



## RS 1300-1600-2000/E-EV Series

High Power Monobloc Modulating Low NOx Gas Burners  
New Monobloc Burners up to 69 MMBtu/hr

Product Overview

## Overview

RS/E-EV series burners are characterised by a modular monoblock structure that means all necessary components can be combined in a single unit thus making installation easier, faster and, above all, more flexible. The series covers a firing range from 28150 to 69435 MBtu/hr, and they have been designed for use in hot water boilers, overheated water boilers as well as steam boilers. Operation on RS 1300-1600-2000/E-/EV series is fully "modulating". The burner can, therefore, supply with precision the demanded power, guaranteeing an high efficiency system level and the stability setting, obtaining fuel consumption and operating costs reduction. The innovative combustion head, adjustment system ensures perfect movement during modulation as well as reducing noise and pollutants.

## Advantages at a glance

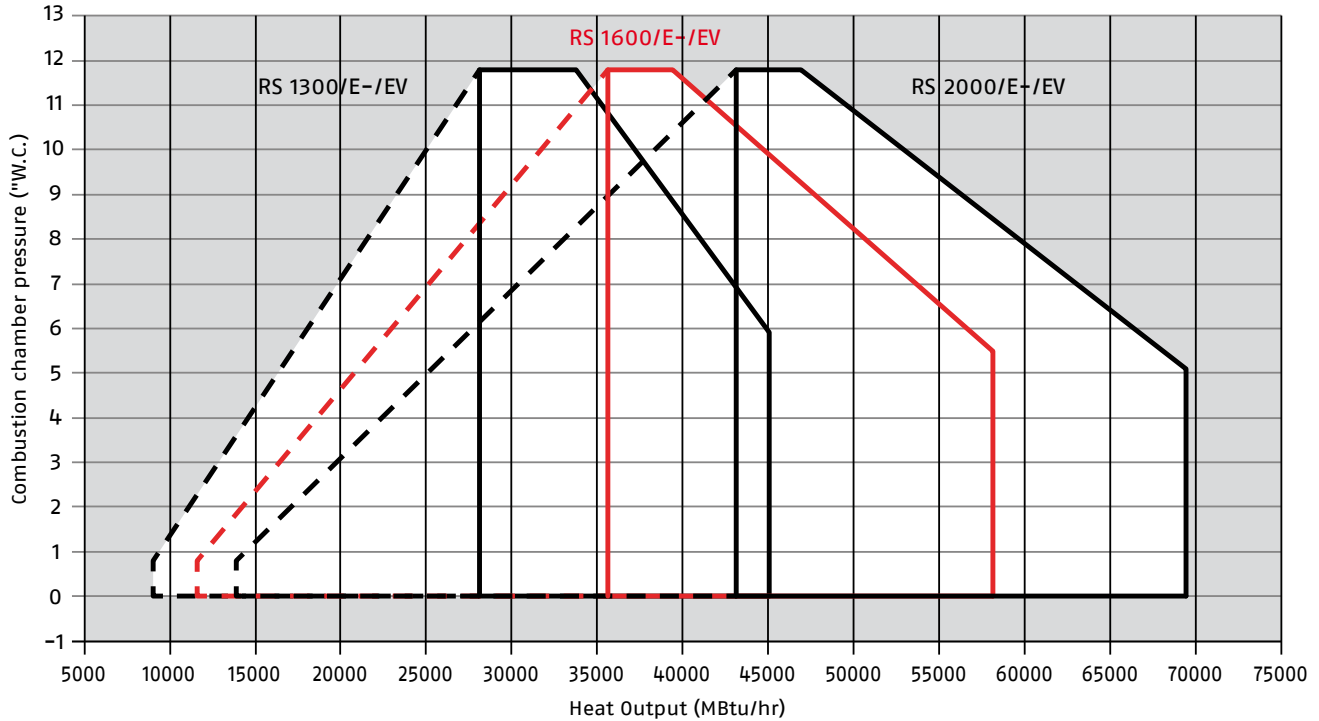
- Easy installation and servicing in spite of the relevant output thanks the monobloc configuration
- Low NOx emissions
- Low noise emissions thanks to the efficient ventilation circuit and sound proofing materials and solutions
- Modulating Operation with integrated PID logic regulator

## ... Other Distinctive Details

- Various configuration available
- Excellent Output Control by Digital Burner Management Systems
- Easy access to internal components by burner opening hinge
- Optional oxygen control suitable for /EV versions
- Protection level NEMA3



# Firing Rates



- Rated working field for burner selection
- Modulation range

Test conditions conforming to EN676  
 Temperature: 20°C  
 Pressure: 1013,5 mbar  
 Altitude: 0 m a.s.l.

## FIRING RATES OUTPUT

Model	MBtu/hr
RS 1300/E-/EV	9010/28150 ÷ 45040
RS 1600/E-/EV	11635/35655 ÷ 58175
RS 2000/E-/EV	13890/43160 ÷ 69435

## LOW SOUND EMISSIONS

Model	dB(A)
RS 1300/E-/EV	90
RS 1600/E-/EV	91
RS 2000/E-/EV	93

## LOW NOx EMISSIONS

Model	ppm at 3% O <sub>2</sub>
RS 1300/E-/EV	< 30
RS 1600/E-/EV	< 30
RS 2000/E-/EV	< 30

Sound pressure measured in manufacturer's combustion laboratory, with burner operating on test boiler at a maximum rated output.

## Ventilation

The ventilation unit comes with a sound proofing system. All the burners in the RS 1300-1600-2000/E-/EV series are fitted with fans, which give excellent performance and are fitted in line with the combustion head. The air flow and sound-deadening materials used in the construction are designed to reduce sound emissions to the minimum and guarantee high levels of performance in terms of output and air pressure. A high precision servomotor through the main management module installed on each burner of RS 1300-1600-2000/E-/EV, controls the air dampers position constantly.



Example of the RS 1600/EV sound proofing system.

## Combustion Head

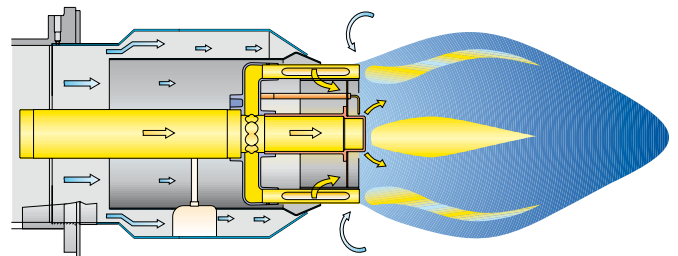
The innovative combustion head adjustment system ensures perfect movement during modulation as well as reducing noise and pollutants. Simple adjustment of the combustion head allows to adapt internal geometry of the head to the output of the burner. The same adjustment servomotor for the air damper also varies, depending on the required output, the setting of the combustion head, through a simple lever. This system guarantees excellent mix on all firing rates range.



Example of a RS 1600/EV burner combustion head

## Safe and Green

The RS/E-/EV series reduces polluting emissions with its exclusive design which optimises air/fuel mixture. The gas in the combustion head is distributed through openings which are perpendicular to the air flow; part of the fuel is injected directly into the centre of the flame. This results in low flame temperature combustion to prevent the formation of NO. Gradual and progressive combustion throughout the flame prevents areas of high oxidation inside the flame. Emissions are further reduced by the re-circulation of combustion gases due to the high velocity of air leaving the combustion head. Pollution levels are below even the most severe standard requirements.



# Burner Operation Mode

Each RS/E-/EV series burner is equipped with an electronic microprocessor management panel, which controls the air damper servomotor as well the fuel servomotors.

Hysteresis is prevented by the precise control of the two servomotors and the software link by can - bus.

The high precision regulation is due to the absence of mechanical clearance normally found in mechanical regulation cams on traditional modulating burners. For the burner commissioning it is necessary to use the AZL unit display included in the burner.

In the RS 1300-1600-2000/E-/EV burners, the PID regulator to control the boiler temperature or pressure is included in the control box. The burner can work for a long time on intermediate output settings (see picture A).

In the RS/EV series variable speed drive control (VDS) and Oxygen control are obtained by installation of a special kit. The display and operating unit (AZL) shows all operational parameters in real time, so as to keep a constant check on the burner:

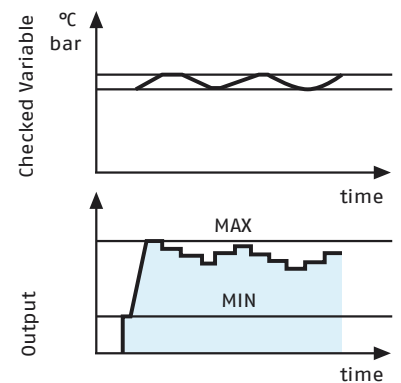
- servomotor angle
- required set-point and actual set-point
- fuel consumption (RS/EV)
- smoke and environmental temperature (RS/EV)
- O<sub>2</sub> value (RS/EV)
- error checking, self diagnostic fault analysis.



## CONTROL BOX MANAGEMENT TABLE

Function	LMV 51 .1	LMV 52.2
Intermittent operation	●	●
Continuos operation	●	●
Intermittent operation flame detector	Infrared Detector	Infrared Detector
Continuos operation flame detector	Infrared Detector	Infrared Detector
Numbers of regulating stepper actuators	4	5
Variable Speed Drive (VSD)	-	○
Input O <sub>2</sub> probe	-	○
Built in O <sub>2</sub> regulator	-	○
Single fuel operation	●	●
Double fuel operation (different timing for oil and gas)	●	●
Gas valve proving system	●	●
Built in temperature pressure PID regulator	●	●
External analog modulation	on demand	●
Analog 4÷20 mA output load signal	●	●
Efficiency Indication	-	○
External e-Bus Interface (AZL)	●	●
Commissioning PC Interface (AZL)	○	○
Commissioning Interface Display (AZL)	●	●

## "Modulating" operation



Picture A

## CONTROL BOX MANAGEMENT VERSION TABLE

	RS/E version	RS/EV version
LMV 51.1	●	
LMV 52.2		●

- Included in supply
- As accessory



**FAN SPEED CONTROL (ON DEMAND)**

The inverter device fitted to the RS/EV series burner acts on the electrical supply frequency of the fan motor to adjust the air flow through the motor speed variation.

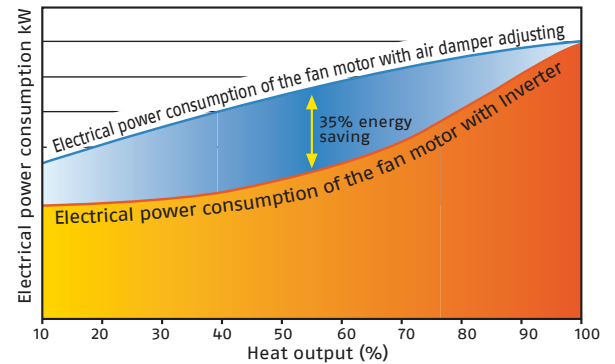
The main advantages of speed control:

- lower sound emissions
- electric power saving.

The fan motor supplies just the necessary air flow, thus reducing sound emissions and avoiding energy loss due to the air damper regulation mechanism.

The inverter technology can save up to 35% of the energy costs.

A safety device to verify the correct speed of the motor is mounted on the air suction circuit of the burner.

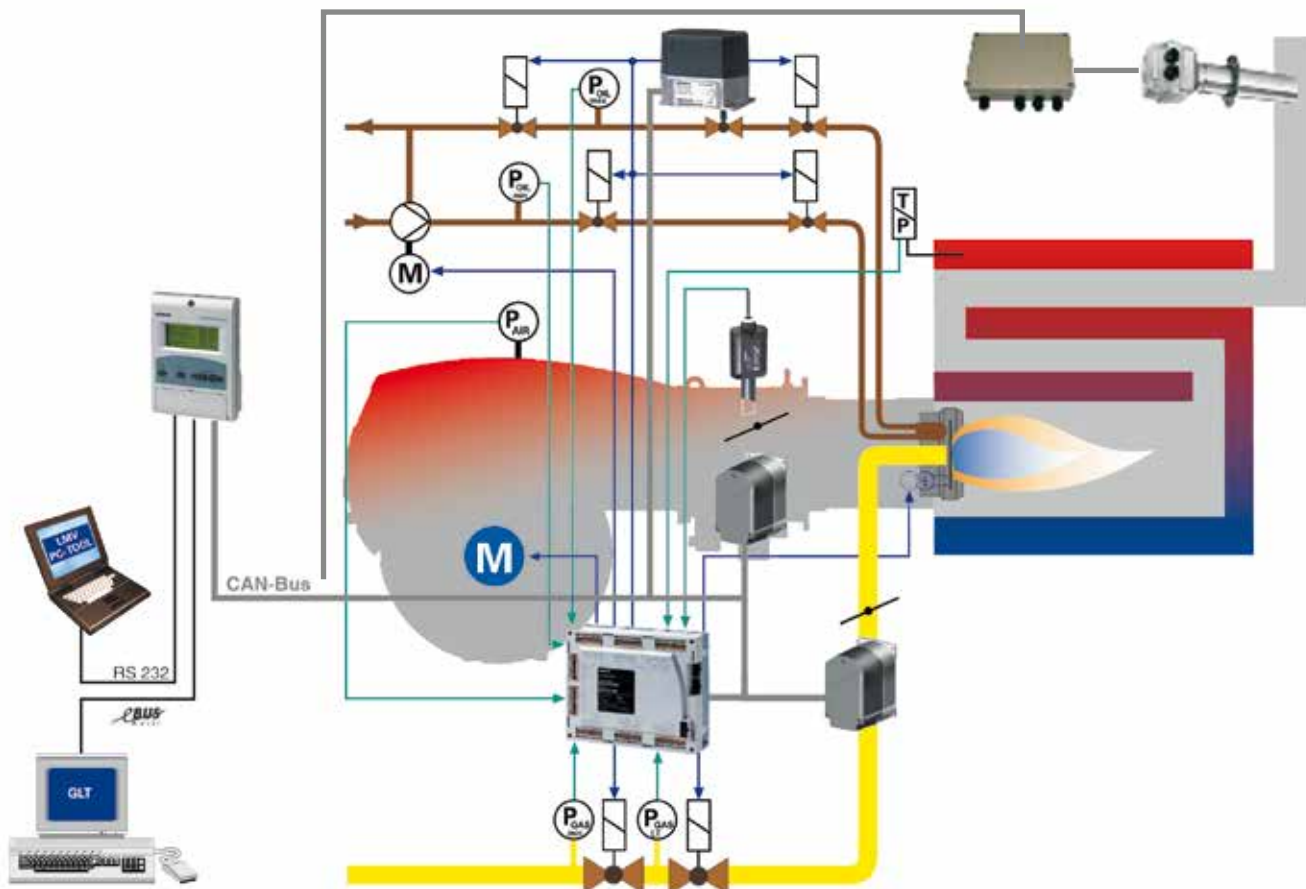


**BURNER MANAGEMENT SYSTEM**

The new electronic cam is a microprocessor based burner management system with matching system components for the control and supervision of forced draft burners.

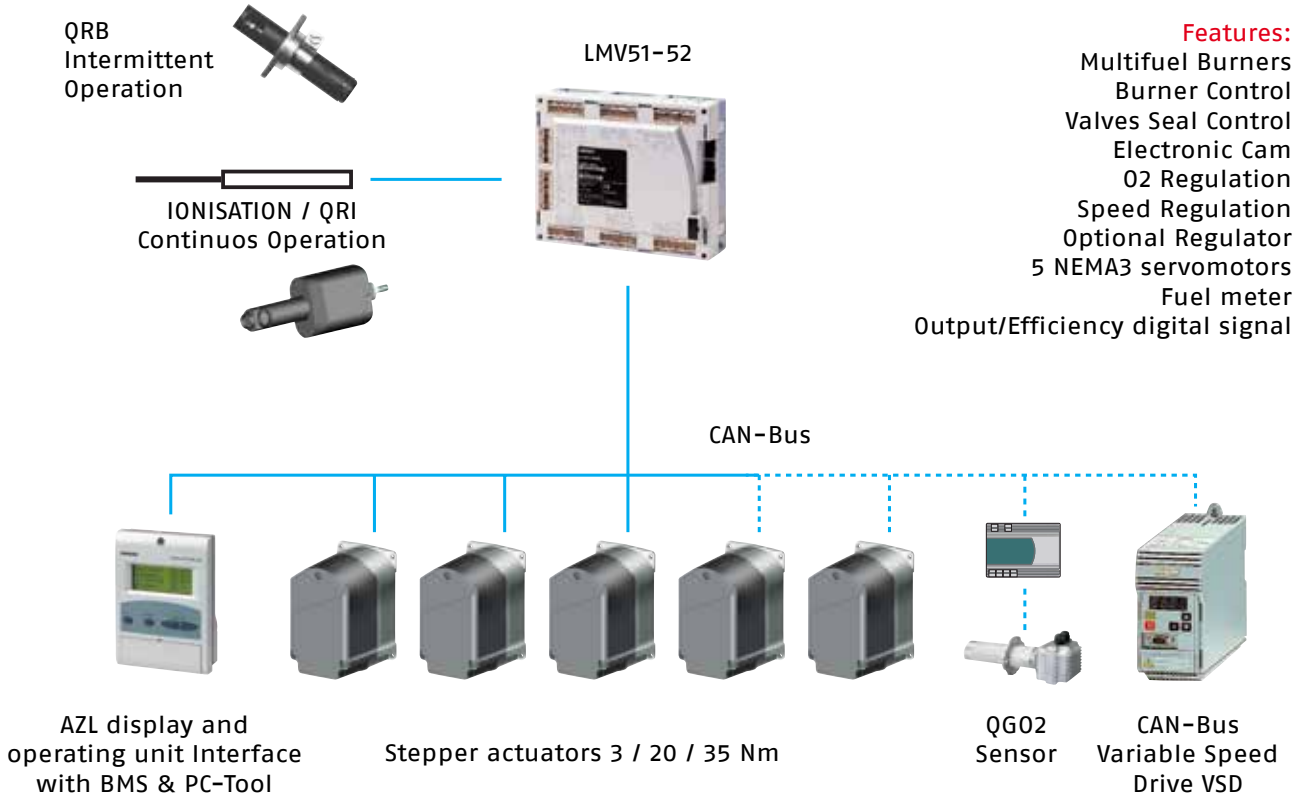
The system components are interconnected via a bus system. Communication between the individual bus users takes place via a reliable system-based data bus.

All safety-related digital outputs of the system are permanently monitored via a contact feedback network.



Example of burner management system in dual fuel burner configuration

**ELECTRONIC CAM PLATFORM**



# Riello Burners a world of experience in every burner we sell.



[ 1 ]



[ 2 ]

Across the world, Riello sets the standard in reliable and high efficiency burner technology.

With burner capacity from 17 thousand to 163 million Btu/hr, Riello gas, oil, dual fuel and Low Nox burners deliver unbeatable performance across the full range of residential and commercial heating applications, as well as in industrial processes.

With headquarter in Legnago, Italy, Riello has been manufacturing premium quality burners for over 90 year. The manufacturing plant is equipped with the most innovative systems of assembling lines and modern manufacturing cells for a quick and flexible response to the market.

Besides, the Riello Combustion Research Centre, located in Angiari, Italy, represents one of the most modern facility in Europe and one of the most advanced in the world for the development of the combustion technology.

Today, the company's presence on worldwide markets is distinguished by a well-constructed and efficient sales network, alongside many important Training Centres located in various countries to meet its customers' needs. Riello has 13 operational branches abroad (in Europe, America and Asia), with customers in over 60 countries.

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