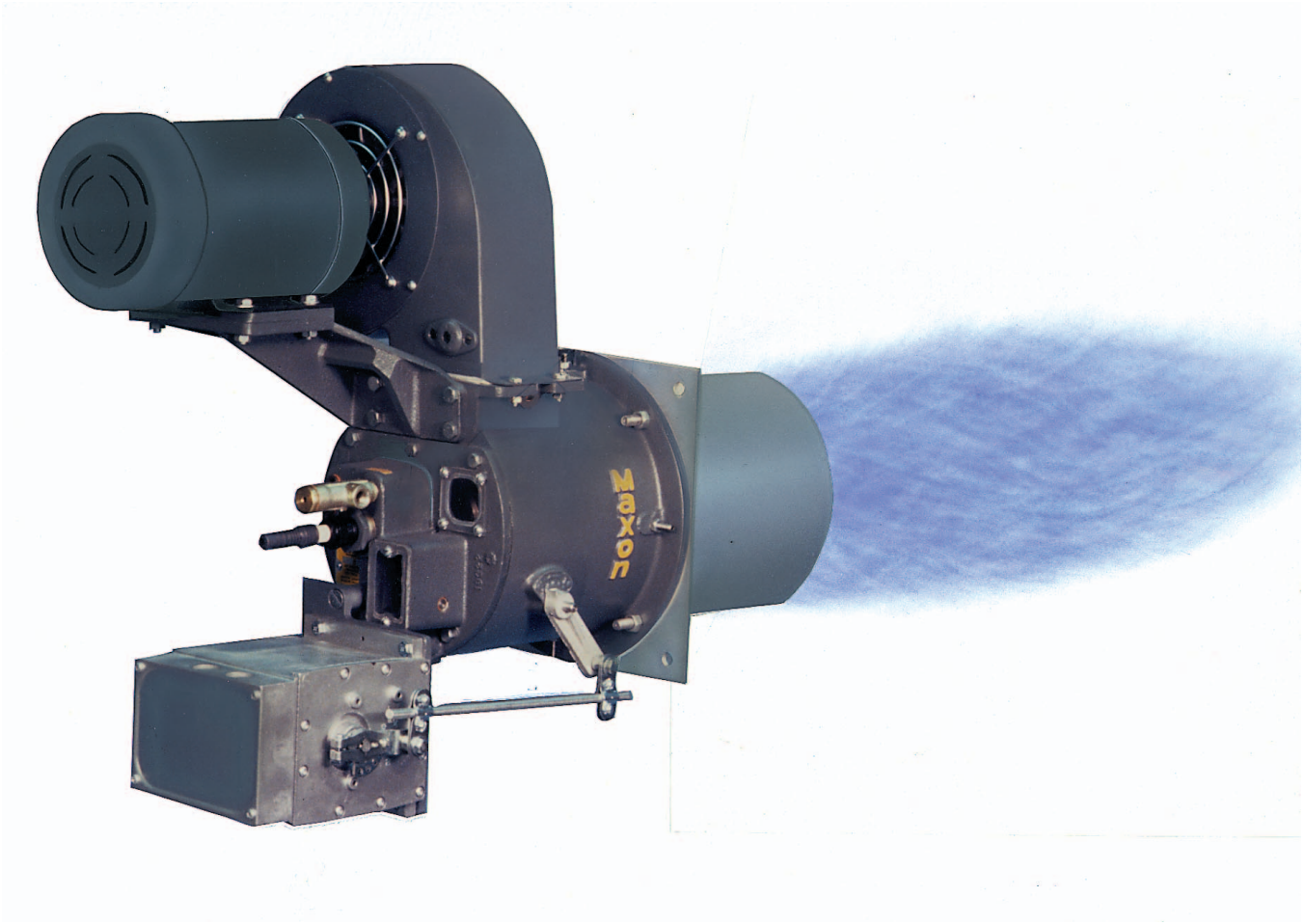
Honeywell

MAXON

OVENPAK® 400 Gas Burners

TECHNICAL CATALOG



Model 415 OVENPAK® Burner with connecting base and linkage assembly to adapt customer's automatic electric control motor

- **Burns any clean fuel gas**
- **Fires into passing air streams**
- **Requires only low pressure gas**
- **Provides clean combustion with low NOx levels**
- **Compact burner design provides quick and easy installation**
- **Simple field adjustment and maintenance**

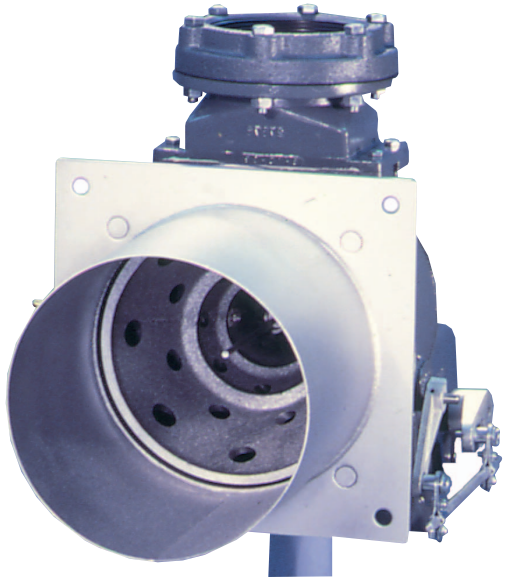
Model "400" OVENPAK® Burner applications have included:
Air heating in ovens and dryers, paint finishing lines, paper and textile machines, food baking ovens, coffee roasters, grain dryers, and fume incinerators. Manufactured under U.S. patent #3,574,508; Canadian and European patents granted and pending.

32M-01002-01

MAXON MODEL “400” OVENPAK® GAS BURNERS

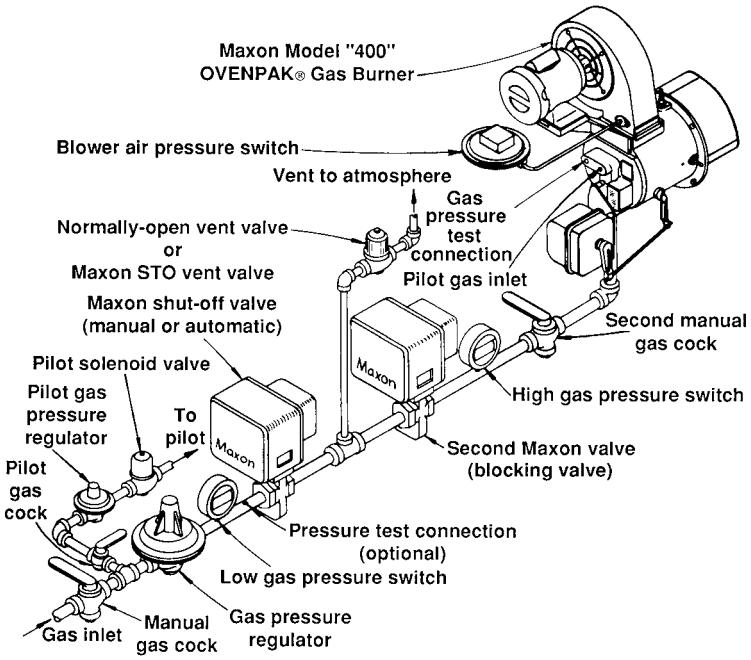
Provides application flexibility with:

- **40:1 turndown or more**
- **Over 90 different styles and sizes**
- **Heat releases to 16,500,000 Btu/hr**
- **Cost-effective external blower (EB) version**



Model EB-3 OVENPAK® Burner with connecting base and linkage assembly

Typical piping layout with “Block and Bleed” gas train arrangement



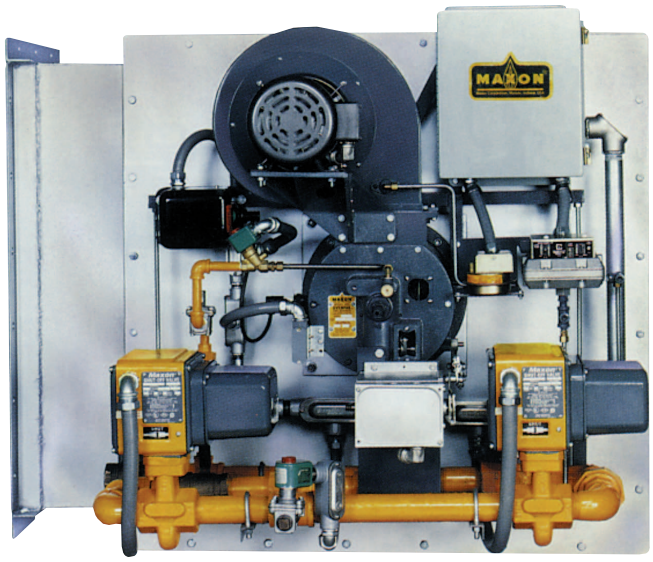
MAXON PRE-ASSEMBLED PACKAGE MODEL "400" OVENPAK® GAS BURNER SYSTEM

- **A complete "packaged burner" system for maximum efficiency**
- **Pre-assembled system includes:**
  – High turndown Model "400" OVENPAK® Burner
  – Completely assembled and pre-wired pipe train package
- **Fast and easy installation with your choice of mounting options:**
  – Arranged for mounting onto your existing duct;
  – Or mounted by MAXON in a pre-fabricated combustion heater/duct

Model 435 OVENPAK® Burner with preassembled "Block & Bleed" pipe train and prewired into package system

MAXON PACKAGED HEATER/DUCT SECTIONS FOR PRE-ASSEMBLED OVENPAK® GAS BURNER SYSTEMS

- **Reduce your fabrication time and costly design details**
- **Easy mounting provided by flanged duct connection joints**
- **Application flexibility offered by:**
  – Three duct sizes
  – Five capacity options
  – Optional return/inlet duct opening positions
- **Discharge air volumes up to 12,000 SCFM**
- **Handles discharge air temperatures up to 600°F (316°C)**



Model 425 OVENPAK® Burner pre-assembled package system, installed and mounted onto a MAXON prefabricated heater/duct section

DESIGN AND APPLICATION DETAILS

OVENPAK® Burners are nozzle-mixing gas burners for many industrial direct-fired applications where clean combustion and high turndown are required. They are simple and versatile for use on a variety of heating applications.

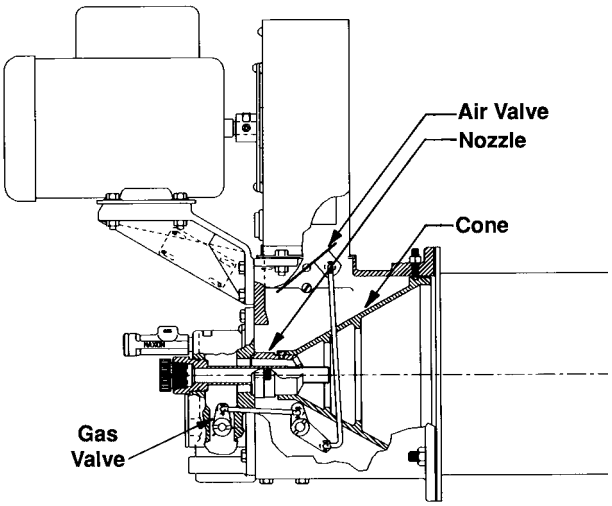
The Model “400” OVENPAK® Burner (shown at right) includes a combustion air blower with nonsparking paddle wheel-type impeller, pilot, spark ignitor, stainless steel discharge sleeve, mixing cone, self-contained internal air and gas proportioning valves, and provision for your flame safeguard sensor.

Model 415 OVENPAK® Gas Burner with optional:

- combustion air filter
- connecting base and linkage assembly
- electrical control motor (by others)

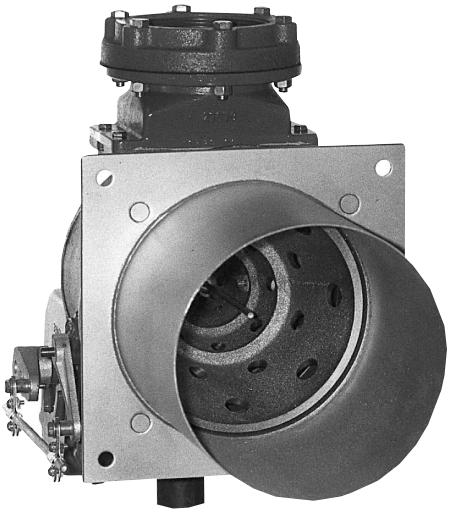
Principle of operation

The OVENPAK® Burner is designed for industrial air heating applications. It is available in two basic versions: 1) packaged with integral combustion air blower, or 2) for use with an external blower. Both versions include a gas and air valve, internally linked together to control the gas-air ratio over the full operating range. The gas flows through the nozzle, then along the inside of the burner cone where combustion air is progressively and tangentially mixed with the gas. This produces a very wide turndown range and a highly stable flame under a variety of operating conditions.



Cross sectional view of a
Model “400” OVENPAK® Gas Burner

DESIGN AND APPLICATION DETAILS



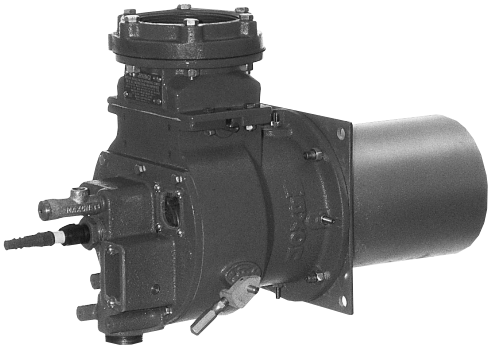
Model EB-3 OVENPAK®* Burner arranged for external blower source with connecting base and linkage assembly to adapt customer's automatic control motor
*view into cone of EB version

Model “EB” (external blower) OVENPAK® Burners (shown at right), like all OVENPAK® Burner assemblies, are designed to deliver heat through a patented mixing cone and stainless steel sleeve.

Flanged burner body design on all OVENPAK® Burner assemblies simplifies mounting and installation on your application. Burner can be installed in any position that does not conflict with your control motor or flame detector requirements.

Minimal torque requirements permit use of most electric or air operators in conjunction with the optional (MAXON supplied) connecting base and linkage assemblies.

“400-MA” and “EB-MA” versions



Model “EB-MA” OVENPAK® Burner with discharge sleeve and optional manual gas control

Model “400-MA” versions include a combustion air blower in your choice of the voltages shown on page 2107, but provide constant combustion air volumes. They differ from “standard” versions by use of a slotted adjustable air butterfly locking device as shown in photo at left. Internally, the linkage normally cross-connecting air and gas butterflies is omitted.

In normal operation, the air butterfly is set to the desired air differential pressure, and the fuel only is throttled by a separate control valve. Maximum capacities match those cataloged for “standard” burners of equivalent size. Minimum capacities with full air flow will be higher than those of “standard” +burner.

“EB-MRV” versions

Model “EB-MRV” OVENPAK® Burner with optional 12" discharge sleeve

“EB-MRV” versions of OVENPAK® Burners permit air/fuel ratio control via a MAXON MICRO-RATIO® control valve throughout the firing range. They differ from standard “EB” burners in that internal gas and air butterflies and the related shafts and linkages are omitted.

In normal operation, air and fuel will be proportioned by an external MAXON MICRO-RATIO® Control valve.

Maximum capacities match those cataloged for “EB” burners of equivalent size and differential air pressure. Minimum capacity and air differential pressure will vary with your application.

CAPACITIES AND SPECIFICATIONS – 60 HERTZ

Standard Model “400” OVENPAK® Burner includes a combustion air blower with motor.

60 Hz Motor Voltages Available

Horsepower	Type	115/208-230/1/60	208-230/460/3/60	575/3/60
1/3 & 1/2	Totally Enclosed	X	X	X
3/4 & 1	Totally Enclosed	X	X	X
1-1/2, 2 & 3	Totally Enclosed	Not Available	X	X

Maximum capacity of Model “400” OVENPAK® Burner is affected by the static pressure within the combustion chamber. Data shown assumes firing in the open, or into an airstream with enough oxygen to complete the combustion process. If burner is fired into an oxygen-starved chamber or airstream, capacities may be reduced as much as 25-30%. Do not attempt to operate beyond the duct static pressure range shown. For higher back pressure applications, select from Model “EB” or “EB-MRV” OVENPAK® Burner options.

All gas pressures are differential pressures and are measured at the gas pressure test connection on the backplate of each OVENPAK® Burner. Differential pressures shown are approximate.

Capacities and Operating Data – Model 405 through 422M

Burner Model			405	407M	408	408M	412M	413M	415	422M
Motor Specification	**Horsepower:**		1/3	1/2	1/3	3/4	1/2	3/4	1/3	3/4
	Frame Number:		48	48	48	56	48	56	48	56
Maximum Capacities (1000's Btu/hr) with Natural Gas Pressures ("wc)	**DUCT STATICS**	**-5.0 to -0.5" wc**	550 2.8"	---	880 3.4"	---	---	---	1650 1.7"	---
		±0" wc	500 2.3"	750 2.5"	800 2.8"	790 2.7"	1200 2.8"	1300 3.3"	1500 1.4"	2150 2.9"
		+1.0" wc	475 2.1"	700 2.2"	760 2.6"	750 2.5"	1100 2.4"	1190 2.8"	1425 1.3"	2000 2.5"
		+2.0" wc	450 1.9"	600 1.6"	720 2.3"	640 1.8"	925 1.7"	1100 2.4"	1350 1.1"	1725 1.9"
		+3.0" wc	---	510 1.1"	---	550 1.3"	800 1.3"	1000 2.0"	---	1610 1.6"
		+4.0" wc	---	450 0.9"	---	495 1.1"	750 1.1"	900 1.6"	---	1500 1.4"
		+5.0" wc	---	---	---	475 1.0"	---	800 1.3"	---	1420 1.3"
Minimum Capacities (1000's Btu/hr)	**Main plus pilot**		15			20			37	
	Pilot only		10			15			20	
Required natural gas differential pressure to burner inlet ("wc)			3.0		3.5	4.1	4.5	5.2	4.2	7.2
Approximate flame length in still air			1/2 to 1 ft.		1 to 1-1/2 ft.	1/2 to 1 ft.	1 to 2-1/2 ft.		2-1/2 to 3-1/2 ft.	1-1/2 to 2 ft.

CAPACITIES AND SPECIFICATIONS – 60 HERTZ

Capacities and Operating Data – Model 425 through 487M

Burner Model			425	432M	435	442M	445	456M	470M	487M
Motor Specification	Horsepower:		3/4	3/4	3/4	1 or 1-1/2 [1]	1 or 1-1/2 [1]	1-1/2	2	3
	Frame Number:		56	56	56	56	56	143T	145T	182T
Maximum Capacities (1000's Btu/hr) with Natural Gas Pressures ("wc)	DUCT STATICS	-5.0 to -0.5" wc	2750 2.7"	---	3850 2.2"	---	5175 3.4"	6400 3.6"	8050 3.7"	10060 4.6"
		±0" wc	2500 2.2"	3200 3.6"	3500 1.8"	4150 2.5"	4500 2.6"	5600 2.8"	7000 2.8"	8700 3.4"
		+1.0" wc	2375 2.0"	3000 3.2"	3325 1.6"	4000 2.4"	4280 2.3"	5340 2.5"	6570 2.5"	8400 3.2"
		+2.0" wc	2250 1.8"	2800 2.8"	3150 1.4"	3800 2.1"	4125 2.2"	5200 2.4"	6300 2.3"	8200 3.0"
		+3.0" wc	---	2650 2.5"	---	3650 1.9"	---	5000 2.2"	5500 1.7"	7500 2.5"
		+4.0" wc	---	2500 2.2"	---	3500 1.8"	---	4600 1.9"	5000 1.4"	6200 1.7"
		+5.0" wc	---	2250 1.8"	---	3300 1.6"	---	4100 1.5"	4500 1.2"	5500 1.4"
		+6.0" wc	---	---	---	---	---	---	3500 0.7"	5000 1.1"
Minimum Capacities (1000's Btu/hr)	Main plus pilot		60		87		110	125	150	175
	Pilot only		35		45		90	105	115	117
Required natural gas differential pressure to burner inlet ("wc)			3.6	4.9	3.8	4.9	4.5	5.1	5.2	7.6
Approximate flame length in still air			2-1/2 to 3-1/2 ft.		3-1/2 to 5 ft.	4 to 5 ft.	4 to 6 ft.	5 to 7 ft.	6 to 8 ft.	8 to 10 ft.

[1] Horsepower will be either 1 HP or 1-1/2 HP, depending upon motor voltage

CAPACITIES AND SPECIFICATIONS – 50 HERTZ

Standard Model "400" OVENPAK® Burner includes a combustion air blower with motor.

Maximum capacity of Model "400" OVENPAK® Burner is affected by the static pressure within the combustion chamber. Data shown assumes firing in the open, or into an airstream with enough oxygen to complete the combustion process. If burner is fired into an oxygen-starved chamber or airstream, capacities may be reduced as much as 25-30%. Do not attempt to operate beyond the duct static pressure range shown. For higher back pressure applications, select from Model "EB" or "EB-MRV" OVENPAK® Burner options.

All gas pressures are differential pressures and are measured at the gas pressure test connection on the backplate of each OVENPAK® Burner. Differential pressures shown are approximate.

50 Hz Motor Voltages Available

Horsepower	Type	115/208-230/1/60	208-230/460/3/60	575/3/60
1/3 & 1/2	Totally Enclosed	X	X	X
3/4 & 1	Totally Enclosed	X	X	X
1-1/2, 2 & 3	Totally Enclosed	X	X	X

Capacities and Operating Data – Model 405 through 422M

Burner Model			405	407M	408	408M	412M	413M	415	422M
Motor Specification	**Horsepower:**		1/3	1/2	1/3	3/4	1/2	3/4	1/3	3/4
	Frame Number:		48	48	48	56	48	56	48	56
Maximum Capacities (1000's Btu/hr) with Natural Gas Pressures ("wc)	**DUCT STATICS**	**-5.0 wc**	460 2.0"	---	735 2.4"	---	---	---	1375 1.2"	---
		-3.0 wc	460 2.0"	---	735 2.4"	---	---	---	1375 1.2"	---
		±0" wc	415 1.6"	625 1.7"	670 2.0"	660 1.9"	1000 2.0"	1080 2.5"	1250 1.0"	1800 2.0"
		+1.0" wc	390 1.4"	585 1.5"	630 1.7"	625 1.7"	920 1.7"	990 2.4"	1190 0.9"	1670 1.8"
		+2.0" wc	---	---	---	---	---	920 1.7"	---	1440 1.3"
Minimum Capacities (1000's Btu/hr)	**Main plus pilot**		15		20	15	20		37	
	Pilot only		10				15		20	
Required natural gas differential pressure to burner inlet ("wc)			2.2	2.3	3.0	2.6	3.5	4.1	2.9	5.6
Approximate flame length in still air			1/2 to 1 ft.		1 to 1-1/2 ft.	1/2 to 1 ft.	1 to 2 ft.		1-1/2 to 2 ft.	2 to 2-1/2 ft.

CAPACITIES AND SPECIFICATIONS – 50 HERTZ

Capacities and Operating Data – Model 425 through 487M

Burner Model			425	432M	435	442M	445	456M	470M	487M
Motor Specification	**Horsepower:**		3/4	3/4	3/4	1 or 1-1/2 [1]	1 or 1-1/2 [1]	1-1/2	2	3
	Frame Number:		56	56	56	56	56	143T	145T	182T
Maximum Capacities (1000's Btu/hr) with Natural Gas Pressures ("wc)	**DUCT STATICS**	**-5.0 wc**	2300 1.9"	---	2920 1.3"	---	4325 2.4"	5350 2.5"	6700 2.6"	8400 3.2"
		-3.0 wc	2300 1.9"	---	2920 1.3"	---	4325 2.4"	5350 2.5"	6700 2.6"	8400 3.2"
		±0" wc	2090 1.6"	2670 2.5"	2780 1.1"	3460 1.8"	3760 1.8"	4670 1.9"	5850 2.0"	7250 2.3"
		+1.0" wc	1970 1.4"	2340 2.0"	---	3340 1.6"	---	4450 1.8"	5500 1.7"	7050 2.1"
		+2.0" wc	---	---	---	3220 1.5"	---	4340 1.7"	5250 1.6"	6850 2.1"
		+3.0" wc	---	---	---	---	---	---	---	6250 1.7"
Minimum Capacities (1000's Btu/hr)	**Main plus pilot**		60		87		110	125	150	176
	Pilot only		35		45		90	105	115	117
Required natural gas differential pressure to burner inlet ("wc)			2.2	3.8	2.2	3.8	3.1	3.6	5.0	5.0
Approximate flame length in still air			2 to 3 ft.		3 to 4-1/2 ft.	3-1/2 to 4 ft.	4 to 5 ft.	5 to 6 ft.		7 to 8 ft.

[1] Horsepower will be either 1 HP or 1-1/2 HP, depending upon motor voltage.

CAPACITIES AND SPECIFICATIONS EXTERNAL BLOWER (EB) VERSIONS

Model EBC-2 and EBC-3 OVENPAK® Burners

EB-1 OVENPAK® Burner	**Combustion and Cooling Air Required**	Differential air pressure ("wc)	3	4	5	6	8	9	10	11
		Volume (SCFM)	150	170	190	210	240	255	270	280
	Heat Releases (1000's Btu/hr)	Maximum Capacity	460	580	715	780	870	910	960	1000
		Minimum & pilot	60	60	60	60	60	60	60	60
		Pilot only	45	45	45	45	45	45	45	45
	Natural Gas Differential pressures ("w.c.)	At burner inlet	2.1	3.4	5.1	6.1	7.6	8.3	9.2	10.0
		At burner test connection	2.0	3.1	4.7	5.6	7.0	7.6	8.5	9.2
	Flame length	in still air	4" to 15" beyond end of discharge sleeve							

EB-2 OVENPAK® Burner	**Combustion and Cooling Air Required**	Differential air pressure ("wc)	3	4	5	6	8	9	10	11
		Volume (SCFM)	220	250	280	310	355	375	395	415
	Heat Releases (1000's Btu/hr)	Maximum Capacity	750	980	1200	1330	1450	1500	1550	1600
		Minimum & pilot	60	60	60	60	70	70	75	80
		Pilot only	25	25	25	25	30	30	35	35
	Natural Gas Differential pressures ("w.c.)	At burner inlet	3	5.2	7.8	9.5	11.3	12.1	12.9	13.8
		At burner test connection	2.5	4.2	6.3	7.7	9.2	9.8	10.5	11.2
	Flame length	in still air	12" to 30" beyond end of discharge sleeve							

EB-3 OVENPAK® Burner	**Combustion and Cooling Air Required**	Differential air pressure ("wc)	3	4	5	6	8	9	10	11
		Volume (SCFM)	350	405	455	495	575	615	650	675
	Heat Releases (1000's Btu/hr)	Maximum Capacity	1620	1900	2120	2320	2670	2840	3000	3150
		Minimum & pilot	90	95	105	115	130	140	150	155
		Pilot only	45	45	50	55	65	70	75	75
	Natural Gas Differential pressures ("w.c.)	At burner inlet	4.1	5.6	7.0	8.3	11.0	12.5	13.9	15.4
		At burner test connection	1.6	2.2	2.8	3.3	4.4	5.0	5.6	6.2
	Flame length	in still air	2 to 3 feet beyond end of discharge sleeve							

EB-4 OVENPAK® Burner	**Combustion and Cooling Air Required**	Differential air pressure ("wc)	3	4	5	6	8	9	10	11
		Volume (SCFM)	550	635	710	775	895	950	1000	1050
	Heat Releases (1000's Btu/hr)	Maximum Capacity	2320	2800	3230	3500	3950	4150	4330	4600
		Minimum & pilot	100	115	130	140	160	170	180	190
		Pilot only	40	40	40	45	50	55	55	60
	Natural Gas Differential pressures ("w.c.)	At burner inlet	2.5	3.7	4.9	5.8	7.4	8.1	8.8	10.0
		At burner test connection	1.9	2.8	3.7	4.3	5.5	6.1	6.6	7.5
	Flame length	in still air	2-1/2 to 3-1/2 feet beyond end of discharge sleeve							

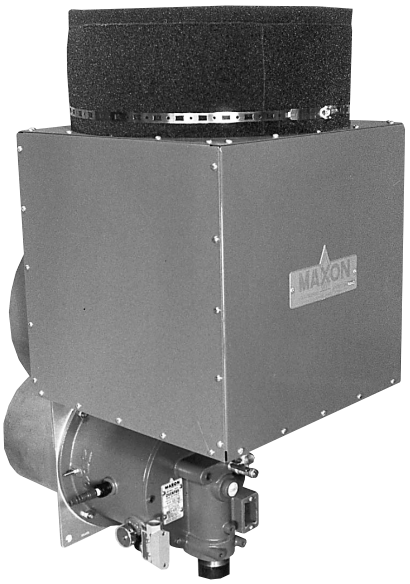
EB-5 OVENPAK® Burner	**Combustion and Cooling Air Required**	Differential air pressure ("wc)	3	4	5	6	8	9	10	11
		Volume (SCFM)	665	770	860	940	1080	1150	1210	1270
	Heat Releases (1000's Btu/hr)	Maximum Capacity	2940	3500	3980	4420	5130	5450	5740	6000
		Minimum & pilot	155	180	200	220	255	270	285	300
		Pilot only	25	30	35	35	40	45	50	50
	Natural Gas Differential pressures (“w.c.)	At burner inlet	2.2	3.1	4.0	4.9	6.6	7.5	8.3	9.1
		At burner test connection	1.3	1.8	2.3	2.9	3.9	4.4	4.8	5.3
	Flame length	in still air	3 to 5 feet beyond end of discharge sleeve							

EB-6 OVENPAK® Burner	**Combustion and Cooling Air Required**	Differential air pressure ("wc)	3	5	8	11	16	18	22	24
		Volume (SCFM)	975	1260	1590	1870	2250	2390	2640	2760
	Heat Releases (1000's Btu/hr)	Maximum Capacity	4710	6700	9500	11200	13500	14300	15800	16500
		Minimum & pilot	335	390	490	575	695	735	815	850
		Pilot only	100	100	100	115	140	145	165	170
	Natural Gas Differential pressures (“w.c.)	At burner inlet	2.8	5.6	11.3	15.7	22.8	25.6	31.3	34.1
		At burner test connection	2.0	4.0	8.1	11.2	16.3	18.3	22.3	24.3
	Flame length	in still air	3 to 8 feet beyond end of discharge sleeve				8 to 12 feet beyond end of discharge sleeve			

EB-7 OVENPAK® Burner	**Combustion and Cooling Air Required**	Differential air pressure ("wc)	3	5	8	11	16	18	22	24
		Volume (SCFM)	975	1260	1590	1870	2250	2390	2640	2760
	Heat Releases (1000's Btu/hr)	Maximum Capacity	4710	6700	9500	11200	13500	14300	15800	16500
		Minimum & pilot	335	390	490	575	695	735	815	850
		Pilot only	100	100	100	115	140	145	165	170
	Natural Gas Differential pressures (“w.c.)	At burner inlet	1.8	3.6	7.3	10.1	14.8	16.6	20.2	22.1
		At burner test connection	1.0	2.0	4.1	5.6	8.2	9.2	11.2	12.2
	Flame length	in still air	3 to 8 feet beyond end of discharge sleeve				8 to 12 feet beyond end of discharge sleeve			

ACCESSORY OPTIONS

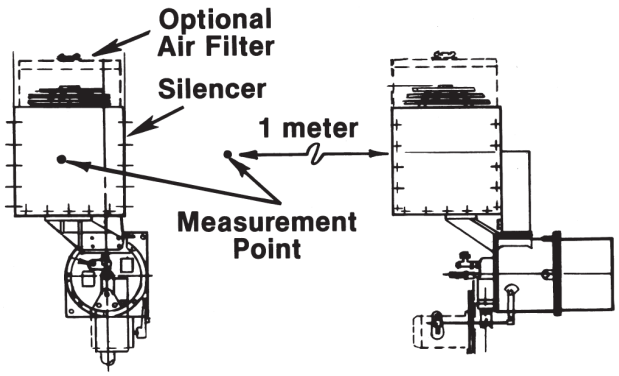
Air filter assemblies and silencers



Air filter assemblies help to trap airborne particulate matter. They are offered with washable replaceable filter elements or with permanent metallic elements (as shown in photograph above). Filters mount onto OVENPAK® Burner's blower housing (or silencer housing of burners so equipped) and surround the blower motor and combustion air inlet.

dB(A) sound levels from actual tests conducted at full-rated 60 Hz capacity are shown in table at right. Measurement point is shown in sketch below. (Meter was set to A-scale, slow response.)

Operation on 50 Hz power results in lower rotational speed of blower, and so reduces air output, capacity, and resulting noise levels. 50 Hz noise levels should not exceed the above data measured on 60 Hz operation.



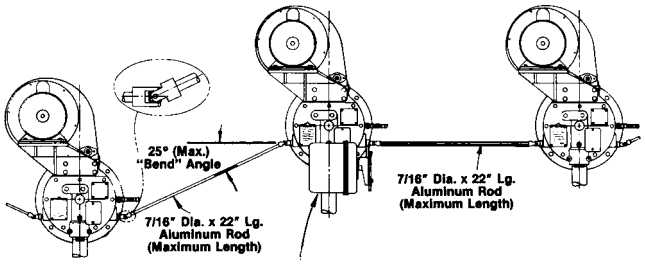
Filter silencers help reduce noise levels. They mount onto OVENPAK® Burner's blower housing and enclose the blower motor and combustion air inlet (as shown in above photograph). They can be furnished in conjunction with a permanent or replaceable filter element assembly described above.

Burner Model	Sound Level dB(A)	
	Standard Burner	with Silencer
405	84	75
407M	83	77
408M	84	75
408	87	78
412M	81	73
413M	82	72
415	89	77
422M	88	79
425	89	78
432M	88	80
435	87	78
442M	89	80
445	89	81
456M	90	83
470M	92	83
487M	94	85

ACCESSORY OPTIONS

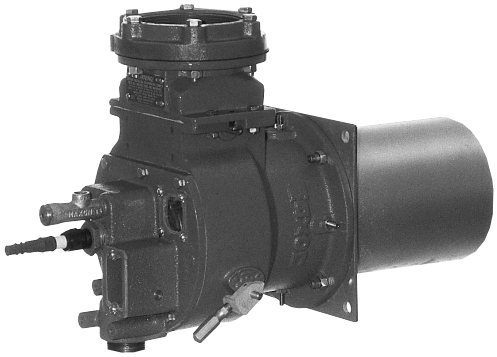
Universal Joint Arrangements (for all versions except EB-MRV) allow control of as many as 5 burners by a single control motor. Torque requirement is 10 in-lbs for EACH burner driven. Primary burner should drive no more than 2 Secondary burners to either side of itself.

Miniature universal joints simplify burner alignment. Aluminum connecting rod can be cut to fit actual burner spacing. (Allowable distance between adjacent burner centerlines is 21" – 33" for 422M and smaller, 23.5" – 36" for larger burners.)



Model "400" OVENPAK® Burner with Control Motor

To order, specify:



1. Primary and secondary burners
2. Any other accessories desired
3. Required quantity of Universal Joint Assemblies

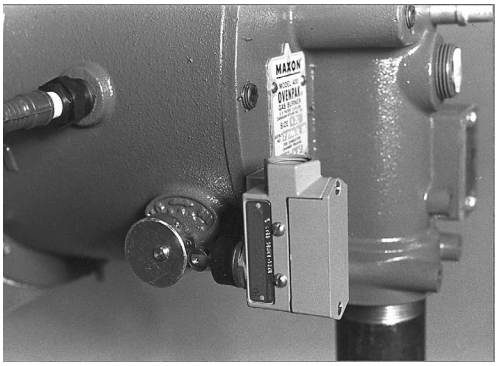
Manual Handle Kit permits setting and locking air and fuel valves at a constant firing rate. See photo at right.

Auxiliary Switches

MAXON offers 4 types, all cam-actuated by the burner main operating shaft. (If Universal Joint Arrangements are used, switch must mount on furthest left burner.) Field installation MAY require burner modification per instructions provided in Product Information Sheet 2000-7/8.

Low Fire Start Switch Assembly (SPDT) opens the circuit when burner leaves minimum position. Also available in Weatherproof and Hazardous Location/Weatherproof versions.

High and Low Fire Position Switch Assembly includes 2 SPDT switches. One switch may be fieldset to activate at high fire position, while other is set to activate at low fire position. Switch assemblies are also available in a weatherproof version.

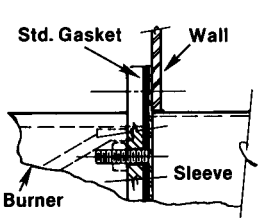


Low Fire Start Switch shown

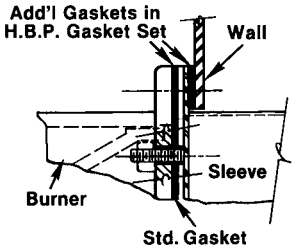
Discharge Sleeve Mounting Gaskets

Standard discharge sleeve gasket provides adequate sealing in most applications.

High Back Pressure Gasket Kit includes 2 additional gaskets to provide sealing against back pressures as shown in sketch at right.



Standard Arrangement

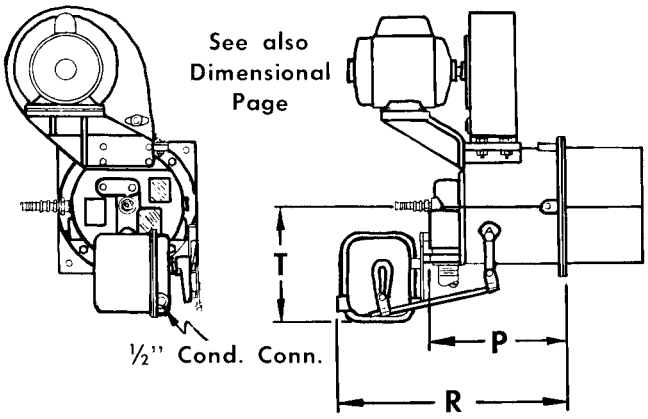


With High Back Pressure Kit

ACCESSORY OPTIONS

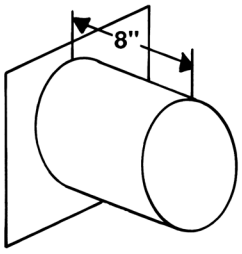
Hi/Lo Control Motor Sets for high or low firing. Optional set includes 2-position unidirectional 11-second 120v 50/60 Hz motor and connecting base with mounting linkage. See table below for dimensions which differ from standard burner.

Burner Model		Dimensions in Inches		
		P	R	T
EB-1, 2	405 - 413M	10.25	17.63	7.75
EB-3	415 - 422M	10.19	17.56	7.75
EB-4, 5	425 to 442M	11.69	19.06	8.75
EB-6, 7	445 - 487M	16.69	24.06	8.75

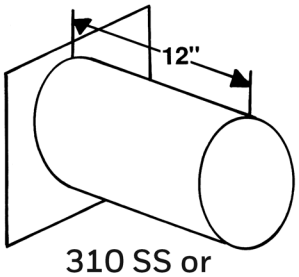


Discharge Sleeves are available in 3 versions:

- Standard sleeve is 8" long, made of #310 SS, and is suitable for downstream temperatures up to 1000°F (538°C).
- For higher velocities, specify 12" long sleeve made of #310 SS for downstream temperatures up to 1000°F (538°C).
- For higher downstream temperatures between 1000°F (538°C) and 1500°F (816°C), specify 8" long, or 12" long high temperature sleeve.



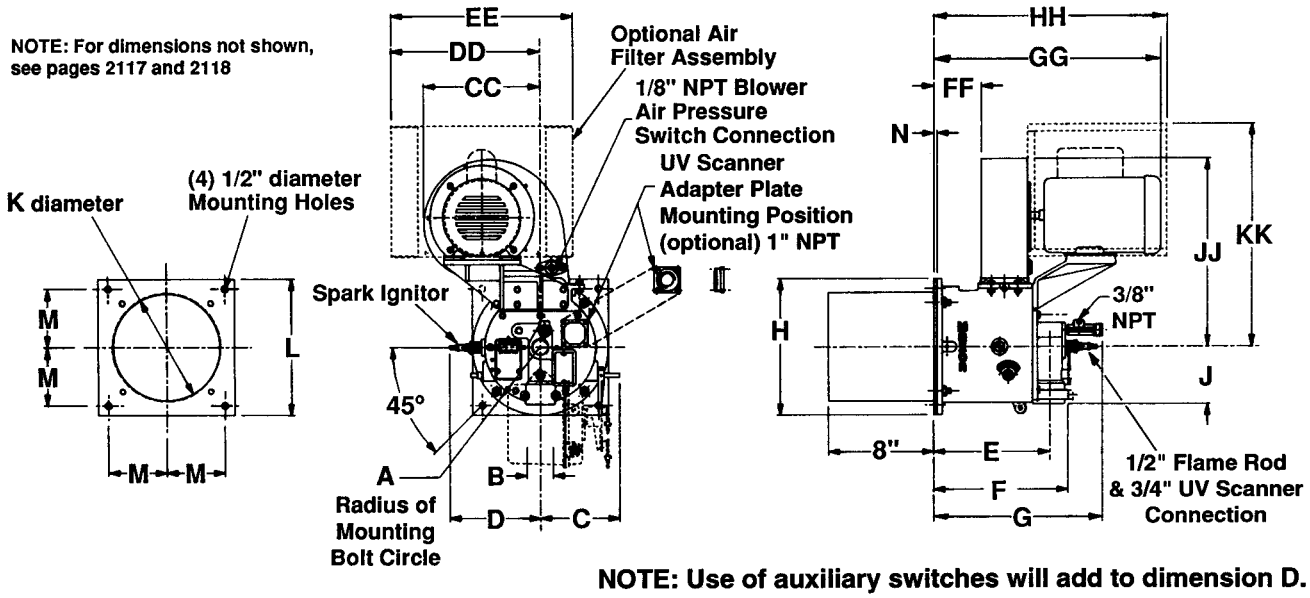
310 SS (std.) or
High Temperature



310 SS or
High Temperature

DIMENSIONS

Model “400” and “400-MA” OVENPAK® Burners



NOTE: Use of auxiliary switches will add to dimension D.

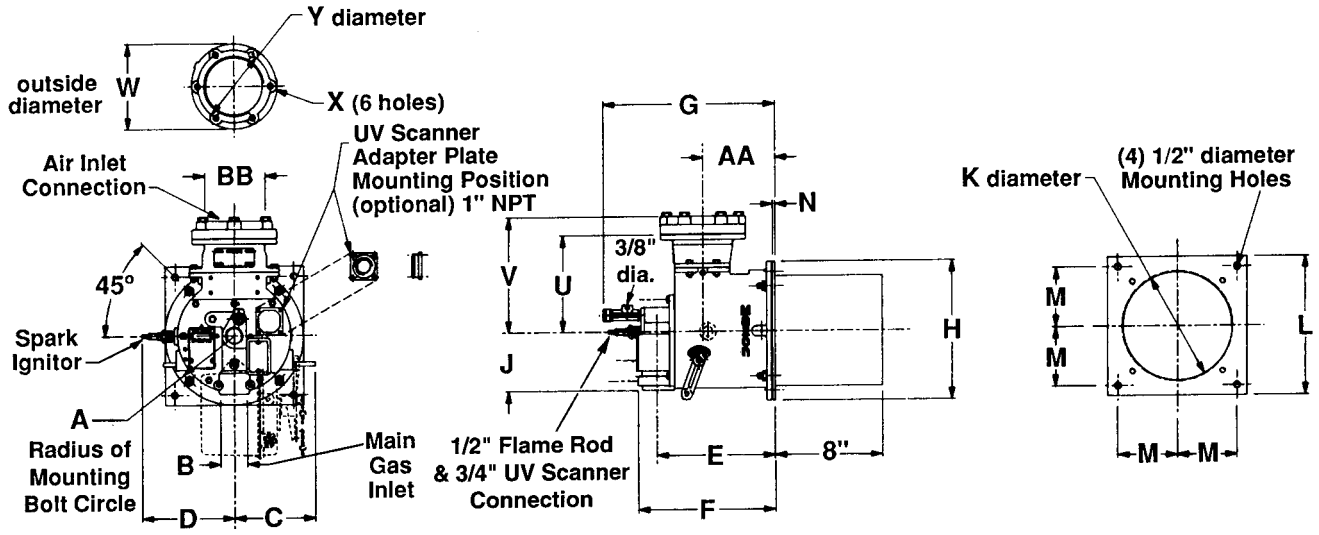
Model	A	B*	C	D	E	F	G	H	J	K	L	M	N	CC	DD	EE	FF	GG	HH	JJ	KK
405														8.81	11.37	14	3.66	17.31	17.81	14.37	17.06
407M														15.25	15.87	18	4.69		19.69	21.69	18.62
408														8.81	11.37	14	3.66	19.12	17.81	14.37	17.06
408M	3.75	1		6.62	8.87	10.30		8.44		6.31	8.44	3.62									
412M			5.44				13.19		4.37				0.25	15.25	15.87	18	4.69	17.31	19.69	21.69	18.62
413M																		19.12			
415	4.75	1-1/4		7.69	8.81	10.25		10.37		8.25	10.37	4.44		8.81	11.37	14	3.59	17.31	17.75	14.37	17.06
422M														15.25	15.87				19.56	21.69	18.62
425		1-1/2												12.12	14.44		3.94		20.5	20.25	19.75
432M	5.75			8.42	10.06	11.88	14.69	12.50	5.44	10.25	12.5	5.62		15.25	15.87		2.81	18.25	21.25	23.56	29.62
435														12.12	14.44	18	3.94		20.5	20.25	19.75
442M		2	6.06										0.37	15.25	15.87		2.81		21.25	23.56	29.62
445	6.81			8.07	14.38	16.88	19.31	14.62	6.5	12.25	14.75	6.69					5.37	22.5	25	23.5	
456M																		24			
470M		3												17.75	17.79	19			26.81	25.94	
487M																					

*Main fuel gas inlet NPT

Pipe threads on this page conform to NPT (ANSI Standard B2.1)

DIMENSIONS

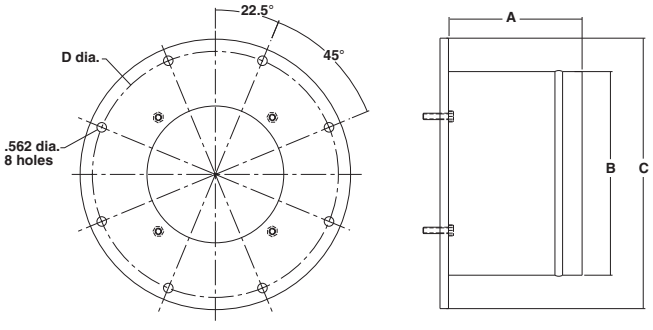
Model EB, EB-MA, and EB-MRV OVENPAK® Burners



NOTE: Use of auxiliary switches will add to dimension D.

Model	A	B	C	D	E	F	G	H	J	K	L	M	N	U	V	W	X	Y	AA	BB
EB-1	3.75	1-1/4	5.44	6.62	8.87	10.31	13.19	8.44	4.37	6.31	8.44	3.62	0.25	7.25	8.62	6.37	0.44	5.44	5.44	4
EB-2																				
EB-3	4.75			7.69				10.37		8.25	10.37	4.44							5.38	
EB-4	5.75	2	6.06	8.42	10.06	11.88	14.69	12.5	5.44	10.25	12.5	5.62	0.37	9.25	10.62	8.87	0.56	7.75	6	6
EB-5																				
EB-6	6.81	3		8.07	14.38	16.88	19.31	14.62	6.5	12.25	14.75	6.69		9.62	11.12	11.7-5		10.25	8.5	8
EB-7																				

Refractory Lined Discharge Sleeve

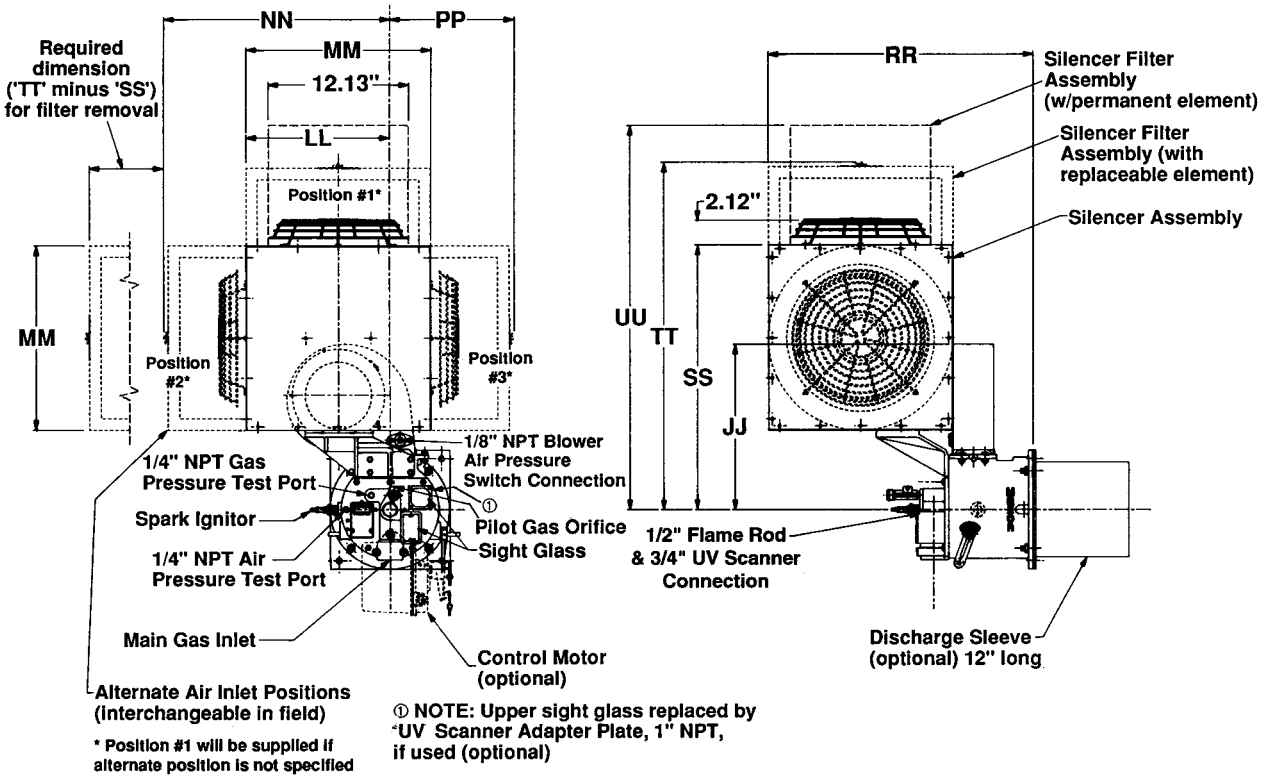


Burner Size	A	B	C	D dia.
405 - 413M EB1, EB2	8.38	10.13	14.06	12.63
415, 422M EB3	8.38	12.0	15.94	14.5
425-442M EB4, EB5	8.38	14.06	18.0	16.53
445-487M EB6, EB7	8.38	16.06	20.0	18.53

Pipe threads on this page conform to NPT (ANSI Standard B2.1)

ACCESSORY DIMENSIONS

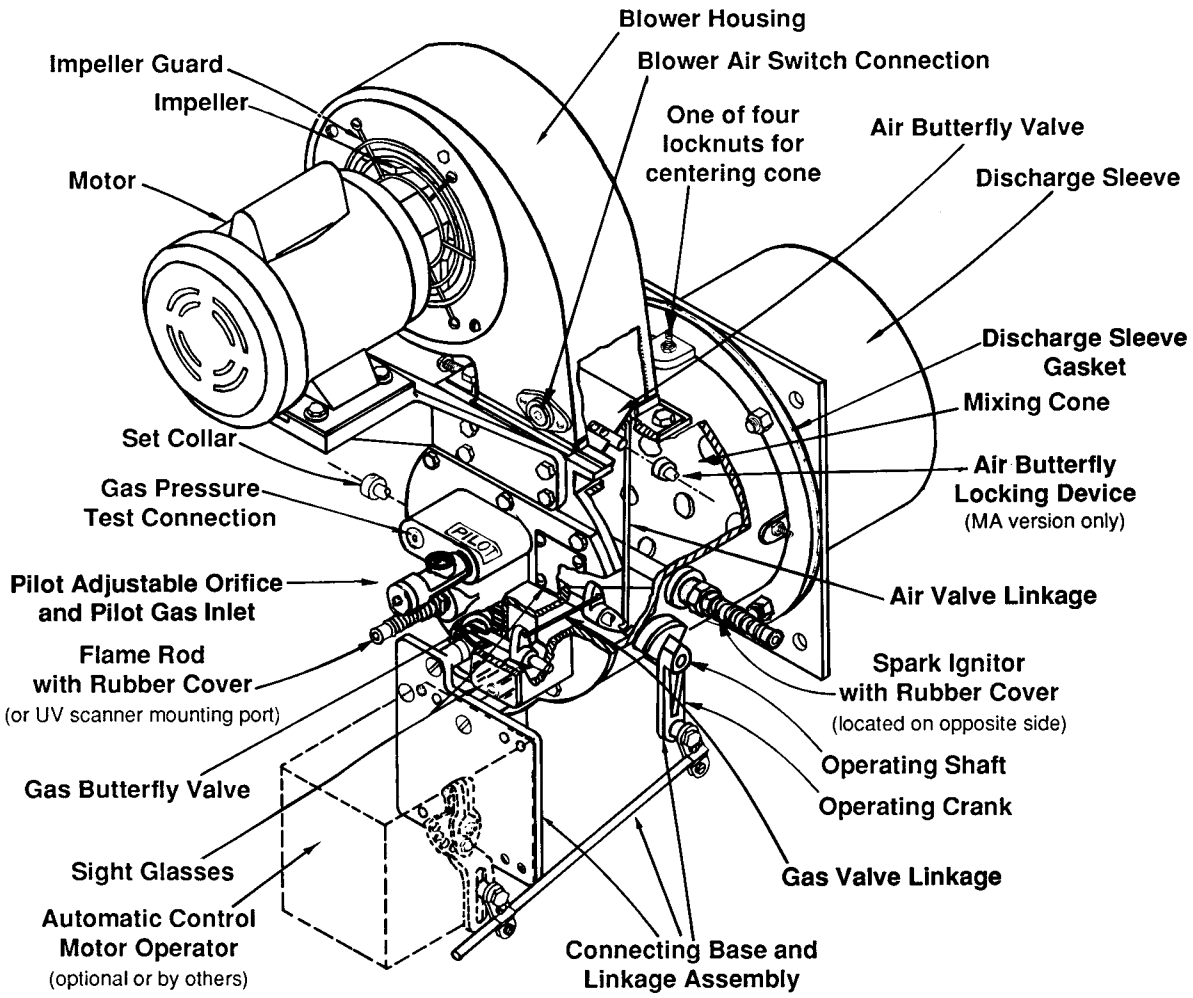
Filter with silencer for Model “400” OVENPAK® Burner



Model	JJ	LL	MM	NN	PP	RR	SS	TT	UU
405	14.4	12.4		19.3	10.4		23.2	29.9	33.6
407M	21.7	15.1		21.9	7.8		24.7	31.4	35.1
408	14.4	12.4		19.3	10.4	23.2	23.2	29.9	33.6
408M	21.7	15.1	16	21.9	7.8		24.7	31.4	35.1
412M									
413M									
415	14.4	12.4		19.3	10.4	23.1	23.2	29.9	33.6
422M	21.7	15.1		21.9	7.8		24.7	31.4	35.1
425	20.2	14.5			8.3	24	25.9	32.6	36.3
432M	23.6	18.1	22	24.9	10.8	24.9	31.9	38.5	42.3
435	20.25	14.5	16	21.4	8.3	24	25.9	32.6	36.3
442M	23.6	18.1	22	24.9	10.8	24.9	31.9	38.5	42.3
445	23.5					28.6			
456M									
470M	25.9	20.2	24	29.2	12.8	29.6	33.9	42.7	44.3
487M									

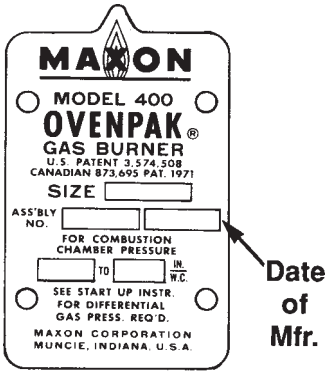
Pipe threads on this page conform to NPT (ANSI Standard B2.1)

COMPONENT IDENTIFICATION



Suggested spare parts

Nameplate



– Spark Ignitor
– Flame Rod, if used
– Filter Elements, if used
– Mixing Cone
– Discharge Sleeve and Gasket
– Motor
– Impeller
– Gas/Air Valve Linkage Kit

To order parts for an existing OVENPAK® Burner assembly, list:

1. Name(s) of part(s) from above illustration
2. Quantity of each required
3. OVENPAK® Burner nameplate information:
   - size and model number of burner
   - assembly number
   - date of manufacture
   - if available, serial number of MAXON fuel shut-off valve in-line to OVENPAK® Burner (This serial number is on MAXON valve's nameplate.)

SUGGESTED MAINTENANCE/INSPECTION PROCEDURES

Discharge sleeve and cone alignment

Centering of the mixing cone provides a small annular opening for the flow of some cooling combustion air along the discharge sleeve wall. We SUGGEST periodic inspection from the discharge side of the burner to assure that this alignment is maintained.

CAUTION

Tightening can lead to cone distortion and greatly reduce cone and discharge sleeve life. Cone should be free to move and allow for thermal expansion.

If re-adjustment is necessary, back out the four lock nuts and re-center mixing cone with adjusting screws handtight. Back each screw out one-half turn before relocking. This allows for thermal expansion as cone gets hot.

Filters should be inspected regularly and cleaned, using a vacuum to remove loose/dry accumulations, then washing and/or degreasing as appropriate for the filter type used.

To replace flame rod or spark ignitor:

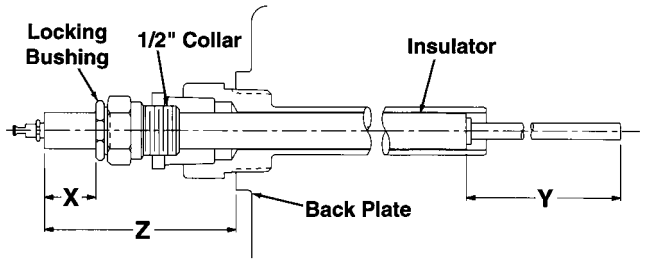
1. Check Table 1 at right for dimension “Y” and cut tip to length shown.
2. Insert 1/2" NPT collar into burner and snug into position.
3. Insert insulator through collar into burner.
4. Check table for dimension “X”, position accordingly, and tighten locking bushing until insulator is held firmly.

WARNING

Over-tightening locking bushing may damage insulator.

NOTE: A full-wave 6000 volt spark ignition transformer is suggested for use with MAXON burner equipment.

Flame Rod



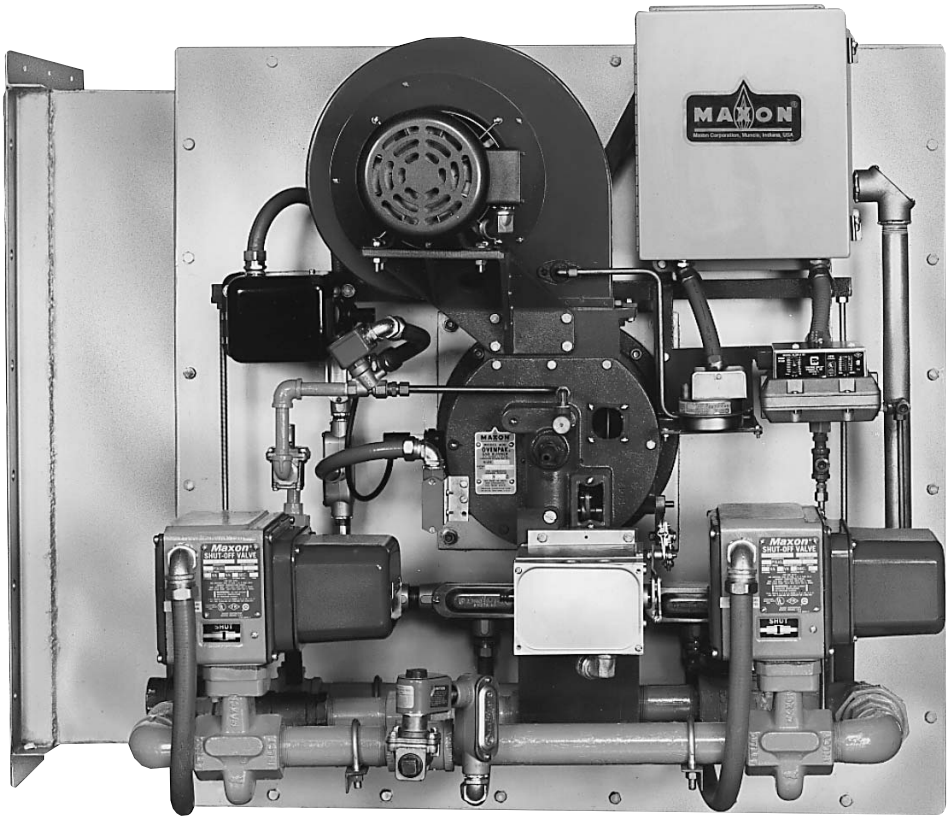
NOTE: 1/2" x 1" adapter bushing supplied by others

Table 1: Flame rod and spark ignitor dimensions for all Model "400" OVENPAK® Burners manufactured after 1/1/91[1]

Burner Model		Spark Ignitor Dimensions		Flame Rod Dimensions		
		X	Y	X	Y	Z
EB-1	405	1.3	.4	.4	6	2.9
	407M					
	408M					
	408					
	412M					
	413M					
EB-2	---	1.3	.4	.4	8.7	2.9
EB-3	415	1.5	.4	.4	6	2.9
	422M					
EB-4 EB-5	425	1.0	.4	.8	10.8	3.5
	432M					
	435					
	442M					
---	445	.75	.4	.4	12.8	2.9
	456M					
	470M					
	487M					
EB-6 EB-7	---	.75	.4	.8	18.8	3.3

[1] Manufactured date is stamped on metal nameplate of Model 400 OVENPAK® Burner. For specifics relative to units manufactured prior to 1/1/91, see Product Information Sheet 2100-3.

MAXON PRE-ASSEMBLED PACKAGE MODEL “400” OVENPAK® GAS BURNER SYSTEM DIMENSIONS



425 OVENPAK® package system installed and mounted onto a MAXON pre-fabricated heater/duct section

Save time and reduce your installation costs with a completely assembled and pre-wired burner and pipe train “package”.

All system components have been carefully selected to match the high performance characteristics of the Model “400” OVENPAK® Gas Burner.

The compact design of this “packaged system” makes mounting to your duct fast and easy. Connect to the gas line and bring in electricity. It's wired and piped, ready to go.

All pre-assembled package systems include a Model “400” OVENPAK® Burner and pipe train. The pipe trains are available with “Block and Bleed” arrangement options only.

Additional application flexibility is provided with five different sized systems, all with 40:1 turndown capacity ranges.

Packaged OVENPAK® Burner systems may also be mounted in a pre-fabricated combustion heater/duct section by MAXON. This option is value-engineered to give you the most for your dollar spent.

DESIGN / APPLICATION SUMMARY

Five Model "400" OVENPAK® pre-assembled package options:

OVENPAK® Burner Model >		405	408	415	425	435
Totally Enclosed Blower Motor	**Horsepower**	1/3			3/4	
	Frame Number	48			56	
Maximum Capacity (Btu/hr)		500,000	800,000	1,500,000	2,500,000	3,500,000
Minimum Capacity (Btu/hr) main plus pilot		15,000	20,000	37,000	60,000	87,000
Minimum natural gas pressure required at pipe train inlet		6" wc		10" wc	9" wc	14" wc
Inlet pipe train size NPT		1.25"			1.5"	
Approximate overall envelope dimensions		42" long x 40" high x 24" wide				

Pre-assembled pipe train “package” includes the following components:

- Burner gas shut-off cock
- Main inlet gas shut-off cock
- Pilot gas train consisting of:
  - Pilot gas shut-off cock
  - Pilot gas pressure regulator (maximum 1 PSIG natural gas inlet pressure)
  - Pilot gas solenoid valve, 115/60VAC
- Main gas pressure regulator (maximum 1 PSIG natural gas inlet pressure)
- Combustion air pressure switch, automatic reset, NEMA 1, 115/60VAC
- Combination high and low gas pressure switch, manual reset, NEMA 1, 115/60VAC
- Spark ignition transformer, 6000 volts, NEMA 1, 115/60VAC
- NEMA type 12 and 13 junction box with terminal wiring strip
- Normally open vent solenoid valve, 115/60VAC

A complete packaged system also includes:

- MAXON Model “400” OVENPAK® Burner assembly
  - Connecting base and linkage assembly to adapt customer-supplied automatic control motor (optional)
  - Low fire start switch (mounted to OVENPAK® Burner)
  - Air filter assembly
- MAXON main gas shut-off valve, position “L”, 115/60VAC
- MAXON main gas “blocking” shut-off valve, position “L”, 115/60VAC00000000

Factory pre-wiring includes the following components for 115 volts 60 hertz AC:

- Low fire start switch
- Combustion air pressure switch
- Combination high and low gas pressure switch
- Pilot gas solenoid valve
- Normally-open vent solenoid valve (when used)
- Spark ignition transformer
- MAXON “main” and/or “blocking” gas shut-off valve(s)
- NEMA type 12 and 13 junction box with terminal wiring strip

Field wiring is required:

- To the packaged system's junction box wiring strip
- To the Model “400” OVENPAK® Burner's combustion air blower motor
- Between your flame safeguard relay and the OVENPAK® Burner's flame sensor

NOTE: A flame rod may be furnished by MAXON; UV detector is a part of the control package when supplied by MAXON or may be supplied by others.

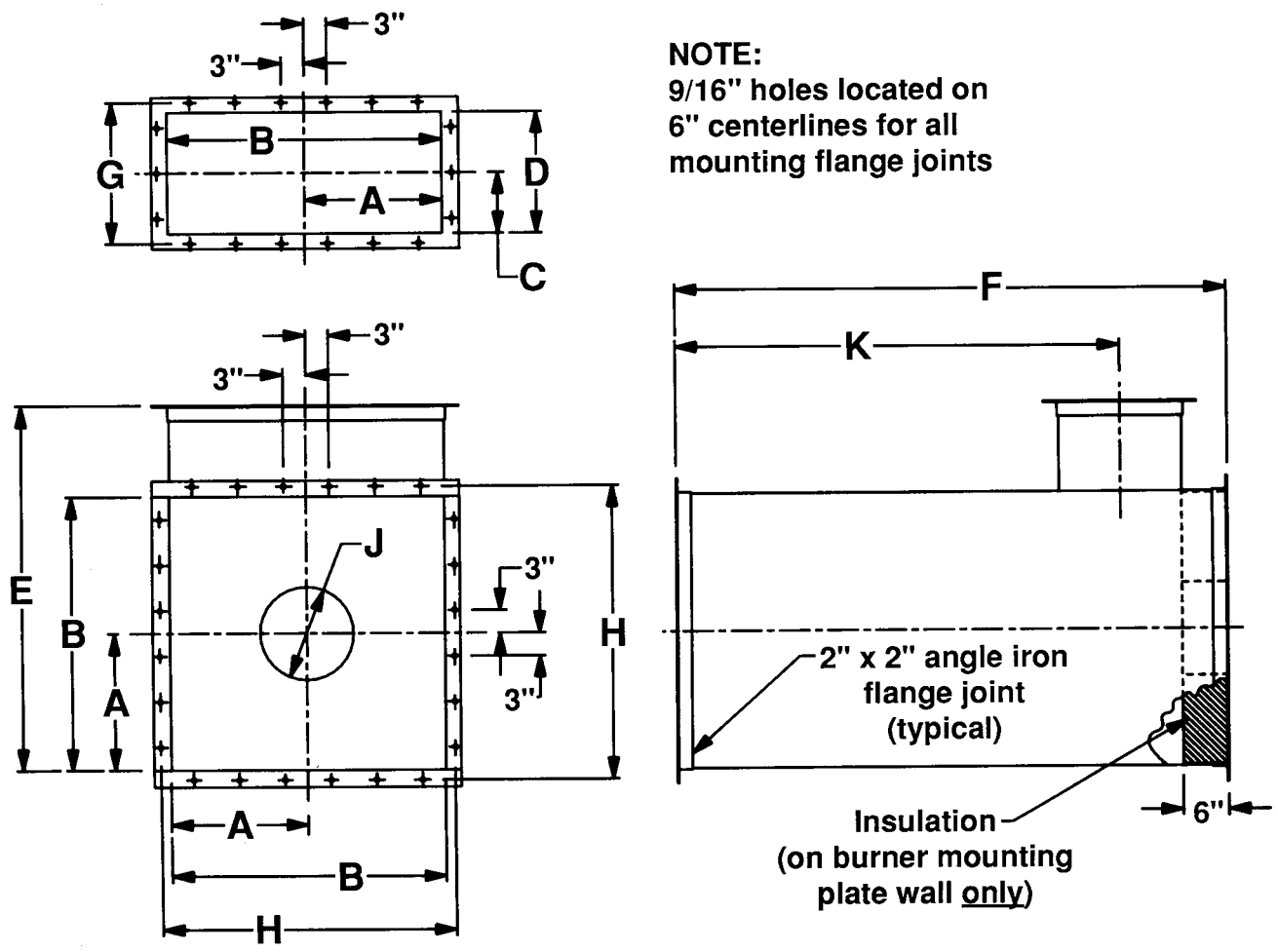
- Other field wiring connections may be required if your control circuit includes high/low temperature limits, automatic temperature controller, and/or other miscellaneous safety limit switches.

MAXON PACKAGED HEATER/DUCT SECTIONS

Reduce your fabrication time with a complete combustion heater/duct including the prewired and prepiped Model "400" OVENPAK® Burner system package.

Easy installation is provided by flanged duct connection joints. Burner is mounted to a .312" mild steel wall, lined with 6" thick fiber insulation. The other 16 gauge aluminized steel heater/duct walls are ready for your insulation.

Application flexibility is offered by three sizes of ducts. All sizes can be fabricated to have return/inlet opening at any 90° increment position (viewing from the back of the OVENPAK® Burner). Continuous welds on all joint seals permit duct section installation on pressure-side or suction-side applications.



Approximate duct section dimensions (in inches)

Model	A	B (inside)	C	D (inside)	E	F	G	H	J (inside)	K
405 - 408	12	24	5	10	36	48	12.62	26.62	7.5	37
415	15	30	6	12	42	60	14.62	32.62	9.5	48
425 - 435	18	36	8	16	48	72	18.62	38.62	11.5	58

MAXON PACKAGED HEATER/DUCT SECTIONS DESIGN AND APPLICATION DETAILS

Maximum discharge temperature 600°F (316°C)

Duct static pressures may range between +2" wc and -5" wc

Optimum design parameters permit up to 3000 feet per minute air velocity through return/inlet duct.

Recommended maximum discharge air volumes

Model "400" OVENPAK® Burner	**405**	**408**	**415**	**425**	**435**
Maximum discharge air volume in SCFM	5000			7500	12,000

To select your packaged system, specify:

1. Quantity _____
2. Model "400" OVENPAK® Gas Burner Assembly _____, for natural gas
   - Arranged ❑ for UV detector, or ❑ with flame rod
   - Furnished with blower motor for _____ AC

❑ With low fire start switch _____ , General Purpose, 115/60 AC
❑ With combustion air filter assembly _____ (optional)
❑ With connecting base and linkage assembly _____ to adapt customer's automatic electric control motor.
Specify/select which one of these electric operators will be used:

- q Barber-Colman #EA51–58, also with prefix MC, MP or MF
- q Honeywell #M644, #M744, #M941, or #M944
- q Penn/Johnson #M-80 or #M81

3. Arranged into pre-assembled and wired pipe train package, 115/60VAC,

❑ With Block and Bleed arrangement assembly _____.

4. With _____ ❑ 1-1/4" or ❑ 1-1/2" MAXON Series _____ ❑ Automatic Reset, ❑ Manual Reset Shut-Off Valve(s), for natural gas, in top assembly position "L" for 115/60VAC

❑ With electrical terminal block (option)
❑ With ❑ 6 second, or ❑ 2.5 second opening time (automatic reset valve(s) only)
❑ With _____ auxiliary signal switch(es) (optional)

NOTE: Specify which switch(es) go in main valve and which switch(es) in blocking valve, if different.

5. With heater/duct section assembly _____ (optional)
with return/inlet duct positioned on ❑ top, ❑ right, bottom, or ❑ left

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