

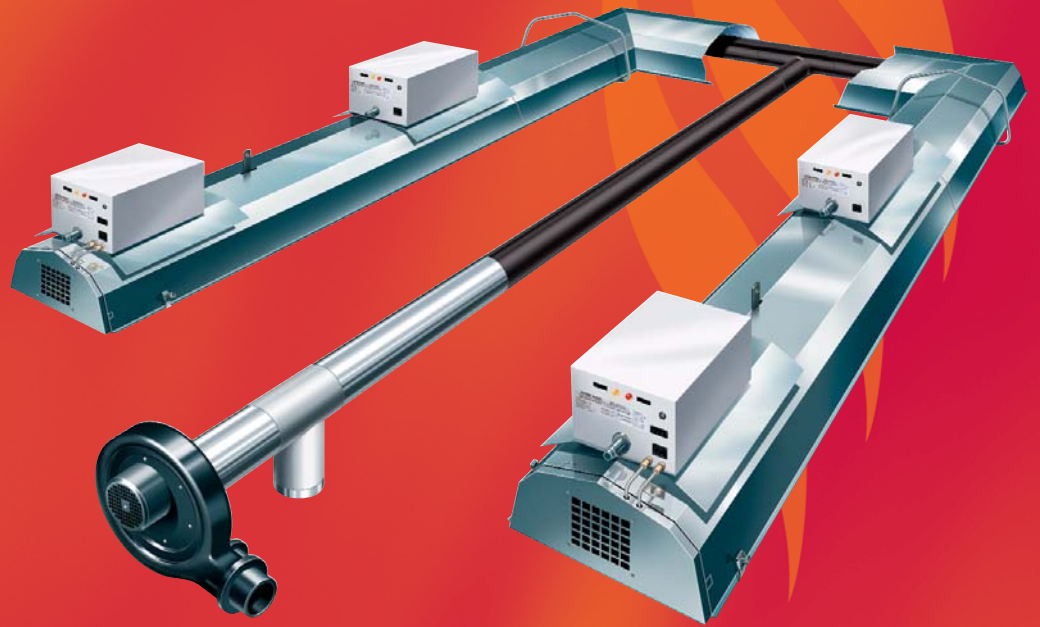
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Nor-Ray-Vac

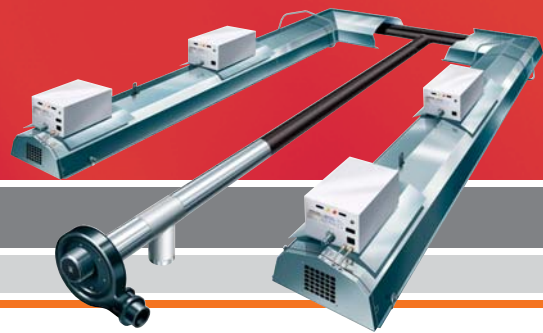
CONTINUOUS RADIANT TUBE HEATING SYSTEMS



 **AMBIRAD**
ENERGY EFFICIENT HEATING SYSTEMS

Nor-Ray-Vac

CONTINUOUS RADIANT TUBE HEATING SYSTEMS



Introduction

Nor-Ray-Vac is a gas fired continuous radiant tube heating system, designed specially for the building it is required to heat. The following criteria form the basis of each particular system design:

- Heat loss of the building for the required thermal environment
- Local climate conditions
- Type of activity in the building
- Specific architectural features relating to the structure

The Nor-Ray-Vac system is designed to provide uniform heat coverage over the entire floor area. Alternatively, the system can also cater for distinct zones providing a varied degree of comfort level within the overall layout of the building.

AmbiRad strives to become part of the 'design team', working closely with engineers or end users to determine the specific design parameters for the Nor-Ray-Vac scheme layout. This contact between the company's engineers and the system designer or client will give the most effective Nor-Ray-Vac system.

The result is a heating system designed specifically for the needs of the building and the way that the premises are managed.

Features & Benefits

- Reduces overall costs, with savings of up to 60% being achieved over conventional heating systems
- In-line fuel efficient burners with inputs ranging from 12 to 46kW
- Common vacuum fan operation
- Stoichiometric or 'perfect' combustion
- 92% combustion efficiency
- Rapid heat-up times
- Good aesthetic integration with building
- Minimal vent penetrations
- Capable of running three 46kW burners in a radiant branch
- Widest range of burner inputs for any continuous system
- Uniform distribution of heat
- Reliability and safety of operation to the latest European standard for multi-burner systems (EN 777)
- Qualifies for inclusion on the Government's Energy Technology List

Model Range

The Nor-Ray-Vac Series continuous radiant tube heating system includes six natural gas or propane burner models from 12 to 46kW, for maximum radiant tube lengths from 5.2 to 27 metres. Maximum tube temperatures range from 450°C to 480°C.

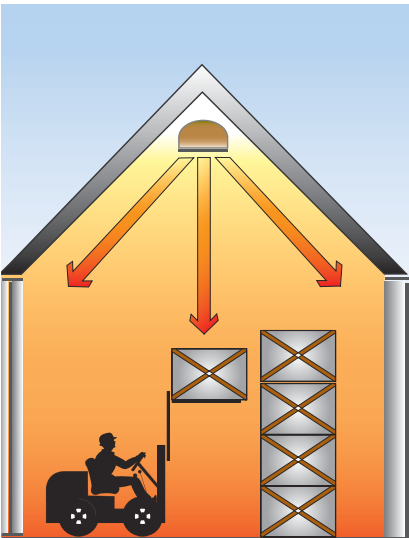
Reduced Operating Cost

With today's ever-increasing world-market competition, corporations must continually find ways to reduce operating costs, especially where gas prices have risen dramatically. AmbiRad's high-efficiency, gas-fired continuous radiant tube heaters can do just that. With increased comfort, along with a reduction in operating costs of up to 60% over conventional systems, AmbiRad will help keep your operating costs down.



Radiant Heating

Radiant heat warms all solid objects and surfaces in its path through electromagnetic waves. Mounted overhead, AmbiRad radiant heaters produce infrared heat that is directed downwards to low level by a reflector. Infrared energy passes through the air dissipating as heat upon contact with people and surfaces thus creating a comfortable, all-round radiant warmth at lower air temperatures. This reduces wasteful heating of empty space and makes substantial energy savings over conventional boiler and air systems.



Comfortable Warmth

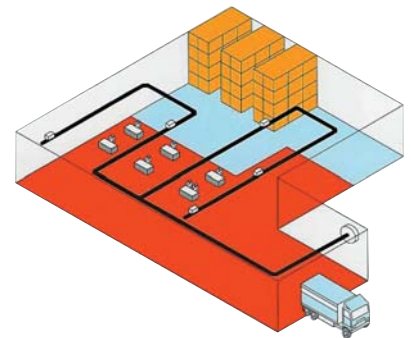
The Nor-Ray-Vac system exploits the concept of radiant heat. As radiant heat can be targeted effectively, energy savings can be achieved by heating only those areas which are occupied.

The Nor-Ray-Vac system has a rapid response to operating temperature and burns fuel at the point of use. This has significant advantages compared with large heating plant which suffers from distribution losses and slow response times.



Nor-Ray-Vac Applications

- Aircraft hangars
- Garages and showrooms
- Greenhouses
- Museums
- New low energy factories / warehouses
- Non-food distribution centres
- Railway sheds
- Sports halls
- Superstore retail outlets
- Vehicle distribution centres
- Warehouses



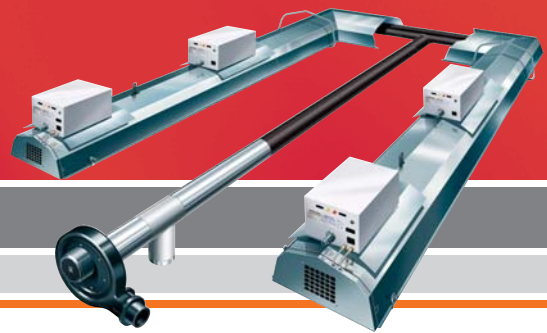
ECA



This symbol verifies that the product was independently assessed and qualifies for the ECA scheme, an upfront tax relief enabling businesses that invest in energy-saving equipment to claim 100% first-year capital allowances against their taxable profits.

Nor-Ray-Vac

CONTINUOUS RADIANT TUBE HEATING SYSTEMS



Specification

Burner Control Housing

Consists of chassis with detachable pivoting lid.

Burner Head Assembly

A lightweight aluminium construction with a ceramic burner head insert. The aerodynamic shape reduces the pressure drop across the burner head and promotes a greater volume flame at the bottom of the tube where maximum heat release is desirable.

End Vent Module

At the start of each radiant branch an end vent module (EVM) is connected to the rear of the first combustion chamber. The EVM/burner incorporates a vacuum pressure switch to prove flow at the start of the radiant branch to comply with European gas appliance standards.

Vacuum Fans

Cast aluminium or robust steel plate fabricated centrifugal fan coated with heat and corrosion resistant paint, capable of a static minimum pressure of 29mbar at 20°C.

System Tube

Calcoat radiant tube, hot coated internally and externally with aluminium, then heat treated, fusing the aluminium into the surface of the steel, ensuring the seam weld is coated with aluminium. The tube fittings are connected together using specially designed stainless steel wrap-around couplings.

Reflectors

The radiant tube sections of the system are fitted with reflectors made of Aluclip or stainless steel to direct infrared rays downwards. The reflectors are a unique design profile to maximise the reflected radiant heat, minimise convective loss, and maximise rigidity.

Control Panel

SmartCom controlled – single or multi-zoned options available.



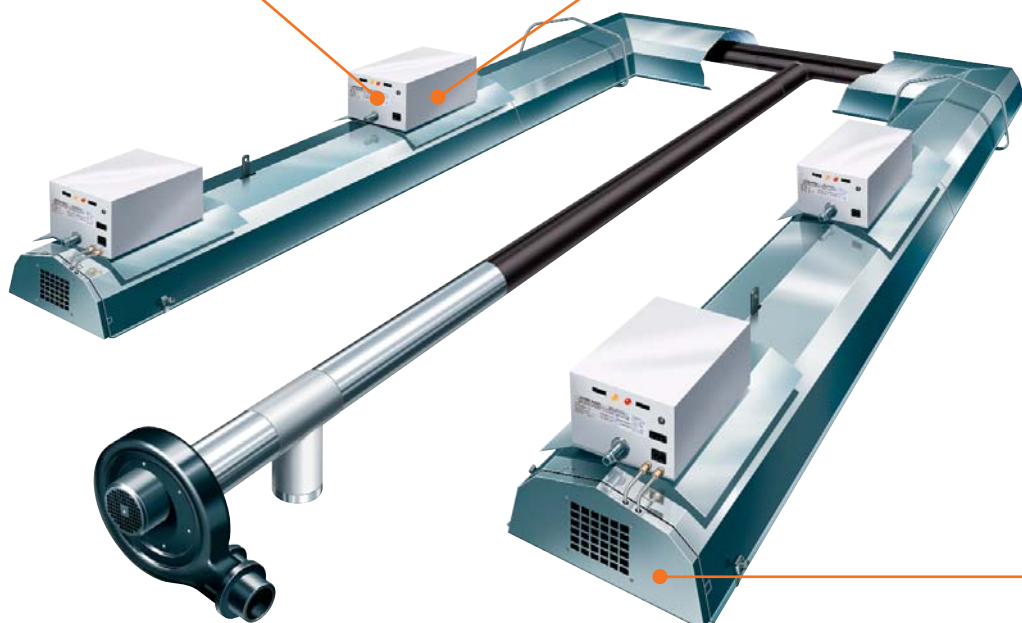
Burning control housing



Burner head assembly



End vent module



System Operation

The system operates on a vacuum principle and utilises a zero governor within a dedicated gas valve ensuring optimum efficiency, reliability and safety.

The zero governor will only allow flow of gas when a vacuum is created by the fan.

Therefore as well as the standard failsafe (where the gas valve locks out with ignition or gas supply failure), the zero governor also

mechanically prevents gas flow in the event of vacuum shut down. The control of gas flow through the zero governor and the air flow into the mixing chamber while under the influence of the vacuum fan, also enable stoichiometric combustion at the burner head.

Stoichiometric combustion permits the inclusion of further burners within the same tubing 'downstream' from the first burner, ensuring

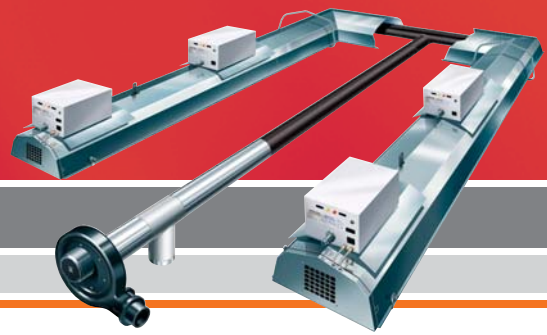
evenly distributed heat along the length of radiant tube.

Conforming to the European Gas Appliance regulations (EN 777), the end vent module burner has been developed to 'prove' flow of air at the start of each radiant branch. The end vent module burner is a unique feature to the Nor-Ray-Vac system and instils the principle of 'safety of operation' as a prerequisite of design.



Nor-Ray-Vac

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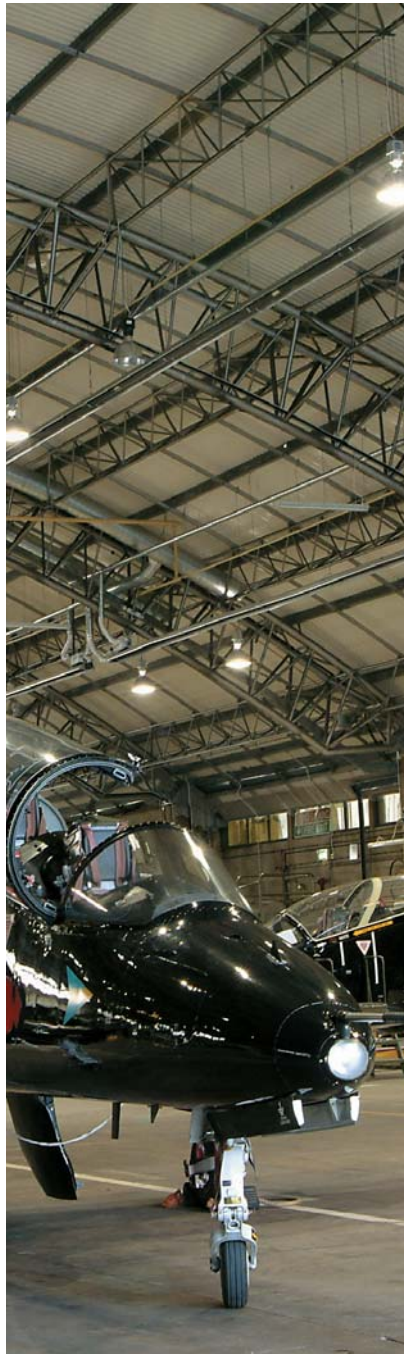
Total Project Support

AmbiRad offers a full range of services to ensure optimum customer satisfaction. The services available include investigative site visits and assistance with system design including:

- Detailed schematic drawings
- Running costs and payback calculations
- Liaison with installation contractors
- Commissioning
- Warranty work
- Tailored service packages

Quality Process

The Nor-Ray-Vac system, as with all AmbiRad products, is manufactured under the strict quality assurance guidelines and is European standard for multi-burner systems (EN 777) approved to guarantee quality and reliability.





SPECIFICATION

Burner Model		NRV12LR	NRV18LR	NRV24LR	NRV32LR	NRV38LR	NRV46LR
Input rating							
Gross	kW	12	18	24	32	38	46
Gas consumption							
Natural gas G20	m ³ /h	1.143	1.715	2.287	3.05	3.62	4.38
Propane G31	m ³ /h	0.452	0.677	0.903	1.21	1.43	1.73
Inlet gas pressure							
mbar Max		50	50	50	50	50	50
mbar Min		12	12	12	12	12	12
Radiant tube length (distance between burners)							
m Max		7.2	10.2	13.1	18	23	27
m Min		5.2	7.4	9.4	14	18	23
Maximum tube temperature	°C	450	450	450	480	480	480

ELECTRICAL DETAILS

Burner Model	NRV12LR	NRV18LR	NRV24LR	NRV32LR	NRV38LR	NRV46LR
Electrical supply	230 volts 1 phase 50Hz					
Current rating	0.05 amps max (inductive)					

NOISE RATING AT 3M BELOW BURNER

Burner Model	NRV12LR	NRV18LR	NRV24LR	NRV32LR	NRV38LR	NRV46LR
dB(A)	46	47	47	48	50	51
NR±2	40	41	41	42	44	45

DISTANCE FROM COMBUSTIBLES

Burner Model	NRV12LR	NRV18LR	NRV24LR	NRV32LR	NRV38LR	NRV46LR
Below tube	End vent/inline					
Without undershield	1120/1250	1120/1250	1120/1250	1440/1700	1570/2100	1700/2100
With undershield	760/850	760/850	760/850	760/850	785/1050	850/1050
Above tube	250	250	250	250	250	250
Horizontally						
Standard reflector	600/770	600/770	600/770	700/850	700/1000	700/1000
Perimeter reflector	305/450	305/450	305/450	305/510	305/600	305/600

All measurements are in millimetres.

MINIMUM MOUNTING HEIGHT

Burner Model	NRV12LR	NRV18LR	NRV24LR	NRV32LR	NRV38LR	NRV46LR
m	3	3.6	4	4.7	5.3	6

SYSTEM WEIGHT

System Type	NRV12LR	NRV18LR	NRV24LR	NRV32LR	NRV38LR	NRV46LR
Average weight	10	10	10	10	10	10

Patents EU 2274703, 2236406.

An AmbiRad Group brand



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