CHROMALOX
Advanced Thermal Technologies

Industrial Heaters & Systems

Heat Trace

Component Technologies

PRODUCTS AND SOLUTIONS ENGINEERED FOR THE WORLD'S TOUGHEST INDUSTRIAL HEATING APPLICATIONS

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INTRODUCTION

Chromalox Has the Electric Heating and Control Technologies for Your Applications

Our High-Quality Systems Are Used Across a Broad Spectrum of Industries

With the broadest product line in the industry, Chromalox provides heat and control systems for more processes than anyone in the world. We meet the needs of industries as diverse as transportation, pharmaceuticals, chemical processing, oil and gas exploration, power generation, and the military. Chromalox systems and components have earned more third-party approvals than any other company—from ISO 9001, UL, CSA, FM, and ATEX, to CE and ASME.

Our Stock and Delivery Capabilities Keep Your Operation Up and Running

Chromalox maintains an inventory of nearly one million items. We also operate the fastest delivery system in the business. We can ship any component or system we stock within 24 hours through our electronic direct order entry system at www.chromalox.com. Orders entered in our website by 4:00 P.M. CT can be shipped the same day. In addition, factory offices, stocking representatives, and over 2,000 authorized distributors carry Chromalox systems and components for same-day pickup.

Local Technical Support Helps You Get the Job Done

We don't just provide products. We provide support. The industry's largest and most experienced group of engineers is right there in the field with you. The majority of our 300+ field sales representatives are degreed engineers, and all are experienced with all Chromalox heating products and applications. Our innovative design engineers are ready to work with your local Chromalox representative to custom-build a precision heating and control system for any application need you have.

Chromalox Service Solutions Help Ensure Optimum Performance and Extended Product Life

As the world's most comprehensive manufacturer of electric heat and control products, Chromalox offers customized service solutions ranging from startup and training, to ongoing maintenance diagnostics, to emergency response. As the designer and manufacturer, we have complete knowledge of your product. We know your systems from the component parts on up.

Chemicals

FPSO & Offshore Platforms

Water & Wastewater Treatment

Pharmaceutical

Marine

Onshore Drilling

INDUSTRIAL HEATERS AND SYSTEMS

No matter how extreme, corrosive, or hazardous your process and environmental conditions are, we excel at bringing our vast array of heater products and systems as solutions to your most difficult industrial process heating problem. We are devoted to providing you with the most cost-effective heat and control solution for your application. We have a virtually unlimited selection of heaters, controls, and configurations to ensure that you get the exact equipment needed for your process and application.

Process Heaters

Heat processing applications vary widely from industry to industry. Chromalox has a process heating solution for nearly every application: immersion heaters that can apply heat at virtually 100% efficiency to water, oils, viscous materials, solvents, and gases; circulation heaters that are designed to heat a flowing medium using in-line or side-arm piping configurations; process air heaters that can apply heat not only by electrically heated air, but even special atmospheres such as argon or nitrogen; and process radiant air heaters that transfer energy through space, without the presence of a medium, for maximum efficiency.

Circulation Heaters

Chromalox circulation heaters are packaged units consisting of a screwplug or flanged immersion heater mounted in a thermally insulated heating chamber for efficient heating of a flowing medium by in-line or side-arm operation. Thermocouple sensors can be provided to connect to most any controller. Select from many terminal enclosures, sheath and vessel materials, flanged connections, and controls. Chromalox offers optional ASME, PED, KOSHA, and SELO certification. Many models in stock.

- Pressure rating: Up to 5,000 psi (34.5 MPa)
- Maximum temperature: Up to 1,400°F (760°C)
- Power ratings: Up to 5,000 kW (17,061 kBTU)

Immersion Heaters - Flanged

Ideal for generating steam and heating gases and liquids in pressure vessels and tanks, flanged immersion heaters are hairpin-bent tubular elements welded or brazed into a flange and provided with electrical enclosures. Chromalox flanged immersion heaters are available in a wide selection of flange sizes and with a variety of electrical enclosures. Most units are UL-listed and CSA-certified or can have ATEX certification. ASME or PED code construction is also available for high-pressure applications. Chromalox can also rebuild large flanged heaters to save you money. Many models in stock.

- Length: Up to 25 ft (7.5 m)
- Power ratings: Up to 5,000 kW (17,061 kBTU)
- Flange material: Brass, steel, or stainless steel
- Sheath material: Copper, steel, stainless steel, or INCOLOY*

Immersion Heaters - Screw Plug

Screw plug immersion heaters consist of tubular elements in a threaded hex plug. Some models are provided with a thermowell for the temperature control sensor and a variety of electrical enclosures for electrical connections. They screw directly through threaded openings in tank walls to heat liquids, viscous fluids, forced air, and gases by direct contact. A patented 360° rotatable housing is available on most models to facilitate easy conduit connections. Many models in stock.

- Screw plug size: ½, ¾, 1, 1¼, 2, and 2½ in. NPT
- Power ratings: Up to 40 kW (136 kBTU)
- Screw plug material: Brass, steel, or stainless steel
- Sheath material: Copper, steel, stainless steel, or INCOLOY*

*INCOLOY is a registered trademark of Huntington Alloys Corporation, Huntington, West Virginia.

Immersion Heaters - Over-the-Side

Over-the-side immersion heaters are designed for installation in the top of the tank with the heated portion directly immersed along the side or at the bottom. They take up little space, eliminate the need for tank penetrations, are easily removed for service, and provide ample working space inside the tank. Custom-configured elements evenly distribute heat by direct contact in numerous applications, including acid and alkali solutions. Many models in stock.

- Heating element material: Copper, steel, stainless steel, cast iron, INCOLOY*, titanium, Teflon* (fluoropolymer), quartz, and ceramic
- Mounting configurations: L-shaped, side/top mount, and deep-tank installation
- Power ratings: Up to 200 kW (682 kBTU)

Storage Tank Heaters

Chromalox offers uniquely designed electric heating systems for storage tanks. The systems can be installed in above- or below-ground tanks made of steel, concrete, or fiberglass. Several feature a unique replaceable-element design whereby the heating elements can be removed and replaced without draining the tank. Very little upkeep is required, making them practically maintenance-free. When combined with temperature controls, power controls, and safety monitoring they provide complete tank heating systems.

- Length: Up to 40 ft (12 m)
- Power ratings: Up to 240 kW (819 kBTU)
- Voltages: 208 to 600 V, 1 or 3 phase
- Maximum temperature: Up to 750°F (399°C)

Process Air Heaters

Process air heaters in stock and custom designs are employed in heating air or other gases in ducts, autoclaves, or ovens. Sheathed tubular, finned tubular, and finned strip elements consistently outperform gas, oil, and open-coil electric units in both heating efficiency and safety. Elements are available separately for use in OEM equipment. Special materials and custom designs are available for marine applications, power plants, or hazardous applications.

- Maximum temperature: 1,200°F (650°C)
- Power ratings: Up to 3,200 kW (10,919 kBTU)
- Voltage: Up to 600 V

Process Radiant Air Heaters

Process radiant heaters include a large selection of elements, fixtures, and panels for the best solution where heated process air or direct contact is impossible, impractical, or undesirable. Drying, curing, preheating, shrinking, and thermoforming are frequent applications. Chromalox sensors and controls are available to provide single-source heating systems suited to your application.

- Watt densities: Up to 5.76 kW/ft² (61.5 kW/m²)
- Element source temperatures: Up to 4,000°F (2,200°C)
- Heating element and panel materials available: INCOLOY*, Quartz, and ceramic

*INCOLOY is a registered trademark of Huntington Alloys Corporation, Huntington, West Virginia.
Teflon is a registered trademark of E. I. Du Pont de Nemours and Company Corporation, Wilmington, Delaware.

Industrial Air and Radiant Heaters

A number of Chromalox heaters are designed and constructed for non-hazardous industrial applications where freeze protection or comfort heat is desired: quiet, reliable, wall- or ceiling-mounted, self-contained blower heaters; fan-forced air washdown heaters ideal for use in corrosive environments; and convection and radiant air heaters that run quietly and virtually maintenance-free because they have no fan or motor.

General-Purpose Industrial Fan-Forced Air Heaters

Heavy-gauge-steel, fan-forced air heaters trimmed in a polyester powder coat come in horizontal or vertical configurations that can be ceiling- and wall-mounted. Adjustable louvers direct airflow. Most Chromalox general-purpose fan-forced air heaters meet UL, CSA, NEC, CE, and OSHA requirements. Various built-in control options are available.

- Power ratings: 2.6 to 50 kW (8.9 to 170.6 kBTU)
- Voltages: 208 to 600 V, 1 or 3 phase

General-Purpose Industrial Convection Air Heaters

General-purpose convection air heaters are designed to be wall-mounted in isolated areas, crane cabs, shop offices, and plants. These heavy-gauge-steel units are coated with a corrosion-resistant powder coating. Various models include thermostats and tamper-proof construction. Most models meet UL, CSA, NEC, CE, and OSHA requirements.

- Power ratings: 250 W to 5 kW (0.9 to 17 kBTU)
- Voltages: 120 to 600 V, 1 or 3 phase

Washdown and Corrosion-Resistant Fan-Forced Air Heaters

Washdown and corrosion-resistant fan-forced air heaters feature heavy-duty construction for use in wet, dirty, corrosive environments. Some models are available with NEMA 4X control enclosures and stainless steel construction to resist dirt contamination and chemical attack, and can be hosed down. Most models meet UL, CSA, NEC, CE, and OSHA requirements.

- Power ratings: 2 to 50 kW (6.8 to 171 kBTU)
- Voltages: 120 to 600 V, 1 or 3 phase

Hazardous-Location Fan-Forced and Convection Air Heaters

Hazardous-location fan-forced and convection air heaters are designed for rugged industrial use in the presence of potentially flammable or explosive gases, vapors, powdered metals, or dusts in locations such as sewage treatment plants, petroleum refineries, and chemical processing plants. Models can be mounted in various configurations and are available with numerous control options. Most models are available with cULus, ATEX, IECEx, and EAC certifications. Consult NEC Article 500 or IEC Standard 60079 for classification of your hazardous area before selecting your heater. XtremeDuty™ models are also available and feature washdown and low-temperature configurations.

- Power ratings: 1.6 to 35 kW (5 to 119 kBTU)
- Voltages: 120 to 690 V, 1 or 3 phase

Infrared Radiant Heaters

Radiant heaters provide virtually instantaneous, dependable heat for tough-to-heat areas. They are designed for fixed mounting and will maintain an isolated comfort level within a larger, cooler area. Heavy-duty, metal-sheathed elements resist impact and vibration and are ideal for high-abuse applications.

Chromalox also offers several accessories such as GFCI, tip-over switches, and cable kits. Fixed configurations meet UL and CSA standards and are UL listed.

- Power ratings: 500 W to 13.5 kW (2 to 46 kBTU)
- Voltages: 120 to 600 V, 1 or 3 phase

Portable Heaters

Clean, odor-free portable heaters are available in two forced-air designs. Both are constructed for heavy-duty service and can be easily moved to virtually any location where instant heat is required. Forced-air designs are ideal for worker comfort, drying and curing, thawing pipes and machinery, and where temporary, localized heat is necessary. Most models meet UL, CSA, NEC, CE, and OSHA requirements.

- Power ratings, forced air: 2 to 60 kW (7 to 205 kBTU)
- Voltages: 208, 240, 480, and 600 V, 1 or 3 phase

Packaged Skids

Many process lines are currently built using modular components referred to as skid packages. Chromalox can provide a complete framework with all associated components such as electric process heaters, SCR/thyristor and contactor power control systems, associated piping, valves, temperature measurement, sensors, instrumentation, PLC or DIN controllers, filtration, shell and tube heat exchangers, separators, and expansion or accumulator tanks.

Packaged Process Skids

Chromalox leverages its decades of experience with process heater engineering into full process control with packaged systems designed as plug-and-play units and engineered to provide temperature, pressure, filtration, and other process control of virtually any liquid or gas process streams.

Fuel Gas Conditioning

Unlike most fabricators and packagers who utilize purchased parts and basically assemble their systems, Chromalox manufacturing is vertically integrated to provide you with the best quality and performance fuel gas conditioning systems on the market. Our factories build the fuel gas conditioning systems from the ground up, guaranteeing quality materials and workmanship from the singular tubular heating element and power controllers, through the piping, pressure vessels, and instrumentation, all the way up to the completely integrated package.

Steam Superheaters

Chromalox steam superheating systems, coupled with SCR power control, provide instantaneous drying of process steam while using only the exact amount of power needed. This results in a steam supply that is both consistent in temperature and quality throughout the distribution lines. Power is instantly available, has no emissions, and is precisely controlled to only the demand needed. Materials of construction include carbon steel, stainless steel, as well as nickel and specialty alloys. SCR power control adjusts rapidly to flow variations. Controller schemes can regulate temperature to ±1°F (±1°C). Boilers, superheater, and power control panels can all be assembled on a modular skid package. All items are manufactured in-house for superior quality and rapid delivery. In-house element manufacturing allows the most efficient, space-saving design possible. All welding, pressure testing, and certification are performed in accordance with ASME standards. Chromalox power control can be fully integrated and skid-mounted with the heater for a complete package.

Heat Transfer Systems

Chromalox heat transfer systems are safe, versatile, user-friendly heating systems for process heating applications requiring closely controlled process temperatures. Pre-engineered and constructed with carefully matched components, these systems provide easy installation and trouble-free operation in the end-user's application.

Hot Oil and Water Systems

Chromalox hot oil and water systems are self-contained heating and cooling packages that provide direct or indirect process heating to temperatures of 750°F (400°C). These systems meet ASME codes and are pre-engineered to include temperature and power controls, expansion tanks, heat exchangers, pumps, valves, gauges, and all necessary piping. This eliminates component selection and assembly. Choose from oil or water temperature control systems for circulation in a closed-loop process.

- Power ratings: 9 to 5,000 kW (31 to 17,061 kBTU)
- Voltages: 208 to 600 V, 1 or 3 phase

Compact Hot Oil and Water Systems

Chromalox compact hot oil and water systems are fully equipped, portable packages capable of reaching operating temperatures of 550°F (290°C). Available in a wide variety of sizes, kW ratings, and voltages for many processes. Choose from the latest state-of-the-art solid-state controls. Many models in stock.

- Power ratings: 4 to 48 kW (14 to 164 kBTU)
- Voltages: 240, 480, and 600 V, 1 or 3 phase

Boilers and Steam Generators

Constructed to ASME, PED, KOSHA, or SELO code of carbon or stainless steel with fiberglass insulation, Chromalox boilers and steam generators are efficient energy management systems that provide low- or high-pressure hot water or steam for industrial processes and comfort heating. NPT or flanged connections are available. Optional transformers, water feed, and blowdown equipment are also available and in stock. Chromalox has the engineering expertise to design and manufacture large-capacity electric boilers to meet a variety of applications.

- Power ratings: 3 to 1,600 kW (10 to 5,459 kBTU)
- Voltages: 120 to 600 V, 1 or 3 phase
- Capacities: Up to 5,000 lb (2,275 kg) of steam/hr @ 250 psig (1 MPa)

Liquid Vaporizers

Chromalox horizontal electric vaporizers are designed for use with Dowtherm,* Therminol,* and other organic fluids to transfer heat at high temperatures and low pressures. They are pre-engineered, pre-wired, and pre-piped packages designed for flexible, dependable, and efficient operation. All units are ASME-certified to 150 psi (1 MPa) at 750°F (400°C) with 300 lb construction throughout. Seal-welded element design eliminates leaks and improves serviceability on the heater. Units available with over-pressure, process, remote, or skid-mounted controls. Optional NEMA weather and explosion-resistant enclosures are also available.

- Power ratings: 15 to 1,500 kW (51 to 5,118 kBTU)
- Voltages: 208 to 600 V, 1 or 3 phase

Impedance Heating Systems

Impedance heating employs the "Joule Effect" to produce and directly transfer heat from the entire circumference and length of pipe to the material being heated. It can be used for proper temperature maintenance as well as to raise fluid temperature. Utilizing the pipe itself and minimum equipment, installation is simple. Temperature control is highly accurate—to within ±1°F (±1°C)—and higher watt densities—up to 190 W/in.² (30 W/cm²)—can be used due to increased velocities with lower pressure drops.

- Power ratings: 1 kW to several MW (3 kBTU to several MBTU)
- Voltages: <50 V (after transformer step-down of 480 or 600 V)
- Temperatures: Up to 2,000°F (1,090°C)

Load Banks and Air Temperature Control Systems

Load banks are used to provide precise energy control for loading dissipation needs. Units feature selectable control to 1 kW and provide such features as stainless steel construction, enclosed heating elements, NEMA 3R outdoor protection, and industrial motor and fan. Air temperature control systems—air handlers—provide durable, accurate temperature control for large-capacity, temporary heating applications. Welded steel construction, tubular elements, and industrial fans offer superior durability and performance under heavy use and in rough environments.

Load Bank Energy Dissipation Units

Used to provide precise energy control for loading dissipation needs, Chromalox load banks feature selectable control to 1 kW and provide such features as stainless steel construction, enclosed heating elements, NEMA 3R outdoor protection, and industrial motor/fan. Many options are available by request, such as dual voltage, multifunction digital readout, camlok connectors, or remote control. Applications include diesel generator testing, braking resistor for inverter drive, base loading, battery discharge, or uninterruptible power supply (UPS) testing.

- Power ratings: 100 to 1,000 kW (341 to 3,412 kBTU)
- Voltages: 240, 480, and 600 V, 1 or 3 phase
- Steps/load control resolution: 1 or 10 kW

Air Temperature Control Systems

Chromalox air temperature control systems provide durable, accurate temperature control for large-capacity, temporary heating applications. Welded steel construction, tubular elements, and industrial fans offer superior durability and performance under heavy use and in rough environments. Applications include temporary on-site comfort heat for large-capacity special events, interim comfort heating during commercial construction prior to permanent HVAC installation, and spot heating for personnel and freeze protection for equipment in the event of plant shutdowns.

- Heating capacity: 50, 100, and 150 kW (171, 341, and 512 kBTU)
- Voltage: 480 and 600 V, 3 phase, 60 Hz
- Fan output: 3,000, 5,000, and 7,000 SCFM (5,097, 8,495, and 11,893 m³/hr)

*Dowtherm is a registered trademark of the Dow Chemical Company, Midland, Michigan
Therminol is registered trademark of Monsanto Company, St. Louis, Missouri

Power Control Systems

Chromalox stocks more standard power control panels in more sizes and configurations than any other supplier. Every pre-engineered, ISO 9001:2008-approved panel is ready for installation, eliminating the hassle and time needed to select, obtain, and assemble components. Chromalox also produces custom power control panels tailored to your requirements in our ISO 9001- and UL 508-certified facility. They are engineered with solid-state controls and sized to virtually any application or specification.

Contactor Control Panels

Chromalox contactor control panels integrate temperature controllers, overtemperature controllers, customer inputs, and contactor power control into a complete package. This cost-effective design is excellent for more static applications such as tank heating. Chromalox offers both standard package sizes and custom units for unique applications. Panels can be rated for hazardous locations and carry UL and CSA certifications.

SCR Control Panels

Chromalox SCR control panels integrate temperature controllers, overtemperature controllers, customer inputs, and Chromalox SCR power control into a complete package. This precise power control allows process temperature to be controlled to ±1°F (±1°C). Chromalox offers both standard and custom units for unique applications. Panels can be rated for hazardous locations and carry UL and CSA certifications.

XtremeDuty Industrial Heaters and Systems

Chromalox® XtremeDuty™ products are designed, engineered, and manufactured to ensure reliable and durable heating in extreme environment or process condition. Our XtremeDuty technologies platform is borne out of decades of extensive application knowledge and successes with real-world applications. To ensure safety and reliability, our XtremeDuty products carry stringent third-party certifications, and pass performance and durability testing through our certified, in-house labs. Having been tested in the most extreme conditions, XtremeDuty heaters are proven to operate continuously, 24 hours a day, 7 days a week with virtually no maintenance required. They also perform at nearly 100 percent efficiency for their life span, ensuring superior performance for your operations.

XtremeDuty Fan-Forced Industrial Air Heater

The Chromalox fan-forced industrial air heater provides primary or supplementary heating for comfort or freeze protection for extreme environments in industrial settings such as onshore and offshore drilling platforms, pump houses, power generating stations, water and wastewater plants, chemical storage facilities, and pipeline metering stations, among others. CXH-XD enhancements include a corrosion-resistant coated heat exchanger, optional 316 stainless steel and epoxy-coated frames, and epoxy coatings for an IP66 control enclosure and motor. Its permanently lubricated, washdown, flame-proof motor provides maintenance-free operation. High-temperature safety cutouts protect the copper heating elements. Heavy-duty magnetic contactors and a low-voltage transformer simplify and hasten installation.

- Power ratings: 3 to 35 kW (10 to 119 kBTU)
- Voltage: 240 to 690 V, 3 phase
- IECEx, ATEX, EAC

XtremeDuty Immersion Tank Flange Heater

LTFX heaters provide low watt density heating over a large surface area while providing precise temperature control for such materials as fire water storage, asphalt, diesel, lube oils, ethanol, bio-diesel, glycerin, animal fats, vegetable oils, fuel oils, or similar types of liquids. Heating elements can be changed without draining the tank. This is ideal for large-capacity tanks that must remain filled for continuous operation and storage.

STFX heaters also feature a replaceable element design and are ideal for smaller, more compact, critical system storage units that need to remain filled for continuous operation and storage. They provide precise temperature control and comply with API-614 for use for such materials as lube oil, fire water storage, water solutions, asphalt, water/glycol, diesel, acidic solutions, ethanol, bio-diesel (B-100), glycerin, animal fats, vegetable oils, fuel oils or similar types of liquids.

XtremeDuty Circulation Heaters

Chromalox offers a number of circulation heaters designed for a variety of corrosive and pressure applications:

- Heating mildly corrosive solutions (pH5 to pH9) using stainless elements and a passivated stainless pipe body
- Heaters with INCOLOY* sheathed elements coupled with a passivated stainless steel pipe body provide long service life when heating highly corrosive solutions and sulfur laden oils
- Heaters with INCOLOY* sheathed elements and a stainless steel vessel enhance safe operation to a nearly 1,400°F (760°C) outlet gas temperature in air, gas, or steam superheating applications
- Fuel and oil heaters used in a variety of combustible solution applications
- ASME and PED dual-certified units that can heat at pressures up to 7,500 psi (517 bar) utilizing stainless steel construction with an IEC and ATEX hazardous-rated enclosure

*INCOLOY is a registered trademark of Huntington Alloys Corporation, Huntington, West Virginia

DirectConnect Industrial Heaters and Systems

Chromalox® DirectConnect™ systems bring a safe and reliable technical design for metal-sheathed electric process heating and power controls for heating systems operating at medium voltages (up to 7,200 V). These patented, DirectConnect medium-voltage electric heating systems capture all the advantages of electric process heat while offering significant cost savings over low-voltage, high-amperage designs. Aside from lower costs and clean operation, medium-voltage electric heating offers advantages such as:

- Lowered safety concerns (no open flames)
- Stable electricity prices
- Minimal maintenance
- Accurate temperature control

DirectConnect Process Heaters

Chromalox® DirectConnect™ process heaters utilize medium-voltage technology to drastically reduce installation, operation, and maintenance costs for large process heating demands. Medium-voltage systems are engineered to provide precise process temperature control and are designed to operate for many years in service at voltages up to 7,200 V. As with traditional low-voltage systems, DirectConnect immersion and circulation heaters can be adapted to suit virtually any liquid or gas application. Common applications include crude oil, natural gas, steam, heat transfer oil, hydraulic fluid, acidic solutions, potable and clean water, glycol solutions, hydrocarbons, industrial gases, hydrogen, oxygen, and superheated air.

DirectConnect Boilers

DirectConnect™ boilers merge the benefits of electric metal-sheathed-element steam boilers with the advantages of medium-voltage operation to enable much larger boiler capacity. Unlike large-capacity electrode boilers, which have a tendency to be difficult to operate, maintain, and repair, Chromalox® DirectConnect™ medium-voltage boilers are as robust and reliable as their low-voltage counterparts. They are marked by long-lasting, tough, and reliable metal-sheathed heating elements that are much more resilient with process variation, varying water quality, and power fluctuations. Combining those advantages with an electric boiler's variability, 99% efficiency (even at high turn-downs), zero emissions, and point-of-use capability, a Direct-Connect medium-voltage boiler from Chromalox is a fantastic steam solution for every industry.

DirectConnect Heat Transfer Systems

As with traditional low-voltage systems, DirectConnect™ heat transfer systems are custom designed specifically to operate with organic and synthetic heat transfer oils, water, and water/glycol mixtures. Common applications include:

- Jacketed tank heating of mixers, kettles, and storage tanks
- Roll heating of embossers, coaters, laminators, and calendars
- Press heating of platens, belt, and laminating presses, as well as compression molding
- Reactor temperature control
- Process heat exchangers

DirectConnect Control Panels

Chromalox® DirectConnect™ control systems allow for a traditional contactor on/off control scheme for medium-voltage process heaters, but is also able to provide full, 100 percent SCR power control at true medium voltage rated for continual operation. In addition, a hybrid approach is available that enables contactor control for the base load with an SCR trim option. This enables tight temperature control while managing costs. Finally, and most important, is our patent-pending auto dry-out feature that enables the DirectConnect process heating system to dry out the elements in place.

HEAT TRACE AND CONTROLS

Heat Trace Cable

The Chromalox heat trace cable line includes cables suitable for process maintenance, pipe and vessel freeze protection, and roof and gutter de-icing applications. With this wide variety of heat trace cables available Chromalox can design systems for the most demanding and complex applications while helping to reduce costs, increase sustainability, and decrease risk.

Self-Regulating Heat Trace Cable

Self-regulating heat trace cable for ordinary and hazardous environments prevents pipe freezing and maintains process temperatures. Constructed of a semiconductive polymer extruded between parallel buss wires, the self-regulating cable adjusts its output to independently respond to temperatures along its length. This heat trace cable can be single-layer overlapped. It is flexible and can be cut to length in the field. Self-regulating cable can be used in Division 1 and Division 2 hazardous areas.

- Circuit lengths: Up to 750 ft (280 m)
- Process maintenance temperature: Up to 302°F (150°C)
- Power ratings: 3, 5, 8, 10, 15, and 20 W/ft (10, 16, 26, 32, 48, and 65 W/m)
- Voltages: 120 and 208 to 277 V

Constant-Wattage Heat Trace Cable

Constant-wattage heat trace cable provides process temperature maintenance and freeze protection. Its rugged construction can tolerate exposure temperatures to 392°F (200°C). Fluoropolymer jackets are available for corrosive environments. Constant-wattage cable is flexible, can be cut to length in the field, and can be used in Division 2 hazardous areas.

- Circuit lengths: Up to 780 ft (238 m)
- Process maintenance temperature: Up to 350°F (175°C)
- Power ratings: 4, 8, and 12 W/ft (13, 26, and 39 W/m)
- Voltages: 120, 208 to 277, and 480 V

Mineral-Insulated Heat Trace Cable

Mineral-insulated heat trace cable is suitable for the most demanding heat trace applications. Its INCOLOY* sheath resists damage, is fire-resistant, and provides a reliable electrical ground. Chromalox mineral-insulated cable can be used in Division 1 and Division 2 hazardous areas.

- Circuit lengths: Up to 1,000 ft (305 m)
- Process maintenance temperature: Up to 1,100°F (593°C)
- Power ratings: 5 to 50 W/ft (16 to 162 W/m)
- Voltages: 120 to 600 V

Commercial Freeze Protection Heat Trace Cable

Chromalox commercial freeze protection heat trace cable is ideal for keeping metal and plastic pipes warm in commercial construction, institutional buildings, and some industrial freeze protection applications. It is constructed of a self-regulating polymer core that varies its output along its entire length, saving energy and eliminating hot spots along the pipe. Parallel construction makes it easier to install than zone or series types of cable since it can be cut to length at any point on the pipe. It can be single-overlapped without overheating the cable.

- Maximum circuit length: 660 ft (200 m)
- Power ratings: 3, 5, and 8 W/ft (10, 16, and 26 W/m)
- Voltages: 120 and 208 to 277 V

Hazardous-Area Heat Trace Cable

Chromalox HSRL and HSRM self-regulating heat trace cable provide safe, reliable heat tracing for freeze protection of pipes, valves, tanks, and similar applications. Constructed of industrial-grade 16 AWG buss wire with a tinned copper braid and fluoropolymer overjacket ensures operating integrity in Division 1 hazardous environments.

- Maximum maintenance temperature rating: 150°F (65°C) and 302°F (150°C)
- Maximum exposure temperature: 185°F (85°C) and 420°F (215°C)

*INCOLOY is a registered trademark of Huntington Alloys Corporation, Huntington, West Virginia

Series Resistance Long-Line Heat Trace Cable

Chromalox SLL heat trace cable provides safe, reliable process temperature maintenance and freeze protection of pipes, valves, tanks, and similar applications with circuit lengths up to 7,500 ft (2,286 m). Constructed of industrial-grade 16, 14, 12, or 10 AWG buss wire with metal braid and fluoropolymer overjacketing, SLL heat trace cable ensures operating integrity in most hostile industrial environments. The 450°F (232°C) maximum exposure temperature rating allows steam cleaning of process equipment with up to 300 psig steam.

- Maximum circuit lengths: Up to 7,500 ft (2,286 m)
- Power ratings: Up to 12 W/ft (39 W/m)
- Voltages: 120 to 600 V

Hot Water Maintenance Heat Trace Cable

Hot water temperature maintenance systems are designed to provide commercial buildings with immediate hot water at the tap without the use of a recirculation system, thus saving on unnecessary water waste. Systems are designed for maintaining desired nominal maintenance temperatures various temperatures used in showers, baths, kitchen, and laundry facilities. HWM cables replace heat lost through the thermal insulation on hot water supply piping to maintain the water at desired nominal temperatures without the need for costly insulated recirculation lines, pumps, and balancing valves. Chromalox offers a myriad of control solutions for these applications from pipe-mounted single-point systems to multi-point distributed systems.

- Circuit lengths: Up to 800 ft (244 m)
- Power ratings: 5 and 10 W/ft (16 and 32 W/m)
- Voltages: 120 and 208 to 277 V

Heat Trace Controls

Whether its 1 circuit or 10,000, Chromalox offers best-in-class engineered control solutions for industrial and commercial applications in ordinary or hazardous locations. Choose from industry leading thermostats, controllers, distribution systems or our powerful supervisory control software to solve your most demanding heat trace application needs.

IntelliTrace Control Panels

Chromalox® IntelliTrace™ heat trace panels are microprocessor-based, complete control solutions for the most demanding industrial heat trace applications in ordinary areas. They provide temperature control, monitoring, and power management in one package. Available as ambient-sensing (ITAS) and line-sensing (ITLS) models, IntelliTrace control panels include advanced features such as sensor mapping, soft-start, multiple sensor inputs per circuit, a large touch-screen display, plus full communications and enhanced data logging. They provide alarms for high/low temperatures, high/low current, ground fault leakage, and sensor faults. The modular design of the control panel components permits selection of only those features needed for a specific heat trace installation, minimizing cost and simplifying system configuration.

The base panels will handle 6 to 36 loops and may be increased up to 72 loops with ITAS-EXT 6-36 (ambient-sensing) and ITLS-EXT 6-36 (line-sensing) Extension Panels. Each circuit has a 40 amperage capacity and accepts 100 to 600 Vac service. The SCR Control may be set to automatic, which includes PID or on/off control, or to manual, which spans a 0% to 100% control output. The 10-in. (25-cm) user-friendly touch-screen display shows the process variable, temperature setpoint, alarm status, current load, control mode, and sensor failure default output for any 6 loops at a time as well as the alarm status for all other loops.

For hazardous (Class I, Divison 2) areas, the IntelliTrace line includes the ITASC1D2 (ambient-sensing) and ITLSC1D2 (line-sensing) panels for 6 to 36 loops and ITASC1D2-EXT 6-36 (ambient-sensing) and ITLSC1D2-EXT 6-36 (line-sensing) extension panels for inreasing capacity to 72 loops. All have the same features and functionality as the ITAS and ITLS models.

For all IntelliTrace models the standard enclosure is rated for NEMA 4 environments. A NEMA 4X 304 SS enclosure is also available. An optional enclosure heater is available for both ordinary and hazardous (Class I, Division 2) areas, and all models come with UL and cUL third-party approvals.

WeatherTrace Control Panels

WeatherTrace™ heat trace control panels are available as ambient-sensing (FPAS) and line-sensing (FPLS) models for use in industrial freeze protection and snow melt applications. They offer the following standard features: NEMA 4 enclosure, Hand/Off/Auto Selector Switch, Load Energized Indicator Lamp, Main Power On Lamp, Main Contactor, and Thermal Magnetic Branch Circuit Breakers with 30 mA Ground Fault Equipment Protection. Options include: NEMA 4X 304 Stainless Steel Enclosures, Main Disconnect Switch, Remote or Local Ambient Temperature Controller, Enclosure Heater, and Type Z Pressurization System. The FPAS series panels have UL and cUL Third Party Approvals. Ambient-sensing and line-sensing WeatherTrace heat trace control panels are also available with Sentinal Monitoring, designated FPASM and FPLSM respectively. Identical to WeatherTrace FPAS and FPLS models, the FPASM and FPLSM models continually monitor the supply voltage to each individual heat trace circuit. Loss of voltage or a ground fault condition triggers automatic alarm condition to an annunciator panel which identifies the faulted zone and a common alarm is activated with a re-ring feature.

All four panel models have UL and cUL third-party approvals

Digital Heat Trace Controller, 1 and 2 Circuit

The Chromalox® IntelliTrace™ ITC1/ITC2 controller is a compact, microprocessor-based temperature control and system management solution for line- or ambient-sensing electrical heat trace applications such as freeze protection and process temperature control. Intended for use in industrial locations in either hazardous (Class I, Division 2) or non-hazardous environments, this controller may be used with constant-wattage, mineral-insulated, or self-regulating heating cable. It is offered in either a single-circuit (ITC1) or an independently controlled and monitored dual-circuit (ITC2) platform. It features a high-resolution color TFT display, capacitive touch switches, and LED indication for power, load, and alarms per circuit.

- SSR control, 40 A per circuit
- 100 to 277 Vac, 50/60 Hz
- Operating temperature: -40˚F to 104˚F (-40˚C to 40˚C)
- Modbus RTU/RS485, RS422 & TCP/Ethernet communications
- PID, On/Off, or manual control modes
- 10 in. x 8 in. x 6 in. (26 cm x 21 cm x 15 cm) NEMA 4X FG wall mount enclosure
- CE, cULus

DTS-HAZ Heat Trace Digital Thermostat

The DTS-HAZ digital thermostat is a microprocessor-based temperature controller and power connection for freeze protection or process temperature maintenance of pipes or tanks protected by heat tracing products. This thermostat can be used with constant-wattage, mineral-insulated, or self-regulating heating cables in ordinary or Division 2 and IECEx/ATEX Zone II hazardous area locations.

- 30 A SSR output
- 100 to 277 Vac operation
- Selectable soft-start
- Large 4-digit, 7-segment LED display of process variables and settings
- LED indication for load, power, and alarm condition
- Programmable temperature, high/low alarms, dead band, units, soft-start, and alarm state
- Common alarm contact for remote indication of alarm status
- UL Listed, cULus, CE

Heat Trace Control Skids

Chromalox heat trace control skids integrate IntelliTrace™ and WeatherTrace™ panels with power distribution panels and transformers on a steel frame to provide a plug-and-play solution for heat trace system control. Custom configurations with many options for footprint and included equipment are available. Engineering support includes custom configuration, layout drawings, detail drawings, panel schedules, and custom programming. Field support includes installation, startup, commissioning, and programming.

- Control panels: ITAS 6-36, ITLS 6-36, FPASM, FPLSM
- Remote monitoring: Chromalox Supervisory Software
- Power distribution panel: Ordinary and Hazardous Area, includes panel board, cabinet, circuit breakers
- Transformers: Ordinary and Hazardous Area, 15 to 115 kVA
- Frames: Painted steel, stainless steel, custom sizes, available sun shade, lifting eyes, and lifting channels
- Configuration: Customizable from control panel only through integrated control, monitoring, power distribution, and transformer

Installation Kits and Accessories

A full line of connection kits and accessories for the installation of heat trace cable. They include all of the necessary components for power connection, straight or tee splices, and water-resistant end seal terminations for heat tracing systems. The connection kits and accessories are third-party approved for ordinary and hazardous areas and are designed for fast, easy installation and safe, reliable operation.

U Series Heat Trace Connection Kits

The U Series line of connection kits and accessories are designed for use with self-regulating and constant-wattage heat trace cables in pipe and tank freeze protection and process maintenance applications. They are designed for fast, easy installation and safe, reliable operation. U Series connection kits and accessories are third-party approved for ordinary and hazardous-area industrial applications.

DL Series Heat Trace Connection Kits

Chromalox DL Series connection kits are designed for use with self-regulating and constant-wattage heat trace cables in pipe and tank freeze protection and process maintenance applications. Designed for fast, easy installation and safe, reliable operation. DL Series connection kits and accessories are third-party approved for ordinary and hazardous-area industrial applications.

HL Series Heat Trace Connection Kits

The HL Series line of connection kits and accessories are designed for fast, easy installation and safe, reliable operation with self-regulating heat trace cable in pipe and tank freeze protection and process maintenance applications. They are third-party approved for Division 1 hazardous-area industrial applications.

EL Series Heat Trace Connection Kits

EL Series connection kits and accessories are designed for fast, easy installation and safe, reliable operation with self-regulating and constant-wattage heat trace cables for pipe and tank freeze protection and process maintenance in ordinary area industrial applications.

MI Series Heat Trace Connection Kits

MI Series connection kits and accessories are designed for fast, easy installation and safe, reliable operation with MI heat trace cable in pipe and tank freeze protection and process maintenance in ordinary and hazardous-area industrial applications.

Heat Trace Systems Design and Monitoring Software

Chromalox offers easy-to-use desktop software for quick access to designing and specifying heat trace projects, then accomplishing temperature control process setup, and monitoring, and managing a heat trace system once installed.

ChromaTrace Software

An indispensable tool for designing and managing heat trace projects, ChromaTrace software does all of the IEEE-compliant heat trace calculations. It allows you to run "what-ifs" to quickly find the most cost-effective solution. The software determines the exact equipment and quantities needed, provides their part numbers, and creates a complete bill of materials instantly. Product data sheets and manufacturer's cross-reference guidelines are provided on-screen for easy reference. ChromaTrace helps manage hundreds of drawings for several heat trace projects and even ties pipe and tank data to specific drawings, identifying which pipes are freeze-protected or process-maintenance, with specific electrical loads in particular areas of the application.

IntelliTrace Supervisory Control (ISC) Software

The Chromalox® IntelliTrace™ Supervisory Control (ISC) system is the advanced solution for monitoring and managing multiple heat trace control panels from a central location. It can be downloaded and installed on your computer or it may be embedded in an industrial PC for either ordinary or hazardous areas.

The Chromalox ISC system is designed to manage up to 128 IntelliTrace control panels. With each IntelliTrace panel controlling up to 72 circuits, the ISC software therefore can easily mange 9,216 heat trace circuits.

ISC continuously provides 100% system-wide monitoring and alarm status of all parameters on every circuit. Alarm status indication is visible from five separate, user-defined monitoring resolution levels, from the highest "corporate" viewpoint down to the individual circuit level. Additionally, IntelliTrace Supervisory Control will provide email alerts of only those alarm events deemed necessary by the user.

Local monitoring and management of heat trace circuits can still be performed through the touch-screen of each individual IntelliTrace control panel. With Chromalox IntelliTrace Supervisory Control installed, remote access to any or all circuits anywhere can be accomplished system-wide from any ISC station on your network.

IntelliTrace Supervisory Control is extremely efficient to set up and manage. Intuitive Windows-based system screens and global application of mass parameter value settings commission the system in minutes, not hours. Navigation to any IntelliTrace control panel is accomplished via 1 to 3 mouse clicks, while individual circuit detail within each panel is simply one more click away.

Skin-Effect Heating Systems

Skin-effect heating is used specifically for providing indirect heat to long runs of piping from a single electrical supply source. It is an easy-to-use arrangement, comprised of a heating tube, skin-effect cable, junction boxes, transformer, and control panel, that provides conductive heating direct to the wall of a process pipe. The small steel heating tube is bonded on the pipe to be heated. Skin-effect electric cable placed inside the tube conducts the voltage to the end of the pipe. The current returns via the small heating tube, but only through the internal thickness as defined by the laws of Kelvin and Maxwell. Supply connections are made in special boxes. Heat input can be adjusted to handle a range of thermal viscosities. The indirect heating arrangement allows it to be used with any potentially corrosive process. Installation can be above-ground, buried, or submerged.

- Temperatures: Up to 392°F (200°C)
- Circuit length: Up to 16 miles (26 kilometers)

Tube Bundles and Instrument Enclosures

Tube Bundles

Pre-traced, pre-insulated tubing bundles are designed to maintain freeze protection, close temperature tolerances, and viscosity control; to avoid gas condensation; and to improve employee safety. Additionally, they maintain process temperatures and protect instrument sampling and impulse lines. Bundles may include single or multiple process tubes suited for use in heat trace systems in industries such as chemicals, plastics, power generation, oil and gas, pulp and paper, pharmaceutical, food production, and water and wastewater.

Energy-efficient, easy-to-install bundles are constructed of industrial-grade quality material, ensuring years of reliability. Tubing bundles are available with copper, stainless, high-alloy or fluoropolymer process tubing, as well as a wide variety of insulation and jacket materials. Traced bundles incorporate steam tubing or electric heat trace with a choice of self-regulating or constant-wattage heating elements.

Instrument Enclosures

Chromalox offers six standard enclosure ranges for the reliable protection and temperature maintenance of sensitive field-mounted instruments. They are turn-key with a range of form factors and installation features, combined with the choice of sizes, that allows optimal and cost-effective environmental protection to be configured easily for virtually any instrumentation or control application. Manufactured from fiberglass, instrument enclosures exhibit strength that matches stainless steel. Fiberglass is also lightweight, does not corrode, and has excellent chemical and flame resistance over other materials.

COMPONENT TECHNOLOGIES

Chromalox component technologies products perform highly critical functions in applications ranging from super plastic forming of aircraft bodies to remediation of contaminated soils present at oil and gas sites to vital medical care equipment in hospitals. We design and manufacture the heating element source, single- and multiple-zone temperature and power controllers, and temperature sensing and input devices.

Component Heaters

Component heaters by themselves meet many heating needs. They can also be integrated into more complex heating systems providing a complete thermal solution for your heating requirements. Shape and size most often are the determining factor in most heater applications. Chromalox carries the widest selection of standard component heaters in many shapes, sizes, and wattages.

Tubular Heaters

Tubular heating elements are versatile and transfer heat exceptionally well by conduction, convection, or radiant heating to heat liquids, gases, and solid surfaces. Available in round, triangular, and flat-pressed cross-sectional shapes, and formed bends made to customer requirements. Many different sheath materials and more than 20 optimal terminations and many stocked accessories are available. Tubular heating elements can be furnished as UL-listed and CSA-certified. In addition, VDE and CE certification are also available.

- Maximum temperature: 1,600°F (870°C)
- Voltages: Up to 600 V

Strip and Ring Heaters

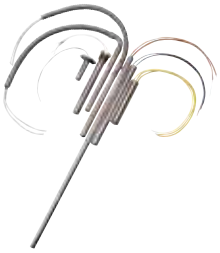
Rugged and easy to install, these units transfer heat by either conduction or convection to heat liquids, gases, and solid surfaces. Applications include drying, melting, baking, or curing. Strip heaters range from 0.5 inch to 2.5 inches (12.75 to 63.5 millimeters) wide and lengths to 72 inches (1.8 meters). Units bolt or clamp to many surfaces. Ring heaters can be nested to provide concentrated heat in small areas. Many sheath materials, termination styles, operating temperatures, sizes, voltages, wattage ratings, and mounting devices are available.

Disc units are solid design and are available from 2¼ to 3¼ inches (57 to 83 millimeters) in diameter.

- Maximum sheath temperature: 1,500°F (815°C)
- Watt density: Up to 38 W/in.² (6 W/cm²)

Cartridge Heaters

Cartridge heaters are inserted into small vessels or drilled cavities to heat liquids, gases, or, most often, metal parts. Chromalox provides an array of sizes, materials, wattage ratings, voltages, termination choices, and mounting options. Optional end seals resist contaminants and keep moisture from entering the heater as operating temperatures increase.



- Diameters: 0.125 to 1.25 in. (3.175 to 31.75 mm)
- Maximum sheath temperature: 1,600°F (870°C)
- Watt density: 25 to 262 W/in.² (4 to 40 W/cm²)

Band and Nozzle Heaters

Band heaters grip tightly to cylindrical surfaces to supply uniform heat transfer. Chromalox band heaters are flexible and come in one- or two-piece construction for easy installation and removal. Stainless steel braids and conduit protect terminations and resist contamination.

- Maximum temperature: 1,500°F (815°C)
- Watt density: Up to 50 W/in.² (7.75 W/cm²)

Thin Blade Heaters

Thin blade elements provide more surface area than standard tubular elements for greater wattage or lower watt densities. Chromalox thin blade heating elements can be configured for immersion, conduction, or convection heating applications. A variety of sheath materials and mounting designs are available. Three-wire construction within the element provides uniform heating. Single- or three-phase current terminations are available with a 120- to 480-volt range.

- Length: Up to 15 ft (4.6 m)
- Profile: 0.235 x 1 in. (6 x 25 mm)
- Maximum temperature: 1,200°F (650°C)
- Watt density: Up to 75 W/in.² (11.5 W/cm²)

Silicone Laminate/Flexible Heaters

Versatile Chromalox silicone laminate/flexible elements find use in applications requiring low to medium temperatures. Rugged construction of lightweight material provides chemical and moisture resistance. Wire elements are durable and wound precisely within the structure for optimal performance. A variety of electrical, shape, and contour fittings meet a broad range of specifications.

- Maximum temperature: 390°F (200°C)
- Voltage: Up to 600 V

XtremeDuty Component Technologies

Like our XtremeDuty™ industrial heaters and systems, XtremeDuty component technologies products are designed, engineered, and manufactured to ensure reliable and durable heating in extreme environmental or process conditions.

XtremeDuty High-Temperature Multiple-Zone Heaters

Chromalox® MaxiZone® multiple-zone heating element technology is ideally suited for large-scale, high-temperature applications because the element's independent heating zones enable individual zone control that yields tight temperature profiles. Where standard conduction close-fit installation is not possible, a radiant/convective heat transfer process using multiple-zone heating makes MaxiZone technology an ideal choice.

MaxiZone Heaters

MaxiZone high-temperature insertion heaters produce continuous sheath temperatures to 1,800˚F (982˚C). They are designed to achieve precise, uniform temperatures with two or three independently controlled heating zones along the length of the sheath. Radiant heat transfer enables MaxiZone heaters to be smaller than the openings in which they are to be placed for easy insertion and removal.

- 1,500°F to 1,800°F (815°C to 982°C)
- Inconel* 600 sheath
- Exact, uniform temperatures with 2 or 3 independently controllable zones
- Radiant heat transfer allows under-sized heaters for easy removal and replacement
- Special bending capabilities
- Standard diameter: 0.495 in. (12.5 mm), 0.685 in. (17.4 mm), and 0.935 in. (23.75 mm)
- Lengths: 18 in. (457 mm) to 15 ft (4.5 m)
- Wattages up to 10kW
- Quick-disconnect plug and jack

XtremeDuty Hazardous-Area Enclosure Heaters

Hazardous-area enclosure heaters are available in a variety of styles and sizes, and T2, T3, and T3C temperature ratings. XPMC explosion-proof enclosure heaters are available in different lengths and configurations. AEPS explosion-proof strip heaters are available in a large variety of lengths. Both are ideal for use in control cabinets, gas analyzers, pump houses, and motor control centers.

XPMC Explosion-Proof Enclosure Heater

- Up to 480 V
- Up to 600 W
- Adjustable thermostat optional on 120 and 240 V
- CSA Certified; Class I, Div. 1 & 2, Groups B, C, D
- Available with T2, T3, and T3C temperature ratings
- Standard diameter: 0.495 in. (12.5 mm), 0.685 in. (17.4 mm), and 0.935 in. (23.75 mm)
- Lengths: 18 in. (457 mm) to 15 ft (4.5 m)
- Quick-disconnect plug and jack

AEPS Explosion-Proof Strip Heater

- 120, 208, 240, 277 and 480 V
- Temperature Code T3 (for Class I, Div. 1, Groups B, C, D), 9 W/in.² (1.4 W/cm²)
- UL Listed

Enclosure Heaters

Installing electric heating elements within enclosures and housings is an excellent solution to protect expensive electronics equipment from damage and failure due to extreme low temperatures or condensation.

- Corrosion-resistant galvanized steel construction
- Heavy-duty tubular element
- Available in multiple mounting configurations
- Standard and custom designs available
- Voltage: Up to 240 V
- cULus listed

*Inconel is a registered trademark of Huntington Alloys Corporation, Huntington West Virginia.

Temperature and Process Controllers

From single- to 32-loop microprocessor-based PID temperature, over-temperature, and process controllers to multiple channel temperature monitors and electronic chart recorders, Chromalox offers precisely the required level of simplicity or sophistication to properly and smartly manage your thermal processes. Most models offer heating and/or cooling control modes, intuitive device programming, full process alarms, remote monitoring via digital communications, and efficient configuration software programs, and many are suitable for NEMA 4 or 4X environments and provide IP 65 or 66 protection.

Single- and Dual-Channel Controllers

Single- and dual-channel controllers combine ease of use and accurate operation for critical temperature and process applications and are available in rear panel mount or front panel 1/32, 1/16, 1/8 and 1/4 DIN cutout sizes. Advanced models offer a multitude of programmable control options such as PID, soft- and delay-start, ramp/soak, profiling, cascade, and ratio control schemes for heating and/or cooling applications. They feature large, channel-specific graphical/text backlit LED displays, several digital and analog I/O choices, full monitoring and alarms, Modbus TCP/IP (Ethernet) or RTU/RS485 communications, and powerful settings, trending, and simulation configuration software.

Multiple-Loop Controllers

Multiple-loop controllers provide an affordable and compact solution to discrete temperature and/or process management of multiple zones. The Chromalox 1/4 DIN package will control up to 8 channels in a single unit, while the modular DIN rail design will manage up to 32 distinct channels per modular set. Several DIN rail modules may be connected to manage up to several hundred channels. These powerful controllers offer full independent channel PID and soft-start control schemes and heater break alarms, facilitate multiple digital and analog I/O possibilities, and feature Modbus RTU/RS485, Modbus TCP/IP (Ethernet), and several other industrial Fieldbus communication protocols. Without sacrificing process integrity, these space-saving devices reduce labor hours and panel equipment size. This reduces installation and material costs, and due to efficiencies being gained, operating costs will also be lower.

Over-Temperature Controllers

Chromalox also offers matching over-temperature controllers that are designed to provide reliable protection of heaters, sensitive processes and materials, and personnel from damaging over- (or under-) temperature conditions in standard front panel mount DIN cutout sizes or rear DIN rail mount designs. Their purpose is to safely shut down a process when an undesirable preset parameter threshold is achieved.

Monitors and Electronic Chart Recorders

The Chromalox CX224 temperature monitor and data logger is a powerful panel-mounted unit that features 12-channel scanning capability, Modbus RS485 communications and ChromaSoft™ CX224 Windows-compatible software for system configuration and data logging. It accepts any combination of RTD, thermocouple, and 4 to 20 mA inputs, continuously displays parameter value and relay status of all 12 channels, and can display data graphing for trend analysis.

Our bench- or panel-mounted ECR1 monitor/chart recorder features a 6.1-inch (155-millimeter) color TFT LCD screen for displaying data. Its 18-channel plug-and-play architecture combined with flexible screen setup make for a user-friendly and versatile recorder. Each input channel can be set up in the field to accept 1 of 11 RTD or thermocouple choices, or 1 of 6 process sensors. Data display varies from charts to bar graphs. Software is available for configuring the ECR1 and analyzing historical data on the flash drive. It allows for real-time system monitoring and configuration by PC via Ethernet or RS232/485/422 (Modbus protocol) interface.

Sensors and Accessories

Sensors range from bare thermocouples and RTDs to the most sophisticated infrared non-contact sensors that directly, consistently, and accurately measure product temperature. Stock accessories include thermowells, wiring, indicating meters, timers, and recorders in addition to electromechanical contactors, thermostats, and thermoswitches.

Solid-State Power Controllers

Solid-state power control components deliver precise power modulation and smooth power output. Phase-angle and zero-crossing firing modes are available that drive single- and three-phase loads from 15 A to 1200 A at voltage ranges from 24 to 690 Vac.

SSR Power Controllers

Solid-state relays (SSRs) are an ideal, low-cost power control solution for switching resistive loads precisely and frequently. Chromalox offers rugged, industrial-grade, touch-safe designs that employ zero crossover firing and manage single-phase loads up to 120 A and three-phase, 3-leg loads up to 55 A at voltages up to 600 Vac. Most controllers come complete with integrated heatsink, SCR thermal protection with LED indication, and have USA and Canadian UL component recognition and CE conformity. Optional alarms are available for overtemperature as well as load and line interrupt conditions.

SCR Power Controllers

Chromalox advanced SCRs (Silicon Control Rectifiers) or thyristors are microprocessor-based power controllers designed to control all types of industrial heater loads ranging from 25 A to 1200 A and up to voltages of 480, 600, and 690 Vac in several different load configurations. They offer powerful system parameter diagnostics, multiple firing mode options, control mode versatility, and on-board communications. Most SCRs offer user-selectable power switching modes such as several zero-crossing (fixed cycle time, burst fire/DOT, and half-single cycle) and phase-angle firing to properly and precisely manage linear-resistive heaters, elements with low thermal inertia, medium/short-wave IR lamps, or transformer-coupled loads. Some models independently manage 4 channels and offer several Fieldbus protocol options which make the Chromalox SCRs an ideal choice for almost any process power control application. An efficient and detailed configuration software program allows you to run trends, save historical data, and read or write device parameters quickly and easily. Configurations may be saved locally for later retrieval or sent across a network for cloning of other units.

CHROMALOX SERVICE SOLUTIONS ENSURE OPTIMUM PERFORMANCE AND EXTEND PRODUCT LIFE

Startup and Commissioning

New equipment startups can often delay project timelines. Minimize any chance for costly setbacks by having a Chromalox qualified engineer for on-site startup and commissioning the mechanical, electrical, instrumentation, and control equipment for any system we have built, anywhere in the world. They will assist with initial equipment startup and perform a complete review of the installed system to ensure optimized integration into your facility, increasing overall efficiency.

Chromalox Cold Weather Contracts

Cold weather can be a strain on much of your system's equipment. To help you avoid unplanned downtimes that can occur due to cold weather Chromalox offers a package of pre-season planning and preventive maintenance services to ensure proper equipment operation before cold weather strikes.

Professional Services

Chromalox comprehensive service solutions also include a selection of professional services to help integrate, operate, and service Chromalox heating and control equipment for your application.

Isometric Drawings: Chromalox will generate 2D and 3D drawings that show how Chromalox heating and control products are integrated into your application.

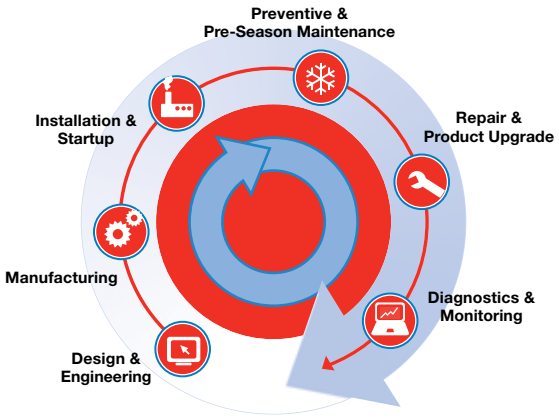
Training: Chromalox offers on-site training of your personnel to help ensure that your Chromalox equipment is properly operated. Expertly trained personnel can better achieve the best results in your process, as well as optimize equipment service life and maximize intervals between required maintenance.

Diagnostics and Troubleshooting: Our experienced engineering staff can help to optimize your process. They are well-versed in diagnosing and correcting process issues, and can custom design heaters and controls that meet your exacting requirements.

Chromalox Service Contracts

Chromalox Service Contracts deliver efficient emergency response and preventive maintenance, helping to eliminate problems before they arise. Chromalox field service personnel are experts at maximizing the performance of your process heat and control systems with a variety of on-site services including multi-point inspections, guaranteed emergency response times, site reports, and replacement parts availability.

PRODUCT LIFE CYCLE



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