

## KINEMAX MEDIUM VELOCITY GAS BURNERS

### TECHNICAL INFORMATION

- Exit velocities up to 275 ft/s (190 miles/h) (300 km/h (85 m/s)) to promote workload heat penetration and better furnace temperature uniformity
- Operate on-ratio, with excess fuel or with excess air to meet the specific demands of your combustion process needs
- Burns most clean, low pressure gaseous fuels
- Turndown capability up to 48:1
- Maximum application flexibility with 5 different sizes and maximum capacities ranging from 0.38 MBtu/h up to 8.0 MBtu/h (110 kW up to 2348 kW)
- Lower fuel consumption using preheated combustion air (up to 800 °F (425 °C))
- Refractory block for chamber temperatures up to 3000 °F (1650 °C)
- Removable backplate, providing access for easy inspection and/or maintenance
- KINEMAX® burners can be used with oxygen enriched combustion air



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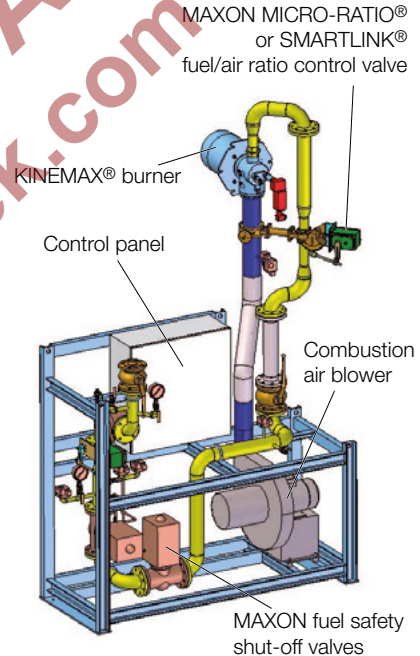
# 1 Application



The KINEMAX® burner is a nozzle-mixing, medium velocity burner. It provides a stream of hot combustion gases that promote circulation within your furnace, improving both temperature uniformity and workload penetration. The air/fuel mixing design allows for the burner to be operated on ratio throughout the firing range, with excess air up to 4700% for some sizes or with excess fuel. Series G KINEMAX® Burners are designed to operate on natural gas, propane, butane or hydrogen but can burn other gaseous fuels as well. In high temperature furnaces KINEMAX® burners can be used wherever good temperature uniformity without flame impingement is required. Among the typical applications are oxidizers, forge furnaces, annealing furnaces, melting furnaces, lehrs, kilns, ceramic furnaces, etc. They can also be used in certain air heating applications. Special considerations have to be taken to protect the flame from high cross velocities. Contact MAXON for more details.

## 1.1 Application examples

KINEMAX® burners are designed to be used in high temperature furnaces. They are commonly applied on heat treatment furnaces, oxidizers, melting furnaces, ceramic furnaces and other high temperature applications.



*KINEMAX® Size 4 gas only burner in a complete system with burner control panel and natural gas pipe-train, including MAXON fuel safety shut-off valves and MAXON gas/air ratio control valve.*

## 2 Certification

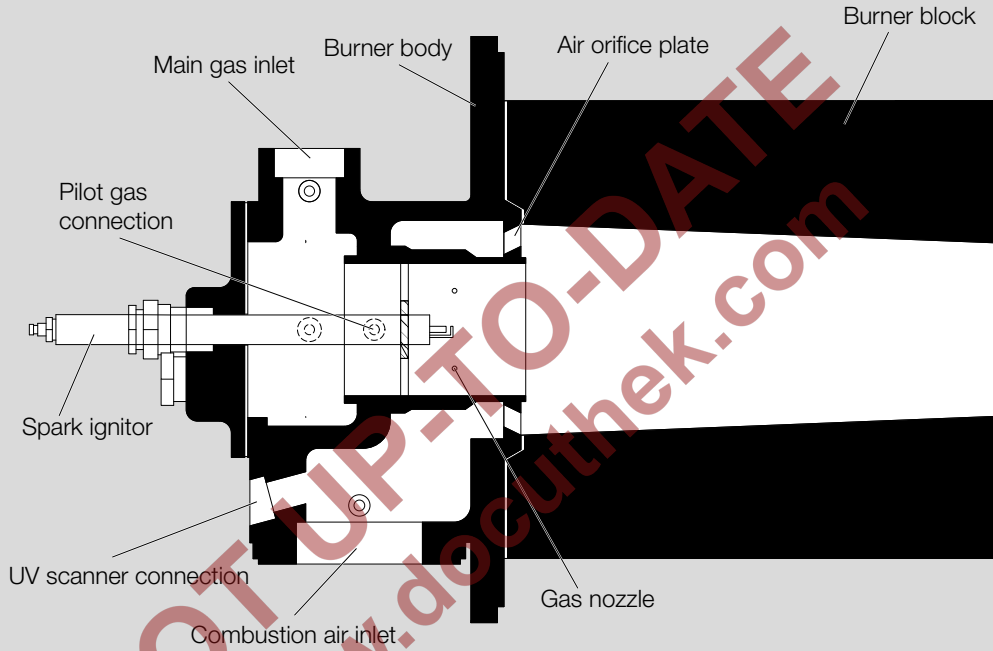
### Eurasian Customs Union



The products KINEMAX meet the technical specifications of the Eurasian Customs Union.

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### 3 Function



Combustion air enters the burner body and is swirled out into the burner block through the internal air orifice plate. Low pressure gas enters the burner body and exits to the block through machined ports in the gas nozzle.

The gas and air are intimately mixed in the cast burner block tunnel. The spark ignitor is positioned to intersect the fuel/air mixture directly in front of the nozzle face.

Pilot gas is introduced directly behind the gas ports in the gas nozzle and essentially flows through to the burner block through the same ports as does the main gas. The pilot capacity is the minimum firing rate of the KINEMAX® burner.

## 4 Selection

The KINEMAX® burner is available in different sizes to cover a broad range of capacities to suit all heating applications. All burners are available in ANSI and ISO version. Connections larger than 2" are available as threaded or flanged.

### 4.1 Typical burner data

#### Imperial

The burner can be operated with different fuels.

Fuel choices:

- natural gas at 60 °F with 1000 Btu/ft<sup>3</sup>(st) HHV - sg = 0.6\*
- 20% hydrogen, 80% natural gas at 60 °F with 862 Btu/ft<sup>3</sup>(st) HHV - sg = 0.493\*

Combustion air : 60 °F - 21% O<sub>2</sub> - 50% Humidity - sg = 1.0\*.

Stated pressures are indicative - actual pressures are function of air humidity, altitude, type of fuel, gas quality

\*sg (specific gravity) = relative density to air (density air = 0.0763 lb/ft<sup>3</sup>(st)).

#### Capacities

Capacities		Burner size												
		1.5 Series G			2 Series G			3 Series G			4 Series G			6 Series G
Maximum	MBtu/h	0.375	0.47	0.55	0.7	0.88	1.0	1.6	2.0	2.4	2.7	3.4	4.0	8.0
Maximum with 497 °F preheated combustion air	MBtu/h	0.245	0.305	0.355	0.455	0.57	0.65	1.04	1.34	1.56	1.75	2.205	2.6	5.2
On-ratio pilot / min.	kBtu/h	30			30			40			50			300
Pilot/minimum with 75% excess air**	kBtu/h	20			20			25			30			200
Turndown ratio with 75% excess air		27.5:1			50:1			96:1			133:1			40:1

\*\* Pilot gas must be regulated separately to 3 "wc - 4 "wc at pilot inlet. For light off with full excess air, pilot must be increased to the indicated main burner minimum capacity, requiring considerably higher gas pressures.

Pressure (natural gas)

Combustion air and gas differential pressure are measured between burner test connections and combustion chamber pressure.

Pressure		Burner size												
		1.5 Series G			2 Series G			3 Series G			4 Series G			6 Series G
Max. capacities	MB-tu/h	0.375	0.47	0.55	0.7	0.88	1.0	1.6	2.0	2.4	2.7	3.4	4.0	8.0
Combustion air diff. pressure	"wc	12	19	26	12	19	26	12	19	26	12	19	26	26
Differential gas pressure required for max capacity	"wc	2	3.1	4.2	2.1	3.2	4.2	1.8	2.8	3.8	1.5	2.3	3.2	6.2

Pressure (hydrogen and natural gas mix)

Combustion air and gas differential pressure are measured between burner test connections and combustion chamber pressure.

Pressure		Burner size												
		1.5 Series G			2 Series G			3 Series G			4 Series G			6 Series G
Max. capacities	MB-tu/h	0.375	0.47	0.55	0.7	0.88	1.0	1.6	2.0	2.4	2.7	3.4	4.0	8.0
Combustion air diff. pressure	"wc	11.52	18.24	24.96	11.52	18.24	24.96	11.52	18.24	24.96	11.52	18.24	24.96	24.96
Differential gas pressure required for max capacity	"wc	2.2	3.4	4.6	2.3	3.5	4.6	2.0	3.1	4.2	1.7	2.5	3.5	6.9

Combustion air volume for max. capacity (natural gas)

		Burner size												
		1.5 Series G			2 Series G			3 Series G			4 Series G			6 Series G
Max. capacities	MB-tu/h	0.375	0.47	0.55	0.7	0.88	1.0	1.6	2.0	2.4	2.7	3.4	4.0	8.0
Combustion air volume for max. capacity (no excess air)	scfm	60	75	88	112	141	160	256	320	384	432	544	640	1280

Combustion air volume for max. capacity (hydrogen and natural gas mix)

		Burner size												
		1.5 Series G			2 Series G			3 Series G			4 Series G			6 Series G
Max. capacities	MB-tu/h	0.375	0.47	0.55	0.7	0.88	1.0	1.6	2.0	2.4	2.7	3.4	4.0	8.0
Combustion air volume for max. capacity (no excess air)	scfm	58.8	73.5	86.2	109.8	138.2	156.8	250.9	313.6	376.3	423.4	533.1	627.2	1254.4

Performance limits with full excess air

Pressure		Burner size													
		1.5 Series G			2 Series G				3 Series G			4 Series G			6 Series G
Max. capacities	MB-tu/h	0.375	0.47	0.55	0.7	0.88	1.0	1.6	2.0	2.4	2.7	3.4	4.0	8.0	
Percent excess air	%	1800	2200	2600	2700	3400	3900	3100	3900	4700	2600	3300	3900	3900	
Turndown ratio with full excess air		11:1	13:1	16:1	20:1	25:1	29:1	32:1	40:1	48:1	27:1	34:1	40:1	16:1	
Minimum capacity to light burner	kBtu/h	35			35			50			100			500	



Flame Geometry

Flame lengths measured from the end of the burner block at maximum rated capacity. Overfiring or excess fuel operation requires higher natural gas supply pressures and gives longer flame lengths.

Pressure		Burner size												
		1.5 Series G			2 Series G			3 Series G			4 Series G		6 Series G	
Max. capacities	MB-tu/h	0.375	0.47	0.55	0.7	0.88	1.0	1.6	2.0	2.4	2.7	3.4	4.0	8.0
Length	in.	4	6	8	8	10	14	12	18	24	24	30	40	48
Diameter	in.	4	5	6	4	5	6	8	9.1	12	10	12	15	36

4.2 Typical burner data

Metric

The burner can be operated with different fuels.

Fuel choices:

- natural gas at 60 °F with 1000 Btu/ft³(st) HHV - sg = 0.6\*
- 20% hydrogen, 80% natural gas at 60 °F with 862 Btu/ft³(st) HHV - sg = 0.493\*

Combustion air : 15 °C - 21 % O2 - 50 % humidity - sg = 1.0\*.

Stated pressures are indicative - actual pressures are function of air humidity, altitude, type of fuel, gas quality

\*sg (specific gravity) = relative density to air (density air = 1.293 kg / Nm³).

Capacities

Capacities		Burner size												
		1.5 Series G			2 Series G			3 Series G			4 Series G			6 Series G
Maximum	kW (Ho)	110	142	161	205	265	294	470	602	704	793	1024	1174	2348
Maximum with 497 °F preheated combustion air	kW (Ho)	72	92	104	133	172	190	305	393	457	513	665	762	1524
On-ratio pilot / min.	kW (Ho)	9			9			12			15			88
Pilot/minimum with 75% excess air**	kW (Ho)	6			6			7			9			59
Turndown ratio with 75% excess air		27.5:1			50:1			96:1			133:1			40:1

\*\* Pilot gas must be regulated separately to 7.5 mbar - 10 mbar at pilot inlet. For light off with full excess air, pilot must be increased to the indicated main burner minimum capacity, requiring considerably higher gas pressures.

Pressure (natural gas)

Combustion air and gas differential pressure are measured between burner test connections and combustion chamber pressure.

Pressure		Burner size												
		1.5 Series G			2 Series G			3 Series G			4 Series G			6 Series G
Max. capacities	kW (Ho)	110	142	161	205	265	294	470	602	704	793	1024	1174	2348
Combustion air diff. pressure	mbar	30	50	65	30	50	65	30	50	65	30	50	65	65
Differential gas pressure required for max capacity	mbar	5	8	10	5	8	10	4	7	9	4	6	8	15

Pressure (hydrogen and natural gas mix)

Combustion air and gas differential pressure are measured between burner test connections and combustion chamber pressure.

Pressure		Burner size												
		1.5 Series G			2 Series G			3 Series G			4 Series G			6 Series G
Max. capacities	kW (Ho)	110	142	161	205	265	294	470	602	704	793	1024	1174	2348
Combustion air diff. pressure	mbar	28.8	48	62.4	28.8	48	62.4	28.8	48	62.4	28.8	48	62.4	62.4
Differential gas pressure required for max capacity	mbar	5.6	8.6	11.7	5.8	8.9	11.7	5.1	7.9	10.7	4.3	6.6	8.9	12.4

Combustion air volume for max. capacity (natural gas)

		Burner size												
		1.5 Series G			2 Series G			3 Series G			4 Series G			6 Series G
Max. capacities	kW (Ho)	110	142	161	205	265	294	470	602	704	793	1024	1174	2348
Combustion air volume for max. capacity (no excess air)	m³(st)/h	102	132	150	191	246	272	436	560	655	736	951	1091	2182

Combustion air volume for max. capacity (hydrogen and natural gas mix)

		Burner size												
		1.5 Series G			2 Series G			3 Series G			4 Series G			6 Series G
Max. capacities	kW (Ho)	110	142	161	205	265	294	470	602	704	793	1024	1174	2348
Combustion air volume for max. capacity (no excess air)	m³(st)/h	99.96	129.36	147.00	187.18	241.08	266.56	427.28	548.8	641.9	721.28	931.98	1069.18	2138.36

Performance limits with full excess air

Pressure		Burner size												
		1.5 Series G			2 Series G			3 Series G			4 Series G			6 Series G
Max. capacities	kW (Ho)	110	142	161	205	265	294	470	602	704	793	1024	1174	2348
Percent excess air	%	1800	2200	2600	2700	3400	3900	3100	3900	4700	2600	3300	3900	3900
Turndown ratio with full excess air		11:1	13:1	16:1	20:1	25:1	29:1	32:1	40:1	48:1	27:1	34:1	40:1	16:1
Minimum capacity to light burner	kW (Ho)	10			10			15			29			147

Flame Geometry

Flame lengths measured from the end of the burner block at maximum rated capacity. Overfiring or excess fuel operation requires higher natural gas supply pressures and gives longer flame lengths.

Pressure		Burner size												
		1.5 Series G			2 Series G			3 Series G			4 Series G			6 Series G
Max. capacities	kW (Ho)	110	142	161	205	265	294	470	602	704	793	1024	1174	2348
Length	mm	100	150	200	200	250	360	300	460	610	610	760	1000	1200
Diameter	mm	100	130	150	100	130	150	200	250	300	250	300	380	910

4.3 Assembly Numbers

4.3.1 Product numbers

For these products, please order the following product numbers: (configured products are those with alphanumeric text)

KINEMAX® Burners	Series G Gas Only**				
	1.5"	2"	3"	4"	6"
Complete Burner Assemblies*	0150KM	0200KM	0300KM	0400KM	0600KM

\* Refer to page 16 (Standard refractory materials) for alternate materials at net extra charge  
\*\* Complete Series C Gas/Oil burner assemblies are no longer available. Spare parts to support these burners are available in the table page 21 (Spare Parts and Accessories)

4.3.2 Segment Choice Detail

Segment Name	Segment Description	Segment Choices (DEFAULT is shaded)	Segment Choice Description
COMBUSTION AIR INLET FLANGE		NO	Choice not selected
		YES	Choice selected
AIR CONNECTION TYPE	Choice of air connection type	ANSI_THRD	ANSI threaded inlet flange
		ISO_THRD	ISO threaded inlet flange
		NONE	No inlet flange
GAS CONNECTION TYPE	Choice of gas connection type	ANSI_THRD	ANSI threaded
		ISO_THRD	ISO threaded
PILOT ORIFICE	Choice of pilot orifice	NO	Choice not selected
		YES	Choice selected
FLAME DETECTION	Choice of flame detection device	FR*	Flame rod
		NONE	No device chosen
		UV	UV scanner provision
BLOCK MATERIAL	material	NONE	No block (for Shanghai only)
		SS	Stainless steel discharge sleeve
		3000	3000F max block temp limit
BLOCK LENGTH	Choice of block length	EXT*	Extended

## Selection

Segment Name	Segment Description	Segment Choices (DEFAULT is shaded)	Segment Choice Description
		NONE	No block (for Shanghai only)
		STD	Standard
SEAL AND SUPPORT	Choice of seal and support material	CS*	Carbon steel seal and support
		NONE	No seal and support
		SS	Stainless seal and support
MOUNTING FLANGE*	Instructions for mounting flange	L	Shipped loose
		N	No mounting flange
		W	Flange welded to S&S
MOUNTING FLANGE GAS-KET*	Choice of mounting flange	NO	Choice not selected
		YES	Choice selected
TEST CONNECTION KIT (COMB AIR)	Choice of combustion air test connection kit	NO	Choice not selected
		YES	Choice selected
TEST CONNECTION KIT (GAS)	Choice of gas test connection kit	NO	Choice not selected
		YES	Choice selected
ORIFICE PLATE**	Choice of orifice plate	LPLT	Low pressure low twist
		STD	Standard
NOZZLE BODY FLANGE GAS-KET	Choice of nozzle body flange gasket	NO	Nzl bdy flg gskt not needed
		YES	Pull nozzle body flange gskt
TEMPERATURE (F)	temperature	450	450F maximum rating
		800	800F maximum rating

\* Not available for 6G burners

\*\* For 3" and 4" burners only

4.4 Standard refractory materials

Standard refractory materials (part #29271)

Maximum operating temperature limit, established by Maxon, is 2600°F (1427°C) for these forward flame type burners where increased block temperature results from flame proximity. Downrating to 2400°F (1360°C) may be necessary if fiber walls and/or frequent cycling are present to reduce thermal shock and stress.

Alternate refractory materials (part #34695)

Maximum operating temperature limit, established by Maxon, is 2800°F (1538°C). Downrating to 2550°F (1399°C) may be necessary for same reasons shown above.

Alternate refractory materials (part #34696)

Maximum operating temperature limit, established by Maxon, is 3000°F (1649°C). Downrating to 2700°F (1482°C) may be necessary for same reasons shown above.

Chemical Analysis of Various Castable Block Materials

Maxon Assembly No.	29271				34695	34696	
Material Trade Name:	LOCEM 30/50X	MIZZOU and MIZZOU PLUS	PUROCAST N	MOROCAST 3000 HS	KRUZITE and KRUZITE PLUS	PUROTAB COARSE	GREENCAST 97 and GREENCAST 97 PLUS
Silica	50.7%	29 - 32%	30.4%	40.1%	15 - 19%	0.1%	0.1%
Alumina	44.5%	60 - 63%	62.7%	53.3%	74 - 78%	96.6%	97 - 97.5%
Titania	1.2%	1 - 2%	2.2%	1.9%	1.5 - 2.5%	-	-
Iron Oxide	1.2%	1 - 2%	1%	1%	1 - 2%	0.1%	0.1 - 0.2%
Lime	1.7%	3 - 4%	2.8%	3.1%	1.3 - 2.3%	2.7%	2 - 2.5%
Magnesia	0.2%	0.1 - 0.6%	0.2%	0.2%	0.1 - 0.6%	0.1%	0.1%
Alkalies	0.4%	0.3 - 0.8%	0.3%	0.3%	0.3 - 0.8%	0.1%	0.1 - 0.3%



4.5 Burner discharge sleeves

Burner discharge sleeves are available in different lengths and materials:

- **standard version** with refractory block for installation in refractory walls, available in different lengths.
- **complete with block sleeve** to provide additional block support in chamber walls of softwall constructions. Block sleeves are available in stainless or carbon steel.

- **complete with stainless steel discharge sleeve** offering lightweight refractory-less burner for use in air heating applications. Maximum upstream temperature is 1000 °F and maximum downstream temperature for this configuration is 1500 °F
- Optional mounting flange enables easy mounting in cases where the standard or extended block lengths do not comply with installation insulation thickness.

KINEMAX® size	Standard version (block/ no sleeve)		Block with carbon steel sleeve		Block with stainless steel sleeve		Stainless steel sleeve (no block)
	standard	extended	standard	extended	standard	extended	
G-1.5	x	x	xo		xo	xo	x
G-2	x	x	xo		xo	xo	x
G-3	x	x	xo		xo	xo	x
G-4	x	x	xo		xo	xo	x
G-6	x				x		x

## 5 Project planning information

### 5.1 Maximum capacities

All KINEMAX® burners can be fired on-ratio, excess gas (40%) or with excess air (depending on size, up to 4700%). Performance data, see page 6 (Selection)

Maximum capacity is a function of differential air pressure supplied to the burner air inlet as read between air test connection and combustion chamber. Combustion air blower rating must be sized to allow for manifold pressure losses.

### 5.2 Preheated air

Preheated combustion air up to 800 °F (425 °C) can be accommodated by standard KINEMAX® burner, resulting in lower fuel consumptions.

The preheated combustion air can have reduced oxygen levels (as low as 17% O<sub>2</sub> if combustion air is 797 °F (425 °C)). Mixing of some low O<sub>2</sub> flue gas allows to combine system thermal efficiency with best emissions.

### 5.3 Process temperature

Standard refractory block permits operation at combustion chamber temperatures of 2600 °F (1425 °C). Special refractory block material allows operation up to 3000 °F (1650 °C). The optional stainless steel sleeve (without block) can only be used when secondary cooling air ( $t^{\circ} < 575^{\circ}\text{F}$  ( $t^{\circ} < 300^{\circ}\text{C}$ )) is available and can be forced over the combustion sleeve.

### 5.4 Piloting and ignition

KINEMAX® burners are equipped with an integrated raw gas pilot, but can use direct ignition as well. Recommended 3/8" pilot gas fine adjustment needle valve is available as an option. Pilots shall be used only for ignition of the main flame (interrupted pilot). Permanent pilot operation is not advised (no permanent or intermittent pilot). Use the main burner at minimum capacity for continuous operation. Use minimally 5000 V/200 VA ignition transformers for sparking of the spark ignitor.

Locate pilot gas valves as close as possible to the pilot burner gas inlet, to have fast ignition of the pilot burner.

### 5.5 Ratio control

KINEMAX® burners can be fired on ratio throughout the firing range or set to give a choice between on ratio and excess air or excess fuel firing. As high as 4700% excess air is possible at minimum capacity. Air / fuel ratio control can be accomplished with MAXON MICRO-RATIO® valves and SMARTLINK® technology.

## 5.6 Flame supervision

All KINEMAX® burner sizes and types can be supervised by means of a UV-scanner.

Burner design incorporates UV-scanner port suitable for supervision of both pilot and main flames.

Two scanner positions are available, see page 24 (Dimensions)

Pay attention to possible pick-up of strange flames (if any in the furnace) when using UV-scanner for flame detection.

Allow some purge or cooling air to the scanner connections (typically 70 ft<sup>3</sup>(st)/h (2 Nm<sup>3</sup>(st)/h) of fresh clean air)

Scanners should be installed as close to the burner as possible.

Sizes 1-1/2 up to 4 have a flame rod assembly option available.

## 5.7 Flame development

KINEMAX® burners shall be installed in combustion chambers or furnaces that allow full development of the burner flame. Cylindrical combustion chambers or flame protection sleeves shall be sized correctly.

Consult MAXON for proper combustion chamber layout.

## 5.8 Combustion air and gas piping

Combustion air piping to the burner shall be done in such way that the air flow to the burner will not disturb the flame. For optimum performance, the first elbow in combustion air piping must be at least six pipe diameters from burner test connection. Location of air control valves directly on the burner inlet is not advised. When possible, locate the air/gas control valves in a position that allows viewing of burner flame during adjustment. Protect control valve operator from excessive radiant and/or ambient heat.

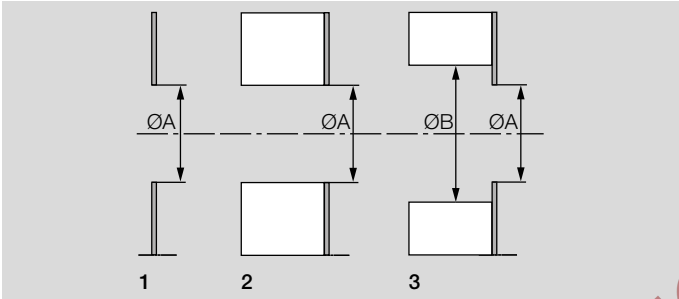
When using one air/gas control valve for multiple KINEMAX® G burners, gas check valves should be installed as close as possible to each burner inlet for dependable light off. MAXON air and gas balancing valves may be used on multi-burner installations for improving heating uniformity.

## 5.9 Oxygen enriched combustion air

MAXON KINEMAX® burners can be used with oxygen enriched combustion air.

Consult MAXON for more information.

5.10 Furnace / combustion chamber requirements



**Sketch 1 :** sheet metal combustion chamber/furnace without internal insulation. Flange/opening internal diameter shall be ØA

**Sketch 2 :**sheet metal combustion chamber/furnace with soft wall internal insulation. Flange/opening internal diameter shall be ØA

**Sketch 3 :**furnace or ovens with brick walls: opening in brick wall shall be ØB (to be rammed with castable refractory)

KINEMAX with refractory block

Dimensions in in. (mm)					
Burner size	1.5	2	3	4	6
ØA	9 (229)	9 (229)	10.5 (267)	11.3 (289)	16.4 (417)
ØB	14.5 (369)	14.5 (369)	16 (407)	16.8 (429)	21.9 (557)

KINEMAX with optional stainless steel discharge sleeve

Dimensions in in. (mm)					
Burner size	1.5	2	3	4	6
ØA	4.4 (112)	4.6 (118)	5.7 (147)	7.2 (184)	N/A
ØB	9.9 (252)	10.1 (258)	11.2 (287)	12.7 (324)	N/A

## 6 Spare Parts and Accessories

A list of spare parts can be found at PartDetective.

KINEMAX® Burners		Series G Gas Only					Series C Gas/Oil	
		1.5"	2"	3"	4"	6"	2"	6"
Flame rod kit includes ground rod and flame rod sub-assembly (A)		51427	51428	51429	51430	-	-	-
Nozzle body flange gasket (between wall & burner flange)		MX35643		MX35644	35645	MX37037	MX35643	MX37037
Back Plate Gasket (between burner back plate and burner body) For 450 °F Maximum Combustion Air Temperature		33880		33881	33882	-	-	-
Graphite Back Plate Gasket (between burner back plate and burner body) For 450 °F Maximum Combustion Air Temperature		50122177-001		50122178-001	50122179-001	-	-	-
Mounting plate (used with combustion sleeve and block only)*		MX34237		MX34238	MX34239	-	MX34237	-
Mounting plate gasket for above		MX34391		MX34392	MX34393	-	MX34391	-
Block Gasket		33889		MX33890	33891	37027	-	-
1/8" test connection kit		MX34137						
Gas swing check valve** (size) Cv flow		Cv = 21.1	-	-	Cv = 80	(3")	-	(3")
Butterfly (BV) Valves** (size) Cv flow	For air	Cv = 80	Cv = 138	Cv = 265	-	-	Cv = 138	
	For gas	Cv = 11	Cv = 18	Cv = 80	Cv = 138	-	Cv = 18	
Graphite BV Gasket				1091069	1091070	1091069		1091069
BV Gasket				29896	29894	29896		29896
Pilot gas adjustable orifice		50431						
Replacement & Spare Parts	Replacement flame rod assembly with rubber cover	51423		51425	51426	-		
	Spark ignitor sub-assembly with rubber cover	MX34042		39782		37160	39777	37160
	Rubber cover (R)	MX18722						

## Spare Parts and Accessories

KINEMAX® Burners			Series G Gas Only					Series C Gas/Oil	
			1.5"	2"	3"	4"	6"	2"	6"
	Observation glass (R)		19284						
Replacement Burner Block Sub-Assemblies*	Standard block		1099658	1098612	1099660	1099662	MX37034	50104	MX37034
	Extended block		MX35904	MX35905	MX35906	MX35907	-	MX50138	-
	Standard block & C.S. combustion sleeve		1101312	1101249	1101327	1101362	-	50139	-
	Standard block & S.S. combustion sleeve		1101314	1101250	1101328	1101363	MX37058	MX50140	MX37058
	Extended block & S.S. combustion sleeve		MX35958	MX35961	MX35964	MX35967	-	50141	-
Air body gasket							MX37028		MX37028
Air Body graphite gasket							50122180-001		50122180-001
Main Housing Gasket							MX37038		MX37038

\* Rated for 3000°F maximum

## 7 Technical data

### Materials of construction

Housing: gray iron

Gas nozzle: carbon steel

Air orifice plate: carbon steel

Block sleeve: carbon steel / AISI 304 (1.4301)

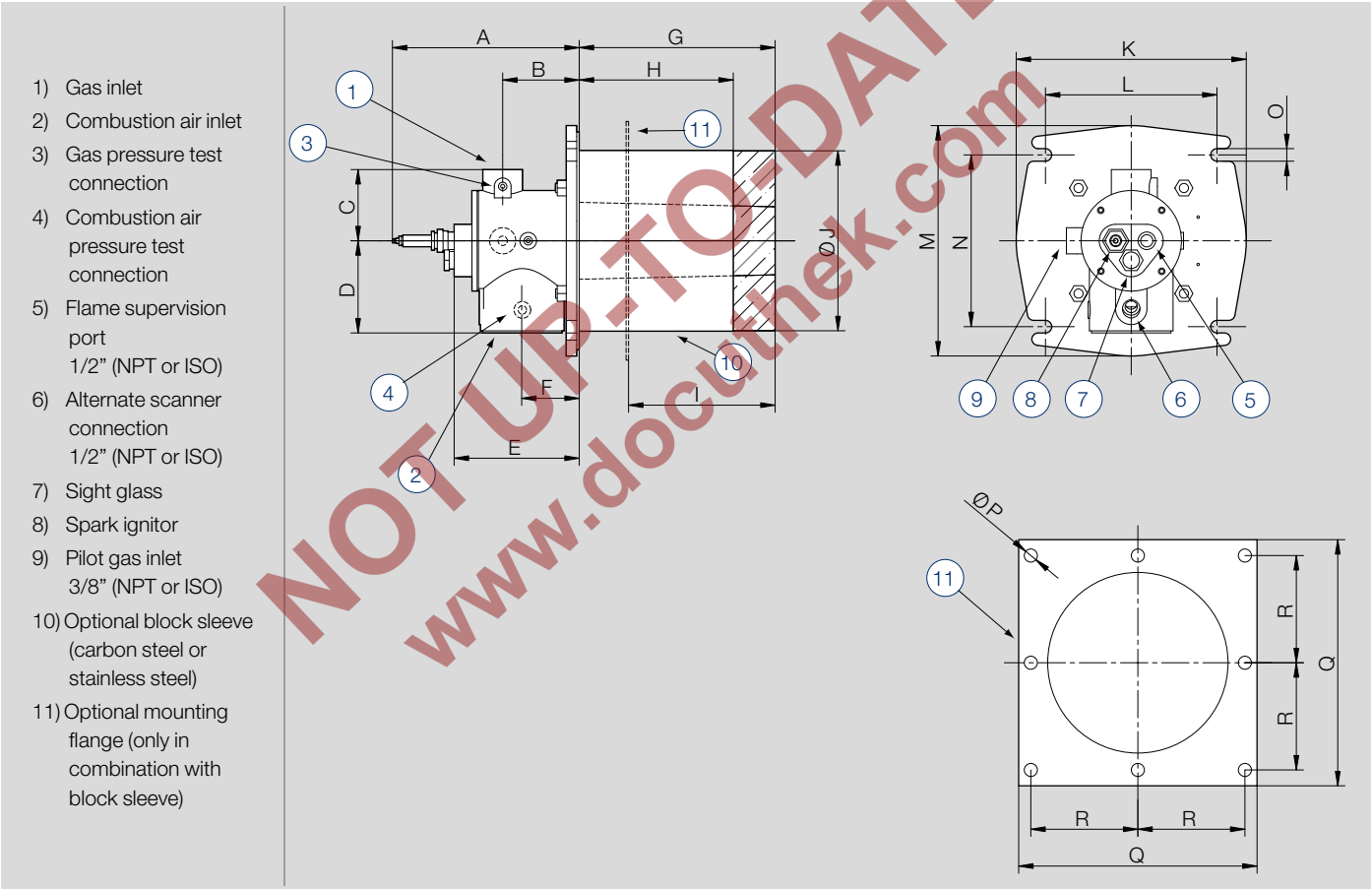
block: castable refractory

sleeve (without block): AISI 310 (1.4541)

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8 Dimensions

8.1 KINEMAX® Size 1.5 and 2 – type G  
(imperial)





Dimensions

Dimensions in in. unless stated otherwise																		
size	Gas inlet		Air inlet															
	ANSI (NPT)	ISO (Rp)	ANSI (NPT)	ISO (Rp)	A*	B	C	D	E	F	K	L	M	N	O	ØP	Q	R
1.5"	3/4	3/4	1.1/2	1.1/2	11	3.69	3.38	4.31	6	2.75	11	8.19	11	8.19	0.6	0.6	11.75	5.12
2"	1	1	2	2	11	3.69	3.38	4.31	6	2.75	11	8.19	11	8.19	0.6	0.6	11.75	5.12

\*includes clearance for removal

Dimensions in in. unless stated otherwise																	
Burner size	Carbon steel block sleeve					Stainless steel block sleeve					Stainless steel long block sleeve					Stainless steel sleeve (no block)	
	Standard block					Standard block					Extended block						
	G	H	I min.	I max.	ØJ	G	H	I min.	I max.	ØJ	G	H	I min.	I max.	ØJ	G	ØJ
1.5"	9.25	2.25	2	5	8.62	9.25	7.25	2	7.25	8.62	13.5	10	3.5	11.5	8.62	9.5	4.0
2"	9.25	2.25	2	5	8.62	9.25	7.25	2	7.25	8.62	13.5	10	3.5	11.5	8.62	9.5	4.25

- 
- Technical drawing of a 4-way solenoid valve, showing three views: side view, front view, and top view. The drawing includes dimensions and callouts for identification.
- Dimensions:**
- Side View:** A, B, H, G, C, D, E, F, I, ØJ
  - Front View:** K, L, M, N, O
  - Top View:** Q, R, ØP
- Callouts:**
- 1: Solenoid coil
  - 2: Solenoid coil mounting bracket
  - 3: Solenoid coil mounting bracket
  - 4: Solenoid coil mounting bracket
  - 5: Valve body mounting bracket
  - 6: Valve body mounting bracket
  - 7: Valve body mounting bracket
  - 8: Valve body mounting bracket
  - 9: Valve body mounting bracket
  - 10: Valve body mounting bracket
  - 11: Valve body mounting bracket

Dimensions

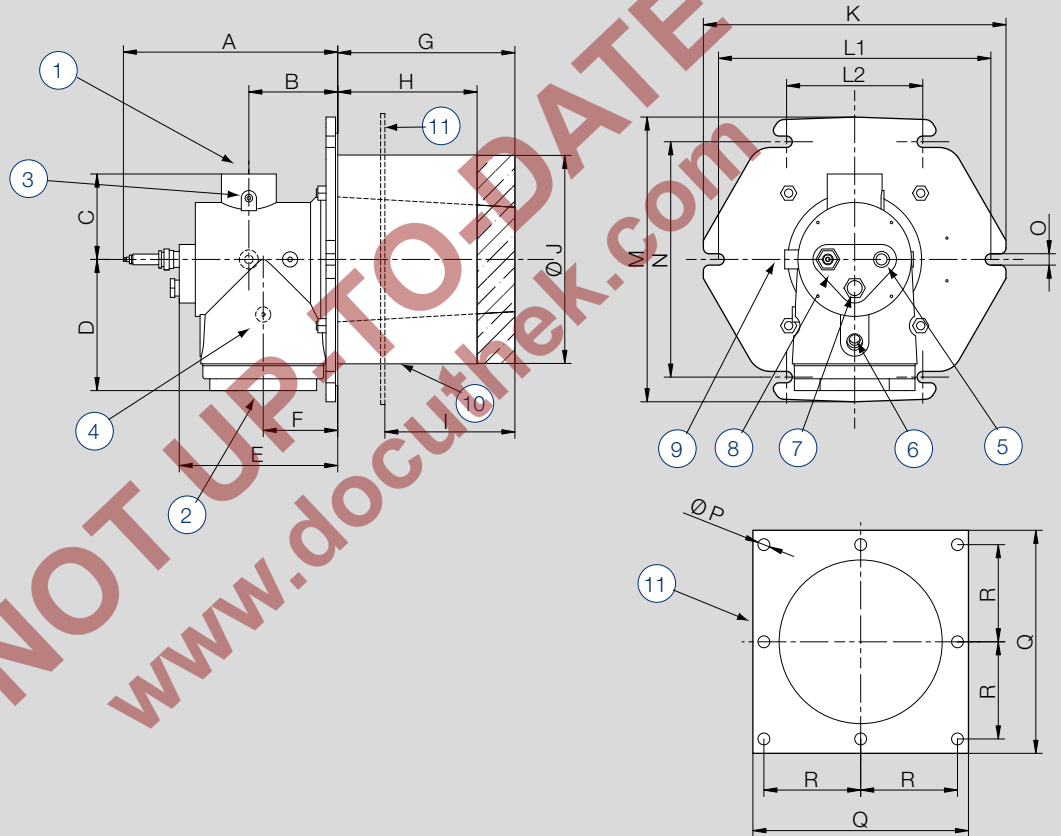
Dimensions in mm unless stated otherwise																		
Burner size	Gas inlet		Air inlet															
	ANSI (NPT)	ISO (Rp)	ANSI (NPT)	ISO (Rp)	A*	B	C	D	E	F	K	L	M	N	O	ØP	Q	R
1.5"	3/4	3/4	1.1/2	1.1/2	280	94	86	109.5	154	70	280	208	280	209	15	16	299	130
2"	1	1	2	2	280	94	86	109.5	154	70	280	208	280	209	15	16	299	130

\*includes clearance for removal

Dimensions in mm. unless stated otherwise																		
Burner size	Carbon steel block sleeve					Stainless steel block sleeve					Stainless steel long block sleeve					Stainless steel sleeve (no block)		
	Standard block					Standard block					Extended block							
	G	H	I min.	I max.	ØJ	G	H	I min.	I max.	ØJ	G	H	I min.	I max.	ØJ	G	ØJ	
1.5"	235	57	50	184	219	235	184	50	184	219	343	254	90	292	219	241	102	
2"	235	57	50	184	219	235	184	50	184	219	343	254	90	292	219	241	108	

## 8.3 KINEMAX® Size 3 and 4 – type G (imperial)

- 1) Gas inlet
- 2) Combustion air inlet
- 3) Gas pressure test connection
- 4) Combustion air pressure test connection
- 5) Flame supervision port  
1/2" (NPT or ISO)
- 6) Alternate scanner connection  
1/2" (NPT or ISO)
- 7) Sight glass
- 8) Spark ignitor
- 9) Pilot gas inlet  
3/8" (NPT or ISO)
- 10) Optional block sleeve  
(carbon steel or stainless steel)
- 11) Optional mounting flange  
(only in combination with block sleeve)



## Dimensions

### Dimensions in in. unless stated otherwise

Burner size	Gas inlet		Air inlet*																
	ANSI (NPT)	ISO (Rp)	ANSI (NPT)	ISO (Rp)	A**	B	C	D	E	F	K	L1	L2	M	N	O	ØP	Q	R
3"	1.1/2	1.1/2	3	3	14.3	4.44	4.19	6.38	7.38	3.31	15	13.88	6.62	14	11.6	0.6	0.625	13.25	5.88
4"	2	2	4	4	16	4.81	4.5	7	8.56	4.06	16	14.38	7.19	15	12.38	0.6	0.625	14.12	6.31

\* optional welding flanges are available.

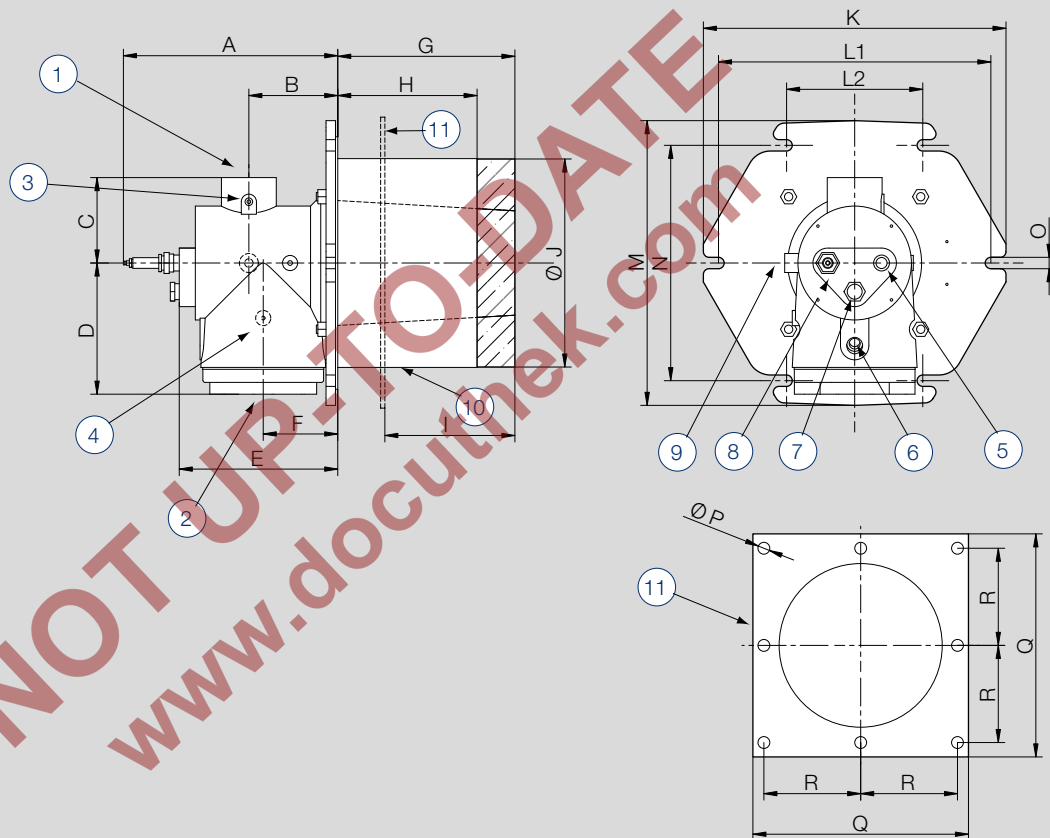
\*\* includes clearance for removal.

### Dimensions in in. unless stated otherwise

Burner size	Carbon steel block sleeve					Stainless steel block sleeve					Stainless steel long block sleeve					Stainless steel sleeve (no block)	
	Standard block					Standard block					Extended block						
	G	H	I min.	I max.	ØJ	G	H	I min.	I max.	ØJ	G	H	I min.	I max.	ØJ	G	ØJ
3"	9.25	2.25	7	7.2	10.12	9.25	7.25	2	7.25	10.12	13.5	10	3.5	11.5	10.12	9.5	5.38
4"	9.25	2.25	7	7.2	11	9.25	7.25	2	7.25	11	13.5	10	3.5	11.5	11	9.5	6.85

## 8.4 KINEMAX® Size 3 and 4 – type G (metric)

- 1) Gas inlet
- 2) Combustion air inlet
- 3) Gas pressure test connection
- 4) Combustion air pressure test connection
- 5) Flame supervision port  
1/2" (NPT or ISO)
- 6) Alternate scanner connection  
1/2" (NPT or ISO)
- 7) Sight glass
- 8) Spark ignitor
- 9) Pilot gas inlet  
3/8" (NPT or ISO)
- 10) Optional block sleeve  
(carbon steel or stainless steel)
- 11) Optional mounting flange  
(only in combination with block sleeve)



## Dimensions

### Dimensions in mm unless stated otherwise

Burner size	Gas inlet		Air inlet*																
	ANSI (NPT)	ISO (Rp)	ANSI (NPT)	ISO (Rp)	A**	B	C	D	E	F	K	L1	L2	M	N	O	ØP	Q	R
3"	1.1/2	1.1/2	3	3	365	113	106	162	187	84	381	340	168	356	295	15	16	337	149
4"	2	2	4	4	407	122	114	178	217	103	406	365	183	381	314	15	16	359	160

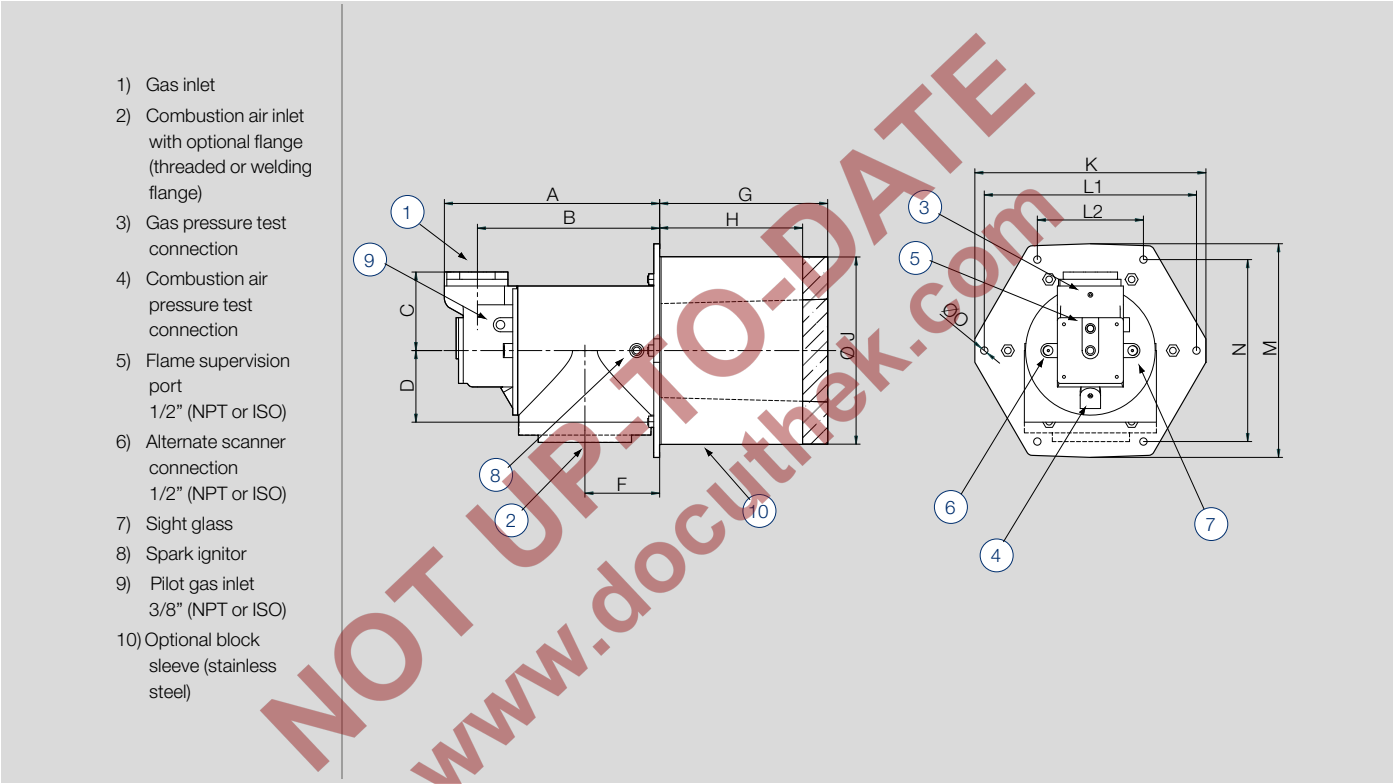
\* optional welding flanges are available.

\*\* includes clearance for removal.

### Dimensions in mm. unless stated otherwise

Burner size	Carbon steel block sleeve					Stainless steel block sleeve					Stainless steel long block sleeve					Stainless steel sleeve (no block)	
	Standard block					Standard block					Extended block						
	G	H	I min.	I max.	ØJ	G	H	I min.	I max.	ØJ	G	H	I min.	I max.	ØJ	G	ØJ
3"	235	57	178	184	257	235	184	51	184	257	343	254	89	292	257	241	137
4"	235	57	178	184	280	235	184	51	184	280	343	254	89	292	280	241	174

8.5 KINEMAX® Size 6 – type G (imperial)

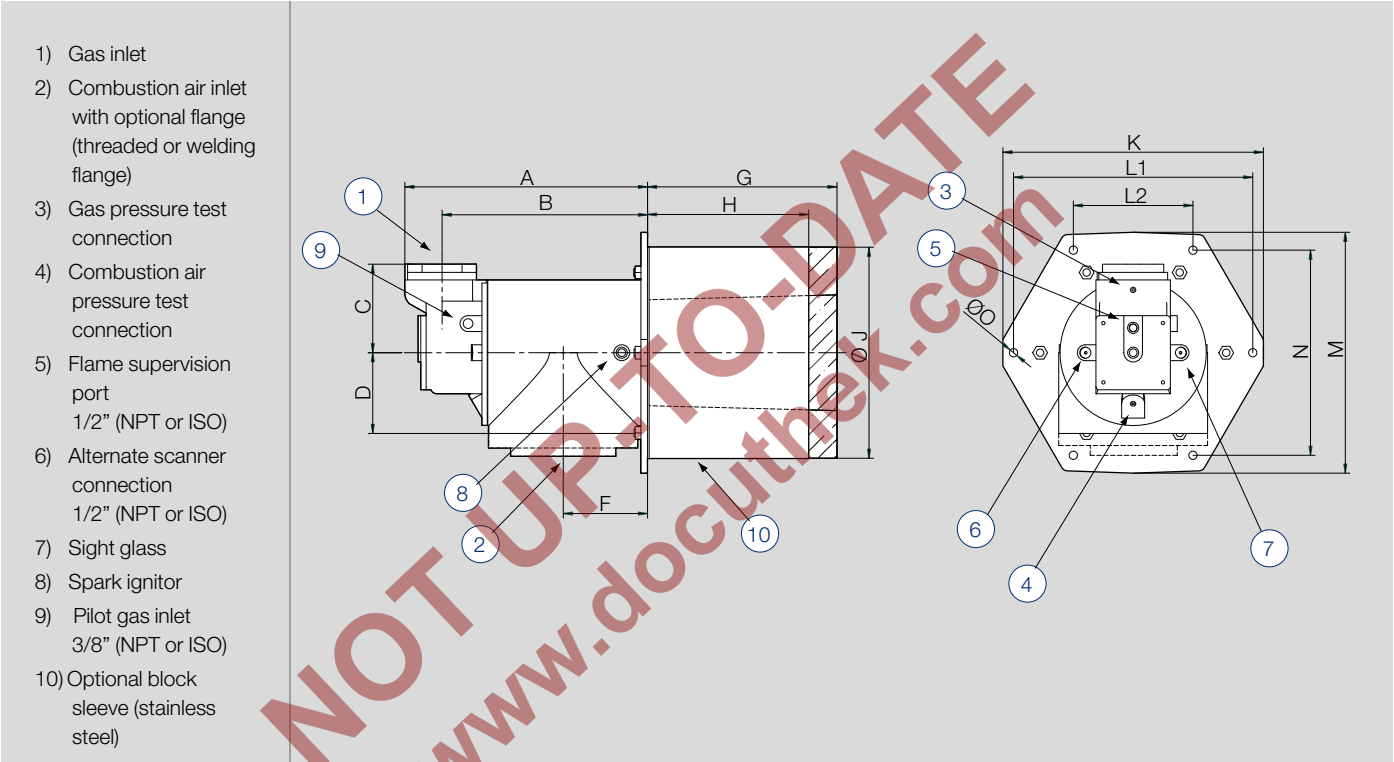


Dimensions in in. unless stated otherwise																			
Gas inlet		Air inlet*							G			ØJ							
ANSI (NPT)	ISO (Rp)	ANSI (NPT)	ISO (Rp)	A	B	C	D	F	std. block	sleeve	H	block	sleeve	K	L1	L2	M	N	O
3	3	6	6	18.25	15.5	6.55	6.10	6.31	14.25	12.5	12	16	8.38	19.62	18	9	18.19	15.5	0.625

\* 6" combustion air inlet flange available in either threaded or welding flange version.



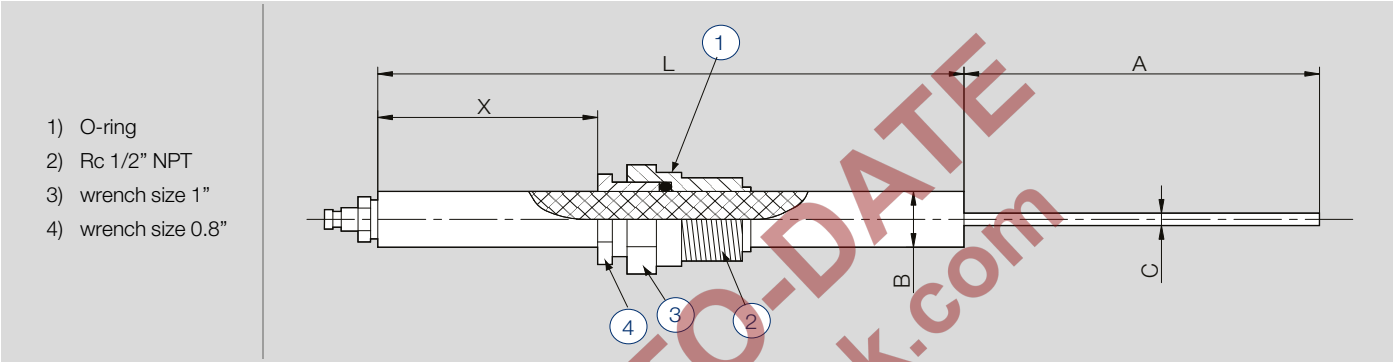
8.6 KINEMAX® Size 6 – type G (metric)



Dimensions in mm. unless stated otherwise																			
Gas inlet		Air inlet*		A	B	C	D	F	G		H	ØJ		K	L1	L2	M	N	O
ANSI (NPT)	ISO (Rp)	ANSI (NPT)	ISO (Rp)						std. block	sleeve		blocks	sleeve						
3	3	6	6	463	394	167	155	160	361	318	305	407	213	498	457	229	463	394	16

\* 6" combustion air inlet flange available in either threaded or welding flange version.

8.7 Flame rod



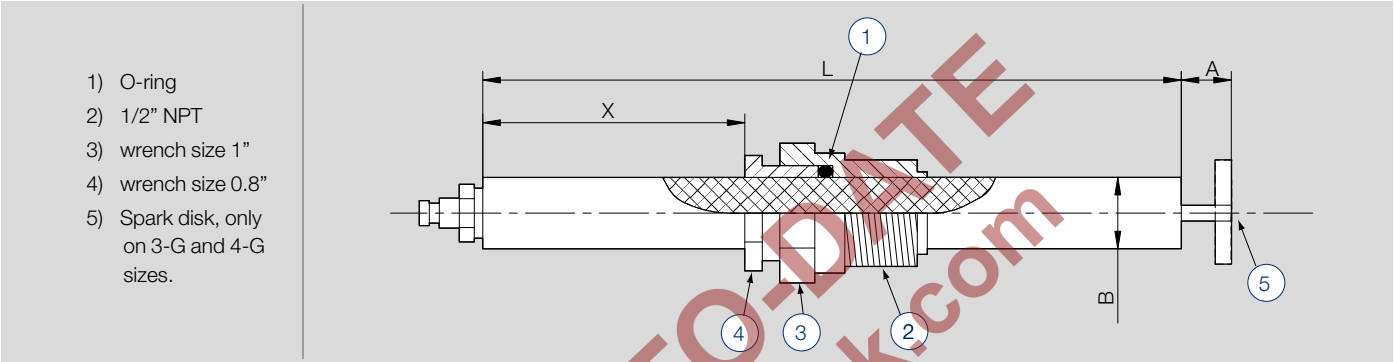
Imperial

Dimensions in in. unless stated otherwise					
Burner size	X	L	A	B	C
1.5-G	2.31	7.44	4.5	0.55	0.2
2-G	2.31	7.44	4.5	0.55	0.2
3-G	3.25	7.44	4.5	0.55	0.28
4-G	2.81	9.25	8	0.55	0.28

Metric

Dimensions in mm unless stated otherwise					
Burner size	X	L	A	B	C
1.5-G	59	191	114	14	5
2-G	59	191	114	14	5
3-G	83	235	114	14	7
4-G	71	235	203	14	7

8.8 Spark ignitor



Imperial

Dimensions in in. unless stated otherwise				
Burner size	X	L	A	B
1.5-G	1.2	6.5	0.5	0.56
2-G	1.2	6.5	0.5	0.56
3-G	2.06	8.25	0.5	0.56
4-G	1.44	8.25	0.5	0.56
6-G	fit to burner	5.5	0.5	0.56

Metric

Dimensions in mm unless stated otherwise				
Burner size	X	L	A	B
1.5-G	30	165	12.7	14.2
2-G	30	165	12.7	14.2
3-G	52	210	12.7	14.2
4-G	37	210	12.7	14.2
6-G	fit to burner	140	12.7	14.2

## 9 Maintenance

### Safety requirements

- » Regular inspection, testing and recalibration of combustion equipment according to the installation's manual are an integral part of its safety.
- » Inspection activities and frequencies shall be carried out as specified in the installation's manual.
- » Perform the following activities at least annually as part of a recommended preventative maintenance routine:
  - 1** Inspect burner internal parts for wear and oxidation, paying special attention to the refractory of the burner block (when applicable).
  - 2** Inspect associated control instruments and devices for function with particular attention to all safety permissive switches.
  - 3** Perform leak tests on fuel shut off valves according to any schedule established by the authority having jurisdiction.

### Visual inspections

- » Regular visual inspection of all connections (air and gas piping to the burner, bolting of the burner mounting flange) and burner flame shape and aspect are essential for safe operation.

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