

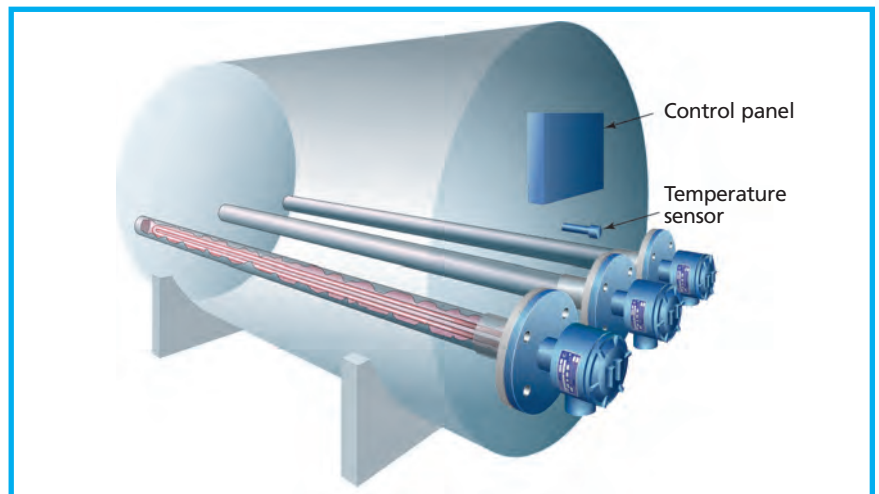
## PIPE INSERT IMMERSION HEATERS



### Typical Heating Applications:

- *Corrosive Liquids*
- *Paint*
- *Tar*
- *Molasses*
- *Asphalt*
- *Glue*

In some applications, where it is necessary to eliminate the direct contact between tubular heaters and the liquid they intend to heat, pipe insert immersion heaters are utilized. These heaters require the installation of separate pipes inside container tanks. Convection and radiation heaters inserted in these pipes heat the walls of the pipes which in their turn transmit that heat to the liquid. This mode of heating is usually utilized inside large vessels for heating corrosive liquids, where it is not desirable to drain the vessel from its content when it becomes necessary to replace them.



# BUCAN PIPE INSERT IMMERSION HEATERS

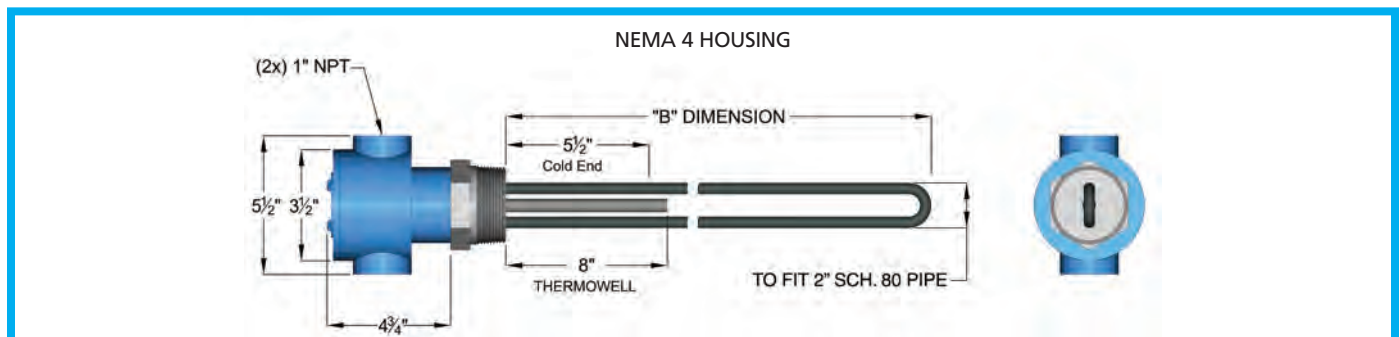
## Standard features

Pipe insert immersion heaters are available with screw plugs or flanges. The standard screw plug is 2" NPT steel screw plug suitable for 2" schedule 80 pipes, while the standard flange utilized is 3" - 150 lbs steel flange suitable for 3" schedule 80 pipes. Other sizes and alloys are available.

In order to keep the watt density on the heater sheath as low as possible, tanks could have multiple pipes and multiple pipe insert immersion heaters.

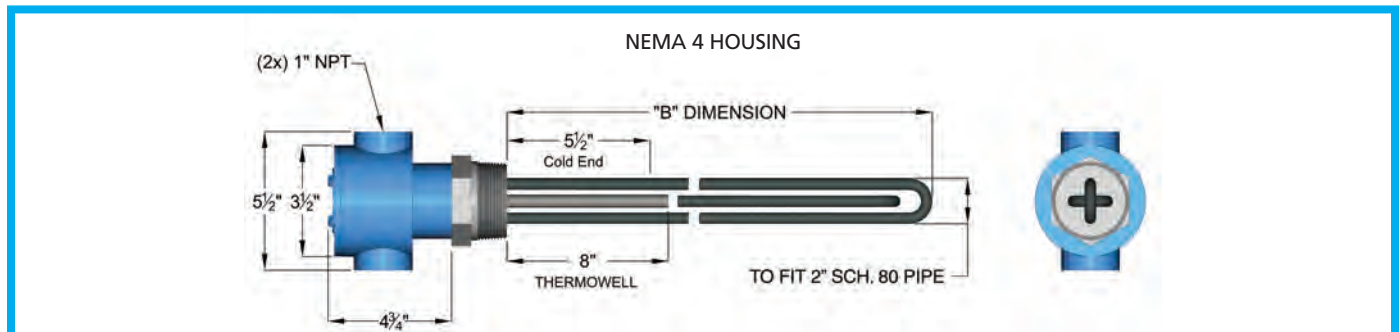
Thermocouples are optional features that could be supplied with these heaters. These thermocouples (usually "K" type) that will detect the sharp rise of the tube temperature when the level of liquid drops below the level of the pipe. In the case of multiple heater systems it is usually sufficient to provide one of the heaters with a thermocouple and place this heater in a pipe that is at a higher level (recommended 6" min.) than the rest of the pipes.

It should be noted that thermocouples or thermostats should not be used as level indicators.



2" NPT STEEL SCREW PLUG WITH ONE INCOLOY ELEMENT

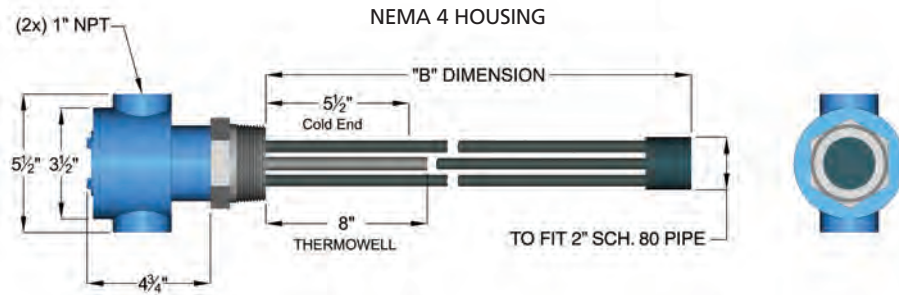
KW	IMMERSED LENGTH		STANDARD VOLTAGE 1 Ø	CATALOGUE #	
	mm	inch		WITHOUT THERMOCOUPLE	WITH THERMOCOUPLE
3	1905	75	208,240,416,480,600	PSH2F130N1905	PSH2F130N1905K
4	2489	98	"	PSH2F140N2489	PSH2F140N2489K
5	3099	122	"	PSH2F150N3099	PSH2F150N3099K
6	3404	134	"	PSH2F160N3404	PSH2F160N3404K



2" NPT STEEL SCREW PLUG WITH TWO INCOLOY ELEMENTS

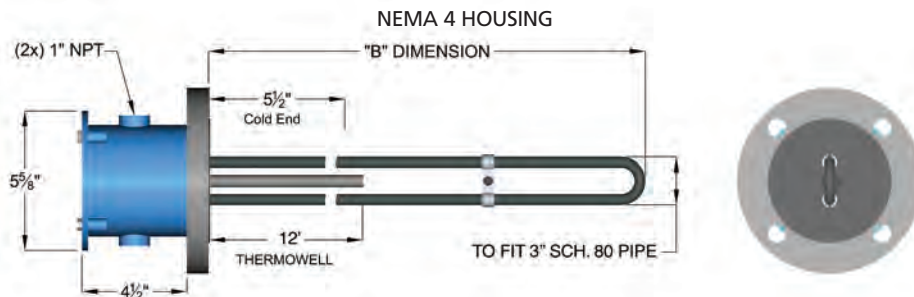
KW	IMMERSED LENGTH		STANDARD VOLTAGE 1 Ø	CATALOGUE #	
	mm	inch		WITHOUT THERMOCOUPLE	WITH THERMOCOUPLE
3	1397	55	208,240,416,480,600	PSH2F230N1397	PSH2F230N1397K
4	1829	72	"	PSH2F240N1829	PSH2F240N1829K
5	2184	86	"	PSH2F250N2184	PSH2F250N2184K
6	2591	102	"	PSH2F260N2591	PSH2F260N2591K
7	2997	118	"	PSH2F270N2997	PSH2F270N2997K
8	3404	134	"	PSH2F280N3404	PSH2F280N3404K

# BUCAN PIPE INSERT IMMERSION HEATERS



## 2" NPT STEEL SCREW PLUG WITH THREE INCOLOY ELEMENTS

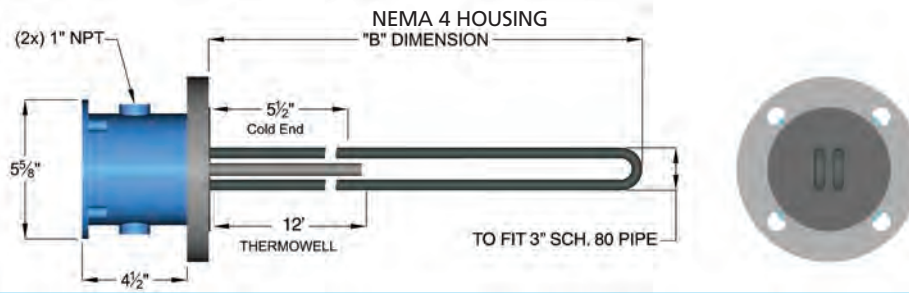
KW	IMMERSED LENGTH		STANDARD VOLTAGE 1 Ø or 3 Ø	CATALOGUE #	
	mm	inch		WITHOUT THERMOCOUPLE	WITH THERMOCOUPLE
2	1143	45	208, 240, 416, 480, 600	PSH2F320N1143	PSH2F320N1143K
3	1626	64	"	PSH2F330N1626	PSH2F330N1626K
4	2083	82	"	PSH2F340N2083	PSH2F340N2083K
5	2591	102	"	PSH2F350N2591	PSH2F350N2591K
6	3048	120	"	PSH2F370N3048	PSH2F370N3048K



## 3" - 150 Lbs STEEL FLANGE WITH ONE INCOLOY ELEMENT

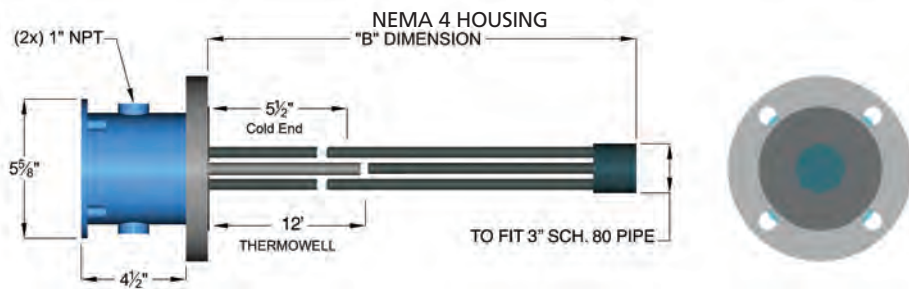
KW	IMMERSED LENGTH		STANDARD VOLTAGE 1 Ø	CATALOGUE #	
	mm	inch		WITHOUT THERMOCOUPLE	WITH THERMOCOUPLE
3	1905	75	208, 240, 416, 480, 600	PFH3-103N1905	PFH3-103N1905K
4	2540	100	"	PFH3-104N2540	PFH3-104N2540K
5	3175	125	"	PFH3-105N3175	PFH3-105N3175K
6	3683	145	"	PFH3-106N3683	PFH3-106N3683K
7	4572	180	"	PFH3-107N4572	PFH3-107N4572K
8	4877	192	"	PFH3-108N4877	PFH3-108N4877K
9	5461	215	"	PFH3-109N5461	PFH3-109N5461K
10	6096	240	"	PFH3-110N6096	PFH3-110N6096K
11	6706	264	"	PFH3-111N6706	PFH3-111N6706K
12	7315	288	"	PFH3-112N7315	PFH3-112N7315K
13	7874	310	"	PFH3-113N7874	PFH3-113N7874K
14	8509	335	"	PFH3-114N8509	PFH3-114N8509K
15	10795	425	"	PFH3-115N10795	PFH3-115N10795K

# BUCAN PIPE INSERT IMMERSION HEATERS



## 3" - 150 Lbs STEEL FLANGE WITH 2 INCOLEY ELEMENTS

KW	IMMERSED LENGTH		STANDARD VOLTAGE 1 Ø	CATALOGUE #	
	mm	inch		WITHOUT THERMOCOUPLE	WITH THERMOCOUPLE
3	1422	56	208,240,416,480,600	PFH3-203N1422	PFH3-203N1422K
4	1829	72	"	PFH3-204N1829	PFH3-204N1829K
5	2210	87	"	PFH3-205N2210	PFH3-205N2210K
6	2591	102	"	PFH3-206N2591	PFH3-206N2591K
7	2997	118	"	PFH3-207N2997	PFH3-207N2997K
8	3404	134	"	PFH3-208N3404	PFH3-208N3404K
9	3810	150	"	PFH3-209N3810	PFH3-209N3810K
10	4216	166	"	PFH3-210N4216	PFH3-210N4216K
11	4623	182	"	PFH3-211N4623	PFH3-211N4623K
12	5029	198	"	PFH3-212N5029	PFH3-212N5029K
13	5436	214	"	PFH3-213N5436	PFH3-213N5436K
14	5842	230	"	PFH3-214N5842	PFH3-214N5842K



## 3" - 150 LB. STEEL FLANGE WITH 3 INCOLEY ELEMENTS

KW	IMMERSED LENGTH		STANDARD VOLTAGE 1 Ø or 3Ø	CATALOGUE #	
	mm	inch		WITHOUT THERMOCOUPLE	WITH THERMOCOUPLE
2	1143	45	208,240,416,480,600	PFH3-302N1143	PFH3-302N1143K
3	1651	65	"	PFH3-303N1651	PFH3-303N1651K
4	2108	83	"	PFH3-304N2108	PFH3-304N2108K
5	2591	102	"	PFH3-305N2591	PFH3-305N2591K
6	3048	120	"	PFH3-306N3048	PFH3-306N3048K
7	3505	138	"	PFH3-307N3505	PFH3-307N3505K
8	4013	158	"	PFH3-308N4013	PFH3-308N4013K
9	4470	176	"	PFH3-309N4470	PFH3-309N4470K
10	4953	195	"	PFH3-310N4953	PFH3-310N4953K
11	5436	214	"	PFH3-311N5436	PFH3-311N5436K
12	5893	232	"	PFH3-312N5893	PFH3-312N5893K
13	6350	250	"	PFH3-313N6350	PFH3-313N6350K
14	6858	270	"	PFH3-314N6858	PFH3-314N6858K
15	7366	290	"	PFH3-315N7366	PFH3-315N7366K

# BUCAN SCREW PLUG, FLANGED AND PIPE INSERT IMMERSION HEATERS

## Installation operation and maintenance instruction

- Electric heaters present a potential hazard for fire and electrical shock. They should be installed by qualified, licensed electricians, and the installation should be done according to the local and national electrical codes.
- Electric heaters should never be used in the proximity of explosive, combustible or any hazardous materials, unless the heaters are specifically certified and approved to operate in such environments.
- For hazardous location heaters installations maintenance and operations please consult the factory.
- Prior to all electrical and mechanical works performed on the heating system, the power supply should be completely disconnected.
- The temperature sensing and/or controlling devices that are installed on some heaters are intended to control only the temperature and are not fail-safe devices. It is highly recommended to back them up by adequate high and/or low limit safety devices.
- Electric heaters expand when energized, adequate space should be provided for this expansion.
- Sufficient space should be left around immersion heaters for maintenance as well as for installation and removal. At least three feet should be left in front of a heater for maintenance purposes, and a minimum space equal to the length of a heater plus two feet for installation and removal.
- Standard flanged or screw plug immersion heaters are made for horizontal mounting and they should be installed as close as possible to the bottom of a tank and above any sludge formation anticipated. In order to prevent the formation of air pockets, it is recommended that the inlet and outlet of a forced circulation system be positioned in the horizontal position with the inlet close to the flange or screw plug, in order to keep the terminal box relatively cold.
- If in a system there is the potential of sludge or scale build-up on the heater elements, this sludge or scale should be cleaned periodically.
- For vertical mounting applications please consult the factory since special cold sections might be required.
- Horizontal mounted flanged or screw plug immersion heaters that are longer than 36" should be supported every 24".
- When energized, liquid immersion heaters should remain fully immersed in the liquid, at all times.
- When energized, heaters that are used in gases should have their heating elements placed completely in an uninterrupted gas stream.
- The tubular elements of a flanged or a screw plug immersion heater should not be bent in the field.
- In order to prevent injury, touching the flanges, screw plugs or terminal boxes of heaters should be avoided. They may become extremely hot. The temperature of the terminal box can be estimated to be 50° F less than the liquid temperature, or same as the gas temperature, when heated. In some cases, stilted terminal boxes could be used in order to protect terminals from high temperature.
- Heating elements may absorb moisture if they sit idle for a long period of time or get exposed to a humid environment. This might lower the insulation resistance and might cause premature failure or even fire. If this is the case, it is recommended to dry them up in an oven at a temperature of approximately 350° F (175° C).
- Terminal boxes should not be insulated; dangerous overheating may occur and harm the electrical wire insulation.
- The amperage rating of the power supply lead wires should be selected as per the requirements of local and national electric codes. In hot environments lead wires amperage rating should be reduced by a correction factor recommended by the wire supplier.
- In order to connect thermocouples used in certain flanged or screw plug immersion heaters to electric panels it is essential to use thermocouple extension wires with proper polarity.
- Terminal ends should be protected from contamination, drippings, vapor or condensation. In harsh environments, it is recommended to use special terminal boxes that have watertight cable connectors. It is a good practice to form a drip loop on power cables before their entry into terminal boxes to prevent condensation from entering terminal boxes.
- For heaters placed in systems that are exposed to vibration, the electrical and mechanical connections should be periodically checked for looseness.
- Periodically, the temperature sensors and thermostats should be checked for correct response to temperature change. If defective, they should be replaced.
- All electric terminals should be tightened with a maximum torque, provided that does not exceed the strength of the terminal screws. To prevent the twisting or the breakage of terminals, it is a good practice to use a counter-torque wrench.
- Terminal boxes should periodically be cleaned to prevent insulation failure, electric shock and even fire.