

ROBERTS GORDON[®] CORAYMAC[™]

Custom
Infrared Heating
System



ROBERTS GORDON[®] INFRARED HEATING

www.robertsgordon.com

CORAYVAC® Helps Reduce Energy Bills and Improve Comfort

CORAYVAC® gas-fired, low-intensity, infrared heating systems help provide custom comfort, while facilitating reduced energy consumption up to 50% and more! CORAYVAC® is a continuous burners-in-series vacuum-operated system that can be designed to condense. This efficient operating mode, combined with the principles of infrared energy, can result in considerable energy savings and comfort, while helping to lower your building's carbon footprint and environmental impact.

With the innovation of CORAYVAC®, Roberts-Gordon pioneered energy efficient low-intensity, infrared heating. Today, CORAYVAC® continues to innovate green products by offering a fully modulating infrared heating system.

LESS HEAT STRATIFICATION

CORAYVAC® does not blow high temperature heated air that ends up rising to the ceiling. In fact, CORAYVAC® does not heat air. CORAYVAC® reflects and directs infrared energy toward the floor. The infrared energy is in the form of electromagnetic waves that can be directed and reflected like light. These waves travel through the air (not heating it) toward the floor until they strike solid objects. The objects are heated when they absorb the infrared energy. Floors, people and equipment below CORAYVAC® absorb and store heat, then re-radiate heat and warm the air by convection as air passes across the warm objects. Compared to other traditional heating systems, CORAYVAC® uses less energy to heat the area at occupant level. In addition, since there is no need for ceiling fans to push heat to the floor, electrical usage can be reduced.

REDUCED BUILDING HEAT LOSS

Because CORAYVAC® does not introduce high temperature air into the heated space, it generates less heat stratification. Air temperatures at the ceiling are lower than with other heating systems. Lower ceiling temperatures result in reduced heat loss through the roof and lowered building heat loss. Lowered building heat loss means less heat is needed to heat the same space.

FLOORS BECOME HEAT RESERVOIRS

The sun does not heat the earth's atmosphere directly; rather its infrared rays heat the earth, people and objects. CORAYVAC® uses less fuel than other heating systems because it heats a building and its occupants similar to how the sun heats the earth. With CORAYVAC®, floors and objects become massive secondary heat exchangers. These objects act as heat reservoirs, storing heat, then releasing it into the space by re-radiation and convection to raise space temperature at occupant level.

FREE ENERGY RECOVERY

In commercial and industrial buildings, rapid air changes and heat loss commonly occur when large doors are opened. As a result, valuable heated air escapes outdoors, wasting money. With air heating, more time and money is required for heat recovery because all the energy burned is used only to heat air, when the heated air is lost, no energy remains in the space. With CORAYVAC®, energy stored in floors and objects is re-used for faster energy recovery in the space, without burning more fuel.

GREATER COMFORT AT LOWER TEMPERATURES

To obtain fuel savings of up to 50% over conventional heating systems, it is essential to design an infrared system for maximum distribution and comfort. When designing systems for comfort, or reaching the operative temperature (T_o), designers need to maximize the mean radiant temperature (MRT) and depress the air temperature (T_{air}). For example, to reach a perceived comfort of 65° F (18° C), with infrared, the air temperature can be lowered to 55° F (12° C). This helps reduce energy costs!

Due to elevated mean radiant space temperature, building occupants feel the same amount of warmth when thermostats are set 5° to 10° F (-15° to -12° C) lower with CORAYVAC® than with other heating systems. Lower thermostat setpoint translates into additional energy savings.

CLEAN, QUIET, DRAFT-FREE HEAT

Since CORAYVAC® quietly warms objects without drafts or blowing air, heated areas are cleaner and quieter.

HIGH EFFICIENCY CONDENSING SYSTEM

CORAYVAC® is unique from other infrared heaters because it can be designed as a condensing system. Lowering exhaust temperatures puts more heat in the space and less wasted through the exhaust. This results in additional efficiency and fuel savings.

ENHANCED FUEL SAVINGS WITH MODULATION

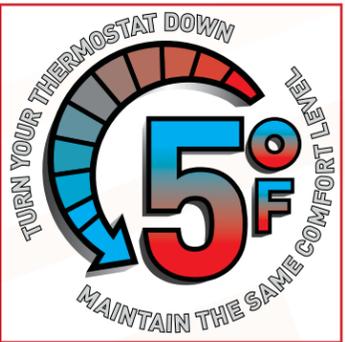
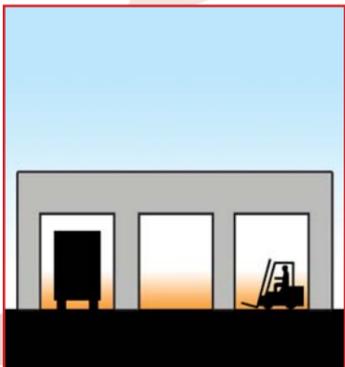
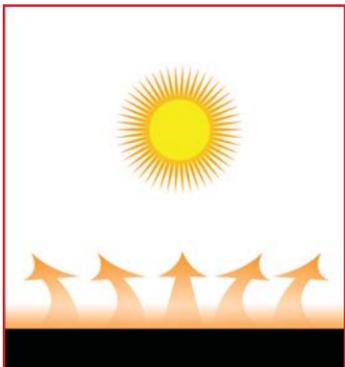
CORAYVAC® modulating and building management controls package, called CORAYVAC® Modulating Heating Control, allow building owners to graduate to higher levels of comfort and energy efficiency. PC based centralized building management control and connectivity is provided in an easy-to-use Windows-based software package. These controls, coupled with proper burner modulation (continuous adjustment of fuel and combustion air), compound the energy saving benefits of CORAYVAC®. An economical CORAYVAC® modulating controls package is also available. CORAYVAC® helps provide a field-proven solution for today's green industrial and a variety of commercial buildings.

UNIFORM COMFORT

Continuous burners-in-series design with custom layout provides even heating and uniform comfort. CORAYVAC® systems are custom-engineered and designed to match the specific building plan and space requirements.

CORAYVAC® spreads a gentle blanket of low-intensity, infrared energy that directly warms people, floors and objects in a building. By more effectively delivering heat to the occupied area (floor level), CORAYVAC® offers many benefits that can result in improved conditions and greater fuel savings.

Proper design, installation, use and maintenance is necessary for optimum performance. This document is intended to assist licensed professionals in the exercise of their professional judgment.



CORAYVAC® High Efficiency, Condensing Infrared System Features

REFLECTORS

ROBERTS GORDON® deep-dish, standard aluminum reflectors are shaped to help direct reflection of the energy emitted by the infrared tube and beam towards the floor where needed. Our industry-leading high efficiency reflectors have a wider design that maximizes the amount of radiant energy emitted from the heat exchanger. This directs an even greater amount of radiant energy towards the floor which results in increased energy savings.

BURNERS-IN-SERIES DESIGN

Located from 10 ft. - 70 ft. (3 m to 21.3 m) apart, CORAYVAC® burners constantly regulate the air-to-gas mixture to achieve the optimum ratio for clean, efficient combustion. Models are available with inputs of 20,000 through 120,000 Btu/h. Features include three-try direct spark ignition, pre-purge, filtered combustion air and cast-iron burner head.

Uniform Heat with CORAYVAC® In-Series Burners

TUBING

The CORAYVAC® system utilizes 4" O.D. (100 mm), 16-gauge tubing. The heat created by the burners is drawn through the tubes, which radiate the warm, gentle, infrared energy. Hot-rolled steel, aluminized steel or double porcelain coated steel tubing are available. Double porcelain coated steel is a cured porcelain coating on the inside and outside surface of the tube, which helps to maximize longevity and minimize corrosion of condensing systems.

VACUUM PUMPS

A vacuum pump draws the heat throughout the entire system. It exhausts products of combustion to the outdoors at temperatures typically below 150° F (66° C). 1/3-hp, 3/4-hp or 2-hp are available for various system sizes and layouts. Up to twelve heaters can be common vented with one vacuum pump. Design flexibility allows side wall venting, even in large buildings.

MODULATING BURNER CONTROLS

Designed for the energy conscious, CORAYVAC® Modulating Heating Controls further improve efficiency of the already efficient CORAYVAC®.

COUPLINGS

Heat exchanger tubing is connected together with couplings. Roberts-Gordon offers stainless steel couplings, lined couplings and damper couplings.

Condensing System - Designed to Condense for Optimum Fuel Saving Efficiency.

COMBUSTION CHAMBERS

Four types of combustion chambers are available for the CORAYVAC® system: cast-iron, hot rolled steel, aluminized steel and double porcelain coated steel. The heavy-duty, cast-iron combustion chamber can be fitted with schedule 40 pipe throughout the system. Double porcelain coated steel is a cured porcelain coating on the inside and outside surface of the chamber, helping to maximize longevity and minimize corrosion of condensing systems.

CORAYVACTM

ROBERTS GORDON[®]

FOR A WIDE RANGE OF INDUSTRIAL AND COMMERCIAL BUILDINGS

*CORAYVAC[®] can heat an entire building evenly,
as well as provide separate zone temperature
control for the building.*

*CORAYVAC[®] CLASSIC SF heavy duty, high efficiency
systems available for specialty fuel vehicle
repair facilities.*

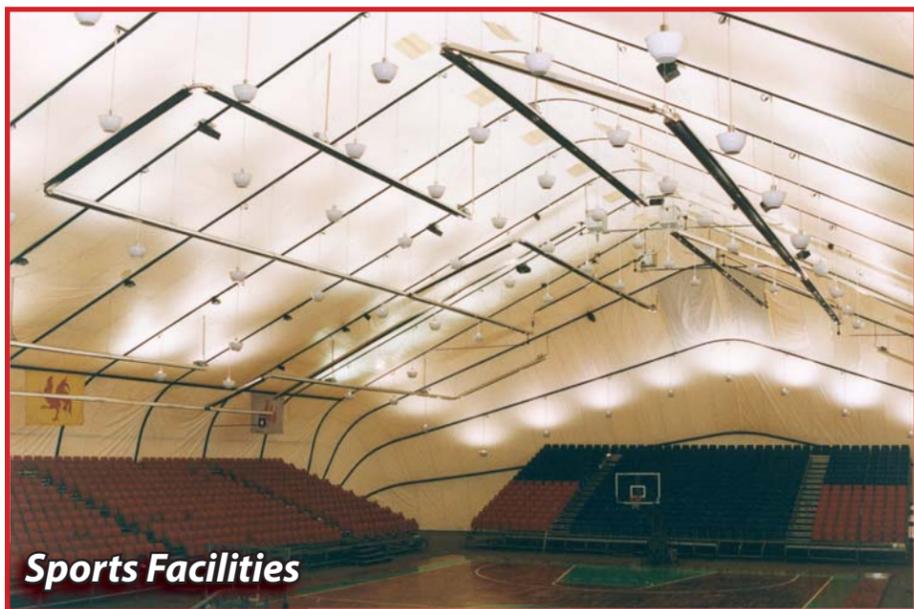
- Machine Shops
- Distribution Centers
- Auto Dealerships
- Vehicle Service Shops
- Bus Garages
- Fire Stations
- Farm Buildings
- Stores
- Package/Parcel Hubs
- Swimming Pools
- Zoo
- Metal Buildings
- Loading Docks
- Auto Body Shops
- Truck Terminals
- Parking Ramps
- Sports Facilities
- Workshops
- Showrooms
- Restaurants
- Hockey Rinks
- Animal Confinement Buildings



Warehouses / Distribution Centers



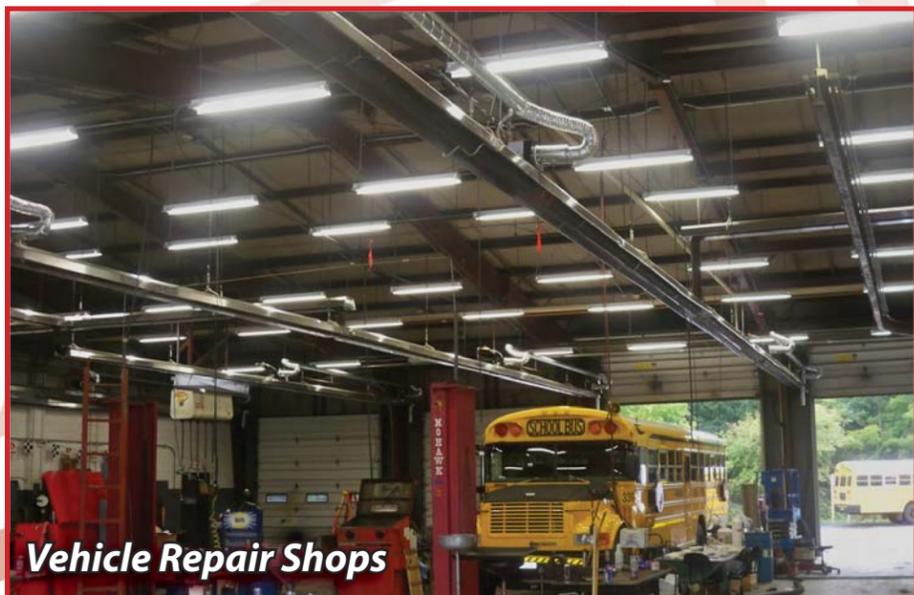
Aircraft Hangars



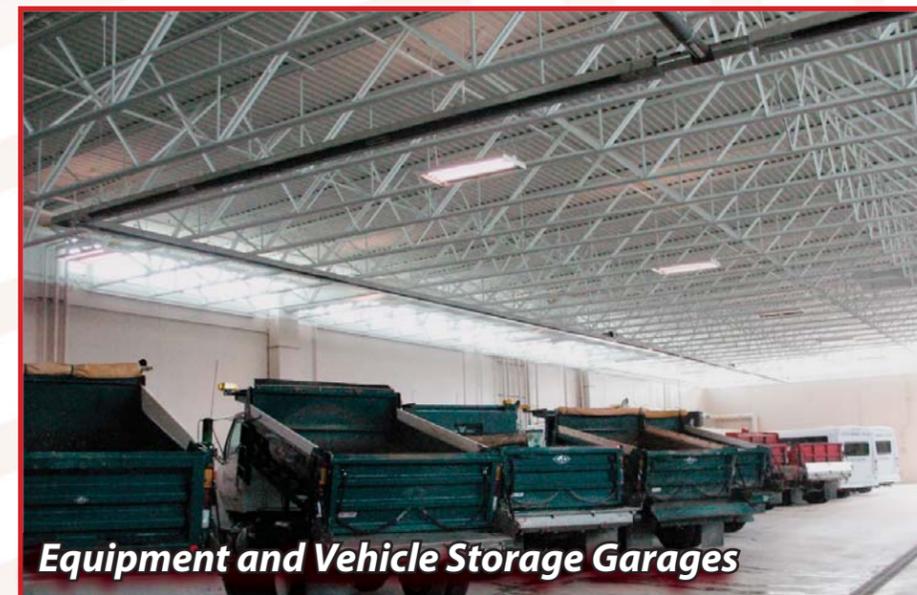
Sports Facilities



Manufacturing Plants

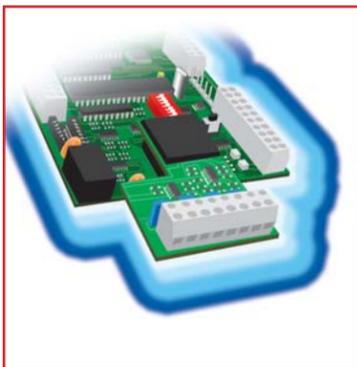


Vehicle Repair Shops



Equipment and Vehicle Storage Garages

Obtain Even Greater Energy Savings with CORAYVAC® Modulating Heating Controls!



Featuring fuel to air linkage technology, CORAYVAC® Modulating Heating Control is a micro-processor based controls package designed to modulate CORAYVAC® systems. The controls provide proper modulation by varying system vacuum and adjusting gas and combustion air according to the indoor/outdoor temperatures and building heat loss. Matching system input to the building heat loss helps reduce heater cycling and temperature set point overshoot. CORAYVAC® Modulating Heating Control helps increase the system efficiency and helps maximize fuel savings. The controls fully modulate burners between 60% and 100% of the burner's maximum rated input.

With the combined strengths of CORAYVAC® and CORAYVAC® Modulating Heating Control, buildings can be designed for comfort without the worry of high heating bills.

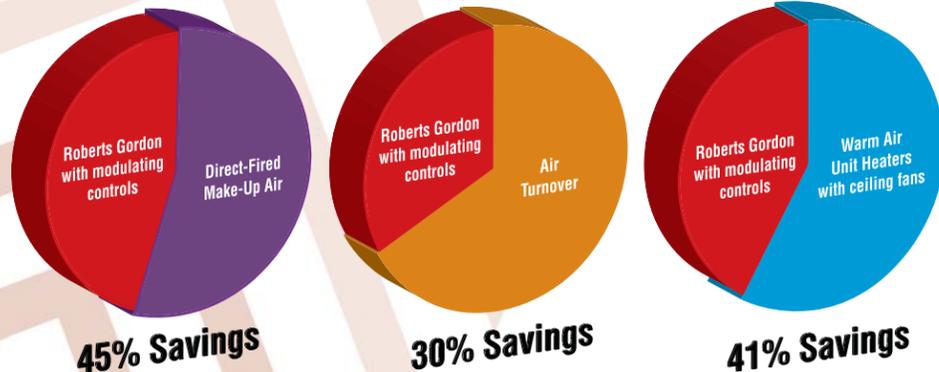


BURNER MODULATION FOR REDUCED FUEL AND ELECTRICAL USAGE

CORAYVAC® burners are equipped with a zero pressure regulator, which alters the amount of vacuum applied to the burner, thereby varying burner input. Altering vacuum also varies combustion air supplied to the burner. Since the fuel and air are changed proportionately, proper, efficient combustion can be achieved throughout the modulation range.

CORAYVAC® Modulating Heating Control utilizes an energy saving programmable variable frequency drive (VFD) at the vacuum pump resulting in drastic electrical savings compared to a mechanical damper at the pump. The inefficient mechanical damper method of varying system vacuum, increases electrical consumption as the pressure drop across the damper increases.

Seasonal Fuel Consumption Comparisons



COMPLETE CONTROL IN YOUR HANDS

The controller features a true "plug and play" installation as there are no external connections required. Used as a stand-alone controller via an easy-to-use touch screen that is incorporated into the control to allow direct access for programming, the CORAYVAC® Modulating Heating Control can also tie directly into a Building Management System.

Wireless or off-site connectivity is also possible with the new CORAYVAC® Modulating Heating Control through the use of any smart device. This secure and tamper-proof feature provides users with a graphical representation that shows the status of the building. This access makes monitoring the system status and settings a breeze, allowing you to view indoor and outdoor temperatures or alter system settings or programming from anywhere with an internet connection!

With an Infrared Factor as high as 15*, and increased thermal efficiency from modulation, a CORAYVAC® Modulating Heating Control produces the most energy efficient low-intensity infrared heating product in the industry and is best way to heat your facility!

*Rated in accordance with AHRI Standard 1330

THE INDUSTRY LEADER™
AS HIGH AS
INFRARED 15
FACTOR



SENSORS

The Roberts-Gordon line of intelligent zone sensors provides the function and flexibility needed to manage the conditions important to the comfort and productivity of zone occupants. The sensors feature a large, easy-to-read LCD that can be configured to display outside air temperatures, heating setpoints, relative humidity, override time remaining, system status, alarms, and more!



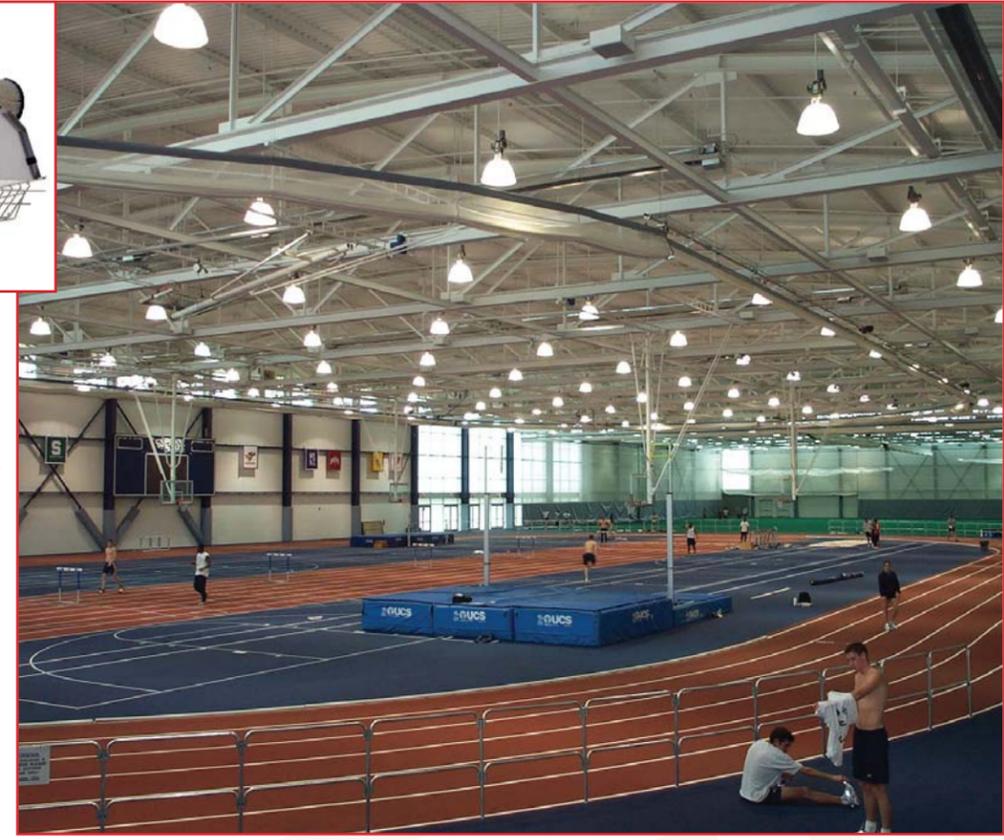
CORAYVAC® High-Efficiency, Condensing Infrared Heating System Accessories



DECO GRILLE
Optional decorative two-foot grille for use with drop ceilings.



PROTECTIVE GRILLE
For Standard Reflectors Only
Protective grilles conveniently attach to reflectors to cover the radiant tubing. This helps prevent items from coming in contact with the radiant tubes.



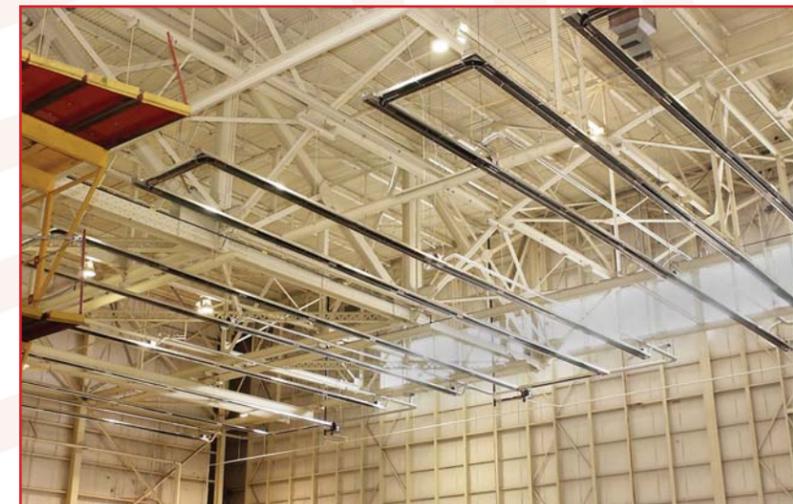
UNIVERSAL SHIELD
Universal shields are aluminum reflectors whose angle and height can be adjusted to direct heat to or away from a desired area. Universal shields are available with or without holes.

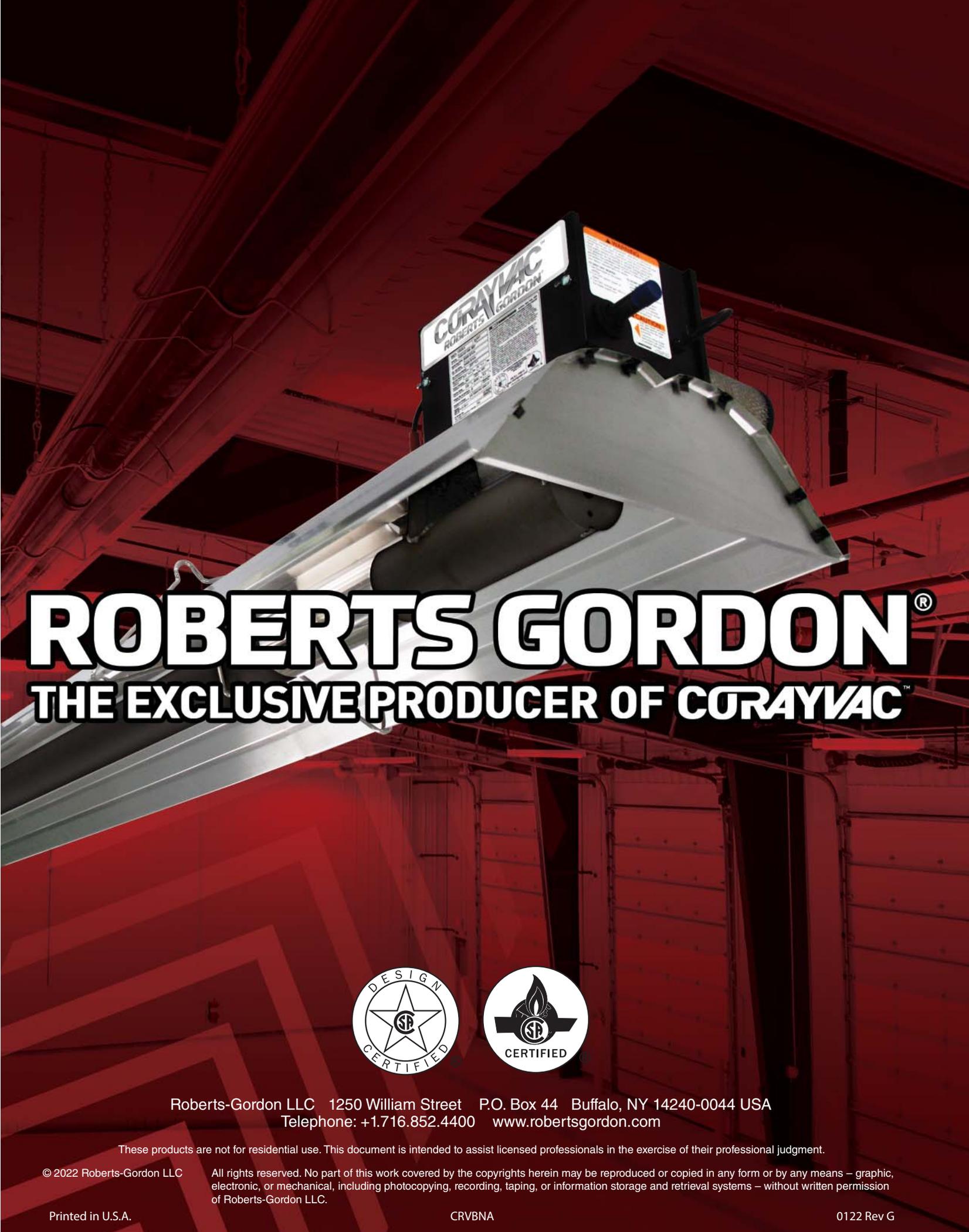


SIDE REFLECTOR
Optional side reflector extensions direct heat towards the floor and center of the building when CORAYVAC® is mounted near a wall.



CONTROL OPTIONS
The CORAYVAC® Heating Control operates as an on/off control that is capable of controlling up to four zones of burners and two systems.





ROBERTS GORDON®

THE EXCLUSIVE PRODUCER OF CORAYVAC™



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Printed in U.S.A.

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