	36	—		TFP02888	(2)	TFP02889	(2)	TFP02890	(1)	39	18
	51	1295	50	—		—		—		TFP02891	(2)	43	20
	60½	1537	60	—		—		—		TFP02892	(2)	46	21
5"—150lb 9 elements	15½	394	18	TFP02893	(3)	TFP02894	(1)	TFP02895	(1)	TFP02896	(1)	34	15
	21½	546	27	TFP02897	(3)	TFP02898	(3)	TFP02899	(3)	TFP02900	(3)	37	17
	27	686	36	—		TFP02901	(3)	TFP02902	(3)	TFP02903	(3)	40	18
	32½	826	45	—		TFP02904	(3)	TFP02905	(3)	TFP02906	(3)	42	19
	38	965	54	—		TFP02907	(3)	TFP02908	(3)	TFP02909	(3)	45	20
	51	1295	75	—		—		—		TFP02910	(3)	52	24
	60½	1537	90	—		—		—		TFP02911	(3)	57	26
6"—150lb 12 elements	15⅜	391	24	TFP02912	(2)	TFP02913	(2)	TFP02914	(2)	TFP02915	(1)	44	20
	21⅜	543	36	TFP02916	(3)	TFP02917	(2)	TFP02918	(2)	TFP02919	(1)	48	22
	26⅞	683	48	—		TFP02920	(4)	TFP02921	(4)	TFP02922	(2)	52	24
	32⅜	822	60	—		TFP02923	(4)	TFP02924	(4)	TFP02925	(2)	56	25
	37⅞	962	72	—		TFP02926	(4)	—		TFP02927	(2)	60	27
	50⅞	1292	100	—		—		—		TFP02928	(4)	68	31
	60⅜	1534	120	—		—		—		TFP02929	(4)	75	34
6"—150lb 15 elements	15⅜	391	30	TFP02930	(3)	TFP02931	(5)	TFP02932	(3)	TFP02933	(1)	47	21
	21⅜	543	45	TFP02934	(5)	TFP02935	(5)	TFP02936	(3)	TFP02937	(5)	52	24
	26⅞	683	60	—		TFP02938	(5)	TFP02939	(3)	TFP02940	(5)	57	26
	32⅜	822	75	—		TFP02941	(5)	TFP02942	(5)	TFP02943	(5)	61	28
	37⅞	962	90	—		TFP02944	(5)	—		TFP02945	(5)	66	30
	50⅞	1292	125	—		—		—		TFP02946	(5)	77	35
	60⅜	1534	150	—		—		—		TFP02947	(5)	85	39
8"—150lb 18 elements	21¼	553	50	—		TFP02948	(3)	TFP02949	(3)	TFP02950	(2)	77	35
	29¾	756	75	—		TFP02951	(6)	—		TFP02952	(2)	85	39
	37¼	946	100	—		TFP02953	(6)	—		TFP02954	(3)	93	42
	45¼	1149	125	—		TFP02955	(6)	—		TFP02956	(6)	101	46
	52¾	1340	150	—		—		—		TFP02957	(6)	109	49
	60¾	1543	175	—		—		—		TFP02958	(6)	117	53
	68¼	1734	200	—		—		—		TFP02959	(6)	125	57

Ordering Information

See Page 11-31 for complete Ordering Information.

Made in USA

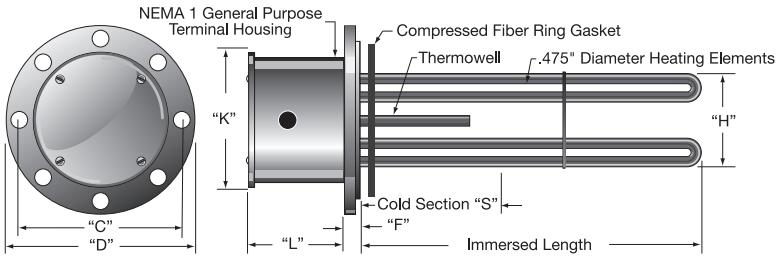
Standard Flanged Immersion Heaters

60 watts/in² (9.3 watts/cm²) — Typical Applications: Deionized Water

✳ *150-lb Raised Face 316 Stainless Steel Flange* ✳ *316 Stainless Steel Sheath Heating Elements*

ANSI Flange Size	Immersed Length in	Immersed Length mm	KW	Part Number 240V-1Ph	Circuits	240V-3Ph	Circuits	480V-1Ph	Circuits	480V-3Ph	Circuits	Approximate Net Weight lbs	Approximate Net Weight kgs
4"—150lb 6 elements	16	406	12	TFP02960	2	TFP02961	1	TFP02962	1	TFP02963	1	27	12
	22	559	18	TFP02964	2	TFP02965	1	TFP02966	1	TFP02967	1	29	13
	27½	699	24	TFP02968	2	TFP02969	2	TFP02970	1	TFP02971	1	31	14
	33	838	30	—		TFP02972	2	TFP02973	2	TFP02974	1	32	15
	38½	978	36	—		TFP02975	2	TFP02976	2	TFP02977	1	35	16
	51½	1308	50	—		—		—		TFP02978	2	39	18
	61	1549	60	—		—		—		TFP02979	2	42	19
6"—150lb 12 elements	15¾	400	24	TFP02980	3	TFP02981	2	TFP02982	2	TFP02983	1	45	20
	21¾	552	36	TFP02984	3	TFP02985	2	TFP02986	2	TFP02987	1	49	22
	27¼	692	48	—		TFP02988	4	TFP02989	3	TFP02990	2	52	24
	32¾	832	60	—		TFP02991	4	TFP02992	3	TFP02993	2	56	25
	38¼	972	72	—		TFP02994	4	—		TFP02995	2	60	27
	51¼	1302	100	—		—		—		TFP02996	4	69	31
	60¾	1543	120	—		—		—		TFP02997	4	75	34
6"—150lb 15 elements	15¾	400	30	TFP02998	3	TFP02999	5	TFP03000	3	TFP03001	1	47	21
	21¾	552	45	TFP03002	5	TFP03003	5	TFP03004	3	TFP03005	5	52	24
	27¼	692	60	—		TFP03006	5	TFP03007	3	TFP03008	5	57	26
	32¾	832	75	—		TFP03009	5	TFP03010	5	TFP03011	5	62	28
	38¼	972	90	—		TFP03012	5	—		TFP03013	5	66	30
	51¼	1302	125	—		—		—		TFP03014	5	77	35
	60¾	1543	150	—		—		—		TFP03015	5	86	39

Flange Heater Dimensions



Flange size in	Flange Mounting Hole Size in	Hole Size mm	No.	Flange Thickness "F" in	Flange Thickness "F" mm	Mounting Bolt Circle "C" in	Mounting Bolt Circle "C" mm	Flange Diameter "D" in	Flange Diameter "D" mm	Cold Section "S" in	Cold Section "S" mm	Bundle Diameter "H" in	Bundle Diameter "H" mm	NEMA 1 Housing "K" in	NEMA 1 Housing "K" mm	NEMA 1 Housing "L" in	NEMA 1 Housing "L" mm	Number of Elements Std.	Number of Elements Max.
3	3/4	19	4	15/16	24	6	152	7-1/2	191	4	102	2-3/4	70	4-5/8	117	2-5/8	67	3	6
4	3/4	19	8	15/16	24	7-1/2	191	9	229	4	102	3-7/8	98	6	152	4	102	6	6
5	7/8	22	8	15/16	24	8-1/2	216	10	254	4	102	5	127	7	178	4	102	6	9
6	7/8	22	8	1	25	9-1/2	241	11	279	4	102	6	152	8	203	6	152	12	15
8	7/8	22	8	1-1/8	29	11-3/4	298	13-1/2	343	6	152	7-13/16	198	10	254	6	152	18	24

Ordering Information

See Page 11-31 for complete Ordering Information.

Custom Designed Flanged Heater for Sanitary Process Solutions

Sanitary fittings are commonly used in the commercial food, dairy and soft drink processing industries. Compared to common pipe flange connections, the sanitary pipe connections' crevice-free interiors provide quicker access for easier cleaning.

Fittings and pipe made from 304 Stainless Steel is suitable for most food industry applications. Type 316L, which is more corrosion resistant, is commonly used in the pharmaceutical and chemical industries.

Design Features

- ✳ *304 SS flange (end cap) suitable for most food applications*
- ✳ *316L SS flange (end cap) used in chemical industries*
- ✳ *304 SS, 316 SS and Incoloy heating elements*
- ✳ *Element hairpin bends are spanked in specially designed dies to re-compact the MgO insulating powder*
- ✳ *Silicone resin seal of elements standard*
- ✳ *NEMA 1 electrical enclosure standard, NEMA 4/7 optional*

Heater Construction

This passivated heater assembly consists of tubular electric heating elements welded into a 6" sanitary end cap fitting which would then be clamped to another fitting in the system. This particular sanitary process uses manufacturer Alfa Laval's fittings.

Connection Components

A typical sanitary type connection is made by joining two ferrules together with a clamp and a gasket. The ferrule is the end of the fitting or pipe that has a lip with a gasket groove making it half of a finished connection.

The heater in the picture at right is shown clamped to the Butt-Weld fitting shown on the left.

Ordering Information

Catalog Heaters

Sanitary Flanged Immersion Heaters are custom manufactured to meet the requirements of specific applications.

Custom Engineered/Manufactured Heaters

TEMPCO will design and manufacture a Sanitary Flanged Immersion Heater to meet your requirements. ***Standard lead time is 4 weeks.***

Please Specify the following:

- ❑ Wattage, Voltage and Phase
- ❑ Flange (End Cap) Size and Material
- ❑ Element Sheath Material
- ❑ Element Watt Density
- ❑ Element Immersion Length
- ❑ Surface Treatments
- ❑ Electrical Enclosure Type
- ❑ Other Type Sanitary Fittings

⚠ **WARNING:** Cancer and Reproductive Harm - www.P65Warnings.ca.gov.