



RS 45-160/E-EV LN NS SERIES

Low NOx Modulating Gas Burners

Product Overview

RS 45-160/E-EV LN NS SERIES



QUALITY ENGINEERED FOR NORTH AMERICAN EMISSION STANDARDS, RIELLO R-SERIES LOW NOX GAS BURNERS ARE BUILT FOR MAXIMUM UPTIME.

The RS/E LN and RS/EV LN burners series covers a firing range from 341 to 7.046 MBtu/hr, and it is based on the Digital Burner Management System, LMV 37 as standard, which is able to manage the air-fuel ratio by independent servomotors in order to obtain a perfect output control and to assure a correct combustion and safe operation on all modulation range. Operation can be "two stage progressive" or, alternatively, "modulating" with the installation of a PID logic regulator and respective probes.

RS/E LN burners series guarantees high efficiency levels in all the various applications, thus reducing fuel consumption and running costs; specifics versions are available to operate with **Variable Speed Drive technology** based on the control of a Frequency Inverter that modifies the air flow through the motor speed variation. Optimisation of sound emissions is guaranteed by the special design of the air suction circuit and by **incorporated sound proofing material**.

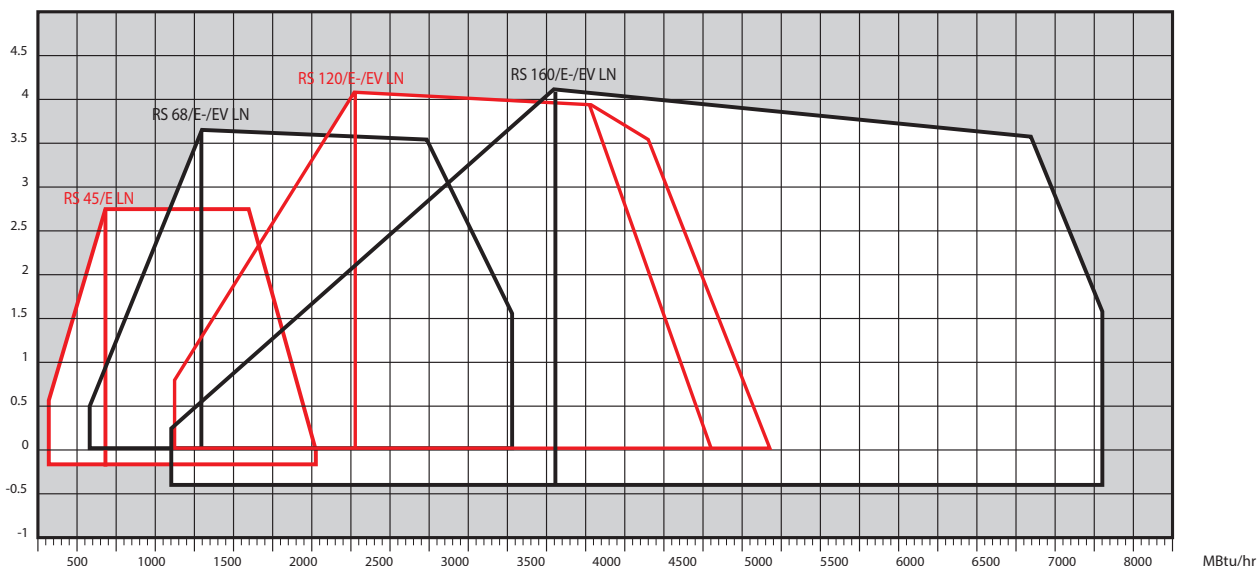
PRODUCT RANGE

MODEL	MBtu/hr
RS 45/E LN	341 - 2.037 (1.969*)
RS 68/E-/EV LN	570 - 3.258
RS 120/E-/EV LN	1.136 - 4.924
RS 160/E-/EV LN	1.136 - 7.046 (6302**)

* Firing rate for C-UL Canadian listing

** Firing rate for C-ETL Canadian listing

FIRING RATES



The max. firing rates are based on:

- zero furnace backpressure;
- ambient temperature of 68 °F;
- barometric pressure 39.4 inches w.c.;
- an elevation of 329 ft a.s.l.

For more details and final burner selection refer to applicable installation manual.

TECHNICAL DATA

MODEL		RS 45/E LN	RS 68/E LN	RS 68/E-EV LN	RS 120/E-EV LN	RS 160/E-EV LN
Fuel		Natural Gas				
Modes of operation		Low-High-Low or Modulating				
Firing rate		341-2.037 (1.969*)	570-3.258	570-3.258	1.136-4.924	1.136-7.046 (6.302*)
Primary control		Siemens LMV 37**				
Ignition transformer		120V-1.6A / 1x7kV-23mA				
Power supply (+/- 10%)	V/Ph/Hz	120/1/60	230/1/60	208-230/460/575/3/60		
	Rpm	3500	3500	3500	3500	3500
Fan motor	HP	0.5	2.4	3	3	7.5
	V	120	230	208-230/460/575		
	A	5.2	11.5	7.8/3.9/3.1	7.8/3.9/3.1	18.6/9.3/7.4
Capacitor	µF	45	70	-		
Power consumption	W max	600	2530	2600	2600	6300
Electrical protection level		NEMA 1				
Noise levels	dBA	72	75	75	77	83.1
CO Emissions	ppm@3%O ₂	less than 16				
NOx Emissions	ppm@3%O ₂	less than 40				
Approvals		UL - ULC - DEA - Mass				

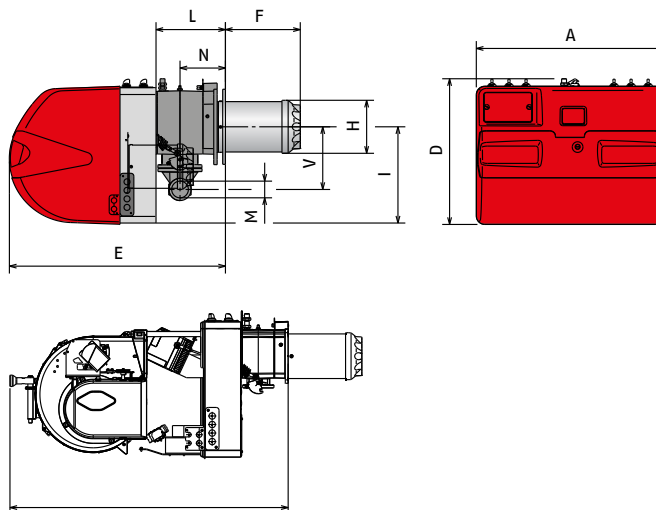
* Firing rate for C-UL Canadian Listing

** LMV 51-52 control available on demand

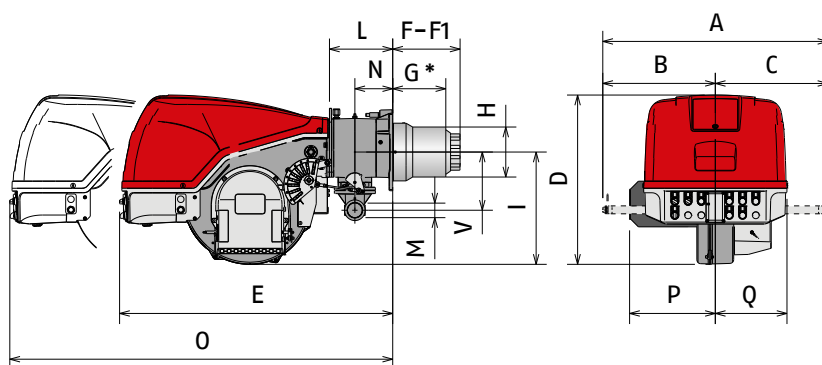
OVERALL DIMENSIONS (INCH)

BURNER

RS 45/E LN



RS 68/E-EV - 120/E-EV - 160/E-EV

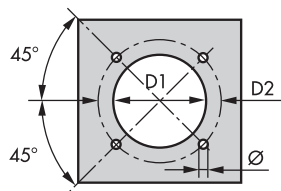


MODEL	A	B	C	D	E	F-F(1)	G*	H
RS 45/E LN	26"	-	-	20 ¹ / ₄ "	26 ³ / ₄ "	9"	-	6 ⁵ / ₁₆ "
RS 68/E-EV LN	33 ¹ / ₂ "	16 ³ / ₄ "	16 ³ / ₄ "	25 ¹ / ₄ "	40 ³ / ₄ "	8 ¹ / ₄ "	7 ¹ / ₂ "	7 ¹ / ₂ "
RS 120/E-EV LN	33 ¹ / ₂ "	16 ³ / ₄ "	16 ³ / ₄ "	25 ¹ / ₄ "	40 ³ / ₄ "	9 ¹⁵ / ₁₆ "-7 ¹ / ₂ "	7 ¹ / ₂ "	7 ¹ / ₂ "
RS 160/E-EV LN	33 ⁷ / ₈ "	16 ³ / ₄ "	16 ³ / ₄ "	25 ¹⁹ / ₃₂ "	40 ³ / ₄ "	14 ¹¹ / ₁₆ "	10 ²⁹ / ₃₂ "	8 ³ / ₄ "

MODEL	I	L	M	N	O	V	P	Q
RS 45/E LN	14 ³ / ₁₆ "	6 ¹ / ₂ "	1 ¹ / ₂ "	4 ¹ / ₄ "	37 ¹ / ₄ "	6 ⁵ / ₈ "	-	-
RS 68/E-EV LN	16 ³ / ₄ "	9"	2"	5 ⁷ / ₈ "	52 ¹³ / ₁₆ "	8 ³ / ₄ "	11 ¹ / ₄ "	10 ⁴¹ / ₆₄ "
RS 120/E-EV LN	16 ³ / ₄ "	8 ¹³ / ₁₆ "	2"	5 ¹¹ / ₁₆ "	52 ¹³ / ₁₆ "	8 ³ / ₄ "	12 ¹³ / ₁₆ "	10 ⁴¹ / ₆₄ "
RS 160/E-EV LN	17 ³ / ₁₆ "	8 ³ / ₄ "	2"	5 ¹³ / ₁₆ "	63 ¹ / ₄ "	8 ³ / ₄ "	18 ¹ / ₈ "	12"

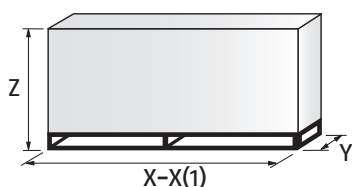
OVERALL DIMENSIONS (INCH)

BURNER - BOILER MOUNTING FLANGE



MODEL	D1	D2	Ø
RS 45/E LN	6 ⁵ / ₁₆ "	8 ¹³ / ₁₆ "	³ / ₈ "W
RS 68/E-EV LN	9 ¹ / ₆ "	12 ¹³ / ₁₆ - 14 ¹ / ₂ "	⁵ / ₈ "W
RS 120/E-EV LN	9 ¹ / ₆ "	12 ¹³ / ₁₆ - 14 ¹ / ₂ "	⁵ / ₈ "W
RS 160/E-EV LN	9 ¹ / ₆ "	12 ¹³ / ₁₆ - 14 ¹ / ₂ "	⁵ / ₈ "W

PACKAGING



MODEL	X-X(1)	Z	Y	lbs
RS 45/E LN	47 ¹ / ₄ "	23 ⁵ / ₈ "	28 "	152
RS 68/E-EV LN	59 ¹ / ₁₆ "	33 ¹ / ₂ "	39 ³ / ₈ "	201
RS 120/E-EV LN	59 ¹ / ₁₆ "	33 ¹ / ₂ "	39 ³ / ₈ "	201
RS 160/E-EV LN	59 ¹ / ₁₆ "	33 ¹ / ₂ "	39 ³ / ₈ "	275

Dimensions given are approximate values.
We reserve the right to make changes in line with future developments.

SPECIFICATION

STATE OF SUPPLY

RS 45/E - 68/E-EV - 120/E-EV - 160/E-EV LN models

Monoblock forced draft Low NOx gas burner with two stage progressive or modulating operation, fully automatic, made up of:

- Microprocessor-based Digital Burner Management System with Variable Speed Drive technology for the control of a Frequency Inverter
- Display Interface operating unit to adjust the system
- Air supply louver box lined with sound-proofing material
- Fan with reverse curve blades high performance with low sound emissions
- Air damper for air flow setting and butterfly valve for regulating fuel output controlled by independent stepper motor actuators
- Starting motor at 3500 rpm, three-phase 230/460/575V, 60Hz (single-phase, 120V and 60Hz for the 45/E LN model, 230V for the RS 68/E LN)
- Low emission combustion head, that can be set on the basis of required output, fitted with:
 - stainless steel end cone, resistant to corrosion and high temperatures
 - ignition electrodes
 - UV scanner
 - gas distributor
 - flame stability disk
- High gas pressure switch (when code requires) to stop the burner in the case of excess pressure on the fuel supply line
- Low air pressure switch stops the burner in case of insufficient air quantity at the combustion head
- Burner on/off selection switch
- Flame inspection window
- Slide bars for easier installation and maintenance
- NEMA 1 electric protection level.

Standard equipment:

- 1 gas train flange
- 1 flange gasket
- 4 screws for fixing the flange
- 1 burner head thermal gasket
- 2 slide bar extensions (for extended head models and RS 160/E-EV LN)
- Instruction handbook for installation, use and maintenance
- Spare parts catalogue.

LMV36 - LMV37

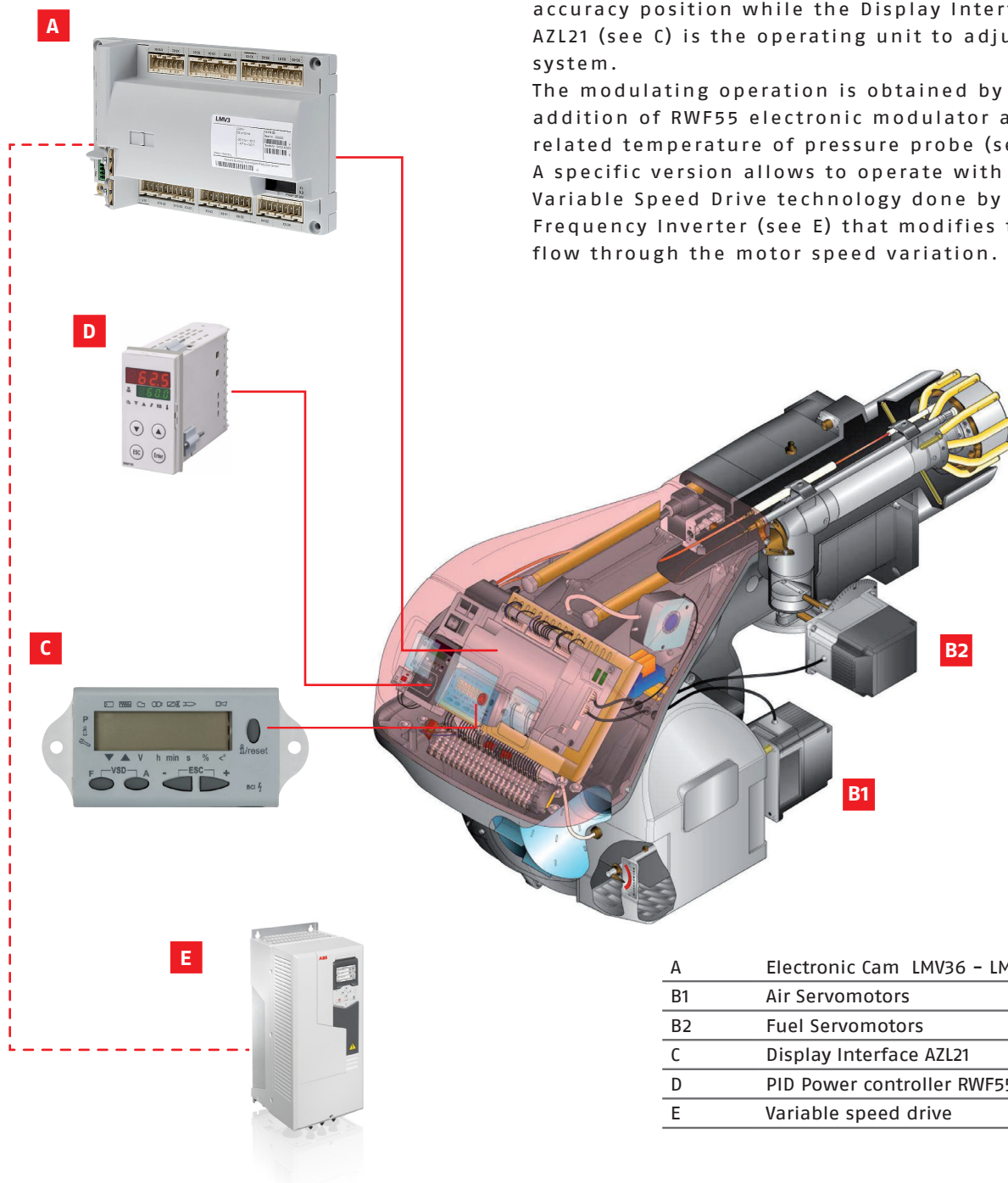
DIGITAL BURNER MANAGEMENT SYSTEM

THE DIGITAL BURNER MANAGEMENT SYSTEM, ALSO CALLED ELECTRONIC CAM, IS A MICROPROCESSOR-BASED DEVICE WITH MATCHING SYSTEM COMPONENTS, DESIGNED FOR THE CONTROL AND SUPERVISION OF FORCED DRAFT BURNERS.

The main electronic device LMV36-37 (see A) includes the standard function of a Flame Control Panel and in the meantime controls the air-fuel mixing.

The actuators, connected to the air damper (see B1) and fuel adjusting device (see B2) with absence of joint clearance and mechanical hysteresis, are stepper motors with high accuracy position while the Display Interface AZL21 (see C) is the operating unit to adjust the system.

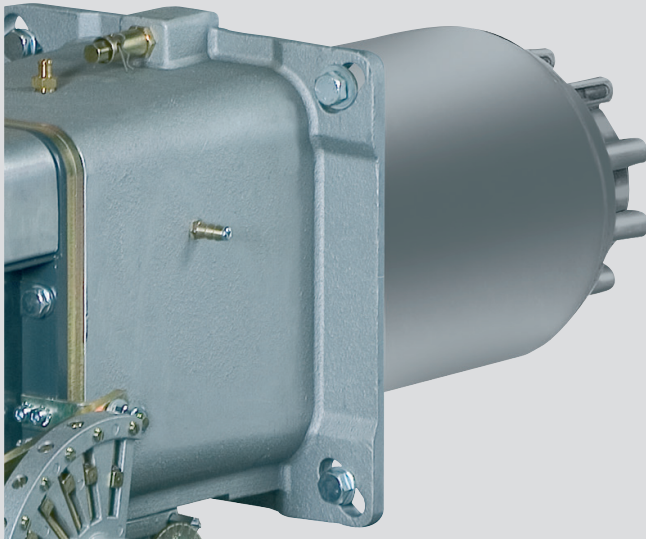
The modulating operation is obtained by the addition of RWF55 electronic modulator and related temperature of pressure probe (see D). A specific version allows to operate with Variable Speed Drive technology done by a Frequency Inverter (see E) that modifies the air flow through the motor speed variation.



A	Electronic Cam LMV36 - LMV37
B1	Air Servomotors
B2	Fuel Servomotors
C	Display Interface AZL21
D	PID Power controller RWF55
E	Variable speed drive

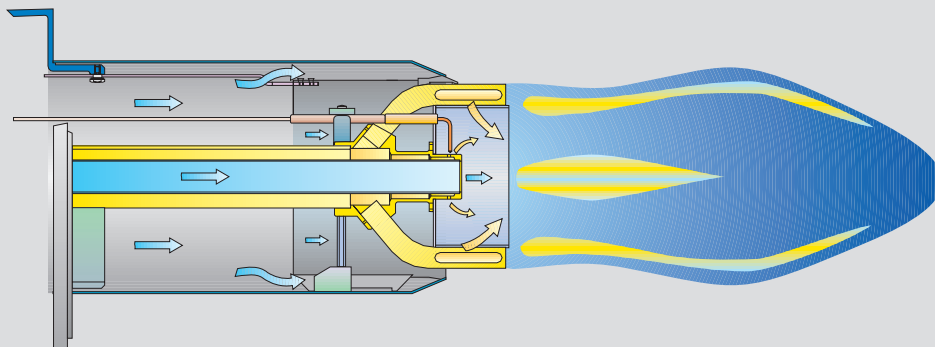
SAFE AND GREEN

RIELLO EXPERIENCE IN COMBUSTION TECHNOLOGY IS VERY WELL DEMONSTRATED IN THE COMBUSTION HEAD OF NEW RS-RLS BURNER MODELS AND ASSURES SMOOTH IGNITION, SAFE OPERATION AND ENVIRONMENTALLY FRIENDLY EMISSIONS.



Riello excels in producing burners which perform well with minimal excess air. This enhances system efficiency and reduces greenhouse gas emissions such as CO₂. With oxygen levels of only 3% (*) typical in the products of combustion and turndown ratios of up to 10-1 (*) on natural gas, system efficiencies are truly maximized. In addition to our standard product we also have available Low NO_x models which use an Advanced Combustion Technology in order to reach NO_x values of less than 30ppm (*) during the combustion of natural gas without the requirement of Flue Gas Recirculation. This enhances system efficiency in comparison with traditional FGR systems and reduces system/ installation costs.

(*) NO_x emissions and Modulation ratios are verified in our Research Center; not all field applications allow similar performance. If guaranteed emissions and/or turndown are required please contact Riello Burners Commercial and Technical Department.



AVAILABLE MODELS

BURNERS

CODE	BURNER MODEL	POWER SUPPLY V/Ph/Hz	FIRING RATE MBtu/hr
Consult Factory	RS 45/E LN	120/1/60	341-2.037 (1969*)
C9342403	RS 68/E LN	230/1/60	570-3.258
C9342400	RS 68/E LN	230/3/60	570-3.258
C9342410	RS 68/E LN	460/3/60	570-3.258
C9342401	RS 68/E LN	575/3/60	570-3.258
C9342700	RS 68/EV LN	230/3/60	570-3.258
C9342710	RS 68/EV LN	460/3/60	570-3.258
C9342701	RS 68/EV LN	575/3/60	570-3.258
C9343400	RS 120/E LN	230/3/60	1.136-4.924
C9343410	RS 120/E LN	460/3/60	1.136-4.924
C9343401	RS 120/E LN	575/3/60	1.136-4.924
C9343700	RS 120/EV LN	230/3/60	1.136-4.924
C9343710	RS 120/EV LN	460/3/60	1.136-4.924
C9343701	RS 120/EV LN	575/3/60	1.136-4.924
C9344400	RS 160/E LN	230/3/60	1.136-7.046 (6.302*)
C9344410	RS 160/E LN	460/3/60	1.136-7.046 (6.302*)
C9344401	RS 160/E LN	575/3/60	1.136-7.046 (6.302*)
C9344700	RS 160/EV LN	230/3/60	1.136-7.046 (6.302*)
C9344710	RS 160/EV LN	460/3/60	1.136-7.046 (6.302*)
C9344701	RS 160/EV LN	575/3/60	1.136-7.046 (6.302*)

* Firing rate for C-UL Canadian Listing (CNL)

** Firing rate for C-ETL Canadian Listing (CNL)

AVAILABLE MODELS

GAS TRAINS CSD-1/CSA/UL/FM - SELECTION/DESCRIPTION

Honeywell & Dungs gas trains are supplied with (2) SS0V, (1) manual ball valve, (1) main gas regulator, (1) lubricated plug valve, low gas pressure switch and 3/8" pilot train including (1) pilot regulator, (1) manual ball valve and (1) SS0V. **Siemens** gas train are supplied with (2) SS0V, (1) manual ball valve, (1) SKP 25 regulating actuator, lubricated plug valve, low gas pressure switch, 3/8" pilot train including (1) pilot regulator, (1) manual ball valve and (1) SS0V.

OPERATING PRESSURE (MIN./ MAX.)	CODE	SAFETY SHUT-OFF VALVE DESCRIPTION	SIZE	RS 45/E LN	RS 68/E EV	RS 120/E EV	RS 160/E EV
8" W.C. / 14"W.C.	C8316016	Honeywell (2) V4297A1013	2"	●			
	C8316424	Dungs (2) MVD 520/6	2"	●			
	C8316617	Siemens (1) SKP15 (1) SKP25 (2) VGG10.504U	2"	●			
	C8316022	Honeywell (2) V5097A1012 (2) V4055A1031	2 1/2"		●		
	C8316430	Dungs (1) MVD 525/6 (1) MVDLE 225/6	2 1/2"		●		
	C8316618	Siemens (1) SKP15 (1) SKP25 (2) VGG10.654U	2 1/2"		●		
	C8316028	Honeywell (1) V5097A1012 (1) V4055A1031 (1) V5097C1018 (1) V4055D1001	3"			●	
	C8316622	Siemens (1) SKP15 (1) SKP25 (2) VGG10.804U	3"			●	
1 PSI / 2 PSI	C8316019	Honeywell (2) V4297A1013	1 1/2"	●			
	C8316419	Dungs (2) MVD 515/6	1 1/2"	●			
	C8316609	Siemens (1) SKP15 (1) SKP25 (2) VGG10.404U	1 1/2"	●	●		
	C8316025	Honeywell (1) V4297A1013 (1) V5097A1004 (1) V4055A1031	1 1/2"		●		
	C8316421	Dungs (1) MVD 515/6 (1) MVDLE 215/6	1 1/2"		●		
	C8316036	Honeywell (1) V5097A1012 (1) V4055A1031 (1) V5097C1018 (1) V4055D1001	2"			●	
	C8316614	Siemens (1) SKP15 (1) SKP25 (2) VGG10.504U	2"			●	●
	C8316041	Honeywell (1) V5097A1012 (1) V4055A1031 (1) V5097C1018 (1) V4055D1001	2 1/2"				●
8" W.C. / 14"W.C. IRI	C8316620	Siemens (1) SKP15 (1) SKP25 (2) VGG10.654U	2 1/2"				
	C8316213	Honeywell (2) V5097C1018 (2) V4055D1019	2"	●			
	C8316815	Siemens (1) SKP15 (1) SKP25 (2) VGG10.404U	2"	●			
	C8316218	Honeywell (2) V5097C1018 (2) V4055D1019	2 1/2"		●		
	C8316819	Siemens (1) SKP15 (1) SKP25 (2) VGG10.654U	2 1/2"		●		
	C8316220	Honeywell (2) V5097C1018 (2) V4055D1019	3"			●	
	C8316821	Siemens (1) SKP15 (1) SKP25 (2) VGG10.804U	3"			●	
	C8316206	Honeywell (2) V5097C1000 (2) V4055D1019	1 1/2"	●			
1 PSI / 2 PSI IRI	C8316809	Siemens (1) SKP15 (1) SKP25 (2) VGG10.404U	1 1/2"	●	●		
	C8316210	Honeywell (2) V5097C1000 (2) V4055D1019	1 1/2"		●		
	C8316215	Honeywell (2) V5097C1018 (2) V4055D1019	2"			●	
	C8316816	Siemens (1) SKP15 (1) SKP25 (2) VGG10.504U	2"			●	
	C8316817	Siemens (1) SKP15 (1) SKP25 (2) VGG10.504U	2"				●
	C8316219	Honeywell (2) V5097C1018 (2) V4055D1019	2 1/2"				●
	C8316820	Siemens (1) SKP15 (1) SKP25 (2) VGG10.654U	2 1/2"				

Major components shipped loose for assembly and wiring by others
For lower or higher gas pressure, please contact factory for correct sizing

BURNER ACCESSORIES

ACCESSORIES FOR MODULATING OPERATION

REGULATOR



To obtain modulating operation, the RS/E series of burners requires a regulator.

BURNER	REGULATOR TYPE	REGULATOR CODE
RS 45/E LN	RWF 55	20094961

The relative temperature or pressure probes fitted to the regulator, must be chosen on the basis of the application.

PROBE



BURNER	PROBE TYPE	RANGE	PROBE CODE	
RS 45/E LN RS 68/E-/EV-120/E-/EV LN RS 160/E-/EV LN	Temperature sensor	Water NI 1000 RTD	C5332020	
		Air NI 1000 RTD	C5332021	
		Water QAE 2020 RTD	C5332027	
	Pressure sensor		4-20 mA	0-10 V
		0 - 15 PSI	C5332040	C5332050
		0 - 60 PSI	C5332041	C5332051
		0 - 150 PSI	C5332042	C5332052
		0 - 200 PSI	C5332043	C5332053
		0 - 300 PSI	C5332044	C5332054

BURNER ACCESSORIES

VARIABLE SPEED DRIVES FOR EV CHASSIS

VSD 208-230-460-575/3/60 are available. Please consult factory.

STEP-DOWN TRANSFORMERS

BURNER	DESCRIPTION	CODE	NOTE
RS 68-120-160/E-EV LN*	Stepdown Transformer 208V - 120V	C7000510	(1)
	Stepdown Transformer 230V - 120V	C7000511	(1)
	Stepdown Transformer 460V - 120V	C7000512	(1)
	Stepdown Transformer 575V - 120V	C7000513	(1)

* 3-phase burners only

(1) Including fuses, mounted to burner

ELECTRICAL OPTIONS

BURNER	DESCRIPTION	CODE	NOTE
RS 45/E LN RS 68/E-120/E-160/E-EV LN	OCI 412 Modbus module	C5360140	
	Set of dry contacts	C7000327	(1)
	Wiring modifications including up to 3 extra terminals	C7000395	
	Additional indicating light	C7000396	(1) (2)
	OCI 412 module + power transformer	20105591	(1)

(1) Installed

(2) A maximum combination of 4 devices can be installed on burner (example: 3 lights and alarm horn or 2 lights, alarm horn and local/remote switch). Additional electrical modifications. consult factory.

DUCTED AIR INTAKE

BURNER	KIT CODE
RS 45/E LN	20112120
RS 68-120 E EV LN	C7005531
RS 160/E EV LN	C7005532

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