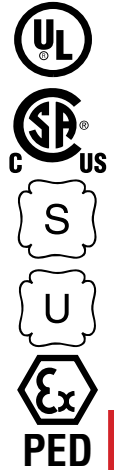


Circulation Heaters Overview

- In-Line or Recirculating Electric Heat Exchangers
- Water, Solutions, Oils, Steam and Gas Heating
- High Efficiency
- Packaged Heater, Vessel and Control
- UL, CSA, ATEX IEC or Other Electrical Certifications Available
- ASME, PED or Other Pressure Certifications Available
- Custom Designs



CIRCULATION HEATERS

Circulation heaters are packaged units designed to heat a flowing medium using in-line or side-arm piping configurations. Complete units consist of built-in heating elements, a heating chamber, thermostat and/or sensors (stock units), insulation, insulation jacket, mounting brackets and inlet and outlet connections.

Circulation heaters offer high efficiency since all heat is generated within the solution. Fluids are directed past the heating elements giving fast response and even heat distribution.

A wide selection of kilowatt ratings, materials, vessel sizes, terminal enclosures, control features and mounting methods are available for all types of heating requirements.

SCR and Contactor Control Panels available for integral or remote mounting. Consult Controls section for details.

Applications

Typical applications include heating water, oils, heat transfer fluids, mild and corrosive fluids, gases and steam. Heaters can be mounted on the side of tanks, inserted into closed-loop systems or installed in-line for process heating.

Water Heating — Washrooms, dish washing and rinsing, process water heating, jacketed kettles, hot water storage tanks and hydronic heating systems.

Freeze Protection — Water cooled engines, stand pipe water tanks for fire protection, oil sump heaters.

Heat Transfer Oil Heating — Process kettles, molding dies and platens, mixing and blending mills, closed-loop heat transfer systems for asphalt and heat sensitive materials.

Fuel Oil Heating — Preheating to pumping viscosity, preheating for delivery to burners.

Steam, Air and Gas Heating — Steam superheating, air preheating for process equipment.

Special Features

Consult your Local Chromalox Sales office for more detailed information on many special features, larger kilowatt heaters and skid mounted circulation heater systems.

Application Engineering

The Chromalox sales and service organization has the technical capabilities and equipment to satisfy virtually any circulation heating application and to assist you in calculating requirements for the more common heating processes.

The Chromalox organization is the most experienced and diversified manufacturer in the electric heating business. Whatever your heating requirements, you can depend on the technical know-how of your Chromalox field representatives. Backed by the highly skilled engineers and modern manufacturing facilities, Chromalox field sales engineers can help determine your requirements and provide you with high quality equipment, properly selected, sized and applied.

Section Outline

Section	Page
Features	C-4
Terminal Enclosures	C-5
Control Options	C-8
Clean Water Series	C-10
Oil Series	C-17
Steam, Air & Gas Series	C-24
Corrosive Solution, Water & Hi-Temperature Gas Series	C-28
Pre-engineered Packaged Units	C-37
Custom Engineering	C-38

Circulation Heaters Selection Guidelines

Selecting a Circulation Heater

Selecting the proper circulation heater component requires critical engineering judgement and careful evaluation of the application. After determining the heat requirement for a specific heat application, the proper selection of the flange and vessel material, heating element sheath material, and correct watt density is critical to achieve long heater life. The ultimate selection of equipment is determined by the knowledge of the process and engineering acumen of the designer or plant engineer. Consult the Technical section of this catalog for circulation heater calculations and guidelines.

Application Factors

Heater selection is influenced by the following parameters.

- ① The heated medium, viscosity, specific heat, density and corrosive properties.
- ② The presence of contaminants in the medium.
- ③ The corrosion resistant properties of the heater sheath material.
- ④ The sheath watt density of the heating elements — the watts per square inch, and the flow rate of the heated medium.
- ⑤ The vessel design and material — pressure and temperature of the fluid being heated.

Corrosion Policy

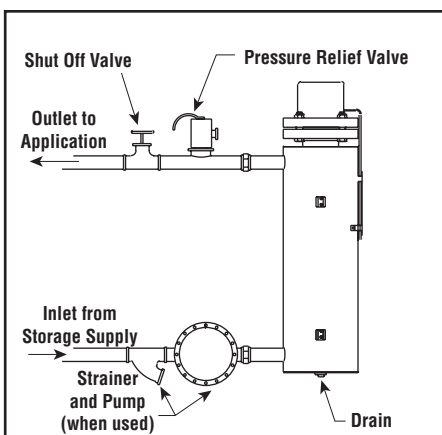
Chromalox will not warrant any electric heater against failure by sheath corrosion if such failure is the result of operating conditions beyond the control of the heater manufacturer. It is the responsibility of the purchaser to make the ultimate choice of sheath material based on his knowledge of the chemical composition of the corrosive solution, character of materials entering the solution, and controls by which he maintains the process.

Circulation Heaters — Selection Guidelines

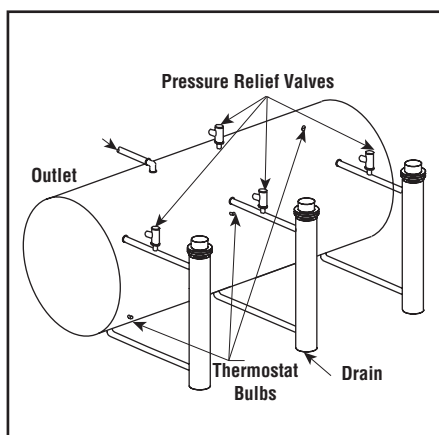
Application	①	②	③	④	⑤
	Solution or Heater Type	Alkaline or Acid Content (Est. % by Volume)	Sheath Material	Watt Density (W/In ²)	Vessel Material
Water	Clean Water	pH6 to pH8 (Neutral)	Copper	45 - 100	Galvanized Steel
Mild Solutions	Process Water and Very Weak Solutions Weak Solutions DeminerIALIZED, De-ionized or Pure Water	pH5 to pH9 (2 - 3%) 5 - 6% —	INCOLOY® INCOLOY® INCOLOY®	45 - 86 45 - 75 45 - 75	Stainless Steel Stainless Steel Stainless Steel
Corrosive & High Viscous Solutions	Mildly Corrosive Solutions More Severe Corrosive Solutions Severely Corrosive Solutions	5 - 15% 10 - 25% 30 - 60%	INCOLOY® INCOLOY® INCOLOY®	20 - 25 20 - 25 10 - 20	Stainless Steel Stainless Steel Stainless Steel
Oil	Low Viscosity Oils Medium Viscosity Oils High Viscosity Oils (Fuel Oil)	— — —	Steel Steel Steel	20 - 25 10 - 20 5 - 15	Steel Steel Steel
Air, Gases & Steam	Medium Temperatures to 750°F High Temperatures to 1400°F	— —	INCOLOY® INCOLOY®	20 - 25 10 - 20	Steel Stainless Steel

Typical Applications

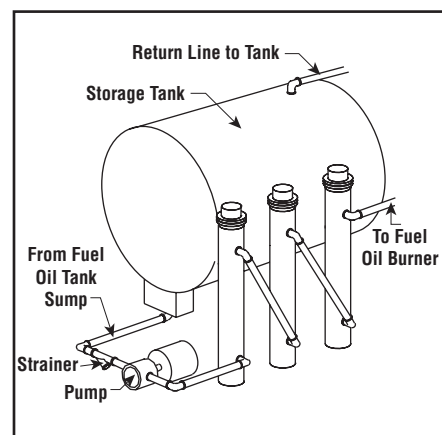
Inline Heating — Where demands for heated water or oil are nearly constant, circulation heaters may be installed directly in the fluid line, eliminating the need for storage tanks and their related heat losses.



Side Arm — Requirements of large storage tanks can be satisfied by using a number of circulation heaters, providing flexibility in temperature control and reducing power demand.



Closed-Loop Fuel Oil Heating — Requirements may be provided by a number of circulation units individually adjustable to temperature and fluid flow, reducing electrical demand on your utility bill.



Circulation Heaters

Selection Guidelines

(cont'd.)

Circulation Heaters — Selection Guidelines

Application	Heater/Vessel Material	kW Rating	Feature	Model	Page
Clean Water	Copper/Steel or Brass	1.5 - 3	Booster	NWHJR	C-13
	Copper/Galv. Steel	3 - 18 6 - 500	Screw Plug Flanged	NWH	C-11
Clean Water or Oil	INCOLOY®/ Galvanized	0.5 - 40	Field Adjustable	NWHSRG	C-14
Corrosive & High Viscous Solutions	INCOLOY®/ Stainless INCOLOY®/ CPVC	6 - 200	Flanged Reduced Watt Density Non-Metallic Body	NWHIS NWHOIS CVCHS	C-29
		2 - 30			C-30
		1.5 - 3			C-16
Oil Light Medium	Steel/Steel	3 - 120	Flanged Baffled	NWHSR NWHO NWHOB	C-19
		30 - 120			C-17
					C-18
Oil Heavy	Steel/Steel	3 - 120 20 - 70	Reduced Watt Density Baffled	NWHOR NWHORB	C-21 C-21
Steam, Air & Gas	INCOLOY®/ Steel INCOLOY®/ Stainless	30 - 50	Low Flow Flanged Flanged Baffled	GCHCIS GCHI GCHIS GCHISB	C-33
		0.5 - 3.0			C-24
		3 - 350			C-32
		2 - 200			C-32
High Pressure Gas & Liquid	Stainless	3 - 30	Seamless Casting	CCX	C-34
Pre-engineered Packages — Wired & Skid Mounted					C-37
ASME & Custom Engineering Specifications (SDS)					C-38

Codes & Standards

ASME Certification to Sections I, III, IV and VIII, Division 1 or PED — Chromalox is the leader in providing ASME (American Society of Mechanical Engineers or PED) certification for pressure vessel applications.

Underwriters Laboratories — UL Listing available for many circulation heaters. Consult your Local Chromalox Sales office.

ATEX Directive — Many Chromalox products are approved for use in explosive atmospheres.

Canadian Standards Association — CSA certification available.

International and National Electrical Code (NEC and IEC) — All Chromalox circulation heaters are built to installation requirements.

Special Features Available

Kilowatt Ratings — Large kilowatt circulation heaters (500 kW and above) are available as single chambers or with multiple chambers in series. Skid mounting and integral control panels are also available.

Vessel Construction — Chamber size available in 10, 12, 14, 16, 18" and above for larger kilowatt capacities.

Pressure Ratings — 150, 300, 400, 600, 900, 1,500 and 2,500 Lb. Class.

Materials — 304, 316, 321, 347 Stainless Steel, INCONEL® and more.

Thermocouples can be provided on element sheath for overtemperature protection and/or mounted in the outlet nozzle for process control.

Inlet and Outlet Nozzles — Available with flanged or threaded connections, smaller or larger pipe sizes and different orientations.

Baffles mounted on element bundle inside chamber to increase fluid or gas velocity.

Terminal Standoffs from 3 to 24" allow the terminal enclosure housing and the field wiring connection to operate at lower temperatures in high temperature heaters. Standoffs are frequently used in heat transfer and gas heating applications.

Mounting Saddles for horizontally mounted circulation heaters.

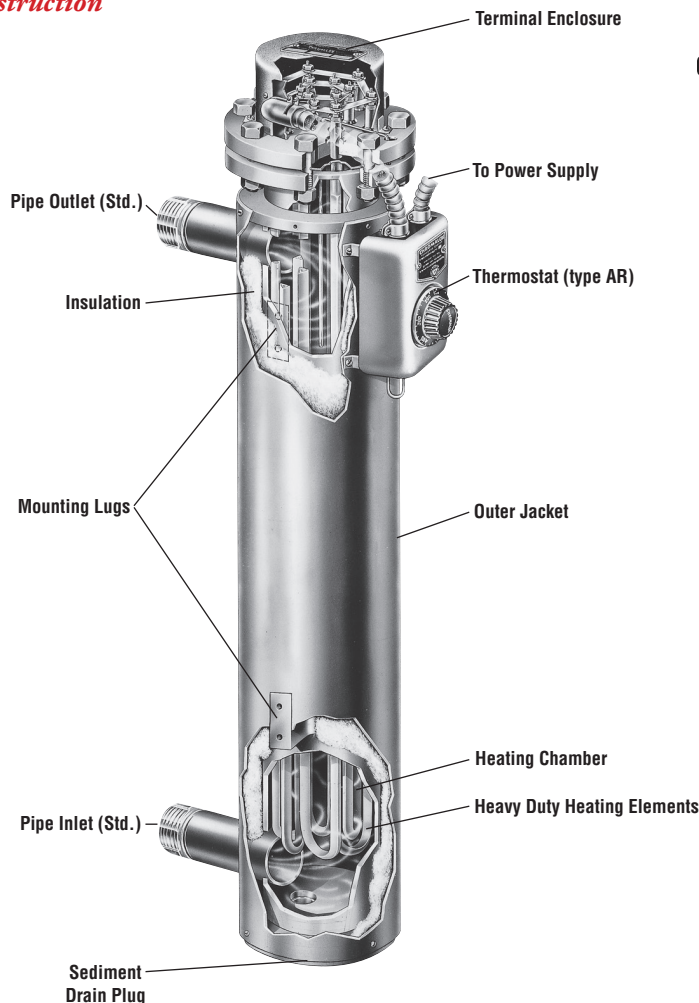
Weatherproof Insulation Jacket for outdoor unprotected installations.

Circulation Heaters

Features

- Kilowatt Ratings from 0.5 kW (500 W) to Over 500 kW (500,000 W)
- Voltage Ratings to 600V
- Pressure Ratings to 5000 psig (345 bar)
- Temperatures to 1500°F (815°C)
- Pipe Chambers 1 - 48" NPS
- Quality Heating Elements in Screw Plugs or Flanges for Ease of Replacement
- Sheath Materials include Copper, Steel, Stainless, INCOLOY® and INCONEL® to Suit Most Operating or Corrosive Environments
- Vessel Materials include Carbon Steel, 304 or 316 Stainless Steel, Non Ferrous Alloys and High Temperature Plastics
- Terminal Enclosures for General Purpose, Moisture Resistant and Explosion Proof Applications
- Thermocouples and RTD Sensors for Process and Overtemperature Control
- Wide Range of Mechanical and Solid State Electronic Controls including Temperature Controllers
- Contactor or SCR Power Panels for Close Temperature Control (see Controls Section)
- Vertical or Horizontal Mounting with Mounting Lugs or Saddle Supports
- Available with High Temperature Standoffs and Internal Element Baffles
- Custom Designed Skid Mounting, Multiple Chambers and Integral Control Panels
- ASME Certification Section I, IV or VIII, Division 1 or PED
- UL, CSA, ATEX and Other Third Party Approval, Listing or Certification Available on Many Models

Basic Construction



Basic Construction

Terminal Enclosures — E1 General Purpose, sheet metal, painted with red enamel, E2 Moisture Resistant/Explosion Proof, E4 Moisture Resistant.

Controls — Some catalog units are provided with a thermostat mounted on the heater.

Mounting — Small units supported by inlet and outlet piping; larger units provided with mounting lugs for support.

Outer Jacket — Constructed of heavy gauge painted steel sleeving which contains high temperature thermal insulation to reduce heat losses from heating chamber.

Heating Chamber — Pipe chambers (150 Lb welded construction, standard) have a flanged or threaded end to receive heater assembly and are closed at the opposite end. Larger

units have drain connections to allow sludge removal. Inlet and outlet nozzles are provided for circulation of fluid or gas through heater chamber. Chamber material available in Steel, Galvanized Steel or Stainless Steel depending on the application.

Heating Elements — Flange or screw plug mounted tubular type heating elements offered in Stainless Steel, Copper, Steel or INCOLOY® sheath to suit corrosive resistance requirements.

Wiring Connections — All Chromalox circulation heaters are provided with internal wiring and power connections that are sized in accordance with wiring tables in the National Electrical Code and International Electric Code. For safe operation of the heaters, all external wiring should also be in accordance with local codes.

Circulation Heaters

Terminal Enclosures

- E1 General Purpose
- E2 Moisture Resistant/Explosion Resistant
- E4 Moisture Resistant
- Conduit Openings Matched to the Number of Circuits

Applications

The versatility of electric heaters permits them to be used in almost any conceivable location indoors or outdoors, exposed to the weather. Chromalox provides a variety of electrical terminal enclosures to match the unique requirements of virtually any environment.

Features

E1 General Purpose Enclosure — Suitable for most indoor or protected commercial and industrial applications.

E2 Combination Moisture Resistant and Explosion Proof Enclosures — Type E2 explosion proof terminal enclosures are intended for use in hazardous locations. Refer to the following table for details.

Type E2 terminal enclosures are provided with gaskets and are suitable for outdoor or wet locations as well as hazardous areas.

E4 Moisture Resistant Enclosure — Suitable for outdoor or wet locations. The terminal covers are provided with water-tight gaskets to seal the electrical terminals and connections from the environment.

Special Requirements for Electric Heaters & Terminal Enclosures in Hazardous Locations:

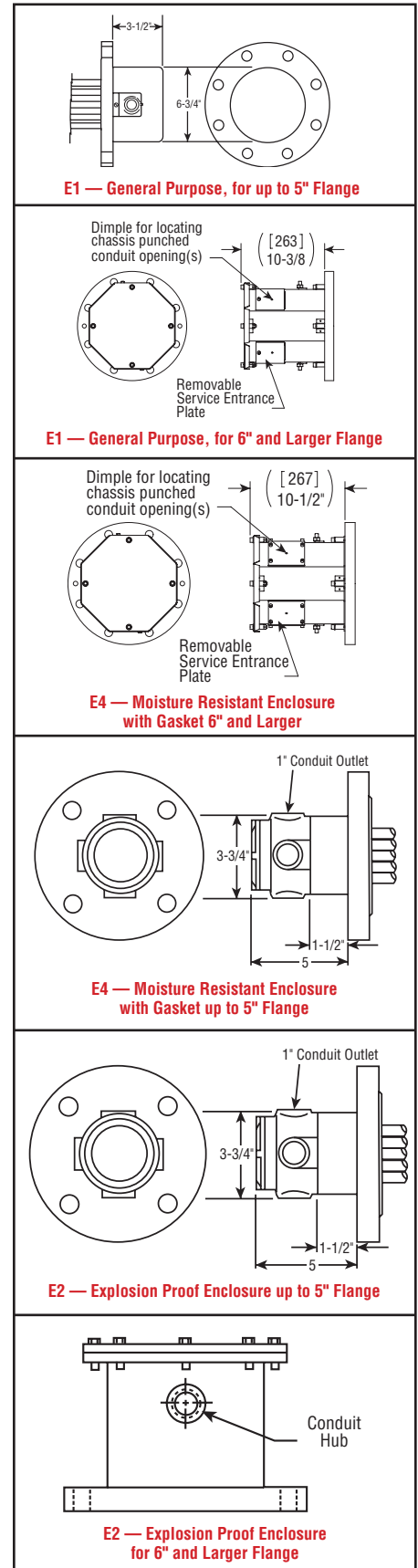
Wiring — The proper use of Type E2 terminal enclosures on electric heaters located in hazardous areas requires that all electrical wiring comply with National Electrical Code (NEC) and International Electrical Code (IEC) requirements for hazardous locations.

Maximum Temperatures — Safe operation in a hazardous location requires the maximum operating temperatures of all exposed surfaces of the heater including temperatures on the outside of the vessel, piping, flanges, screw plugs, enclosures and other heat conducting parts be limited. The maximum surface temperature permitted in any hazardous location is determined by the flammable liquids, vapors or gases present. The end user or purchaser of the electric heating equipment is responsible for determining the proper classification of an area and for providing Chromalox with hazardous area specifications and requirements for proper equipment design. (NEC Articles 500 and 501 provide guidelines for evaluating and classifying hazardous locations.)

Safety Devices — Approved pressure and/or temperature limiting controls must be used on electric heaters and heating elements to ensure safe operation in the event of system malfunctions.

Note 1 — Class I Group B locations include Hydrogen gas. These areas require additional conduit seals and thread engagement. Contact your Local Chromalox Sales office for heaters and terminal enclosures suitable for Class I Group B hazardous locations.

Typical Terminal Enclosures



Circulation Heaters

Terminal Enclosures

Third Party Specifications by Housing Style

Model	Purpose		North American Designation(s)	Canadian Designation(s)	European Designation(s)	International Designation(s)
E1	General Purpose	Generic Agency (s)	NEMA 1, NEC UL/CSAus	NEMA 1 IP32 CSA	IP32 CE: Manufacturer's Declaration	CE: Manufacturer's Declaration
		Ratings	General Duty Only	General Duty Only	General Duty Only	General Duty Only
E4*	Moisture Resistant Note: Temps over T3 (200°C) require stand-offs for third party listing. Refer to IECex & ATEX certifs. for standoff dimensions	Generic Agency (s)	NEMA 4 UL / CSAus	NEMA 4 CSA	IP66 CE: Manufacturer's Declaration	IP66 CE: Manufacturer's Declaration
		Ratings	Class I Div. 2, Groups B, C, D Groups E, F: 200°C (T3) Group G 165°C (T3B) Class I Zone 2 AEx nA II T1 to T6	Class I Div. 2, Groups B, C, D Class II Division 2, Groups E, F: 200°C (T3) Group G 165°C (T3B) Class I Zone 2 Ex nA II T1 to T6	II 3 G Ex nA II T1 to T6	Ex nA II T1 to T6
E2	Moisture Resistant/ Explosion Proof Ex d IIB+H2 T1 to T6 Note: Temps over T4 (135°C) require stand-offs for third party listing. Refer to IECex & ATEX certifs. for standoff dimensions	Generic Agency (s)	CSAus	CSA	ATEX	IECex
		Ratings	Class I, Div. 1 Groups B,C & D Class II, Div. 1 Groups E, F & G Class I Zone 1 AEx d IIB + H2 T1 to T6	Class I, Div. 1 Groups B,C & D Class II, Div. 1 Groups E, F & G Class I Zone 1 Ex d IIB + H2 T1 to T6	I 2 G EEx d IIB+H2 T1 to T6	Ex d IIB+H2 T1 to T6
E5 Flange Size 3"-8" 8"-12" 12"-18"	Moisture Resistant/ Explosion Proof Ex d IIB+H2 T1 to T6 540°C, 600°C ATEX IIC Labeling Reference CFP4, CFP8, CFP12 Refer to European Catalog	Generic Agency (s)			ITS ATEX	IECex
		Ratings			II 2 G EEx de IIC T1 to T6, 540°C, 600°C	Ex de IIC T1 to T6 540°C, 600°C

* **WARNING:** Addition of sparking devices such as a Thermostat to an E4 housing will annul hazardous area rating.

Circulation Heaters

Terminal Enclosures

ATEX/IECEX/CSA Zone Classification Selection chart for terminal enclosure standoff dimension based on 30°C rise over 40°C ambient

70°C Cable Supply			Vertical Heater Orientation		Horizontal Heater Orientation	
Temperature Code	Wet Face Temperature: °F	Wet Face Temperature: °C	Minimum Standoff Dimension		Minimum Standoff Dimension	
			Inches	mm	Inches	mm
T6	185	85	3	76	1	25
T5	212	100	3	76	2	50
T4A	248	120	5	127	3	76
T4	275	135	6	152	3	76
T3C	320	160	7.5	191	4	102
T3B	329	165	7.5	191	4	102
T3A	356	180	7.5	191	5	127
T3	392	200	9	229	5	127
T2D	419	215	9	229	5	127
T2C	446	230	9	229	6	152
T2B	500	260	10.5	267	6	152
T2A	536	280	10.5	267	6	152
T2	572	300	10.5	267	7.5	191
T1	842	450	13.5	343	9	229

ATEX/IECEX/CSA Zone Classification Selection chart for terminal enclosure standoff dimension based on 10°C rise over 60°C ambient

70°C Cable Supply			Vertical Heater Orientation		Horizontal Heater Orientation	
Temperature Code	Wet Face Temperature: °F	Wet Face Temperature: °C	Minimum Standoff Dimension		Minimum Standoff Dimension	
			Inches	mm	Inches	mm
T6	185	85	9	229	6	152
T5	212	100	10.5	267	7.5	191
T4A	248	120	12	305	7.5	191
T4	275	135	12	305	7.5	191
T3C	320	160	12	305	7.5	191
T3B	329	165	12	305	9	229
T3A	356	180	13.5	343	9	229
T3	392	200	15	381	9	229
T2D	419	215	15	381	10.5	267
T2C	446	230	15	381	10.5	267
T2B	500	260	16.5	419	10.5	267
T2A	536	280	18	457	10.5	267
T2	572	300	18	457	10.5	267
T1	842	450	24	610	12	305

CSA Class and Division Classification Selection chart for terminal enclosure standoff dimension based on 85°C rise over 40°C ambient

125°C Cable Supply			Vertical Heater Orientation		Horizontal Heater Orientation	
Temperature Code	Wet Face Temperature: °F	Wet Face Temperature: °C	Minimum Standoff Dimension		Minimum Standoff Dimension	
			Inches	mm	Inches	mm
T6	185	85	0	0	0	0
T5	212	100	0	0	0	0
T4A	248	120	0	0	0	0
T4	275	135	0	0	0	0
T3C	320	160	2	50	0	0
T3B	329	165	2	50	0	0
T3A	356	180	4	102	2	50
T3	392	200	4	102	2	50
T2D	419	215	4	102	2	50
T2C	446	230	4	102	2	50
T2B	500	260	6	152	4	102
T2A	536	280	6	152	4	102
T2	572	300	6	152	4	102
T1	842	450	7.5	191	6	152

Circulation Heaters

Mechanical & Electronic Control Options

Ordering Information

To Order — Complete the Model Number using the Matrix provided.

Note – Shaded sections of the model build table are not a finite list. Items such as Number of Elements, Wattage, Voltage, Circuits, and Phase should be adjusted to match design.

Model	Clean Water
GCH	Gas Circulation Heater
NWH	Liquid Circulation Heater
Code	Bundle Connection Style
(Blank)	ANSI Flange
MT	NPT Threaded Screwplug
SRG	Special Galvanized Body w/ 2.5" NPT Plug, Incoloy Element
Code	Element Sheath Material
(Blank)	Copper
O	Carbon Steel
S	304 Stainless Steel
I	Incoloy 800
X	Other Material
Code	Shell Material
(Blank)	Carbon Steel
S	304 Stainless Steel
X	Other Material
Code	Baffled Flow
(Blank)	No Baffles
B	Baffled Flow
Code	Number of Elements
03	Three Heating Elements
06	Six Heating Elements
12	Twelve Heating Elements
18	Eighteen Heating Elements
27	Twenty Seven Heating Elements
36	Thirty Six Heating Elements
45	Forty Five Heating Elements
Code	Wattage
004P5	4.5 kW (use actual kilowatt in three digits)
Code	Terminal Housing Style
E1	General Purpose
E4	Moisture Resistant
E2	Explosion / Moisture Resistant
E5	Explosion / Moisture Resistant - addition of Group IIC w/ Acetylene (IEC only)
Code	Non-Standard Feature
(Blank)	Catalog PCN item
XX	Custom Feature
Code	Voltage
208	208V
240	240V
380	380V
415	415V
480	480V
575	575V
Code	Number of Circuits
1	One
2	Two
3	Three
4	Four
Code	Phase
1P	Single Phase
3P	Three Phase
Code	Kilowatts
4.5	kW

GCH **I** **-03** **-004P5** **-E4** **480V** **1** **-3P** **4.5kW** **Typical Model Number**

Example of Final Model Description: GCHI-03-004P5-E4 480V 1-3P 4.5kW

Note: Shaded sections of the model build table are not a finite list. Items such as Number of Elements, Wattage, Voltage, Circuits and Phase should be adjusted to match design.

Circulation Heaters

Mechanical & Electronic Control Options

- **Wide Range of Mechanical and Electronic Control Options**
- **NEMA 1, 4, 7 and 12 Enclosures**
- **Process Controllers - Integral or Remote with the Sensor in the Heater Thermowell (AR Control) or in the Heater Outlet**
- **High Limit Controllers - Integral or Remote, Sensor in the Heater Thermowell (AR Control) or Welded to Element Sheath**
- **Type J or K Thermocouples (Std.) RTD's and Other Type Thermocouples Available**
- **Mechanical and Electronic Controls can be Combined**
- **Magnetic Contactors or SCR Power Control for Multiple Circuits and High Amperages**

Applications

Mechanical and Electronic Controls & Thermal Sensors can be provided for all circulation heaters for overtemperature protection for the heater and fluid medium and/or for process control.

Control Selection Guidelines

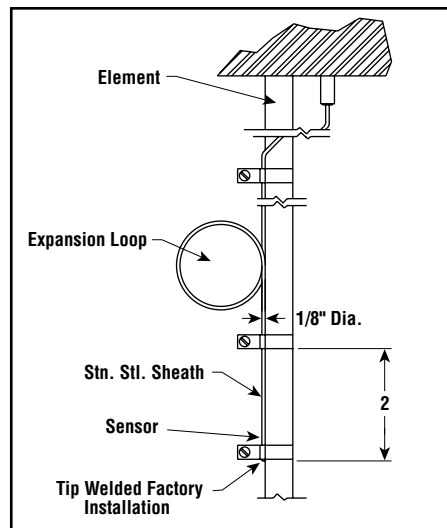
AR Controls — Type AR bulb and capillary controls are standard on many stock heaters with temperature ranges as indicated in the product descriptions. These rugged non-indicating controls are suitable for most applications. Optional temperature ranges are available. Consult the Controls Section for details.

Electronic Controls — Electronic process controls provide greater control accuracy and operating system flexibility than is available with mechanical controls. Consult the Controls Section for details.

Control Panels — Integral or remote mounted control panels with electronic controls and solid state (SCR) or contactor power controllers can be provided using virtually any combination of control devices. Consult the Controls Section for details.

Overtemperature Protection — De-energizing the heating elements when sheath temperatures exceed recommended limits can prevent element damage and extend the life of the heater. A thermal sensor can be attached to the element sheath for overheat protection. Properly connected to a solid state high limit controller, the sensor will turn the heater off in the event of a low-flow or no-flow condition. Type J thermocouples are recommended for liquid and type K for gas applications.

Remote Mounted Electronic Control

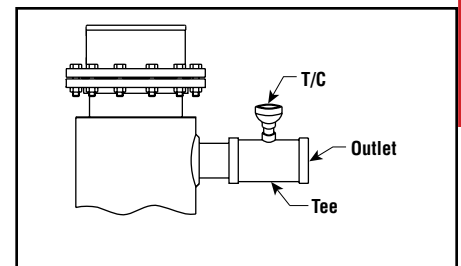


High Limit Controls — Electronic high limit controls can be mounted on the heater chamber with an overheat thermocouple welded to heating element sheath inside the chamber. This arrangement provides protection by shutting down the heater at a predetermined element sheath temperature. Option also available with thermocouple only, welded or clamped to heater element sheath as shown above.

Magnetic Contactors — Heaters utilizing two or more circuits or with amperage draw that exceeds the thermostat rating will require a contactor(s). Contactors are ordered separately and mounted remote from the heater. Consult the Controls Section for details.

Electronic Process Control Thermocouples — Thermal sensors can be mounted in a tee on the heater outlet nozzle. Electronic controller is remote mounted.

Ordering Information — To order circulation heaters with electronic controls, specify



model, volts, kW and provide the following information.

Electronic Control Check List

Overtemperature thermocouple:	Yes / No /
High temperature limit controller:	Yes / No /
Controller Model No.	_____
Mounting:	/ Integral / Remote
Process control thermocouple:	Yes / No /
Type:	_____
Location:	_____
Process controller:	Yes / No /
Controller Model No.	_____
Mounting:	/ Integral / Remote

NWH Series

Clean Water Applications

- Screw Plug or Flanged Heater Design
- 2 - 14" Galvanized Carbon Steel Pipe Body, 150 Lb Construction
- 3 - 500 kW
- 120, 240 and 480V, 1 & 3 Phase
- General Purpose, Moisture Resistant Terminal, Moisture Resistant/Explosion Proof Enclosure
- 0.475" Dia. Copper Sheath Elements (45 - 50 W/in²)
- With & Without Thermostat
- UL, CSA, ATEX and Other Third Party Approval, Listing or Certification Available on Many Models

Applications

Clean Water Heating — Ideal for heating municipal water for industrial washing and rinsing processes.

Other applications include indirect heating of viscous liquids and temperature maintenance of storage tanks.

Features

Terminal Enclosures — Standard stock heater terminal enclosure is General Purpose E1. Explosion Proof/Moisture Resistant E2 or Moisture Resistant E4 enclosures are available as assembly stock.

Elements — Sturdy 0.475" diameter copper sheath elements provide superior strength and rigidity. Chromalox elements utilize high quality resistance wire for coil construction. The coil is surrounded with high purity magnesium oxide which is compacted to a dense solid to ensure high thermal conductivity and dielectric strength.

Flanges — Zinc coated carbon steel flanges are standard on 3" and larger water circulation heaters. Flange dimensions conform to ANSI B16.5 standards. NWHMT heaters utilize a brass screw plug.

Vessels — Chromalox vessels consist of a pipe body, nozzles and end cap. The pipe body and nozzles are galvanized ASTM A53B carbon steel pipe. The end cap or disk is galvanized ASTM A516 Grade 70 carbon steel plate. Mounting lugs are welded to the pipe wall. The vessel is wrapped with thermal insulation and covered with a painted sheet metal jacket.

Wiring — Wiring terminals are spaced to provide proper arcing and creepage clearances per the NEC. Termination insulators provide electrical isolation between the terminals and the grounded metal sheaths to ensure personnel safety and equipment service life. Heavy duty jumper straps and other terminal parts assure tight connections and an extra margin of current carrying capacity.



Controls — Some heaters come equipped with mechanical AR thermostats. These thermostats are suitable for most applications. Explosion-resistant and liquid-tight thermostats are provided on E2 and E4 units, respectively.

WARNING — **Hazard of Fire.** These devices function as temperature controls only. Because they do not fail-safe, an approved temperature and/or pressure safety control must be used for safe operation. Consult Controls section of this catalog.

Control Panels — Integral or remote mounted control panels with electronic controls and solid state (SCR) or contactor power controllers can be provided using virtually any combination of control devices. Consult the Controls Section for details.

NWH Clean Water Applications

- 3 - 14" ANSI Blind Flange Design
- 3 - 14" Galvanized Carbon Steel Pipe Body, 150 Lb Construction
- 6 - 500 kW
- 240 and 480V, 1 & 3 Phase
- General Purpose, Moisture Resistant Terminal, Moisture Resistant/Explosion Proof Enclosure
- 0.475" Dia. Copper Sheath Elements (45 - 50 W/in²)
- With & Without Side Mounted AR Thermostat (60 - 250°F)
- UL, CSA ATEX and Other Third Party Approval, Listing or Certification Available

Features

Terminal Enclosure — E1 General Purpose is standard. E2 Moisture Resistant/Explosion Proof or E4 Moisture Resistant Enclosures available.

Flange — 3 - 14" ANSI B-16.5 Blind Flange with 1/2" thermowell for thermostat bulb and a 1/8" NPT threaded opening for a thermocouple or RTD.

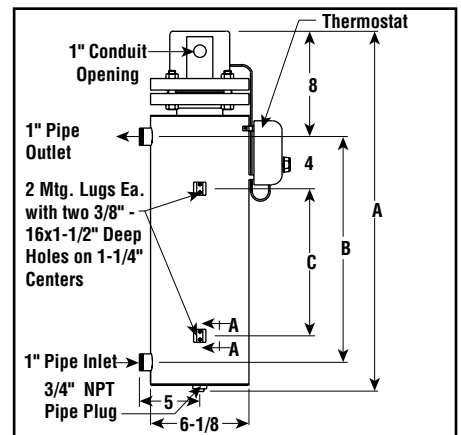
Vessel — Pipe body and nozzles are galvanized ASTM A53B carbon steel pipe. The end disk is galvanized ASTM A516 Grade 70 carbon steel plate. Provided with thermal insulation and painted sheet metal jacket.

Wiring — Convenient field wiring terminals are provided for easy installation.

Controls — Series 3 and 6 stock and assembly stock heaters come equipped with side mounted thermostat. Series 18 and 45 furnished without thermostat.



*Dimensions (Inches)
NWH-3*



Note — Add 2" to A dimension for E2 enclosure.

Applications

Clean Water Heating — Higher kilowatt ratings and larger capacity tanks for industrial and commercial water heating applications.

Specifications and Ordering Information

kW	Volts	Ckt & Phase	Dimensions (In.)			Model	Stock	PCN	Wt. (Lbs.)
			A	B	C				
Series 3 — 3 inch, 150 lb carbon steel vessel — 3 copper elements (45 W/in²) with side mounted thermostat — 1" NPT pipe inlet and outlet									
6	240	1-1	32-15/16	22-1/2	16-1/2	NWH-03-006P-E1	S	100052	70
6	240	1-3	32-15/16	22-1/2	16-1/2	NWH-03-006P-E1	NS	100060	70
6	480	1-1	32-15/16	22-1/2	16-1/2	NWH-03-006P-E1	NS	010065	70
6	480	1-3	32-15/16	22-1/2	16-1/2	NWH-03-006P-E1	S	100087	70
9	240	1-1	32-15/16	22-1/2	16-1/2	NWH-03-009P-E1	NS	100183	70
9	240	1-3	32-15/16	22-1/2	16-1/2	NWH-03-009P-E1	S	100191	70
9	480	1-1	32-15/16	22-1/2	16-1/2	NWH-03-009P-E1	NS	010161	70
9	480	1-3	32-15/16	22-1/2	16-1/2	NWH-03-009P-E1	S	100212	70
12	240	1-1	42-15/16	32-1/2	26-1/2	NWH-03-012P-E1	NS	010217	80
12	240	1-3	42-15/16	32-1/2	26-1/2	NWH-03-012P-E1	S	100319	80
12	480	1-1	42-15/16	32-1/2	26-1/2	NWH-03-012P-E1	NS	010250	80
12	480	1-3	42-15/16	32-1/2	26-1/2	NWH-03-012P-E1	S	100335	80
15	240	1-1	55-7/16	45	39	NWH-03-015P-E1	NS	010313	94
15	240	1-3	55-7/16	45	39	NWH-03-015P-E1	S	100431	94
15	480	1-1	55-7/16	45	39	NWH-03-015P-E1	NS	010364	94
15	480	1-3	55-7/16	45	39	NWH-03-015P-E1	S	100458	94
18	240	1-1	55-7/16	45	39	NWH-03-018P-E1	NS	010410	94
18	240	1-3	55-7/16	45	39	NWH-03-018P-E1	S	100554	94
18	480	1-1	55-7/16	45	39	NWH-03-018P-E1	NS	010460	94
18	480	1-3	55-7/16	45	39	NWH-03-018P-E1	S	100570	94
Series 6 — 5 inch, 150 lb carbon steel vessel — 6 copper elements (45 W/in²) with side mounted thermostat — 2" NPT pipe inlet and outlet									
24	240	2-3	41-3/4	30	11-3/8	NWH-06-024P-E1	NS	100677	140
24	480	1-3	41-3/4	30	11-3/8	NWH-06-024P-E1	S	100693	140
30	240	2-3	48-3/4	37	14-1/8	NWH-06-030P-E1	NS	100790	155
30	480	1-3	48-3/4	37	14-1/8	NWH-06-030P-E1	S	100810	155
40	240	2-3	60-1/4	48-1/2	20-5/8	NWH-06-040P-E1	NS	100917	176
40	480	2-3	60-1/4	48-1/2	20-5/8	NWH-06-040P-E1	NS	010671	176
50	480	2-3	73-5/8	61-7/8	27-5/16	NWH-06-050P-E1	NS	010700	210
60	480	2-3	86-5/8	74-7/8	33-7/8	NWH-06-060P-E1	NS	010735	240
Stock Status: S = stock NS = non-stock To Order—Specify model, volts, phase, kW, PCN and quantity.									

NWH

Clean Water

Applications (cont'd.)

Specifications and Ordering Information

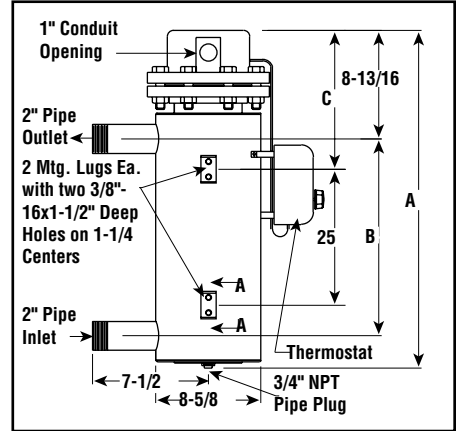
kW	Volts	Ckt & Phase	Dimensions (In.)			Model	Stock	PCN	Wt. (Lbs.)
			A	B	C				
Series 18 — 8 inch, 150 lb carbon steel vessel — 18 copper elements (50 W/In²) — 2-1/2" NPT pipe inlet and outlet									
50	240	3-3	45-1/4	24-11/16	27-3/16	NWH-18-050P-E1	NS	102664	396
50	480	3-3	45-1/4	24-11/16	27-3/16	NWH-18-050P-E1	NS	102672	396
75	240	3-3	53-1/4	32-11/16	29-3/16	NWH-18-075P-E1	NS	102701	414
75	480	3-3	53-1/4	32-11/16	29-3/16	NWH-18-075P-E1	NS	102710	414
100	240	3-3	60-1/4	39-11/16	36-3/16	NWH-18-100P-E1	NS	102744	425
100	480	3-3	60-1/4	39-11/16	36-3/16	NWH-18-100P-E1	NS	102752	425
125	240	3-3	67-7/8	47-5/16	43-13/16	NWH-18-125P-E1	NS	080012	470
125	480	3-3	67-7/8	47-5/16	43-13/16	NWH-18-125P-E1	NS	080020	470
150	240	3-3	77-3/8	56-13/16	53-5/16	NWH-18-150P-E1	NS	080039	535
150	480	3-3	77-3/8	56-13/16	53-5/16	NWH-18-150P-E1	NS	080047	535
175	240	3-3	86-3/8	65-13/16	62-5/16	NWH-18-175P-E1	NS	080055	625
175	480	3-3	86-3/8	65-13/16	62-5/16	NWH-18-175P-E1	NS	080063	625
200	240	3-3	96-3/8	75-13/16	72-5/16	NWH-18-200P-E1	NS	080071	705
200	480	3-3	96-3/8	75-13/16	72-5/16	NWH-18-200P-E1	NS	080080	705
Series 45 — 14 inch, 150 lb carbon steel vessel — 45 copper elements (50 W/In²) — 6" flanged pipe inlet and outlet									
250	480	3-3	68-1/2	49-11/16	59-3/16	NWH-45-250P-E1	NS	086019	830
300	480	3-3	76	57-3/16	66-11/16	NWH-45-300P-E1	NS	086027	960
350	480	3-3	83-1/2	64-11/16	74-3/16	NWH-45-350P-E1	NS	086035	1,090
400	480	3-3	91	72-3/16	81-11/16	NWH-45-400P-E1	NS	086043	1,220
450	480	3-3	98-1/2	79-11/16	89-3/16	NWH-45-450P-E1	NS	086051	1,350
500	480	3-3	106	87-3/16	96-11/16	NWH-45-500P-E1	NS	086060	1,480

Stock Status: S = stock NS = non-stock
To Order—Specify model, volts, phase, kW, PCN and quantity.

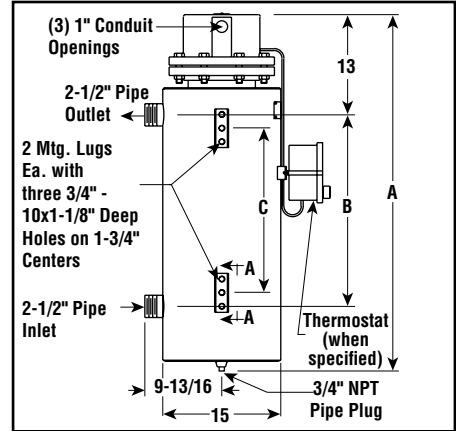
Note — Refer to the Controls section for control panels.

Dimensions (Inches)

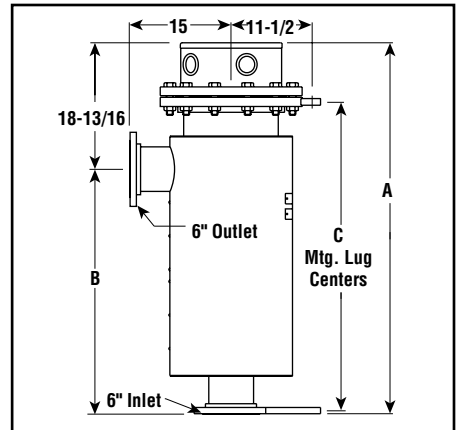
NWH-6



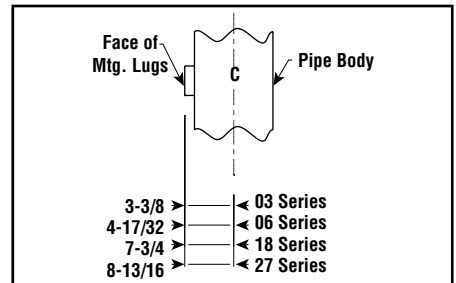
NWH-18



NWH-45



NWH-AA



Ordering Information

To Order — Complete the Model Number using the Matrix provided.

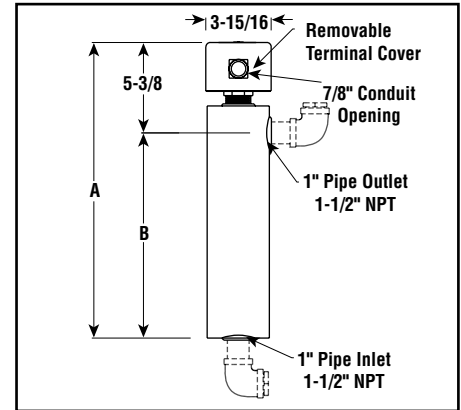
Model	Clean Water
NWH	Water Circulation Heater
Code	Number of Elements
03	Three
06	Six
18	Eighteen
45	Forty Five
Code	kW
024P	24
030P	30
040P	40
050P	50
060P	60
075P	75
100P	100
125P	125
200P	200
250P	250
300P	300
350P	350
400P	400
450P	450
500P	500
Code	Terminal Enclosure
E1	General Purpose
E2	Moisture Resistant/Explosion Resistant
E4	Moisture Resistant
NWH	06 024P E1
Typical Model Number	

NWHJR Booster Heater-Water Applications

- Heavy Wall Galvanized Steel
- 1.5 - 3 kW
- 120 and 240V, Single Phase
- 0.315" Dia. Copper Sheath Elements (80 W/In²)
- General Purpose or Moisture Resistant Terminal Enclosure
- Integral Thermostat (60 - 180°F)



Dimensions (Inches)



Features

Terminal Enclosure — E1 General Purpose is standard. E4 Moisture Resistant available.

Elements — Seamless 0.315" diameter copper sheath heating element brazed to a 1" brass screw plug.

Vessel — Standard with galvanized steel.

Thermostat — Integral thermostat with 60 to 180°F temperature range located inside the terminal enclosure.

Mounting — Easy to install; minimal size and weight, no supporting brackets are required.

Third Party — UL Listed - CSA Certification available (except NWHJRG-01-003P-E1 120V).

Applications

Type NWHJR (Junior) can be used to supply hot water or boost water temperature anywhere in a water distribution system.

Specifications and Ordering Information

kW	Volts	Ckt & Phase	DIM (In.)		Model	Stock	PCN	Wt. (Lbs.)
			A	B				
150 lb carbon steel pipe body — 1 copper element (80 W/In²)								
1.5	120	1-1	18	12-3/8	NWHJRG-01-01P5-E1	S	197720	14
1.5	240	1-1	18	12-3/8	NWHJRG-01-01P5-E1	S	197739	14
2	120	1-1	18	12-3/8	NWHJRG-01-002P-E1	S	197747	14
2	240	1-1	18	12-3/8	NWHJRG-01-002P-E1	S	197755	14
2.5	120	1-1	22	16-3/8	NWHJRG-01-02P5-E1	S	197763	16
2.5	240	1-1	22	16-3/8	NWHJRG-01-02P5-E1	S	197771	16
3	120	1-1	22	16-3/8	NWHJRG-01-003P-E1	S	106825	16
3	240	1-1	22	16-3/8	NWHJRG-01-003P-E1	S	197780	16

Stock Status: S = stock NS = non-stock
To Order—Specify model, volts, phase, kW, PCN and quantity.

"Under the U.S. Federal Safe Drinking Water Act, it is unlawful to install or use this product in any service that comes into contact with water for human consumption (including drinking, food or beverage preparation, hand washing, or teeth brushing). This product is intended exclusively for use in non-potable service."

Ordering Information

To Order — Complete the Model Number using the Matrix provided.

Model	Water Booster Heater			
NWHJRG	Water Circulation Heater Galvanized Tank			
	Code	Number of Elements		
01	One			
	Code	kW		
	01P5	1.5	02P5	2.5
	002P	2	003P	3
003P	Code	Terminal Enclosure		
	E1	General Purpose		
	E4	Moisture Resistant		
NWHJRG	01	003P	E1	Typical Model Number

NWHSRG

The Chromalox® **versaTHERM™** Heater Clean Water and Oil Applications

- Field Adjustable kW and Voltage Ratings
- Multiple Inlet Connections
- 0.5 - 40 kW Water
0.5 - 10 kW Oil
- 120, 208, 240 and 480V, 1 Phase
208, 240 and 480V, 3 Phase
- INCOLOY® Sheath Elements
(2 - 80 W/In² Water)
(2 - 23 W/In² Oil)
- Carbon Steel or Galvanized Pipe Body
- General Purpose Terminal Enclosure
- Integral Thermocouple

Applications

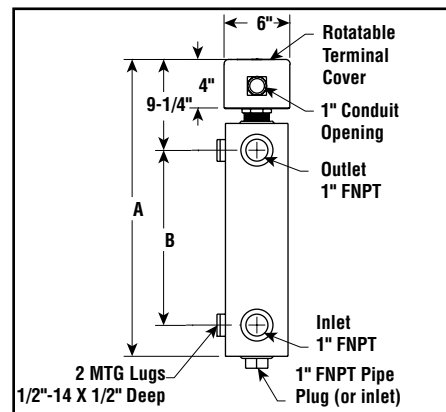
Chromalox versaTHERM circulation heaters can boost water or oil temperature anywhere in a distribution system or application.

The unique versatility of this design allows field adjustment of the rating by simple connections to the six elements of the heater. This simplifies selection and spare parts since each heater may be used in several different heating applications.

See the application matrix for the many kW values available with different wiring styles and voltages.



Dimensions (Inches)



Features

Field Adjustable Ratings — Each standard heater may be wired to different voltages and kW. See chart on following page for application matrix.

Inlet Connections — Standard side inlet can be changed to end connection for ease of piping.

Terminal Enclosures — E1 General Purpose is standard. Housing can be rotated 360° to match conduit connections.

Elements — INCOLOY® sheath heating element welded to a 2.5" steel screw plug.

Vessel — Galvanized steel body available for water and oil applications.

Mounting — Easy to install; compact size.

Standard Integral Thermocouple — J type thermocouple in a thermowell; can be used for process or overtemperature control on the process fluid. See 4468 series control panel for stock power and temperature control components for complete heating solution.

Specifications and Ordering Information Table

Max. kW	Max. Volts	DIM (In.)		Model	Stock	PCN	Wt. (Lbs.)
		A	B				
Galvanized Pipe Body / Water • 5 to 40 kW							
See Application Matrix for Rating	29-5/8	19		NWHSRG-06-018P-E1	NS	100010	45
	29-5/8	19		NWHSRG-06-018P-E1	NS	100028	45
	41-5/8	30-3/4		NWHSRG-06-020P-E1	NS	100036	65
	29-5/8	19		NWHSRG-06-024P-E1	NS	100044	45
	29-5/8	19		NWHSRG-06-024P-E1	NS	100079	45
	41-5/8	30-3/4		NWHSRG-06-040P-E1	NS	100095	65
Stock Status: S = stock NS = non-stock To Order —Specify model, volts, phase, kW, PCN and quantity.							



Same-day shipping on stock item orders received before 4 pm CST.
3-day shipping on assembly-stock items.

NWHSRG

Clean Water and Oil Applications (cont'd.)

Selection Steps

Note that the same part can be field adjusted for another rating or reapplied for a different application.

1. Select which type of heater you need: oil, or water.
2. Using the application matrix for the oil or water heater find the row in the matrix that has kW capacity you need. Select next larger unit if between ratings. For ratings over 40 kW on water and 10 kW on oil use multiple units piped in series or parallel.
3. Select the column that matches the voltage rating that you require.
4. Find the intersection of the column and row selected. This is the PCN for your voltage and wattage requirement. Verify voltage for single or three phase. Shaded areas are 3 phase only.
5. Go to the specifications and ordering table on the prior page. Locate PCN number identified in step 4. Note model number and description from this table. Dimensions will be shown.
6. Place order for item identified in step 5. When unit is received, instructions will show you how to wire the kW and voltage configuration that you desire. Only show description from ordering table when ordering.

Example:

Light Oil heating application,
2.75 kW 240V 3 phase capacity.

1. Select oil application matrix.
2. Locate 2.75 kW on chart. Use 3 kW as next higher rating. Confirm that 20 w/sq. in. is suitable for light oil.
3. Find column with 240Volt 3 phase power.
4. Intersection of row and column is PCN 100079. Confirm 3 phase and single phase available. Note there is spare capacity for back up or for future increase in requirements.
5. Locate PCN 100079 in specifications and ordering table as a NWHSRG-06-024P-E1 unit. When received this will have instructions on wiring for 3 kW 240 V 3 phase application with labels for this rating.
6. Order NWHSRG-06-024P-E1 PCN 100079 unit.

Contact Sales Office with any questions when ordering

Application Matrix - Oil

kW	W/In ²	PCN			
		120 Volts 1ph	208 Volts 1 or 3 ph	240 Volts 1 or 3 ph	480 Volts 1 or 3 ph
0.50	2			100079	
0.75	5	100079*	100079*		
1.50	5	100079	100079	100079	100028
2.25	15		100079*	100028*	
2.50	6	100095	100095	100095	
3.00	20	100044*	100044*	100079*	
4.50	15	100010	100079	100028	100028
5.00	11	100036	100036	100036	
6.00	20	100044	100044	100079	100079
10.00	21			100095	100095

Note — Shaded items are 3 ph only * items have 100% spare capacity

Application Matrix - Water

kW	W/In ²	PCN			
		120 Volts 1ph	208 Volts 1 or 3 ph	240 Volts 1 or 3 ph	480 Volts 1 or 3 ph
0.50	2			100079	
0.75	5	100079*	100079*		
1.50	5	100079	100079	100079	100028
2.25	15		100079*	100028*	
2.50	6	100095	100095	100095	
3.00	20	100044*	100044*	100079*	
4.50	15	100010	100079	100028	100028
5.00	11	100036	100036	100036	
6.00	20	100044	100044	100079	100079
9.00	59			100010*	100028*
10.00	21			100095	100095
12.00	78			100044*	100079*
18.00	59			100010	100028
20.00	80			100036	100095*
24.00	78			100044	100079
40.00	80				100095

Note — Shaded items are 3 ph only * items have 100% spare capacity

Ordering Information

To Order — Complete the Model Number using the Matrix provided.

Model	Water Booster Heater	
NWHSRG	Circulation Heater	
	Galvanized Tank - Water	
	Code	Number of Elements
	06	Six
	Code	Max. kW
	04P5	4.5
	005P	5.0
	006P	6.0
	010P	10.0
	Code	Terminal Enclosure
	E1	General Purpose
NWHSRG-06 - 005P - E1 Typical Model Number		

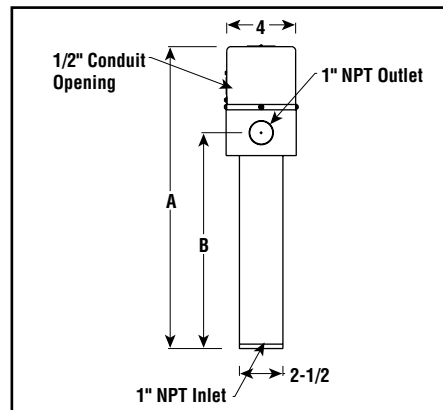
CVCHS

Booster Heater-Corrosion Solution Applications

- Non-metallic (CPVC) Pipe Body
- 1.5 - 3 kW
- 120 and 240V, Single Phase
- General Purpose Terminal Enclosure
- INCOLOY® Sheath Elements (75 W/In²)
- Integral Thermostat (60 - 190°F)
- Integral Automatic Cutout (Set at 195°F)



Dimensions (Inches)



Applications

Used to heat clean and corrosive solutions. Ideal for side-arm heating, in-line circulation and engine pre-heaters.

Unit is designed for a maximum operating pressure of 100 psi at 200°F

Features

Terminal Enclosure — E1 General Purpose is standard.

Elements — INCOLOY® sheath elements rated 75 W/In².

Flange — Stainless steel flange for corrosion resistance.

Vessel — CPVC pipe body material is resistant to many corrosive solutions and is ideal for water applications. Pipe body material provides good thermal insulation, reducing heat loss.

Thermostat — Integral thermostat with 60 to 200°F temperature range, located inside the terminal enclosure.

High Limit Control — Integral automatic cutout (overtemperature control) protects against fluid or element overheating (set to open at 195°F).

Vibration Resistant — Vibration resistant construction to withstand vibrations typically experienced on many types of operating equipment (i.e., engines).

Easy to Install — Minimal size and light weight, no supporting brackets are required.

Specifications and Ordering Information

kW	Volts	Ckt & Phase	DIM (In.)		Model	Stock	PCN	Wt. (Lbs.)
			A	B				
150 lb CPVC plastic pipe body — 1 INCOLOY® element (75 W/In²)								
1.5	120	1-1	17-5/16	12-3/8	CVCHS-01-01P5-E1	S	025021	3
1.5	240	1-1	17-5/16	12-3/8	CVCHS-01-01P5-E1	S	025030	3
2	120	1-1	17-5/16	12-3/8	CVCHS-01-002P-E1	S	025048	3
2	240	1-1	17-5/16	12-3/8	CVCHS-01-002P-E1	S	025056	3
2.5	120	1-1	21-5/16	16-3/8	CVCHS-01-02P5-E1	S	025064	4
2.5	240	1-1	21-5/16	16-3/8	CVCHS-01-02P5-E1	S	025072	4
3	120	1-1	21-5/16	16-3/8	CVCHS-01-003P-E1	S	025080	4
3	240	1-1	21-5/16	16-3/8	CVCHS-01-003P-E1	S	025099	4

Stock Status: S = stock NS = non-stock
To Order—Specify model, volts, phase, kW, PCN and quantity.

Ordering Information

To Order — Complete the Model Number using the Matrix provided.

Model	Corrosive Solution Booster Heater			
CVCHS	Corrosive Water Solution Circulation Heater			
Code	Number of Elements			
01	One			
Code	kW			
01P5	1.5	02P5	2.5	
002P	2	003P	3	
Code	Terminal Enclosure			
E1	General Purpose			
CVCHS	01	01P5	E1	Typical Model Number

NWHO Series

Light, Medium & Heavy Weight Oil Applications

- Flange Heater Design
- 2 - 14" Carbon Steel Pipe Body, 150 Lb Construction
- 1 - 200 kW
- 120, 240 and 480V, 1 & 3 Phase
- General Purpose, Moisture Resistant Terminal, Moisture Resistant/Explosion Proof Enclosure
- 0.475" Dia. Steel Sheath Elements (12 - 23 W/in²)
- With & Without Thermostat
- UL, CSA, ATEX and Other Third Party Approval, Listing or Certification Available on Many Models

Applications

Light and Medium Weight Oil (20 - 23 W/in²) Ideal for temperature maintenance and for improving flow characteristics of oils. They are also used to heat Heat Transfer Oils under proper conditions.

Heavy or Fuel Oil (5 - 15 W/in²) — Heating heavy oils reduces the viscosity, thereby improving flow and process efficiency. Preheating fuel oils provides better atomization at the burners and allows the use of lower grade fuel oils.

Features

Terminal Enclosures — Standard stock heater terminal enclosures are E1 General Purpose. Moisture Resistant/Explosion Proof E2 and Moisture Resistant E4 Enclosures are available as assembly stock.

Elements — Sturdy 0.475" diameter steel sheath elements provide superior strength and rigidity. Chromalox elements utilize high quality resistance wire for coil construction. The coil is surrounded with high purity magnesium oxide which is compacted to a dense solid to ensure high thermal conductivity and dielectric strength.

Flanges — Carbon Steel Flanges are standard on 3" and larger light and heavy weight oil circulation heaters. Flange dimensions conform to ANSI B16.5 standards.

Vessels — Chromalox vessels consist of a pipe body, nozzles and end cap. The pipe body and nozzles are ASTM A53B carbon steel pipe. The end cap or disk is ASTM A516 Grade 70 carbon steel plate. Mounting lugs are welded to the pipe wall. The vessel is wrapped with thermal insulation and covered with a painted sheet metal jacket.

Baffle Assemblies — Internal baffle assemblies are provided for Chromalox circulation heaters for use in heating highly viscous or heavy fuel oils. Baffles reduce the internal cross sectional area thereby increasing the velocity of the fluid in contact with the heating element sheaths. Increasing the velocity of the fluid reduces the tendency of heavy oils to overheat and break down or carbonize.



Wiring — Wiring terminals are spaced to provide proper arcing and creepage clearances. Termination insulators provide electrical isolation between the terminals and the grounded metal sheath to enhance personnel safety and equipment service life. Heavy duty jumper straps and other terminal parts assure tight connections and an extra margin of current carrying capacity.

Controls — All stock and assembly stock heaters come equipped with mechanical AR thermostats. These thermostats are suitable for most applications. Explosion-resistant and liquid-tight thermostats are provided on E2 and E4 units, respectively.

WARNING — Hazard of Fire. These devices function as temperature controls only. Because they do not fail-safe, an approved temperature and/or pressure safety control must be used for safe operation. Consult Controls section of this catalog.

Control Panels — Integral or remote mounted control panels with electronic controls and solid state (SCR) or contactor power controllers can be provided using virtually any combination of control devices. Consult the Controls section for details.

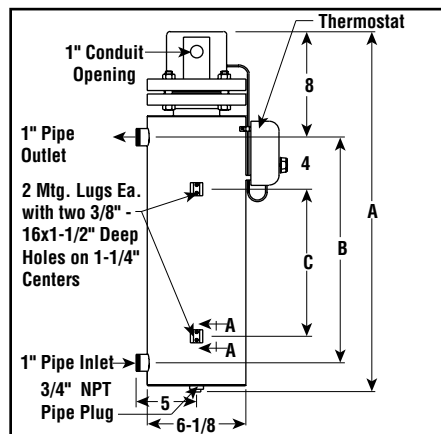
NWHO & NWHOB

Light & Medium Weight Oil Applications

- 3 - 10" ANSI Blind Flange Design
- 3 - 10" Carbon Steel Pipe Body, 150 Lb Construction
- 3 - 120kW
- 240 and 480V, 1 & 3 Phase
- General Purpose, Moisture Resistant Terminal, Moisture Resistant/Explosion Proof Enclosure
- 0.475" Dia. Steel Sheath Elements (20 - 23 W/in²)
- With & Without Side Mounted AR Thermostat (200 - 550°F)
- UL, CSA, ATEX and Other Third Party Approval, Listing or Certification Available



Dimensions (Inches) NWHO-03



Note — Add 2" to A dimension for E2 enclosure.

Applications

Light and Medium Weight Oil — Temperature maintenance and heating of heat transfer oils. Improve flow ability of medium weight oils.

Features

Terminal Enclosure — E1 General Purpose is standard. E2 Moisture Resistant/Explosion Proof or E4 Moisture Resistant Enclosures available.

Elements — 0.475" diameter steel sheath elements.

Flange — 3 - 10" ANSI B-16.5 Blind flange with 1/2" thermowell for thermostat bulb and a 1/8" NPT threaded opening for a thermocouple or RTD.

Vessel — Pipe body and nozzles are ASTM A53B carbon steel pipe. The end disk is ASTM A516 Grade 70 carbon steel plate. Provided with thermal insulation and painted sheet metal jacket.

Wiring — Convenient field wiring terminals are provided for easy installation.

Controls — Series 3 and 6 stock and assembly stock heaters come equipped with side mounted thermostat. Series 18 and 27 are furnished without thermostat.

WARNING — Hazard of Fire. These devices function as temperature controls only. Because they do not fail-safe, an approved temperature and/or pressure safety control must be used for safe operation. Consult Controls section of this catalog.

Specifications and Ordering Information

kW	Volts	Ckt & Phase	Dimensions (In.)			Model	Stock	PCN	Wt. (Lbs.)
			A	B	C				
Series 3 — 3 inch, 150 lb carbon steel vessel — 3 steel elements (23 W/in²) with side mounted thermostat — 1" NPT pipe inlet and outlet									
3	240	1-1	32-15/16	22-1/2	16-1/2	NWHO-03-003P-E1	NS	011615	70
3	240	1-3	32-15/16	22-1/2	16-1/2	NWHO-03-003P-E1	NS	011640	70
3	480	1-1	32-15/16	22-1/2	16-1/2	NWHO-03-003P-E1	NS	011674	70
3	480	1-3	32-15/16	22-1/2	16-1/2	NWHO-03-003P-E1	NS	011703	70
4.5	240	1-1	32-15/16	22-1/2	16-1/2	NWHO-03-04P5-E1	NS	011738	70
4.5	240	1-3	32-15/16	22-1/2	16-1/2	NWHO-03-04P5-E1	NS	011151	70
4.5	480	1-1	32-15/16	22-1/2	16-1/2	NWHO-03-04P5-E1	NS	011789	70
4.5	480	1-3	32-15/16	22-1/2	16-1/2	NWHO-03-04P5-E1	S	101178	70
6	240	1-1	42-15/16	32-1/2	26-1/2	NWHO-03-006P-E1	NS	011834	80
6	240	1-3	42-15/16	32-1/2	26-1/2	NWHO-03-006P-E1	S	101274	80
6	480	1-1	42-15/16	32-1/2	26-1/2	NWHO-03-006P-E1	NS	011885	80
6	480	1-3	42-15/16	32-1/2	26-1/2	NWHO-03-006P-E1	S	101290	80
7.5	480	1-1	55-7/16	45	39	NWHO-03-07P5-E1	NS	011930	94
7.5	480	1-3	55-7/16	45	39	NWHO-03-07P5-E1	NS	011965	94
9	240	1-1	55-7/16	45	39	NWHO-03-009P-E1	NS	011990	94
9	240	1-3	55-7/16	45	39	NWHO-03-009P-E1	S	101514	94
9	480	1-1	55-7/16	45	39	NWHO-03-009P-E1	NS	011279	94
9	480	1-3	55-7/16	45	39	NWHO-03-009P-E1	S	101530	94

Stock Status: S = stock NS = non-stock
To Order—Specify model, volts, phase, kW, PCN and quantity.

NWHO & NWHOB

Light & Medium

Weight Oil Applications *(cont'd.)*

Specifications and Ordering Information

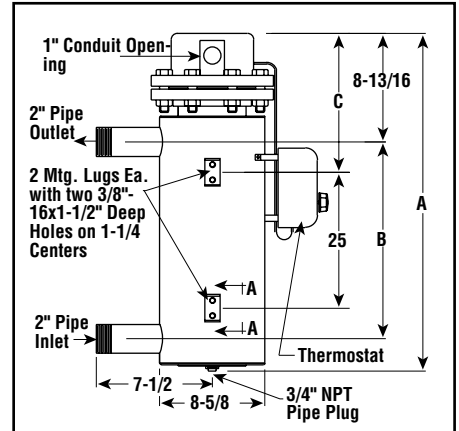
kW	Volts	Ckt & Phase	Dimensions (In.)			Model	Stock	PCN	Wt. (Lbs.)
			A	B	C				
Series 06 — 5 inch, 150 lb carbon steel vessel — 6 steel elements (23 W/in²) with side mounted thermostat — 2" NPT pipe inlet and outlet									
12	240	1-3	41-3/4	30	11-3/8	NWHO-06-012P-E1	NS	101637	140
12	480	1-3	41-3/4	30	11-3/8	NWHO-06-012P-E1	NS	011560	140
15	240	1-3	48-3/4	37	14-1/8	NWHO-06-015P-E1	S	101750	155
15	480	1-3	48-3/4	37	14-1/8	NWHO-06-015P-E1	S	101776	155
20	240	2-3	60-1/4	48-1/2	20-5/8	NWHO-06-020P-E1	S	101872	176
20	480	1-3	60-1/4	48-1/2	20-5/8	NWHO-06-020P-E1	S	101899	176
25	240	2-3	73-5/8	61-7/8	27-5/16	NWHO-06-025P-E1	NS	011316	212
25	480	1-3	73-5/8	61-7/8	27-5/16	NWHO-06-025P-E1	NS	011367	212
30	240	2-3	86-5/8	74-7/8	33-7/8	NWHO-06-030P-E1	NS	011324	240
30	480	1-3	86-5/8	74-7/8	33-7/8	NWHO-06-030P-E1	S	107537	240
Series 18 — 8 inch, 150 lb carbon steel vessel — 18 steel elements (20 W/in²) — 2-1/2" NPT - pipe inlet and outlet									
30	240	3-3	53-1/4	32-11/16	29-3/16	NWHO-18-030P-E1	NS	080194	360
30	480	3-3	53-1/4	32-11/16	29-3/16	NWHO-18-030P-E1	NS	080207	360
40	240	3-3	60-1/4	39-11/16	36-3/16	NWHO-18-040P-E1	NS	080231	436
40	480	3-3	60-1/4	39-11/16	36-3/16	NWHO-18-040P-E1	NS	084005	436
50	240	3-3	67-7/8	47-5/16	43-13/16	NWHO-18-050P-E1	NS	080274	500
50	480	3-3	67-7/8	47-5/16	43-13/16	NWHO-18-050P-E1	NS	080282	500
60	240	3-3	77-3/8	56-13/16	53-5/16	NWHO-18-060P-E1	NS	080311	600
60	480	3-3	77-3/8	56-13/16	53-5/16	NWHO-18-060P-E1	NS	080320	600
70	240	3-3	86-3/8	65-13/16	62-5/16	NWHO-18-070P-E1	NS	080354	660
70	480	3-3	86-3/8	65-13/16	62-5/16	NWHO-18-070P-E1	NS	080362	660
80	240	3-3	96-3/8	75-13/16	72-5/16	NWHO-18-080P-E1	NS	080397	750
80	480	3-3	96-3/8	75-13/16	72-5/16	NWHO-18-080P-E1	NS	080400	750
Series 27 — 10 inch, 150 lb carbon steel vessel — 27 steel elements (20 W/in²) — 3" NPT pipe inlet and outlet									
80	240	3-3	77-9/16	52	48-1/2	NWHO-27-080P-E1	NS	095871	720
80	480	3-3	77-9/16	52	48-1/2	NWHO-27-080P-E1	NS	095898	720
90	240	3-3	81-9/16	56	52-1/2	NWHO-27-090P-E1	NS	095919	735
90	480	3-3	81-9/16	56	52-1/2	NWHO-27-090P-E1	NS	095935	735
100	480	3-3	87-9/16	62	58-1/2	NWHO-27-100P-E1	NS	095951	750
120	480	3-3	97-9/16	72	68-1/2	NWHO-27-120P-E1	NS	095994	765

Stock Status: S = stock NS = non-stock
To Order—Specify model, volts, phase, kW, PCN and quantity.

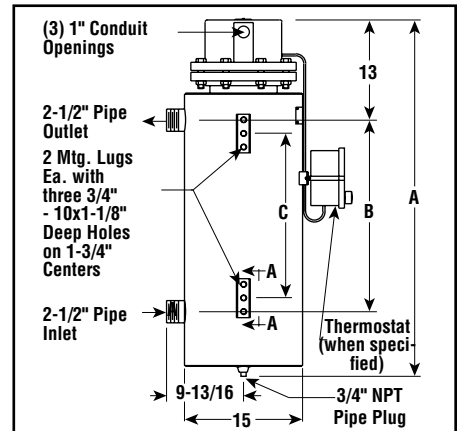
Note — Refer to the Controls section for control panels.

Dimensions (Inches)

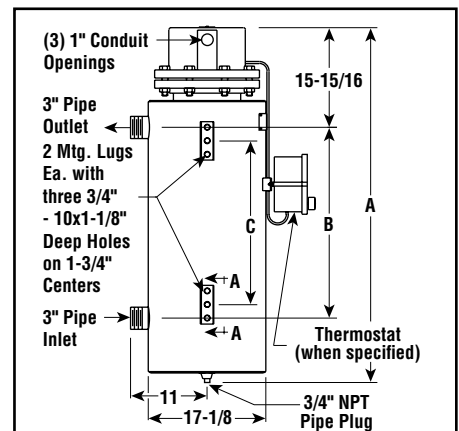
NWHO-06



NWHO-18



NWHO-27



NWHO & NWHOB

Light & Medium Weight
Oil Applications (*cont'd.*)

Specifications and Ordering Information

kW	Volts	Ckt & Phase	Dimensions (In.)			Model	Stock	PCN	Wt. (Lbs.)
			A	B	C				
Series 18 - 8 inch, 150 lb carbon steel vessel — 18 baffled steel elements (20 W/In²) — 2-1/2" NPT pipe inlet and outlet									
30	240	3-3	53-1/4	32-11/16	29-3/16	NWHOB-18-030P-E1	NS	080215	366
30	480	3-3	53-1/4	32-11/16	29-3/16	NWHOB-18-030P-E1	NS	080223	368
40	240	3-3	60-1/4	39-11/16	36-3/16	NWHOB-18-040P-E1	NS	080256	442
40	480	3-3	60-1/4	39-11/16	36-3/16	NWHOB-18-040P-E1	NS	080266	442
50	240	3-3	67-7/8	47-5/16	43-13/16	NWHOB-18-050P-E1	NS	080290	506
50	480	3-3	67-7/8	47-5/16	43-13/16	NWHOB-18-050P-E1	NS	080303	506
60	240	3-3	77-3/8	56-13/16	53-5/16	NWHOB-18-060P-E1	NS	080338	606
60	480	3-3	77-3/8	56-13/16	53-5/16	NWHOB-18-060P-E1	NS	080346	606
70	240	3-3	86-3/8	65-13/16	62-5/16	NWHOB-18-070P-E1	NS	080370	666
70	480	3-3	86-3/8	65-13/16	62-5/16	NWHOB-18-070P-E1	NS	080389	666
80	240	3-3	96-3/8	75-13/16	72-5/16	NWHOB-18-080P-E1	NS	080418	756
80	480	3-3	96-3/8	75-13/16	72-5/16	NWHOB-18-080P-E1	NS	080426	756
Series 27 - 10 inch, 150 lb carbon steel vessel — 27 baffled steel elements (20 W/In²) — 3" NPT pipe inlet and outlet									
80	240	3-3	77-9/16	52	48-1/2	NWHOB-27-080P-E1	NS	095880	726
80	480	3-3	77-9/16	52	48-1/2	NWHOB-27-080P-E1	NS	095900	726
90	240	3-3	81-9/16	56	52-1/2	NWHOB-27-090P-E1	NS	095927	741
90	480	3-3	81-9/16	56	52-1/2	NWHOB-27-090P-E1	NS	095943	741
100	480	3-3	87-9/16	62	58-1/2	NWHOB-27-100P-E1	NS	095960	756
120	480	3-3	97-9/16	72	68-1/2	NWHOB-27-120P-E1	NS	096006	771

Stock Status: S = stock NS = non-stock
To Order—Specify model, volts, phase, kW, PCN and quantity.
Note — Refer to the Controls section for control panels.

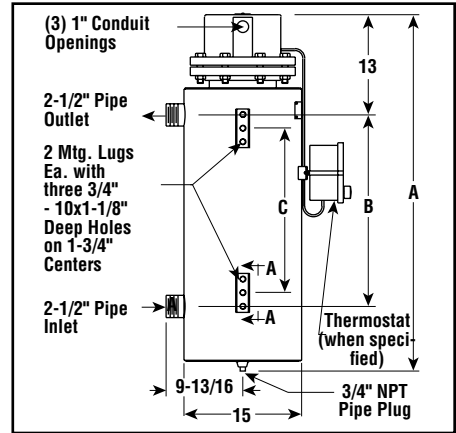
Ordering Information

To Order — Complete the Model Number using the Matrix provided.

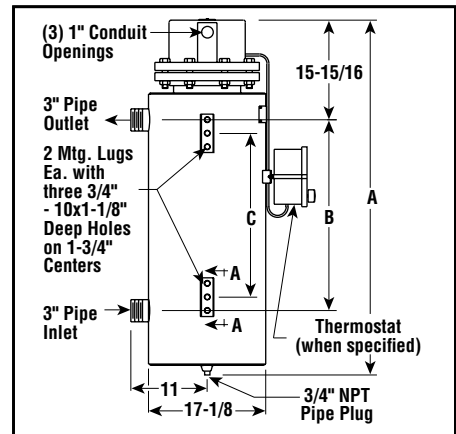
Model	Light and Medium Weight Oil		
NWHO B	Oil Circulation Heater		
	Internal Baffles		
	Code	Number of Elements	
	03	Three	
	06	Six	
	18	Eighteen	
	27	Twenty Seven	
	Code	kW	
	003P	3	015P 15
	04P5	4.5	020P 20
	006P	6	025P 25
	07P5	7.5	030P 30
	009P	9	040P 40
	012P	12	050P 50
			060P 60
			070P 70
			080P 80
			090P 90
			100P 100
			120P 120
	Code	Terminal Enclosure	
	E1	General Purpose	
	E2	Moisture Resistant/Explosion Resistant	
	E4	Moisture Resistant	
NWHOB	18	030P	E1
Typical Model Number			

Dimensions (Inches)

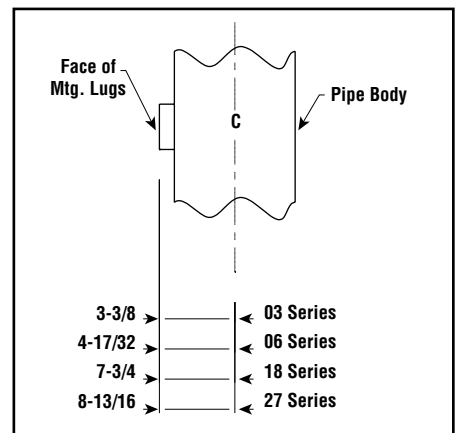
NWHOB-18



NWHOB-27



NWHOB-AA



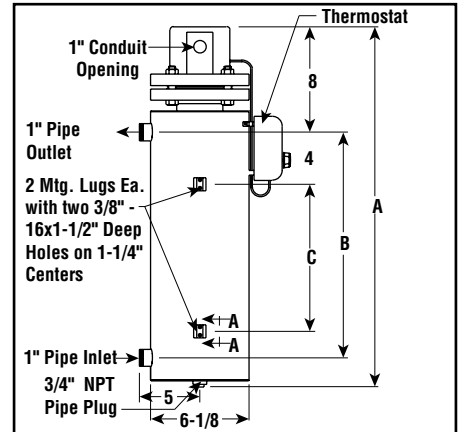
NWHOR & NWHORB

Medium, Heavy & Fuel Oil Applications

- 3 - 14" ANSI Blind Flange Design
- 3 - 14" Carbon Steel Pipe Body, 150 Lb Construction
- 3 - 120kW
- 240 and 480V, 1 & 3 Phase
- General Purpose, Moisture Resistant Terminal, Moisture Resistant/Explosion Proof Enclosure
- 0.475" Dia. Steel Sheath Low Watt Density Elements (12 - 15 W/in²)
- With & Without Side Mounted AR Thermostat (60 - 250°F)
- UL, CSA, ATEX and Other Third Party Approval, Listing or Certification Available



Dimensions (Inches) NWHOR-03



Note — Add 2" to A dimension for E2 enclosure.

Applications

Medium and Heavy Weight Oil — Low watt density reduces the risk of damaging highly viscous fluids. Improve flow ability of fuel oils.

Features

Terminal Enclosure — E1 General Purpose is standard. E2 Moisture Resistant/Explosion Proof or E4 Moisture Resistant Enclosures available.

Elements — 0.475" diameter steel sheath elements.

Flange — 3 - 14" ANSI B-16.5 Blind flange with 1/2" thermowell for thermostat bulb and a 1/8" NPT threaded opening for a thermocouple or RTD.

Vessel — Pipe body and nozzles are ASTM A53B carbon steel pipe. The end disk is ASTM A516 Grade 70 carbon steel plate. Provided with thermal insulation and painted sheet metal jacket.

Wiring — Convenient field wiring terminals are provided for easy installation.

Controls — Series 03 and 06 stock and assembly stock heaters come equipped with side mounted thermostat. Series 18, 27 and 45 are furnished without thermostat.

WARNING — **Hazard of Fire.** These devices function as temperature controls only. Because they do not fail-safe, an approved temperature and/or pressure safety control must be used for safe operation. Consult Controls section of this catalog.

Specifications and Ordering Information

kW	Volts	Ckt & Phase	Dimensions (In.)			Model	Stock	PCN	Wt. (Lbs.)
			A	B	C				
Series 03 — 3 inch 150 lb carbon steel vessel — 3 steel elements (15 W/in²) with side mounted thermostat — 1" NPT pipe inlet and outlet									
3	240	1-1	32-15/16	22-1/2	16-1/2	NWHOR-03-003P-E1	NS	010760	70
3	240	1-3	32-15/16	22-1/2	16-1/2	NWHOR-03-003P-E1	NS	101995	70
3	480	1-1	32-15/16	22-1/2	16-1/2	NWHOR-03-003P-E1	NS	010815	70
3	480	1-3	32-15/16	22-1/2	16-1/2	NWHOR-03-003P-E1	NS	010840	70
4	240	1-1	42-15/16	32-1/2	26-1/2	NWHOR-03-004P-E1	NS	010874	80
4	240	1-3	42-15/16	32-1/2	26-1/2	NWHOR-03-004P-E1	NS	010903	80
4	480	1-1	42-15/16	32-1/2	26-1/2	NWHOR-03-004P-E1	NS	010938	80
4	480	1-3	42-15/16	32-1/2	26-1/2	NWHOR-03-004P-E1	NS	010962	80
6	240	1-1	55-7/16	45	39	NWHOR-03-006P-E1	NS	010997	94
6	240	1-3	55-7/16	45	39	NWHOR-03-006P-E1	NS	102234	94
6	480	1-1	55-7/16	45	39	NWHOR-03-006P-E1	NS	011041	94
6	480	1-3	55-7/16	45	39	NWHOR-03-006P-E1	S	102250	94

Stock Status: S = stock NS = non-stock
To Order—Specify model, volts, phase, kW, PCN and quantity.

NWHOR & NWHORB

Medium, Heavy &
Fuel Oil Applications *(cont'd.)*

Specifications and Ordering Information

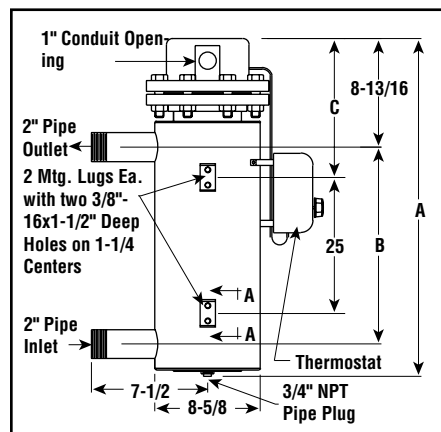
kW	Volts	Ckt & Phase	Dimensions (In.)			Model	Stock	PCN	Wt. (Lbs.)
			A	B	C				
Series 06 — 5 inch, 150 lb carbon steel vessel — 6 steel elements (15 W/in²) with side mounted thermostat — 2" NPT pipe inlet and outlet									
8	240	1-3	41-3/4	30	11-3/8	NWHOR-06-008P-E1	NS	102357	140
8	480	1-3	41-3/4	30	11-3/8	NWHOR-06-008P-E1	NS	011172	140
10	240	1-3	48-3/4	37	14-1/8	NWHOR-06-010P-E1	NS	011236	155
10	480	1-3	48-3/4	37	14-1/8	NWHOR-06-010P-E1	NS	102496	155
12	240	1-3	60-1/4	48-1/2	20-5/8	NWHOR-06-012P-E1	NS	014200	176
12	480	1-3	60-1/4	48-1/2	20-5/8	NWHOR-06-012P-E1	NS	011498	176
15	240	1-3	73-5/8	61-7/8	27-5/16	NWHOR-06-015P-E1	NS	090253	212
15	480	1-3	73-5/8	61-7/8	27-5/16	NWHOR-06-015P-E1	NS	107510	212
18	240	1-3	86-5/8	74-7/8	33-7/8	NWHOR-06-018P-E1	NS	011527	240
18	480	1-3	86-5/8	74-7/8	33-7/8	NWHOR-06-018P-E1	NS	107529	240
Series 18 — 8 inch, 150 lb carbon steel vessel — 18 steel elements (12 W/in²) — 2-1/2" NPT pipe inlet and outlet									
20	240	3-3	53-1/4	32-11/16	29-3/16	NWHOR-18-020P-E1	NS	080442	450
20	480	3-3	53-1/4	32-11/16	29-3/16	NWHOR-18-020P-E1	NS	080450	450
25	240	3-3	60-1/4	39-11/16	36-3/16	NWHOR-18-025P-E1	NS	080485	500
25	480	3-3	60-1/4	39-11/16	36-3/16	NWHOR-18-025P-E1	NS	080493	500
30	240	3-3	67-7/8	47-5/16	43-13/16	NWHOR-18-030P-E1	NS	080522	565
30	480	3-3	67-7/8	47-5/16	43-13/16	NWHOR-18-030P-E1	NS	080530	565
35	240	3-3	77-3/8	56-13/16	53-5/16	NWHOR-18-035P-E1	NS	080565	650
35	480	3-3	77-3/8	56-13/16	53-5/16	NWHOR-18-035P-E1	NS	080573	650
40	240	3-3	86-3/8	65-13/16	62-5/16	NWHOR-18-040P-E1	NS	080602	725
40	480	3-3	86-3/8	65-13/16	62-5/16	NWHOR-18-040P-E1	NS	080610	725
45	240	3-3	96-3/8	75-13/16	72-5/16	NWHOR-18-045P-E1	NS	080645	815
45	480	3-3	96-3/8	75-13/16	72-5/16	NWHOR-18-045P-E1	NS	080653	815
Series 27 — 10 inch, 150 lb carbon steel vessel — 27 steel elements (12 W/in²) — 3" NPT pipe inlet and outlet									
50	240	3-3	77-9/16	52	48-1/2	NWHOR-27-050P-E1	NS	023237	730
50	480	3-3	77-9/16	52	48-1/2	NWHOR-27-050P-E1	NS	023253	730
60	240	3-3	87-9/16	62	58-1/2	NWHOR-27-060P-E1	NS	023270	750
60	480	3-3	87-9/16	62	58-1/2	NWHOR-27-060P-E1	NS	023296	750
70	240	3-3	97-9/16	72	68-1/2	NWHOR-27-070P-E1	NS	023317	770
70	480	3-3	97-9/16	72	68-1/2	NWHOR-27-070P-E1	NS	023333	770
Series 45 — 14 inch, 150 lb carbon steel vessel — 45 steel elements (15 W/in²) — 6" flanged pipe inlet and outlet									
90	480	3-3	76	57-3/16	66-11/16	NWHOR-45-090P-E1	NS	011607	830
125	480	3-3	91	72-3/16	81-11/16	NWHOR-45-125P-E1	NS	086094	960
150	480	3-3	106	87-3/16	96-11/16	NWHOR-45-150P-E1	NS	086115	1,080
175	480	3-3	121	102-3/16	111-11/16	NWHOR-45-175P-E1	NS	086131	1,200
200	480	3-3	128-1/2	109-11/16	119-11/16	NWHOR-45-200P-E1	NS	086158	1,320

Stock Status: S = stock NS = non-stock
To Order—Specify model, volts, phase, kW, PCN and quantity.

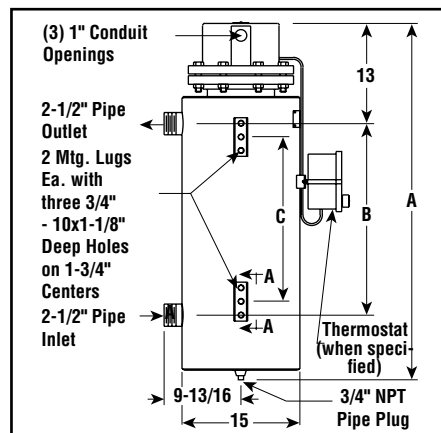
Note — Refer to the Controls section control panels.

Dimensions (Inches)

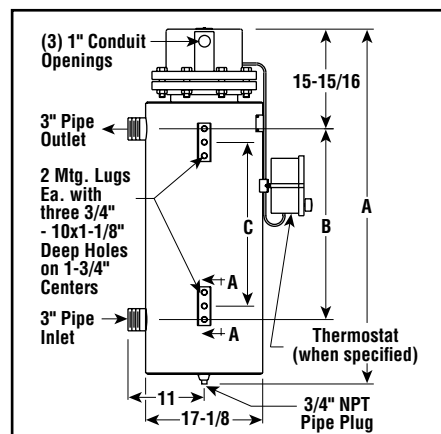
NWHO-06



NWHOR-18



NWHOR-27



NWHOR & NWHORB

Heavy & Fuel Oil Applications (Baffled)

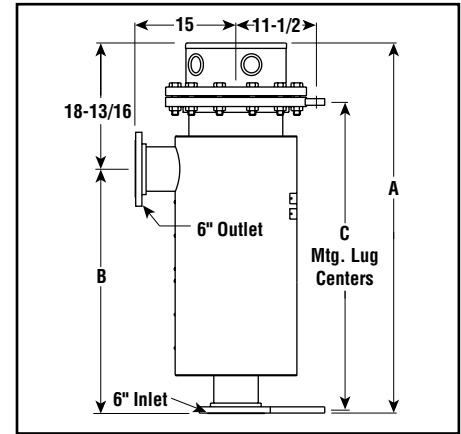
Specifications and Ordering Information

kW	Volts	Ckt & Phase	Dimensions (In.)			Model	Stock	PCN	Wt. (Lbs.)
			A	B	C				
Series 18 — 8 inch 150 lb carbon steel vessel — 18 baffled steel elements (12 W/in²) — 2-1/2" NPT pipe inlet and outlet									
20	240	3-3	53-1/4	32-11/16	29-3/16	NWHORB-18-020P-E1	NS	080469	456
20	480	3-3	53-1/4	32-11/16	29-3/16	NWHORB-18-020P-E1	NS	080477	456
25	240	3-3	60-1/4	39-11/16	36-3/16	NWHORB-18-025P-E1	NS	080506	506
25	480	3-3	60-1/4	39-11/16	36-3/16	NWHORB-18-025P-E1	S	082000	506
30	240	3-3	67-7/8	47-5/16	43-13/16	NWHORB-18-030P-E1	NS	080549	571
30	480	3-3	67-7/8	47-5/16	43-13/16	NWHORB-18-030P-E1	NS	080557	571
35	240	3-3	77-3/8	56-13/16	53-5/16	NWHORB-18-035P-E1	NS	080581	656
35	480	3-3	77-3/8	56-13/16	53-5/16	NWHORB-18-035P-E1	NS	080590	656
40	240	3-3	86-3/8	65-13/16	62-5/16	NWHORB-18-040P-E1	NS	080629	731
40	480	3-3	86-3/8	65-13/16	62-5/16	NWHORB-18-040P-E1	NS	080637	731
45	240	3-3	96-3/8	75-13/16	72-5/16	NWHORB-18-045P-E1	NS	080661	821
45	480	3-3	96-3/8	75-13/16	72-5/16	NWHORB-18-045P-E1	S	084507	821
Series 27 — 10 inch, 150 lb carbon steel vessel — 27 baffled steel elements (12 W/in²) — 3" NPT pipe inlet and outlet									
50	240	3-3	77-9/16	52	48-1/2	NWHORB-27-050P-E1	NS	023245	736
50	480	3-3	77-9/16	52	48-1/2	NWHORB-27-050P-E1	NS	023261	736
60	240	3-3	87-9/16	62	58-1/2	NWHORB-27-060P-E1	NS	023288	756
60	480	3-3	87-9/16	62	58-1/2	NWHORB-27-060P-E1	NS	023309	756
70	240	3-3	97-9/16	72	68-1/2	NWHORB-27-070P-E1	NS	023325	776
70	480	3-3	97-9/16	72	68-1/2	NWHORB-27-070P-E1	NS	023341	776

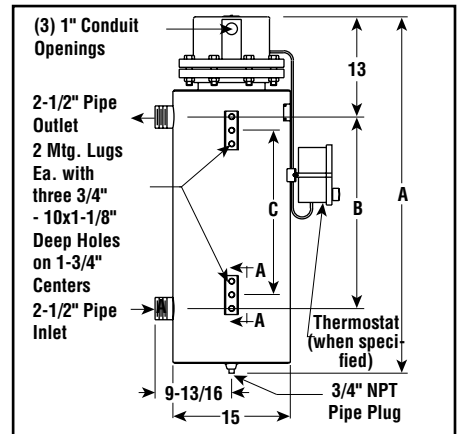
Stock Status: S = stock NS = non-stock
To Order — Specify model, volts, phase, kW, PCN and quantity.

Note — Refer to the Controls section for control panels.

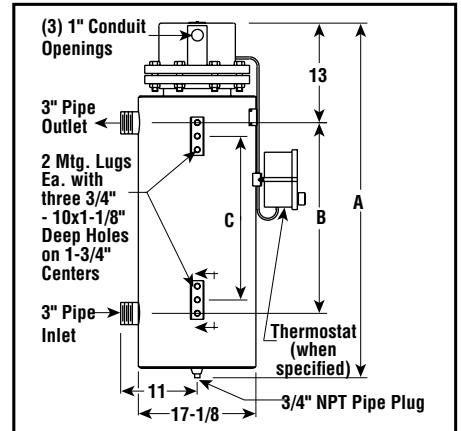
Dimensions (Inches) NWHOR-45



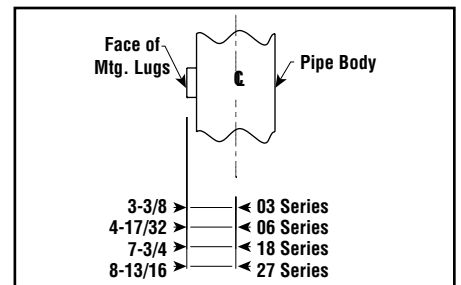
NWHORB-18



NWHORB-27



NWHOR-AA



Ordering Information

To Order — Complete the Model Number using the Matrix provided.

Model	Medium, Heavy and Fuel Oil				
NWHO	Oil Circulation Heater				
R	Low Watt Density Elements				
B	Internal Baffles				
Code	Number of Elements				
03	Three	27	Twenty Seven		
06	Six	45	Forty Five		
18	Eighteen				
Code	kW				
003P	3	020P	20	060P	60
004P	4	025P	25	070P	70
006P	6	030P	30	090P	90
008P	8	035P	35	125P	125
010P	10	040P	40	150P	150
012P	12	045P	45	175P	175
015P	15	050P	50	200P	200
018P	18				
Code	Terminal Enclosure				
E1	General Purpose				
E2	Moisture Resistant/Explosion Resistant				
E4	Moisture Resistant				
NWHORB 18	030P	E1	Typical Model Number		

GCHI & Series

Steam, Air & Gas Applications

- **Screw Plug or Flange Heater Design**
- **2 - 18" Carbon Steel Pipe Body, 150 Lb Construction**
- **1 - 350kW**
- **120, 240 and 480V, 1 & 3 Phase**
- **General Purpose, Moisture Resistant Terminal, Moisture Resistant/Explosion Proof Enclosure**
- **0.475" Dia. INCOLOY® Sheath Elements (15 - 23 W/in²)**
- **With & Without Thermostat**
- **CSA and Other Third Party Approval, Listing or Certification Available on Many Models**

Applications

Air and Gas — Chromalox circulation heaters provide a cost effective means for heating air and common industrial gases such as Argon, Helium and Nitrogen as well as gaseous mixtures for a wide variety of industrial processes.

High Temperature Gas — Refer to Stainless Steel circulation heaters later in this section.

Steam Superheating — Chromalox circulation heaters are used to increase the enthalpy and quality of steam. Smaller units can be used to make up line losses in steam generating and distribution systems.

Features

Terminal Enclosures — Standard stock heater terminal enclosures are E1 General Purpose. Moisture Resistant/Explosion Proof E2 and Moisture Resistant E4 Enclosures are available as assembly stock.

Elements — Sturdy 0.475" diameter INCOLOY® sheath elements permit higher watt densities and operating temperatures. Steel sheath elements may be used in low temperature applications. Chromalox elements utilize high quality resistance wire for coil construction. The coil is surrounded with high purity magnesium oxide which is compacted to a dense solid to ensure high thermal conductivity and dielectric strength.

Flanges — Carbon Steel Flanges are standard on low to medium temperature heaters 3" and larger. Flange dimensions conform to ANSI B16.5 standards.

Vessels — Chromalox vessels consist of a pipe body, nozzles and end cap. The pipe body and nozzles are ASTM A53B carbon steel pipe. The end cap or disk is ASTM A516 Grade 70 carbon steel plate. Mounting lugs are welded to the pipe wall. The vessel is wrapped with thermal insulation and covered with a painted sheet metal jacket.

Baffle Assemblies — Internal baffle assemblies are provided on some stock circulation heaters. Baffles reduce the internal cross sectional area thereby increasing the velocity of the gas. Increasing the gas velocity reduces the operating temperature of the elements and the shell of the vessel.

Wiring — Wiring terminals are spaced to provide proper arcing and creepage clearances. Termination insulators provide electrical isolation between the terminals and the grounded metal sheath to enhance personnel safety and equipment service life. Heavy duty jumper straps and other terminal parts assure tight connections and an extra margin of current carrying capacity.

Control Thermostats — All Series 3 and 6 stock and assembly stock heaters come equipped with mechanical AR thermostats.



These thermostats are suitable for small size gas heaters and provide low cost control in low and medium temperature applications. Explosion-resistant and liquid-tight thermostats are provided on E2 and E4 units, respectively.

Precision Temperature Control and Control Panels — For larger kW gas heaters and precise control of gas temperatures in high temperature applications, Chromalox recommends the use of thermocouple sensors, electronic PID temperature controls and SCR power panels for gas heating applications. The use of electronic and SCR controls will minimize overshoot and reduce the possibility of heater damage from overtemperature operation. Integral or remote mounted control panels with electronic controls and solid state (SCR) or contactor power controllers can be provided using virtually any combination of control devices. Consult the Controls section for details.

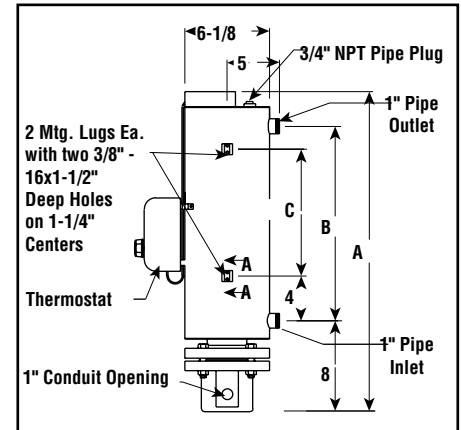
GCHI & GCHIB

Steam, Air & Gas
Applications to 750°F¹

- 3 - 18" ANSI Blind Flange Design
- 3 - 18" Carbon Steel Pipe Body, 150 Lb Construction (750°F Max. Vessel and 1600°F Max. Sheath Temp.)¹ For Stainless Steel Pipe Body Construction, Refer to GCHIS Series Circulation Heaters.
- 3 - 350kW
- 240 and 480V, 1 & 3 Phase
- General Purpose, Moisture Resistant Terminal, Moisture Resistant/Explosion Proof Enclosure
- 0.475" Dia. INCOLOY® Sheath Elements (15 - 23 W/in²)
- 3 and 5" with Side Mounted Thermostat (200 - 550°F), 8, 10, 14 and 16" without Thermostat
- CSA and Other Third Party Approval, Listing or Certification Available



Dimensions (Inches) GCHI-03



STEAM, AIR
AND GAS

Applications

Steam, Air and Gas — Higher kW ratings for larger industrial and commercial gas heating applications.

Features

Terminal Enclosure — E1 General Purpose is standard. E2 Moisture Resistant/Explosion Proof or E4 Moisture Resistant available.

Elements — 0.475" diameter INCOLOY® sheath elements.

Flange — 3 -10" ANSI B-16.5 flange with 1/2" thermowell for thermostat bulb and a 1/8" NPT threaded opening for a thermocouple or RTD.

Vessel — Pipe body and nozzles are ASTM A53B carbon steel pipe. The end disk is ASTM A516 Grade 70 carbon steel plate. Provided with thermal insulation and painted sheet metal jacket.

Baffle Assembly — Internal baffle assemblies are provided on GCHIB-18 models. Baffles reduce the internal cross sectional area thereby increasing the velocity of the gas. Increasing the gas velocity reduces the operating temperature of the elements and the shell of the vessel.

Wiring — Convenient field wiring terminals are provided for easy installation.

Controls — Series 03 and 06 stock and assembly stock heaters come equipped with side mounted thermostat. Series 18, 27, 45 and 108 are furnished without thermostat.

Specifications and Ordering Information

kW	Volts	Ckt & Phase	Dimensions (In.)			Model	Stock	PCN	Wt. (Lbs.)
			A	B	C				
Series 03 — 3 inch, 150 lb carbon steel vessel — 3 INCOLOY® elements¹ (23 W/in²) with thermostat									
3	240	1-1	32-15/16	22-1/2	16-1/2	GCHI-03-003P-E1	NS	013240	62
3	240	1-3	32-15/16	22-1/2	16-1/2	GCHI-03-003P-E1	S	103915	62
3	480	1-1	32-15/16	22-1/2	16-1/2	GCHI-03-003P-E1	NS	013258	62
3	480	1-3	32-15/16	22-1/2	16-1/2	GCHI-03-003P-E1	S	103958	62
4.5	240	1-1	42-15/16	32-1/2	26-1/2	GCHI-03-04P5-E1	NS	013266	72
4.5	240	1-3	42-15/16	32-1/2	26-1/2	GCHI-03-04P5-E1	NS	104070	72
4.5	480	1-1	42-15/16	32-1/2	26-1/2	GCHI-03-04P5-E1	NS	013274	72
4.5	480	1-3	42-15/16	32-1/2	26-1/2	GCHI-03-04P5-E1	S	104117	72
6	240	1-1	55-7/16	45	39	GCHI-03-006P-E1	NS	013282	94
6	240	1-3	55-7/16	45	39	GCHI-03-006P-E1	S	104230	94
6	480	1-1	55-7/16	45	39	GCHI-03-006P-E1	NS	013290	94
6	480	1-3	55-7/16	45	39	GCHI-03-006P-E1	S	104272	94

Stock Status: S = stock NS = non-stock
To Order—Specify model, volts, phase, kW, PCN and quantity.

1. Outlet gas temperature must be kept below both maximum sheath and vessel temperature or element and heater damage may occur. Contact your Local Chromalox Sales office for application assistance.

GCHI & GCHIB

Steam, Air & Gas

Applications to 750°F¹ (cont'd.)

Specifications and Ordering Information

kW	Volts	Ckt & Phase	Dimensions (In.)			Model	Stock	PCN	Wt. (Lbs.)
			A	B	C				
Series 06 — 5 inch, 150 lb carbon steel vessel — 6 INCOLOY® elements¹ (23 W/in²) with thermostat									
9	240	1-1	41-3/4	30	11-3/8	GCHI-06-009P-E1	NS	013303	135
9	240	1-3	41-3/4	30	11-3/8	GCHI-06-009P-E1	NS	104715	135
9	480	1-1	41-3/4	30	11-3/8	GCHI-06-009P-E1	NS	013311	135
9	480	1-3	41-3/4	30	11-3/8	GCHI-06-009P-E1	NS	013320	135
12	240	1-1	48-3/4	37	14-7/8	GCHI-06-012P-E1	NS	013338	164
12	240	1-3	48-3/4	37	14-7/8	GCHI-06-012P-E1	S	104870	164
12	480	1-1	48-3/4	37	14-7/8	GCHI-06-012P-E1	NS	013346	164
12	480	1-3	48-3/4	37	14-7/8	GCHI-06-012P-E1	S	104598	164
20	240	1-1	60-1/4	48-1/2	20-5/8	GCHI-06-020P-E1	NS	013354	195
20	240	1-3	60-1/4	48-1/2	20-5/8	GCHI-06-020P-E1	NS	013362	195
20	480	1-1	60-1/4	48-1/2	20-5/8	GCHI-06-020P-E1	NS	013370	195
20	480	1-3	60-1/4	48-1/2	20-5/8	GCHI-06-020P-E1	S	105478	195
25	240	1-1	73-5/8	61-7/8	27-5/16	GCHI-06-025P-E1	NS	013389	212
25	480	1-3	73-5/8	61-7/8	27-5/16	GCHI-06-025P-E1	NS	013397	212
25	240	1-1	73-5/8	61-7/8	27-5/16	GCHI-06-025P-E1	NS	013400	212
25	480	1-3	73-5/8	61-7/8	27-5/16	GCHI-06-025P-E1	NS	013418	212
30	240	1-3	86-5/8	74-7/8	33-7/8	GCHI-06-030P-E1	NS	013434	240
30	480	1-3	86-5/8	74-7/8	33-7/8	GCHI-06-030P-E1	NS	013450	240
Series 18 — 8 inch, 150 lb carbon steel vessel — 18 baffled INCOLOY® elements¹ (20 W/in²)									
30	240	3-3	54-5/16	32-11/16	29-3/16	GCHIB-18-030P-E1	NS	080768	350
30	480	3-3	54-5/16	32-11/16	29-3/16	GCHIB-18-030P-E1	NS	080776	350
40	240	3-3	61-5/16	39-11/16	36-3/16	GCHIB-18-040P-E1	NS	080784	420
40	480	3-3	61-5/16	39-11/16	36-3/16	GCHIB-18-040P-E1	NS	080792	420
50	240	3-3	68-15/16	47-5/16	43-13/16	GCHIB-18-050P-E1	NS	080805	480
50	480	3-3	68-15/16	47-5/16	43-13/16	GCHIB-18-050P-E1	NS	080813	480
Series 27 — 10 inch, 150 lb carbon steel vessel — 27 INCOLOY® elements¹ (15 W/in²)									
50	240	3-3	68-9/16	43	39-1/2	GCHI-27-050P-E1	NS	020212	400
50	480	3-3	68-9/16	43	39-1/2	GCHI-27-050P-E1	NS	020220	400
60	240	3-3	75-9/16	50	46-1/2	GCHI-27-060P-E1	NS	020239	440
60	480	3-3	75-9/16	50	46-1/2	GCHI-27-060P-E1	NS	020247	440
70	240	3-3	81-9/16	56	52-1/2	GCHI-27-070P-E1	NS	020255	480
70	480	3-3	81-9/16	56	52-1/2	GCHI-27-070P-E1	NS	020263	480
80	240	3-3	91-9/16	66	62-1/2	GCHI-27-080P-E1	NS	020271	520
80	480	3-3	91-9/16	66	62-1/2	GCHI-27-080P-E1	NS	020280	520
90	240	3-3	100-9/16	75	71-1/2	GCHI-27-090P-E1	NS	020298	560
90	480	3-3	100-9/16	75	71-1/2	GCHI-27-090P-E1	NS	020300	560

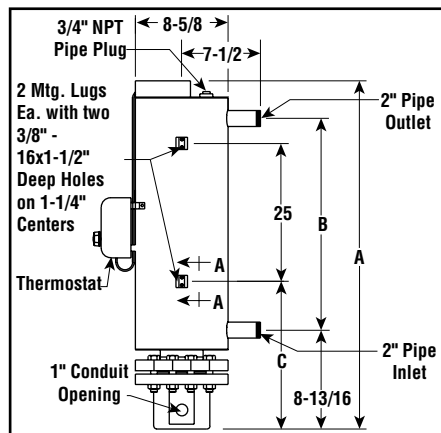
Stock Status: S = stock NS = non-stock
To Order—Specify model, volts, phase, kW, PCN and quantity.

1. Outlet gas temperature must be kept below both maximum sheath and vessel temperature or element and heater damage may occur. Contact your Local Chromalox Sales office for application assistance.

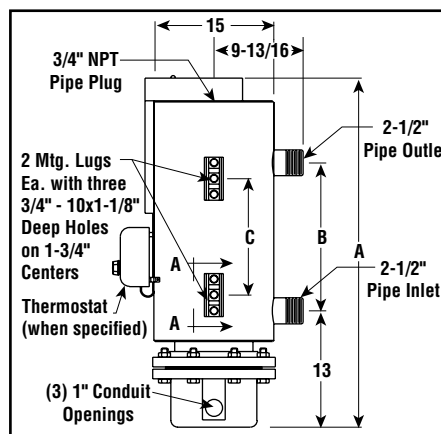
Other Note — Refer to the Controls section for control panels.

Dimensions (Inches)

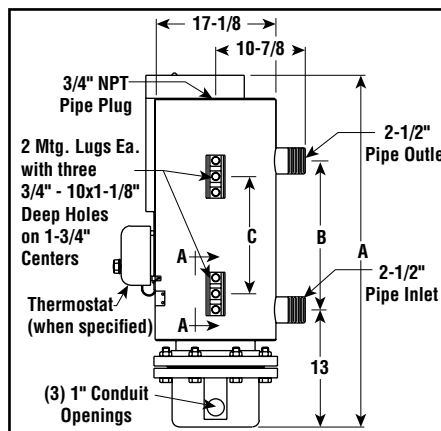
GCHI-06



GCHIB-18



GCHI-27



GCHI & GCHIB

Steam, Air & Gas

Applications to 750°F¹ (cont'd.)

Specifications and Ordering Information

kW	Volts	Ckt & Phase	Dimensions (In.)					Model	Stock	PCN	Wt. (Lbs.)
			A	B	C	D	E				
Series 45 — 14 inch, 150 lb carbon steel vessel — 45 INCOLOY® elements¹ (15 W/in²)											
75	480	3-3	76	57-3/16	66-11/16	15	11-1/2	GCHI-45-075P-E1	NS	086238	835
90	480	3-3	76	57-3/16	66-11/16	15	11-1/2	GCHI-45-090P-E1	NS	086254	925
125	480	3-3	91	72-3/16	81-11/16	15	11-1/2	GCHI-45-125P-E1	NS	086270	1,025
150	480	3-3	106	87-3/16	96-11/16	15	11-1/2	GCHI-45-150P-E1	NS	086297	1,125
175	480	3-3	121	102-3/16	111-11/16	15	11-1/2	GCHI-45-175P-E1	NS	086318	1,225
Series 72 — 16 inch, 150 lb carbon steel vessel — 72 INCOLOY® elements¹ (15 W/in²)											
200	480	3-3	93	74-5/8	84-1/8	16	12-3/4	GCHI-72-200P-E1	NS	086393	1,265
225	480	3-3	101	82-5/8	92-1/8	16	12-3/4	GCHI-72-225P-E1	NS	086369	1,310
250	480	3-3	109	90-5/8	100-1/8	16	12-3/4	GCHI-72-250P-E1	NS	086334	1,355
Series 108 — 18 inch, 150 lb carbon steel vessel — 108 INCOLOY® elements¹ (15 W/in²)											
300	480	6-3	94	75-1/2	85	17	13-1/2	GCHI-108-300P-E1	NS	086422	1,400
325	480	6-3	100	81-1/2	91	17	13-1/2	GCHI-108-325P-E1	NS	086457	1,450
350	480	6-3	106	87-1/2	97	17	13-1/2	GCHI-108-350P-E1	NS	086481	1,500

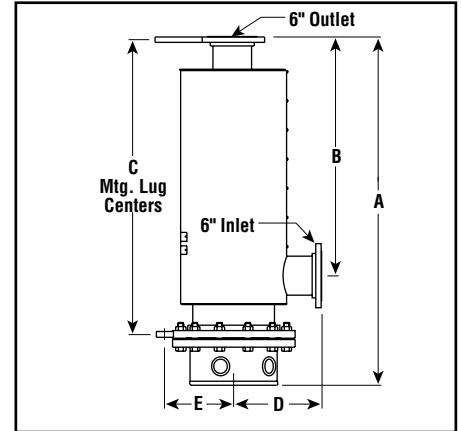
Stock Status: S = stock NS = non-stock
To Order—Specify model, volts, phase, kW, PCN and quantity.

1. Recommended temperature limits for all GCH heaters with carbon steel vessels and INCOLOY® elements are 1600°F maximum for the sheath temperature and 750°F maximum for the vessel temperature at 5 psi pressure maximum. Exceeding these recommendations will void the factory warranty. Outlet gas temperatures must be kept below both the maximum sheath and vessel temperature or element and vessel damage may occur. Contact your Local Chromalox Sales office for assistance in determining the gas flow characteristics and proper heater selection. Heaters supplied without controls.

Other Note — Refer to the Controls section for control panels.

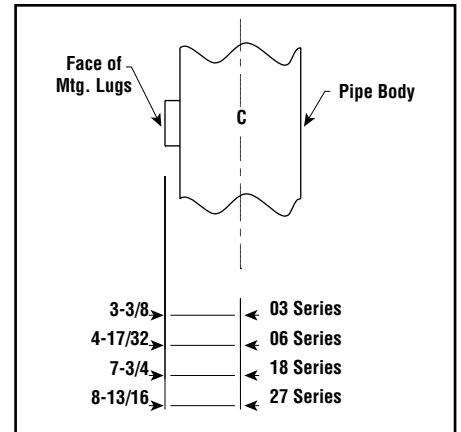
Dimensions (Inches)

GCHI-45, 72, 108



STEAM, AIR AND GAS

GCHI-AA



Ordering Information

To Order — Complete the Model Number using the Matrix provided.

Model	Steam, Air and Gas to 750°F ¹			
GCHI	Gas Circulation Heater — INCOLOY® Elements — Steel Vessel			
B	Internal Baffles			
	Code	Number of Elements		
	03	Three	45	Forty Five
	06	Six	72	Seventy Two
	18	Eighteen	108	One Hundred Eight
	27	Twenty Seven		
	Code	kW		
	003P	3	040P	40
	04P5	4.5	050P	50
	006P	6	060P	60
	009P	9	070P	70
	012P	12	075P	75
	020P	20	080P	80
	025P	25	090P	90
	030P	30	125P	125
	Code	Terminal Enclosure		
	E1	General Purpose		
	E2	Moisture Resistant/Explosion Resistant		
	E4	Moisture Resistant		
GCHI	45	072P	E1	Typical Model Number

NWHIS, NWHOIS & GCHIS Series

Pure Water, Corrosive Solution & High Temperature Gas Applications

- **Flanged Heater Design**
- **3 - 14" Type 304 Stainless Steel Pipe Body, 150 Lb Construction**
- **2 - 200kW**
- **120, 240 and 480V, 1 & 3 Phase**
- **General Purpose, Moisture Resistant Terminal, Moisture Resistant/Explosion Proof Enclosure**
- **0.475" Dia. Stainless Steel or INCOLOY® Sheath Elements (15 - 50 W/in²)**
- **With & Without Thermostat**
- **UL, CSA, ATEX and Other Third Party Approval, Listing or Certification Available on Many Models**

Applications

Pure Water — Heating of demineralized or de-ionized water that is highly aggressive to mild steel.

Mildly Corrosive Solutions — Heat mildly corrosive solutions (pH5 to pH9) using stainless elements and a passivated stainless pipe body.

Highly Corrosive Solutions and Oils — Low watt density INCOLOY® sheath elements coupled with a passivated Stainless Steel pipe body provides long service life when heating highly corrosive solutions and sulfur laden oils.

Steam Superheating — Increase the enthalpy and quality of steam. Smaller units can be used to make up line losses in steam generating and distribution systems.

High Temperature Gas — INCOLOY® elements and a Stainless Steel vessel enhance safe operation to nearly 1400°F outlet gas temperature in air, gas or steam superheating applications.

Features

Terminal Enclosures — Standard stock heater terminal enclosure E1 General Purpose. Moisture Resistant/Explosion Proof E2 or Moisture Resistant E4 Enclosures are available as assembly stock.

Elements — Sturdy 0.475" Dia. Stainless Steel or INCOLOY® sheath elements provide superior strength and rigidity. Chromalox elements utilize high quality resistance wire for coil construction. The coil is surrounded with high purity magnesium oxide which is compacted to a dense solid to ensure high thermal conductivity and dielectric strength.

Corrosion Resistance — NWHIS and NWHOIS pipe bodies and all Stainless Steel heating elements are passivated to provide additional resistance to corrosion.

Flanges — Type 304 Stainless Steel flanges are standard on 3" and larger circulation heaters. Flange dimensions conform to ANSI B16.5 standards.

Vessels — Pipe body and nozzles are type 304 ASTM A312 ERW Stainless Steel pipe. The end disks are type 304 ASTM A240 Stainless Steel plate. Provided with thermal insulation and painted sheet metal jacket.

Baffle Assemblies — Internal baffle assemblies are provided for model GCHISB-18 heaters to increase the velocity of the air, gas or steam as it passes through the vessel. Increasing the velocity of the gas helps reduce the temperature of the element sheaths and the vessel walls in critical applications.

Wiring — Wiring terminals are spaced to provide proper arcing and creepage clearances. Termination insulators provide electrical isolation between the terminals and the grounded metal sheath to enhance personnel safety and equipment service life. Heavy duty jumper straps and other terminal parts assure tight connections and an extra margin of current carrying capacity.

Controls — All stock and assembly stock heaters, Series MTSS, 03 and 06, come equipped



with mechanical AR thermostats. These thermostats are suitable for most applications. Explosion-resistant and liquid-tight thermostats are provided on E2 and E4 units, respectively. Individual product pages list other types of thermostats and controls available for each heater. For heaters listed without controls, refer to the Overview on Mechanical and Electrical Control Options in this section.

Precision Temperature Control and Control Panels — For larger kW heaters and precise control of gas temperatures in high temperature applications, Chromalox recommends the use of thermocouple sensors, electronic PID temperature controls and SCR power panels for circulation heater applications. The use of electronic and SCR controls will minimize overshoot and reduce the possibility of heater damage from overtemperature operation. Integral or remote mounted control panels with electronic controls and solid state (SCR) or contactor power controllers can be provided using virtually any combination of control devices. Consult the Controls section for details.

NWHIS

Pure Water & Mildly Corrosive Solution Applications

Specifications and Ordering Information

kW	Volts	Ckt & Phase	Dimensions (In.)			Model	Stock	PCN	Wt. (Lbs.)
			A	B	C				
Series 03 — 3 inch, 150 lb 304 passivated stainless steel vessel, 3 INCOLOY® elements (45 W/In²) with side mounted thermostat (60 to 250°F) — 1" NPT pipe inlet and outlet									
6	240	1-3	32-15/16	22-1/2	16-1/2	NWHIS-03-006P-E1	NS	012010	70
6	480	1-3	32-15/16	22-1/2	16-1/2	NWHIS-03-006P-E1	NS	012028	70
12	240	1-3	42-15/16	32-1/2	26-1/2	NWHIS-03-012P-E1	NS	012036	80
12	480	1-3	42-15/16	32-1/2	26-1/2	NWHIS-03-012P-E1	NS	012044	80
18	240	1-3	55-7/16	45	39	NWHIS-03-018P-E1	NS	012052	98
18	480	1-3	55-7/16	45	39	NWHIS-03-018P-E1	NS	012060	98
Series 06 — 5 inch, 150 lb 304 passivated stainless steel vessel, 6 INCOLOY® elements (45 W/In²) with side mounted thermostat (60 to 250°F) — 2" NPT pipe inlet and outlet									
24	240	2-3	41-3/4	30	11-3/8	NWHIS-06-024P-E1	NS	012079	140
24	480	1-3	41-3/4	30	11-3/8	NWHIS-06-024P-E1	NS	012087	140
30	240	2-3	48-3/4	37	14-1/8	NWHIS-06-030P-E1	NS	012095	155
30	480	1-3	48-3/4	37	14-1/8	NWHIS-06-030P-E1	NS	012108	155
40	240	2-3	60-1/4	48-1/2	20-5/8	NWHIS-06-040P-E1	NS	012116	176
40	480	2-3	60-1/4	48-1/2	20-5/8	NWHIS-06-040P-E1	NS	012124	176
50	480	2-3	73-5/8	61-7/8	27-5/16	NWHIS-06-050P-E1	NS	012132	210
Series 18 — 8 inch, 150 lb 304 passivated stainless steel vessel, 18 INCOLOY® elements (45 W/In²) — 2-1/2" NPT pipe inlet and outlet									
50	240	3-3	45-1/4	24-11/16	21-3/16	NWHIS-18-050P-E1	NS	021311	396
50	480	3-3	45-1/4	24-11/16	21-3/16	NWHIS-18-050P-E1	NS	021320	396
75	240	3-3	53-1/4	32-11/16	29-3/16	NWHIS-18-075P-E1	NS	021338	414
75	480	3-3	53-1/4	32-11/16	29-3/16	NWHIS-18-075P-E1	NS	021346	414
100	240	3-3	60-1/4	39-11/16	36-3/16	NWHIS-18-100P-E1	NS	021354	425
100	480	3-3	60-1/4	39-11/16	36-3/16	NWHIS-18-100P-E1	NS	021362	425
125	240	3-3	67-7/8	47-5/16	43-13/16	NWHIS-18-125P-E1	NS	021370	470
125	480	3-3	67-7/8	47-5/16	43-13/16	NWHIS-18-125P-E1	NS	021389	470
150	240	3-3	77-3/8	56-13/16	53-5/16	NWHIS-18-150P-E1	NS	021397	535
150	480	3-3	77-3/8	56-13/16	53-5/16	NWHIS-18-150P-E1	NS	021400	535
175	240	3-3	86-3/8	65-13/16	62-5/16	NWHIS-18-175P-E1	NS	021418	625
175	480	3-3	86-3/8	65-13/16	62-5/16	NWHIS-18-175P-E1	NS	021426	625
200	240	3-3	104-3/8	83-13/16	79-5/16	NWHIS-18-200P-E1	NS	021434	705
200	480	3-3	104-3/8	83-13/16	79-5/16	NWHIS-18-200P-E1	NS	021442	705

Stock Status: S = stock NS = non-stock
To Order—Specify model, volts, phase, kW, PCN and quantity.
Note — Refer to the Controls section for control panels.

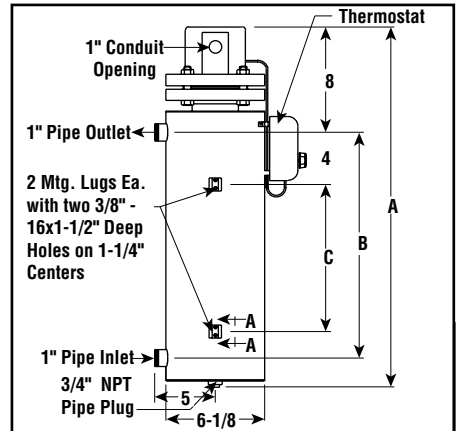
Ordering Information

To Order — Complete the Model Number using the Matrix provided.

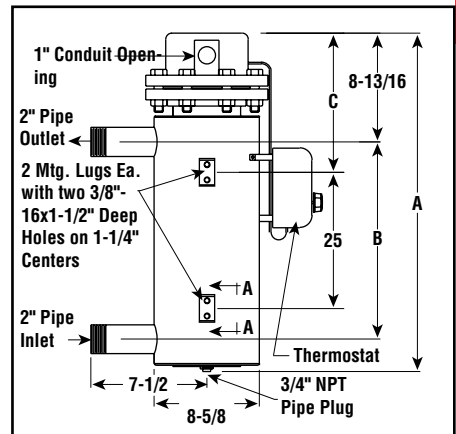
Model	Pure Water and Mildly Corrosive Solution			
NWH IS	Water Circulation Heater INCOLOY® Elements — Stainless Steel Vessel			
	Code	Number of Elements		
	03	Three		
	06	Six		
	18	Eighteen		
	Code	kW		
	006P	6	040P	40
	012P	12	050P	50
	018P	18	075P	75
	024P	24	100P	100
	030P	30	125P	125
	Code	Terminal Enclosure		
	E1	General Purpose		
	E2	Moisture Resistant/Explosion Resistant		
	E4	Moisture Resistant		
NWH	03	006P	E1	Typical Model Number

Dimensions (Inches)

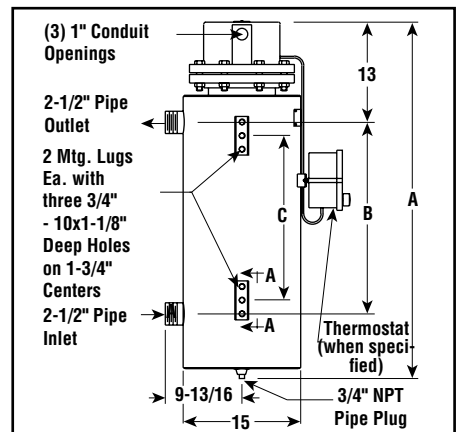
NWHIS-03



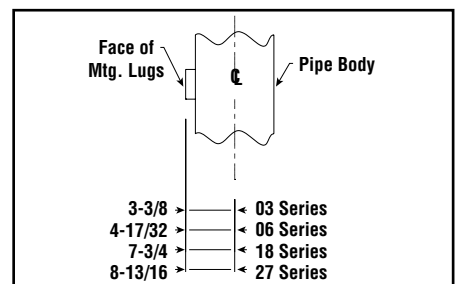
NWHIS-06



NWHIS-18



NWHIS-AA



STEAM, AIR AND GAS

NWHOIS

Corrosive Oil & Highly Corrosive Solution Applications

Specifications and Ordering Information

kW	Volts	Ckt & Phase	Dimensions (In.)			Model	Stock	PCN	Wt. (Lbs.)
			A	B	C				
Series 03 — 3 inch, 150 lb 304 passivated stainless steel vessel, 3 INCOLOY® elements (15 W/in²) with side mounted thermostat (60 to 250°F) — 1" NPT pipe inlet and outlet									
2	240	1-3	32-15/16	22-1/2	16-1/2	NWHOIS-03-002P-E1	NS	012140	70
2	480	1-3	32-15/16	22-1/2	16-1/2	NWHOIS-03-002P-E1	NS	012159	70
4	240	1-3	42-15/16	32-1/2	26-1/2	NWHOIS-03-004P-E1	NS	012167	80
4	480	1-3	42-15/16	32-1/2	26-1/2	NWHOIS-03-004P-E1	NS	012175	80
6	240	1-3	55-7/16	45	39	NWHOIS-03-006P-E1	NS	012183	98
6	480	1-3	55-7/16	45	39	NWHOIS-03-006P-E1	NS	012191	98
Series 06 — 5 inch, 150 lb 304 passivated stainless steel vessel, 6 INCOLOY® elements (15 W/in²) with side mounted thermostat (60 to 250°F) — 2" NPT pipe inlet and outlet									
8	240	1-3	41-3/4	30	11-3/8	NWHOISR-06-008P-E1	NS	012204	140
8	480	1-3	41-3/4	30	11-3/8	NWHOISR-06-008P-E1	NS	012212	140
12	240	1-3	60-1/4	48-1/2	20-5/8	NWHOISR-06-012P-E1	NS	012220	176
12	480	1-3	60-1/4	48-1/2	20-5/8	NWHOISR-06-012P-E1	NS	012239	176
Series 06 — 5 inch, 150 lb 304 passivated stainless steel vessel, 6 INCOLOY® elements (23 W/in²) with side mounted thermostat (60 to 250°F) — 2" NPT pipe inlet and outlet									
25	240	2-3	73-5/8	61-7/8	27-5/16	NWHOIS-06-025P-E1	NS	012247	176
25	480	1-3	73-5/8	61-7/8	27-5/16	NWHOIS-06-025P-E1	NS	012255	176
30	240	2-3	86-5/8	74-7/8	33-7/8	NWHOIS-06-030P-E1	NS	012263	240
30	480	1-3	86-5/8	74-7/8	33-7/8	NWHOIS-06-030P-E1	NS	012271	240

Stock Status: S = stock NS = non-stock
To Order—Specify model, volts, phase, kW, PCN and quantity.
Note — Refer to the Controls section for control panels.

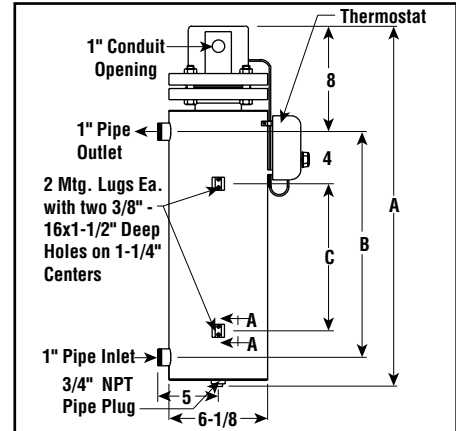
Ordering Information

To Order — Complete the Model Number using the Matrix provided.

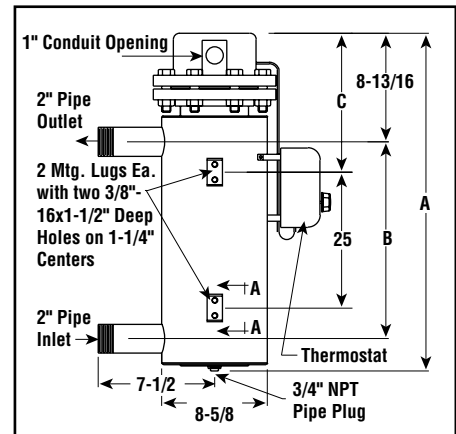
Model	Corrosive Oil and Highly Corrosive Solution		
NWHO	Oil Circulation Heater		
IS	INCOLOY® Elements — Stainless Steel Vessel		
R	Reduced Watt Density		
Code	Number of Elements		
03	Three		
06	Six		
Code	kW		
002P	2	008P	8
004P	4	012P	12
006P	6	025P	25
Code	Terminal Enclosure		
E1	General Purpose		
E2	Moisture Resistant/Explosion Resistant		
E4	Moisture Resistant		
NWHOIS 03	002P	E1	Typical Model Number

Dimensions (Inches)

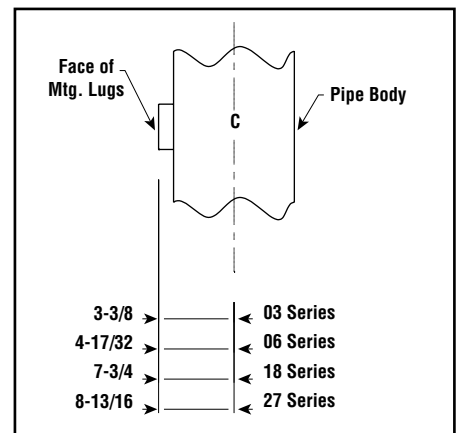
NWHOIS-03



NWHOIS-06



NWHOIS-AA



GCHIS, GCHISB & GCHISR

High Temperature Gas Applications to 1200°F¹

Specifications and Ordering Information

kW	Volts	Ckt & Phase	Dimensions (In.)			Model	Stock	PCN	Wt. (Lbs.)
			A	B	C				
Series 03 — 3 inch, 150 lb 304 stainless steel vessel — 3 INCOLOY® elements (15 W/In²) with side mounted thermostat (200 to 550°F) — 1" NPT pipe inlet and outlet¹									
2	240	1-3	33-1/4	22-1/2	16-1/2	GCHISR-03-002P-E1	NS	012280	62
2	480	1-3	33-1/4	22-1/2	16-1/2	GCHISR-03-002P-E1	NS	012298	62
4	240	1-3	55-3/4	45	36	GCHISR-03-004P-E1	NS	012300	94
4	480	1-3	55-3/4	45	36	GCHISR-03-004P-E1	NS	012319	94
Series 06 — 5 inch, 150 lb 304 stainless steel vessel — 6 INCOLOY® elements (15 W/In²) with side mounted thermostat (200 to 550°F) — 2" NPT pipe inlet and outlet¹									
4	240	1-3	41-3/4	30	11-3/8	GCHISR-06-004P-E1	NS	012327	135
4	480	1-3	41-3/4	30	11-3/8	GCHISR-06-004P-E1	NS	012335	135
8	240	1-3	48-3/4	37	14-7/8	GCHISR-06-008P-E1	NS	012343	164
8	480	1-3	48-3/4	37	14-7/8	GCHISR-06-008P-E1	NS	012351	164
12	240	1-3	60-1/4	48-1/2	20-5/8	GCHISR-06-012P-E1	NS	012360	195
12	480	1-3	60-1/4	48-1/2	20-5/8	GCHISR-06-012P-E1	NS	012378	195
15	240	1-3	73-5/8	61-7/8	27-5/16	GCHISR-06-015P-E1	NS	021733	215
15	480	1-3	73-5/8	61-7/8	27-5/16	GCHISR-06-015P-E1	NS	021741	215
20	240	1-3	86-5/8	74-7/8	33-7/8	GCHISR-06-020P-E1	NS	021750	253
20	480	1-3	86-5/8	74-7/8	33-7/8	GCHISR-06-020P-E1	NS	021768	253
Series 06 — 5 inch, 150 lb 304 stainless steel vessel — 6 INCOLOY® elements (23 W/In²) with side mounted thermostat (200 to 550°F) — 2" NPT pipe inlet and outlet¹									
25	240	2-3	73-5/8	61-7/8	27-5/16	GCHIS-06-025P-E1	NS	012386	195
25	480	1-3	73-5/8	61-7/8	27-5/16	GCHIS-06-025P-E1	NS	012394	195
30	240	2-3	86-5/8	74-7/8	33-7/8	GCHIS-06-030P-E1	NS	012407	240
30	480	1-3	86-5/8	74-7/8	33-7/8	GCHIS-06-030P-E1	NS	012415	240
Series 18 — 8 inch, 150 lb 304 stainless steel vessel — 18 baffled INCOLOY® elements¹ (23 W/In²)									
30	240	3-3	50-1/8	28-1/2	25	GCHISB-18-030P-E1	NS	021856	340
30	480	3-3	50-1/8	28-1/2	25	GCHISB-18-030P-E1	NS	021864	340
40	240	3-3	54-5/16	32-11/16	29-3/16	GCHISB-18-040P-E1	NS	021872	410
40	480	3-3	54-5/16	32-11/16	29-3/16	GCHISB-18-040P-E1	NS	021880	410
50	240	3-3	61-5/16	39-11/16	36-3/16	GCHISB-18-050P-E1	NS	021899	480
50	480	3-3	61-5/16	39-11/16	36-3/16	GCHISB-18-050P-E1	NS	021901	480
Series 27 — 10 inch, 150 lb stainless steel vessel — 27 INCOLOY® elements¹ (20 W/In²)									
50	240	3-3	56-9/16	31	27-1/2	GCHIS-27-050P-E1	NS	024037	340
50	480	3-3	56-9/16	31	27-1/2	GCHIS-27-050P-E1	NS	024045	340
60	240	3-3	62-9/16	37	33-1/2	GCHIS-27-060P-E1	NS	024053	370
60	480	3-3	62-9/16	37	33-1/2	GCHIS-27-060P-E1	NS	024061	370
70	240	3-3	68-9/16	43	39-1/2	GCHIS-27-070P-E1	NS	024070	400
70	480	3-3	68-9/16	43	39-1/2	GCHIS-27-070P-E1	NS	024088	400
80	240	3-3	75-9/16	50	46-1/2	GCHIS-27-080P-E1	NS	024096	430
80	480	3-3	75-9/16	50	46-1/2	GCHIS-27-080P-E1	NS	024109	430
90	240	3-3	81-9/16	56	52-1/2	GCHIS-27-090P-E1	NS	024117	543
90	480	3-3	81-9/16	56	52-1/2	GCHIS-27-090P-E1	NS	024125	560

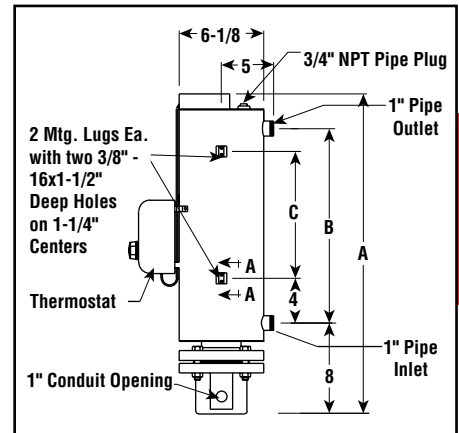
Stock Status: S = stock NS = non-stock
To Order—Specify model, volts, phase, kW, PCN and quantity.

1. Recommended temperature limits for all GCH heaters with stainless steel vessels and INCOLOY® elements are 1600°F maximum for the sheath temperature and 1200°F maximum for the vessel temperature at 5 psi maximum pressure. Exceeding these recommendations will void the factory warranty. Outlet gas temperatures must be kept below both the maximum sheath and vessel temperatures or element and vessel damage may occur. Consult factory representative for assistance in determining the gas flow characteristics and proper heater selection.

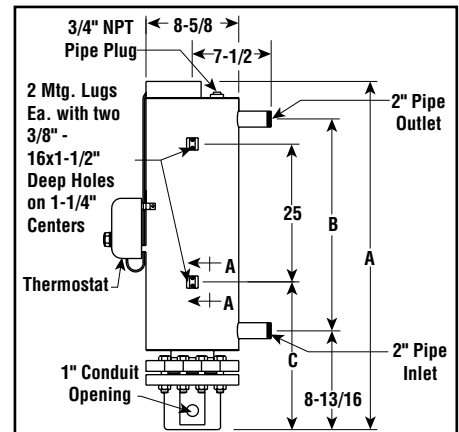
Other Note — Refer to the Controls section for control panels.

Dimensions (Inches)

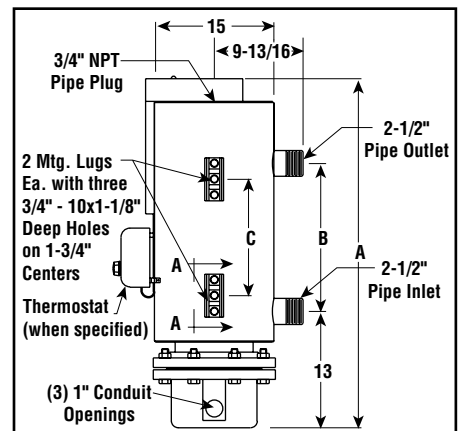
GCHIS-03



GCHIS-06



GCHISB-18



STEAM, AIR AND GAS

GCHIS & GCHISB

High Temperature Gas Applications to 1200°F¹ (cont'd.)

Specifications and Ordering Information

kW	Volts	Ckt & Phase	Dimensions (In.)					Model	Stock	PCN	Wt. (Lbs.)
			A	B	C	D	E				
Series 45 — 14 inch, 150 lb stainless steel vessel — 45 INCOLOY® elements¹ (15 W/In²)											
90	480	3-3	76	57-3/16	66-11/16	15	11-1/2	GCHIS-45-090P-E1	NS	024336	925
125	480	3-3	91	72-3/16	81-11/16	15	11-1/2	GCHIS-45-125P-E1	NS	024344	1,025
150	480	3-3	106	87-3/16	96-11/16	15	11-1/2	GCHIS-45-150P-E1	NS	024352	1,125
175	480	3-3	121	102-3/16	111-11/16	15	11-1/2	GCHIS-45-175P-E1	NS	024360	1,225
200	480	3-3	128-1/2	109-11/16	119-11/16	15	11-1/2	GCHIS-45-200P-E1	NS	024379	1,325

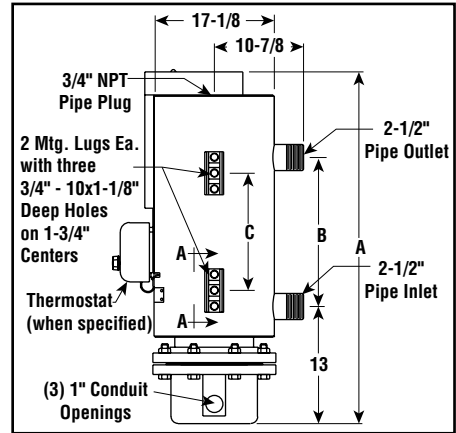
Stock Status: S = stock NS = non-stock
To Order—Specify model, volts, phase, kW, PCN and quantity.

- Recommended temperature limits for all GCH heaters with stainless steel vessels and INCOLOY® elements are 1600°F maximum for the sheath temperature and 1200°F maximum for the vessel temperature at 5 psi pressure maximum. Exceeding these recommendations will void the factory warranty. Outlet gas temperatures must be kept below both the maximum sheath and vessel temperature or element and vessel damage may occur. Contact your Local Chromalox Sales office to determine the gas flow characteristics and proper heater selection.

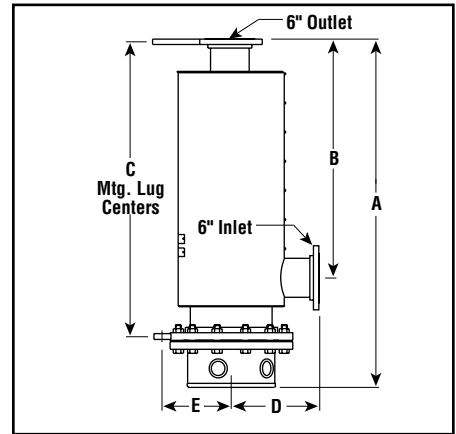
Other Note — Refer to the Controls section for control panels.

Dimensions (Inches)

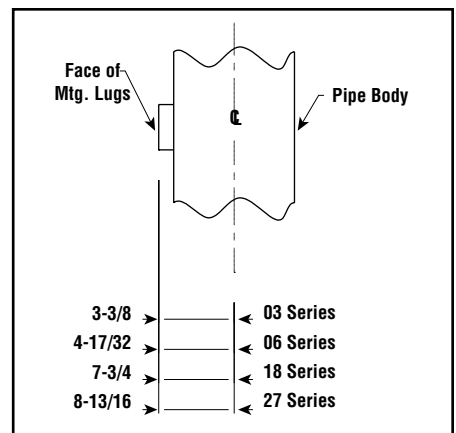
GCHIS-27



GCHIS-45



GCHIS-AA



Ordering Information

To Order — Complete the Model Number using the Matrix provided.

Model	High Temperature Gas to 1200°F ¹			
GCHIS	Gas Circulation Heater INCOLOY® Elements — Stainless Steel Vessel Internal Baffles			
B	Code	Number of Elements		
	03	Three		
	06	Six		
	18	Eighteen		
	27	Twenty Seven		
	45	Forty Five		
	Code	kW		
	002P	2	050P	50
	004P	4	060P	60
	008P	8	070P	70
	012P	12	075P	75
	015P	15	080P	80
	020P	20	090P	90
	025P	25	125P	125
	030P	30	175P	175
	040P	40	200P	200
	Code	Terminal Enclosure		
	E1	General Purpose		
	E2	Moisture Resistant/Explosion Resistant		
	E4	Moisture Resistant		
GCHIS	18	030P	E1	Typical Model Number

GCHCIS

Small Capacity/Low Flow Gas Applications

- Cartridge Heater Design
- Stainless Steel Pipe Body
- 0.5 - 3 kW
- 120 and 240V, Single Phase
- INCOLOY® Sheath Elements (37 W/In²)
- General Purpose, Moisture Resistant Terminal, Moisture Resistant/Explosion Proof Enclosure
- Internal Overtemperature Protection (type K T/C)
- Process Temperature Sensor in Outlet (type J T/C)

Applications

Gas — Designed to efficiently heat gases, particularly at low-flow rates and relatively high temperatures. (Outlet temperatures to 600°F.)

Features

Terminal Enclosure — Available with E1 General Purpose or E2 Moisture Resistant/Explosion Proof.

Cartridge Heater Element — INCOLOY® sheath and spiral wound baffle for efficient heat transfer.

Vessel — Stainless Steel (304) construction of all wetted parts.

Thermal Insulation — High temperature pipe insulation inside protective outer jacket.

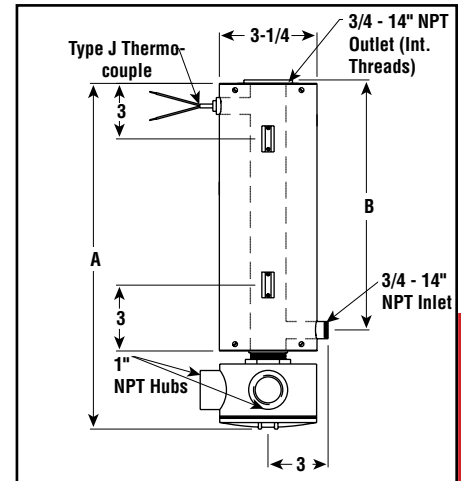
Process Control — Accurate process control using a Type J thermocouple located in the heater outlet.

High Limit Sensor — Integral overtemperature protection using a Type K thermocouple located inside the cartridge heating element sheath.

Installation — Compact rugged design permits easy installation.



Dimensions (Inches)



Heater with E2 Terminal Enclosure.

STEAM, AIR AND GAS

Specifications and Ordering Information

kW	Volts	Ckt & Phase	DIM (In.)		Model	Stock	PCN	Wt. (Lbs.)
			A	B				
1 inch, 304 stainless steel pipe body — 1 INCOLOY® cartridge element (37 W/In ²) — E1 terminal enclosure								
0.5	120	1-1	14	8	GCHCIS-01-0P50-E1	NS	024483	3
0.5	240	1-1	14	8	GCHCIS-01-0P50-E1	NS	024491	3
1	120	1-1	20	14	GCHCIS-01-001P-E1	NS	024504	3
1	240	1-1	20	14	GCHCIS-01-001P-E1	NS	024512	3
2	120	1-1	32	26	GCHCIS-01-002P-E1	NS	024520	4
2	240	1-1	32	26	GCHCIS-01-002P-E1	NS	024539	4
3	240	1-1	44	38	GCHCIS-01-003P-E1	NS	024547	4

Stock Status: S = stock NS = non-stock

To Order—Specify model, volts, phase, kW, PCN and quantity.

1. Order Electronic Controls separately for remote mounting. Consult Controls section for details.

2. Special voltage and wattage ratings available. Contact your Local Chromalox Sales office.

Ordering Information

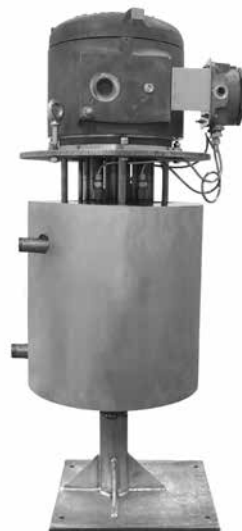
To Order — Complete the Model Number using the Matrix provided.

Model	Small Capacity/Low Flow Gas			
GCH	Gas Circulation Heater			
C	Cartridge Element			
IS	INCOLOY® Sheath — Stainless Steel Vessel			
Code	Number of Elements			
01	One			
Code	Watts			
0P50	500	002P	2,000	
001P	1,000	003P	3,000	
Code	Terminal Enclosure			
E1	General Purpose			
E2	Moisture Resistant/Explosion Resistant			
GCHCIS 01	0P50	E1	Typical Model Number	

CCX

High Pressure Circulation Heater

- Heat Gas or Fluids to 3500 psi (241 bar) or 7500 psi (517 bar)
- 3 - 30 kW
- 120 - 690 V, 1 & 3 Phase
- Moisture or Explosion Resistant Terminal Housing
- ATEX Certified (Zone 2)
- ASME Section VIII and PED Pressure Code Rated
- 3/4" or 1" 316 Stainless Steel Process Piping
- INCOLOY 800 or 316 Stainless Steel Heating Elements
- (1) Type J Thermocouple Process Sensor
- (2) Type J Thermocouple Overtemperature Sensors
- 316 Stainless Steel Thermowells for Sensors
- Marine Grade Aluminum Casting
- Butt-Weld Connections
- 316 Stainless Steel Vertical or Horizontal Mounting Plate



Hazardous Area Housing shown



Description

Chromalox CCX - Cast Circulation Heat Exchanger - is designed to operate at up to 3500 psi (241 bar) at 392°F (200°C), with an available option for up to 7500 psi (517 bar).

The moisture resistant enclosure is designed to accept NPT, metric, and / or gland plate connections. An optional explosion proof terminal housing is available for hazardous area installations and is certified by both ATEX and IECex.

The aluminum casting ensures even heat transfer throughout the process piping, while limiting temperature input. The rugged design, certified by ASME and PED, ensures safe, reliable operation for many years.

Applications

The CCX heater is engineered to heat high pressure natural gas to control moisture content for turbine seals. Due to the robust design, the CCX design is also suited for many high pressure applications involving, air, nitrogen, CO₂, and other industrial gases. Seamless piping with corrosion resistant material also make it suitable for liquid applications. The casting allows definitive temperature control as the point of heat transfer to the process stream. This also makes the CCX an effective heat exchanger for temperature sensitive heating applications.

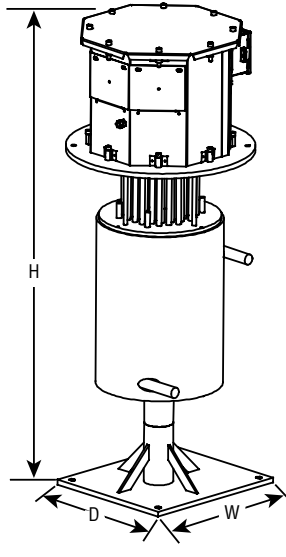
Construction

Chromalox CCX is constructed for tough industrial applications such as offshore environments or process critical areas.

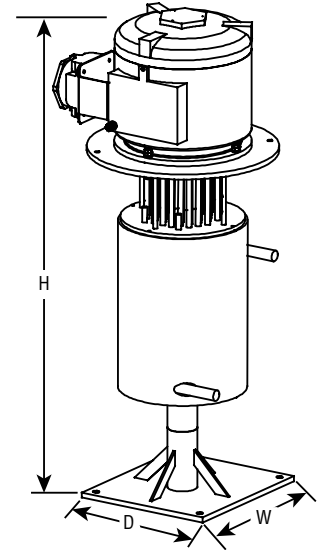
The heavy-wall piping is rated by ASME and PED for continuous high pressure usage, while the butt-weld connections will help provide a sealed process environment. A uniquely designed heat transfer configuration ensures maximum element longevity, even in tough applications. Heat transfer is provided by long-life, high temperature rated INCOLOY 800 heating elements.

The hazardous rated enclosure is certified by both IEC and ATEX for Group II, Zone 1 environments.

CCX High Pressure Circulation Heater (cont'd.)



E4 Moisture Resistant Housing



E2 Hazardous Area Housing

Options

- Hazardous Rated Certified by ATEX & IECex
- 7500 psi (517 bar) Construction
- 1" 316 Stainless Process Piping (specify 3500 or 7500 psi design)
- Electropolished Process Piping
- Exterior Insulation with 316 Stainless Jack-eting
- RTD Temperature Sensors
- Extended Voltage Capability (up to 690 V)
- 2500# 316SS ANSI flanged connections (specify 3/4" or 1" size, for 3500 psi design only)
- 316 Stainless Steel Heating Elements
- Bracket for Wall or Horizontal Mounting
- Vertical Lifting Eyes
- Anti-Condensation Heater for Terminal Enclosure

Model Proportions

Units	Design Pressure	Temp Rating (T3)	Weight	Width	Depth*	Height	Inlet/Outlet Connections	Piping Volume
Imperial	3500/7500 psi	392°F	550 lbs.	18-1/2"	14"	50-3/8"	3/4" ANSI	36.5 in ³
Metric	241/517 bar	200°C	250 kg	47 cm	35.6 cm	128 cm	3/4" ANSI	598 cm ³

* For wall/horizontal mounting bracket, depth will increase to 18-1/4" (46.4 cm)

Standard Features

Seamless, 316 Stainless Steel Piping Corrosion Resistant, ASME/PED rated 3500 psi (241 bar)
 Moisture Resistant Terminal Enclosure CE & ATEX rated Rated for IEC Zone 2, safe area
 Multiple Sensors Provides both process and overtemperature monitoring
 Marine Grade Aluminum Casting External corrosion resistance for harsh environments
 Butt-Weld Connections Welded, sealed connections minimize potential leakage
 Heavy-Wall INCOLOY 800 Elements High-temperature, corrosion resistant offering
 Compact Footprint Space saving design
 Floor Mounting Plate Pre-drilled mounting plate for easy installation
 Integrated Heat Distribution Stringent temperature control of film interface

Benefits

CCX High Pressure Circulation Heater (cont'd.)

Ordering Information

To Order — Complete the Model Number using the Matrix provided.

Model Description Table

CCX Cast Circulation Exchanger									
Code		Pressure Designation							
SD		Standard Duty -3500 psi (241 bar)							
XD		Xtreme Duty - 7500 psi (517 bar)							
CD		Special Pressure / Temperature Design							
Code		Element Sheath Material							
I		INCOLOY							
S		Stainless Steel							
X		Other Material							
Code		Wattage							
-30P-		30.0 kW (use actual kilowatt in two digits)							
Code		Terminal Housing Style							
E4		Moisture Resistant							
E2		Explosion / Moisture Resistant							
Code		Non-Standard Feature							
(Blank)		Standard Item							
XX		Custom Feature							
Code		Voltage							
208	208V	240	240V	380	380V	415	415V	480	480V
415	415V	480	480V	575	575V				
Code		Number of circuits							
1	One	1	One						
2	Two	2	Two						
Code		Phase							
1P	Single Phase								
3P	Three Phase								
Code		Kilowatts							
30	kW								
CCX-	SD	S	-30P	-E2	415V	1	-3P	30	Typical Model

Note: Shaded sections of the model build table are not a finite list. Items such as Number of Elements, Wattage, Voltage, Circuits, and Phase should be adjusted to match design.

Notes on installation area and operating conditions

The CCX unit with E4 terminal housing is rated for safe area, ATEX category 3 (Zone 2).

The hazardous location option (E2) is certified to operate per IEC Certificate No. IECEx ITS 15.0018X and ATEX Certificate Number ITS14ATEX18050X and is rated for II 2G Exde IIC T3 or T3Gb in ambient conditions of -20°C to +40°C or +60°C. Refer to certificate for complete details.

The pressure rating is certified by ASME, Sect VIII, Division 1. PED certification will be by SEP (Sound Engineering Practice).

All CCX units are designed for a maximum rating of T3 (392°F / 200°C) at either 3500 psi (241 bar) or 7500 psi (517 bar).

Circulation Heater Systems

Pre-engineered Packaged Units

- Skid Mounted, Prewired Packaged Unit
- Carbon Steel or Stainless Steel Pipe Body, 150 Lb Construction
- 30 - 2,000 kW
- Standard and Special Voltages
- General Purpose, Moisture Resistant Terminal, Moisture Resistant/Explosion Proof Enclosure
- Copper, Steel, Stainless Steel, INCOLOY® or INCONEL® Sheath Elements (45, 23 or 15 W/In²)
- Solid State (SCR) Control Panels, Standard



Heater vessel designed for Class 150 pressure-temperature rating. ASME certification and higher temperature and pressure ratings available.

mineralized or de-ionized water and corrosive fluids. Carbon steel is used for heating oils.

Flanged Immersion Heaters — Heater assemblies are easily removed for periodic cleaning and inspection.

Heater Vessels — Available in a range of sizes and materials to meet most kilowatt and corrosion resistance requirements.

Horizontal or Vertical Mounted Heater Vessel — Pre-assembled packages oriented to fit within the space limitations of the system.

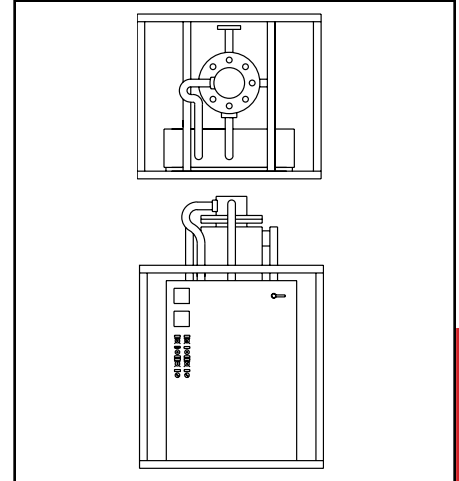
Skid Mounted Construction — Heavy gauge metal skid with heater vessel and control panel securely attached to frame supports. Lifting lugs are provided for easy handling.

Solid State Control Panels — Standard SCR power controller provides a higher degree of process control than mechanical means, matching the heater output to various flow and temperature demands.

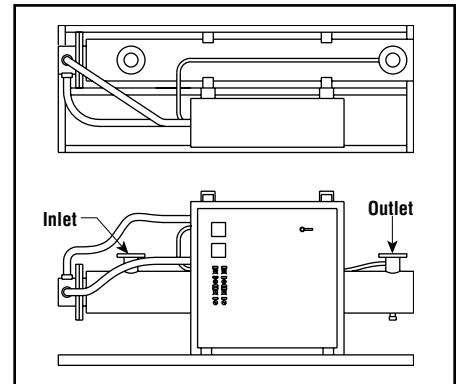
Control Panels — Integral or remote mounted control panels with electronic controls and solid state (SCR) or contactor power controllers can be provided using virtually any combination of control devices. Consult the Controls Section for details.

For detailed information on ratings and dimensions, consult your Local Chromalox Sales office.

Vertical Mount



Horizontal Mount



Applications

Compact Packaged Heaters — Automatically controlled heating of any flowing media including water, oil, heat transfer solutions, steam, air or other gases for booster, in-line or side-arm applications.

Features

Kilowatt Selection — Package units available from 30 - 2,000 kW. Units can be connected in series or one large unit can be provided for higher wattages (see Table).

Terminal and Control Enclosures — Standard construction of terminal enclosures and control panels is NEMA 1 E1 General Purpose. NEMA 12 control enclosures and Moisture Resistant E4 terminal enclosures are available as assembly stock. Contact your Local Chromalox Sales office for Explosion Proof and Moisture Resistant E2 and control enclosures.

Elements — 0.475" Dia. elements provide superior strength and rigidity. Chromalox elements utilize high quality resistance wire for coil construction. Copper is used for heating water. INCOLOY® for heating steam, gas, de-

STEAM, AIR AND GAS

Kilowatt Selection

kW @ Approx. W/In ²			Heater Vessel Pipe Size
45	23	15	
30	15	10	5
45	20	15	5
60	30	20	5
75	35	25	5
90	45	30	5
80	40	30	8
120	60	40	8
160	80	55	8
200	100	70	8
240	125	80	8
90	45	30	10
135	70	45	10
180	90	60	10
235	120	40	10
270	140	90	10
120	60	40	12
180	90	60	12
240	125	80	12
330	170	110	12
360	185	120	12
180	90	60	14
270	140	90	14
360	185	120	14
450	230	150	14
540	275	180	14
300	155	100	16
450	230	150	16
600	305	200	16

Circulation Heater Systems

ASME & Custom Engineered Units

- **ASME Certification to Section I, III, IV and VIII, Div. 1 PED**
- **Custom Vessel Designs and Configurations Per Customer Specifications**
- **Custom Designed Mechanical and Solid State Controls and Control Panels**
- **Variety of Vessel Materials Available Including Carbon Steel and 300 Series Stainless Steels**
- **Standard and Special Kilowatt Ratings**
- **Standard and Special Voltages**
- **NEMA 1, 4, 7 & 12 Control Panels and E1, E2 and E4 Terminal Enclosures**
- **Third Party Certifications Available on Many Units**

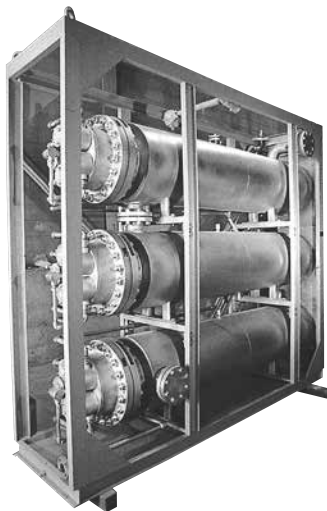
Applications

Customer Specifications — Chromalox satisfies many customer requirements using existing stock sub-components from our extensive inventory. However, when an application calls for a heater other than a catalog item, stock or assembled stock design, Chromalox has many special features and variations that can be added to circulation heaters to meet special customer requirements.



Features

Kilowatt Selections — Custom units can produce the required kilowatt ratings with element watt densities carefully selected for the specific media.



Vessel Pressure-Temperature Ratings — Non-ASME and ASME ratings to 2500 Lbs and operating temperatures to 1500°F are available. Low temperature and cryogenic designs and ratings are also available.

Series Mounted System

Voltage Ratings — Standard and special voltages up to 600 volts.

Electronic Controls and Control Panels — Electronic controls and panels for process and overtemperature control are available mounted on the units or as remote units.

Process Thermocouples and Sensors — Thermocouples or RTD sensors can be mounted in vessel nozzles.

Overheat Thermocouples on Sheath — Thermocouples can be mounted on the element sheath(s) to sense sheath temperature and protect the heater.

High Temperature Standoffs for Terminal Enclosures — Terminal enclosures on high temperature heaters can be mounted with standoffs to reduce enclosure temperatures.

Mounting Lugs or Mounting Saddles — Special mounting lugs or mounting configurations are available. Mounting saddles are provided with slotted mounting holes to allow for expansion.

Flanges, Fittings, Nozzles and Nozzle Orientation — Special nozzles, nozzle flanges and nozzle orientation can be designed to meet virtually any customer requirement.

Distributed Wattage Elements — Help control vessel wall temperatures on high temperature gas circulation heaters.

Control Panels — Integral or remote mounted control panels with electronic controls and solid state (SCR) or contactor power controllers can be provided using virtually any combination of control devices. Consult the Controls Section for details.

Ordering Information — Selection and design of a custom or ASME circulation heater system requires critical engineering judgment. Chromalox representatives can help you determine the correct specifications for your application. To properly design your entire system you should clearly define the following:

The following forms PE306 or PE307 can be used to help specify the correct circulation heater system for your application.

For further assistance in specifying and detailing your requirements, consult your Local Chromalox Sales office.



Heater Systems

ASME & Custom Engineering Specifications

Customer Specifications
ASME Heater

Date _____ Prepared By _____

Customer Name _____ Sales Engineer _____

Location _____ Order/Inquiry No. _____

1. Medium Being Heated _____

Temperature: From (*specify units*) _____ To (*specify units*) _____

Sp. Ht. _____ Viscosity _____ @ _____ (*specify units*)

Lethal Substance¹ Yes No

Minimum Flow Rate _____ (*specify units*)

Maximum Flow Rate _____ (*specify units*)

Max. Pressure: Operating (*specify units*) _____

Design Pressure (*specify units*) _____

Max. Temperature: Operating (*specify units*) _____

Design Temp. Max. (*specify units*) _____ Min. _____

Corrosion Allowance (Standard is .0005" inches) _____

2. Heater Construction - Model No. _____

Nominal Vessel Size (NPS) 3" 5" 8" 10" 12" 14" 16" 18" Other _____

Pressure Rating _____ Lb. Construction (150, 300, 400, etc.)²

Vessel Materials _____ (Carbon Steel, Stainless, etc.)²

Element Materials _____ (Copper, Steel, Stainless, INCOLOY®)²

Inlet & Outlet Size (NPS) _____ NPT or Flanged _____

Terminal Enclosure _____ E1, E2, E3, E4, E6

Mounting Position _____ (Vertical or Horizontal)

Insulation Jacket _____ (Standard, Weather Resistant, None)

ASME Code Section _____ (I, IV, VIII)²

Circulation Type _____ (Baffled or Non-Baffled)

3. Electrical Data: kW _____ Voltage _____ Phase _____ No. of Circuits _____

Watt Density² _____ Overheat Protection _____

4. Temperature Control Requirements _____

5. Remarks (Other Requirements) _____

Note —

1. By "lethal substances" are meant poisonous gases or liquids of such a nature that a very small amount of the gas or of the vapor of the liquid mixed or unmixed with air is dangerous to life when inhaled. For purposes of this design, this class includes substances of this nature which are stored under pressure or may generate a pressure if stored in a closed vessel.
2. Design parameters may be specified but factory engineers will advise if design calculations or code requirements suggest a better choice.

Form PE306-5

CUSTOM
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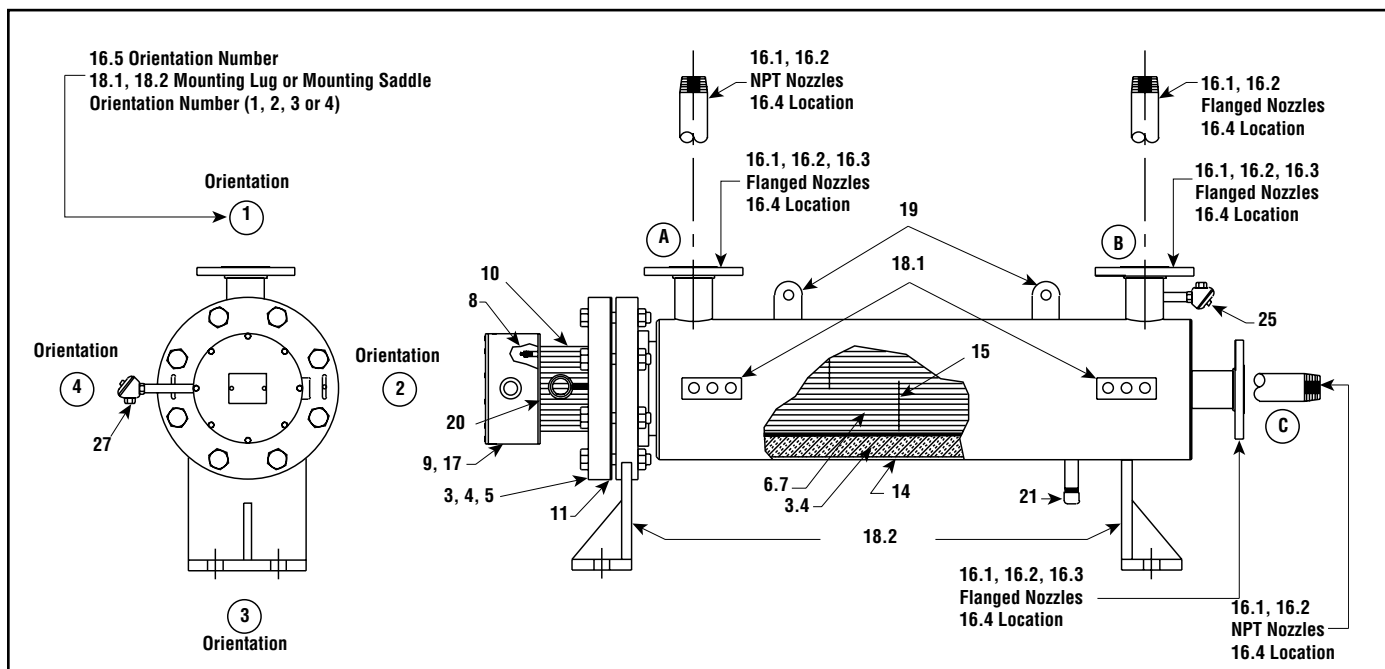
Circulation Heater Systems

ASME & Custom Engineering Specifications *(cont'd.)*

Form PE307

Customer Name: _____ Reference: _____ Date: _____

Page 1 of 2



Note — Drawing is for Illustration Purposes Only. The flange size, number of heating elements, terminal enclosure configuration etc., will vary according to options selected.

Operating Conditions				4. FLANGE AND VESSEL MATERIAL:			
1. HEATED MEDIUM:				<input type="checkbox"/> Carbon Steel		<input type="checkbox"/> Carbon Steel-Galvanized	
2. TEMPERATURE IN:		°F	TEMPERATURE OUT:		°F	<input type="checkbox"/> 304 Stainless Steel	
3. FLOW RATE:		SCFM or	GPM or		5. FLANGE RATING: <input type="checkbox"/> Class 150 <input type="checkbox"/> Class 300 <input type="checkbox"/> Other <i>(Specify)</i>		
		Lbs/Hr or	<input type="checkbox"/> Other <i>(Specify)</i>		6. HEATING ELEMENT WATT DENSITY: <input type="checkbox"/> 6.5 W/In ² <input type="checkbox"/> 15 W/In ²		
4. OPERATING PRESSURE:		psig.		<input type="checkbox"/> 23 W/In ² <input type="checkbox"/> 45 W/In ² <input type="checkbox"/> Other <i>(Specify)</i>		7. HEATING ELEMENT SHEATH MATERIAL:	
5. DESIGN TEMPERATURE:		°F Max.		°F Min.		<input type="checkbox"/> Steel <input type="checkbox"/> Copper <input type="checkbox"/> 304 Stainless Steel	
6. DESIGN PRESSURE:		psig.		<input type="checkbox"/> 316 Stainless Steel		<input type="checkbox"/> INCOLOY®	
7.		<input type="checkbox"/> Indoor <input type="checkbox"/> Outdoor		<input type="checkbox"/> Other <i>(Specify)</i>		8. TERMINAL SEALS: <input type="checkbox"/> Yes <input type="checkbox"/> No	
8. HAZARDOUS AREA ENVIRONMENT:				<input type="checkbox"/> Silicone Resin (450°F)		<input type="checkbox"/> Silicone Fluid (500°F)	
Class	Div.	Group		<input type="checkbox"/> RTV (450°F)		<input type="checkbox"/> Epoxy (250°F)	
9. AMBIENT TEMPERATURE:				<input type="checkbox"/> Hermetic (Maximum 1000°F Sheath Temperature)		<input type="checkbox"/> Other <i>(Specify)</i>	
°F				<input type="checkbox"/> Other <i>(Specify)</i>		9. TERMINAL ENCLOSURE: <input type="checkbox"/> General Purpose	
Heater Specifications (Check All That Apply)				<input type="checkbox"/> Moisture Resistant		<input type="checkbox"/> Explosion Proof	
1. RATING:				<input type="checkbox"/> 4" <input type="checkbox"/> 6" <input type="checkbox"/> Other <i>(Specify)</i>		10. TERMINAL ENCLOSURE STANDOFFS: <input type="checkbox"/> Yes <input type="checkbox"/> No	
Volts	Phase	Kilowatts		<input type="checkbox"/> 4" <input type="checkbox"/> 6" <input type="checkbox"/> Other <i>(Specify)</i>		11. BODY FLANGE GASKET:	
2. NUMBER OF ELECTRICAL CIRCUITS: <input type="checkbox"/> Standard				<input type="checkbox"/> Standard		<input type="checkbox"/> Standard <input type="checkbox"/> Spiral Wound <input type="checkbox"/> Other <i>(Specify)</i>	
<input type="checkbox"/> Other: No. of Circuits				kW/Circuit			
3. NOMINAL FLANGE & VESSEL SIZE/NO. HEATING ELEMENTS:							
<input type="checkbox"/> 3"/3	<input type="checkbox"/> 6"/12	<input type="checkbox"/> 8"/18					
<input type="checkbox"/> 10"/27	<input type="checkbox"/> 12"/36	<input type="checkbox"/> 14"/45					
<input type="checkbox"/> 16"/72	<input type="checkbox"/> 18"/108	<input type="checkbox"/> Other <i>(Specify)</i>					

Circulation Heater Systems

ASME & Custom Engineering Specifications *(cont'd.)*

Form PE307

Page 2 of 2

Customer Name: _____ Reference: _____ Date: _____

Heater Specifications *(Check All That Apply)*

12. ASME DESIGN and CERTIFIED: <input type="checkbox"/> Yes Section _____					23. ELECTRONIC PROCESS TEMPERATURE CONTROL MOUNTED ON HEATER: <input type="checkbox"/> Yes <input type="checkbox"/> No a) <input type="checkbox"/> General Purpose <input type="checkbox"/> Moisture Resistant <input type="checkbox"/> Explosion Proof					
13. ELECTRICAL CODES: National Electrical Code <i>(Standard)</i> <input type="checkbox"/> UL Listed <input type="checkbox"/> CSA Certified <input type="checkbox"/> Other <i>(Specify)</i> _____					24. MECHANICAL PROCESS TEMPERATURE HIGH LIMIT PROTECTION CONTROL MOUNTED ON HEATER: <input type="checkbox"/> Yes <input type="checkbox"/> No a) <input type="checkbox"/> General Purpose <input type="checkbox"/> Moisture Resistant <input type="checkbox"/> Explosion Proof b) Temperature Range (°F) <input type="checkbox"/> 0 - 100 <input type="checkbox"/> 60 - 250 <input type="checkbox"/> 200 - 550 <input type="checkbox"/> 300 - 700					
14. THERMAL INSULATION: <input type="checkbox"/> None <input type="checkbox"/> Standard <input type="checkbox"/> High Temperature <input type="checkbox"/> Weatherproof Jacket					25. PROCESS THERMOCOUPLE IN OUTLET: a) <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Type J <input type="checkbox"/> Type K b) With Separate Terminal Box <input type="checkbox"/> None <input type="checkbox"/> General Purpose <input type="checkbox"/> Moisture Resistant <input type="checkbox"/> Explosion Proof					
15. CIRCULATION: <input type="checkbox"/> Unbaffled <input type="checkbox"/> Baffled										
16. NOZZLE SIZE, TYPE and ORIENTATION: <input type="checkbox"/> No Standard or as Indicated Below					26. ELECTRONIC HIGH LIMIT PROTECTION CONTROL MOUNTED ON HEATER: <input type="checkbox"/> Yes <input type="checkbox"/> No a) <input type="checkbox"/> General Purpose <input type="checkbox"/> Moisture Resistant <input type="checkbox"/> Explosion Proof					
Nozzles	1. Size	2. Type	3. Rating	4. Location						5. Orientation
Inlet										
Outlet										
Notes: 16.1 Size is Nominal 16.2 Type is NPT threaded or raised Face Flange 16.3 Rating is 150 Lb. 300 Lb. etc. if Flanged 16.4 Location is A, B or C (from Figure) 16.5 Orientation is 1, 2, 3 or 4 (from Figure)					27. OVERHEAT THERMOCOUPLE ON HEATING ELEMENT SHEATH: a) <input type="checkbox"/> None <input type="checkbox"/> Type J <input type="checkbox"/> Type K b) With Separate Terminal Box <input type="checkbox"/> None <input type="checkbox"/> General Purpose <input type="checkbox"/> Moisture Resistant <input type="checkbox"/> Explosion Proof					
17. MOUNTING POSITION: <input type="checkbox"/> Vertical-Terminal Box <input type="checkbox"/> Up <input type="checkbox"/> Down <input type="checkbox"/> Horizontal										
18. MOUNTING METHOD: <input type="checkbox"/> Standard or as Indicated Below 18.1 <input type="checkbox"/> Mounting Lugs-Orientation Number 18.2 <input type="checkbox"/> Mounting Saddles-Orientation Number Notes: Orientation Number is 1, 2, 3 or 4 (from Figure)					28. SKID MOUNTED CIRCULATION HEATER SYSTEM COMPLETE WITH CONTROL PANEL WIRED TO HEATER: a) <input type="checkbox"/> Yes <input type="checkbox"/> No b) <input type="checkbox"/> Vertical Orientation <input type="checkbox"/> Horizontal Orientation c) Control Panel <i>(Attach Detail Requirements)</i>					
19. LIFTING LUGS on HEATER PIPE BODY: <input type="checkbox"/> Yes <input type="checkbox"/> No 20. LIFTING LUGS on HEATER FLANGE: <input type="checkbox"/> Yes <input type="checkbox"/> No 21. DRAIN PIPE-3/4" NPT: <input type="checkbox"/> Yes (Horizontal Mount) <input type="checkbox"/> No										
22. MECHANICAL PROCESS TEMPERATURE CONTROL MOUNTED ON HEATER: <input type="checkbox"/> Yes <input type="checkbox"/> No a) <input type="checkbox"/> General Purpose <input type="checkbox"/> Moisture Resistant <input type="checkbox"/> Explosion Proof b) Temperature Range (°F) <input type="checkbox"/> 0 - 100 <input type="checkbox"/> 60 - 250 <input type="checkbox"/> 200 - 500 <input type="checkbox"/> 300 - 700 <input type="checkbox"/> Other <i>(Specify)</i> _____					29. Other SPECIAL FEATURES: 30. MODEL NUMBER: _____ _____ _____					

**CUSTOM
ENGINEERING**

Circulation Heater Systems

Custom Engineering
& Manufacturing



Chromalox has the engineering and manufacturing capability to provide complete circulation heater systems for most process heating applications. These systems are engineered for the specific requirements of kilowatts, flow rate, fluid velocity, pressure, temperature and space limitations of each application.

Experienced ASME certified welders ensure the structural integrity of large pressure vessel circulation heater.

If standard products and options do not fit your requirement, contact your local Chromalox Sales office for further technical assistance.

Custom engineered circulation heaters are skid mounted for easy installation, and supplied with an integral control panel.

The heaters and control panel are rigidly mounted on a sturdy metal frame. Control sensing devices are pre-wired to the heater. The only installation required is to connect the piping system to the heater inlet and outlet and wire the power connection to the control panel.

Electrical enclosures are available for indoor, outdoor and hazardous areas.

Chromalox circulation heater systems can include complete Control Panels, integrally mounted or separate, to greatly reduce the time spent installing and starting up the application. By pre-engineering systems with all the correct components, including sophisticated temperature and power controllers optimum performance is enhanced while guess work is minimized.

A wide variety of solid state and electro-mechanical controls can be found in the Controls section of this catalog.

These Control panels maintain process temperatures and can provide high limit control. On-off or proportioning type solid state controls complete with stepdown transformer, line fusing, pilot lights, contactors or SCR's, and cooling fan as necessary are pre-wired and mounted in an enclosure. Outdoor hazardous area enclosures are also available.

