Specifications of OPTIMA™ SLS Burners

Typical burner data Fuel: natural gas at 60°F with 1000 Btu/ft^3 (st) HHV - sg = 0.6 (1) Combustion air: 60°F - 21% O_2 - 50% humidity - sg = 1.0 (1) Stated pressures are indicative. Actual pressures are a function of air humidity, altitude, type of fuel and gas quality							
8" OPTIMA™ SLS							
Maximum Capacity	Heat Input (MBtu/h)	8.0	9.2	10.3	11.3	12.2	13.0
Combustion Air	Differential Pressure ("wc) (4) Vol. Flow (scfh)	12 114,090	16 131,740	20 147,290	24 161,348	28 174,276	32 186,309
Fuel - Natural Gas	Differential Pressure (psig) (3)	1.40	1.86	2.33	2.80	3.26	3.73
Fuel - Propane (2)	Differential Pressure (psig)	0.56	0.75	0.93	1.12	1.30	1.49
Minimum Capacity	Heat Input (MBtu/h)	0.80	0.80	0.80	0.80	.80	0.80
Turndown Ratio	---	10.0	11.5	12.9	14.1	15.2	16.3
Approximate Flame Size	Length (ft) Diameter (ft)	4 2					
Burner Weight	(lb)	350					
Pilot Capacity	(Btu/h)	125,000 - 250,000					
Pilot-Natural Gas	Differential Pressure ("wc)	1.6 - 6.4					

Typical burner data Fuel: natural gas at 60°F with 1000 Btu/ft^3 (st) HHV - sg = 0.6 (1) Combustion air: 60°F - 21% O_2 - 50% humidity - sg = 1.0 (1) Stated pressures are indicative. Actual pressures are a function of air humidity, altitude, type of fuel and gas quality							
10" OPTIMA™ SLS							
Maximum Capacity	Heat Input (MBtu/h)	12.5	14.5	16.2	17.7	19.2	20.5
Combustion Air	Differential Pressure ("wc) (4) Vol. Flow (scfh)	12 179,332	16 207,075	20 231,517	24 253,614	28 273,935	32 292,848
Fuel - Natural Gas	Differential Pressure (psig) (3)	1.26	1.68	2.10	2.52	2.94	3.36
Fuel - Propane [2]	Differential Pressure (psig)	0.50	0.67	0.84	1.01	1.18	1.34
Minimum Capacity	Heat Input (MBtu/h)	1.30	1.30	1.30	1.30	1.30	1.30
Turndown Ratio	---	9.6	11.1	12.5	13.6	14.7	15.8
Approximate Flame Size	Length (ft) Diameter (ft)	4.5 2.5					
Burner Weight	(lb)	520					
Pilot Capacity	(Btu/h)	125,000 - 250,000					
Pilot - Natural Gas	Differential Pressure ("wc)	1.6 - 6.4					

(1) sg (specific gravity) = relative density to air (density air = 0.0763 lb/ft^3 (st))
(2) Propane (2500 Btu/ft^3 HHV) sg = 1.52
(3) Differential natural gas pressure required at burner gas inlet
(4) Differential combustion air pressure at full capacity measured at the air test port

Typical burner data Fuel: natural gas at 60°F with 1000 Btu/ft^3 (st) HHV - sg = 0.6 (1) Combustion air: 60°F - 21% O_2 - 50% humidity - sg = 1.0 (1) Stated pressures are indicative. Actual pressures are a function of air humidity, altitude, type of fuel and gas quality							
12" OPTIMA™ SLS							
Maximum Capacity	Heat Input (MBtu/h)	20.3	23.4	26.2	28.7	31.0	33.1
Combustion Air	Differential Pressure ("wc) (4) Vol. Flow (scfh)	12 290,210	16 335,106	20 374,660	24 410,419	28 443,300	32 473,910
Fuel - Natural Gas	Differential Pressure (psig) (3)	2.34	3.12	3.90	4.68	5.46	6.24
Fuel - Propane [2]	Differential Pressure (psig)	0.86	1.15	1.44	1.73	2.02	2.30
Minimum Capacity	Heat Input (MBtu/h)	1.87	1.87	1.87	1.87	1.87	1.87
Turndown Ratio	---	10.9	12.5	14.0	15.3	16.6	17.7
Approximate Flame Size	Length (ft) Diameter (ft)	5 3					
Burner Weight	(lb)	750					
Pilot Capacity	(Btu/h)	125,000 - 250,000					
Pilot - Natural Gas	Differential Pressure ("wc)	1.6 - 6.4					

Typical burner data Fuel: natural gas at 60°F with 1000 Btu/ft^3 (st) HHV - sg = 0.6 (1) Combustion air: 60°F - 21% O_2 - 50% humidity - sg = 1.0 (1) Stated pressures are indicative. Actual pressures are a function of air humidity, altitude, type of fuel and gas quality							
16" OPTIMA ™ SLS							
Maximum Capacity	Heat Input (MBtu/h)	31.6	36.5	40.8	44.7	48.3	51.6
Combustion Air	Differential Pressure ("wc) (4) Vol. Flow (scfh)	12 451,931	16 521,845	20 583,440	24 639,126	28 690,336	32 738,000
Fuel - Natural Gas	Differential Pressure (psig) (3)	1.10	1.47	1.84	2.21	2.58	2.94
Fuel - Propane [2]	Differential Pressure (psig)	0.44	0.59	0.74	0.88	1.03	1.18
Minimum Capacity	Heat Input (MBtu/h)	2.90	2.90	2.90	2.90	2.90	2.90
Turndown Ratio	---	10.9	12.6	14.1	15.4	16.6	17.8
Approximate Flame Size	Length (ft) Diameter (ft)	6 4					
Burner Weight	(lb)	1300					
Pilot Capacity	(Btu/h)	125,000 - 250,000					
Pilot - Natural Gas	Differential Pressure ("wc)	1.6 - 6.4					

(1) sg (specific gravity) = relative density to air (density air = 0.0763 lb/ft^3 (st))
(2) Propane (2500 Btu/ft^3 HHV) sg = 1.52
(3) Differential natural gas pressure required at burner gas inlet
(4) Differential combustion air pressure at full capacity measured at the air test port

Typical burner data Fuel: natural gas at 60°F with 1000 Btu/ft^3 (st) HHV - sg = 0.6 (1) Combustion air: 60°F - 21% O_2 - 50% humidity - sg = 1.0 (1) Stated pressures are indicative. Actual pressures are a function of air humidity, altitude, type of fuel and gas quality							
22" OPTIMA ™ SLS							
Maximum Capacity	Heat Input (MBtu/h)	57.2	66.1	73.9	81.0	87.4	93.5
Combustion Air	Differential Pressure ("wc) (4) Vol. Flow (scfh)	12 818,571	16 945,204	20 1,056,770	24 1,157,634	28 1,250,387	32 1,336,720
Fuel - Natural Gas	Differential Pressure (psig) (3)	0.97	1.29	1.61	1.93	2.25	2.58
Fuel - Propane [2]	Differential Pressure (psig)	0.39	0.52	0.64	0.77	0.90	1.03
Minimum Capacity	Heat Input (MBtu/h)	8.00	8.00	8.00	8.00	8.00	8.00
Turndown Ratio	---	7.2	8.3	9.2	10.1	10.9	11.7
Approximate Flame Size	Length (ft) Diameter (ft)	8 5					
Burner Weight	(lb)	1750					
Pilot Capacity	(Btu/h)	125,000 - 250,000					
Pilot - Natural Gas	Differential Pressure ("wc)	1.6 - 6.4					

(1) sg (specific gravity) = relative density to air (density air = 0.0763 lb/ft^3 (st))
(2) Propane (2500 Btu/ft^3 HHV) sg = 1.52
(3) Differential natural gas pressure required at burner gas inlet
(4) Differential combustion air pressure at full capacity measured at the air test port

Materials of Construction

Burner Housing	Carbon Steel, powder coated (TGIC) AISI 1008 / 1010 (1.1121)
Burner Sleeve	AISI 309 / 310 Stainless Steel (1.4823 / 1.4841) AISI 330 Stainless Steel (optional)
Burner Cone	AISI 309 / 310 Stainless Steel (1.4823 / 1.4841) AISI 330 Stainless Steel (optional)
Fuel Injector Nozzle	AISI 304 Stainless Steel (1.4301)

Selection Criteria

Application Details

OPTIMA™ SLS Burners provide reliable, clean heat in applications with a moving stream or process flow. Indirect fired applications are also permissible with proper configuration of the burner (contact MAXON). The burner may be installed on processes with suction or back pressures up to 1.5 psig. Contact MAXON if higher application pressures are required for special gasketing options.

Burner Protection

The flame scanner must have a cooling air flow of 1 scfm . This can be supplied by the combustion air blower. It should be connected to the tee on the flame scanner pipe nipple. An adjustable orifice can be used for fine control.

Pilot

The pilot gas valve should be located close to the burner for quick ignition.

An interrupted pilot is required for safe operation and ignition.

Pilot flow and pressure requirements for each burner are shown in the OPTIMA™ Capacities and Specifications chart.

Pilot air may be required in applications with high moisture or low oxygen content. In basic air heating applications, a raw gas pilot and/or direct spark ignition is permissible as long as oxygen levels remain over 18% and the air stream is not heavily saturated where condensation could occur within the pilot assembly.

Multiple Burners Manifolded to a Single Blower

For good air distribution, the air manifold should extend one diameter past the burner inlet with the burner feeding from a tee rather than an elbow.

For maximum flexibility, each burner should have its own pilot and main gas regulators.

Proper air manifold sizing using the equal area method should be utilized. Conscientious manifold design will allow maximum turndown and best performance.

Process Temperature

Application temperatures are limited to 1000°F with moving process flows. The OPTIMA™ SLS should be installed so that radiant energy is released to the process and not trapped around the burner sleeve. Avoid packing insulation directly against the discharge sleeve beyond the first 6 inches. Process flows should flow over the discharge sleeve to provide the longest practical service life. Standard 309/310 discharge sleeve should be used for local application temperatures near the burner up to 750°F . For temperatures over 750°F, select the optional 330 stainless steel sleeve.

Piloting & Ignition

Interrupted pilots are required for optimal ignition and emissions performance.

MAXON does not recommend the use of standing pilots as the burner is not intended to confirm main flame/pilot flame scanner discrimination.

OPTIMA™ pilots may operate with raw gas in some applications. Where high moisture or oxygen < 18% by volume is present, combustion air must be piped to the pilot for reliable operation.

Ratio Control

OPTIMA™ SLS Burners produce ideal emissions with constant 43% excess air. Operation at other ratios is permissible depending upon application and emissions requirements. Contact MAXON for details.

OPTIMA™ SLS burners perform best when equipped with the SMARTFIRE® self compensating, intelligent ratio control system. This system provides optimal operation of the burner for efficiency, reliability, and emissions control. Variations in combustion air temperature, barometric pressure and process application pressures will be corrected by the SMARTFIRE® system. In stable pressure applications, SMARTFIRE® may be substituted for SMARTLINK® digital ratio control. Contact MAXON for details.

Flame Supervision

The OPTIMA™ SLS burner is arranged for use with UV or IR scanners as flame detectors. The standard flame supervision location will detect both main flame and pilot flame. Do not use standing pilots in this arrangement.

Piping

Follow all applicable codes including regional codes, local directives, standards and recommendations of your insurance carrier when designing and installing OPTIMA™ SLS burners. Installation should only be undertaken by qualified gas contractors licensed for any regional or local requirements.

Piping weight should be independently supported. Do not use the burner as a piping support or hang weight from the burner's flange connections.

Do not utilize hydraulic leak tests on piping feeding burner systems. Avoid the use of teflon tape or other pipe tape for sealing pipe threads.

Fuels

The OPTIMA™ SLS is designed to burn a variety of fuels and fuel blends. Optimal emissions performance will occur with clean, dry fuel gases such as natural gas, propane, and butane. Contact MAXON for information on combusting special fuels, fuels with low heating value, and fuels with corrosive constituents.

Expected Emissions

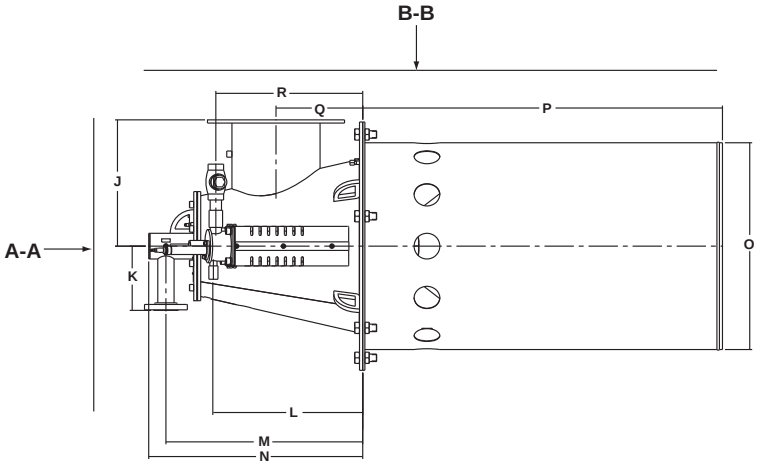
Typical emissions for the OPTIMA™ SLS with 43% excess air:

NOx < 9 - 15 ppm corrected to 3% Oxygen

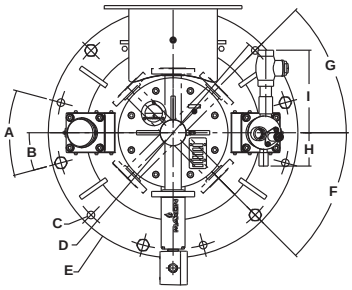
Production of various pollutants can be highly dependent upon burner application and installation. Differing temperatures, process velocities, oxygen levels, and fuels can all impact the actual level of emissions produced. No guarantee of emissions is intended or implied without specific evaluation and written guarantee by MAXON.

Dimensions

8” OPTIMA™ SLS



View A-A



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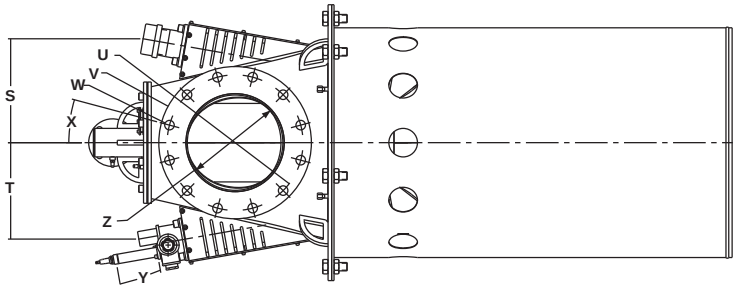
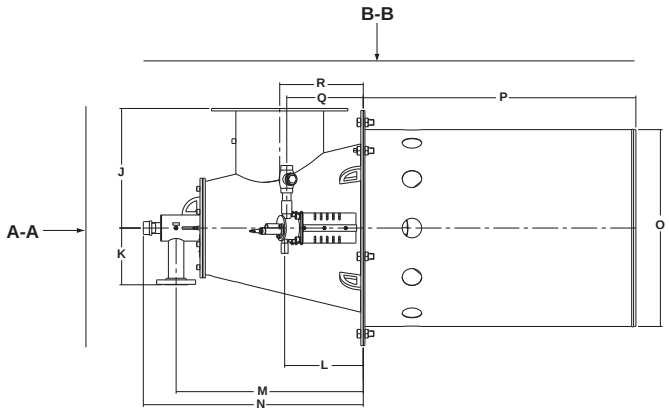


29.5” clearance required to remove burner nozzle

Dimensions in inches unless stated otherwise												
A	B	C Ø	D Ø	E Ø	F	G	H	I	J	K	L	M
30°	15°	0.88	27.0	29.0	45°	45°	3.87	9.57	14.75	7.5	17.43	22.98

N	O Ø	P	Q	R	S	T	U Ø	V Ø	W Ø	X	Y	Z Ø
24.99	24.15	42.0	10.13	17.14	10.92	10.13	14.25	16.0	1.0	15°	4.26	10.02

10” OPTIMA™ SLS



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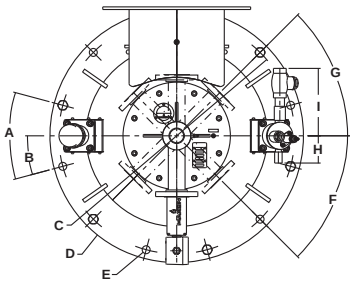

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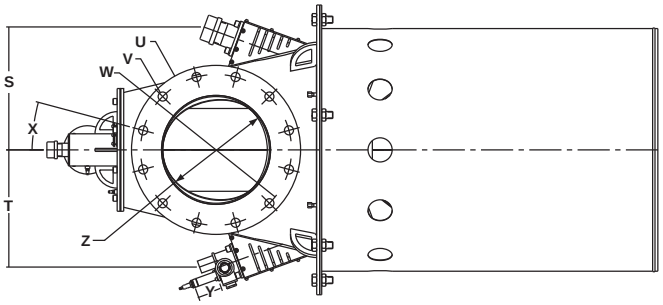
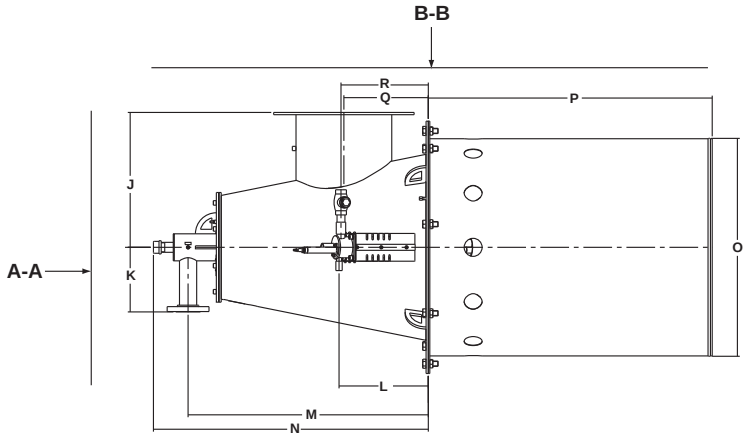


35.5” clearance required to remove burner nozzle

Dimensions in inches unless stated otherwise												
A	B	C Ø	D Ø	E Ø	F	G	H	I	J	K	L	M
30°	15°	33.5	36.0	1.12	45°	45°	3.87	9.57	18.31	8.69	12.08	28.84

N	O Ø	P	Q	R	S	T	U Ø	V Ø	W Ø	X	Y	Z Ø
33.89	30.15	42.0	11.75	12.87	15.26	14.55	21.0	1.12	18.75	15°	2.67	13.25

12” OPTIMA™ SLS



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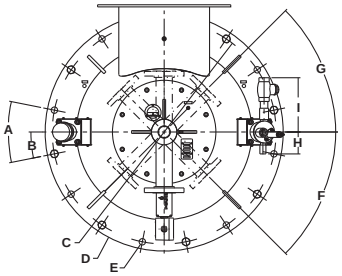

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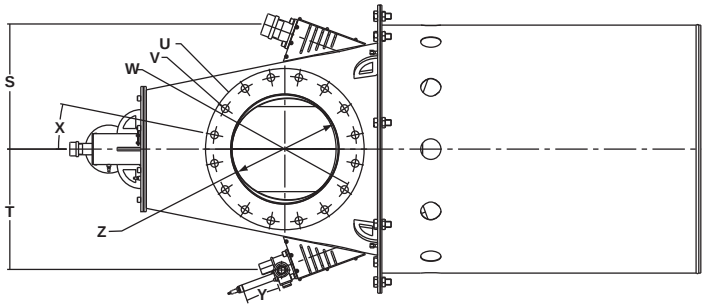
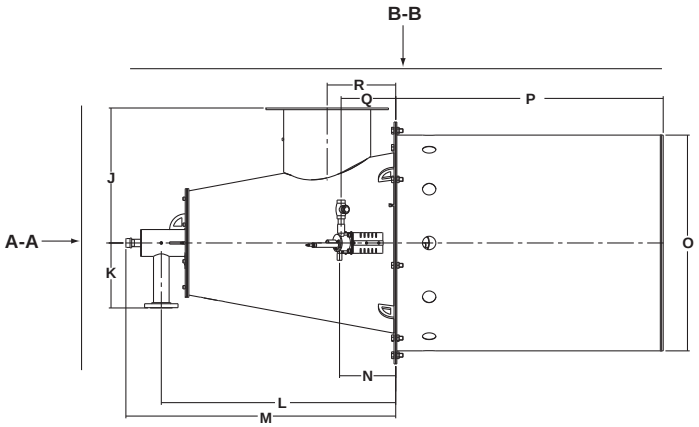


45.5” clearance required to remove burner nozzle

Dimensions in inches unless stated otherwise												
A	B	C Ø	D Ø	E Ø	F	G	H	I	J	K	L	M
22.5°	11.25°	39.5	42.0	1.12	45°	45°	3.87	9.57	22.45	10.75	14.9	40.19

N	O Ø	P	Q	R	S	T	U Ø	V Ø	W Ø	X	Y	Z Ø
45.99	36.27	47.5	14.13	14.57	18.23	17.53	23.5	1.12	21.25	11.25°	5.10	15.75

16” OPTIMA™ SLS



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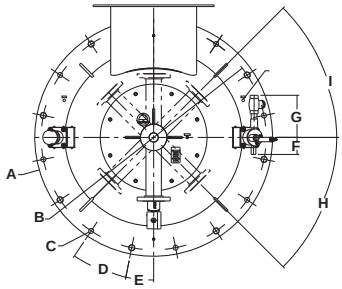

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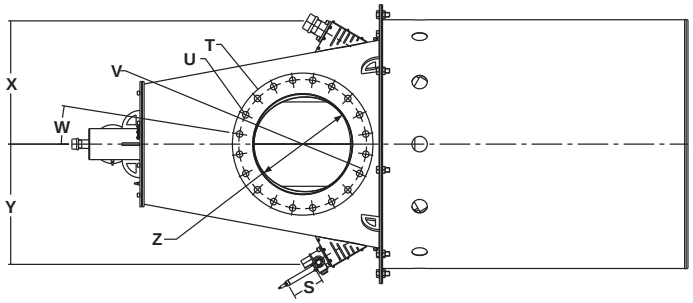
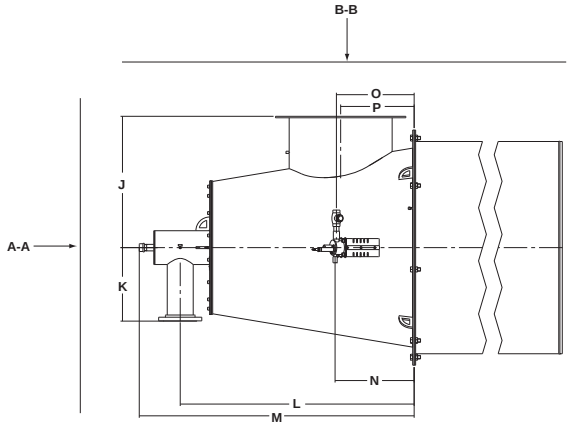


57.5” clearance required to remove burner nozzle

Dimensions in inches unless stated otherwise												
A Ø	B Ø	C Ø	D	E	F	G	H	I	J	K	L	M
54.0	51.09	1.12	22.5°	11.25°	3.87	9.57	45°	45°	30.12	14.5	52.58	60.52

N	O Ø	P	Q	R	S	T Ø	U Ø	V Ø	W	X	Y	Z Ø
12.63	48.15	60.0	12.27	15.38	5.79	27.5	1.25	25.0	9°	23.87	23.29	19.25

22” OPTIMA™ SLS



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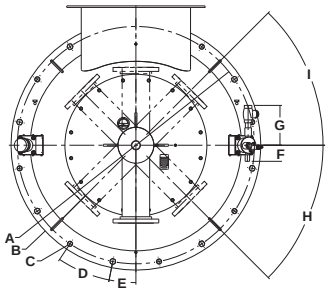

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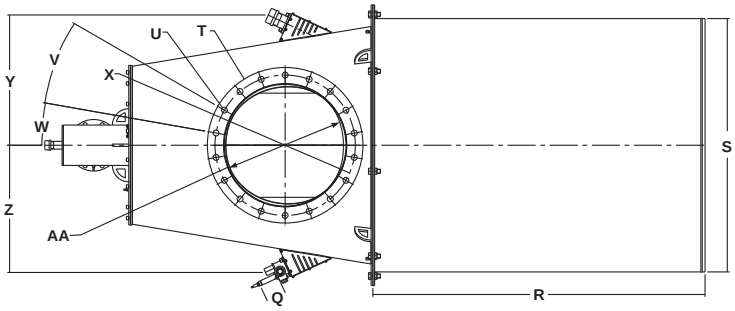
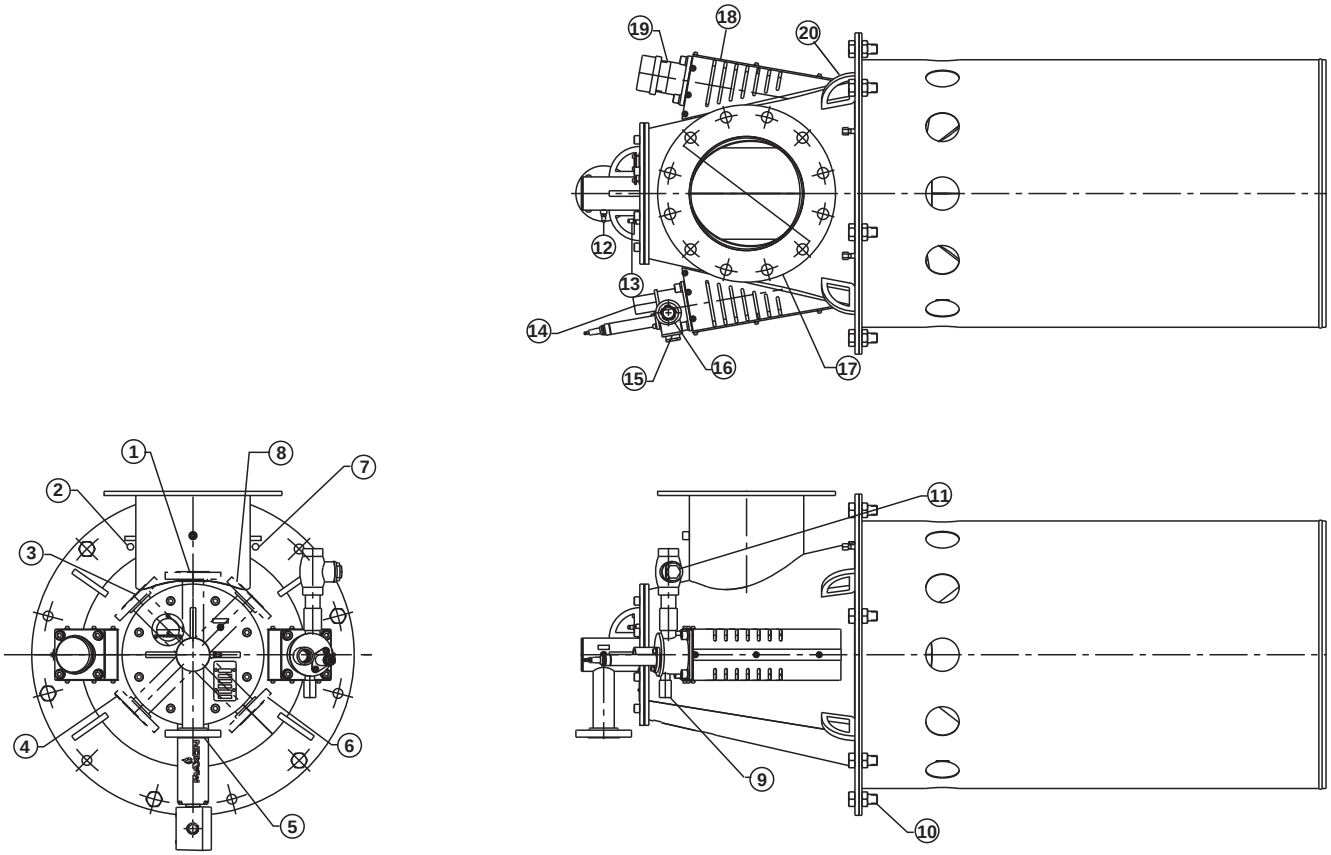


76.5” clearance required to remove burner nozzle

Dimensions in inches unless stated otherwise												
A Ø	B Ø	C Ø	D	E	F	G	H	I	J	K	L	M
57.0	60.0	1.25	22.5°	11.25°	3.87	9.57	45°	45°	33.50	18.75	59.68	70.13

N	O	P	Q	R	S Ø	T Ø	U Ø	V	W	X Ø	Y	Z	AA Ø
20.12	19.77	18.75	3.49	71.0	54.15	3.25	1.25	20°	10°	30.0	27.82	27.16	26.0

Component Identification and Fuel Inlet Positions



Number	Description		Number	Description
1	Fuel inlet position #4		11	Pilot air adjustable orifice
2	1/8” NPT chamber pressure tap		12	1/8” NPT fuel pressure tap
3	Fuel inlet position #3		13	1/8” NPT combustion air pressure tap
4	Fuel inlet position #2		14	1” NPT coupling for UV scanning
5	Fuel inlet, Class 150 RF steel pipe flange, position #1 (see note below)		15	Pilot and spark ignitor assembly; position “right” shown
6	Fuel inlet position #6		16	1” NPT pilot air inlet connection
7	1/8” NPT chamber pressure tap		17	Flange diameter and bolt pattern matches standard ANSI flange (see note below)
8	Fuel inlet position #5		18	Pilot position “left”
9	1/2” NPT pilot fuel inlet		19	2-1/2” NPT alternate scanning port
10	7/8-9 hex head bolts and nuts, if required, are to be used for shipping purposes only		20	Lifting lugs

NOTES:
Number 5 - 8” burner = 1-1/2” flange; 10” burner = 2” flange; 12” burner = 2-1/2” flange; 16” burner = 3” flange; 22” burner = 6” flange
Number 17 - 8” burner = 10” flange; 10” burner = 14” flange; 12” burner = 16” flange; 16” burner = 20” flange; 22” burner = 26” flange