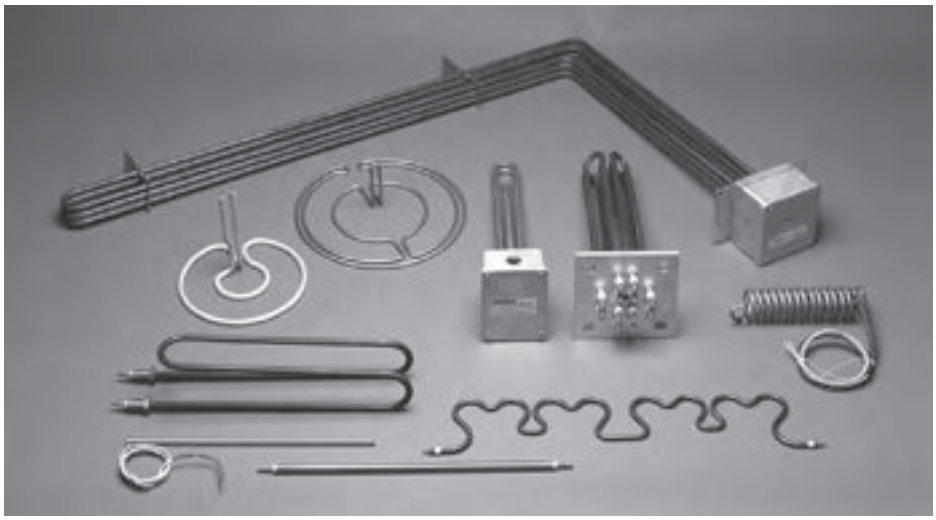
PROCESS HEATERS

Straight and formed Durotube™ tubular heating elements, screw plug immersion heaters, flanged immersion heaters, circulation heaters, and high temperature process air heaters are available in a wide selection of standard designs from Durex Industries. Durex engineering is available to assist with the design and development of special heaters for particular requirements.



FEATURES:

- Select high quality sheath materials to suit the application.
- Precision wound helical Nichrome resistance wire.
- High purity MgO (Magnesium Oxide) powder insulation compacted to provide maximum heat conductivity and dielectric strength.
- Integral cold pin fusion welded to helical resistance wire for optimum current carrying capability.

TYPICAL APPLICATIONS:

- Mold and die heating
- Plastic manifold heating
- Immersion heating
- Pipe or tube heating
- Defrosting
- High process air heating

TUBULAR HEATING ELEMENT

1. Selected high quality sheath materials (see table below for selection).
2. Precision helical wound nickel-chrome resistance wire.
3. High purity magnesium oxide powder compacted to provide maximum heat conductivity and optimum dielectric strength.
4. Integral cold pin fusion welded to helical resistance wire provides optimum current carrying capacity.
5. Threaded screw terminal with ceramic or mica insulator provides a positive connection from leadwire to terminals.
6. UL recognized elements, optional.

SHEATH MATERIAL SELECTION

MATERIAL	MAX. TEMP. °F	MAX. WATT/SQ. IN.	RECOMMENDED APPLICATIONS
Copper	350	60	Water, non-corrosive liquids
Steel	750	20	Oil immersion
Stainless Steel	1200	30	Corrosive liquids, food processing
Incoloy	1600	40	Corrosive liquids, air, clamp on

Other materials available: Inconel 600, Monel 400, Hastelloy, Titanium, Carpenter 20

PHYSICAL AND ELECTRICAL SPECIFICATIONS

Sheath Dia. ± .005"	.260	.315	.375	.430	.475	.496	.625
Sheath Length Max. (Inches)	222	260	222	260	260	222	222
Maximum Voltage	250	277	480	550	550	550	550
Maximum Amperage	15	30	30	40	40	40	40
Wattage Tolerance	Industry Standard +5% -10%						
Resistance Tolerance	Industry Standard +10% -5%						

LENGTH TOLERANCES

Overall Sheath Length	11-20	21-50	51-80	81-110	111-140	141-170	171-200	201& up
Sheath Length	± 3/32	± 1/8	± 5/32	± 3/16	± 7/32	± 1/4	± 3/8	± 1/2
Heated Length	± 1/4	±1/2	± 7/8	± 1-1/8	± 1-3/8	± 1-5/8	± 1-7/8	± 2-3/8
Min. Unheated	1	1-1/4	1-1/2	1-5/8	1/3/4	2	2-1/4	2-1/2

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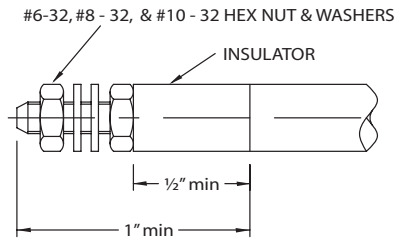
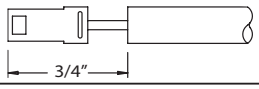
TERMINATIONS

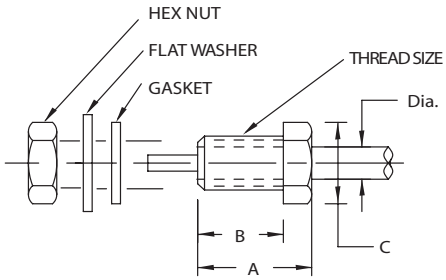
TYPE - S
THREADED STUD TERMINAL



TYPE - D
QUICK DISCONNECT SPADE



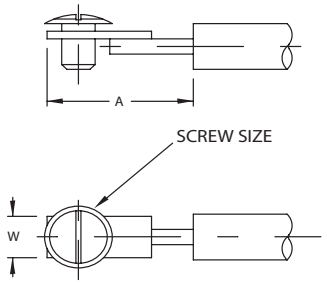
TYPE - B
THREADED BULKHEAD FITTINGS



DIA.	THD.	A	B*	C	MATERIAL
.260	1/2-20	3/4"	5/8"	3/4"	Brass
.315	1/2-20	3/4"	5/8"	3/4"	Brass & Stainless
.430	5/8-18	15/16"	3/4"	7/8"	Brass, Steel & Stainless

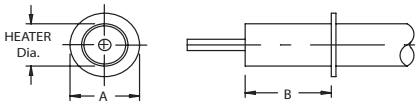
*Custom bulkhead length and threads available.

TYPE - L
SCREW LUG TERMINAL



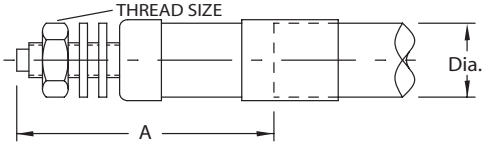
SCREW SIZE	A	W
#6-32	5/8"	1/4"
#8-32	7/8"	5/16"
#10-32	1-1/16"	7/16"

TYPE - R
LOCATOR WASHERS



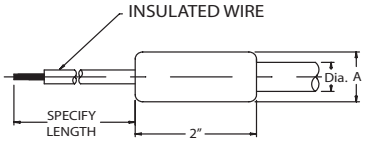
HEATER DIA.	A	B
.260	3/4"	ADVISE
.315	5/8"	ADVISE
.430	3/4"	ADVISE

TYPE - H
CERAMIC TO METAL HERMETIC TERMINALS



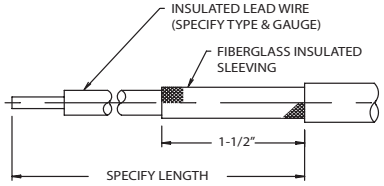
THREAD SIZE	DIA.	A
#8-32	.260	1-3/4"
#10-32	.315	1-7/8"
#1/4-28	.430	2-1/8"

TYPE - M
MOLDED RUBBER LEAD

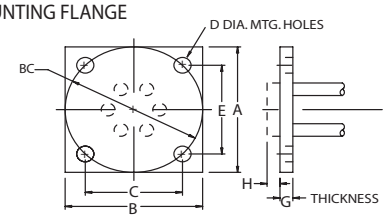


DIA.	A
.260	7/16"
.315	7/16"
.430	5/8"

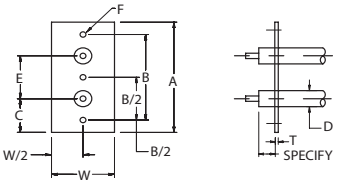
TYPE - W
LEAD WIRE TERMINAL ASSEMBLY



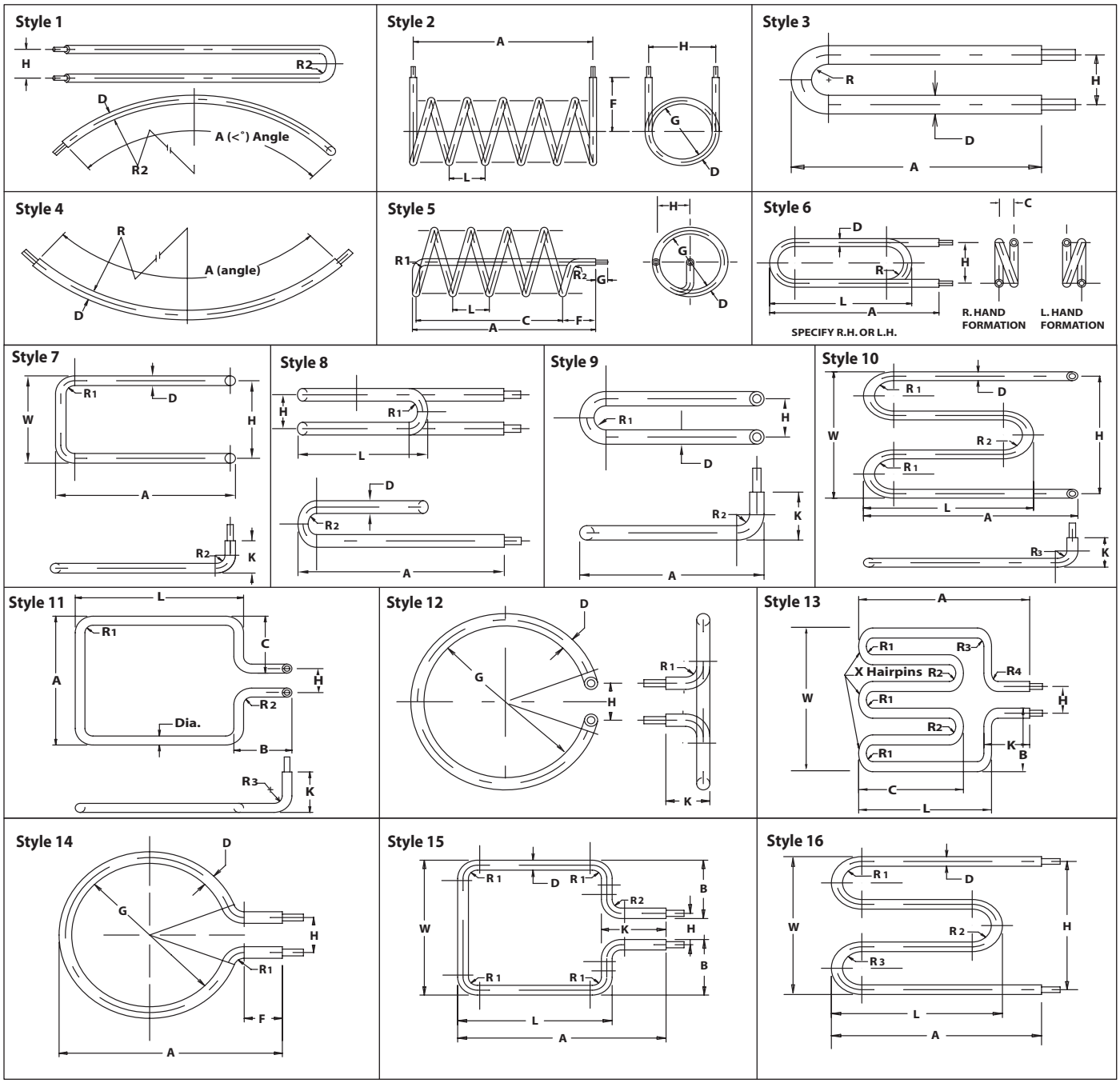
TYPE - F
MOUNTING FLANGE



TYPE - K
MOUNTING BRACKET



TYPICAL BEND FORMATIONS



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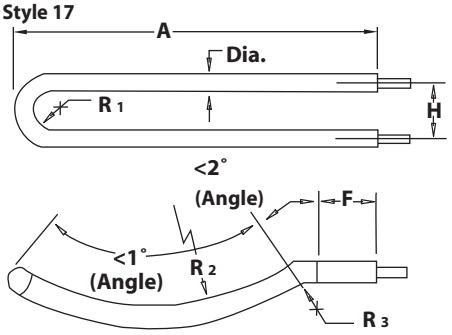
TYPICAL BEND FORMATIONS

Style 17



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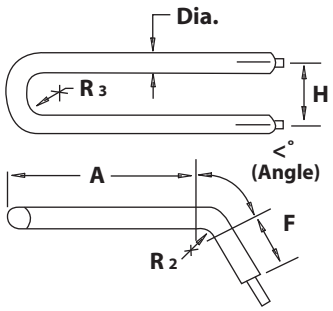

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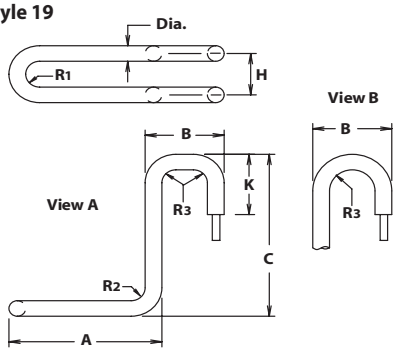

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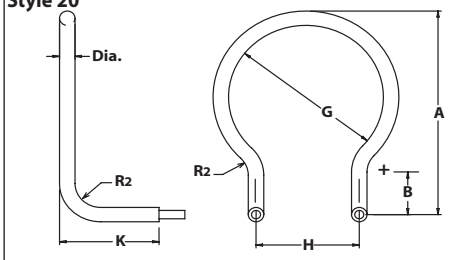

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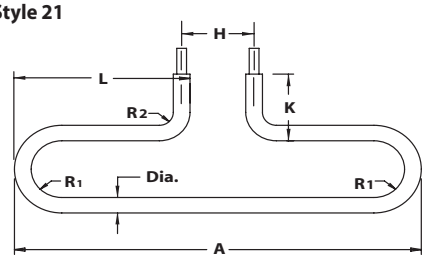

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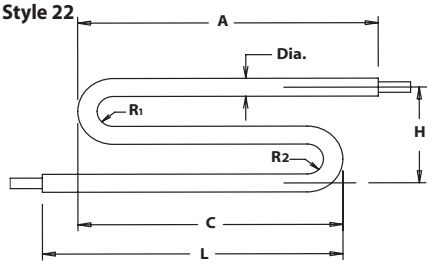

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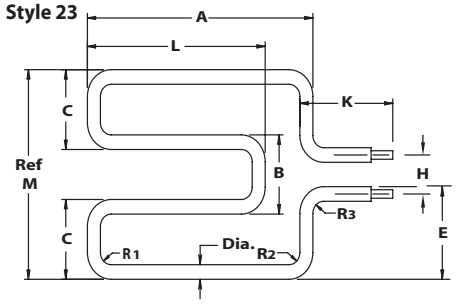

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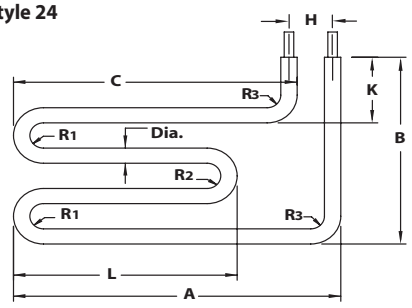

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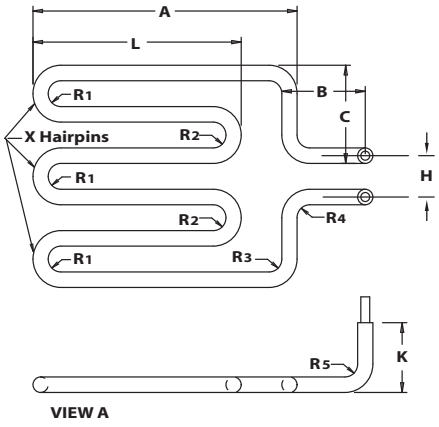

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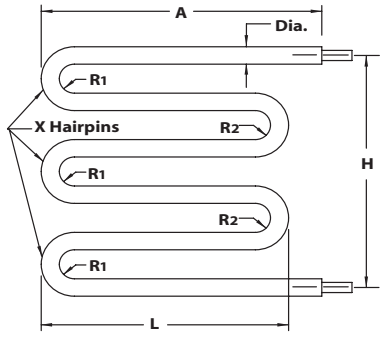

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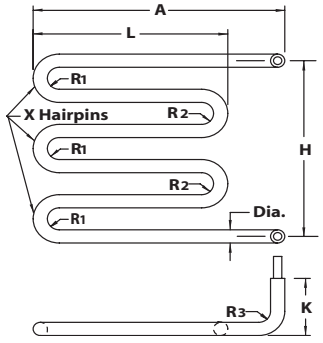
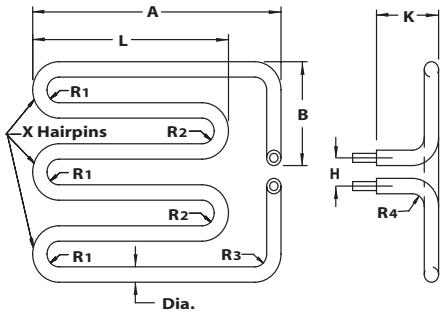


TYPICAL BEND FORMATIONS

Style 28



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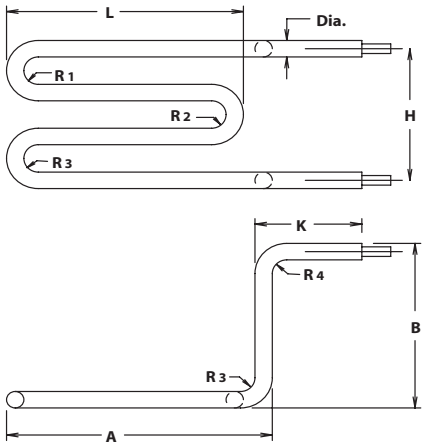

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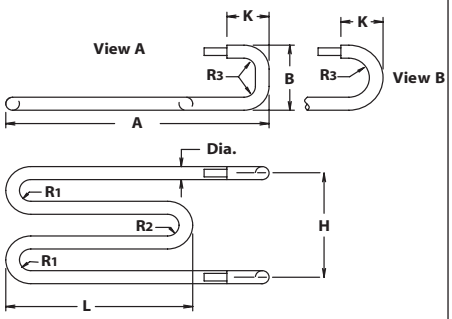

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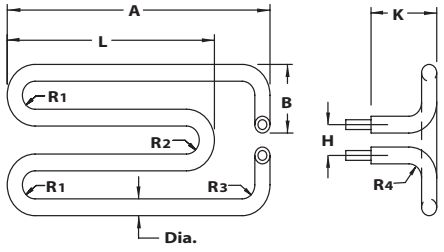

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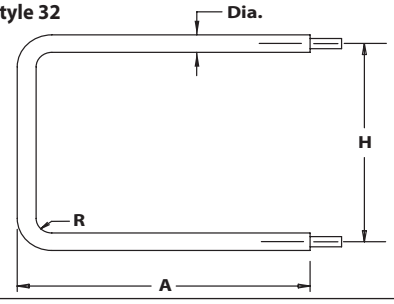

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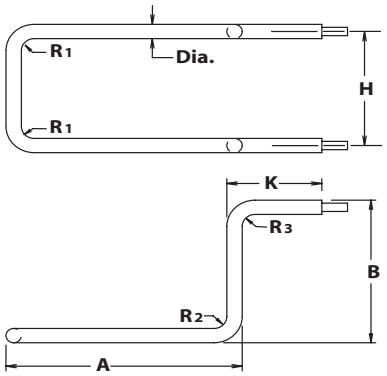

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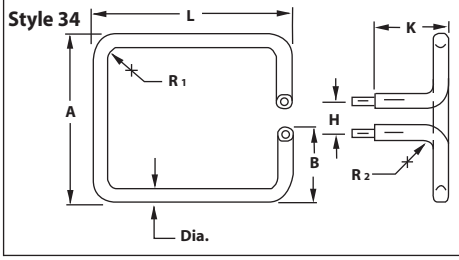

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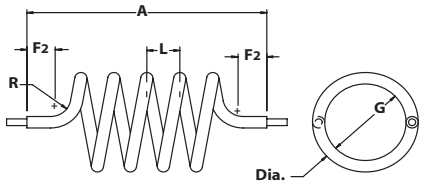

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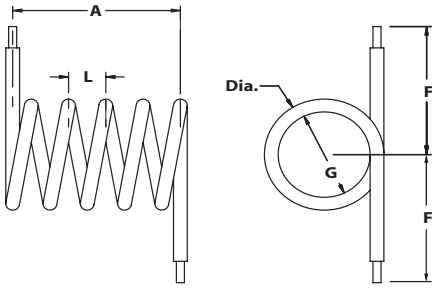

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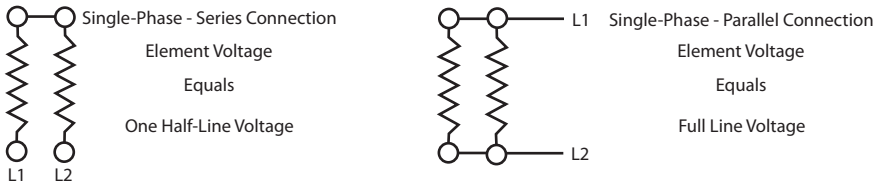
PROCESS HEATER WIRING DIAGRAMS

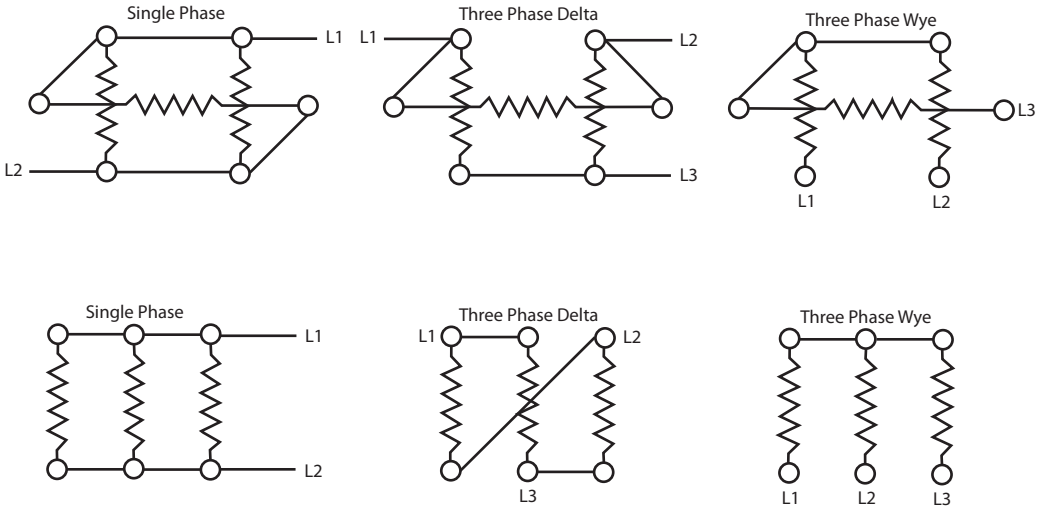
TYPICAL WIRING DIAGRAMS WITHOUT THERMOSTATS

Process Heaters with Two Elements



Note: Dual-Voltage heaters are factory wired for the highest voltage (series connection) unless otherwise specified. Easily rewired for lower voltage operation (parallel connection).

Process Heaters with Three Elements

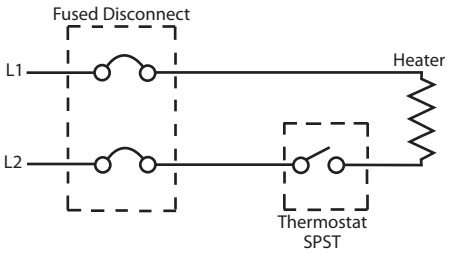


Standard process style heaters with three elements are factory wired for three-phase delta. They can be rewired for single-phase operation with no wattage change. Wattage can be reduced to one third of the designed wattage by switching from three-phase delta to Wye connection.

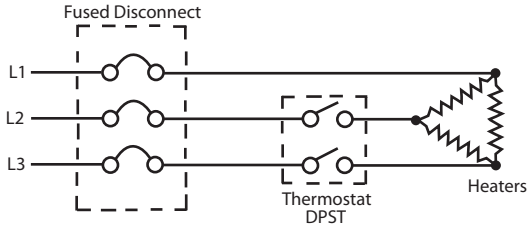
PROCESS HEATER WIRE DIAGRAMS

TYPICAL WIRING DIAGRAMS FOR HEATERS WITH THERMOSTATS

When Heater Amperage Does Not Exceed the Amperage of the Thermostat

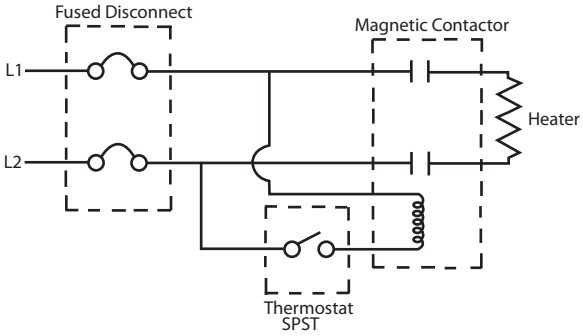


120V Single-Phase Heater



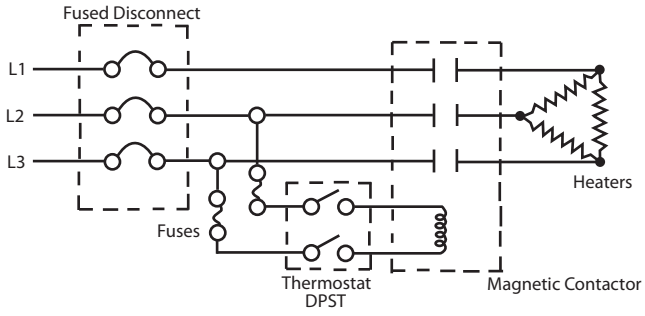
Three-Phase Heater

When Heater Amperage Exceeds the Amperage of the Thermostat



Any Voltage Single-Phase Heater

Use a Single Pole-Single Throw (SPST) thermostat wired in series with the holding coil of a magnetic contractor or mercury relay (pilot duty).



Three-Phase Heater

Use a Double Pole-Single Throw (DPST) thermostat wired in series with the holding coil of a magnetic contractor or mercury relay (pilot dury).

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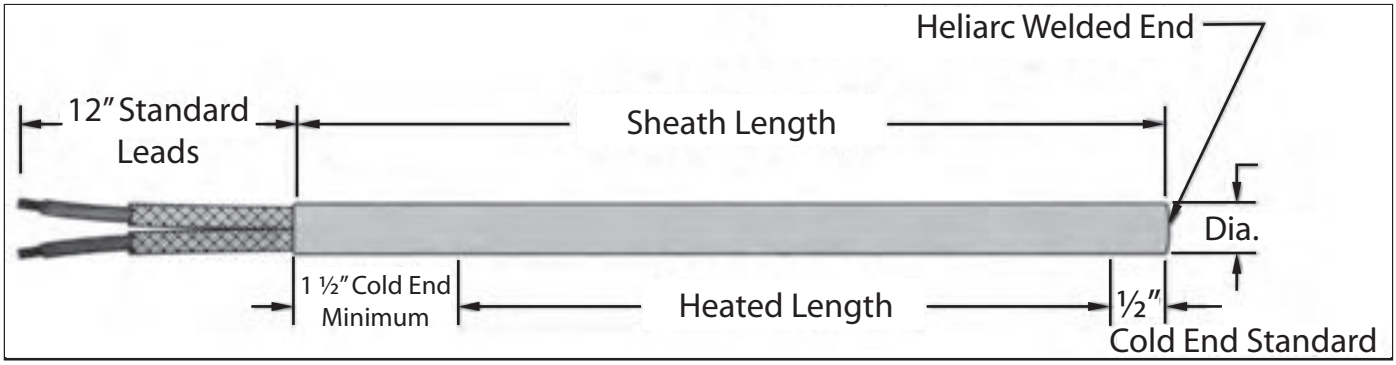
CART-TUBE

SINGLE END TUBULAR HEATER



CART-TUBE – The single-ended tubular element design with the lead termination at one end. This type of construction makes it a very versatile heater that can be used for a wide variety of applications. The Cart-Tube heater is custom designed to fit your particular requirement. Cart-Tube is available in many sheath diameters and materials.

FEATURES

- Rugged tubular element compacted construction
- High purity magnesium oxide insulation
- Nickel Chrome resistance wire
- Heliarc welded end
- High temperature alloy sheath materials

APPLICATIONS

- Heating molds and dies
- Plastic manifold heating
- Immersion heating
- Pipe or tube heating
- Defrosting

SPECIFICATIONS

SHEATH DIA.	TOLERANCE	LENGTH		MAXIMUM VOLTAGE	MAXIMUM AMPERAGE	MIN. BEND RADIUS	SHEATH MATERIALS
		MIN	MAX				
.315	± .003	10"	96"	240	15	3/4"	STEEL 304 STAINLESS STEEL 316 STAINLESS STEEL INCOLOY COPPER
.375	± .003	12"	96"	240	15	3/4"	
.430	± .004	15"	120"	240	20	1.0"	
.475	± .005	15"	120"	240	25	1-1/4"	
.495	± .005	15"	120"	240	25	1-1/4"	
.625	± .005	18"	120"	480	30	2"	
.687	± .005	18"	120"	480	30	2"	
.750	± .005	18"	120"	480	30	2-1/2"	

WATTAGE TOLERANCE: NEMA STANDARD +5% - 10%

LEAD TERMINATIONS

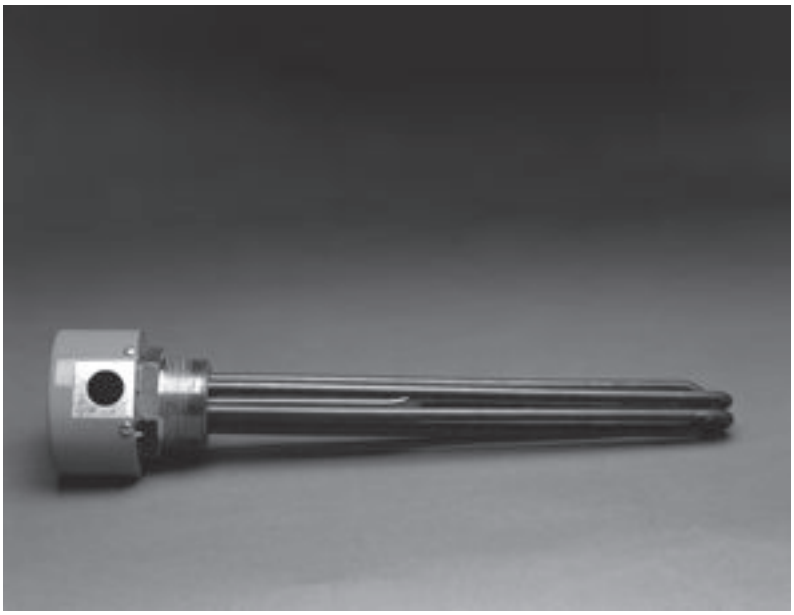
Type S	Standard 10" long fiberglass insulated leadwire	Type B1	Stainless steel overbraid lead protection
Type C1	Stainless steel flexhose lead protection	Type B2	Right angle stainless steel lead protection
Type C4	Right angle stainless steel flexhose	Type BF	Threaded bulkhead fitting

BENDING/FORMING

The Cart-Tube heater can be custom formed to meet your particular specifications.
Please see previous pages for typical bend formations.

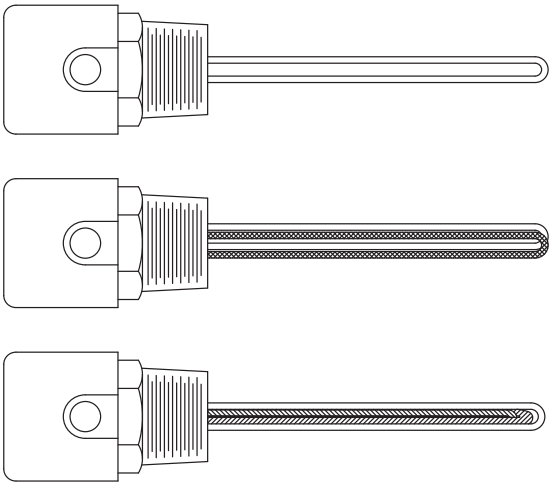
SCREW PLUG IMMERSION HEATERS

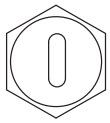
Screw plug immersion heaters utilize an NPT screw plug for direct immersion into liquids, oils, or other heat transfer mediums. These heaters utilize a rugged tubular heating element with sheath materials of copper, stainless steel, or Incoloy®. The elements are formed and welded or brazed into the screw plug fitting for a liquid tight seal.



STANDARD FEATURES:

- Various heavy-duty metal sheath elements
- Recompacted bends for consistent MgO density
- Three standard terminal boxes:
  NEMA 1 for General Purpose,
  NEMA 4 for Moisture Resistance,
  NEMA 7 for Explosion Resistance
- Standard NPT threads in five sizes:
  1", 1 ¼", 1 ½", 2", and 2 ½"
- Screw plug materials: Brass, Steel, Stainless Steel
- Optional thermowells for thermostats
- Corrosion-resistant hardware
- Hydrostatic pressure tested.





Single Element

Two Element

Three Element

OPTIONAL FEATURES:

- Thermostatic controls in NEMA 1, 4 or 7 enclosures available in 3 temperature ranges.
- Element watt densities to suit the application. Type 316 stainless steel elements in all plug sizes.
- Thermocouples in either Type "J" or "K" for control or high limit protection.
- Sheath materials: Carpenter 20, Monel 400, Inconel 600, Hastelloy, and Titanium.
- Passivated elements and plugs for pure and deionized water, photo chemicals, and special processes.

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SCREW PLUG IMMERSION HEATERS

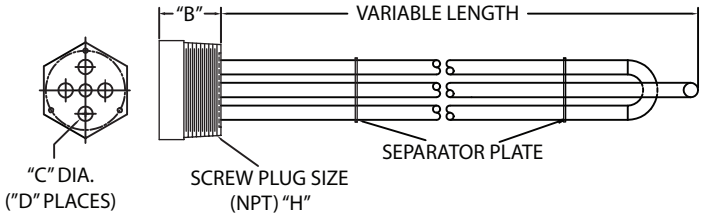
APPLICATION GUIDELINES

Application Element - Guidelines

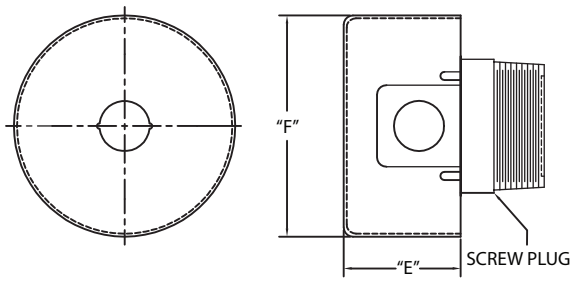
Application	Screw Plug Size	Sheath Material	Screw Plug Material
Clean Water	1"	Copper	Brass
	1¼"	Copper	Brass
	2"	Copper	Brass
	2"	Copper	Brass
	2"	Copper	Brass
	2"	Incoloy®	Brass
	2½"	Copper	Brass
	2½"	Copper	Brass
Process Water	1"	304 Stainless Steel	304 Stainless Steel
	2"	304 Stainless Steel	304 Stainless Steel
	2"	304 Stainless Steel	304 Stainless Steel
	2"	304 Stainless Steel	304 Stainless Steel
	2"	304 Stainless Steel	304 Stainless Steel
	2½"	304 Stainless Steel	304 Stainless Steel
	2½"	304 Stainless Steel	304 Stainless Steel
Solution Water	2"	Incoloy®	304 Stainless Steel
	2"	Incoloy®	304 Stainless Steel
	2"	Incoloy®	304 Stainless Steel
	2"	Incoloy®	304 Stainless Steel
	2½"	Incoloy®	304 Stainless Steel
	2½"	Incoloy®	304 Stainless Steel
Corrosive Solutions	2"	304 Stainless Steel	304 Stainless Steel
	2"	304 Stainless Steel	304 Stainless Steel
	2"	Incoloy®	304 Stainless Steel
	2"	Incoloy®	304 Stainless Steel
Severely Corrosive Solutions	2"	304 Stainless Steel	304 Stainless Steel
	2"	304 Stainless Steel	304 Stainless Steel
	2"	Incoloy®	304 Stainless Steel
	2"	Incoloy®	304 Stainless Steel
Light Weight Oil	1"	Steel	Steel
	1¼"	Steel	Steel
	2"	Steel	Steel
	2"	Steel	Steel
	2"	Steel	Steel
	2"	Steel	Steel
	2½"	Steel	Steel
	2½"	Steel	Steel
Medium Weight Oil	2"	Steel	Steel
	2"	Steel	Steel
	2"	Steel	Steel
	2"	Steel	Steel
	2½"	Steel	Steel
	2½"	Steel	Steel
Heavy Weight Oil	2"	Steel	Steel
	2"	Steel	Steel
	2"	Steel	Steel
	2"	Steel	Steel
	2½"	Steel	Steel
	2½"	Steel	Steel

SCREW PLUG TERMINATION ENCLOSURE CONFIGURATIONS

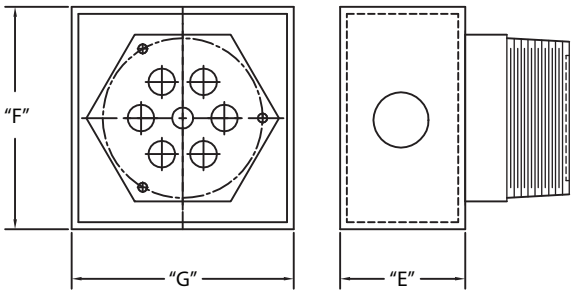
SCREW PLUG HEATER WITHOUT ENCLOSURE



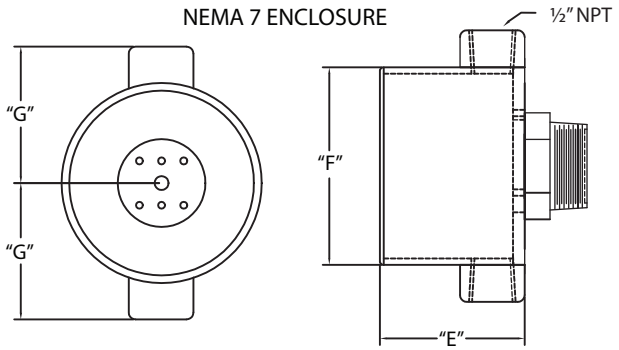
NEMA 1 ENCLOSURE



NEMA 4 ENCLOSURE



NEMA 7 ENCLOSURE



Screw Plug Size	Enclosure Type	Number of Elements	B	C (Max. Element Dia.)	D	E	F	G
1.00	No Enclosure	1	1.25"	0.32"	2.00	N/A	N/A	N/A
1.00	NEMA 1	1	1.25"	0.32"	2.00	1.63"	3.25"	3.25"
1.00	NEMA 4	1	1.25"	0.32"	2.00	4.72"	3.50"	3.50"
1.00	NEMA 7	1	1.25"	0.32"	2.00	5.11"	3.50"	4.50"
1.25	No Enclosure	1, 2, 3	1.25"	0.32"	2, 4, 6	N/A	N/A	N/A
1.25	NEMA 1	1, 2, 3	1.25"	0.32"	2, 4, 6	1.63"	3.25"	3.25"
1.25	NEMA 4	1, 2, 3	1.25"	0.48"	2, 4, 6	2.50"	3.50"	3.50"
1.25	NEMA 7	1, 2, 3	1.25"	0.32"	2, 4, 6	5.11"	3.50"	4.50"
1.50	No Enclosure	1, 2, 3	1.50"	0.38"	2, 4, 6	N/A	N/A	N/A
1.50	NEMA 1	1, 2, 3	1.50"	0.32"	2, 4, 6	2.63"	4.00"	4.00"
1.50	NEMA 4	1, 2, 3	1.50"	0.44"	2, 4, 6	3.92"	4.00"	4.00"
1.50	NEMA 7	1, 2, 3	1.50"	0.32"	2, 4, 6	5.11"	4.75"	5.25"
2.00	No Enclosure	3	1.88"	0.43"	6.00	N/A	N/A	N/A
2.00	NEMA 1	3	1.88"	0.43"	6.00	2.50"	4.00"	4.00"
2.00	NEMA 4	3	1.88"	0.43"	6.00	2.25"	4.00"	4.00"
2.00	NEMA 7	3	1.88"	0.43"	6.00	5.35"	4.75"	5.25"
2.50	No Enclosure	3	1.88"	0.43"	6.00	N/A	N/A	N/A
2.50	NEMA 1	3	1.88"	0.48"	6.00	2.63"	4.75"	4.75"
2.50	NEMA 4	3	1.88"	0.44"	6.00	4.50"	4.75"	4.75"
2.50	NEMA 7	3	1.88"	3.92"	6.00	3.92"	5.75"	6.50"

Standard Material Combinations	
Screw Plug	**Element**
Brass	Copper
Brass	Incoloy
Brass	Steel
Stainless Steel	Incoloy
Stainless Steel	Stainless steel
Steel	Copper
Steel	Incoloy
Steel	Steel

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SCREW PLUG IMMERSION HEATERS

LIST OF SIZES & RATINGS

APPLICATION: CLEAN WATER

1" NPT	IMMERSED LENGTH "B"	WATTS	VOLTAGE		NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			120V 1PH	240V 1PH			
BRASS PLUG	4-1/2″	500	■	■	1	60	MS103C-H04HN-0500 ☐
	6-1/2″	750	■	■	1	60	MS103C-H06HN-0750 ☐
COPPER SHEATHED ELEMENTS	6-5/8″	1000	■	■	1	60	MS103C-H06KN-1000 ☐
	8″	1250	■	■	1	60	MS103C-H08ON-1250☐
	10-5/8″	1500	■	■	1	60	MS103C-H10KN-1500 ☐
	12-1/2″	2000	■	■	1	60	MS103C-H12HN-2000 ☐
	14-3/4″	2500	■	■	1	60	MS103C-H14MN-2500☐
NEMA 1 HOUSING	16-3/4″	3000	■	■	1	60	MS103C-H16MN-3000☐
	21″	4000	■	■	1	60	MS103C-H21ON-4000 ☐

APPLICATION: LIGHTWEIGHT OILS, DEGREASING SOLUTIONS, HEAT TRANSFER OILS.

1" NPT	IMMERSED LENGTH "B"	WATTS	VOLTAGE		NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			120V 1PH	240V 1PH			
STEEL PLUG	6-1/2″	250	■	■	1	20	MS101B-H06HN-0250 ☐
	9-1/4″	350	■	■	1	20	MS101B-H09DN-0350 ☐
STEEL SHEATHED ELEMENTS	9-3/4″	500	■	■	1	20	MS101B-H09MN-0500 ☐
	13-1/2″	750	■	■	1	20	MS101B-H13HN-0750 ☐
	16-3/4″	1000	■	■	1	20	MS101B-H16MN-1000 ☐
	23-3/4″	1500	■	■	1	20	MS101B-H23MN-1500 ☐
NEMA 1 HOUSING							

APPLICATION: CLEAN WATER

1-1/4" NPT	IMMERSED LENGTH "B"	WATTS	VOLTAGE		NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			120V 1PH	240V 1PH			
BRASS PLUG	4-3/8″	500	■	■	1	60	MS1D3C-H04FN-0500 ☐
	4-3/8″	1000	■	■	2	60	MS1D3C-J04FN-1000 ☐
	6-3/8″	750	■	■	1	60	MS1D3C-H06FN-0750 ☐
COPPER SHEATHED ELEMENTS	6-3/8″	1500	■	■	2	60	MS1D3C-J06FN-1500 ☐
	8-1/2″	2000	■	■	2	60	MS1D3C-J08HN-2000 ☐
	10-3/4″	2500	■	■	2	60	MS1D3C-J10MN-2500☐
	15″	3000	■	■	2	60	MS1D3C-J15ON-3000 ☐
NEMA 1 HOUSING	19″	4300	■	■	2	60	MS1D3C-J19ON-4300 ☐
	23-1/2″	5000	■	■	2	60	MS1D3C-J23HN-5000 ☐
	27-1/2″	6000	■	■	2	60	MS1D3C-J27HN-6000 ☐

APPLICATION: LIGHTWEIGHT OILS, DEGREASING SOLUTIONS, HEAT TRANSFER OILS.

1-1/4" NPT	IMMERSED LENGTH "B"	WATTS	VOLTAGE		NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			120V 1PH	240V 1PH			
STEEL PLUG	6-3/8″	500	■	■	2	20	MS1D1B-J06FN-0500 ☐
	8-7/8″	700	■	■	2	20	MS1D1B-J08PN-0700 ☐
STEEL SHEATHED ELEMENTS	12-3/4″	1000	■	■	2	20	MS1D1B-J12MN-1000☐
	19-3/8″	1500	■	■	2	20	MS1D1B-J19FN-1500 ☐
	25-3/8″	2000	■	■	2	20	MS1D1B-J25FN-2000 ☐
	36-7/8″	3000	■	■	2	20	MS1D1B-J36PN-3000 ☐
NEMA 1 HOUSING							

APPLICATION: FORCED AIR AND GASES, CAUSTIC SOLUTIONS, DEGREASING SOLUTIONS

1-1/4" NPT	IMMERSED LENGTH "B"	WATTS	VOLTAGE		NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			120V 1PH	240V 1PH			
304 STAINLESS STEEL PLUG	13-3/8″	1000	■	■	2	23	MS1D2N-J13FN-1000 ☐
INCOLOY® SHEATHED ELEMENTS	19″	1500	■	■	2	23	MS1D2N-J19ON-1500 ☐
	24-3/8″	2000	■	■	2	23	MS1D2N-J24FN-2000 ☐
NEMA 1 HOUSING							

* Blank box denotes voltage selection: See Table 4 on Page 86.

SCREW PLUG IMMERSION HEATERS

LIST OF SIZES & RATINGS

APPLICATION: CLEAN WATER

2" NPT	IMMERSED LENGTH "B"	WATTS	VOLTAGE				NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			120V 1PH	240V 3PH	480V 1PH	480V 3PH			
BRASS PLUG COPPER SHEATHED ELEMENTS NEMA 1 HOUSING	8-1/8″	2000	■		■		2	60	MS203C-J08BN-2000 ☐
	8-1/8″	3000		■		■	3	60	MS203C-A08BN-3000☐
	11-1/8″	2000	■		■		2	60	MS203C-J11BN-2000 ☐
	11-1/8″	4500		■		■	3	60	MS203C-A11BN-4500☐
	15-1/8″	4000	■		■		2	60	MS203C-J15BN-4000 ☐
	15-1/8″	6000		■		■	3	60	MS203C-A15BN-6000☐
	21-1/8″	6000	■		■		2	60	MS203C-J21BN-6000 ☐
	21-1/8″	9000		■		■	3	60	MS203C-A21BN-9000☐
	26-5/8″	8000	■		■		2	60	MS203C-J26KN-8000 ☐
	26-5/8″	12000		■		■	3	60	MS203C-A26KN-120C☐
	32-1/8″	10000	■		■		2	60	MS203C-J32BN-100C ☐
	32-1/8″	15000		■		■	3	60	MS203C-A32BN-150C☐

APPLICATION: PROCESS WATER

2" NPT	IMMERSED LENGTH "B"	WATTS	VOLTAGE				NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			120V 1PH	240V 3PH	480V 1PH	480V 3PH			
304 STAINLESS STEEL PLUG INCOLOY® SHEATHED ELEMENTS NEMA 1 HOUSING	9-3/4″	2000	■		■		2	48	MS202N-J09MN-2000 ☐
	9-3/4″	3000		■		■	3	48	MS202N-A09MN-3000☐
	13-1/4″	2000	■		■		2	48	MS202N-J13DN-2000 ☐
	13-3/4″	4500		■		■	3	48	MS202N-A13MN-4500☐
	17-3/4″	4000	■		■		2	48	MS202N-J17MN-4000 ☐
	17-3/4″	6000		■		■	3	48	MS202N-A17MN-6000☐
	20-1/4″	5000	■		■		2	48	MS202N-J20DN-5000 ☐
	20-1/4″	7500		■		■	3	48	MS202N-A20DN-7500☐
	25-3/4″	6000	■		■		2	48	MS202N-J25MN-6000 ☐
	25-3/4″	9000		■		■	3	48	MS202N-A25MN-9000☐
	32-3/4″	8000	■		■		2	48	MS202N-J32MN-8000 ☐
	32-3/4″	12000		■		■	3	48	MS202N-A32MN-120C☐
	40-1/4″	10000	■		■		2	48	MS202N-J40DN-100C ☐
	40-1/4″	15000		■		■	3	48	MS202N-A40DN-150C☐
	47-3/4″	18000		■		■	3	48	MS202N-A47MN-180C☐

APPLICATION: LIGHTWEIGHT OILS, DEGREASING SOLUTIONS, HEAT TRANSFER OILS

2" NPT	IMMERSED LENGTH "B"	WATTS	VOLTAGE				NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			120V 1PH	240V 3PH	480V 1PH	480V 3PH			
STEEL PLUG COPPER SHEATHED ELEMENTS NEMA 1 HOUSING	9-1/2″	1000	■		■		2	23	MS201C-J09HN-1000 ☐
	9-1/2″	1500		■		■	3	23	MS201C-A09HN-1500☐
	13-1/2″	1500	■		■		2	23	MS201C-J13HN-1500 ☐
	17-1/2″	2000	■		■		2	23	MS201C-J17HN-2000 ☐
	17-1/2″	3000		■		■	3	23	MS201C-A17HN-3000☐
	20-1/2″	2500	■		■		2	23	MS201C-J20HN-2500 ☐
	25″	3000	■		■		2	23	MS201C-J25ON-3000 ☐
	25″	4500		■		■	3	23	MS201C-A25ON-4500☐
	32-1/2″	4000	■		■		2	23	MS201C-J32HN-4000 ☐
	32-1/2″	6000		■		■	3	23	MS201C-A32HN-6000☐
	40″	5000	■		■		2	23	MS201C-J40ON-5000 ☐
	40″	7500		■		■	3	23	MS201C-A40ON-7500☐
	47-1/2″	6000	■		■		2	23	MS201C-J47HN-6000 ☐
	47-1/2″	9000		■		■	3	23	MS201C-A47HN-9000☐
	64″	12500		■		■	3	23	MS201C-A64ON-125C☐

* Blank box denotes voltage selection: See Table 4 on Page 86

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SCREW PLUG IMMERSION HEATERS

LIST OF SIZES & RATINGS

APPLICATION: DEIONIZED WATER, DEMINERALIZED WATER, CLEAN WATER

2-1/2" NPT	IMMERSED LENGTH "B"	WATTS	VOLTAGE		NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			120V 1PH	240V 1PH			
BRASS PLUG	7-5/8″	3000	■	■	3	60	MS2H3C-A07KN-3000☐
	10-5/8″	4500	■	■	3	60	MS2H3C-A10KN-4500☐
COPPER SHEATHED ELEMENTS	14-5/8″	6000	■	■	3	60	MS2H3C-A14KN-6000☐
	17-5/8″	7500	■	■	3	60	MS2H3C-A17KN-7500☐
	20-5/8″	9000	■	■	3	60	MS2H3C-A20KN-9000☐
	26-1/8″	12000	■	■	3	60	MS2H3C-A26BN-120C☐
NEMA 1 HOUSING	31-5/8″	15000	■	■	3	60	MS2H3C-A31KN-150C☐
	37-1/8″	18000	■	■	3	60	MS2H3C-A37BN-180C☐

APPLICATION: PROCESS WATER

2-1/2" NPT	IMMERSED LENGTH "B"	WATTS	VOLTAGE		NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			120V 1PH	240V 1PH			
304 STAINLESS STEEL PLUG	9-3/8″	3000	■	■	3	48	MS2H2N-A09FN-3000 ☐
	12-7/8″	4500	■	■	3	48	MS2H2N-A12PN-4500 ☐
	17-3/8″	6000	■	■	3	48	MS2H2N-A17FN-6000 ☐
INCOLOY® SHEATHED ELEMENTS	19-7/8″	7500	■	■	3	48	MS2H2N-A19PN-7500 ☐
	24-7/8″	9000	■	■	3	48	MS2H2N-A24PN-9000 ☐
	32-3/8″	12000	■	■	3	48	MS2H2N-A32FN-120C ☐
NEMA 1 HOUSING	39-7/8″	15000	■	■	3	48	MS2H2N-A39PN-150C ☐
	47-3/8″	18000	■	■	3	48	MS2H2N-A47FN-180C ☐

APPLICATION: LIGHTWEIGHT OILS, DEGREASING SOLUTIONS, HEAT TRANSFER OILS

2-1/2" NPT	IMMERSED LENGTH "B"	WATTS	VOLTAGE		NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			120V 1PH	240V 1PH			
304 STAINLESS STEEL PLUG	17-3/8″	3000	■	■	3	23	MS2H2N-A17FN-3000 ☐
	24-7/8″	4500	■	■	3	23	MS2H2N-A24PN-4500 ☐
	32-3/8″	6000	■	■	3	23	MS2H2N-A32FN-6000 ☐
INCOLOY® SHEATHED ELEMENTS	39-7/8″	7500	■	■	3	23	MS2H2N-A39PN-7500 ☐
	47-3/8″	9000	■	■	3	23	MS2H2N-A47FN-9000 ☐
	63-7/8″	12000	■	■	3	23	MS2H2N-A63PN-125C☐
NEMA 1 HOUSING	76-3/8″	15000	■	■	3	23	MS2H2N-A76FN-150C☐

APPLICATION: MEDIUM WEIGHT OILS, HEAT TRANSFER OILS.

2-1/2" NPT	IMMERSED LENGTH "B"	WATTS	VOLTAGE		NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			120V 1PH	240V 1PH			
STEEL PLUG	17-1/4″	3000	■	■	3	23	MS2H1B-A17DN-3000 ☐
	24-3/4″	4500	■	■	3	23	MS2H1B-A24MN-4500☐
STEEL SHEATHED ELEMENTS	32-1/4″	6000	■	■	3	23	MS2H1B-A32DN-6000 ☐
	39-3/4″	7500	■	■	3	23	MS2H1B-A39MN-7500☐
	47-1/4″	9000	■	■	3	23	MS2H1B-A47DN-9000 ☐
NEMA 1 HOUSING	63-3/4″	12000	■	■	3	23	MS2H1B-A63MN-125C☐
	76-1/4″	15000	■	■	3	23	MS2H1B-A76DN-150C ☐

APPLICATION: BUNKER C AND #6 FUEL OILS

2-1/2" NPT	IMMERSED LENGTH "B"	WATTS	VOLTAGE		NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			120V 1PH	240V 1PH			
STEEL PLUG	17-1/4″	1000	■	■	3	8	MS2H1B-A17DN-1000 ☐
	24-3/4″	1500	■	■	3	8	MS2H1B-A24MN-1500☐
STEEL SHEATHED ELEMENTS	32-1/4″	2000	■	■	3	8	MS2H1B-A32DN-2000 ☐
	39-3/4″	2500	■	■	3	8	MS2H1B-A39MN-2500☐
	47-1/4″	3000	■	■	3	8	MS2H1B-A47DN-3000 ☐
NEMA 1 HOUSING	63-3/4″	4000	■	■	3	8	MS2H1B-A63MN-4000☐
	76-1/4″	5000	■	■	3	8	MS21B-A76DN-5000 ☐

* Blank box denotes voltage selection: See Table 4 on Page 86.

SCREW PLUG IMMERSION HEATER INSTALLATION AND OPERATION

BEFORE INSTALLING:

1. Unpack the heater at the place of installation. Inspect the heater for shipping damage and report any claims to the carrier. Do not operate damaged equipment.
2. Check the nameplate watt and volt rating against your supply voltage and capacity and the requirements of your installation.

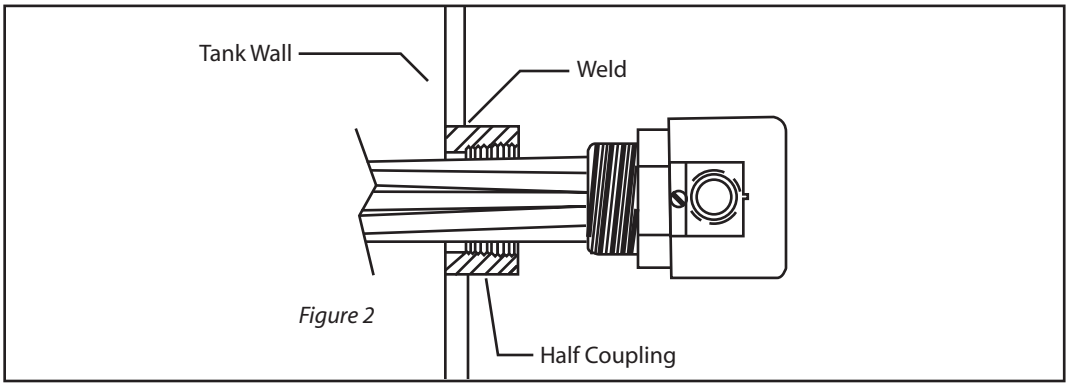

Figure 2

INSTALLATION INSTRUCTIONS

MOUNTING (FIGURE 2)

1. The heater must be installed so that the heated section is immersed at all times. Premature failure of the element will occur if this is not done.
2. Horizontal mounting of the heater is recommended.
3. The heater should be located as close to the bottom of the tank as possible for maximizing heating efficiency.
4. Locate the heater below the minimum liquid level and above the maximum expected sludge level. (Figure 3)
5. Cover the threads of screw plug immersion heaters with teflon tape or sealing compound before installing.
6. Use a wrench on the hex portion of screw plug to tighten the heater in the threaded tank opening. Do not turn the heater by the terminal enclosure.

WIRING

1. All wiring should be done in accordance with the National Electrical Code and applicable local codes.
2. Refer to the typical wiring diagrams on pages 45 and 46 for the proper method of connecting the heater.
3. The current carrying capacity of the power supply leads should exceed the heater amperage by at least 25%. Be sure to consider the ambient operating temperature and apply the appropriate correction factor to the ampacity rating of the wire. Lead wire used must be rated for 150°C minimum.

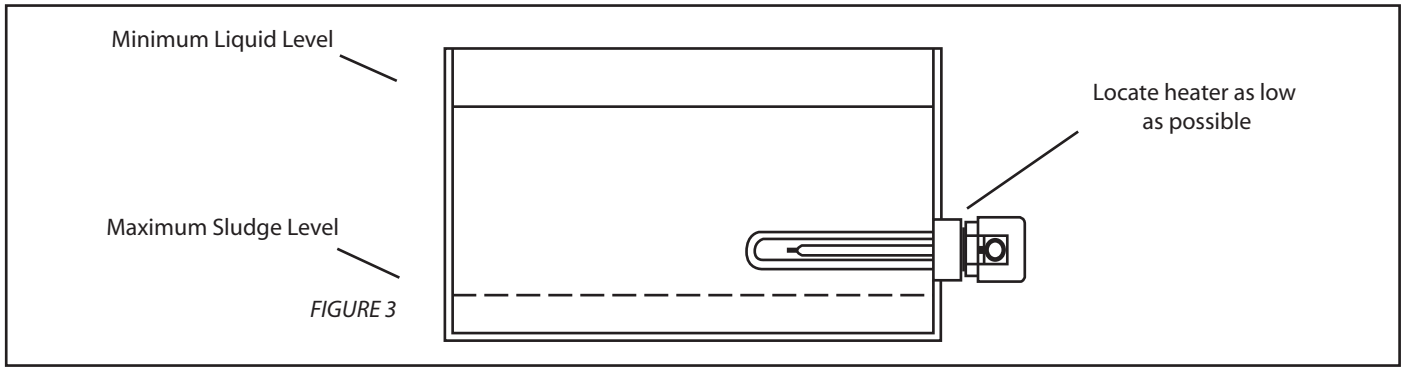

FIGURE 3

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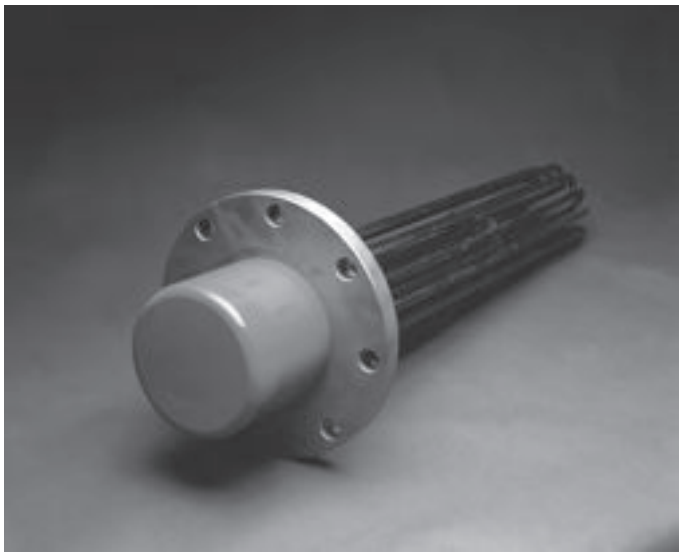
FLANGE IMMERSION HEATERS

Flanged Immersion Heaters are constructed with formed tubular heating elements brazed or welded to a high pressure flange for direct immersion into tanks and pressure vessels. Capable of achieving higher wattage requirements than conventional screw plug heaters due to additional heating elements that can be added to this heater design.



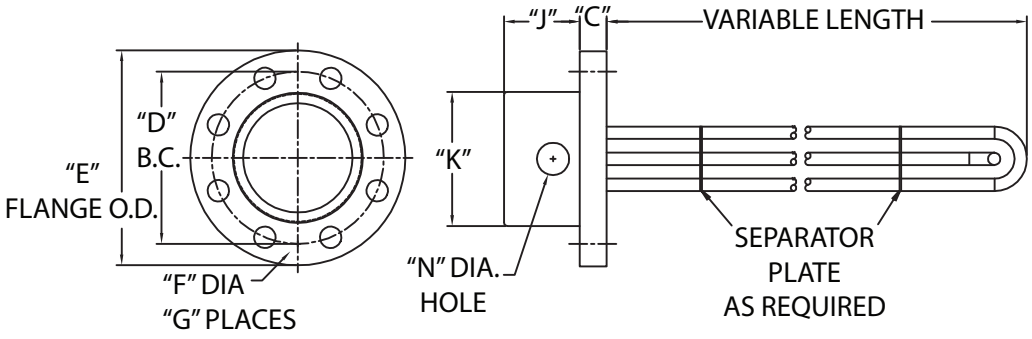
FEATURES:

- Standard sheath materials: copper, Incoloy®, and steel
- Recompacted bends for consistent MgO density
- Elements are sealed to prevent leakage and contamination.
- Heavy duty metal sheath elements
- NEMA 1 housing (optional NEMA 4 or 7 available)
- Silver braze construction on non-ferrous flanges
- Thermowells
- 150 lb rated flange with 1/16" raised face
- Optional 300 lb rated flange
- Flanges meet ASTM & ANSI specifications
- Corrosion resistant hardware
- Welded construction between elements and flanges
- Hydrostatic pressure testing

TYPICAL APPLICATIONS:

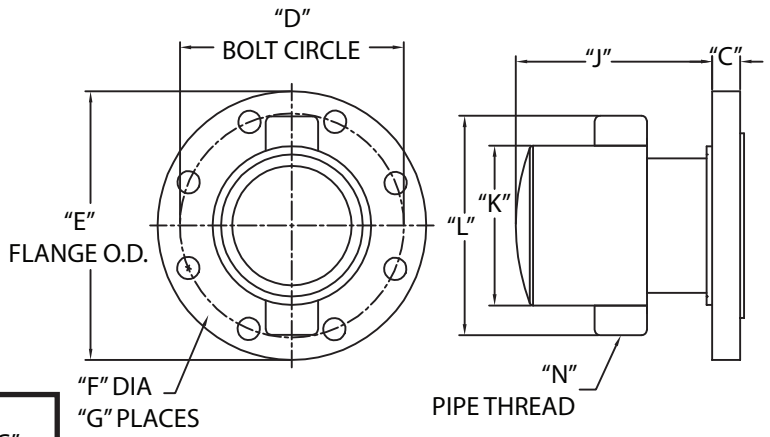
- Freeze Protection
- Process Liquids
- Solution Liquids
- Asphalt
- Wax
- Paraffin
- Fluid Heating

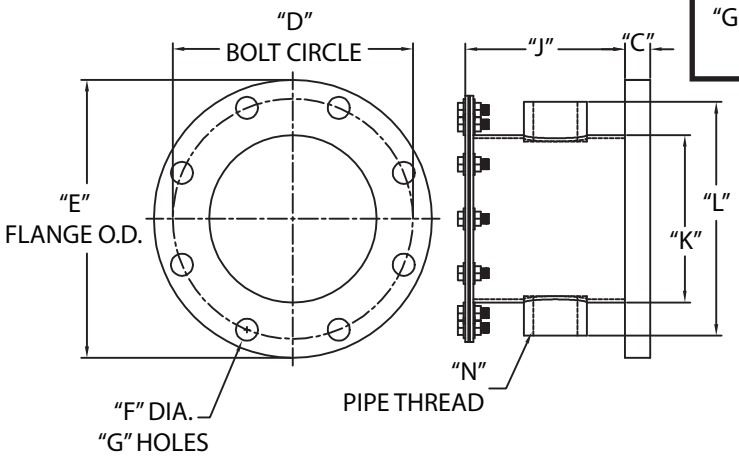
FLANGE IMMERSION HEATER TERMINAL ENCLOSURE CONFIGURATIONS



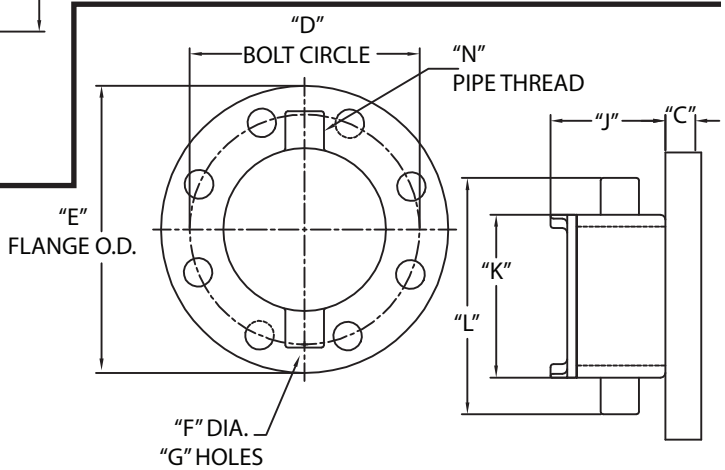
GENERAL PURPOSE, ALL FLANGE SIZES

MOISTURE RESISTANT/ EXPLOSION RESISTANT 3" FLANGE ONLY, WITH THERMOSTAT





NEMA 4, ALL FLANGES



EXPLOSION RESISTANT

*See next page for corresponding values.

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FLANGE IMMERSION HEATER TERMINAL ENCLOSURE CONFIGURATIONS

Flange Size	Enclosure Type	Max. Number of Elements	C	D Bolt Circle	E Flange O.D.	F	G	J	K	L	N
3"	No Enclosure	3	0.94"	6.00"	7.50"	0.75"	4	N/A	N/A	N/A	N/A
3"	NEMA 1	3	0.94"	6.00"	7.50"	0.75"	4	4.00"	5.50"	N/A	1.13"
3"	NEMA 4	3	0.94"	6.00"	7.50"	0.75"	4	6.00"	5.50"	7.00"	1.50"
3"	NEMA 7	3	0.94"	6.00"	7.50"	0.75"	4	6.00"	5.50"	7.00"	1.50"
4"	No Enclosure	6	0.94"	7.50"	9.00"	0.75"	8	N/A	N/A	N/A	N/A
4"	NEMA 1	6	0.94"	7.50"	9.00"	0.75"	8	4.00"	5.50"	N/A	1.13"
4"	NEMA 4	6	0.94"	7.50"	9.00"	0.75"	8	6.00"	5.50"	7.00"	1.50"
4"	NEMA 7	6	0.94"	7.50"	9.00"	0.75"	8	6.00"	5.50"	7.00"	1.50"
5"	No Enclosure	9	0.94"	8.50"	10.0"	0.88"	8	N/A	N/A	N/A	N/A
5"	NEMA 1	9	0.94"	8.50"	10.0"	0.88"	8	4.00"	6.00"	N/A	1.13"
5"	NEMA 4	9	0.94"	8.50"	10.0"	0.88"	8	6.00"	6.00"	7.50"	1.50"
5"	NEMA 7	9	0.94"	8.50"	10.0"	0.88"	8	6.00"	6.00"	7.50"	1.50"
6"	No Enclosure	12	1.0"	9.50"	11.0"	0.88"	8	N/A	N/A	N/A	N/A
6"	NEMA 1	12	1.0"	9.50"	11.0"	0.88"	8	4.00"	7.00"	N/A	1.13"
6"	NEMA 4	12	1.0"	9.50"	11.0"	0.88"	8	6.00"	7.00"	8.50"	1.50"
6"	NEMA 7	12	1.0"	9.50"	11.0"	0.88"	8	6.00"	7.00"	8.50"	1.50"
8"	No Enclosure	18	1.12"	11.75"	13.0"	0.88"	8	N/A	N/A	N/A	N/A
8"	NEMA 1	18	1.12"	11.75"	13.0"	0.88"	8	6.00"	9.00"	N/A	1.13"
8"	NEMA 4	18	1.12"	11.75"	13.0"	0.88"	8	6.00"	9.00"	10.50"	1.50"
8"	NEMA 7	18	1.12"	11.75"	13.0"	0.88"	8	6.00"	9.00"	10.50"	1.50"
10"	No Enclosure	36	1.19"	14.25"	16.0"	1.00"	12	N/A	N/A	N/A	N/A
10"	NEMA 1	36	1.19"	14.25"	16.0"	1.00"	12	6.00"	10.0"	N/A	1.13"
10"	NEMA 4	36	1.19"	14.25"	16.0"	1.00"	12	7.00"	10.0"	11.50"	1.50"
10"	NEMA 7	36	1.19"	14.25"	16.0"	1.00"	12	7.00"	10.0"	11.50"	1.50"
12"	No Enclosure	45	1.25"	17.0"	19.0"	1.00"	12	N/A	N/A	N/A	N/A
12"	NEMA 1	45	1.25"	17.0"	19.0"	1.00"	12	6.00"	10.0"	N/A	1.13"
12"	NEMA 4	45	1.25"	17.0"	19.0"	1.00"	12	7.00"	10.0"	11.50"	1.50"
12"	NEMA 7	45	1.25"	17.0"	19.0"	1.00"	12	7.00"	10.0"	11.50"	1.50"

FLANGE IMMERSION HEATERS

SELECTION GUIDELINES

OPTIONAL FEATURES

• NEMA 4 (moisture resistant) or NEMA 7 (explosion resistant) enclosures.

• Thermostatic controls in NEMA 1, 4, or 7 enclosures available in 3 temperature ranges.

• Passivated elements and flanges for pure and deionized water applications, photo chemicals and special processes.

• Standoff housing design available for high temperature applications.

• Other sheath materials: Carpenter 20, Monel 400, Inconel 600, Hastelloy, and Titanium.

• Type 304 or 316 Stainless Steel flanges.

• 300 lb ANSI rated flange.

Application	Flange Size (In.)	Sheath Material	Flange Material	Watt Density
Clean Water	3"	Copper	Steel	40-80
	4"	Copper	Steel	40-80
	5"	Copper	Steel	40-80
	6"	Copper	Steel	40-80
	8"	Copper	Steel	40-80
	10"	Copper	Steel	40-80
	12"	Copper	Steel	40-80
	14"	Copper	Steel	40-80
Process Water	3"	304 Stainless Steel	Steel	60
	4"	304 Stainless Steel	Steel	60
	5"	304 Stainless Steel	Steel	60
	6"	304 Stainless Steel	Steel	60
	8"	304 Stainless Steel	Steel	60
Solution Water	3"	Incoloy®	Steel	50
	4"	Incoloy®	Steel	50
	5"	Incoloy®	Steel	50
	6"	Incoloy®	Steel	50
	8"	Incoloy®	Steel	50
Mildly Corrosive Solution	3"	304 Stainless Steel	Steel	25
	4"	304 Stainless Steel	Steel	25
	5"	304 Stainless Steel	Steel	25
	6"	304 Stainless Steel	Steel	25
	8"	304 Stainless Steel	Steel	25
Corrosive Solution & Gas	3"	Incoloy®	Steel	25
	4"	Incoloy®	Steel	25
	5"	Incoloy®	Steel	25
	6"	Incoloy®	Steel	25
	8"	Incoloy®	Steel	25
	10"	Incoloy®	Steel	25
	12"	Incoloy®	Steel	25
	14"	Incoloy®	Steel	25
Severely Corrosive Solution	3"	Incoloy®	304 Stainless Steel	15
	4"	Incoloy®	304 Stainless Steel	15
	5"	Incoloy®	304 Stainless Steel	15
	6"	Incoloy®	304 Stainless Steel	15
Demineralized or De-ionized Water	3"	Incoloy®	304 Stainless Steel	25
	5"	Incoloy®	304 Stainless Steel	25
Boiler & Water	2½ sq.	Copper	Brass	15
	2½ sq.	Incoloy®	Steel	15
	4½ sq.	Copper	Steel	15
Light Weight Oil	3"	Steel	Steel	25
	4"	Steel	Steel	25
	5"	Steel	Steel	25
	6"	Steel	Steel	25
	8"	Steel	Steel	25
	10"	Steel	Steel	25
	12"	Steel	Steel	25
	14"	Steel	Steel	25
Medium Weight Oil	3"	Steel	Steel	15
	4"	Steel	Steel	15
	5"	Steel	Steel	15
	6"	Steel	Steel	15
Heavy Weight Oil	3"	Steel	Steel	8
	4"	Steel	Steel	8
	5"	Steel	Steel	8

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FLANGE IMMERSION HEATERS

LIST OF SIZES & RATINGS

APPLICATION: CLEAN WATER

3" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE				MAX. NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER
			240V 1PH	240V 3PH	480V 1PH	480V 3PH			
	15-1/2″	6.75	■	■	■	■	3	60	MFPR03-C15HA-6750☐☐N
COPPER	21-1/2″	9.0	■	■	■	■	3	60	MFPR03-C21HA-9000☐☐N
SHEATHED	27″	12.0	■	■	■	■	3	60	MFPR03-C27OA-120C☐☐N
ELEMENTS	32-1/2″	15.0	■	■	■	■	3	60	MFPR03-C32HA-150C☐☐N
	38″	18.0	■	■	■	■	3	60	MFPR03-C38OA-180C☐☐N
NEMA 1 HOUSING	51″	25.0			■	■	3	60	MFPR03-C51OA-250C☐☐N
	60-1/2″	30.0			■	■	3	60	MFPR03-C60HA-300C☐☐N

APPLICATION: PROCESS WATER

3" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE				MAX. NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER
			240V 1PH	240V 3PH	480V 1PH	480V 3PH			
	13-1/2″	4.5	■	■	■	■	3	48	MFPR03-N13HA-4500☐☐N
INCOLOY®	18″	6.0	■	■	■	■	3	48	MFPR03-N18OA-6000☐☐N
SHEATHED	20-1/2″	7.5	■	■	■	■	3	48	MFPR03-N20HA-7500☐☐N
ELEMENTS	25-1/2″	9.0	■	■	■	■	3	48	MFPR03-N25HA-9000☐☐N
	33″	12.0	■	■	■	■	3	48	MFPR03-N33OA-120C☐☐N
NEMA 1 HOUSING	40-1/2″	15.0			■	■	3	48	MFPR03-N40HA-150C☐☐N
	48″	18.0			■	■	3	48	MFPR03-N48OA-180C☐☐N

APPLICATION: FORCED AIR AND GASES, CAUSTIC SOLUTIONS, DEGREASING SOLUTIONS

3" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE				MAX. NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER
			240V 1PH	240V 3PH	480V 1PH	480V 3PH			
	18″	3.0	■	■	■	■	3	23	MFPR03-N18OA-3000☐☐N
INCOLOY®	25-1/2″	4.5	■	■	■	■	3	23	MFPR03-N25HA-4500☐☐N
SHEATHED	33″	6.0	■	■	■	■	3	23	MFPR03-N33OA-6000☐☐N
ELEMENTS	40-1/2″	7.5	■	■	■	■	3	23	MFPR03-N40HA-7500☐☐N
	48″	9.0	■	■	■	■	3	23	MFPR03-N48OA-9000☐☐N
NEMA 1 HOUSING	64-1/2″	12.5			■	■	3	23	MFPR03-N64HA-125C☐☐N
	77″	15.0			■	■	3	23	MFPR03-N77OA-150C☐☐N

APPLICATION: LIGHTWEIGHT OILS, DEGREASING SOLUTIONS, HEAT TRANSFER OILS

3" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE				MAX. NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER
			240V 1PH	240V 3PH	480V 1PH	480V 3PH			
	18″	3.0	■	■	■	■	3	23	MFPR03-B18OA-3000☐☐N
STEEL	25-1/2″	4.5	■	■	■	■	3	23	MFPR03-B25HA-4500☐☐N
SHEATHED	33″	6.0	■	■	■	■	3	23	MFPR03-B33OA-6000☐☐N
ELEMENTS	40-1/2″	7.5	■	■	■	■	3	23	MFPR03-B40HA-7500☐☐N
	48″	9.0	■	■	■	■	3	23	MFPR03-B48OA-9000☐☐N
NEMA 1 HOUSING	64-1/2″	12.5			■	■	3	23	MFPR03-B64HA-125C☐☐N
	77″	15.0			■	■	3	23	MFPR03-B77OA-150C☐☐N

APPLICATION: BUNKER C AND #6 FUEL OILS

3" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE				MAX. NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER
			240V 1PH	240V 3PH	480V 1PH	480V 3PH			
	33″	2.0		■		■	3	8	MFPR03-B33OA-2000☐☐N
STEEL	48″	3.0		■		■	3	8	MFPR03-B48OA-3000☐☐N
SHEATHED	64-1/2″	4.0		■		■	3	8	MFPR03-B64HA-4000☐☐N
ELEMENTS	77″	5.0		■		■	3	8	MFPR03-B77OA-5000☐☐N
NEMA 1 HOUSING									

* 1st Blank box denotes voltage selection: See Table 4 on Page 86.
2nd Blank box denotes number of phases.

FLANGE IMMERSION HEATERS

LIST OF SIZES & RATINGS

APPLICATION: CLEAN WATER

4" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE				NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER
			240V 1PH	240V 3PH	480V 1PH	480V 3PH			
COPPER SHEATHED ELEMENTS NEMA 1 HOUSING	15-1/2″	13.5	■	■	■	■	6	60	MFPR04-C15HB-135C☐☐N
	21-1/2″	19.5	■	■	■	■	6	60	MFPR04-C21HB-195C☐☐N
	27″	25.0	■	■	■	■	6	60	MFPR04-C27OB-250C☐☐N
	32-1/2″	31.5	■	■	■	■	6	60	MFPR04-C32HB-315C☐☐N
	38″	36.0	■	■	■	■	6	60	MFPR04-C38OB-360C☐☐N
	51″	49.5			■	■	6	60	MFPR04-C51OB-495C☐☐N
	60-1/2″	57.0			■	■	6	60	MFPR04-C60HB-570C☐☐N

APPLICATION: PROCESS WATER

4" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE				NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER
			240V 1PH	240V 3PH	480V 1PH	480V 3PH			
INCOLOY® SHEATHED ELEMENTS NEMA 1 HOUSING	13-1/2″	9.3	■	■	■	■	6	48	MFPR04-N13HB-9300☐☐N
	18″	13.2	■	■	■	■	6	48	MFPR04-N18OB-132C☐☐N
	20-1/2″	15.0	■	■	■	■	6	48	MFPR04-N20HB-150C☐☐N
	25-1/2″	18.0	■	■	■	■	6	48	MFPR04-N25HB-180C☐☐N
	33″	24.9	■	■	■	■	6	48	MFPR04-N33OB-249C☐☐N
	40-1/2″	30.6			■	■	6	48	MFPR04-N40HB-306C☐☐N
	48″	36.6			■	■	6	48	MFPR04-N48OB-366C☐☐N

APPLICATION: FORCED AIR AND GASES, CAUSTIC SOLUTIONS, DEGREASING SOLUTIONS

4" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE				NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER
			240V 1PH	240V 3PH	480V 1PH	480V 3PH			
INCOLOY® SHEATHED ELEMENTS NEMA 1 HOUSING	18″	6.3	■	■	■	■	6	23	MFPR04-N18OB-6300☐☐N
	25-1/2″	9.0	■	■	■	■	6	23	MFPR04-N25HB-9000☐☐N
	33″	12.0	■	■	■	■	6	23	MFPR04-N33OB-120C☐☐N
	40-1/2″	15.0	■	■	■	■	6	23	MFPR04-N40HB-150C☐☐N
	48″	18.0	■	■	■	■	6	23	MFPR04-N48OB-180C☐☐N
	64-1/2″	24.0			■	■	6	23	MFPR04-N64HB-240C☐☐N
	77″	28.5			■	■	6	23	MFPR04-N77OB-285C☐☐N

APPLICATION: LIGHTWEIGHT OILS, DEGREASING SOLUTIONS, HEAT TRANSFER OILS

4" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE				NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER
			240V 1PH	240V 3PH	480V 1PH	480V 3PH			
STEEL SHEATHED ELEMENTS NEMA 1 HOUSING	18″	6.3	■	■	■	■	6	23	MFPR04-B18OB-6300☐☐N
	25-1/2″	9.0	■	■	■	■	6	23	MFPR04-B25HB-9000☐☐N
	33″	12.0	■	■	■	■	6	23	MFPR04-B33OB-120C☐☐N
	40-1/2″	15.0	■	■	■	■	6	23	MFPR04-B40HB-150C☐☐N
	48″	18.0	■	■	■	■	6	23	MFPR04-B48OB-180C☐☐N
	64-1/2″	24.0			■	■	6	23	MFPR04-B64HB-240C☐☐N
	77″	28.5			■	■	6	23	MFPR04-B77OB-285C☐☐N

APPLICATION: BUNKER C AND #6 FUEL OILS

4" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE				NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER
			240V 1PH	240V 3PH	480V 1PH	480V 3PH			
STEEL SHEATHED ELEMENTS NEMA 1 HOUSING	33″	4.5		■		■	6	8	MFPR04-B33OB-4500☐☐N
	48″	6.0		■		■	6	8	MFPR04-B48OB-6000☐☐N
	64-1/2″	7.5		■		■	6	8	MFPR04-B64HB-7500☐☐N
	77″	9.0		■		■	6	8	MFPR04-B77OB-9000☐☐N

* 1st Blank box denotes voltage selection: See Table 4 on Page 86.
2nd Blank box denotes number of phases.

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FLANGE IMMERSION HEATERS

LIST OF SIZES & RATINGS

APPLICATION: CLEAR WATER

5" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE				NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER
			240V 1PH	240V 3PH	480V 1PH	480V 3PH			
COPPER SHEATHED ELEMENTS NEMA 1 HOUSING	15-1/2″	20.7	■	■	■	■	9	60	MFPR05-C15HK-207C☐☐N
	21-1/2″	28.0	■	■	■	■	9	60	MFPR05-C21HK-280C☐☐N
	27″	37.5	■	■	■	■	9	60	MFPR05-C270K-375C☐☐N
	32-1/2″	45.0		■	■	■	9	60	MFPR05-C32HK-450C☐☐N
	38″	54.0		■	■	■	9	60	MFPR05-C380K-540C☐☐N
	51″	72.0				■	9	60	MFPR05-C510K-720C☐☐N
	60-1/2″	85.5				■	9	60	MFPR05-C60HK-855C☐☐N

APPLICATION: PROCESS WATER

5" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE				NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER
			240V 1PH	240V 3PH	480V 1PH	480V 3PH			
INCOLOY® SHEATHED ELEMENTS NEMA 1 HOUSING	13-1/2″	13.5	■	■	■	■	9	48	MFPR05-N13HK-135C☐☐N
	18″	19.5	■	■	■	■	9	48	MFPR05-N180K-195C☐☐N
	20-1/2″	22.5	■	■	■	■	9	48	MFPR05-N20HK-225C☐☐N
	25-1/2″	28.5	■	■	■	■	9	48	MFPR05-N25HK-285C☐☐N
	33″	37.5	■	■	■	■	9	48	MFPR05-N330K-375C☐☐N
	40-1/2″	46.0		■	■	■	9	48	MFPR05-N40HK-460C☐☐N
	48″	55.0		■	■	■	9	48	MFPR05-N480K-550C☐☐N

APPLICATION: FORCED AIR AND GASES, CAUSTIC SOLUTIONS, DEGREASING SOLUTIONS

5" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE				NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER
			240V 1PH	240V 3PH	480V 1PH	480V 3PH			
INCOLOY® SHEATHED ELEMENTS NEMA 1 HOUSING	18″	9.5	■	■	■	■	9	23	MFPR05-N180K-9500☐☐N
	25-1/2″	13.5	■	■	■	■	9	23	MFPR05-N25HK-135C☐☐N
	33″	18.0	■	■	■	■	9	23	MFPR05-N330K-180C☐☐N
	48″	26.1	■	■	■	■	9	23	MFPR05-N480K-261C☐☐N
	64-1/2″	34.0		■	■	■	9	23	MFPR05-N64HK-340C☐☐N
	77″	43.0		■	■	■	9	23	MFPR05-N770K-430C☐☐N

APPLICATION: LIGHTWEIGHT OILS, DEGREASING SOLUTIONS, HEAT TRANSFER OILS

5" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE				NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER
			240V 1PH	240V 3PH	480V 1PH	480V 3PH			
STEEL SHEATHED ELEMENTS NEMA 1 HOUSING	18″	9.5	■	■	■	■	9	23	MFPR05-B180K-9500☐☐N
	25-1/2″	13.5	■	■	■	■	9	23	MFPR05-B25HK-135C☐☐N
	33″	18.0	■	■	■	■	9	23	MFPR05-B330K-180C☐☐N
	40-1/2″	26.1	■	■	■	■	9	23	MFPR05-B40HK-261C☐☐N
	48″	31.0	■	■	■	■	9	23	MFPR05-B480K-310C☐☐N
	64-1/2″	34.0		■	■	■	9	23	MFPR05-B64HK-340C☐☐N
	77″	43.0		■	■	■	9	23	MFPR05-B770K-430C☐☐N

APPLICATION: BUNKER C AND #6 FUEL OILS

5" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE				NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER
			240V 1PH	240V 3PH	480V 1PH	480V 3PH			
STEEL SHEATHED ELEMENTS NEMA 1 HOUSING	40-1/2″	7.7		■		■	9	8	MFPR05-B40HK-7700☐3N
	48″	9.0		■		■	9	8	MFPR05-B480K-9000☐3N
	64-1/2″	12.0		■		■	9	8	MFPR05-B64HK-120C☐3N
	77″	15.0		■		■	9	8	MFPR05-B770K-150C☐3N

* 1st Blank box denotes voltage selection: See Table 4 on Page 86.
2nd Blanks box denotes number of phases.

FLANGE IMMERSION HEATERS

LIST OF SIZES & RATINGS

APPLICATION: CLEAR WATER

6" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE				NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			240V 1PH	240V 3PH	480V 1PH	480V 3PH			
	15-3/8″	28	■	■	■	■	12	60	MFPR06-C15FC-280C☐☐N
COPPER	21-3/8″	38	■	■	■	■	12	60	MFPR06-C21FC-380C☐☐N
SHEATHED	26-7/8″	50		■	■	■	12	60	MFPR06-C26PC-500C☐☐N
ELEMENTS	32-3/8″	61.2		■	■	■	12	60	MFPR06-C32FC-612C☐☐N
	37-7/8″	72		■		■	12	60	MFPR06-C37PC-720C☐☐N
NEMA 1 HOUSING	50-7/8″	96				■	12	60	MFPR06-C50PC-960C☐3N
	60-3/8″	115				■	12	60	MFPR06-C60FC-115K☐3N

APPLICATION: PROCESS WATER

6" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE				NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			240V 1PH	240V 3PH	480V 1PH	480V 3PH			
	13-1/2″	18.6	■	■	■	■	12	48	MFPR06-N13HC-186C☐☐N
INCOLOY®	18″	26.4	■	■	■	■	12	48	MFPR06-N18OC-264C☐☐N
SHEATHED	20-1/2″	32.0	■	■	■	■	12	48	MFPR06-N20HC-320C☐☐N
ELEMENTS	25-1/2″	38.0	■	■	■	■	12	48	MFPR06-N25HC-380C☐☐N
	33″	50.0	■	■	■	■	12	48	MFPR06-N33OC-500C☐☐N
NEMA 1 HOUSING	40-1/2″	60.5		■	■	■	12	48	MFPR06-N40HC-605C☐☐N
	48″	72.0		■	■	■	12	48	MFPR06-N48OC-720C☐☐N

APPLICATION: FORCED AIR AND GASES, CAUSTIC SOLUTIONS, DEGREASING SOLUTIONS

6" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE				NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			240V 1PH	240V 3PH	480V 1PH	480V 3PH			
	18″	12.5	■	■	■	■	12	23	MFPR06-N18OC-125C☐☐N
INCOLOY®	25-1/2″	18.0	■	■	■	■	12	23	MFPR06-N25HC-180C☐☐N
SHEATHED	33″	24.0	■	■	■	■	12	23	MFPR06-N33OC-240C☐☐N
ELEMENTS	40-1/2″	29.5	■	■	■	■	12	23	MFPR06-N40HC-295C☐☐N
	48″	35.0	■	■	■	■	12	23	MFPR06-N48OC-350C☐☐N
NEMA 1 HOUSING	64-1/2″	46.5		■	■	■	12	23	MFPR06-N64HC-465C☐☐N
	77″	57.0		■	■	■	12	23	MFPR06-N77OC-570C☐☐N

APPLICATION: LIGHTWEIGHT OILS, DEGREASING SOLUTIONS, HEAT TRANSFER OILS

6" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE				NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			240V 1PH	240V 3PH	480V 1PH	480V 3PH			
	18″	12.5	■	■	■	■	12	23	MFPR06-B18OC-125C☐☐N
STEEL	25-1/2″	18.0	■	■	■	■	12	23	MFPR06-B25HC-180C☐☐N
SHEATHED	33″	24.0	■	■	■	■	12	23	MFPR06-B33OC-240C☐☐N
ELEMENTS	40-1/2″	29.5	■	■	■	■	12	23	MFPR06-B40HC-295C☐☐N
	48″	35.0	■	■	■	■	12	23	MFPR06-B48OC-350C☐☐N
NEMA 1 HOUSING	64-1/2″	46.5		■	■	■	12	23	MFPR06-B64HC-465C☐☐N
	77″	57.0		■	■	■	12	23	MFPR06-B77OC-570C☐☐N

APPLICATION: BUNKER C AND #6 FUEL OILS

6" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE				NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			240V 1PH	240V 3PH	480V 1PH	480V 3PH			
STEEL	40-1/2″	9.6		■		■	12	8	MFPR06-B40HC-9600☐3N
SHEATHED	48″	12.0		■		■	12	8	MFPR06-B48OC-120C☐3N
ELEMENTS	64-1/2″	16.2		■		■	12	8	MFPR06-B64HC-162C☐3N
	77″	19.2		■		■	12	8	MFPR06-B77OC-192C☐3N
NEMA 1 HOUSING									

* 1st Blank box denotes voltage selection: See Table 4 on Page 86.
2nd Blank box denotes number of phases.

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FLANGE IMMERSION HEATERS

LIST OF SIZES & RATINGS

APPLICATION: CLEAR WATER

8" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE			NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			240V 3PH	480V 1PH	480V 3PH			
COPPER SHEATHED ELEMENTS	21-3/4"	61.2	■	■	■	18	60	MFPR08-C21MD-612C☐☐N
	29-3/4"	85.5	■		■	18	60	MFPR08-C29MD-855C☐3N
	37-1/4"	103.5	■		■	18	60	MFPR08-C37DD-103K☐3N
	45-1/4"	129.5	■		■	18	60	MFPR08-C45DD-129K☐3N
	52-3/4"	151.0			■	18	60	MFPR08-C52MD-151K 83N
NEMA 1 HOUSING	60-3/4"	172.5			■	18	60	MFPR08-C60MD-172K 83N
	68-1/4"	193.5			■	18	60	MFPR08-C68DD-193K 83N

APPLICATION: PROCESS WATER

8" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE			NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			240V 3PH	480V 1PH	480V 3PH			
INCOLOY® SHEATHED ELEMENTS	25-3/4"	56.5	■	■	■	18	48	MFPR08-N25MD-565C☐☐N
	35-3/4"	79.0	■		■	18	48	MFPR08-N35MD-790C☐3N
	44-1/4"	99.0	■		■	18	48	MFPR08-N44DD-990C☐3N
	54-1/4"	121.5	■		■	18	48	MFPR08-N54DD-121K☐3N
	63-1/4"	145.0			■	18	48	MFPR08-N63DD-145K 83N
NEMA 1 HOUSING	72-3/4"	166.5			■	18	48	MFPR08-N72MD-166K 83N
	82-1/4"	190.0			■	18	48	MFPR08-N82DD-190K 83N

APPLICATION: FORCED AIR AND GASES, CAUSTIC SOLUTIONS, DEGREASING SOLUTIONS

8" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE			NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			240V 3PH	480V 1PH	480V 3PH			
INCOLOY® SHEATHED ELEMENTS	32-3/4"	36	■	■	■	18	23	MFPR08-N32MD-360C☐☐N
	43-1/4"	46.5	■	■	■	18	23	MFPR08-N43DD-465C☐☐N
	51-1/4"	55.0	■	■	■	18	23	MFPR08-N51DD-550C☐☐N
NEMA 1 HOUSING								

APPLICATION: LIGHTWEIGHT OILS, DEGREASING SOLUTIONS, HEAT TRANSFER OILS

8" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE			NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			240V 3PH	480V 1PH	480V 3PH			
STEEL SHEATHED ELEMENTS	32-3/4"	36	■	■	■	18	23	MFPR08-B32MD-360C☐☐N
	43-1/4"	46.5	■	■	■	18	23	MFPR08-B43DD-465C☐☐N
	51-1/4"	55.0	■	■	■	18	23	MFPR08-B51DD-550C☐☐N
	61-3/4"	65.7	■	■	■	18	23	MFPR08-B61MD-657C☐☐N
	70-1/4"	77.4	■	■	■	18	23	MFPR08-B70DD-774C☐☐N
NEMA 1 HOUSING	79-1/4"	86.5	■		■	18	23	MFPR08-B79DD-865C☐3N

APPLICATION: BUNKER C AND #6 FUEL OILS

8" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE			NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			240V 3PH	480V 1PH	480V 3PH			
STEEL SHEATHED ELEMENTS	43-1/4"	16.2	■		■	18	8	MFPR08-B43DD-162C☐3N
	53-1/4"	19.8	■		■	18	8	MFPR08-B53DD-198C☐3N
	61-1/4"	22.5	■		■	18	8	MFPR08-B61DD-225C☐3N
	70-1/4"	26.5	■		■	18	8	MFPR08-B70DD-265C☐3N
NEMA 1 HOUSING	79-1/4"	29.7	■		■	18	8	MFPR08-B79DD-297C☐3N

* 1st Blank box denotes voltage selection: See Table 4 on Page 86.
2nd Blank box denotes number of phases.

FLANGE IMMERSION HEATERS

LIST OF SIZES & RATINGS

APPLICATION: PROCESS WATER

10" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE		NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			240V 3PH	480V 3PH			
INCOLOY® SHEATHED ELEMENTS	54-3/4"	252		■	36	48	MFPR10-N54MF-252K83N
	63-3/4"	295		■	36	48	MFPR10-N63MF-295K83N
	73-3/4"	342		■	36	48	MFPR10-N73MF-342K83N
NEMA 1 HOUSING							

APPLICATION: FORCED AIR AND GASES, CAUSTIC SOLUTIONS, DEGREASING SOLUTIONS

10" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE		NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			240V 3PH	480V 3PH			
INCOLOY® SHEATHED ELEMENTS	33-1/4"	72.0	■	■	36	23	MFPR10-N33DF-720C☐3N
	43-3/4"	92.0	■	■	36	23	MFPR10-N43MF-920C☐3N
	57-3/4"	126.0	■	■	36	23	MFPR10-N57MF-126K☐3N
NEMA 1 HOUSING							

APPLICATION: LIGHTWEIGHT OILS, DEGREASING SOLUTIONS, HEAT TRANSFER OILS

10" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE		NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			240V 3PH	480V 3PH			
STEEL SHEATHED ELEMENTS	33-1/4"	72.0	■	■	36	23	MFPR10-B33DF-720C☐3N
	43-3/4"	92.0	■	■	36	23	MFPR10-B43MF-920C☐3N
	57-3/4"	126.0	■	■	36	23	MFPR10-B57MF-126K☐3N
	62-1/4"	137.0		■	36	23	MFPR10-B62DF-137K83N
NEMA 1 HOUSING	70-3/4"	152.0		■	36	23	MFPR10-B70MF-152K83N
	78-3/4"	171.0		■	36	23	MFPR10-B78MF-171K83N

APPLICATION: BUNKER C AND #6 FUEL OILS

10" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE		NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			240V 3PH	480V 3PH			
STEEL SHEATHED ELEMENTS	51-3/4"	37.8	■	■	36	8	MFPR10-B51MF-378C☐3N
	62-1/4"	46.8	■	■	36	8	MFPR10-B62DF-468C ☐3N
	70-3/4"	54.0	■	■	36	8	MFPR10-B70MF-540C☐3N
	78-3/4"	59.5	■	■	36	8	MFPR10-B78MF-595C☐3N
NEMA 1 HOUSING							

APPLICATION: PROCESS WATER

12" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE		NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			240V 1PH	480V 3PH			
INCOLOY SHEATHED ELEMENTS	54-5/8"	315.0		■	45	48	MFPR12-N54KG-315K83N
	63-5/8"	366.5		■	45	48	MFPR12-N63KG-366K83N
	73-1/8"	416.0		■	45	48	MFPR12-N73BG-416K83N
NEMA 1 HOUSING							

APPLICATION: FORCED AIR AND GASES, CAUSTIC SOLUTIONS, DEGREASING SOLUTIONS

12" 150 LB ANSI FLANGE	IMMERSED LENGTH	KW	VOLTAGE		NUMBER OF ELEMENTS	WATT DENSITY	PART NUMBER*
			240V 1PH	480V 3PH			
INCOLOY SHEATHED ELEMENTS	33-1/8"	88.0		■	45	23	MFPR12-N33BG-880C83N
	43-5/8"	124.0		■	45	23	MFPR12-N43KG-124K83N
	57-5/8"	157.5		■	45	23	MFPR12-N57KG-157K83N
NEMA 1 HOUSING							

* Blank box denotes voltage selection: See Table 4 on Page 86.

Listed sizes are standard. Custom sizes can be ordered as specified by the customer.

FLANGE IMMERSION HEATER INSTALLATION AND OPERATION

BEFORE INSTALLING:

1. Unpack the heater at the place of installation. Inspect the heater for shipping damage and report any claims to the carrier. Do not operate damaged equipment.

2. Check the nameplate watt and volt rating against your supply voltage and capacity and the requirements of your installation.

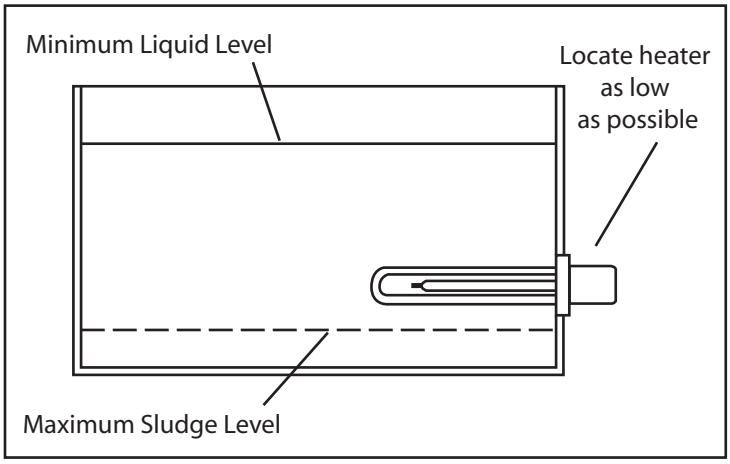
INSTALLATION INSTRUCTIONS

MOUNTING

1. Most Flanged heaters are designed for direct immersion into a liquid. Heater tubes must be installed into the system so that the tubes are covered by liquid at all times during operation. Care should be taken to avoid air entrapment or pockets of overheated fluid around the heater tubes.

2. Flanged heaters mounted into tanks should be installed horizontally near the tank bottom to allow natural circulation. Agitation of the liquid in the tank will improve system performance. Heaters should be located to avoid sludge build around the heater tubes.

3. Circulating or forced flow systems must have unrestricted flow to ensure proper control performance, heater life, and system integrity.



WIRING

1. Heater should be properly grounded to prevent electrical shock hazard.

2. Do not support or suspend heater from termination or wiring.

3. Make sure the heater supply voltage is the same as the rated heater voltage.

4. System should include a flow switch, low liquid level cut-off switch, over temperature switch, or other safety device (depending on type of system). Heater tubes designed for direct immersion will fail if operated in air.

5. Do not exceed 105% of rated voltage. Higher voltages result in higher wattage output which could damage the heater, system, or medium heated.

6. All wiring should be done in accordance with the National Electrical Code and applicable local codes.

7. Refer to the typical wiring diagrams on pages 45 and 46 for the proper method of connecting the heater.

8. The current carrying capacity of the power supply leads should exceed the heater amperage by at least 25%. Be sure to consider the ambient operating temperature and apply the appropriate correction factor to the ampacity rating of the wire. Lead wire used must be rated for 150°C minimum.

SCREW PLUG & FLANGE IMMERSION HEATER INSTALLATION AND OPERATION

BEFORE ENERGIZING:

1. Check that the pipe plug is properly sealed and screwed tightly into the coupling.
2. Check that power supply connections are made according to the wiring diagram. Also, check for positive connection of all bus bars and power supply leads.
3. The insulation material used in electric heaters may absorb moisture during shipping. While in storage or when subjected to a humid environment. Because this moisture can lead to eventual failure of the heater, it is recommended that the heater be subjected to a high potential test and/or checked with a megohmeter before energizing. A test voltage of 1000 volts plus twice the rated voltage should be used for the high potential test.
   [ex: Heater Voltage = 480V. Test voltage = 1000V + (2 x 480V) = 1960V].
   A reading of 50 megohms or greater can be considered acceptable if checking insulation resistance.

OPERATION AND MAINTENANCE:

1. Do not operate the heater unless it is completely immersed.
2. Do not bend the elements.
3. The heater can be protected from possible mechanical damage by placing a screen or grill around the elements.
4. Protect the terminal end of the heater from spray, condensation, dripping and vapors. A protective terminal enclosure should be used if the heater is to be subjected to these conditions.
5. If the heater is to be operated in the presence of explosive vapors or dust, an explosion resistant terminal enclosure must be provided.
6. Do not set the thermostats above the boiling point of the liquid. The boiling liquid could create a steam pocket which could cause the element(s) to overheat and burn out.
7. Periodically, remove the heater from the tank to inspect the elements for signs of corrosion and remove any deposits from the sheath. BE SURE POWER IS DISCONNECTED BEFORE REMOVING ELEMENTS.
8. Be sure the sheath material is compatible with the material being heated. Copper sheathed elements are used to heat oil, alkaline, wax and other similar materials. Stainless steel and Incoloy sheathed elements are most often used for heating water and corrosive solutions.
9. Make sure the watt-density of the heater is suitable for the material being heated. The velocity, viscosity, thermal conductivity of the material and operating temperature are all factors in determining the allowable watt-density of the element.
10. When heating liquids in a large tank, the use of several small heaters will provide more uniform heat distribution than a single large heater.

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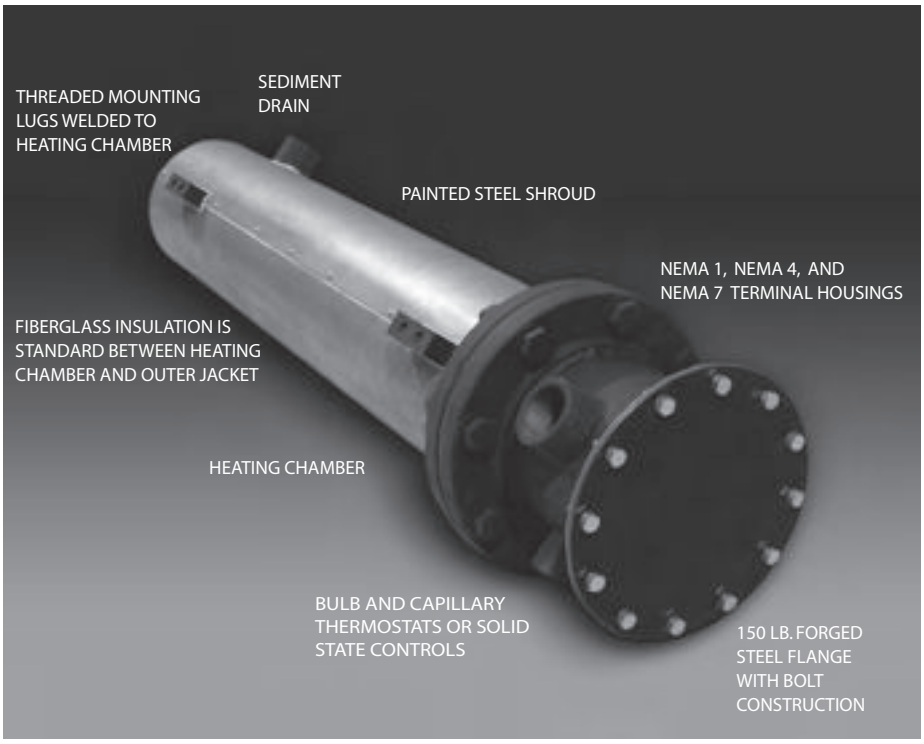
CIRCULATION HEATERS

Circulation Heater for 3" - 8" units. Inlet - outlet connections are NPT pipe threads (flanged connections are optional). Standard inlet - outlet connections on 10" and larger units are 150 lb. rated flanges.



OPTIONAL FEATURES

- Weather proof insulated shroud
- All stainless steel construction
- ASME section 8 construction on vessel.
- Other sheath materials: Carpenter 20, Model 400, Inconel 600, Hastelloy, and Titanium
- High pressure construction
- High temperature ceramic fiber insulation
- Passivation on all wetted surfaces

APPLICATION FACTORS

Heater selection is influenced by the following parameters:

- The heated medium, viscosity, specific heat, density and corrosive properties
- The presence of contaminants in the medium
- The corrosion resistant properties of the heated medium
- The sheath watt density of the heating elements (the watts/in^2) and the flow rate of the heated medium
- The vessel design and materials of construction
- Times, temperature, and pressure

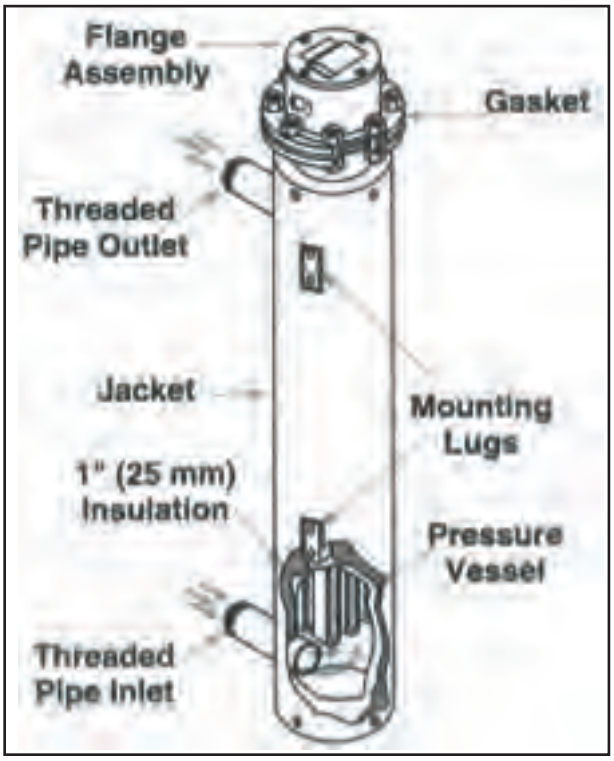
CIRCULATION HEATERS

PRESSURE VESSELS

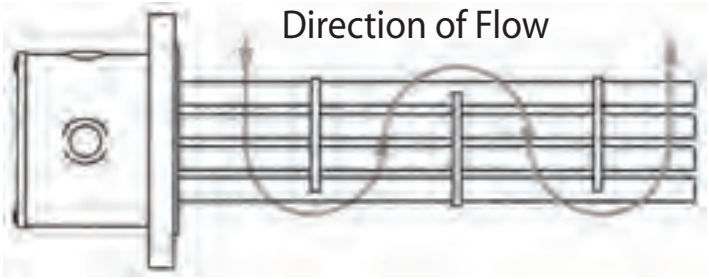
All standard pressure vessel (tank) materials are rated to 150 lb. and made from:

- Carbon Steel
- 304/316 Stainless Steel

All catalog pressure vessels (tank) are steel unless otherwise noted.



Baffles



APPLICATION	1 SOLUTION OR HEATER TYPE	2 ALKALINE OR ACID CONTENT (EST. % BY VOLUME)	3 SHEATH MATERIAL	4 WATT DENSITY (W/In^2)	5 VESSEL MATERIAL
Water	Clean Water	pH6 to pH8 (Neutral)	Copper	45-100	Galvanized Steel
Mild Solutions	Process Water and Very Weak Solutions	pH5 to pH9 (2-3%)	Incoloy®	45-86	Stainless Steel
	Weak Solutions	5-6%	Incoloy®	45-75	Stainless Steel
	Demineralized, De-ionized, or Pure Water	—	Incoloy®	45-75	Stainless Steel
Corrosive & High Viscous Solutions	Mildly Corrosive Solutions	5-15%	Incoloy®	20-25	Stainless Steel
	More Severe Corrosive Solutions	10-25%	Incoloy®	20-25	Stainless Steel
	Severely Corrosive Solutions	30-60%	Incoloy®	10-20	Stainless Steel
Oil	Low Viscosity Oils	—	Steel	20-25	Steel
	Medium Viscosity Oils	—	Steel	10-20	Steel
	High Viscosity Oils (Fuel Oil)	—	Steel	5-15	Steel
Air, Gases & Steam	Medium Temperatures to 750˚F	—	Incoloy®	20-25	Steel
	High Temperatures to 1400˚F	—	Incoloy®	10-20	Stainless Steel

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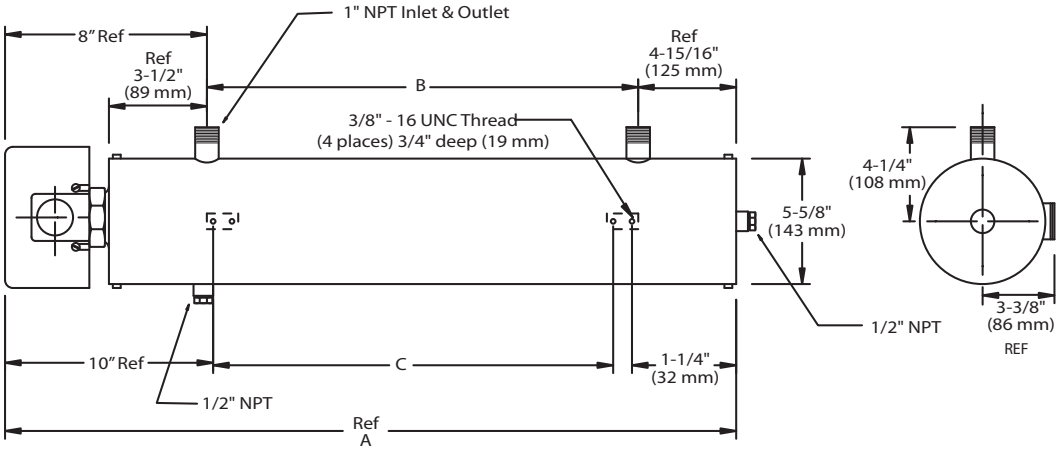
CIRCULATION HEATERS

SCREW PLUG TYPE



APPLICATION: PROCESS WATER

2" NPT	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		120V/240V 1PH	240V/480V 1PH						
SCREW PLUG	3	■	■	23-1/4"	15"	—	20	3	HCP200-N23DW-3000 ☐
INCOLOY® SHEATHED ELEMENTS	4	■	■	31-1/4"	23"	—	27	3	HCP200-N31DW-4000 ☐
STEEL TANK	5	■	■	31-1/4"	23"	—	27	3	HCP200-N31DW-5000 ☐
48 W/IN²	6	■	■	31-1/4"	23"	—	27	3	HCP200-N31DW-6000 ☐
NEMA 4 HOUSING	8	■	■	38-3/4"	30-1/2"	26"	36	3	HCP200-N38MW-8000 ☐
	10	■	■	46-1/4"	38"	26"	43	3	HCP200-N46DW-100C ☐
	12	■	■	54-1/4"	46"	39"	50	3	HCP200-N54DW-120C ☐

APPLICATION: FORCED AIR AND GASES, CAUSTIC SOLUTIONS, DEGREASING SOLUTIONS

2" NPT	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		120V/240V 1PH	240V/480V 1PH						
SCREW PLUG	1.5	■	■	23-1/4"	15"	—	20	3	HCP200-B23DW-1500 ☐
STEEL SHEATHED ELEMENTS	2	■	■	31-1/4"	23"	—	27	3	HCP200-B31DW-2000 ☐
STEEL TANK	2.5	■	■	31-1/4"	23"	—	27	3	HCP200-B31DW-2500 ☐
23 W/IN²	3	■	■	31-1/4"	23"	—	27	3	HCP200-B31DW-3000 ☐
NEMA 4 HOUSING	4	■	■	38-3/4"	30-1/2"	26"	36	3	HCP200-B38MW-4000 ☐
	5	■	■	46-1/4"	38"	26"	43	3	HCP200-B46DW-5000 ☐
	6	■	■	54-1/4"	46"	39"	50	3	HCP200-B54DW-6000 ☐

APPLICATION: PROCESS WATER

2-1/2" NPT	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
SCREW PLUG	6	■	■	21"	22-1/2"	16-1/2"	65	3	HCP2H0-N21OW-6000 ☐
INCOLOY® SHEATHED ELEMENTS	7.5	■	■	31"	22-1/2"	16-1/2"	65	3	HCP2H0-N31OW-7500 ☐
STEEL TANK	9	■	■	31"	22-1/2"	16-1/2"	65	3	HCP2H0-N31OW-9000 ☐
48 W/IN²	12	■	■	41"	32-1/2"	26-1/2"	76	3	HCP2H0-N41OW-120C ☐
NEMA 4 HOUSING	15	■	■	53-1/2"	45"	39"	93	3	HCP2H0-N53HW-150C ☐
	18	■	■	53-1/2"	45"	39"	95	3	HCP2H0-N53HW-180C ☐

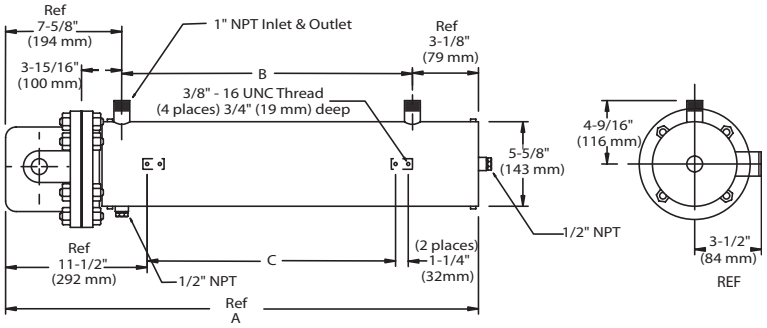
APPLICATION: FORCED AIR AND GASES, CAUSTIC SOLUTIONS, DEGREASING SOLUTIONS

2-1/2" NPT	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		120V/240V 1PH	240V/480V 1PH						
SCREW PLUG	3	■	■	31"	22-1/2"	16-1/2"	70	3	HCP2H0-B310W-3000 ☐
STEEL SHEATHED ELEMENTS	3.75	■	■	31"	22-1/2"	16-1/2"	70	3	HCP2H0-B310W-3750 ☐
STEEL TANK	4.5	■	■	31"	22-1/2"	16-1/2"	70	3	HCP2H0-B310W-4500 ☐
23 W/IN²	6	■	■	41"	32-1/2"	26-1/2"	80	3	HCP2H0-B410W-6000 ☐
NEMA 4 HOUSING	7.5	■	■	53-1/2"	45"	39"	96	3	HCP2H0-B53HW-7500 ☐
	9	■	■	53-1/2"	45"	39"	96	3	HCP2H0-B53HW-9000 ☐

* Blank box denotes voltage selection: See Table 4 on Page 86.

CIRCULATION HEATERS

FLANGED TYPE: 3”



APPLICATION: PROCESS WATER, MILD SOLUTIONS

3" 150LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
INCOLOY® SHEATHED ELEMENTS STEEL TANK 48 W/IN² NEMA 4 HOUSING	6	■	■	33″	22-1/2″	16-1/2″	70	3	HCF031-N33OW-6000 ☐
	7.5	■	■	33″	22-1/2″	16-1/2″	70	3	HCF031-N33OW-7500 ☐
	9	■	■	33″	32-1/2″	26-1/2″	70	3	HCF031-N33OW-9000 ☐
	12	■	■	43-1/4″	45″	39″	80	3	HCF031-N43DW-120C ☐
	15	■	■	55-3/4″	45″	39″	96	3	HCF031-N55MW-150C ☐
	18	■	■	55-3/4″	63″	53″	98	3	HCF031-N55MW-180C ☐

APPLICATION: LIGHTWEIGHT OILS, HEAT TRANSFER OILS

3" 150LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
INCOLOY® SHEATHED ELEMENTS STEEL TANK 23 W/IN² NEMA 4 HOUSING	3	■	■	33″	22-1/2″	16-1/2″	70	3	HCF031-N33OW-3000 ☐
	4.5	■	■	33″	22-1/2″	16-1/2″	70	3	HCF031-N33OW-4500 ☐
	6	■	■	43-1/4″	32-1/2″	26-1/2″	80	3	HCF031-N43DW-6000 ☐
	7.5	■	■	55-3/4″	45″	39″	96	3	HCF031-N55MW-7500 ☐
	9	■	■	55-3/4″	45″	39″	98	3	HCF031-N55MW-9000 ☐
	12.5	■	■	73-3/4″	63″	53″	120	3	HCF031-N73MW-125C ☐

APPLICATION: FORCED AIR AND GASES, CAUSTIC SOLUTIONS, DEGREASING SOLUTIONS

3" 150LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
STEEL SHEATHED ELEMENTS STEEL TANK 23 W/IN² NEMA 4 HOUSING	3	■	■	33-1/4″	22-1/2″	16-1/2″	70	3	HCF031-B33DW-3000 ☐
	4.5	■	■	33-1/4″	22-1/2″	16-1/2″	70	3	HCF031-B33DW-4500 ☐
	6	■	■	43-1/4″	32-1/2″	26-1/2″	80	3	HCF031-B43DW-6000 ☐
	7.5	■	■	55-3/4″	45″	39″	96	3	HCF031-B55MW-7500 ☐
	9	■	■	55-3/4″	45″	39″	98	3	HCF031-B55MW-9000 ☐
	12.5	■	■	73-3/4″	63″	53″	120	3	HCF031-B73MW-125C ☐

APPLICATION: MEDIUM WEIGHT OILS, LUBE OILS, LIQUID PARAFIN, #4 AND #5 FUEL OIL

3" 150LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
STEEL SHEATHED ELEMENTS STEEL TANK 13 W/IN² NEMA 4 HOUSING	3	■	■	43-1/4″	32-1/2″	26-1/2″	80	3	HCF031-B43DW-3000 ☐
	3.75	■	■	52-3/4″	41″	26-1/2″	120	3	HCF031-B52MW-3750 ☐
	5	■	■	61-3/4″	51″	26-1/2″	120	3	HCF031-B61MW-5000 ☐
	6.25	■	■	73-3/4″	63″	26-1/2″	120	3	HCF031-B73MW-6250 ☐
	7.5	■	■	85-5/8″	74-7/8″	26-1/2″	140	3	HCF031-B85KW-7500 ☐

APPLICATION: BUNKER C AND #6 FUEL OIL

3" 150LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
STEEL SHEATHED ELEMENTS STEEL TANK 8 W/IN² NEMA 4 HOUSING	2	■	■	43-1/4″	32-1/2″	26-1/2″	80	3	HCF031-B43DW-2000 ☐
	2.5	■	■	73-3/4″	63″	26-1/2″	120	3	HCF031-B73MW-2500 ☐
	3	■	■	73-3/4″	63″	26-1/2″	120	3	HCF031-B73MW-3000 ☐
	4.25	■	■	73-3/4″	63″	26-1/2″	120	3	HCF031-B73MW-4250 ☐
	5	■	■	85-5/8″	74-7/8″	26-1/2″	140	3	HCF031-B85KW-5000 ☐

* Blank box denotes voltage selection: See Table 4 on Page 86.

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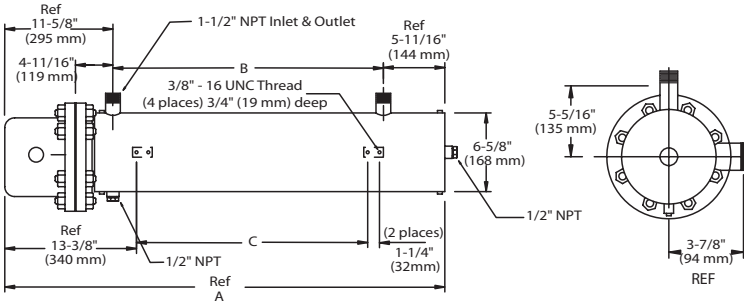
CIRCULATION HEATERS

FLANGED TYPE: 4”



APPLICATION: FORCED AIR AND GASES, CAUSTIC SOLUTIONS, DEGREASING SOLUTIONS

4" 150 LB ANSI FLANGE	KW	VOLTAGE 240V 3PH	VOLTAGE 480V 3PH	A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
INCOLOY® SHEATHED ELEMENTS STEEL TANK 23 W/IN² NEMA 4 HOUSING	6	■	■	37-13/16”	20-1/2”	17”	125	6	HCF041-N37NW-6000 ☐
	9	■	■	42-1/2”	25-3/4”	22”	160	6	HCF041-N42HW-9000 ☐
	12	■	■	48-5/16”	31”	27-1/2”	163	6	HCF041-N48EW-120C ☐
	15	■	■	69-5/16”	52”	48-1/2”	229	6	HCF041-N69EW-150C ☐
	18	■	■	69-5/16”	52”	48-1/2”	234	6	HCF041-N69EW-180C ☐
	25	■	■	90-15/16”	73”	69-1/2”	298	6	HCF041-N90RW-250C ☐
	30	■	■	90-15/16”	73”	69-1/2”	306	6	HCF041-N90RW-300C ☐

APPLICATION: LIGHTWEIGHT OILS, HEAT TRANSFER

4" 150 LB ANSI FLANGE	KW	VOLTAGE 240V 3PH	VOLTAGE 480V 3PH	A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
STEEL SHEATHED ELEMENTS STEEL TANK 23 W/IN² NEMA 4 HOUSING	6	■	■	37-13/16”	20-1/2”	17”	125	6	HCF041-B37NW-6000 ☐
	9	■	■	42-1/2””	25-3/4””	22”	160	6	HCF041-B42HW-9000 ☐
	12	■	■	48-5/16”	31”	27-1/2”	163	6	HCF041-B48EW-120C ☐
	15	■	■	69-5/16”	52”	48-1/2”	229	6	HCF041-B69EW-150C ☐
	18	■	■	69-5/16”	52”	48-1/2”	234	6	HCF041-B69EW-180C ☐
	25	■	■	90-15/16”	73”	69-1/2”	298	6	HCF041-B90RW-250C ☐
	30	■	■	90-15/16”	73”	69-1/2”	306	6	HCF041-B90RW-300C ☐

APPLICATION: MEDIUM WEIGHT OILS, LUBE OILS, LIQUID PARAFIN

4" 150 LB ANSI FLANGE	KW	VOLTAGE 240V 3PH	VOLTAGE 480V 3PH	A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
INCOLOY® SHEATHED ELEMENTS STEEL TANK 16 W/IN² NEMA 4 HOUSING	3	■	■	30”	13”	11”	125	6	HCF041-N300W-3000 ☐
	4	■	■	34-1/2”	17”	13”	125	6	HCF041-N34HW-4000 ☐
	5	■	■	37-3/4”	20-1/2”	17”	127	6	HCF041-N37MW-5000 ☐
	6	■	■	42-1/2”	25-3/4”	22”	160	6	HCF041-N42HW-6000 ☐
	8	■	■	48-5/16”	31”	27-1/2”	163	6	HCF041-N48EW-8000 ☐
	10	■	■	69-5/16”	52”	48-1/2”	229	6	HCF041-N69EW-100C ☐
	12	■	■	69-5/16”	52”	48-1/2”	234	6	HCF041-N69EW-120C ☐

APPLICATION: BUNKER C AND #6 FUEL OIL

4" 150 LB ANSI FLANGE	KW	VOLTAGE 240V 3PH	VOLTAGE 480V 3PH	A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
STEEL SHEATHED ELEMENTS STEEL TANK 8 W/IN² NEMA 4 HOUSING	5	■	■	69-5/16”	52”	48-1/2”	229	6	HCF041-B69EW-5000 ☐
	6	■	■	69-5/16”	52”	48-1/2”	234	6	HCF041-B69EW-6000 ☐
	8	■	■	90-5/16”	73”	69-1/2”	298	6	HCF041-B90EW-8000 ☐
	10	■	■	90-5/16”	73”	69-1/2”	306	6	HCF041-B90EW-100C ☐

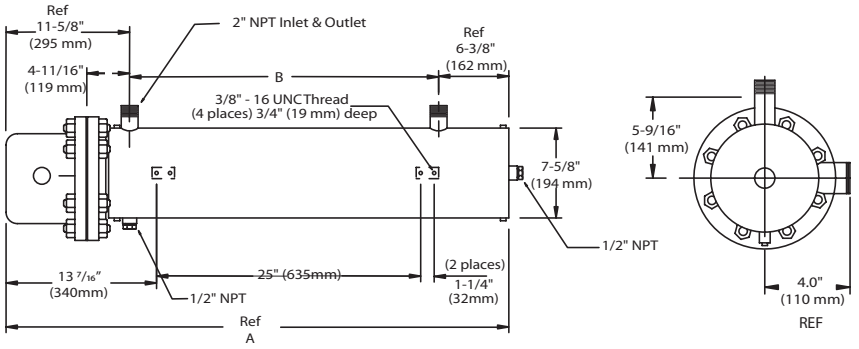
APPLICATION: PROCESS WATER

4" 150 LB ANSI FLANGE	KW	VOLTAGE 240V 3PH	VOLTAGE 480V 3PH	A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
INCOLOY® SHEATHED ELEMENTS STEEL TANK 48 W/IN² NEMA 4 HOUSING	9	■	■	37-13/16”	20-1/2”	17”	122	6	HCF041-N37NW-9000 ☐
	12	■	■	37-13/16”	20-1/2”	17”	125	6	HCF041-N37NW-120C ☐
	15	■	■	37-13/16”	20-1/2”	17”	127	6	HCF041-N37NW-150C ☐
	18	■	■	37-13/16”	20-1/2”	17”	160	6	HCF041-N37NW-180C ☐
	24	■	■	37-13/16”	20-1/2”	17”	165	6	HCF041-N37NW-240C ☐
	30	■	■	69-5/16”	52”	48-1/2”	229	6	HCF041-N69EW-300C ☐
	36	■	■	69-5/16”	52”	48-1/2”	234	6	HCF041-N69EW-360C ☐

* Blank box denotes voltage selection: See Table 4 on Page 86.

CIRCULATION HEATERS

FLANGED TYPE: 5”



APPLICATION: PROCESS WATER

5" 150LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
INCOLOY® SHEATHED ELEMENTS STEEL TANK 48 W/IN² NEMA 4 HOUSING	37.0	■	■	41-3/4”	30”	25”	140	9	HCF051-N41MW-370C ☐
	45.0	■	■	48-3/4”	37”	25”	155	9	HCF051-N48MW-450C ☐
	54.0	■	■	60-1/4”	48-1/2”	25”	176	9	HCF051-N60DW-540C ☐
	62.0	■	■	60-3/4”	48-1/2”	25”	176	9	HCF051-N60MW-620C☐
	72.0	■	■	75-5/8”	61-7/8”	25”	210	9	HCF051-N75KW-720C ☐
	87.0	■	■	86-5/8”	74-7/8”	25”	240	9	HCF051-N86KW-870C ☐

APPLICATION: LIGHTWEIGHT OILS, HEAT TRANSFER OILS

5" 150LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
INCOLOY® SHEATHED ELEMENTS STEEL TANK 23 W/IN² NEMA 4 HOUSING	15.0	■	■	43-3/4”	30”	25”	140	9	HCF051-N43MW-150C ☐
	18.0	■	■	48-3/4”	37”	25”	155	9	HCF051-N48MW-180C☐
	22.0	■	■	60-1/4”	48-1/2”	25”	176	9	HCF051-N60DW-220C ☐
	26.0	■	■	60-1/4”	48-1/2”	25”	176	9	HCF051-N60DW-260C☐
	34.0	■	■	73-5/8”	61-7/8”	25”	210	9	HCF051-N73KW-340C ☐
	40.0	■	■	86-5/8”	74-7/8”	25”	240	9	HCF051-N86KW-400C ☐

APPLICATION: FORCED AIR AND GASES, CAUSTIC SOLUTIONS, DEGREASING SOLUTIONS

5" 150LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
STEEL SHEATHED ELEMENTS STEEL TANK 23 W/IN² NEMA 4 HOUSING	18.0	■	■	55”	37”	17-9/16”	145	9	HCF051-B550W-180C ☐
	22.0	■	■	55”	37”	17-9/16”	167	9	HCF051-B550W-220C ☐
	26.0	■	■	66-1/2”	48-1/2”	23-15/16”	180	9	HCF051-B66HW-260C ☐
	34.0	■	■	79-7/8”	61-7/8”	29-7/8”	195	9	HCF051-B79PW-340C ☐
	40.0	■	■	92-7/8”	74-7/8”	36-15/16”	220	9	HCF051-B92PW-400C ☐

APPLICATION: MEDIUM WEIGHT OILS, LUBE OILS, LIQUID PARAFIN, #4 AND #5 FUEL OIL

5" 150LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
STEEL SHEATHED ELEMENTS STEEL TANK 13 W/IN² NEMA 4 HOUSING	10.0	■	■	43-1/2”	32-1/2”	25”	150	9	HCF051-B43HW-100C ☐
	12.0	■	■	48-3/4”	37”	25”	155	9	HCF051-B48MW-120C ☐
	14.5	■	■	60-1/4”	48-1/2”	25”	176	9	HCF051-B60DW-145C ☐
	18.0	■	■	73-5/8”	61-7/8”	25”	210	9	HCF051-B73KW-180C ☐
	21.5	■	■	86-5/8”	74-7/8”	25”	240	9	HCF051-B86KW-215C ☐

APPLICATION: BUNKER C AND #6 FUEL OIL

5" 150LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
STEEL SHEATHED ELEMENTS STEEL TANK 13 W/IN² NEMA 4 HOUSING	6	■	■	33”	22-1/2”	25”	120	9	HCF051-B33OW-6000 ☐
	11.5	■	■	48-3/4”	37”	25”	155	9	HCF051-B48MW-115C ☐
	16.0	■	■	60-1/4”	48-1/2”	25”	176	9	HCF051-B60DW-160C ☐
	20.0	■	■	73-5/8”	61-7/8”	25”	210	9	HCF051-B73KW-200C ☐
	27.0	■	■	86-5/8”	74-7/8”	25”	240	9	HCF051-B86KW-270C ☐

* Blank box denotes voltage selection: See Table 4 on Page 86.

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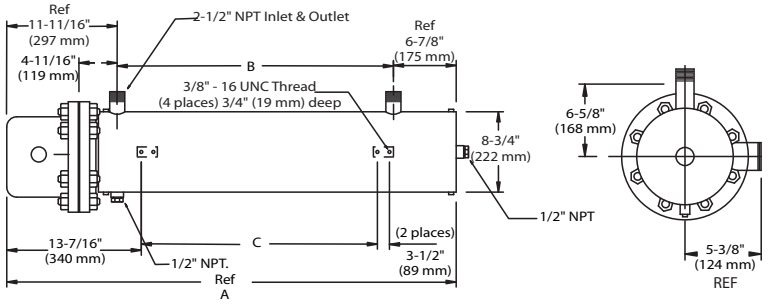
CIRCULATION HEATERS

FLANGED TYPE: 6”



APPLICATION: CLEAN WATER

6" 150 LB ANSI FLANGE	KW	VOLTAGE 240V 3PH	VOLTAGE 480V 3PH	A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
INCOLOY® SHEATHED ELEMENTS STEEL TANK 60 W/IN² NEMA 4 HOUSING	24	■	■	39-1/16”	20-1/2”	17”	212	12	HCF061-N39AW-240C ☐
	36	■	■	39-1/16”	20-1/2”	17”	217	12	HCF061-N39AW-360C ☐
	48	■	■	49-9/16”	31”	27-1/2”	222	12	HCF061-N49JW-480C ☐
	72	■	■	70-9/16”	52”	48-1/2”	290	12	HCF061-N70JW-720C ☐
	120	■	■	91-9/16”	73”	69-1/2”	360	12	HCF061-N91JW-120K ☐

APPLICATION: PROCESS WATER

6" 150 LB ANSI FLANGE	KW	VOLTAGE 240V 3PH	VOLTAGE 480V 3PH	A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
INCOLOY® SHEATHED ELEMENTS STEEL TANK 48 W/IN² NEMA 4 HOUSING	18	■	■	39-1/16”	20-1/2”	17”	212	12	HCF061-N39AW-180C☐
	24	■	■	39-1/16”	20-1/2”	17”	214	12	HCF061-N39AW-240C☐
	36	■	■	39-1/16”	20-1/2”	17”	222	12	HCF061-N39AW-360C☐
	48	■	■	49-9/16”	31”	27-1/2”	226	12	HCF061-N49JW-480C ☐
	72	■	■	70-9/16”	52”	48-1/2”	298	12	HCF061-N70JW-720C ☐

APPLICATION: FORCED AIR AND GASES, CAUSTIC SOLUTIONS, DEGREASING SOLUTIONS

6" 150 LB ANSI FLANGE	KW	VOLTAGE 240V 3PH	VOLTAGE 480V 3PH	A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
INCOLOY® SHEATHED ELEMENTS STEEL TANK 23 W/IN² NEMA 4 HOUSING	12	■	■	39-1/16”	20-1/2”	17”	214	12	HCF061-N39AW-120C☐
	18	■	■	39-1/16”	20-1/2”	17”	222	12	HCF061-N39AW-180C☐
	24	■	■	49-9/16”	31”	27-1/2”	226	12	HCF061-N49JW-240C ☐
	36	■	■	70-9/16”	52”	48-1/2”	298	12	HCF061-N70JW-360C ☐
	50	■	■	91-9/16”	73”	67-1/2”	360	12	HCF061-N91JW-500C ☐
	60	■	■	91-9/16”	73”	67-1/2”	370	12	HCF061-N91JW-600C ☐

APPLICATION: LIGHTWEIGHT OILS, HEAT TRANSFER OILS

6" 150 LB ANSI FLANGE	KW	VOLTAGE 240V 3PH	VOLTAGE 480V 3PH	A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
STEEL SHEATHED ELEMENTS STEEL TANK 23 W/IN² NEMA 4 HOUSING	12	■	■	39-1/16”	20-1/2”	17”	212	12	HCF061-B39AW-120C☐
	18	■	■	39-1/16”	20-1/2”	17”	218	12	HCF061-B39AW-180C☐
	24	■	■	49-9/16”	31”	27-1/2”	230	12	HCF061-B49JW-240C ☐
	36	■	■	70-9/16”	52”	48-1/2”	298	12	HCF061-B70JW-360C ☐
	50	■	■	91-9/16”	73”	67-1/2”	360	12	HCF061-B91JW-500C ☐
	60	■	■	91-9/16”	73”	67-1/2”	368	12	HCF061-B91JW-600C ☐

APPLICATION: MEDIUM WEIGHT OILS, LUBE OILS, LIQUID PARAFIN, #4 AND #5 FUEL OILS

6" 150 LB ANSI FLANGE	KW	VOLTAGE 240V 3PH	VOLTAGE 480V 3PH	A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
INCOLOY® SHEATHED ELEMENTS STEEL TANK 16 W/IN² NEMA 4 HOUSING	6	■	■	39-1/16”	20-1/2”	17”	212	12	HCF061-N39AW-6000☐
	8	■	■	39-1/16”	20-1/2”	17”	214	12	HCF061-N39AW-8000☐
	10	■	■	39-1/16”	20-1/2”	17”	217	12	HCF061-N39AW-100C☐
	16	■	■	49-9/16”	31”	27-1/2”	226	12	HCF061-N49JW-160C ☐
	20	■	■	70-9/16”	52”	48-1/2”	290	12	HCF061-N70JW-200C ☐
	24	■	■	70-9/16”	52”	48-1/2”	298	12	HCF061-N70JW-240C ☐

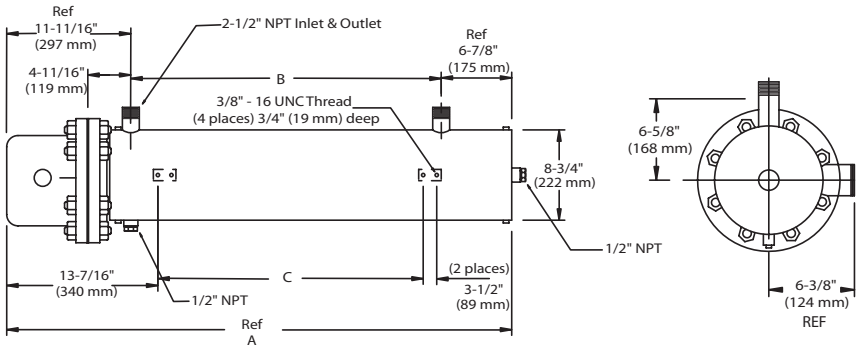
APPLICATION: BUNKER C AND #6 FUEL OIL

6" 150 LB ANSI FLANGE	KW	VOLTAGE 240V 3PH	VOLTAGE 480V 3PH	A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
STEEL SHEATHED ELEMENTS STEEL TANK 48 W/IN² NEMA 4 HOUSING	8	■	■	49-9/16”	31”	27-1/2”	226	12	HCF061-B49JW-8000☐
	10	■	■	70-9/16”	52”	48-1/2”	290	12	HCF061-B70JW-100C☐
	12	■	■	70-9/16”	52”	48-1/2”	298	12	HCF061-B70JW-120C☐
	16.5	■	■	91-9/16”	73”	69-1/2”	360	12	HCF061-B91JW-165C☐
	20	■	■	91-9/16”	73”	69-1/2”	368	12	HCF061-B91JW-200C☐

* Blank box denotes voltage selection: See Table 4 on Page 86.

CIRCULATION HEATERS

FLANGED TYPE: 8”



APPLICATION: PROCESS WATER

8" 150LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
INCOLOY® SHEATHED ELEMENTS STEEL TANK 48 W/IN² NEMA 4 HOUSING	50	■	■	45-1/4”	24-3/4”	21-1/4”	425	18	HCF081-N45DW-500C☐
	75	■	■	53-1/4”	32-3/4”	29-1/4”	295	18	HCF081-N53DW-750C☐
	100	■	■	60-1/4”	39-3/4”	36-1/4”	415	18	HCF081-N60DW-100K☐
	150	■	■	77-3/8”	56-3/4”	53-1/4”	535	18	HCF081-N77FW-150K ☐
	175	■	■	86-3/8”	65-3/4”	62-1/4”	625	18	HCF081-N86FW-175K ☐
	200	■	■	96-3/8”	75-3/4”	72-1/4”	705	18	HCF081-N96FW-200K ☐

APPLICATION: LIGHTWEIGHT OILS, HEAT TRANSFER OILS

8" 150LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
INCOLOY® SHEATHED ELEMENTS STEEL TANK 23 W/IN² NEMA 4 HOUSING	30	■	■	53-1/4”	32-3/4”	29-1/4”	366	18	HCF081-N53DW-300C☐
	40	■	■	60-1/4”	39-3/4”	36-1/4”	436	18	HCF081-N60DW-400C☐
	50	■	■	67-7/8”	47-1/4”	43-3/4”	500	18	HCF081-N67PW-500C☐
	60	■	■	77-3/8”	56-3/4”	53-1/4”	590	18	HCF081-N77FW-600C☐
	70	■	■	86-3/8”	65-3/4”	62-1/4”	660	18	HCF081-N86FW-700C☐
	80	■	■	96-3/8”	75-3/4”	72-1/4”	750	18	HCF081-N96FW-800C☐

APPLICATION: FORCED AIR AND GASES, CAUSTIC SOLUTIONS, DEGREASING SOLUTIONS

8" 150LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
STEEL SHEATHED ELEMENTS STEEL TANK 23 W/IN² NEMA 4 HOUSING	30	■	■	54”	32-11/16”	29-3/16”	370	18	HCF081-B540W-300C☐
	40	■	■	61”	39-11/16”	36-3/16”	410	18	HCF081-N60DW-400C☐
	50	■	■	68-5/8”	47-5/16”	43-13/16”	440	18	HCF081-N67PW-500C☐

APPLICATION: MEDIUM WEIGHT OILS, OILS, LUBE OILS, LIQUID PARAFIN, #4 AND #5 FUEL OIL

8" 150LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
STEEL SHEATHED ELEMENTS STEEL TANK 13 W/IN² NEMA 4 HOUSING	25	■	■	60-1/4”	39-3/4”	36-1/4”	500	18	HCF081-B60DW-250C☐
	30	■	■	67-7/8”	47-1/4”	43-3/4”	565	18	HCF081-B67PW-300C☐
	37.5	■	■	86-3/8”	65-3/4”	62-1/4”	725	18	HCF081-B86FW-375C☐
	44	■	■	96-3/8”	75-3/4”	72-1/4”	815	18	HCF081-B96FW-440C☐
	50	■	■	96-3/8”	75-3/4”	72-1/4”	815	18	HCF081-B96FW-500C☐

APPLICATION: BUNKER C AND #6 FUEL OIL

8" 150LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
STEEL SHEATHED ELEMENTS STEEL TANK 8 W/IN² NEMA 4 HOUSING	13.3	■	■	60-1/4”	22-1/2”	36-3/4”	500	18	HCF081-B60DW-133C☐
	16.7	■	■	67-7/8”	37”	47-1/4”	565	18	HCF081-B67PW-167C☐
	20	■	■	77-3/8”	48-1/2”	53-1/4”	650	18	HCF081-B77FW-200C☐
	23	■	■	86-3/8”	61-7/8”	62-1/4”	725	18	HCF081-B86FW-230C☐
	27	■	■	96-3/8”	74-7/8”	72-1/4”	815	18	HCF081-B96FW-270C☐

* Blank box denotes voltage selection: See Table 4 on Page 86.

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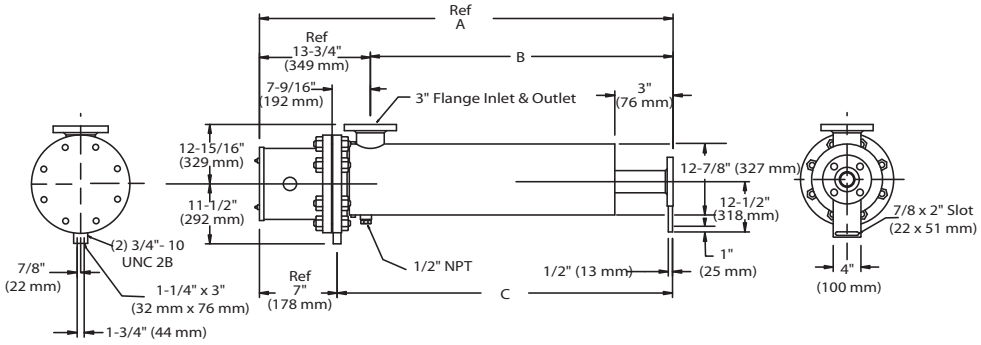
CIRCULATION HEATERS

FLANGED TYPE: 10”



APPLICATION: PROCESS WATER

10" 150 LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
INCOLOY® SHEATHED ELEMENTS STEEL TANK 48 W/IN² NEMA 4 HOUSING	170	■	■	59″	46″	52″	510	33	HCF101-N59OW-170K☐
	205	■	■	66″	53″	58-1/2″	540	33	HCF101-N66OW-205K☐
	231	■	■	73″	60″	65-1/2″	575	33	HCF101-N73OW-231K☐
	285	■	■	66″	73″	78-5/8″	650	33	HCF101-N66OW-285K☐
	305	■	■	80″	80″	86-1/8″	675	33	HCF101-N800W-305K☐
	347	■	■	88″	88″	93-5/8″	710	33	HCF101-N880W-347K☐

APPLICATION: LIGHTWEIGHT OILS, HEAT TRANSFER OILS

10" 150 LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		120V/240V 3PH	240V/480V 3PH						
STEEL SHEATHED ELEMENTS STEEL TANK 23 W/IN² NEMA 4 HOUSING	135	■	■	86″	73″	78-5/8″	650	33	HCF101-B86OW-135K☐
	147.5	■	■	93″	80″	86-1/8″	675	33	HCF101-B93OW-147K☐
	165	■	■	101″	88″	93-5/8″	710	33	HCF101-B101W-165K☐

APPLICATION: FORCED AIR AND GASES, CAUSTIC SOLUTIONS, DEGREASING SOLUTIONS

10" 150 LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
INCOLOY® SHEATHED ELEMENTS STEEL TANK 23 W/IN² NEMA 4 HOUSING	107.5	■	■	74-5/16″	61″	67-5/16″	515	33	HCF101-N74EW-107K☐
	124	■	■	81-13-16″	67″	74-13/16″	530	33	HCF101-N81NW-124K☐

APPLICATION: MEDIUM WEIGHT OILS, LUBE OILS, LIQUID PARAFIN, #4 AND #5 FUEL OILS

10" 150 LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
STEEL SHEATHED ELEMENTS STEEL TANK 13 W/IN² NEMA 4 HOUSING	57.5	■	■	66″	55″	58-1/2″	675	33	HCF101-B66OW-575C☐
	61.0	■	■	73″	60″	65-1/2″	715	33	HCF101-B73OW-610C☐
	74.5	■	■	86″	73″	78-5/8″	795	33	HCF101-B86OW-745C☐
	85.5	■	■	93″	80″	86-1/8″	845	33	HCF101-B93OW-855C☐
	94.0	■	■	101″	88″	93-5/8″	895	33	HCF101-B101W-940C☐

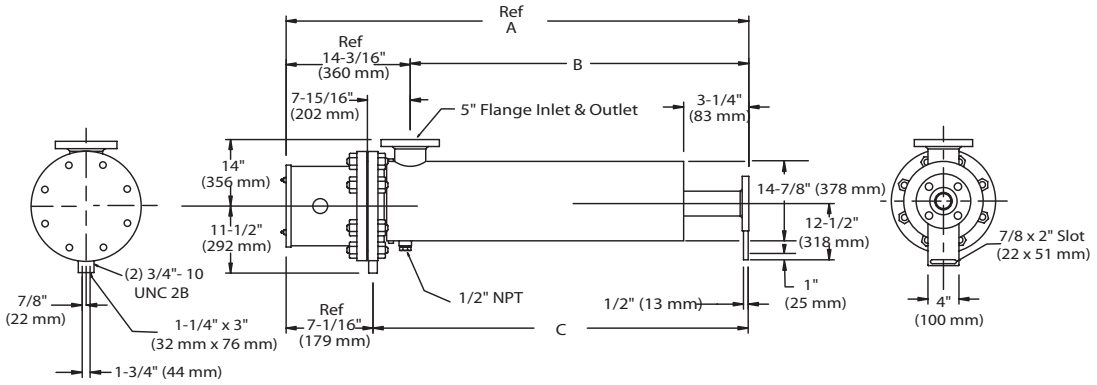
APPLICATION: BUNKER C AND #6 FUEL OIL

10" 150 LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
STEEL SHEATHED ELEMENTS STEEL TANK 8 W/IN² NEMA 4 HOUSING	33.0	■	■	66″	53″	58-1/2″	675	33	HCF101-B66OW-330C☐
	38.0	■	■	73″	60″	65-1/2″	715	33	HCF101-B73OW-380C☐
	46.2	■	■	86″	73″	78-5/8″	795	33	HCF101-B86OW-462C☐
	52.8	■	■	93″	80″	86-1/8″	845	33	HCF101-B93OW-528C☐
	57.8	■	■	101″	88″	93-5/8″	895	33	HCF101-B101W-578C☐

* Blank box denotes voltage selection: See Table 4 on Page 86.

CIRCULATION HEATERS

FLANGED TYPE: 12”



APPLICATION: PROCESS WATER

12" 150LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
INCOLOY® SHEATHED ELEMENTS STEEL TANK 48 W/IN² NEMA 4 HOUSING	232.5	■	■	59″	44-13/16″	52″	635	48	HCF121-N59OW-232K☐
	276.0	■	■	66″	51-13/16″	58-1/2″	675	48	HCF121-N66OW-276K☐
	319.0	■	■	73″	58-13/16″	65-1/2″	715	48	HCF121-N73OW-319K☐
	396.0	■	■	86″	71-13/16″	78-5/8″	795	48	HCF121-N86OW-396K☐
	444.0	■	■	93″	78-13/16″	86-1/8″	845	48	HCF121-N93OW-444K☐
	492.0	■	■	101″	86-13/16″	93-5/8″	895	48	HCF121-N101W-492K☐

APPLICATION: LIGHTWEIGHT OILS, HEAT TRANSFER OILS

12" 150LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
STEEL SHEATHED ELEMENTS STEEL TANK 23 W/IN² NEMA 4 HOUSING	134.5	■	■	66″	51-13/16″	58-1/2″	675	48	HCF121-B660W-134K☐
	154.0	■	■	73″	58-13/16″	65-1/2″	715	48	HCF121-B730W-154K ☐

APPLICATION: FORCED AIR AND GASES, CAUSTIC SOLUTIONS, DEGREASING SOLUTIONS

12" 150LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
INCOLOY® SHEATHED ELEMENTS STEEL TANK 23 W/IN² NEMA 4 HOUSING	162.5	■	■	66″	60-7/16″	67-9/16″	73	48	HCF121-N66OW-162K☐
	180.0	■	■	73″	68″	75-1/16″	73	48	HCF121-N73OW-180K☐

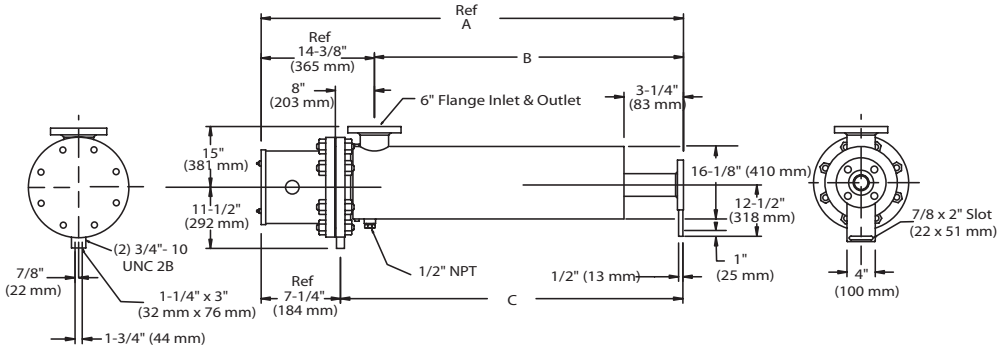
APPLICATION: FORCED AIR AND GASES, CAUSTIC SOLUTIONS, DEGREASING SOLUTIONS

12" 150LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
INCOLOY® SHEATHED ELEMENTS STEEL TANK 13 W/IN² NEMA 4 HOUSING	125.0	■	■	96-3/4″	82-1/2″	87-11/16″	700	48	HCF121-N96MW-125K☐
	136.0	■	■	104-3/4″	90″	97-11/16″	750	48	HCF121-N105W-136K☐

* Blank box denotes voltage selection: See Table 4 on Page 86.

CIRCULATION HEATERS

FLANGED TYPE: 14”



APPLICATION: PROCESS WATER

14" 150 LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
INCOLOY® SHEATHED ELEMENTS STEEL TANK 48 W/IN² NEMA 4 HOUSING	272.5	■	■	59″	44-5/8″	52″	780	57	HCF141-N59OW-272K☐
	327.8	■	■	66″	51-5/8″	58-1/2″	830	57	HCF141-N66OW-327K☐
	367.0	■	■	73″	58-5/8″	65-1/2″	890	57	HCF141-N73OW-376K☐
	470.0	■	■	86″	71-5/8″	78-5/8″	990	57	HCF141-N86OW-470K☐
	527.0	■	■	93″	78-5/8″	86-1/8″	1045	57	HCF141-N93OW-527K☐
	584.0	■	■	101″	86-5/8″	93-5/8″	1100	57	HCF141-N101W-584K☐

APPLICATION: LIGHTWEIGHT OILS, HEAT TRANSFER OILS

14" 150 LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		120V/240V 3PH	240V/480V 3PH						
STEEL SHEATHED ELEMENTS STEEL TANK 23 W/IN² NEMA 4 HOUSING	228.0	■	■	86″	71-5/8″	78-5/8″	990	57	HCF141-B86OW-228K☐
	242.5	■	■	93″	78-5/8″	86-1/8″	1045	57	HCF141-B93OW-242K☐
	276.5	■	■	101″	86-5/8″	93-5/8″	1100	57	HCF141-B101W-276K☐

APPLICATION: FORCED AIR AND GASES, CAUSTIC SOLUTIONS, DEGREASING SOLUTIONS

14" 150 LB ANSI FLANGE	KW	VOLTAGE	A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		480V 3PH						
INCOLOY® SHEATHED ELEMENTS STEEL TANK 23 W/IN² NEMA 4 HOUSING	236.5	■	90″	75-5/8″	81″	1025	57	HCF141-N900W-236K☐
	270.0	■	97″	82-5/8″	89″	1160	57	HCF141-N970W-270K☐
	290.0	■	105″	90-5/8″	96″	1200	57	HCF141-N105W-290K☐

APPLICATION: MEDIUM WEIGHT OILS, LUBE OILS, LIQUID PARAFIN, #4 AND #5 FUEL OILS

14" 150 LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
STEEL SHEATHED ELEMENTS STEEL TANK 13 W/IN² NEMA 4 HOUSING	85.5	■	■	66″	51-5/8″	58-1/2″	830	57	HCF141-B66OW-855C ☐
	99.5	■	■	73″	58-5/8″	65-1/2″	890	57	HCF141-B73OW-995C ☐
	128.0	■	■	86″	71-5/8″	78-5/8″	990	57	HCF141-B86OW-128K ☐
	142.5	■	■	93″	78-5/8″	86-1/8″	1045	57	HCF141-B93OW-142K ☐
	156.5	■	■	101″	86-5/8″	93-5/8″	1100	57	HCF141-B101W-156K ☐

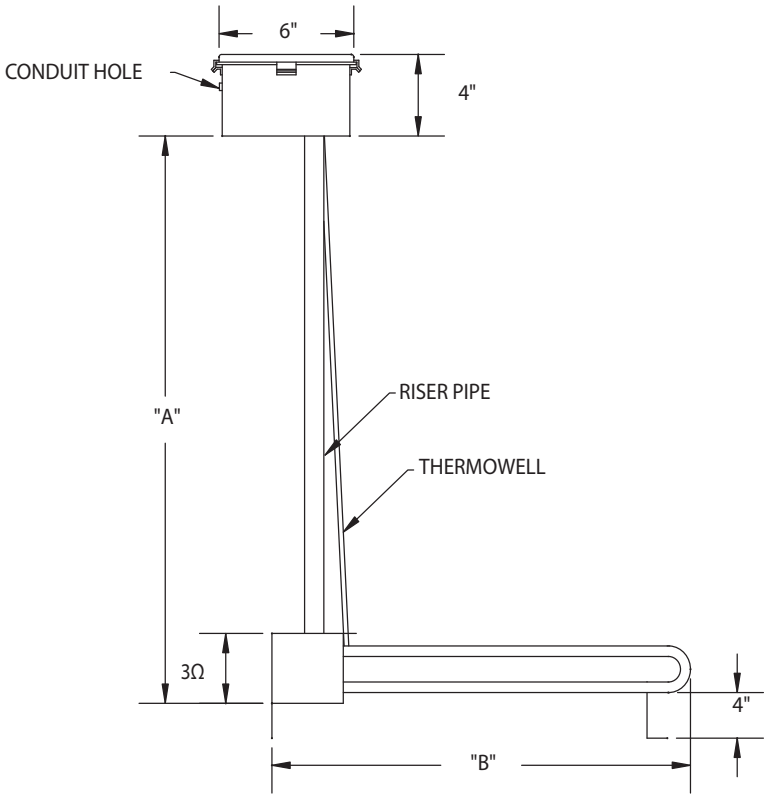
APPLICATION: BUNKER C AND #6 FUEL OIL

14" 150 LB ANSI FLANGE	KW	VOLTAGE		A	B	C	WT. (lbs.)	NUMBER OF ELEMENTS	PART NUMBER*
		240V 3PH	480V 3PH						
STEEL SHEATHED ELEMENTS STEEL TANK 8 W/IN² NEMA 4 HOUSING	51.0	■	■	66″	51-5/8″	58-1/2″	830	57	HCF141-B66OW-510C☐
	62.5	■	■	73″	58-5/8″	65-1/2″	890	57	HCF141-B73OW-625C☐
	74.0	■	■	86″	86-5/8″	78-5/8″	990	57	HCF141-B86OW-740C☐
	88.5	■	■	93″	78-5/8″	86-1/8″	1045	57	HCF141-B93OW-855C☐
	97.0	■	■	101″	86-5/8″	93-5/8″	1100	57	HCF141-B101W-970C☐

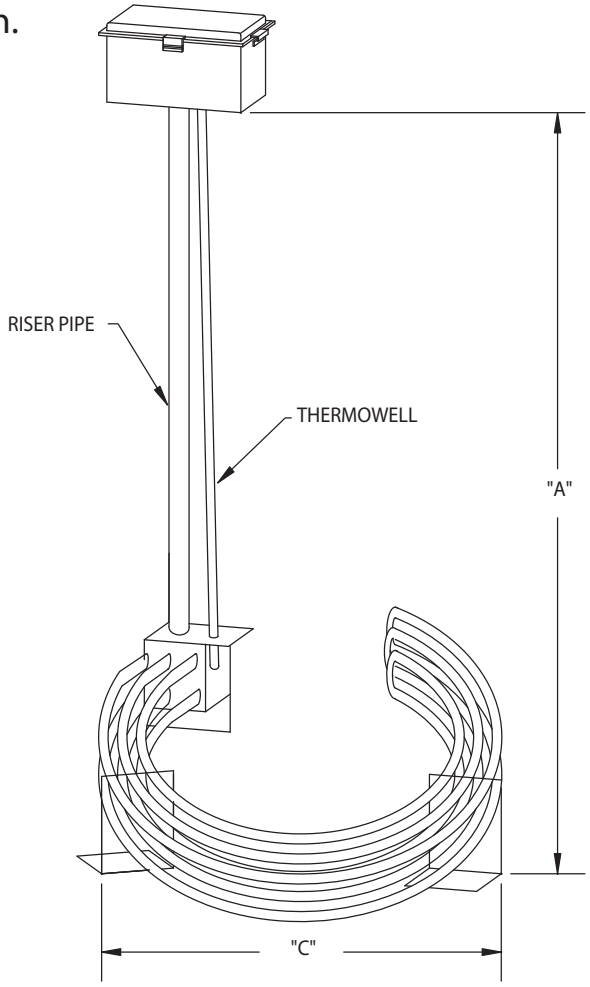
* Blank box denotes voltage selection: See Table 4 on Page 86.

LN & ON OVER-THE-SIDE IMMERSION HEATERS

Used in tanks in which through-the-wall heaters cannot be installed, portability is required, or when heaters must be removed without emptying the tank. Suitable for freeze protection, heating viscous materials for improved flow, or in most open tank applications with the proper sheath and watt density selection.



L-SHAPED



O-SHAPED

FEATURES:

- Lightweight and portable
- Self supporting
- All compatible materials
  - Stainless steel elements and stainless steel riser
  - -Incoloy® elements and stainless steel riser
  - -Steel elements and steel riser
- NEMA 4 housing with terminal block for wiring
- Thermowell for installation of thermostat
- Sludge legs

OPTIONS:

- Built-in thermostat: 60-250˚F or 150-550˚F
- Explosion resistant terminal enclosure (NEMA 7)
- Shorter or longer riser height
- Special ratings or materials
- Right angle risers
- Passivation or other external finishing
- Thermocouples for process control and/or high limit

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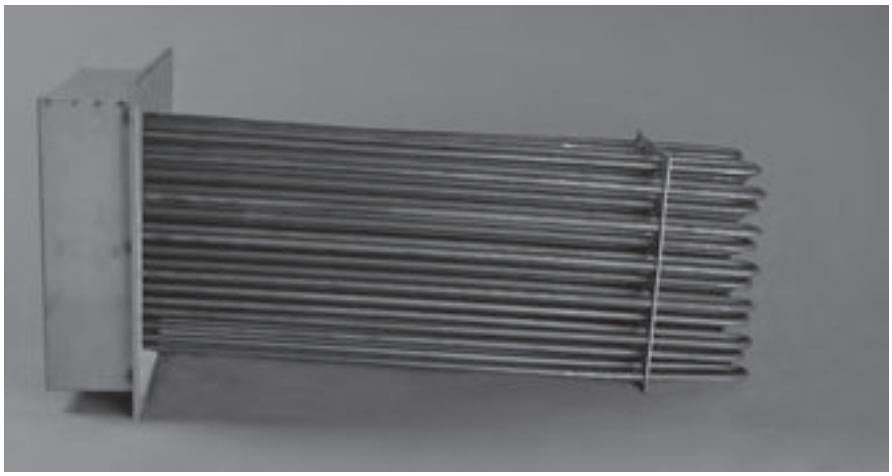
LN & ON OVER-THE-SIDE IMMERSION HEATERS

KW	VOLTS 3-PHASE	A	B	LN CATALOG NUMBER	C	ON CATALOG NUMBER
INCOLOY SHEATHED ELEMENTS						
3	240	39.312″	14.625″	MTLNA-39E14KW-30005	10.75″	MTONA-39E10MW-30005
	480	39.312″	14.625″	MTLNA-39E14KW-30008	10.75″	MTONA-39E10MW-30008
6	240	39.312″	22.625″	MTLNA-39E22KW-60005	13.5″	MTONA-39E13HW-60005
	480	39.312″	22.625″	MTLNA-39E22KW-60008	13.5″	MTONA-39E13HW-60008
9	240	39.312″	30.125″	MTLNA-39E30BW-90005	16″	MTONA-39E160W-90005
	480	39.312″	30.125″	MTLNA-39E30BW-90008	16″	MTONA-39E160W-90008
12	240	51.312″	37.625″	MTLNA-51E37KW-120C5	18.5″	MTONA-51E18HW-120C5
	480	51.312″	37.625″	MTLNA-51E37KW-120C8	18.5″	MTONA-51E18HW-120C8
15	240	51.312″	45.125″	MTLNA-51E45BW-150C5	21.25″	MTONA-51E21DW-150C5
	480	51.312″	45.125″	MTLNA-51E45BW-150C8	21.25″	MTONA-51E21DW-150C8
18	240	51.312″	52.625″	MTLNA-51E52KW-180C5	23.5″	MTONA-51E23HW-180C5
	480	51.312″	52.625″	MTLNA-51E52KW-180C8	23.5″	MTONA-51E23HW-180C8
STEEL SHEATHED ELEMENTS						
3	240	39.312″	22.625″	MTLBA-39E22KW-30005	13.5″	MTOBA-39E13HW-30005
	480	39.312″	22.625″	MTLBA-39E22KW-30008	13.5″	MTOBA-39E13HW-30008
4.5	240	39.312″	30.125″	MTLBA-39E30BW-45005	16″	MTOBA-39E160W-45005
	480	39.312″	30.125″	MTLBA-39E30BW-45008	16″	MTOBA-39E160W-45008
6	240	39.312″	37.625″	MTLBA-39E37KW-60005	18.5″	MTOBA-39E18HW-60005
	480	39.312″	37.625″	MTLBA-39E37KW-60008	18.5″	MTOBA-39E18HW-60008
7.5	240	51.312″	45.125″	MTLBA-51E45BW-75005	21.25″	MTOBA-51E21DW-75005
	480	51.312″	45.125″	MTLBA-51E45BW-75008	21.25″	MTOBA-51E21DW-75008
9	240	51.312″	52.625″	MTLBA-51E52KW-90005	23.5″	MTOBA-51E23HW-90005
	480	51.312″	52.625″	MTLBA-51E52KW-90008	23.5″	MTOBA-51E23HW-90008
STAINLESS STEEL SHEATHED ELEMENTS						
3	240	39.312″	14.625″	MTLRA-39E14KW-30005	10.75″	MTORA-39E10MW-30005
	480	39.312″	14.625″	MTLRA-39E14KW-30008	10.75″	MTORA-39E10MW-30008
6	240	39.312″	22.625″	MTLRA-39E22KW-60005	13.5″	MTORA-39E13HW-60005
	480	39.312″	22.625″	MTLRA-39E22KW-60008	13.5″	MTORA-39E13HW-60008
9	240	39.312″	30.125″	MTLRA-39E30BW-90005	16″	MTORA-39E160W-90005
	480	39.312″	30.125″	MTLRA-39E30BW-90008	16″	MTORA-39E160W-90008
12	240	51.312″	37.625″	MTLRA-51E37KW-120C5	18.5″	MTORA-51E18HW-120C5
	480	51.312″	37.625″	MTLRA-51E37KW-120C8	18.5″	MTORA-51E18HW-120C8
15	240	51.312″	45.125″	MTLRA-51E45BW-150C5	21.25″	MTORA-51E21DW-150C5
	480	51.312″	45.125″	MTLRA-51E45BW-150C8	21.25″	MTORA-51E21DW-150C8
18	240	51.312″	52.625″	MTLRA-51E52KW-180C5	23.5″	MTORA-51E23HW-180C5
	480	51.312″	52.625″	MTLRA-51E52KW-180C8	23.5″	MTORA-51E23HW-180C8

FLANGED DUCT HEATERS



Tubular duct heaters are used for both natural and forced convection industrial applications. These units are a source of consistant heat in processes which require high air temperatures. Durex Industries duct heaters feature heavy gauge mounting flange, terminal box, built-in thermowell, and rugged stainless steel construction. Typical uses are high temperature drying, heat treating, annealing, process ovens, and other high temperature applications.

CONSTRUCTION FEATURES:

- Heavy gauge terminal box with NEMA 1 housing and high temperature aluminum paint
- 3/8" thick steel mounting flange
- Silicone rubber seals at the terminals retard moisture absorption during storage
- Incoloy® sheath
- Recompacted bends to restore MgO density

OPTIONAL FEATURES:

- Built-in thermowell with heat sink as required
- Duct guide frame
- Installed thermocouples
- Restriction Baffles

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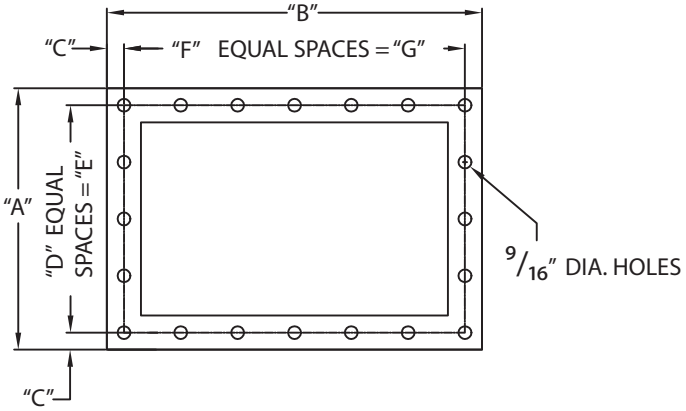
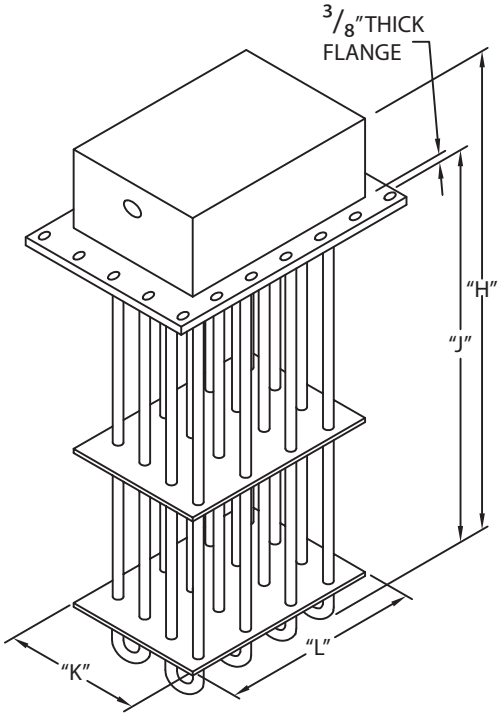
FLANGED DUCT HEATERS





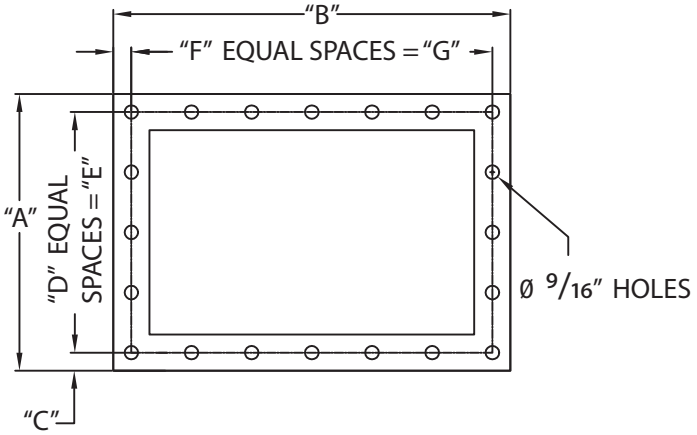
Heater Kw Rating	Number of Elements	A In Inches	B In Inches	C In Inches	D # of Holes	E In Inches	F # of Holes	G In Inches	H In Inches	J In Inches	K In Inches	L In Inches	Heater Voltage	Number of Circuits	Part Number	Misc. Notes
6	6	10.00	12.00	0.75	4	2.12	5	2.10	28.00	24.00	7.00	9.00	240-480	1	FDH43N-06024N-60005-XXXX01	240 Volt, NEMA 1 ENCLOSURE WITHOUT THERMOSTAT
12	12	12.00	14.00	0.75	5	2.10	6	2.08	34.00	30.00	9.00	11.00	240-480	1	FDH43N-12030N-120C5-XXXX01	240 Volt, NEMA 1 ENCLOSURE WITHOUT THERMOSTAT
18	18	14.00	14.00	0.75	5	2.16	6	2.08	34.00	30.00	11.00	11.00	240-480	1	FDH43N-18030N-180C5-XXXX01	240 Volt, NEMA 1 ENCLOSURE WITHOUT THERMOSTAT
24	24	14.00	20.00	0.75	6	2.08	9	2.06	34.00	30.00	11.00	14.00	240-480	1,2	FDH43N-24030N-240C5-XXXX01	240 Volt, NEMA 1 ENCLOSURE WITHOUT THERMOSTAT
30	30	12.50	20.00	0.75	5	2.20	9	2.06	34.00	30.00	9.00	21.00	240-480	1,2	FDH43N-30030N-300C5-XXXX01	240 Volt, NEMA 1 ENCLOSURE WITHOUT THERMOSTAT
36	36	14.00	24.00	0.75	6	2.08	10	2.25	34.00	30.00	14.00	15.00	240-480	1,2,3	FDH43N-36030N-360C5-XXXX01	240 Volt, NEMA 1 ENCLOSURE WITHOUT THERMOSTAT
42	42	15.50	24.00	0.75	7	2.07	10	2.25	34.00	30.00	11.00	13.00	240-480	1,2	FDH43N-42030N-420C5-XXXX01	240 Volt, NEMA 1 ENCLOSURE WITHOUT THERMOSTAT
48	48	17.00	24.00	0.75	7	2.21	10	2.25	34.00	30.00	14.00	21.00	240-480	2,4	FDH43N-48030N-480C5-XXXX01	240 Volt, NEMA 1 ENCLOSURE WITHOUT THERMOSTAT
54	54	18.50	24.00	0.75	8	2.12	10	2.25	34.00	30.00	15.00	21.00	240-480	3	FDH43N-54030N-540C5-XXXX01	240 Volt, NEMA 1 ENCLOSURE WITHOUT THERMOSTAT
60	60	20.00	24.00	0.75	9	2.06	10	2.25	34.00	30.00	17.00	21.00	240-480	4,5	FDH43N-60030N-600C5-XXXX01	240 Volt, NEMA 1 ENCLOSURE WITHOUT THERMOSTAT

HIGH TEMPERATURE PROCESS AIR HEATERS

High temperature Process Air Heaters are used for both natural and forced convection industrial applications. Durex Industries Process Air Heaters feature heavy gauge mounting flange and terminal box, built-in thermowell with heat sink, and rugged stainless steel construction. Typical uses for high temperature process air heaters include higher temperature recirculating ovens, preheating combustion air, oven conversions, high temperature drying, heat treating, annealing, and dehumidification.

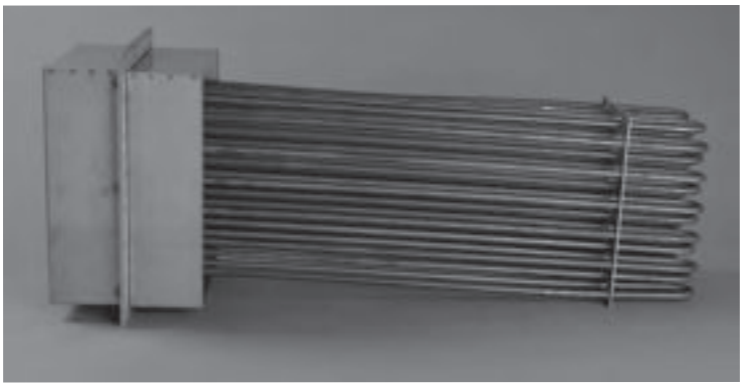
CONSTRUCTION FEATURES:

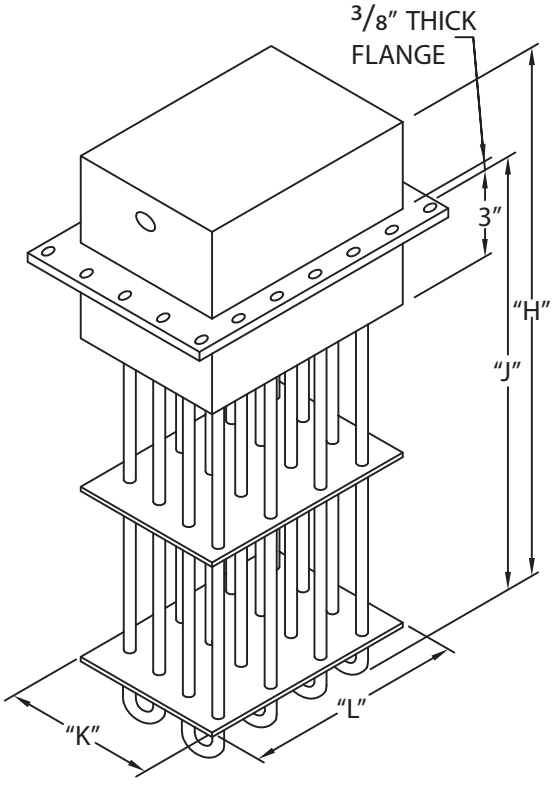
- Heavy gauge terminal box with Nema 1 housing and high temperature aluminum paint
- 3/8" thick steel mounting flange
- Silicone rubber seals at the terminals retard moisture absorption during storage
- Incoloy® sheath
- Recompacted bends to restore MgO density



OPTIONAL FEATURES:

- Four 3/8" diameter stainless steel support rods and stainless steel support plate
- Built-in thermowell with heat sink
- Thermostat installed
- Guide frame
- Restriction baffles





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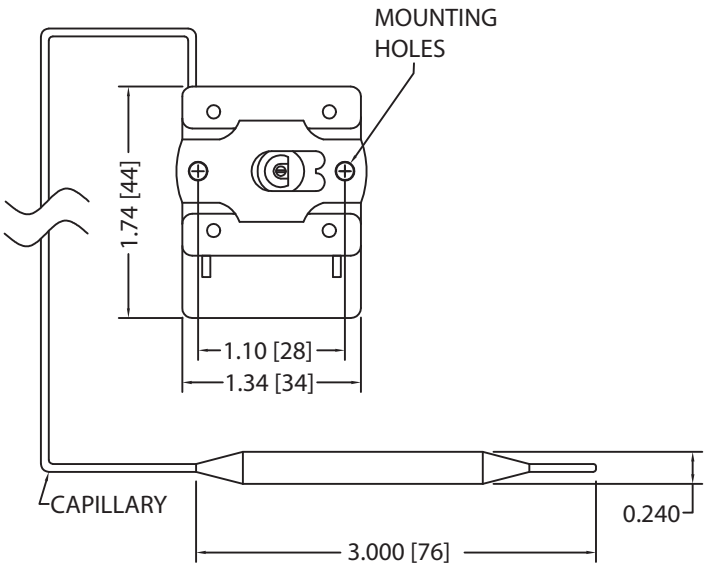
HIGH TEMPERATURE PROCESS AIR HEATERS

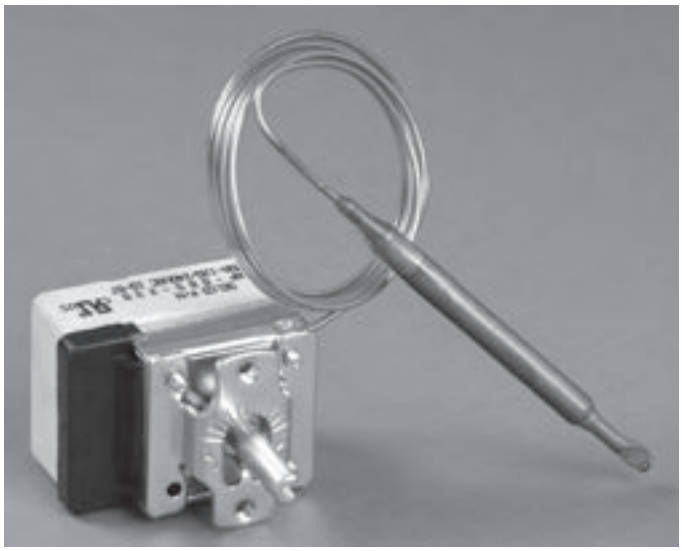
Heater Kw Rating	Number of Elements	A in inches	B in inches	C in inches	D # of holes	E in inches	F # of holes	G in inches	H in inches	J in inches	K in inches	L in inches	Heater Voltage	Number of Circuits	Catalog Part Number	Misc. Notes
5	3	8.00	10.00	0.75	3	2.15	4	2.12	28.00	24.00	3.00	4.50	240-480	1	PH43N-03024N-50005-XXXX01	240 Volt, NEMA 1 ENCLOSURE without THERMOSTAT
10	6	10.00	12.00	0.75	4	2.12	5	2.10	28.00	24.00	4.50	6.00	240-480	1	PH43N-06024N-100C5-XXXX01	240 Volt, NEMA 1 ENCLOSURE without THERMOSTAT
15	9	10.00	14.00	0.75	4	2.12	6	2.08	28.00	24.00	4.50	9.00	240-480	1	PH43N-09024N-150C5-XXXX01	240 Volt, NEMA 1 ENCLOSURE without THERMOSTAT
20	12	12.00	14.00	0.75	5	2.10	6	2.08	34.00	30.00	6.00	9.00	240-480	1,2	PH43N-12030N-200C5-XXXX01	240 Volt, NEMA 1 ENCLOSURE without THERMOSTAT
25	15	13.00	14.00	0.75	5	2.10	6	2.08	34.00	30.00	7.50	9.00	240-480	1,2	PH43N-15030N-250C5-XXXX01	240 Volt, NEMA 1 ENCLOSURE without THERMOSTAT
30	18	14.00	14.00	0.75	6	2.08	6	2.08	34.00	30.00	9.00	9.00	240-480	1,2,3	PH43N-18030N-300C5-XXXX01	240 Volt, NEMA 1 ENCLOSURE without THERMOSTAT
35	21	14.00	16.00	0.75	4	2.12	12	2.05	34.00	30.00	9.00	10.50	240-480	1,3	PH43N-21030N-350C5-XXXX01	240 Volt, NEMA 1 ENCLOSURE without THERMOSTAT
40	24	14.00	17.00	0.75	6	2.08	9	2.06	34.00	30.00	9.00	12.00	240-480	2,4	PH43N-24030N-400C5-XXXX01	240 Volt, NEMA 1 ENCLOSURE without THERMOSTAT
45	27	14.00	18.50	0.75	4	2.12	14	2.18	34.00	30.00	9.00	13.50	240-480	3	PH43N-27030N-450C5-XXXX01	240 Volt, NEMA 1 ENCLOSURE without THERMOSTAT
50	30	14.00	20.00	0.75	5	2.10	9	2.06	34.00	30.00	9.00	15.00	240-480	2,5	PH43N-30030N-500C5-XXXX01	240 Volt, NEMA 1 ENCLOSURE without THERMOSTAT
80	36	14.00	24.00	0.75	6	2.08	10	2.25	34.00	30.00	9.00	18.00	240-480	2,3	PH43N-36030N-800C5-XXXX01	240 Volt, NEMA 1 ENCLOSURE without THERMOSTAT
80	48	17.00	24.00	0.75	7	2.21	10	2.25	34.00	30.00	12.00	18.00	240-480	2,4	PH43N-48030N-800C5-XXXX01	240 Volt, NEMA 1 ENCLOSURE without THERMOSTAT
90	54	18.50	24.00	0.75	8	2.12	10	2.25	34.00	30.00	13.50	18.00	240-480	3,6	PH43N-54030N-900C5-XXXX01	240 Volt, NEMA 1 ENCLOSURE without THERMOSTAT
100	60	20.00	24.00	0.75	9	2.06	10	2.25	34.00	30.00	15.00	18.00	480	4,5,6	PH43N-60030N-100K8-XXXX01	480 Volt, NEMA 1 ENCLOSURE without THERMOSTAT
120	36	14.00	24.00	0.75	6	2.08	10	2.25	62.00	58.00	9.00	18.00	480	4,6	PH43N-36058N-120K8-XXXX01	480 Volt, NEMA 1 ENCLOSURE without THERMOSTAT
144	48	17.00	24.00	0.75	7	2.21	10	2.25	56.00	52.00	12.00	18.00	480	4,6	PH43N-48052N-144K8-XXXX01	480 Volt, NEMA 1 ENCLOSURE without THERMOSTAT
160	48	17.00	24.00	0.75	7	2.21	10	2.25	62.00	58.00	12.00	18.00	480	4,8	PH43N-48058N-160K8-XXXX01	480 Volt, NEMA 1 ENCLOSURE without THERMOSTAT
162	54	18.50	24.00	0.75	8	2.12	10	2.25	56.00	52.00	13.50	18.00	480	6	PH43N-54052N-162K8-XXXX01	480 Volt, NEMA 1 ENCLOSURE without THERMOSTAT
180	54	18.50	24.00	0.75	8	2.12	10	2.25	62.00	58.00	13.50	18.00	480	4,6	PH43N-54058N-180K8-XXXX01	480 Volt, NEMA 1 ENCLOSURE without THERMOSTAT
218	72	24.00	24.00	0.75	8	2.12	13	2.19	56.00	52.00	18.00	18.00	480	6	PH43N-72052N-218K8-XXXX01	480 Volt, NEMA 1 ENCLOSURE without THERMOSTAT
240	72	20.00	24.00	0.75	8	2.12	13	2.19	62.00	58.00	18.00	18.00	480	6,8	PH43N-72058N-240K8-XXXX01	480 Volt, NEMA 1 ENCLOSURE without THERMOSTAT
270	80	20.00	28.00	0.75	9	2.06	13	2.19	56.00	52.00	15.00	22.50	480	10	PH43N-80052N-270K8-XXXX01	480 Volt, NEMA 1 ENCLOSURE without THERMOSTAT
300	90	20.00	32.00	0.75	9	2.06	14	2.18	62.00	58.00	15.00	27.00	480	10	PH43N-90058N-300K8-XXXX01	480 Volt, NEMA 1 ENCLOSURE without THERMOSTAT

NOTE: See drawings on previous page

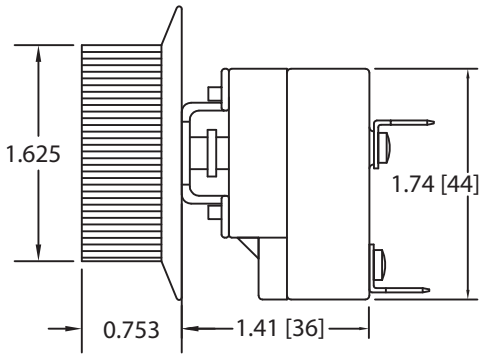
PROCESS HEATERS

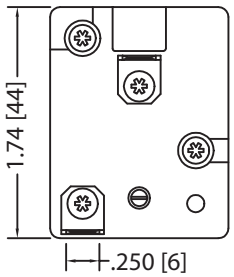
THERMOSTAT OPTIONS





- SPST Adjustable thermostat
- Wide range of temperature selections
- Complete with knob & bezel





PART NUMBER	DESCRIPTION
CNTR-TSTAT-351-1	Adjustable Thermostat from 50-110°F
CNTR-TSTAT-2567F2-1	DPST Thermostat Controller from 0-100°F
CNTR-TSTAT-2567F1-1	Thermostat Controller from 60-250°F
CNTR-TSTAT-CAP-85-230-1	SPST Adjustable Thermostat from 80-230°F with knob & bezel
CNTR-TSTAT-CAP-120-570-1	SPST Adjustable Thermostat from 120-570°F with knob & bezel

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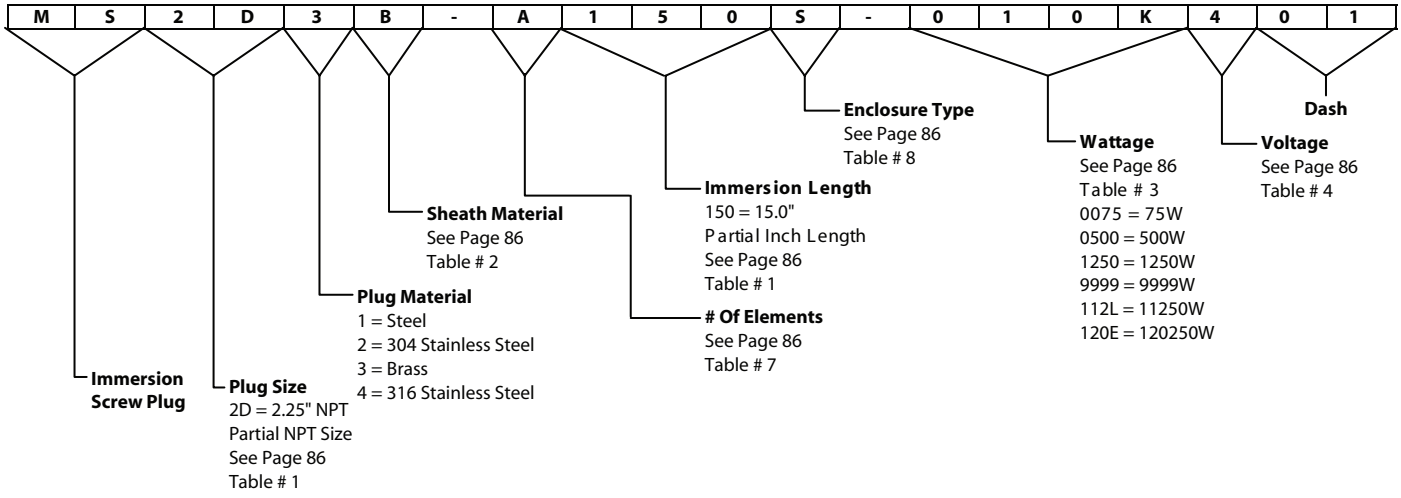
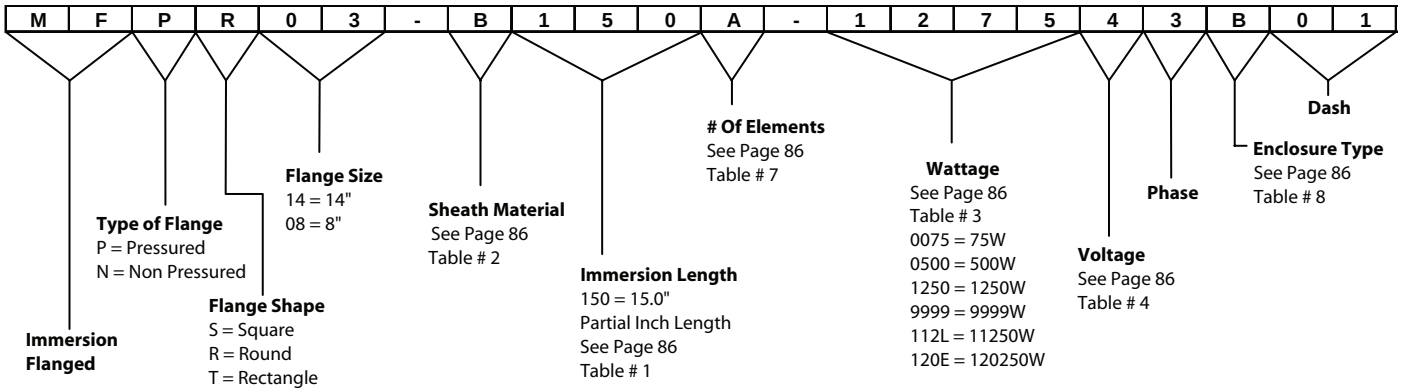
PART NUMBERS

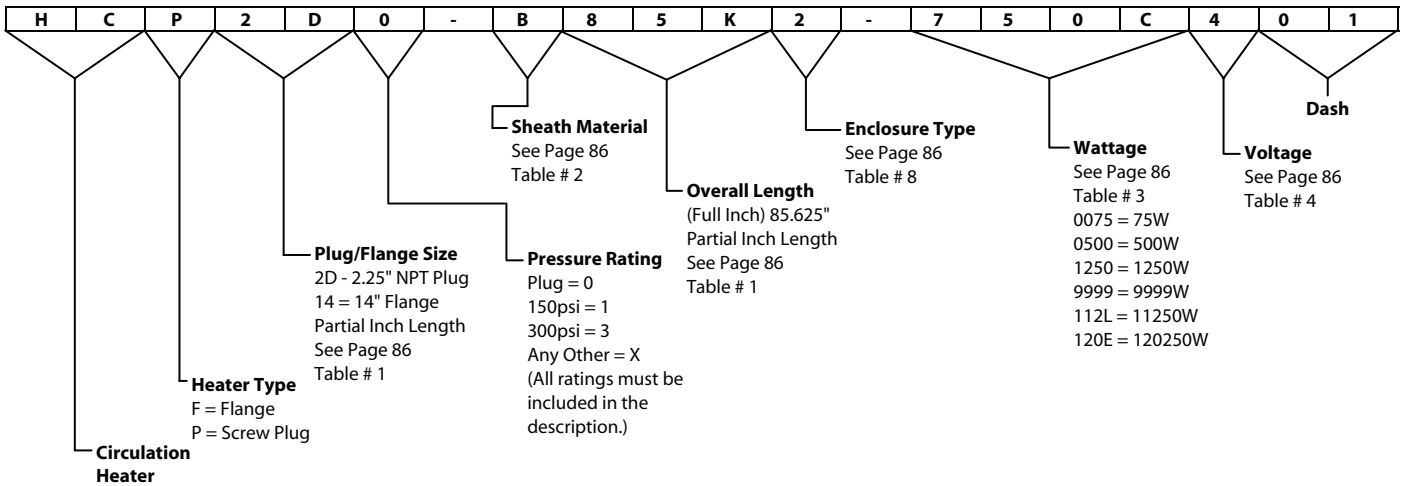
Immersion Screw Plug



Immersion Flanged



Circulation Heater



TABLES AND CODES

Table # 1

Frac.	= Deci.	= Code
0	= 0	= 0
1/16"	= .062"	= A
1/8"	= .125"	= B
3/16"	= .188"	= C
1/4"	= .250"	= D
5/16"	= .312"	= E
3/8"	= .375"	= F
7/16"	= .438"	= G
1/2"	= .500"	= H
9/16"	= .562"	= J
5/8"	= .625"	= K
11/16"	= .688"	= L
3/4"	= .750"	= M
13/16"	= .812"	= N
7/8"	= .875"	= P
15/16"	= .938"	= R
1"	= 1.000"	= S

Table # 2

Sheath Material Code

C = Copper (COP)

B = Steel (STL)

R = 304 Stainless STL (304SS)

S = 316 Stainless STL (316SS)

N = Incoloy (INC)

L = Inconel (INL)

X = Special (SPL)

Table # 3

Wattage Codes

C = 00

A = 25

L = 50

B = 75

K = 000

E = 250

D = 500

F = 750

Table # 4

Voltage Codes

< - 100 = 1
101 - 130 = 2
131 - 199 = 3
200 - 219 = 4
220 - 250 = 5
251 - 300 = 6
301 - 420 = 7
421 - 500 = 8
500 - > = 9
Dual Rating = X

Table # 5

Termination Types

B = Threaded Bulkhead Fittings
D = Quick Disconnect Spade
F = Mounting Flange
H = Ceramic to Metal Hermetic Terminals
K = Mounting Bracket
L = Screw Lug Terminals
M = Molded Rubber Leads
R = Locator Washer
S = Threaded Stud Terminal
W = Lead Wire Terminal Assembly
X = Special

Table # 6

Sheath Dia. Code

.040= 04	.260 = 26
.062 = 06	.312 = 31
.093 = 09	.315 = 32
.100 = 10	.375 = 38
.125 = 13	.430 = 43
.150 = 15	.475 = 48
.172 = 17	.496 = 49
.188 = 19	.625 = 63
.200 = 20	.687 = 69
.220 = 22	.750 = 75
.250 = 25	

Table # 7

# of Elements

1 = H
2 = J
3 = A
6 = B
12 = C
18 = D
27 = E
36 = F
45 = G
Special = X

Table # 8

Enclosure Code

W/O T-STAT	DESCRIPTION	WITH T-STAT		
		60°-250°F	100°-550°F	300°-700°F
N	NEMA 1	K	L	M
W	NEMA 4	A	B	C
E	NEMA 7	P	R	T
X	SPECIAL	D	Y	F
Z	NONE	S		

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